ARCHITECTURE

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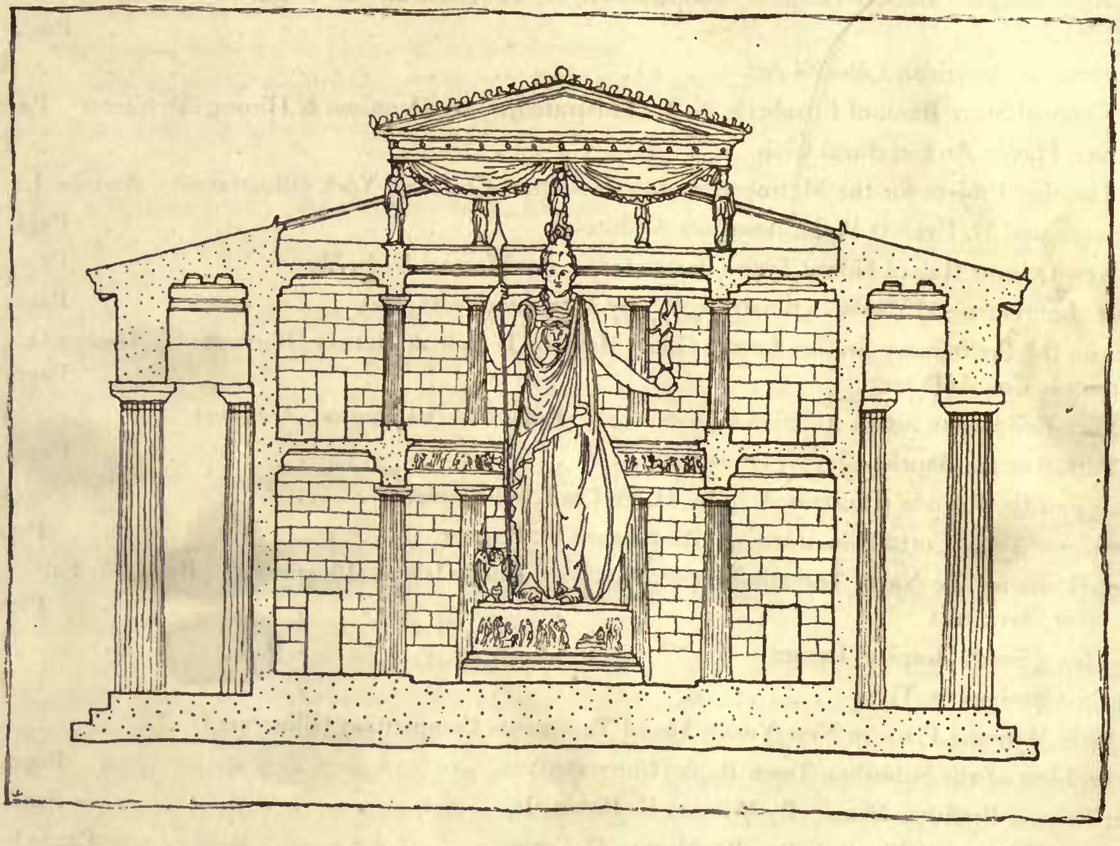

ARCHITECTVRE

·THE· PROFESSIONAL · ARCHITECTVRAL · MONTHLY·

Vol. XLV. · No. 1

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JANUARY, 1922

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PLATES AND ILLUSTRATIONS

Architecture, edited in the interest of the profession, is published the fifteenth of every month by Charles Scribner's Sons (Charles Scribner, President), Fifth Avenue at 48th Street, New York.

Price, mailed flat to any address in the United States, Mexico, or Cuba, $5.00 per annum in advance, $1.00 a number; to Canada, $6.00 per annum; to any foreign address, $7.00 per annum.

Entered as Second-Class Matter, March 30, 1900, at the Post-Office at New York, N. Y., under the Act of March 2, 1879.

LAFAYETTE MEMORIAL, PROSPECT PARK, BROOKLYN, N. Y.

Daniel Chester French, Sculptor. Henry Bacon, Architect.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV JANVARY, 1922 NO. 1

Puritan Architecture

By Murray P. Corse

I


Governor Bradstreet House. The chimney alone is of the seventeenth century; the rest was altered in Georgian period, when pitch of roof was lowered, as may be seen by examining chimney.

HAVING occasion, recently, to write a brother architect who was spending his vacation on Cape Cod, I inquired casually if he knew of any seventeenth-century houses in his vicinity. His astonishing reply was to the effect that there is no such thing as seventeenth-century architecture in America. "And if there were," he added, "I can't see what interest it would be to anybody. The early settlers were too much occupied with getting settled to bother with architecture or any other art."

That even an architect should ignore this most interesting period convinced me of the need for more light. We have been deluged, unfortunately, with such a mass of literature on "styles" that anything further may receive scant welcome; nevertheless, there ought to be a revival of interest in the work of our ancestors. It has more qualities than one to recommend it; among them simplicity, dignity, virility; above all, it is essentially American. The present moment, moreover, when we find that owing to the cost of building a real distinction in architecture is increasingly difficult to attain, yet feel an ever-increasing disgust for the lack of it, is particularly appropriate for such a revival.

"By seventeenth century," my friend went on to ask, "don't you really mean what the Italians do, *i. e.*, the seventeen hundreds, ending in 1799?" That there may be no misunderstanding, let us clearly state at once that I mean nothing of the sort; but, on the contrary, the previous century, beginning with the first settlement at Plymouth (1620) and ending somewhere around 1699. That the dates are merely approximate goes without saying. The oldest house that we possess, the Fairbanks House at Dedham, is claimed for 1634; at the other extremity the style merges into that of the succeeding epoch, the Georgian.

From the Plymouth colony, the first to be settled, we were shown some interesting material in Mr. Baum's recent articles. From Salem, however, which followed soon after (1626–28), and its immediate neighbors, Danvers, Saugus, Topsfield, we will obtain the great wealth of our material. These places were colonized by the Puritans, people better endowed with the goods of this world than the earlier arrivals, known as Pilgrims, who landed on Plymouth Rock. Large and dignified residences were erected as early as the middle of the century, and many of these have come down to us in a fair state of preservation. Boston was colonized in 1630, but little there remains of our period. Five years later the Connecticut Valley began to be settled, partly by members of the older colonies who were dissatisfied with the strict religious supervision. Connecticut and Rhode Island, however, have a history quite their own. Their early architecture is fully treated in the interesting books of Messrs. Isham and Brown. To the Bay colonies, therefore, let us devote our entire attention, with such exceptions as will be necessary to fill out gaps; and indeed, if we suffer at all, it will be from too great wealth of material.

To these colonies, moreover, the term Puritan, which I use in default of a better, is particularly appropriate. During the greater part of the seventeenth century, it must be borne in mind, the colonies of New England were practically self-governing; it was not until 1686 that quarrels with the English monarchy, the last of the Stuarts, brought about a revocation of their charters. Hence, a curious anomaly. In speaking of colonial architecture, one visualizes the more stately and formal work of the succeeding century, even down to 1820. And yet part of that period comes under the republic; none of it is really colonial. The term, however, like Gothic, applied to an art with which the Goths had nothing whatever to do, is so generally accepted that a change could only make for confusion.

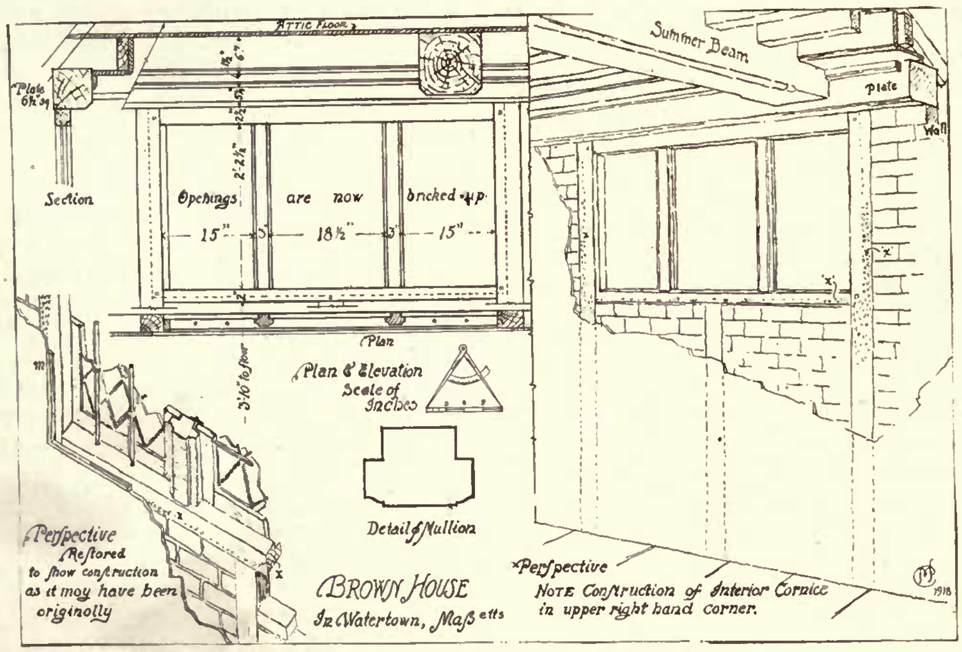
The most striking characteristic of the earlier period is the very absence of features so closely associated with the more pronounced architectural styles. One would look in vain for pilaster, pediment, or other classical detail (except certain mouldings) in any building that can be accurately dated prior to 1690. Yet how rapidly they crop up immediately after. Nor is it possible to discover the more obvious features of Gothic architecture. With the latter, it is true, the seventeenth-century style possesses a certain spiritual kinship. But considered literally it seems as far removed from the one as from the other. We might, indeed, call it pure architecture. Doors and windows, roofs

Pickering House, Salem. (Present condition.)

Imaginary restoration, as it may have appeared originally. Drawn directly from photo. Characterless ornament and projecting porch dropped; window-sills raised a few inches; leaded casements substituted for later type; otherwise no alteration has been made in either proportion or detail.

and chimneys and wall surfaces constitute the entire scheme; the decorative effect is obtained from purely utilitarian elements.

To gain a comprehensive view of the period, the quickest way will be to consider these elements individually: doors and windows, walls and ceilings, fireplaces and chimneys, and that curious and romantic mystery, the overhanging second story. Finally, but reserving this for a future article, we shall take up the effect of all working together, so to speak, in team formation, the mass, the silhouette, and the development or genesis of the plan.



Brown House, Watertown. Triple casement frame, north wall (as seen before restoration by Society for the Preservation of New England Antiquities). Little nicks (x) in woodwork (clinch for plaster) show how plaster partly covered jamb and sill. Moulding (m) (lower left-hand corner) is conjectural.

Beginning with windows, it may be noted that their Gothic affinities would be much more obvious were they all provided with their original casements and their diamond panes set in lead. The difference produced by this one feature may easily be seen in the illustrations, where restored and unrestored views are shown side by side, for there are no old casements in their original location. The few that have been preserved, either as curiosities or by happy accidents, are in museums—the Essex Institute at Salem; the Society for the Preservation of New England Antiquities and the old State House in Boston; and some at Guildford and at Hartford, Connecticut. These are for the most part furnished with diamond panes, but the rectangular pane is not unknown.

The sash is invariably of wood, an inch and a half to two inches, by three-quarters of an inch thick. It is provided with a simple rebate, into which the lead panel is set and tacked. Crosspieces, also of wood, are let into the frame at intervals. To these, which correspond to the saddle-bars of a stained-glass window, the leads are wired in convenient places. That these crosspieces served a purpose is recorded by an incident of King Philip's war. On a Sabbath of 1675, while the family were at church, the Minot House in Dorchester was attacked by a prowling Indian and defended by a solitary nurse-maid. The Indian tried to gain entrance first by the door and then by the window. That the nurse had time to hide the babies, load and fire a musket, and finally gather a shovelful of live coals to greet her assailant in the face, all before he had succeeded in forcing an entrance, speaks for itself. Such a window unreinforced would have given way at the first blow.

Casements were frequently grouped in pairs, as is evident from the spaces which they occupied. In this case there was no mullion, so that one had the advantage of the full opening for the admission of light and air. But the triple grouping was also popular, in wooden houses as well as in masonry, and gives a more characteristic Gothic touch. Among the illustrations will be seen an original frame from the Brown House at Watertown. Indications, such as hinge-marks and the wearing on the sill, prove that the central light alone was movable; the side panels apparently were fixed. Little holes in the sill (see figure), as well as in the

Ward House, Salem, restored. Now in gardens of Essex Institute. (Photo, courtesy Halladay Hist. Photo Co.)

head, show that the rods or saddle-bars in the side lights were vertical; in the central panel they evidently belonged to the sash and swung with it. The shape and size of the panes is, of course, guesswork; no trace of them is now left. This interesting window owed its preservation to the fact that it was walled up by a later addition. It is worth remarking that the mouldings as well as the general proportion of this frame are very similar to the type of Jacobean chest made in this country at about the same period.

The grouping of these windows and their effect on the general appearance of the building really belongs to our next chapter, but I cannot refrain from calling attention to some of its possibilities now. With single, coupled, and triple casements the early designers played as a musician plays with his instrument, and they gained a flexibility and expressiveness difficult to obtain in the more severely classical styles. In the Ward House (Salem), for instance, two sets of double casements are to be found, one on either side of the door; a similar arrangement in the second story; and over the pier between the opening in the gables are single windows. On the end, one double opening on the ground story, one on the second, with a single casement in the third, directly over them, which brings it slightly off centre with the gable, recalls the arrangement of the front, but breaks up the monotony with harmonious variety. Similar is the fenestration of the Pickering House, illustrated. On the front of the exquisite little Hathaway House in the same town we see a triple casement on the first floor, a double on the second, and a single sash under the gable. Unusual forms may have existed, such as the oval windows in the so-called Craddock House at Medford, which seem to be original. In the attic of the Fairbanks House at Dedham, now walled up, is a frame for four lights. These apparently were all fixed, and each had a vertical saddle-bar.

In the same house is preserved the curious casement shown in the illustration on page 4. We have here clearly a transition between the leaded window and the all-wood type of the following century. Were there any means of determining the date of this interesting example it would mark an epoch in our architectural progress. Its horizontal divisions are wood muntins; the vertical are the old-fashioned lead calmes. Somewhere around the end of the century a complete revolution took place. Not only was the leading given up for wood muntins, but the casement also was superseded by what we now call the double-hung or guillotine window. The exact date is not important, as this surely was an importation from England; moreover, the two must have overlapped.

That the guillotine window was common early in the eighteenth century would appear from numerous dwellings of that period. These contain such windows, evidently in their original condition, whereas in earlier buildings the windows have clearly been altered. The guillotine window, however, we must remember, was not "double hung" at first; strictly speaking, it was not hung at all, that is to say, not provided with weights. Messrs. Isham and Brown doubt if weights were used here before 1725. I know of examples as late as 1800 where there are none. Moreover, the upper sash in these examples is generally fixed, built into the frame of the window, so that only the lower half opens. This necessitated a larger opening, which was done in height rather than in breadth, and the abandonment of groups. The result was more in keeping with the classical spirit then in progress, and its effect on the style is obvious.

Still the manufacture of lead calmes went on, even into the Georgian period, and received a new lease of life when leaded fanlights came into fashion. And that guillotine windows with leaded panes were not unknown is proved by the existence of one such in a Connecticut museum. But a vertically sliding sash without weights is always in danger of receiving a fall, so the wooden muntins, being stronger, would naturally supersede the leads for practical reasons as well as æsthetic. On the other hand, we see in the restoration of the Whipple House at Ipswich diamond panes set in wood. These are not original, but used in this case for the sake of economy; whether any such originally existed would be impossible to say. That they would not be popular is evident from the difficulty of keeping them clean.

Doors are of the simplest description. Outside doors, of which few original now remain, were frequently made up of two thicknesses of oak planks, the exterior being vertical, the interior horizontal. These are held together by numerous wrought-iron nails, whose heads form a pattern on the outside. This pattern is accented by slightly incised lines, running diagonally like the leads of the casements; they were probably used to help the carpenter in spacing the nails. Together with the hinges and the iron ring, serving both as knocker and to raise the latch, they give a most

Interior of Hart or Burnham House, Ipswich. The moulding on the chimney lintel is unusual.

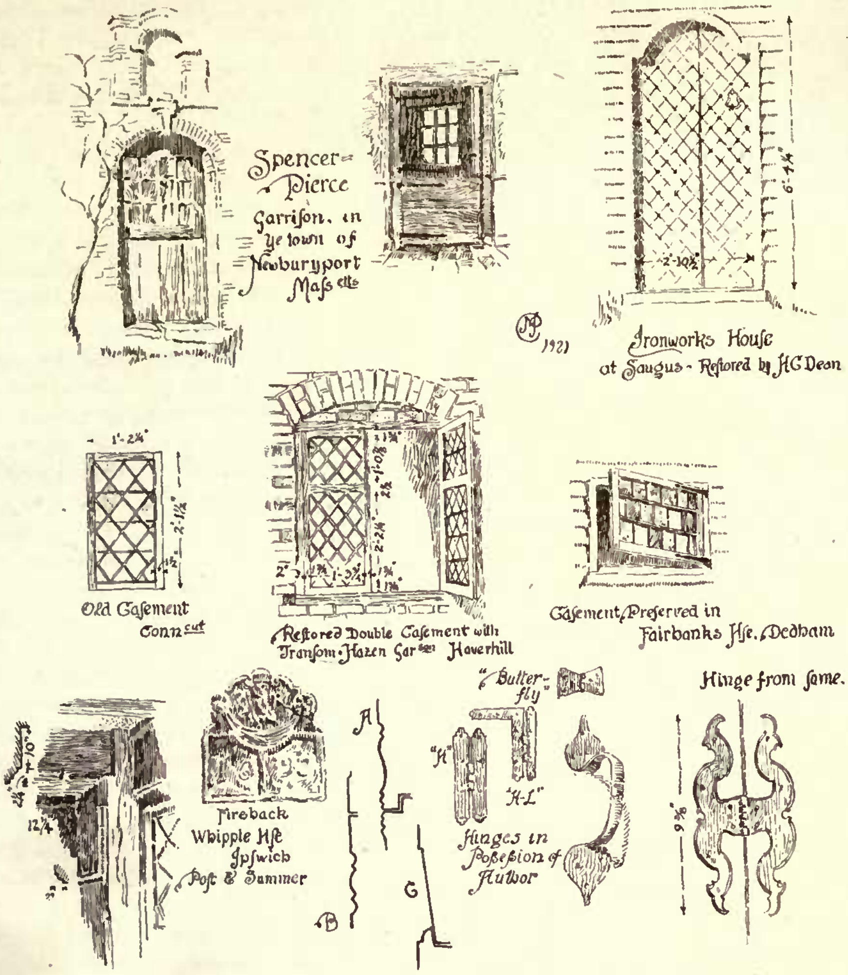
distinctive character. In the museum at Deerfield is preserved a romantic example from the old Indian House (built by John Sheldon in 1698), with a hole hewn clear through by tomahawks during the hideous massacre of 1703. Another specimen was brought to light at the remodelling of the house of the Seven Gables. From these two most of the modern reproductions shown in the illustrations were copied. That at the Ironworks House at Saugus, so ably restored by the late Henry C. Dean, with its "tombstone head," was suggested by an old print.

We read of Dutch doors belonging to this period, doors divided in two horizontally, the upper half swinging free on its own hinges of the lower. Certainly that at the Spencer-Pierce Garrison in Newburyport is very old; that it could hardly be the original door seems clear from the size of the lights and the awkward way they fit into the arch. If it belongs to our period at all, it must be toward the end.

Interior doors were generally of the invisible type; that is, they had no trim, and the wainscot mouldings were carried across. Indeed, they often look as if they had been cut out of the wainscot after it was finished. In plaster walls, however, some kind of trim is indispensable; and even in wood partitions the opening is occasionally marked by a simple but elegant moulding. The hardware also is extremely simple, simpler even than that of the outside doors. One exceptionally beautiful pair of hinges is still in its location in the Fairbanks House; otherwise the ironwork is not particularly characteristic; the same type of latch and hinge is found well into the eighteenth century, until superseded by brass and cast iron. Nevertheless, these few mouldings and the strap, or H, hinge, simple as they are—the delicate latch unpainted, yet free from rust, thanks to the Norwegian iron of which they are made—save the whole from bareness, that "barn-door" effect. Indeed, they impart a distinction difficult to reproduce in machine-made work.

The question of mouldings brings us naturally to the wainscot. This was commonly of broad boards in random widths set vertically. Horizontal sheathing does occur, and it may have been the rule in earlier dwellings; but the vertical is not only more effective, as it adds to the apparent height of the room, but more practical as well. Water, it will readily be seen, that has found its way inside the clapboards will follow down the vertical grooves, but tend to work through the horizontal.

Mouldings show various degrees of elaboration. In the illustration *A*, *B*, *C* (below) are shown some of the more characteristic. *A* is from the Witch House in Salem, which will be treated at length in the second article; *B*, from the Hart or Burnham House in Ipswich; its effect may be seen in the illustration, page 3. The shallowness of these mouldings, truly Jacobean, makes them admirable for emphasizing joints without unduly cutting up the wall. The bevel moulding, *C*, familiar to lovers of Georgian, belongs in spirit to the later development; although bolder and more vigorous, it does not produce as restful a surface. To judge from the few remaining examples, it may have been contemporary with the others; but we must be on our guard against modern restorations as well as early alterations. In the Fairbanks House, for example (1636), it appears on some sheathing unquestionably very old, but whether it belongs to the original structure may be doubted. To convert this type of sheathing into panelling by a horizontal return is evidently but a step, but that step carries us into the Georgian.



Details of seventeenth-century architecture.

Frequently three walls were plastered, the fireplace end alone being sheathed. This gives a charming effect, which must be seen to be appreciated, and finds itself repeated in the ceiling, where beams and joists are of wood, left in its natural color, but the underside of the floor boards plastered, or at least whitewashed. This also may be seen in the Hart House, where it will be noticed how beautifully chamfered is the large summer beam, while the joists are plain. These chamfers and stops are one of the great triumphs of the style. A singularly interesting combination from the Whipple House is here shown in the illustration. Where the summer rests on a post projecting into the room, both are chamfered elaborately; the post has in addition a moulded bracket to receive the beam. Of these summers and their structural meaning we shall treat in the second article.

In the second article, also, will be considered the effect produced on the plan by the huge mass of chimney and fireplace; here we are concerned with details. The enormous size is explained by primitive conditions; severe winters required a practically continuous fire from November until spring. The larger the log, then, the less cutting and tend-

Capen House, Topsfield, near the "Green," restored. Pronounced overhang, with brackets, casement windows (said to be exact size of originals) with rectangular panes, nail-studded.

Overhanging gable end with chamfered end girt, bracket and drops; moulded verge board.

ing; the more security in keeping the fire overnight. So the fireplaces are cavernous, measuring even ten feet by three, and five feet high under the lintel. The latter is a hardwood beam of generous section, bevelled on the back to assist the draft; sometimes chamfered on the front, sometimes covered with sheathing or a moulded board and narrow shelf. This again may be seen in the Hart House, with an exceptionally beautiful bit of moulding (of which the two lower tiers are original), truly mediæval in character.

Before the kitchen fireplace (or hall, as it was then called) all the cooking had to be done; hence ingenious little ovens are managed in the mass of masonry. Into these glowing embers are shovelled until the surrounding brick grow hot; then the oven is cleaned and ready for use like a fireless cooker! Many mechanical devices for cooking helps have come down to us, such as the spit revolved by clock-work, or even by a fan in the chimney driven by the draft, but these lie outside of our province.

From such enormous fireplaces generous flues must open. These coming out through the middle of the roof in wood houses, or at the ends in masonry, form one of the most decorative features of the outside. They are generally of brick in Massachusetts, though not infrequently of stone in Connecticut. Many examples are beautifully adorned with little spurs or pilasters, sometimes even with arcades. Not the least charming is that illustrated on the Governor Bradstreet House, the chimney belonging to our period, though the rest of the house is "Georgianized." It can be seen (illustration) that the roof was once much steeper and came up on the chimney close under the lower projecting ledge or string-course (so placed to prevent the water from working its way down inside the roof), and covered the broken-off feet of the front and end spurs. These spurs, it may be superfluous to add, in spite of their Gothic character, have nothing to do with the construction.

The overhanging second story, as a rule, ran only across the front, but in the Ward House we see it returned along the end. The Capen House at Topsfield shows an excellently restored example, with all the appurtenances, brackets and drops, and a projecting gable as well. Here the chamfered end girt is worthy of notice, also the moulded verge or barge board. This must once have been an important feature; an original is preserved in the museum at Deerfield, cut into a pattern quite Gothic, or at least Elizabethan, with a sort of dog's-tooth moulding added. The drops themselves have a structural significance, being the carved ends of the posts projecting through the floor above, so to speak. Several ancient drops exist in their original position, notably those on the House of the Seven Gables.

From such simple elements it is clear a dignified and even handsome building may be evoked. Other details there were, such as finials for the gable peaks, and bits of carving may have decorated the houses as well as the furniture; but enough has been said to indicate the possibilities of the style. In a second article we shall consider the plan and the internal arrangement along with its development through the period, and touch on the interesting question of the construction.

Announcements

John T. Comes, A.A.I.A., Renshaw Building, Pittsburgh, Pa., announces that he has taken into partnership two of his former associates, Mr. Will R. Perry and Mr. Leo A. McMullen, and the firm will henceforth be known by the name of Comes, Perry & McMullen.

Ernest F. Coe, landscape architect, has removed his office to 951 Forest Road, New Haven, Connecticut.

J. Osborne Hunt, architect, begs to announce the opening of new offices in the Hunt Building, 219 E. Hanover Street, Trenton, New Jersey, from his former office, 114 N. Montgomery Street, Trenton, New Jersey. Manufacturers' samples and catalogues are requested to complete our files.

Boyd, Abel and Gugert, registered architects, have removed their offices to the Otis Building, 112 South 16th Street, Philadelphia.

LaBrode & Buillard, architects, New Orleans, announce their removal on December 1, 1921, to the new Olympia Building, 888 Purchase Street, where they will be associated, as in the past, with Fred W. Greene, Jr., real estate, in the suite of offices numbered 501 and 502.

Former clients and other visitors will be cordially welcomed in these new quarters, and renewed efforts made to give complete satisfaction to all seeking service in building and realty operations.

The Chemung Canal Trust Company, Elmira, N. Y.

Dennison & Hirons, Architects

ON the site of one of Elmira's old landmarks—a central location, surrounded by three of the city's most important streets—the Chemung Canal Trust Company has erected its new building.

Designed in the Italian Renaissance style with great simplicity and unusual refinement of detail, this edifice, the creation of Dennison & Hirons, architects, of New York, has been planned to serve the most intricate and modern methods of banking which facilitate operations and give comfort to both public and employees.

The Chemung Canal Trust Company, founded in 1833, has served a long and useful career, and is one of the best-known banking institutions in the central part of the State. It takes its name from the Chemung Canal, which borders the city.

It was appropriate, therefore, that the home of such a company should be one of the notable contributions to the architecture of the city in dignity and attractiveness of design. The building was conceived and planned in this spirit.

The exterior of the building is of Indiana limestone. The three large openings at the side and the one on the front and another in the rear are beautifully proportioned, equipped with metal frames and sash with beautiful wrought-iron grilles. The doors of the main entrance are bronze.

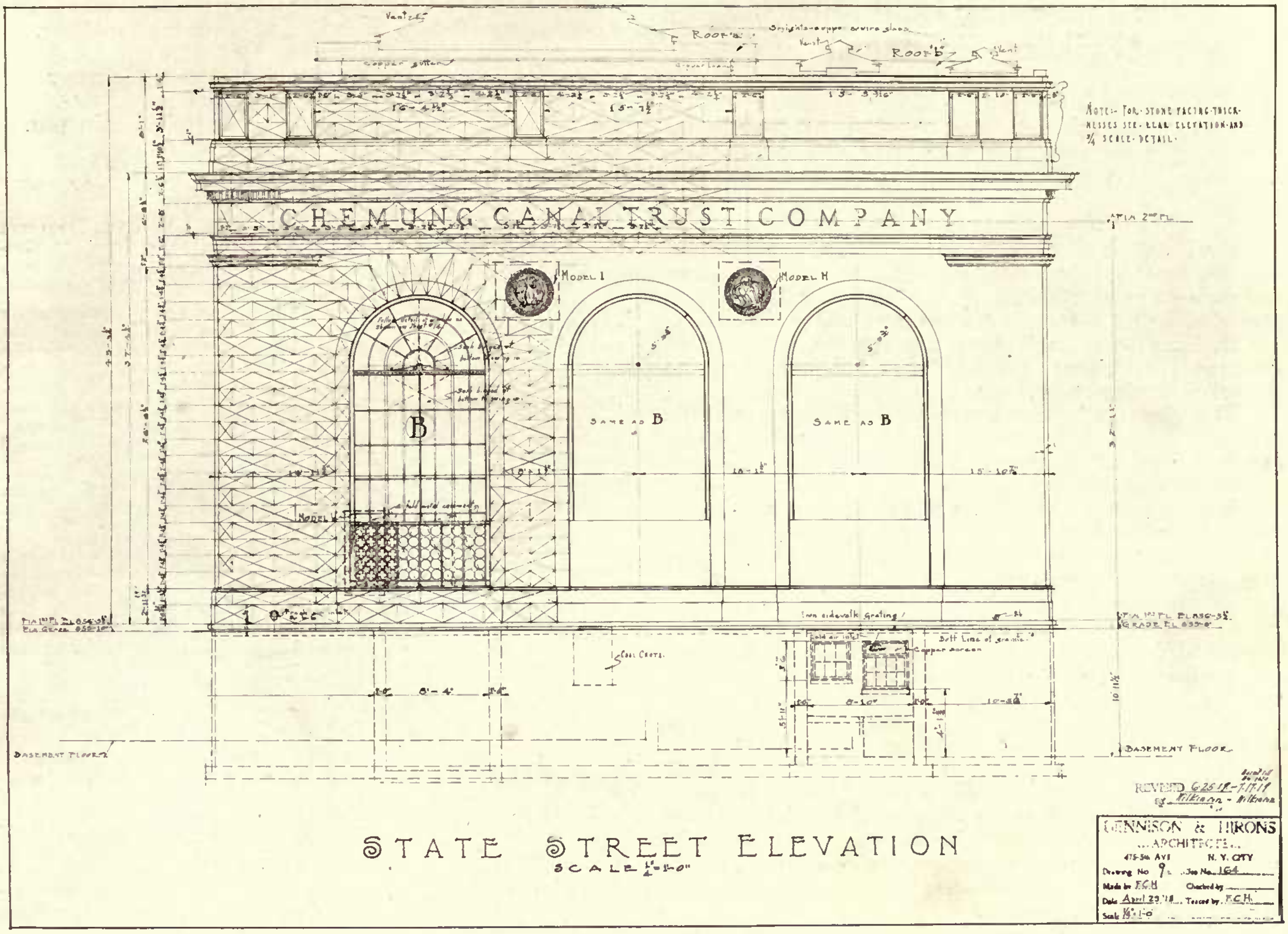
This building has a second floor devoted largely to the clerical work of the bank, which is ingeniously lighted by a small court and skylights. In this part of the building there is also a clerks' locker-room for employees occupied on this floor, and there is also a directors' and committee-room, each beautifully panelled in a walnut-colored mahogany.

Painting on ceiling.

The main floor is developed in one large banking-room with a mezzanine gallery in the rear. It receives its light from three sides. The decorative effects achieved throughout express themselves in unusual harmony of line and color. The large coves of the ceiling, which start at the spring of the window arches, receive penetrations from all window openings and on the inside wall this effect is duplicated, there being three blank arches opposite the three large windows. The Renaissance detail of the coves is in low relief and beautifully colored after the best examples of work of this period.

It may be observed from the plan that the shape of the room is extremely irregular, it being much narrower in front than in the rear.

That portion of the ceiling which is flat is beautifully decorated in a kite-shaped panel, portraying a bird's-eye map of Elmira and the surrounding country about the time the bank was founded. This panel, painted by Andrew T. Schwartz of New York, was created after a careful study of the early history of Elmira. It pictures many points of historical interest, especially that pertaining to Joseph Brandt, who represented the six Indian nations, who signed the treaty with the Washington government officials. The Chemung River, now a canal, is conspicuously shown, which, at the time the bank was founded, was the principal communication between Elmira and outlying sections.



The plan of the banking-room, if carefully studied, reveals the numerous conveniences which both the bank and its customers enjoy. On entering at the left is a ladies' retiring-room. The next division on this side is given to two banking departments, in the rear of which is a spacious area for officers. Connecting with this is a stair to the mezzanine gallery, where clerical work in connection with the trust business is conducted. At either end of the officers' space are private rooms. On the other side of the public lobby one finds near the vestibule a private room for customers, three banking departments, and in the rear the safe-deposit department, connecting with a modern burglar-proof vault having a fifteen-inch steel door. The safe-deposit booths and private conference rooms are placed under the mezzanine gallery.

In the basement is another clerks' locker-room and toilet, together with large storage vaults for the use of the bank's records, trunk storage for customers and the usual provisions to house mechanical equipment. The building is equipped with an elevator, pneumatic-tube system, telautograph service, and dictaphone system.

While the area given over to this building is of only fair proportions, its compactness and excellent arrangement, together with its exceptionally fine equipment of every device employed in banking, makes it one of the most notable examples of bank architecture in the central part of New York State.

Dennison & Hirons' years of practical study in the planning of bank buildings is shown very clearly in this admirable building.

Banking-room bronze detail.

Some Interesting Comments on Building Conditions

THE following letters are in answer to our request for some comment upon local building prospects. We wish to thank the authors for their interesting replies.

THE EDITOR.

CHICAGO, December, 1921.

Conditions in the building industry in the Chicago district are unsettled, but with indications that between now and spring a great deal toward stabilization will be accomplished and that a large amount of work will go forward.

Building costs have been considerably reduced and anticipated reductions in freight rates will probably bring about still further reductions.

The shortage of moderate-priced dwellings and the very high rentals charged for homes and apartments is giving a tremendous impetus to buildings of this character, and the outlook for a large amount of residence work is good.

Bond houses report a great dearth of good bonds and that the market is able to absorb quickly all well-secured issues. This condition, coupled with lowered building costs, should bring out a great deal of public and semipublic work, particularly schools, hospitals, and buildings of that nature.

Conditions in the city of Chicago are chaotic—the different trades-unions refusing to accept or abide by the terms and conditions of the Landis Wage Award have or will be declared "outlaws," and the newly formed "Citizens' Committee to Enforce the Landis Award, Inc.," composed of 180 of the leading business men of Chicago, will seek to enforce strictly the terms of the award and declare an "open shop" on all such trades. This committee will undertake to secure contractors and men to take the place of all who refuse to work; will furnish such protection as is necessary to workmen so secured; will insure the contractors against damage from strikes or riots; and will exert its tremendous influence to enable building to proceed.

While there is little question that the intolerable situation long existing in Chicago is in the process of being thoroughly cleaned up, and that the building industry will ultimately be placed on a more equitable and stable basis than it has ever been before, there will inevitably be a period of considerable disorder and uncertainty that will greatly retard building operations during the coming year.

Yours very truly,

N. MAX DUNNING.

PITTSBURGH, December 23, 1921.

Many people seem to expect that, when business conditions improve, there will be a sudden avalanche of constructive propositions which will nearly overtax the facilities of architects' offices and result in unprecedented prosperity for every one connected with the building trades.

I do not look for any such condition to arise. The improvement is already under way in Pittsburgh, as is indicated by an increase in the number of building operations reported; and it seems logical to think that this movement will continue to increase in intensity, possibly over several years, until we arrive at a normal building condition.

Very truly yours,

COMES, PERRY & MCMULLEN
Architects

By JOHN T. COMES.

BOSTON, December 24, 1921.

Replying to your letter of December 6, it does not seem to us that more than a medium amount of building is in prospect for the coming year. Although the cost of building has been materially reduced, the waste of wealth in the war has been so great that we question whether the country will recover from it for a great many years. Furthermore, the labor situation is not fully stabilized, and this exercises a depressing effect on the minds of prospective builders.

Very truly yours,

KILHAM, HOPKINS & GREELEY
Architects

By W. H. KILHAM.

Book Reviews

HISTORIC HOUSES OF SOUTH CAROLINA. By MRS. HARRIETTE KERSHAW LEIDING. Limited Edition Printed from Type, 100 Illustrations, with Frontispiece in Photogravure. 324 pages. Octavo. Handsome Cloth Binding. J. B. Lippincott Company, Philadelphia.

This is the only book covering the field of old and interesting houses and churches in South Carolina, and South Carolina holds an important and unique place in the history of our country. The houses there are distinctive from those in other sections of the country. The same high ideals of family and social life prevailed and are presented forcibly in the descriptions and in the many anecdotes and sketches. It has value as local history and belongs with Lancaster's "Historic Virginia Homes and Churches," Sale's "Manors of Virginia," Smith's "Dwelling Houses of Charleston," etc., all of which are now out of print.

DRAWING FOR ART STUDENTS AND ILLUSTRATORS. By ALLEN W. SEABY, University College, Reading, England. Charles Scribner's Sons, New York.

This is an admirable book for both student and teacher, written by a teacher of experience. In these days of supposed shorthand ways of becoming an artist it is encouraging to have such a book as this that emphasizes the necessity for *study*—downright and continued hard work. The way is not easy but it is made easier by such helpful and sincere aid as this book offers. There are numerous illustrations, drawings, and reproductions from some famous masters in art.

THE ART OF DRAWING IN LEAD-PENCIL. By JASPER SALWEY, Associate of the Royal Institute of British Architects. Charles Scribner's Sons, New York.

No architect, student, or amateur needs to be told that sketching with a pencil is one of the most fascinating and helpful ways of spending spare moments. The pity of it is that more men do not take it seriously and find in constant sketching a means to a greater end.

The photograph can never take the place of a carefully made sketch, preserve the local color and atmosphere, the charm that we call "artistic." The book is illustrated with drawings showing technical methods to be employed in a wide variety of subjects. There is a chapter on the "Reproduction of Pencil Drawings" that is of special interest for those drawing for illustration.

INSIDE THE HOUSE BEAUTIFUL. A Collection of Interior Views Showing Furnishings and Their Arrangement. By HENRIETTA C. PEABODY. The Atlantic Monthly Press, Boston.

Contents: The Hospitable Hall, Making the Living-Room Livable, Curtains and Hangings, Books and Their Placing, Pictures and Wall-Hangings, Porch and Sun-Room, Dining Arrangements, Kitchen Comforts, The Sleeping-Room, Lighting, Good Furnishings for Here and There.

A book largely made up of illustrations that have appeared in "The House Beautiful," addressed especially to the lay audience but of interest to the architect.

THE ART OF ILLUSTRATION. By EDMUND J. SULLIVAN. Illustrated. Charles Scribner's Sons, New York.

The author of this book is one of the most distinguished of English illustrators, and knows his subject from every angle. This is a book for the student and for all who would be informed of the methods of work and the processes of modern illustration. It is of English illustration only that Mr. Sullivan writes, and England produced some great men in this field, especially in the sixties.

There are chapters on "Automatic Drawing and the Power of Suggestion," "Object and Subject," "Form and Line," "Cartoons," "Flexibility of the Pen Line," "On the Use of Models," "Phil May and Beardsley," "Sandys and Boyd Houghton," "Blake," "Doré and Scale," "Reduction of Drawings by Process," "Methods of Tone Drawing," "Authors and Illustration."

We commend to illustrators in general the chapter on "The Necessity for Accuracy of Reference to Text."

The illustrations include examples of such famous names as Holbein, Blake, Menzel, Millais, Sandys, A. Boyd Houghton, Charles Keene, Phil May, Beardsley, E. A. Abbey.

SPANISH INTERIORS AND FURNITURE. Photographs and Drawings by ARTHUR BYNE with Brief Text by MILDRED STAPLEY. Corresponding Members of the Hispanic Society of America, Authors of "Spanish Ironwork," "Spanish Architecture of the XVI Century," "Decorated Wooden Ceilings in Spain." Part One. Portfolio. William Helburn, Inc., New York.

The authors are widely known as authorities for their work in connection with the Hispanic Museum, and this extensive collection should prove an especially valuable addition to the architect's and decorator's libraries. There seems to be an increasing vogue for old things Spanish and, heretofore, but few adequate references for their study.

There will be four parts, 200 Plates in all with text.

Daniel Chester French, Sculptor. Henry Bacon, Architect.

Lafayette College and the Lafayette Statue

THAT American colleges in these days know how to conduct any ceremony with dignity, solemnity, and even beauty that arises from the aid of music on the organ, or even by the college band or the college orchestra, was strikingly exemplified at Lafayette College, Easton, Pa., in November, when in connection with the regular Founder's Day exercises a supremely effective statue of the youthful Lafayette by Daniel Chester French, cast by the Gorham foundry, was dedicated in the presence of the usual academic assemblage of trustees, faculty, graduates and undergraduates, the Governor of State Honorable William C. Sproul, the orator of the day, Justice William I. Schaeffer of the Supreme Court of Pennsylvania, Attorney-General Alter, and the special guest of honor, Morris L. Clothier of Philadelphia, who gave the statue and pedestal and steps which connect the terrace on which the statue stands with the Georgian Chapel which is its architectural background. The statue, which has now become the focus of the Lafayette College campus and places the institution through the art of French, who was given a degree of Doctor of Laws, by the way, on the occasion of the dedication of the statue, on the same plane as Harvard with its John Harvard and Columbia with its Alma Mater, both distinguished examples of the work of French, represents the youthful Lafayette, and, with its Houdon type of countenance, is an inspiration in face and pose and ensemble. Though, in a way, it is the replica of the statue of Lafayette by French which stands in Prospect Park, Brooklyn, engaged against a horse, as a matter of fact the statue at Lafayette College, which by reason of its beauty from now on will give this country the definite Lafayette type, is a remodelled statue in the round and stands out in the open above a dignified pedestal by Henry Bacon. The statue looks southward from the great hilltop rising several hundred feet above the town of Easton, and is surrounded on all sides by beautiful grounds and picturesque tree masses laid out several generations ago by Donald G. Mitchell (Ike Marvell) at the start of landscape-gardening in America. So well did Mitchell do his work that to-day, despite the indifference of most colleges to campus planting, the campus of Lafayette has a unity that is unique despite the diverse character of the architecture of the various buildings that represent the bad taste and good taste of over seventy years of growth. With the Lafayette statue in place a new orientation and a new tone is given to the campus, and the enthusiasm over the statue on the day of dedication is bound to be repeated by all who see it. It is a credit to American art and those who made it possible from the president of the college, Doctor John H. McCracken, to all who assisted in realizing the idea of the donor, that the statue should represent Lafayette as the youthful soldier, who in age and crusading spirit was typical of the young men we sent back to France in 1917 and 1918, to repay the debt we owed to Lafayette and his Fatherland.

THE STANFORD WHITE MEMORIAL DOORS.

These bronze doors, recently unveiled at the Library of New York University, were given as a memorial to Stanford White by a group of his friends and admirers. They were designed by his son, Lawrence Grant White, of the firm of McKim, Mead & White.

They are subdivided into small panels, eight of which are enriched with symbolical figures in relief, the models for which were contributed by sculptors who had been associated with Stanford White. The two upper figures are by Andrew O'Connor, typifying "Inspiration" and "Generosity." The next two lower panels are by Philip Martiny, "Architecture" and "Decoration," signifying the principal activities with which Stanford White was identified. Below these are "Painting" and "Sculpture," by Herbert Adams, and "Music" and "Drama," by A. A. Weinman, typifying the allied arts in which Mr. White took an especial interest. The first three sculptors, with Daniel C. French, worked together under Stanford White on the bronze doors of St. Bartholomew's Church in New York; and Mr. Weinman had modelled the pediment sculpture for the Madison Square Presbyterian Church, now on the exterior of the Metropolitan Museum. The lions' heads are by Ulysses Ricci, and the inscription by Janet Scudder.

These doors are a departure from the ordinary method of casting. They are built up of plates of bronze, each panel, stile, and rail being cast in a separate piece. The rosettes, it will be noted, are structurally significant, and form the heads to the bolts which fasten the bronze to the wooden doors.

Editorial and Other Comment

Progress

THERE is with most of us as we begin a new year a tendency to be optimistic, to forget something of the hard going in the hope of smoother travel ahead. And we are optimistic up to a certain point, when our optimism loses much of its merely emotional aspect and becomes chiefly a matter of determination to accept the worst and make the best of it; not by dwelling on failures and difficulties, but on clear thinking about ways to discount what has been. The times may be out of joint, we are quite ready to admit that there have been many bad dislocations, but they won't be reset by complaining. We must call the doctor or a convocation of learned doctors, and get very busy with up-to-date methods of organizing for the prevention of further casualties due to obsolete systems.

The last months of 1921 showed a greatly increased development of all kinds of building, and there are predictions that the good work is to continue and grow apace with the new year. We hope so; yes, we believe things are going to be better. But if this seems like the same old unreasoned optimism, we hasten to remark that the millennium is not in sight nor do we hear a general chorus of "All's right with the world."

There will continue to be corruption, graft, profiteering, and general rascality in the building world for some years, and it will take us some time to get rid of, or put in their proper place, the un-American and selfish leaders of labor who have sacrificed the personal liberty of thousands and put intelligence and ability on a par with the inefficient and incompetent.

There are hopeful signs that American labor is realizing that it has been sold many times to serve the purposes of the foreign agitator and that something must be done and done now to restore the self-respect and right to govern his own life in accordance with the principles of personal liberty and opportunity that every intelligent and thoughtful American knows to be his unalienable possession.

Architecture and Art

WE are among those who accept the fact that architecture and art may be spoken of together without any ignoring of the fact that architecture is ever a very practical and a very exacting business.

This is why, in making this magazine, we have been governed first of all by a wish to follow a good plan, to see that the materials we use are the best, that the foundations are sound, that the substantial elements are more important than the trimmings, that our edifice may embody not alone our own conceptions but also those of the men to whose genius and training we owe our very being.

To this end we give especial care to the quality of our paper, to employing expert knowledge in the making of our plates and their printing, for we believe that the greatest care we may give to the presentation of an architect's work is only his just due.

We do not mean to dwell too strongly upon our mere physical appearance, but we do take pride in making a good appearance, both in our letter-press and illustrations devoted to architecture, and to the advertising pages given over to the always interesting and valuable announcements of our business friends.

We have been much gratified by the reception given to our magazine and its growth in favor and circulation during the past year. A very large proportion of our old subscribers are going with us into the new year, and many new names are coming to us these days. We have tried very hard to make our magazine *your* magazine; we mean, we have tried to make it representative of your work and your needs, and we shall strive all the harder with the encouraging support we are receiving to make ARCHITECTURE more and more to your liking. We can only succeed with your criticism, approval, co-operation, and support.

A Code of Ethics for the Building Industry

THE New York Building Congress recently formulated a code of ethics that it is hoped will take the place of the many more or less undefined codes that have been in use. It is so good that we deem it worthy of passing it on to our readers all over the country.

GENERAL—ARTICLE 1

It is unethical for any one engaged in the building industry or any of its branches:

Section 1—To unduly or improperly increase the cost of work or to produce work or workmanship inferior to that contracted for.

Section 2—To falsely or maliciously injure the reputation or business of another.

Section 3—To offer or accept commissions intended to influence sales or contracts.

Section 4—To endeavor to circumvent the fair and reasonable enforcement of ordinances and safety and sanitary codes.

Section 5—To resort to or countenance "Shopping."

THE OWNER—ARTICLE 2

Section 1—To call for unnecessary or full estimates on tentative projects, or from unacceptable bidders or to withhold proper facilities from those estimating.

Section 2—To refuse credit data and statement as to reality of the project.

Section 3—To deal directly with the contractor where an engineer or architect has been employed for full services, including supervision.

Section 4—To place upon the contractor under a lump sum contractor the moral responsibility of acting in a judicial capacity on his own work.

Section 5—To endeavor to improperly influence the architect's or engineer's decisions as to contract obligations.

THE BANKER—ARTICLE 3

Section 1—To fail to give due weight to the community value of improvements for which loans are desired.

Section 2—To fail to acquaint the borrower with all conditions (especially as to approval of materials and construction) under which the loan is made.

Section 3—To overload building costs with fees, commissions, or bonuses not legitimately earned.

THE REAL ESTATE BROKER—ARTICLE 4

Section 1—To misrepresent conditions or conceal any facts having an important bearing upon the real value of a property.

Section 2—To advise a type of development opposed to the community interests.

THE ARCHITECT AND ENGINEER—ARTICLE 5

Section 1—To act in any other than a judicial capacity in determining contract obligations; or to fail to require full performance equally by owner and contractor.

Section 2—To require a contractor to perform for him any part of the service which is generally recognized as the architect's work.

Section 3—To cover possible oversights or errors by indefinite clauses in contract or specifications.

Section 4—To withhold certificates for payment when properly due under a contract.

Section 5—To engage in the building trades.

THE CONTRACTOR—ARTICLE 6

Section 1—To give, knowingly, work or workmanship inferior to that contracted for.

Section 2—To endeavor to supplant the architect or engineer with the owner.

Section 3—To submit to the owner directly, without the architect's approval and knowledge, any proposals or estimates.

Section 4—To fail to recognize his moral obligations to subcontractors whose bids he has used in making his own proposal.

Section 6—To knowingly or carelessly underestimate the value of any work.

Section 7—To withhold payment of subcontractors and detailers for work or for materials for which he has received payment.

SUBCONTRACTORS AND MATERIAL DEALERS—ARTICLE 7

Section 1—To knowingly mislead through trade customs or terms, as to the real cost or quality of work or materials.

LABOR—ARTICLE 8

Section 1—To restrict the quantity or quality of the output of the individual.

Section 2—To increase cost through arbitrary rules as to number of workmen employed or use of plant and equipment.

Section 3—To deny to any man the opportunity to learn, and when qualified, to practise a trade.

Section 4—To abandon the work pending the decision of disputes between trades.

Prizes of Rome in Architecture, Sculpture, and Painting Announced

THE American Academy in Rome announces its annual competitions for Fellowships in Architecture, Sculpture, and Painting. Each fellowship is for a term of three years with a stipend of three thousand dollars, and opportunity for travel. Studio and residence at the academy are provided free of charge. The competitions, which will be held in various institutions throughout the country, and will probably begin in late March or early April, are open to all unmarried men, citizens of the United States. Entries will be received until March 1. Any one interested should apply for application blank and circular of information to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park Avenue, New York City.

Cleveland's Building Exposition

THE American Building Exposition, originally scheduled to open January 4, in the new Cleveland municipal auditorium, has been postponed until February 22, because of the failure to have the building ready by the first of the year. The exposition management is entirely pleased with the change, as the later date is far more seasonable. In fact, at the time of its selection the earlier date was imperative if the exposition was to be the opening attraction in the new building. Even with the delay it will still open the building.

Commercial, factory, and home construction and equipment will be featured in the exposition, which will cover a period of eleven days. Both floors of the auditorium will be utilized, the street-level floor being devoted to structural materials, real estate, financing, architecture, and landscaping, with a division for contractor's machinery and equipment; the lower floor to be occupied wholly with interior decoration, finishing, furnishing, and equipment.

Six years ago Cleveland instituted the building show along the lines upon which it is being conducted to-day. Now Cleveland is revolutionizing the building-show plan by making it a non-profit, co-operative effort in which only the exhibitor profits. All earnings are to be rebated, pro rata. In other words, the show will be put on at actual cost to the exhibitor.

The staging of the show will be most elaborate. Cleveland lumber interests will combine in an exhibit expected to cost in excess of $25,000. Two brick exhibits will each cost in excess of $15,000. More than a score of others will exceed $5,000 each. Finished cottages in wood, brick, and stucco will be featured. It promises to be one of the largest expositions of its kind the coming year.

The Stanford White Memorial Bronze Doors

Presented to the Gould Library of New York University

The Presentation Address by Thomas Hastings

Mr. Chancellor, Ladies, and Gentlemen:

Stanford White was a man of strong convictions. It is remarkable that in his early life after having been apprenticed to H. H. Richardson, a man reputed for his brilliant personality, he showed such strength and courage of his convictions in resisting this dominating character and in building for his time upon a more lasting foundation, an influence which so materially raised the standard of art in this country.

Indeed, in these two men the truth is vividly illustrated that the direction in which a man works and his influence upon his following is of far greater importance to the artistic world than are the comparatively few executed examples of his own individual undertaking. Stanford White always consistently adhered to classic principles and saw no logical or historic reason for a revival of the mediævalism of his predecessor. With these strong convictions his work was always personal with a most unusual inborn sense of beauty. He was a man of vision, a true artist, because he realized that to meet the physical problems of modern conditions he should avoid the shallow appeal of mere superficial misapplied association, and build rather upon the lasting foundations of those never-failing traditions of our immediate ancestors.

In handing you this key and in behalf of the committee representing a large number of friends of Stanford White, I have the honor to present to this university the completed memorial. The readiness of his friends to give and the eagerness and enthusiasm of the artists to freely, and without recompense, contribute their work in order to realize this most successful outcome, is, indeed, a tribute not only to his genius but also to his lovable and generous character in remembrance of all he has done to uplift and to encourage and help the artists of his time.

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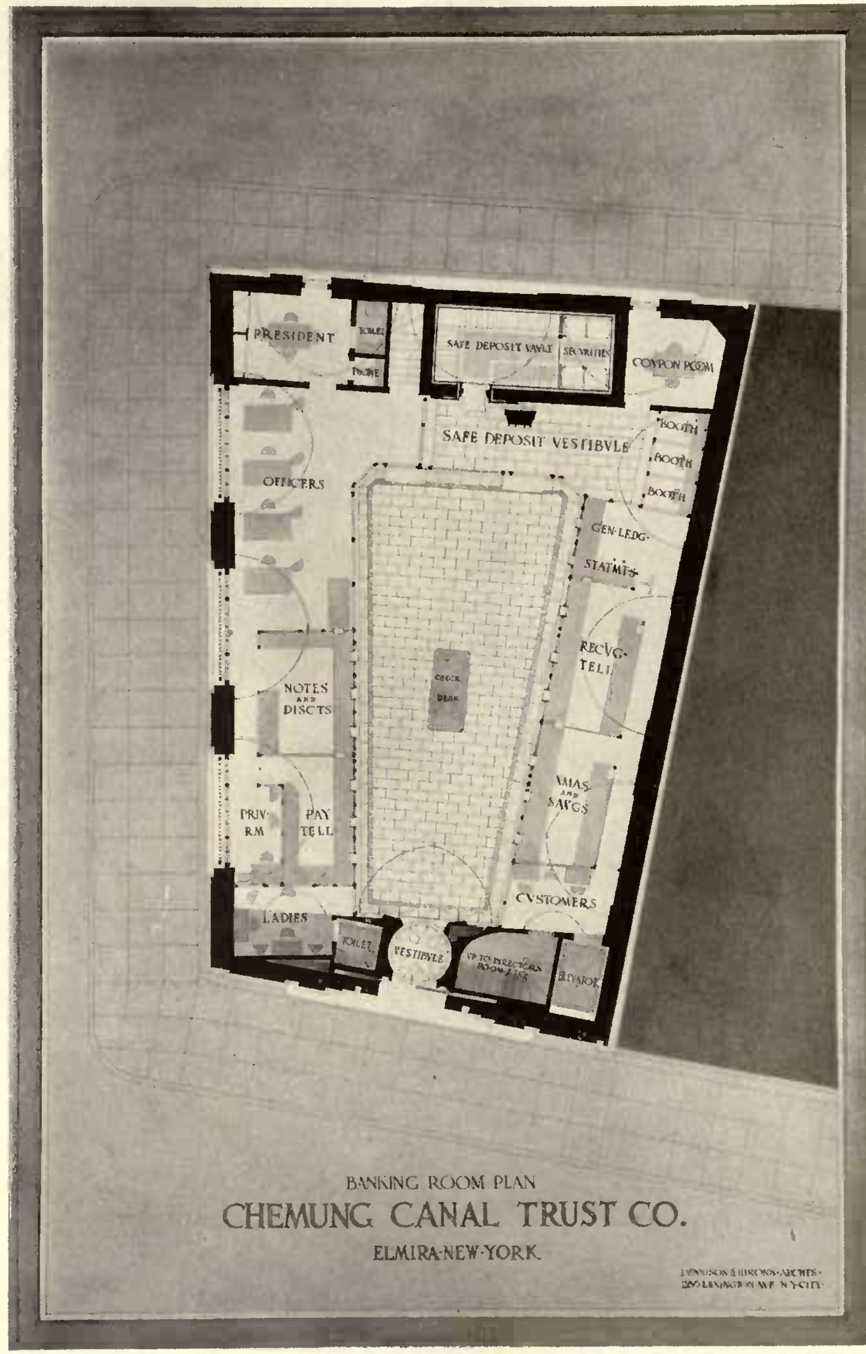
CHEMUNG CANAL TRUST CO. BUILDING, ELMIRA, N. Y. Dennison & Hirons, Architects

BANKING-ROOM, CHEMUNG CANAL TRUST CO. BUILDING, ELMIRA, N. Y.

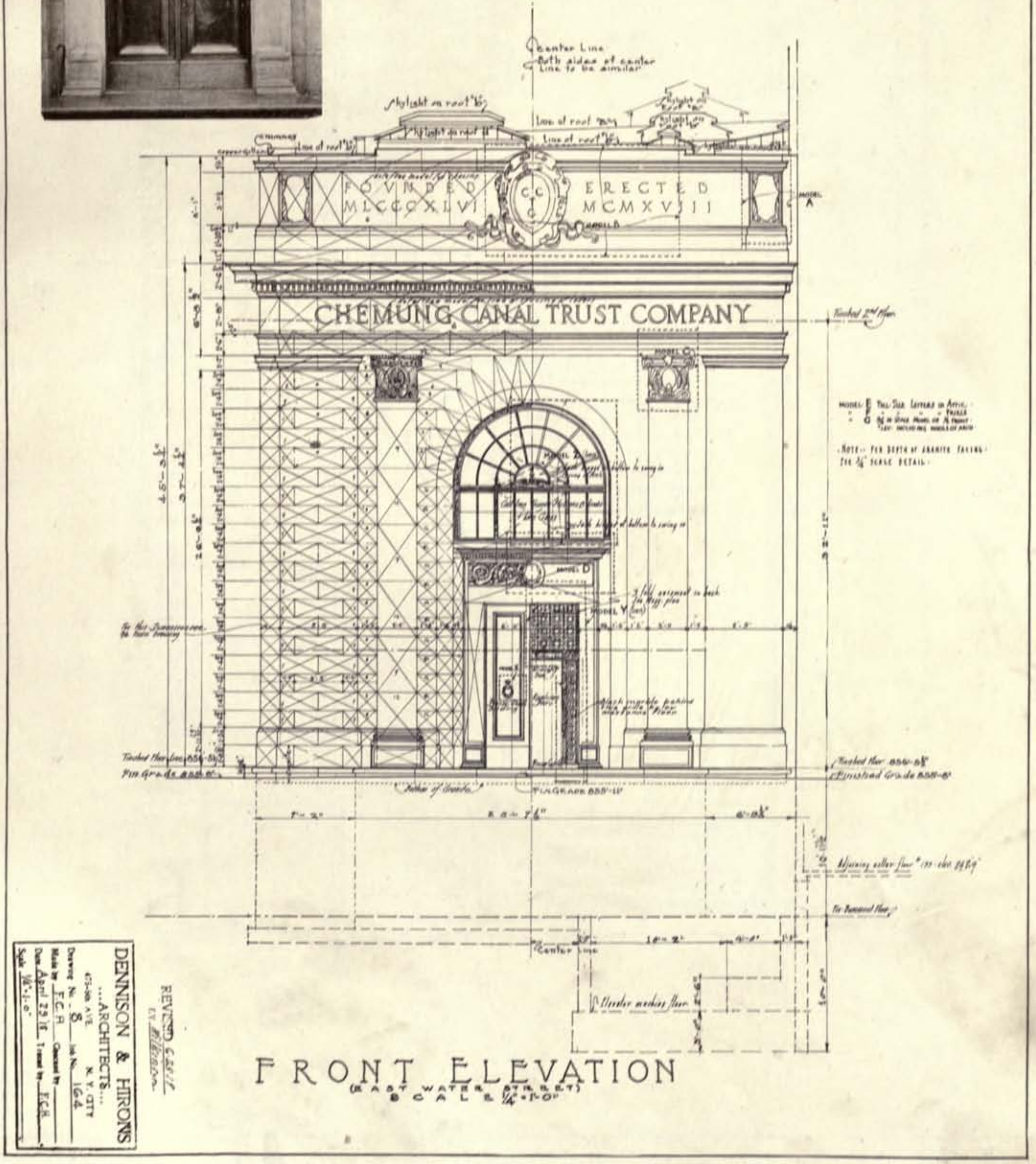
Dennison & Hirons, Architects.



BANKING-ROOM.

Dennison & Hirons, Architects.

CHEMUNG CANAL TRUST CO. BUILDING, ELMIRA, N. Y.



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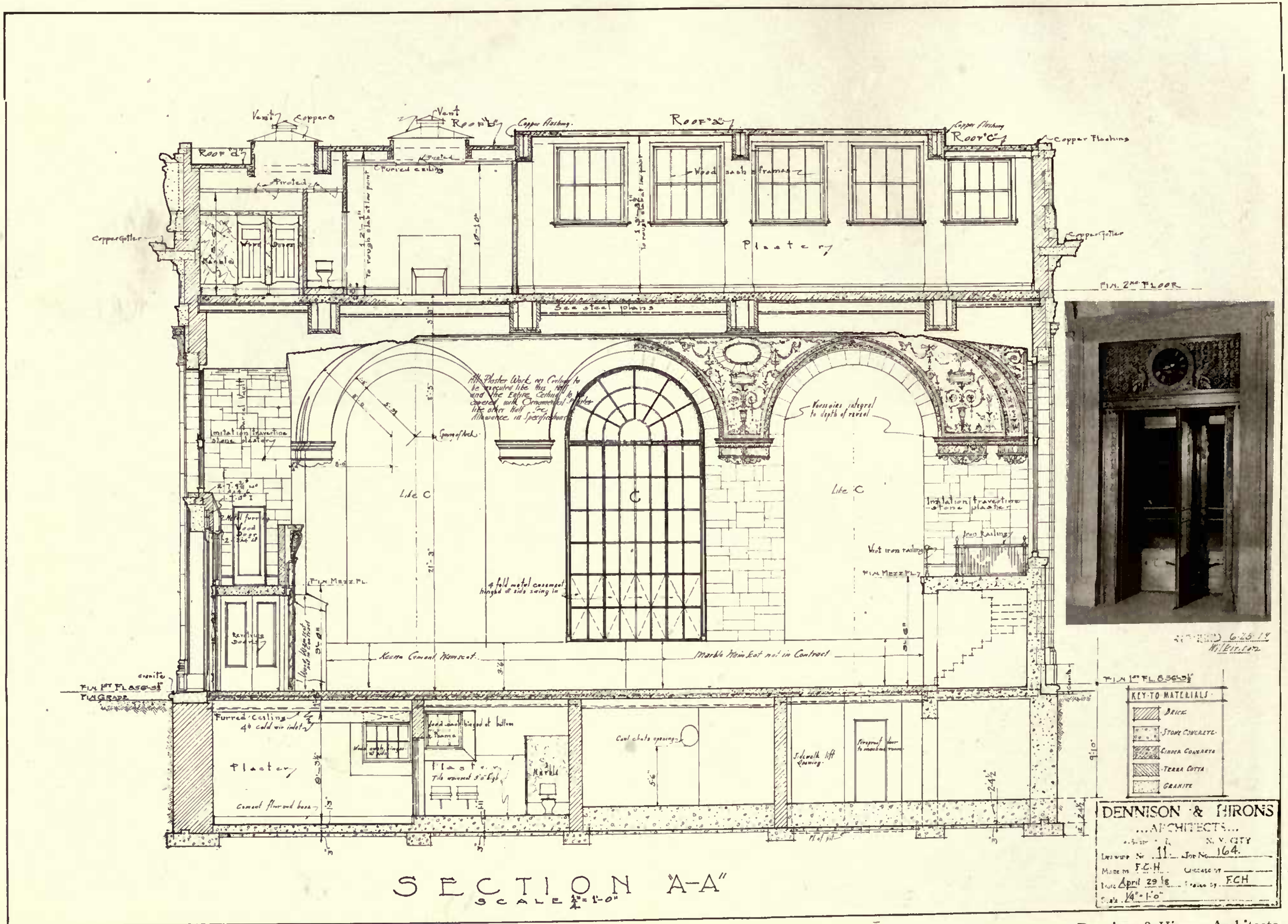
Dennison & Hirons, Architects.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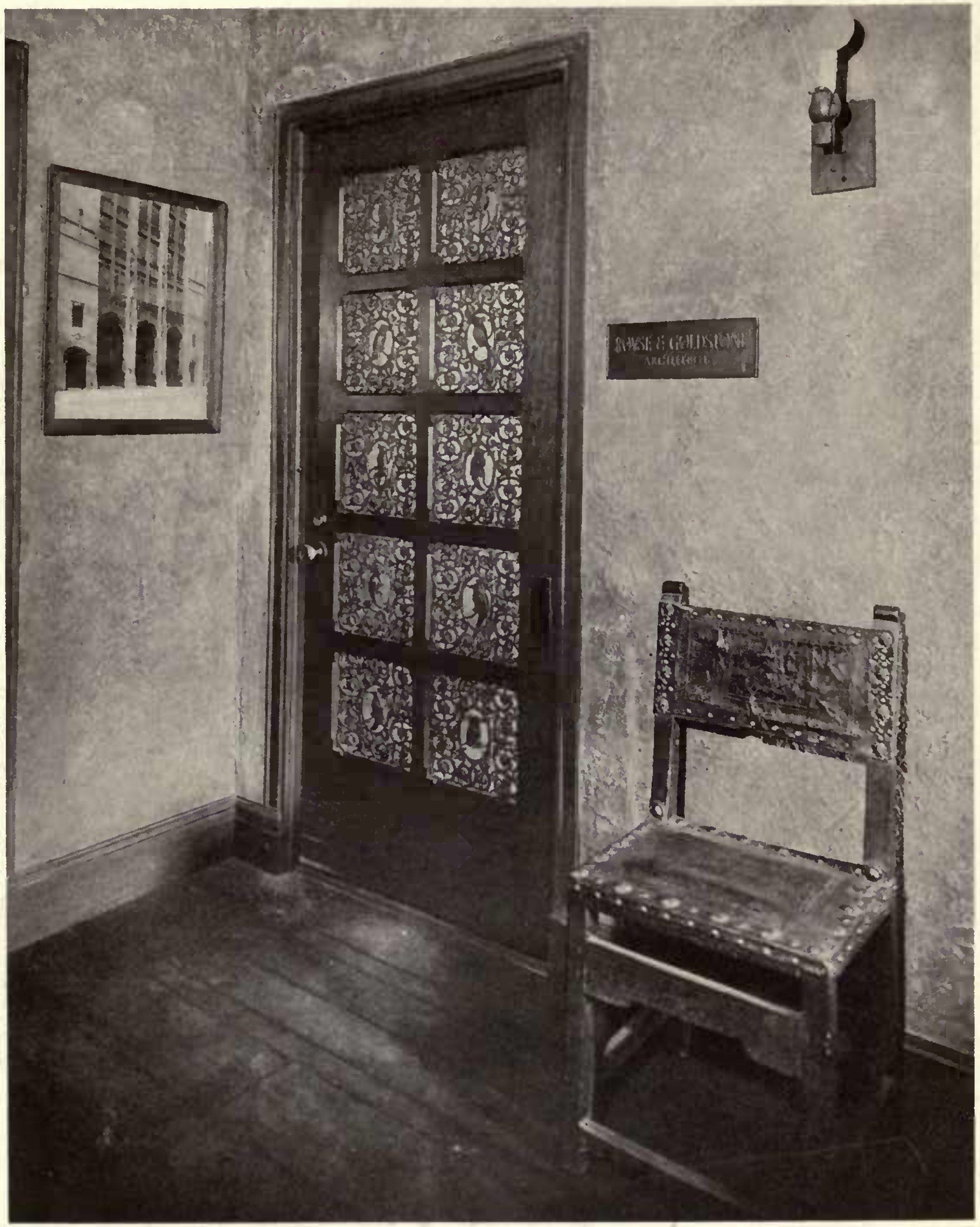
SCALE 1/4"=1'-0"
KEY TO MATERIALS
Brick
Stone Concrete
Cinder Concrete
Terra Cotta
Granite
DENNISON & HIRONS
...ARCHITECTS...
N. Y. CITY
Roof "A"
Roof "C"
Plastery
Like C
C
Imitation travertine stone plaster
Keene Cement Wainscot
Marble Wainscot not in Contract
See steel plans
Wood sash & frames
Copper Flashing
Copper Gutter
Plaster
Furred Ceiling

126

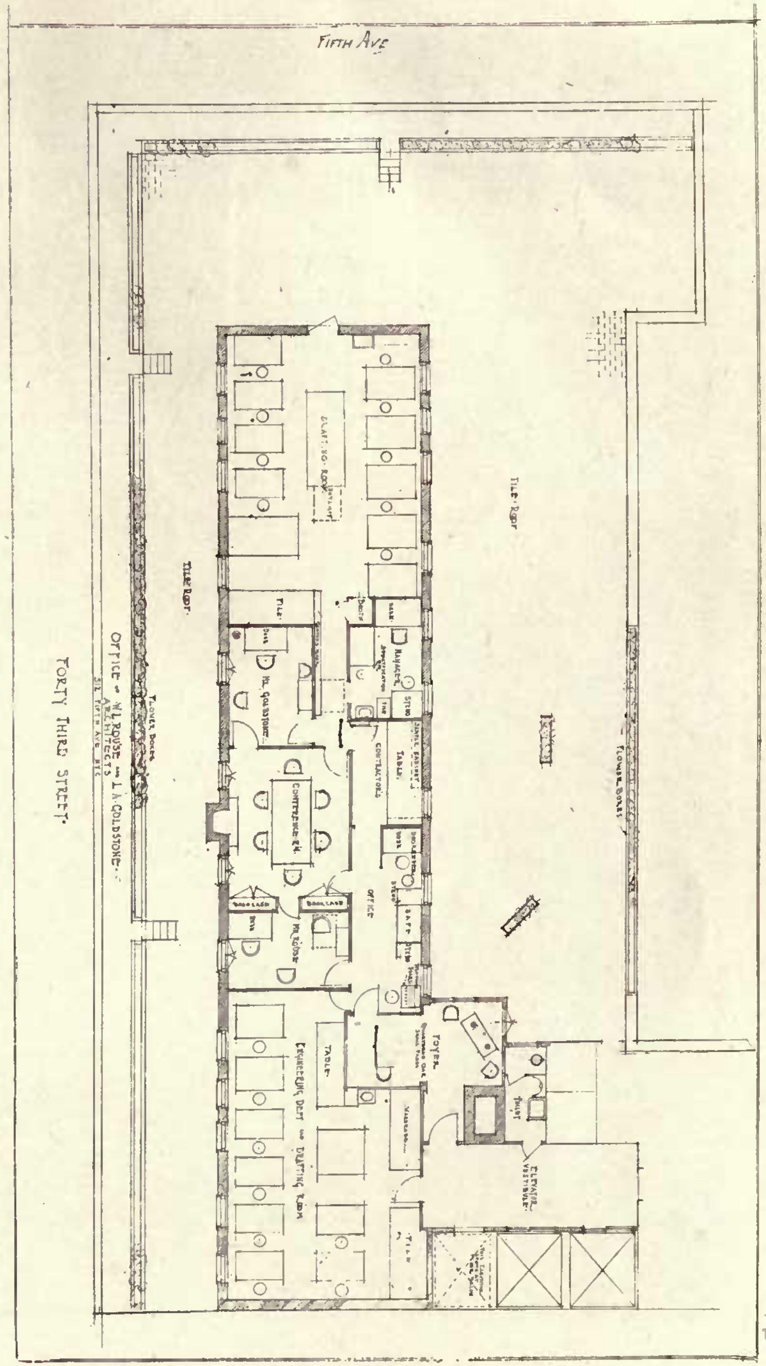
EXTERIOR STONE DETAILS.

Dennison & Hirons, Architects.

CHEMUNG CANAL TRUST CO. BUILDING, ELMIRA, N. Y.



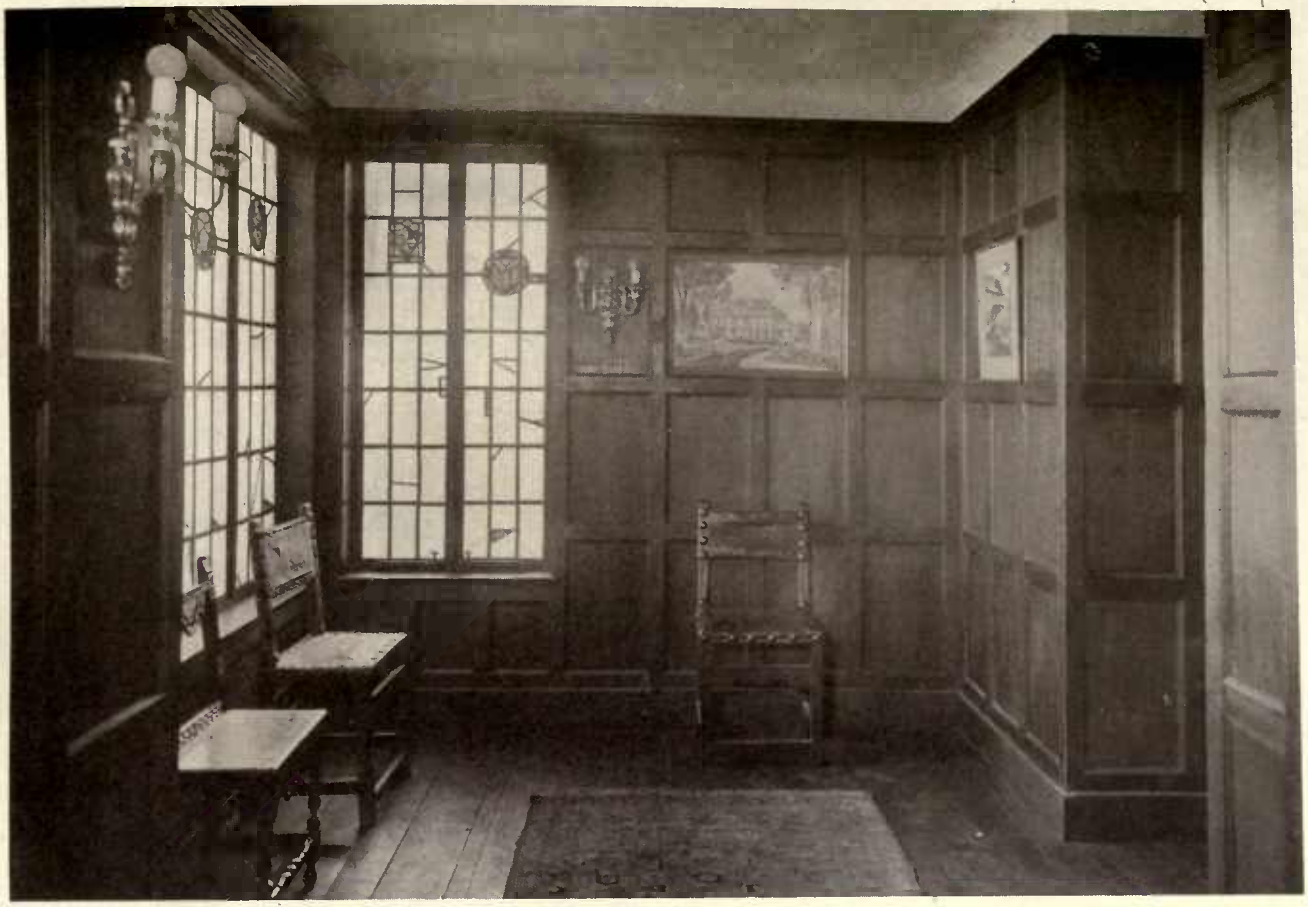
ENTRANCE.



PLAN OF OFFICES.

OFFICES OF W. L. ROUSE AND L. A. GOLDSTONE, ARCHITECTS, NEW YORK CITY.

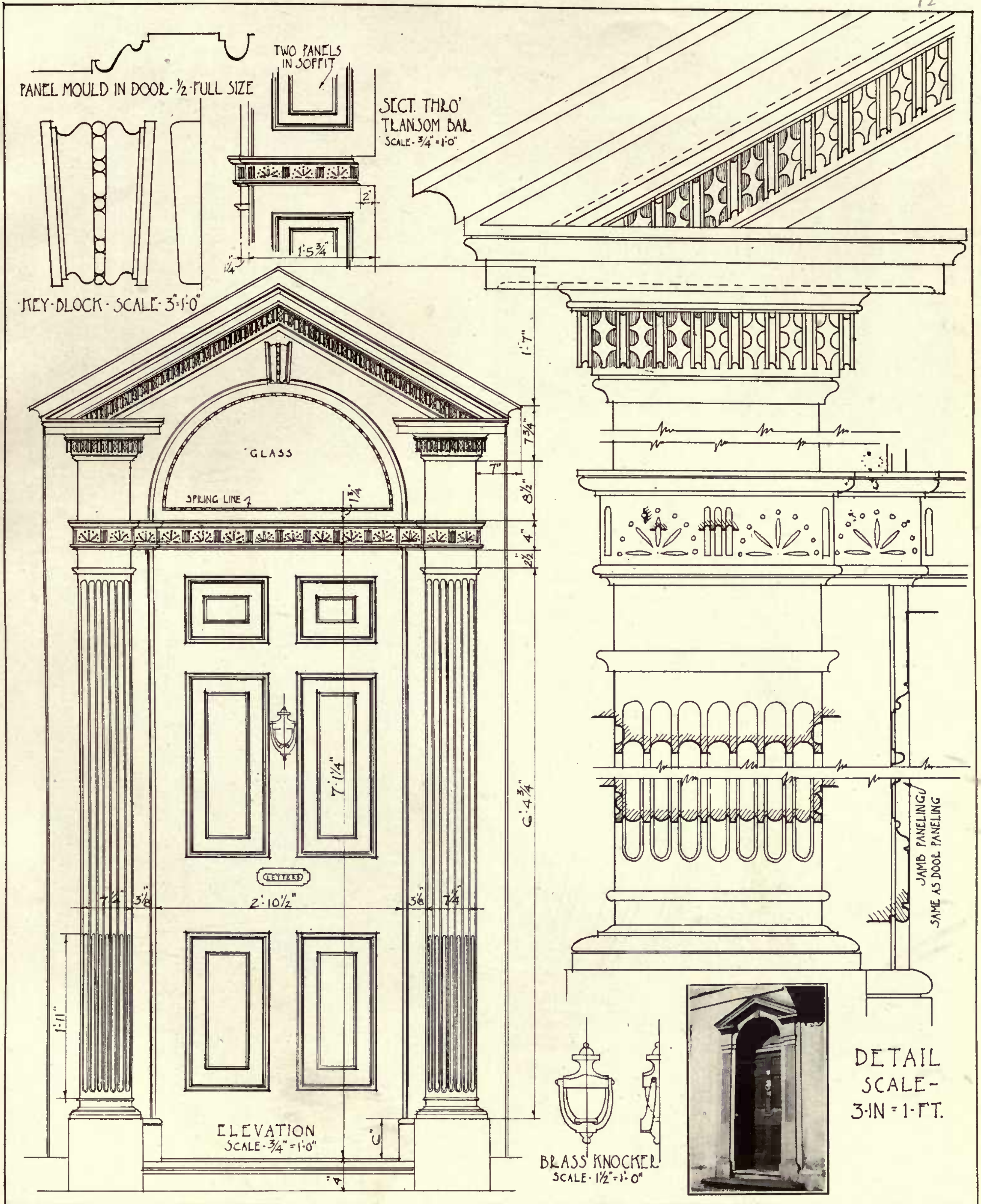
12



RECEPTION-HALL.

CONSULTATION-ROOM.

OFFICES OF W. L. ROUSE AND L. A. GOLDSTONE, ARCHITECTS, NEW YORK CITY.



COLONIAL ARCHITECTURE of the CAROLINAS

DOORWAY ---- IZARD HOUSE
DATE - ABOUT - 1790 CHARLESTON - S. C.

MEASURED & DRAWN by J. A. ALTSCHULER

1ST SERIES

PRIVATE GARDEN OF THE DUKE OF SAN PEDRO "A" PROVINCE OF GRANADA

TERRACE - PRIVATE GARDEN OF THE MARQUIS DE LA VEGA Y INCLAN "B" TOLEDO.

SMALL GARDENS IN SPAIN

BY FRANÇIS HÕWARD GARDEN ARCHITECT

A SECLUDED GARDEN RESIDENCE OF SEÑOR DE CEPERO "C" NEAR SEVILLE

PRIVATE PATIO "D" RESIDENCE OF THE DUKE OF ALBA

ORIGINAL STVDIES IN SPAIN BY MR HÕWARD

"A"—Private garden of the Duc de San Pedro, near Granada, Spain, showing bit of old castle wall to the left, with characteristic stone fountain in foreground, and light wrought-iron work on the terrace.

"B"—Private garden of the Marquis de la Vega y Inclan, Toledo. Beautiful portico of stone columns at corner of the garden, with benches made of gracefully cut bricks of Roman form.

"C"—Private garden of Señor de Cepero, Seville. Boxwood trees of great age, flanking a brick-paved walk and low fountain, with small statue, and showing delicate architecture of a loggia at end of path.

"D"—A back yard in Seville. Note the use of many simple pots containing small plants, set around on cement borders beside the paths—an idea useful in our city gardens.

Photographic studies made in Spain by Francis Howard, Garden Architect, illustrating the practical solution of comparatively small garden spaces in a manner which combines natural beauty with an architectural setting. These ideas Mr. Howard has adopted in some of his garden work, and he claims they should be more universally used by architects, especially for the smaller type of garden.

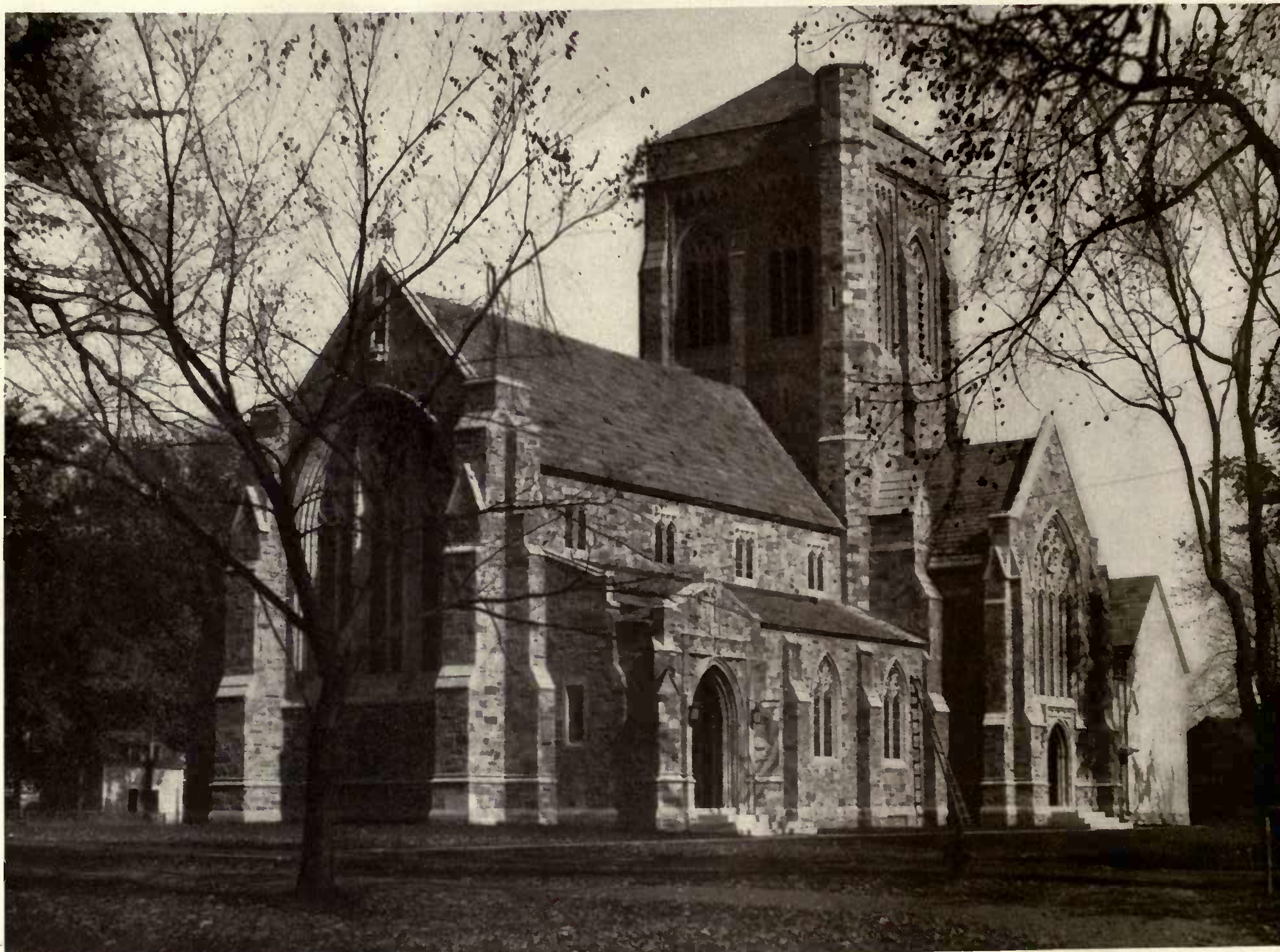
"E"—Courtyard garden inside the small provincial Museum of Cordoba, with simplest type of Spanish fountain, exquisite antique statue and beautiful colored tile work, with loggia.

"F"—Vine-clad garden court with star-shaped fountain surrounded by colored pebble pavement in a gentleman's garden, Granada.

"G"—Corner of terrace in small garden in Cordoba with pierced stone balustrade and ancient wall font and delicate iron railing at top of wall

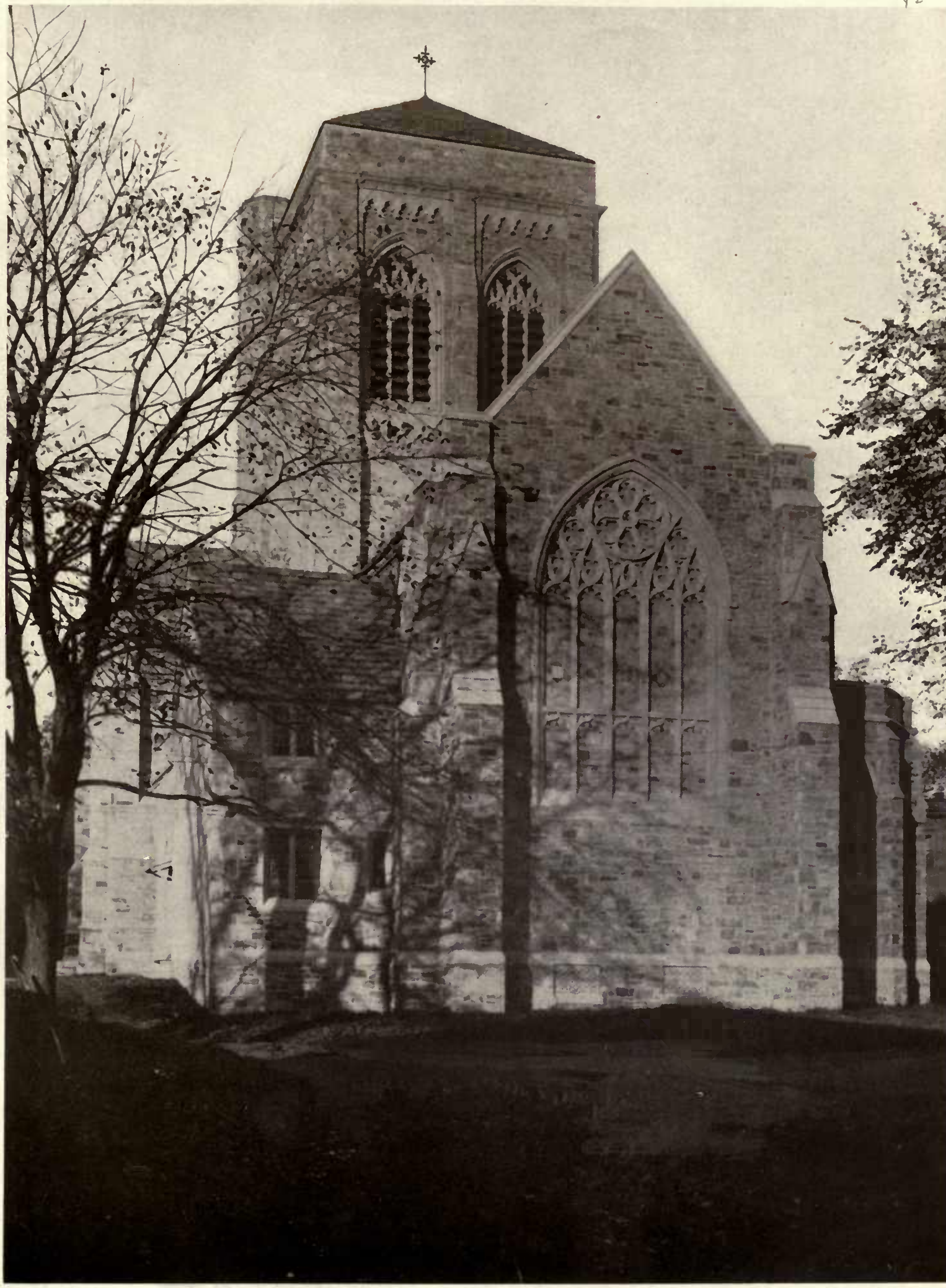
"H"—Small patio in Cordoba with quaint staircase and loggia made with naïve simplicity out of wooden columns with corbels and round Spanish tiles over them

Selections from original studies of small gardens made in Spain by Francis Howard, Garden Architect. Most of this series of photographs illustrate the manner in which the Spaniards utilize the limited space about their city homes; and the ideas are recommended by Mr. Howard for practical use in America.



ST. MICHAEL'S CHURCH, LITCHFIELD, CONN.

Rossiter & Müller, Architects.



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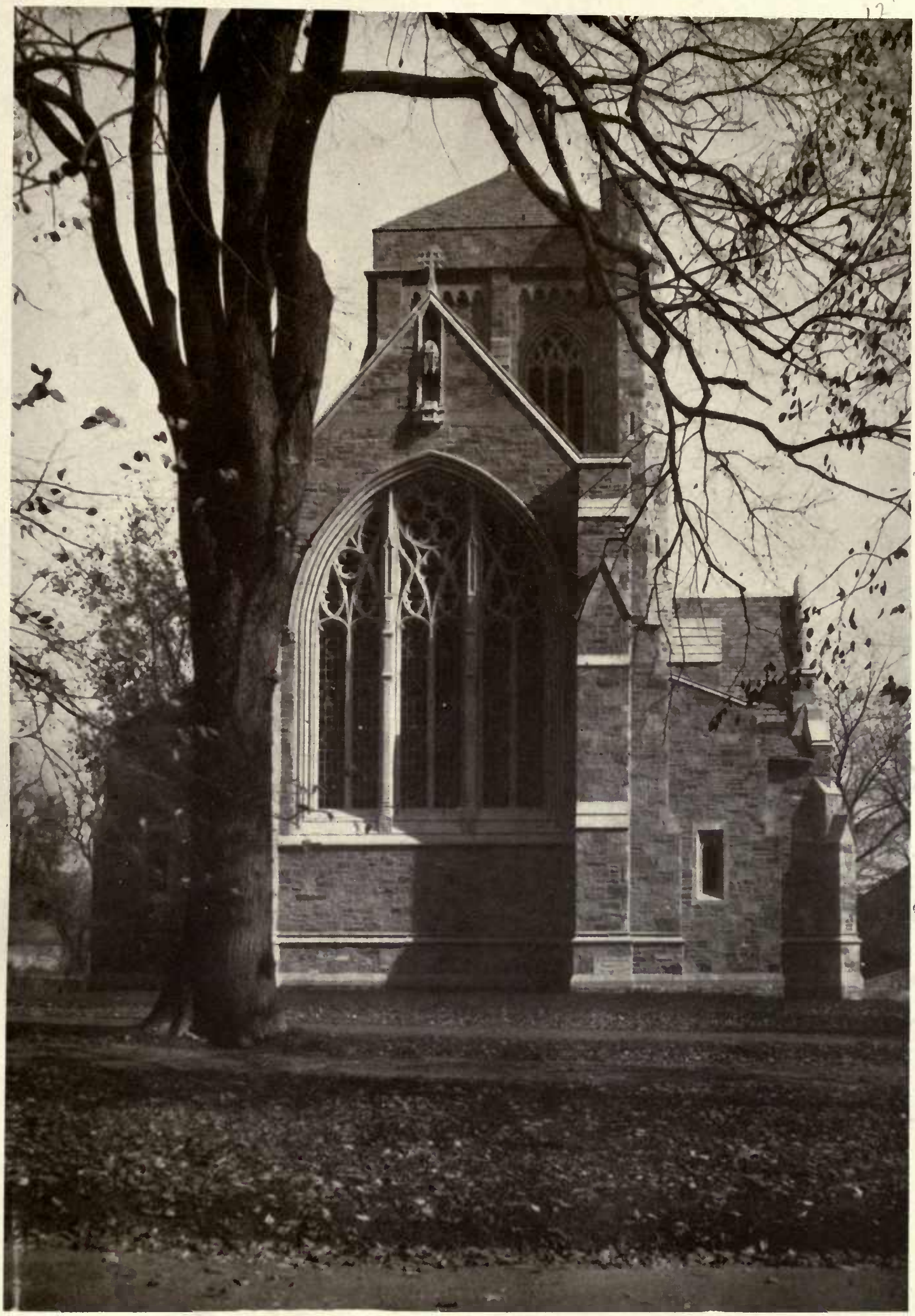

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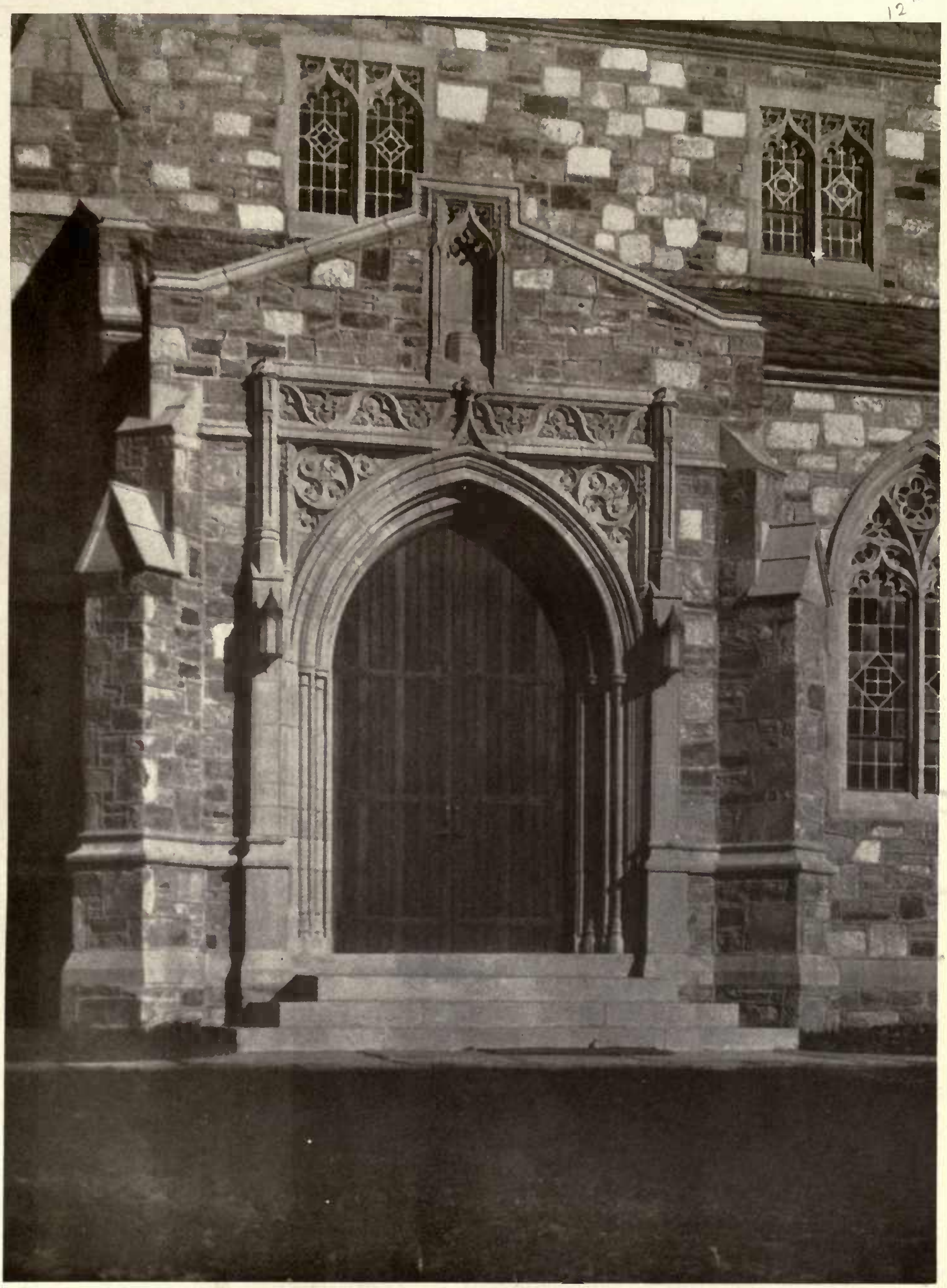
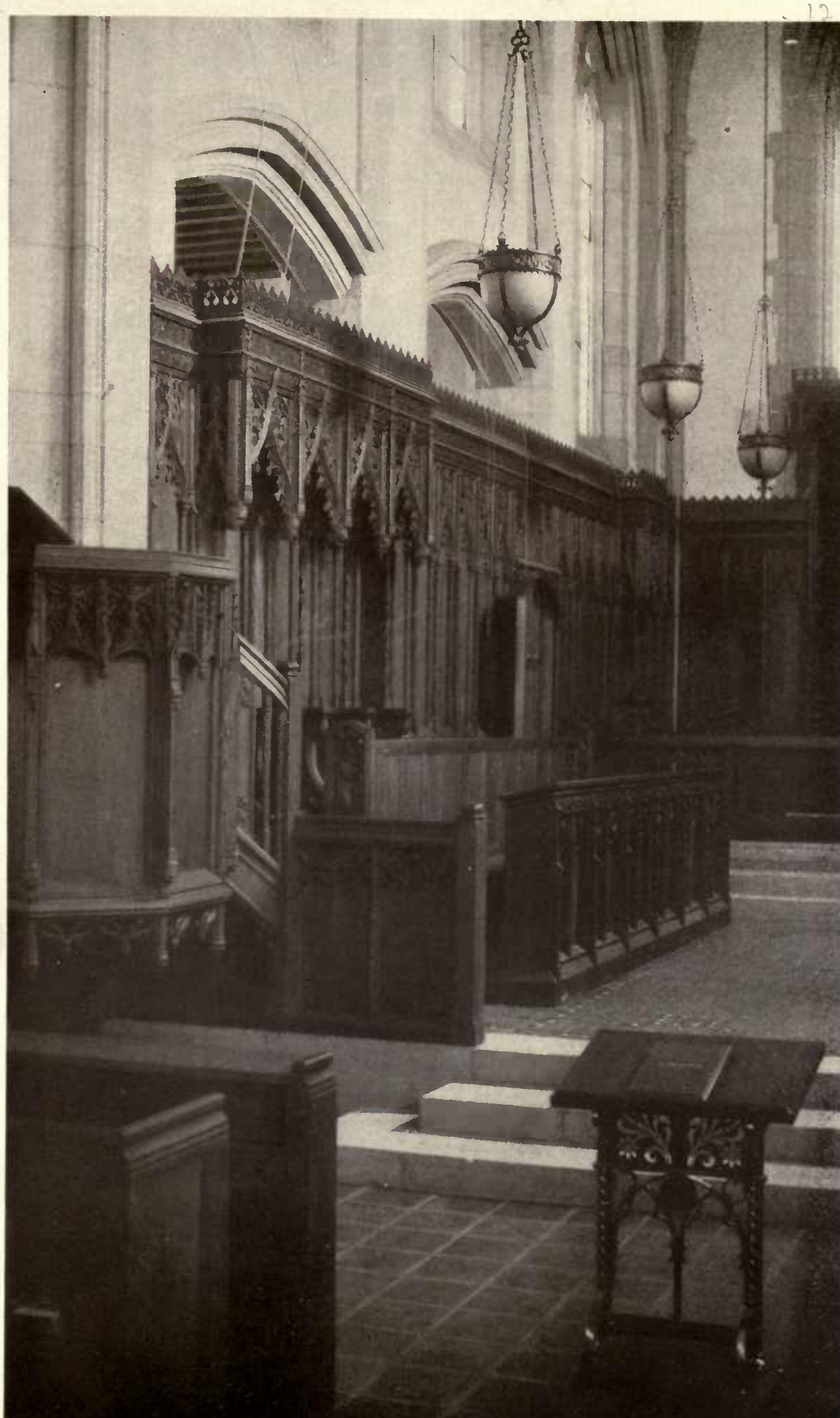


ENTRANCE-DOORWAY, ST. MICHAEL'S CHURCH, LITCHFIELD, CONN. Rossiter & Müller, Architects.



THE CHANCEL, ST. MICHAEL'S CHURCH, LITCHFIELD, CONN. Rossiter & Müller, Architects.

St. Michael's Church, Litchfield, Connecticut

Rossiter & Müller, Architects

WHEN the problem of erecting a new church in memory of Cora W. Towne was taken up between the architects and parish—made possible by the generosity of her husband, Henry R. Towne—the all-important question centred about the choice of style of the new St. Michael's. There were many who argued, and with excellent reason, that in an old county-seat like Litchfield, whose streets were studded with admirable specimens of colonial architecture, and whose traditions traced back to post-revolutionary days, that the most logical and fitting expression would be found in the adoption of the style so successfully developed by Sir Christopher Wren and his followers. The architects, Rossiter & Müller, and the donor were strong in their convictions, however, that it is the Gothic rather than the church of classic design which lends itself most happily to sacred emblems and mute gospels, by virtue of its aspiring forms. The decorated period of English Gothic was therefore thought best adapted to meet the needs of this congregation of four hundred. This meant planning an edifice whose interior dimensions, counting in the two side-aisles, are 40 feet by 80 feet, plus a chancel 22 feet wide by 38 feet long. By referring to the accompanying plan the relation of the component parts, including chapel and baptistry, may be seen.

Interior, St. Michael's Church, Litchfield, Conn.

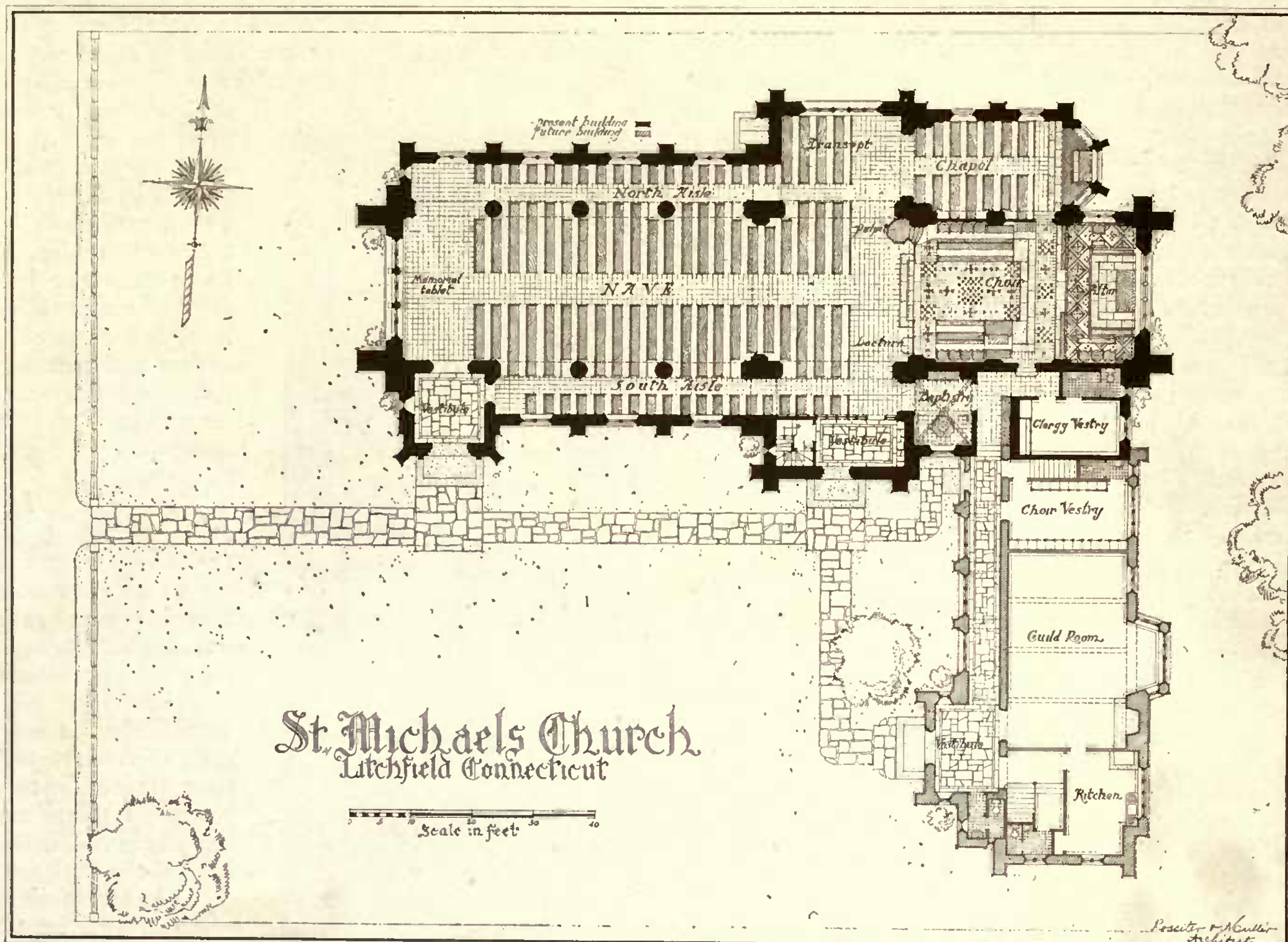
The style and the dimensions of the church having been determined, a stone was sought that would prove sufficiently diverse in color to give a variety of tonal quality to the exterior. One of this character was found in the dump of an abandoned quarry in the town of Roxbury, Conn. Being of every imaginable hue of gray, with an intermixture of ochres running the whole gamut of browns and yellows, the general result is one of extreme cheerfulness. Indeed, the warmth of colors suggests the play of the sun upon the walls even though the day be dark. The avoidance of monotony was carried into the roof, where graduated slate of various sizes and colors were employed to the distinct harmony of the general effect. In combination with the Roxbury stone, one moulded of an aggregate of cement and trap rock was chosen for the window tracery and general outside trimmings, as well as for the tower piers, arched columns, corbels, etc.; but with this difference, that the interior stone is not only warmer in color, but having been bush-hammered, has a softer effect, most pleasing to the eye. But it is not by the mere choice of stone and wood that an artistic result has been achieved. The several groups of craftsmen employed upon the building have taken material often vulgarized by common use and transfigured it to their own meaning. They have wrought in the spirit of mediæval workmen, and invested each unseen and hidden part with a character akin to that which was born of the worship of ancient builders.

The roof is carried on oaken trusses of interlacing tracery supported by stone corbels. The interspaces and panelled ceiling beneath the tower are treated with native chestnut—the last contribution, it may be said, of forests which have passed into the limbo of things nature has eliminated from the land of the Puritans.

The floor of the nave, chapel, and baptistry, apart from that directly under the pews, where oak plank has been used, is laid with 9″ by 9″ terra-cotta quarries. In the chancel, tile from the Moravian Pottery Company has been harmoniously employed; woven into the design are many of symbolic significance—reproductions of those found in the pavements of early Christian churches. They constitute a part of that symbolism which forms the aerial ladder which people climb to the Kingdom of Mary's Son. The steps leading to the floor of the sanctuary and the floor, itself, are of marble of light Siena hue. It is in the chancel and woodwork related thereto that the architects have bestowed their most earnest thought. The pulpit, the choir, and priest stalls attest with their elaborate carvings and delicate traceries the combined interest of designer and craftsmen in their attempt to produce a work of art that may be likened unto many chancels executed by the master builders of Europe.

Generally speaking, when an old church has been outgrown and yields to the demands of a new one, the building committee is immediately confronted with the awkward problem of dealing with memorials sacred to members of the congregation. It is, therefore, their part to avoid, if possible, bringing them in conflict with the newly adopted forms and color schemes. This problem has been most happily solved by the donor, who added a chapel to the plan of the church to take care of the memorial windows and tablets contributed by parishioners of an earlier day, leaving free the wall spaces and traceries.

In conclusion it may be said that the church, or, rather, the south side of it, has been designed with reference to erecting a parish house to be placed contiguous to the present robing chamber. This will not only form a semiclose of the lot but give a desired proportion to the various features, by bringing them more into a sequential relation, and thereby add a greater significance to the dominant note—the central tower.



Announcements

Le Brun Travelling Scholarship Competition Year, 1922.—The Executive Committee of the New York Chapter of the American Institute of Architects, as Trustees of the Travelling Scholarship founded by Pierre L. Le Brun, announces a competition for the selection of a beneficiary. The programme calls for drawings to be delivered about March 1, 1922. All those wishing to enter the competition should arrange at once for nomination by a member of the American Institute of Architects. Nomination blanks can be had of the Secretary of any Chapter, A. I. A., or of the Le Brun Scholarship Committee, 215 West 57th Street, New York. Nominations should be sent, so as to be received before January 1, 1922, to: Le Brun Scholarship Committee, 215 West 57th Street, New York, Julian Clarence Levi, Chairman.

Isaac Menline, consulting engineer and late engineer of design and construction for the garment centre Capitol Buildings (Seventh Avenue at 37th Street), and for several years prior thereto assistant engineer in the Bureau of Buildings, Manhattan, begs to announce that he has opened an office for the practice of engineering at 112 West 42d Street, New York.

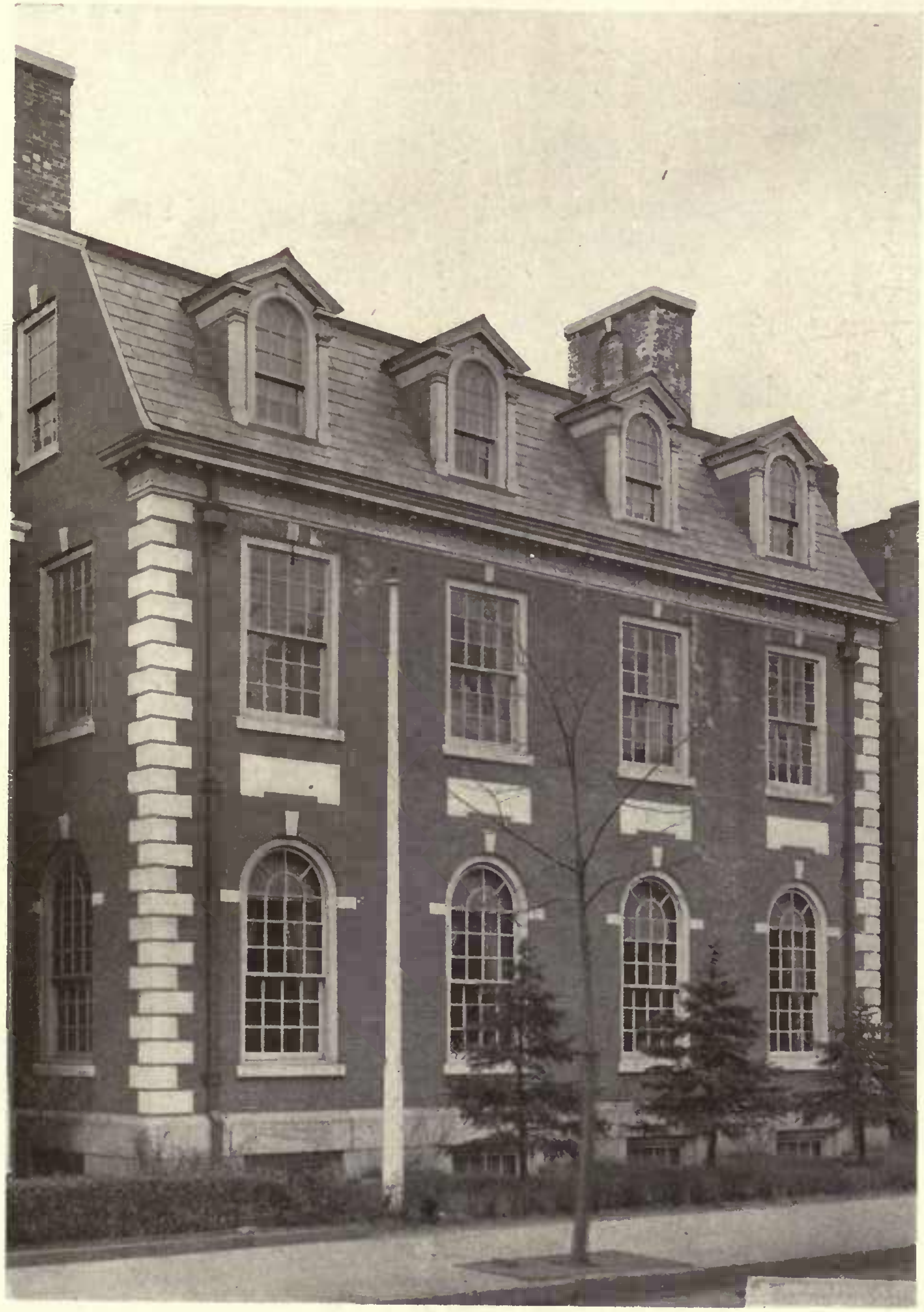
The Gorton Single-Pipe Vapor System

THE Gorton Single-Pipe Vapor System has the same general piping plan as the ordinary single-pipe steam system; the only difference lies in the addition of the Gorton Vapor Appliances. This is equally true of both the double-pipe and the single-pipe vapor systems, as the piping plan of either vapor system is the same as that of the corresponding steam system.

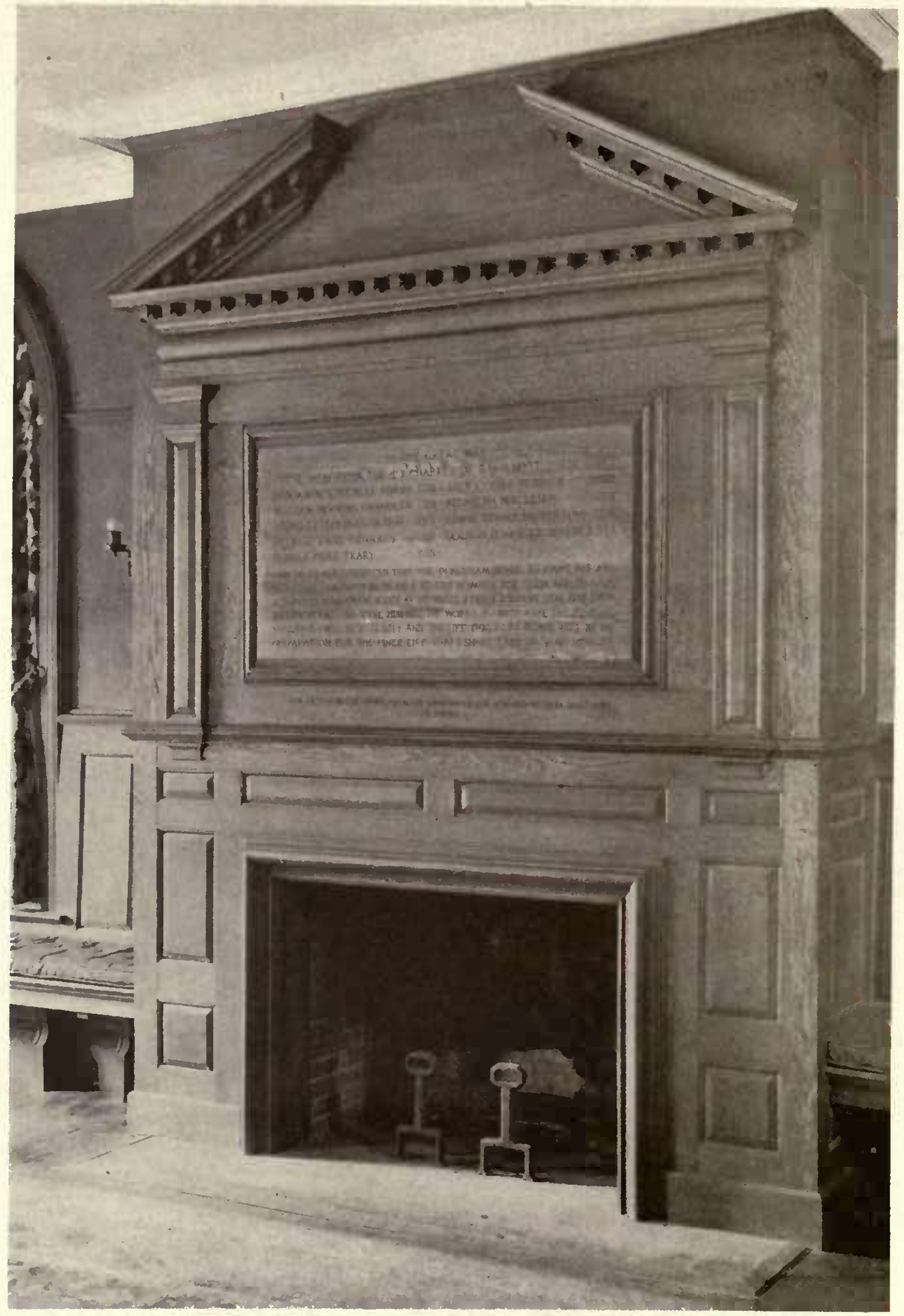
It is not the piping plan that changes a steam system to a vapor system, but it is the appliances that are used in connection with the system, which, by quickly clearing the air from the system, permit the vapor to circulate under a minimum pressure.

The Gorton Single-Pipe Vapor System operates under the same low vapor pressure as the two-pipe vapor system, which is from 4 to 12 ounces, except on large installations, where there is a variable increase in the pressure according to the size of the system.

The success of the Gorton Single-Pipe Vapor System has been attained by the development of two appliances—the Gorton Vapor Air Relief Valve and the Gorton Quarter Turn Packing Lock Radiator Valve.



EXTERIOR.



MEMORIAL MANTEL.

J. Frederick Kelly, Architect.

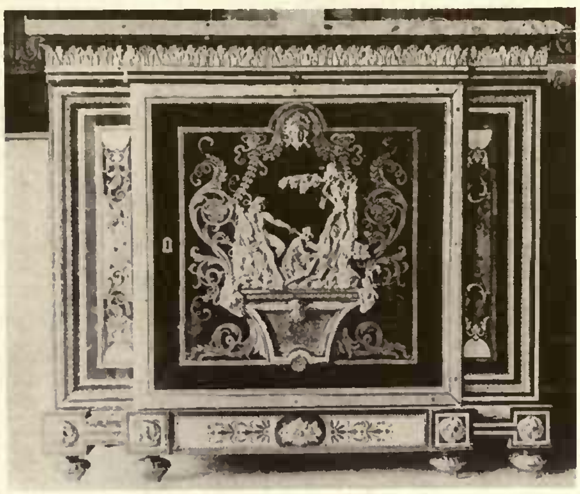
BETA THETA PI FRATERNITY HOUSE, NEW HAVEN, CONN.

André-Charles Boulle

A Master of Seventeenth-Century Decoration

By Henry Coleman May

DURING the last ten or fifteen years there has been a very marked and wide-spread revival of interest in eighteenth-century art in all its forms. One might say that its purely decorative aspects have received even more attention than have the work of its representative painters and sculptors. As far as French art is concerned, there is a very logical reason for this particular point of view, though it is one which does not concern this article. Paintings and statues have formed the object of hectic rivalry in public and private sales, and furniture, with all its accessories



Commode in the Louvre. Bas-relief of Apollo and Marsyas. Bronze, ebony, and tortoise-shell.

and complements, has reached prices which hitherto were reserved for the creations of the great masters alone. The names of French furniture designers and makers of this period are now known to all who take even a small degree of interest in the matter, and pieces bearing their signatures are avidly sought after by great and small collectors alike.

With the exception of a very few, these ebonists were merely "petits-maîtres." This term, however, implies no disparagement; it is merely for the matter of distinction. Indeed, we have long recognized the infinite charm and talent of those artists who come under this heading. Their productions were graceful and spirited, full of imagination and taste; in a word, thoroughly descriptive of their epoch. In this last quality lies their greatest charm for modern eyes, and it is the one which above all attracts the collector.

The names of Cressent, Oeben, Riesener, and Jacob, of Caffieri, Gouthière, and Thomire, are familiar to all. They were the giants of their period.

But the first of this dynasty of artists belonged to another century, to the preceding one. His name was Boulle, and his very remarkable creations have, it would seem to us, been somewhat forgotten in the interest which centres around the perhaps more pleasing productions of his successors.

This is partly explained by the fact that his pieces belong to an extremely grandiloquent age, to one which had little in common with the succeeding century and nothing at all with our own modern times, with its individual ideas and systems. This great ebonist remains, however, the supreme master in his sphere. In real importance he has never been surpassed. Whether his taste, which corresponded so perfectly to that of the age in which he worked, is a popular one nowadays remains another question, but in artistic and intrinsic value his productions are certainly worthy of a continued interest.

André-Charles Boulle was born in Paris in 1642. His father was a cabinetmaker of some repute, but his ancestry would appear to be obscure. In 1677 he married Anne-Marie le Roux at St. Sulpice, he being described in the register of that church as "marqueteur et ébéniste ordinaire du Roi."

Up to this time his history seems to be unknown, and no authentic records have been found proving to any extent his previous activities. He had, however, already attained a position of some eminence in 1672, as in that year he received official consecration in being admitted to lodgings in the Louvre.

During the reign of Louis XIV a part of the upper galleries of the Louvre had been arranged to serve as habitations and workrooms for a certain number of artists, the latter living and working there at the expense of the crown. The king had established in his palace a regular colony of sculptors, architects, and painters, of jewellers, clock-makers, gold and silver smiths, and of upholsterers, all of them naturally having attained the highest possible excellence and the most wide-spread reputation in their particular profession or trade. In creating this asylum for artists and artisans, Louis XIV gave them not only an inestimable mark of protection and reward but as well freed them from the trammels of the industrial communities and unions which at that date in France had already attained a highly organized state and one, consequently, extremely prejudicial to the proper development of artistic initiative.

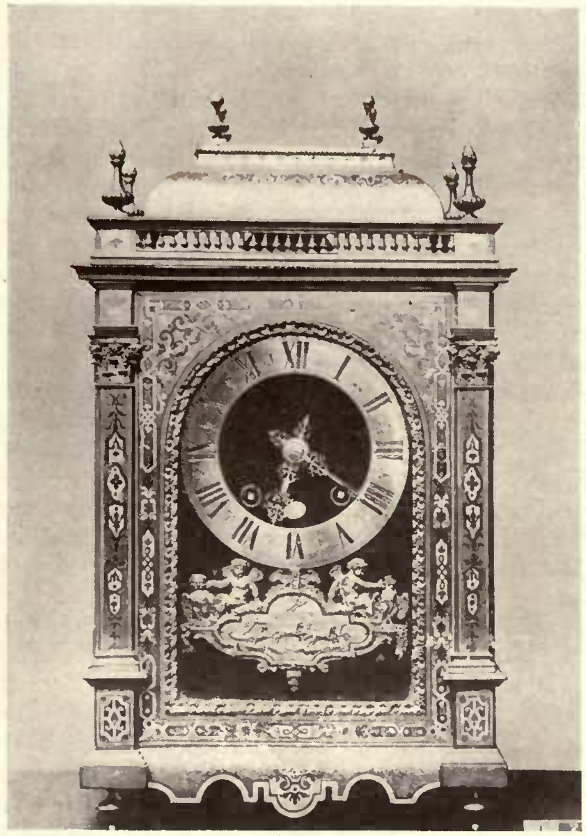
It is needless to add that admission to the Louvre was a greatly coveted honor as well as an enormous help. Throughout the greater part of the eighteenth century it retained its efficiency as well as its prestige.

Boulle was admitted to the palace after the death and in order to take the place of Jean Macé, the most celebrated cabinetmaker of the early seventeenth century. The latter had lived and worked there with his three sons. At his death, and on account of the consequent vacancy occurring thereby, Colbert wrote to the king recommending Boulle as the man best fitted to take the deceased ebonist's place in the Louvre, qualifying him as "le plus habile ébéniste de Paris."

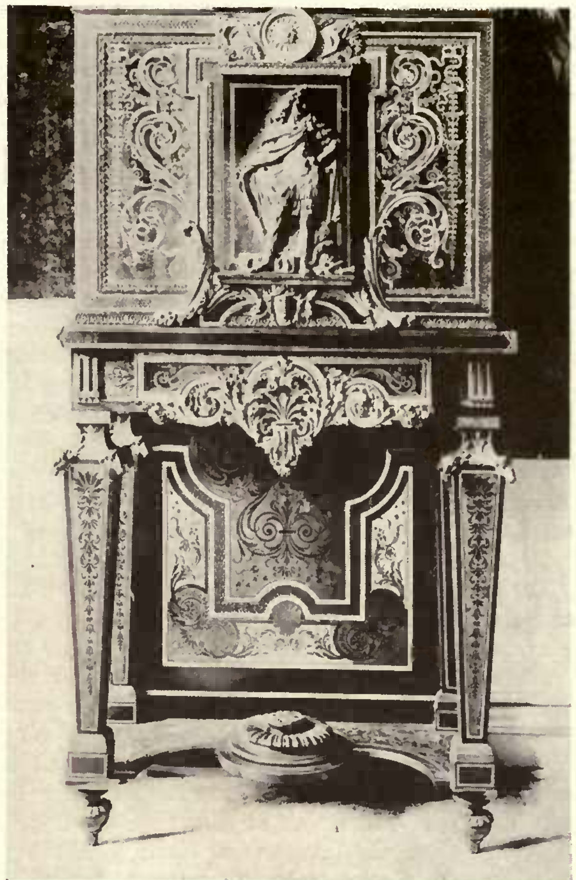
This occurred in 1672, just prior to the Flanders campaign, when Louis XIV was about to undertake his memorable passage of the Rhine. Boulle at this time had attained his thirtieth year.

In 1688 we find him definitely established in his official residence with his wife and their seven children, most of the latter having been born within the palace. Four of his sons followed their father in his profession, and though

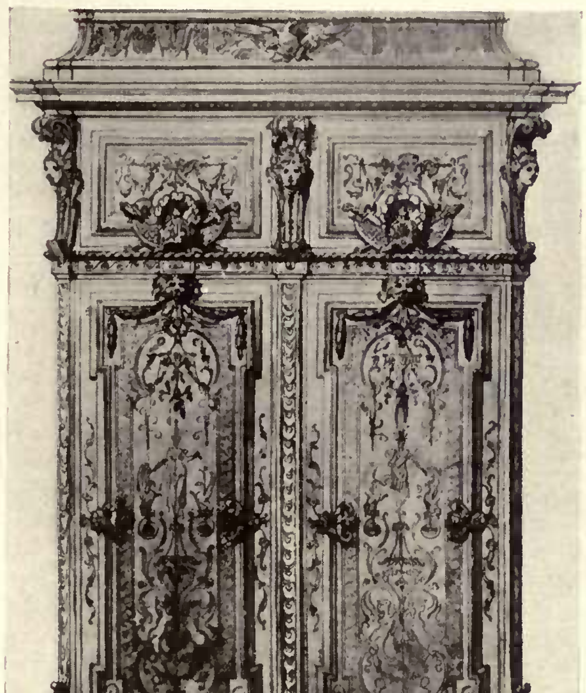
(*Continued on page* 18.)



CLOCK IN THE SOUTH KENSINGTON MUSEUM, LONDON. BOULLE'S EARLY MANNER.



CABINET MADE FOR THE LOUVRE, BEARING ALLEGORICAL FIGURE OF LOUIS XIV.



ORIGINAL DRAWING FOR A WARDROBE.

WARDROBE BY BOULLE IN HIS FINAL MANNER.

(*Continued from page* 16)

they never inherited his remarkable talent, they succeeded in attaining a certain reputation as cabinetmakers and designers, due, no doubt, to the excellence of the training they were lucky enough to have received. Two of them, Jean-Phillipe and Charles-Joseph, seem indeed to have reached a particular degree of excellence. As their father grew in years he left them in charge of most of his work and gave up his own time almost entirely to enlarging his collection of paintings, drawings, and engravings, of medals, statues, and bas-reliefs, which, besides being an invaluable aid to him in his profession, became the most cherished distraction and occupation of his old age.

In August, 1720, through some unknown cause, Boulle's apartment caught fire and his entire collection, as well as many finished and partly finished pieces of furniture of the most magnificent description, perished in the flames. Among the works thus destroyed were drawings and statuettes by Michael Angelo, antique specimens of sculpture and paintings by contemporary artists. The owner valued his losses at 208,570 pounds, a considerable figure for the period, and this catastrophe marks the culminating point and decline in the artist's life. From that time on he seems to have been constantly engaged in financial difficulties, in law-suits and other annoyances which darkened his remaining years of life. He died at the advanced age of ninety in March, 1782, harassed by debts and family troubles, but leaving to posterity a legacy of inestimable value. He was buried in the graveyard which at that time surrounded the church of St. Germain l'Auxerrois, close to the tomb of Bérain, of Antoine Coyzevox, of Santerre, and of numerous other artists.

Boulle represents that moment in the history of furniture when the last vestiges inherited from the Middle Ages disappeared in the flowering of a perfected art. His name, which has become a synonym for a certain class of furniture, whose principal characteristic is the incrustation of bronze in tortoise-shell and ebony, might well stand for the very first phase in the history of modern furniture and decoration. The forms themselves which he created differed widely from those invented by earlier artists and artisans.

In the very early days furniture in France was of a most summary description. It consisted principally in coffers, chests, and wardrobes. It was only in the fourteenth century that elements of decoration were introduced, generally by pasting canvas over the wooden surfaces and covering the former with painted decoration. In the following century the structure of furniture gained in elegance and the decorations ceased somewhat to be of a merely applied sort but became more logical in character. Chests and "armoires" took on a far more refined and interesting aspect, and began somewhat to resemble their beautiful Italian prototypes in delicacy of decoration and grace of proportion. It is only in the sixteenth century that painted decoration disappears and sculptured wood takes its place. In order to make up for the lack of color to which the eye had become accustomed, these chests and tables were at that time covered with the richest damasks, embroideries, and tapestries. Chairs were treated in the same manner; the wooden construction of beds disappeared under the ample folds of velvets and brocades, and one might say that the furniture of this period was represented almost entirely by tissues and tapestries.

In the early seventeenth century these two elements were combined; structural features ceased to be disguised by hangings. Incrustations, low reliefs, and figured compositions began to take the place of painted decoration and covers made of rich materials. It remained for Boulle to effect that complete transformation which at once brought furniture, as we now understand the term, into its proper place in art and its exact relation to necessity and decoration.

The use of marquetry and incrustation in furniture goes back to the remotest antiquity. Among the inventories which have come down to us from the fourteenth century we oftentimes find mention of works of this sort, though generally of Oriental origin. A great number of small pieces seem to have been used in Europe at that time, mainly boxes, jewel-cases, and miniature coffers, incrusted with ivory, mother-of-pearl, and semiprecious stones, worked into delicate designs. These usually took the form of arabesques, alternating with verses from the Koran, a form of decoration which recalls the familiar walls of the Alhambra, or the perfumed caskets from Damascus which found their way into mediæval Europe as a result, undoubtedly, of the Crusades.

Of French work proper of this sort, specimens are very rare indeed. In the inventories of the effects having belonged to Charles V (1380), to the Duke of Berry (1416), to Charles VI (1418), as well as those of Charlotte de Savoie (1483) and Anne de Bretagne (1498), mention is made of various pieces which were undoubtedly of French workmanship and decorated in a manner somewhat similar to the objects above mentioned, though in a totally different style.

All this goes to prove that the use of marquetry was known in remote times. During the Renaissance it became quite current. In Italy, Spain, and even Germany, this form of decoration was at that time far more common than in France. The first mention of incrustation of precious woods, of marquetry proper, is made in 1600, when Marie de Medicis arrived in the harbor of Marseilles in a galley "so royally rich and of such excessive beauty that the sea had never before seen anything to compare to it. Its prow was made of marquetry of precious woods from India, incrusted with ebony, ivory, and with lapis."

Up to the middle of the sixteenth century the term "marquetry" meant almost entirely a combination of ebony and ivory, with, occasionally, the addition of one or two precious metals. The opening of the seventeenth century marks the appearance of several new woods used in cabinet-making, and later on in the same period we find pieces of furniture decorated with tortoise-shell and with designs outlined in bronze, brass, and pewter.

This last class of furniture was finally brought to a very extraordinary point of perfection by Boulle. As we have already said, his name has been used as a synonym for this kind of furniture, but as we see from the preceding statements, he was, as a matter of fact, not responsible for its actual creation, which, like almost all elements making up the decorative arts, was the result of a slow and very perceptible development. In Cardinal Mazarin's inventory made in 1653 there is a description made at a time when Boulle was only eleven years old of a cabinet whose characteristics apply precisely to those later made by our ebonist. This particular piece is described as "a cabinet made of ebony and tortoise-shell, outlined on the sides with gilded brass, carried by four monsters made of gilt bronze, the four corners decorated with pierced bronze work, designed to represent leaves, masks, cartouches, and animals; the front drawer decorated with gilt bronze worked into a design in bas-relief representing divers scenes from Ovid's Metamorphoses, the ground being of tortoise-shell, etc."

However, even if Boulle was not the actual inventor of this type of furniture, he was undoubtedly the one who carried it to its highest type of perfection and whose superiority over all his predecessors and contemporaries was beyond dispute. Up to the last he was considered without a rival in France in his particular art, and posterity has confirmed this opinion.

In describing his method we can do no better than to quote Jacquemart:

"He constructed furniture in ebony, covered large surfaces with tortoise-shell on which a design was cut out and incrusted with metal forming arabesques, scrolls, masks; in a word, an infinite variety of decorative elements. To this was added bas-reliefs of gilt bronze, 'sabots,' 'chutes,' and all the other usual bronze accessories.

"Boulle's method of procedure was to superpose two plates of equal size and thickness, one of metal, the other of tortoise-shell, and after having traced his design, cutting them out at the same time with the same stroke of the saw. He thus obtained four proofs of the composition: two at the base where the design appeared in hollow spaces, two ornamental, which, when placed in the spaces of the opposite ground piece, inserted themselves exactly and without any perceptible joining. The result of this practice was seen in two different and simultaneous pieces of furniture—one designated on the first part was the tortoise-shell ground with metal application; the other, called the second part, was applied metal with tortoise-shell arabesques. The counterpart, therefore, being still more rich than the type, the pieces were arranged with crossed effects, as may be seen in the gallery of Apollo, where the consoles are of the two descriptions. Boulle did more, and in his great compositions he found means to add to the splendor of the effect by simultaneously employing the first and second parts in suitably balanced masses. This assemblage was seen in all its perfection in the great piece of furniture belonging to Sir Richard Wallace which appeared at the exhibition of the Corps Législatif."

Although Colbert was primarily responsible for Boulle's entry into the Louvre and, consequently, into the direct service of Louis XIV, it does not seem that up to that time he had executed any works for the crown, or at least any of importance. In fact, his name does not appear in the "Comptes des Batiments" before 1669. In 1672 we find him occupied with his first important commission for the crown. At that date he was working in the palace of Versailles on the redecoration of a small apartment for the queen. In 1680 he made several pieces of furniture for these same rooms, and two years later we find on the entries "two marquetry tables enriched with rock-crystal for the dauphin's apartment." From this time he was constantly at work not only for the king and his court but for various members of the royal family. He designed and made furniture for Madame de Maintenon, for Philippe d'Orleans, as well as for the duchess, his wife. In the same year he executed a series of cabinets for the Galerie des Glaces at Versailles and for the great gallery at Saint Cloud, several of which have fortunately been preserved up to the present time. His most important work during this period was for the dauphin's study at Versailles. This completed work was considered at the time to be one of the chief marvels of the palace. It was one of the principal objects of interest for distinguished strangers, foreign princes, ambassadors, and other travellers of note.

Commode in Boulle's middle manner.

Up to the time of his marriage with Marie Anne Christine of Bavaria (March, 1680) the dauphin had had no official apartment in Versailles. Consequently at the time of his marriage he ordered Boulle to decorate rooms for him which would correspond in magnificence to his rank. The work was begun at once and finished in the autumn of 1683. The possessor did not long enjoy these splendid new surroundings, as less than a year later the dauphin received the order to remove his apartment to the lower floor, and the entire decoration had to be taken down, its dimensions changed, and in fact completely altered and rehandled.

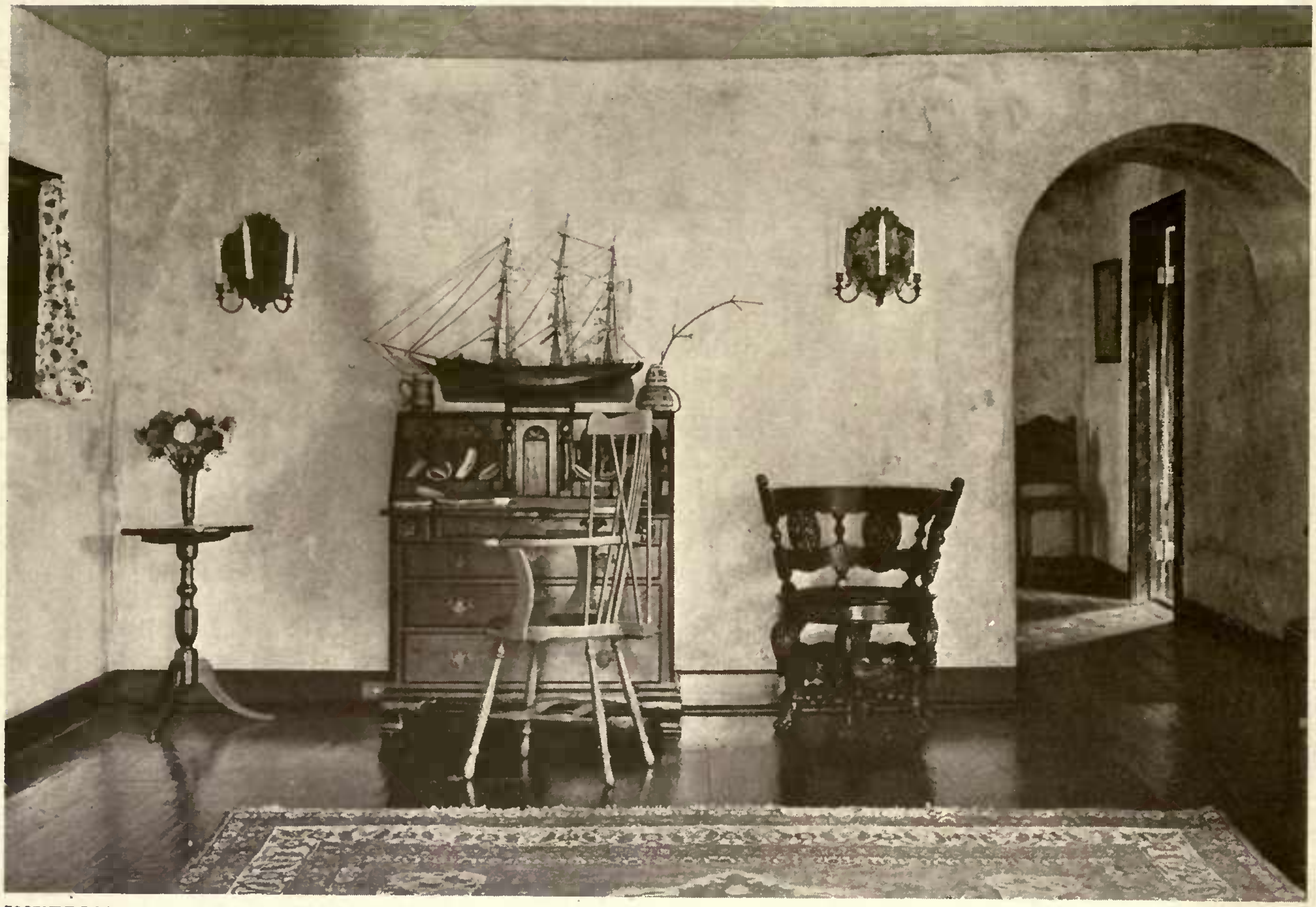
This second apartment looked out on the Louis XIII gallery and continued to be an object of admiration for all connoisseurs up to the time of its occupant's death. After his decease it does not seem to have been properly kept up; the decorations deteriorated through dampness and neglect, and the next dauphin who occupied the rooms had these vestiges of splendor removed to make way for a newer and more fashionable form of ornamentation.

There are reasons to suppose that Bérain furnished some of the motives of decoration used by Boulle in this apartment; in fact, it is not difficult to believe that the two artists must oftentimes have drawn inspiration one from the other, so similar in many respects are their graceful inventions. One might say that the names of Boulle and Bérain summarized the most distinctively "Louis XIV" moment of that period of decorative art.

For nearly half a century Boulle worked for the court, and found time as well to furnish the great financiers of the time and many members of the nobility with furniture, decorative designs, and objects of art. Samuel Bernard, one of the richest men of his time, ordered a writing-table from him for which he paid 50,000 livres, and a clock can still be seen at the Imprimerie Nationale which our artist designed for the Prince de Rohan. He worked as well for foreign celebrities—for the Elector of Cologne and for several Bavarian princes. At least one sample of his work went to the Far East, as in 1687 Louis XIV presented the Siamese Ambassador with a small coffer made by Boulle.

At the present time specimens of his work are to be seen all over the world. In Paris alone superb examples are to be found in the Bibliothèque Mazarine, in the Louvre, in the Cluny Museum, at Versailles and Fontainebleau, and in numerous private collections. In England his work was always highly appreciated, and the pieces forming part of the collections formerly at Hamilton Palace and still at Hertford House and Windsor Castle are, in themselves, sufficient to justify the artist's reputation.

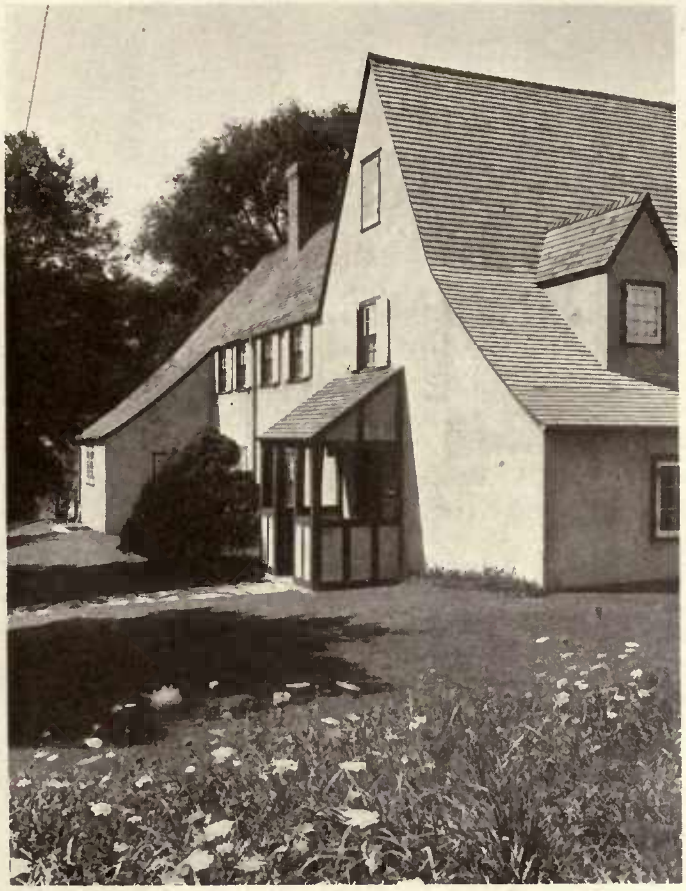
It must be said in conclusion that Boulle's creations were primarily intended for formal and generally immense apartments. They were part of the general scheme of decoration then in vogue and could not be translated to less pompous usage. As a result his pieces have never reached the popularity in modern times which his successor's works still and indeed increasingly enjoy. They necessarily lack that grace and gaiety which characterize creations of a later period, but for the furnishing of great palaces no ebonist of any time has surpassed the genius of André-Charles Boulle.

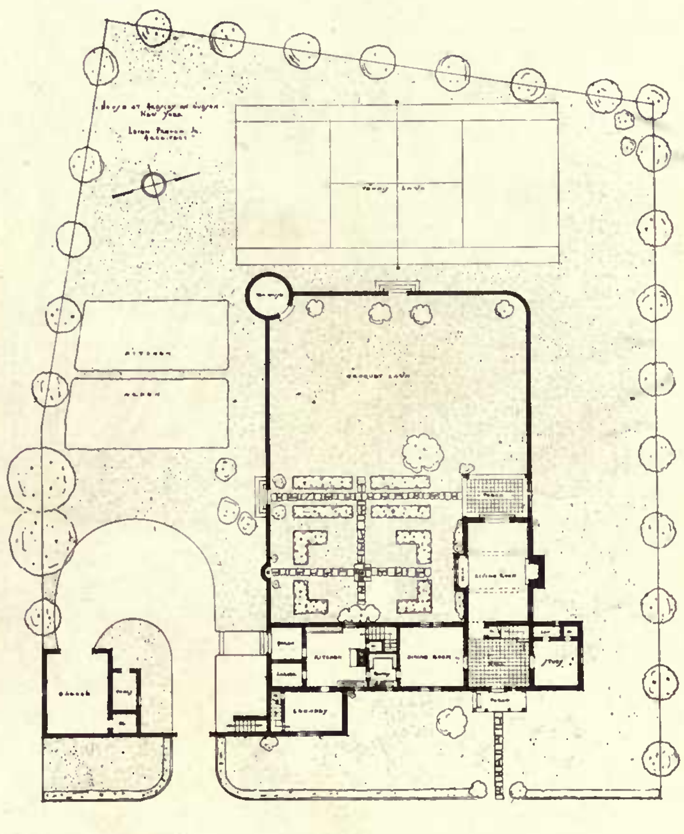


INTERIOR.

HOUSE AT ARDSLEY-ON-HUDSON, N. Y.

Leigh French, Jr., Architect.





HOUSE AT ARDSLEY-ON-HUDSON, N. Y.

Leigh French, Jr., Architect.

Polychrome Terra-Cotta

By Edward H. Putnam

Illustrations by courtesy of Atlantic Terra-Cotta Company

THE ancient temples of Greece are standards of architectural precedent in line, proportion, and detail, and standards of color might be derived from the same source had not centuries of time eroded all but the faintest traces. But early examples of color are not lacking, particularly in the Far East, in time-proof faience, and later on in Italy, where the science of terra-cotta color glaze was understood and the art appreciated.

The highest development of color was reached by Luca

The little Kelly & McAlinden Building at Perth Amboy, N. J., the first polychrome terra-cotta building in the country, blazed a trail that has been followed by many of the most noteworthy buildings of modern times. Thomas Fox, Architect.

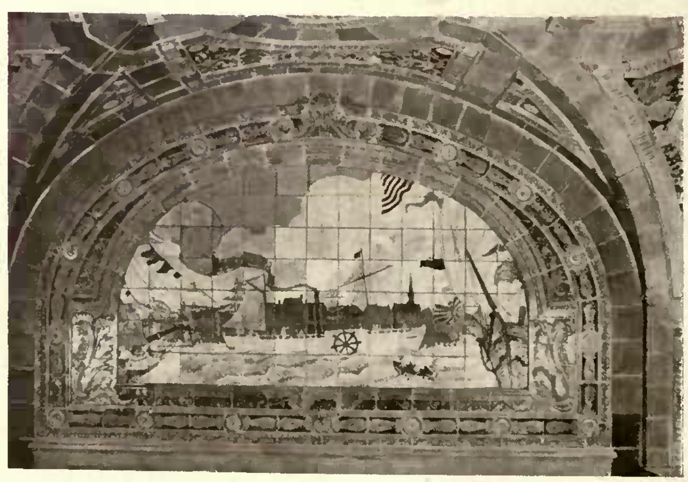
Della Robbia, followed by his nephew, but here the chain was broken and the art almost lost. Spasmodic attempts to revive the industry were made in Europe, but it remained for the New World to definitely and permanently succeed.

It now seems hardly possible that the small, two-story front of a hardware shop, erected in Perth Amboy, New Jersey, in 1898, should have had a direct influence on Stanford White's decision to use polychrome terra-cotta for the Madison Square Presbyterian Church, and through the church an indirect connection with the Masonic Temple and the Academy of Music, in Brooklyn, the Woolworth Building, in New York, and countless other polychrome buildings throughout the country. And yet the connection exists. The Kelly & McAlinden Building was the first building in America to use polychrome terra-cotta, and served as a practical example showing the possibilities of the revived industry to the architectural profession.

The Perth Amboy company had been experimenting in color for several years, and was desirous of an opportunity to try it out commercially. The company offered to redesign the building for color and furnish polychrome terra-cotta instead of gray terra-cotta at the same cost. Naturally, the offer was accepted, and the manufacturers engaged Mr. Thomas Fox, an architect of Boston, to work out the new design for color. Mr. Fox had recently been in Europe studying the color work of the Della Robbias and other old masters, and he selected early Italian Renaissance as the period that would give the best opportunity for the most interesting design in color.

The modelled detail was developed with elaborate care in exact accordance with precedent, and every advantage was taken for the effective introduction of color. A large list of the colors used gives an unfair impression of flamboyancy; it needs a view of the building to appreciate the result at its true worth. It must be remembered that precedent calls for strong colors; in fact, strong colors are necessary; weak colors are too neutral in the elevation of a building at some height above the eye-level.

Mr. Fox used primary red, blue, green, buff, light yellow, and cream-white, and designed a truly beautiful façade, correct in all its architectural details. The matt glaze texture of terra-cotta tends to harmonious color combination. For example, one can hardly imagine a pleasant contrast of green and blue on painted wood, but the colors are most successfully combined in many textiles, and no one ever objected to green trees against a blue sky. In terra-cotta colors the same harmony prevails.

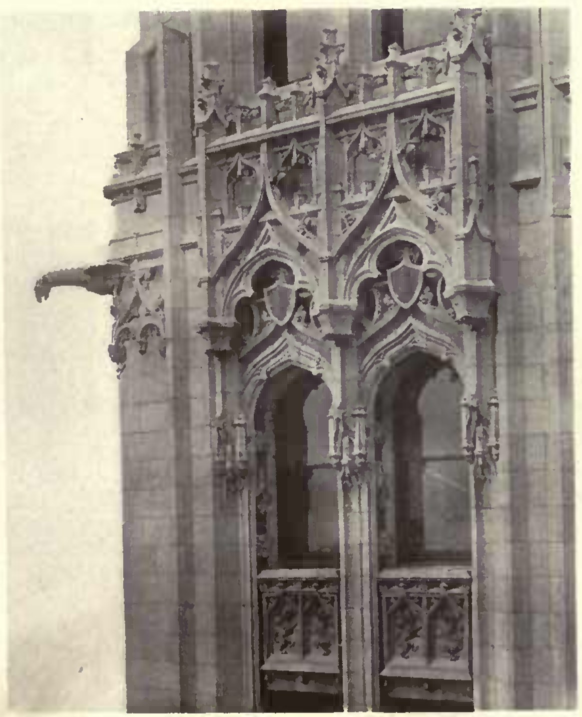


Terra-cotta grille of Hotel McAlpin, New York. F. M. Andrews, Architect. One of twenty-four panels in polychrome terra-cotta designed by Fred Dana Marsh.

MADISON SQUARE PRESBYTERIAN CHURCH, NEW YORK.
McKim, Mead & White, Architects.
The first famous building to use polychrome terra-cotta.

BROOKLYN ACADEMY OF MUSIC. Herts & Tallant, Architects.
Window detail of polychrome terra-cotta.

BROOKLYN ACADEMY OF MUSIC. Herts & Tallant, Architects.
Section of main cornice of polychrome terra-cotta.



TWENTY-EIGHTH-STORY WINDOW, WOOLWORTH BUILDING, NEW YORK. Cass Gilbert, Architect.
Nine different colors occur in the detail of the Woolworth Building. Dark colors are used for backgrounds to accentuate natural shadows.

PAN-AMERICAN UNION, WASHINGTON, D. C.
Albert Kelsey and Paul Cret, Architects.
Gray and polychrome terra-cotta contrasted with white stucco walls.

DETAIL OF WINDOW-JAMB, WOOLWORTH BUILDING, NEW YORK. Cass Gilbert, Architect.
Polychrome terra-cotta.

RECEPTION–ROOM.

THE BUILDING OF THE AMERICAN ENCAUSTIC TILE CO., 16 EAST 41ST STREET, NEW YORK.

Designed by the owners.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Architectural School, Columbia University

Article XV

ROOFING MATERIALS

A ROOFING material should not be judged by its first appearance, but rather by its condition after four or five winters have passed over it. And in choosing the roof for the small house, this is a statement which applies with even greater emphasis, since the temptation is magnified to select that material which is low in cost and bright upon its first appearance.

As an illustration, there are certain types of wood-shingle roofs which have a charm in the beginning that is apt to disappear with age. These are constructed of shingles, dipped in many varieties of colored creosote stains, browns, reds, greens, blues, yellows, and the like, and when newly laid have a warm, mottled, and colorful texture which suggests the multiplicity of tone that nature often produces with age. In fact, the designer who originated this roof was trying to imitate the aging effect of nature, much as Tiffany glass is an imitation of the effect of time upon certain ancient glasses; only in the latter case the operation is the same but the time element reduced, while in the case of the roof it is a stage-like imitation of nature at work.

And there are many other fads in roofing, all of which have as their basis the imitation of the weathering effect of nature. Ridge-poles are constructed with a sag to resemble the settlement which is often observed in picturesque old houses. Shingles are laid, like the scales of an armadillo, and ridges, hips, and eaves are rounded to present the appearance of old thatched roofs. Asbestos shingles are broken with rough edges, and defective tiles are used—all for the purpose of giving that ragged appearance which nature develops with age. Now, to a certain extent there is an element of architectural truth in such devices, but they should be used with the greatest discretion, for, as has been previously asked: "If a roof looks old when it is new, how old does it look when it really is old?"

Before discussing the various methods of laying roofing materials, let us observe some of them after they have been on the house for a few years.

Of course, we are all familiar with the short life of the wooden shingle, which is only about fifteen years. But the life can be extended by dipping them into creosote stains, either just before laying or by the more convenient processes of factory dipping. Cedar has been found to be the best wood for these shingles, since it has a natural resistance to decay. The old hand-split shingles were more durable than the modern shingles, for the surface that they exposed to the weather was the natural cleavage plane of the wood fibres. The sawed shingle delights in curling and twisting out of a flat plane, and always seems to split so that the crack lines up with the space between the shingles on the course above, thus permitting the rain to leak through. And then the nails either rust away or the wood rots around them, until individual shingles drop away from the others, leaving small or large holes in the roof. It is well recognized that the sparks from a neighboring fire find a ready meal in the punk and rotten butts of the shingles, and many a house has been burned to the ground because of this.

The nearest competitor to the wooden shingle in cost is the asphalt shingle, which is made from roofing felt, saturated with asphalt compounds, and surfaced, under pressure, with crushed slate of greenish or red hue. The life of these shingles depends a great deal upon the thickness of the body. Some roofs, laid with very thin asphalt shingles, develop an appearance of chicken-pox after a year or two, for the heating effect of the sun, the lifting force of the wind and ice cause certain individual shingles to bend up from the plane of the roof and, in extreme cases, even flap in a heavy gale, like so many small pin feathers. But this is not so true of the thicker grades of these shingles. Often, too, these asphalt shingles bulge under the hot sun, but this is due to careless laying, for each shingle should be separated from the other by a small space to allow for this expansion. It takes a good many years for the crushed slate on the surface to wear off, but gradually this happens, as also the elasticity of the body degenerates. Finally, as the surface begins to moult, the shingle itself becomes stiff and brittle and begins to break off. Of course, these shingles are superior to wood in resisting sparks from a near-by fire, and their life is longer, if they have a thick enough body.

That same material used for asphalt shingles is made into roll roofings. So-called shingle strips are made, which consist of long narrow rolls of asphalted felt with the crushed-slate surface, the lower edge of which is cut out to form the lower third of the shingles, and, when applied to the roof, the appearance is identical with a roof laid with individual units. Another type of roll roofing is made to imitate wood shingles, by having a shingle pattern stamped with black asphalt upon the surface of crushed slate. It is laid on the roof from the ridge down to the eaves, lapping joints with the next roll about two inches. At a distance the black pattern gives the camouflaged appearance of a shingle roof. The chief objection to any of these roofs is that the long and large areas are nailed down along the edges so that the sag and expansion of the material raises little bumps and hills over the entire roof, which, to say the least, are very unsightly. Then, again, the nails are exposed, and unless they are copper, the chances are that they will rust away before the roof is worn out, permitting the edges to become loose, and the wind to get under the material and rip it away from the roof. Moreover, the roll roofing has only one thickness at any point, while the shingle roofing has either two or three layers over the entire area of the roof.

The cheaper grades of slate roof, such as one would be tempted to use on the small house, show weaknesses in aging that should not be used as arguments against slate roofs in general. These cheap roofs are built up of poorer grades of slate, and very thin sheets at that, and a poor grade of nail is used. The effect of weathering on such roofs is to

(*Continued on page* 28.)

FRONT.

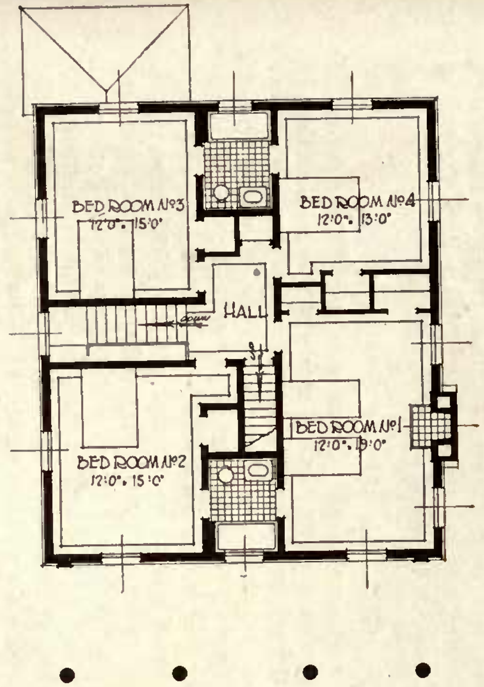
HALL.

Robert C. Hunter & Bro., Architects.

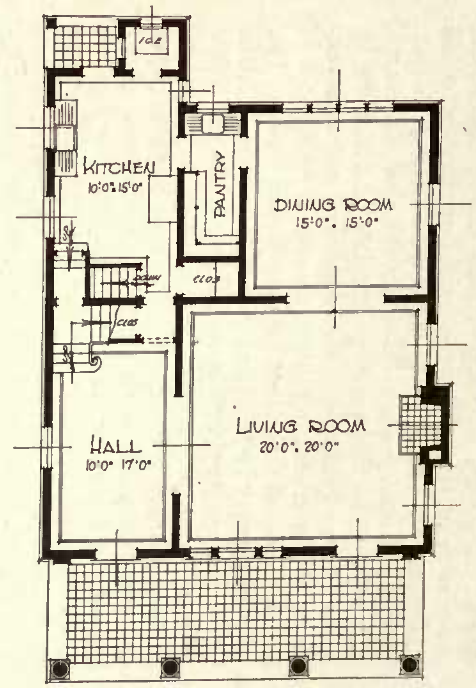
HOUSE WALTER H. MERRITT, TENAFLY, N. J.

DINING-ROOM.

LIVING-ROOM.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

Robert C. Hunter & Bro., Architects.

HOUSE, WALTER H. MERRITT, TENAFLY, N. J.

(*Continued from page* 25.)

chip off pieces of slate and to rust the nails, so that whole units drop off. Generally, too, in these cheap slate roofs, the tar paper is omitted from underneath, and the wind suction through the roof draws the snow through the cracks onto the floor of the attic, where it melts and stains the ceilings below. However, properly selected and well-laid slate roofs have none of these disadvantages, but then the cost of them is generally a barrier to using them on the small house.

As with the slate roof, so with the tile roof, the cost is generally the reason for not selecting it, and yet, from an economical point of view, in the end they are not as expensive, since with the less durable roofs one is never sure of how much damage to the interior a leak will cause. Tile roofs of poor quality have as bad reputations as slate roofs. Small, thin tile are very brittle, and falling limbs and other objects often break individual tiles, and it is very hard to replace them. Unless the tile are laid upon a building paper the wind suction is even worse than with slate roofs.

Probably the greatest defects in tile or slate roofs is not in the material itself, but in the flashings and valley construction. Instead of using copper the flashings are usually of tin, which is permitted to rust out because of neglect in painting. Leaks develop in the valleys and around chimneys in spite of the roofing material.

While asbestos shingles can show great practical durability, even superior to slate and tile in some cases, yet there are many instances of ugly weathering. Tile and slate roofs develop warm, lovely tones with age. Asbestos shingles, since they are chiefly made from cement under pressure, must necessarily depend for their color upon inert pigments introduced into their composition at the time of manufacture, and for this reason their color is apt rather to fade than become richer with age. Their tendency is to return to the natural color of the cement. For this reason we see on every hand red asbestos-shingle roofs which have bleached out to sickly and thirsty pinks, and brown roofs that have blanched to whitish-brown, much like the color which chocolate candy develops when it is very stale. Then, too, certain makes of asbestos shingles show, as time goes on, salt-like deposits on the surface, like the whitewash which appears upon brick walls. This gives a motely appearance to the roof, for some shingles will develop this white stain more than others.

The reader should not draw from these statements the general conclusion that the asbestos shingles should not be used, and that there have been none made that overcome the above difficulties, but it would be well for him to observe these defects before deciding upon any one brand.

The manufacturers of tin advise that the tin be painted on both sides, when laid, and thereafter kept painted at four to five year intervals. In other words the tin roof is as good-looking as the paint which covers it, for it has no color or texture of its own. Can there be much charm in a roof of this kind? Can one picture a cosey and homelike small house with either a flat or standing seam tin roof? Perhaps the flat decks which do not show are satisfactory, when covered with tin, but those upon which any walking is to be done should be covered with wood lattice or else the nails of the shoes may punch through the tin and cause a leak. Tin roofs have their place and their duty to perform, but they are hardly suited to flat roofs over which is to be done much walking. Heavy deck canvas, laid in paint and covered with paint, is the best for this purpose. The ferry-boats give evidence of the practical wear of this kind of roof.

Tin or galvanized-iron shingles or imitation tiles are often seen, applied to the roofs of small houses. The owner probably admired a real tile roof, and the nearest approach his pocketbook would permit him to come to it was the use of imitation tile of tin, copper, or galvanized iron. Most architects ridicule this peculiar weakness in human nature which chooses imitation diamonds, glass pearls, oil-paper stained-glass windows, and pressed-metal tiles, instead of real ones, but they should look to themselves before they throw stones, and ask who invented the imitation thatched roof of wooden shingles.

Shingle Roof

The wooden-shingle roof is of such old and traditional origin in this country that it seems useless to describe the essential features of its construction, yet for the sake of completeness we shall call attention to the important points to be observed. Cypress, cedar, and redwood are considered to be the best woods from which to saw shingles. The grain of the wood should be vertical and show the edge. It is generally conceded that creosote-dipped shingles which are treated at the factory are easier to apply than those dipped on the job, and, as all wood shingles should be treated with some preservative, it is well to consider them. However, much criticism has been aimed at factory-dipped shingles, in that they are generally too brittle from overdrying in the kilns, but this is not true of all makes. The sizes and the weathering of some of the standard creosoted shingles are as follows:

16 inches length, random widths, laid 4½ inches to the weather, and either 5 or 6 shingles at the butt ends to 2 inches.

18 inches length, random widths, laid 5½ inches to the weather, and 5 butt ends to 2½ inches.

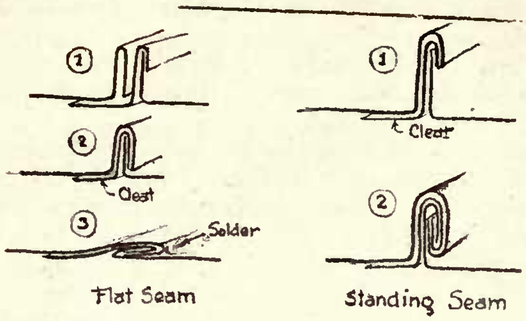
24 inches lengths, random widths, laid 7½ inches to the weather, and ½ inch thick at the butt ends.

There are about thirty varieties of colored stains to select from, and special shapes are cut for constructing the so-called thatched roof, the shingles being bent to a curve of about 20 inches radius. The pitch of wooden-shingle roofs should not be less than 8 inches rise per foot for the ordinary weathering shown in the above statements. The tops of rafters are covered with shingle lath, with a spacing suitable to the weathering arrangement of the shingles. There are some who advocate the use of sheathing to cover the rafters in a tight manner and also the use of building paper underneath the shingles, but, although this gives a tighter and warmer roof, dry-rot attacks the shingle much quicker, because of the accumulation of dampness on the under side of the shingle courses.

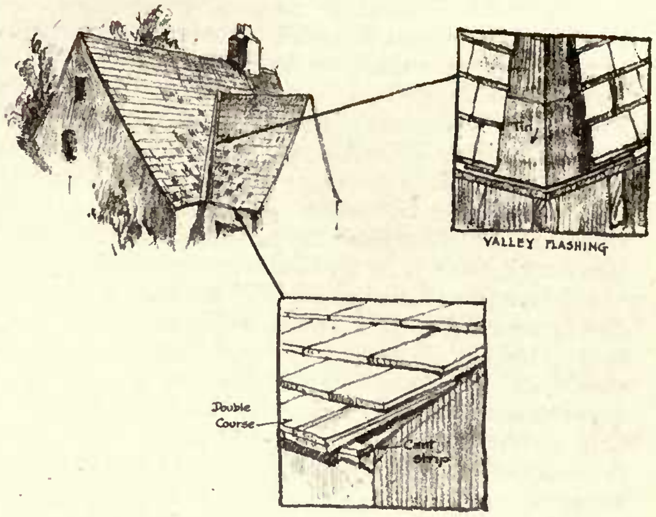
The first course of shingles at the eaves should be a double course with the upper layer breaking joints with the lower, and the shingles should project about 2 inches beyond the mouldings of the eaves and about 1½ inches beyond the edge of the gable ends of the roof.

Hips may be finished either with the saddle-board or with a row of shingles running parallel to the line of the ridge. Hips are best finished with a row of shingles running parallel with their edges, which treatment is called the Boston hip. If the courses are carried to the hip line and mitred, then the joint must be waterproofed by using tin shingles underneath the wooden ones, these tin shingles being folded over the hip. The method of flashing around chimneys, at the base of dormers, and in open valleys will be more fully discussed in connection with slate roofs, and, since the principles are the same, what is said for slate roofs in this connection is true for wooden-shingle roofs.

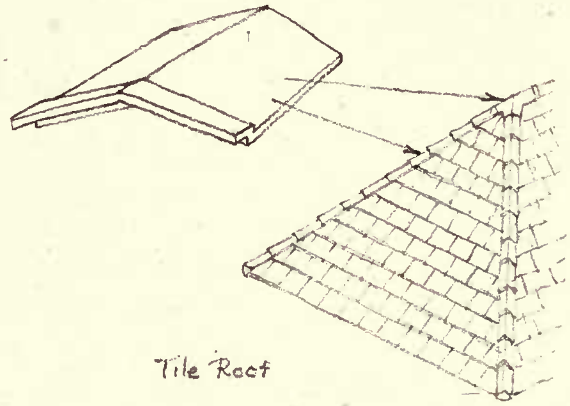
(*Continued on page* 30.)

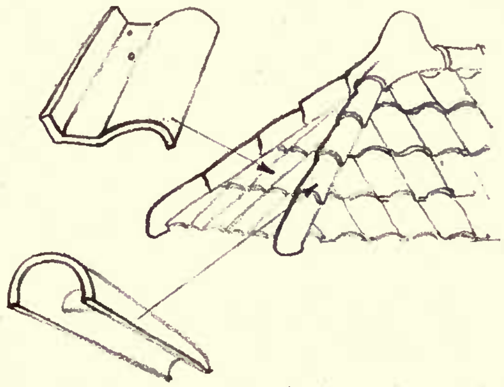


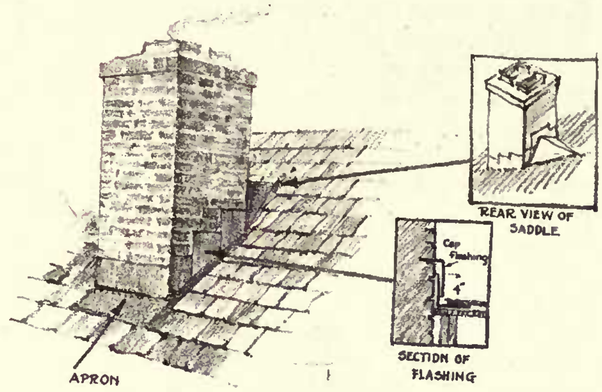
Tin Roofs

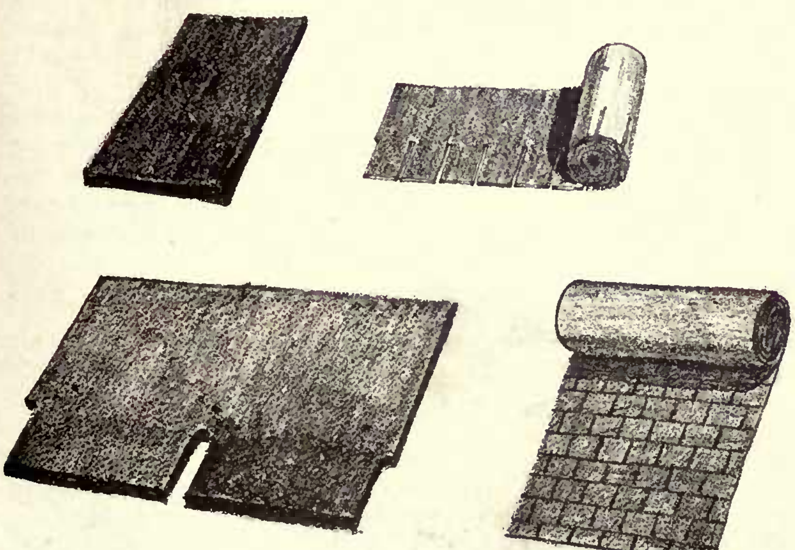


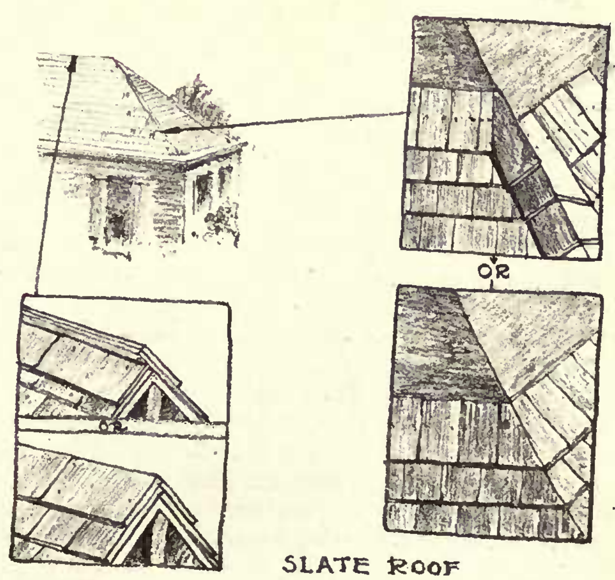
SLATE DETAILS


Tile Roof


Tile Roof




ASPHALT SHINGLES



SLATE ROOF

(*Continued from page* 28.)

Method of Laying Slate Roofs

There has been much made of the so-called European method of laying slate roofs in recent years, but this type of roof costs more than the ordinary slate roof, since special heavy slate is used at the eaves, and the weathering is reduced as the courses approach the ridge, and special care is taken in blending colored slates. While this type of roof is very beautiful, it is really, from a point of view of cost, rather out of the race when applied to the small house, for it will be hard enough to stretch the estimates of the small house to include even the ordinary slate roof.

In the preparation of the ordinary slate roof, the rafters should be covered with ⅞-inch-thick, tongued-and-grooved roofing boards. In order to prevent buckling, if they should swell with dampness, it is essential not to drive the joints between boards up too tight. As these boards are surfaced only on one side, this side is laid against the rafters and the tongues are placed upward so that a better shedding of water is secured. Good nailing with tenpenny nails is important, and all joints at ends of boards should be made over rafters. A cheaper but not so good a bed for the slate can be made with common, unsurfaced sheathing-boards. In the cheapest kind of work sheathing-boards are not used, but only shingles lath.

Over the top of this rough boarding should be tacked 11 pounds per 100 square feet slater's roofing felt, laid horizontally and lapping joints 3 inches.

The usual commercial sizes of slates are $\frac{3}{16}$ inch thick, and of the following standard sizes: 6 x 12 inches, 7 x 12 inches, 8 x 12 inches, 7 x 14 inches, 8 x 14 inches, 10 x 14 inches, 8 x 16 inches, 9 x 16 inches, 10 x 16 inches, 12 x 16 inches, 9 x 18 inches, 10 x 18 inches, 12 x 18 inches, 10 x 20 inches, 12 x 20 inches, 11 x 22 inches, 12 x 22 inches, and 12 x 24 inches. They have two holes in each piece for nails, which nails should be 1-inch copper, slater's nails or 3d galvanized slater's nails for cheaper work.

The first course should be started 2 inches below the line of the sheathing-boards at the eaves, and the necessary tilt is given with a $\frac{3}{16}$ x 1 inch cant strip. A double thickness of slate is used for the first course, the upper layer breaking joints with the lower. At the gable ends the slate should not overhang more than 1½ inches.

The exposure to the weather for courses of slate is determined by taking one-half of (the length of the slate minus 3 inches).

The ridges of the roof may be finished in two ways, either with the combed ridge or the saddle ridge. The combed ridge is formed by projecting a finishing course and a combing course of slate on the north or east side of the roof 1½ inches beyond the top and combing course on the opposite side of the roof. Both courses are laid with slate set lengthwise, the length being twice the width of the slate used on the roof. This last course is laid in elastic roofing cement, and the nails are also covered with it.

The saddle ridge is formed by alternately butting the ends of the top course on one side with the top course on the other, and then doing the same with the combing course. This makes a zigzag joint which is closed by the elastic cement used in setting.

The Boston hip is the best. Each course is brought at its upper or nailing edge to within 2 inches of the hip line. A small strip of slate then finishes this off by fitting to a mitre cut made on a slate set parallel with the line of the hip. These hip slates have the lower corner of their butt ends on a line with the next lower course, and they are lapped with the opposite hip slate and made tight with roofing cement.

Hips may also be finished by bringing each course up to the hip line, and mitring them with the opposite courses on the other side of the hip.

Valleys should be lined with 16 ounces copper, 4 pounds lead, IX tin, or a prepared roofing roll weighing 37 pounds per 108 square feet. Measuring from the centre of the valley to the edge of the slate, the distance should be 2 inches at the top and increase ½ inch in 8 feet 0 inch toward the bottom. And the flashing should extend up under the slate on either side about two-thirds the width of the slate used. If 8 inches x 16 inches slates are used, this means that the distance should be about 5 inches. If the slopes of the two intersecting roofs are different, and there is a chance that the volume of water sweeping down the larger and steeper incline may be forced up under the slate at the valleys, the metal lining should be crimped up (inverted V-shape) at the centre 1 inch to form a little dam against the rush of the flood.

Flashing used against chimneys, dormers, or other vertical walls should be bent up 4 inches and extend into the slate courses 4 inches. All vertical flashings against masonry should be cap-flashed and made tight with elastic cement. The cap-flashing should extend down over the flashing 3 inches, and be inserted into the masonry at least 2 inches.

Sometimes the closed valley is designed for slate roofs, in which case the valleys must be rounded out with the roofing-boards, blocked to position. The slate courses should be carried around this curved valley, but each course in the valley should be covered with flashing just under the lap of the course above and extend up toward the nails.

Tile Roofing

Preparations of the roof for the laying of tile should follow similar lines described for slate roofs. Over the roofing boards should be tacked asphalt roofing felt, weighing not less than 30 pounds per 100 square feet and lapping 2½ inches.

The valleys should be lined with this felt, running the entire length and then the flashing metal placed on top, secured with clips at intervals. The width of the valley metal should not be less than 24 inches, and both edges should be turned up ¼-inch the entire length of the strip. The felt covering the main surface of the roof should lap over the valley metal 4 inches.

Cant strips must be nailed along the eaves to start the first course of tile, unless special tiles are provided. Copper nails should be used to fasten these tiles, and each unit should be locked with the next as the pattern demands.

Tiles which border the hips should be cut close against the hip board, and elastic cement used to make the joint tight. All hips and ridges are finished with specially designed ridge and hip roll tiles, and the interior spaces should be left empty and not be filled with pointing mortar as is sometimes done.

Asbestos Shingles

Asbestos shingles are applied in practically the same way as slate. Over the roofing-boards should be laid slater's felt as for a slate roof, and a cant strip ¼ x 1½ inches should be nailed along the eaves line to start the first course of asbestos shingles, which should be a double course and overhang the eaves 1½ inches. The average size of asbestos shingles is 9 x 18 inches x ¼ inch for the lower layer of the first course, and 8 x 16 inches x ⅛ inch for the upper layer of the first course and the other courses. They are laid about

7 inches to the weather, and the ridges and hips may be finished with the Boston hip, or by a specially designed ridge and hip roll. Where the hip roll is used the ridge-pole should project above the roof, or a false one be added so that a substantial nailing can be had for this tile.

The most widely advertised asbestos shingle roofs employ shingles which have rough edges, and which have various shades of coloring, some gray, some red, others reddish brown, and others grayish brown. The causes which led up to the development of this type of roof were the artistic failures of the first asbestos shingle roofs. These early roofs were made with shingles which had edges as smooth and sharp as steel plates, surface texture as slick as a trowelled cement floor, and colors of either gray or pale red that were so perfectly matched that at a distance the individual shingles blended into one dead-level plane, so that the roof of the house looked more like the armored plate of a battle-ship than anything else—it was so perfectly made.

Asphalt Shingles

Before laying asphalt shingles the rafters should be covered with tongued and grooved roofing-boards, and these covered with black waterproof building-paper, lapped 2 inches.

There are two types of asphalt shingle units. One consists of a unit of twin shingles, so arranged that the butt ends which show to the weather appear as two individual shingles, and the other consists of one shingle unit. Both types are usually laid 4 inches to the weather and nailed with 1-inch galvanized nails No. 10 wire with ⅜-inch heads. At the eaves should be nailed a galvanized-metal drip edge, and over this a double course of shingles for the first course. Hips and ridges are finished with what appears to be a Boston hip, but the shingles are bent over the hip line. The valleys and gutters are best when they are lined with strips of ready roofing similar to the shingles themselves.

Asphalt shingles which come in long rolls or units of four or five, are laid in a similar manner, except that, due to their continuous length, they are unable to expand without bulging up on the roof.

Tin Roofs

Flat roofs, with an incline of about ½ inch to the foot, should be covered with the flat seam roof. The standing seam may be used on roofs with a pitch not less than 2 inches to the foot. The tin is laid upon the sheathing-boards without an intermediate layer of building-paper; in fact tar paper should never be used. In cities building codes often require that tin roofs should be laid upon roofing felt $\frac{1}{16}$-inch thick, placed over the sheathing-boards, but this is a fire precaution against burning brands which may drop upon the roof, for this felt cushion gives an air insulation, preventing the quick ignition of the decking below the tin.

In laying the flat seam roof a number of sheets are fastened together to form a long strip of tin. The edges are bent over ½ inch so that they can be interlocked with the next strip. The tin is fastened to the roof with tin cleats that lock into the seams of the sheets and are fastened at the other end with two 1-inch barbed-wire nails. These cleats are spaced about 8 inches apart. All the seams are flattened down, and solder well sweated into them, rosin being the only flux used.

Tin, approximately in thickness 30 gauge, U. S. Standard, is called IC and is recommended for the roof proper, while valleys and gutters should be lined with IX tin, approximately 27 gauge. It should be painted on both sides before laying with pure linseed-oil and red lead, or red oxide, Venetian red, or metallic brown. Two coats should be given to the exposed side and a third coat about a year later. Before the second coat is applied the first should have dried for at least two weeks.

The construction of the standing seam roof is shown in the drawings to consist of long strips of tin, made of standard sheets fastened together with the flat and soldered seam, but the edges of the strips fastened to the next strip with the so-called standing seam which must run parallel to the pitch of the roof. Cleats, spaced a foot apart, are used to fasten the tin to the sheathing-boards. One edge of the next strip is turned up 1½ inches, and then over the top of the edge of the other strip. The cleat is locked in between the two. The upstanding seam is then turned down again upon itself, tightly locking the strips together.

Estimating Costs

By Noble Foster Hoggson

ANY one who has tried to figure out just what he should allow for a three weeks' camping trip and then has taken the trip is in a fair position to get some conception of the problems of the estimating department of a building concern. It is not a job for any one except the most experienced. For remember that, unlike the camper, who can easily enough make up for the things omitted in his final estimate, there is no such alternative for the building concern, especially if it be one which is operating under a contract which guarantees a predetermined cost. Such an estimate must be accurate and complete and made by men who know not only what things *ought* to cost but what they *will actually* cost in the end.

The men who estimate for a big building which as yet is in the preliminary plan stage must be able to conceive of it as a finished structure; to give to the rough plan and its elevation the necessary third dimension—an idea of the mass of the building as standing on the plan.

There are various methods of getting at the quantities for an estimate which are in common usage. But the most accurate results are obtained when the estimate is made up by itemizing all the materials entering the construction. This is called "taking off the quantities." For example, to determine the cost of the construction of one hundred square feet of floor it is possible to arrive at an approximation by using a figure representing the cost of a unit of that type of construction. But a more reliable estimate is made by determining the quantities of material which go into the component parts of the floor—forms for reinforcing, the reinforcement, the concrete, the cement finish, the furring, the plaster, and the linoleum or other covering surface.

These quantities multiplied by the prevailing unit cost of the material and added together give a reliable estimate, and this method is typical of all estimators' work.

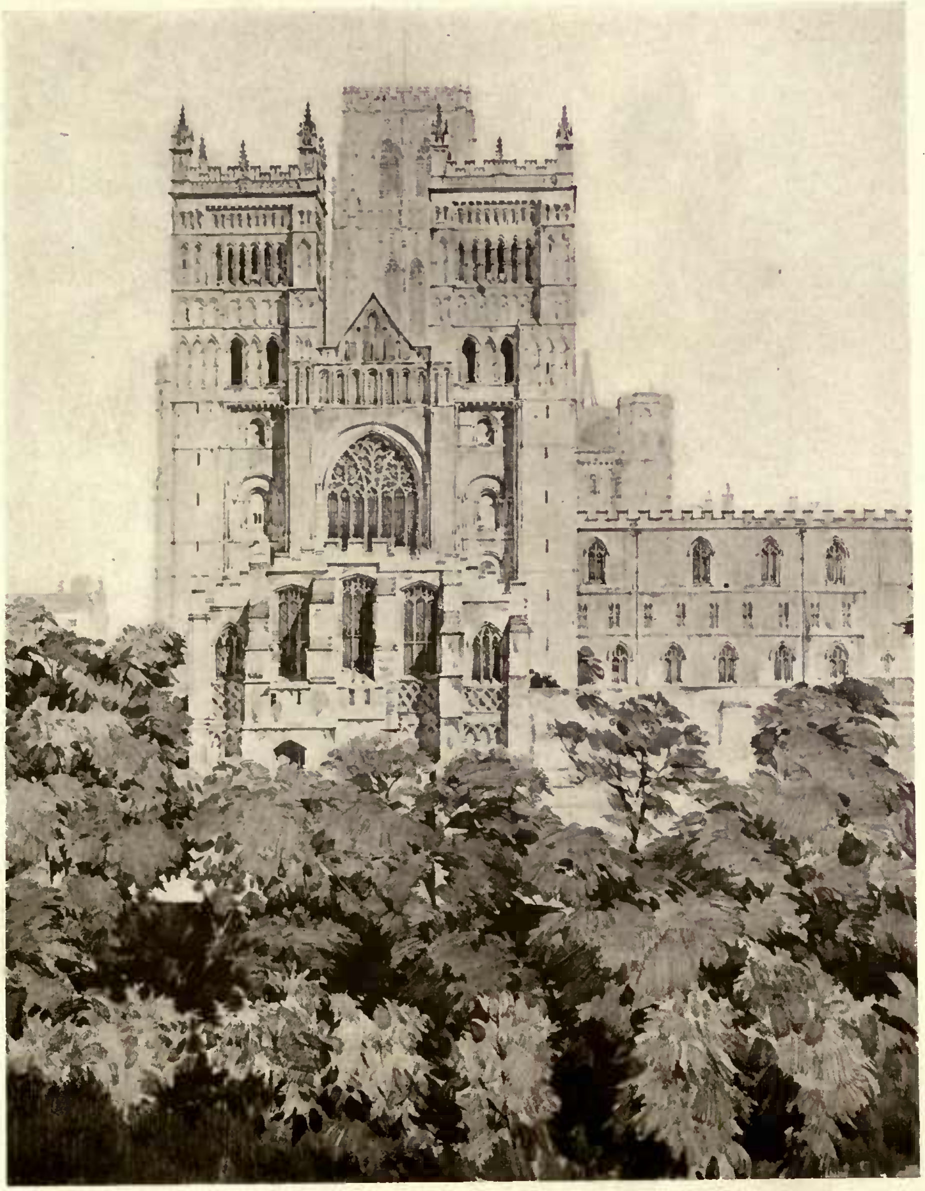
The Birch Burdette Long Sketch Competition of 1921 for sketches of buildings or others of an architectural character was recently judged at the Architectural League of New York by Mr. Howard Greenley, president of the League, Mr. Charles Z. Klauder, of Philadelphia; Mr. Bertram G. Goodhue, of New York; Mr. Birch Burdette Long, of New York; and Mr. Eugene Clute, of New York.

The competition produced some unusual and very interesting sketches. This is but one of the many useful and very beneficial works that the League is now doing, along with the policy of the educational programme which has been mapped out.

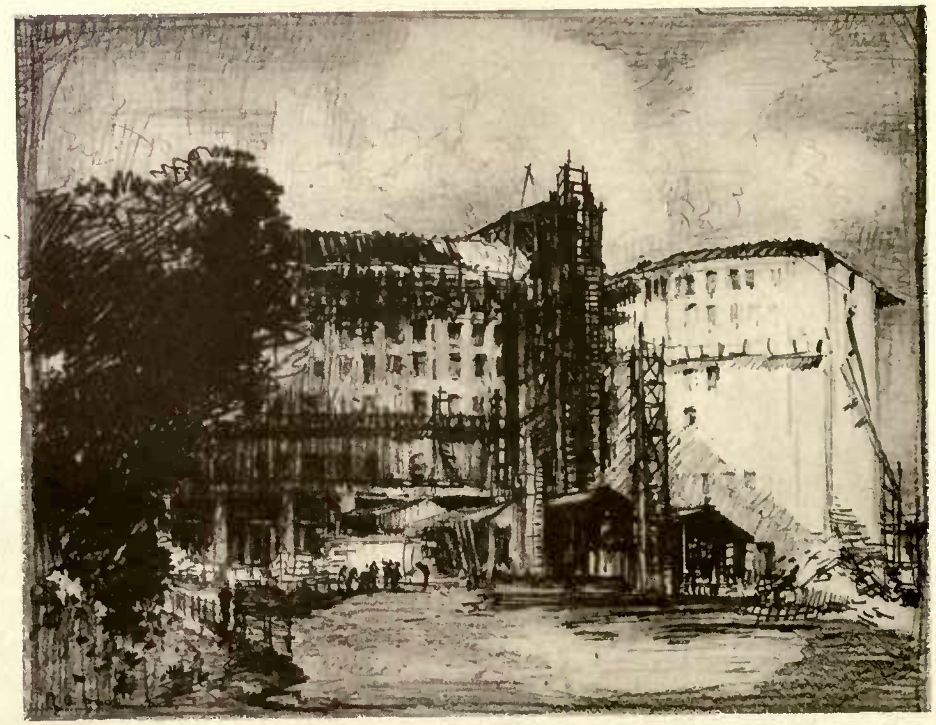
The prize-winners were as follows:

First prize of $100.00, Mr. Kenneth John Conant, Cambridge, Mass.
Second prize of $50.00, Mr. Robert A. Lockwood, Los Angeles, Calif.
Third prize of $25.00, Mr. Otto F. Langman, New York City.
Fourth prize of $15.00, Mr. Elliot L. Chisling, New York City.
Six $10.00 prizes to:

Mr C. H. Nelson, Alfred University, Alfred, N. Y.
Mr. W. H. Butterfield, New York City.
Mr. John Wenrich, Rochester, N. Y.
Mr. E. Maxwell Fry, Liverpool School of Architecture, Liverpool, England.
Mr. Lionel H. Pries, West Philadelphia, Pa.
Mr. Arthur G. Wilson, Montreal, Canada.



FIRST PRIZE, KENNETH JOHN CONANT.



SECOND PRIZE, ROBERT A. LOCKWOOD.

BIRCH BURDETTE LONG COMPETITION.

THIRD PRIZE, OTTO F. LANGMAN.

AWARDED A PRIZE OF THE FIFTH GRADE, LIONEL H. PRIES.

FOURTH PRIZE, ELLIOT L. CHISLING.

AWARDED A PRIZE OF THE FIFTH GRADE, E. MAXWELL FRY.

BIRCH BURDETTE LONG COMPETITION.

Concrete Construction

By DeWitt Clinton Pond, M.A.

NINTH ARTICLE

THE design of the beams and slabs required for the support of the wagon-court presents no new problem, although the spacing of the rods and bars is somewhat different from that which might be expected from a tentative study of the typical slab—*S*37. The live load in this court is taken as 350 pounds per square foot. If it is assumed that the slab will be a 5-inch slab, then its weight per square foot will be 60 pounds. There will be 1 inch of waterproofing over this and 2 inches of cinder concrete fill, with a finish coat of cement and sand which will be 1 inch thick. The total dead and live load will therefore be as listed below:

Live load	350	pounds.
Slab	60	"
Fill	10	"
W. P.	10	"
Finish	10	"
Total	440	"

The bending moment in the slab, which will be considered as 6 feet—as laid out on the tentative design sheet of the engineer—in length, can be found in the usual manner from the formula $M = \frac{1}{12} \times W \times L$.

$$\frac{440 \times 6 \times 6.4 \times 12}{12} = 16{,}900 \text{ inch-pounds.}$$

The depth of the slab is determined by the formula $d^2 = M \div 1{,}279.5$.

$$d^2 = \frac{16{,}900}{1{,}279.5} = 13.2$$

$$d = 3.63$$

With the addition of fireproofing the slab thickness will be taken as $4\frac{3}{4}$ inches.

The stress in the steel will be found by dividing the moment as determined above by the *effective depth*, or $\frac{7}{8} \times d$.

$$\frac{16{,}900 \times 8}{7 \times 3.75} = 5{,}150 \text{ pounds.}$$

The area of the steel will be determined by dividing this stress by the allowable unit stress in the steel, or 16,000 pounds per square inch.

$$\frac{5{,}150}{16{,}000} = .32 \text{ square inches.}$$

If $\frac{1}{2}$-inch square bars are to be used, each bar having a sectional area of one-quarter of a square inch, then there will be $.32 \div .25 = 1.285$ bars required in every foot of slab, and the spacing of these bars on centres will be found by dividing the number of inches in a foot by 1.285.

$$\frac{12}{1.285} = 9.3 \text{ inches on centres.}$$

It will be noticed by referring to the slab schedule that these bars are spaced $8\frac{1}{2}$ inches on centres. The reason for this will be given later.

The slab *S*47 differs from *S*37 in two respects. It is a semi-continuous slab and the span is reduced by 8 inches owing to the fact that there is a basement wall below it. Although the formula $M = \frac{1}{10} \times W \times L$ should be used in this case, which would give a larger moment than found above, the smaller span will account for the fact that calculations will show this slab may be reinforced by $\frac{1}{2}$-inch square bars spaced 9 inches on centres.

The remaining slab in this panel is *S*38. Its span is only 5 feet 6 inches, and it will be seen that one part of it is continuous and the remaining part is semi-continuous, but owing to reasons which will be given later the same number is applied to both parts. It will be found that the depth of the slab can be made $4\frac{1}{2}$ inches and that for the continuous slab the spacing of $\frac{1}{2}$-inch square bars can be $10\frac{1}{2}$ inches on centres, but the bars in the semi-continuous slab should be $8\frac{1}{2}$ inches apart. It is this fact that influences the spacing of all the bars in the slabs of the wagon-court.

It can be seen that if the bars were spaced in accordance with the calculations given above, the spacing in one part of *S*38 would be $8\frac{1}{2}$ inches, in the other part $10\frac{1}{2}$ inches, in *S*37 it would be $9\frac{1}{2}$ inches, and in *S*47 it would be 9 inches. Where the spacing changes it is customary to have the bars project 1 foot 6 inches beyond the centre of the beam dividing the two spacings, or, in other words, the bars are lapped 3 feet. If this were done in the present case the loss of steel due to this lapping of bars would more than offset the saving due to the more economical spacing of the bars. Therefore, all the steel is spaced $8\frac{1}{2}$ inches on centres. *S*47 is made the same as *S*37, and *S*38 differs only in the thickness of the slab.

This completes the slab design.

The beams present no new problem, but it may be well to investigate the design of *B*5, which may be considered as typical. On the tentative design sheet of the engineer this

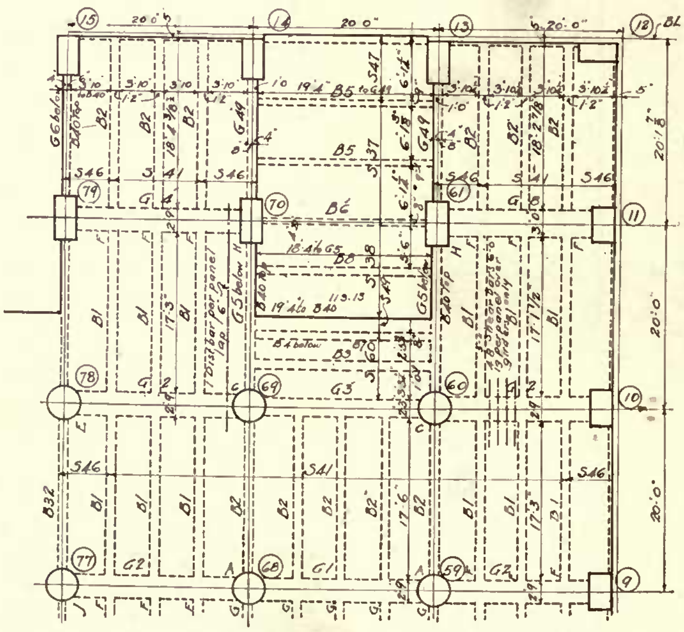


FIGURE II

beam is shown as 10 inches wide, and architectural considerations limit the depth to 2 feet 6 inches. From these dimensions it is possible to find the cross-sectional area of the beam, which is 300 square inches, and the weight of the beam per foot of length is therefore 300 pounds. The beams are spaced 6 feet 10 inches on centres, so the weight per square foot of floor due to the addition of the beam load will be $300 \div 6.83 = 44.0$, and if this is added to the 440-pound load already determined the total live and dead load per square foot will be 484 pounds. The load upon the beam will be found to be 64,000 pounds. These beams are simple beams, and in order to determine the moment the formula $M = \frac{1}{8}WL$ will be used.

$$M = \tfrac{1}{8} \times 64{,}000 \times 20 \times 12 = 1{,}920{,}000 \text{ inch-pounds.}$$

$$S = \frac{1{,}920{,}000 \times 8}{7 \times 28.5} = 77{,}000 \text{ pounds.}$$

$$A_s = 77{,}000 \div 16{,}000 = 4.81 \text{ square inches.}$$

In order to find the number of $1\frac{1}{4}$-inch square bars that will be required it is only necessary to divide the above required area by 1.5625. $4.81 \div 1.5625 = 3.07$ bars. Three bars will be used.

In order to determine how many bars can be turned up it will be necessary to use the formula $U = V \div (\frac{7}{8} \times d)$. The total load on the beam is 64,000 pounds and the shear at each end is 32,000 pounds, so—

$$U = \frac{32{,}000 \times 8}{7 \times 28.5} = 1{,}280.$$

The superficial area of a $1\frac{1}{4}$-inch square bar is 5 square inches for every inch of length. As each square inch is allowed 100 pounds for bond stress, then each bar will develop 500 pounds, and there will be required

$$\frac{1{,}280}{500} = 2.50 \text{ bars.}$$

In the present case it was decided that two bars should be straight and one bar bent up, although it would have been better to have them all straight.

Mk	Total No.	Steel		
		No.	Size	Length
A	2	1	$1\frac{1}{4}$	8'0"
C	2	2-1	$1\frac{1}{4}$"-$\frac{7}{8}$	8'0"
E	2	2	$1\frac{1}{4}$"	8'0"
F	13	1	$\frac{7}{8}$"	8'0"
G	5	1	$\frac{3}{4}$	8'0"
H	2	3-1	$1\frac{1}{4}$"-1	8'0"
J	1	1	$1\frac{1}{8}$	8'0"

FIGURE XXVIII

By investigating the shear it will be found that the beam is safe; in fact, it can be reduced to 9 inches in width.

By reducing the width of the beam to 9 inches the unit shear becomes 142 pounds per square inch. Forty pounds is allowed to the concrete in ordinary practice, and therefore 102 pounds must be taken up by the stirrups. The span of the beam is 19.33 feet and the portion over which the shear will be applied will be

$$\frac{102}{142} \times 19.33 \times 12 = 167 \text{ inches.}$$

As the beam is 9 inches wide and as the average shear over this length of beam is 51 pounds, the shear will be $167 \times 9 \times 51 = 76{,}600$ pounds. If $\frac{3}{4}$-inch square bars are used for the stirrups, each stirrup will have a value of 4,500 pounds, and 17 stirrups will be required. There will be one bar bent up, and this will have an effective area against shear at each end of $1.5625 \times .7 = 1.094$ square inches. The effective area of each stirrup is .281 square inches, so the bent-up steel will take the place of $1.094 \div .281 = 3.9$ stirrups at each end, of 7.8 stirrups at both ends. There will be only 10 stirrups needed.

Slab Schedule					
Mk	Total No Slabs	Slab Thickness	Steel Bars	Remarks	Near Col.
			Size and Spacing		
S 37	2	$4\frac{3}{4}$	$\frac{1}{2}$" ■ Bars $8\frac{1}{2}$" o.c.	1-$\frac{3}{8}$" Dist. Bar per panel	14
S 38	2	$4\frac{1}{2}$	$\frac{1}{2}$" ■ Bars $8\frac{1}{2}$" o.c	1-$\frac{3}{8}$" Dist. Bar per panel	70
S-41	18	5"	$\frac{1}{2}$" ⌀ Rods $7\frac{1}{4}$" o.c.	1-$\frac{3}{8}$" Dist. Bar per panel	59
S 46	10	5"	$\frac{1}{2}$" ⌀ Rods 6" o.c.	1-$\frac{3}{8}$" Dist. Bar per panel	9
S 47	1	$4\frac{3}{4}$	$\frac{1}{2}$" Bars $8\frac{1}{2}$" o.c.	1-$\frac{3}{8}$" Dist. Bar per panel	13
S 60	2	$4\frac{1}{4}$	$\frac{3}{8}$" ■ Bars 5" o.c.	1-$\frac{3}{8}$" Dist Bar per panel	

FIGURE IV

This completes the design of *B*5. *B*6 and *B*8 require slightly less reinforcing, as the first beam has a shorter distance to span and the second carries less load.

The only other beam in this section of the plan is *B*4. This beam is directly below *B*7, which is a very shallow beam supporting a first-floor slab. *B*7 is supported on struts, and the struts in turn are supported on *B*4. On this account *B*4 is heavily loaded. It will be found that there is a load of 100,000 pounds upon this beam, that the stress in the steel is 120,000 pounds, and that there will be required 5 square bars each $1\frac{1}{4}$ inches square.

The interesting point about the design of *B*4 is that it is not a complete T-beam. One arm of the T is missing. In this case there is not as much concrete to resist compression as there would be under ordinary circumstances. Fig. XXIX shows the shape of the beam. One-sixth of the span would be 3.33 feet, and six multiplied by the thickness of the slab would be 27 inches, and as this is the minimum it will be taken as the length of the arm. On account of the shear the beam is made 13 inches thick, so the distance across the top of the beam is 40 inches. The neutral axis is three-eighths of $28\frac{1}{2}$ inches, or 10.69 inches, below the top. The stress at the top of the beam is 650 pounds per square inch. The stress at the under side of the slab is 376 pounds per square inch. The total allowable compressive stress in the concrete is 107,500 pounds.

The stress in the steel was found to be 120,000 pounds, so there must be 12,500 pounds of stress taken up by the steel. If the steel is placed 2 inches below the top, the allowable compressive stress in the steel is

$$\frac{15 \times 8.69 \times 650}{10.69} = 7{,}920 \text{ pounds per square inch.}$$

If this figure is divided into 12,500 pounds, it will be found that there will be required 1.56 square inches of steel. This area can be made up of 2 bars each 1 inch square.

*G*49 offers no new problem, although it must be made deep enough to support not only the slab at the general first-floor level but the beams and slabs at the wagon-court level. The determination of the reinforcing is arrived at by the same methods as were used in the designs of all the beams and girders in this panel.

*G*5 and *B*40 are the two remaining structural members in this part of the plan, and as they present no new difficulties, it will not be considered necessary to investigate their design.

An important point to be noted about the girder design is the fact that all girders have been designed as T-beams. This can only be done in case shear bars are placed across the tops

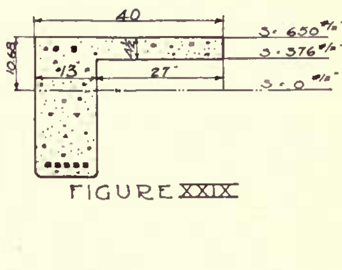


FIGURE XXIX

of the girders. By referring to Fig. II the reader will find that such a requirement is noted on the plan. At the right of column 60 a note calls for "4 $\frac{3}{8}$-inch shear bars, 6 feet long, 13 per panel, over girders only." Shear bars are also called for in the diagram which accompanies the beam and girder schedule in Fig. III.—Article Eight.

Another important item with regard to the schedules which form part of the structural plans is that in addition to the slab, beam, and girder schedule, there is one giving the additional steel over supports. In not all cases is it possible to bend up 50 per cent of the steel, and as steel must be provided to withstand a negative moment over supports of equal magnitude to the positive moment, there must be more bars added. A schedule similar to the one shown in Fig. XXVIII accompanies every structural plan. On the plan, letters such as A, C, E, F, G, H, and J are shown, and in the schedule the amount of steel to be added at the points where these letters occur is listed. It will be noted that the letter A is shown at columns 68 and 59. At these points there must be added steel, as *G*2 must be reinforced by 12 $1\frac{1}{4}$-inch square bars, whereas *G*1 is reinforced with only 10 bars of like area. It is the rule to have as much steel over the supports as is found in the more heavily reinforced girder or beam adjacent to the support. There must be 12 bars in the top of the two girders at A. Six bars are bent up in *G*2 but only 5 in *G*1, so that there must be one added bar to make the proper area.

The letter C is shown at columns 60 and 69, between *G*2 and *G*3. The first girder is reinforced with 12 $1\frac{1}{4}$-inch square bars and the second with 5 $1\frac{1}{4}$-inch and 4 $1\frac{1}{8}$-inch square bars. In this case it is necessary to add 2 $1\frac{1}{4}$-inch and 1 $\frac{7}{8}$-inch square bars. In like manner, the reinforcing for negative bending is made to conform to the requirements over girders and at columns.

It will be noticed that all of the bars listed in Fig. XXVIII are 8 feet long. The length is determined in general practice by two requirements. The first is that the bars must reach the point of contraflexure and the second is the bars must extend far enough into the concrete to develop a bond stress equal to the maximum tension in the steel. The last requirement is fulfilled if the bars extend in both directions 40 diameters beyond the point of maximum stress. In this case the point of contraflexure can be taken as one-fifth of the span, or 4 feet on either side of the column or girder. The total length of the steel is 8 feet. If 40 diameters is taken as the length, it will be found that this would be 8 feet 4 inches in the case of $1\frac{1}{4}$-inch square bars. As this is only 4 inches more than the result obtained above, and as smaller bars will have lengths less than 8 feet, it was decided to make all the bars of this length.

Announcements

The Structural Service Bureau, an organization for increasing safety, efficiency, and productivity in the building industry through a better understanding of the characteristics, manufacture, and utilization of materials, equipment, and devices, has removed from the Estey Building to the Otis Building, 112 South 16th Street, Philadelphia, Pa. Increased space and facilities enable the bureau to co-operate further with industries and producers in standardizing processes, parts, sizes, and arrangements; in eliminating waste of materials and labor; and in placing informative data concerning their programmes and products before architects, engineers, constructors, and the consuming public. The members are D. Knickerbacker Boyd, Victor D. Abel, Francis A. Gugert, A. Lynwood Ferguson, and associates.

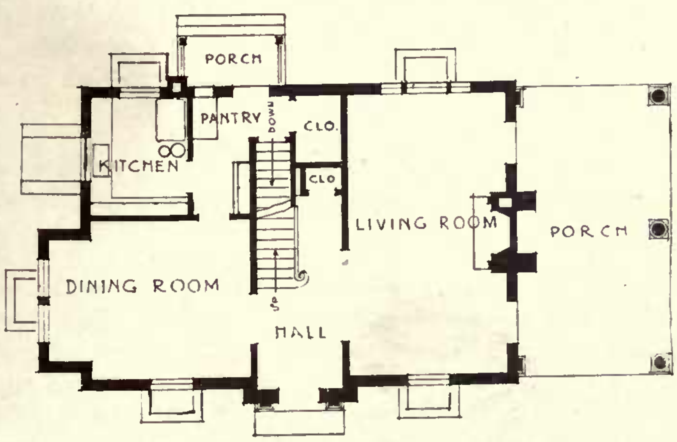
A new corner bead, manufactured by the Milwaukee Corrugating Co., affords a perfect union at corners with any kind of construction. It has the same grip on the plaster as metal lath. The mortar hugs the nose of the bead closely, filling the corner solidly and doing away with the inert metal heretofore present in all beads, and which contributed weakness rather than strength to the corner. The diamond mesh of Expanded Beads reinforces the corner solidly, and any shock experienced by the nose of the bead is immediately transmitted through the walls in all directions, without injury to the corner.

Reduced Prices Announced by Roofing Manufacturer.—Substantial price reductions, ranging from 24 per cent to 31 per cent, and effective November 16, were announced by the Flintkote Company, Inc., of Boston. This concern manufactures asphalt shingles and prepared roofings—products which are used in great volume in connection with residential building, and on renewals and repairs.

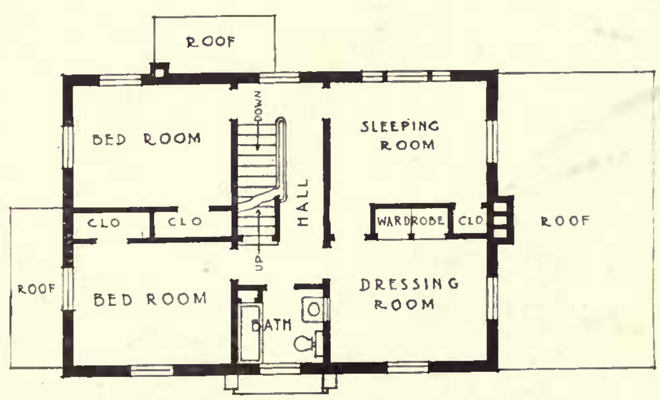
A Reduction in Price.—In December the Cornell Wood Products Company, of Chicago, announced a flat reduction on Cornell Wood Board of $4 per thousand square feet f.o.b. mill Cornell, Wisconsin. The company stated that this reduction was inspired by the desire to encourage construction, and to assist in stimulating activity in the building trade. Cornell wood board is now not only extensively used instead of lath and plaster for walls, ceilings, and partitions, but has been adopted by a number of manufacturing industries to take the place of wood in such articles as cigar-boxes and similar containers; for toys and novelties; for packing-cases, crates, and compartments; for furniture—mirror backs, drawer bottoms, veneered table-tops, chair seats, phonograph cases, folding art screens, and general cabinet work; and for window displays, exhibition booths, and parade floats.

A recent consolidation is that of the Zahner Metal Sash and Door Company of Canton, Ohio, and the Empire Art Metal Company, College Point, Long Island, New York City, under the corporate name of the Central Metal Products Corporation. Ample working capital is being provided and through this consolidation greatly increased facilities for systematic production and service will be available to the trade. The executive offices are in Canton, Ohio, with sales offices or agencies in all principal cities. Both the Canton and Empire plants have a nation-wide reputation for producing Hollow Metal Doors and Trim of a high order, and installations in many of the largest buildings recommend their products.

We are in receipt of the new catalogue of Rogs Heaters, describing the various types, condensers, expansion joints, coolers, and airjector pumps. Rogs Heater and Manufacturing Company, Buffalo, N. Y.



FIRST FLOOR



SECOND FLOOR

HOUSE AT POTTSTOWN, PA.

C. E. Schermerhorn and Watson K. Phillips, Architects.

Book Reviews

ADQUADRATUM. A Study of the Geometrical Bases of Classic and Mediæval Religious Architecture, with Special Reference to Their Application in the Restoration of the Cathedral of Nidaros (Throndhjem), Norway. By FREDERIK MACODY LUND. Profusely Illustrated by Plans, Sections, Views, and Details of Notable Temples, Churches, Cathedrals, and Other Buildings in Greece, Italy, Germany, Denmark, France, England, and Norway. Printed by Order of the Norwegian Parliament and Published by B. T. Batsford, London. Charles Scribner's Sons, New York.

The work forms two handsome royal quarto volumes (size 12¾ x 9¾ inches), Volume I containing 24 pages of preliminary matter and 386 pages of text with 323 illustrations (many of which are printed in two colors) and 6 plates (xxxi-xxxvi), bound in cloth gilt, Volume II comprising 32 large folding plates enclosed in cloth portfolio uniform in style with the letterpress volume.

This remarkable work, embodying the results of a prolonged study of the building arts during the classic and mediæval epochs, should prove of interest to all serious students of art history. Its publication has been made possible through the public spirit of the Norwegian Parliament, at whose expense it has been produced, it being felt that the author's researches afford important data for consideration at the hands of those who will ultimately be charged with the restoration of the great Norman-Gothic Cathedral of Nidaros, the national sanctuary of Norway, one of the most beautiful buildings of northern Europe.

The learned author, an historian and art critic of international repute, sets out to prove that the great temples of classical antiquity, no less than the succeeding church buildings of mediæval times, were conceived as a coherent whole according to recognized geometrical principles based upon a logical yet richly varied use of a certain proportion between the width, the length, and the height of the building, the structure being planned upon an ever-varying play of the elementary regular polygons and their angles. He contends that these laws of geometrical proportions had sunk so deeply in the minds of the ancient builders that they were able to create not only beautiful architectural types, but were capable of varying, without infringing, the regularity of these laws, so that, keeping strictly to the principles of construction, the unity of the whole was attained even in the variations.

SCULPTURE OF TO-DAY. By KINETON PARKS. Two Volumes. Chapman & Hall, London; Charles Scribner's Sons, New York.

Volume I, "America, Great Britain." Volume II, "Continent of Europe"—Spain, France, Switzerland, Belgium, Holland, Germany, Austria, Hungary, Italy, Jugoslavia, Czechoslovakia, Poland and Lithuania, Russia, Denmark, Norway, and Sweden.

Sculpture has not had the consideration from writers on art that has been given so profusely by critics and propagandists to the sister art of painting, nor has sculpture the same appeal to the general student of art. But no one can resist the beauty and appeal of the great sculpture of Greece, nor be indifferent to its progress in our own times.

In these days sculpture, too, has its manifestations of revolt against conventions, and some of the things called sculpture are as wonderful in their utter lack of beauty of form as the most extreme of cubist paintings.

In these two volumes we may get a more or less rapid impression of the modern tendency in the sculpture of the world, and familiarize ourselves with names and particular examples by means of the many illustrations.

There are interesting chapters on The Status of Sculpture, The Materials of Sculpture, The Methods of the Sculptor, The Appreciation of Sculpture.

There is some truth in what the author says in his chapter on "The Presentation of Sculpture": "The interest of the study of English and American sculpture is by way of an immersion, that of Continental Europe an engrossment. There is much dignity in the former, but more fire in the latter. Anglo-Saxon sculpture is fabricated, as a whole, with great technical ability and careful gravity, Continental sculpture with more temperament.

"In America and Great Britain artists are often made; those of the Continent of Europe are often born."

Somehow we in common with many of our Anglo-Saxon brethren find that in the main "temperament," whatever it may be, is not an equivalent for years of devotion to an ideal founded on hard work dominated by an honest and defined artistic conscience. There is too much temperament in a lot of the so-called art of our day and too little sanity. The Greeks knew better.

"HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES." 30th Edition for 1922. 2,324 pages, 8½ x 11½ inches. S. E. Hendricks Co., Inc., 70 Fifth Avenue, New York.

In these times of standardization we are always glad to see a publication adopt the size which is becoming the generally accepted standard. The latest convert to come to our notice is "Hendricks' Commercial Register." In its new size 8½ x 11½ inches with a type size 7 x 10 it presents a greatly improved appearance. The text matter has been opened up, leaving a space between the columns, making it more readable as well as more attractive and giving ample space for checking and memoranda. The larger page taking more matter naturally requires fewer pages and gives a thinner book, which, in turn, makes it easier to handle. The publishers' statement in the front says that although the increased size of the page takes 25 per cent more matter, and would normally reduce the number of pages from 2,800 to 2,100, enough new matter has been added to make more than 2,300 pages. This well reflects the energy of the publishers in the performance of their task of securing new information and keeping the book up-to-date.

Its lists completely cover the electrical, engineering, machinery, building, manufacturing, chemical, and similar industries. While we have not been able as yet to thoroughly check up the book, we have noted a few changes which appear excellent; for example, the subject of "Twist Drills" has been handled in a more comprehensive manner than we have ever noticed in any similar publication, and which is new in this edition. The same is true of "Fire Doors" and "Electric Lamp Sockets."

"Hendricks'" is comprehensive, well arranged, and thoroughly indexed for instant reference, and is a valuable guide in both purchasing and selling.

THE VOLUTE IN ARCHITECTURE AND ARCHITECTURAL DECORATION. By REXFORD NEWCOMB, Assistant Professor of Architectural History, University of Illinois. Paper cover. Published by the university at Urbana, Ill.

Professor Newcomb has written a most interesting history of the part played by the volute in architecture, and the many excellent illustrations add greatly to the value of the presentation.

SEEING THE ITALIAN VILLAS. Where They Are and How to Get There. By LEON HENRY ZACH, Harvard University School of Landscape Architecture. Reprinted from *Landscape Architecture*.

Announcements

W. Whitehill, architect, announces the removal of his office on December 12, 1921, to the Buckley-Newhall Building, 41st Street and Sixth Avenue, New York City.

France Honors Three American Architects.—The French Government has conferred upon three American architects, members of the American Institute of Architects, Messrs. Welles Bosworth, Charles Butler, and Julian Clarence Levi, the cross of the Legion of Honor. The announcement was made that Mr. Bosworth has contributed to the interests of France in America and has in his profession carried on the French architectural traditions; that Mr. Butler in 1915 and 1916, while attached to the French Ministry of War, designed several military hospitals, and that Mr. Levi was chief of construction in Base Section 1 in the American Red Cross. The latter are graduates of the École des Beaux Arts and are respectively chairman and secretary of the Committee of the American Institute of Architects that organized the exhibition of American architecture at the Paris salon last spring, where Mr. Bosworth was an exhibitor.

George E. Gable and C. Stanley Wyant have opened offices for the practice of architecture at 634 South Western Avenue, Los Angeles, California, under the firm name of Gable & Wyant, architects, and desire to receive manufacturers' catalogues and samples.

Arden Gallery, 599 Fifth Avenue, Scribner Building, announces an exhibition, Mothers and Children in painting and sculpture, by eminent American artists.

The L. J. Wing Manufacturing Company, 352–362 West 13th Street, New York, says: "The Wing blower way to increase boiler capacity and to improve combustion is the Positive way—because it boosts the draft and regulates it; the Quick way—because it can be installed practically overnight; and the Cheapest way—because it is low in first cost and economical to operate. Boiler plants aggregating over 2,000,000 horse-power are equipped with Wing blowers. Why not equip yours and obtain double duty from your boilers and more heat for less dollars?"

A GLIMPSE OF LOWER NEW YORK FROM THE MANHATTAN BRIDGE. *From a Photograph by J. B. Carrington.*

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV FEBRVARY, 1922 NO. 2

39

The Condition of Modern Architecture

By Leslie W. Devereux

Bush Building, New York.

TWO thoughts stand out as clear and important: the similarity of modern conditions of architecture with those of the Roman republic, and the individual tendency of modern design.

The resemblance of modern life and thought to the Roman ideal, in the time of the republic, is very striking. Conditions both of life and thought have, of course, improved wonderfully. Yet the ideal remains essentially the same. Modern business methods impose conditions upon architecture just as the Roman political system imposed them in the days of the republic. As Mr. Van Brunt points out,* it is not common for a man to incommode himself nowadays for the sake of an architectural idea. "The merchant requires that the first story of his shop or warehouse shall be of glass; the formulas of Vitruvius, Vignola, Palladio, and all the most venerable traditions and usages of art must yield to this inexorable demand; the building committee insists that their church must be a place where all may see and hear the speaker, and that accommodation must be provided on the first floor for vestry, Sunday-school, class-rooms, kitchen, and all the social and religious exigencies of their style of worship and service, although Pugin would faint with horror at the result. Yet it is out of just such prosaic exactions as these that our architecture must be developed. We must have narrow façades on our streets, and these must be built to the skies and crowded with windows. We can find no historic precedent for such things. We must accept the conditions as they are given us and create our architecture accordingly."

Of similar conditions existing in the time of the Roman republic, M. Viollet-le-Duc says: "It was indifferent to the Roman what order or cornice or moulding the architect chose to apply to his building; but the moment he undertook the reason, to establish certain principles by virtue of which he came in contact with the will of the magistrate, the moment, for example, he refused to give three stories to a building whose proportions he believed better adapted to two, whatever authority he might invoke, whatever good reason he might urge, the magistrate would at once direct him to obey and not to amuse himself by discussing the principles of his art with him, a Roman, who admitted no other reasons or authorities than those of state."

Mr. Van Brunt says that it is doubtless to this quality in our people that we are indebted for the most characteristic expressions in our work. "A public like ours, trained in habits of business, is positive and exacting, and at least has the virtue of compelling the architect to fulfil all such practical requirements in a straightforward and common-sense manner." To this quality may be attributed much of our peculiar and appropriate forms of construction, our novel use of steel, hollow tile, reinforced concrete, terra-cotta, stucco, and other materials, as well as our methods of construction. Similarly, to this identical quality is the Roman indebted for much of his peculiar type of construction, for the use of rubble masonry cores, tied together with concrete and covered with a veneer of marble or stone to which the architectural forms were applied.

It may be well to mention here the new "Zoning Law," recently enacted in New York, which, it is almost unanimously predicted, will do much to improve both the skyline and the architecture of New York City. This law provides that, in certain districts, a building can only be built up a certain distance without being "set back" from the lot line in order to admit light, to penetrate to the street. The height varies in different districts, depending upon the general character of its buildings, and it is always a multiple of the width of the street, varying from the street width to two and one-half times the street width. Furthermore, the laws restrict certain districts to certain "uses" (residence, business, or factory, for example), thus tending to make these localities more uniform in the character and appearance of their building. The "set-back" restrictions will also do much to add interest to the upper stories of high buildings, and to eliminate unfinished blank walls.

Another point of resemblance between modern architectural conditions and those of the Romans is the "dangerous superficiality of thought and work, arising from a deficient education in art and from a want of leisure," as Mr. Van Brunt expresses it. Mr. Van Brunt thinks that we can and ought to control this superficiality of thought and work, whether arising from want of education or from the atmosphere of bustle and haste in which we live; and he thinks that the organization of the American Institute of Architects is the first step toward combating this evil. However, in order to be really effective, he thinks that it should increase its membership, spread its influence farther, and make itself more universally felt. The numerous state societies and the registration laws also operate to decrease this evil.

*Discourses on Architecture by Eugène Emanuel Viollet-le-Duc; translated with an introductory essay by Henry Van Brunt.

Still another point of resemblance between the Romans and ourselves is the indifference or absence of sympathy in the public for the just expression of beauty or fitness in buildings. Mr. Van Brunt attributes this partially to the atmosphere of haste in which we live, which, he claims, is distinctly detrimental to the development of good style, and partly to the lack of education on the part of the public in matters of art. It may also be attributed to the material and realistic tendency of our age, to the absence of feeling and sympathy either for art, beauty, or the development of the ideal, whether politically, intellectually, or morally. However, conditions have also been improving in this respect in the last twenty years.

We are like the Romans in that we disdain everything which does not perform a useful function in our great business system, which takes the place of the Roman political system. We, like the Romans, trouble ourselves little to know whether a certain form is in harmony with the true principles of art (which was the great concern of the Greek, Byzantine, and mediæval architects). We care not to discuss, like the Greeks, whether our opinions are logically deduced. We, like the Romans, again, do not delight in outline, a play of light and shade. With the Romans we demand but one thing, that our architecture shall be a symbol of our grandeur and success; and, more especially, that it shall agree with our business system and be a useful work, exactly filling a prescribed programme.

These facts do not, of course, apply to all types of construction, nor to the works of all architects. There are certain buildings, such as residences and churches, which are largely immune from these conditions. Similarly, there are certain architects high up in the profession who have a deep regard for harmonious forms, logical construction, outline, light and shade, and other concerns of true art. And it is precisely because they do concern themselves with these matters that they stand so high in the profession. But, taking a general average of conditions, our similarity in these respects to the Romans is, I think, evident. And, furthermore, the Romans had as many exceptions as ourselves to these conditions, and it is in these very exceptions that we find the best examples of their art.

The Roman found among the Greeks superior workmen and he imported them, hired them, and permitted them to decorate his monuments according to their own taste, but recognizing the artist only as a workman. We find many of our artists among naturalized foreigners, or men of foreign birth or descent, who, although essentially American in their affiliations, nevertheless retain some of the foreign love of art and depth of feeling. A list of our artists, more particularly our painters and sculptors, presents an appalling preponderance of foreign-sounding names. And we also, in many cases, are inclined to hire them as workmen rather than as artists.

Conditions in this respect have also improved enormously in the last twenty years. Americans are beginning to take a much greater interest in American art, and the number of American-born men and women who have taken up some form of art as a profession has increased wonderfully in the last quarter of a century.

Lastly, and most important of all, our architecture resembles that of Rome in that it is only a shell or a clothing of the actual structural form. To use M. Viollet-le-Duc's comparison between Greek and Roman architecture, "in Greek architecture the visible exterior form was but the result of construction; it may be compared to a naked man, the surface of whose body is but the consequence of his needs, of the structure of his organs, of the mutual relations and positions of bones, functions, and muscles. His beauty increases when all parts of his body are exactly fitted to their several purposes—nothing more nor less. But Roman architecture is man-clothed; the man is one thing, his clothing is another; this clothing may be good or bad, rich or poor, well or badly cut, but it is not a part of his body; if well-made and beautiful, it ought to be studied; but if it interferes with his movements, if there is neither grace nor reason in its forms, it should be disregarded."

Our architecture, in general, corresponds to this type of building. It is an exterior shell or garment over the form beneath. And, like Roman architecture, it has its true, real, useful system of construction, combined with a view of answering certain definite purposes; it has also its envelope, its decoration, which is independent of the structure, as clothing is independent of the man. The Romans, as practical people, attached but a secondary importance to this clothing, this decoration; they wanted it simply to cover and do honor to their monuments; they cared little whether it was reasonably applied or not, whether or not it indicated exactly the essential forms of construction of the edifice, and illustrated those forms. The Roman was above, or rather did not sympathize with or comprehend the reasoning of the Greek.

"The Roman, it must be understood," says M. Viollet-le-Duc, "was not parsimonious; but he was economical, that is to say, he strove to avoid waste, both of land and of material. He did not comprehend that artistic feeling which prompted the Greek and mediæval builder to work for their own honor; but, according to his understanding, the sculptor he employed labored for public good and to celebrate the munificence of the Roman benefactor. He did not call the artist to his aid till the material purpose of the monument was attained, and merely as *a dresser* of the work; and with reference to these finishing processes, his concern was not for delicacy or refinement of detail, but rather that his monument should be covered with precious marbles, rich in color; and, with the taste of the *parvenu*, he esteemed these marbles in proportion to their rarity and difficulty of working."

We may easily find parallel opinion to-day harmonizing with this conception of the functions of architecture. And not so many years ago it may be said that it was almost the general view of the country.

The Romans, in order to cover their shell of construction and to decorate their monuments, adopted Greek forms and detail for this purpose. "Their ideas of art," says M. Viollet-le-Duc, "were those of pirates, who, with barbarous and tasteless pride, adorn themselves with foreign and incongruous spoils." But if we note that the Romans borrowed from the Greeks, we should also consider how their peculiar genius modified what they borrowed. Of the three Greek orders, the Doric, the Ionic, and the Corinthian, the Romans preferred the Corinthian, since they cared less for purity of form than for ostentation. He preferred to the carefully studied sweetness and purity of the Greek lines, abundance of sculpture; he was rich and he desired to appear so. The Corinthian order became soon the only one applied by the Romans to their religious edifices. But, as the small size of most of the Greek temples was hardly consistent with the genius of the Romans, who, from the earliest times of the empire, were prone to cover their cities with immense edifices, they exaggerated the dimensions of the Greek Corinthian order; and this, like the other orders, they soon imbued with their peculiar spirit as constructors. The Roman had no time to waste in studying purity of contour or unprofitable refinements; he desired absolute symmetry. Not only was this his taste, but it was much simpler to carry out and took much less time and effort than the careful refinements of the Greeks. But it is important to observe that the Roman, who thus applied the law of symmetry to the forms of his art, that is, to the envelope of his monuments, would boldly and intelligently free himself from its restraint when it interfered with the satisfaction of a material need, as in the practical arrangements and details of his works of public utility. This is a salient point in the character of Roman architecture.

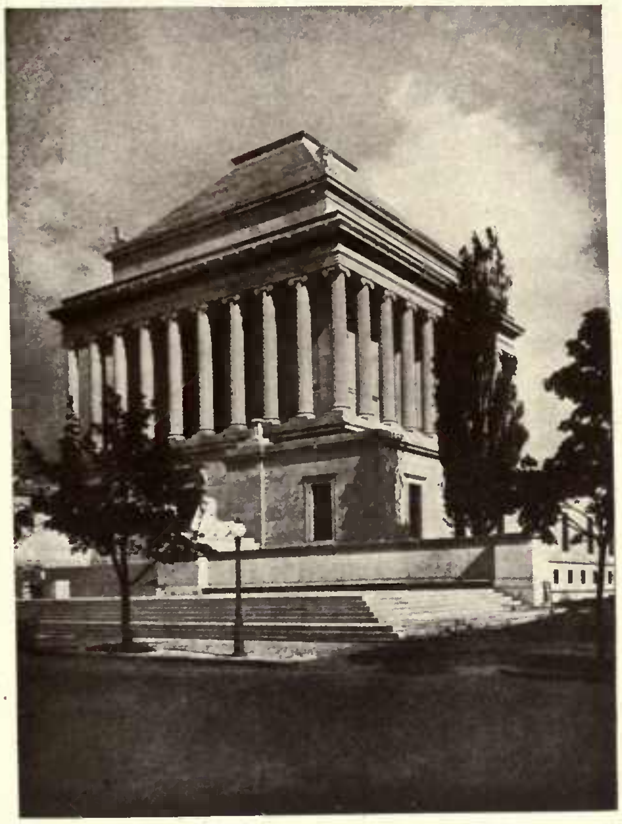
"Exaggeration," says M. Viollet-le-Duc, "is the great stumbling-block in the way of true grandeur. This error the Romans scrupulously avoided. They were grand but simply so, without effort or refinement. And thus, between the two extremes of daring and of moderation, of ambition and of common sense, their taste found characteristic expression."

Our architecture, in general, corresponds to the Roman idea. It is a shell or envelope over the structural form beneath. And, like the Romans, who borrowed Greek forms of trabeated architecture to cover their structural forms of arcuated construction, we borrow promiscuously from all the styles that have gone before us, and clothe our buildings in raiment inspired from Egyptian, Greek, Roman, Byzantine, Lombard, Romanesque, Gothic, Renaissance, and other precedent. And, still like the Romans, we have developed these styles, to a greater or less extent, into an original treatment or expression of them which is peculiar and appropriate to our thought, life, and conditions. Just as the Romans developed from the Greek forms a style of their own, appropriate to the expression of the grandeur and power of their political system, so are we developing from previous styles an expression or style—or a multiplicity of them—which is the symbol of the grandeur and success of our business system.

This, then, is our ideal as expressed in our thought, life, and art; and, whether we like it or not, it is what will go down to posterity as the monument of our civilization, the representation of our state of culture, commerce, and morals.

The second thought which stands out in connection with modern architecture is that architecture is becoming more and more an individual art; that is to say, the artistic side of it is becoming so, for our constructive forms, as we have just pointed out, are dictated largely by the needs of our civilization. But the artistic side, which we have shown has, in general, become divorced from structure, is now largely a matter of individual genius and ability.

With the invention of printing and photography, and the increased facilities of travel, it is now possible for a man in almost any part of the world to keep in touch with the conditions and thought of any other locality. It is possible, by books and photographs, to study the art or life of any previous epoch, and it is comparatively easy to travel to almost any land to verify these studies. Through newspapers, magazines, books, photographs, moving-pictures, and plays, the thought of any country may be easily transported to any other. Thus opinion tends to become universal, and the thought of any one country on a given subject is apt to be that of any other, except for certain nuances of taste and customs and requirements. The conception of a certain type of building, for example, in one country is likely to be that in any other, with the exceptions just mentioned. Under these conditions it is no longer possible to hope for any truly national school of art, which will not have its exponents and admirers in other lands, and which will be an expression only of its own national feeling. The opportunities of learning are universal, and, to all practical purposes, equal. It thus devolves upon the individual to educate himself and to acquire as much or as little learning as he desires; upon him depends the extent to which he shall study and understand his art, and the experience and knowledge he shall acquire in its practice.



Scottish Rite temple, Washington, D. C. John Russell Pope, Architect.

Upon these two considerations, then, depends the development of modern architecture: first, upon the fact that, in general, construction is divorced from art, and architecture is a mere envelope or decoration, more or less independent of the structure but still relying on it to the extent that it must be an appropriate and beautiful dress, not hampering its forms of construction and enhancing rather than detracting from the structural or functional beauty; and, second, that the extent to which this is accomplished has become the concern of an individual artist rather than of a national school.

With this picture in our mind, we can discern more readily the ideal of modern architecture. It is to develop these forms to the utmost beauty; to make them express, as far as possible, the requirements and uses of the building, its structural conditions, its functional forms, and to enhance them to their greatest possible development both in grace and beauty. To accomplish this, it is necessary not only to satisfy the requirements of use and structure, but also to perfect the beauty of proportions, form, and color. And in doing this, the development of the true expression of the material employed in proportions, form, and color will in the future, as it has done in the past, lead to the finest possible development of our modern ideal.

M. Viollet-le-Duc bears out this thought in saying that "by using such forms as shall most naturally and inartificially express the qualities and capacities of the materials we employ, by using cast-iron forms for cast iron and wrought-iron forms for wrought iron, by having appropriate distinctions of treatment for a form of granite, of sandstone, of marble, of brick, and of wood, we shall not only open a vast and inexhaustible field for variety and novelty of design, but must at last succeed in attracting the sympathy and appreciation of the public for an art which, by its false and arbitrary standards of criticism, has so long been alienated from them."

As regards truth of expression in architecture, Professor John Erskine, in a series of lectures at Columbia University on "The Materials of Poetry," states that truth in poetry is measured by its expression of an ideal rather than of material facts. By ideals is meant genuine and real aspirations, not fanciful dreams. Architecture, says Professor Erskine, is great in so far as it expresses its ideal purpose. And originality in architecture consists not so much in inventing novel forms, as in applying and adapting traditional froms to new uses and requirements. Architecture is original if it expresses, or helps to express, a new thought appropriately and if it is truthful to type and to requirements. Truthfulness to type and to requirements begets both great art and originality. And architecture is the most truthful and ideal of arts.

In proportion, then, as we apply our knowledge and love, our intellectual and spiritual energy to the achievement of this ideal, in that ratio will our results appear as true works of art, as great and beautiful monuments of our civilization and our time.

Cleveland's Building Exposition Postponed

THE postponement of the opening date of the American Building Exposition, Cleveland, from February 22 to a date in April, probably not later than the 18th, is announced by reason of the insistence of Mayor Kohler that the new city auditorium be complete to the last detail before it is formally accepted by the city and offered for exhibition purposes. The exposition is to be the first public attraction in the new building.

This is the second postponement that has been forced upon the exposition management through failure to have the building finished upon schedule time. This uncertainty about the building's completion has worked a considerable hardship, but with the date now fairly definitely fixed the management expects speedily to close out the remaining unsold space, approximately $15,000 worth of an aggregate of $100,000.

Both floors of the auditorium will be utilized, and from the variety of exhibits already booked the show promises to be one of the most complete and extensive of the year. On the structural material floor more than 75 per cent of the exhibitors will vie with each other in the artistic quality of their offerings, discarding wholly the stock booths and building special exhibits. The largest of the individual exhibits will represent an outlay of approximately $25,000.

The exposition, sponsored by The Builders Exchange, is being put on upon a co-operative, non-profit basis, the net profits to be rebated pro rata to the exhibitors, the sole object being to stimulate building interest in the Cleveland district.

Skilled Labor Scarce in the South

SKILLED labor in Southern fields is extremely scarce. The Aberthaw Construction Company, when doing work below the Mason and Dixon Line, has found it advisable in most instances to import the bulk of skilled labor from the North. Carpenters, masons, and others whose work is high-grade are, in general, much better trained in the North, and can be relied upon to do so much better work that it has been found futile to attempt to rely exclusively on the local product.

When it comes to bosses for the negro laborer, however, these are almost invariably drawn from the local field, because the natives understand how to handle the black man, with special emphasis on the Southern black man, far better than any Northerner can possibly know. They josh him and coax him along in a way which appeals to his sense of humor, and by keeping up a continual chatter are able to get results which would be utterly impossible by the methods adopted in the North with Italian and other foreign labor. This same form of good-natured raillery often disarms complaints when made, and causes the previously disgruntled darky to forget his troubles entirely and go off with a grin on his face.

It will be evident from the above random remarks that geography has a good deal to do with the handling of labor in building construction. Knowledge of local characteristics and of various types of men is essential if results are to be obtained. Even under the best of conditions, however, with adequate knowledge and familiarity with the men, there arise many cases where the kind of result desired is unobtainable, no matter how great may be the effort to get it.

Announcements

Hobart Upjohn, M.E., A.I.A., architect, announces the removal of his offices on January 15, 1922, to Room 5952 Grand Central Terminal, Forty-second Street, New York City.

Mr. Eric Kebbon, formerly associated with Mr. Welles Bosworth, announces that he is now established in the practice of architecture at 522 Fifth Avenue, New York.

Samuel Hannaford & Sons, architects, Cincinnati, announce that they have moved from the Hulbert Block to the tenth floor of the Dixie-Terminal Building.

W. H. Reeves, successor to Reeves & Baillie, architects, announces that Messrs. Ralph R. Burgess and George W. Meyer have become members of the firm, which will continue the general practice of architecture at 125 North Jefferson Avenue, Peoria, Ill., hereafter under the name of Reeves, Burgess & Meyer.

Rodger C. McCarl, architect, begs to announce that he has removed his offices from Wilmington, North Carolina, to 203–204 Latonia Building, Charlotte, North Carolina, for the practice of architecture. Manufacturers' samples and catalogues are requested.

A. Goldberg has removed his office from 354 State Street to 164 Montague Street, Brooklyn, N. Y., and will be glad to receive catalogues, etc.

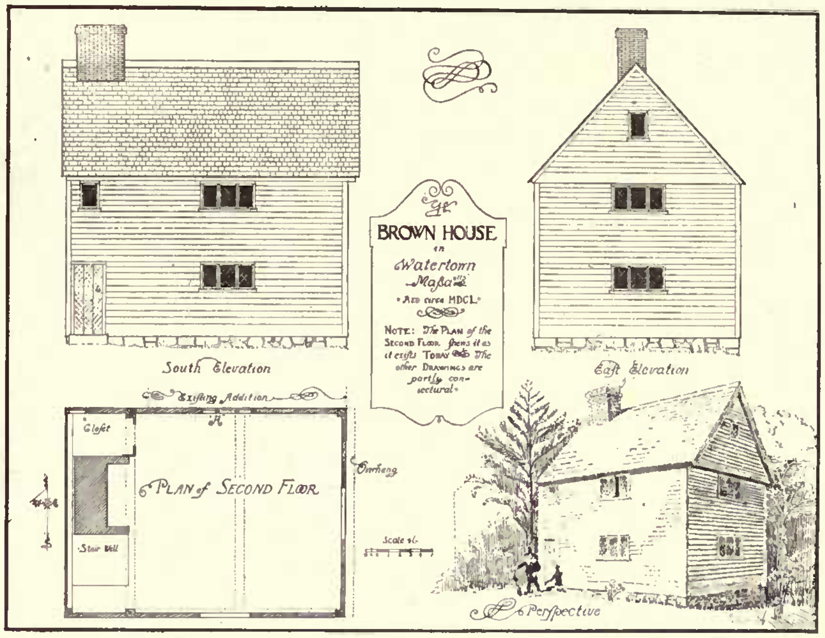
Puritan Architecture

By Murray P. Corse

II

IN a previous article we considered the elements that go to make up this seventeenth-century style of New England architecture, the doors and casement windows, the chimneys and fireplaces. It now remains to gather these up into a whole and to study the effect produced by all working together. Let us begin, then, with the genesis or development of the plan.

How little there was that might be called real development among the details has already been pointed out. With the plan, however, we have more promising material, for this shows some sort of continuous progress. Gaps occur, it is true, and there is a retracing of steps, so that it would never be safe to infer the exact date of a building from its shape or degree of elaboration; this much at least we can say, that an imposing and complex structure like the Witch House, or the Seven Gables in its full development, would not have been found in the first days of the colony.



1.

Moreover, the dating of early houses is so difficult and the examples so few, that a consistent history would be impossible. What appears to be one of the earliest types, the Brown House at Watertown (Illustration I), belongs in all probability to the second half of the century. We may, however, consider it as the prototype; the description and illustrations will enable the reader to visualize it more clearly. We know, besides, from documentary evidence, that the western half of the Whipple House was built considerably earlier than the eastern; that the involved plan of the Seven Gables started with a beginning almost as simple; and that the Paul Revere House in Boston, if we ignore the ell, presents the same disposition on a grander scale.

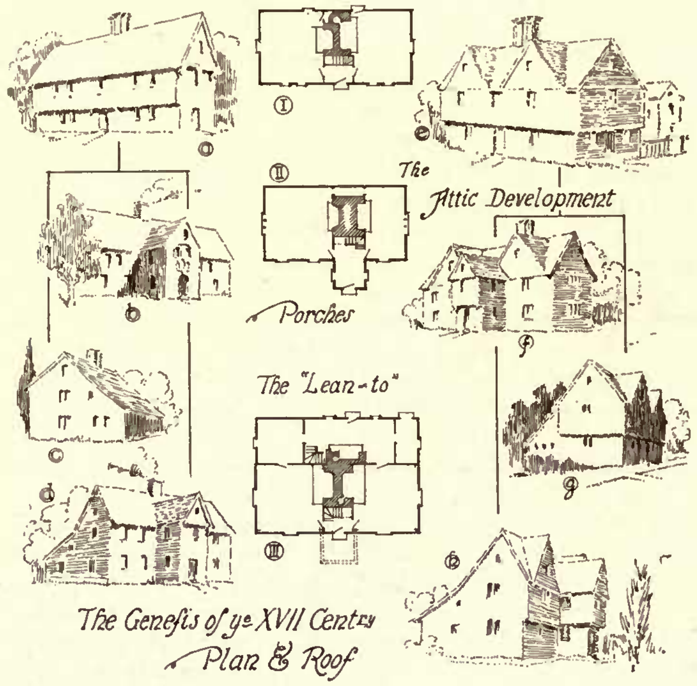
In the Brown House we have a little jewel of the first water. It might be called, to borrow a phrase from the great French archæologist, the Parthenon of our American architecture. When I first beheld it, it had fallen into the most pitiful state of decay, and a few more winters would have left it nothing but a pile of rotting timbers; but it has since been acquired, most fortunately, by the Society for the Preservation of New England Antiquities and very perfectly restored. Its grace of outline and charm of proportion should go far toward dispelling any illusions we may entertain in regard to lack of artistic sensibilities on the part of our Puritan ancestors.

As the drawing shows, there are but two rooms and an attic, the latter accessible by ladder. Hence, both rooms had three exposures, in each of which (on the second floor, at least) was a triple casement. For a full discussion of this, the reader is referred to the first article, where it was explained how the frame of the north casement owed its preservation to being walled up by a later addition. Why this ell should have been placed in such a position is difficult to imagine, for the intention was almost certainly to enlarge the house along the dotted lines in the perspective, as was actually done in many other cases, as the Whipple House.

This, indeed, seems to have been the regular mode of procedure: to build a "one-room" house, with its long side facing south and chimney at either east or west end, and then to add on at that end, placing the second fireplace back to back. This method might commend itself to the present generation, which is seldom able, for financial reasons, to carry out its dream-castle at once. Still later, as the family increased, a lean-to was added; but this in general belongs to a later development, and will be considered further on.

The two-room type may be seen to advantage at Topsfield in the Parson Capen House (Illustration II *a*). The long, straight roof line, unbroken by dormers, is strongly reminiscent of the English countryside, yet the plan is distinctly American. One rarely comes across a rectangular first floor with central entry in front of a huge chimney-stack in the mother country. This central location of entry and stairs, indeed, has clung to our domestic architecture with a tenacity hardly to be paralleled. Later on, to be sure, the chimneys were displaced to make room for a larger entrance and more dignified flight of stairs, and pop out at either end of the ridge, thus producing what we generally accept as the colonial type of home, and its popularity has survived to the present day; but the central entry is its hall-mark.

The end-chimney arrangement, however, seems to have been contemporary with the other. Indeed, among existing examples, if the dates commonly assigned to the so-called Craddock House at Medford (1637) and the Spencer-Pierce House at Newburyport should prove correct, which is doubtful, the end-chimney type would seem the earlier.



II. The plans are merely typical, though taken from actual measurements; the outlines represent: *a*, Parson Capen House at Topsfield; *b*, Spencer-Pierce Garrison, as it now is, Newburyport, showing the development of the projecting porch with an otherwise unbroken roof; *c*, Rebecca Nourse House. Danvers (restored), with lean-to; of *d* there seems to be no extant example, though it must have been common at one time; on the right-hand side is shown the development of gables reaching the main ridge; *e*, Old Hunt House, Salem, now destroyed; *f*, the Seven Gables as it probably looked before the pronounced ell was added; *g*, Ward House, Salem, gables and lean-to, and *h*, the final achievement, with gables, lean-to, porch, and all, such as may be seen in the Ironworks House at Saugus, or as the Witch House may have appeared.

But it will be noted that both of these are masonry buildings. Here motives of economy, which dictated the central location of the chimneys, were not so pressing, and the convenience of large entry and commodious stairs gained the day. Still we see the long unbroken roof line (for the dormers on the Craddock House are modern), identical, except for the placing of the chimney, with the roof of the frame dwelling.

The genesis of the plan, or its family tree, so to speak, is shown in Illustration II. At the top the plain rectangle; to the left, with unbroken roof, like the Parson Capen House; to the right, like the Ward House in Salem, with twin gables. The second step is the addition of an enclosed porch, as it was called; projecting entry or vestibule we might call it now. This was more of a gain than seems possible, for it increased the entry appreciably and gave an extra room both on the second floor and in the attic. In the same way the addition of gables gained attic space. These gables were once much commoner, as is evidenced by old prints; during the classical craze of the last century they were ruthlessly stripped off; their exact size and location can, however, be determined by marks of the footing on the plates.

The last addition was the lean-to; at first to buildings already finished, but presently it became an integral part of the plan. While this increased the ground floor, often nearly doubling it, nothing was added to the chambers except closet space. Still later chambers were contrived in the lean-to by raising the roof of the latter. This produced either a broken roof line or a dissymmetrical pitch. An interesting example is shown in Illustration III, the east end of the Whipple House. The ink line indicates the original silhouette. But whether this raised lean-to ever came within the limits of our period cannot be determined from the material at hand.

III. Whipple House, Ipswich, with end overhang ("Hewn overhang"), beautifully moulded. Ink line indicates original silhouette.

IV. Old print of Witch or Roger Williams House, Salem, probably done from memory after alterations.

The full development might have been seen, a century ago, in a house on the corner of Essex and North Streets in Salem, variously known as the Roger Williams or the Witch House. The former title is dubious, the latter sentimental, but as they are well established, there is no use in flying in the face of custom. In its present condition it offers little more than an antiquarian puzzle; fortunately, however, we possess information about its history. To begin with, there is on record an agreement drawn up between Judge Corwin, its one-time owner, and a certain Daniel Andrew, who contracted for alterations. An interesting feature of this document, a portion of which will be quoted further on, is that it gives not only actual dimensions and details of work but the date of the alterations as well. In addition there exist in the Essex Museum several old prints showing the house as it appeared before the classical craze reduced it to a condition satisfactory to the improved taste of the time. One of these is reproduced, the others vary somewhat; but all agree in showing three gables on the front, a projecting porch, diamond panes, and a pronounced overhang to the second story.

V. Witch House as it appears to-day.

Before going on to describe this interesting house more minutely, it will be advisable to consider the overhang at some length. Just when it arrived in this country, what its antecedents were, or its reason for being, are questions much mooted by the authorities. On one point only are they in agreement, namely, that it could not possibly have existed for the sake of fighting the Indians. As their arguments are among the worst that I have ever encountered, it seems unnecessary to waste any more time on them.

Overhanging second stories had been known in Europe since the early middle ages. They were in all probability copied from military architecture, where parapets carried forward of the wall surface on brackets offer a means of firing on an attacking force. Translated into domestic work, they enlarge the second story, an inestimable advantage in a crowded city. Even in the country, a saving of cellar space is effected. The architectural possibilities are self-evident, and this alone would probably have sufficed to keep the feature in vogue throughout our period.

Structurally, the overhang offers two variations. The first in time as well as in importance is known as the framed overhang, the other as hewn. In the former the first-story posts end at the ceiling level; across these the second-story girts are carried to receive the overhanging girt and the feet of the second-story posts. It will be seen that even when the overhang ran along the front only, a complicated joint ensued; when the overhang was returned along the end, the framing grew quite involved. Of the latter an example may be seen in the garden of the Essex Museum in Salem, under the returning overhang of the Ward House. If you are tall enough to reach, you may let down a panel which the restorers have kindly provided for that purpose, and there study at your leisure this interesting detail of ancient carpentry. With the hewn overhang, on the contrary, the posts are continuous from sill to plate; it is their peculiar shape alone which allows the second story to project over that below. The term is derived from the fact that the posts are hewn out of a single timber, and it is evident that the overhang could amount to only a few inches at most.

VI. Imaginary restoration of Witch House from actual measurements. (See description in text.)

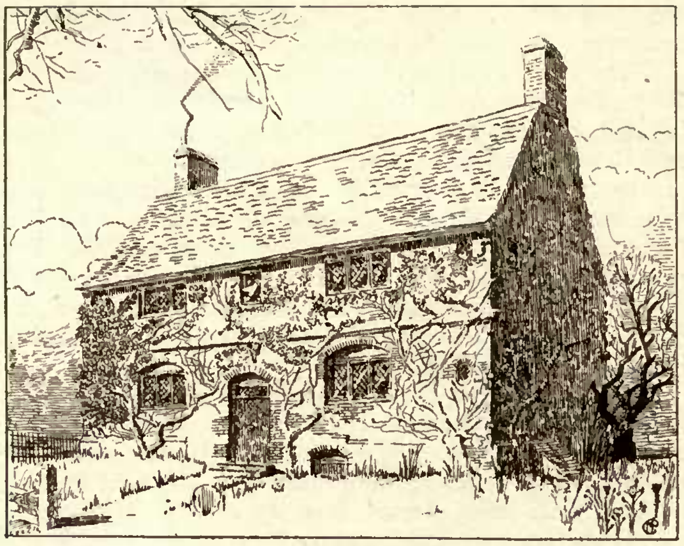
The framed overhang seems to have disappeared about 1690; the other maintained its popularity into the following century, especially in Connecticut, where Messrs. Isham and Brown claim to have seen examples of it as late as the nineteenth. More than a decorative feature it could hardly have been, as the amount of floor space gained scarcely justifies the labor involved. One of the finest examples is on the gable of the Whipple House, with which we are already familiar. Here the huge girt is beautifully chamfered and stopped, and its effectiveness as an architectural feature is particularly striking.

To return now to our restoration of the Roger Williams House, the old prints, I remarked, agree in showing three gables, a projecting porch, etc. Unfortunately, the drawings, it is believed, were made from memory after the building had been altered into its present uninteresting form. We may, however, assume them to be correct in their main features, especially where they are borne out by statements in the aforesaid contract. This is printed in full in the "Visitor's Guide to Salem," published by the Essex Museum. The more important points for our problem are as follows:

The contractor is to build a cellar under the east room (concealed in the photograph (Illustration V) by the drug-store on the right), to underpin the porch and the remaining part of the house "not exceeding three feet in height," and the kitchen on the north side "not exceeding one foot." The size of the kitchen, "twenty feet long by eighteen wide," is mentioned. This kitchen must have been in the lean-to; in another place the document calls for the utilization of stones "in the lean-to cellar that now is." Under lathing and plastering, a reference to the porch and porch chamber, which are to be filled, lathed and plastered with bricks and clay, and lime and hair besides, also to be lathed and "sieled" with lime overhead. The whole is to be finished by August following "provided that said Daiel be not lett or hindered by want of carpenter work." Dated nineteenth day of February, 1674–75.

From this it is clear that an east and west room, a good-sized lean-to, and, most interesting of all, a porch large enough to contain a chamber above, were in existence before that date. On considering the photograph, it is evident that the porch projected where the front door is now. The depth of the projection could be determined by an excavation, as it was underpinned. However, we will assume it to be seven feet, as in the Ironworks House at Saugus. The present roof, a gambrel, is evidently a later addition; looking through the branches of the tree, one can see a little ledge breaking around the spur, where the original roof must have intersected. The exact pitch is determined by traces on the chimney in the attic. The depth of the overhang we have; the only thing that remains undecided is the pitch of the gables. As the ridge of the large gables came up to the main ridge, we have only the pitch of the small gable to guess at. This is assumed to be somewhere between the other two.

(*Note:* the print is too uncertain a guide for any of the details. The end overhang, for instance, could never have existed. Drops and finials are sprinkled around with a prodigality quite out of character with the Puritan spirit. These I have inserted in the drawing (Illustration VI) where they seemed reasonable. Exact data was obtained from a careful survey of the second floor, thanks to the courtesy of Miss Grace Atkinson, who now occupies it with a very charming antique store. Two points may be remarked:



VIII. Craddock House, Medford, as it may have appeared originally.

in the prints the front gables are shown as covering the whole distance from the re-entrant angle of the porch to the end of the building; this would be an unusual disposition, to say the least; as it is ugly and makes these gables too broad for the main gable and their pitch too flat, I have shown them, as in other examples, stopping about eighteen inches from the end; the side overhang of the porch was omitted, as it made its gable too broad for the others, resulting in either too flat a pitch or too high a ridge. The plan shows the second story, both in its present condition, in black, and the conjectural restoration. Strange to say, the east room has three windows on the front and two summer beams. This caused me considerable vexation, until indications that the house originally ended at the second summer were discovered. This, moreover, makes the right-hand gable, which would otherwise be altogether too broad, about right. A full discussion of doors and windows was given in the first article; it will be unnecessary to retrace the steps here.)

A similar type is to be found at Saugus, in the old Ironworks House, ably restored by the late Henry Dean for Mr. Wallace Nutting. Here were made some of the first iron utensils in this country, and here Mr. Nutting has revived the industry along ancient lines. The house itself is an excellent example of what may be done in this "style," having been carefully restored inside and out, and yet made thoroughly livable and up to date.

These typical plans, however, by no means exhaust the possibilities. The Seven Gables, developing along another line by the addition of a projecting ell, gives us a plan that does not enter into the scheme at all. The Paul Revere House in Boston also has a pronounced ell, in this case making an oblique angle evidently to conform to the shape of an irregular lot. The Spencer-Pierce Garrison at Newburyport, to which a very early date is assigned, had a cruciform plan. In the original disposition there were probably end chimneys as shown in a sketch made for me by Mr. Dean, who was most familiar with the type.

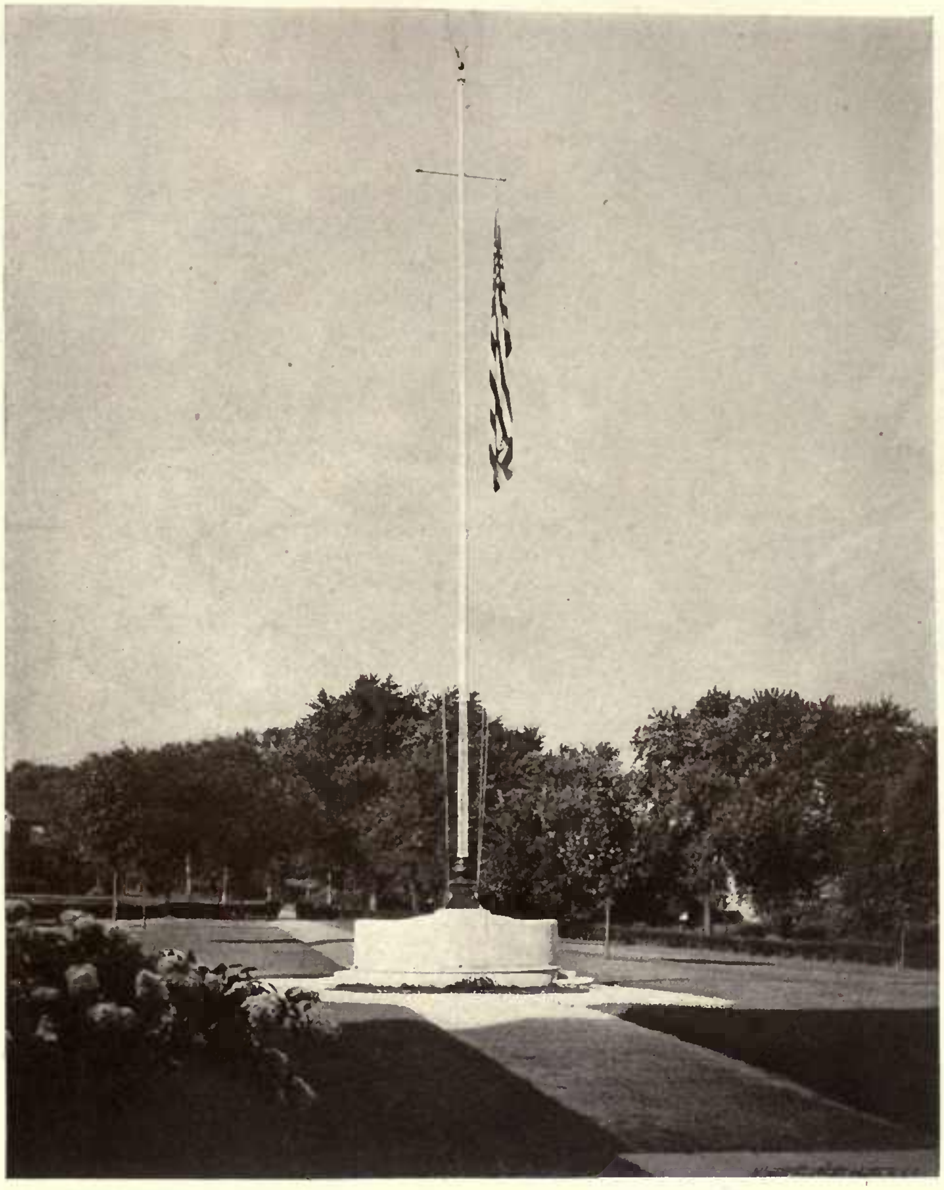
It would have seemed advisable in such narrow limits to confine our attention to frame houses, but I cannot refrain from saying a few words about stone and brick. The Spencer-Pierce, just referred to, is exceptional in every way. I know of no other in Massachusetts so strongly recalling the English-cottage type. Indeed, its resemblance to Crossways Farm, Abiger Hammer, illustrated in "Old Cottages and Farmhouses in Surrey," is so striking as to make one wonder if the original Pierces did not come from near there.

Of the brick buildings, the Peaslee Garrison at Haverhill, also restored by Mr. Dean, speaks for itself; for the so-called Craddock House in Medford, I have been obliged to make an imaginary restoration (Illustration VIII). There is evidence that the windows were lengthened at the bottom, and the brick pier between the coupled openings is clearly of a later date. This would leave an appropriate space for the triple casements as shown. The dormers also are modern; whether the gambrel roof is original, I cannot say. Other brick and stone houses may be found in Connecticut and Rhode Island, and are well illustrated and described in the books of Isham and Brown.

Viollet-le-Duc once made an impassioned appeal for a more careful study of the great monuments of Gothic art, not for the sake of copying them, but that the principles which inspired the builders might be understood, and prove an inspiration for the present day. He based his appeal on several grounds—racial, climatic, economic. His words might be almost without change applied to the situation in this country by substituting this Puritan style for that of the great cathedrals. Racially it is our heritage, devised and perfected by our ancestors; it grew up and adapted itself to the climate in which we live. The half-timber house, for instance, was almost certainly tried and abandoned by the early settlers as unpractical in our violent winters and parching summers, which cause exposed timbers to shrink; nor can the recent revival of half-timber work be called a success, in spite of a few good examples. The old builders had a peculiar gift for adapting the form of their houses to the site; "they seem to spring, like a growth of nature, from the soil on which they are planted," a quality which deserves much closer attention than it often receives; and they had a remarkably true sense of proportion and harmony of shape.

The present day offers an excellent occasion for such a revival, not only on account of the sentimental reason of the tercentenary, but for the far more pressing one of the difficult labor situation and the shortage of materials. Most of our advanced architects are convinced that the day of reckless extravagance in building and sumptuous magnificence in decoration has gone by; and where can we find a better inspiration for dignified simplicity than in these seventeenth-century homes of our Puritan ancestors?

X. Craddock House, present condition.



Albert W. Treat, Robert von Ezdorf, Architects.

Soldiers' and Sailors' Memorial, Village of Queens, Long Island, N. Y.

THE Art Commission of New York City has been very generous in its praise of the conception of this monument. It is set very appropriately in the large parking space in front of Public School 34, and interrupts a nine-foot pathway which leads a distance of five hundred feet to the school entrance from the forking formed by two main arteries of highways.

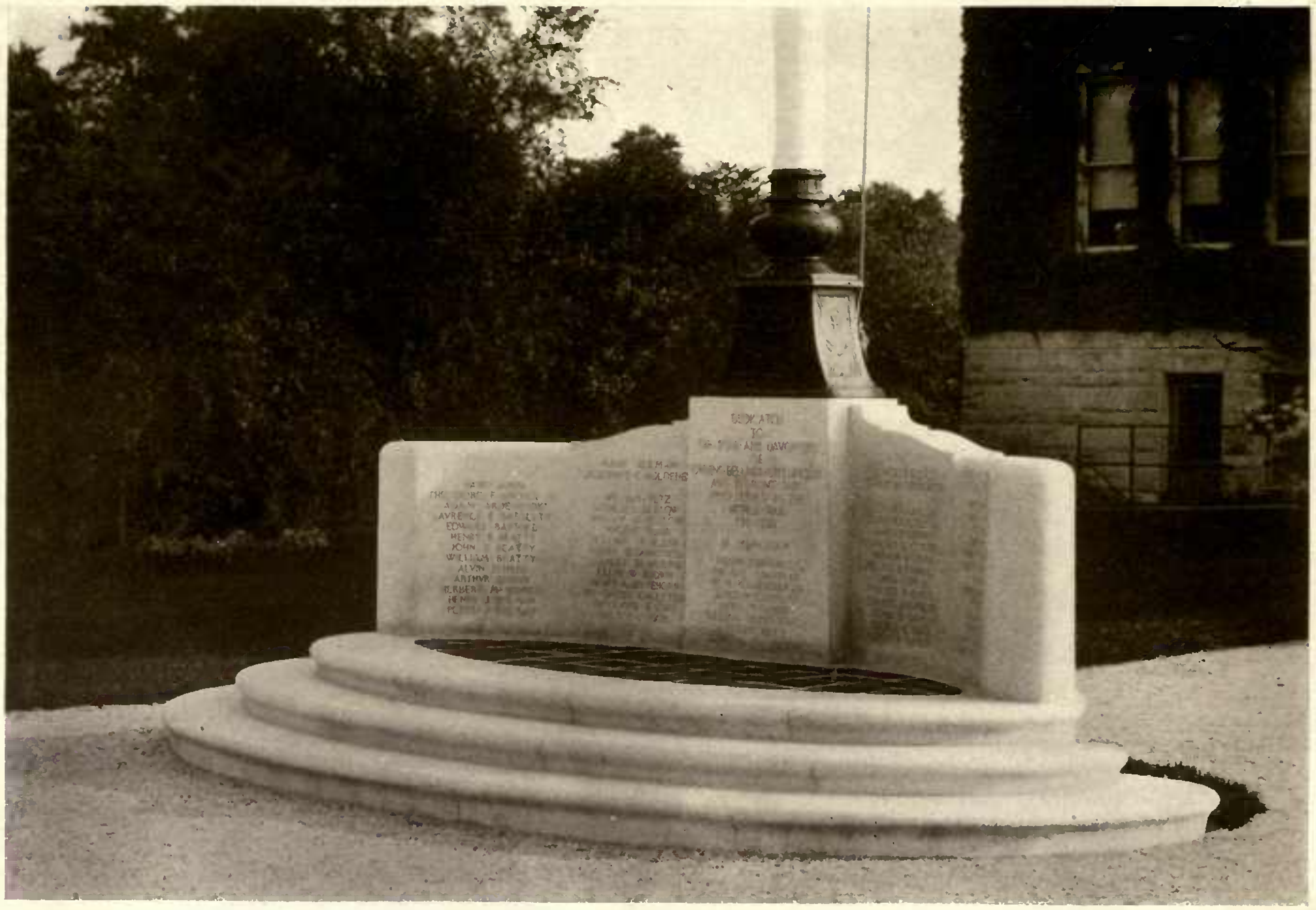
The monument consists of an elliptical platform raised fifteen inches above the ground, approached by three Concord granite steps, the field of the platform being filled with heather-brown quarry tile. The rear half of this platform supports a forty-inch high granite parapet in the centre of which is a die block which forms the base of the fifty-foot steel flagpole which rises out of the monument at this point and is developed from the granite die block by a statuary bronze socle treated in low relief with the insignia of the army on the two faces and that of the navy on the two ends. Near the top of the flagpole is a halyard arm to designate the naval character of war service, and the pole terminates with a beautiful gilded American eagle.

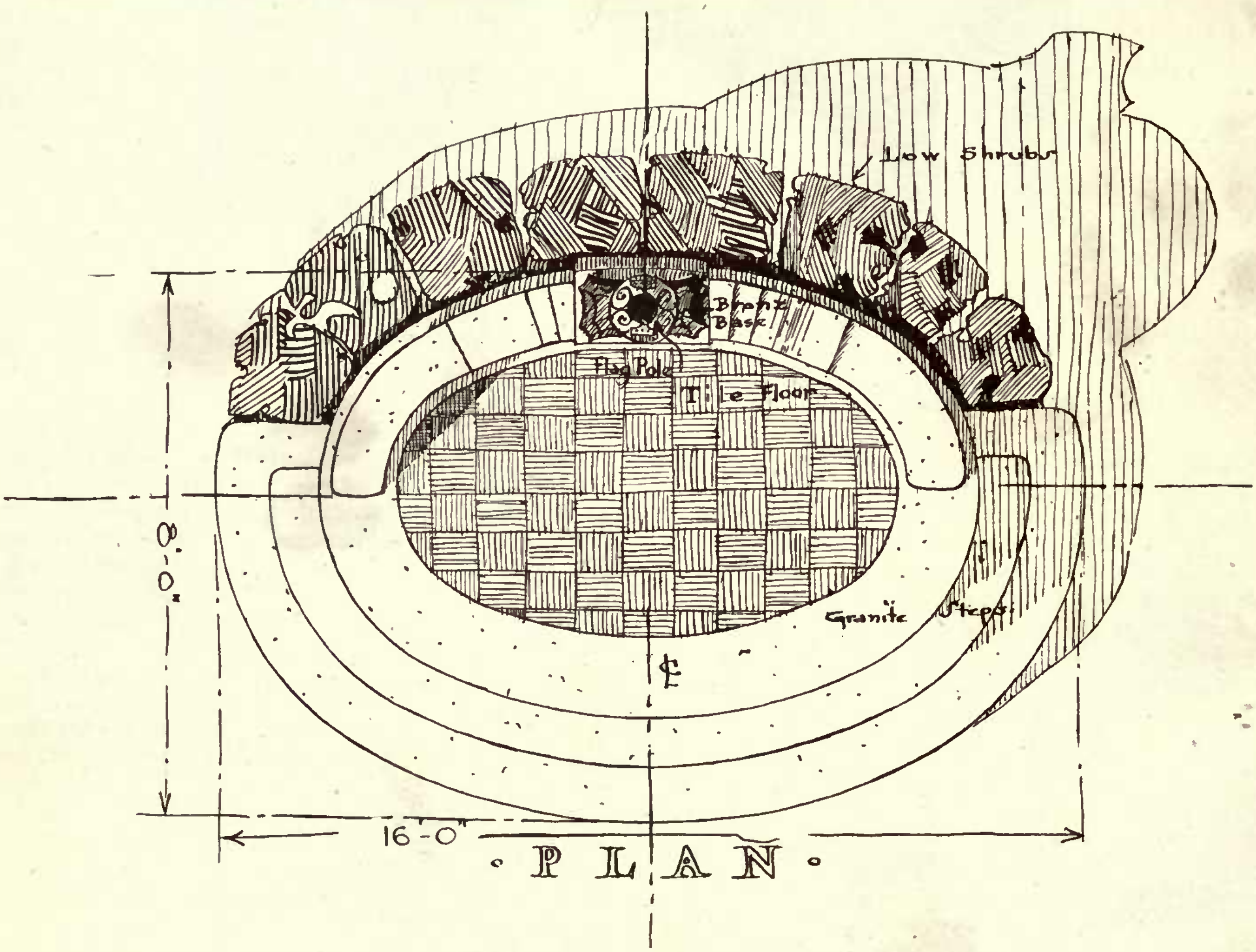
Upon the two faces of the granite parapet are inscribed in incised lettering the one hundred and thirty-eight names of the girls and boys of the locality in the form of an honor roll. The flagpole die block in the centre of the parapet on the front face is used for the dedicatory inscription and the list of "In Memoriam" names.

To complete the ellipse formed by the front steps, there is planted at the rear a border of myrtle and ivy, signifying the immortality of the service rendered by the boys and girls. All the names are arranged in alphabetical order, without regard to rank or station.

The entire operation cost $5,200.

The platform is planned to be used at each "Safe and Sane" Fourth of July celebration when the villagers gather at the school grounds to watch the children's folk-dancing, and listen to the reading of the Declaration of Independence and the customary Fourth of July orations.





SOLDIERS' AND SAILORS' MEMORIAL, VILLAGE OF QUEENS, LONG ISLAND, N. Y.
Albert W. Treat, Robert von Ezdorf, Architects.

Editorial and Other Comment

A Solution of the Building Problem

THE promise of a great building development in New York City to relieve the housing shortage is said to be dependent upon the willingness of labor to concede, as their part of the work, a dollar a day reduction from current wages. Without this concession the work will be impossible, say the experts, and without the needed construction no part of the community will suffer more from high rents than those whose skilled help will make the new building possible. We have many times said that it is the labor cost that is holding back new construction, and we have cited facts from various authorities. One of the best statements of conditions we have seen is contained in an editorial in the New York *Herald*, and it so clearly summarizes the actual conditions that we take the liberty of passing part of it on to our readers out of town, for the conditions are not local, but govern new construction everywhere.

"What that dollar a day a man means in costs, interest, taxes, and rents is easy to see. In the average dwelling place of New York, whether it is a house by itself or an apartment in a big building, there are anywhere from 1,000 to 3,000 days of labor. This represents an average of from six to ten men on the job for periods ranging all the way from 150 days to 300 days.

"If 2,000 days of labor to the average dwelling represents a fair run of the whole, merely the $1 for each of the days amounts to $2,000. Now every dollar of labor, like every dollar of masonry or paint or window glass or whatever the material may be, must work itself into interest charges, must work itself into tax bills, must work itself into insurance and depreciation charges. So every dollar of labor must work itself into the rent which provides the money to meet the interest payments, the tax payments, the insurance payments, and the depreciation payments.

"An interest rate of 6 per cent, a tax rate of 2½ per cent, and an insurance and depreciation rate of 3½ per cent all put together make a charge of 12 per cent on every dollar of labor that goes into a house. This 12 per cent on the $2,000 of labor either added to or taken from the average dwelling place calls for $240 a year or $20 a month. If labor sticks it on it is $20 a month more rent to be paid. If labor takes it off it is $20 less rent to be paid.

"This has been the reason enough housings were not built and could not be built when the labor cost alone of building an average dwelling place has called for a higher rent charge than the average occupant of the average dwelling place could afford to pay. Readjust the wage costs along with the other costs, which are minor to the labor costs, and the houses will build. It is the only way."

Two Fine Achievements

TWO recent buildings constructed in down-town New York that have added greatly to the architectural dignity of that neighborhood of monumental office-buildings are Mr. Morris's Cunard Building and the new International Mercantile Building by Mr. Chambers. The latter is an alteration, a making over of the old and ugly red-brick structure known as No. 1 Broadway, and more or less famous as one of our first so-called skyscrapers. In his reconstruction Mr. Chambers has entirely rebuilt the exterior and made a number of important changes in the interior involving some difficult and instructive engineering problems.

The large main booking-office on the ground floor, with its fine light from the windows facing Battery Park, is an admirable example of good taste in its details. The breaking of the long lines of the ceiling by large circles at either end was a happy idea, and the use of various nautical symbols in the decoration, especially the large compasses in the floor, that repeat the greater circles above, give an impression of carefully studied composition. The exterior walls present a harmony in various quiet tones of color with contrasts in detail that add charm without detracting from a sense of well-balanced masses. Both Mr. Chambers and Mr. Morris have shown their fine artistry as well as abundant consideration for those purely practical matters that, after all, must be the things by which all good architectural compositions are judged.

We were pleased to notice that Mr. Chambers has signed his work where all may read that he is the architect, and we wish this were more often done, for we believe it will have a good effect upon the public in making it look upon our architects with both more serious consideration and an inclination to encourage better work in all kinds of building construction.

The Architect and Advertising

MAY an architect advertise like any other business man or is he bound by professional ethics to hide his light under a bushel, or to evade the issue by cutting a little hole in the side and let a small gleam escape now and then when the other fellow is not looking? There are many ways of gaining publicity, from a brass band and a parade to the very proper cultivation of an influential circle of friends socially prominent.

This is only leading up to what seemed to us a legitimate and dignified method of publicity on the part of the well-known firm of Walker & Gillette. Their work was recently on exhibition in a prominent Fifth Avenue art gallery. It struck us as an admirable idea and worthy of being followed by other members of a profession that, after all, *is* identified with art, no matter how much we may be inclined, in these days of intense seeking after the material things of life, to deny any and all so-called highbrow pretensions.

The Exhibition of the Architectural League

THE annual exhibition of the Architectural League of New York is given this year in the Fine Arts Building, at No. 215 West 57th Street. The exhibition opened on Friday, February 3, and a reception was given on Saturday, February 4.

The exhibition, opened to the public commencing on Friday, the 5th, will last until March 4th, inclusive. Hours are from 10 A. M. to 6 P. M. and from 8 P. M. to 10.30 P. M.; Sundays from 1 P. M. to 6 P. M.

Admission, fifty cents, except on Mondays, which is a free day.

The exhibition this year includes drawings and models of proposed and executed work, both in architecture and the allied arts; also, specimens of decorative painting, furniture, metal work, and ceramics.

Last year, it will be recalled, the League's exhibition was given in the spacious unfinished new galleries of the Metropolitan Museum of Art.

These exhibitions are of value not only to architects and craftsmen but as well to the general public, and we sincerely hope the public will appreciate this opportunity and profit thereby.

Medals were awarded in architecture to Walker & Gillette; in painting to Ezra Winter, for his Cunard Building decorations; in sculpture to Leo Lentilli, whose flagpole for the Rice Playfield dominates the Vanderbilt gallery; in landscape gardening to Olmstead Brothers, for work in Cleveland, Ohio, and Brookline, Mass., and in native industrial art to Samuel Yellin.

The Avery prize was awarded to Grace H. Talbot, for her statuette entitled "The Novice." The prizes in collaborative competition went to Francis J. Creamer, architect; George Davidson, painter; and C. Paul Jennewein, sculptor.

The Chicago Architectural Exhibition

THIS exhibition will be given jointly by the Chicago Architectural Club, the Illinois Society of Architects, the Illinois Chapter, A. I. A., with the co-operation of the Art Institute of Chicago, and is to be held in the Galleries of the Art Institute of Chicago, March 11 to April 9, 1922. The exhibition will be illustrative of architecture and the allied arts, and includes drawings and models of proposed or executed work, academic drawings, examples of rendering sketches, examples of decorative painting, sculpture, and the allied arts and crafts, photographs and other features, especially arranged with the exhibition committee.

Gold Medal Awarded the Carnegie Institute of Technology

THE gold medal of the Société des Architectes Diplomés par le Gouvernement Français, which was put in the hands of the American Group for award to that institution which shall have most distinguished itself in the year in architectural teaching, according to Beaux Arts principles, has been awarded for the season 1920–1921 to the Carnegie Institute of Technology. Allow me to offer you, for our group, our congratulations of the really excellent results of the serious work shown by your students. As usual the results shown by the competitions held by the Beaux Arts Institute of Design have been used as a basis. The five silver medals for award to individual students who have shown the highest standard therein have been awarded to the following students: R. A. Fisher, "T" Square Club; A. E. Westover, Jr., "T" Square Club; R. F. Lawson, University of Pennsylvania; R. B. Thomas, Yale University; B. Dierks, Carnegie Institute of Technology. Results in work of the first class were shown this year by the following institutions: Carnegie Institute of Technology, Columbia University, Cornell University, Chicago School of Architecture, Harvard University, John Huntington Polytechnic Institute, Massachusetts Institute of Technology, Pennsylvania State College, Syracuse University, University of Kansas, University of Pennsylvania, University of Texas, University of Virginia, Yale University.

Yours very truly,

(Signed) JOHN M. HOWELLS,
American Group,
Société des Architectes Diplomés.

Committee: Messrs. Lloyd Warren, Edwin H. Denby, Jas. Gamble Rogers, Wm. A. Delano, Jos. H. Freelander, John M. Howells.

Waste in Industry

From an Address Delivered by J. Parke Channing at the National Convention of the Associated General Contractors, Cleveland, Ohio

IN assigning the relative responsibility for waste, fifty per cent of this responsibility has been placed at the door of management and less than twenty-five per cent at the door of labor. In assessing this responsibility, there has been no purpose or desire to place blame upon any individual, group, or class. Waste, like industry itself, is the result of a slow growth, but undoubtedly the greatest opportunity to-day for correcting it is in the hands of management. By management is meant all of those engaged in industry, from foremen up to the financial heads of the concern. The importance of management has been shown by that terrible experiment conducted in Russia, in which an attempt was made to carry on industry by the workman himself. It has failed miserably, and now its protagonists are asking that technical men come into Russia to re-establish its industries.

The causes of waste may be generally classified under the heads of Low Production, Interrupted Production, Restricted Production, and Lost Production. Low production is caused by faulty material control, faulty design control, faulty production control, lack of cost control, lack of research, faulty labor control, ineffective workmanship, and faulty sales policies. Interrupted production is caused by idle men, idle material, and idle plants. Restricted production comes about either by restrictions of the owners or management or by labor. Lost production is largely due to ill health, physical defects, and accidents.

The recent Conference on Unemployment makes suggestions toward correcting interrupted production due to idle men. Probably of all things this is the most vital. It is unfortunate that in a country like this United States we should have idle men when we have such rich resources and such demands for finished goods. A large portion of this unemployment is due to booms and depressions, and while we do not thoroughly understand the causes of these cycles, we are getting nearer and nearer to the truth, and I believe that we can look forward to a time when the peaks and valleys will be nearly levelled out.

The one thing, to my mind, that stands in the way is a psychological one, and that is that when we are in a boom period we fail to realize it, imagine conditions are normal, and that the real boom is ahead of us. It is only a few far-sighted and sound-thinking men who realize the actual condition. It is incumbent upon owners and managers to study this question thoroughly, to see that information is collected and distributed and to properly interpret it.

THE HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.

ENTRANCE LOGGIA, FACING 16TH STREET.

FOUNTAIN IN END OF LOGGIA. (Cast aggregate with medallion of colored terra-cotta.)

HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.

THE BALLROOM.

THE MAIN LOBBY. Appleton P. Clark, Jr., Architect.

The walls, columns, mantel, etc., are of cast aggregate. The ceiling is colored after the fashion of Italian majolica.

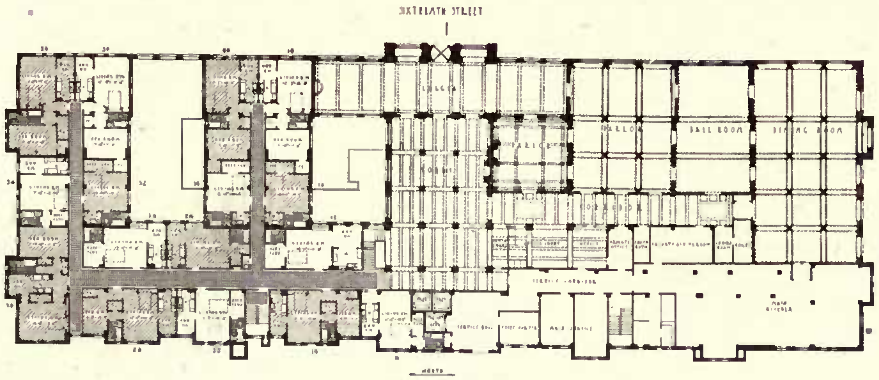
THE HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

THE LARGE PARLOR.

THE SMALL PARLOR. (Panelled in chestnut. Stone and brick fireplace. English glass ceiling lights.)

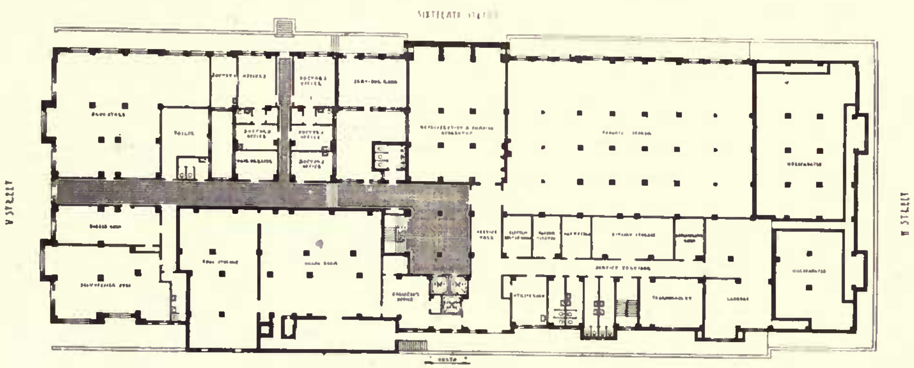
THE HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.

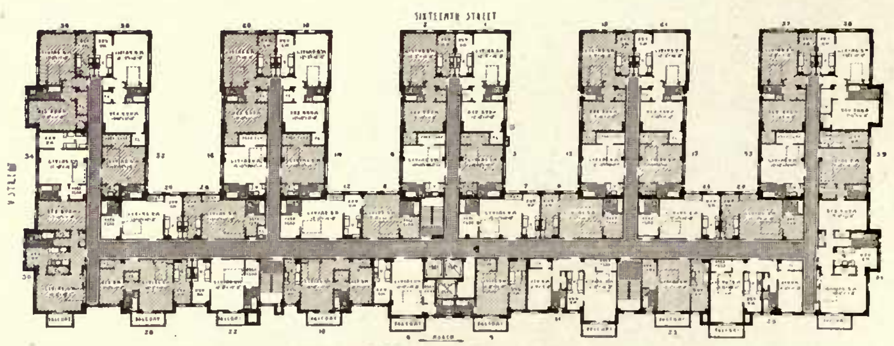


PLAN OF FIRST FLOOR

PLAN OF SEVENTH & EIGHTH FLOORS



PLAN OF BASEMENT FLOOR



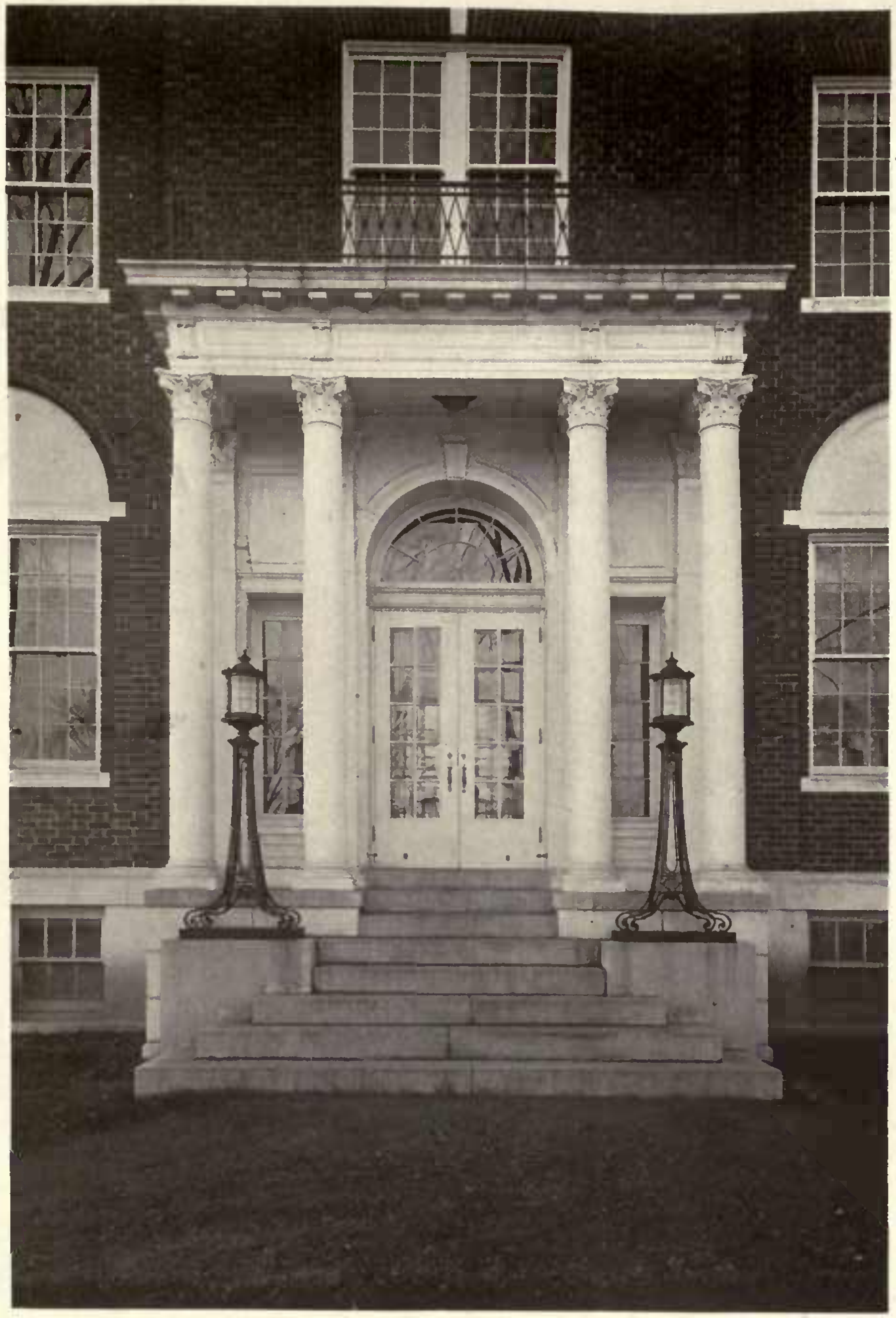
PLAN OF SECOND TO SIXTH FLOORS INCLUSIVE

PLANS, HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.

ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.

Walter P. Crabtree, Architect.



DETAIL OF MAIN ENTRANCE.

STAIR HALL, FIRST FLOOR.

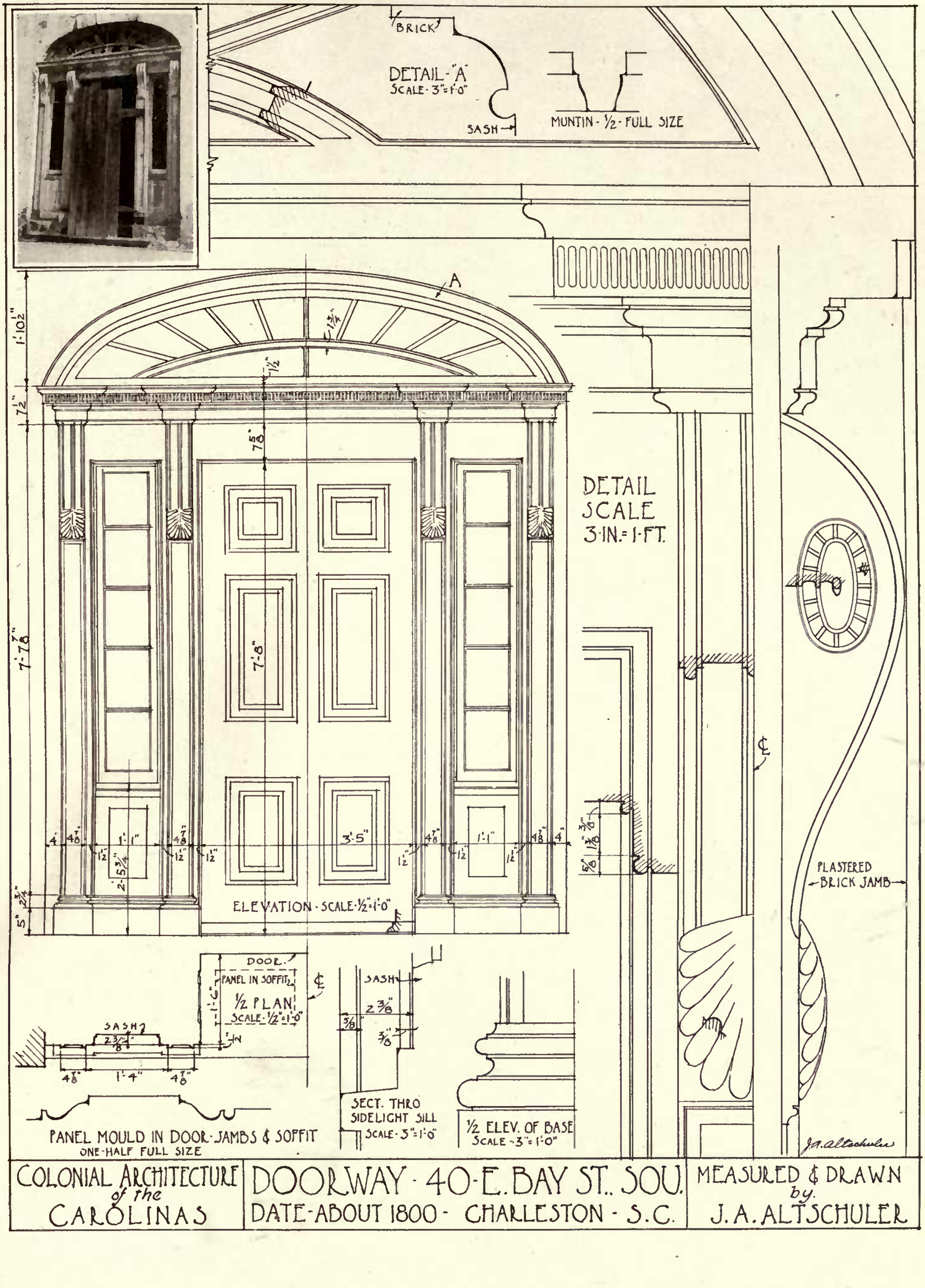
Walter P. Crabtree, Architect.

ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.

BILLING AND ENTRY DEPARTMENT, SECOND FLOOR.

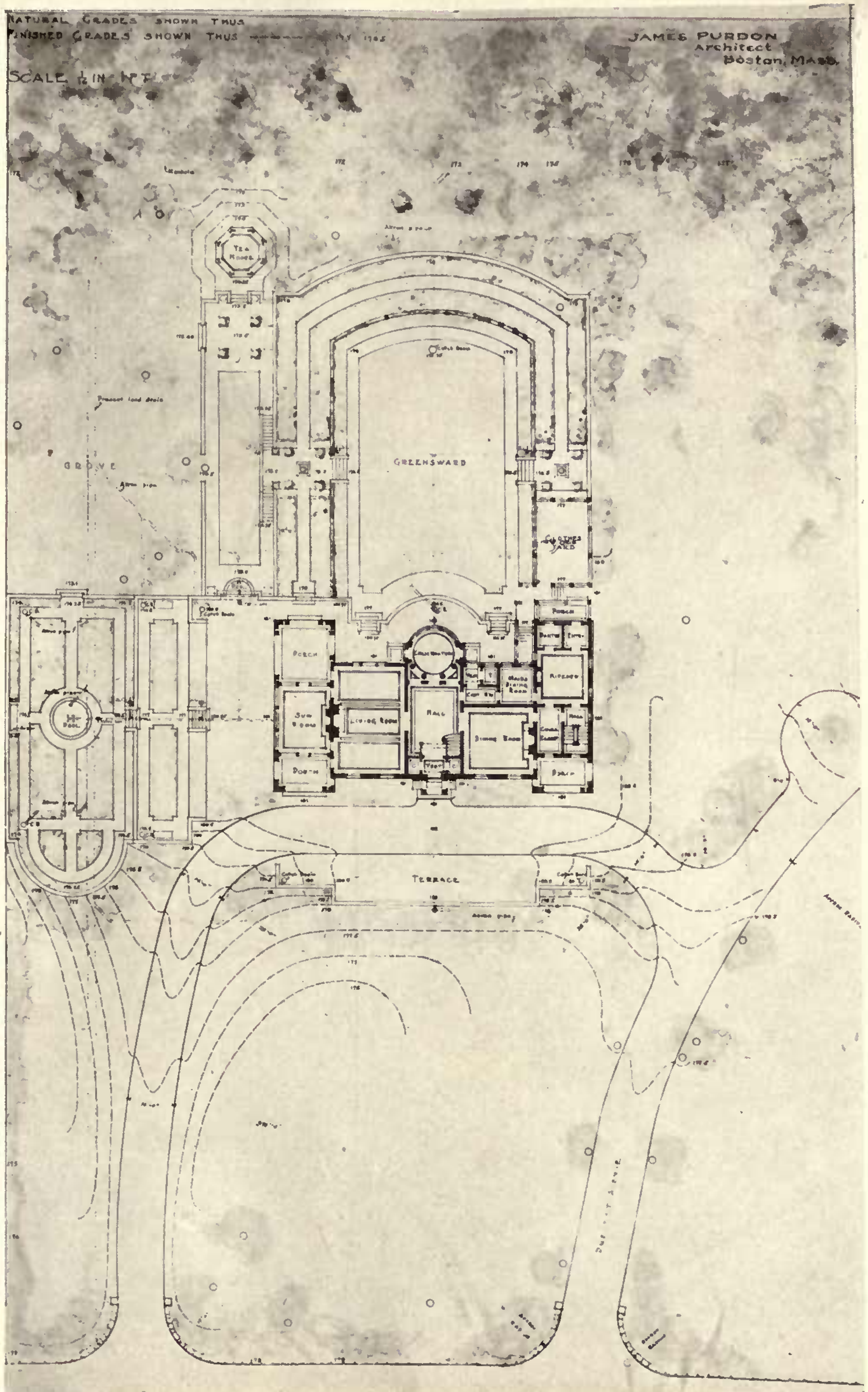
STAIR HALL, SECOND FLOOR. Walter P. Crabtree, Architect.

ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.


BRICK
DETAIL-"A"
SCALE-3"=1'-0"
SASH
MUNTIN - 1/2 - FULL SIZE
A
DETAIL
SCALE
3-IN.=1-FT.
ELEVATION - SCALE-1/2"=1'-0"
PLASTERED
BRICK JAMB
DOOR
PANEL IN SOFFIT
1/2 PLAN
SCALE-1/2"=1'-0"
SASH
SECT. THRO
SIDELIGHT SILL
SCALE-3"=1'-0"
1/2 ELEV. OF BASE
SCALE-3"=1'-0"
PANEL MOULD IN DOOR-JAMBS & SOFFIT
ONE-HALF FULL SIZE
J.A. Altschuler
COLONIAL ARCHITECTURE of the CAROLINAS
DOORWAY - 40-E. BAY ST. SOU.
DATE-ABOUT 1800 - CHARLESTON - S.C.
MEASURED & DRAWN by J.A. ALTSCHULER

FRONT, SUBURBAN RESIDENCE IN MASSACHUSETTS.

James Purdon, Architect.



PLAN.

CONSERVATORY.

FRONT TERRACE.

James Purdon, Architect.

SUBURBAN RESIDENCE IN MASSACHUSETTS.

SUN-PARLOR.

LIVING-ROOM. James Purdon, Architect.

SUBURBAN RESIDENCE IN MASSACHUSETTS.

HALL.

DINING-ROOM.

James Purdon, Architect.

SUBURBAN RESIDENCE IN MASSACHUSETTS.

INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK. Walter B. Chambers, Architect.

MAIN BOOKING OFFICE (FIRST CLASS), INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK. Walter B. Chambers, Architect.

On the north wall are two large decorative maps, of the Atlantic and Pacific Oceans, with the steamship routes indicated. The four circular vent registers in the ceiling are ship steering-wheels.

The lighting fixtures on the walls are suggestive of ship lanterns—those hung from the ceiling of the main waiting-room are terrestrial globes.

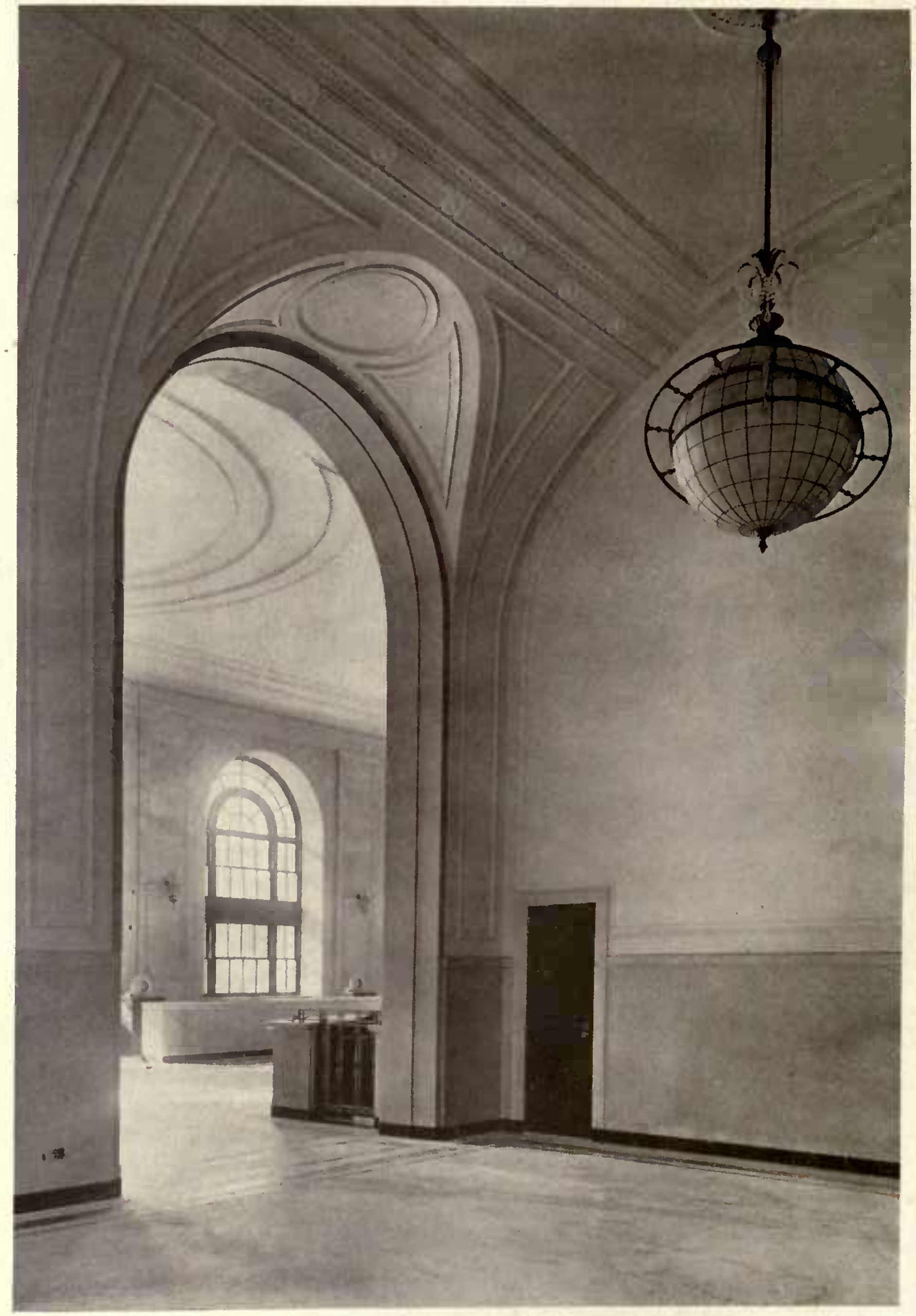
In the marble floor, at either end, are large marble ship compasses, each over twenty feet in diameter, correctly oriented and composed of red Numidian, Belgium black, green and white cippolino, verde antico, levanto, breche-violette, and American white marbles.

Against the soft buff-colored Botticino marble walls are twelve panels, destined to frame a historic series of portraits of the company's best-known ships, from the days of the old sail and side-wheel vessels down to the latest super-giant *Majestic*, now nearly completed.

GALLERY, MAIN BOOKING OFFICE, INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.

Walter B. Chambers, Architect.

MAIN ENTRANCE.



PASSAGE FROM WAITING-ROOM TO BOOKING-OFFICE.

Walter B. Chambers, Architect.

INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.

Reconstruction of No. 1 Broadway

Walter B. Chambers, F. A. I. A., Architect

THE problem was to transform an old-fashioned red-brick and brownstone structure, inadequately planned and equipped, as measured by modern needs, into an up-to-date office-building, specially arranged to meet the requirements of its new owners, the International Mercantile Marine Co.

To make the radical structural changes needed in order to rearrange the interior spaces, to recast the exterior into a dignified and agreeable architectural composition, expressive of the building's character and purpose, and to do this while nearly two-thirds of the building was occupied, and without unduly disturbing or inconveniencing the occupants, added special difficulties.

No. 1 Broadway (before alteration), Battery Park façade.

The old elevator equipment had to be discarded because it was mechanically unfit and the elevators were in the wrong places. Eight new electric elevators were installed, in two banks. In order to maintain service for the occupied floors it was necessary to install and operate one of the new banks of elevators before the old ones were taken out.

The same thing is true of the old staircases. The two new stair lines had to be built in their new locations before the old ones could be removed.

The old plumbing and heating systems were completely discarded and replaced by modern equipment, which includes a proper fresh-air supply and vitiated-air-exhaust ventilating system for the company's main offices. But the service to the occupied floors was maintained without interruption.

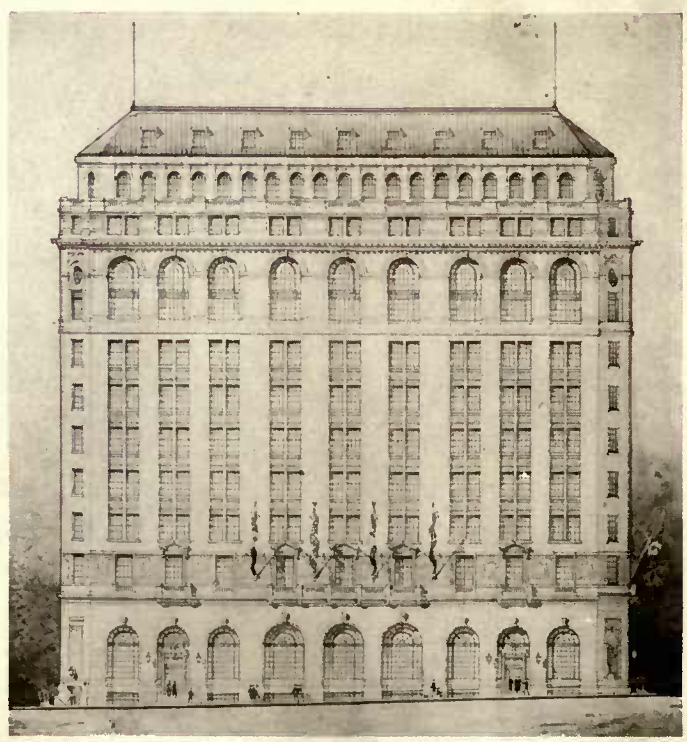
A new electric-wiring system was installed and a pneumatic-tube equipment added.

To carry out this work while seven floors of the building were occupied complicated matters immensely and caused many delays. A programme was prepared in the architect's office, in which the exact sequence of the operations was carefully studied, to insure their practical working, and this programme was carried out to the end, with only minor modifications, and always directly under the architect's supervision.

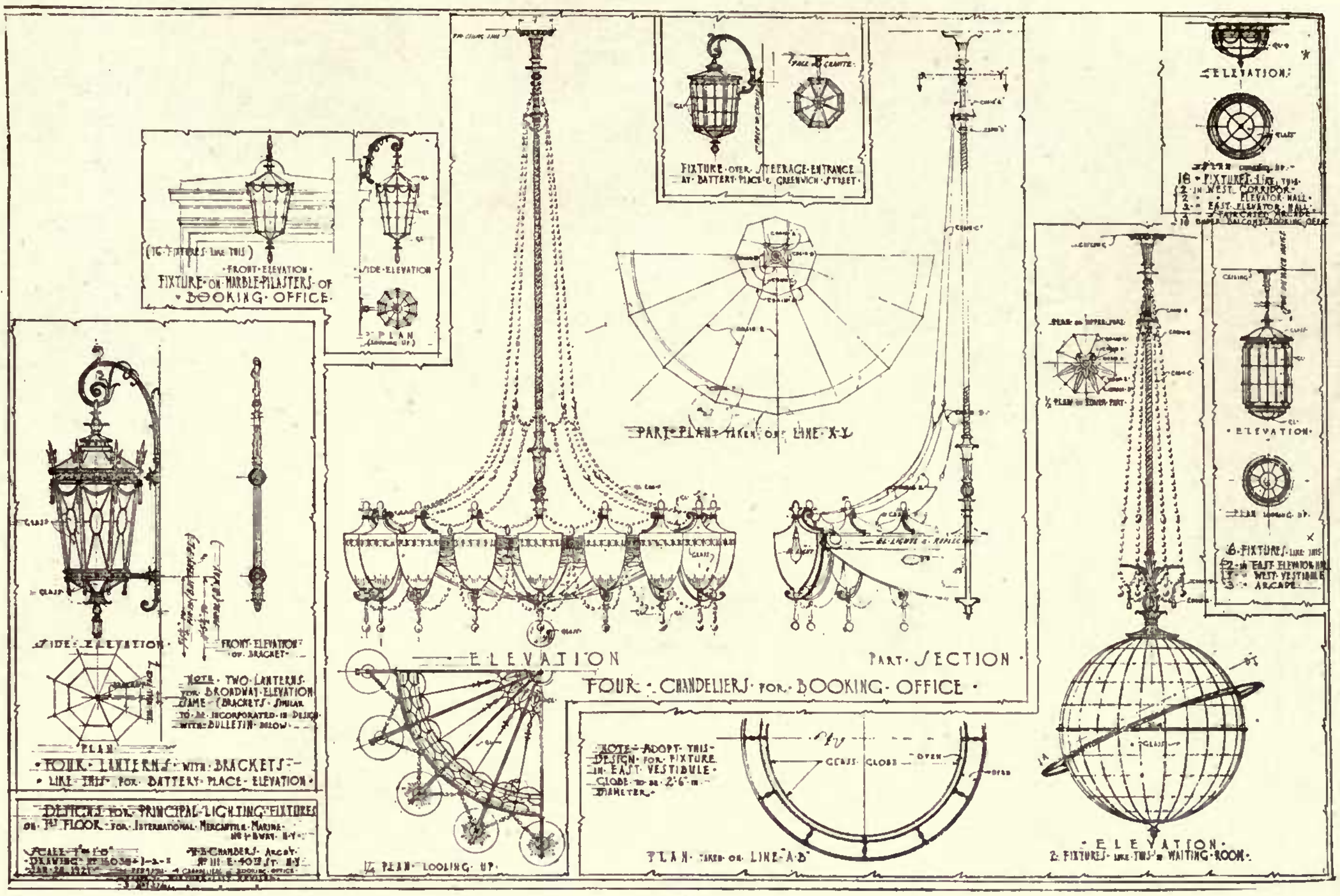
There was no general contractor in charge of the work. The work under each trade—more than forty of them—was done under a direct lump-sum contract, awarded by the owners after competition to the lowest bidder on the architect's detailed drawings and specifications prepared for that particular trade.

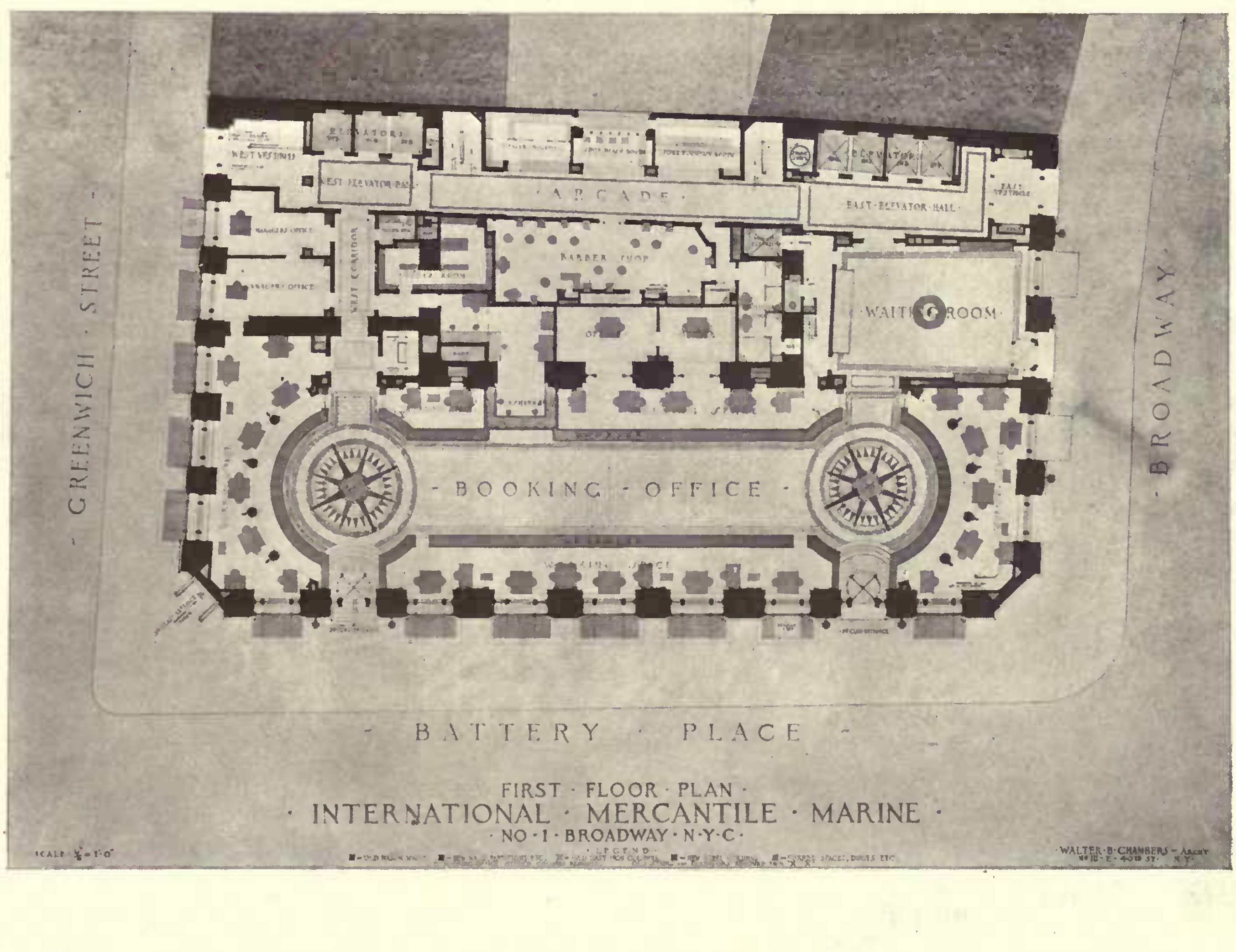
This is true of all but two of the forty-odd trades involved—the only two exceptions being the structural steel and the masonry cutting, etc. The nature of the problem made it impossible to have these two trades under lump-sum contracts.

The remodelling of the upper part of the building—removing the old roof, adding new stories—required the



Architect's sketch for alteration.


FIXTURE ON MARBLE PILASTERS OF BOOKING OFFICE
FRONT ELEVATION
SIDE ELEVATION
PLAN
FIXTURE OVER STEERAGE ENTRANCE AT BATTERY PLACE & GREENWICH STREET
PART PLAN TAKEN ON LINE X-Y
ELEVATION
PART SECTION
FOUR CHANDELIERS FOR BOOKING OFFICE
1/2 PLAN LOOKING UP
PLAN TAKEN ON LINE A-B
GLASS GLOBE
ELEVATION
2 FIXTURES LIKE THIS IN WAITING ROOM
FOUR LANTERNS WITH BRACKETS LIKE THIS FOR BATTERY PLACE ELEVATION
DESIGNS FOR PRINCIPAL LIGHTING FIXTURES ON 1ST FLOOR FOR INTERNATIONAL MERCANTILE MARINE


ARCADE
WEST ELEVATOR HALL
EAST ELEVATOR HALL
BARBER SHOP
WAITING ROOM
BOOKING OFFICE
GREENWICH STREET
BROADWAY
BATTERY PLACE
FIRST FLOOR PLAN
INTERNATIONAL MERCANTILE MARINE
NO 1 BROADWAY N Y C
SCALE 1/8" = 1'0"
LEGEND
WALTER B. CHAMBERS — ARCHT

DIRECTORS' ROOM.

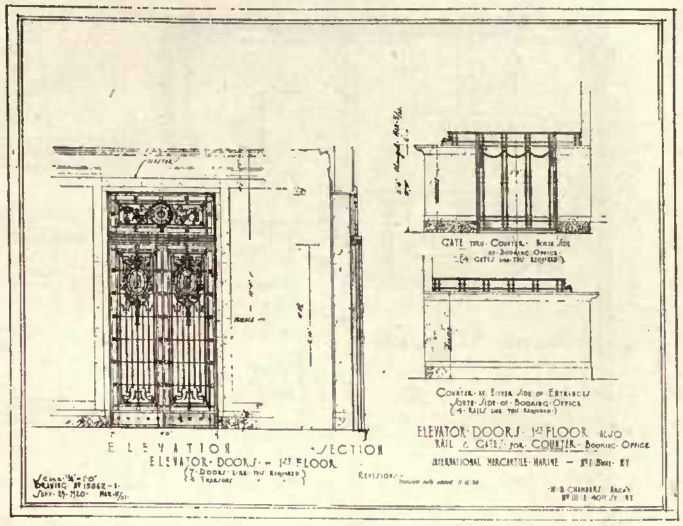
BETWEEN DECKS, SECOND-CLASS BOOKING-OFFICE. Walter B. Chambers, Architect.

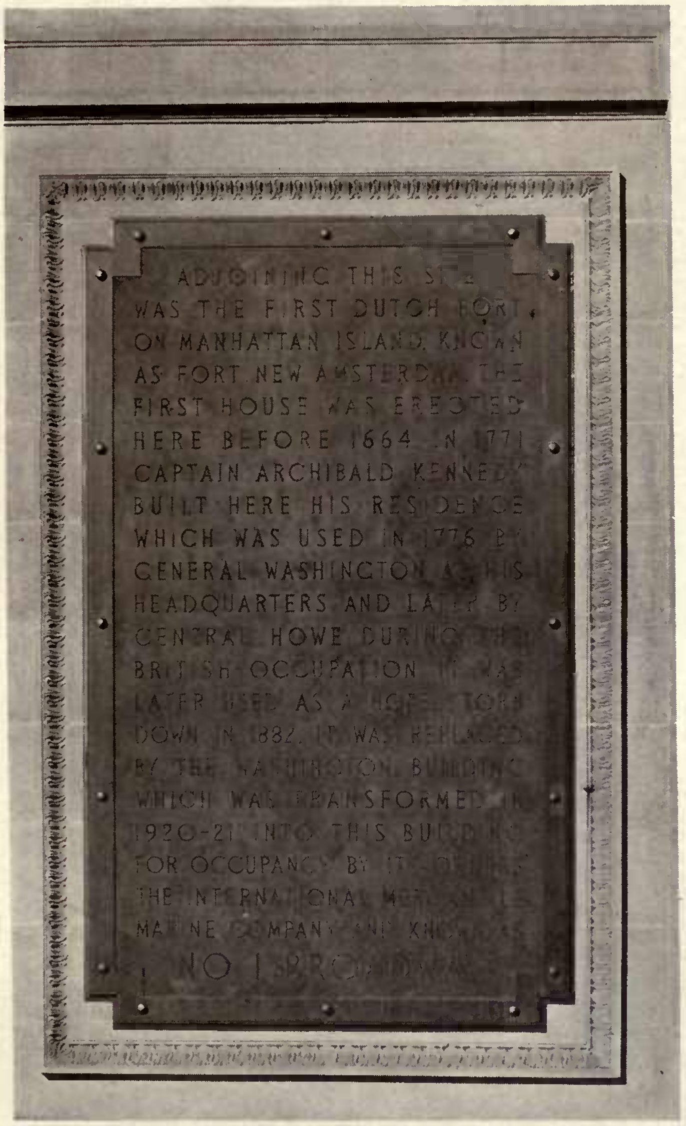
INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.

installation of a temporary roof, at the ninth-floor level, to protect the occupants of the floors below while that work was going on over their heads.

In order to provide the owners with an adequate booking-office, it was necessary to take out an entire tier of floor-beams and their supporting columns and throw the ground and first floors into one. To do this the first step was to put in place heavy steel girders at the second-floor level, each girder over forty feet long, five feet high, and four feet wide, and weighing over thirty tons.

These spanned the whole building from front to rear





wall, and were designed to carry the weight of the entire framing above. The second step was to let this weight down upon the backs of the new girders. These were two very delicate engineering operations, which required the most careful study for their successful achievement. After they were done it was a comparatively simple matter to remove the old beams and columns below the new girders, leaving the big space clear and ready to be transformed into the company's booking-office, which is over one hundred and sixty feet long, forty feet wide, and twenty-five feet high.

In designing the building, the architect's purpose was to express in both the exterior and interior character its ownership and occupancy by the International Mercantile Marine Company, whose ships sail to all parts of the globe.

Heraldic devices of the twenty cities which are among the company's principal ports of entry have been placed in Venetian mosaic against the piers at the second-floor level on the Broadway and Battery Park façades.

The stone carvings surrounding them, and those around the main entrance on Broadway, are composed of nautical and marine elements, anchors, ropes and pulleys, tridents, sea-shells, and starfish.

In the spandrels over the main entrance are the figures of Neptune, God of the Seas, and Mercury, God of Trade, and above them is the American emblem, the eagle.

Flagpoles in bronze sockets, guyed back to the stone fronts and grouped four on the Battery Park façade and two on Broadway, are for the flags of the company's various steamship-lines.

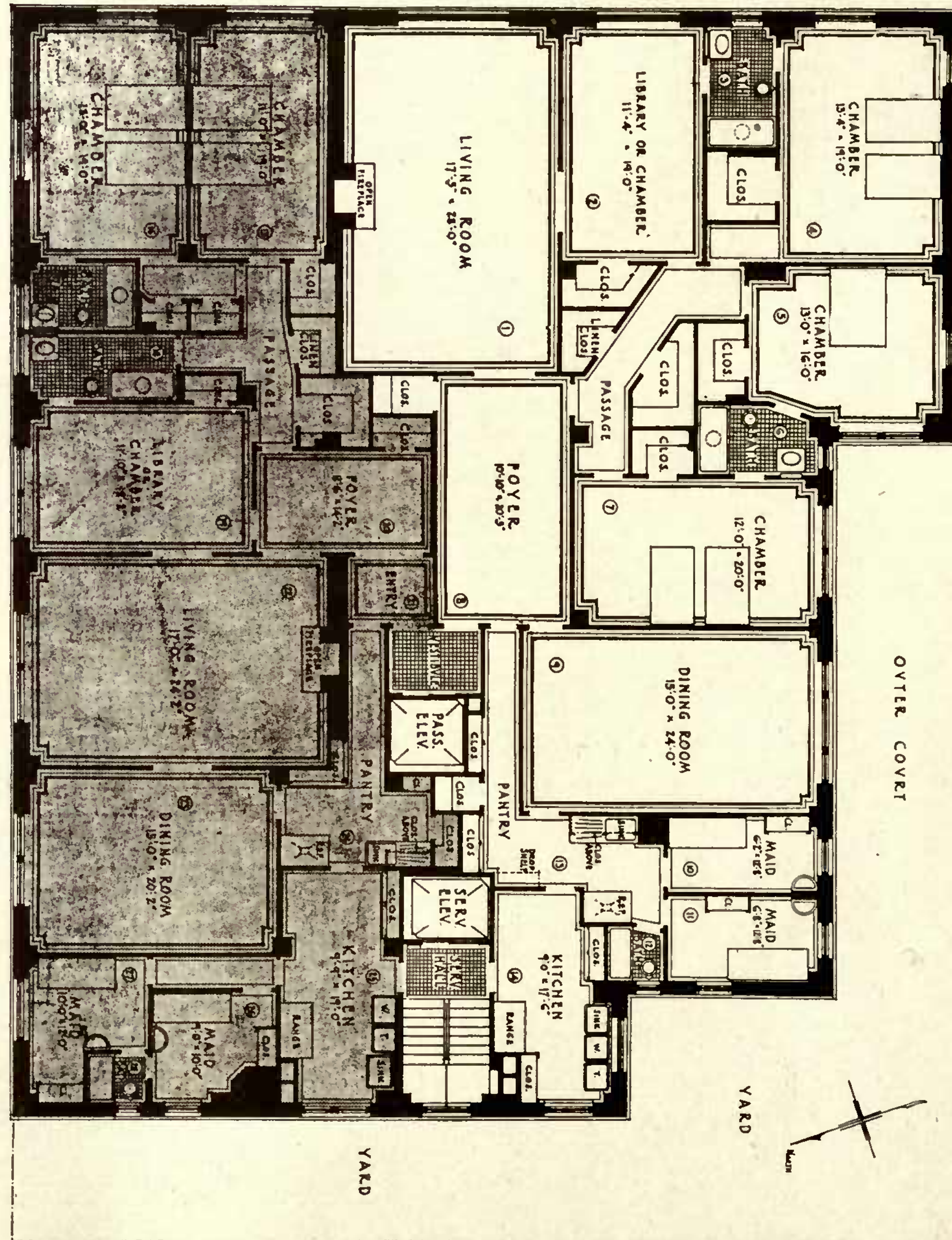
The details of the interior ornamental work have been designed and carried out in the same spirit.

The bronze counter gates and railings in the booking-office and the wrought-iron grillework on the elevator fronts in the main hall also include in their design the anchor, rope and pulley, steering-wheel, trident, sea-shell, starfish, and dolphin motives, sometimes combined with the company's monogram.

The waiting-room, on Broadway, will also have the five large panels on its walls filled with paintings of marine or nautical subjects allied to the company's activities.

Note.—The New York Down-Town League recently awarded Mr. Chambers the first prize for this alteration of a representative down-town office-building.—Editor.

APARTMENT HOUSE, 876 PARK AVENUE, NEW YORK.



W. L. Rouse, L. A. Goldstone, Architects.

A Little House of Spanish Style

By Charles Alma Byers

THE Spanish style of architecture has naturally exerted a very pronounced influence in home-building in southern California since the earliest days, but not always have the interpretations of the style been good or expressive of a proper comprehension of its true possibilities. In the last few years, however, a quite commendable advance in this direction, particularly in that the architects are endowing their interpretations with more feeling and with more of the style's native atmosphere, is becoming manifest.

The little house illustrated herewith (pages 58 and 59) is charmingly exemplary of this improvement. It is naturally an adaptation with modifications, to suit it to modern American requirements; yet it retains, outwardly at least, not only all the most desirable of those characteristics that typify domestic Spanish architecture, but also much of the style's charm in the way of atmosphere. But a single story in height, it possesses the generally desired low and rambling appearance, and it is, moreover, designed with the usual court, or *patio*, as well as with a most charming pergola reaching out into the garden in the rear.

As seen from the street, the house has a pleasingly dignified appearance, and yet it is by no means characterlessly plain. The front entrance, which is especially attractive, is designed with a rather massive employment of blue-red brick for the steps and unevenly floored stoop, and with *bas-relief* ornamented but simply lined framing for the doorway of cast artificial stone of a light-gray shade with marble-like veining. Immediately above the arched hood of the entrance's framing is a wall embellishment in the nature of a small circular window, uniquely recessed, and this part of the wall, somewhat elevated and arched, is finished with a brick coping. The door itself is of dark-brown oak, and over it, enclosed by the slightly extended hood, is the usual electric light.

The exterior walls are of cement-stucco over frame construction, and are finished in a deep shade of tan. The roof, for the most part, is flat and of composition, and hence is concealed by the higher extending walls. The middle portion, however, consists of dark-red roofing tile, with front and rear slopes. Similar tile is also used for covering a small cornice-like roof extension over a group of French windows on the front. The color scheme, which is particularly enhancing, further includes dull olive-green for the trimming, which is confined mainly to the woodwork about the windows; and black wrought-iron grilles, contributing still an additional color, comprise character-lending enclosures for the French-window group on the front and for each of the single windows of the same type at either side of the chimney on the left-hand wall.

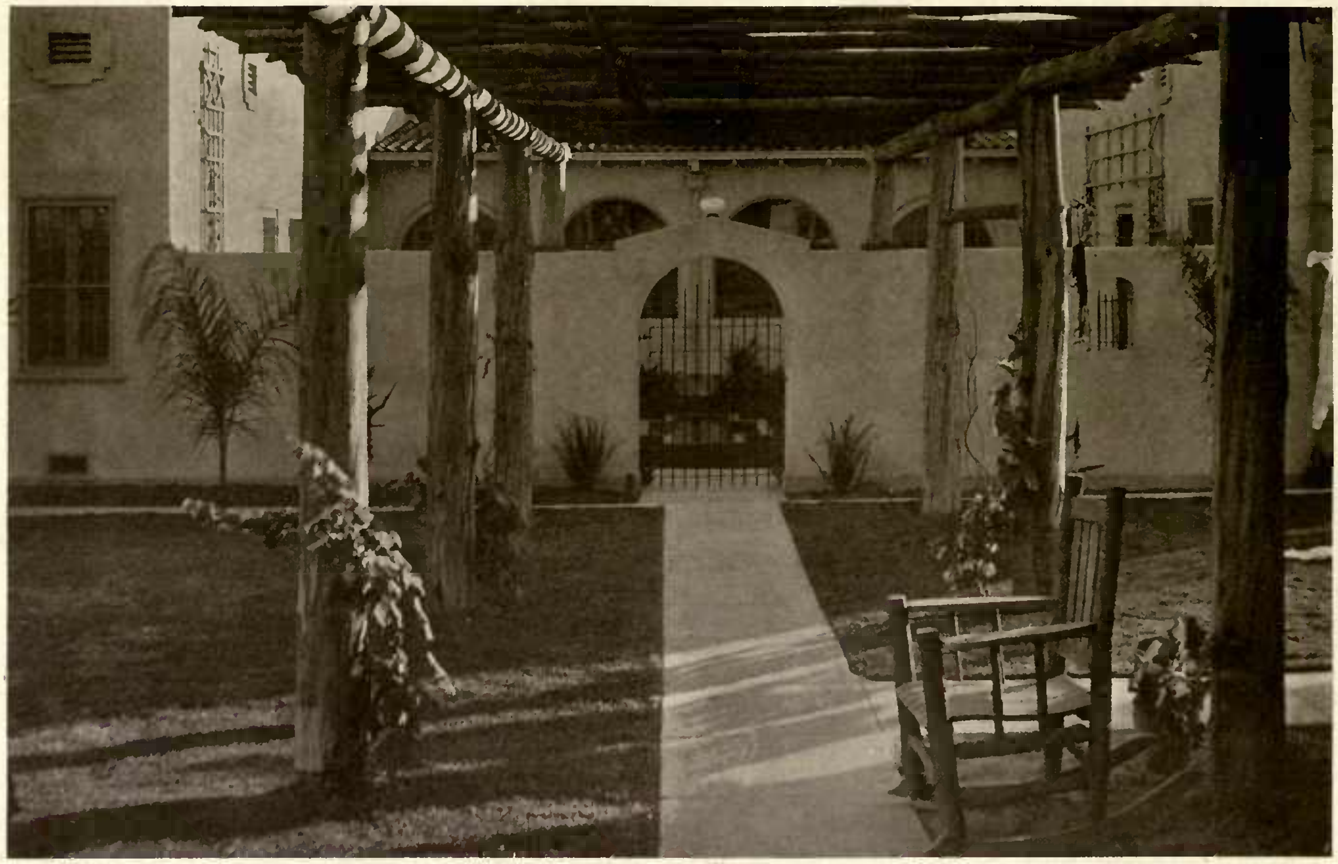
The *patio* in the rear, with its attending features, not only is an exceptionally large one but constitutes a retreat that is very much to be appreciated, indeed. Closed in on three sides by the walls of the house and on the remaining side by a high stucco-finished garden-wall, it naturally affords the utmost privacy. In the centre is a small brick-edged pool, surrounded by a well-kept lawn, and about the four sides of the space runs a cement-paved walk, bordered by an effective planting of low-growing shrubbery. Facing the court from the front there is a long veranda, or porch, nine feet deep, which is floored with dark-red cement, possesses a gas-grate fireplace, and is excellently furnished. Two large arched plate-glass windows and two pairs of French doors, set in doorways of the same size and similarly arched, interpose between this veranda and the *patio;* and the porch is directly accessible through glass doors from the living-room, the dining-room, and two of the bedrooms, while the *patio* itself may be directly reached not only by way of the porch but from the kitchen, the rear bedroom, and a bathroom.

Extending away into grounds in the rear from the gateway in the back wall of the *patio* is the pergola. It is erected over a cement-paved walk, and both its uprights and its crosspieces are of eucalyptus—logs and poles in the rough. Vines, incidentally, are being trained to climb the uprights, and in time the walk will be a veritable corridor of green.

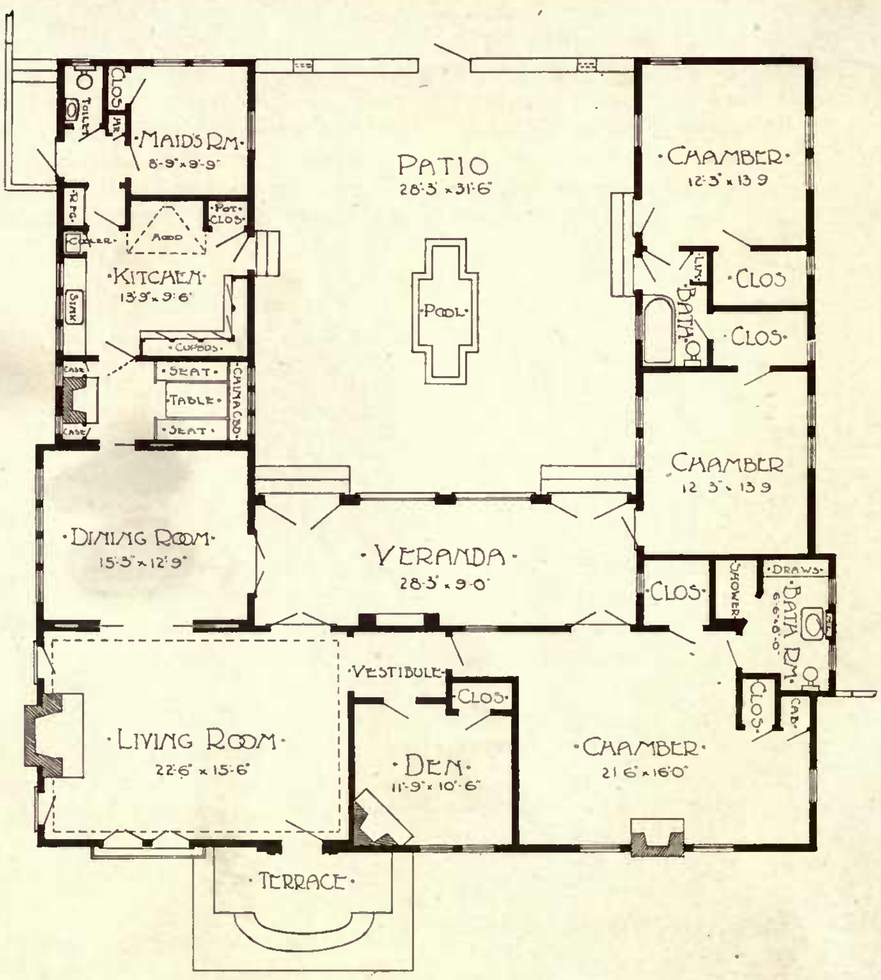
The arrangement of the house's interior will be observed from the floor plan. It should be especially noted that, in addition to the customary living-room, dining-room, kitchen, and bedrooms, there are two baths, a den, a maid's room, and a most delightful little breakfast-room. The last-named division is equipped with built-in seats and table, as well as with china cupboards and drawer-and-shelf cabinets, and contains a gas-grate fireplace. Similar fireplaces are also found in the den and a bedroom, and in the living-room there is a large wood-burning fireplace. There is an unusual liberal introduction of conveniently located closets, and there are also many excellent built-in features, especially in the kitchen, little breakfast-room, and the bathrooms.

The interior is not only delightfully arranged but also charmingly finished and decorated. The woodwork consists of Southern gum, finished in mahogany style, in the living-room and dining-room; of California redwood, waxed but nearly natural as to color, in the den; of pine, in old ivory finish, in bedrooms, maid's room, and veranda; and of pine, in white enamel, in the bathrooms, kitchen, and breakfast-room. The living-room and dining-room are finished with staff cornices, and the walls of the den are treated with a panelled wainscot and plate-rail, to a height of five feet. In the living-room and dining-room the walls are covered with light-weight canvas and painted a light-tan shade; in the bedrooms and maid's room they are papered; and in the kitchen they are finished, in high wainscot effect, with a smooth, hard plaster coat which is enamelled like the woodwork. Oak flooring is used throughout, except in the bathrooms, even to the kitchen and the closets, and the bathrooms are floored with tile and finished with tile-wainscoted walls.

The house possesses neither basement nor cellar. It is heated by the gas-grate and wood fireplaces already mentioned, and is otherwise modernly and completely equipped in every respect. It is located in Long Beach, California, and is the home of G. Van Camp. H. H. Whiteley is the architect.

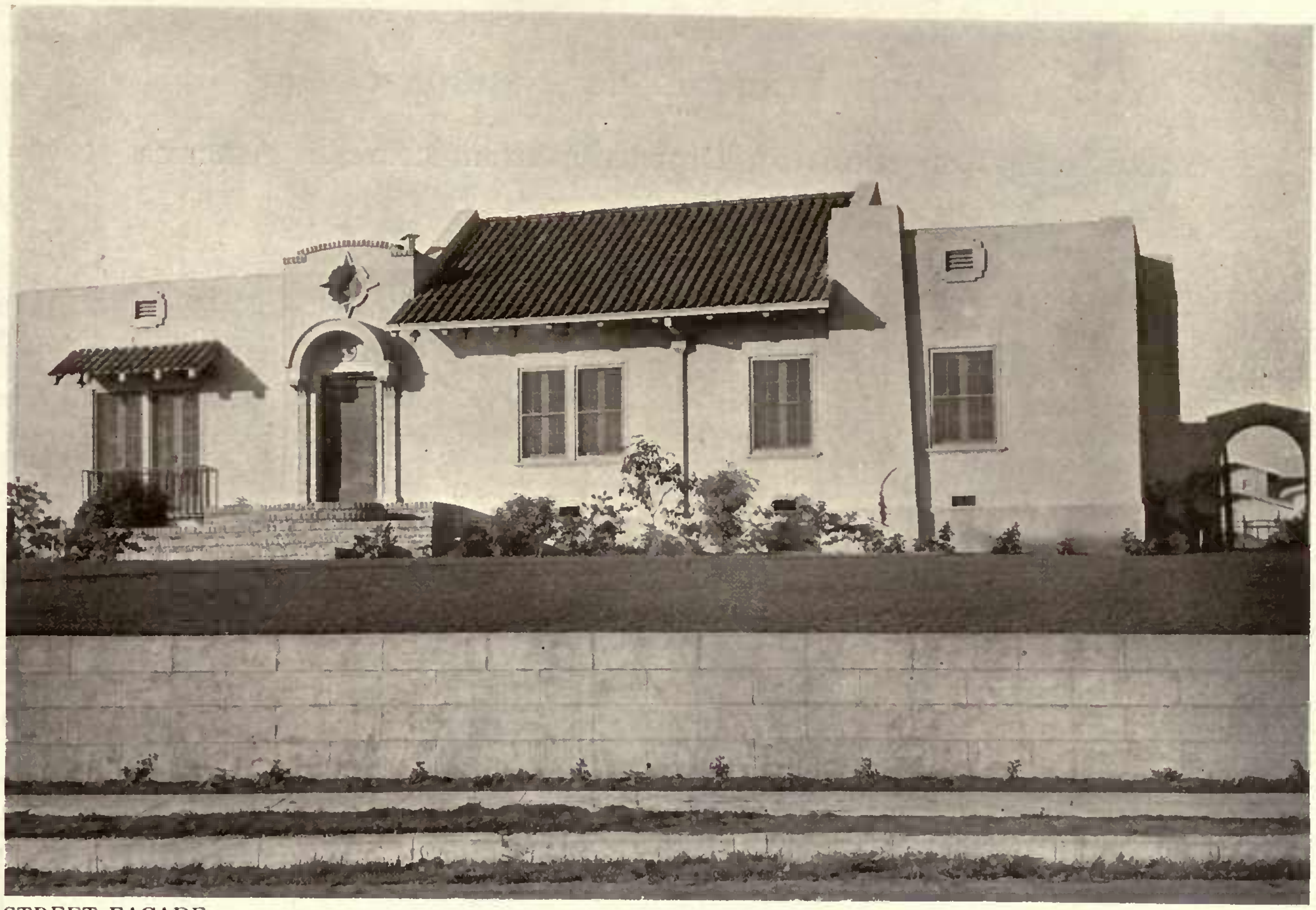


A PERGOLA OF EUCALYPTUS LOGS AND POLES EXTENDS FROM THE PATIO INTO THE REAR GROUNDS.



PLAN. H. H. Whiteley, Architect.

HOUSE, G. VAN CAMP, LONG BEACH, CALIF.



STREET FAÇADE.

VERANDA FACING PATIO.

HOUSE, G. VAN CAMP, LONG BEACH, CALIF.

H. H. Whiteley, Architect.

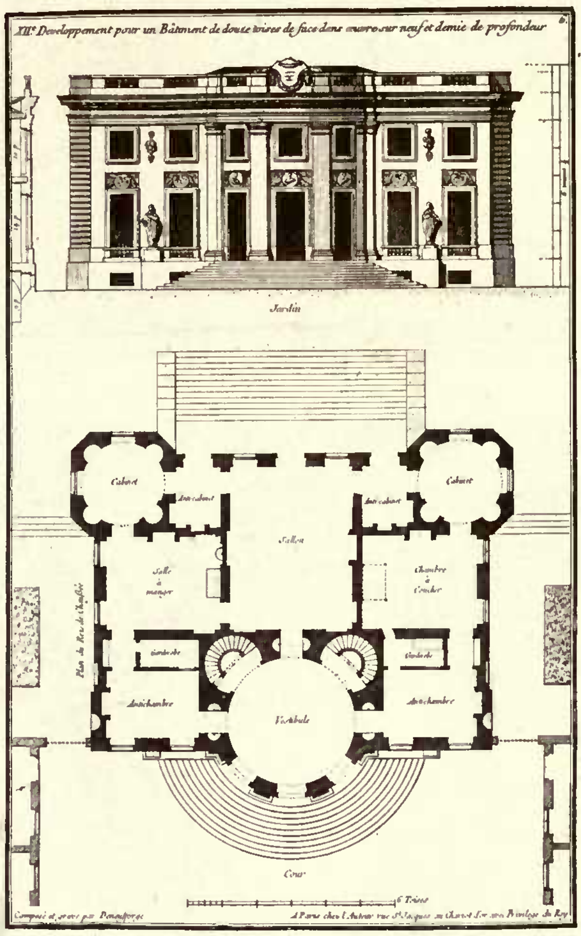
Jean François de Neufforge

and Some Reflections on Domestic Architecture in America

By Henry Coleman May

IT is natural to suppose that art is in a constant state of evolution. Yet there appears, at given moments, to have been times in its history when, through the accomplishment of an individual, the very last word would seem to have been said. There have been artists whose genius was so great that their productions must represent the highest possible development of their particular branch of art, whether that be painting, sculpture, or architecture. On looking at such works one feels that the future may produce things as good, but that to do better would be well-nigh impossible.

This view presupposes that the arts are susceptible of culmination; that their development has necessarily a limit. It would be nearer the truth, however, to say that the youth of art is eternal, that no climax can be reached. Its tentative stages are over, its full development has long since been arrived at; its manifestations renew themselves so regularly that ultimate stagnation would appear to be wholly impossible. It has now become a question of interpretation, no longer one of development. The greatest works belong to all time. Velasquez and Sargent might have met as contemporaries. Michael Angelo is eternal; he would have found himself quite at home in Rodin's studio, and not disapproving. . . . Palladio and Samson, with all their differences of taste and temperament, might easily have been friends.



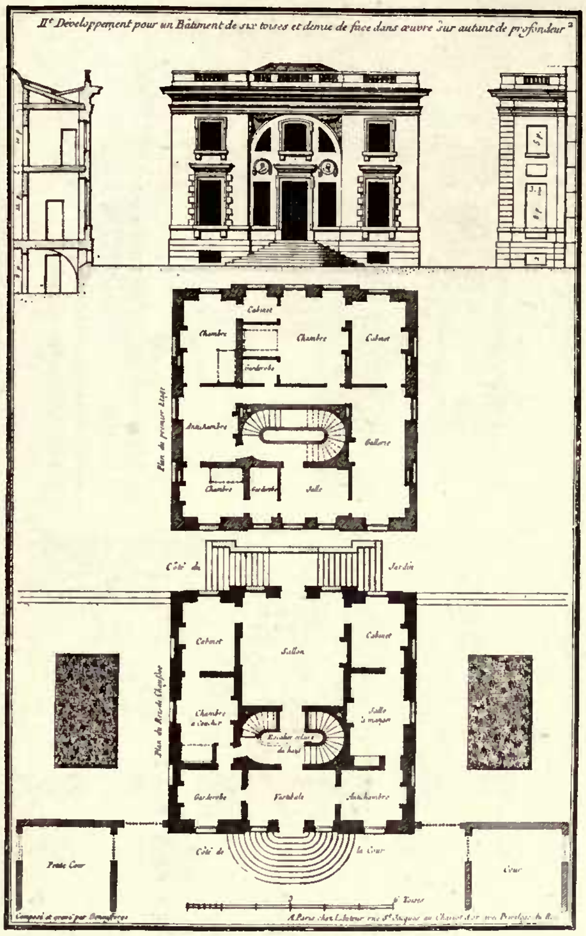
The history of domestic architecture in France found its apotheosis in the middle period and toward the end of the eighteenth century. Its highest manifestations are seen in the works and those resulting from the guidance of Antôine, Soufflot, and Gabriel. Their buildings are not only objects of beauty but examples of perfect practicability in designing and planning. From the point of view of pure architecture the houses of the Louis-Quinze and Louis-Seize epochs were triumphs. They represented a combination of the best motifs of the "grand siècle" with the new requirements resulting from a more intimate comprehension of every-day life. The spirit was classic but the interpretation thoroughly French, just as, centuries before, the Greek forms translated to ancient Italy became distinctly those of imperial Rome.

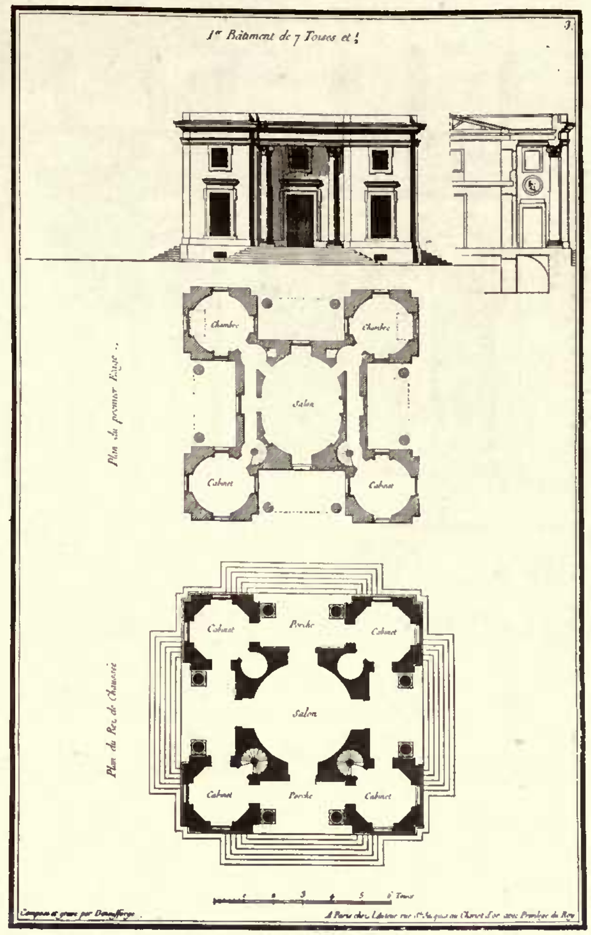
From about 1700 down to the outbreak of the Revolution French architecture was an expression in stone of the mentality of every cultured artist and thinker of the day. It was a result of that critical quality which is developed among the French to such a pre-eminent degree. In all their works, and principally in those inspired by the academic, there was that fidelity to sequence, interpreted with the elegance, distinction, and logic so peculiar to Gallic architecture since the development of the Renaissance.

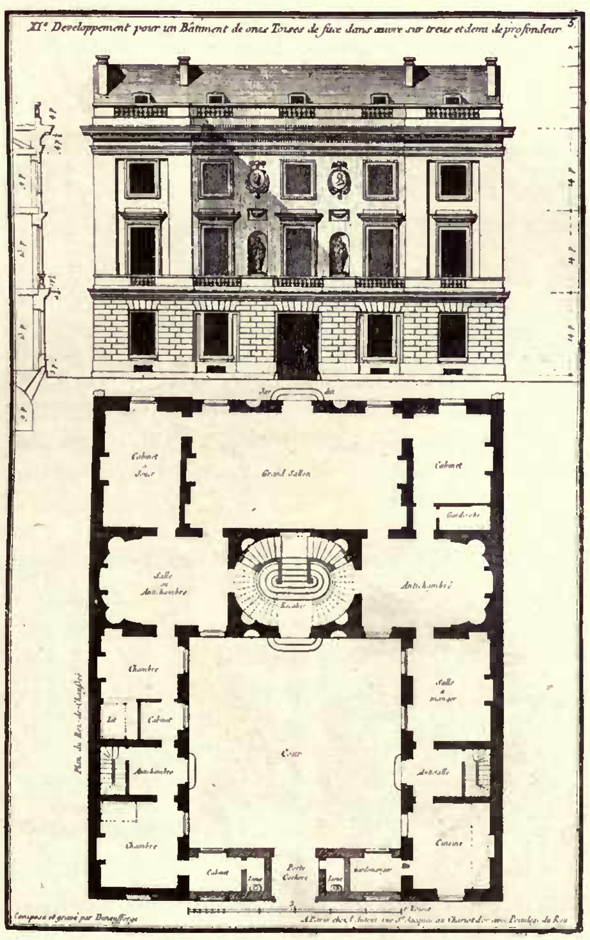
There will, of course, always be people who prefer, for instance, the superficial and very often meaningless ornament of the old palace at Blois to the ordered magnificence and clarity of its later wing, that built by Mansart for Philippe d'Orleans. This is the difference between the romantic mind with its love of the picturesque (oftentimes a pseudopicturesqueness) and that mentality which is the result of all the gradual affining processes of civilization. With the latter comes inevitably a feeling for fitness, simplicity, and purity of line for proper proportions; in fact, for all those elements meaning taste cultivated to its highest degree.

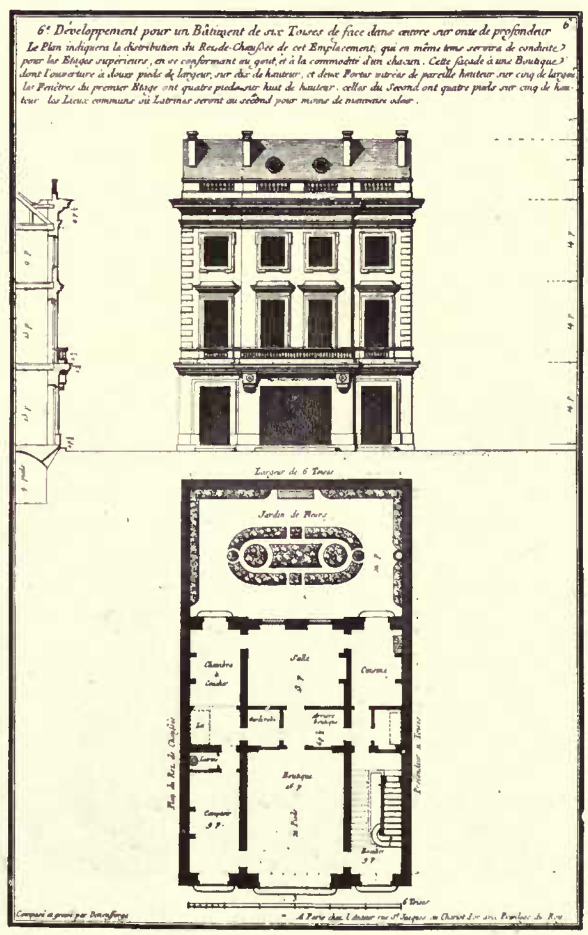
These last qualities are evident in the designs of Jean François de Neufforge, an architect who perhaps above all his contemporaries represents for us the spirit of his particular time most consistently. His name is one of the last on that list of artists who worked before the empire cast its pretentious frigidity over French art, a severity which even the prolific Percier and Fontaine failed to interpret with entire success. He bequeathed to his followers a veritable mine of inspiration and suggestion in the innumerable designs he has left to posterity.

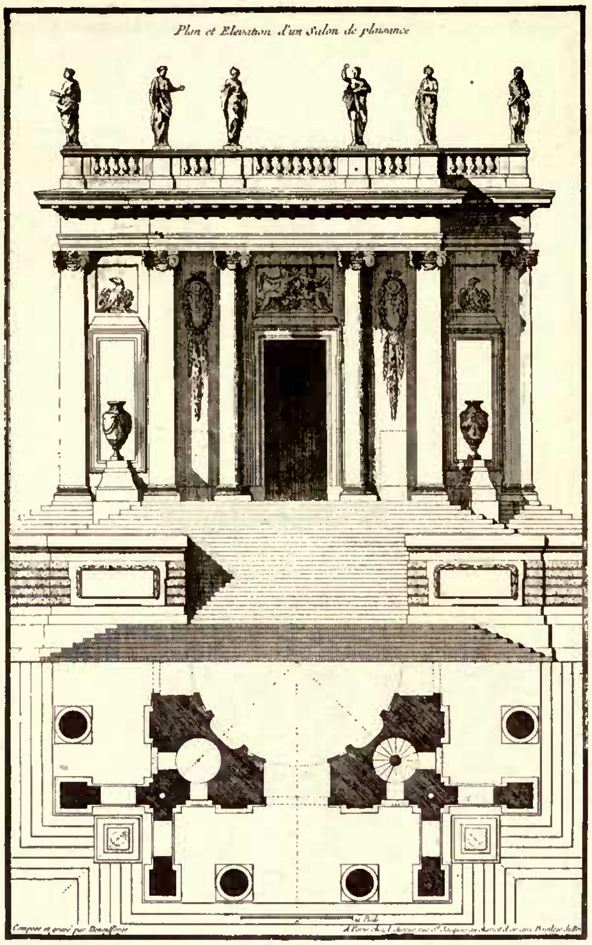
Neufforge's "Recueil Elementaire d' Architecture" is a complete résumé of the style of Louis-Seize in architecture as well as in interior decoration. This stupendous work consists of eight volumes, the first having been begun in 1757 and the last finished in the year 1768. In its pages are to be found designs for every imaginable kind of edifice, from palaces and theatres down to the humblest dwellings. Neufforge was really the Du Cerceau of his day. His books are an invaluable aid and asset to the architect, particularly so as the houses therein can be most easily adapted to modern uses, while the elevations themselves are so logical as to necessitate very often no change whatever. They personify very strictly all the characteristics of the style of their epoch, which, through its practicability and beauty, has become one equally of our own time. French architec-

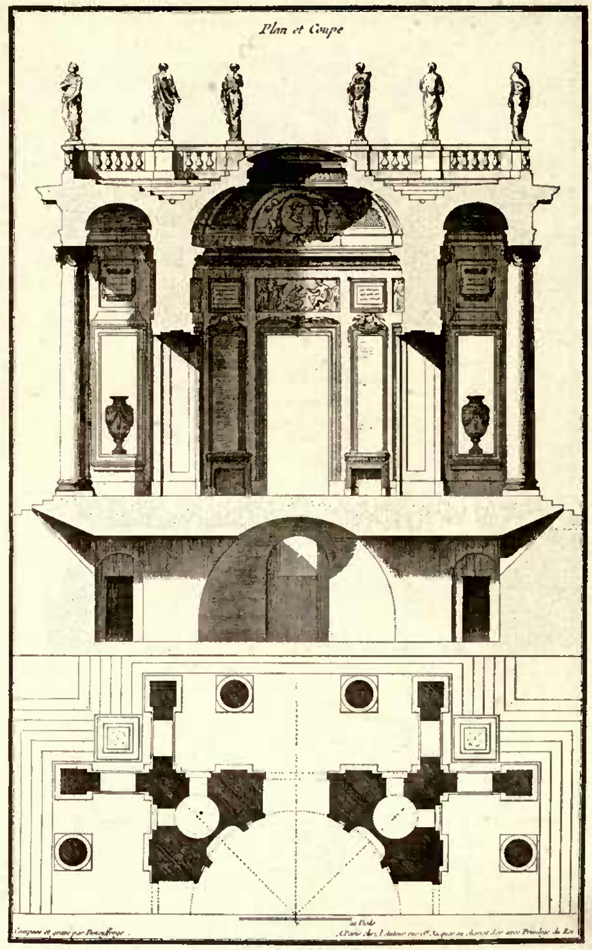

IIe Développement pour un Bâtiment de six toises et demie de face dans œuvre sur autant de profondeur
Plan du premier Etage
Côté du Jardin
Côté de la Cour
Petite Cour
Cour

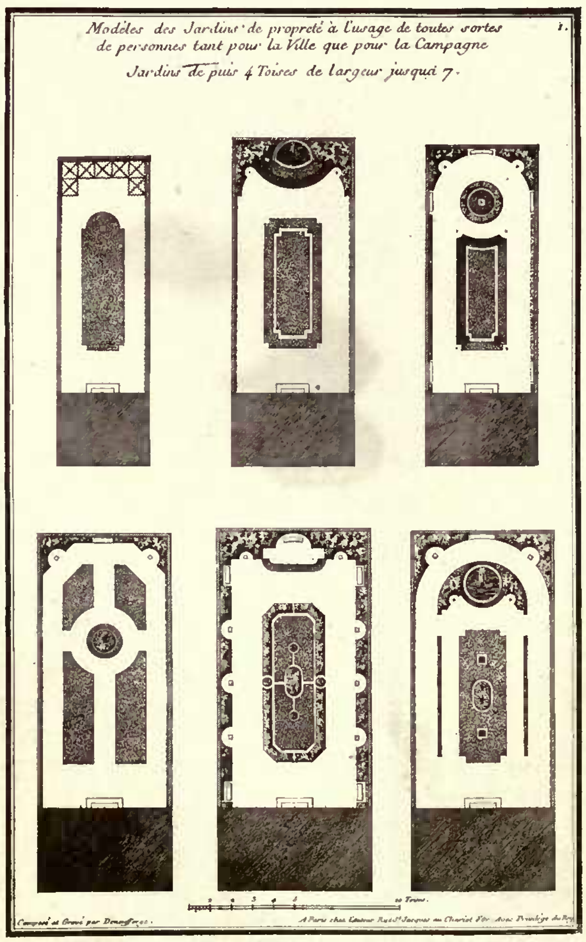

1er Bâtiment de 7 Toises et ½
Plan du premier Etage
Plan du Rez de Chaussée
Salon

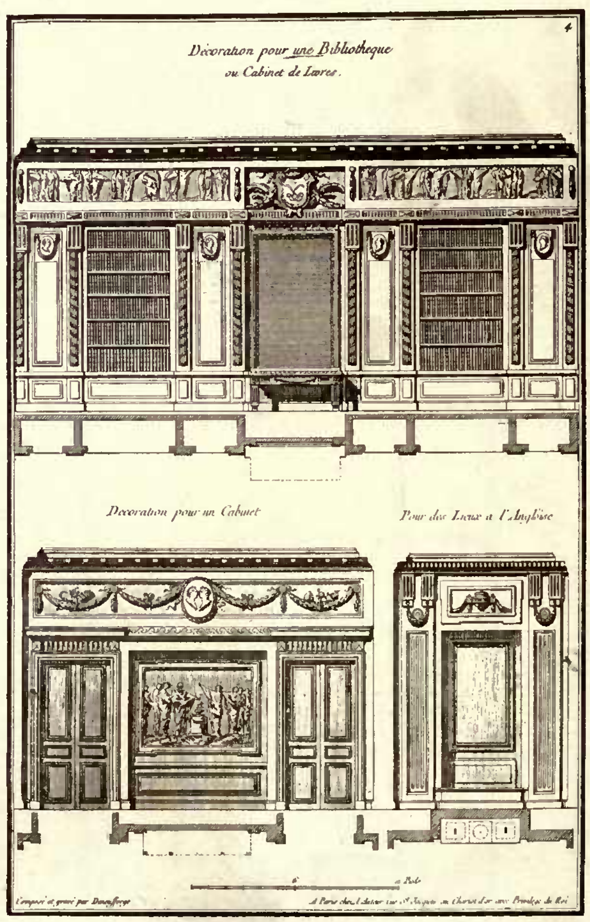

XIe Developpement pour un Bâtiment de onze Toises de face dans œuvre sur treize et demi de profondeur
Grand Sallon
Cour


6e Développement pour un Bâtiment de six Toises de face dans œuvre sur onze de profondeur
Le Plan indiquera la distribution du Rez-de-Chaussée de cet Emplacement, qui en même tems servira de conduite pour les Etages supérieurs, en se conformant au goût, et à la commodité d'un chacun. Cette façade à une Boutique dont l'ouverture à douze pieds de largeur, sur dix de hauteur, et deux Portes vitrées de pareille hauteur sur cinq de largeur. les Fenêtres du premier Etage ont quatre pieds sur huit de hauteur. celles du Second ont quatre pieds sur cinq de hauteur. les Lieux communs où Latrines seront au second pour moins de mauvaise odeur.
Jardin de Fleurs
Plan du Rez de Chaussée


Plan et Elevation d'un Salon de plaisance
Composé et gravé par Deneufforge


Plan et Coupe
Composé et gravé par Deneufforge


Modèles des Jardins de propreté à l'usage de toutes sortes
de personnes tant pour la Ville que pour la Campagne
Jardins depuis 4 Toises de largeur jusqu'à 7.
Composé et Gravé par Deneufforge

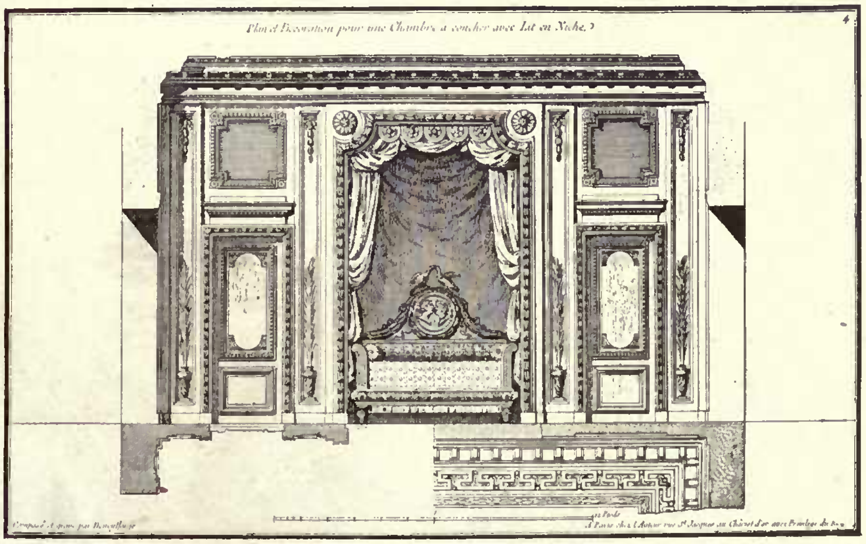

Décoration pour une Bibliotheque
ou Cabinet de Livres.
Decoration pour un Cabinet
Pour des Lieux a l'Angloise
Composé et gravé par Deneufforge

ture toward the close of the eighteenth century was no longer in any sense in a period of transition. Its forms were definite and the manner into which it deteriorated during the succeeding régime was more a "pastiche" than a continuation.

Neufforge's drawings are always structural and geometrical; his plans as a rule rectilinear. The curves so descriptive of the preceding style were transformed by him into straight lines, lines carried through with the least possible interruption. Soufflot and Oppenordt, and very often Gabriel, disguised and rounded their angles. Their successor returned to definite corners and ceased as well to use broken pediments generally. Cartouches were no longer introduced to vary the severity of cornices, friezes, and balustrades. Swags were replaced by looped-up drapery; urns of severely classical outline were introduced in decoration instead of the vases from whose openings sprays of sculptured leaves and flowers or stone flames burst forth in rococo convolutions. Rotundas and semicircular porticos, however, were not neglected by Neufforge, features of which our own modern American architects have yet to realize the beauty and effectiveness. Bellanger, perhaps the most popular architect of his day, used this last form of design far more frequently than Neufforge. One of the most charming and successful rotundas imaginable is the one incorporated by the former in the celebrated pavilion at Bagatelle.

We can learn many lessons from Neufforge's designs—lessons concerning not only taste but also teaching us to make life more agreeable as well as more beautiful.

In most American towns houses seem to be planned and built to give their inhabitants the least possible privacy both from within as well as from without. In many cases this could be changed by a simple method, merely in turning the house around, as it were; by having its principal living and drawing rooms facing the back yard, transformed into a garden, while the kitchens and its adjacent rooms look out into the street. Particularly could this be easily done in the lesser towns, where space is plentiful. In a city as congested as New York it is difficult to alter the established order of things, although it is probably the only town where this kind of planning has been attempted, and very successfully, quite latterly. There, of course, one has the disadvantage of a hideous view—the ugly backs of adjoining houses—although when one considers the streets themselves this is but a choice of evils, and time might gradually transform the rear view into one of agreeable façades and contiguous gardens. Everything, after all, must have a beginning; Rome was not built in a day. As to the garden question, it would be hard to improve on Neufforge's designs, more particularly those intended for limited areas—a sphere of landscape gardening in which the French have ever excelled.

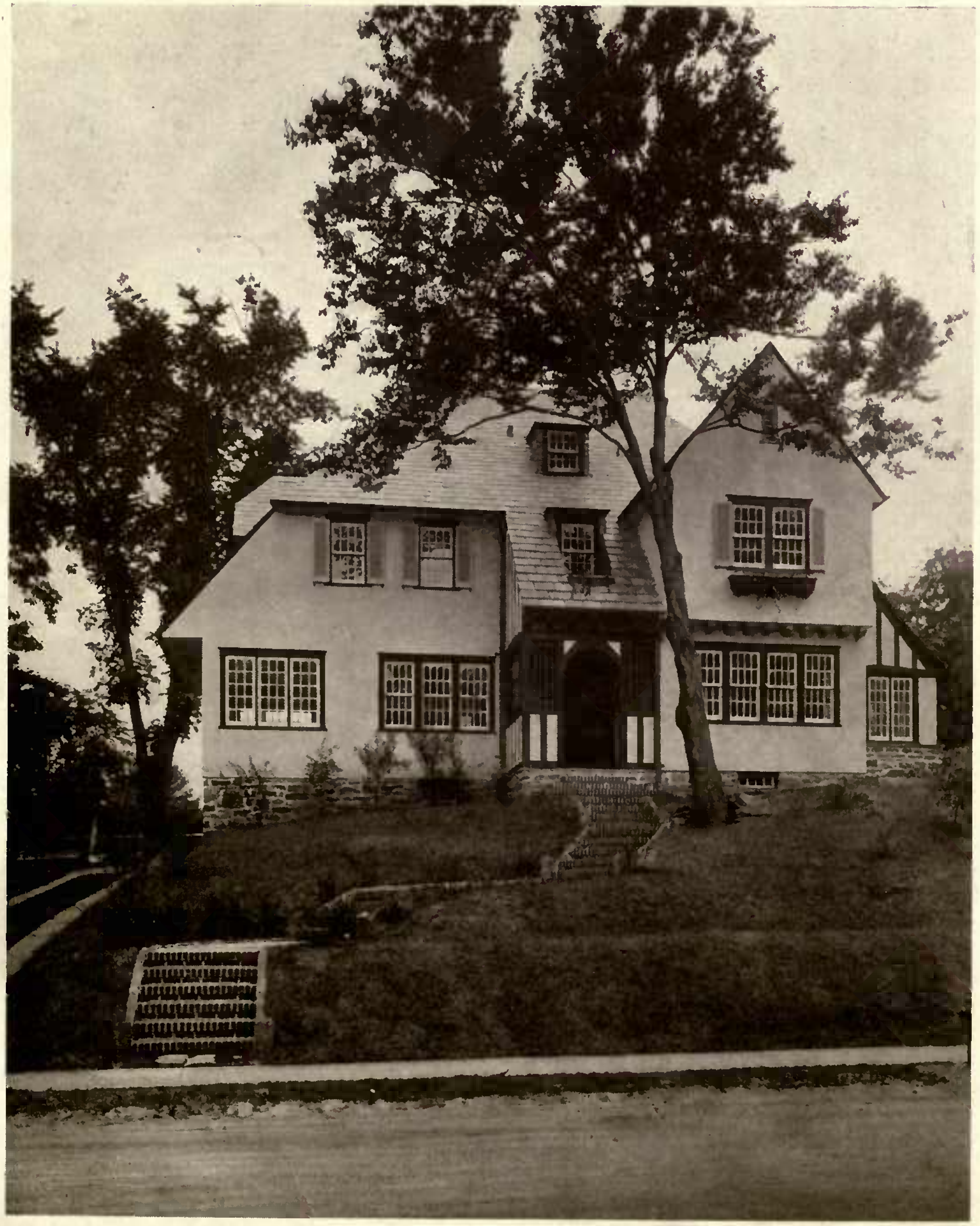


In other towns this system could be very easily adopted. New localities are constantly springing up on the borders of already settled districts and nothing could be simpler than a reversal of the crude, superannuated, and uncomfortable plan of the usual American house. In a recent modernization of one of Neufforge's plans, the reception-rooms of the house are shown giving out on a walled garden. Of course in a great many American communities a wall would still be considered immoral; a kitchen facing the street would be thought an utter absurdity, except perhaps by the cook! The neighbors could not be regaled by the edifying sight of a family sitting around the indefatigable victrola in full view of the entire street, when hot weather makes it necessary to keep the windows open and to draw aside concealing curtains.

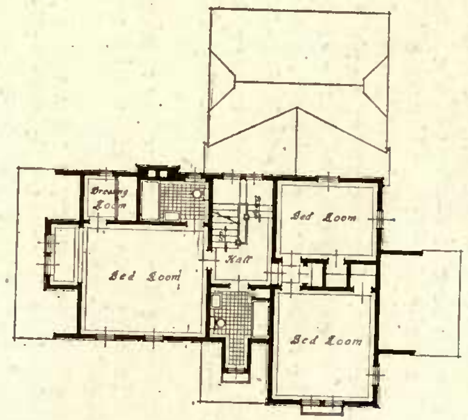
It is obvious that this system could be used in small as well as in great houses. It is a plan which need not by any means apply solely to mansions and palaces.

In regard to more expensive houses, a type which is practically never met with in this country is that called by the French a "pavilion," but which was in reality a very complete residence planned to give the effect of a retreat rather more than a habitation. These smaller houses became known in eighteenth-century Paris by the name of "Folies," a term which implies phantasy more than folly. Many of them, built by Bellanger, Ledoux, or Brongniart, were models of what a medium-sized dwelling should be. Architecturally they played a most important rôle in eighteenth-century construction. Neufforge has left us many designs for this style of building, designs which could profitably be adapted for residences in the more formal resorts, or in towns such as Washington, where it is still possible to build a house entirely surrounded by a garden.

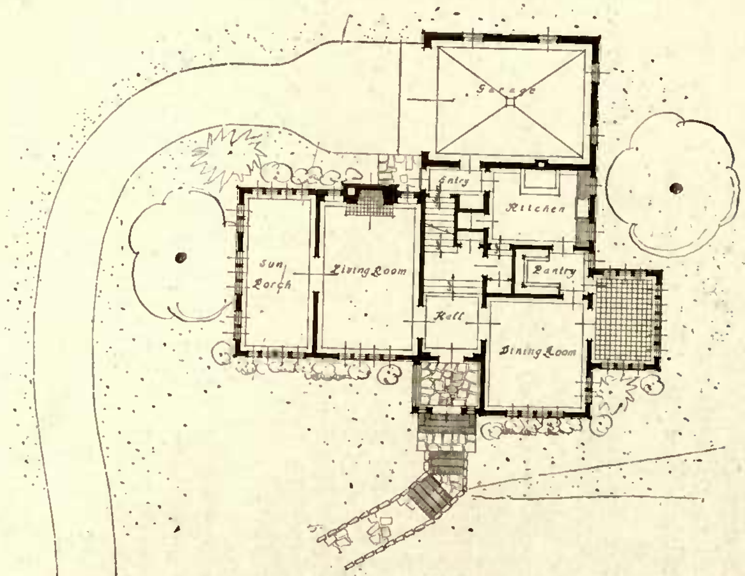
Where detached building is impossible it is to be regretted that a uniformity of height and general design could not be arrived at in city planning, although it is evident that, to put such a measure through, civic governments would have to adopt means which the general American public could not fail but to regard as coercive. The magnificent London squares, notably those planned and carried out by the Brothers Adam, are perfect examples of a general scheme of architecture applied to numerous separate dwellings. The Place Vendôme is the most beautiful and imposing expression of such a system. But America is, though infinitely the most progressive, yet still the least civilized of the great nations, and the average citizen of this country would hardly consent to have a house on which he had spent some of his hard-earned money a factor in any general scheme instead of a unit in itself. This cannot be expected until, through generations of affinement, a higher vision has been developed. But not until then will the American town have any coherent architectural value, nor will it seem to future generations to have ever been a place inhabited by others than the heterogeneous. At present there is something distinctly distressing in the impression of disorder created from the architectural chaos of our streets.



HOUSE, FRANK CUZZI, MOUNT VERNON, N. Y.



Second Floor Plan
Scale feet



~First Floor Plan~

S. A. Guttenberg, Architect.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, School of Architecture, Columbia University, New York

Article XVI

PAINTING AND VARNISHING THE HOUSE

ACTUALLY the process of varnishing or painting the woodwork and metalwork on the house is the spreading of a thin protective coat, one-thousandth part of an inch thick or less, over the surface in order to protect it from the wear and tear of use and weather and decay. And a marvel it is that any material could be found which, spread in so thin a film, could withstand the chemical action of the sun's rays, the expansion and contraction of the surface over which it is laid, the abrasive action of blown sand, hail, and rain, the natural wear of walking feet and rubbing clothes and bumping furniture, and a dozen other accidents which conspire to mar the surface of woodwork in the home.

Is it a wonder that for this protective coat of varnish all experts demand that the best materials be used? But out of ignorance it is not always so, for the lower cost of varnish and paint is more evident than the quality of the substance of which they are made.

The varnishes which are most used in good houses are made of resins, melted in a kettle and mixed with linseed-oil, and thinned with turpentine as they cool. They have the peculiar property, when spread with a brush over a surface, of hardening by a chemical change brought about by absorbing oxygen from the air, and making a strong, transparent, protective coat over the substance upon which they have been applied. The kind of resins* have much to do with the quality of the varnish, since the linseed-oil and turpentine are apt to be about the same grade in all varnishes. Dark or light varnishes can be made; hard or soft and elastic surfaces can be produced; varnishes capable of resisting the wettest kind of weather and those which turn white under the least dampness are manufactured for various purposes, and practically in all cases those varnishes which are the best are the highest in cost.

The cheap varnishes which are the most abundant upon the market, and which are used for cheap furniture and houses, are made of rosin and not resin, or are resin varnishes adulterated with rosin. Most houses erected by speculative builders are finished with cheap rosin varnishes, but no architect should be guilty of specifying them, for he should know better than to attempt to save money by purchasing the poorer grades of varnishes, since the real cost of varnished work is in the labor rather than in the cost of the materials used. These cheap rosin varnishes cannot stand up under the sponge test, which is merely the application of a wet sponge to the surface overnight. The next morning the rosin varnish will be found to be white and dissolved down to the wood, and will never recover its appearance. Better grades of varnish may turn white under this sponge test, but upon drying return to their original color, but the finest grades of varnish will not be affected at all. The difference between these varnishes can also be observed by rubbing the thumb over the surface of such a fine varnish as is on a piano and noticing that no effect other than a higher polish is produced, while if the same rubbing is done on a cheap varnish, it will be crumbled off from the wood. Every one has seen the ugly surface cracks which develop with age in old doors or upon old church pews in musty churches of the dark ages of American architecture. In nearly all cases these cracks are due to cheap rosin varnishes.

Before varnishing or painting any interior woodwork, it is important to observe all the preliminary precautions, or else failure may result, even though the work is conscientiously performed in the latter stages. One of these early precautions is to paint the back of all trim for doors and windows with some good linseed-oil paint, and apply a first coat of filler to the outside surface, and all this as soon as it arrives on the job. This is to prevent the wood from absorbing the dampness which is prevalent in all new buildings, and as most trim has been kiln-dried beyond ordinary requirements for construction work, it is very thirsty for water, and will soak it up quickly from the atmosphere. This trim should not be permitted to stand in the building overnight without the priming coat. As the first coat of filler is linseed-oil, there is not much excuse for not doing this, for it can be applied very rapidly. Of course, where the wood is to be stained with an oil stain, the application of the linseed-oil before the stain is applied will prevent the proper penetration of the stain into the wood, and as the architect generally insists upon seeing samples of the staining work before it is applied, the above precautions of protecting the wood as soon as it comes are often thrown to the winds.

And in connection with this matter of stains, a word may not be amiss. Most manufacturers make among their many stains certain brilliant-red mahogany colors, bright Irish-green colors, and horrible yellows. These are made to meet certain gaudy tastes shown by the public, but of their use by architects no word could condemn them enough. And on a par with these stains is the varnishing with no stain at all of yellow-pine trim, an architectural atrocity which is committed on every hand in small houses. The quiet browns, grays, grayish greens, and the like are the only safe ranges of color for staining interior trim, for, after all, the casing of doors and windows must blend in with the walls and serve as a background for the furniture and not screech at it. And directly in line with this statement should be emphasized the rule that highly polished surfaces in varnishes for trim are as much out of place as brilliant colors. Many architects prefer wax in place of the polish of varnish, and with good reason. The manufacturers of varnishes make certain grades which dry with a dull finish, and also show samples of beautiful dull finishes which can be secured by the laborious method of rubbing the final coat of varnish with powdered pumice-stone, water, and felt.

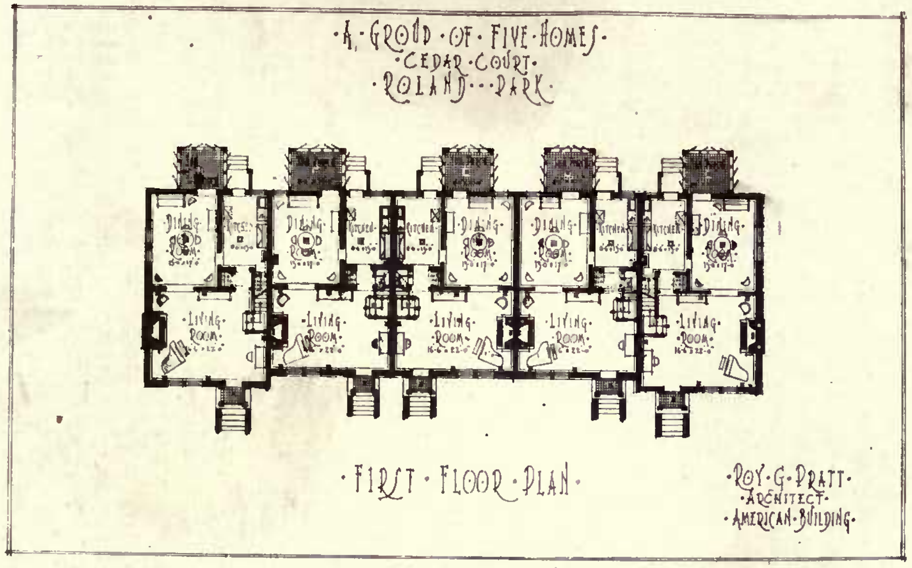
But before any varnishing can be done, and for that matter any painting, it is essential that the pores of the wood are filled, so that the surface to be varnished has no soft and absorbent places, but presents a hard and glossy body. Woods like oak, ash, and chestnut have such large pores that paste fillers are required to fill them in. These paste

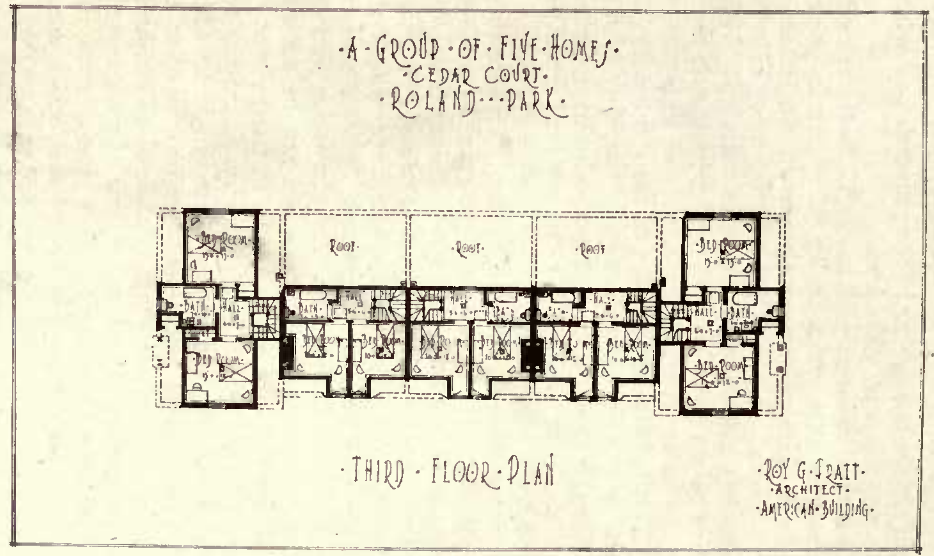
(*Continued on page* 68)

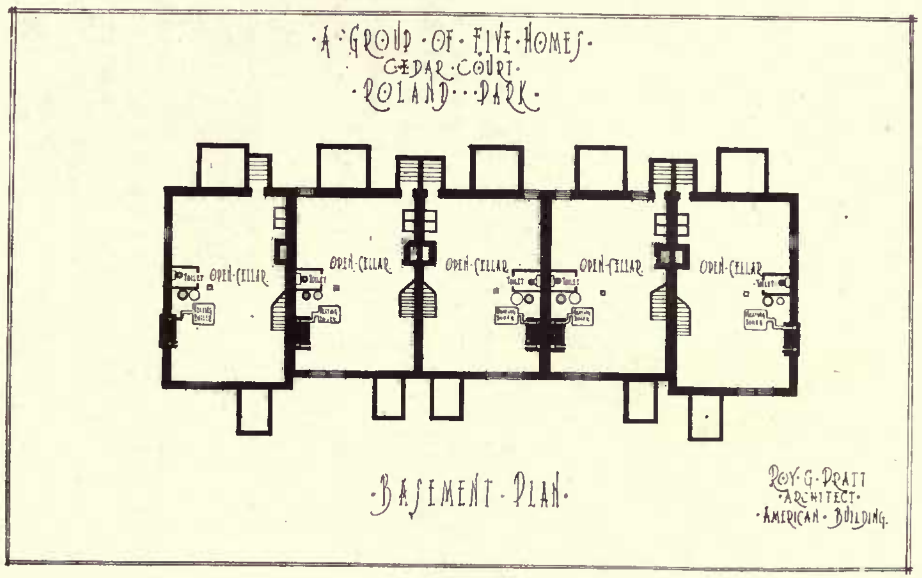
* Varnish resins or gums are imported from countries that the average man knows little about. The island of Zanzibar furnishes one of the costliest and finest of gums. It is called Zanzibar copal and is the gum of a fossil tree. New Zealand furnishes the most widely used gum, kauri. It is dug out of the ground by the natives. The west coast of Africa furnishes the gum known as Sierra Leone copal, which is used much in automobile work.

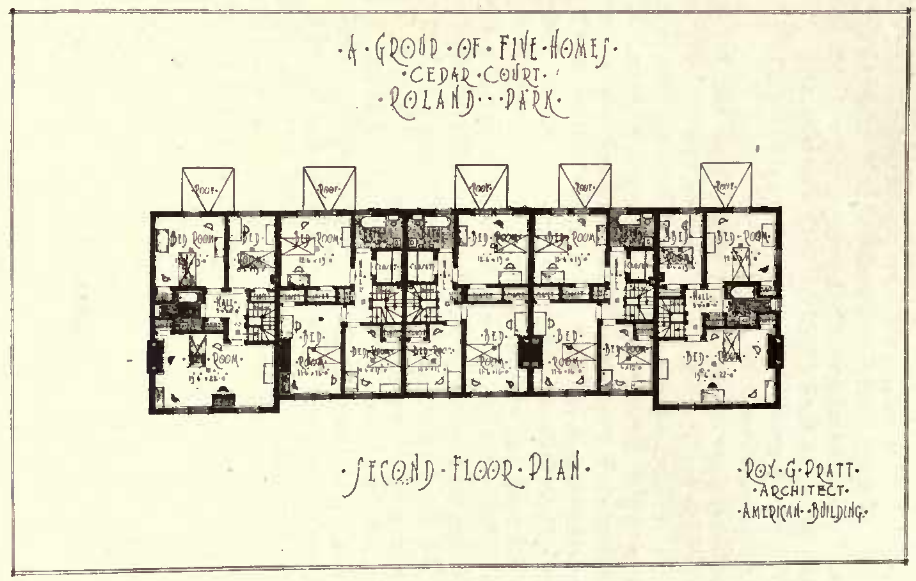
A GROUP OF FIVE HOUSES, CEDAR COURT, ROLAND PARK, MD.

Roy G. Pratt, Architect.









A GROUP OF FIVE HOUSES, CEDAR COURT, ROLAND PARK, MD.

Roy G. Pratt, Architect.

(*Continued from page 65.*)

fillers consist of a solid part like pulverized quartz and a liquid part of a quick-drying varnish. It is rubbed over the surface of the wood and into the pores and permitted to set, when the excess is then wiped off with excelsior and, finally, felt. When the wood is stained with an oil stain, this filler may be colored to match.

Architects are often shown samples of the beautiful finishes which are possible with the use of this or that manufacturer's stains and varnishes, and supplied with specifications by which they are told they can secure these finishes, but much to their sorrow the results are not like the samples, and probably never will be. All of these samples are made under ideal conditions by the most careful experts. Laboratory conditions and regularity and first-class skill can produce finishes on a small sample board which could not possibly be reproduced in a building except at enormous costs. In the first place, there is always more or less dust blowing around in a newly constructed building, and not the greatest care is taken in it to provide the exact control of humidity and temperature required for drying varnishes. And as every one knows, the men who do the painting are generally far from being the most skilful artisans of their trade. It, too, is a big temptation to put on one or two heavy coats of varnish instead of three or four thin coats, and there is not an expert living who can tell how many coats of varnish are on a piece of wood after the work is done. Unless the architect has observed each step of the application, he cannot deny, when the painter shows him the finished woodwork, that there are not as many coats of varnish on it as he required in his specifications. Yet time will tell the tale, but then it is too late.

However, the treatment of floors and stair treads is the worry of many an architect, although he ought to remember that in factories sheet steel is laid on the floors at the doorways, and even this wears through. Why should he be disheartened if after a year the stair treads and the patches of floors near the door-sills are scratched down to the wood through coats of varnish one-thousandth of an inch thick? Even the best varnish will break down under this abrasion, but only the best should be used. Cheap floor varnishes are not worth the labor of laying, and yet how many spend money on them. Some architects, and with good reasons, prefer finishing the floors with wax instead of varnish. As a base for this wax, a thin coat of varnish is excellent. Various manufacturers have different formulas for floor waxes, and they are more or less complex, but generally turpentine is the softening and drying material. The wax paste is rubbed into the floor and polished with weighted brushes—a tedious job. However, it is a job which any servant or housewife of ordinary intelligence can perform, so that whenever the floors become worn around the doors or the stair treads become shabby, the housekeeper is able to repair them easily, and there is no doubt that a waxed floor is more beautiful than a varnished one. But remember the slipping and sliding rugs on a wax floor and be sure to fasten them down.

When examined critically, paint is not much more than a varnish with a finely ground opaque powder, called the pigment, suspended in it. This pigment takes away the transparent qualities of the varnish and gives a definite color to the surface. Enamels actually do use varnishes as their vehicle or base, but ordinary paint uses linseed-oil, which acts much like a varnish, in that it has the property of becoming hard and elastic under the oxidizing effect of the air.

The exteriors of most houses are painted with white lead or zinc-white pigments mixed with linseed-oil. Zinc makes a harder paint than white lead, but it is best to mix the two pigments together in the proportion of one-third of zinc to two-thirds of white lead.

In extensive investigations the U. S. Bureau of Standards suggests that much saving of money in paint would be made if white paint were abandoned altogether in favor of dark-colored pigments for exterior use. Horrible suggestions, but these are the facts in the case! White and light-tint paints invariably fail on the south side of a house, before the paint on the other side shows signs of deterioration. This is because the light of the sun breaks down the strength of the linseed-oil, which is the body of the paint film. For this reason dark pigments, which are more opaque, cut off the light and protect the oil film more than the lighter-colored pigments.

Another common cause of failure in exterior painting is the application of it to the wood during unseasonable weather, when the surface of the wood is wet. Paint will only properly adhere to a wood surface when it is free of any moisture.

Another one of the causes of failure of lead and zinc paints for exterior work suggested by some authorities is the use of volatile thinners like turpentine and benzine. They say that such thinners should not be permitted on the job, for they are a temptation to the painter. If raw linseed-oil is used, and it is necessary to shorten the time required for drying, some good drier should be added, say five per cent. This drier should be pale in color and free from rosin. Driers are usually made of oil combined with a good proportion of lead and a little of manganese.

White pine, Douglas fir, yellow pine, cypress, or any of these woods usually contain some knots, which are sure to damage exterior white paint unless properly treated. These knots have a certain amount of pitch in them, which will penetrate through any oil paint and leave an ugly mark. They should be covered with shellac, which is not affected by the pitch. Shellac is a spirit varnish made from shellac resins dissolved in alcohol. The yellow shellac is the strongest, but the white is used where a light-colored paint is to be applied on top of it. The pitch which is so bad in knots is often distributed throughout the wood, as in Southern yellow pine, and this will often cause the paint to peel off. To prevent this to a certain extent, some specifications advise using benzol in the priming coat, in order to make the paint penetrate more deeply into the wood and get a better grip on the surface.

The priming coat of any painting job should either be pure linseed-oil or linseed-oil with very little pigment in it. Its purpose is to fill the pores of the wood before the other coats are applied, for if an ordinary thick coat of paint were applied to raw wood, the surface would draw so much oil out of the film of paint that most of the pigment would be left dry and unfastened upon the outside.

Only after the wood has been given the priming coat is it then time to putty up the nail holes and other defects, and not before, because the dry wood, as in the case of paint, will suck out the oil from the putty and leave it without anything to bind it together. The best putty for this work is made of linseed-oil with enough white lead in it to make a thick paste. The putty which is commonly used, however, is made of whiting or ground chalk mixed with linseed-oil. This is durable if real linseed-oil is used, but often some inferior adulterant is substituted.

After the holes are all puttied, the other coats of paint may be added. At least two good coats should be applied, and three coats give superior results. Plenty of time should be allowed between coats to permit thorough drying of the previous one.

69

Concrete Construction

By DeWitt Clinton Pond, M.A.

TENTH ARTICLE

IN view of the fact that the following articles will deal with such kinds of flat-slab construction as are found in the 395 Hudson Street Building, which was designed to conform with the New York law, the present article and the one following it will deal with this type of construction in a general way. In them particular reference will be made to the rules embodied in the metropolitan ordinances.

The Board of Standards and Appeals of New York, on July 8, 1920, adopted rules covering the design of reinforced-concrete flat slabs. As almost all engineers are forced to abide by building ordinances of one kind or another, the rules governing design in New York will form a fair basis for comparison with the regulations of other cities, and an explanation of certain of the passages will tend toward an understanding of flat-slab construction on the part of the student.

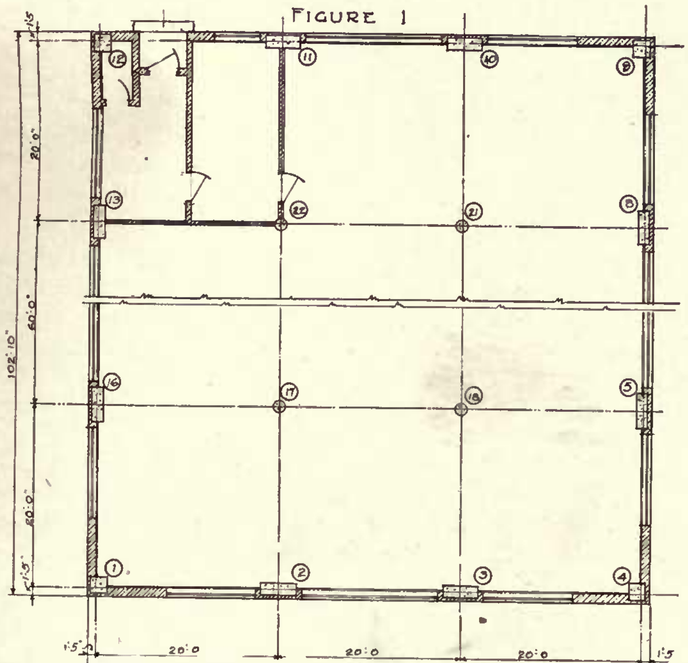
The rules apply to "the design of reinforced-concrete flat slabs" used as floors or roofs, but which must consist of "three or more rows of slabs, without beams or girders, supported on columns, the construction being continuous over the columns and forming with them a monolithic structure."

A floor such as shown in Fig. 1 would conform to this rule, as it consists of three rows of slabs and can be designed without beams and girders.

The fourth rule stated in the code deals with the allowable stresses in concrete, but before discussing this it may be of advantage to investigate the proportions and kind of columns required to support flat slabs and note the points at which the stresses are allowed.

It will be noted in Fig. 1 that the columns are spaced 20 feet on centres and that the panels are square. The reason for spacing the columns as shown will be considered later when slab design is investigated. According to Rule 5 the least dimension of any column shall be not less than one-fifteenth of the average span of any slabs supporting it,

FIGURE 1



but in no case shall the least dimension of an interior column be less than 16 inches and of an exterior column be less than 14 inches. In the cases of columns 17, 18, 21, and 22 in Fig. 1, the diameters of these supporting members cannot be less than one-fifteenth of 20 feet, or 1 foot 4 inches. Had the span been less than 20 feet the columns would have the same diameter, for, according to the rule, this dimension

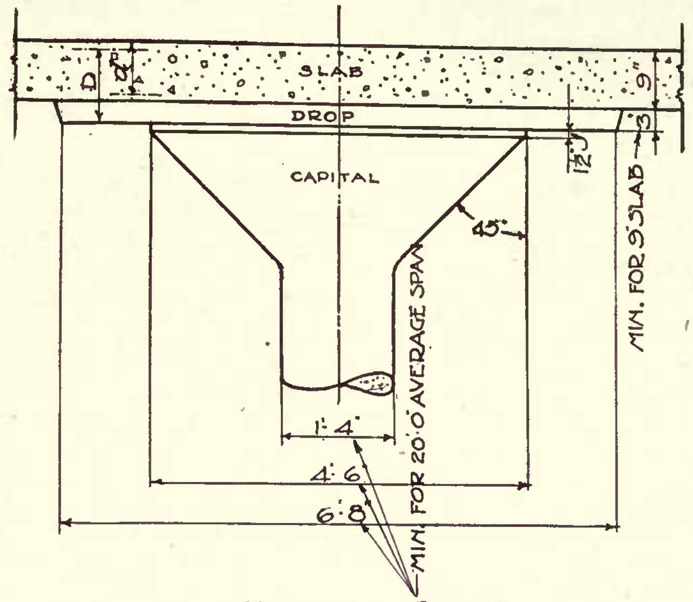


FIGURE 2

could not be less than 16 inches in any case. If the panel had been rectangular, measuring 20 feet by 25 feet, the average span would have been 22.5 feet and the diameter of the column would be at least 1 foot 6 inches. The rules illustrated above also apply to the least dimension of an exterior column except that the minimum dimension is 14 inches.

The figures given are minimum dimensions. It is quite possible that the load on any one of the columns may be large enough to require more concrete in the column than would be found in case the minimum figures were the determining factor. The determination of the diameters of columns for the purpose of supporting loads is carried out in the usual manner. The reinforcement in the interior columns is ordinarily made up of spiral and vertical steel rods and bars, and the reinforcement of exterior columns is in general made up of vertical rods and hoops.

However, in flat-slab construction the columns have capitals and "drop panels" which are not found in connection with columns supporting beams and girders. The capitals are placed on the columns in order to prevent the columns from being punched through the floor. They and the drop panels above them may be considered as spread footings turned upside down. Instead of preventing the punching of the columns into the ground, they are used to prevent the floor or roof from being pushed down and around the columns. Now according to Rule 6 "every reinforced-concrete column, supporting a flat slab, shall be provided with a capital whose diameter is not less than 0.225 of the average span of any slabs supported by it." This diameter "shall be measured where the vertical thickness of the capital is at least $1\frac{1}{2}$ inches, and shall be the diameter of the inscribed circle in that horizontal plain." Fig. 2 shows the elevation of such a capital and its least dimensions, based upon the assumption that the column is one of the four interior ones

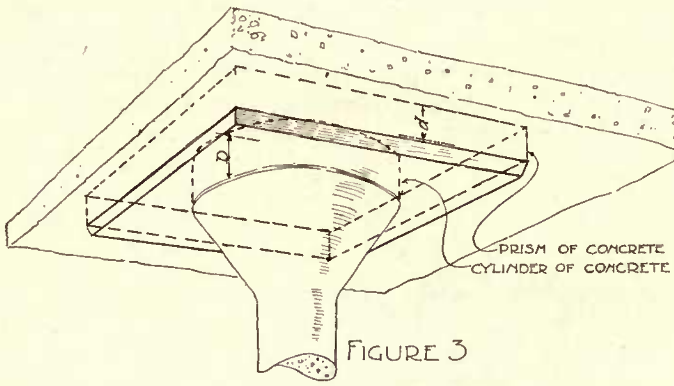


FIGURE 3

shown in Fig. 1. It will be noticed that the diameter of the capital is 4 feet 6 inches at a point $1\frac{1}{2}$ inches below the drop panel, and that this dimension is obtained by multiplying 20 feet by 0.225. Rule 6 continues: "The slope of the capital, considered effective below the point where its diameter is measured, shall nowhere make an angle with the vertical of more than forty-five degrees." This angle is shown in the figure, and the reason for this requirement is that, were the capital flatter, there would not be enough concrete around the column to prevent its punching through the capital, drop panel, and floor. There is a provision made in Rule 6 for considering as part of the column capital a portion of the drop panel inclosed within the lines of the column capital, provided the drop panel is smaller than required in the following rules. This provision need not be considered at the present.

The drop panel is described in Rule 7. It is not necessary to have a drop panel above a capital, but the slab thickness is less when the drop is used and the positive moment in the outer section is less. Therefore, although there are obvious advantages in maintaining a flat ceiling without drop panels, many engineers use them because of the economy effected. The width is determined by "the shearing stress in the slab around the perimeter of the drop, but in no case shall the width be less than 0.33 of the average span of any slabs of which it forms a part." In the case of the interior columns in Fig. 1, the width of the drop panel cannot be less than 6 feet 8 inches. When the allowable stresses are considered, the width of the drop panel will be investigated further.

The thickness of the drop is determined upon the basis of resisting the punching of the column capital through the drop panel and the floor, and also upon the basis of providing allowable compressive stresses in the concrete in resisting the negative moment on the column head. In no case shall the thickness of the drop be less than one-third the thickness of the slab. In case the slab is a 9-inch slab the drop cannot be less than 3 inches in thickness. Drops over exterior columns must extend to the one-sixth point in the panel from the centre line of the column.

To return to Rule 4, there are two values of unit shear allowed in flat slabs.

The first value is given for the concrete in the slab directly above the circumference of the column capital. If the capital were punched through the floor and drop panel it would push out a cylinder of concrete. The cylinder would have a diameter equal to the diameter of the capital, and would have a height equal to the distance from the under side of the drop panel to the centre of the reinforcing steel. This distance is marked D in Fig. 2. The shearing value of the concrete around the circumference and for the total height is given as 120 pounds per square inch. If the slab is 9 inches thick and the drop is 3 inches thick, the total depth will equal 12 inches. Subtracting $1\frac{3}{4}$ inches as the distance to the centre of the steel, D becomes $10\frac{1}{4}$ inches. The distance around the circumference at the top of the capital such as shown in Fig. 2 is 170 inches, $D = 10\frac{1}{4}$ inches, and the area of concrete sheared out is 1,743 square inches, and the supporting value, as far as the allowable shear is concerned, can be found to equal 209,160 pounds. The diameter of the capital is determined as the least allowed for a square panel measuring 20 feet on a side, and it will be found that such a panel will have to be loaded very heavily to produce a shearing stress as large as the one found above.

The second value given for allowable shear is in reference to the concrete directly above the drop panel. Should the drop panel be punched through the slab, a square prism of concrete would be pushed out with a base the size and shape of the drop and a height equal to the thickness of the slab. When the shearing value of the slab is considered, the effective depth, or $\frac{7}{8} \times D$, is used. D in this case is $7\frac{1}{2}$ inches when allowance for fireproofing is made. The area

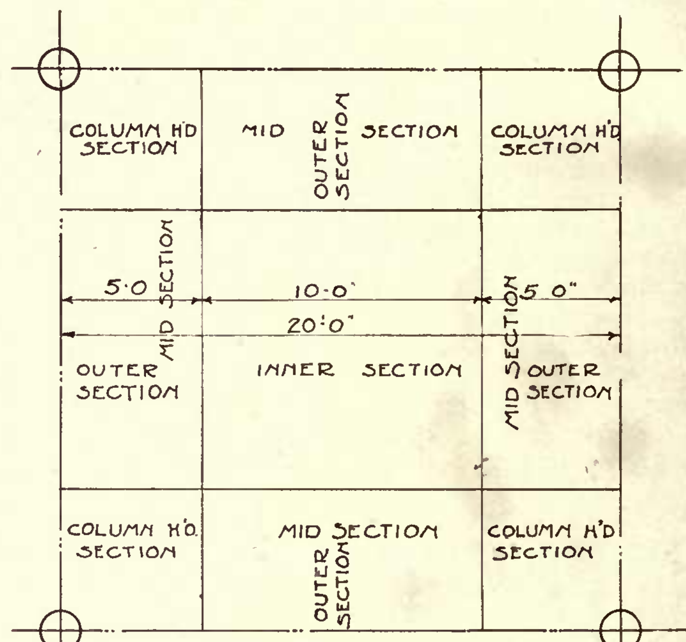


FIGURE 4

of sheared concrete would be for a drop panel 6 feet 8 inches square, $80 \times 4 \times \frac{7}{8} \times 7\frac{1}{2} = 2{,}100$ square inches. The allowable shear around the perimeter of the drop is 60 pounds on the effective area, so the total shear around the drop shown in Fig. 2 is 126,000 pounds. This is less than the allowable shear around the column capital, but even in this case the load would have to be large in order to make it necessary to increase the size of the drop.

The only other allowable stress referrred to in Rule 4 is the unit compressive strength of concrete at the column head, which is given as 750 pounds per square inch. Reference will be made to this in connection with the design of the slab itself.

So far the minimum dimensions of the column capital have been established, the minimum width and thickness of the drop, and the allowable shearing stresses in the slab at

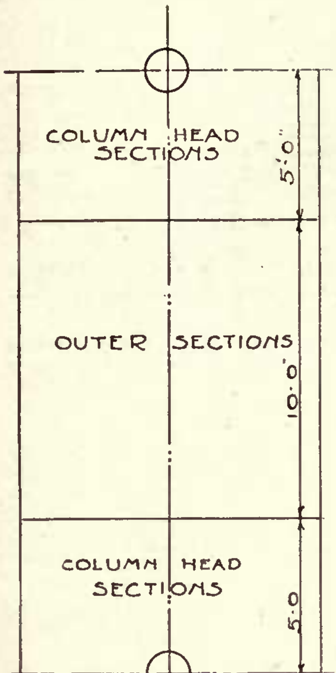


FIGURE 5

the column capital and around the perimeter of the drop, as well as the compressive value of concrete at the column head. The next step will be the determination of the thickness of the slab and the methods used in designing the reinforcing.

According to Rule 8, "the thickness of a reinforced-concrete flat slab shall be not less than that derived by the formula $t = 0.024 \times L \times \sqrt{w} + 1\frac{1}{2}$ for slabs without drops, and $t = 0.02 \times L \times \sqrt{w} + 1$ for slabs with drops, in which t is the thickness of the slab in inches, L is the average span of the slab in feet, and w is the total live and dead load in pounds per square foot; but in no case shall the thickness be less than one-thirty-second ($\frac{1}{32}$) of the average span of the slab for floors, nor less than one-fortieth ($\frac{1}{40}$) of the average span of the slab for roofs, nor less than 6 inches for floors, nor less than 5 inches for roofs." In order to show how the formula, which is given above, is applied it will be necessary to assume some loads and apply them to the floor panels shown in Fig. 1. If the slab is 9 inches thick the dead load per square foot is 108 pounds for the slab alone. Assuming a dry-cinder fill of 2 inches weighing 10 pounds and a 1-inch cement finish weighing 10 pounds more, the total dead load equals 128 pounds. The live load can be taken as 250 pounds per square foot, and the total dead and live loads will be 378 pounds, or 380 pounds per square foot in even figures. As the bays are 20 feet square, the average span is also 20 feet, and with these values it is possible to substitute in the formula in order to find the thickness of the slab. In the case of a slab without drop panels the thickness becames $t = 0.024 \times 20 \times \sqrt{380} + 1\frac{1}{2} = 10.86$ inches. In the case of a slab with drop panels the thickness would be determined as follows: $t = 0.02 \times 20 \times \sqrt{380} + 1 = 8.8$ inches. It can be seen that the slab must be made about 2 inches thicker if drop panels are not used.

If the load had not been as great, it is possible that the thickness of the slab would have been determined by the fact that the slab must be one-thirty-second of the average span. This ratio in the present case would give thickness of 7.5 inches.

There are in all fourteen rules, and of these the first eight have been referred to. Before discussing Rules 9 and 10, dealing with Reinforcement and Line of Inflection, Rule 11, covering Moment Sections, should be investigated.

For the purpose of design a panel is divided into sections as shown in Fig. 4. The sections are included between imaginary lines which are assumed to run parallel with the column centre lines and, at distances equal to one-quarter of the space between columns, on either side of the centre lines. If L is taken to represent the distance between columns, then the dividing lines are located at distances equal to $\frac{1}{4} \times L$ on either side of the column centres. In the present case the lines are located 5 feet away from the columns.

The different sections—separated by the imaginary lines—are designated by special names in the code, as shown in Fig. 4. The section directly in the centre of the panel is known as the inner section. The sections directly over the columns are known as column-head sections, and the sections not designated as above are known as mid-sections, or outer sections, depending upon the direction in which the reinforcing is being designed.

It is somewhat difficult to explain just what is meant by two designations for the same section. In Fig. 5 a strip of the panel is shown. At each end are two column-head sections and in the middle are two outer sections. In this strip or band the steel is designed so as to be placed longitudinally with the band. The steel in the two column-head sections would have to resist a negative moment, the steel in the two outer sections would have to resist a positive moment. When the reinforcing bars are designed for such a band, formulas are given in the rules for the negative moment in the column-head sections and for the positive moment in the outer sections.

Fig. 6 shows a strip which does not touch the columns but runs directly through the centre of the panel. It includes the inner section and mid-sections at each end. The mid-sections overlay the outer sections of the bands which run between the columns, and it can be seen that when the steel in the mid-section overlaps the steel—at right angles to it—in the outer section, there is a negative moment at this point. The moment in the inner section is always a positive moment.

It will be seen that column-head sections are always designed to resist negative bending, as are also the mid-sections, but the inner sections and outer sections are designed to resist positive bending.

The steel in the bands running from column to column

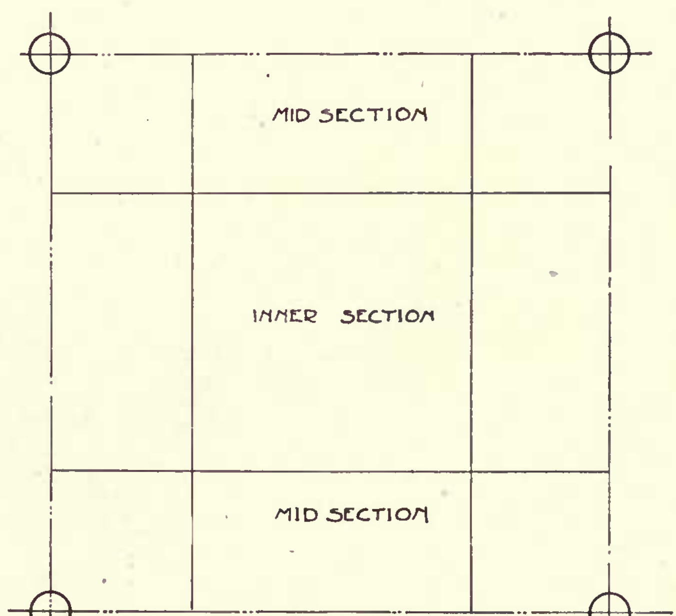


FIGURE 6

is known as *band steel*, and the steel running from the mid-section to the inner section and then to the next mid-section is called *slab steel*. The inner section is looked upon as a kind of suspended panel supported by the bands.

In the formulas applied to the design of slab, steel will be discussed and a comparison will be made between two and four way reinforcing.

n2

Book Reviews

SMALL HOUSES. Their Economic Design and Construction. Essays on the Fundamental Principles of Design and Descriptive Articles on Construction. With Plates Drawn by the Author, Illustrating Methods and Results. By ERNEST FLAGG, architect. Large folio. Charles Scribner's Sons, Publishers, New York.

There is a certain kind of courage involved in all innovations, and in perhaps no other profession is this more true than in that of architecture. In his preface Mr. Flagg says, "Those who object to new methods simply because they are not accustomed to them will have little use for this book," but in this very statement he piques curiosity and leads his readers to seek an understanding of the new and economical methods he writes about and makes practically manifest in the text and numerous drawings and photographs with which this handsome book is illustrated.

Even a cursory look at the houses, placed, as they are, in their natural environment of garden or village street, excites pleasurable interest. They have the appeal that belongs to fitness, to a well-ordered arrangement of simple elements. You are immediately struck with the absence of ornament, with the lack of any salient features that might class them with a particular period or style. One will think of certain French originals, mayhap, and, if so, of the simple country houses of the smaller French towns.

The essential feature of Mr. Flagg's designs is their individuality, based upon his own theories of plan, and especially their economic and time-saving new methods of construction. The walls of these houses are built of mosaic rubble, and the method of building them as shown and explained in full is obviously a means of great economy in both labor and time.

The author emphasizes the fact that the most important deviation from ordinary methods which these designs illustrate is the use of ridge-dormers, or their equivalent, ridge skylights, and the various consequences arising therefrom. Instead of being gloomy, stuffy, and hot, the dormers render the space under the rafters, perfectly ventilated, light at all times, and cool in hot weather. These ridge-dormers are made possible by the strength of the rubble-stone walls where no tie-beams are needed. In summer the ridge-dormers keep the house cooler; in winter, when closed, they help to add cheerfulness and light. There are sectional drawings showing the placing and proper construction of these dormers.

Mr. Flagg begins by explaining his use of his "The Module System in Construction" and "The Module System in Design." The chapters on Windows, Roof-Covering, Foundations and Cellars, Repairs, Trim, Casing and Doors, Concrete, Carpentry, Heating, Floors and Ceilings, Standardization, Hardware, Plumbing and Drainage, Roof Framing, Gutters, Leaders, Skylights, Half-Timber and Plaster Work, Fireplaces, Stairs, Repairs, will be read with interest and profit. Many readers also will enjoy following Mr. Flagg in the more or less abstract essays included among these purely practical matters, giving his theories and conclusions on art. We may read of Truth, Beauty, Proportion, Fitness, Unity, Artistic Convention, Decoration, Ornament, Simplicity, Certainty, Color Drawing, Symmetry, Order and Balance, and come to the conclusion that, after all, it is upon these purely æsthetic approaches to the practical that we must base our judgments of all architecture, determine what is tolerable and desirable, what is good or bad.

The many illustrations in pen and ink are both practical and picturesque, and many will, we feel sure, enjoy the pleasant and home-like human note introduced in the way of small figures, for which the author makes grateful acknowledgment "to his daughter Betsy for the charming little people which embellish his drawings." The book is handsomely printed, and each of the large plates contains a table of modules.

THE KIDDER-NOLAN ARCHITECTS AND BUILDERS HANDBOOK. A Handbook for Architects, Structural Engineers, Builders, and Draftsmen. Compiled by a Staff of Specialists. THOMAS A. NOLAN, M.S.A.M., Editor-in-Chief. Seventeenth Edition, enlarged. John Wiley & Sons, Inc., New York.

The new revised and enlarged seventeenth edition of this book is now ready—prepared under the able editorship of Professor Thomas Nolan, Fellow of the American Institute of Architects, assisted by a competent staff of architects and engineers, who have personally prepared many of the articles.

This book is full of live, usable information, and every phase of building construction has been thoroughly covered.

Through years of constant use, thousands of architects, builders, and contractors have come to depend upon KIDDER and its always convenient data. From cover to cover it is authoritative and thoroughly reliable, every fact being strictly up to the minute.

COUNTRY RESIDENCES IN EUROPE AND AMERICA. By LOUIS VALCOULON LE MOYNE. Second Edition with Additional Material. G. P. Putnam's Sons, New York.

The author says the purpose of this book is to describe what he thinks to be "the most interesting country residences in various parts of Italy, France, England, and America." We need not say that to choose from such infinite variety means the omission of many things we should, perhaps, expect to find, but the selection includes many famous and beautiful examples. In the American section we note Mt. Vernon, Arlington, Hunnewell Place, Biltmore, Monticello, Weld, among others.

The author has included in this new edition some full-page plates in color from original paintings in water-color. They are treated in a conventionally decorative way in broad flat washes. The text consists of brief comment in large type upon each subject.

ENGLISH HOMES. Period V. Vol. I. Early Georgian, 1714–1760. By H. AVRAY TIPPING, M.A., F.S.A. Charles Scribner's Sons, New York.

The new volume in this sumptuous series dealing with the architecture and history of famous English homes is in keeping with those that have gone before. The text gives in brief chapters the names and records of the architects with comment on particular features and the story of the families associated with the homes.

The period included, while no doubt inspired by the earlier traditions of Palladio as exemplified in the work of Inigo Jones and others, was less governed by the restraint and consideration for a well-defined classic reserve. Everything was on a more grandiose scale, especially the details of interior decoration. Most of the work of the time came under the influence of the famous amateur, Lord Burlington, and his chief professional authority, William Kent. Horace Walpole, a man of fashion and amateur of the arts, was a prominent figure.

The most intelligent and informed members of society "placed æsthetics in the forefront of human interests and attainment."

The period was one of transition.

Gibbs and Campbell (author of "Vitruvious Britannicus"), Leoni and Kent were, in the days of George I and under the ægis of Burlington, the chief writers as well as practitioners in that very Italian style of architecture which alone they countenanced as "regular." The source of their inspiration was foreign and in large measure archaic. Their intellectual attitude was literary and doctrinaire. Their æsthetic spirit was one of choice exclusiveness and specialized artificiality. The local characteristics of landscape, climate, and material, the habits and needs of the generality of the house-holding or house-needing population must not distract them from the contemplation of the great works of Classic Rome and Renaissance Italy. Grandeur reduced to rule was their study and their aim. The word palatial appealed to them excessively. Now Wren had lived and practised at a time when, although many fine private houses were being built, the provision of public buildings, ecclesiastical and civic, occupied the architectural foreground. Such were not the great undertakings of the Early Georgian period. A wealthy oligarchy ruled the land, not merely politically but also intellectually and æsthetically. A cultured aristocracy, with whom knowledge of the arts, largely gathered by foreign travel, was a customary and expected accomplishment, had purse and power as well as desire and capacity to realize the utmost dreams of ceremonious housing and splendid living. There was no palace built for a king, but many to be provided for great landowners and millionaire merchants. These mark the period not merely by their own bulk, but by their influence over more modest contemporary dwellings. Nor can due appreciation of the architectural phase of which they are the dominant product be reached without accounting for the part played in their creation by their owners themselves or by specially informed and interested members of the society to which the owners belonged.

The illustrations are profuse and the plates are handsomely printed. This whole series should prove a valuable reference for the architect's library.

OLD SPAIN—ARCHITECTURE AND APPLIED ARTS. By AUGUST L. MAYER, Ph.D. With 310 illustrations. Brentanos, New York.

There seems to be rather a surprising revival of interest in things Spanish and in the past year or two a considerable number of American artists and architects have gone to Spain for study and inspiration. A series of drawings made by Vernon Howe Bailey have been purchased by the Hispanic Museum, and more recently a number of pen drawings by Ernest Peixotto. There is no dearth of information on old Spanish furniture, but comparatively little on the subjects of this profusely illustrated book. As in most books of this kind, the text is but a brief introduction. The plates are grouped under the following heads: Moorish Art, City Sites and Castles, Churches, Buildings, Furniture, Wrought-Iron Work, Precious Metals, Leather, Carpets, Stuffs, Ceramic Art, Ivory, Glass.

We cannot refrain from mentioning that the book is bound in yellow cloth with blued edges for the pages. The outside paper wrap is blue paper with the title in black. These are minor things, but we learn many lessons from just such exhibitions in the way of good taste and suitableness.

THE HOME PAINTING MANUAL. The Sherwin Williams Co., Cleveland, Ohio. Department B. 435. Paper Covers.

This is a useful and practical little book with many attractive illustrations in color as well as black-and-white. It deals with such matters as The Right Use of Paint, Estimating, Individual Treatment in Exterior Painting, Interior Finishing, Treatment of Floors, Color Harmony, Wall and Ceiling Treatment, Stencils. As the publishers say: "There is excellent material available treating on period furniture, decoration and color-schemes, but little telling how walls may be decorated in paint. There are histories and dissertations on the subject of well-known and rare cabinet woods, but nothing to guide one in the finishing or refinishing processes."


DESIGN FOR THE LIBRARY
AT LOUVAIN
DESTROYED BY THE GERMANS · 1914
RESTORED BY AMERICA · 1922
WARREN AND WETMORE ARCHITECTS

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV MARCH, 1922 NO. 3

To Rebuild the Library at Louvain

As the Gift of the American People

Warren & Wetmore, Architects

MEMORIAL TOWER LIBRARY AT LOUVAIN

IT was on July 28, 1921, that Dr. Nicholas Murray Butler, in the presence of many celebrities, laid the corner-stone of the new Library of the University of Louvain, which has been planned as a gift of the American people to the people of Belgium. The ceremonies attending the laying of the stone were impressive. A message from President Harding was read; King Albert delivered an address, as did former President Poincaré, of France, and Premier Carton de Wiart, of Belgium. Cardinal Mercier, primate of Belgium, blessed the building.

As the corner-stone swung into place, Dr. Butler said:

"America will watch this splendid building rise like the phœnix from its splendid ashes to bear witness to the unbreakable bonds that bind America to Belgium, to France, to Great Britain, and to all their allies. A nation cannot do battle in a great cause or for a noble ideal without receiving a new baptism of spirit.

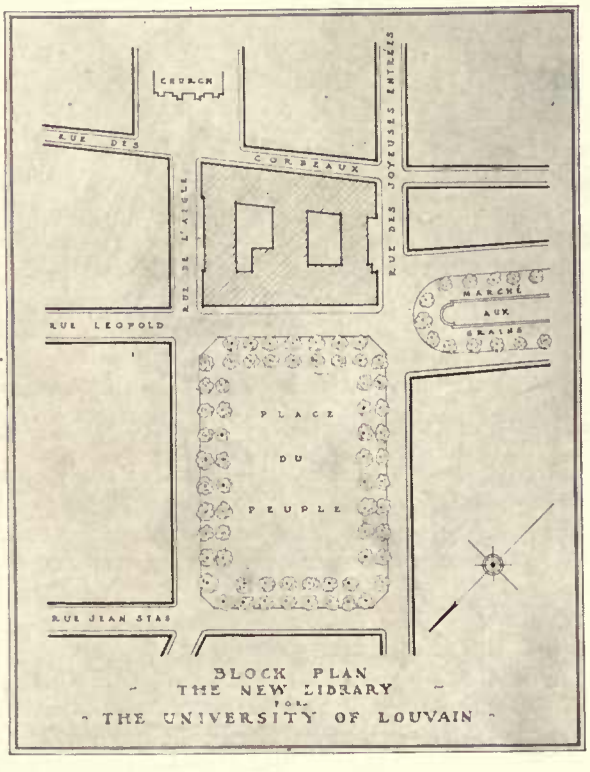
"Such a new baptism of spirit has come to the people of the United States, and this act of theirs, so small when compared with their ambitions and hopes, is convincing evidence that America will never stand idly by while freedom is destroyed, while liberty is turned into slavery, or while the cannon and flames of war carry destruction to the most splendid monuments to human aspirations and human accomplishments."

The question is now, Will America see it through? Belgium confidently believes it will, even though it means a matter of almost a million dollars.

The old library, erected in 1425, was originally used as a Cloth Market by the merchants of Louvain. With the growth of the university, space was needed for the storing of the manuscripts accumulated through the centuries, and permission was given by the authorities to use the floor of the old Cloth Market. Gradually floor after floor was taken until the library finally absorbed the greater part of the building. It was still known, however, by the traditional name of Cloth Market.

Then came the Great War, with the German invasion, and the wilful destruction of this beautiful building on the night of August 25, 1914. There was absolutely no military necessity for it.

German apologists have said that the treasures of the library were not burned, but that thousands of volumes were taken from the place before the fire. If that is so, where are the books that were saved? Certainly they are not in Belgium. By the terms of the Treaty of Versailles, Germany is compelled to send ten thousand books a month to Louvain in reparation. These books are picked by a committee of scholars selected by Louvain University and con-



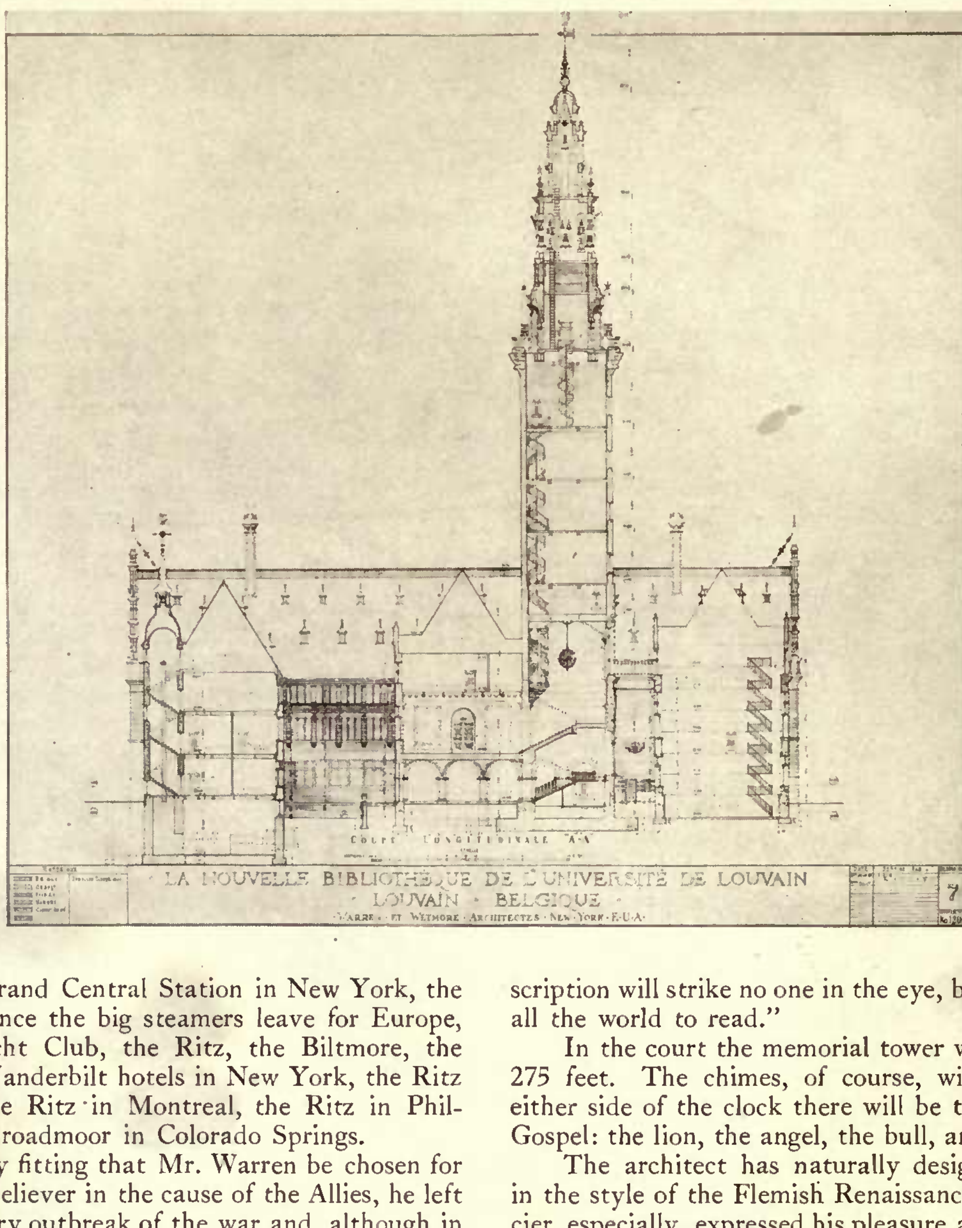
BLOCK PLAN – THE NEW LIBRARY – FOR – THE UNIVERSITY OF LOUVAIN –

firmed by King Albert. The libraries of Heidelberg, Leipsic, Jena, and Bonn are being carefully combed for literary treasures that will help to repair the damage. But so far none of the old Cloth Market books have been found.

Only one manuscript of the old library was saved. Professor van der Essen, of the university, happened to have at his home manuscript No. 906, which contains the official correspondence of the university from about 1583 to 1637. The rest is with the destroyed parchments of Alexandria.

The loss, of course, was not only Belgium's but civilization's.

Quite inevitably, there arose after the war the International Committee for the Reconstruction of the Library of Louvain, the presiding officer of which is M. Imbart De la Tour, who is also president of the French Institute. Dr. Nicholas Murray Butler was made chairman of the American committee, which subsequently asked to take over the whole project. It was M. De la Tour who invited Whitney Warren, of Warren & Wetmore, to become the architect.



Mr. Warren, with Mr. Charles D. Wetmore, his associate, has been responsible for many notable structures, among others the Grand Central Station in New York, the Chelsea Docks, whence the big steamers leave for Europe, the New York Yacht Club, the Ritz, the Biltmore, the Belmont, and the Vanderbilt hotels in New York, the Ritz in Atlantic City, the Ritz in Montreal, the Ritz in Philadelphia, and the Broadmoor in Colorado Springs.

It was especially fitting that Mr. Warren be chosen for his task. A warm believer in the cause of the Allies, he left for France at the very outbreak of the war and, although in an unofficial capacity, did much to let France know where American sympathies lay.

As far back as 1905, he had been made a member of the French Institute.

Last year he went over to Louvain and chose the site himself; it occupies one side of the Place du Peuple and was originally intended for the Palais de Justice, or Magistrates' Court of the Province of Brabant. But it was agreed that it was the ideal place for the library. . . .

The building's depth will be 150 feet, while the façade will be 220 feet in length, with a wide loggia, or covered arcade, with seventeen arches. Rain is frequent in Louvain, so the arcade, which will contain various tablets, will be practical as well as beautiful. At either end of the building will rise the stacks of books.

The work on the stacks will be pushed first, for the immediate necessity is some place for the storing of the books that are piling up all over Louvain. Not only Germany's monthly ten thousand are coming, but the Allied countries, too, are helping, so that more than three hundred thousand volumes are already on hand. The work of gathering the books from the United States has been under the direction of Mr. Putnam, librarian of the Congressional Library, while Mr. Lane, head of the Widener Library at Harvard, has done valiant service also.

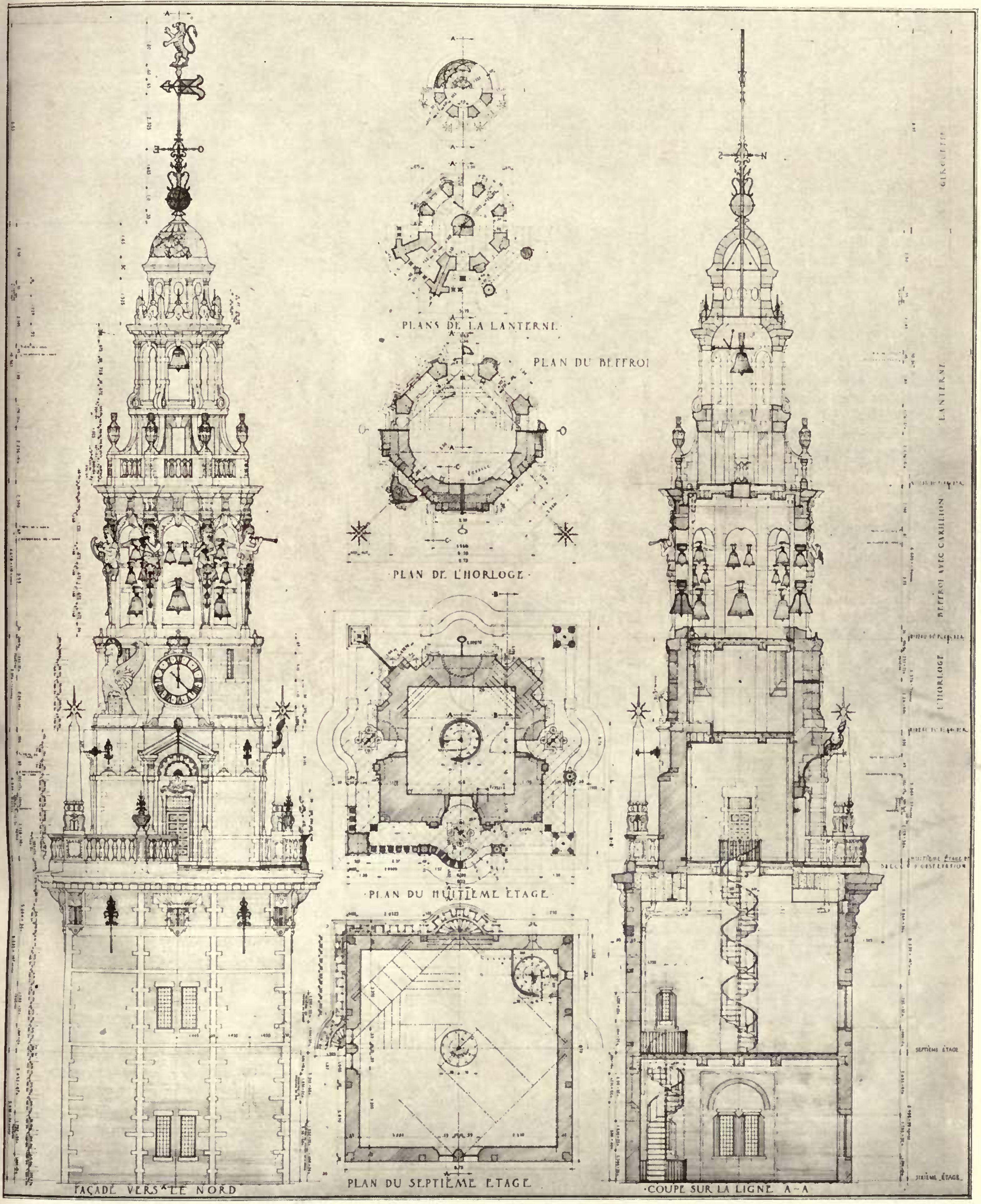
After the stacks will follow the façade and portico. Midway on the façade are to be raised the ornaments in the form of a Gothic shield. The principal figure will be that of Notre Dame des Victoires; to the left will be a figure of St. George; to the right, a representation of St. Michael. Interwoven in the balustrade is to be the inscription, "Furore Teutonica Diruta, Dono Americano Restituta" ("Destroyed by Teutonic Fury, Restored by American Gift"). "The inscription will strike no one in the eye, but it will be there for all the world to read."

In the court the memorial tower will rise to a height of 275 feet. The chimes, of course, will be a feature. On either side of the clock there will be the four figures of the Gospel: the lion, the angel, the bull, and the eagle.

The architect has naturally designed the new library in the style of the Flemish Renaissance, and Cardinal Mercier, especially, expressed his pleasure at this. The building stone will be of local products. What iron and steel is needed will come, it is hoped, from America, as will the library stacks.

Ultimately the library will house two million books and will have a seating capacity for three hundred readers, twelve seminary rooms for special classes and students, a small museum, and, what is very important, the offices of administration. The latter are essential, for the new library will be the soul of the university.

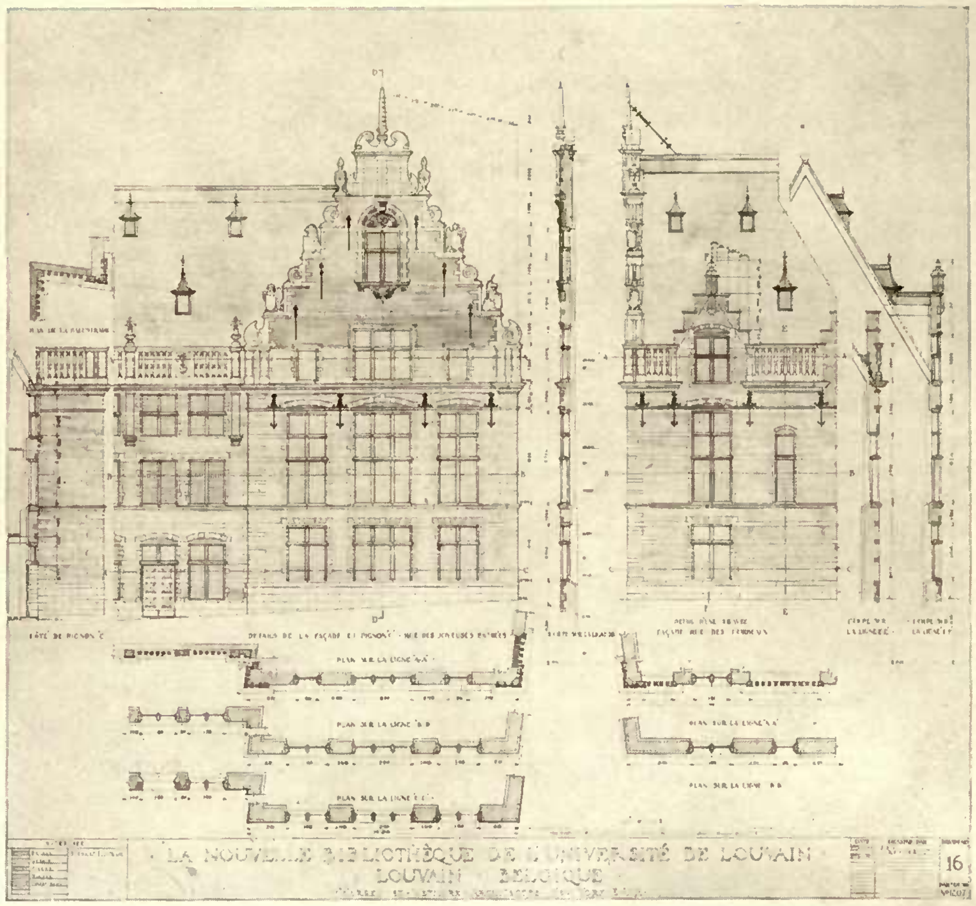
Mr. Warren estimates that the building will cost a million dollars. The American committee, of which Dr. Butler is president, has on it many notable Americans—among them



LA NOUVELLE BIBLIOTHÈQUE DE L'UNIVERSITÉ DE LOUVAIN, LOUVAIN, BELGIQUE. Warren & Wetmore, Architects, New York, U. S. A.

J. P. Morgan, Thomas W. Lamont, W. H. Crocker, Eugenius H. Outerbridge, Herbert Putnam, and Henry S. Haskell. These, together with the late Alexander H. Hemphill, raised about one hundred and sixty thousand dollars when the plans for the new library were laid. This has been expended in clearing the site and sinking the foundation.

Mr. Warren thinks that the task is peculiarly an undergraduate one, and that Harvard, Yale, Princeton, and Columbia might well take the initiative and line up the other colleges of our country.



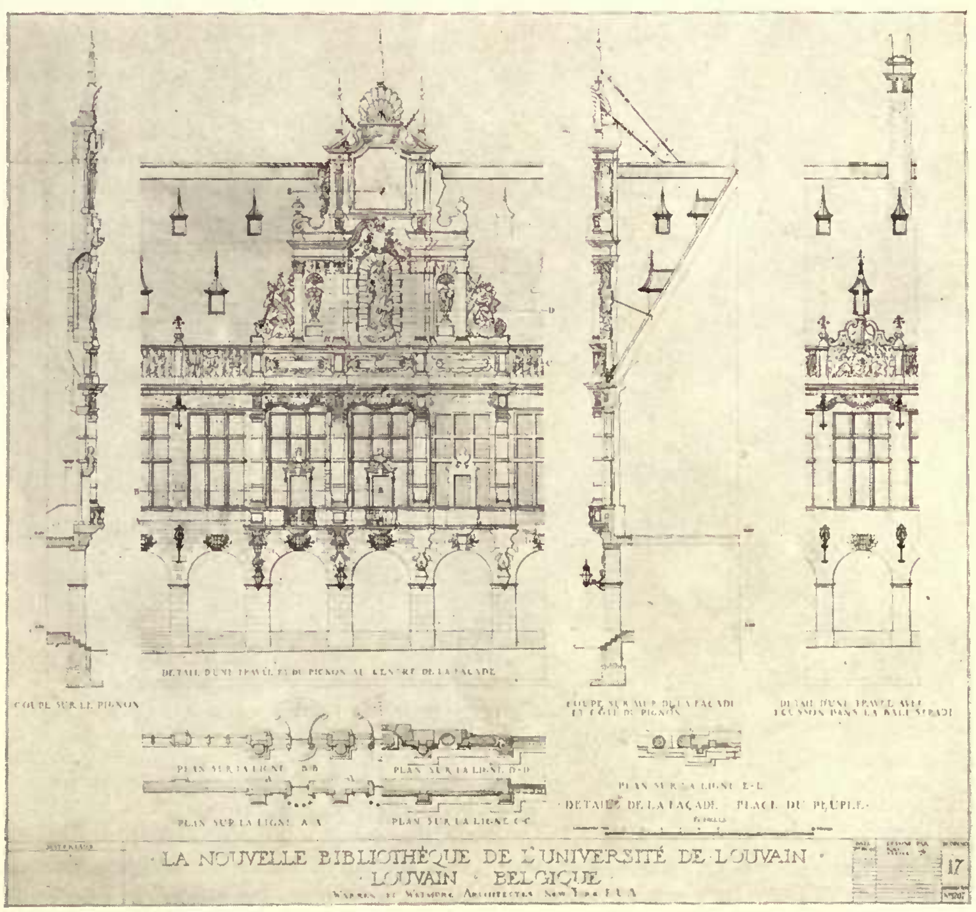
The Building as Described by the Architects

The location is the Place du Peuple, by far the best and most imposing site in the city of Louvain. The buildings surrounding this square were destroyed by the Germans at the same time as the library. The tower will dominate the surrounding country.

The principal façade will consist of a covered arcade, which will serve as a general meeting-place for the students, over which is placed the main reading-room lighted by large windows.

The material to be used is of local white stone and red brick, with blue-slate roof and copper flashings, certain details of the façade being gilded, as is usual in monuments in Belgium.

On the ground floor besides the arcade already mentioned will be a small museum for the treasures of the library, also the administrative offices.



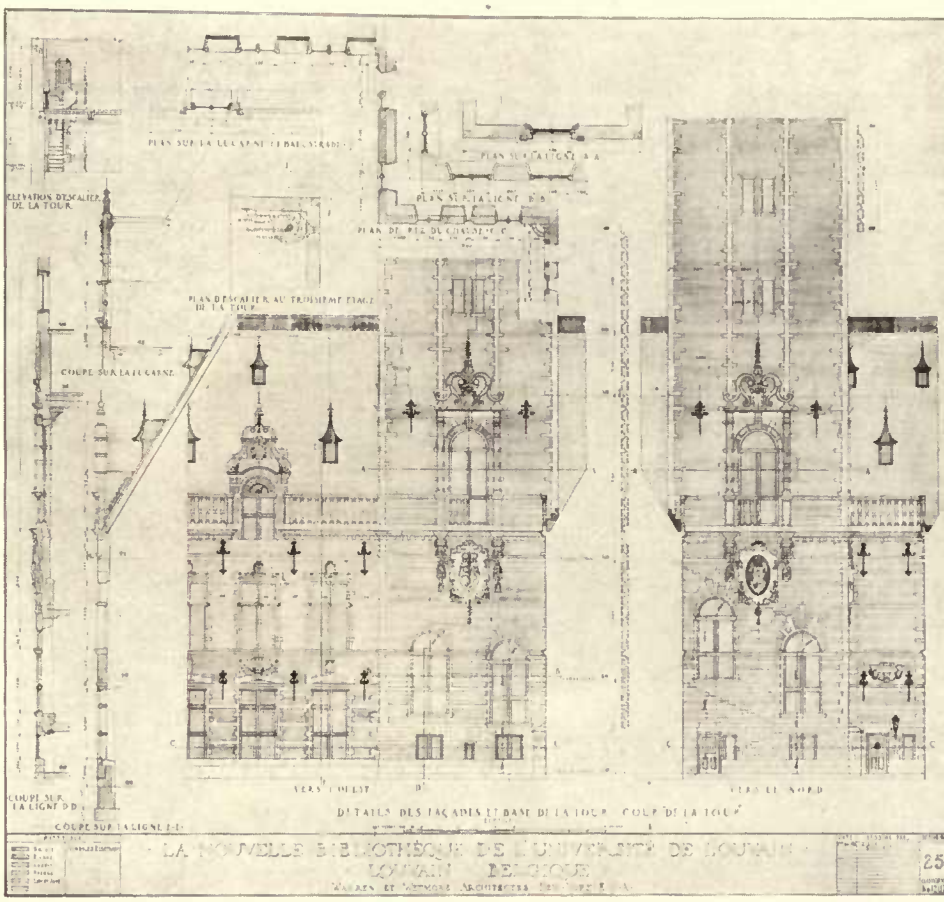
A monumental stairway leads to the second story, on which is the catalogue and distributing room, situated in the very heart of the building, connecting the reading-room (occupying the entire front) with the stack (occupying the entire rear), thus giving the most economical and efficient service possible. Twelve seminars or special study-rooms complete the building.

The stacks have an eventual capacity of two million books, and the seating in the reading-room is for three hundred—figures required by the university authorities.

The façade is symbolical in composition and detail: in the central motive, interest centres on the figure of Notre Dame des Victoires, supported by St. George and St. Michael crushing the Evil Spirits; above is a bas-relief representing the destruction of the old library, while underneath, crowning the doors leading to the three exterior pulpits, are busts of the heroes of the war: King Albert, Cardinal Mercier, and Queen Elizabeth. The coats of arms of Belgium and the United States are framed in the high balustrade which surrounds and crowns the building; in this balustrade is interwoven an inscription describing the destruction of the old library and the fact that the restoration is a gift of the American people.

On the stepped gables at either end are commemorative tables and the heraldic animals of the allied powers: the eagle, the unicorn, the lion, the cock, etc.

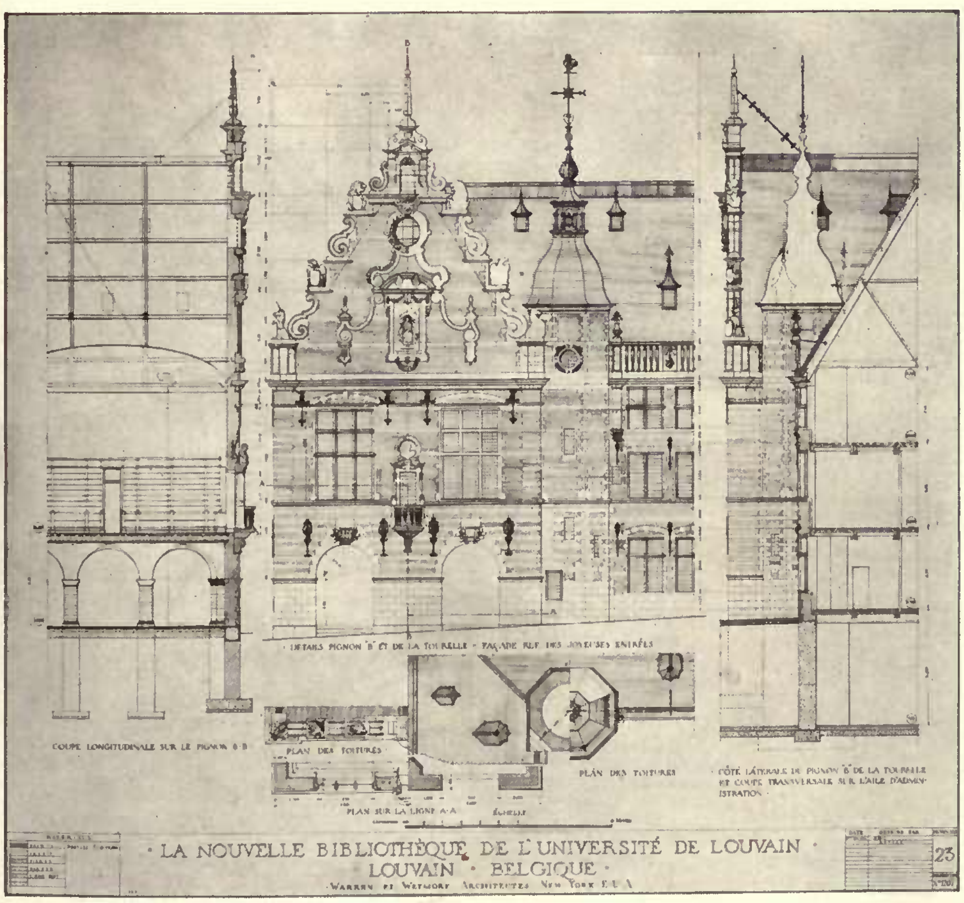
The tower crowned by the carillon, or chimes, so universal in all Flemish towns, typifies the voice of the university—the voice of Truth. It is supported on the four corners by the beasts or symbols of the Evangelists: the bull, the eagle, the angel, and the lion. Hourly, this carillon will ring forth the national airs of those nations who fought in the Great War, that Honor, Right, and Justice might survive—"The Star-Spangled Banner," "The Marseillaise," "God Save the King," the "Brabançonne," etc.



Letter from Cardinal Mercier Accepting the Plans Submitted for the Restoration of the Library

THE ARCHBISHOP'S PALACE
MALINES, BELGIUM

The plans and drawings which you were kind enough to bring with you to show me are perfect. It is a joy as well as a duty to give you my congratulations.



Your project has a character eminently practical. All the different departments are provided for and you have solved the various problems which arose therefrom, with an elegant simplicity.

With a sense of delicacy which touched me deeply, you laid to one side your American ideals to follow our national ambitions by designing a building recalling the purest traditions of our Flemish and Brabançonne art.

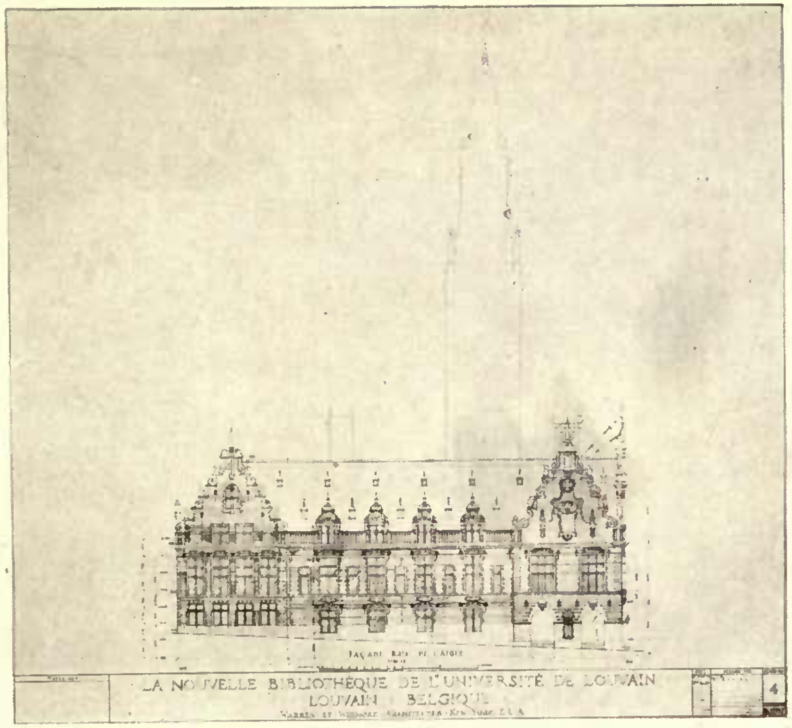
But even finer and more touching than the gift of the Library to Louvain is the gesture of the Nation which has claimed the privilege of rebuilding it.

To the end the American People intend to preach before the world the disinterestedness and cult of Justice. America entered the great war without having any interest either personal or national, but solely because she wanted Right to prevail and Injustice punished. Its first mission once achieved it does not wish that the results of the crime committed by the German incendiaries should be borne any longer by those who were their first victims, and to the obstination of Germany in her dishonor, she proudly opposes her will by reestablishing as soon as possible, the reign of Justice and the Triumph of Civilization in a great Scientific Institution.

The United States still grows in the eyes of the world and shall be great in History for having confided to the Committee for the Restoration of the University of Louvain the task of raising the ruins of the University, and when in the near future your compatriots visit our ancient Brabançonne city to admire the monument they will have the gratification, I do not doubt, to feel as they look upon it, that their generosity has spiritually enriched them to as great an extent even as it has helped us.

Please accept all my wishes for the success of the realization of the noble task and rest assured of my devotion to the American people.

✠ D. J. Cardinal Mercier,
Archbishop of Malines.


LA NOUVELLE BIBLIOTHÈQUE DE L'UNIVERSITÉ DE LOUVAIN
LOUVAIN BELGIQUE
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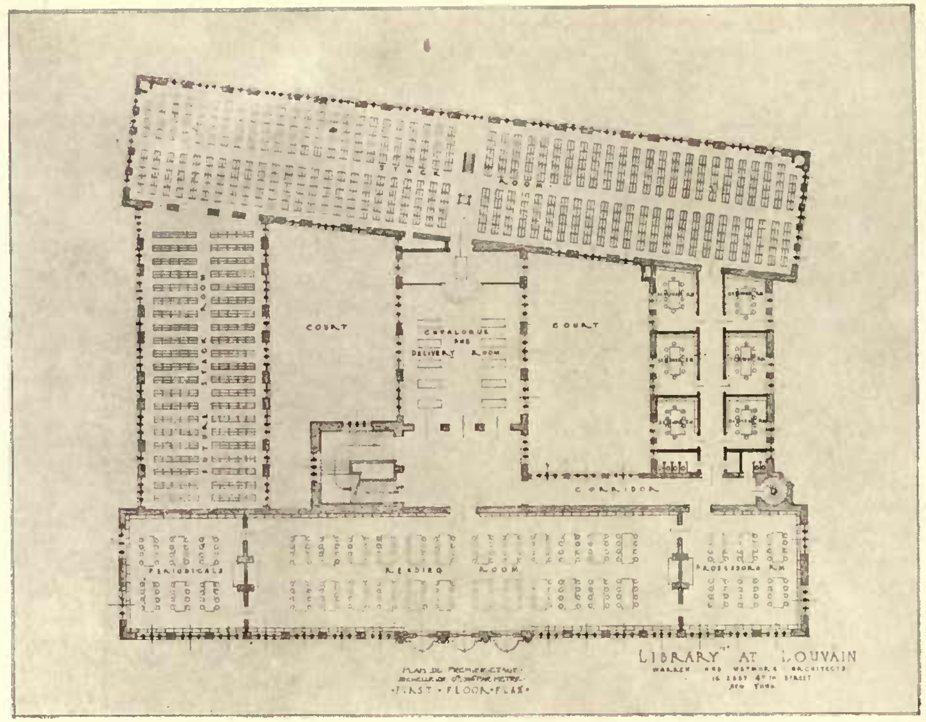
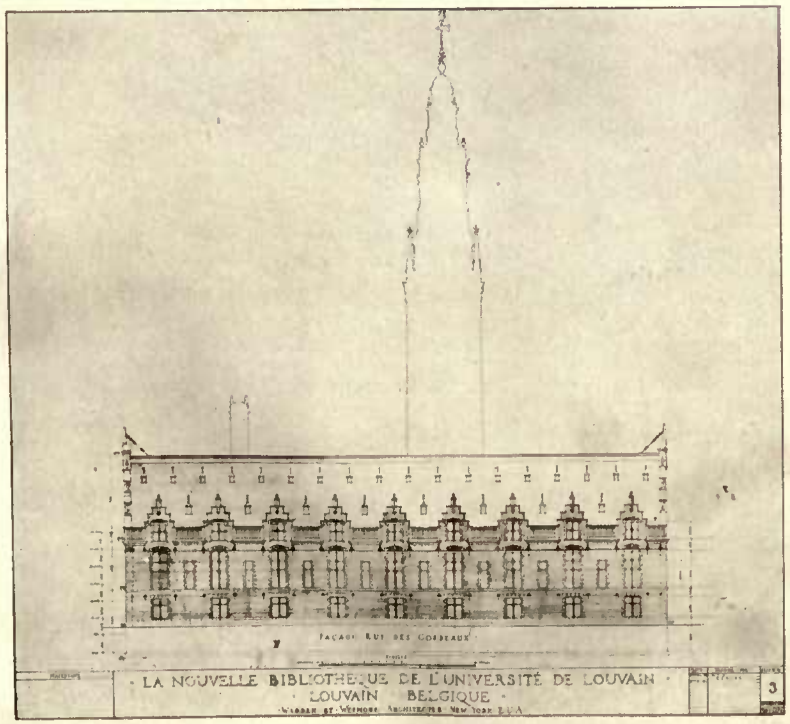

COURT
COURT
CORRIDOR
PERIODICALS
READING ROOM
LIBRARY AT LOUVAIN
FIRST FLOOR PLAN


FAÇADE RUE DES CORBEAUX
LA NOUVELLE BIBLIOTHÈQUE DE L'UNIVERSITÉ DE LOUVAIN
LOUVAIN BELGIQUE
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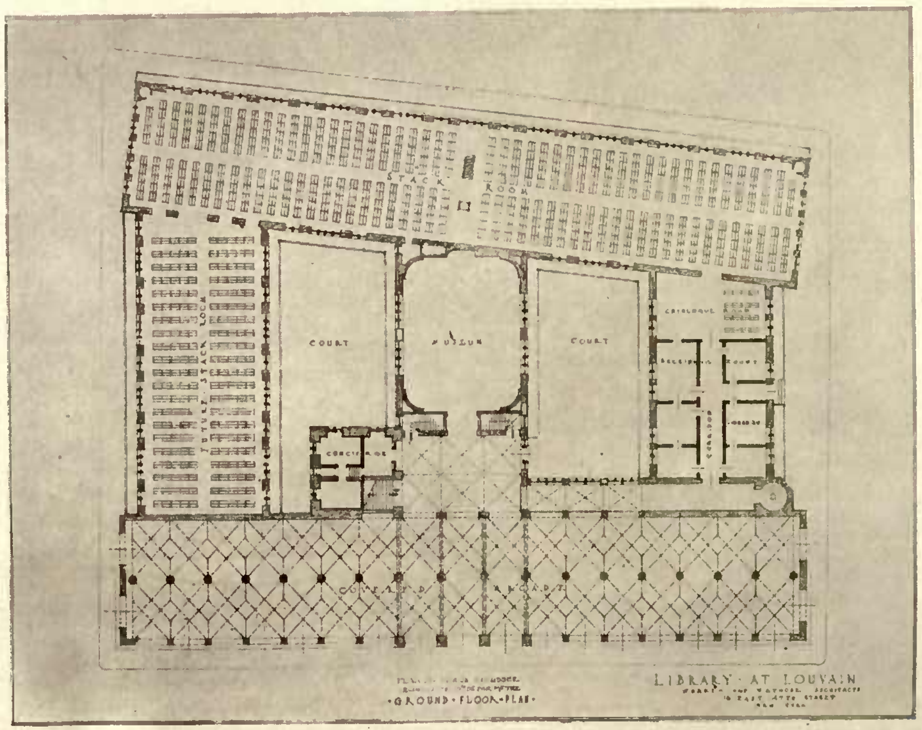

COURT
COURT
LIBRARY AT LOUVAIN
GROUND FLOOR PLAN

The Combination Building — Church and School

By John V. Van Pelt

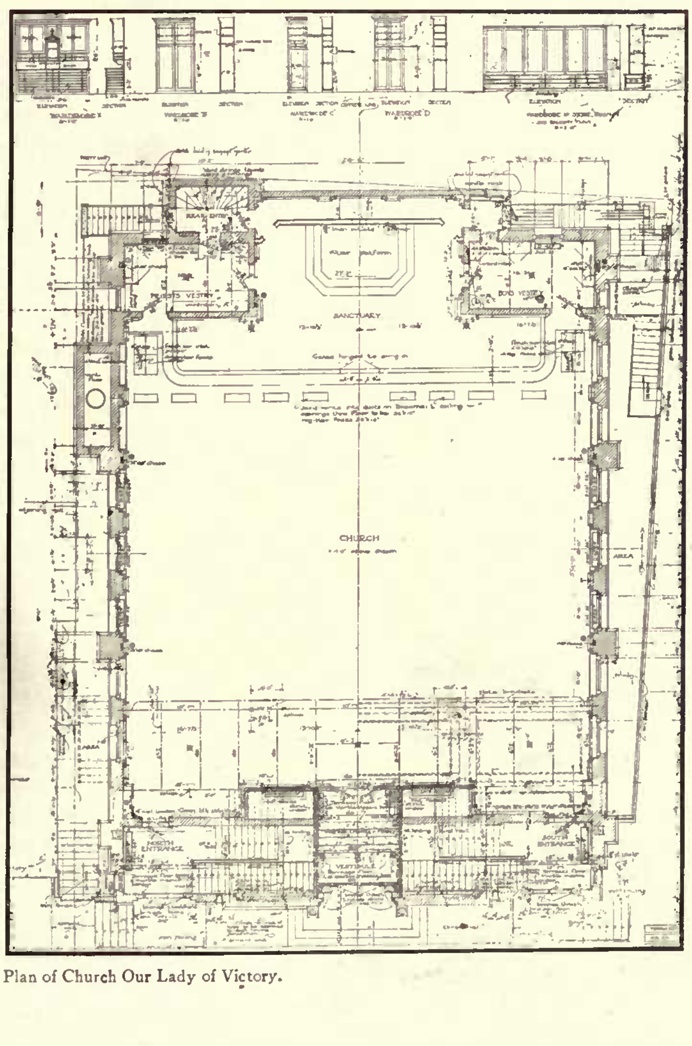
A LAWYER met an architect lately on the morning train. "I hear you are getting busy," he said. "Not a thing doing," replied the architect. "Why, Smith told me he was going to have you make the designs for his new house. He said you were just the man to express in concrete form all the word 'Home' means." "He came in," said the architect dejectedly—"I couldn't do it." "My dear fellow," commiserated the lawyer, "what was the matter?" "Why, the idiot told me all about what he wanted me to express and then I found his wife insists on a suite of rooms for her mother right across the front of the house." "Um," mused the lawyer, "he needs me instead of you."

But circumstances will not always permit a divorce between the spiritual and material in a building. Even the "home" has its back door. This is increasingly true as the progress of civilization introduces new complexities. In mediæval times the adjuncts of a church were only a sacristy and living quarters for the priests. Now the Catholic churches of New York require an auditorium with moving-picture installation for entertainments, rooms for social gatherings, a fully equipped, say a twenty-classroom, school, and a rectory. Many of the Protestant churches have church buildings with a large auditorium, gymnasium, swimming-pool, Sunday-school rooms, committee rooms, society rooms, and living quarters for a staff of church workers.

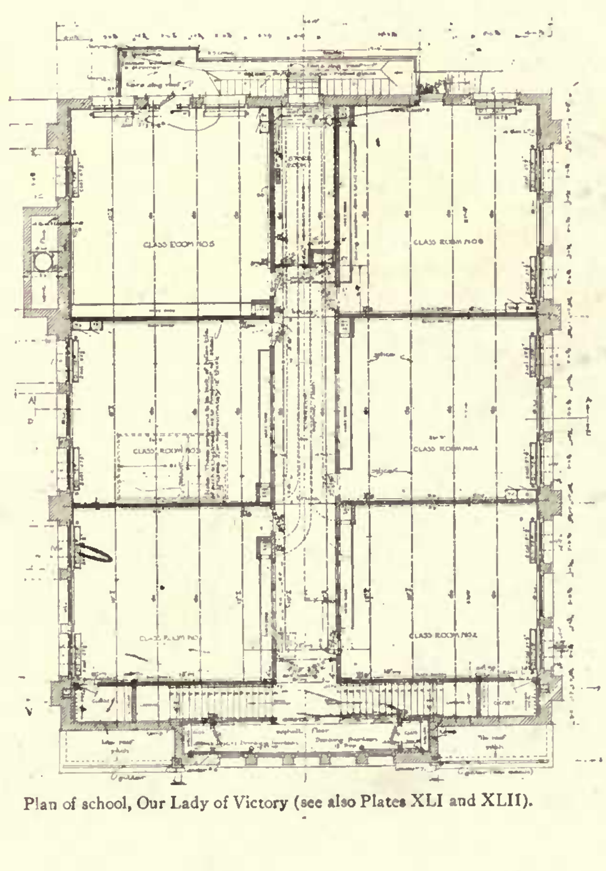
It is interesting to compare these different combinations, and I propose taking them up in the chronological order of their appearance. The first that I remember as a proclaimed world wonder was of the commercial type—Adler & Sullivan's Chicago Auditorium building. That the Auditorium theatre was arranged in protest against the usual tiers of balconies was sufficient to attract attention, but that it formed part of a building containing a hotel and office-building made it a catchword for the press of the day. Now the grouping of a hotel and an office-building in a railroad station seems a logical combination, and subways have inured us to trains carrying loads of human freight under all sorts of buildings.

The second combination building to attract attention had different characteristics. In Boston the Baptist Church required a temple which must include, besides the main hall and its accessories, several minor halls and a series of stores and offices for rental purposes. Mr. Blackall, of Blackall & Newton, worked out a most interesting plan in which the main temple is one flight up with stores in the lower part of the building and offices and the other halls above the temple. In this composition the character of the large hall is announced by a broad expanse of wall surface, the offices by small windows.

The third structure that made much of a stir as a combination was the Broadway Tabernacle at 57th Street and Broadway, New York. A competition was held to select the architect, and immediately came to the fore the question, which has since been the most difficult one to answer for designs of this kind: "Should the character of the exterior of each dissimilar part express the particular portion it en-



Plan of Church Our Lady of Victory.



Plan of school, Our Lady of Victory (see also Plates XLI and XLII).

closes at the expense of unity or should it aim at a greater whole and express throughout the character of the most important element?" If there is no dominating element, the question becomes more vexed.

Mr. J. Stewart Barney, the winner of the competition and architect of the Broadway Tabernacle, tells me that one of the other competitors frankly said he could not harmonize the church and required offices, so he placed his church of one style on the corner and his office-building in a different one behind it. Mr. Barney's design gave the office-building somewhat the effect of a church-tower, and in any event its style was quite at one with the church. The space allotted to different departments facilitated this, and above a certain height he was able to superimpose progressively smaller areas, offsetting these and decorating the whole with Gothic finials and ornament till he reached the apex. This adaptation and subordination to practical requirements is one of the tenets of Mr. Barney's creed, as it should be of any true architect.

It was in 1909 that I first came into close touch with this kind of problem. Mr. Franklin A. Green, deputy architect of the Board of Education of New York, was asked by successive parishes of the Roman Catholic Church to undertake some of their buildings, and associated me with him in the enterprise. The first that introduced a combination was St. Gabriel's School on East 36th Street. In the basement is a playground, gymnasium, and above it a chapel. This has entrances on either side which also give access for girls and boys, respectively, to a fully equipped twenty-classroom school on the four upper floors. Huge trusses concealed in the classroom partitions and running up a full story height support the part of the building that covers the chapel and so obviate obstructing columns. The general style of the building is reminiscent of Italian Renaissance. The chapel has windows on the front with engaged Ionic columns, the classrooms are separately grouped in large arched bays running up three stories with a crowning story situated at the level of the frieze of the building. The general aspect is that of a school, while the chapel is implied by the special windows. In this building the problem was not specially complicated, as the chapel was only incidental to the whole composition.

In the next ecclesiastical group that I built in association with Mr. Green, St. Ambrose's Church on West 54th Street, New York, the problem was much more difficult. There is an auditorium for social gatherings in the basement, a church that seats six or seven hundred on the first floor, then two floors of a school, the equivalent of sixteen classrooms, above that a large rectory reached by a small automatic elevator, and on top of the whole a tiled recreation space with a tennis-court. The elevation, for which I cannot accept much responsibility is not very satisfactory, as rigid economy was necessary. Some large terra-cotta Gothic arches announce the church and school entrances. Above this are rectangular, perfectly plain, school windows, and at the top a frieze and cornice in terra-cotta. Here again the character of each part of the building shows the influence of what is behind it. Since the school, church, and rectory are more dissimilar than are the elements at St. Gabriel's, the problem did not resolve itself as well.

Shortly after this, I was engaged more personally in the design and construction of two other combinations: Our Lady of the Rosary at Yonkers and Our Lady of Victory opposite Clairmont Park on Webster Avenue in the Bronx. These each contain a playground, gymnasium in the basement, the church on the ground floor, and a school over the church. In each case I decided to take the bull by the horns, to consider the building a church, and to subordinate the evidences of the school as much as faithful adherence to all practical requirements of light and ventilation might permit. The Church of Our Lady of Victory is in Italian Romanesque with two side entrances that serve both church and school and a central entrance for the church alone. The vestibule, staircases, and entrance to the school hall occupy the front of the building, so that the different window-openings are not amiss, and the upper windows of the school that show on the side elevations do not clash with the general appearance of the building. See Plates XLI and XLII. It must be borne in mind that such problems are not sought, but are forced upon one by the need of economy. In a congested locality where land values are high they permit a tremendous saving—forty thousand dollars on the land alone in the case of St. Ambrose's, and doubtless a goodly percentage in a one-hundred-and-fifty-thousand-dollar building, as the foundations and roof of the church serve for the school and rectory as well.

The latest development of the combination building is the Fifth Church of Christ Scientist on the northwest corner of Madison Avenue and 43d Street in New York, A. D. Pickering, architect, Starrett & Van Vleck, consulting architects. The church, which has its entrance on 43d Street, covers less than a third of the lot area and occupies only five stories in the height of the building, which is some seventeen stories high. Thus the church has offices both beside and over it. The church itself is interesting and the design good. It extends in from the street about a hundred feet and is on the second floor, so that one enters a series of vestibules under the rising rear seats and then ascends by a main flight of steps on either side directly into the body of the church. There are other staircases in the corners that serve the balconies. The seating capacity is seventeen hundred. A Sunday-school room occupies the space beyond the entrance vestibules under the main body of the church.

The design of the 43d Street elevation comprises a high Ionic order along the front of the church proper. This has dignity and is characteristic of the neo-classic style often adopted by the Christian Scientists for their places of worship. As the remainder of this façade and the other street fronts are treated in a manner that is distinctly expressive of an office-building, the composition falls into the class that treats the separate portions in conformity with the several uses behind each part. It has been possible to do this and still preserve unity, because the classic order is not distinctly ecclesiastical. Indeed, many banks, public buildings, and even office-buildings are not dissimilar in their general effect from the entrance of this church. Unquestionably the problem would have been much less easy of solution had the dominant motive been that of an Episcopal or Roman Catholic church.

My own conclusion is that if two elements of such a problem are diametrically opposed, the need of unity in the composition entails eclipse of the lesser by the greater. As our civilization develops and such combinations become more numerous, it may be that the genius of American architecture, in which I have the greatest faith, will find a solution that shall give us a true expression of all parts and at the same time a beautiful whole.

The National State Bank of Elizabeth, N. J.

Dennison & Hirons, Architects

THE illustrations on the accompanying pages show an interesting solution of a somewhat difficult problem of a bank built on an inside lot, this lot being quite irregular in form. The problem which confronted the architects was the simplifying of this form to give a dignified and well-proportioned banking-room, and an exterior which would harmonize with its surroundings and yet give ample light and ventilation.

The question of lighting an inside lot is always a difficult one, as, in the event of a building being over one hundred feet long, the only means available for lighting are those through windows in the front and the rear and by means of a skylight.

The first thought was to develop the front of the building with a large central motif. This solution would have been practical in a large city where the surrounding buildings were of considerable height or monumental proportions. The town of Elizabeth has no high buildings and those surrounding this edifice were not over three stories in height; therefore, it can be readily understood that a building fifty-three feet wide, having a single central motif, would of necessity be at least sixty feet high. This solution of the problem would have developed in a design which would have proved overpowering for the surroundings and, in the estimation of its designers, would have been out of scale.

It is doubtful, with such a solution, if the light would have been as satisfactory as it has proved in the design executed. The adapted scheme shows a three-bay treatment which gives excellent light and has permitted of a motif of such proportion as to be in better scale and character with the surrounding buildings.

The same scheme of three windows was carried out for the rear elevation, which elevation, though several feet narrower, is hardly noticeable because of the false perspective obtained in the layout of the banking-room.

Recent banking laws in some States permit national banks to do a trust business, and most of these, in planning new buildings, provide for the development of a trust department. National banks in most of the smaller cities also handle a savings business of considerable proportions. Thus, the plans of these buildings should divide themselves into three divisions —a commercial banking business, savings business, and trust business.

In those departments devoted to the first and last of these, there are officers who are constantly in consultation with the public. It is desirable, therefore, that they be placed in a conspicuous location and that proper facilities for consultation in private be provided. The plans for the National State Bank provide well for this.

As one enters the banking-room a large open space for the use of officers is placed on either side of the public lobby. That on the right is for the commercial department and on the left for the trust department. · Connected with the officers' space for the commercial banking department is a consultation room and president's room, and with that space for the trust officers there is connected a private consultation room and a ladies' room.

The rest of the public lobby is surrounded by the tellers of various departments who come in direct contact with the public. Adjoining the officers' space of the commercial banking department is the note teller, and following the cages of the paying and receiving tellers, between which there is an alcove for the use of ladies. This permits women to receive prompt service from the tellers without waiting in line in the public lobby, as from each of the teller's departments a wicket opens into the alcove.

It is the custom in many banks to have individual tellers' cages, in some of which the tellers do both receiving and paying work, while in others separate tellers are provided to do receiving and paying work. The practice followed, however, is very largely according to the ideas of different bankers.

In this building there is one receiving and one paying teller's cage, and in each of these there is room for three men to work. The chief argument in favor of a cage for each man is that it provides for this man complete control of the funds with which he is intrusted, whereas in cages where more than one man works, this cannot be done.

Adjoining the trust department, on the left of the public space, is the trust teller, the savings department, and the quarters of the statement clerk.

In the rear of the room is a large vault, nine feet by eighteen feet, which is divided into two parts for the bank's securities and its safe-deposit business. The vault has a sixteen-inch rectangular steel door and space for three thousand safe-deposit boxes. The other section of the vault is given over to tellers' chests and lock-ups for the protection of the bank's securities.

As it was desirable to have the banking-room appear as

large as possible, the usual practice of placing a directors' room in a gallery, thus cutting down the size of the banking-room, was overcome by the arrangement of a one-story extension in the rear which houses not only a directors' room and one or more conference-rooms but also a machine-room, in which posting-machines, which so often create an objectionable noise in the banking-room, are properly provided for.

The walls of the banking-room, treated in a series of arches and pilasters in travertine stone, surround a series of plaster panels, painted a neutral tone, slightly darker than the stonework. The decorative frieze above these and the coffered ceiling, treated in soft neutral tints, give a pleasing richness to the room, which was inspired by many of the noble precedents of the Renaissance.

The banking-screen and floor are of Napoleon gray marble, honed finish.

The question of artificial lighting is always an interesting one. In this instance the lighting of the banking-room is by means of indirect reflectors placed in the back of the cornice of the banking-screen. Attention may be called also to the use of the space on the right side of the banking-room, because of the irregularity of the lot. In this space there is an officers' toilet and a book vault, and over these a small locker space and toilet for women clerks. Then there is an open gallery in the rear of the banking-room over the vaults to be used for future working space.


The directors' room

The directors' room is kept extremely simple to offset the beautiful stone mantel and luxurious appointments. The decorative ceiling is kept very low in relief and finished in ivory tints. The leaded-glass windows are particularly appropriate, the small medallions embodied in the design illustrating previous edifices in which the bank carried on its business for more than a century past, it having been founded in 1812, thus making it one of the oldest institutions in the State.

The basement of the bank is conveniently equipped with a series of vaults for the use of the bank and other vaults for the protection of trunks or other articles that customers may leave in the bank's care. There is also a clerks' locker-room and toilet, lunch-room and kitchenette, as well as the usual provisions for mechanical equipment, heating-plant, etc.

Physical Fitness and Safety

WORKMEN in an up-to-date industrial plant must be fitted into their positions only after a rigid physical examination, conducted along the lines of an army or navy examination, declared A. A. Bureau, safety engineer, of Morris & Co., Chicago packers, speaking to-day before the Ninth Annual Congress of the National Safety Council in the Milwaukee Auditorium.

Mr. Bureau discussed the importance of the physical examination both as a safety measure and as an efficiency measure, and pointed out the advantages to be derived from it by both the employer and the employee. The physical fitness of a man for his employment should occupy first consideration in the mind of the modern intelligent employer, said Mr. Bureau.

"In the past we hired men on the basis of education or skill," Mr. Bureau continued. "To-day we realize that the physical condition is the greatest factor in the hiring and placing of men. A man's mental alertness, soundness of judgment, efficiency, and skill depend, to a large extent, upon his physical condition. A man in poor health is like a dirty machine; he cannot make his body respond quickly in the face of impending danger. Also, he cannot do his best work, regardless of how good the working conditions may be. As to safety, an abnormal man is never 100 per cent mentally or physically alert. He decreases the safety of his fellow workers. Accidents are costly misfortunes, both in human suffering and cold cash. As to efficiency, anything less than his best is a decrease in the production of a department in which a man is employed. The loss in production caused by the physical health of one man, when multiplied by many such men, soon can make a marked difference in the total amount of production for the plant. Therefore the physical condition of the employees is an important factor: first, in the reduction of accidents, and, second, in the cost of production. As time goes on there will be more emphasis laid upon the grading of workers according to their physical fitness to perform the work of the particular job for which they are hired. Our physical examinations in the future must have a broader scope."

Editorial and Other Comment

A Good Investment

ON other pages of this number are shown the prize-winning plans for model tenements recently exhibited in New York. A large debt of thanks is due to Mr. I. N. Phelps Stokes for his initiative in the matter, and faith in the possibility of solving the housing problem based on the safest of business considerations.

This competition has taken the question of building for the people out of the hands of the speculators and placed it with those who are willing and ready to look upon the question as a sound business man's proposition based on something beyond greed for immediate and exorbitant returns.

The facts would seem to demonstrate that these tenements can be built to rent for nine dollars a room or even less, and return a good profit on the investment.

That some of them are going to be built is already an established fact, thanks again to Mr. Stokes.

Once the good work is started we may look for a regular boom in new construction in this field, and the need is becoming more acute every day.

The architects of these plans have demonstrated that such tenements can be built to yield a safe and continuing profit, and a number of large and experienced building organizations are ready to begin on an extensive scale the moment funds are assured.

If New York makes headway in relieving its own intolerable housing congestion and shows that it can be done to yield a handsome return, we shall look for a wholesome and sorely needed building development all over the country.

It would appear that there is no longer any possible excuse for the existence of the profiteering tenement landlord, and that his days are numbered.

Bringing Architecture and the Related Arts Closer Together

THE exhibition of the Architectural League in New York this year was more than ever a marking of the tendency to affiliate more intimately with the arts of the craftsmen in related fields. We used to go to look chiefly at photographs and plans of buildings; now we go to look at these crowded together and surrounded by about everything that can be put either in or on a building. The exhibition of the little model interiors by the mural painters was a new and interesting departure and will no doubt become quite a feature of future shows.

To the casual visitor who was trying to find what is what in architecture the show was a bit confusing, for he was rather lost in a maze of things that he suspected belonged together, but couldn't always tell where to begin the discovery of how and why.

We are, however, in entire sympathy with any possible efforts that will bring the dear public to a realizing sense of what's what in decoration, and we enjoyed the League show in many ways, and appreciate how much energy and time and thought went into its arrangement.

It is a pity that we cannot have a permanent exhibition of the kind where things can be arranged without crowding and with places set apart for each kind of exhibit, all the crafts included.

The League is a great power for good and its shows deserve a much larger attendance and a more liberal support on the part of the public than they receive.

There is no doubt that the League is very much alive and that in its opening the way for a friendly association with those concerned commercially in the better furnishing of houses after they are built, it is helping to a wider knowledge of the fact that bad taste can only be cured by the getting together of all concerned in making the things that go to furnishing the house. The League's work in this direction is a big asset in furthering the good work that is being done by our museums.

If the manufacturers can be persuaded that good craftsmanship pays better than the awful things that we have been accustomed to, there is hope for us as a nation!

We are constantly confronted with the statement that we are years behind Europe in our industrial arts, and "pity 'tis, 'tis true," but the League is on the right track to change all this. More power to them!

"Architecture" as a Reference Library

THE annual index of ARCHITECTURE is now ready for distribution to subscribers who wish to bind their numbers, and will be sent upon request.

The past year was an especially interesting one in many ways, and the variety of material presented in the numbers from January to December, 1921, gives better than anything we might say an idea of the wide field covered and the high quality of most of the architecture that America is developing, both in public and domestic buildings.

We are all inclined to look with a critical eye upon new developments and rightly so, for only by eternal vigilance may we hope to awaken the public to the fact that we have developed a native architecture and that its future lies largely in their hands.

The public is not blind as some would have us think; on the contrary, it is keen of vision, but, the vision is too often focussed badly and overlooks the more significant things that make up the material upon which to base a judgment of our architecture in general.

The monumental building in the way of a great public institution was splendidly represented in Mr. Cass Gilbert's noble Library at Detroit and Mr. James Gamble Rogers's

Harkness Memorial at Yale University has been recognized as a really great achievement in modern collegiate gothic.

Mr. Magonigle's design for the Kansas City war memorial solved a very difficult problem in a distinguished way, and Mr. Goodhue's bold and highly original design for the Nebraska State Capitol gives promise of a new, and we believe, desirable departure in the designing of civic buildings in general.

Certainly there is no lack of originality combined with great knowledge in such buildings as these, nor any cause to complain that our architecture is lacking in native initiative.

We may all take pride in such achievements, but we must not overlook at the same time the high quality of our domestic architecture. Our modern city residences have shown large improvement in the matter of design, and, as for our country homes, many of them are far ahead of anything in Europe.

Any one who wants to see where we are ahead of other countries in our domestic architecture needs only to compare the plans of a well-designed American house with its English equivalent, for instance. And we all know that there is nothing anywhere in the world to compare with our wonderful business buildings. The fact is, we are better planners in everything we build.

Our readers will always find in the twelve numbers of the year examples of good architecture from all over the United States, together with many articles of an informing and helpful character.

If you should ask us to tell you what Architecture has been doing, therefore, we should refer you to this or any other volume index of recent years to answer for us.

The Cost of Labor

THE following are preliminary figures from the Department of Commerce, Washington, showing the percentage which the amount paid to each labor group bears to the total labor cost of a six-room house:

TOTAL LABOR COST, 100 PER CENT

TRADE	FRAME HOUSE	BRICK HOUSE
Carpenters	49.6	32.2
Bricklayers	6.2	21.5
Hod-carriers	2.2	6.7
Plasterers	7.9	8.8
Plumbers	8.7	7.6
Electricians	2.6	2.5
Painters	10.0	6.3
Common laborers	6.3	9.9
All others	6.5	4.5
Total	100.0	100.0

These averages were constructed from reports covering a large number of six-room brick and frame houses throughout the country.

The relation of the amount paid to the various groups to the total labor cost varies according to the types of construction prevailing in the various localities; however, these averages give a fair view of the general distribution of labor costs.

The Dallas Architectural Club held its first annual exhibition of Texas architecture and allied arts in the ballroom of the Jefferson Hotel in February.

Officers and Committees, Texas Chapter A. I. A. for 1922

Officers—Herbert M. Greene, President, 620 North Texas Building, Dallas; Carl V. Seutter, Vice-President, 424 Moore Building, San Antonio; Clarence C. Bulger, Secretary, 4419 Junius Avenue, Dallas; Alfred C. Finn, Treasurer, 202 Foster Building, Houston. Executive Committee—O. J. Lorehn, Houston; H. A. Overbeck, Dallas; Roy E. Lane, Waco. Membership Committee—H. A. Overbeck, Chairman, Dallas; Professor Samuel E. Gideon, Austin; Carl V. Seutter, San Antonio; A. C. Finn, Houston. Legislative Committee—D. F. Coburn, Chairman, Dallas; Roy E. Lane, Waco; Professor F. E. Giesecke, Austin. Publicity Committee—Ralph Bryan, Chairman, Dallas; Maurice J. Sullivan, Houston; Ralph Cameron, San Antonio. Civic Improvement Committee—Chas. D. Hill, Chairman, Dallas; Carl G. Staats, Fort Worth; Herbert S. Green, San Antonio; O. J. Lorehn, Houston; Otto H. Thorman, El Paso.

Book Reviews

A HISTORY OF ARCHITECTURE ON THE COMPARATIVE METHOD. For Students, Craftsmen, and Amateurs. By Sir Banister Fletcher, Architect, F. R. I. B. A., F. S. I., F. R. G. S., F. R. S. I. Sixth Edition, Rewritten and Enlarged, with about 3,500 Illustrations. Charles Scribner's Sons, New York.

This new edition of a book unrivalled in its field differs from former editions published under the joint names of the late Professor Banister Fletcher and Banister F. Fletcher, in that it has been entirely rewritten by the son, whose name it now bears alone. It has been recast from beginning to end, and much new material added. Many of the new descriptions are the result of personal observations "from ancient Troy to modern Chicago." "In Egypt I have studied the Pyramids, Temples, and Tombs from Cairo to Khartoum. I have made repeated pilgrimages to the mainland and isles of Greece, and to the Greek colonies of Asia Minor; besides exploring the Palace of King Minos in Crete. In traversing Italy I have made sojourns in Rome, in the hilltop cities and the towns of the plains; while I have visited the palace ruins at Spalato on the Adriatic, which reveal the majestic might of Roman rule. In the romantic island of Sicily I have noted how faithfully the varied buildings reflect the many dynastic changes. In North Africa I have studied the ruins of Timgad, Tebessa, and Carthage. I have twice visited Constantinople and examined St. Sophia and the numerous Byzantine churches converted into Mosques. In Palestine I have gone down from Jerusalem to Jericho, through Samaria and Nazareth to Damascus and the great Roman temples at Baalbek in Syria. I have studied the architecture of Spain from Burgos in the north to Cordova in the south, and have made many expeditions to the fair land of France, with her magnificent heritage of Gothic cathedrals; to Belgium with her remarkable town halls; to the canalized cities of Holland, with their stately burgher houses, besides repeated visits to all our English cathedrals and to many castles, mansions, and manor-houses throughout England. I have also been introduced in America to the last word in domestic architecture, and to that steel-frame modernity known as the 'skyscraper.'"

Changes include consecutive numbering of text pages and illustrations, the redrawing of many illustrations and rearranging, adding many new ones in line with recent discoveries, and extending the text and making it much more readable in the way of greater smoothness and fulness of description.

This has always been a great book, an invaluable reference for the architect, the student, and lover of the arts, and in its new form it will be more than ever one of those books that will be needed by every one wishing a readable, comprehensive and complete history of architecture.

The author has wisely refrained from doing the familiar thing of the English traveller. Instead of dismissing the whole subject of American architecture with a cynical reference to our tall buildings, he has devoted a brief chapter to it of a merely outline descriptive nature, saying that "The architecture of that great continent, with all its daring originality and with its many ramifications, would require a volume to itself. Houses, large and small, are among the most satisfactory buildings in both town and country. House plans often show great originality."

The many illustrations, drawings of details, and photographs—there are fifteen hundred added to this new edition—add immensely to the interest of the text, enabling the readers to look at many famous buildings referred to and to follow the author's comments on significant details.

Many have been waiting for and will welcome this new edition. The book has been out of print for some time, and the publishers have been unable to supply the many requests for it that have come to them in the past year. With its nearly 1,000 pages this remarkable book is not only interesting reading, but an encyclopædic reference for the library, to be consulted on all occasions.

THE NATIONAL STATE BANK, ELIZABETH, N. J.

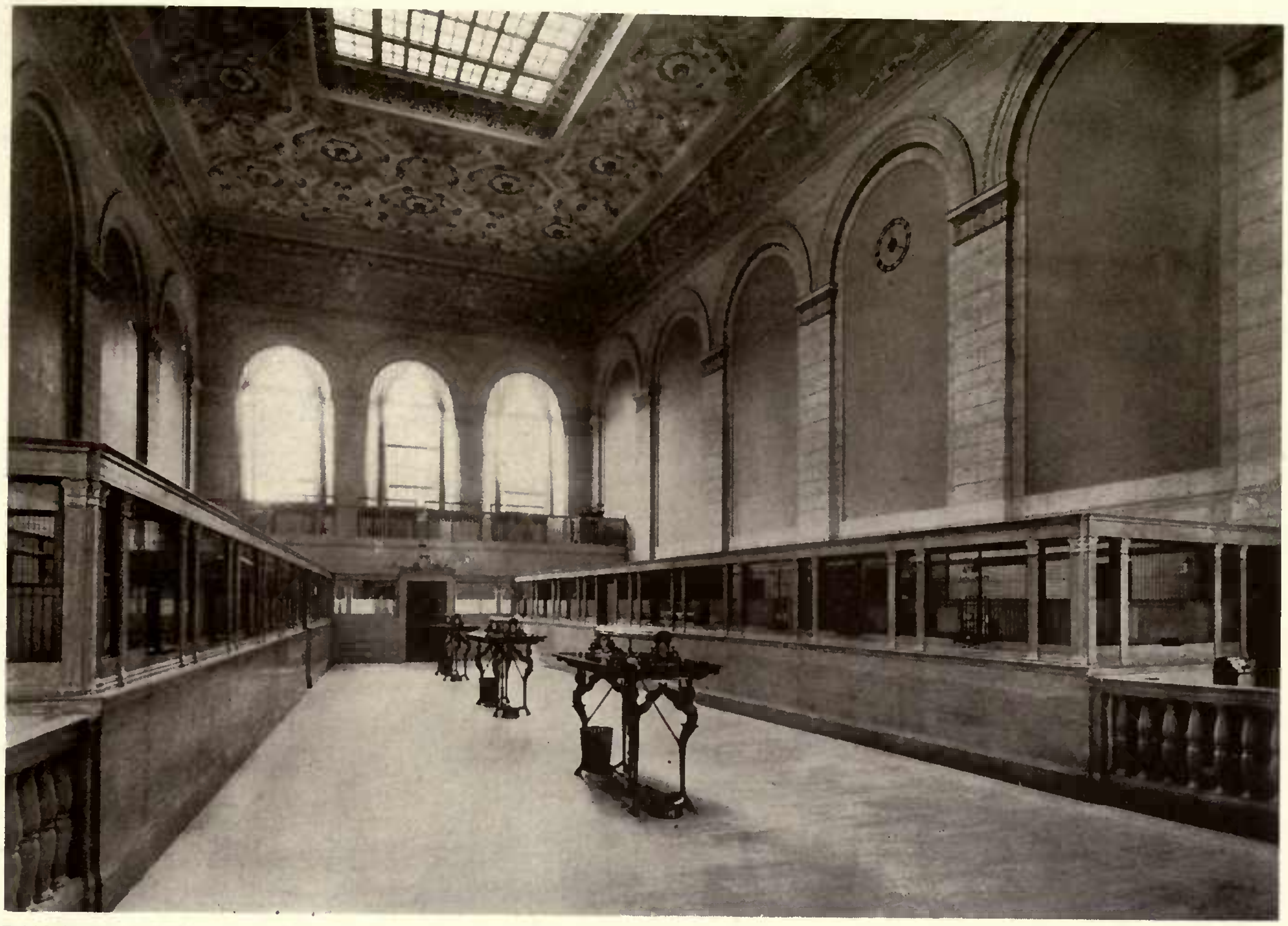
Dennison & Hirons, Architects.

MAIN ENTRANCE.

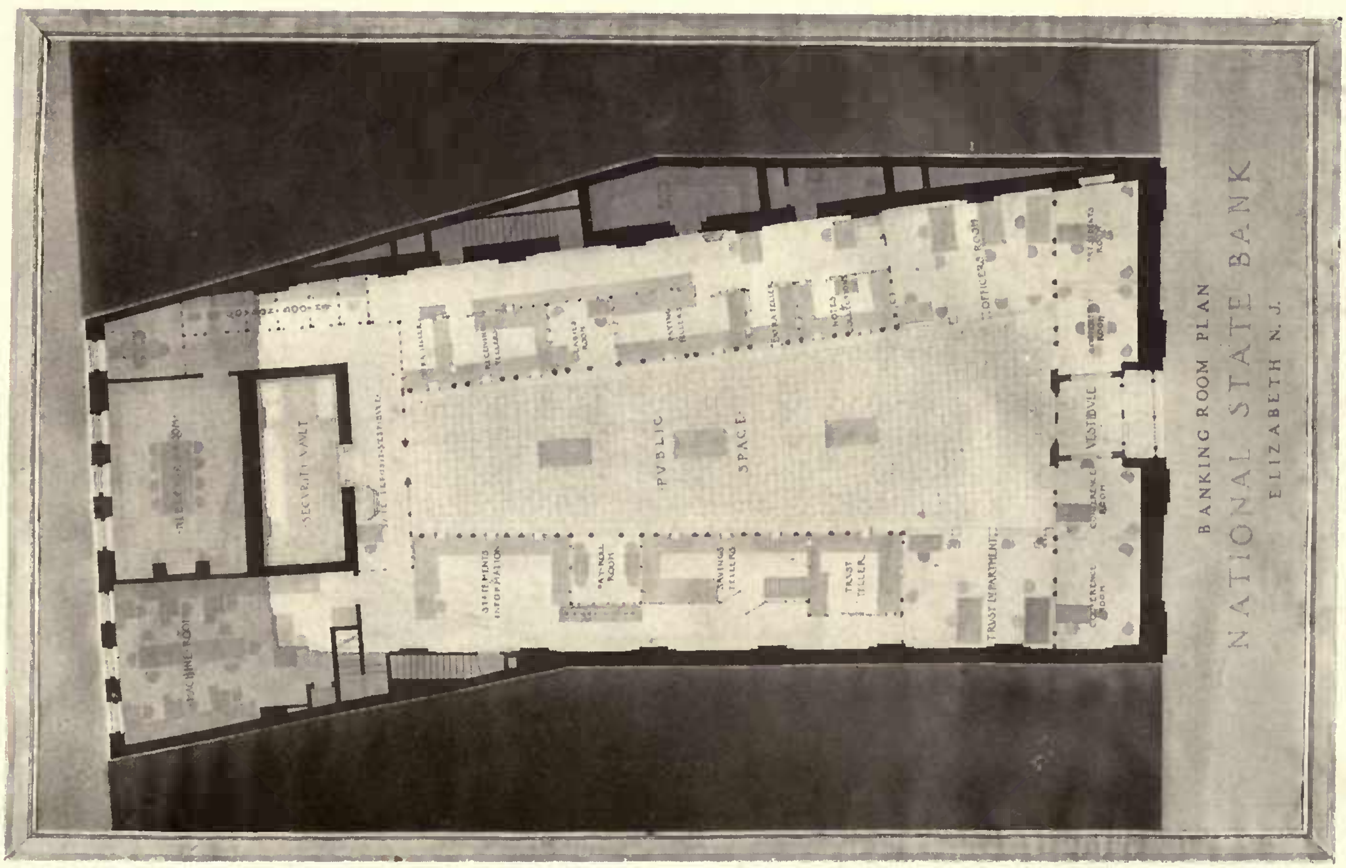
DOORWAY IN BANKING-ROOM.

Dennison & Hirons, Architects.

NATIONAL STATE BANK, ELIZABETH, N. J.

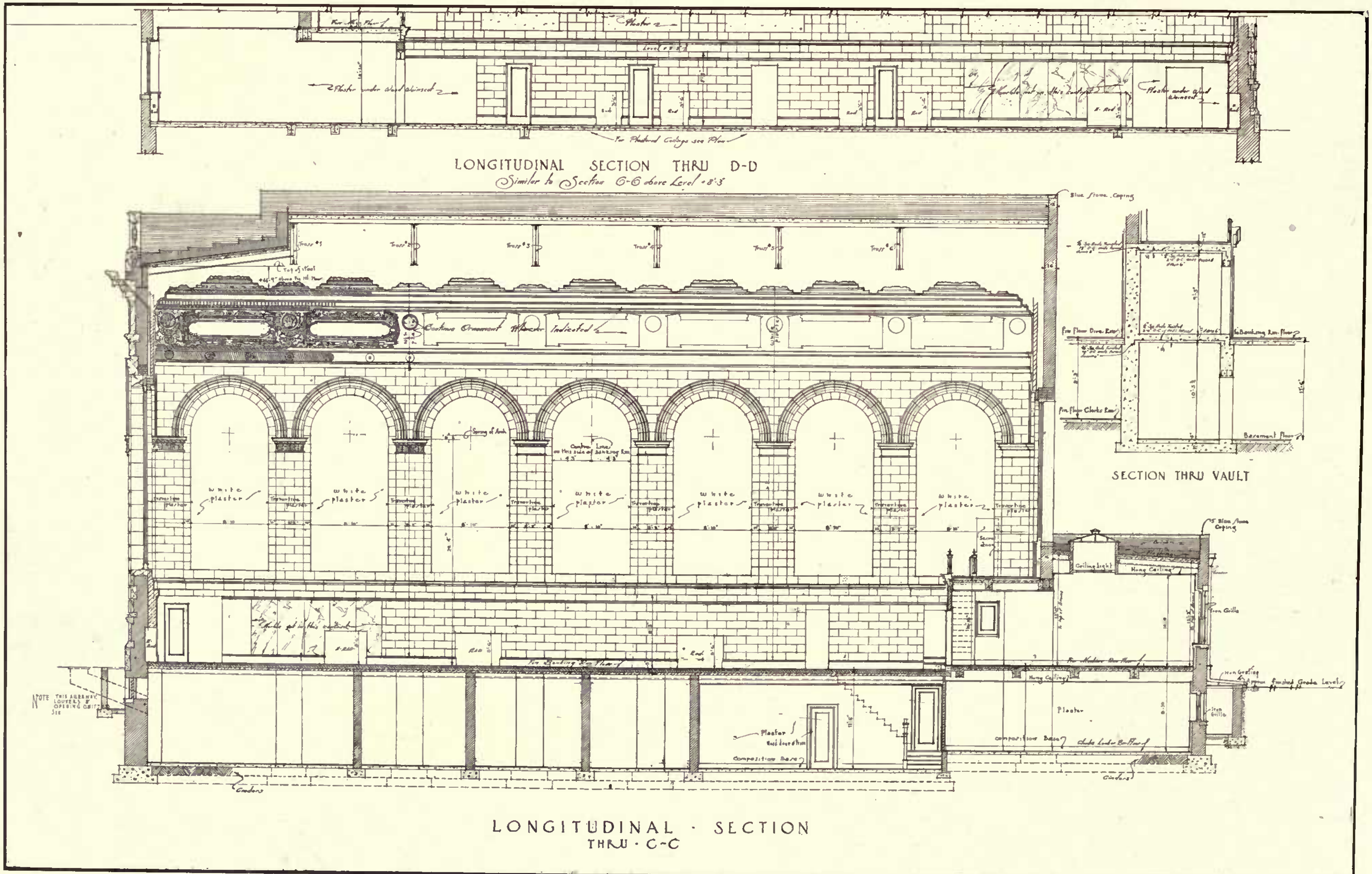


BANKING–ROOM.



NATIONAL STATE BANK, ELIZABETH, N. J.

Dennison & Hirons, Architects.



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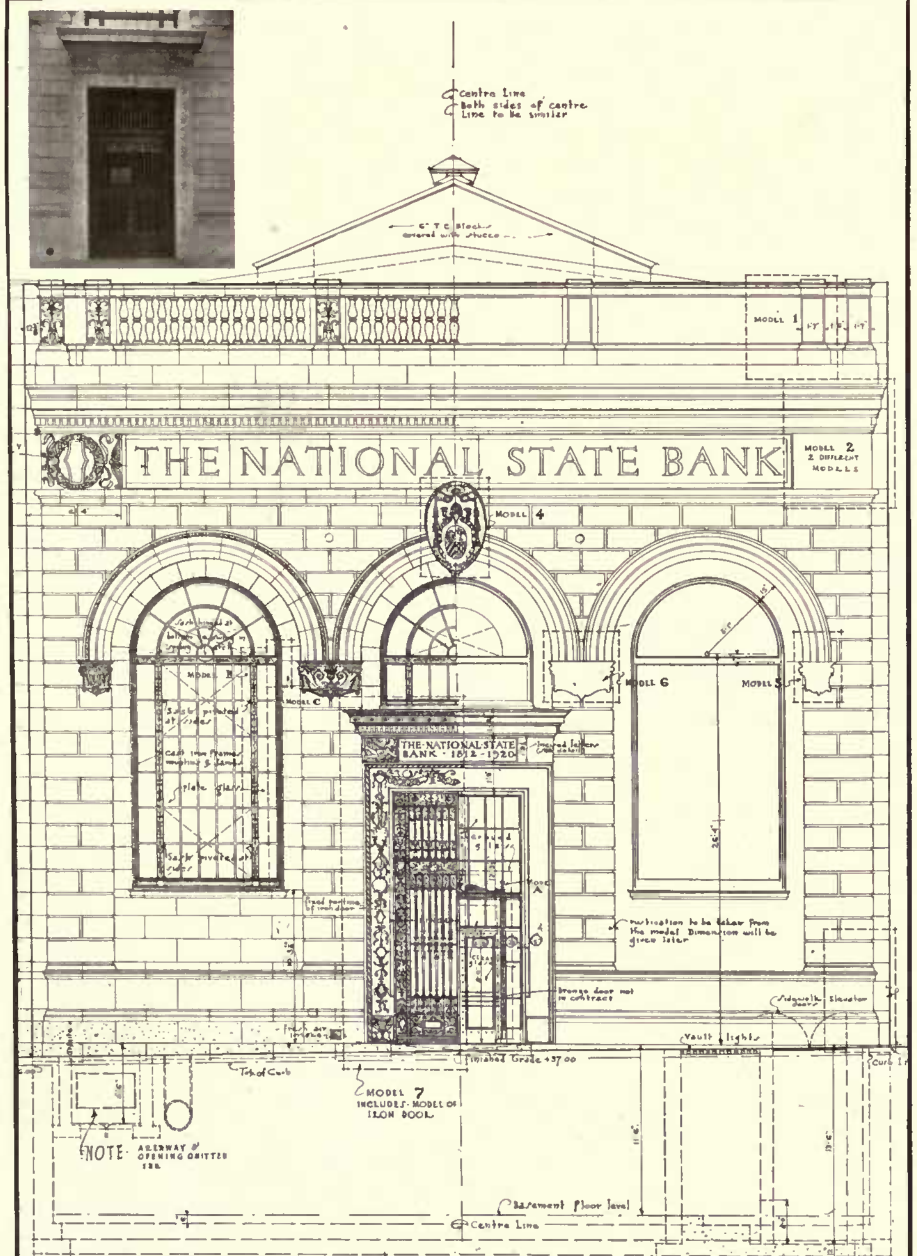

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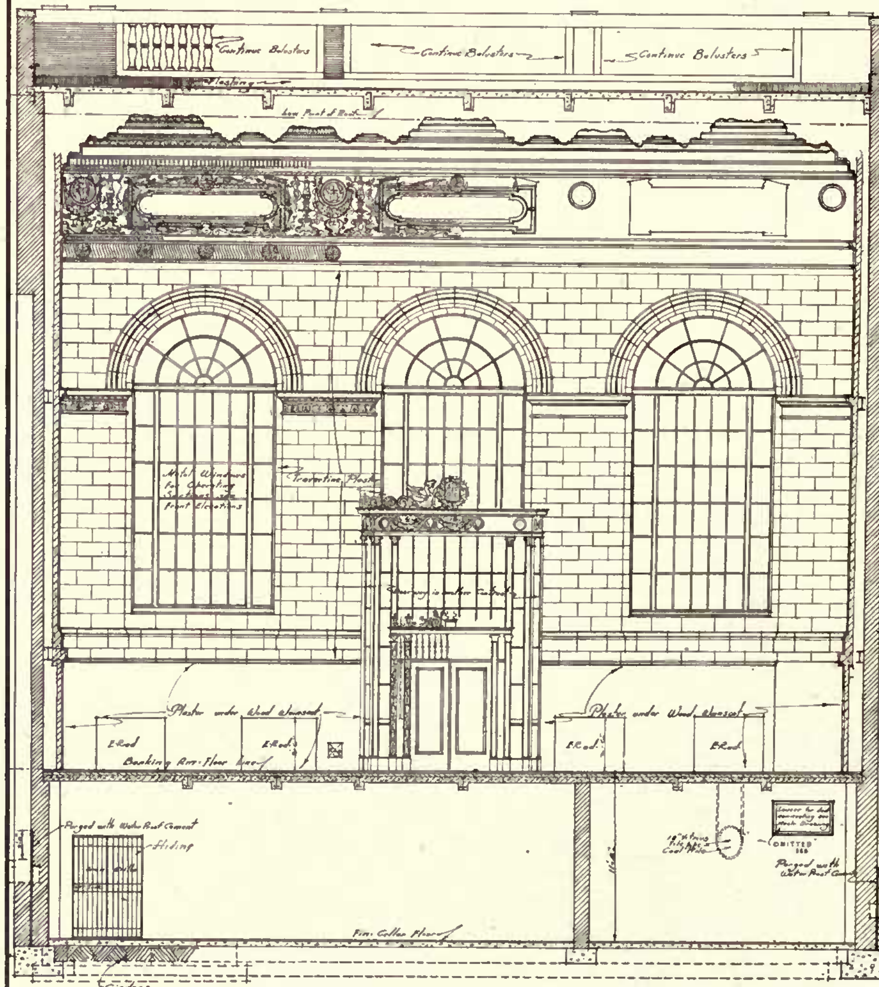
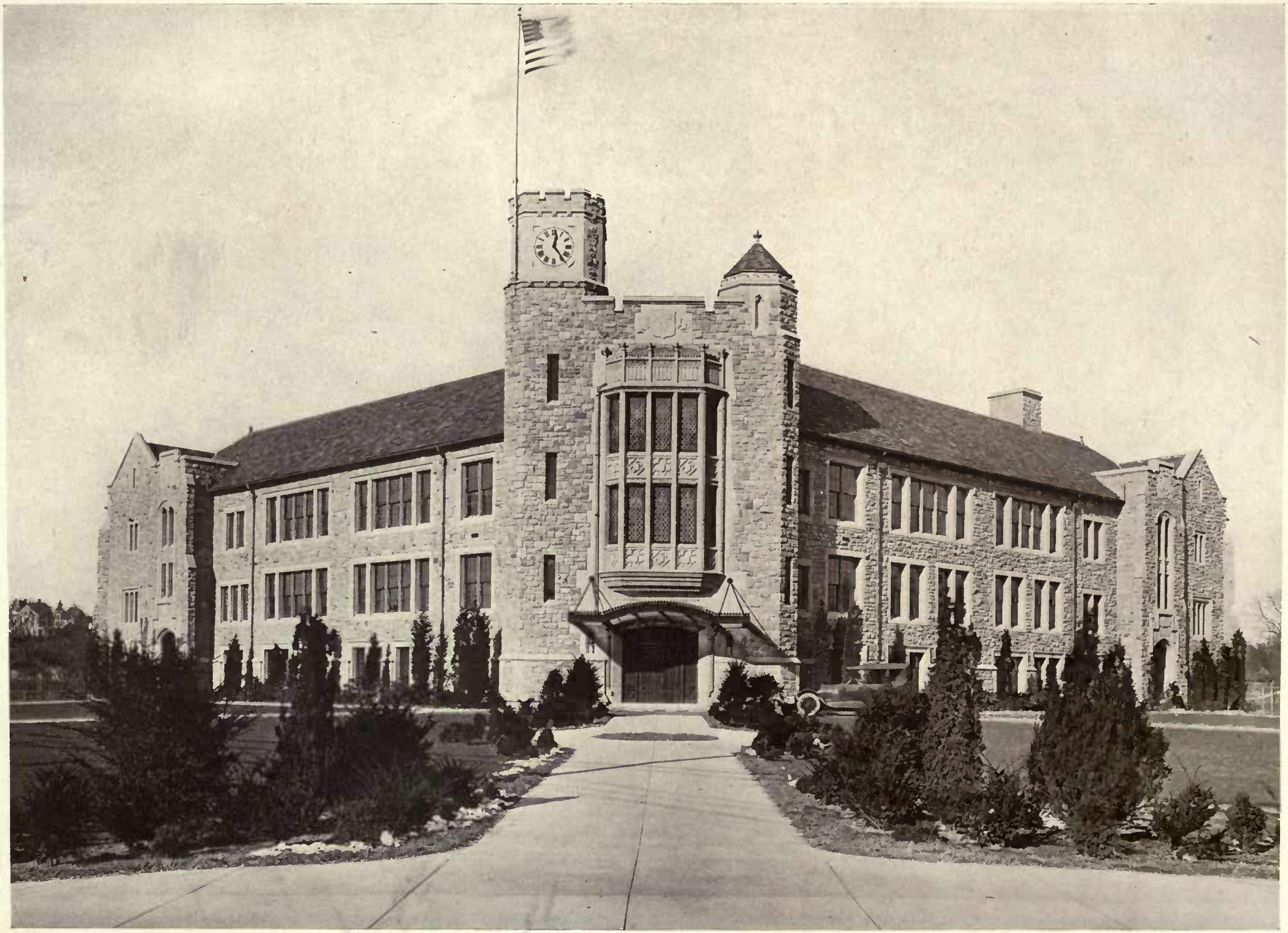


TRANSVERSE SECTION B-B

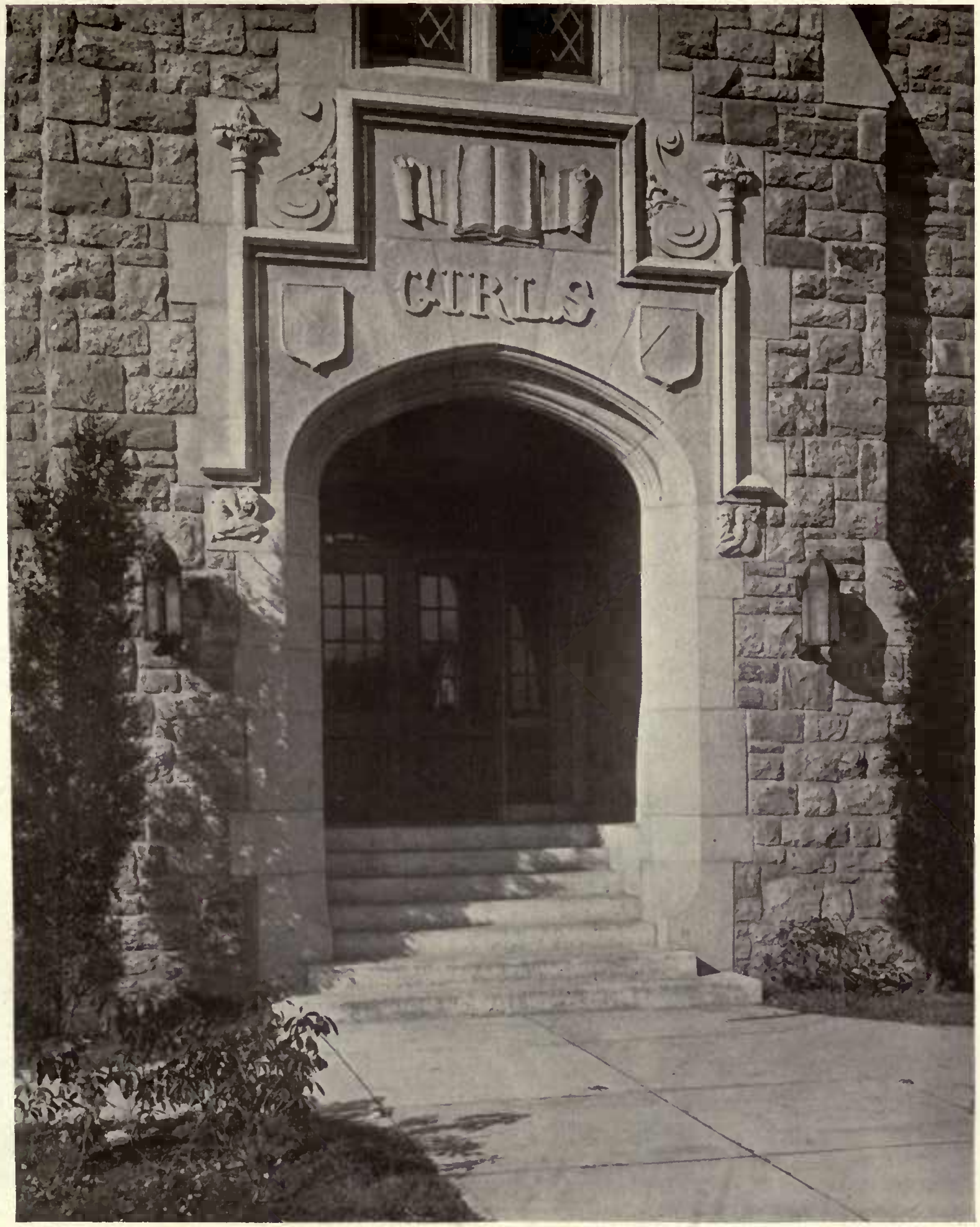
NATIONAL STATE BANK, ELIZABETH, N. J.

Dennison & Hirons, Architects.

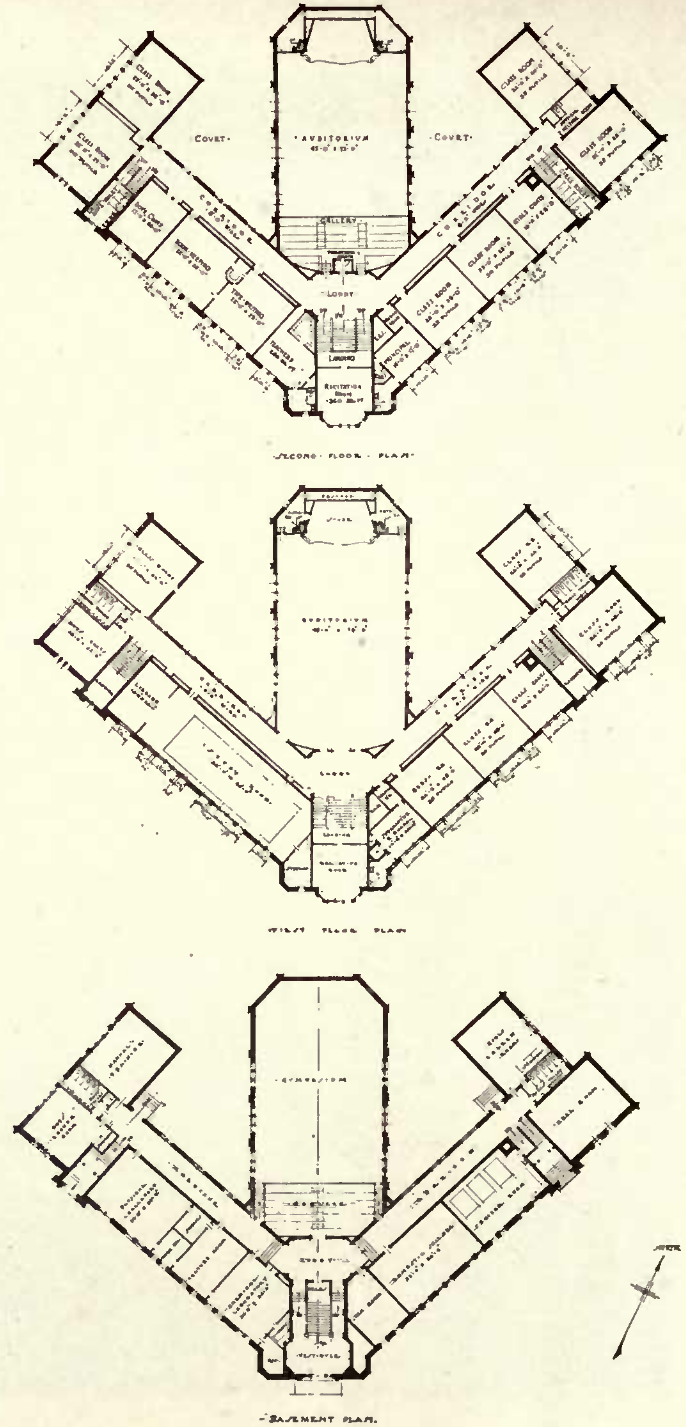


HIGH SCHOOL, PELHAM, N. Y.

Tooker & Marsh, Architects.



ENTRANCE DOORWAY.



PLANS.

Tooker & Marsh, Architects.

HIGH SCHOOL, PELHAM, N. Y.

HALL AND STAIRWAY.

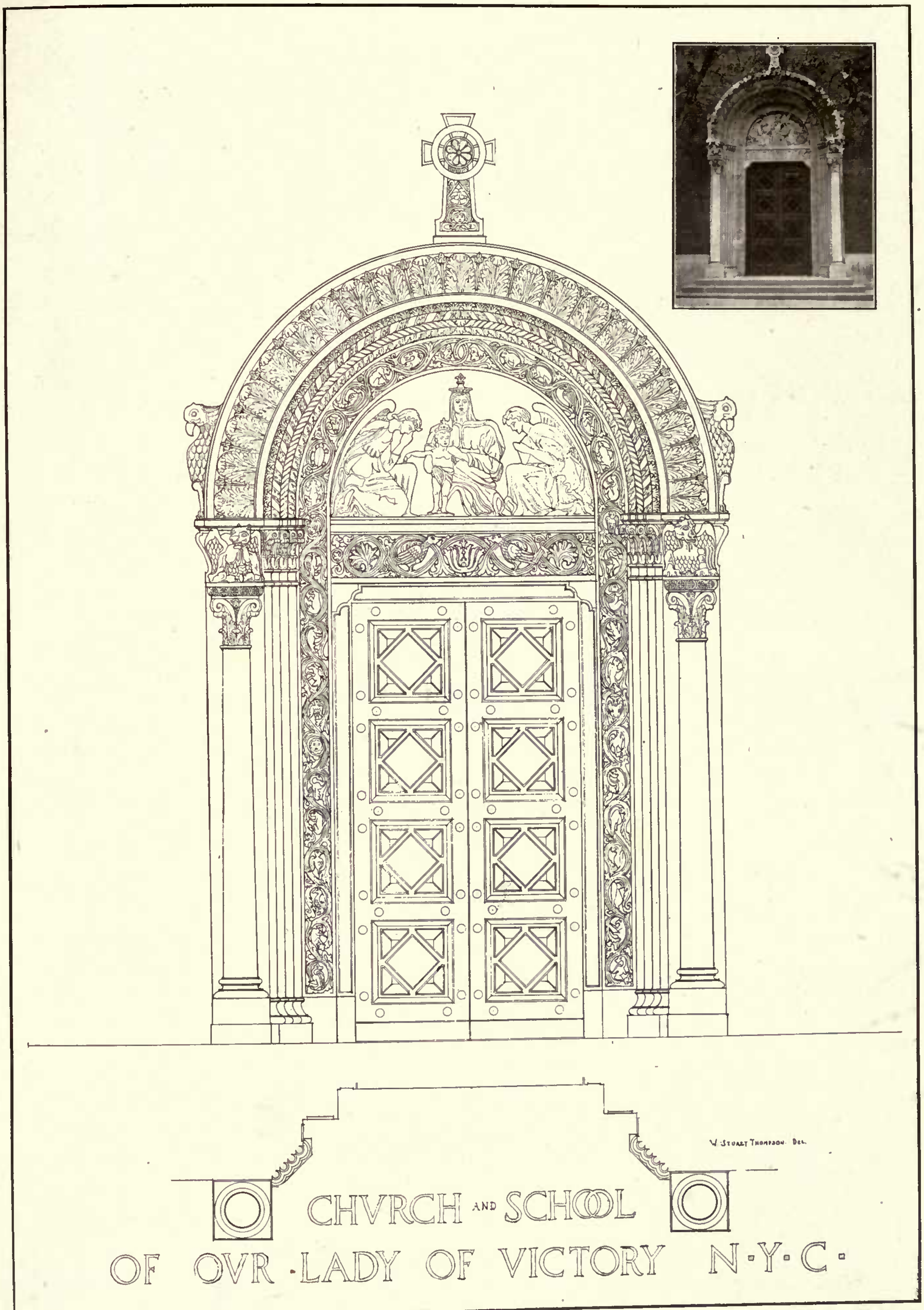
AUDITORIUM.

Tooker & Marsh, Architects.

HIGH SCHOOL, PELHAM, N. Y.

CHURCH AND SCHOOL OF OUR LADY OF VICTORY, NEW YORK.

John V. Van Pelt, Architect.



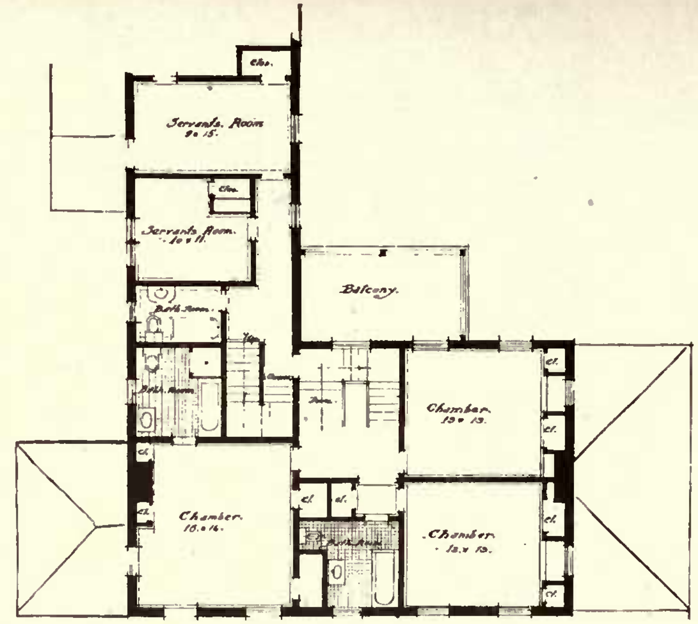
DETAIL OF CHURCH DOORWAY.

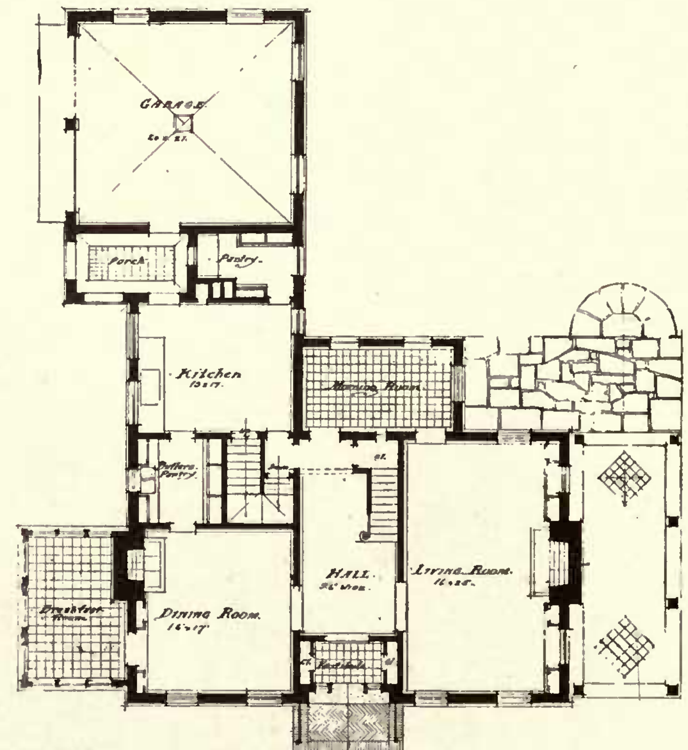
John V. Van Pelt, Architect.

Smith & Bassett, Architects.

HOUSE, HARRY TYLER SMITH, HARTFORD, CONN.

HOUSE, HARRY TYLER SMITH, HARTFORD, CONN.





FIRST FLOOR PLAN.

Smith & Bassett, Architects.

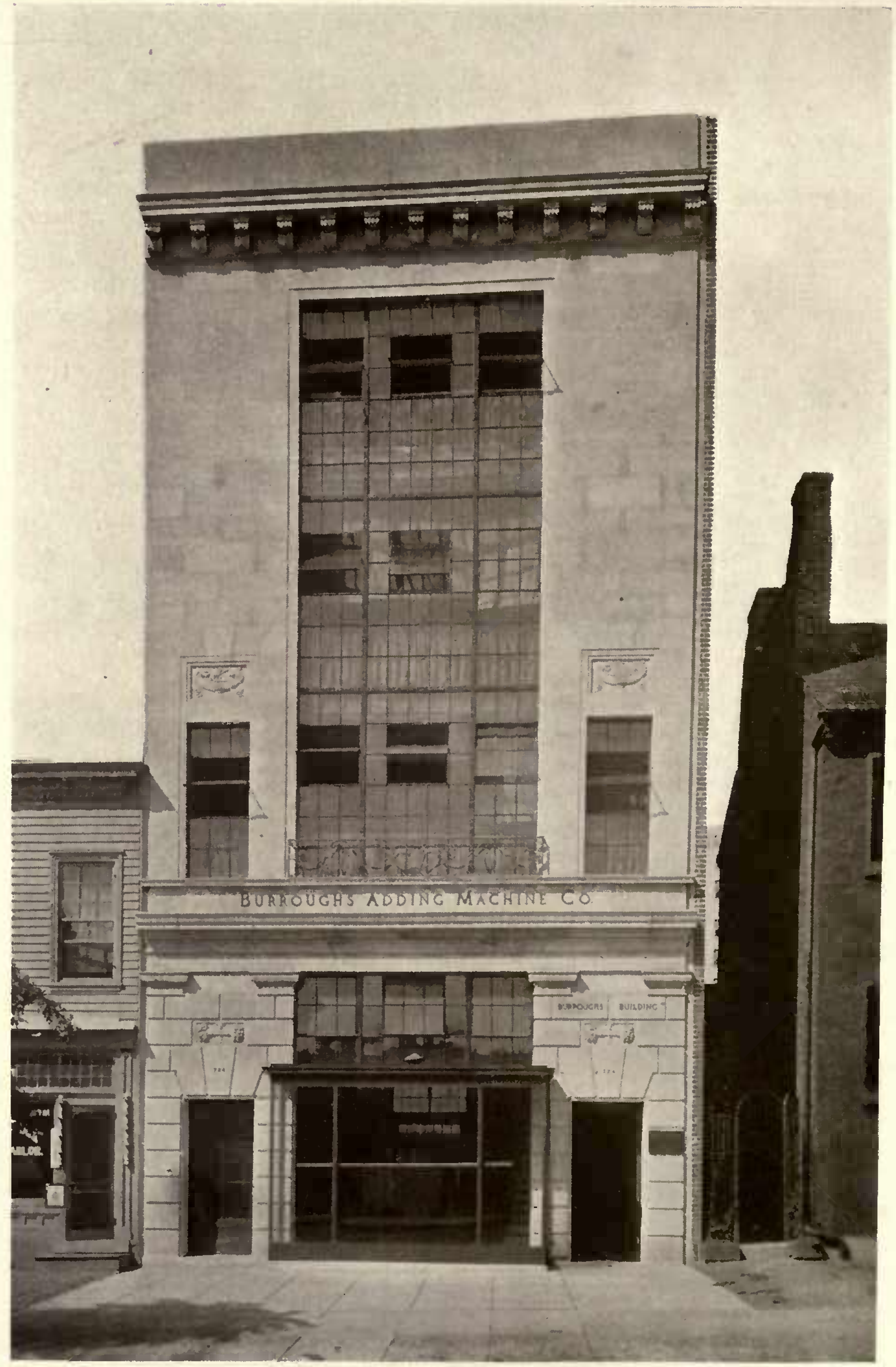
COLONIAL ARCHITECTURE of the CAROLINAS	DOORWAY - DATE-ABOUT-1804	18 MEETING ST., SOU. CHARLESTO - S.C.	MEASURED & DRAWN by J.A. ALTSCHULER

STORE AND APARTMENTS, 1145 CONNECTICUT AVENUE,
WASHINGTON, D. C.

STORE AND APARTMENTS, 1803 CONNECTICUT AVENUE,
WASHINGTON, D. C.

George Ray, Architect.

CARPENTER BUILDING, 1223 CONNECTICUT AVENUE, WASHINGTON, D. C.



BURROUGHS BUILDING, 724 17th STREET, WASHINGTON, D. C.

George Ray, Architect.

AUDITORIUM.

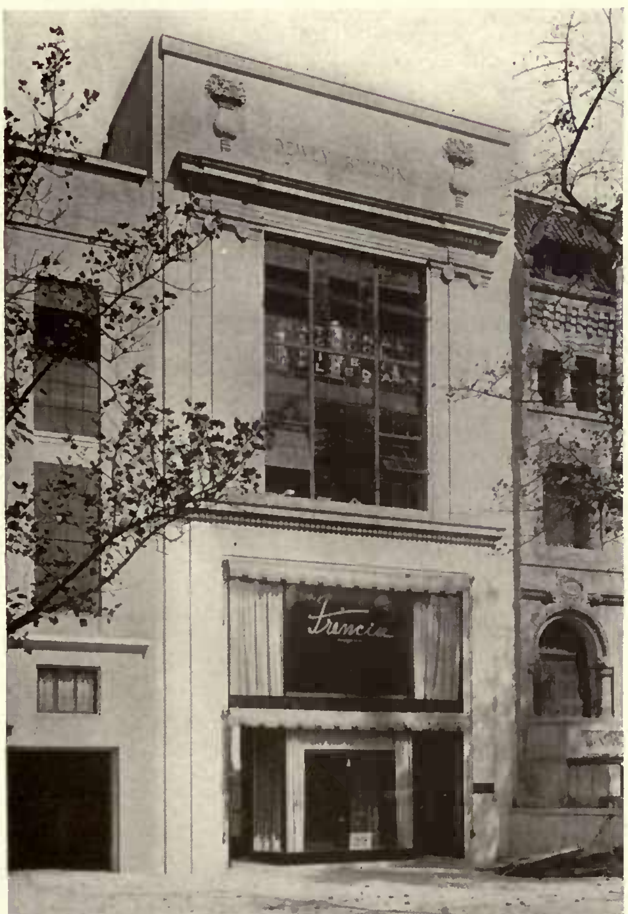
INTERIOR OF STORE.

H. C. Anthony, Architect.

BIBLE HOUSE, 5 EAST 48TH STREET, NEW YORK.

STORE AND APARTMENTS FOR MRS. MAUD LEMON, WASHINGTON, D. C.

REDMOND BUILDING, 1516 K STREET, WASHINGTON, D. C.

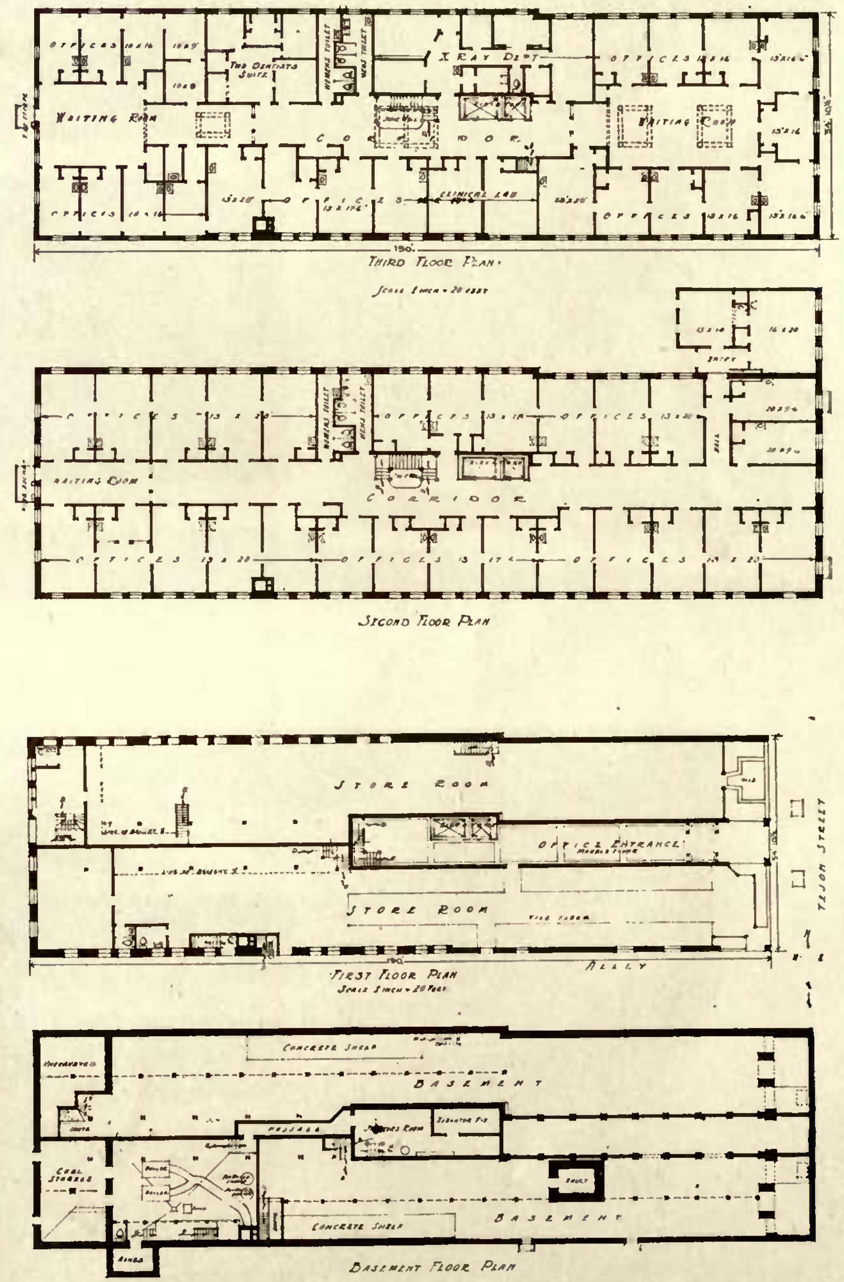


DEWEY BUILDING, 1747 RHODE ISLAND AVENUE, WASHINGTON, D. C.

STORE BUILDING, 804 17TH STREET, WASHINGTON, D. C.

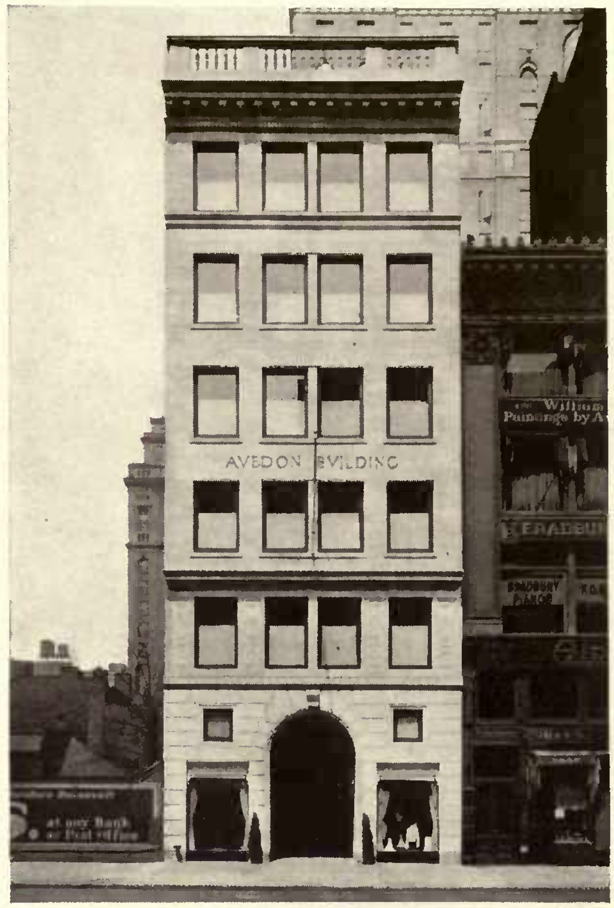
George Ray, Architect.

FERGUSON BUILDING, COLORADO SPRINGS, COLO.



MacLaren & Hetherington, Architects.

HORNPECK BUILDING (RETAIL SHOP), 59th STREET, NEW YORK. Augustus N. Allen, Architect.



AVEDON BUILDING (RETAIL SHOP), FIFTH AVENUE, NEW YORK. Harry Allan Jacobs, Architect.

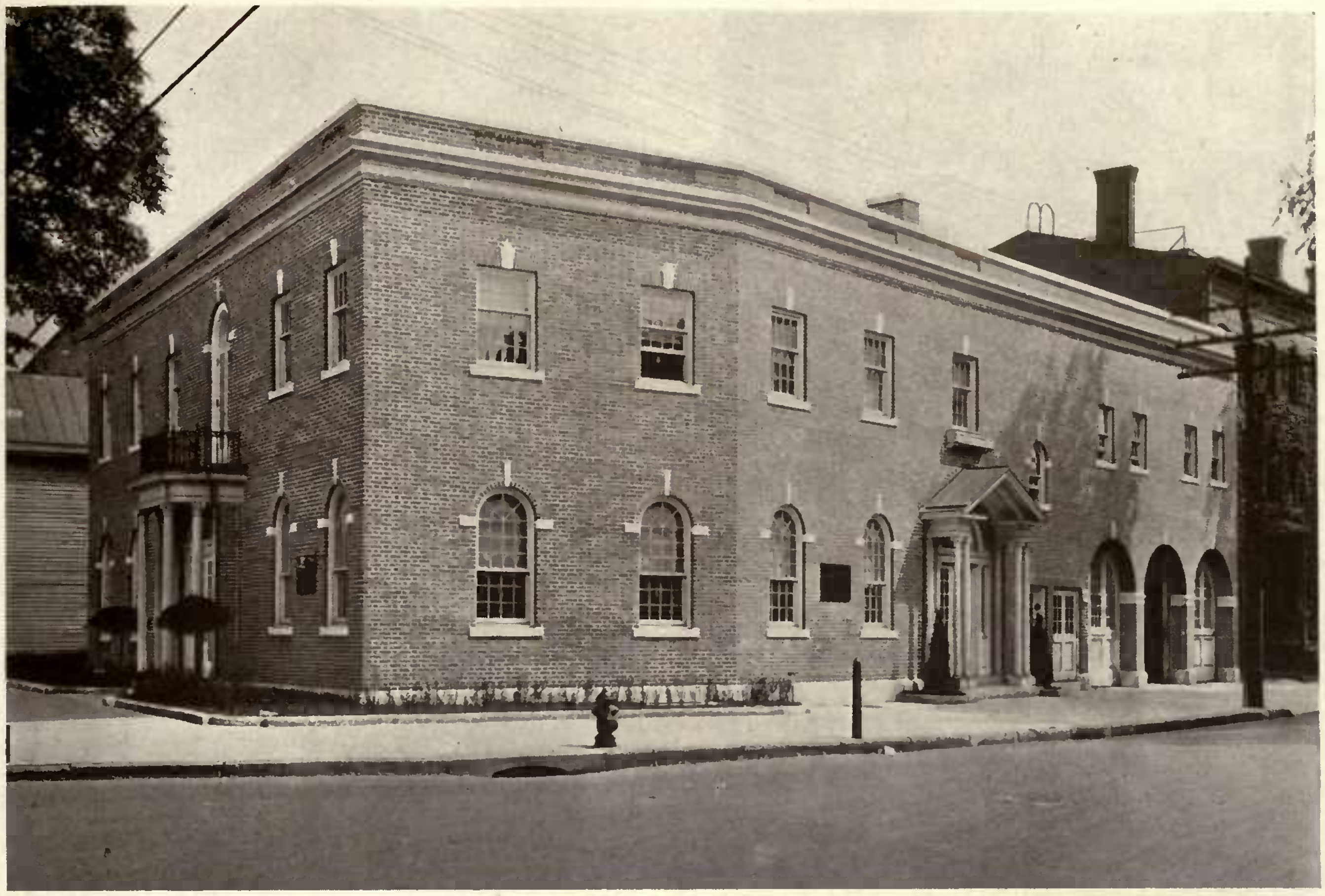
POST & FLAGG BUILDING (BANKING-HOUSE), BROAD STREET, NEW YORK. Geo. B. Post & Sons, Architects.

ROUMANIAN HOUSE (BANKING-HOUSE), 31 BROADWAY, NEW YORK. Irving S. Cobb, Architect.

DURYEA BUILDING, WASHINGTON, D. C.

OFFICE-BUILDINGS FOR B. F. SAUL, WASHINGTON, D. C.

George Ray, Architect.



BEECHER & BENNETT BUILDING (UNDERTAKING PARLORS), NEW HAVEN, CONN. Charles Scranton Palmer, Architect.

STORE, FISK RUBBER CO., ALBANY, N. Y. Fred T. Ley & Co., Inc., Architects and Engineers.

Art Gallery, Henry Reinhardt & Son, Fifth Ave., New York. John H. Duncan, architect.

Primrose house, East 52d St., New York. Ekin Wallick, architect.

Announcements

Felix Rasulo, architect, has moved from 139 Beech Street to 520 Proctor Building, Yonkers, New York.

Langley & Howland, architects, announce their removal from 118 King W. to their new offices in the York Building, northwest corner King and York Streets, Toronto.

We notice the change in the corporate name of Moline Heat to the H. W. Nelson Corporation, manufacturers of heating-ventilating equipment, Moline, Illinois. This company will continue under the same management to manufacture and sell the Univent and Moline Heat, but as two distinct and separate products. They solicit your future patronage and thank you sincerely for the many favors you have shown them in the past. H. W. Nelson is the president.

Samuel A. Hertz, architect, 15-17 West 38th Street, announces that his telephone number has been changed to Fitz Roy 4013.

We have received from the Trucson Laboratories, Detroit, Michigan, a valuable pamphlet on the "Science and Practice of Integral Waterproofing."

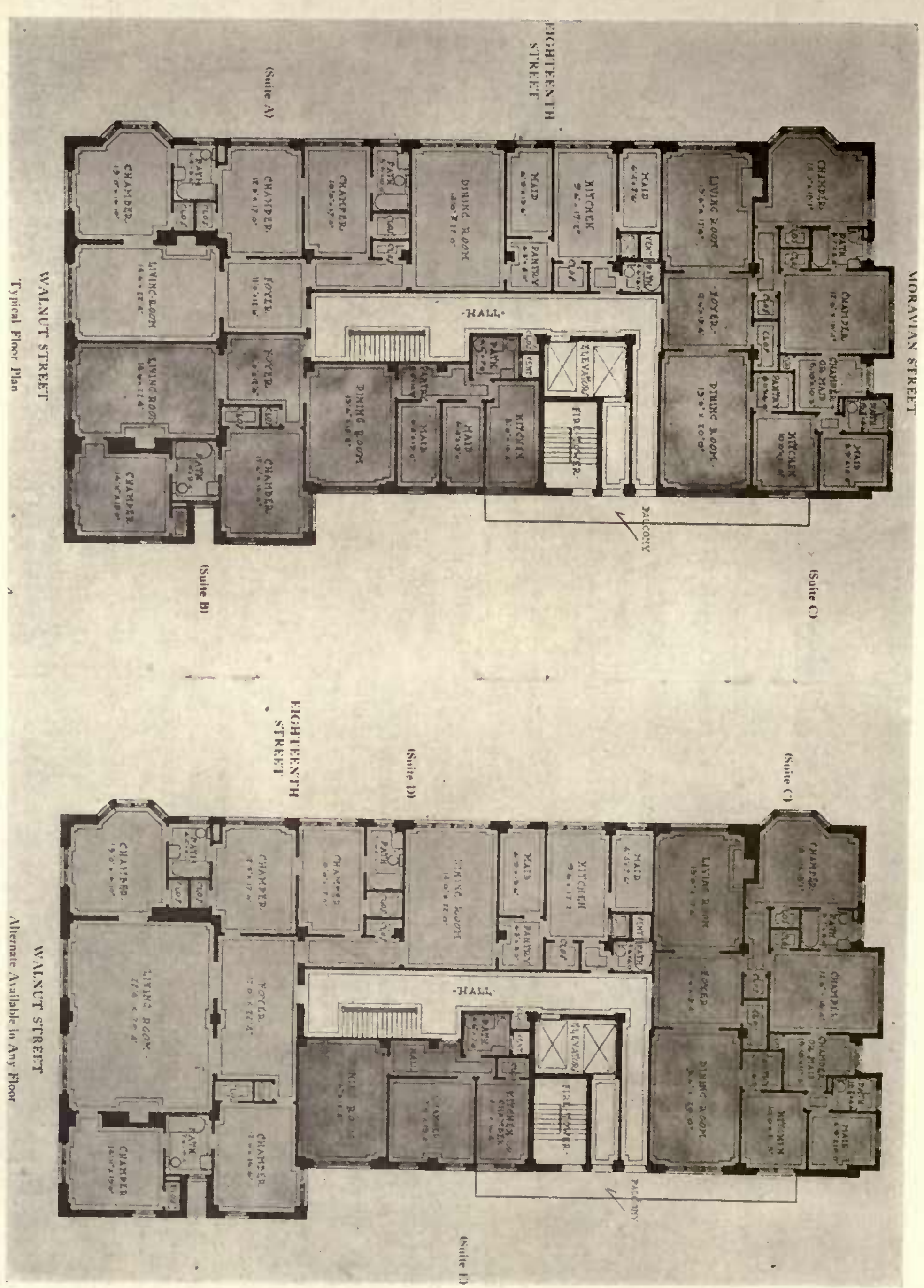
Architects will be glad to receive a copy of the attractive little pamphlet issued by the Hess Warming and Ventilating Co., of Chicago, showing illustrations of the Hess sanitary medicine-cabinet and lavatory mirrors.

Our readers will be interested in the new "Wodack" combination portable electric drill and grinder, which has been recently developed. It is used as a portable electric drill and also as a portable electric grinder. The new tool fills a need in those shops and factories where hand-drilling and grinding operations are performed, yet not enough of either to warrant the purchase of two separate machines. In designing this tool it was necessary to so construct it that by the use of one motor it would have the desired speed for drilling as well as the proper speed for grinding.

Haig's Etchings at the New York Public Library.—The Prints Division of the New York Public Library has arranged an exhibition of the etchings of A. H. Haig, who died in August last year, and of whose work the library has ninety-nine etchings and six drawings. The exhibition will be on view in the Stuart Gallery to the end of March.

Haig's work has, primarily, the double interest of architecture and locality. Himself an architect, he brought to the delineation of buildings an appreciation of structural qualities, and of a balance of parts that sets decoration into its proper place, without undue emphasis on sculptural details. But in his pencil studies he often drew such details with scrupulous care, studying his subject from various points of view before beginning to etch it. Haig's name is especially associated with ecclesiastical architecture. He delineated the cathedrals of Chartres, Amiens, Upsala, Barcelona, Bruges, Toledo, Seville, Rheims, Palermo, Canterbury, Peterborough, and Ulm, as well as Notre Dame of Paris, Westminster Abbey, Kirkstall Abbey, and St. Mark's, Venice. He often pictured the solemnity and magnificent grandeur of cathedral interiors, but, to cite Lewis Hind: "Sometimes he darts off to a scene of light and color and bustle, anxious over the composition rather than the architecture, as witness the Cairo series."

APARTMENT HOUSE, 135 SOUTH 18TH STREET, PHILADELPHIA, PA.



McIlvain & Roberts, Architects.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Architectural School, Columbia University, New York

Article XVII

LABOR-SAVING DEVICES FOR THE HOME

The Demand

THE need for labor-saving devices to help in housekeeping is more evident in the small house than in the larger house, although the cost of such machinery often prevents its installation in the former, whereas in the latter it is more to be found, since the person who builds a large house is apt to have more funds to draw upon. Yet labor-saving devices really belong to the small house, for the large house is still run by the servant, but the small one is kept by the lady of the house. She rightly objects to working in the old-style kitchen, which was very large and ugly, and the useless up-keep of many rooms that are really not needed is not to her liking, so that in practice the small house is in a way a labor-saving device in itself, since it reduces the amount of house to be kept, and makes the kitchen small and attractive. Then, frankly, labor-saving machinery is more becoming to this house which is in itself designed to save labor, and money wisely spent upon such devices is by no means out of proportion to the cost of construction, even if in direct comparison it shows a larger percentage ratio to the building cost in the small house than in the large house.

The fundamental needs which demand mechanical power in place of brawn can be classified into the following:

(*a*) Machines for cleaning.
(*b*) Machines for preparation of food.
(*c*) Machines for moving objects about the house.
(*d*) Machines designed to watch over various household cares.
(*e*) Machines to simplify and make pleasant the toilet.

But before such machines could be developed to a point of usefulness, some source of power had to be found which could be used by the average family. This to-day is electricity. If the house cannot tap in on some public generating plant, then it is not at all too costly a proposition to install a private generating plant run by a gasolene-engine. The rapid spread of public-service wires throughout the country and the increasing demand for private generating plants is evidence that where money permits, the people are ready to take advantage of the power of electricity to reduce the labor of keeping house. This electric energy which is being more widely distributed has called forth invention after invention of labor-saving machinery. It would not be hard to compile a list of some five hundred or more such machines, good, bad, and indifferent. Pick up any magazine and glance through the advertisements, and a fairly comprehensive list of housekeeping machines can be made, or look through some one of the popular scientific magazines and page after page will be found devoted to new inventions along this line. For example, in the latter, here is a small list made from a page of one of these magazines: A combined electric toaster and heater, a special brush on a long wire handle for cleaning the drain-pipe of the refrigerator, an electric clothes-wringer which has rollers soft enough not to break the buttons, a combined crib and wardrobe, the latter being under the mattress, a dust-pan which is held in position by the foot, a counterbalanced electric light that can be hung over the back of a chair and an electric water-heater to fasten to the faucet.

Machines for Cleaning

Under this classification ought to be included machines which reduce the need of cleaning, for they accomplish the same results, but in a negative way.

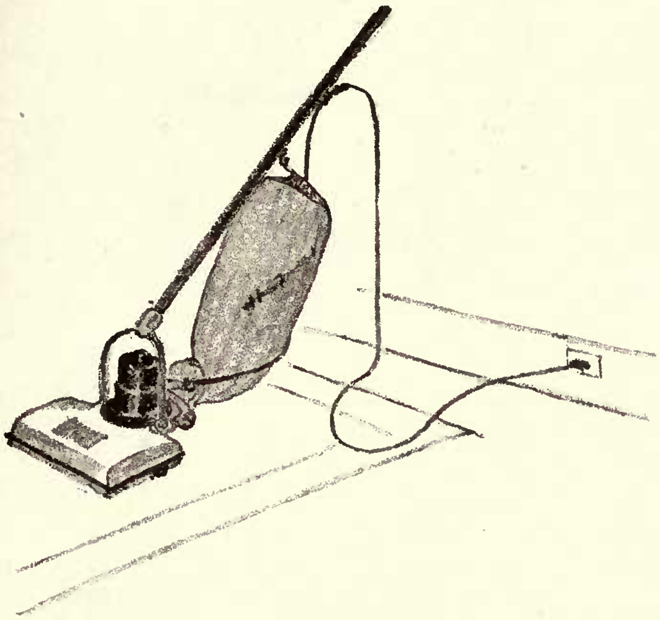
One of the dirtiest and meanest jobs about the house is the sifting and shovelling of ashes from the furnace. The light ashes are bound to be tracked through the house on the feet, or float in the rising warm air to the rooms above, while the sifting process is going on. The continued need of removing ashes and putting more coal in the furnace to make more ashes often disgusts the housekeeper so much, that the apartment-house looks very attractive, for here this dirty work is done by the janitor.

Now the modern oil-burner, suitable to heat the furnace of a small house, represents a real labor-saving device, because it eliminates this problem of the ashes, but it requires electric power to make it practical, since a mechanical movement is necessary to properly atomize the oil for burning. Looking impartially at the latest inventions along this line that are now on the market, one cannot help but admit that they are highly desirable from the labor-saving point of view, if not always from an economical one. The easy control of the fire of one of these oil-burners is admirable. In mild weather the flame can be turned down quite low, burning perhaps only twelve gallons of oil in twenty-four hours, but if the weather suddenly becomes cold the flame is easily advanced to meet the conditions. No extra shovelling of coal is required in cold weather, and the worry of banking the fire in the evening is eliminated.

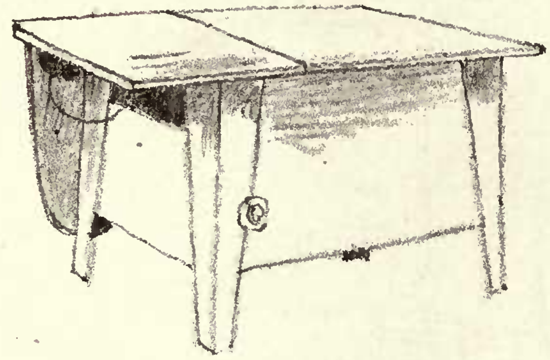
But one must not forget the various improvements which have been made in coal-burning furnaces to eliminate the ash and coal shovelling labor as much as possible. There is the self-feeding boiler, which has a large magazine of coal which can be filled once a day and which automatically supplies the fire with fuel as it burns up. Then, too, there is the large ash-pit in which the ashes may accumulate for some time before removal is necessary, or the revolving ash-collector sunk into the floor below the furnace into which the ashes may be dropped and taken out in cans.

For cleaning purposes, one must recognize the enormous grip that the vacuum cleaner has had on the popular mind, and nearly every housekeeper would own one if money permitted it. Perhaps the installation of pipes throughout the house for a central cleaning-machine in the cellar is a little too expensive for the small home, but certainly electric

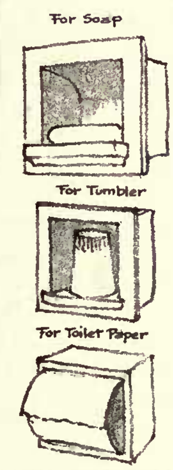
(*Continued on page* 96.)



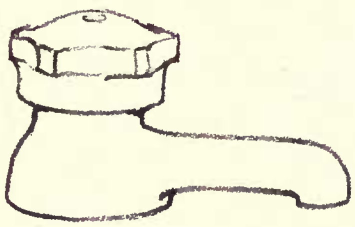
THE·PORTABLE VACUUM·CLEANER



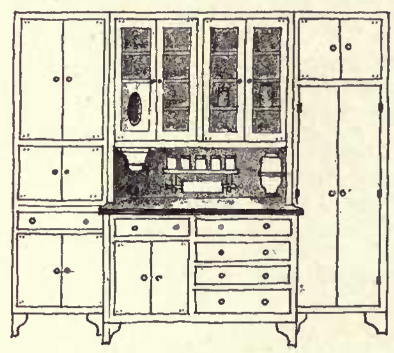
DISH WASHER AND TABLE



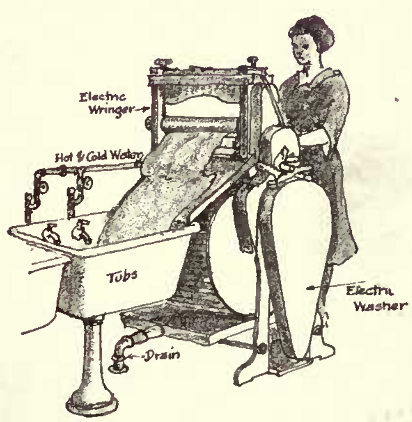
To be built in the tile wainscot

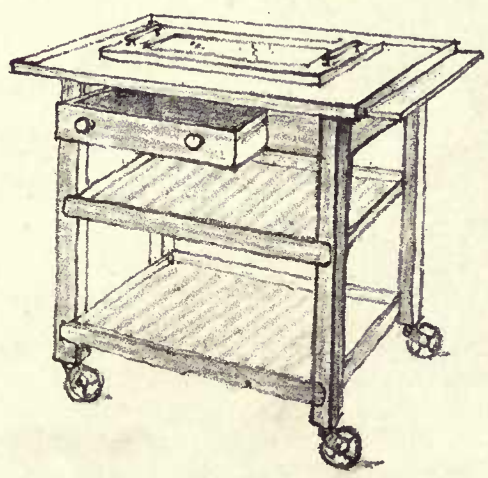


White Enameled Faucet



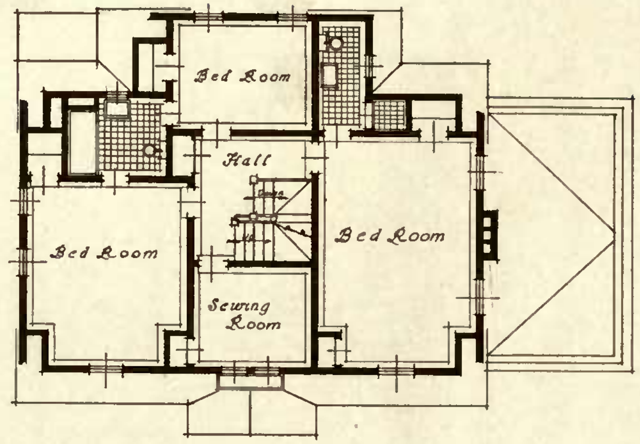
– KITCHEN DRESSER OF WHITE ENAMELED – · STEEL –



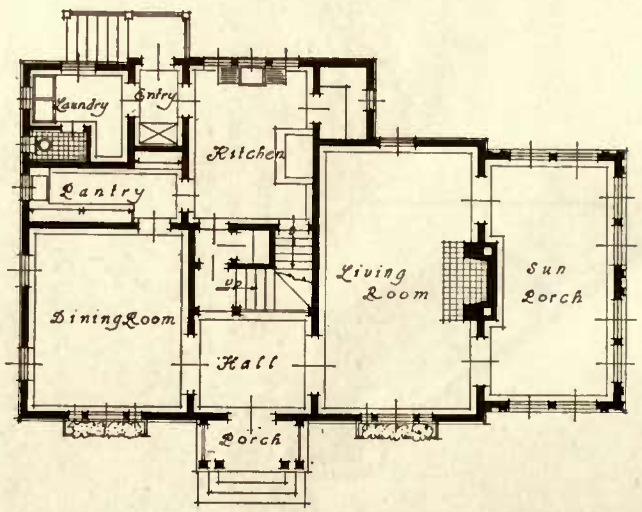


~ A·TABLE·SERVICE-WAGON –

ENTRANCE DETAIL, HOUSE, GEORGE GIBSON, MT. VERNON, N. Y.



~Second Floor Plan~
Scale 0 5 10 feet



~First Floor Plan~

S. A. Guttenberg, Architect.

HOUSE, GEORGE GIBSON, MT. VERNON, N. Y. S. A. Guttenberg, Architect.

(*Continued from page* 92.)

base plugs should be located in the rooms to which the portable type of cleaner can be attached. Such outlets should be placed in central positions in order to permit the moving of the machine to all parts of the various rooms.

The laundry should be equipped with electric outlets to which an electric washer can be plugged. These machines usually require about 300 watts. Electric irons require about 600 watts. If laundry labor-saving devices are to be bought as a complete equipment, a small fortune can be spent upon them, for there are electric wringers, electrically driven mangles for ironing flat work, a special ironing-board with electric-iron attachment and electrically heated clothes-driers. A plan of a well-equipped laundry is shown in the Illustration.

If we consider the machines used in the kitchen for cleaning purposes, a considerable list can be made, but the gas and oil stove and fireless cooker should not be forgotten, since they accomplish cleaning in a negative way, for they eliminate the dirt and ashes of the old-fashioned coal-range. Then, too, the automatic gas water-heater, and also the oil water-heater, gives the best material for cleaning that is known to mankind: hot water. But as electricity becomes more available we have the electric stove and the electric water-heater, which is superior to the gas and oil heater, as far as labor-saving is considered. Then there is the electric dish-washer, which performs all the washing, rinsing, and drying operations. The dishes and other tableware are securely held in removable racks while being washed, thus preventing breakage. When not in operation this dish-washer can be used as a white-enamel-topped kitchen-table. One must not forget the electric silver-polisher and knife-grinder and other smaller instruments for cleaning that can be operated by a small motor.

Machines for the Preparation of Foods

Machines of this kind include a great variety of small inventions intended to safely store the food, prepare it for cooking, and cook it. There is the small electric refrigerator, the thermonor which keeps foods chilled by evaporation of water, the ordinary ice-box, with its special door to put ice in from the outside, the special receiving-box in the wall into which the milkman can place his milk bottles in the morning or the butcher his meat. Then for the small house is the very important kitchen-cabinet with its special place for the keeping of flour, sugar, dish pans, and a hundred other things that are needed to be handy at the time of preparing the food. Electrically operated coffee-grinders, meat-choppers, bread-mixers, egg-beaters, toasters, coffee-percolators, chafing-dishes, samovars, frying-pans, tea-kettles, radiant grilles, and other similar devices are but a few suggestions of the multitude of inventions actually on the market and found practical as labor-saving machines. Why should one sweat at the brow on a hot summer day freezing the ice-cream when an electrically driven motor can do the same work at the cost of a few cents? Why should one swelter in the hot kitchen during the jam and jelly making season when an electric fan can give the necessary cooling breeze, and the electric stove apply the heat more to what it is cooking than to the surrounding atmosphere? Of course the answer is that the cost of such equipment is too high, but we are gradually learning how to make these articles cheaper, and also learning how much energy they save us. Old traditions are breaking down in the kitchen, and the new machines are accepted more readily than they used to be. No longer does the younger generation think that what was good enough for father or mother is good enough for it. Grandmother used to wear her fingers down peeling potatoes and carrots, and stain them black, but daughter prefers to use a simple scraping device of hard stones set in a waterproof substance which acts like rough sandpaper upon the skins of the vegetables, and then grandmother used to chop meat in a bowl, but now it is put in at one end of an electric grinder and comes out hash at the other. The older generation of cooks were not attracted by labor-saving devices, but the point of view to-day is different. That is the reason that the small house is attracting more buyers to-day than formerly, for its small up-keep and its small and cheerful kitchen is means of escape from too heavy household duties.

Machines for Moving Objects About the House

The electric dumb-waiter belongs to this class, but it is not installed in small houses very often. However, every one can afford the clothes-chute which guides the dirty clothes down to the laundry. The table-service wagon is a very convenient help in serving a meal and removing the dishes when there is no maid to wait upon the diners. Then there is the china-closet which opens through to the kitchen from the dining-room. The dishes are washed in the kitchen and placed in the closet, and at the next meal they are taken out from the dining-room side without waste of steps. The old ash-can need not be lugged out of the cellar if a small telescope hoist is installed, and the coal can be put into the cellar through a metal coal-chute instead of through the window. Wet clothes from the laundry can be hung out of the window on a revolving dryer without going out into the yard, or placed in an electric dryer in the laundry on rainy days. The transportation of small objects about the house can be very much reduced if machinery for this purpose is installed in the beginning. Most people think it is worth the price, and as soon as they see a way to paying for it, they are certain purchasers.

Machines that Automatically Keep Watch

There is no need of getting up at five o'clock in the morning to turn the draft on in the furnace so that the house will be warm by breakfast. An electric thermostatic control can be made to do this, and in fact it can be regulated to keep the house in good temperature all the day. It is not necessary to light a fire to have hot water if an automatic gas-heater is next to the boiler, which lights the gas with a pilot-light when the faucet is turned on or when the temperature gets below a predetermined number of degrees. One does not need to worry about burning the roast in the oven if an automatic clock-timer is on it which turns off the gas after the meat has cooked the correct number of hours. Food in a fireless cooker never worries the housekeeper, for it will not burn, and she knows it will be ready to serve when taken out. She does not have to stay home to let the delivery boy in with the vegetables, for he can put them into a small metal box built into the wall, which has a door that permits him to put his goods in but does not permit any one getting an arm into the house, and the iceman can deliver ice without calling her to the door. And so it goes; each new invention along this line removes the need of thinking of the small things about the house and of being continually on hand and a slave to them.

(*Continued on page* 106.)

Power-House, Naval Torpedo-Station, Newport, R. I. C. W. Fairweather, Architect.

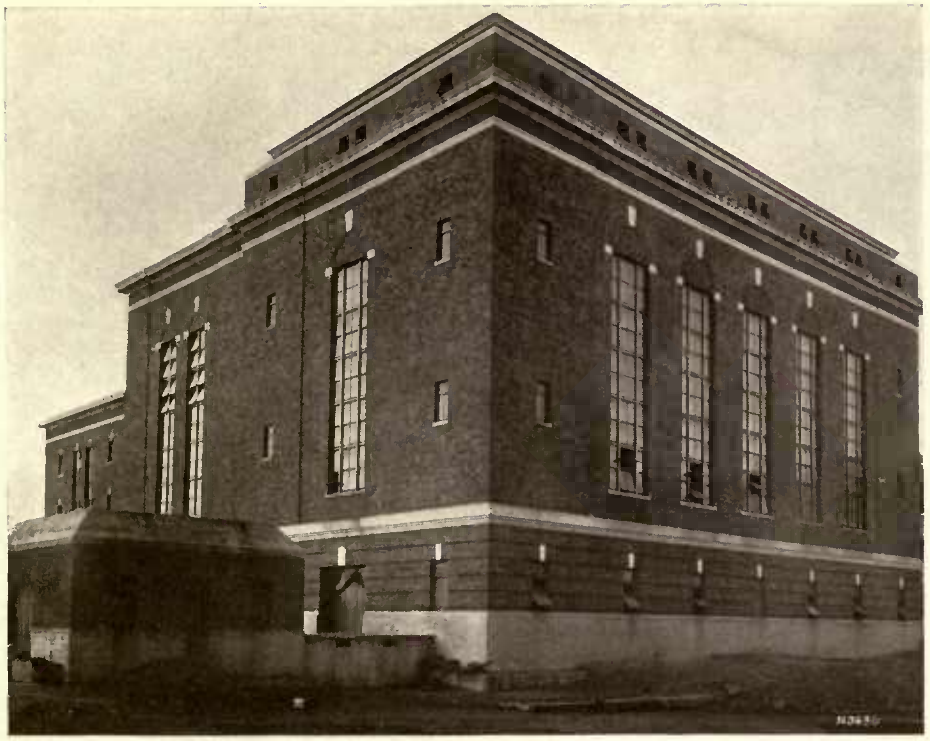
Power-House for the Naval Torpedo-Station, Newport, Rhode Island

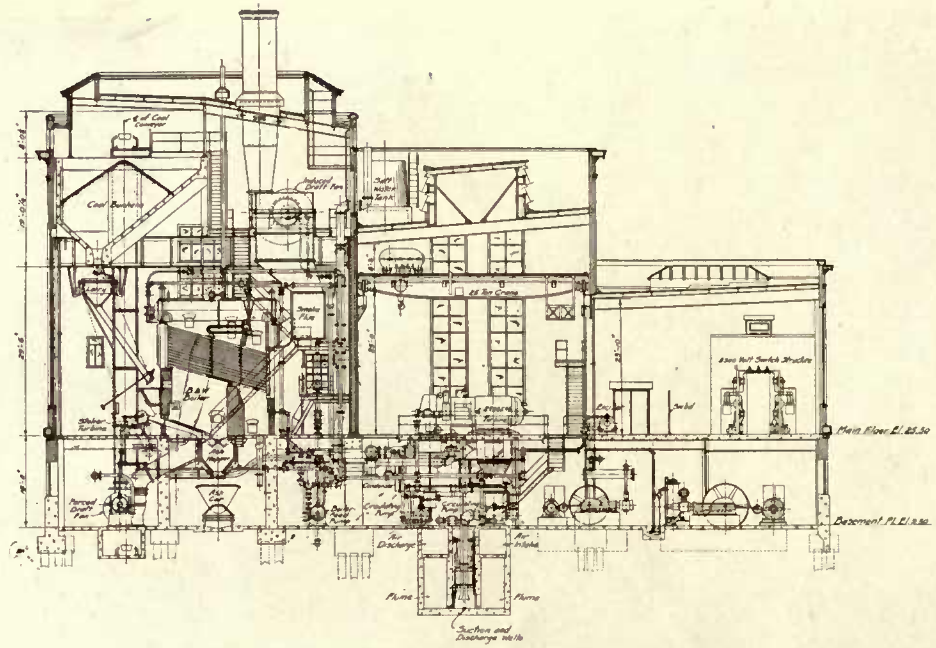
PERHAPS one of the most difficult problems for the architect of to-day is the design of the industrial building. Fifteen or twenty years ago, when steel sash were not in vogue, the designer had a fairly free scope in working out the proportions for this class of work. And the result was lamentable. The old-fashioned factory was usually sturdy enough in construction and sometimes happily conceived from the point of view of exterior proportion, but it was poorly lighted and badly ventilated, and was a poor place for the housing of workers and the manufacture of goods. Then the days of steel sash arrived, and manufacturers offered light frames and lots of glass, and the essential sanity of the idea caused the evolution of the modern factory which usually consists of bays on about 20-foot centres—because the steel work on such centres works out economically—and of the 20 feet, about 16 or 17 are devoted to sash. And we dress the building up with a cornice and a base, and put a little ornament in the brick spandrels and a touch of cut stone here and there, but when we are all through, we feel rather prouder of the practical efficiency of the modern factory than of its æsthetic qualities.

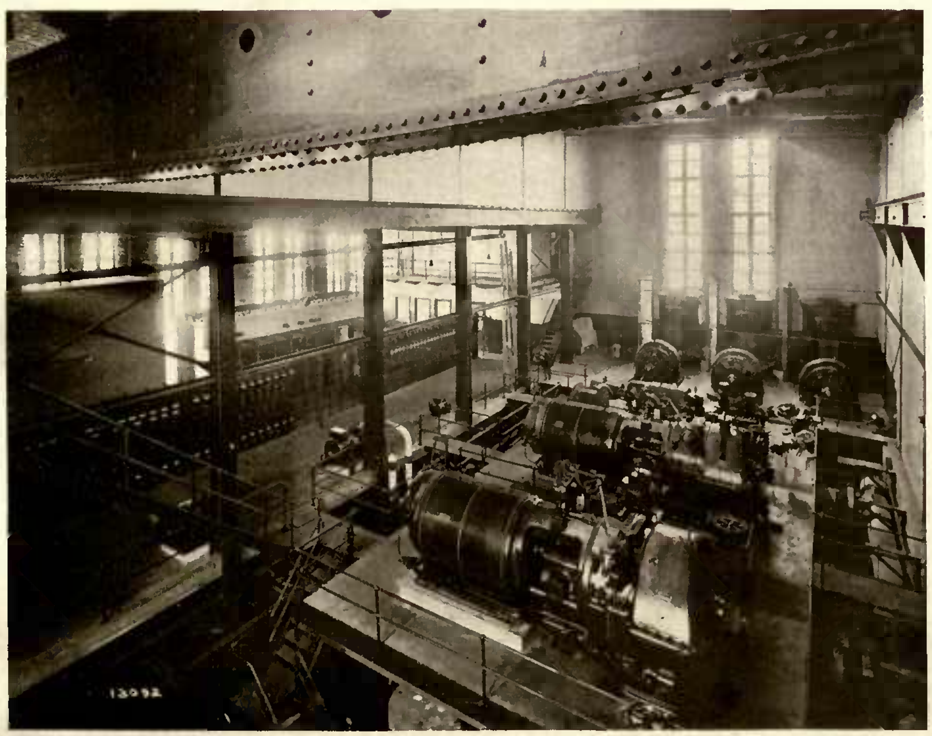
But the steam power-house and the hydroelectric plant do offer an opportunity for the artistic, since both are to some extent monumental in character and do not require any extraordinarily large area of sash. Thus the designer has a free hand in regard to proportions.

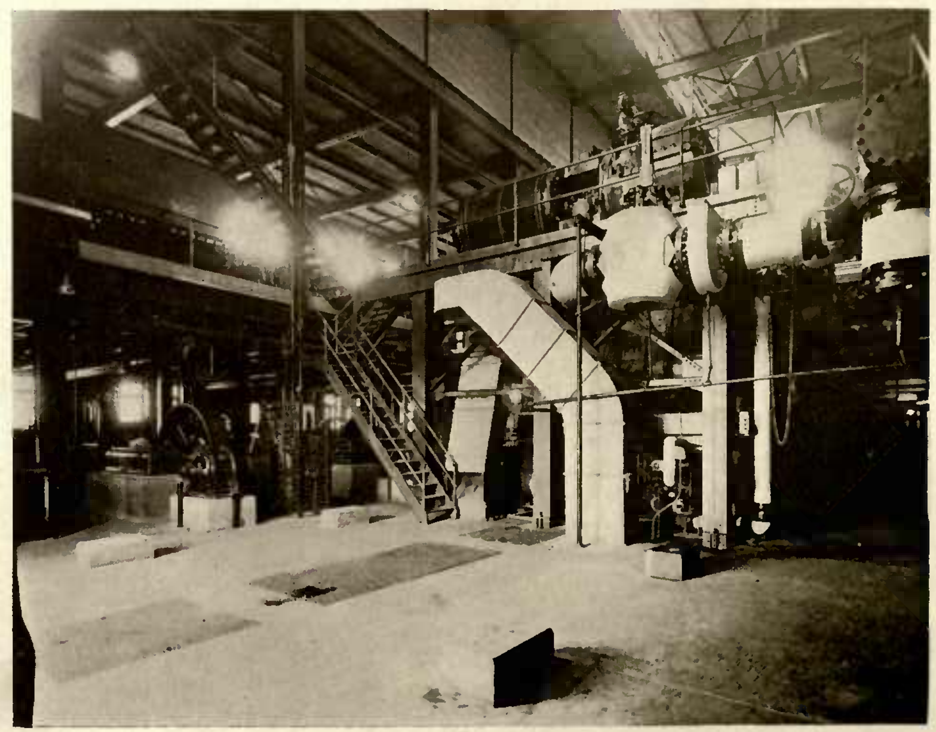
Among the many modern power-houses recently constructed by Dwight P. Robinson & Company (with which Westinghouse, Church, Kerr & Co. has been consolidated) the plant for the Naval Torpedo-Station at Newport, Rhode Island, although comparatively small, is probably as complete as any development of its kind ever carried out. This plant was designed and constructed under a contract awarded by the Bureau of Yards and Docks, Navy Department, in November, 1917. C. W. Fairweather was the architect.

The design for the boiler-house required a ground floor, an operating floor about 16 feet above, and a gallery floor above the boilers. The equipment consists of four 500-horse-power Babcock and Wilcox boilers set in two batteries and equipped with Westinghouse underfeed stokers, forced and induced draft-blowers, overhead coal-bunker, travelling weigh-larry, two turbine-driven centrifugal boiler-feed pumps









POWER-HOUSE, NAVAL TORPEDO-STATION, NEWPORT, R. I.

C. W. Fairweather, Architect.

and one feed-water heater; also two hot-water heaters and two turbine-driven centrifugal pumps for circulating hot water for heating the buildings on the Island, and three duplex motor-driven fire-pumps. The pumps and forced draft-blowers are mounted on the ground floor, the boilers and stokers on the operating floor, and the induced draft-blowers and hot-water heaters on the gallery above the boilers.

The turbine-house design required a ground floor and an operating floor. This building is equipped with one 300-kilowatt and two 2500-kilowatt turbo-generators mounted on the operating floor. Each turbine is equipped with a surface condenser, turbine-driven centrifugal circulating pumps, and vacuum and hot-well pumps which are mounted on the ground floor; also two 500-kilowatt rotary converters with transformers which are mounted on the operating floor.

The operating floors of the switch-house, turbine-house, and boiler-house are all on the same elevation. The switchboard and switching equipment are located on the operating floor. On this floor also are the superintendent's offices and a repair-shop. On the ground floor below the switch-house there are installed three Ingersoll-Rand multi-stage high-pressure air-compressors designed for a capacity of 50 cubic feet of air per hour compressed to 3500 pounds pressure; also two multi-stage high-pressure compressors designed for a capacity of 150 cubic feet of air per hour compressed to 1800 pounds pressure, and three two-stage air-compressors designed for a capacity of 200 cubic feet of free air per hour at 100 pounds pressure. The compressors are motor-driven. The accumulators for the high-pressure air and the air-receiving tank for low-pressure air are also mounted on this floor.

Floor space in the building is provided for one extra 2500-kilowatt unit, two extra boilers, and one rotary converter.

The final design of the building is a modification of a series of steps from the switchboard-room up to the boiler-room. Since the extreme height in the boiler-room is needed at the centre, only the main roof line was lowered, providing a raised portion in the middle with a hipped Ludovici-tile finish. A monitor was designed for the turbine-room for ventilating purposes, which offered an opportunity for raising the end walls sufficiently to run the main boiler-room cornice along the turbine-room wall. Very careful attention was given to the spacing and size of windows and piers to help make the building as interesting to the eye and as correct as possible.

As the plant was built during the war, it was felt that a rigid economy should be exercised in the selection of materials and that the work should be so detailed that the labor of construction would be simple in character.

The exterior walls are faced with mill-quality Fiske-lock brick laid with large light-colored joints and backed with common brick, the facework being laid in running bond. The base is of concrete, light in color and bush hammered.

The trim is terra-cotta in simple mouldings enriched at the entrances. An ornamental structural frame was designed for the window-openings and filled with Trus-Con sash with few muntins. Exterior doors were of hollow metal.

Simplicity is the key-note of the interior, the walls being faced with common brick, as stated before, the floor having granolithic finish, and all walls and ceilings being painted in pleasant tones of green and buff.

The Prize-Winning Plans in New York's Model Tenements Competition

THE prize-winning plans in the recent competition for model tenements, held under the auspices of the Chamber of Commerce, the Merchants Association, the Advisory Council of the real-estate interests of the city, the Real Estate Board of New York, and the trustees of the Phelps-Stokes Fund, shown in this number of ARCHITECTURE, we believe, will be studied with interest all over the country.

The awards were as follows: First prize, consisting of the commission to erect a model tenement house on a lot 100 by 100 feet, Sibley & Fetherston, 101 Park Avenue; second prize, $1,500, Frank J. Schefcik, 4168 Park Avenue; third prize, $1,000, John Tompkins, 139 East Fifty-third Street.

In addition a supplementary prize of $100 was awarded to Raymond M. Hood, 7 West Forty-second Street, for his plan submitted in the preliminary competition.

The model house will be built on a plot 100 by 100 with 46 rooms, exclusive of baths, on each floor. Rents will be $1.80 a room a week plus 60 cents for bathroom or $16.80 a month for two rooms, $24.00 for three rooms, $31.50 for four rooms. This with hot water, steam heat, electric light, and janitor service.

The living-rooms will average 140 square feet, or 10 by 14 or 12 by 12. All living-rooms are to be 10 per cent larger than the minimum now permitted by the tenement-house law, and one bedroom will be at least 15 per cent more than the limit. All rooms will be outside rooms.

The estimated cost of this house is $200,000 complete. Of this amount $40,000 is set aside for land cost. It is estimated that the rental from this house will return 7 per cent net, and allow 1 or 2 per cent for a sinking fund.

In the two-room apartments there will be a bedroom about 10 by 14 and a living-room, dining-room with a kitchenette alcove 9½ by 18.8, and a bathroom with shower or tub as well as basin and toilet.

The other apartments will be arranged on the following standards: bedrooms, 8 by 10, living-rooms 10 by 14, kitchens 10 by 7.

As in the case of the second and third prize-winners, the house will have 40 per cent of the apartments of three rooms and 30 per cent of two and four rooms.

Mr. Schefcik, winner of the second prize gave the following facts with regard to financing his building.

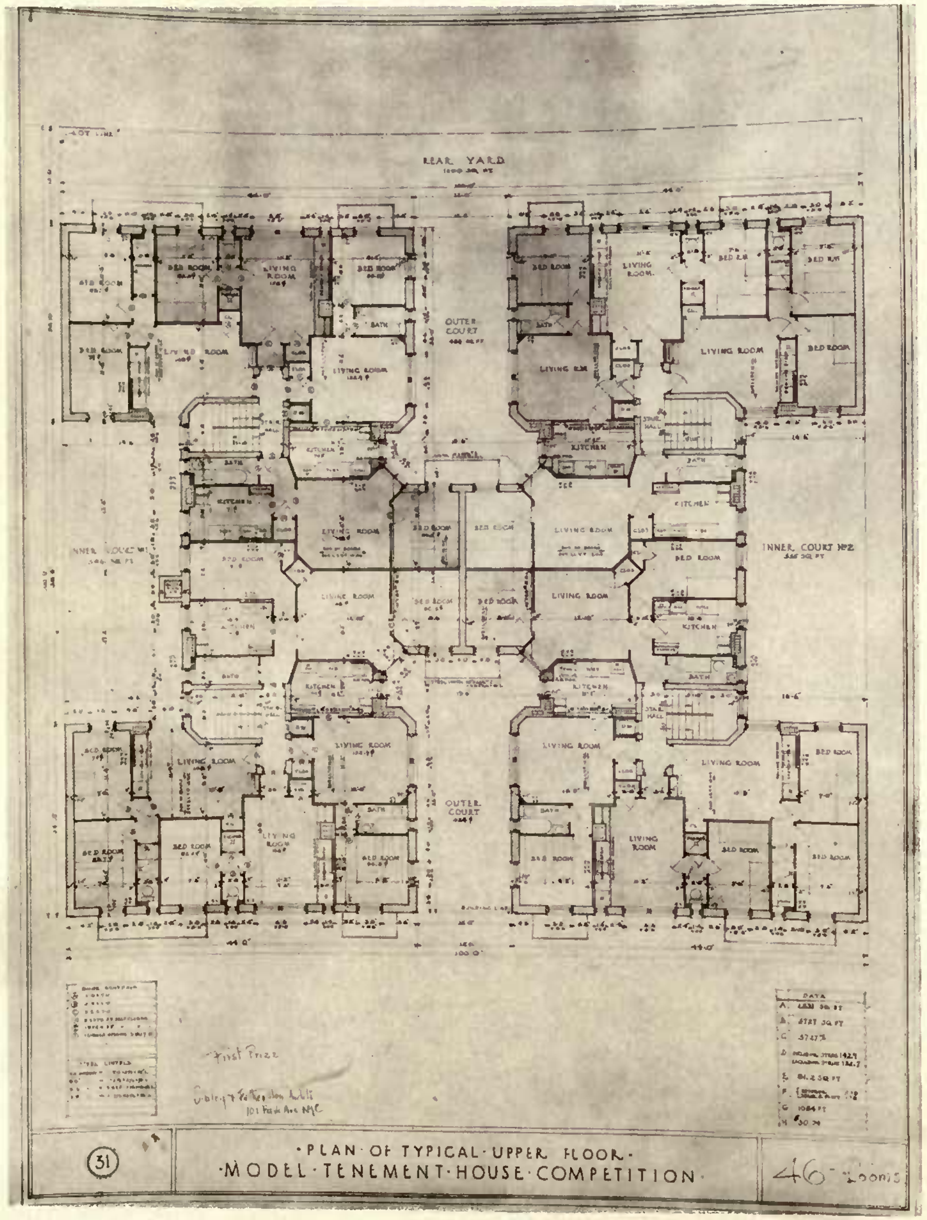
The cost to build is placed at $67,762. Twenty thousand for the land, an additional $20,000, making the total $87,762, or 30 cents a cubic foot.

Figuring the rental at $7.50 a room a month it will yield $12,780 a year. If figured at $1.80 a room a week plus 60 cents for bath the yield would be $13,845. This means 7½ per cent on more than $103,800. The assessed value o the property, put at $95,850.

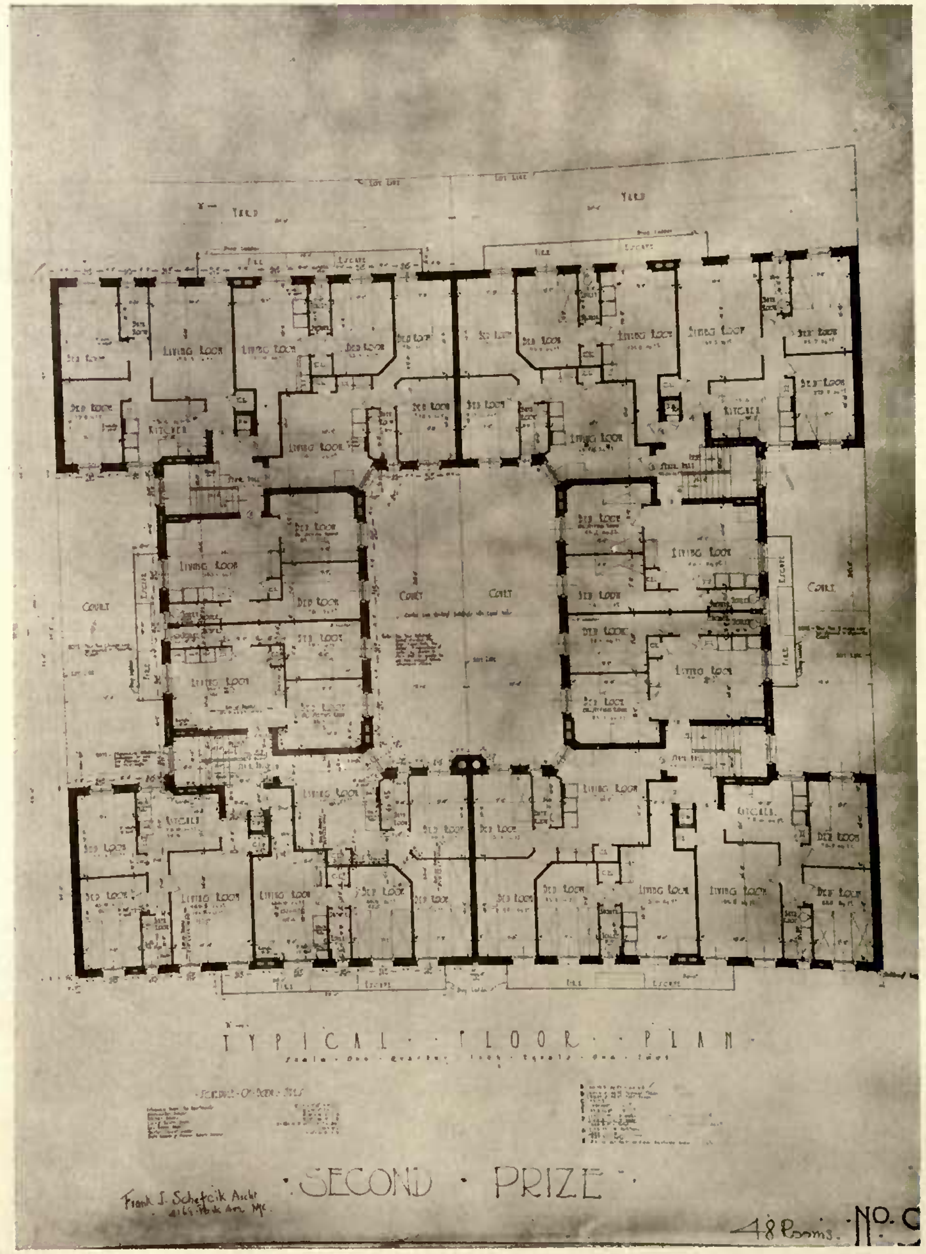
With these figures and assuming that the lender would take mortgages at 60 per cent of the cost, the result would be as follows:

The equity would be, with the 60 per cent mortgage, $35,105. The $13,845 rental would be a gross return of a little less than 40 per cent on the equity.

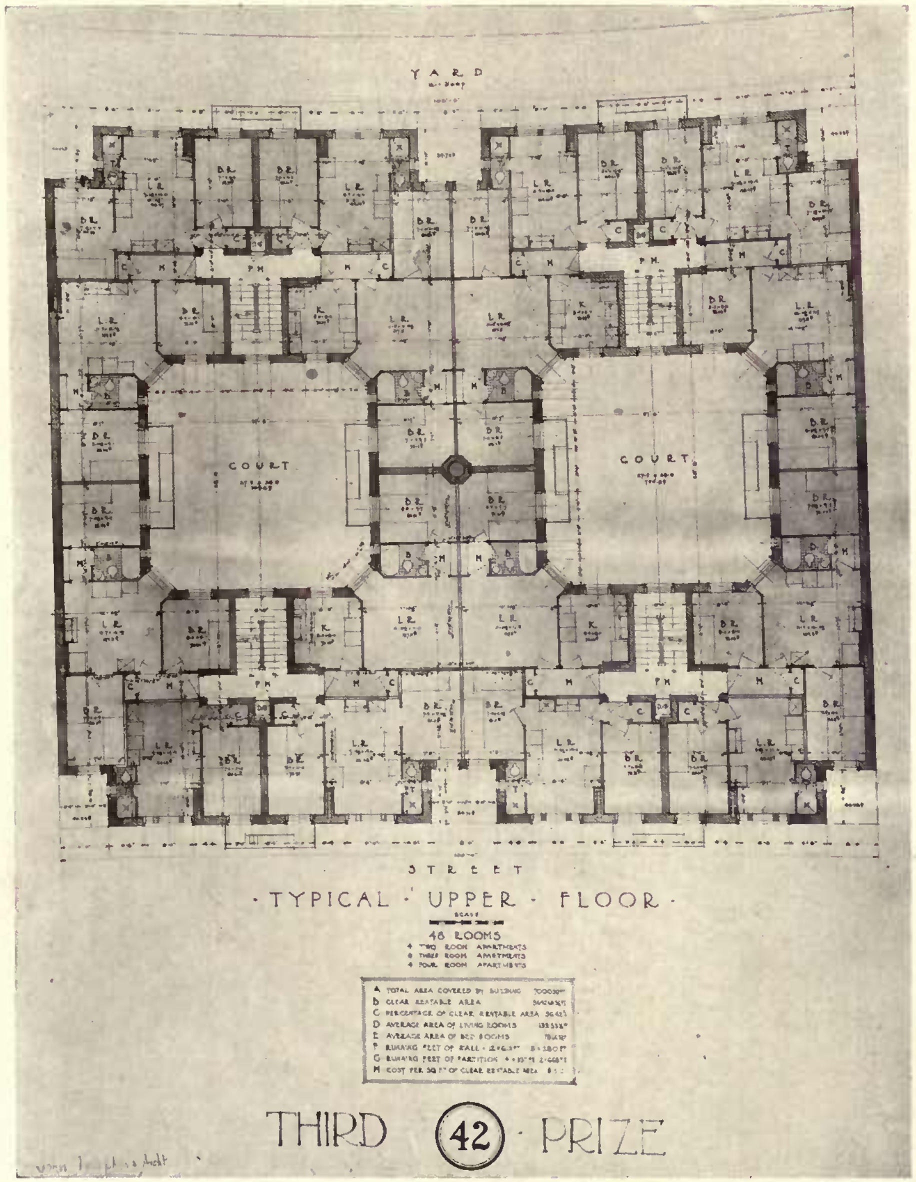
If the house is mortgaged to 60 per cent of the assumed valuation, the equity would be $30,252 and the gross return more than 42 per cent. These figures are significant when we consider what the profits must be to those landlords who have taken advantage of the shortage in housing that has existed in these past few years.



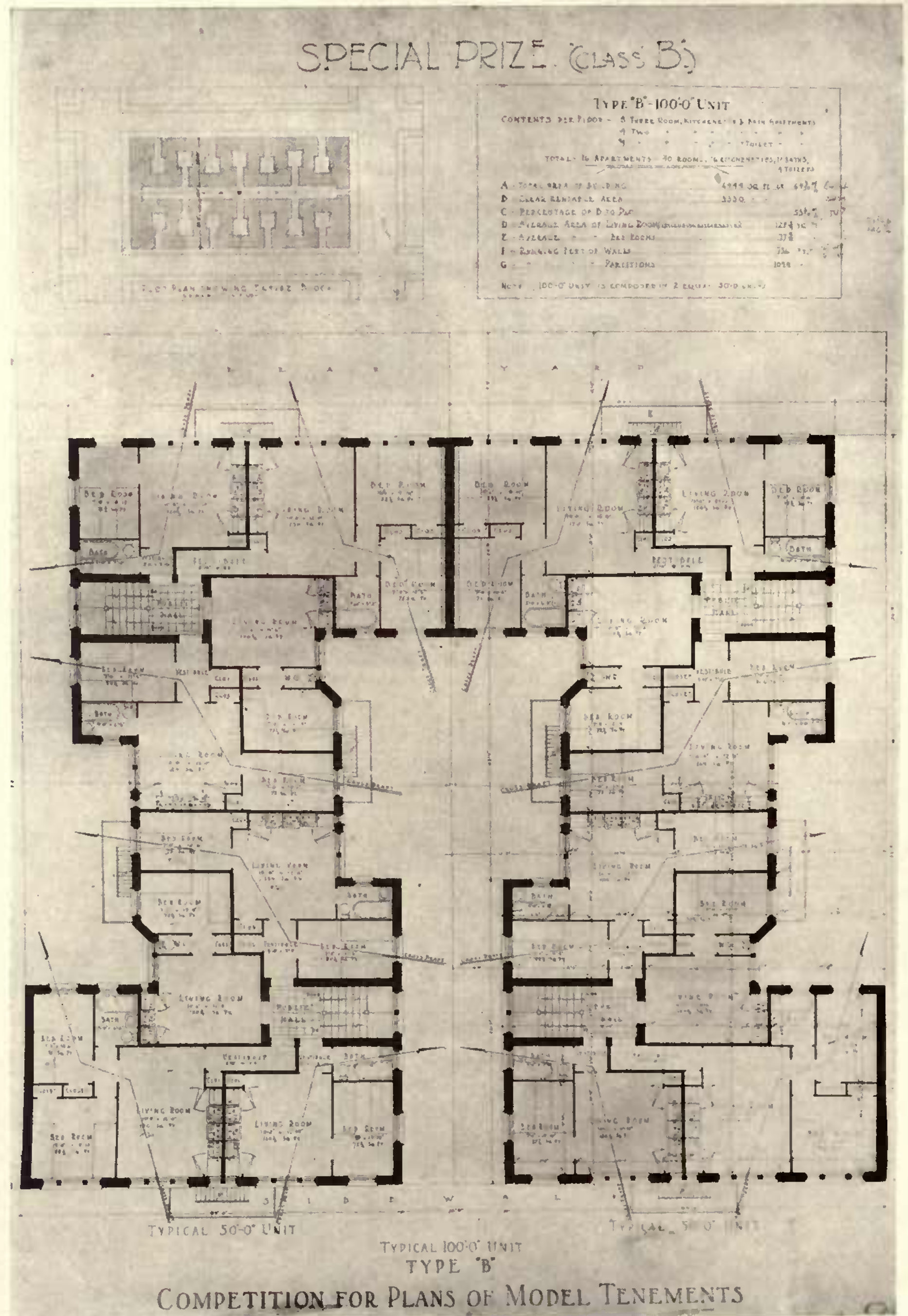
FIRST PRIZE, SIBLEY & FETHERSTON, ARCHITECTS.



SECOND PRIZE, FRANK J. SCHEFCIK, ARCHITECT.



THIRD PRIZE, JOHN TOMPKINS, ARCHITECT.



SPECIAL PRIZE, RAYMOND M. HOOD, ARCHITECT.

Concrete Construction

By DeWitt Clinton Pond, M.A.

ELEVENTH ARTICLE

IN the last article there was a discussion of certain rules dealing with flat-slab construction in the amendment to the Building Code of New York, adopted by the Board of Standards and Appeals, July 8, 1920. The rules referred to in that article dealt with the type of slab, allowable stresses, proportion and minimum dimensions of columns, column capitals, drop panels, the minimum thickness of slab and the sections with which it is assumed that a slab is divided for the purpose of design. It will be recalled that these sections were designated as column-head, outer, inner, and mid sections.

There is not much difficulty in establishing what is meant by the column-head and inner section. The first is directly over the column, and the second is directly in the centre of a panel. The names of outer and mid sections are apparently applied to the same part of the band connecting column-head sections, but if the direction of the reinforcing steel is taken with account, it will be seen that there is no real conflict in these terms.

Rule 12 gives an explanation of the notation used in the formulas for the design of reinforcing steel in the panels. The following notations are quoted directly from the code:

W is the total dead and live load on the panel under consideration, including the weight of drop, whether a square, rectangle, or parallelogram;

W_1 is the total live load on the panel under consideration;

L is the length of side of a square panel centre to centre of columns; or the average span of rectangular panel which is the mean length of the two sides;

n is the ratio of the greater to the less dimension of the panel;

h is the unsupported length of a column in inches, measured from top of slab to base of capital;

I is the moment of inertia of the reinforced-concrete column section.

Assuming a live load of 250 pounds per square inch, and such slab thickness and fill and finish as given in the last article, the total load per square foot will be taken as 380 pounds, and if the columns are spaced 20 feet on centres in both directions, the total load on the panel due to this construction is 152,000 pounds. In order to determine W—the first algebraic symbol given in the list—it will be necessary to add the weight of the drop panel. This was found to be 6 feet 8 inches square and 3 inches deep, so it will weigh approximately 2,000 pounds. W equals 154,000 pounds.

W_1 will equal only 100,000 pounds.

In the present case there is no question regarding the length of L, which is 20 feet. Had the panel measured 18 feet by 20 feet, L would be the average of these two dimensions of 19 feet.

n is of no importance in the first assumed case, as the panel is square, but in the case of such a rectangular panel as the one just referred to it would be 1.11, and it will be seen when section B of Rule 12 is considered that this ratio has no small significance.

The symbols h and I need no special comment.

Under Rule 12 there are three sections dealing with panel design and three dealing with column design. All six sections give formulas for determining the bending in slabs and columns, and are designated as sections A, B, C, D, E, and F.

Section A gives the formulas for determining the bending moments in the slabs of an interior square panel. It refers to "two-way," "three-way," and "four-way" reinforcing. In two-way reinforcing the bands may be considered as flat and wide girders supported between columns, and the inner section may be regarded as a suspended slab with steel placed in two directions extending over the bands at the mid-sections. In the bands the tendency toward bending is positive in the centre between columns and negative at the column-head section. In the inner section the bending is positive in the centre and is negative over the bands. Engineers often refer to the steel in the column-head and outer sections as band steel, and the steel in the inner and mid sections as slab steel. The bands are laid out in the same manner as shown in Figs. 4 and 6.

In the three-way reinforcing the bands are designed as shown in Fig. 7, and in Fig. 8 is shown the method of laying out four-way reinforcing. The question as to which system is the best is open to dispute. In theory the four-way system is the best, as all the steel, except a small amount in the mid-section, runs from column to column and the loading is carried back to the columns directly by the bands. It can be seen that in two-way reinforcing a load on the inner section is carried by the slab construction to the bands and then back to the column. It can be seen also that this resembles the method of carrying loads in beam and girder construction; first, from the beam to the girder, and then from the girder to the column. There are engineers who claim, however, that this theoretical advantage is out-

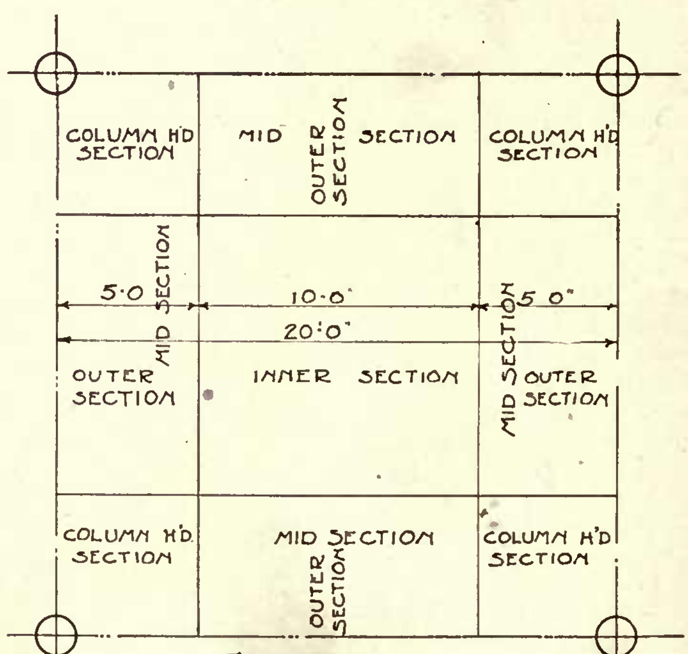


FIGURE 4

weighed by the fact that there is a mass of steel over the column-heads due to the fact that there are vertical, horizontal, and diagonal bands meeting at these points. As far as economy is concerned, there is very little difference in the systems as called for in the New York Code. It is understood that the code requirements are not the same as specified by the Joint Committee, and that there may be other ordinances which would make one system more economical than others.

According to subdivision 1, under section *A*, in two-way systems for slabs with drops the negative moment resisted on the two column-head sections should be $-\frac{1}{32}WL$. In the square panel referred to above, the negative moment in the column-head sections would be $-\frac{1}{32} \times 154{,}000 \times 20 \times 12 = 1{,}155{,}000$ inch-pounds, which is resisted by the bent-up band steel. The method of obtaining the area of steel required is exactly the same as employed in finding such an area in the case of a beam. If the distance from the bottom of the drop to the steel is $10\frac{1}{4}$ inches, as stated in the last article, the area of steel at the column-head sections is found as follows:

$$A_s = \frac{1{,}155{,}000 \times 8}{7 \times 16{,}000 \times 10.25} = 8.05 \text{ square inches.}$$

The above calculation is given simply for the purpose of showing the method of determining the area of steel required in case the depth of the drop panel is the same as specified for the minimum requirements. It may be that this depth will have to be made greater—as will be shown in the next article when an actual design in flat-slab construction will be investigated—in order to provide a proper area of concrete in compression.

The other negative moment resisted in a square panel is in the mid-section where the slab steel crosses the band steel. The formula for determining the moment at this point is given in the first subdivision as $M = \frac{1}{133}WL$. In the case of a 9-inch slab and a distance of $7\frac{1}{2}$ inches from the top of the slab to the steel, the area of steel required at the mid-section would be found in the following manner:

$$M = \frac{1}{133} \times 154{,}000 \times 20 \times 12 = 277{,}900 \text{ inch-pounds.}$$

$$A_s = \frac{277{,}900 \times 8}{16{,}000 \times 7 \times 7.50} = 2.64 \text{ square inches.}$$

The positive moments—for slabs with drops—are given in the rules as $\frac{1}{80}WL$ for the two outer sections and as $\frac{1}{133}WL$ for the inner section.

It is interesting to note the difference in the formulas given above for slabs with drops and the formulas given for slabs without them. In the latter case the negative moment on the two column-head sections is given as $\frac{1}{36}WL$, which is less than the same moment for slabs with drops. However, the negative moment on the mid-section is the same for both cases, $-\frac{1}{133}WL$. Of the positive moments the only one that is different is the moment on the two outer sections, which is given as $\frac{1}{63}WL$.

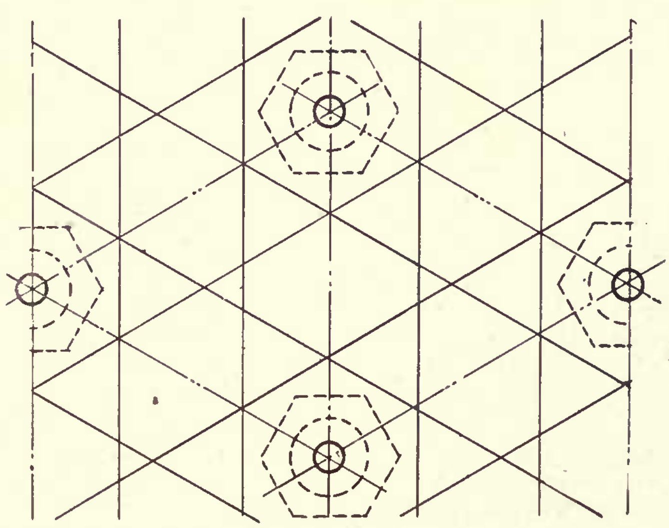


FIGURE 7

In four-way systems the negative moments are the same as given for the two-way system. For slabs with drops the positive moments in the two outer sections and the inner section are given as $\frac{1}{100}WL$. These formulas require little explanation. In order to obtain moments it is simply neces-

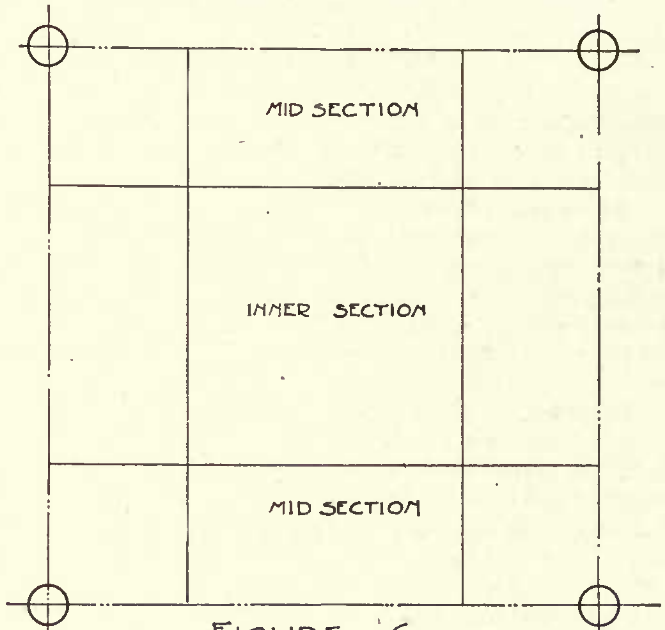


FIGURE 6

sary to substitute in the formulas. It is important to remember, however, in designing the steel for the inner section that, according to Rule 9, "the effective area of the reinforcement at any moment section shall be the sectional area of the bars crossing such section multiplied by the sine of the angle at such bars with the plane of the section." This rule will be discussed more fully later.

Formulas are also given in the rules for three-way systems. Such systems are not used as widely as are the two-way and four-way, as they require special spacing of columns as shown in Fig. VII in January number. The advantage of such reinforcing is found in the fact that the spans of the bands are all equal and that there is less steel at the column-head section than in the four-way method. From an architectural point of view it is claimed that the column spacing allows more freedom of circulation, as it is not necessary to make 90-degree turns at aisles. This feature applies to garages particularly, and it is claimed that it is a more simple matter to park cars in a garage having columns spaced in this manner than when the usual spacing is used.

When such a system is used the panels become parallelograms of the shape of two equilateral triangles placed base to base. In the rules for three-way design the load *W* is the load in such a parallelogram. The length *L* is the distance from centre to centre of column. The negative moments at the column-head sections and the mid-section are determined as required for the four-way system, and positive moment for the two outer sections is also the same as required for the four-way system. It will be noted that there is no inner section.

In section *B* rules and formulas are given for the design of rectangular panels. In the case of such panels the ratio n is important. In the first subdivision of this section is the following statement:

"When the ratio n does not exceed 1.1, all computations shall be based on a square panel of a length equal to the average span; the reinforcing shall be equally distributed in the short and long directions, according to the bending moment coefficients specified for interior square panels."

As an example of a panel in which the ratio is within the above limits, one having columns spaced 20 feet on centres in one direction and 19 feet on centres in the other can be investigated. Such a panel will measure 19 by 20 feet and the ratio will be 1.05. In such a case the design is exactly the same as it would be for a square panel measuring 19 feet 6 inches square.

Methods are given in the second subdivision of section *B* for determining the bending moments in a rectangular panel where the ratio n lies between 1.1 and 1.33. It is significant that no methods are given for such determination in case the ratio exceeds 1.33. No sanction is given to a panel measuring 18 feet by 25 feet when the ratio is 1.38. For such a panel the determination of the reinforcement would be a special problem and the calculations would have to be submitted to the superintendent of buildings for approval.

In the case of rectangular panels having ratios between those given above, the load W is taken for the entire panel. In the case of an 18-foot by 20-foot panel the load W would be:

$$\begin{array}{lr} \text{Slab load} = 18 \times 20 \times 380 = & 136{,}800 \\ \text{Drop} = & +\ 2{,}000 \\ \hline & 138{,}800 \end{array}$$

The moments for a two-way system in the sections at right-angles to the long dimensions are determined as for a square panel, except that L is given a value equal to the long dimensions of the panel, and the moments for sections at right-angles to the short dimensions are found in the same manner, except that L is given a value equal to the short dimensions. As an example of this, the moment in the two outer sections at right-angles to the 20-foot dimensions of the above panel would be:

$$\tfrac{1}{80} \times 138{,}800 \times 20 \times 12 = 416{,}400 \text{ inch-pounds.}$$

The same moment for the two outer sections at right-angles to the 18-foot dimensions would be:

$$\tfrac{1}{80} \times 138{,}800 \times 18 \times 12 = 374{,}760 \text{ inch-pounds.}$$

From the above figures it can be seen that a square panel is more economical than a rectangular one, for the same load —138,800 pounds—could have been carried on a square measuring 18.97 feet on a side. The substitution of 18.97 feet for L in the above formulas would show that the sum of the moments would be less than given above. The loss of economy is not great in the above case, as the ratio is only slightly over 1.1, but as this increases toward 1.33 the loss becomes greater.

In a four-way system for a rectangular panel the band steel—in the column-head and outer sections—is designed in

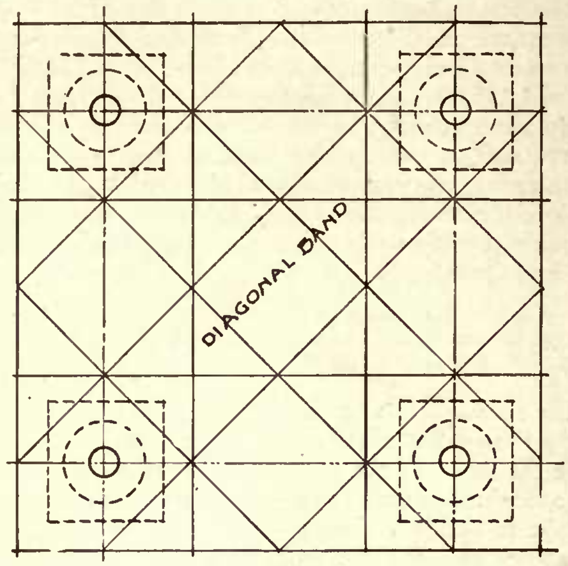


FIGURE 8

the same manner as for a two-way system for the same type of panel, but in the design of the steel in the diagonal bands and in the mid-sections, L is taken as the *average* length. In a diagonal band, with L taken as the average length, only $\tfrac{7}{10}$ of the area of steel is available for reinforcement, as the sine of 45 degrees is approximately 0.70.

The rule for determining the moments in the three-way system for rectangular panels is quoted below:

"In the three-way system, the negative and positive moments on the bands running parallel to the long dimensions shall be determined as for a square whose side is equal to the greater dimension; the moments on the bands running parallel to the short direction shall be determined as for a square whose side is equal to the lesser dimension. The load W shall be taken as the load on the parallelogram panel under consideration."

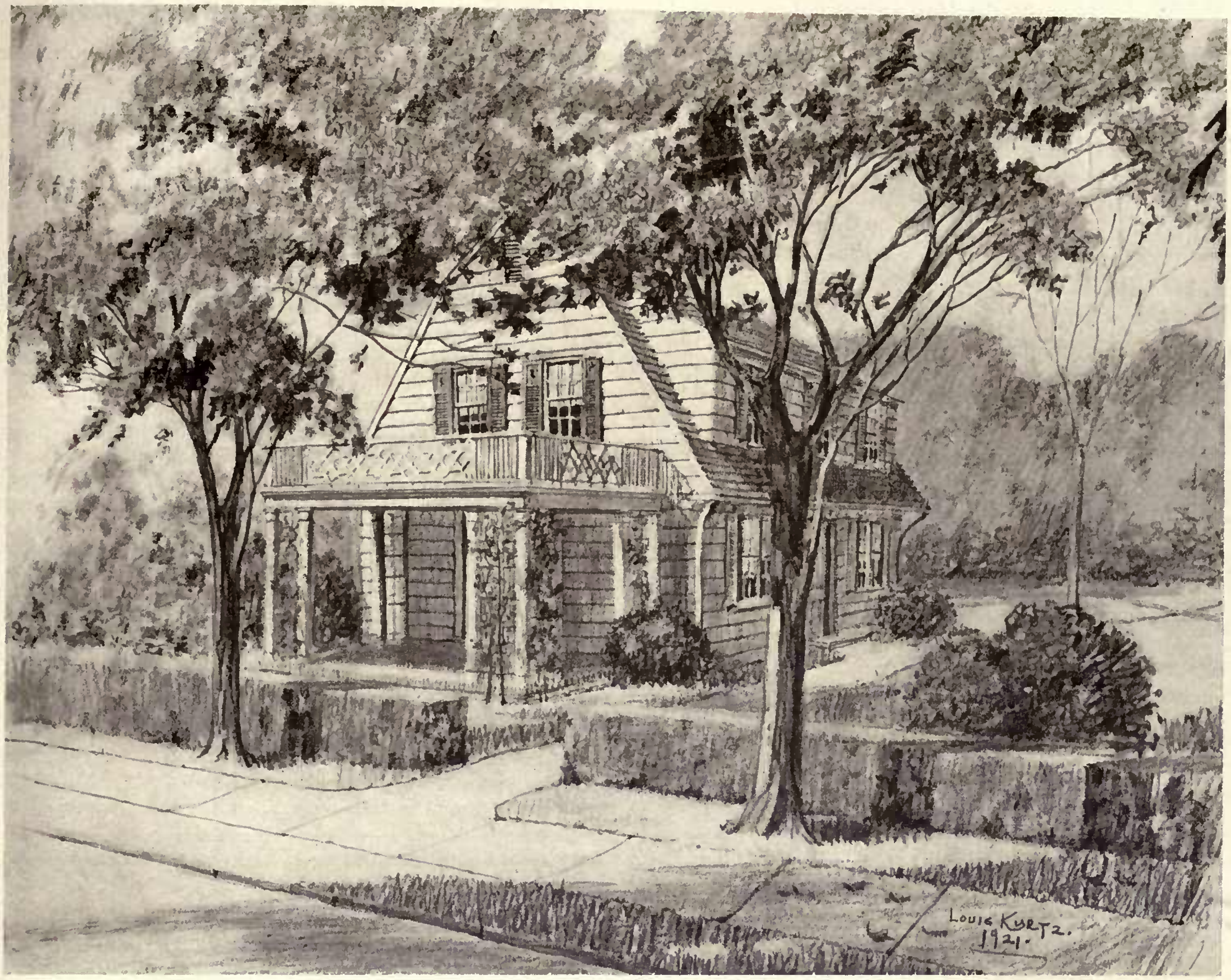
The sections dealing with the design of exterior panels, bending-in columns due to unequal loading, and beams under walls on flat slabs and at openings, will be discussed in the next article, as well as a comparison of two-way and four-way reinforcing designed in accordance with the above rules.

Strength of Southern Pine and Douglas Fir Compared

THERE is little difference between the strength of the Southern pines and that of Douglas fir from the Pacific Northwest, tests made at the United States Forest Products Laboratory show. True longleaf yellow pine averages heavier, stronger, and tougher than Douglas fir. True shortleaf pine averages heavier and tougher than the fir, but is about equal to it in strength as a beam or post. Loblolly pine, though averaging heavier than the fir, is somewhat weaker. The difference in strength between any of these pines and Douglas fir, however, is not so great but that low-density pieces of the one species are weaker than the average for the other species.

"Technical Notes," Forest Products Laboratory, U. S. Forest Service, Madison, Wisconsin.

Edward Buehler Delk, Architect, 59th and Ward Parkway, Kansas City, Mo., wants to secure a copy of ARCHITECTURE for November, 1912.



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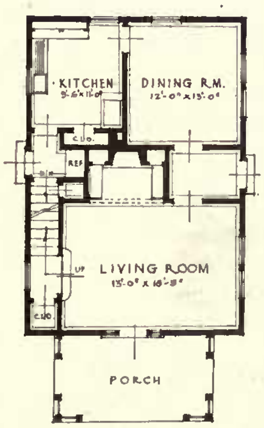
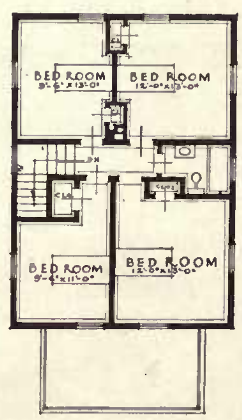


FIRST FLOOR PLAN



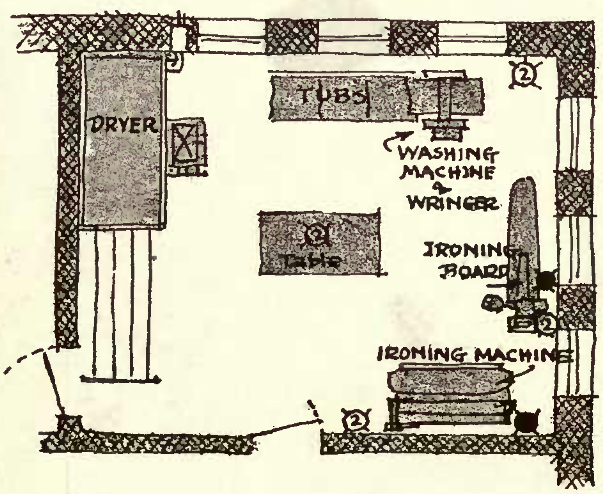
SECOND FLOOR PLAN

(*Continued from page* 96.)

Machines to Simplify the Toilet

We often forget the elegance of the modern bathtub, but think of the labor of our forefathers when the bath night came around. The water had to be heated on the stove, the tub gotten out and filled with cold water from the pump, and then warmed up with the water in the teakettle, and after all was finished the water and tub had to be removed. It was quite an event, and there is no wonder that a bath was taken only once a week. But what is it to have a bath to-day, with plenty of hot water, a thermostatic control of its temperature, a fine shower and a warm bathroom. But such things as a bathroom with its modern lavatory, water-closet, and bathtub and tiled floor and wainscot are commonplace things, and are always expected to be installed in a house. One does not question the advisability of spending money on this equipment, and so it will be in the future with much of the machinery which we hesitate to buy to-day on account of the additional cost in the construction of the house.

If one is willing to spend the money, electrically operated shampooing-machines can be installed, curling-irons, vibrators, ozonators, hair-dryers, shaving-mugs, heat-baths, etc., but these seem luxuries to us yet. But will the next generation look upon them this way? A very elegant bath room may also be equipped with built-in receptacles in the tile wainscot for holding soap, sponges, toilet-paper, tumblers, tooth-brushes, etc. Fine white-enamelled medicine-cabinets are not uncommon to see built into the walls. Glass rods for towels and glass shelves for miscellaneous objects add much to the practical up-keep of the bathroom. Faucets over the bathtubs and lavatories are now covered with white enamel and have porcelain handles, so that the work of polishing nickel ones is done away with. Water-closet bowls are designed with such deep water-seals and with such powerful flushing-jets that they do not need the cleaning that the older types required. Tubs are built into the walls and down on the floors, so that dirt cannot collect under them as it did under the old leg-supported tubs. Thus each year brings forth more improvements that are helping to reduce the labor of keeping house.



UP-TO-DATE LAUNDRY

To Build Cheaper Houses of Brick

"THE brick industry is working out a scheme to raise a million dollars to aid home-builders and is pushing a new and economical method of bricklaying so a brick home can be built more cheaply," says Ralph P. Stoddard, secretary of the Common Brick Association of Cleveland, at the annual brick convention at St. Louis recently. "During the past two years brick manufacturers have been working out new methods of using brick so brick homes can be built at low cost. The first development was the Ideal wall—a hollow wall of solid brick—now being used from one end of the country to the other. Due to this new wall, thousands of houses are going up in brick which would otherwise have been built less permanently. Building codes in a hundred cities recognize this lower-cost construction, a remarkable record for one year.

"But the brick industry would go further," continued Stoddard. "Under the new financial scheme, any responsible head of a family of good character who desires to own his home will be aided from a central million-dollar fund subscribed by the industry. Each loan must be approved by the local brick manufacturer and by a responsible local bank or building and loan association, which latter will have the actual handling of the money. This loan," he said, "will help fill the gap between the amount normally loaned on construction and the cost of the house. We know a brick house is worth more than any other type of house, although it does not necessarily cost more, and we are willing to back this up with our money.

"A new trowel has just been introduced to further cut brickwork cost. It looks much like a grocer's old-fashioned sugar-scoop, and is filled with mortar in the same way."

"CIVIC VIRTUE." By Frederick MacMonnies, Sculptor.

(*See pages 117, 118*)

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THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV APRIL, 1922 NO. 4

Three Basque Towns

By Henry S. Churchill

THE Basque country is, to the traveller who rushes on the twenty-mile-an-hour "espresso lujo" from San Sebastian to Burgos, little more than a confusion of unpronounceable names, a memory of green hills, and recognition of Basques by their *boinas*. Yet here, in the three provinces of Guipuzcoa, Avala, and Viscaya, between the barriers of the Pyrenees, the Bay of Biscay, and the arid uplands of Old Castile, lies one of the most charming districts of Spain.

Oñate University, seen from the tower of the church.

The region is widely known for its unique language, untraceable, and as old, perhaps, as the frescos of the Cave of Altamira; well known, too, for its *pelota*, the game that sentimental humanitarians would like to see the Spaniard substitute for the good red-blooded bull-fight. It is less well known as the centre of the modern Spanish art movement, the home of Zuloaga, and the brothers De Zubiaurre; it is still less known for its folk-songs and its political movement toward separatism and autonomy; and not at all known for its quiet, ancient towns, full of old palaces, universities, country mansions, and still more ancient gates, calvaries, and shrines.

Those who will explore the Vascongada, by its narrow-gauge railways, by motor over excellent roads, by ox-cart, or on foot, will find in its towns and villages poor wine and worse olive-oil, clean beds, hospitable people, strange superstitions, and an astonishing amount of architectural material.

From among many towns, Elorrio, Oñate, and Vergara are selected because they are typical in themselves, and also representative of the diversity of types that are to be found in closely neighboring localities. Very old towns they are, full of local history and legend, from the days of Roland to those of the Carlist wars. Now the thriving little places pulsate with political life, for they are all centres of separatism. The Basques, together with the Catalonians, justly consider themselves too alert and intelligent to be held back from the modern world by the rest of mediæval Spain.

The Basques have always been sailors as well as mountaineers, and in the great days of Spain they were not least among the high admirals and other piratical robbers of the Americas. Their day of glory over at the courts of the intolerable Philips, they returned to their mountain towns, where they built themselves palaces, endowed churches and monasteries, spoke their native Basque, and hated their Castilian masters, to whose commands they replied simply: "*Se obedece pero no se cumpla*"—"We obey but we will not comply."

Elorrio, the loveliest of these three towns, owes much of its beauty to such nobles. As one comes upon the town from the encircling heights, the eye is caught by the yellow of the stone palaces, like sunshine permanently glinting through the trees; by the rich, wine-dark tiles of the hipped roofs; by the castle-like walls and delicate tower of the church. The fantastic forms of the Pyrenees frame it all. It is unreal, a sleepy, dream-gold evocation of a vanished Spain, a distant, Peruvian, silvered Spain. A sonorous peal of bells floats strange harmonies into the distance at baptisms, weddings, and funerals; a different, ancient toll for each. It is a land of church-bell exorcism, of old crosses, of pre-Christian superstitions. . . . A noble lady once took down from over her palace doors and windows the little bundle of dried twigs that keeps away evil spirits, and that night she cooked her own dinner. Her servants could by no means be persuaded that iron bars were a better protection against evil than were twigs of St. John's eve.

Fortified in the tenth century, the cramped circle of Elorrio's old wall may still be traced, from the point on the river bank, where the two metres of its masonry now forms

The Artesinado ceiling of the stair-hall, University of Oñate.

the basement of a house, through the fifteenth-century gate by the Casa Mendivil, back to the river bank half a mile farther up-stream. The first building to be erected outside the walls was a palace of the Urquijo family, the great barons who first successfully put down civil war in the region, and prepared the way for the city of palaces that was to come. Their arms, two dogs holding a riband between them, are to be found in the quarterings of nearly every escutcheon in the town; for they were careful to secure the conquests won by the sword. The original Urquijo escutcheon may be seen over a door of the palace still occupied by the family.

Indeed, descendants of the builders occupy most of the palaces, and are proud of their beautiful, well-kept town, to which they come to escape the horrors of a Madrid summer. The palaces, or, more properly, *casas solariegas*, literally "houses of the ground," or manor-houses, which form the streets of this little summer resort, are amazing in their simple dignity and proportion. Italian influence is manifest, for they all date from the sixteenth and seventeenth centuries, but tempered however by that Spanish pride which achieved the terrific humility of the Escorial; a pride so old as to need no investiture, so deep as to disclaim all pomp. An unadorned façade, a rich wood cornice, balconies of simple fine wrought iron, a panelled wood door, an escutcheon. Nothing more was necessary.

The cornices, wide and overhanging, are the most striking feature. They vary from simple rafter ends to elaborately carved brackets of oak or chestnut. The finest is that of the Casa de Beitia, with its beams splayed to turn the corners. That of the Casa del Conde del Valle is one of the richest, but the treatment at the corner and on the rake at the side is very clumsy.

The Casa de Beitia has also the finest escutcheon in Elorrio. The figures of the mermaids are cut full and free from the background. It is inscribed "Esta casa yzo el capitan Don Antonio de Beitia Año D. 1694." It is to be noted that the glorious yellow stone of the locality does not lend itself to carving, and that the escutcheons are all cut from blocks of imported white limestone. The backgrounds were originally painted a dark blue or red earth color, traces of which remain. The latter color was, and still is, used to paint biblical inscriptions on the façades.

The ironwork of the balconies and of the occasional roadside chapels, such as that on the estate of Señor Picaza, is simple and strong. The long curling brackets of the balconies are most graceful. Here, as elsewhere in Spain, the refractory metal seems to afford the truest expression to native genius.

The plans in general are simple and straightforward, enclosed in a rectangle without wings or ells, under one hipped roof. The entrance-hall is flanked by service-rooms; an enclosed stairway to the main floors leads up from the right as one enters. The living-rooms are on the first floor, as in Continental mansions generally. Masters' rooms are on the second floor. Servants are lodged either under the roof or on the ground floor. A universal feature is the arched loggia to the south, affording a shelter from rain and winter winds to the women of the house who, in half-Oriental Spain, are seldom allowed to venture upon the streets. In Elorrio many of these loggias are four-arched, instead of three, as would be expected. Simplicity and seclusion are the keynotes of the houses; the Spaniard does not entertain lavishly in his home.

Two exceptions to the type may be noted. The massive casa now being remodelled by Señor Don Juan Gonzalez has a great open stone staircase, in the Italian "grand manner," leading all the way to the second floor. The rooms open out magnificently, and the loggia is a two-storied one. This is also, by the way, the only building in Elorrio with a stone cornice. The casa of Señor Don José Maria de Urquijo, an impressive, rusticated building, sixty-seven feet wide and about seventy-five feet deep, has a patio after the manner of the south. The exterior is exceedingly dignified; the carved wood window-frames are worth noting. This building, it is said, was built in eight months, to be in readiness to receive Philip II.

Above the roofs of the town, almost like a castle, rise the precipitous walls of the church, its beautiful Renaissance tower ornamented with inlaid slate. As this church is a typical one, it may be described here. The plan is without transepts, the body of the church divided by large built-up columns into a nave and two aisles, of equal height. Lack of sufficient exterior buttressing has allowed the centre vault to push the columns visibly out of plumb. The ends of the aisles are screened, sometimes by very good rejas, so as to provide chapels. The high altar, of course, occupies the end of the nave. In Elorrio the retablo is Baroque, full of movement and vast in scale, entirely covered with gold-leaf that three hundred years have left untarnished. The west door opens under the *coro*, which, in these smaller churches, is a balcony across the west end, instead of being placed in the nave opposite the high altar, as is usual. Supplementary chapels are provided by placing altars against the walls, as the horrible pseudo-Siammese atrocity in Elorrio, erected to the memory of the Beato Berroa-Ochua, a native of the town, killed while proselytizing among the Ammanites. He was a good man, and probably does not have to look at his altar from his heavenly abode. Light comes from openings high in the uncompromisingly severe walls. An ample porch protects the panelled doors, and affords a gathering place for the people. Sometimes this porch is excessively extended, as in Durango, and becomes the market.

Across the plaza from the Elorrio church is the Ayuntamiento, or town-hall, a fine arcaded structure, reminiscent

Chestnut brackets of the Conde del Valle cornice.

One of the finest of Elorrio palaces, the Casa de Beitia.

Balcony and window-frames of the casa of Sr. Don José Maria de Urquijo

The fifteenth-century gate next to the Casa Mendivil.

"El Torre," Oñate.

A panelled door from the Casa del Sr. Don José Maria de Urquijo.

The Ayuntamiento (town hall), Elorrio.

Rejas in the church, Oñate

Cloisters built across a brook, Oñate.

Reja of the chapel on the estate of Sr. de Picaza.

Loggias must have a southern exposure in a country where some rain falls every day.

of Italy. Inscriptions on the façade bid the counsellors remember "that idle word that men shall speak, they give account thereof in the day of Judgment."

The country is steeped in primitive religion; roadside crosses and calvaries abound. The former are usually arranged along the road as pilgrimage stations of the cross. Elorrio has a complete set, running through the town itself. The calvaries are called *humiliados*, places where the traveller humbled himself and gave thanks in prayer for dangers passed on the road. They consist of a more or less ornamented base or column, surmounted by a cross with two groups of sculpture, one side representing the crucifixion, the other the descent or a pietá. Elorrio has one dated 1521, a fair example of late Gothic; and another, date unknown, but presumably very early Renaissance, with a singularly moving pietá—a little masterpiece of delicate sculpture. Durango has a good example of a calvary, and many others may be found along the roadsides.

Oñate, only a short distance away, across a divide, differs noticeably in its architectural style from Elorrio. It is less Italian, more rural, comparatively unsophisticated.

The casas are long, low, simple buildings; formal in fenestration, but with an air of comfort and liveableness lacking in the more grandiose palaces of Elorrio. The casa of the Duque del Sotomayor, facing the plaza, is the most formal of them. It has the corner turrets, projecting above the roof, which are a characteristic of the country houses of Vergara, not far away. Elorrio has only one palace so treated, that of the Marques Tola; of the Oñate type, long, low, with whitewashed stucco, Elorrio had no examples at all, nor has Oñate any of the Elorrio type. Adjoining the Casa del Duque is the donjon-like square structure known as El Torre, a grim edifice with a mediæval cornice, black stone trim, and windows simply holes punched in the masonry. The sombreness is accentuated, rather than relieved, by the Gothic triple window over the entrance and by the curious low-relief all-over pattern carved in the stone.

Oñate is also the proud possessor of an university, built by Charles the Second, whose statue and royal arms adorn the entrance. The exterior is of field stone, with red sandstone buttresses, elaborately carved. The design is not successful, as the buttresses are entirely out of scale, and seem to belong to another, smaller building. The court, however, is a splendid example of the two-tier arcade; the sculptured medallions in the spandrels are of high quality. The entrance passage, under the statue of Charles, and the ceiling of the stair hall have as fine artesinado ceilings as can be found in Spain.

The principal church of Oñate is a jumble of atrocious baroque and poor late Gothic. It contains, however, four rejas well worthy of comparison with some of the smaller ones in the cathedrals. The cloisters, too, are interesting, built as they are, over a brook. Their exterior walls are among the sights of Oñate. No photograph can do justice to the amazing blood-orange color of the natural stone, nor to the effect of the plain wall surface with its repeated motive of naïve lions holding up a shield, nor to the exquisite delicacy of the cresting seen against the sky.

Near the town is the Convento de Bidaureta, built by the Catholic kings. It is a barn-like building inside; and the exterior is interesting only for its magnificent royal escutcheons and the amusing belfry of "mission" type.

Near by is the prosperous town of Vergara, presenting a different kind of domestic building from either of the two already described. They are square, box-like houses, with round turrets at the corners, ending in ornamental pinnacles above the sweeping eaves of the hipped roofs. Windows occur as wanted; there is little attempt at architectural effect. Yet these houses, when set against a green hill, flanked by an old bridge, and reflected in the waters below, are often charming as are few Spanish things. There is in Spain much dignity, much austerity, a great deal of gloomy magnificence, but little joy or charm.

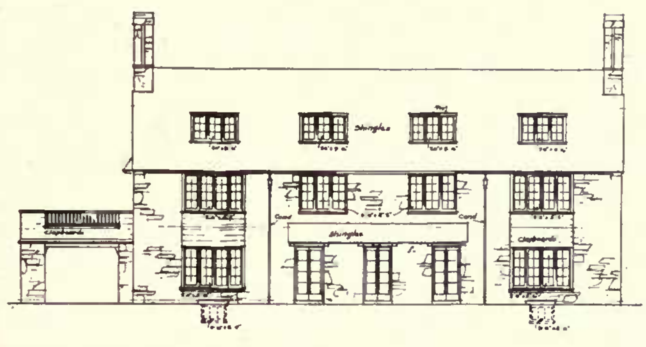
The Plaza Mayor of Vergara is a handsome, arcaded square. The Ayuntamiento is simply distinguished by escutcheons and incised biblical inscriptions. Near the Plaza is the Palacio Iturbe, with an astonishing band of low-relief ornament—kings and queens hunting game in a strange forest, a whimsical, fantastic design, like an embroidery. The Palacio Jaurequi, next to it, built by a friend of Cervantes, is of Florentine gloom, with its tremendous, overhanging cornice. A curious "stunt" found in Vergara is a corner loggia cut into the building, with an arch, broken in plan, surmounted by a pediment that also breaks around the corner. The supporting pilasters and caps are given a false perspective in an attempt—quite a futile one—to persuade the spectator that the proceeding is a normal one.

Vergara has two good churches. That of Santa Maria is singularly picturesque, rising like a cliff from the banks of the little river that flows to one side of the town. It has a very fine wood Renaissance retablo; and the elaborately ribbed domical vaulting is effective, although it would give a French Gothicist the horrors.

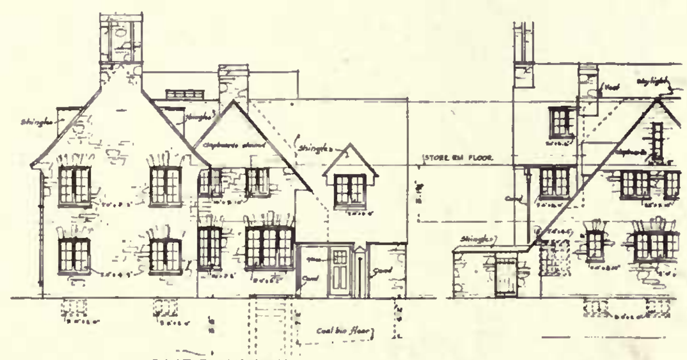
The other church, that of San Pedro, uninteresting in itself, shelters the famous Christo of Montañes. It is the peer of this master's similar work in Sevilla; a realist piece that at once avoids the vacuous sentimentality of the Cellini in the Escorial, and the contortions of the Berruguete school. Montañes, perhaps, learned moderation from his friend Velasquez.

(See also Plate LI.)

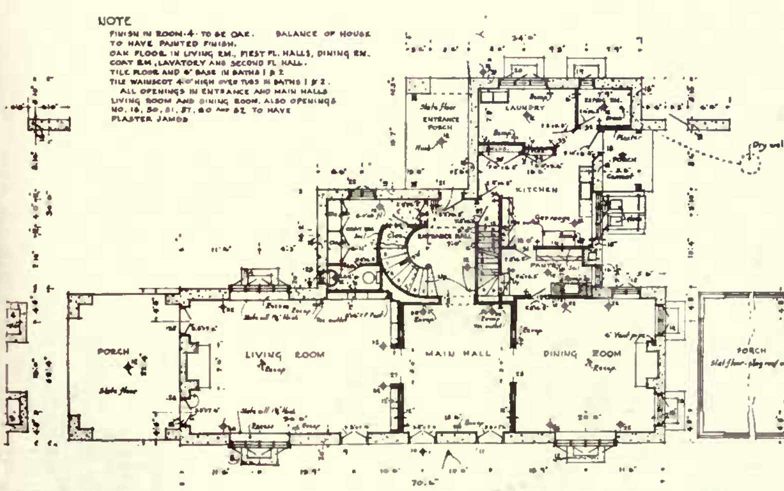
Square, box-like houses, Torre Moyua, Vergara.



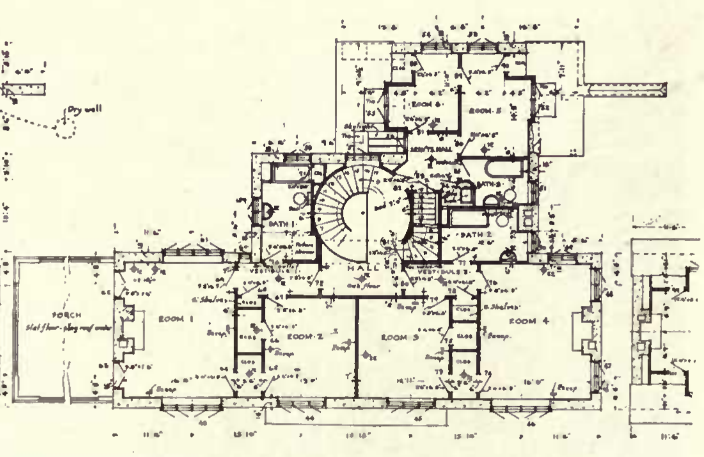
•SOUTH ELEVATION•



•EAST ELEVATION•



FIRST FLOOR PLAN



•SECOND FLOOR PLAN•

HOUSE, NOAH SWAYNE 2D, ARDMORE, PA.

McIlvain & Roberts, Architects.

LIVING-ROOM, HOUSE, NOAH SWAYNE 2D, ARDMORE, PA. McIlvain & Roberts, Architects.

Halls and stairway, House, Noah Swayne 2D, Ardmore, Pa. McIlvain & Roberts, Architects.

The Le Brun Travelling Scholarship Competition

THE Le Brun Travelling Scholarship for 1922 has been awarded to Mr. Lionel H. Pries of Philadelphia.

There were thirty-three competitors from all parts of the United States.

The quality of the designs submitted was unusually high and the solutions varied. The winner receives $1,400 to enable him to travel abroad for the purpose of study. In addition to the prize, the Jury gave mention placed first to Mr. George K. Trautwein of Philadelphia; mention placed second to Mr. John O. Vegezzi of New York City and mention placed third to Mr. Paul Hyde Harbach of Buffalo. Mentions not placed were awarded as follows: Mr. George N. Pauly, Mr. Roy F. Larson, Mr. Gerald K. Geerlings, Mr. Louis Fentor, Mr. Roy Walling Cheesman, and Mr. Frederick Ross Lorenz.

This prize was founded by Mr. Michel Le Brun in 1910, and was originally awarded every other year, but recently Mr. Pierre Le Brun has increased the endowment so as to enable the New York Chapter, American Institute of Architects, trustees of the fund, to award it annually. The jury of award was composed of Mr. Pierre N. Le Brun, ex-officio, Mr. Milton B. Medary, Mr. Henry Bacon, Mr. Louis Ayres, Mr. Laurence F. Peck, Mr. Francis Nelson, and Mr. Julian Clarence Levi, chairman.

JULIAN CLARENCE LEVI, *Chairman*,
Le Brun Scholarship Committee.

Book Reviews

COLLECTED PAPERS ON ACOUSTICS. By WALLACE CLEMENT SABINE, Late Hollis Professor of Mathematics and Natural Philosophy in Harvard University. With portrait and numerous illustrations from photographs and drawings. 4to. Harvard University Press, Cambridge, Mass.

Professor Sabine was the acknowledged authority on this one of the most interesting and complicated of architectural problems. He had devoted many years to a most careful scientific study of the subject in all its phases, and was called in consultation many times.

The chapter headings give a comprehensive idea of the range of his investigations and make manifest the great value and importance of such a volume for the architect's library: Reverberation, The Accuracy of Musical Taste in Regard to Architectural Acoustics, The Variation in Reverberation with Variation in Pitch, Melody, and the Origin of the Musical Scale, Effects of Air-Currents and of Temperature, Sense of Loudness, The Correction of Acoustical Difficulties, Theatre Acoustics, Building Material and Musical Pitch, Architectural Acoustics, Insulation Sound, Whispering Galleries.

Many expensively constructed theatres and halls have been failures through a lack of knowledge of the principles that this book presents in such thorough fashion. It is a monumental volume in the very real sense of the phrase.

PICTURESQUE SPAIN. ARCHITECTURE, LANDSCAPE, LIFE OF THE PEOPLE. By KURT HIELSCHER. 4to. Brentano's, New York.

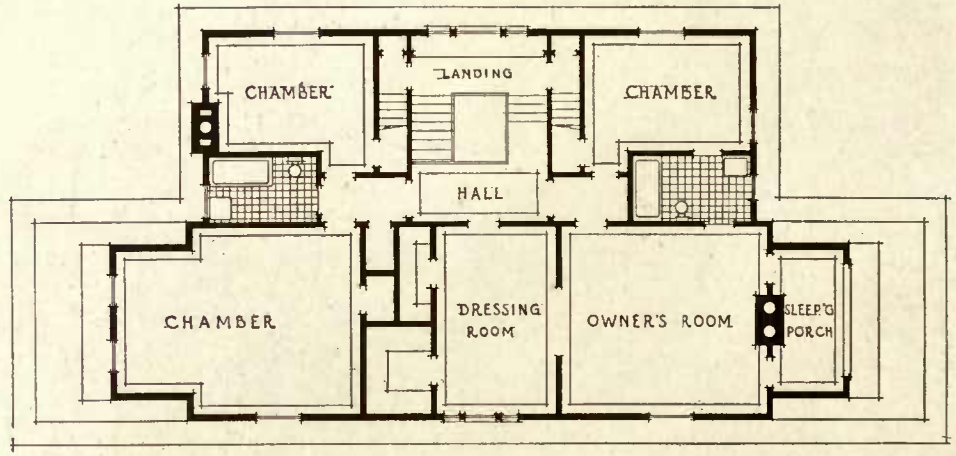
This collection of pictorial photographs is another contribution to the ever-growing books about Spain.

The country seems to have been newly discovered in recent years, and both architects and painters have gone there of late in search of fresh material. Many of the photographs in this collection are much above the ordinary so-called picturesque camera studies.

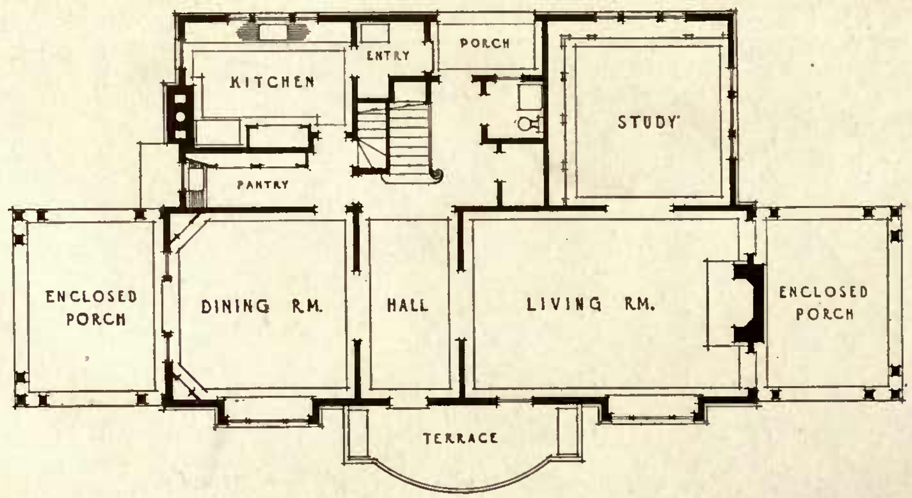
SKETCHES OF EARLY AMERICAN ARCHITECTURE. By O. R. EGGERS. With a series of descriptive monographs by William H. Crocker. Portfolio. The American Architect, Publishers.

Mr. Eggers is too well known for his beautiful drawings to need any special comment here. This series of plates that first appeared in *The American Architect* covers a wide and diversified range of subjects, handled with skill and delicacy and yet with enough insistence upon detail to make the drawings of practical value. Mr. Crocker's text, brief as it is, shows his own fine sense of the picturesque and sympathetic appreciation of the quality and significance of the drawings.

GARDEN VIEW, HOUSE, F. M. SIMPSON, LITTLE FALLS, N. Y.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

Dwight James Baum, Architect.

HOUSE, F. M. SIMPSON, LITTLE FALLS, N. Y. Dwight James Baum, Architect.

HALL TOWARD DINING-ROOM.

HALL TOWARD LIVING-ROOM.

Dwight James Baum, Architect.

HOUSE F. M. SIMPSON, LITTLE FALLS, N. Y.

Editorial and Other Comment

Art and the Public

WE present in this number Mr. MacMonnies's much talked about "Civic Virtue," designed for the fountain in front of New York's justly famous City Hall, together with the sculptor's own statement of the ideas that inspired his design. Mr. MacMonnies needs no defense of his art from us, his position as one of the most distinguished sculptors of modern times was established long ago.

It seems to us that to put an artist of his distinction in the hands of the philistines for discussion is, to say the least, not only unnecessary but quite beyond the canons of good taste and fair play. We have an art commission presumed to be competent to pass on the desirability and suitability of our public monuments, and "they had seen the actual model and a painted silhouette in cardboard placed on the site in the exact position the statue is to occupy," and had given it their approval. The preliminary baiting of the artist without any real or reasonable basis for such criticism seems to be characteristic of our dear public when it is given the opportunity.

These are parlous times for the arts of all kinds, when every man or woman in the street is an authority, "he knows nothing of art, but he does know what he likes," and as for the gentle sex, is there anything that mere man has done or can do that may not be better done by the newly emancipated?

Somehow we feel that in this instance the mob spirit has been manifested in a shameless and needlessly offensive way. It reminds us painfully of the fact that our standards of decency in the treatment of art have fallen like the walls of some of the shoddy and unscrupulously constructed recent buildings, and are in keeping with the stuff with which we have been recently edified in the much-exploited show of the Independents and in the guise of plays with which our theatres are reeking. We are becoming a people of independents in many ways, independent of respect for all authority, artistic and otherwise. For a time, that some of us can still remember, art was a citadel to be attacked by the elect, nowadays we call the public in consultation, and the result is not better art but more discouragement and disgust for the men and women who are giving their lives in the effort to build up an American art that honors us all.

There never was a thing created of man that could please every one. Differences of opinion in this case are justifiable, of course; it might have been something else, but in itself it is a worthy, a dignified and remarkable achievement. If it had been put in place without all of the preliminary gallery play we believe it would have been looked upon and accepted without question as another of the comparatively few civic monuments we can all be proud of.

The School as a Community Centre

THERE is a marked tendency in the designing of schoolhouses toward making them serve a wider civic purpose. The school is the natural centre of interest in most towns, and is usually a source of considerable pride for all concerned. Our public-school buildings have been greatly improved within the past eight or ten years, both in their planning and appearance. In many places they are the outstanding architectural monuments, often exceeding in importance the City Hall that in former times included jail and court-house. We never more needed to emphasize the importance of the school as the chief source of inspiration in the effort at the Americanization of our millions of foreign-born. We need to make them first of all familiar with our language. Their children go to our schools, and the parents should be made to realize that the schools are for them also.

As a community centre a hall for special public entertainments can be provided and made useful for many occasions, where pupils and parents may come together for the common purpose of learning how to become better and more capable Americans. Many adults of foreign birth live here for years with hardly any knowledge of English, and, as their children grow up and go out into the world, feel that they are shut off from association with the younger generation and with the wonderful English language that so often spells opportunity and success for its possessors.

The schools should be made a beacon by night as well as a mark by day, and to make them serve the community in broader ways is to assure a more cheerful support of the tax-payers in their building. To make the schools not only educational but social centres will do a lot to unify and bring a new spirit of nationality into town life.

The History of Architecture

RECENT reviews of Sir Banister Fletcher's great book "A History of Architecture on the Comparative Method," have spoken of it in the highest terms. It is really a wonderful book in the condensation of text, its lavish use of photographs and detailed drawings, in fact it is, as *The Architectural Review* of London well says, "Encyclopædic in character, and may be used with equal advantage as a text-book for study or as a work of reference of unusual competence and comprehensiveness." We were struck with the following in the author's preface, and it seems to apply to so many other things about which books are written that we are tempted to repeat it for those who may not stop at the entrance of Sir Banister's temple.

"The history of architecture has suffered from the insatiable instinct for classification. A writer collects a few facts and dates, and instead of treating them as material for a working hypothesis, builds up his history in a series of compartments, which are ultimately put forward as an actual and authentic sequence in fact. Thus, in the old days of the Gothic revival, we were taught to discriminate between Early English, Decorated, and Perpendicular, and the writers of our guide-books still disfigure their pages and mislead their readers with E.E., Dec., and Perp. History is not so easy nor is it so accommodating to a man with a passion for system. Things happen simultaneously as well as one after the other, and a habit of design that may have become obsolete in one place may linger on in another for a hundred years or more. It is impossible to assign a specific date to the beginning and end of any vital development of architecture, where movements go far back into the past and reach far forward into the future, and the ordinary text-book classification by styles and periods, limited to definite terms of years, have little value in that they have to exclude large quantities of relevant facts. When, therefore, one speaks of the architecture of Louis Quatorze, Louis Quinze, or Louis Seize, it is necessary to define more closely what one means."

"Civic Virtue," as Conceived by the Artist

An Extract from a Letter to the Editor by Mr. Frederick MacMonnies

"THE youth has one foot behind one of the sirens who is impeding his progress by entwining herself and her fish's tails about it, and the other foot is planted on a rack in front of the other siren, who is attempting to snare him with her net. He is not 'trampling,' 'kicking,' nor 'stepping' upon, but escaping from the sirens.

"I am blamed for choosing a male figure to suggest strength, female to suggest grace and beauty, forms of sea monsters to suggest treachery and guile. I did not invent this. I have to take things as they are. An artist is not responsible for verities. He only records them. He is observer—spectator of life. He will not lie to please anybody. To flatter the ambitions of women he cannot pretend that their graceful fragile forms give an impression of strength.

"The Creator has willed otherwise. He cannot express his idea at all unless he bases it on the verities. He cannot get it across. The attainment of suffrage by women has not yet changed the fundamental verities, nor altered the laws of creation. When it does, some artist will be there to record the change.

"The gem-like City Hall recalling another age, lying at the bottom of the well formed by the canon-like wall of surrounding skyscrapers of the present city, required a design that would harmonize the old and new. To make the fountain emblematic of our treasured antique jewel and a living part of modern New York; to 'throw back' and indulge in the ease of archæology and build a graceful miniature fountain and figures such as might have been done when the City Hall was built (when horses trotted about drawing dainty ladies and elegant casual gentlemen in fragile carriages, and the sky line of New York was uncluttered as far as the Palisades), would have been to make the neighborhood as dead as the Roman Forum or St. Paul's Churchyard.

"I believe my titanic Youth will bring down some of the strength of the towering structures about, and by his robust scale only add by opposition (if such a thing is possible) to the grace and dignity of the City Hall and light up the park with life and modernity."

For the Simplification of Building Materials

SIMPLIFICATION of building materials as a means of eliminating waste in industry was discussed at a recent conference held between officials of the Department of Commerce and representatives of architectural, engineering, and building organizations.

The Fabricated Production Department of the Chamber of Commerce of the United States is co-operating with the Department of Commerce and the industry in the movement.

The work of the meeting may be summed up in the following resolution which was adopted:

"*Whereas*, The undersigned committee of architects, contractors, and engineers are fully in accord with Secretary Hoover's programme for elimination of waste as a major means to the stimulation of American business, *and*

"*Whereas*, Prominent among the many factors which contribute to such wastes in building as evidenced by the high cost of construction are the multiplicity of types and the great variety of dimensions which now abound in many of the component parts which enter construction, *and*

"*Whereas*, The cost of construction will undoubtedly be thereby lessened, the industry stimulated, and interest of the public conserved by dimensional simplification;

"*Be it Resolved*, That this committee formed to discuss the subject of dimensional simplification recommends to the Department of Commerce that the Division of Simplified Practice study certain essential parts of construction with a view to simplifying the types and lessening the number of different dimensions of those parts."

In selecting the items of building materials to be given attention first, the following were designated: mill-work, plumbing, heating, interior wall construction, hardware, lighting fixtures, clay products, the latter including brick, tile of all kinds, terra-cotta, sewer-pipe, etc.

The High Cost of Forest-Fires

FOREST-FIRES are costing the West five or six million dollars every bad year, says a recent issue of *The Forest Patrolman*, published by the Western Forestry and Conservation Association at Portland. Much of this loss is preventable. This association asserts that the wise expenditure of one per cent of this five million dollars could secure such public interest and so encourage fire prevention measures that forest-fire causes could be reduced practically to lightning and incendiaries.

Forest-fire losses the past season were heavy in Montana and parts of Idaho, light in Washington and above normal in Oregon. California had severe fires late in the season, so that complete data is not yet in with reference to her total losses. The expenses for protection of privately owned lands will be above the average for the season, due in part to the high cost of labor and supplies. The effort of private timberland owners to reduce fire loss is efficiently organized and has been generally effective.

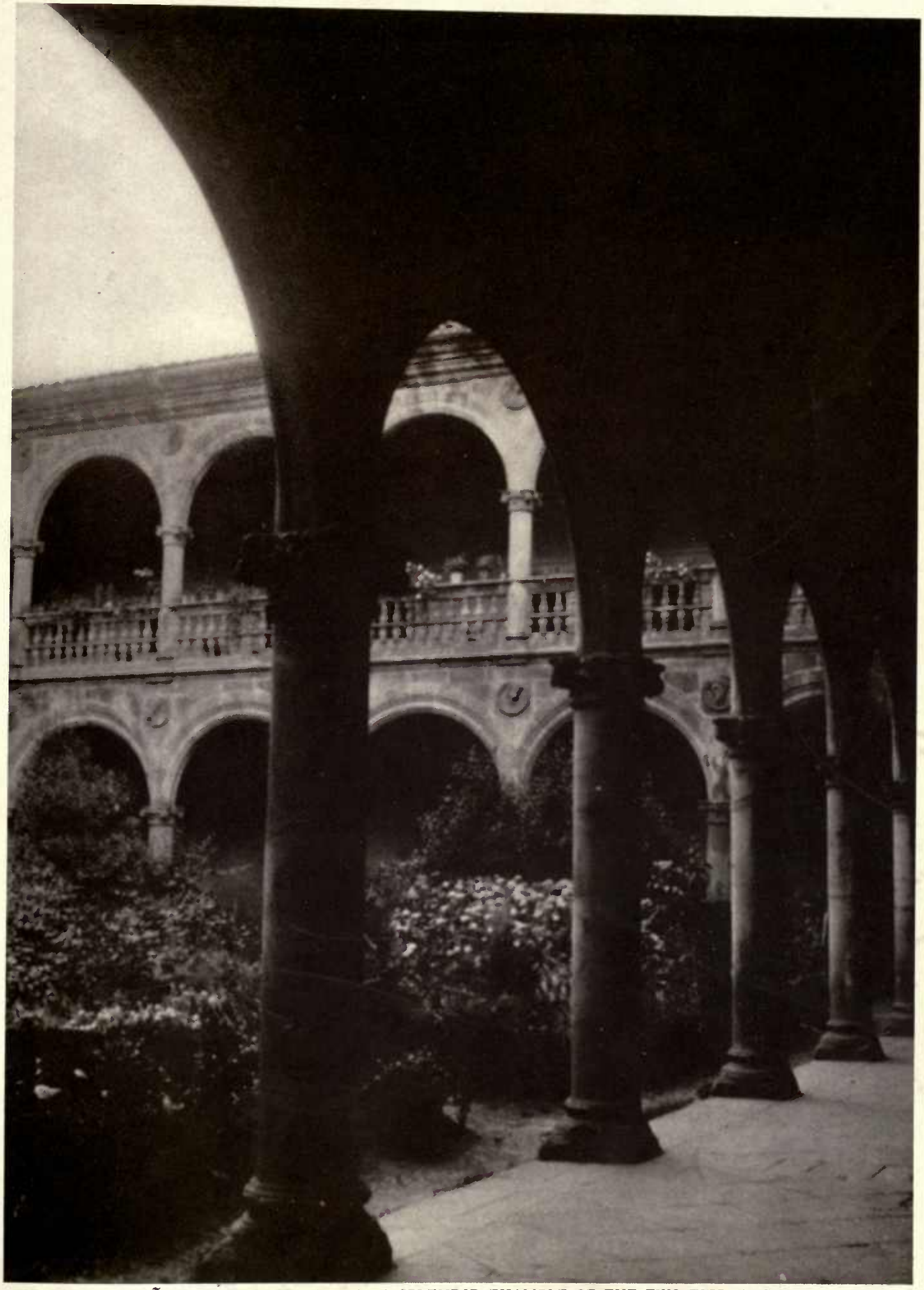
The Twenty-fifth Architectural Exhibition of the Philadelphia Chapter, American Institute of Architects and T Square Club, will be held at the galleries of the Art Alliance, 1823 Walnut Street, Philadelphia, Penna., May 14 to 28, inclusive. Address all communications to R. J. Wadsworth, Chairman, 204 S. Quince St., Philadelphia.

HOUSE, NOAH SWAYNE II, ARDMORE, PA.

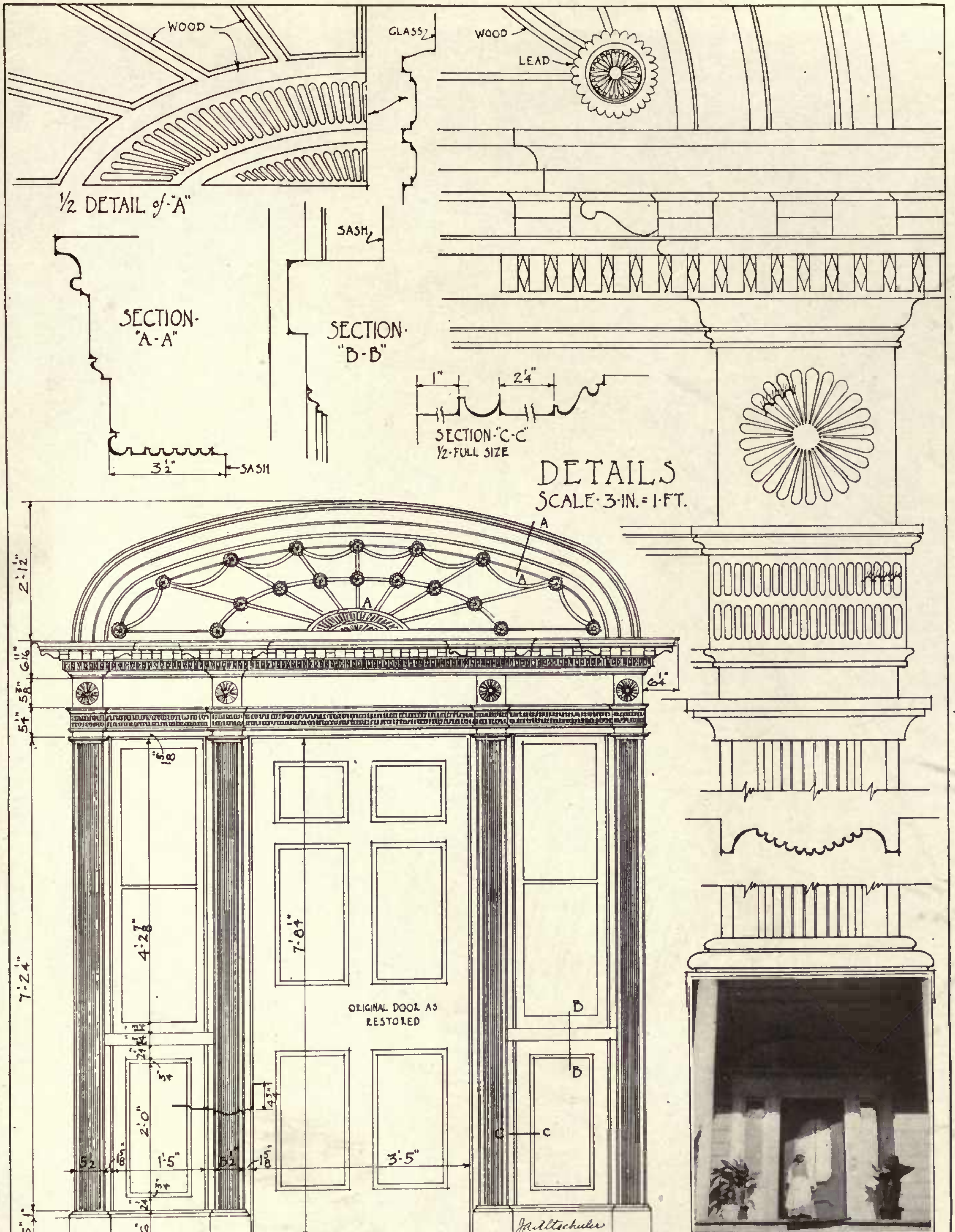
McIlvain & Roberts, Architects.

HOUSE, NOAH SWAYNE II, ARDMORE, PA.

McIlvain & Roberts, Architects.



THE COURT OF OÑATE UNIVERSITY, SPAIN. A SPLENDID EXAMPLE OF THE TWO-TIER ARCADE.



COLONIAL ARCHITECTURE of the CAROLINAS	DOORWAY · DATE 1810 30 GEORGE ST., CHARLESTON · S · C.	MEASURED & DRAWN by J. A. ALTSCHULER

MAIN ENTRANCE, HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS. Atlee B. Ayres, Architect.

HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS. Atlee B. Ayres, Architect.

PORCH.

COVERED PORCH. Atlee B. Ayres, Architect.

HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS.

SUN ROOM.

GARDEN ENTRANCE.

HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS.

Atlee B. Ayres, Architect.

SUN ROOM.

GARDEN ENTRANCE.

Atlee B. Ayres, Architect.

HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS.

LIVING–ROOM.

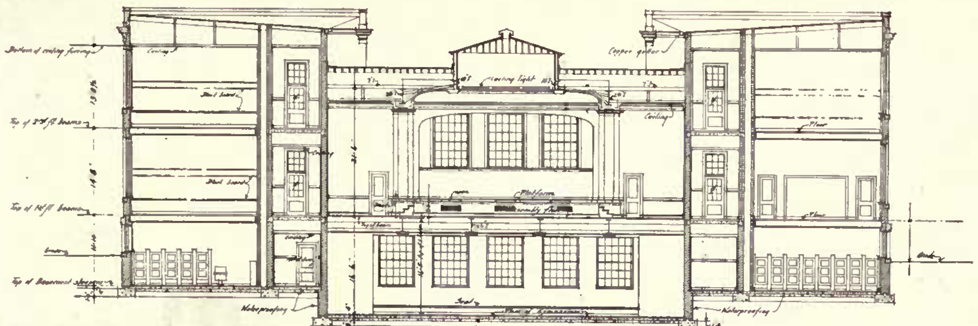
DINING–ROOM.

Atlee B. Ayres, Architect.

HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS.

HIGH SCHOOL, WOODMERE, LONG ISLAND, N. Y.

Henry Bacon, Architect.



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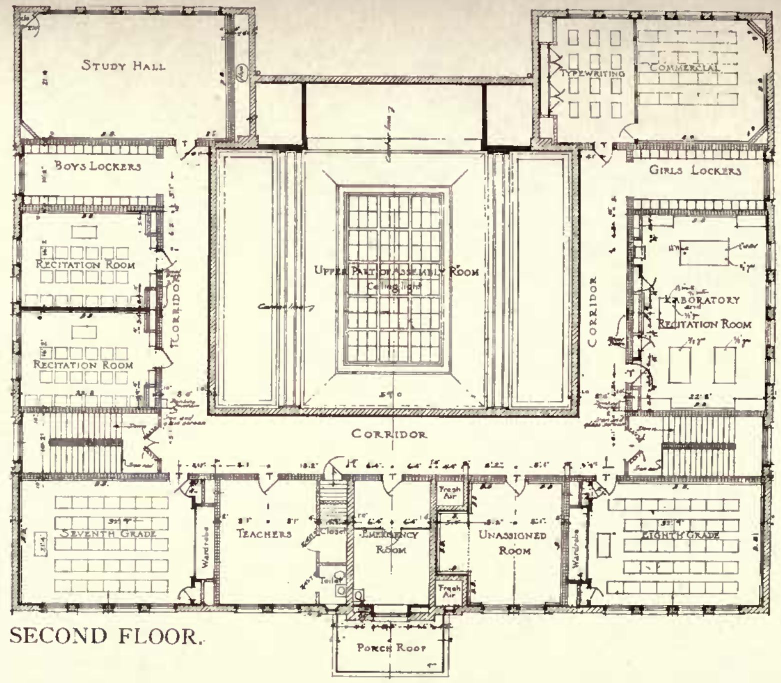
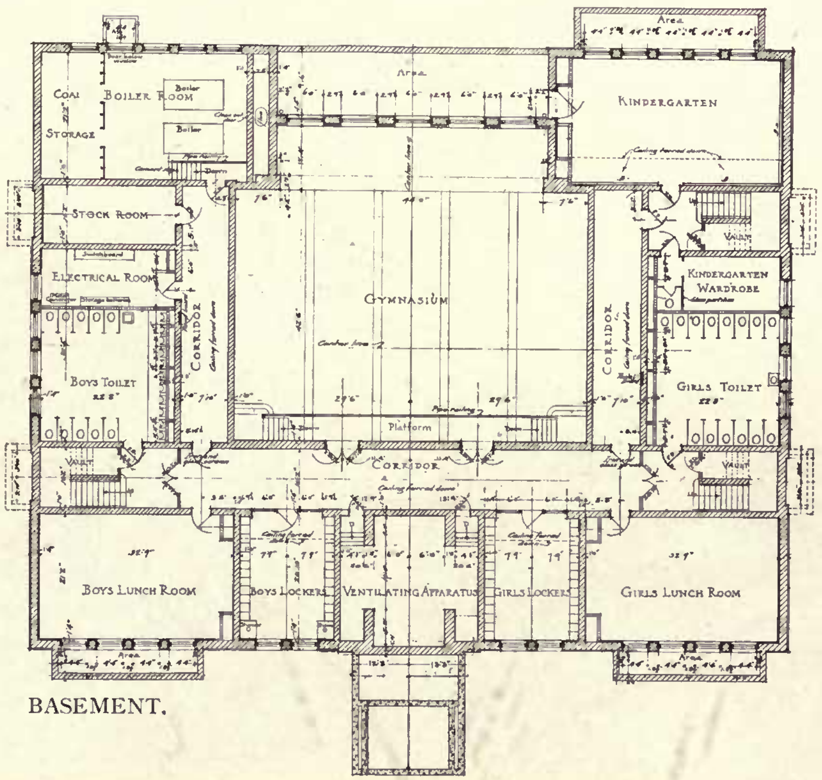


SECOND FLOOR.



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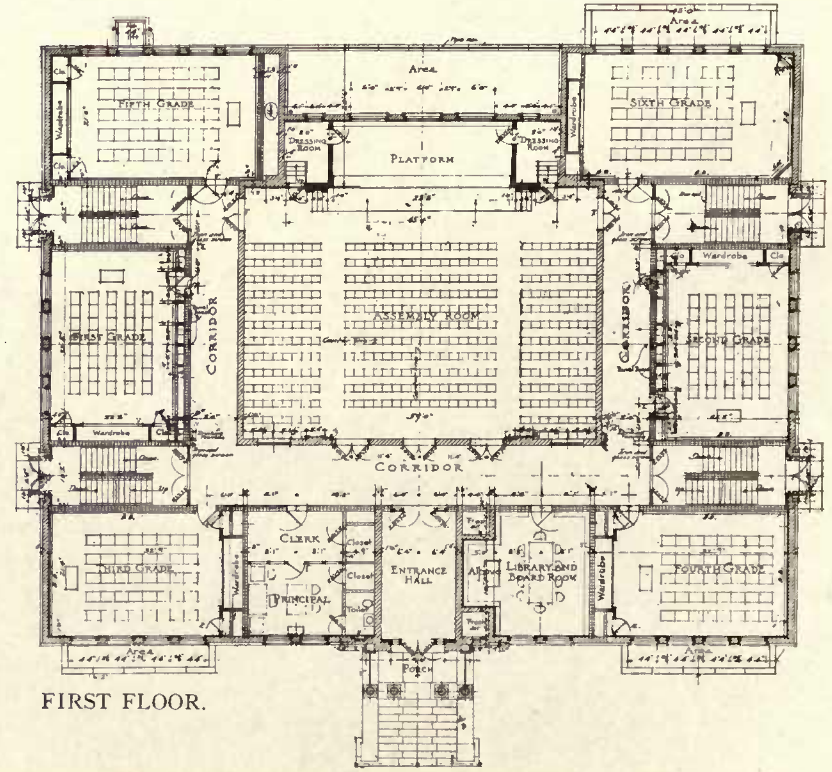
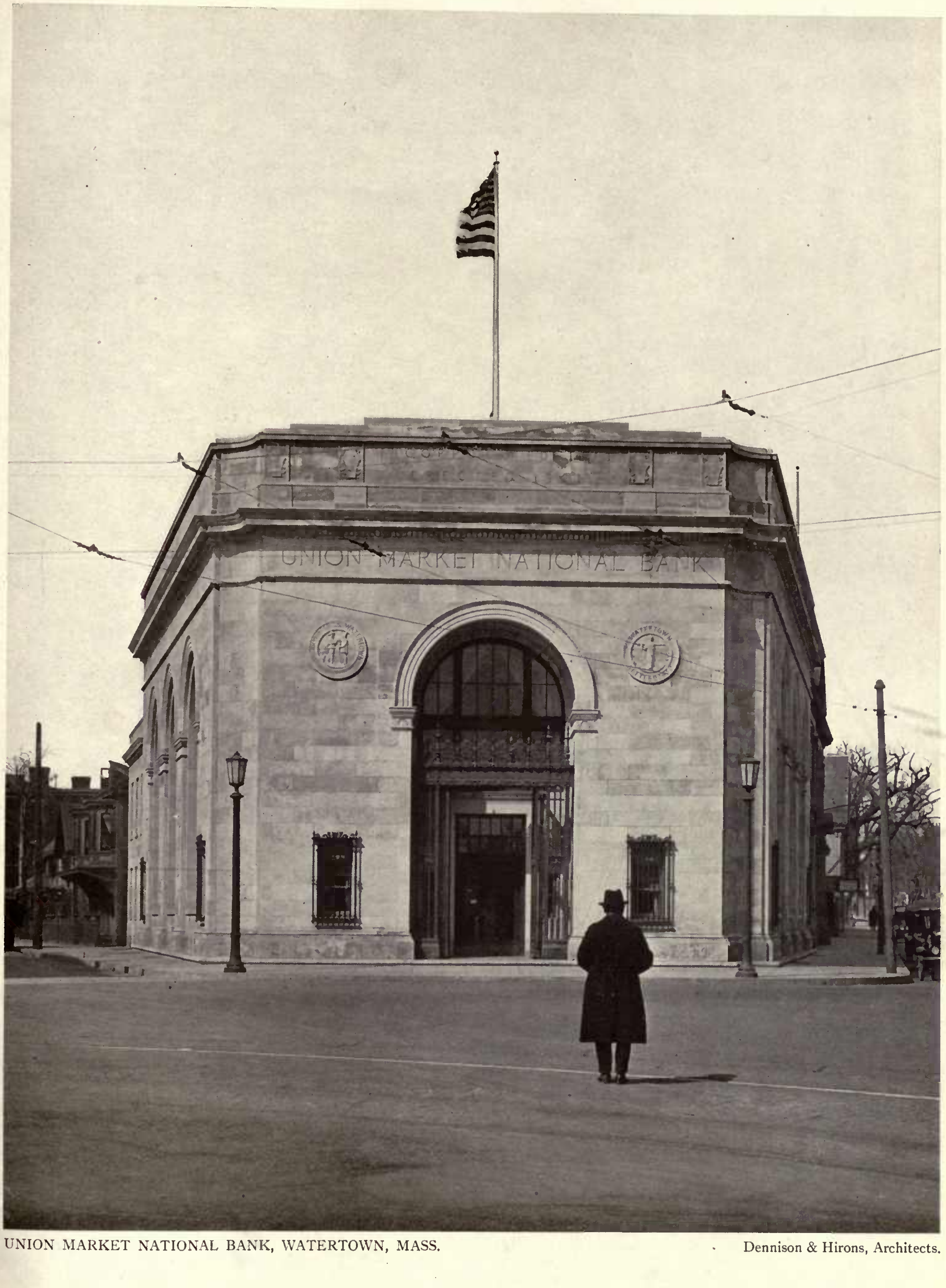


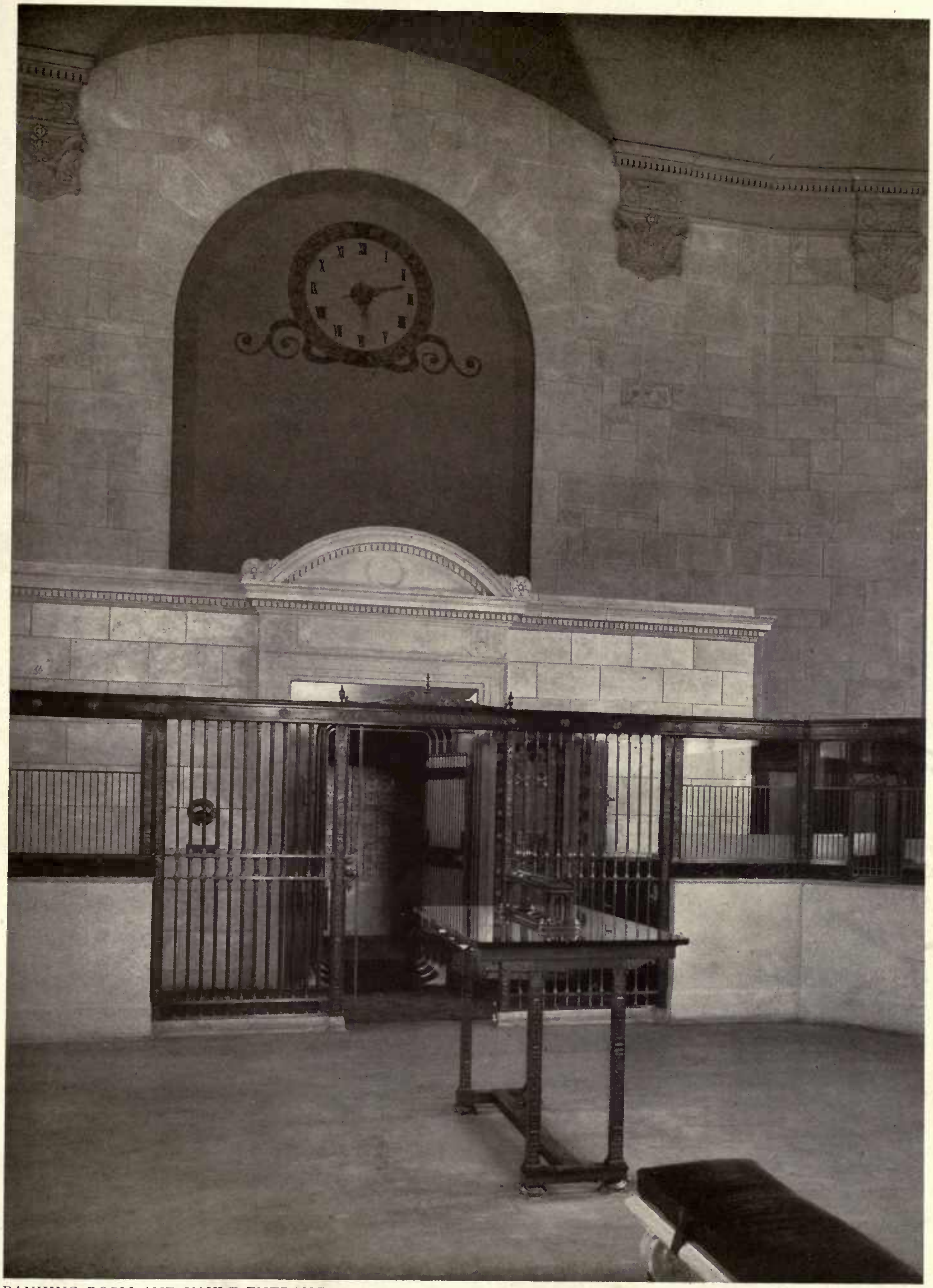
FIRST FLOOR.

HIGH SCHOOL, WOODMERE, LONG ISLAND, N. Y.

Henry Bacon, Architect.



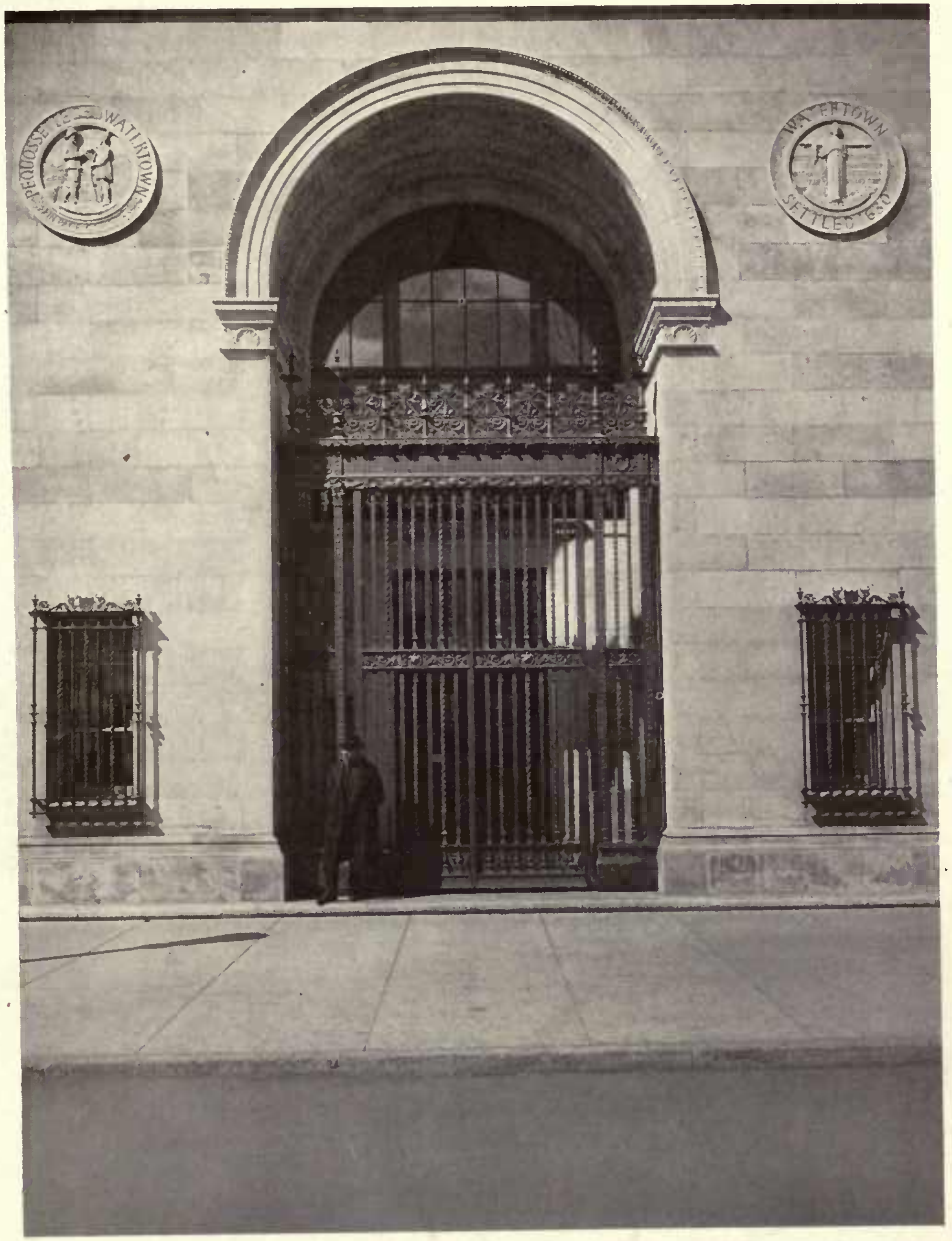
UNION MARKET NATIONAL BANK, WATERTOWN, MASS. Dennison & Hirons, Architects.



BANKING-ROOM AND VAULT ENTRANCE.

Dennison & Hirons, Architects.

UNION MARKET NATIONAL BANK, WATERTOWN, MASS.

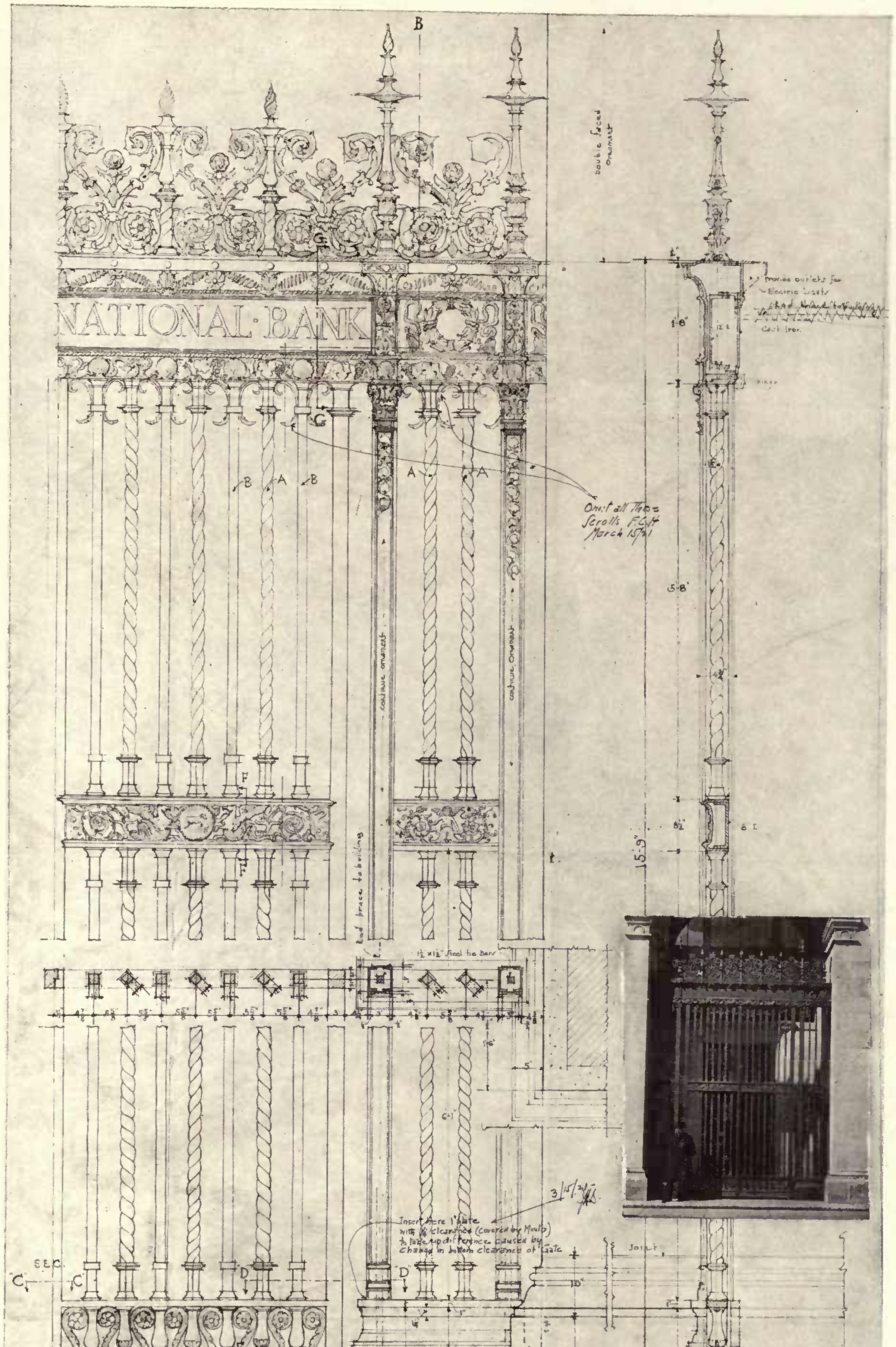


MAIN ENTRANCE.

OFFICERS' SPACE.

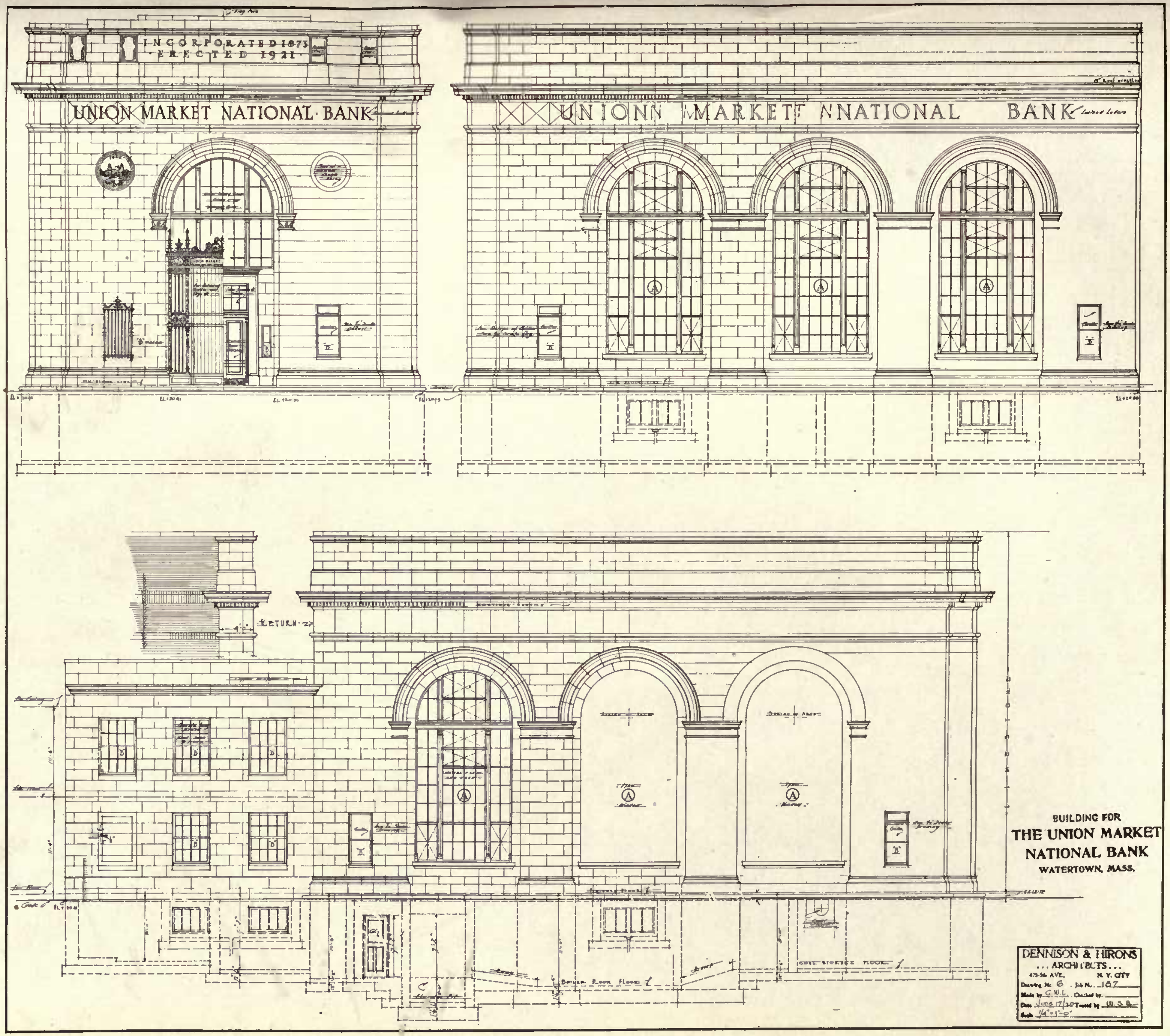
Dennison & Hirons, Architects.

UNION MARKET NATIONAL BANK, WATERTOWN, MASS.



ARCHITECT'S SKETCH, ENTRANCE GATES, UNION MARKET NATIONAL BANK, WATERTOWN, MASS.

Dennison & Hirons, Architects.



ELEVATIONS, UNION MARKET NATIONAL BANK, WATERTOWN, MASS.

Dennison & Hirons, Architects.

The Problem of the Suburban Town Bank

A BANKER once said: "Mr. Architect, I like the rear of our building best; it is so simple and dignified; it looks good to me."

"But," said the architect, "Mr. Banker, you are mistaken; there is no architecture on the rear."

This explains most architects' frame of mind when they have had carte blanche in designing a building, and especially a bank building, where the opportunity of designing in the classic tempts one to go the limit.

Ceiling decoration.

For one who has observed the progress and tendency in the design of bank buildings, it must be admitted that the use of the classic has been overdone; that most bank buildings lack individuality and that the main purpose of an imposing exterior, namely, its advertising qualities, is lost by reason of one bank's similarity to another.

Mr. Banker's preference for the rear of his building because of its simplicity is typical of the ideas of many bankers to-day. Fads in architecture, as well as in other things, have to run their course and, the Greek and Roman temples having had their day, bankers have had an opportunity to observe that the simple design outlives the ornate and is more in harmony with the purpose for which their buildings are intended.

Limited funds which force economy in design are often a good thing; it encourages the architect to simplify his building, and in these days when construction costs are 60 to 80 per cent above normal, it puts his client in a better position to charge off the excessive cost of his building.

Similar conditions confronted the architects of the Union Market National Bank at Watertown, Mass. The "rear-elevation" idea for the front and sides was not studied in vain. This building, placed on a large plaza, bounded by two of six streets which radiate from it, is to be seen at a great distance from many points. It is conspicuous for its lack of ornament and it is doubtful if an unnecessary moulding or embellishment of any kind is to be found. Its plain wall surface of Indiana limestone with well-proportioned openings gives it great dignity and simplicity.

The wrought-iron work, protecting the small openings in front and the main entrance, has been executed with great skill and refinement and relieves the building of too great a severity.

It is interesting to note the successful treatment of the corners at either side of the main entrance. Evidently, the front was too wide for the single-arch treatment and this means of reducing its width apparently eliminated the trouble. It might be added that the treatment of the corners, though unusual, is very successful and probably is accountable for the pleasing silhouette of the building.

It is apparent that the plan of the building offered many difficulties owing to its irregular form, but the convenient arrangement of the interior and its charming proportions, color, and detail, while irregular, is still symmetrical and extremely impressive.

The departments of the bank are grouped about a centre public lobby, at the end of which an ornamental bronze grille protects the safe-deposit vault. At the left of the entrance is an open space for officers, to which the president's room is connected on one side and the note teller and working space on the other. To the right is another open space for the use of customers, similar to that for the officers. There is a ladies' retiring-room in the adjoining corner and the bank's savings department flanks the opposite side.

The safe-deposit vault is conspicuously shown in the rear of the room standing well above the banking screen. Conveniently near are numerous coupon booths and two private rooms.

The vault is designed to withstand fire, burglars, flood, and the oxyacetylene torch, and gives protection of the best type. Its outer covering is concrete reinforced with steel railroad rails; its inner shell is steel, in addition to which an electric lining is provided to guard against attacks of every description. The door, as fine as is known to the safe-making art, is twenty inches in thickness. The vault provides space for three thousand safe-deposit boxes and a separate department for the protection of the bank's money and securities.

The walls of the banking-room are finished with Travertine stone. The vaulted ceiling, with its penetrations over the side-windows and rear panels, is plain, sand-finished plaster, in the centre of which is a large mural decoration.

First preliminary study.

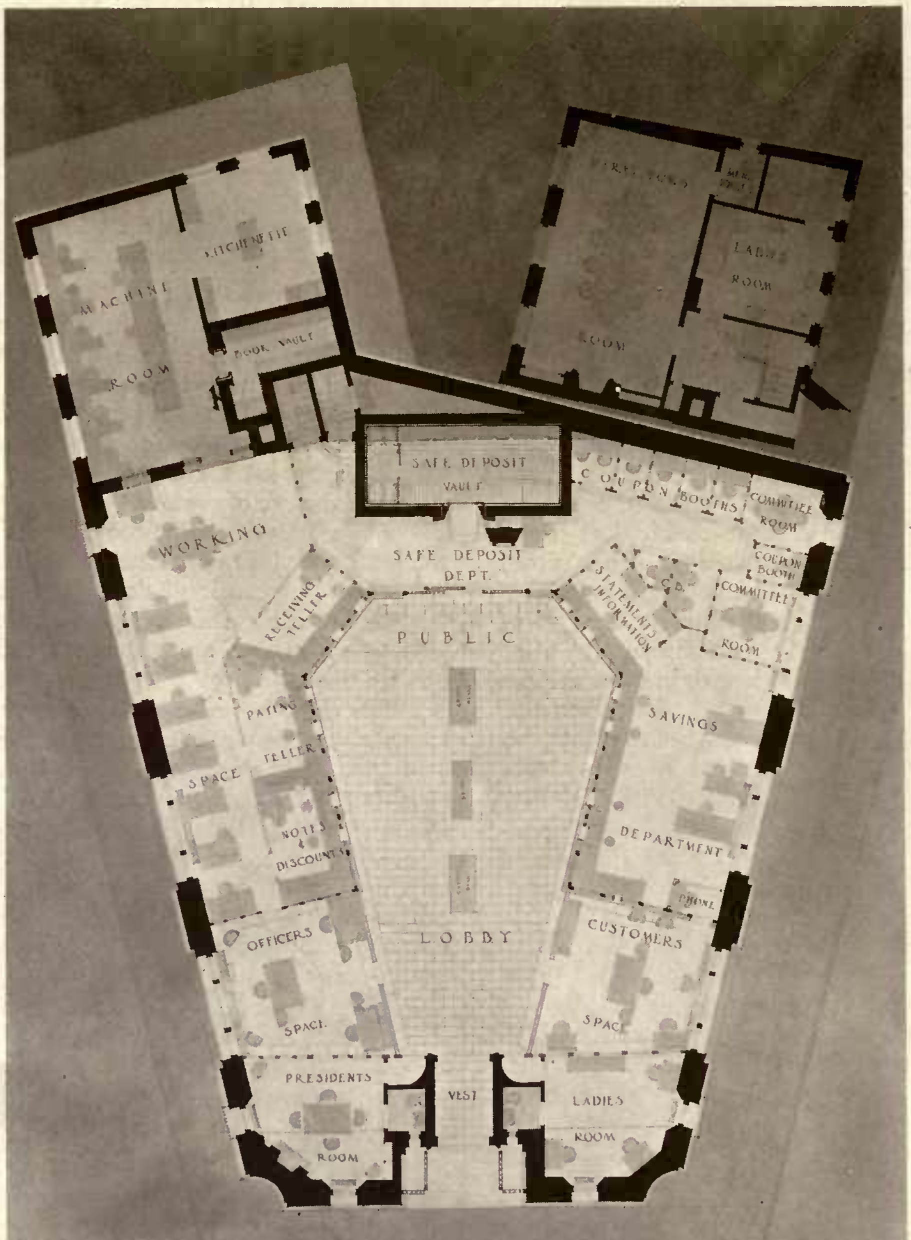
This mural, designed by the architects and executed by Andrew T. Schwartz, shows a map of the vicinity of Watertown. At the base of a decorative frame surrounding this are grouped the figures of Finance, Agriculture, and Manufacture. The map has no little historical interest, as the numerous districts shown were once a part of Watertown and this centre, after the numerous divisions were made and other towns came out of them, was known as the mother town. This idea is appropriately carried out in one of the medallions on the exterior of the building.

The large panels in the rear of the banking-room are of slightly darker tone than the walls and relieve what might otherwise be a monotonous stone surface. These panels contain appropriate inscriptions relating to the functions of a bank.

The marble employed in the banking screen is Tavernelle with a band of black and gold under the bronze top. The public space floor is Tennessee marble, and elsewhere cork tile is used.

The artificial lighting is by indirect upward reflectors placed on the back of the banking screen cornice, while during the day, abundance of light is provided by six windows, framed in metal, twenty-five feet high, of which three are placed on either side of the room.

The rectangular extension connected with the main building contains two stories; on the main floor, a machine-room, a book-vault, a clerks' dining-room, and kitchenette.



BANKING ROOM PLAN
THE UNION MARKET NATIONAL BANK.
WATERTOWN, MASS.

The ceiling of the machine-room is covered with a special material to absorb sound. The second floor contains a directors' room and women clerks' rest room.

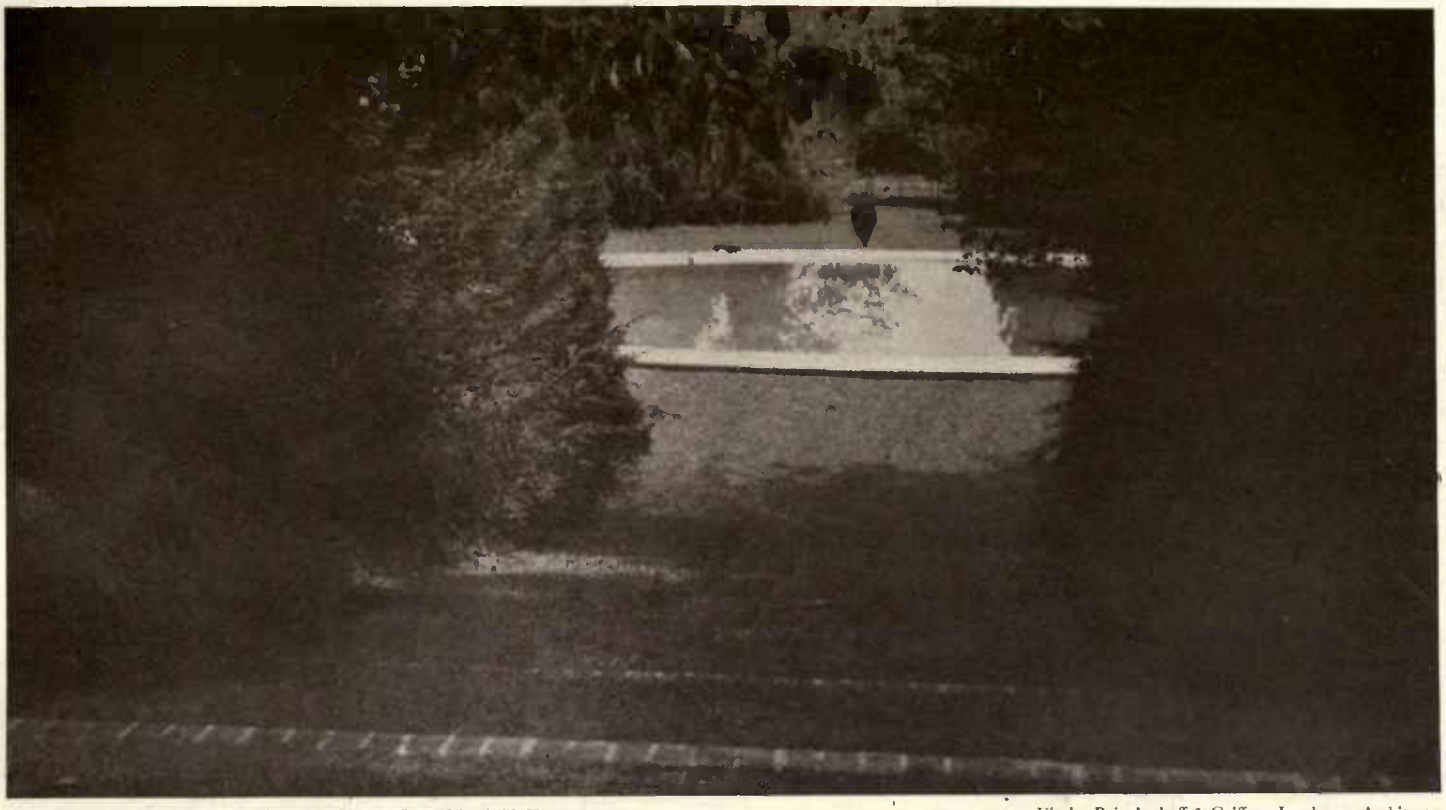
The cellar of the building is arranged for clerks' locker-room, bank storage vault, a trunk storage vault containing fifteen hundred square feet, a machine-room, boiler-room, coal-bunkers, sidewalk lift, etc.

The furnishings throughout are simple and of a color to harmonize with the surroundings. The counter work in back of the banking screen is metal, all other furniture being walnut, of which that in the officers', customers', and directors' rooms is of special design, relieving it of the usual uninteresting commercial character.

The benches in the public space with carved ends and leather tops, are of marble. The bronze work of the banking screen, simple in outline and ornamented in low relief, after models by Ricci & Zari, is full of refinement and equal to their best productions.

The check desks in the public space, with their unique lighting devices, are especially beautiful.

An interesting device for the display of advertising matter is provided in the form of an ornamental case in the lower part of one of the side windows, facing the most important thoroughfare. Advertising material is too often permitted to disfigure the interior or exterior of bank buildings and this excellent means of solving the problem would seem to be a step in the right direction.



Swimming-pool, Estate Bronson Winthrop, Syosset, Long Island, N. Y. Vitale, Brinckerhoff & Geiffert, Landscape Architects.

Broad grassy lawns, uniform evergreen screen, and an oval pool.

When Contractors Invade the Architect's Field

By Mr. F. E. Davidson

A. I. A. and President of the Illinois Society of Architects

THE matter of co-operation between the architect and builder is a very simple every-day proposition and in its fundamental elements is no different from any other instance where co-operation is essential to the best development of any operation in which men are engaged.

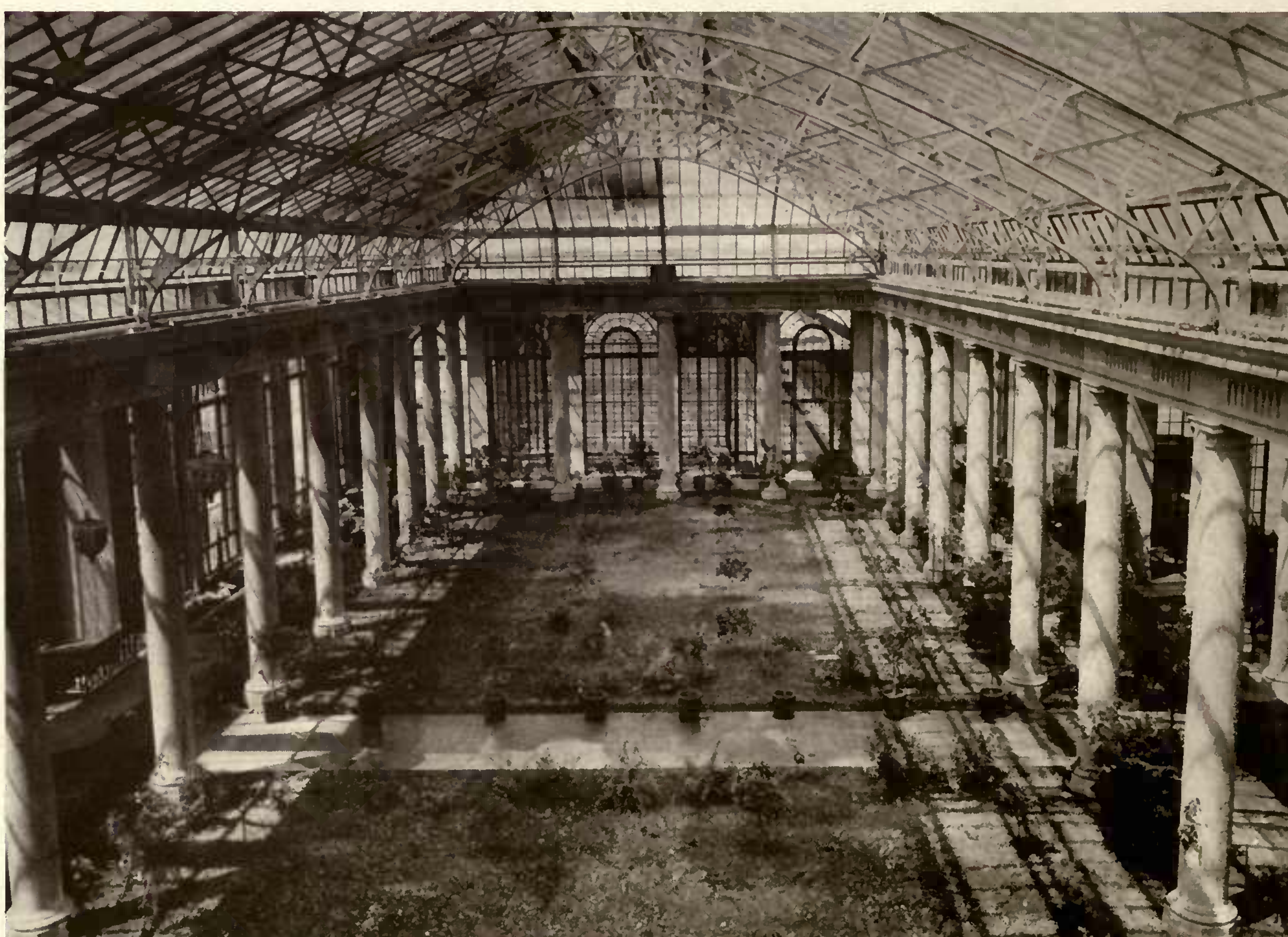
I have often wondered to what extent the present apparent lack of co-operation between the architect and the builder may be charged to the now quite general requirement of the various States that the State shall control and regulate those calling themselves architects, and the tendency, all too apparent, for builders to disregard laws regulating the profession and to assume that they are a law unto themselves. The most responsible and best-known builders recognize their proper field of usefulness and rarely, if ever, trespass upon the work of the profession, but need I tell you of the thousands of cases where the contractor advises an owner that the services of an architect are a useless luxury and that he, the builder, can plan equally as well as any architect? I have no sympathy with those who conceive it to be the function of the builder to be also the designer, nor have I any sympathy with the suggestion made in some States that the State should license contractors. I can conceive of nothing more disastrous to the building industry, to the business of builders, to our profession as architects, than to place the building industry under State control, as was some time ago recommended in the State of New York when a proposal to create a State trade commission to regulate the building industry was defeated.

The profession of architecture is unalterably opposed to the architect who tries to build on the side and may I suggest that contractors just as unreservedly outlaw the builder who tries to play architect on the side. This is not a trade-unionism doctrine. It is common, every-day horse sense.

Many builders, while they give lip service and hand applause to the recognition of the field of the architect, alone with the owner forget their Sunday profession by Monday practices in order to get the edge on a competitor. They talk about the architect being necessary only to himself. They tell the owner that they can provide all the plans needed to secure a building permit and to construct the building, and many times, I regret to say, they induce the owner to fall for the "bunkum," and with what result? The owner who believes them is either a fool or a crook. He is either a man who knows nothing whatever about planning or building problems, or he is a man trying to get something for nothing, and right here will be seen the danger-signal of trouble ahead.

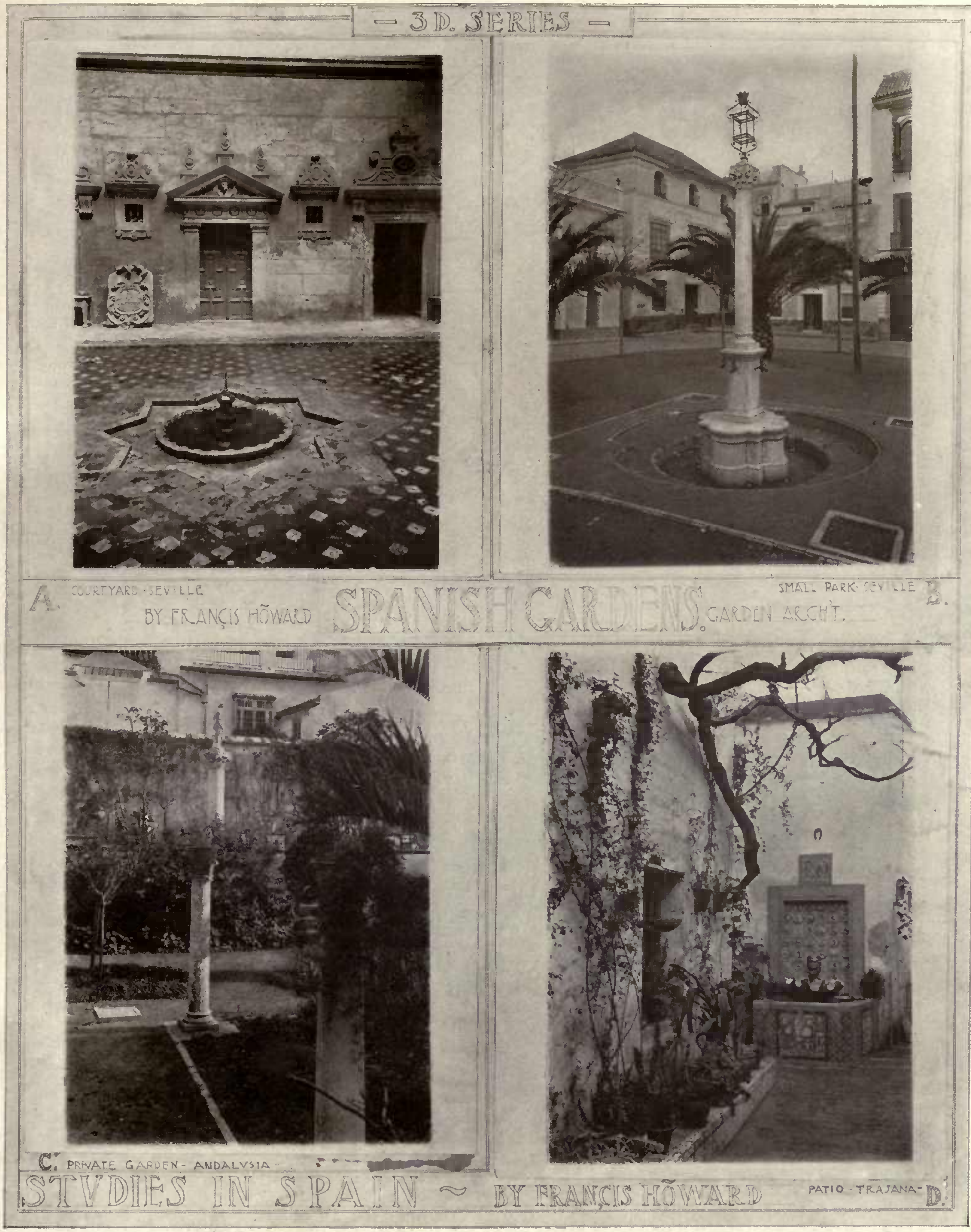
Not knowing the builders' problem, the owner is not sympathetic to it. He has not either the indulgence or the instinct to be sympathetic with them and remember in these cases their appeal to the architect is cut off. An architect in his professional capacity is an owner's professional personality.

MAIN ENTRANCE.



INTERIOR.

ORANGERIE, ESTATE PIERRE S. DU PONT, WILMINGTON, DEL.



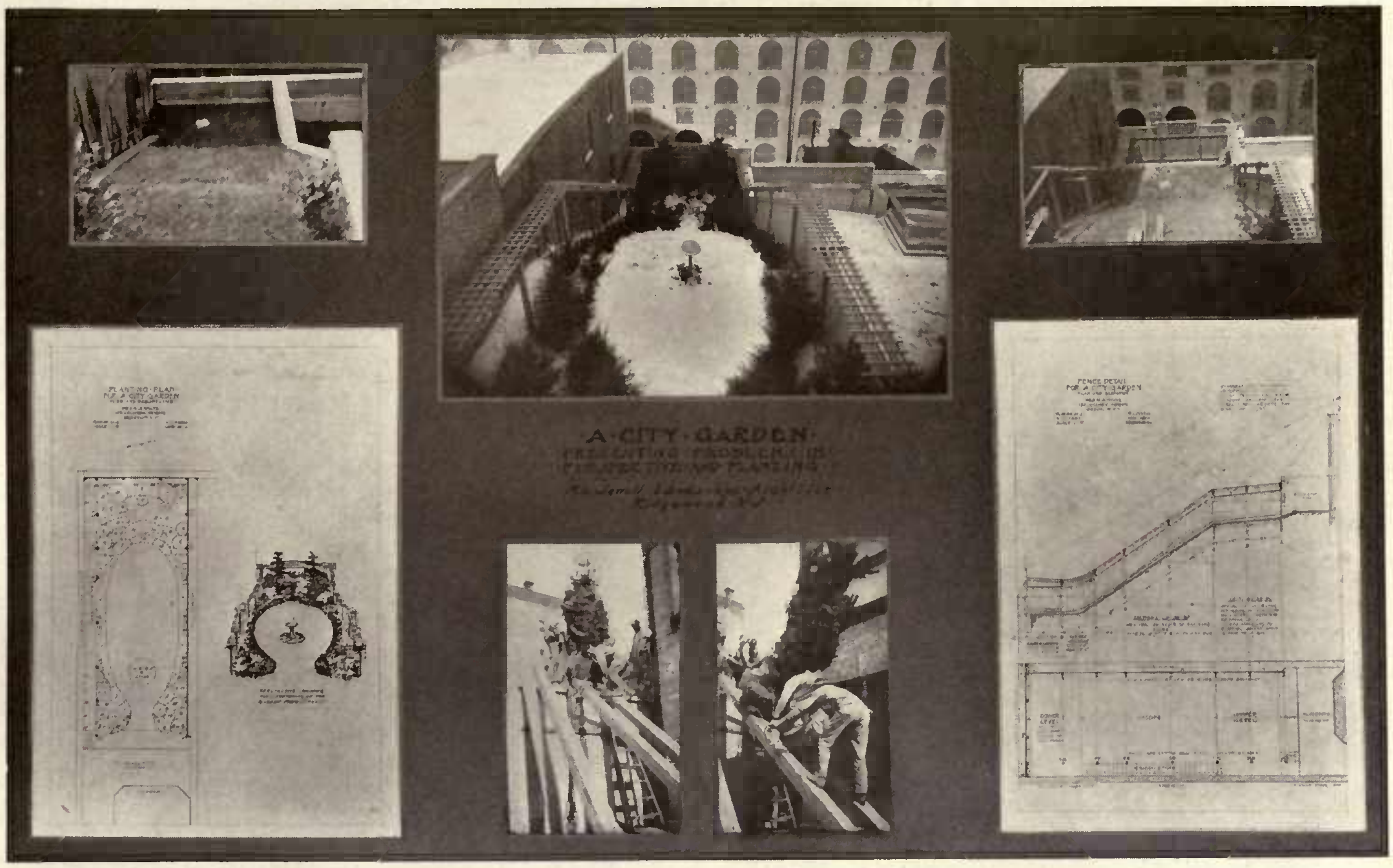
A. Courtyard with fountain in form of a star. Pavement inset with tile, etc.

B. The column is used to hold ornamental lantern, and also has outlets for drinking.

C. Small pots filled with flowers are set in columns of marble.

D. Tile fountain in blues and yellows with vines clinging to side-wall.

GARDEN OF CITY RESIDENCE, THOMAS W. LAMONT, NEW YORK. Walker & Gillette, Architects.



A City Garden

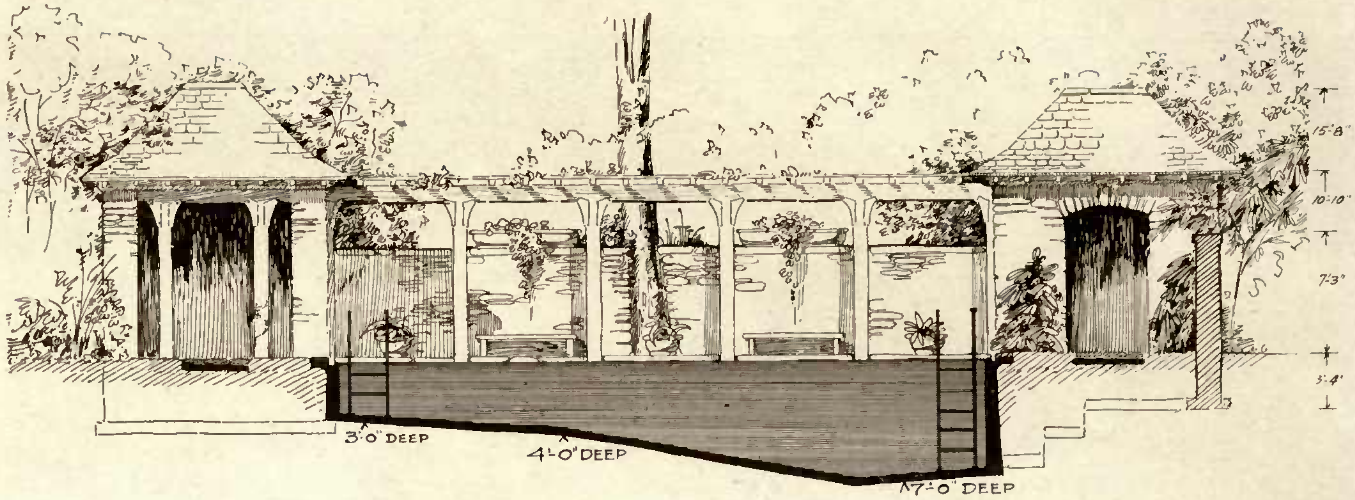
By Marjorie Sewell, Landscape Architect

ON first considering the possibilities of this city property for a garden site the landscape architect was overwhelmed by a feeling of despair. Then, as a careful analysis of the situation revealed one difficulty after another, the problem became an intensely absorbing one.

Exposure to wind, protection from sun, a permanently damp and acid soil condition, not to mention an irregular boundary of concrete retaining walls, should have been sufficient limitations for any garden. But owing to the peculiar grading and the angle of vision, the property was apparently telescoped to one-third its actual size. This extreme foreshortening was partly due to a bank which sloped away from the house at an angle of thirty-four degrees, and partly to the fact that the first-floor window, from which the garden was to be viewed, was in reality three stories above the upper level of the garden. Had the house been located at the bottom of this slope an interesting terrace treatment could have been used. However, under the existing conditions the bank appeared almost level and the lower end of the garden seemed to rise. It was therefore decided to treat the whole plot as one simple unit, from a bird's-eye point of view, and as far as possible to eliminate the lines and angles of the existing boundaries.

Along the north and west property lines a wooden fence topped by lattice was constructed to conceal the concrete walls, and to serve as windbreak and heat reflector. On the south side, where no further protection was desired, the fence was balanced by posts and lattice only. Again, because of the view from above, the lattice was placed horizontally and the fence posts carried up to support it, pergola fashion. For interest and variety in this simple construction, the posts were placed in front of the paling and, together with the lattice, painted a lighter shade of gray.

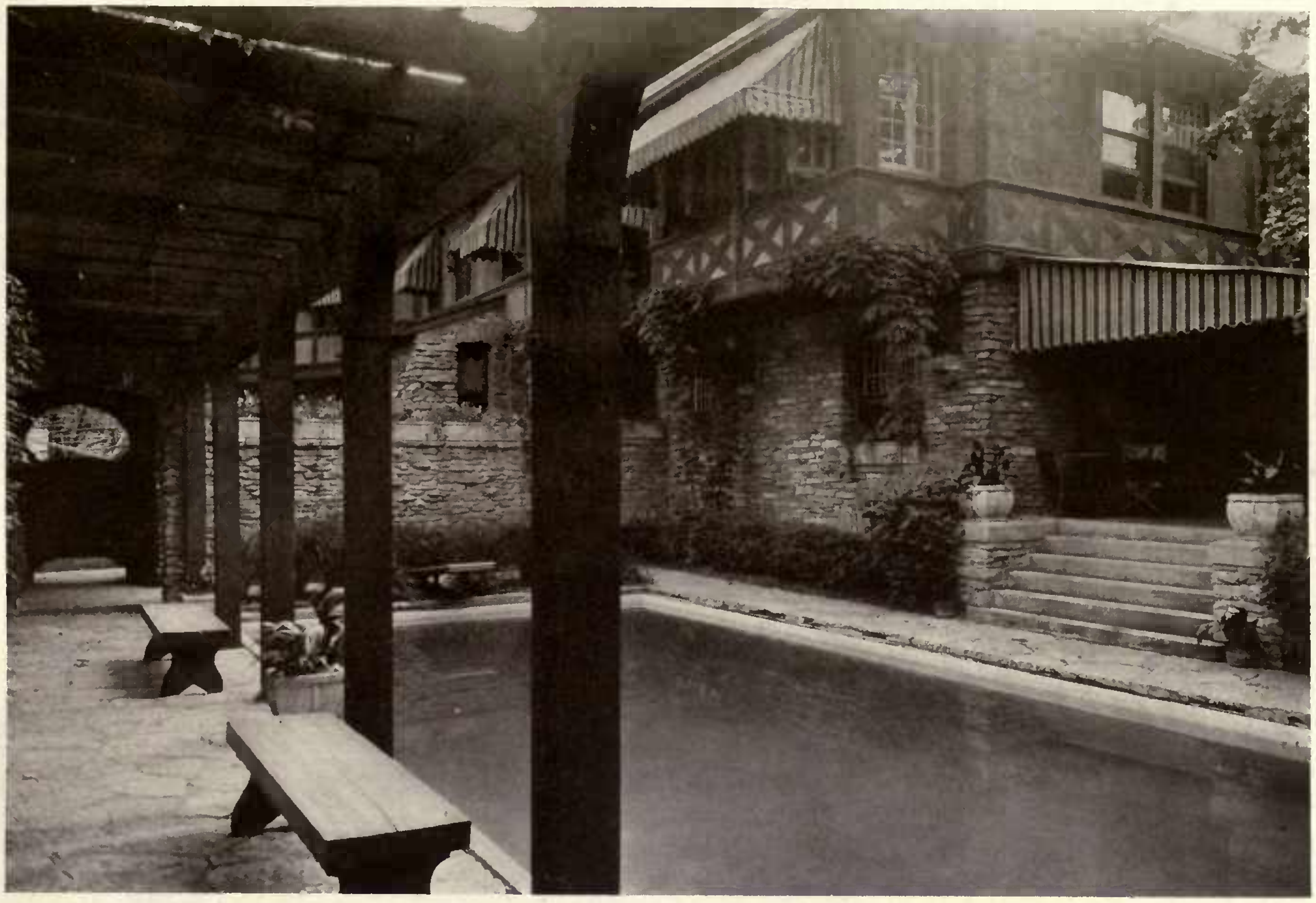
Having provided a more restful boundary for the garden, it was now desirable to place the centre of interest in the apparent centre of the garden. This was finally located at the edge of the upper level and in line with the window, several feet off the true axis. In order to appear round, the circular bed was made oval. And in the same way all planting operations were based upon perspective rather than plan and elevation. Shrubs were selected according to their breadth instead of height, and along the slope so spaced and planted as to counteract the effect of foreshortening. Only those varieties adapted to shade and acid soil could be depended upon for such adverse conditions. Hardy evergreens were chosen for winter effect, and to lighten their solid masses

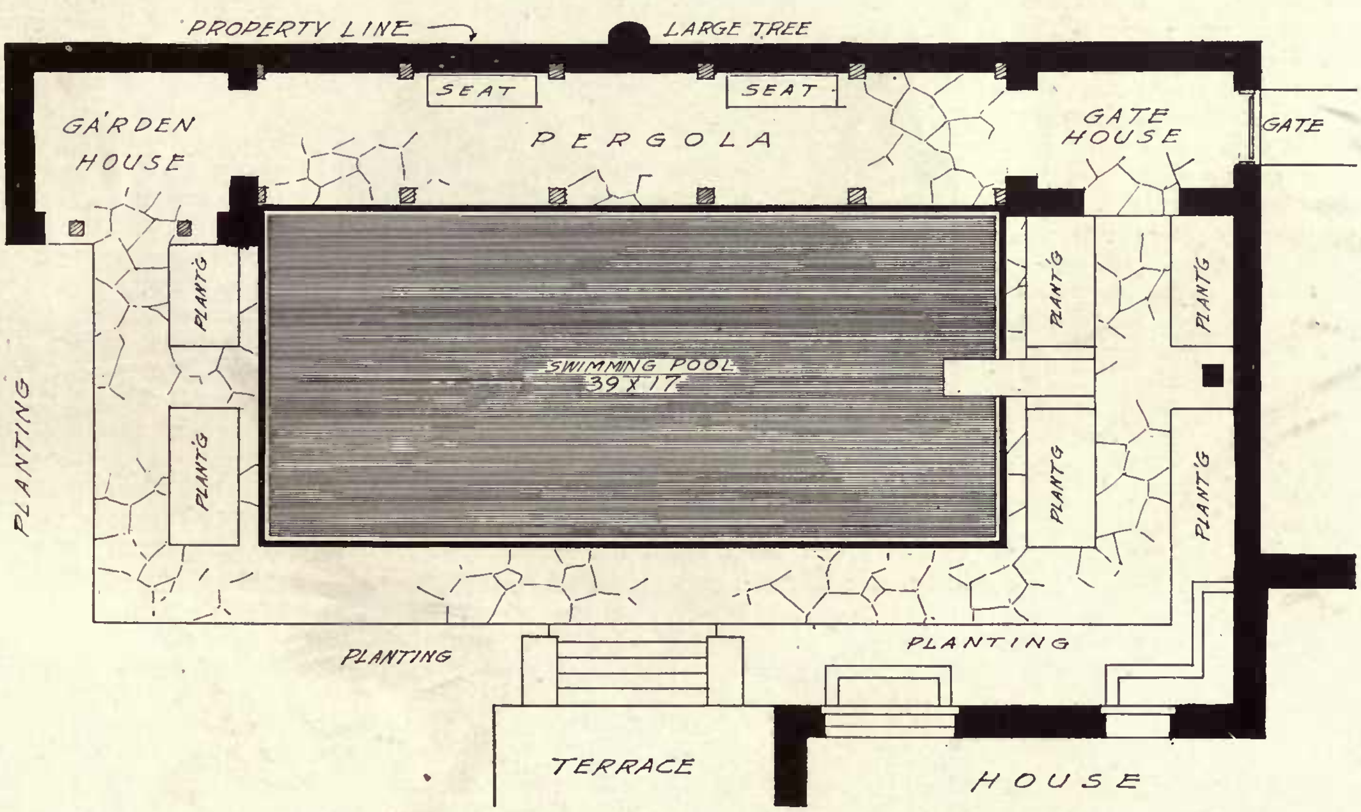


Swimming-pool, Frederick J. Flach, Cincinnati, Ohio. Tietig & Lee, Architects. William Pitkin, Jr., and Seward H. Mott, Landscape Architects.

spring and fall blooming shrubs and vines were introduced. The planting operations required infinite patience and skill. Each plant was delivered with a ball of earth, and, according to its size and weight, either lowered through the cellar or hoisted over the retaining wall.

Having tried to solve each problem in turn, the greatest drawback still remains. Of course the atmospheric conditions can be alleviated by thorough spraying to remove soot and dust from the leaves of the plants. It is also interesting to note that for the best results in city gardening Mr. Hicks recommends a system of transplanting every few seasons, or, in other words, a summer's vacation in the country for a tired city plant.





PLAN. Tietig & Lee, Architects. William Pitkin, Jr., and Seward H. Mott, Landscape Architects.

SWIMMING-POOL, FREDERICK J. FLACH, CINCINNATI, OHIO.

Charles Cressent—1685-1768

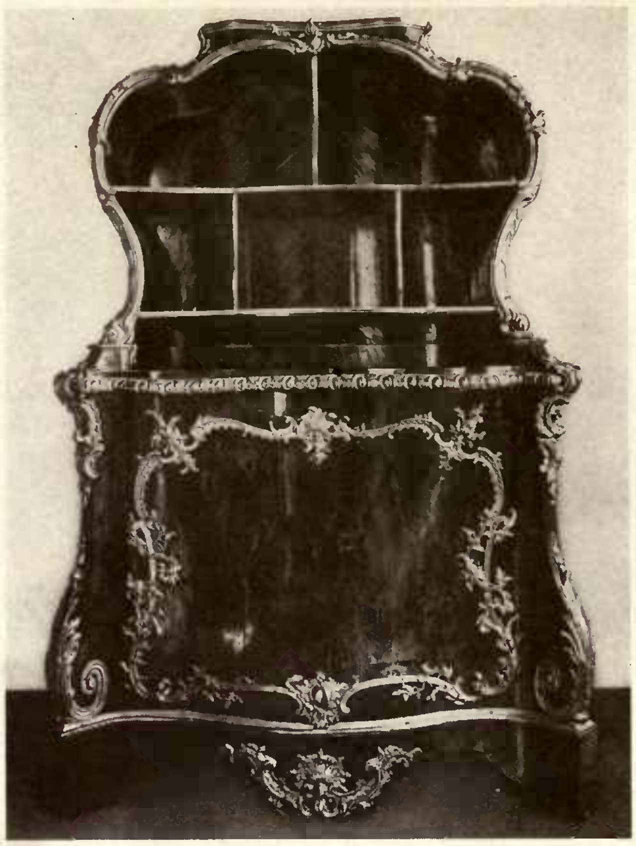
By Henry Coleman May

MICHELET, speaking of art, said: "The regency was a century composed of seven years." If, in the same spirit, one goes on to consider its development from the death of Louis XIV to the end of the eighteenth century, one would conclude as well that this period of time represents in accomplishment not merely one but several centuries, so rapidly and intensely did the progressive affinements of its art occur.

Although our subject deals with one who gave an impetus to his special branch of art which continued throughout the greater part of the seventeen hundreds, Charles Cressent, nevertheless, primarily represents the taste of the regency.

After the death of the Grand Monarque, in 1715, and during the minority of Louis XV, Philippe, Duc d'Orléans, became Regent of France. His court, up to the time of his end, in 1723, was notorious for its dissipation. The etiquette which had obtained so strictly while the long preceding reign had lasted, was greatly relaxed during those seven succeeding years. In private life, liberty grew into license. The necessity of a continued "tenue" inseparable from the pompous publicity of Versailles lessened to a very appreciable extent as the court was removed from that place to Paris, into the more intimate atmosphere of the Palais-Royal or the Luxembourg. Simultaneously with the closing of the ancient order, various centres sprang up in the capital. In the salons of the nobility coteries began to form around men and women, particularly the latter, who represented new developments in ideas and taste. After an era of continuously regulated behavior individualism began anew to reassert itself. With the names of Conti, Montesquieu, Hénault, and Voltaire are associated a group of brilliant artists whose talent blossomed into a vivid originality once Lebrun's goddesses and Mignard's duchesses had ceased to hold sway.

Above all other names looms that of Watteau. His genius is supremely indicative of the taste of the regency at its highest and best. He is the magician of the epoch, and his magic still moves us to wonder and admiration. So pervading was his charm that it is impossible to consider any artists of these particular years without turning toward this master as the source of their inspiration. We see his painted attitudes in stone, his pencilled faces in bronze; his costumes were copied on the contemporary stage, and one is even inclined to believe that the vaporous landscapes of France, the graduated perspectives of its gardens, changed subtly once Watteau's brush had transferred them to canvas.



"Cartonnier." Satinwood and gilt bronze. Formerly the property of H. H. the Princess of Saxe-Altenbourd. "Chinese Palace," Oranienbaum, Russia.

At this time, thanks to the financial enterprises of the celebrated Law, a great number of colossal fortunes had been made. Paris saw an activity in building which up to that time had been unknown in its history. Those who already possessed houses altered and redecorated them according to the taste of the day, and as an obvious consequence furniture had to be made in a fashion suitable to these new surroundings. It would, of course, be an exaggeration to imagine that the aspect of things changed suddenly and completely. Style is constituted not through absolute innovations, but by modifications typical of the existing order, and more particularly is this true of all French styles whose genesis is in tradition and whose evolution is natural and comprehensively progressive. From time to time an artist of real genius gives a new *accent* to the modification. Watteau did this in painting and Cressent in cabinetmaking.

Charles Cressent was, artistically speaking, the direct successor of Boulle, in the importance of his work, in its originality, and in the influence it exercised on later ebonists. Needless to say his designs were vastly different from those characteristic of the earlier master. After the Louis XIV formula, whose object was to strike the senses by its magnificence and majesty, that of the regency strove to please rather than to impress. It was, in quite a definite sense, a formula of reaction. At the same time, though expressive of another mental attitude, it was logical enough to represent a continuation of seventeenth-century forms. It was also important enough to constitute the basis of the succeeding style, that of Louis XV, the characteristics of which became, however, somewhat involved as it progressed, on account of the enormous amount of individual artistic activity resulting from the then comparatively disseminated condition of society.

The son of a sculptor and the grandson of a carpenter, Charles Cressent was born in Amiens in 1685. In 1714 he was admitted as a sculptor to the Academy of Saint-Luc in Paris. Five years later he married the widow of one Poitou, who had been ebonist to the regent, thereby taking a step which was perhaps one of the most important in his life, as, thanks to this fact, added to his already recognized talent, he placed himself where he could logically be called upon by those in authority to succeed Joseph Poitou as "ébéniste

Commode. Satinwood and gilt bronze. Collection of Baron de Schlicting, Paris.

attitré." From 1719 to 1757 he worked indefatigably. At the last date he retired from business, and in 1768, in midwinter, he died, and was buried in the cemetery of Saint-Joseph, not far from the tomb of Molière.

So much for the mere dates concerning the salient events of his life, as well as that of his death.

In the year 1720 the regent commissioned the architect Gilles-Marie Oppenord to design and superintend the altering and redecorating of the Palais-Royal. Of Dutch parentage, though born in Paris, Oppenord was the foremost architect of the moment, and can be considered one of the creators of what we call the "Style Régence." He had been given the official title of "Director-General of Buildings and Gardens to the Duc d'Orléans."

The work to be done in the Palais-Royal was of no small importance, and Oppenord set about to secure associates to assist him in this undertaking. Foremost among them we find the names of Robert de Cotte and of Charles Cressent, whom Oppenord had undoubtedly met when the future "ébéniste du régent" was working within the Louvre in the atelier of Girardon. That period of Cressent's career we cannot but consider as a most important one. The sculptor Girardon was a man of extremely cultivated tastes. He possessed a collection of Italian bronzes which was perhaps unequalled in Paris at that time. Living as he was amidst statues and bas-reliefs dating mainly from the Renaissance, Cressent could not fail to be influenced by such surroundings. This influence must have been visible in his own work, which at that time seems to have consisted entirely of sculpture. We learn from documents of the epoch that besides a few original statues, only one of which has survived, Cressent was engaged in restoring works by Augier, le Lorrain, and Girardon.

When he was called upon to furnish designs for the Palais-Royal he had, since perhaps some four or five years, given up sculpture proper in order to associate himself with the ebonist Poitou (whose widow he subsequently married), for whom he furnished many bronze ornaments destined for the decoration of furniture. In the Wallace Collection there is a commode undoubtedly made by Poitou, to which are added gilt bronzes, the work of Cressent, the whole piece being in the style of Boulle. This is probably the earliest specimen of Cressent's work. Its ensemble can hardly be considered characteristic of his style which, a few years later, found such individual, original expression in his complete pieces. The two other examples belonging to his first period are clocks, one preserved in the Musée des Arts-Décoratifs, the other still remaining in the Palace of Versailles.

Even from the first, however, his style was very distinctive. His bronzes, those meant to be applied to furniture, were particularly bold in character and were excessively realistic in manner. His representations of human forms, and more particularly of heads, used as "chutes" for the angles of tables or commodes, were full of life and expression. Though his types are incontestably borrowed from Watteau, they are very varied and never meaningless. He had a predilection for busts of young women, whose smiling features and jewelled ornaments must have seemed strangely modern to contemporary eyes, and for the more classic masks of old men, whose flowing hair and beard were used in a somewhat more conventionalized manner. On many of his pieces we see highly spirited groups of children, a favorite theme of his, combined sometimes with bacchantes or involved scrolls. Lifelike presentments of animals, of dogs and dragons, and of the gods of ancient mythology were used profusely by Cressent in his early and middle period, and again we have reminiscences of Watteau in his mouldings of personages drawn from the "Comédie Italienne."

By the middle of the eighteenth century Charles Cressent's vogue was at its height. He had, several years before, been created "ébéniste du régent," and although he worked

Bookcase. Satinwood and gilt bronze. Formerly in the Dournovo Collection, St. Petersburg, Russia.

Writing-table in the Louvre characteristic of Cressent's fully developed style.

throughout the greater part of the reign of Louis XV (though fortunately he never allowed his very personal and highly developed style to be influenced by later fashions), for some reason unknown to us he was not promoted to the rank of "ébéniste du roi." He supplied furniture for the court, for the "hôtels" and "châteaux" of the aristocracy as well as for palaces of foreign sovereigns, but curiously enough never for the King of France. Considering his reputation as well as his prodigious talent and capacity for work, this neglect must have been the result of some intrigue, the details of which have been lost to posterity. Every period, however, has its outstanding name. Boulle was characteristic of the century of Louis XIV.; Cressent, admirably descriptive of the brilliantly artistic years of the regency; while Oeben, who had studied under Boulle, and who rose to fame under the reign of the fifteenth Louis, stands preeminently for the style of that time.

Writing-table originally made for Versailles. Now in the Louvre.

It was Cressent who first used various kinds of wood, both exotic and domestic, in cabinetmaking. Following the severe epoch of ebony and tortoise-shell, the gay society of the regency demanded furniture of a more pleasing character to decorate its salons and bedchambers. Cressent triumphed in assorting, with impeccable taste, a great variety of woods, which he worked harmoniously together with much imagination and fantasy. In his middle period he covered these surfaces, worked into geometrical patterns or into an infinite variety of decorative designs, with a profusion of gilt bronzes, enhancing thereby the color of the highly polished wood itself. Never, however, did his work become too elaborate, and even in his richest compositions Cressent did not forget the value of line. In his bronzes there is always a boldness which is reminiscent of the classic traditions of the preceding century. Unlike Meissonier, his imagination kept ever within the bounds of proportion.

Another very noticeable characteristic of his work is its appearance of completeness, of unity. This is due to the fact that besides being a sculptor, designer, and cabinetmaker, besides understanding thoroughly the arts of founding and veneering, he was as well an experienced carpenter. His apprenticeship in this line had begun when as a very young child he had worked in his grandfather's shop in Amiens. And, in spite of the then excessively strict corporative laws, Cressent managed, no doubt by the help of his high protector, to remain a carpenter, ebonist, founder, and sculptor, all in one. In this respect he is undoubtedly unique in the annals of cabinetmaking, and the natural result of his varied knowledge we see in pieces which, unlike very many others, are not the outcome of collaboration and do not therefore give the impression of resulting from a combination of tastes.

Outside of his workshop, which, in conjunction with his residence, was situated in the rue Notre-Dame-des-Victoires (and from which, unusually enough, he never moved throughout his entire Paris career), he reached a position of a certain eminence. As time went on he became known as an authority and expert on all art matters. The regent was fond of the arts. He appreciated music and painting as well as the various sciences, and it was not unnatural, therefore, that he grew interested in the opinions and personality of Charles Cressent. We have reason to believe that Philippe d'Orléans oftentimes sought the advice of his ebonist on the question of his own art purchases. Cressent himself was the possessor of an important collection of paintings, of antique bronzes and marbles, as well as of Oriental and European porcelain, to say nothing of furniture due to his own and others' invention. A catalogue, dated 1756, at the time of his retiring from business, is preserved in the Bibliothèque Nationale. In it his various belongings are enumerated. Through it we are able to identify many articles of his creation, and from it we learn that Cressent owned important paintings by Rembrandt, Dürer, Rubens, and Van Dyck, as well as canvases bearing the signatures of lesser lights, both contemporary and belonging to the preceding century.

As Cressent grew in years his style became simpler, the lines of his compositions more severe and less covered with bronze decorations. There are three pieces which illustrate perfectly the different phases occurring in his taste. The first is a large writing-table, now in the Gallery of Mirrors at Versailles. On this piece of furniture the Peace Treaty was signed on the 28th of June, 1919. In it we still find the Louis XIV tradition. Its bronzes, though of large dimensions, of bold and realistic design, do not give the dominant impression, as in his later pieces. They are primarily structural, and follow the lines of the table itself.

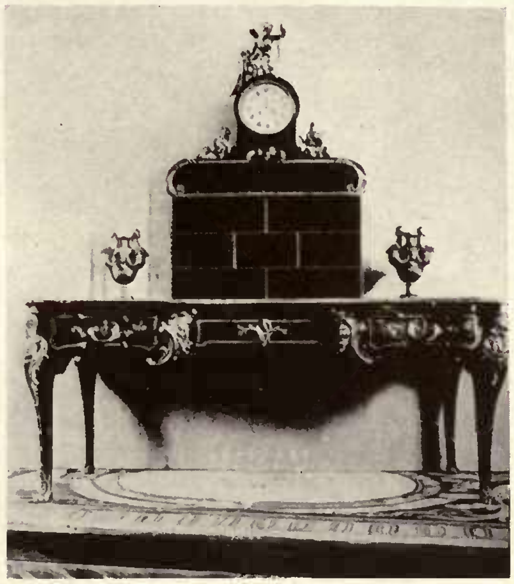
Cabinet in the Bibliothèque Nationale, in Cressent's early manner. (The Chinese figures do not belong to the piece.)

In a commode now in the Wallace Collection we have an example of his middle manner. The wood would seem to be a mere accessory for the bronzes which, with great exuberance and richness, unfold their continuous design over its surface. In the centre there is a female face surrounded by leaves and arabesques, which on both sides resolve themselves into conventionalized figures of dragons. The side panels are as well covered with bronzes. The corner "chutes" descend the entire length of the legs, finishing in heavy and elaborate "sabots."

Two celebrated cabinets, which some years ago passed into the Rothschild and Castellane collections, are descriptive of his final style. In outline they are absolutely severe. The two panels are ornamented with gilt bronze, forming a design nearer the neo-classic Louis XV manner than any other of Cressent's creations. The handling is lighter and more delicate, and, correspondingly, larger surfaces of undecorated wood are visible.

As to his statues, only one example has survived. This is the bust of the Duc Louis d'Orléans, son of the regent, which is kept in the Bibliothèque Nationale.

To enumerate all his existing authentic works would require a fair-sized pamphlet. Luckily for posterity many of his clocks, tables, commodes, and cabinets have been carefully preserved and registered, a certain number of examples being owned by the state, others being distributed about in various French and English collections.



Large writing-table with "Cartonniers" surmounted by figures of Diana, now in the Louvre.

It is impossible to look at his works without realizing that Cressent was a very complete artist, full of fire and inspiration, and one who notwithstanding the taste of his time never allowed his genius to descend to the exaggerated passion for "rocaille." In all his creations there is an air of nobility and grandeur, a feeling of strength often coupled with restraint. When, as in his middle period, he ignores this latter quality, his exuberance never loses its sense of proportion; even his most excessive ornament is always harmonious, and strikes one by its continuity in design. The unrelated arabesques of the "rococo" masters find no place in his compositions.

Three years before his death, in 1765, the aged artist published his third and last catalogue, an inventory of the treasures whose dispersal was to occur so shortly afterward. He left no heirs, his wife had died several years earlier, and the principal beneficiary under the terms of his will was his housekeeper.

Nowadays one is apt to say to oneself that modernity should be encouraged, that one should have furniture and decorations made corresponding to the "cachet" of our own time. But once in the presence of these commodes and tables, these secretaries and "coiffeuses" of another age, these creations of luxury and elegance, made with a mastery which seems to be really a thing of the past, one's ardor for modernity melts away, and one is content to remain under this enchanting spell of the past. Then, too, in a time such as ours, which has lost to so incredible an extent all idea of form, it is perhaps as well to keep alive the taste for an era when society was a positive organization, and one in which, although one did as one pleased behind closed doors, a feeling for dignity and a knowledge that "noblesse oblige" still obtained among ladies and gentlemen. Modernity has come to mean a relaxing of form in every sense. What could be more expressive of this relation between furniture and manners than the following reflection, so aptly put forth by the author of the "Propos d'Alain"?

"Period furniture is primarily meant for conversation and for good manners. It regulates one's attitudes even more than does costume, and thereby the channels of one's thoughts, passions, and desires. Also, when necessary, it marks the order of precedence. As soon as this strict observance, which is so indispensable to the art of conversation, ceases to be followed, forms begin to lose their point. Society must be supported by furniture. . . . As soon as negligence, 'abandon,' vagueness, and phantasy appear, wit disappears; there is no real 'esprit' left. Man can have nothing worth saying if he is not above all aware of himself, and his confidences are not worthy of attention unless they have been properly composed."

Announcements

Wesley S. Bessell, architect, announces his removal from 56 West 45th Street, New York, to 58 West 49th Street, and will be pleased to receive catalogues and samples at the new address.

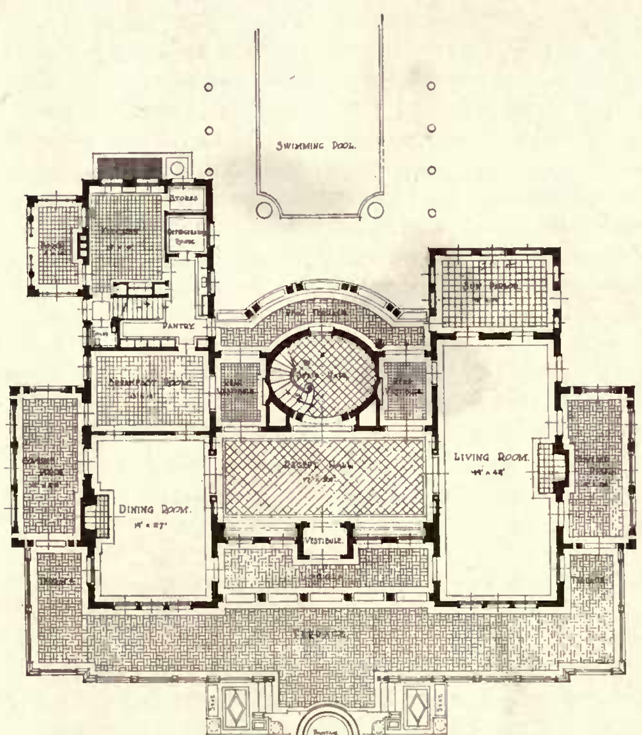
Giaver, Dinkelberg & Ellington, architects and engineers, Detroit, Mich., announce the removal of their offices from 602 Book Building to 1507 Stroh Building, 28 West Adams Avenue.

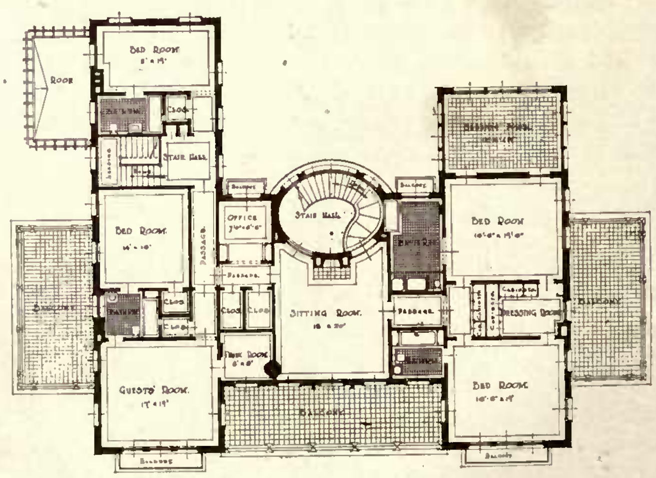
Geo. E. Trent, architect, has opened an office for the practice of architecture at 613½ Ninth Street, Huntington, West Virginia, and desires manufacturers' catalogues and samples.

Felix Rasulo, architect, advises us that his address is now 3 Getty Square, Yonkers, New York.

To take care of greatly increased production demand, the Crittall Casement Window Company has begun the erection of a new plant at Hearn and Springfield Streets, Detroit, Mich. The new plant is being built by A. A. Albrecht, contractor, and will be ready for occupancy May 1. The plans are the Crittall Casement Window Company's own. This building is designed to be the central and larger of a group of three, the other two to be built later. The main building is 300 feet long by 100 in width, and will contain the general offices as well as the steel-casement factory.

RECEPTION HALL.





HOUSE, W. C. RIGSBY, SAN ANTONIO, TEXAS.

Atlee B. Ayres, Architect.

Profit from a Profitless Year

By William Pitkin, Jr.

Member Society of Landscape Architects

UNDOUBTEDLY income-tax returns for the year 1921 which the government will receive from architects and landscape architects will reflect an average income considerably less than for several preceding years, though there will be exceptions where firms engaged primarily on large commercial projects will show an increased earning, and occasionally even a small practitioner will have made an unusually good profit, due to some local or peculiar condition.

But on the whole the returns will indicate that the earnings of the professions have decreased enormously, and while an average taken from all the returns will probably reflect some profit, they will show in a vast number of cases that there has been an actual loss of more or less seriousness.

Among those more firmly established members of the professions who have weathered the difficult period of 1921, but have come through with a loss, or at least with only a small profit, it would be interesting to know how many count the year as entirely unprofitable in every sense of the word.

The intent of this article is to show that a year which fails to produce a dollars-and-cents profit need not necessarily be an unprofitable year, and may even be made a period productive of exceptionally valuable and satisfying returns.

Such profits will necessarily be of an indirect and even intangible nature, but if rightly appreciated and intelligently reinvested, they are sure in succeeding years to produce a direct and generous return.

The first and most important benefit gained from a period of depression when the amount of business in an office is so greatly reduced, is the amount of time which becomes available for use. As such a depression always follows a period of intense activity, the change affords a breathing spell as welcome to the professional man as the interval between rounds is to a boxer.

This newly available time affords infinite opportunities for activities which have been absolutely prohibited during periods of good business due to the pressure of daily demands essential to the execution of a large volume of work.

These opportunities include the possibility of realizing the dreams and aspirations in the mental background of every worth-while professional man for further study and travel.

Books and files hardly opened for months become accessible, and from them much valuable information is gleaned for use during future busy periods. New theories and methods previously barely touched upon are now thoroughly studied, discussed, and adopted as they are found worthy and applicable to one's needs. Materials are investigated, and one's knowledge of kinds, quantities, and varieties greatly refreshed and increased.

Travel, whether abroad or in this country, and over a wide territory or confined to one's own locality, is the most effective medium for the broadening of the trained mind. The good work of other men of earlier centuries or of to-day is the greatest source of inspiration for the professional man.

The opportunity for travel is never as available as during a period of poor business, for it is only under such conditions that one has the leisure for it. And at no other time can the professional man better afford to travel, for it involves little if any loss of income due to his absence, as would be the case were he to travel and neglect his work during a period of good business.

Another result of a year like the one just past is the opportunity for the clear and thoughtful analysis of one's organization, professional practice, and business methods.

For the first time one has a chance to get a proper perspective denied him in the rush of a busy season. It is quite amazing what unseen weaknesses, undesirable tendencies, and waste will develop from such an investigation, and it will be found that many changes may be effected which will result in a stronger personnel, increased efficiency, and greater economy.

Many offices have probably found that a reduction in the size of their force not only greatly reduces the cost without materially affecting the output, but also that it brings about a realization of the fact that certain members of the firm have been rapidly losing their personal contact with the designing and strictly professional part of their business in order to handle the executive work made necessary by the size of the organization which they have built up.

The result, while seemingly satisfactory during a period of easy business, is bound to be unsatisfactory during a period of opposite conditions, when the personal service and contact of the principals are such important factors in the securing, holding, and conducting of the comparatively few projects on which they are engaged.

It is safe to predict that when they have realized the joy and satisfaction which comes from a renewed participation in the affairs of the drafting room, and the details of the problems, many principals will not again permit themselves to become detached from the fundamental and most interesting processes of their profession, and that the comparatively smaller organizations of 1921 will persist through the years of plenty which are to follow.

The securing of new business is an essential function of any architect or landscape architect, whether it is performed in accordance with the requirements of the greatest sticklers for professional etiquette, or of those who prefer the outright methods of ordinary business.

To those of either extreme, or to the vast majority following an intermediate course, a year like the past offers untold opportunities for the building up of those connections and resources through which they secure their business.

Desirable publicity of all kinds can be worked up at leisure, including the photographing of completed projects for publication; the writing of articles for technical and layman magazines; the preparation of drawings, models, and photographs for exhibitions; and the gathering of data and making of lantern-slides for lecture purposes. All of these operations are, of necessity, generally neglected by the average office in busy times.

Incidentally, such activity not only reflects to the credit of the individual, but also reacts to the benefit of the entire profession, and does add immensely to the layman's understanding and appreciation of the work of that profession.

With some concerns, and doubtless with many, most of the new business secured in 1921 can be traced to two sources, which are, in order of importance, satisfied clients and previous publicity.

Never has the old adage, "A true friend is a friend in adversity," been proven more conclusively to such concerns than during the past year, and nothing has been more clearly proven than the value of making such true friends out of clients. Many offices have been occupied entirely on work secured through satisfied clients, to whom they have, in past years, rendered conscientious, capable, and efficient service.

It is a lesson which should be thoughtfully considered and thoroughly learned, and occasionally in future years should be brought out from the mind's storehouse, carefully cleaned of the dust accumulated through other busy periods, and set up for renewed appreciation.

Previous publicity—the second source of 1921 business —may have been of many different kinds, but in so far as it fixed in the prospect's mind the consciousness that a certain firm was responsible for a high quality of work in a certain line, it was a most successful instrument in the procuring of that new work. The prestige gained through such publicity (which may be limited to the actual work itself) was responsible undoubtedly for a great part of the business obtained by many firms last year.

In another way not quite so pleasant to consider 1921 has also proven profitable. It has taught the value of a good agreement or contract between the professional man and his client, as well as between client and contractor. Many operations have been discontinued or abandoned, with subsequent misunderstanding due to the varied interpretations of contracts. And many cases have resulted in legal action, or at least been subjected to arbitration. Very frequently the professional man has come out a loser, and, even though there has been no financial loss, there has been a loss of good-will or prestige, which is equally disastrous.

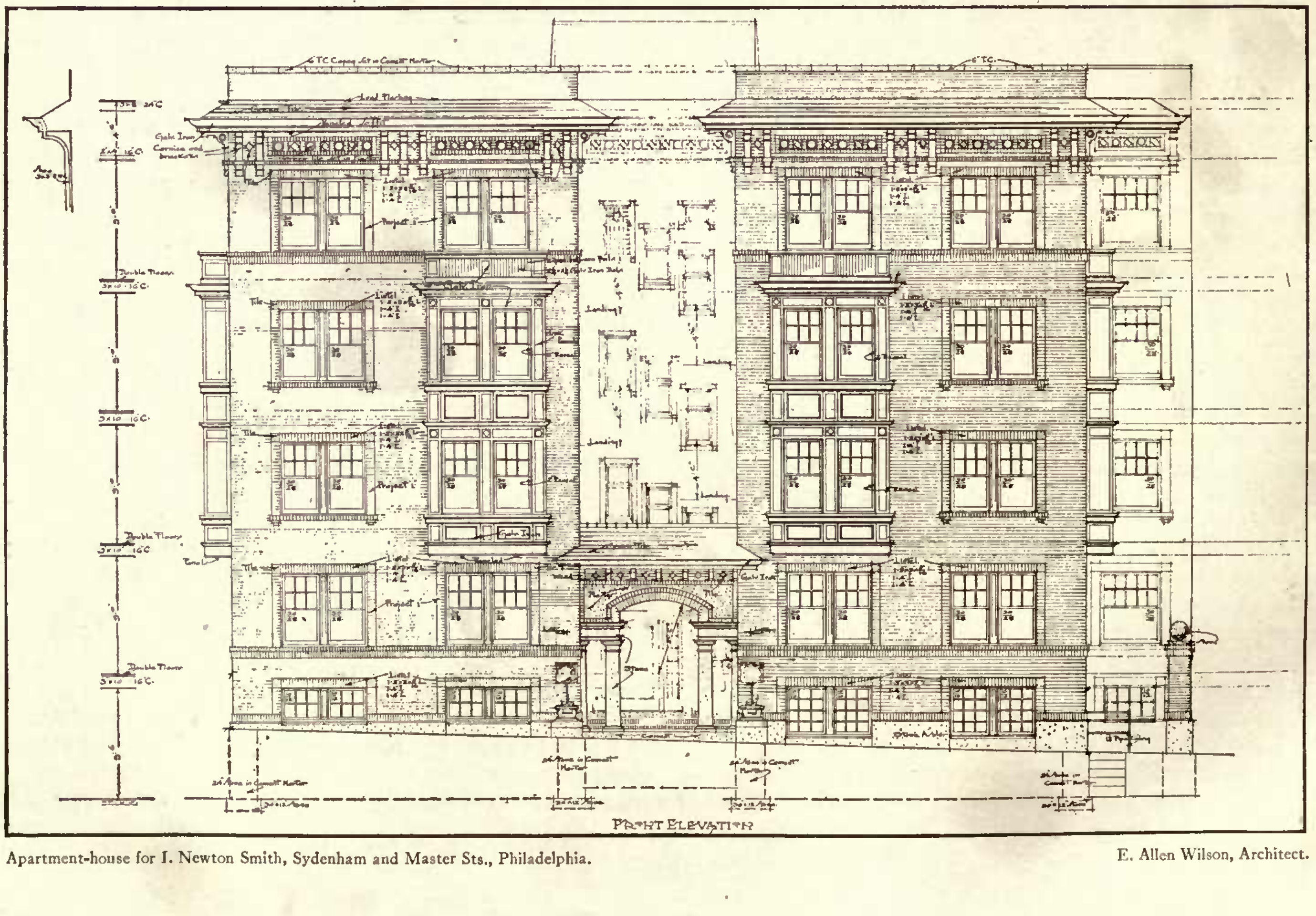
A clear and concise contract, capable of standing legal action, has in the majority of cases produced utmost satisfaction to all parties, with no misunderstanding and no interruption of cordial relations.

It is well, therefore, in times of comparatively quiet business, to check over all agreements or contracts and to rectify wording which may be ambiguous or capable of misinterpretation. It might also be added that methods of keeping accounts, auditing bills, issuing certificates, and handling other business matters can be checked up to advantage at such a time with a certainty that some improvements can be made which will prevent future difficulties, effect a saving, and increase efficiency.

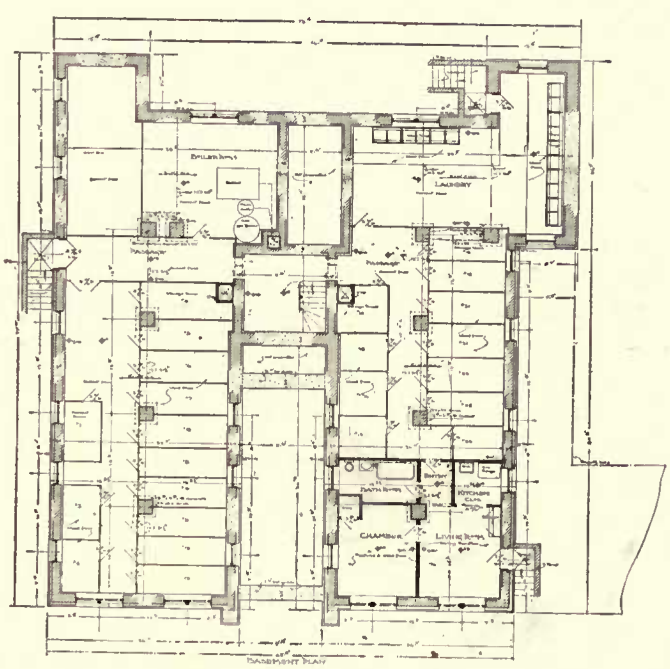
There are doubtless many other ways in which different individuals have utilized the unusual amount of time on their hands during the recent dull period. Many have probably considered their unexpected leisure as undesirable and have invested it unwisely or wasted it. Others have accepted it as inevitable and employed it in developing certain outdoor sports, with the compensation of minds and bodies refreshed and strengthened. Still others have been grateful for it and grasped at the opportunity to follow special hobbies and to work up projects long postponed for want of sufficient time.

But to those who have realized that such leisure could be applied to the broadening of their professional knowledge and to the improvement of business methods, and who have conscientiously, persistently, and intelligently applied themselves to the multiplicity of tasks at hand, a year like the past will be looked back upon with gratitude for the opportunities it afforded, with pleasure in the knowledge acquired, and with satisfaction in the work accomplished.

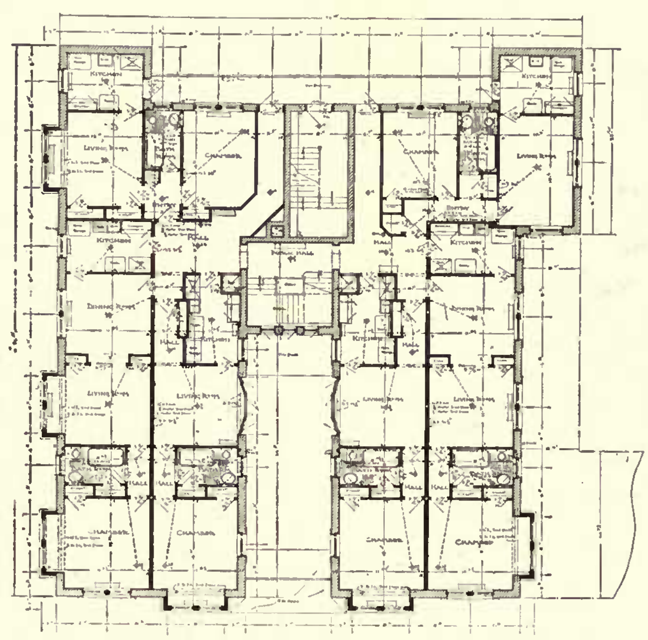
To such it is certain that the year 1921, though unprofitable in the sense of an actual money return, will have been productive of other forms of profit which will be possible of a tenfold increase in terms of money when business conditions have returned again to a state of normalcy.



Apartment-house for I. Newton Smith, Sydenham and Master Sts., Philadelphia. E. Allen Wilson, Architect.



BASEMENT PLAN.



TYPICAL FLOOR PLAN. E. Allen Wilson, Architect.

APARTMENT-HOUSE FOR I. NEWTON SMITH, SYDENHAM AND MASTER STREETS, PHILADELPHIA, PA.

Designed and executed by C. S. Connick.

The Soldiers Memorial Window in Hyde Park Baptist Church of Chicago

THIS window is an interesting study in stained glass, expressed in terms of honest craftsmanship which are related to the great masterpieces of the Middle Ages. It is frankly decorative, rather than pictorial, and shows an exuberant pleasure in the use of lead lines and bar lines, those rugged fundamentals of the craft that are so often timidly disguised.

The color scheme suggests a quiet jewelled splendor, and ranges from silvery and pearly whites to cool blues and flaming rubies and golds.

The symbolism of color, as it has come to us from the Middle Ages, has been observed throughout the composition. White, the color of peace and innocence; blue, for loyalty and eternity; red, for Divine Passion, courage, and self-sacrifice; green, for youth and hope; and gold, for achievement, are beautifully evident.

In design, the highest expression symbolically is to be found in the triumphant Lamb of God in the small circular piece. Flames and stars, the seraphim at the feet of St. Michael, and the doves at the feet of St. Gabriel are equally significant of the Heavenly Powers and the nearness to the Heavenly Kingdom and the Throne of God.

The inscriptions are as follows. For St. Michael "They Loved not their lives unto the death," and for St. Gabriel, "On Earth, Peace, Good-Will Toward Men." And at the base of the window: "To honor the devotion of all those from this congregation who served in the great war." "To commemorate the sacrifice of five who in that service laid down their lives."

Announcements

Leon M. Gurda and Francis S. Gurda have formed a partnership for the practice of architecture under the firm name of Gurda & Gurda, Architects, with offices at 470 Mitchell Street, Milwaukee, Wis. The firm name was formerly Leon M. Gurda, Architect. Additional catalogues and samples are desired.

When you plan or you build—remember the cardinal points of good stucco design: (1) Stucco should not be run down to the ground without a solid impervious base course. (2) The proper overhang and drip should be provided for all window-sills and other horizontal woodwork, and some stop should be provided at the ends to avoid the concentration of water over end of the sill. (3) The design should be chosen to permit of a generous overhang of eaves and cornices. (4) There should be no horizontal surfaces of stucco on which water can collect. Liberal and discriminating use of flashings should be made wherever water might get behind stucco—such as at roof and wall intersections, under joints of masonry trim, etc. (5) Chimneys should be covered with impervious caps to avoid unprotected stucco at top of chimney. Chimneys should be wrapped with metal lath before stuccoing.

Sheathing should be eliminated and metal lath back-plastered according to the findings of the U. S. Bureau of Standards.

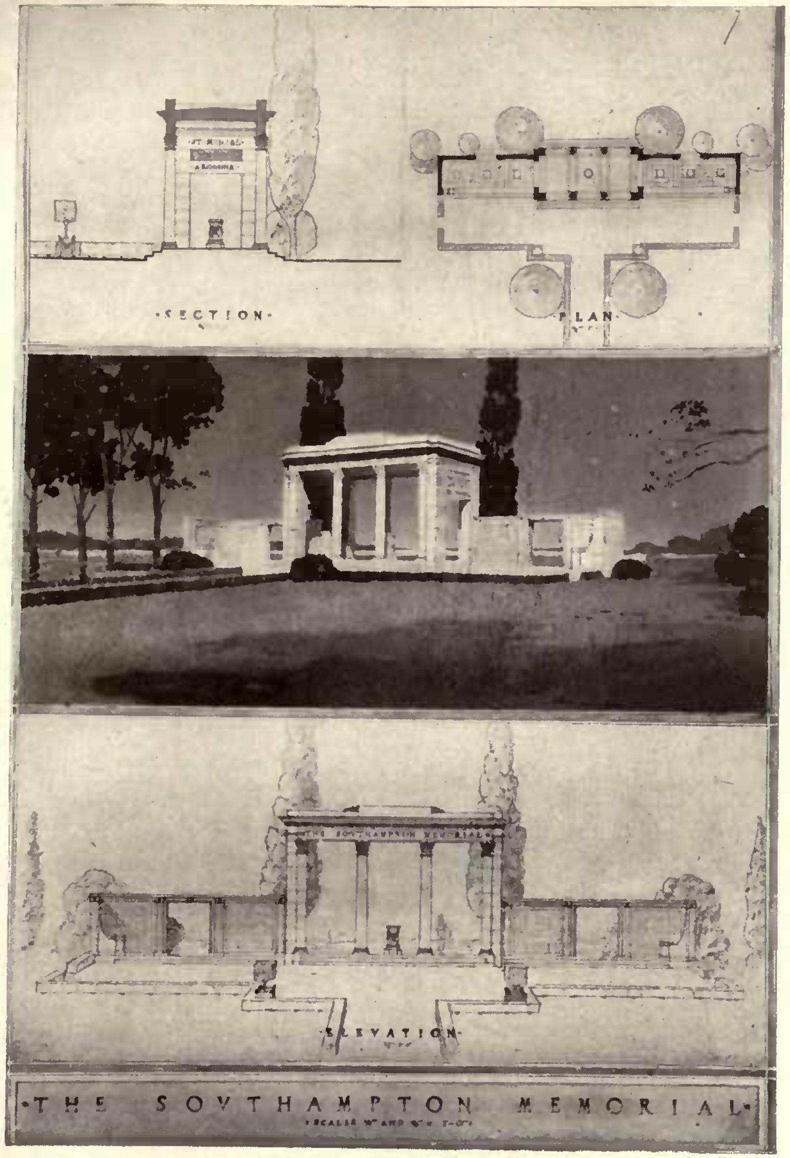
The architect of the Bible House building, 5 East 48th Street, published in our March number, is Wilfred E. Anthony, not H. C. Anthony as it appeared through an error. It is one of the most interesting and suitable small business buildings in New York.

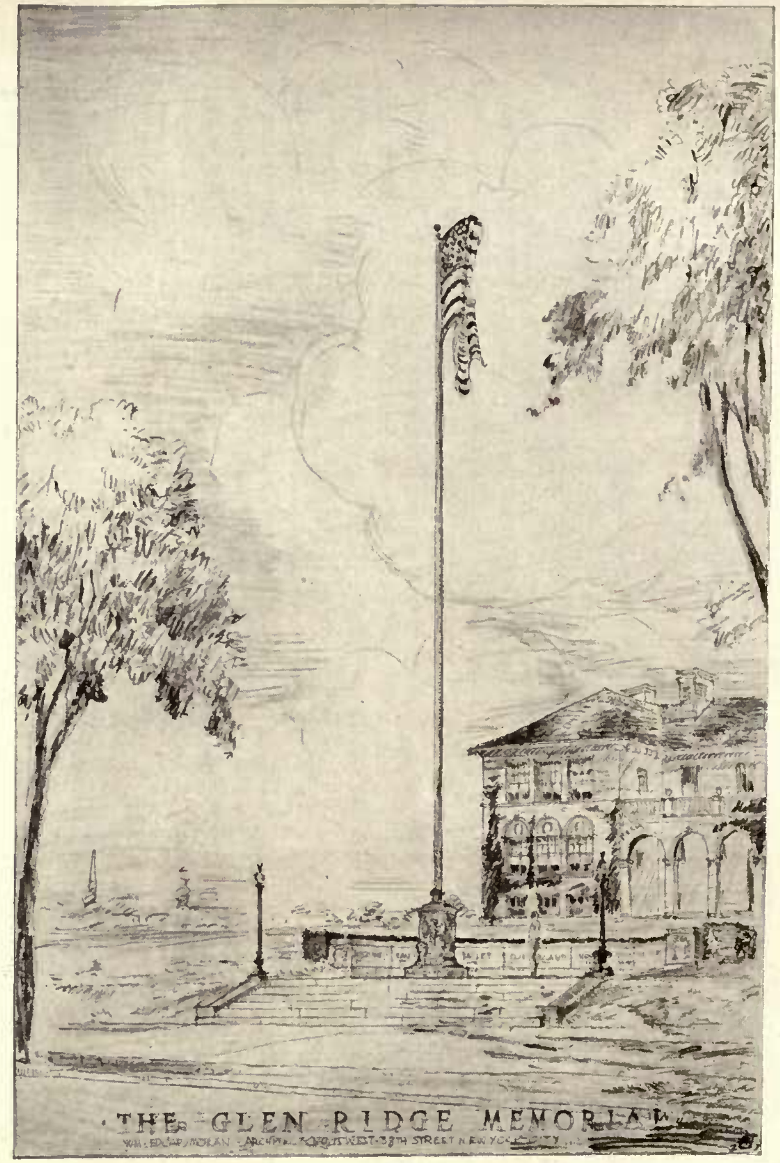
Messrs. Nichols, Sheppard & Colthurst, architects and engineers, 32 Sandwich Street W., Windsor, Ontario, wish to announce that after March 1 they will be located at their new offices, Dowler Building, Sandwich Street W., Windsor, Ontario.

The firm of Warren & Knight, architects, wishes to announce that after January 1, 1922, Mr. John Eayres Davis, formerly practising architect of Detroit, Michigan, will become a member of the firm, the new firm name to be Warren, Knight & Davis, architects, 1607 Empire Building, Birmingham, Ala. They are members American Institute of Architects.

Frank Irving Cooper Corporation, architects and engineers, have moved to 172 Tremont Street, Boston, Mass. Formerly at 33 Cornhill.

J. Frederick Kelly, architect, announces the removal of his offices on March 1, 1922, to the fifth floor, Simons Building, 39 Center Street, New Haven, Conn.





Two War Memorials

William Edgar Moran, Architect.

THE Southampton Soldiers Memorial is to be the centre of the parked treatment of a plot of ground approximately two acres in extent running from the main road of the town to a lake, and in making the design, two considerations appeared to be of first importance: First, that the names of those to be commemorated should be clearly and legibly described; and, second, that the design should be an intrinsic part of the landscape treatment of the site, and should not interfere with, but should tend to add to, or frame, this natural beauty.

The memorial consists of a platform raised above the ground, the centre portion of three, and the side two steps above the grade. On the centre platform it is proposed to erect an open colonnade or temple, roofed for shelter. On the walls of this temple would be inscribed the great victories of the war, and in the centre would be a suitably inscribed commemorative altar of victory.

To the left and right of the centre, walls are to be erected, whereon the names of those who served are to be inscribed. It will be noted that the centre portion of the temple is open, and openings have been left in the side-walls, so that views of the lake and surrounding hills may be framed.

The landscape treatment will be of the simplest type, low shrubs, with perhaps an enclosing planting of elms, to frame the monument.

The Soldiers Memorial at Glen Ridge, N. J., is designed to be placed on the axis of the high school on a gently sloping lawn. From the sidewalk a broad flight of steps leads to a cobbled platform; on this will be erected a simply detailed low stone wall, semicircular in plan, on which will be carved the names of those who died in the service. At the centre of this semicircle will be erected a flagpole with a stone pedestal carved with appropriate symbols, the shield of United States and of New Jersey; the design is to be flanked by two bronze candelabra.

Concrete Construction

By DeWitt Clinton Pond, M.A.

TWELFTH ARTICLE

IN the last two articles most of the rules dealing with flat-slab construction which are found in the amendment to the Building Code of New York were discussed. The only rules which remain as subjects for investigation in these articles are those dealing with bending-in columns and with the requirements for beams and girders which would be used as special supports under walls and at openings.

There will be bending developed in interior columns

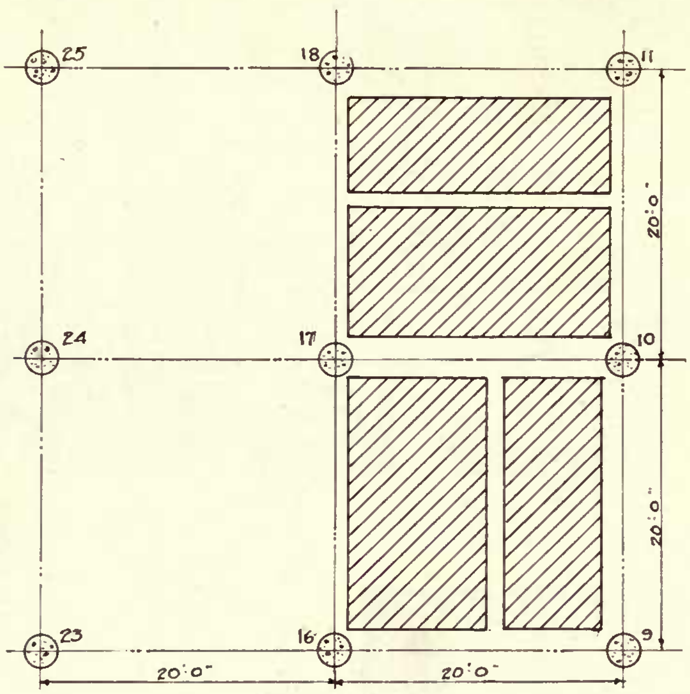


FIGURE 9

where there are "unequally loaded panels, eccentric loading, or uneven spacing of columns." Paragraph D in Rule 12 deals with this condition. The formula given for the bending moment "resulting from unequally loaded panels shall be considered as $\frac{1}{40}W_1L$, and shall be resisted by the columns immediately above and below the floor-line under consideration in direct proportion to the values of their ratios I/h."

Conditions which might produce bending moments in interior columns are illustrated in Figs. IX and X. In Fig. IX the panels between columns 16, 17, 18, 23, 24, and 25 carry the typical live load for the floor of 175 pounds per square foot. The two panels between columns 9, 10, 11, 16, 17, and 18, however, have especially heavy machinery upon them, which brings the live load per panel up to 250 pounds per square foot. It will be noticed that in the formula given above for the determination of the bending moment in the column due to this condition the symbol W_1 is used, which designates the total *live* load on a panel. By substituting for W_1 the value obtained from the given unit live load on a panel measuring 20 feet square, it is possible to obtain the following result:

$$M = \tfrac{1}{40} \times 100{,}000 \times 20 = 50{,}000 \text{ foot-pounds.}$$

According to the code, this moment is distributed between the columns directly above and below the floor carrying this special load in a manner similar to that illustrated in Fig. XI. The proportion governing this distribution is given above. Assuming that the column below the floor under consideration measures 36 inches in diameter, and measures 12 feet high from top of slab to base of capital, and that the column directly above measures 34 inches in diameter and 13 feet high, then I/h for the lower column would be 510.14 and for the upper one would be 419.6. As the bending moment is resisted by the two sections of columns in direct proportion to these values, approximately five-ninths of it is taken by the lower column and four-ninths by the upper. In accordance with this, 27,777 foot-pounds must be resisted by the lower column and 22,222 foot-pounds by the one above it.

In order to reduce such a moment into terms of direct stress, it is necessary to assume a column section larger than required to carry the direct stress due to floor loads, and to check this to see if it is large enough to carry both this load and the added load due to the tendency toward bending caused by the unequally loaded panels. The formula to use for this purpose is familiar flexure formula $M = f \times I/c$, in which f is the fibre stress in the extreme fibre, I the moment of inertia of the section, and c the distance from the neutral axis to the most extreme fibre.

The moment of inertia for the area enclosed within a 36-inch spiral is 82,300 and I/c equals 4,570. M is known. It is necessary to find f. The formula may be arranged as follows:

$f = M \div I/c.$

$f = 27{,}777 \times 12 \div 4{,}570 = 73$ pounds per square inch.

The eccentric loading will increase the unit stress by only 73 pounds and the stress upon the 36-inch column will

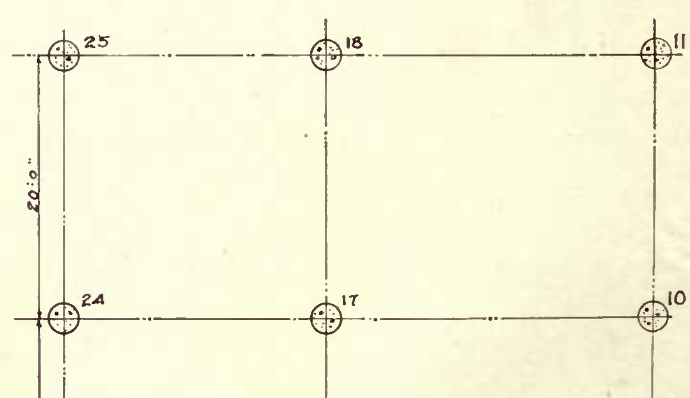


FIGURE 10

be increased by 75,000 pounds. When the allowable load upon a column having a 36-inch spiral and measuring outside 3 feet 4 inches is considered, it will be seen that the added load due to eccentricity is worth considering, as it will add 1 inch to the diameter. It must be remembered that this column is unusually large and that there are cases where eccentric loads will require a considerable increase in the diameter of a column.

Columns which are most apt to be eccentrically loaded are wall columns, and a paragraph is devoted to them in the code. This is paragraph E, Rule 12, and is given below:

"Wall columns shall be designed to resist bending in the same manner as interior columns, except that W shall be substituted for W_1 in the formula for the moment. The moment so computed may be reduced by the counter-moment of the weight of structure which projects beyond the centre line of the wall columns."

There should be no difficulty in understanding this requirement. If there is a brick wall enclosing the building, the weight of this wall multiplied by its distance from the centre of the column may be taken as a counter-moment to the floor load. As has been shown in previous articles, the wall loads are usually separated in the design sheets so that the total moment may be determined with comparative ease. However, it will be found that this wall moment will do little to counteract the moment due to the floor load. Engineers always check the bending in exterior columns, but it is often found that the sections are made so large in the upper stories of a building for architectural reasons that the eccentric loading does not overstress the concrete, and that in the lower stories the sections are so large, due to the loading, that the same effect is produced.

As an example of this a rectangular exterior column, measuring 1 foot 8 inches by 3 feet 10 inches, may be taken. The total load upon this column was 136,000 pounds, but the area of concrete and steel was capable of carrying 489,000 pounds. The total live and dead load on the panel supported, in part, by this column was 90,000 pounds. $\frac{1}{40}WL$ would become $\frac{1}{40} \times 90{,}000 \times 20 \times 12$. This would equal 540,000 inch-pounds. The stress in the extreme fibre will be increased by 188 pounds per square inch in the columns above and below. If this unit stress were imposed over the entire area of the column, the load would be increased by 80,900 pounds. Add this load to the total given above, and the sum would not equal the allowable load on the section.

The point at which an exterior column of this type should be checked carefully for bending due to eccentricity is at the floor where the total load upon the column becomes almost as large as the allowable load upon the section.

Paragraph F of Rule 12 deals with roof columns. It states that "roof columns shall be designed to resist the total moment resulting from unequally loaded panels. . . ." The difference between this consideration and the ones given above is that in the first cases the bending could be resisted by the two sections immediately above and below the panel under consideration, but in the case of the column section under the roof, all the tendency toward bending must be taken up by that section.

There are two other rules to be investigated. The first of these is Rule 13, which states: "In the design and construction of reinforced-concrete flat slabs, additional slab thickness, girders, or beams shall be provided to carry any walls or concentrated loads in addition to the specific uniform live and dead loads. Such girders or beams shall be assumed to carry twenty (20) per cent of the total live and dead panel load in addition to the wall load. Beams shall also be provided in case openings in the floor reduce the working strength of the slab below the prescribed carrying capacity."

This rule requires but little comment. As often happens, in any form of construction, openings must be cut through floors for elevator-shafts and stairways, and where this is done in flat-slab construction, beams and girders must be provided. The beams must not only carry such walls as are used to enclose openings but one-fifth of the panel load as well.

The last rule—14—simply calls for the filing with the superintendent of buildings such calculations and analyses as are used for conditions not outlined in the previous rules. Where structures have a width of less than three rows of slabs, or where exterior drops, capitals, or columns are omitted, or where special or irregular panels are used, such action must be taken.

The rules are not difficult to understand or to apply, and form a very satisfactory basis for designing flat-slab construction.

There is some question as to the saving effected by designing either two-way or three-way reinforcing. In view of this it might be well to investigate the design of a rectangular panel for two-way and four-way systems and compare the results.

The panel which will be selected will measure 21 feet 9½ inches by 19 feet 9 inches. The live load upon it will be taken as 200 pounds. The average span will be 20 feet 9¼ inches, and the total live and dead loads will be 316 pounds, as shown below:

Live load	200	pounds.
2-inch fill	10	"
1-inch finish	10	"
8-inch slab	96	"
	316	"

The system which will be investigated first will be a four-way system, and the first step will be to determine the thickness of the slab, or t. As there will be drop panels in this design, the formula which will be used will be $t = 0.02L\sqrt{W} \times 1$.

$$t = .02 \times 20.77 \times \sqrt{316} + 1 = 8.4 \text{ inches.}$$

The slab will be considered 8½ inches thick. It is now necessary to find the *effective* depth, or d. In a four-way system there is one layer of steel at the outer section and two layers at the inner section, so d will be different in each case. Allowing 1 inch of concrete under the steel, and assuming that ½-inch rods or bars will be used, the distance from the bottom of the slab to the centre of the steel in the outer section will be 1¼ inches, and in the inner section it will be 1½ inches. d for the outer section will equal $8.5 - 1.25 = 7.25$, and for the inner section it will equal $8.5 - 1.50 = 7.0$ inches. The depth at the column-head section will be determined later.

The next item to be investigated will be the diameter of the column capital. In accordance with Rule 6, this must be $0.225L$, or, in the present case, $.225 \times 20.77 = 4.67 =$ 4 feet 8 inches.

M at the column-head section will equal $\frac{1}{32}WL$. In order to substitute the proper values in the equation, it will be necessary to determine the value of W, the total dead and live load on the panel. If the slab is made 8½ inches thick, the unit dead and live load will be 322 pounds per square foot, and the total load for the slab itself will be

$21.8 \times 19.75 \times 322 = 138{,}600$ pounds. The weight of the drop must next be determined, and it will be necessary to assume its size. As the width cannot be less than one-third of the panel length, this dimension will be taken as 7 feet, and the depth will be assumed to be 4 inches. The weight of the drop will be $7 \times 7 \times \frac{1}{3} \times 144 = 2.350$ pounds. The total will be 141,000 pounds.

There will be two moments at the column heads, one

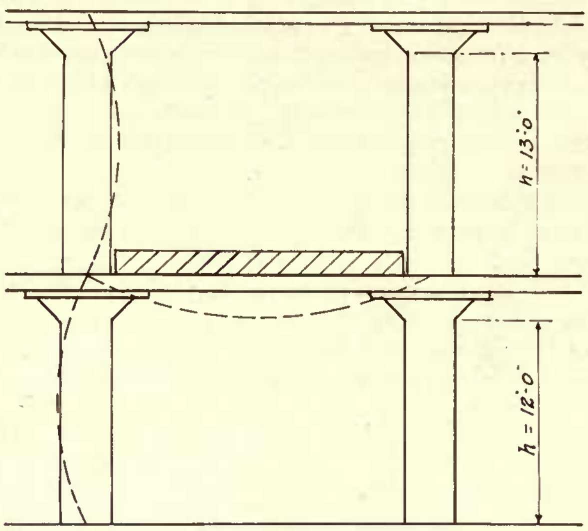


FIGURE 11

for the section perpendicular to the long dimension, and one for the section perpendicular to the short dimension. The calculations are given below:

$M = \frac{1}{32} \times 141{,}000 \times 21.8 = 96{,}050 \times 12 = 1{,}162{,}600$ inch-pounds.

$M = \frac{1}{32} \times 141{,}000 \times 19.75 = 86{,}930 \times 12 = 1{,}063{,}100$ inch-pounds.

The next step is the determination of d for the section above the column head. The thickness of the drop depends upon this calculation.

The constant used in other calculations for the determination of d has been 1,279.5. This was determined on the basis that the allowable stress in the extreme fibre was 650 pounds. In the tenth article of this series attention was called to the fact that the allowable stress in concrete in compression at the column-head section is 750 pounds, and in this case the constant becomes 1,474. The concrete in the drop is considered as resisting the compression stresses brought to the column-head section by the bands, and as the drop has been assumed to be 7 feet wide, the calculation for determining the depth at this section is as follows:

$$\frac{1{,}162{,}600}{7 \times 1{,}475} = 112 = d^2.$$

$$d = 10.6.$$
$$t = 10.6 + 2 = 12.6.$$

The total depth at the drop will be taken as $12\frac{3}{4}$ inches, and as the thickness of the slab is $8\frac{1}{2}$ inches, the drop will be $4\frac{1}{4}$ inches thick and will measure 7 feet by 7 feet.

The next calculations will be for the determination of the areas of steel in the different sections, and if the formulas given in the last article are noted and the distance from the bottom of the drop to the centre of the steel in the column-head section is taken as $11\frac{1}{2}$ inches, these problems should be easily understood.

The moments at the column-head section are 1,162,600 and 1,063,100 inch-pounds. The areas of steel in the two bands are

$$A_{s1} = \frac{1{,}162{,}600 \times 8}{7 \times 16{,}000 \times 11.5} = 7.22 \text{ square inches.}$$

$$A_{s2} = \frac{1{,}063{,}100 \times 8}{7 \times 16{,}000 \times 11.5} = 6.60 \text{ square inches.}$$

The moments in the two mid-sections are found by the formula $M = \frac{1}{133}WL$. The depth to the steel has already been found.

$$M = \tfrac{1}{133} \times 141{,}000 \times 19.75 \times 12 = 251{,}200 \text{ inch-pounds.}$$
$$M = \tfrac{1}{133} \times 141{,}000 \times 21.8 \times 12 = 278{,}100 \text{ `` `` }$$

$$A_{s1} = \frac{251{,}200 \times 8}{7 \times 16{,}000 \times 7.25} = 2.47 \text{ square inches.}$$

$$A_{s2} = \frac{278{,}100 \times 8}{7 \times 16{,}000 \times 7.25} = 2.74 \text{ square inches.}$$

The positive moments in the outer sections are given by the formula $M = \frac{1}{100}WL$.

$$M = \tfrac{1}{100} \times 141{,}000 \times 19.75 \times 12 = 334{,}170.$$
$$M = \tfrac{1}{100} \times 141{,}000 \times 21.8 \times 12 = 368{,}860.$$

$$A_{s1} = \frac{334{,}170 \times 8}{7 \times 16{,}000 \times 7.25} = 3.29 \text{ square inches.}$$

$$A_{s2} = \frac{368{,}860 \times 8}{7 \times 16{,}000 \times 7.25} = 3.63 \text{ square inches.}$$

The moment at the inner section is determined by the same formula, but as the steel cuts the section at an angle of 45 degrees, and as L becomes the *average* span, the calculations are different.

$$M = \tfrac{1}{100} \times 141{,}000 \times 20.77 \times 12 = 351{,}430 \text{ inch-pounds.}$$

$$A_s = \frac{351{,}430 \times 8}{7 \times 16{,}000 \times 7 \times 1.4} = 2.56 \text{ square inches.}$$

A glance back at the calculations for the column-head section will show that the two areas of steel were 6.60 square inches and 7.22 square inches. These areas are made up of three bands of steel in each case. One band will be perpendicular to the section, and two will be at an angle of approximately 45 degrees. The band which crosses parallel to the section will not have any reinforcing value. Only seven-tenths of the steel which crosses the section diagonally can be considered as providing reinforcing.

The direct band in one case will have an area of steel equal to 3.29 square inches. The two diagonal bands will have an *effective* area of $2.56 \times 1.4 = 3.58$ square inches. The area resisting negative bending in one direction will be $3.29 + 3.58 = 6.87$ square inches. As there are only 6.60 square inches required, this area will be ample. The negative moment in the other direction will be resisted by an area of $3.63 + 3.58 = 7.21$ square inches, which is extremely close to the required amount.

The design of the two-way system will be taken up in the next article.

140a

TEMPLE OF ISIS, ENTRANCE PYLONS, PHILÆ.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV MAY, 1922 NO. 5

Architecture as a Human Document—Ancient and Mediæval Styles

By Albert C. Phelps, A. I. A.
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From a lecture delivered at the Metropolitan Museum of Art, New York

I

Grotesque, Rheims.

ARCHITECTURE has been called the history of man wrought in stone, and by a recent writer, not a professional architect, "the most convincing and eloquent expression of the life of its own age that the past has handed down to us."

The moral and religious significance of architecture was at one time, if not overrated, at least so emphasized, by writers who approached it from the literary point of view, as to obscure the merits or defects of a composition as a work of art. By a natural reaction, recent critics have been inclined to treat architecture almost wholly from the technical point of view, ignoring too much the great human background—the ideas and conditions that must have preceded and were largely responsible in determining the characteristics of the historic styles. This has been unfortunate for both architect and layman; for architects have failed to grasp the complete significance of the great works, and laymen, discouraged by the excessive use of technical terminology and narrowness of vision, too frequently have decided that it is a hopeless task to attempt to understand architecture at all.

My chief purpose in these articles is to try to suggest how the study of architecture may well supplement the study of social and political history. Indeed it would be possible to show how occasionally a knowledge of architecture has disclosed important facts and even prevented certain theories from leading us far astray in our search for historical truth. The late March Phillipps said: "What the historians give us of the past is usually truth with very little life in it, and what the romancers give us is usually the life with very little truth in it; but art's testimony is both living and true."

The historian of architecture usually deals chiefly with the æsthetic merits of the successive styles; and this is quite proper, as a sympathetic attitude is necessary for the adequate interpretation of the masterpieces of art. However, from our present point of view, the deficiencies and failures are of vast, if not equal, importance as revealing the characteristics and qualities of their producers.

Approaching the architecture of ancient Egypt, one sees reflected some of the aspects of nature and many of the characteristics of the people in their massive structures. It has been suggested, and probably with much truth, that the regular rise and ebb of the Nile influenced profoundly the people who dwelt upon its banks. While we know that Egyptian history and Egyptian life were more varied than

Model of the Parthenon, Metropolitan Museum, New York City.

Coucy.

struction the Doric temple utters once for all with supreme felicity."

Technical critics have been prone to censure the Greeks for certain apparent inconsistencies in their buildings, when viewed from the standpoint of construction beautified. These critics usually have failed to appreciate that Greek logic was dealing with æsthetic principles rather than with the literal translation of forms developed in one material into those of another.

While the wooden origin of the Doric order is by no means universally accepted by present-day archæologists, and the attempt to explain all its parts by reference to a supposed evolution from clay and wood construction leads to material difficulties, the theory that the column was developed directly from the stone pier and that the triglyphs are little piers, rather than beam-ends, is not unattended with difficulties almost equally great. It was, indeed, æsthetic logic rather than structural logic that concerned the Greek designer primarily.

was at one time believed, nevertheless the chief characteristics of the people remained the same for centuries, and this changeless aspect, this monotonous, unvarying, massive treatment of their architectural works, with the main stress laid upon horizontal lines, but confirms our knowledge of the Egyptians gained from other sources. Indeed, with few exceptions—a notable one of which is the temple of Queen Hatshepsu at Deir-el-Bahari—the architecture, like the people, seems eternally archaic, incapable of development into an intellectual art, and remains essentially materialistic to the end.

In the art of the Tigris-Euphrates valley, as in Egypt, one sees the persistence of the primitive, the childish, the archaic. In both countries the conditions of life were based upon an unusual and perennial fertility of the soil, due to the regular overflow and control of great rivers, and in both the unvarying routine that distinguished their civilization and mode of life is reflected in their art.

In Mesopotamian architecture the monotonous treatment of the masses with their regular sky-line is hardly relieved by the stepped pyramid or *ziggurat*, isolated or forming part of a group, as in the early temple at Asshur and the Palace of Sargon at Khorsabad. The ponderous forms were due largely to the materials available—the local mud or clay held in place and protected by an outer casing of burned bricks or a poor quality of stone. Still, there is much the same uncouthness, apparently due to definite choice, as in the architecture of Egypt.

Physical power was represented in the great winged bulls that served as portal guardians, and physical force, vigor of action, and ruthless cruelty have never been so vividly depicted as upon the wainscot slabs of the royal Assyrian palaces.

In approaching the master work of Greek architecture, the Doric temple, one discerns immediately the leading attributes of the Greek mind, which are clearness, logic, definition. Some one has said: "All there is eternally logical in the post and lintel principle of con-

The Greek conception of the function of art was that it should be a source of ideas more than a record of them. In the Doric temple certain essential elements, such as unity, harmony, proportion, subordination, apply equally well to ethics as to art, and when carried to the point of perfection before our eyes reveal to our minds and hearts their intellectual and ethical significance. It has been said that arguments addressed to the mind are strong, but a spectacle addressed to the eye is stronger. Even if it be denied that it is stronger, it is at least an independent testimony. Thus we see that, while we are rarely inclined to give heed to the ethical or spiritual significance of Greek architecture, though perhaps not a primary consideration in the development of the style, it was of considerable importance.

But in spite of its perfection, perhaps because of it, Greek architecture does not fully satisfy modern taste. As Matthew Arnold says: "Though in many respects the ancients are far above us, yet there is something that we demand which they cannot give." Is it then surprising that

Ravenna. San Apollinare in Classe.

Cordova.

all modern attempts to revive and most of those to adapt the Greek style to present conditions have resulted and must result in failure?

Roman architecture is much more flexible and practical than the Greek, and is thus more nearly adaptable to modern requirements. Still, while the bigness, the grandeur, and dignity easily arouse our admiration, there is a uniformity, even monotony, to which modern culture will not submit.

Rome strove to unify all her possessions. She conquered nations and incorporated them in the empire, and at the same time connected them by bridges and roads, thus abolishing barriers and bringing distant provinces into connection.

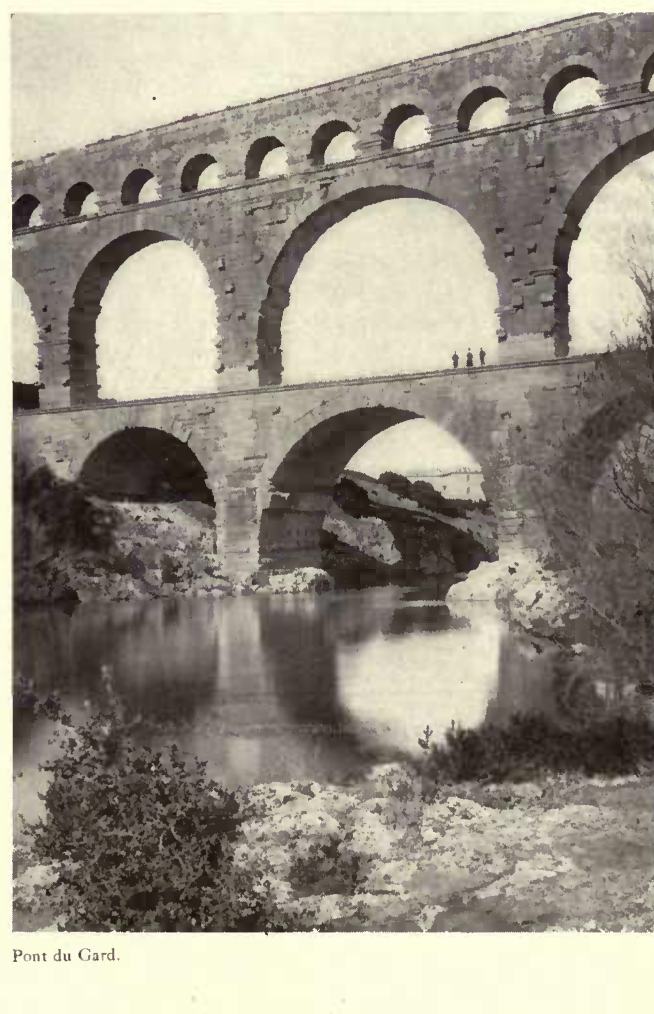
Her great aqueducts, that stretch across the plains with monotonous succession of arches, her amphitheatres, with their endless repetition of column and arch, and their unbroken rings of seats, are fit emblems of her irresistible course, her levelling, all-dominating policy, before which all limitations, all local varieties, are forced to disappear.

While Rome drew much from Greek, as from Oriental sources, there is a marked difference, aside from structural principles and developments in the two styles. The Greeks delighted in contrasts, as of decorated with plain surfaces and of minor variations of detail. The Romans cared more for effect gained by repetition of motive; the mind is not excited to an active artistic delight, but is impressed with a vague sense of sublimity. "Therefore," some one has said, "an interior like that of the Pantheon, with its simple divisions, its surfaces so sparingly broken, its immense dome brooding equally over all, conveys a sublime idea of unity, which is perfectly expressive of the character of the Romans."

The early Christian basilica reflects the struggles and ideals of the early church not only in its symbolism but in its very structure. The rugged exteriors, such as one still sees in the churches of Ravenna, illustrate the contempt for externals on the part of the founders of Christianity, while the splendid interiors, gleaming with mosaics and polished stones—not infrequently borrowed from pagan structures—reveal the richness of the inner life. The effect of unity, due to the centring of interest upon the high altar, the logical arrangement of the parts, and the clear illumination—as contrasted with many mediæval works—indicate the debt of their builders to classic art in much the same way that the writings of the Fathers reflect not a little of pagan culture and philosophy.

In Byzantine architecture we have a strange commingling of Eastern and Western ideas, but with eventual unity of effect and clearness of statement. The principles of Roman and Oriental construction were adopted and applied with Greek logic till, in Sta. Sophia at Constantinople, we have an interior unsurpassed, if not unequalled, in the works of man. A recent writer has said: "Sta. Sophia, developing a great structural principle in broad daylight with unexampled logic and daring, addresses itself entirely to the intellect. St. Mark's, sensuous and contemplative, with its dark splendor of coloring half seen, half guessed, in the rich obscurity of its vaults, addresses itself entirely to the emotions."

Arabic architecture and the Arabic influence in European work are frequently passed over by the historian as something apart or of little concern to the technical student of architecture. That this influence was considerable in later mediæval work is now appreciated, and to the student of civilization the Arabic styles are of vast importance, for in their architecture, as nowhere else, the peculiarities and weaknesses of the race can be grasped. The spasmodic, impulsive,


Pont du Gard.

short-lived brilliancy of action of the Arabs is stamped indelibly upon their architectural works. The lack of reason and prevalence of passion, as a determining motive, are reflected all too frequently in the structural weakness, the lack of unity and coherence, and the active energy revealed in their structures. "The arch never sleeps," the Arab is said to have asserted. Really he would not let it take the form of repose that was prevalent in the classic Roman work, but distorted it into fanciful though frequently elegant shapes. Most Arab buildings are as if built for momentary enjoyment and in accordance with a momentary caprice.

The characteristics mentioned are particularly conspicuous in the architecture of the Moors, as seen in the Mosque, now the Cathedral, of Cordova, and in that highly romantic structure, the Alhambra Palace at Granada. Some Arabic structures, as the later mosques at Cairo, and particularly derivative styles, as the Mohammedan works of Persia and of India, exhibit truly monumental qualities, based upon earlier traditions in those regions and clothed with decorative detail that in grace, imagination, and appropriate richness has never been equalled.

Romanesque architecture, as the name suggests, was derived from the Roman, but shows great variety and bears much the same relation to the parent style that the Romance languages do to the Latin. In spite of the variations of type, there is a certain unity in the style, due to the chief common problem—the building of a monumental and fireproof church—and to the similarity of the conditions under which the builders labored.

Whether the great Lombard churches of northern Italy were built by the Lombards themselves or by Eastern craftsmen working under their direction, the style reflects the characteristics of the Lombard race. Power, vigor, initiative are all evident in these churches, and yet also the inability of the builders greatly to lighten their fabrics or to free them from the essential inertia of their Roman prototypes. St. Ambrose at Milan, in spite of its extensive restoration, and S. Michele at Pavia are typical examples of this phase of the style.

In Tuscan works, such as the cathedral group at Pisa, the Eastern influence is more noticeable, and it was the decorative rather than the structural problem that concerned their builders primarily. Delicacy of detail, beauty of color, charm of atmosphere are all present in these delightful works.

In the south of Italy and in Sicily, as seen in Palermo Cathedral and in the splendid Royal Chapel in the same city, the buildings were the result of a curious commingling of various influences and traditions, viz., the classic, the Byzantine, the Saracenic, and even some slight impress of the Normans, the masters of southern Italy at that time. Marion Crawford, in his delightful book "The Rulers of the South," has traced these influences and embellished his descriptions with a wealth of romantic tales and traditions.

St. Trophîme at Arles illustrates the rural character of the monastic work in France. A certain general resemblance to the Lombard churches of Italy is noticeable, but with the local characteristics emphasized.

The great domical churches of southwestern France at Cahors, Perigueux, and Angoulême record, let us hope, for ages to come, the evidence of a great overland and maritime trade with Venice and Constantinople, bringing in its wake ideas and principles of construction and decoration, as well as polite literature and Eastern culture.

Who can look upon the great Norman churches of Caen—St. Stephen's and the Trinity—without seeing reflected in them the qualities of their builders—William the Conqueror and his wife Matilda?

Durham Cathedral illustrates the Norman style in England, where the essential features of continental work were retained, but with greater material resources, the architects were enabled to enrich their structures with elaborate carvings and to decorate their walls with beautiful paintings, but slight traces of which remain to suggest their effectiveness.

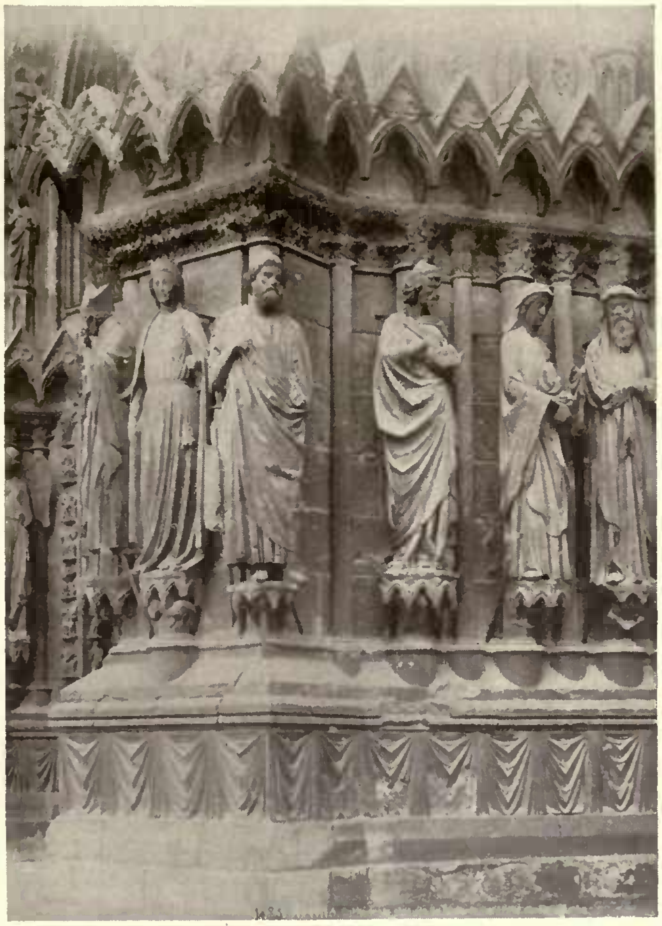
Space will permit but a passing glance at the splendid series of round-arched churches of the Rhine Valley. Spires, Mainz, Worms, Bonn, Laach, and the group at Cologne tell us with unfaltering accents of the power and lofty purpose of the men who laid their foundations and reared their picturesque masses.

Gothic is the only architecture known to us, with one possible exception—the Arabic—that possesses the quality of energy, *i. e.*, strength in action as contrasted with strength in repose. Viollet-le-Duc's ideal cathedral illustrates this in a marked degree.

Art always works somewhat mysteriously, and it never manifests itself, at least not in the form of a great historic style of architecture, till it has behind it a combined and united effort. It was this effort that was taking direction and gathering momentum in the so-called Romanesque period. In the twelfth century, and especially in the Ile de France, the structural system of the new style was perfected. The Gothic period was an age of vigor and virility, and these qualities were reflected in the almost fiercely energetic features of Gothic architecture, and structurally, at least, the exhibition of vital energy is the supreme motive of Gothic works. That the term Gothic should be limited to the great vitalized architecture of north central France all will not agree. Surely there were manifestations of a more peaceful contemporaneous art in England, retaining many of the elements of quiet repose of an earlier style and developing a decorative treatment unsurpassed in refinement and appropriateness. Still, the fact remains that, as an expression of the essential characteristics of the time, continental Gothic, and more especially French Gothic, stands quite apart.

A type of the Gothic, and indeed one might well say the masterpiece of the style, was Rheims Cathedral, the coronation church of France. Essentially and peculiarly a national monument, it is no wonder that it should have been singled out for destruction during the late war, and only the splendid stability of its structural members prevented its entire collapse beneath the repeated German bombardments. Rheims alone might well serve for a discourse upon the subject I have chosen, for the building even yet, in its damaged condition, is an encyclopædia of mediæval life.

Mediæval iconography is a complex and difficult subject, and it changed and developed as quickly as technic in sculpture. Emil Mâle, especially in his "Religious Art of the Thirteenth Century," has set forth with unusual clearness and sympathy the essential qualities of Gothic art. Allegory, symbolism, and reminiscence are important elements in mediæval decoration. In a general sense the cathedral was the Bible of the poor, but doubtless much of the decoration baffled his understanding, as it has many modern archæologists learned in all the intricacies of mediæval thought. One reason for this is that the religion of the common people was somewhat sharply differentiated from that of the priests. The religion of the clerks and doctors has come down to us in literature; that of the common people has largely disappeared, except in the miracle-play and in the traditions of certain festivals. In general, it is the most subtle, the most intellectual type of scholastic philosophy that is reflected in the sculpture and stained glass



Statuary, Rheims Cathedral.

porch, and his ignominy is still advertised in the sculptures of the pedestal beneath the feet of Christ. In the Last Judgment, above, the usual realistic resurrection, separation, and reception by God the Father, or condemnation to the fiery furnace, appear.

What could be more naïve than the Adam and Eve decorating a hollow moulding or more sinister than the weird face gazing down from a lofty height?

A comparison of the attitude and conception of the designers of the twelfth, thirteenth, and fourteenth centuries is well seen in the figures of the Madonna in the early entrance of the north transept of Rheims Cathedral, on the central pier of the west front of Rheims, and of the south porch of Amiens. We have here simple and serene motherhood, the supercilious *grande dame*, and the too-charming woman that Ruskin so well described as the soubrette type.

The interior of a French Gothic cathedral has never, perhaps, been better characterized than by the great Abbot Suger of St. Denis, who, writing of his own abbey, said: "When the house of God, many-colored as the radiance of precious stones, called me from the cares of this world, then holy meditation led my mind to thoughts of piety, exalting my soul from the material to the immaterial, and I seemed to find myself, as it were, in some strange part of the universe, which was neither wholly of the baseness of earth nor wholly of the serenity of Heaven, but by the Grace of God I seemed lifted in a mystic manner from the lower toward that upper sphere."

Perhaps no single structure illustrates better the peaceful atmosphere, beautiful surroundings, and quiet repose of the English Gothic than Salisbury Cathedral. Lichfield, Wells, Lincoln, and York all have their special merits, among

of the Gothic church; however, the popular religion does sometimes appear in the grotesques and in some guild windows.

The "Encyclopædia" of Vincent of Beauvais, tutor of the children of Louis IX of France, comprised all human knowledge catalogued under the head of four "mirrors"—the mirrors of nature, science, morals, and history. This same encyclopædic tendency is seen in the cathedral decorations. Gothic artists probably did not set out to illustrate Vincent of Beauvais, but inherited the same scholastic philosophy. M. Mâle has shown that the façades of the great cathedrals possess a unity and comprise an artistic composition corresponding to several or all the mirrors of nature, science, morals, and history.

A suggestion of the comprehensiveness of the decoration of a Gothic cathedral may be gained by a glance at the sculptures of the west front and north transept of Rheims. Christ, the Virgin, saints, apostles, and royal personages occupy positions of prominence, while minor characters, allegorical figures of vices, virtues, signs of the zodiac, and labors of the year, clothe the archivolts and fill the most diverse areas with consummate grace. The figures of Elizabeth and Mary of the Visitation group, while nobly grand, are intensely human, and the St. Joseph of the Presentation, on the opposite jamb, is the embodiment of the typical thirteenth-century Frenchman of any market town. The Portal of Judgment of the north transept contains—still undamaged, I am told—one of the grandest figures of mediæval art in the statue of Christ on the central pier. The production of this figure illustrates one of the most human aspects of mediæval life: a cloth-merchant, convicted of the use of a false yardstick, was required to supply the chief decoration of this

Statuary, Rheims Cathedral.

which are picturesqueness of mass and refinement and singularity of detail.

Innumerable parish churches of Great Britain illustrate the charm of the style quite as much as the larger buildings. Indeed there is an intimacy and quaintness about them that make them particularly appealing, and their arrangement and general design express most clearly the local traditions and customs.

Reasonable conservatism is a quality generally conspicuous in English Gothic architecture, as it is in British character, but the venturesomeness, even the dash and brilliancy that appear in the conduct of British military leaders are not lacking in architectural works. King's College Chapel at Cambridge is a notable example of this, where the structural daring and unity of effect are equalled in few continental Gothic buildings.

An exceedingly interesting field from the point of view of the political historian is that of military architecture: the Norman and later castles of England and Scotland, as well as the châteaux of France, the castles along the Rhine, and the fortresses of Italy. In all we see how the exigencies of mediæval warfare were considered and met with a fertility of invention and structural capacity coupled with an apparently instinctive æsthetic sense scarcely found elsewhere in the history of architecture. And these structures not only reveal military prowess on the part of their builders; they remind us that the ability of a handful of men, defending a fortress, to resist for months the attacks of a numerous and veteran army led to boldness and even insolence on the part of the weak toward the powerful which foreshadowed modern democracy.

The Tower of London, the White Tower of which was built by the bishop of Rochester not long after the Norman Conquest, has been the scene of innumerable tragic events in British history. Edinburgh Castle, perched high on its rock, dominates the town as it did in the beginning, when the fortress gave its name to the adjacent community. Stirling and Linlithgow, steeped in the romance of Scottish history, still appeal by their picturesqueness and rugged grandeur.

The Châteaux de Saumur, as shown in a "Book of Hours" in the Château de Chantilly, was a characteristic castle of northern France, with the walled town at its side and the peaceful labors of the field proceeding under its protection.

The Louvre of Philip Augustus was one of the proudest of its class, but scarcely superior to that of Coucy, the tower of which succumbed only toward the end of the late war. Viollet-le-Duc declared this donjon to be the finest work of the sort in all Europe. The pride and independence of the builder was set forth in the family motto, which may be freely rendered: "I am not king, nor prince, nor duke, nor count; I am the lord of Coucy."

Carcassonne, in spite of extensive restorations, and Avignon, as it once existed, awaken a long chain of memories of military glory and ecclesiastical schism, the following out of which would confirm our belief that architecture is a living witness and the very stones are eloquent.

The Château Gaillard, built by Richard the Lion-Hearted, commanded the Seine and protected Rouen, the Norman capital. Many historians and novelists have attempted the description of the attack and capture of a mediæval fortress, but I know of none that equals that of Charles Reade in "The Cloister and the Hearth."

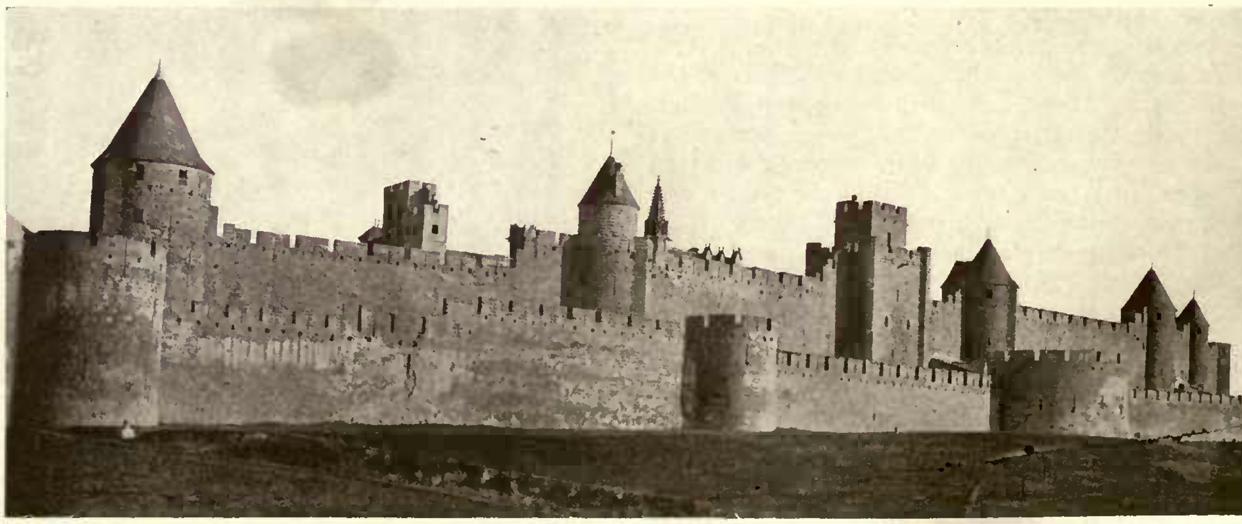
Who has not succumbed to the romantic atmosphere of the Rhine in song and story if not as revealed in such picturesque structures as Rheinstein Castle?

Italy still retains many walled towns and quaint fortifications, and the Castle of Milan was a stronghold which for military strength and architectural merit scarcely had its equal north of the Alps.

Not only were the dwellings of the great feudal barons strongly fortified, but monasteries at times occupied strategic positions and defied attack with impregnable defenses. Mont St. Michel, above all, preserves its charm in spite of restoration and threatened commercialization.

The Palazzo Vecchio, at Florence, for long the seat of the ruling body of the city, still asserts in its every line the dignity of the law and its contempt for hostile act, whether that of political opponents or furious populace.

We might go on indefinitely, examining the human aspects of mediæval architecture in the lesser domestic structures of the Middle Ages, eloquent examples of which remain in all European countries. More spontaneous, less ambitious and affected than their great neighbors, bearing much the same relation to each other as the simple parish church to the cathedral, they are priceless human documents, displaying a resourcefulness and integrity coupled with a simple contentment of which our present-day world stands much in need.



Carcassonne.

The New Orleans Raised House Type

By Morgan D. E. Hite
Chairman Louisiana State Housing Commission

THESE houses exhibit the "raised house type," which is quite distinctive of New Orleans and is not found elsewhere. It has been evolving for some years from the original Spanish type of plantation house (1769–1803), which was built with all rooms on one floor, and raised on heavy square brick pillars nine or ten feet above the ground. The soil was damp and no excavation for cellars was possible, so that the whole basement story was above ground, and frequently left entirely open underneath for free circulation of air or latticed in between the brick or stuccoed piers with green diagonal lattice. Sometimes kitchen and dining quarters and other service rooms were partitioned off. Another reason for the raising of the houses on basements in Louisiana was the possibility then of river and bayou overflows.

House, John L. Cahill, New Orleans, La. Morgan D. E. Hite, Architect.

In New Orleans proper there were many hundreds of this general type of house built, but on a smaller scale, to fit city lots and to satisfy the demand of the population for rooms all on one floor. The climatic conditions made life easier by horizontal traverse of a building than up and down, and to this day in the extreme South, as represented by Louisiana and New Orleans, the ground floor of any building has an overwhelmingly greater value, because the shopping public is averse to going "up-stairs" to buy or to eat, or for anything except to regular business offices, and not these unless served by good elevator service.

The one-floor house is extremely popular in New Orleans, and the universal requirement is for a raised basement. The accompanying photographs show how this has been evolved, from the original prototype mentioned above to the type now prevailing and rapidly undergoing further evolution. The "raised basement" to-day is designed as an integral part of the house, and accommodates a service entry with stairs leading up to kitchen or pantry or hall; a room for the heater or furnace; laundry, servants' rooms, storage rooms, and latterly one, two, or three fireproof garages, with fire-door access from garage to basement. In addition, fully one-third of the better-class homes of this type use the excess basement space as a "den," or billiard or card-room for the men-folks, or it is floored as a dancing area for the young folks. These raised basements have the floor practically at ground level, made of concrete or creosoted cinders floored over, and are thoroughly dry and well-windowed and ventilated. The houses here shown have garages in this basement, some at side, some at rear. The usual height from grade to house-floor finish line is eight feet.

The raised house has practically displaced all other types in this city, since people have begun to buy wider lots than was formerly the case, the narrower types, such as marked "residence of John L. Cahill," being built on forty-five feet width, and that marked "residence of Mrs. W. H. Dielmann," built on sixty feet, the "residence of Mrs. Richmond Martinez" being built on one hundred feet.

Some of the more expensive homes are built two stories high, and wherever the servant problem is not serious the two-story is liked, because the sleeping-rooms are off the ground, but even many expensive homes are now being planned all on one floor, and this type has quite a future, due to the great number built and to be built, enabling the architects here to evolve something entirely new in mass and planning, due to the difference of the problem from what has been customary.

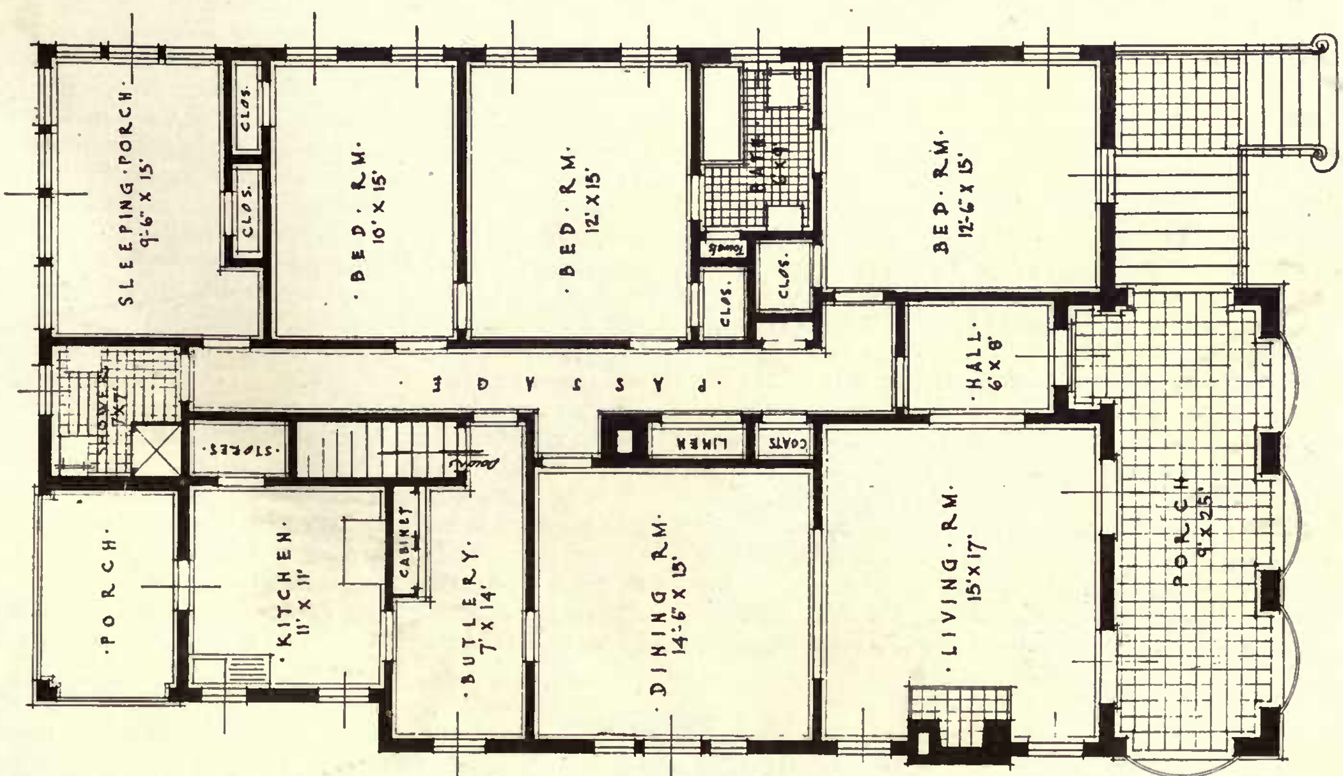
The convenience of the one-floor house, from a housekeeping standpoint, is worth attention. The practical minds of the New Orleans women and the newcomers from other sections of the country immediately see the advantages of this combination of main floor and raised basement.

We have done considerable work along this line, and recognize the problem as a new one in American architecture —or, for that matter, in any country's architecture, although something of the Louisiana raised house is discernible in Manila and the suburbs of some of the Spanish-speaking tropical places, showing the parentage of this house to be Spanish, although, as the pictures show, it has somewhat departed from the original to meet modern mandatory needs.

(*Continued on page* 150)

HOUSE, MRS. W. H. DIELMANN, NEW ORLEANS, LA. Morgan D. E. Hite, Architect.

HOUSE, MRS. RICHMOND MARTINEZ, NEW ORLEANS, LA. Morgan D. E. Hite, Architect.



HOUSE, PAUL MEYER, NEW ORLEANS, LA. Nathan Kohlman, Architect.

(*Continued from page* 147)

The raised house gets the sleeping-rooms well off the ground, one of the chief desires of the people here, New Orleans being a flat city at sea-level, and still possessing a traditional dislike for dampness, although the great mechanical drainage works here have long since lowered the water-line many feet below the surface, where once upon a time it was within a foot of the top of the ground. Besides, the rainfall here is tropical in its volume, and it is desirable to keep the rooms moisture-free, and this we succeed admirably in doing with the raised-basement house.

Last year the Southern Pine Association contracted with the Architects' Small House Service Bureau of Minneapolis to produce a book of plans, and asked this office to make suggestions which might be helpful in enlarging its value. We suggested that some of the Gulf Coast raised-basement houses be shown, and the writer made a trip to Minneapolis with this in view, resulting in the incorporation of plans and designs for three houses of this type. In Minneapolis a young Southern architect, Mr. Jefferson Hamilton, entered sympathetically into the work of planning this type of house, so foreign to the Northern architects, and almost totally unknown to architects elsewhere. Mr. Hamilton's designs have proved among the most popular shown in the book, and, in particular, one of his raised-basement types has been used widely as a means of advertising the beauty of design which was the object of the whole plan book. Mr. Hamilton's houses are based on photographs and sketches of houses we had built in New Orleans, and, to the writer's knowledge, is the first presentation of the raised-basement type publicly made, hence we think something more on this subject will prove of interest to you.

Attractive Brick House of English Style

Meyer & Holler, Architects

By Charles Alma Byers

IN the Plate is shown an exceptionally charming representation of an English style of architecture. As reference to the floor plans will show, the house is actually of quite moderate size, as compared to what the appearance it presents to the street tends to indicate.

The outside walls are of dark-red brick of very rough texture, with so-called clinker brick liberally introduced to produce a still more rustic exterior. The mortar used for the brick is tinted a rich cream, and the principal trimming is also in cream. The oriel window-group, or bay protruding from the front of the second story, however, as well as the front door, is largely finished in olive-brown. The roof covering consists of split shakes instead of ordinary shingles, and is painted a dark shade of olive-green, while the rustic wood shutters at some of the windows are painted olive-green to match.

The front doorway, it will be observed, is constructed with an arched or rounded top, and there is a delightful lounging porch on one of the rear corners, with somewhat similarly arched openings or open windows on each of three sides. Both the entrance stoop and the lounging porch, as well as all walks, are paved with brick. The windows are mainly of the casement type, and those of the first floor are nearly of full inside wall length.

The arrangement of the interior will be noted from the accompanying floor plans. Points and features deserving of special notice in this connection are, for instance, the way in which the stairway is designed to ascend from a corner of the living-room, together with the lavatory accessible from the first landing; the introduction of French doors at either side of the living-room fireplace to give access to the rear garden; the use of a pair of wide glass doors between the living-room and dining-room, and, further, the fact that the first-floor rooms include a delightful den and a charming little breakfast-room. The lounging-porch referred to above will be noticed to be accessible either from the den or indirectly from the living-room and a protecting overhang of the second story. On the second floor are three bedrooms, two bathrooms, and some unusually roomy closets.

The built-in features include a bookcase in the den, a buffet in the breakfast-room, a cabinet ironing-board on the rear-entry porch, a draught cooler-closet, a great deal of cupboard room and other conveniences in the kitchen, a linen cabinet in the up-stair hall, a medicine-case in each of the bathrooms, and a cabinet of drawers in one of the bedroom closets.

The interior finish and decorative scheme is quite in keeping with the outside appearance and attractive, although but moderately expensive. The woodwork in the living-room, den, and dining-room consists of California redwood, finished with a waxed surface and left in possession of nearly its natural color. In the remainder of the interior the woodwork is Oregon pine. In the breakfast-room and bedrooms, including the up-stair hall, it is finished in old-ivory style, and in the kitchen and bathrooms it is in white enamel. The walls of the breakfast-room are panelled to a height of four feet six inches, and in the kitchen and bathrooms they are finished with a smooth, hard plaster coat to the same height and enamelled like the woodwork. In the living-room, dining-room, and bedrooms the walls are papered, and elsewhere they are tinted. Hardwood flooring is used throughout, except in the kitchen and bathrooms, and tile is used in the latter.

The house possesses a large basement, reached by an inside stairway accessible either from the dining-room or from the outside. The equipment includes a good furnace and all other modern conveniences. The house is located in the Hollywood suburb of Los Angeles, Cal., and was designed by architects Meyer & Holler, of that city.

Editorial and Other Comment

Small Houses and Their Cost

APPARENTLY the period of waiting for old times to come back again has been a waiting for the impossible. Pre-war prices, according to the best informed authorities, are among the things that we can only talk about and forget. They will never come our way again, any more than the other things that went with them, low rents and comfortable living on the basis of pre-war incomes.

The cost of materials has shown a decided tendency toward lowered prices, but even so the tendency is not enough to encourage any dreams of a complete return to the prices of 1914 and before.

It is not the cost of materials, however, that has been the chief cause of a lack of building, but the untoward cost of labor. Labor is the factor that has more than doubled the cost of building, and no one is willing to predict that labor is going to turn the unions into philanthropic bodies for the public welfare. Labor is, perhaps, no more selfish than the rest of the body politic, only it does seem as if the old standards of self-respect and pride of the individual in labor performed as a full equivalent for wages paid, have fallen into the discard.

There is a revival of building, but even so, nothing in proportion to the need, and the reason is obvious. We are indebted to the Chemical National Bank of New York for the following interesting figures. They are the answer to the question: Why don't you build?

A home of type *A* cost in 1914, $5,529. In 1920 the same house cost $12,815, an increase of 131 per cent in relation to the 1914 figure. In March, 1922, such a house would cost $9,502, 71 per cent more than the 1914 cost, and 26 per cent below the maximum cost in 1920.

TYPE *A*—2-STORY FRAME HOUSE

7 Rooms—Size 30′ x 34′. Contents 29,100 cubic feet
Floor Area 2,640 square feet

	1914	(Peak) 1920	March 1922
Excavation	$240.00	$420.00	$420.00
Foundations and cement	470.00	1,459.00	1,167.00
Masonry	250.00	667.00	543.00
Plastering	359.00	962.00	809.00
Carpentry and glass	2,520.00	5,629.00	3,845.00
Painting	320.00	608.00	560.00
Plumbing and gas	350.00	686.00	517.00
Heating	400.00	1,029.00	712.00
Metal work	180.00	455.00	291.00
Tile work	40.00	87.00	54.00
Mantels	80.00	173.00	109.00
Electric	250.00	500.00	377.00
Hardware	70.00	140.00	98.00
Total cost	$5,529.00	$12,815.00	$9,502.00
Cost per cubic foot	$0.19	$0.44	$0.325
Cost per square foot	2.09	4.85	3.60
Per cent of change	100 per cent	231 per cent	171 per cent

The cost of a home of type *B* in 1914 was $4,176. To build such a house in 1920 cost $9,767, 133 per cent above 1914 costs. The present cost of this home is $7,374, which is 76 per cent above 1914 prices and 24 per cent below the maximum cost.

TYPE *B*—2-STORY COLONIAL HOUSE

8 Rooms (Including 2 Attic Rooms)—Size 23′ x 41′
Contents 25,315 cubic feet. Floor Area 2,530 square feet

	1914	(Peak) 1920	March 1922
Excavation	$160.00	$280.00	$280.00
Foundations and cement	410.00	1,273.00	1,018.00
Masonry	258.00	689.00	560.00
Plastering	385.00	1,031.00	868.00
Carpentry and glass	1,030.00	2,301.00	1,571.00
Painting	304.00	577.00	532.00
Plumbing and gas	340.00	666.00	503.00
Heating	420.00	1,081.00	748.00
Metal work	187.00	473.00	302.00
Tile work	126.00	274.00	171.00
Mantels	60.00	130.00	81.00
Electric	420.00	840.00	634.00
Hardware	76.00	152.00	106.00
Total cost	$4,176.00	$9,767.00	$7,374.00
Cost per cubic foot	$0.165	$0.385	$0.29
Cost per square foot	1.65	3.86	2.91
Per cent of change	100 per cent	233 per cent	176 per cent

The 1914 cost of a type *C* home was $4,701, which by 1920 had risen to $10,913, a figure 132 per cent above the earlier cost. The cost of erecting this house in March, 1922, is $8,112, 72 per cent above the 1914 cost and 26 per cent below the peak cost.

TYPE *C*—2-STORY SHINGLE HOUSE

8 Rooms (Small)—Size 26′ x 35′. Contents 24,360 cubic feet
Floor Area 2,385 square feet

	1914	(Peak) 1920	March 1922
Total cost	$4,701.00	$10,913.00	$8,112.00
Cost per cubic foot	$0.193	$0.448	$0.333
Cost per square foot	2.00	4.64	3.68
Per cent of change	100 per cent	232 per cent	172 per cent

The rise in prices and wage increases between 1914 and 1920 more than doubled building costs between those two dates. The subsequent decline, while not sufficient to restore costs to the old level, has brought about a very material decrease in construction costs, the fall in costs in two years amounting to 25 per cent of costs at the peak.

The prospective builder is, of course, interested in knowing whether he may look for further declines, for which he should wait. It would be beyond the scope of this article to attempt to forecast the course of building costs in the future. General wholesale prices, as measured by the index number of the U. S. Bureau of Labor Statistics, seem to be stabilized at a level about 50 per cent above that of the pre-war period. Building costs are above this level, but many of the elements which bulk large in building costs, such as freight rates and wage rates, are less susceptible to downward revision than are commodity prices in general. The general housing shortage, and the increasing volume of building at present price levels are factors which serve to strengthen building material prices. While it is entirely possible, therefore, that building costs may decline still further, it is not probable that drastic declines will occur.

If these facts do not seem especially encouraging, to fill with gladness the hearts of those who are looking forward to the better times that have been so long predicted, we may yet say that there is every indication of an unprecedented amount of building in spite of costs.

The housing need has become something more than a matter of speculation; it has assumed the acute stage where something must be done. And when something arrives at this point a way is always found to do it.

Encouragement

THERE are already abundant present indications that the future is going to be a season of "feverish activity," according to the *American Contractor*. The figures for March are indeed "astonishing" compared with recent years. But the way of continued progress does lie in rigid economy of time, of labor, and of materials. The architect who is wise enough to simplify and do away with needless luxuries in the way of construction will be sought. Some of the things considered essential in the modern house of 1914 may often be classed with needless luxuries to-day. Some of them, if not in the plans, wouldn't be missed.

"The Bill-Board Blight"

THIS is the title of the Bulletin of the Municipal Art Society of New York. The Blight is something that offends the sense of decency of every man or woman who looks about our cities or wearies of the interminable and incredibly stupid signs that share with the telegraph-poles the fleeting vision of the tired traveller. One longs to look over the passing landscape and our city streets freed of invitations to investigate the qualities of malted milk, pain-killers, chewing-gum, and the hundred crudely advertised things that we'd buy more cheerfully and with less resentment if their names were not continually plastered all over the open places.

It would not be seemly for us to deny the efficacy of well-considered advertising, but these bill-boards seem to us not only ill-considered but a positive affront to our sense of the fitting.

What are we going to do about it? Tell the advertisers they are wasting good money; write them and tell them that every time you see one of their bill-boards you are "agin it" and the thing it proclaims. In time maybe laws will be passed that will protect us from these eyesores.

Amendments to the New York Law for the Registration of Architects

ONE of the principal amendments is that which makes it the duty of the attorney-general to prosecute offenders. The want of a clear provision on this point in the law as originally enacted has handicapped the regents in its enforcement.

Another amendment which will interest many readers is that which extends the exemption period. It will now be possible for competent architects who were in actual practice in New York State prior to the 28th day of April, 1915, to obtain registration certificates without examination if their applications are filed before the end of the current year, 1922, and on condition that they satisfy the board as to their qualifications. All such architects may continue to practise without a certificate if they so desire. The amendment of the law does not affect the requirement in this respect, except to provide that every architect practising without a certificate will have to file an affidavit that he was in bona fide practice one year before the law was enacted.

A third amendment to the law requires the payment of an annual fee by every registered architect in the State. This amendment was made at the request of the regents, who consider that this requirement will prevent fraudulent use of certificates, and keep the list of registered architects free from dead-wood. The annual fee for re-registration is $2, payable on or before September 1.

The other amendments are chiefly verbal ones in the interest of making the law more concise and clear, and removing one or two ambiguities.

One item of interest to the profession will be that a definition of an "architect" is now incorporated in the registration law, which reads as follows: "'Architect' means one who designs plans for structures and superintends or supervises their construction."

There is no change in the fundamental requirement of the law, that no one can practise architecture in New York State, or call himself an architect, without obtaining a certificate of registration, with the exception of those who were in the practice when the law was originally enacted.

The attention of all registered architects should be called to the fact that each is subject to heavy fine if he does not have recorded in the office of the county clerk in the county in which the applicant resides his certificate of registration, and have the certificate stamped upon the back by that official (fee $1). In case of loss of the certificate the board of examiners should be notified.

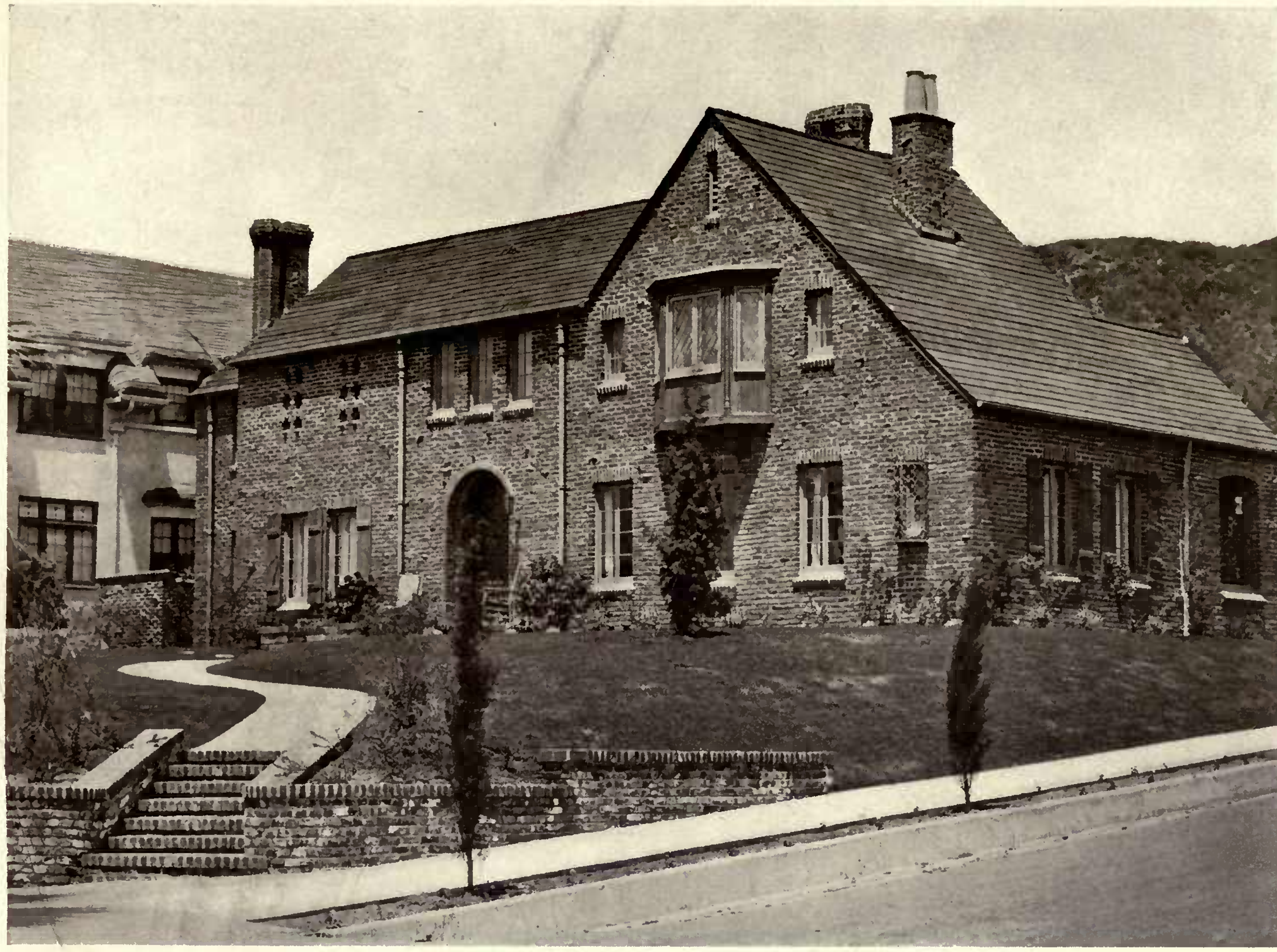
Correspondence in reference to the registration law, and requests for application blanks, or information relative to the law, should be addressed to the Board of Examiners and Registration of Architects, Education Building, Albany, New York. Payment for registration and annual re-registration should be sent to the same address.

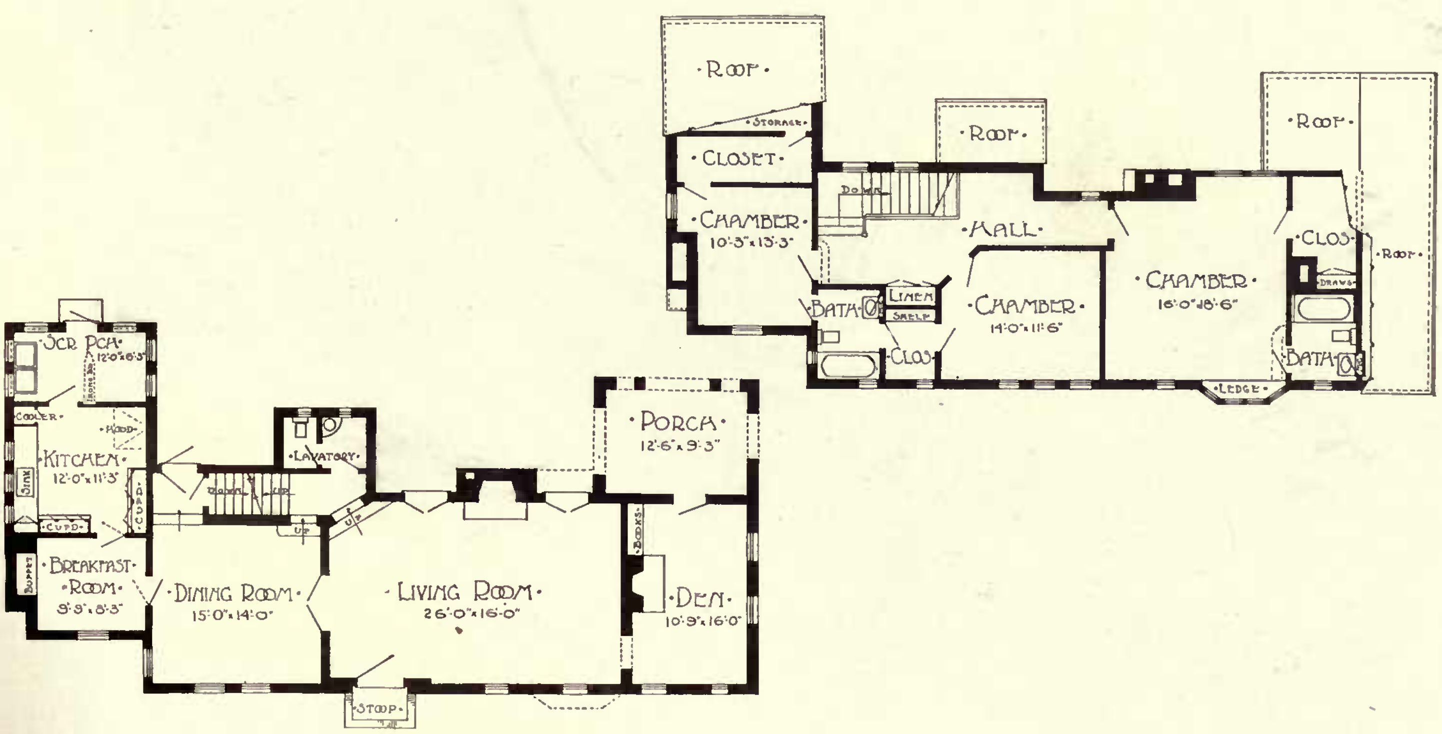
Summer Session at Carnegie Institute of Technology

A WIDE variety of subjects is offered for the summer session at Carnegie Institute of Technology, Pittsburgh, Pa. Courses of six weeks and eight weeks will be given in the College of Fine Arts, College of Industries, Margaret Morrison College, and the College of Engineering.

The work of the summer session at Carnegie is arranged to meet the needs of teachers, undergraduate students, and others interested in technical subjects. The courses for teachers are scheduled for six weeks, from July 5th to August 12th. Eight weeks' courses will run from June 26th to August 19th.

Courses are planned for architectural draftsmen who desire additional training in design and working drawings, and for those who are planning to enter the institute. Subjects offered are design, working drawings, and superintendence, and outdoor sketching.



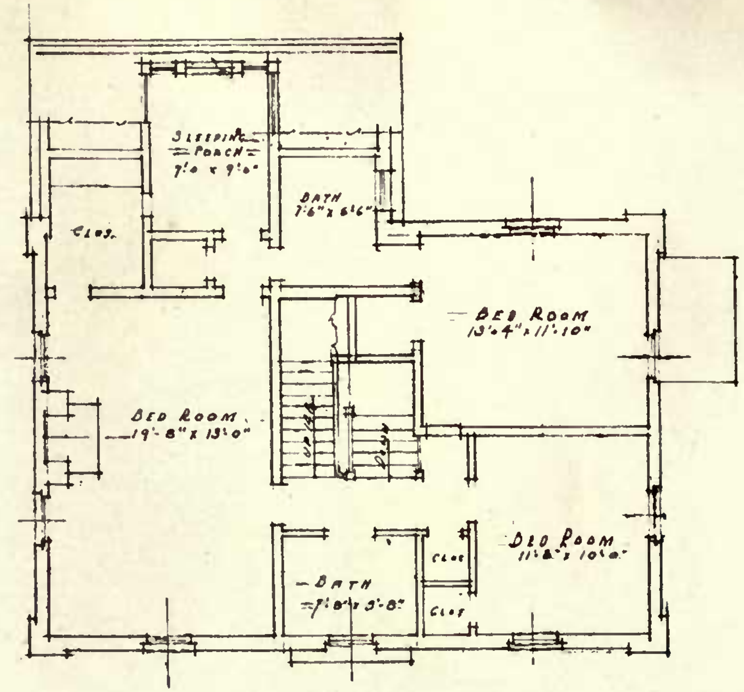


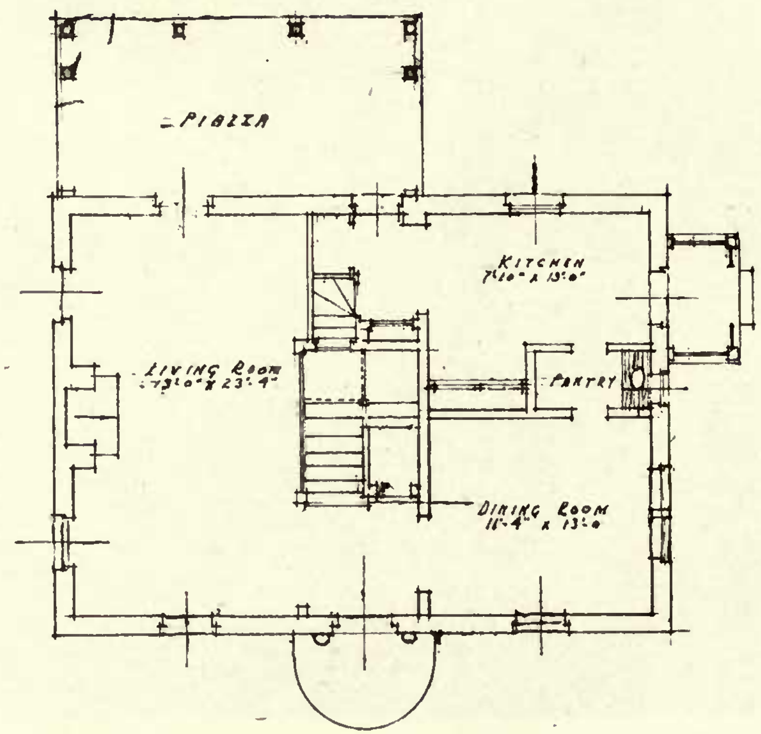
HOUSE, HOLLYWOOD, CALIF. Meyer & Holler, Architects.

HOUSE, DR. EDWARD FISHER, ENGLEWOOD, N. J.

Aymar Embury II, Architect.

HOUSE, DR. EDWARD FISHER, ENGLEWOOD, N. J.

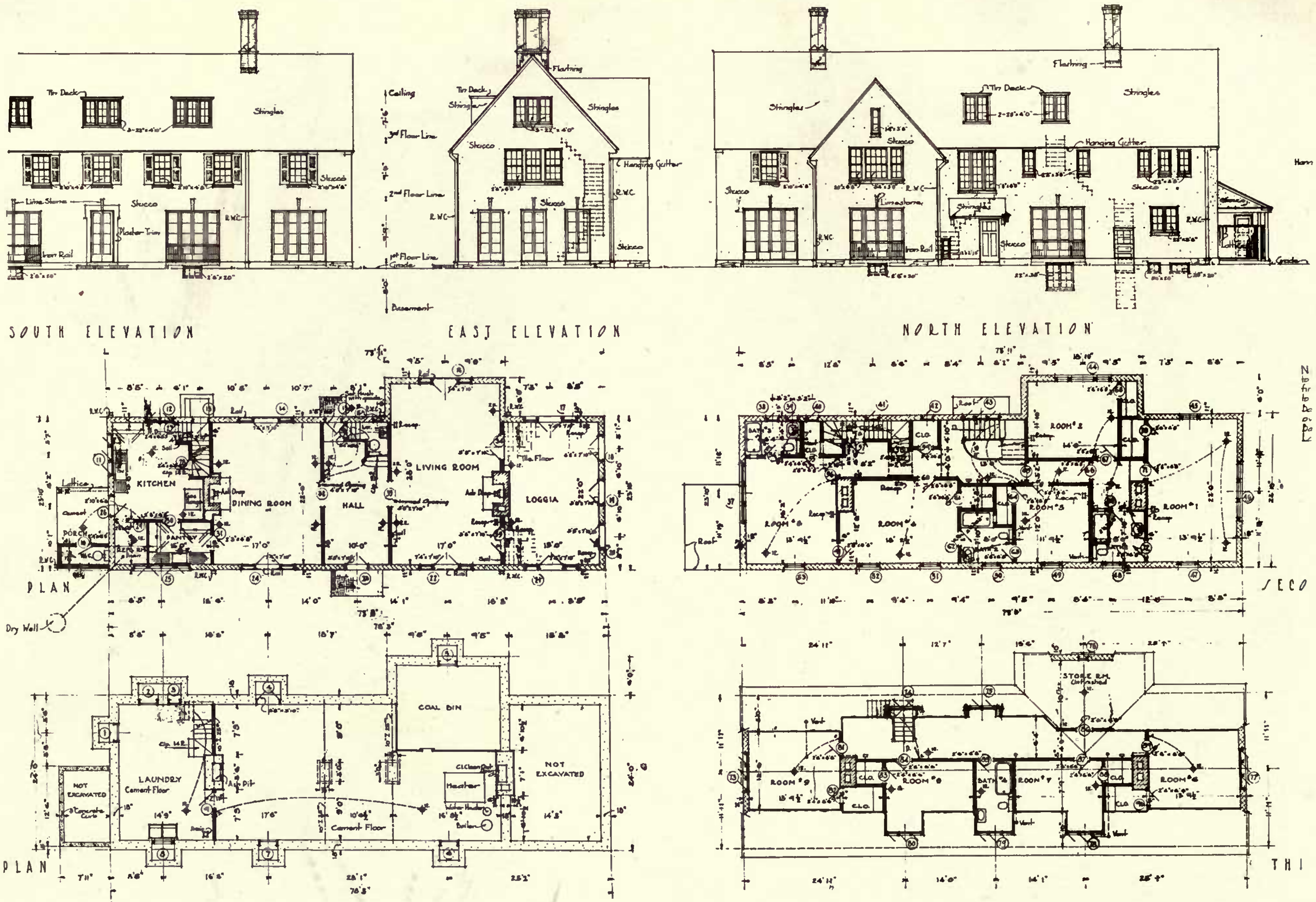




Aymar Embury II, Architect.

HOUSE, JOHN McMULLIN, OVERBROOK, PA.

McIlvain & Roberts, Architects.

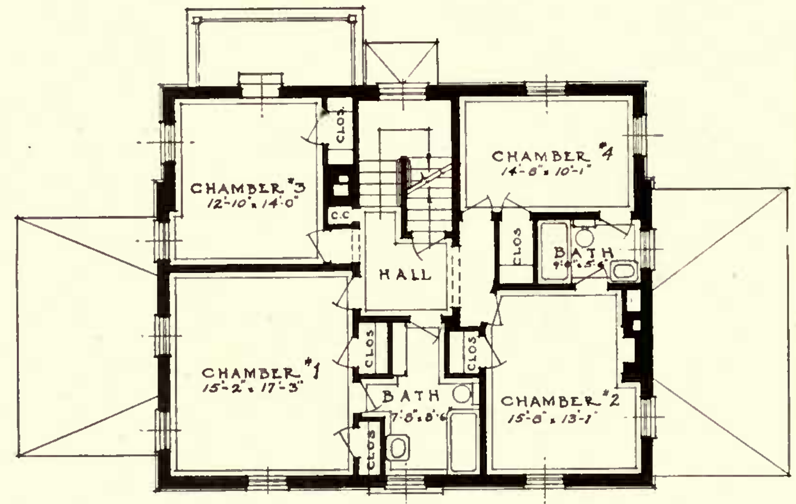


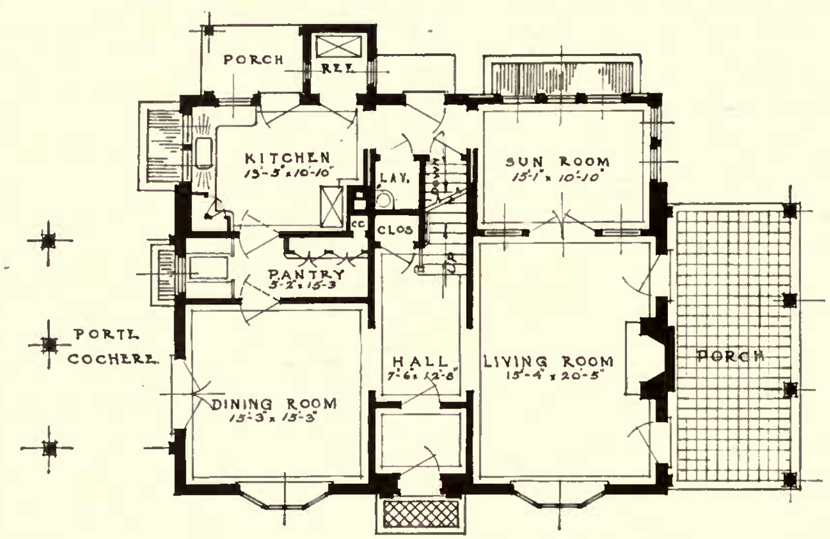
MR. JOHN McMULLIN, OVERBROOK, PENNA.

McIlvain & Roberts, Architects.

HOUSE AT CLEVELAND, OHIO.

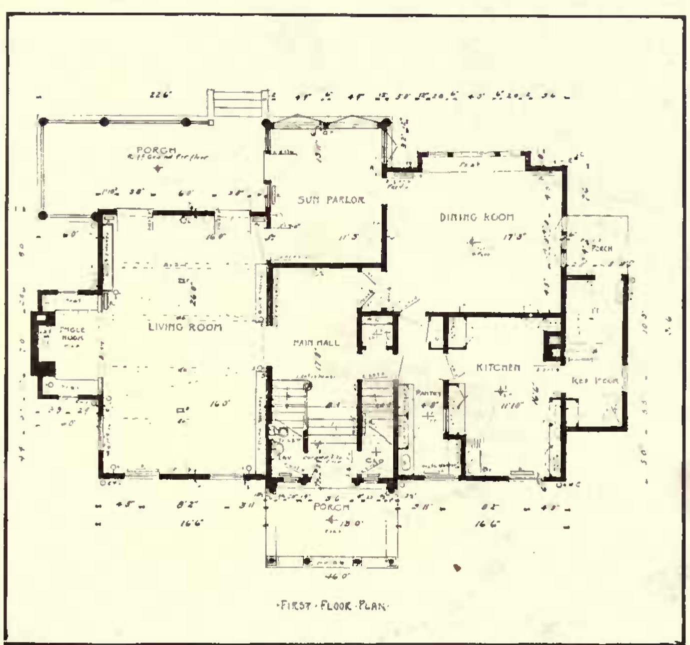
Dwight James Baum, Architect.



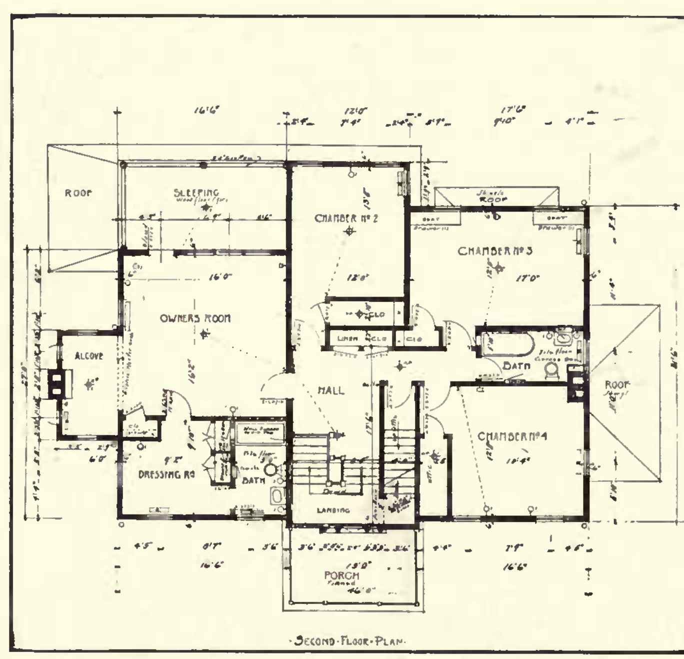


HOUSE AT CLEVELAND, OHIO.

Dwight James Baum, Architect.



·FIRST·FLOOR·PLAN·



·SECOND·FLOOR·PLAN·

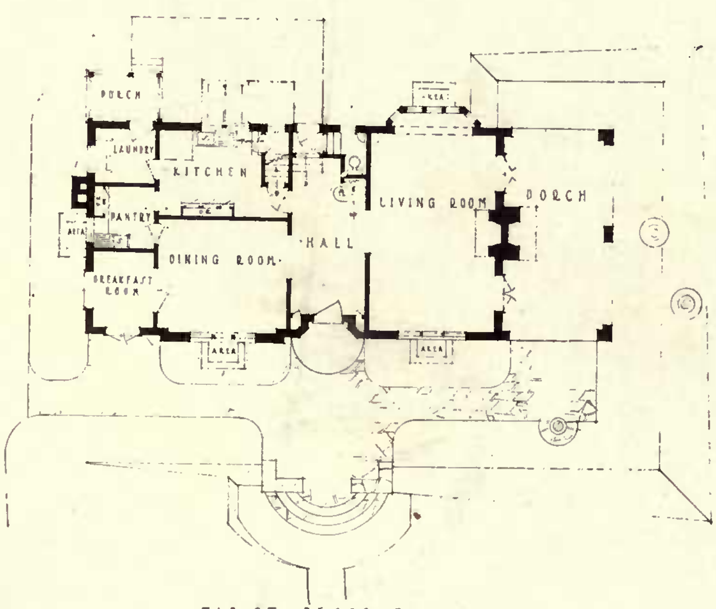
HOUSE, DR. JOSEPH C. PALMER, SYRACUSE, N. Y.

H. D. Phoenix, Architect.

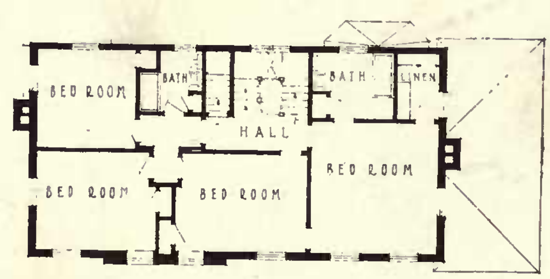
HOUSE, MARGUERITE H. MONAGHAN, OVERBROOK, PA.

Paul Monaghan, Architect.

LIVING-ROOM.



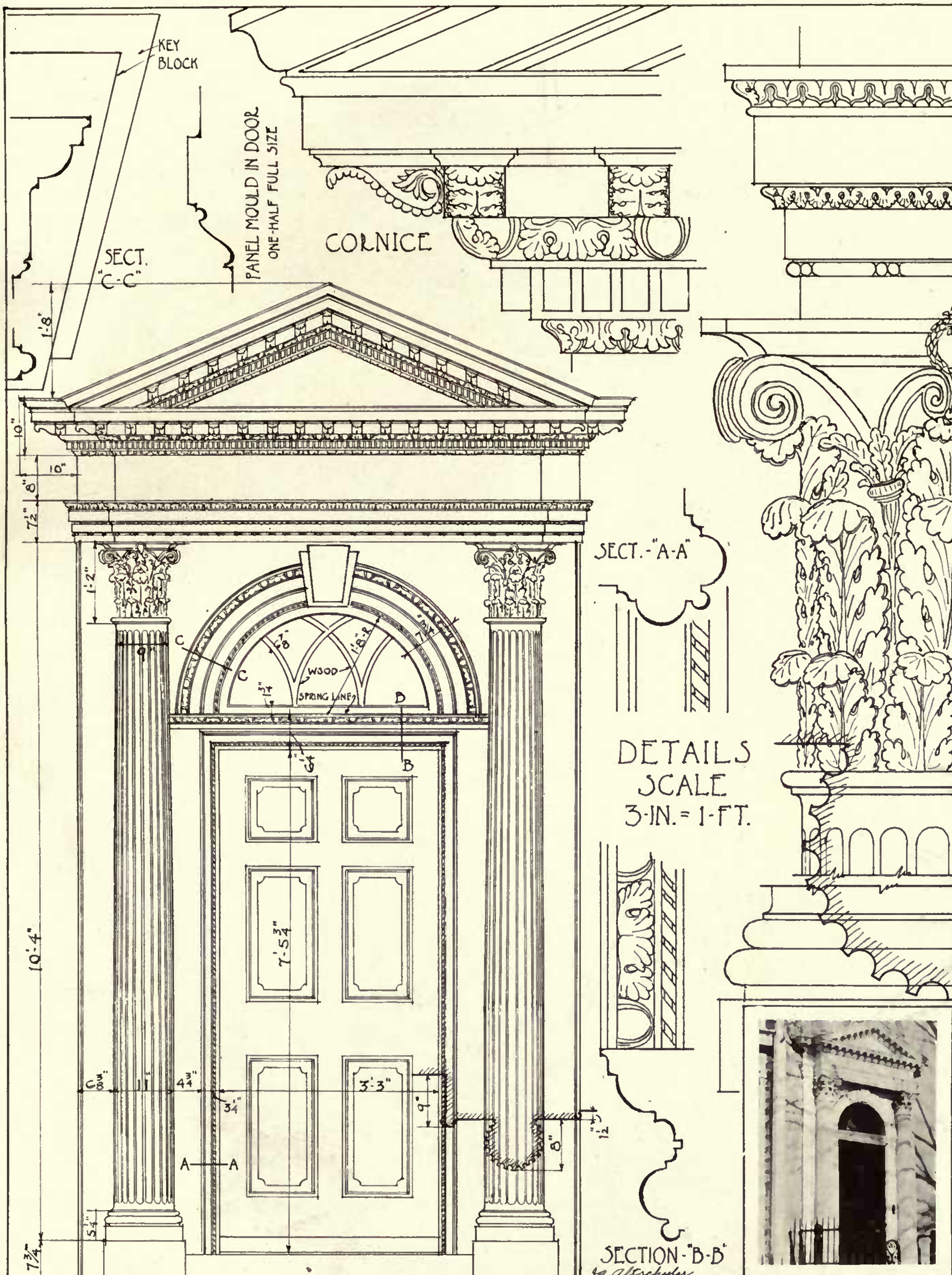
FIRST · FLOOR PLAN



· SECOND · FLOOR · PLAN ·

HOUSE, MARGUERITE H. MONAGHAN, OVERBROOK, PA.

Paul Monaghan, Architect.



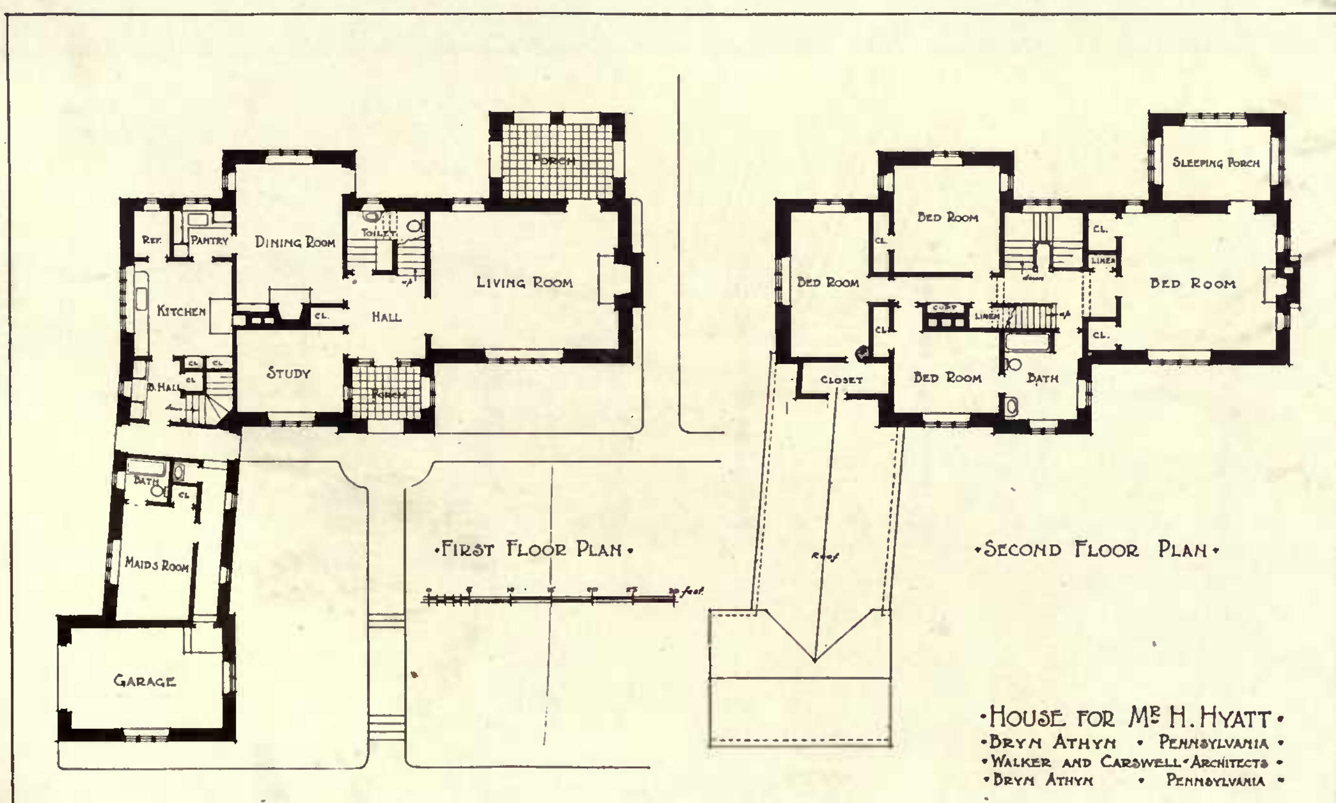
COLONIAL ARCHITECTURE *of the* CAROLINAS

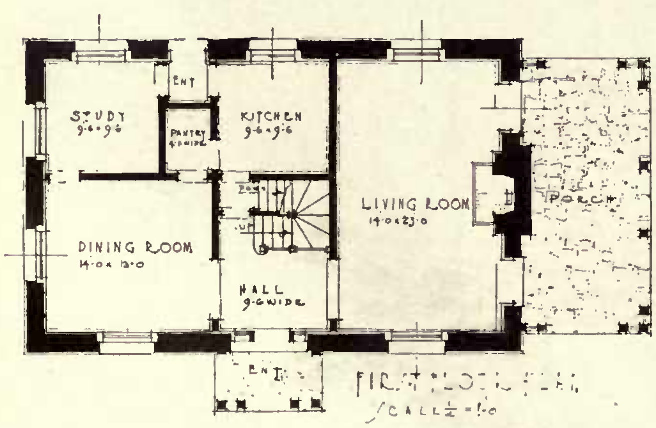
DOORWAY - 104 TRADD ST., DATE - 1772 CHARLESTON - S.C.

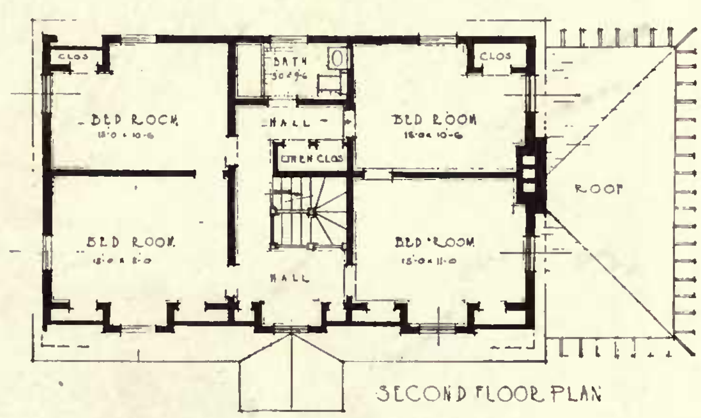
MEASURED & DRAWN *by* J. A. ALTSCHULER

HOUSE, H. HYATT, BRYN ATHYN, PA.

Walker & Carswell, Architects.

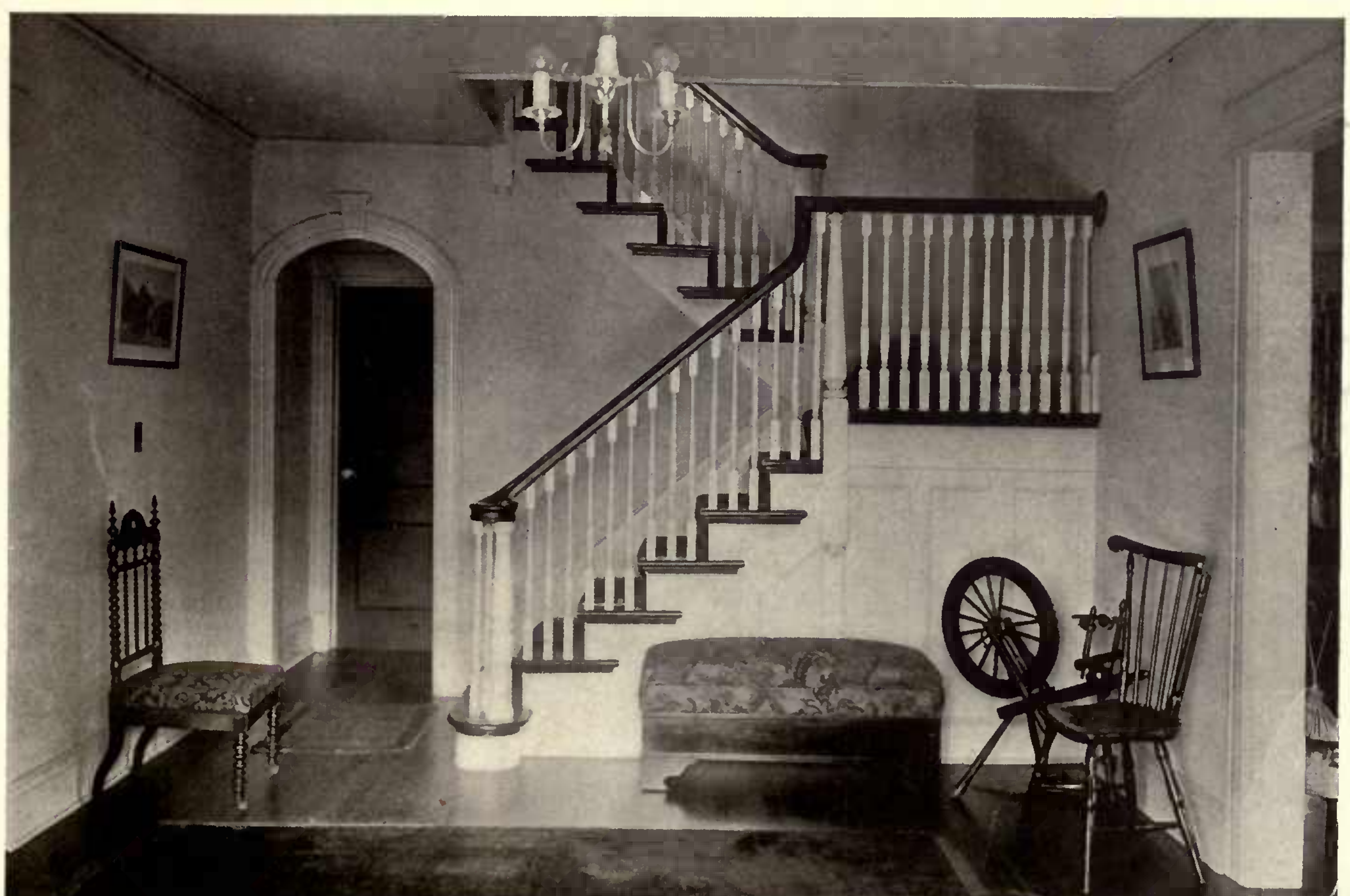

Ref.
Pantry
Dining Room
Toilet
Porch
Living Room
Kitchen
Cl.
Hall
Study
B. Hall
Bath
Maids Room
Garage
·First Floor Plan·
Sleeping Porch
Bed Room
Linen
Bath
Closet
Roof
·Second Floor Plan·
·House for Mr H. Hyatt·
·Bryn Athyn · Pennsylvania·
·Walker and Carswell·Architects·
·Bryn Athyn · Pennsylvania·





HOUSE, MRS. ANN E. CRAIGHILL, GUILFORD, BALTIMORE, MD. Roy G. Pratt, Architect.

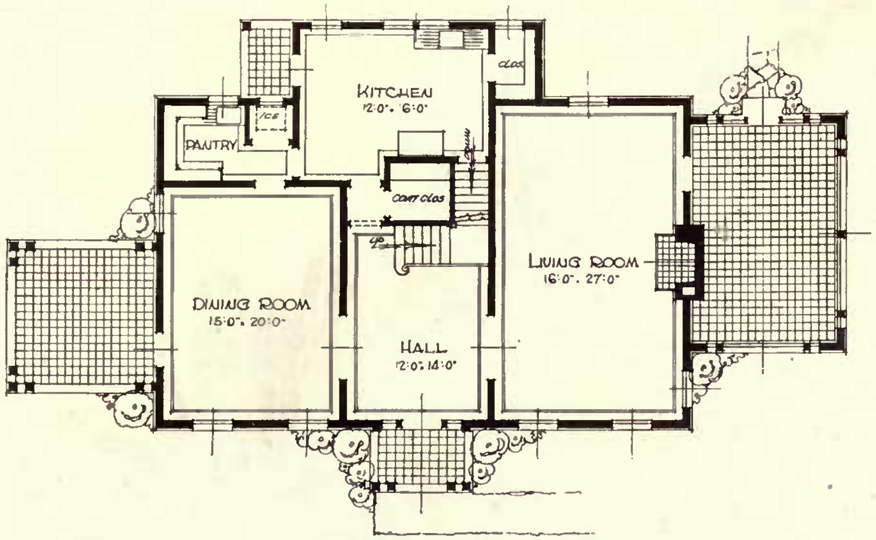
GENERAL VIEW.



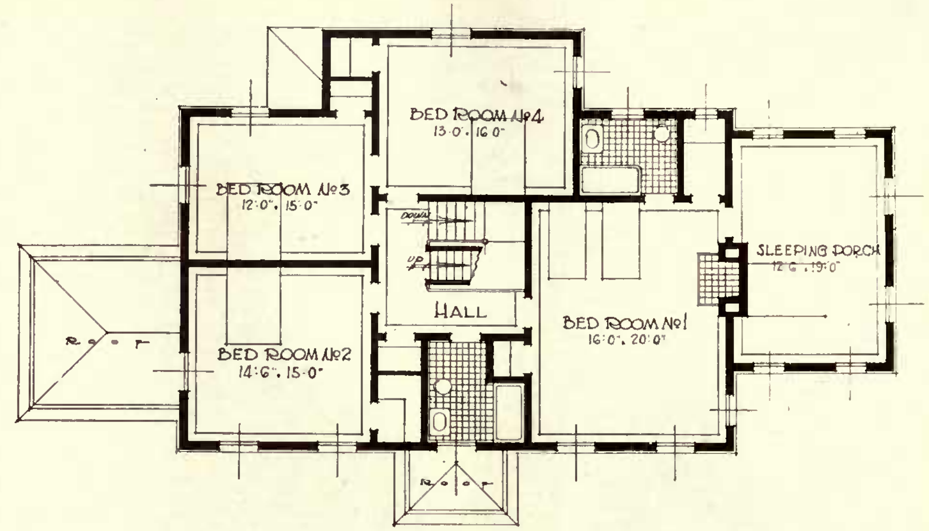
HALL.

HOUSE, W. H. WALKER, TENAFLY, N. J.

R. C. Hunter & Bro., Architects.



FIRST FLOOR PLAN



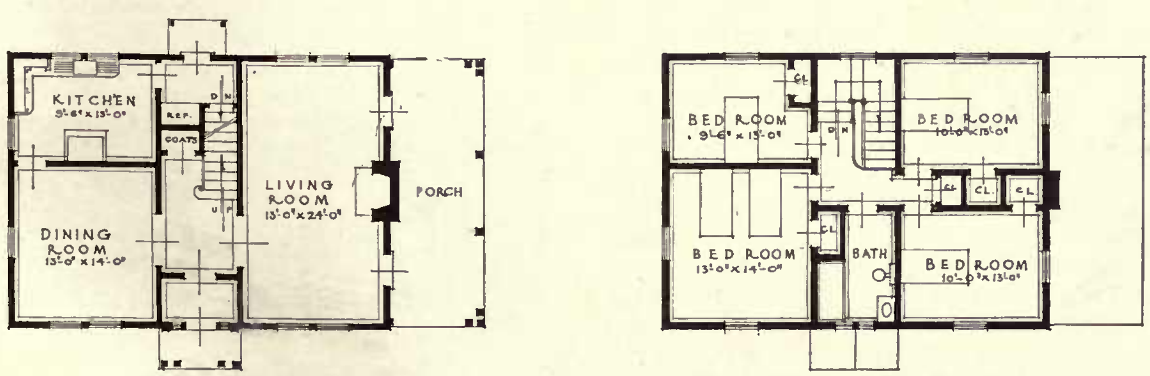
SECOND FLOOR PLAN

LIVING-ROOM.

DINING-ROOM.

R. C. Hunter & Bro., Architects.

HOUSE, W. H. WALKER, TENAFLY, N. J.



FIRST FLOOR PLAN · SCALE · SECOND FLOOR PLAN

HOUSE AT LARCHMONT, N.Y

ADOLPH WITSCHARD, ARCH'T
56-WEST 45TH ST. N.Y.C

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Architectural School of Columbia University

Article XVIII

CONCRETE WORK AROUND THE HOUSE

CONCRETE has become such an excellent servant to the needs of various objects built around the house that no apology will be offered for devoting an article to its use. Of course, one is familiar with the artistic flagstone walk with open joints through which the grass is allowed to grow, and one cannot deny the beauty of brick pavements; but in spite of these the concrete walk is found about more houses wherever one goes than any other type, and, although in most cases very ugly, yet it cannot be relegated to the past even by the most fastidious, for its existence depends upon very fundamental qualities of practical serviceability. And likewise, although we may not have seen concrete walls that had the charm of rubble-stone or brick, yet they are coming to be used more and more, for they can be made to appear very beautiful if properly made. Concrete garden furniture, concrete pools, fountains, garden ornaments, tennis-courts, and other familiar adjuncts to the lawn about the house, are making themselves evident on all sides. There is something about the material that lends itself to such uses, for even the owner of the house can get out and work in it and need not call in a contractor.

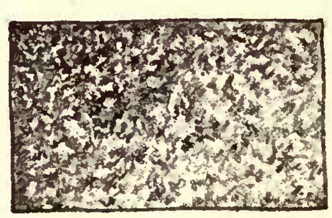
However, much of the prejudice that exists against concrete is due to its usual ugly appearance, which is no fault of the material but of the one who built with it. We see too much concrete that is dull, pasty, and gray, and marred on the surface with cobweb lines of cracks; but this need not be. Concrete surfaces can be made as brilliant as any other material by properly treating it. All that is needed to do this is to carefully study the methods of producing textures, and texture is nothing more than breaking up the surface into small patches of light and dark, so intermingled that they give interest. For example, after the forms have been removed the outside of the concrete can be covered with cement mortar, thrown onto it with a whisk-broom which will make the mortar stick to the surface in little lumps and hills. The light playing over such a surface will cast shadows in the hollows between the lumps and light up the tops of the lumps. This will give a texture of interest that is pleasing to the eye. On the other hand, the cement mortar may be plastered over the surface of the concrete and used as a sticking bed to hold small pebbles of different colors and shades thrown against it. These pebbles will be colorful, and some dark and dull and some light or sparkling like glass. Thus a play of broken light will be thrown back from the surface to the eye, and the observer will be pleased. Then, too, the outer layer of the cement which was next to the forms may be composed of white cement and some aggregate like small chips of marble. When the forms are removed it will be found that this beautiful aggregate will not show, but the entire surface will partake of the monotonous white or gray of the cement. However, if this thin coating of cement is removed, then the variety and sparkle of the aggregate below will be revealed. This might be done by striking the surface all over with a stone-cutting tool which is used to surface stones, or it might be done by a scrubbing or rubbing with carborundum blocks. There are innumerable ways by which texture can be developed on anything made of concrete, and experimenting in this line is a most fascinating employment. For this reason, if properly handled, concrete is particularly adapted to the making of all kinds of house accessories, since it is also easily shaped in moulds.

The materials used for this concrete work have much to do with its success. Ordinarily there is no need of inspecting the cement, for most of the well-known brands of cement on the market are about as reliable as human effort can make them. The materials which do need consideration, however, are sand and gravel. The one essential of sand is that it be free from loam, mica, clay, and organic matter. No sand should contain more than 3 per cent by weight of loam or clay or 1 per cent of mica. The quantity of loam or other fine impurities can be determined by shaking the sand up with water in a bottle, and allowing it to settle. The fine impurities will settle on the top and its proportional relation to the sand estimated. To determine whether the sand has much organic matter in it, a 12-ounce prescription bottle can be filled with sand to 4½ inches and then added to this should be added a 3 per cent solution of caustic soda until this solution and the sand fill seven ounces. The contents should be shaken well and allowed to stand for twenty-four hours. If the liquid which settles on top shows a dark color then the sand has too much organic matter in it, but if it is clear or slightly yellow it may be used without washing. The size of sand particles should be such that they will pass through a quarter-inch screen.

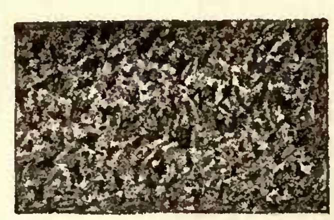
The usual size of aggregates should range from one-quarter inch to an inch and a half in diameter, and the various sizes should be so graded that they will make the most compact mass. The common run of bank gravel must be screened and washed. To make really good concrete that is water-tight, the grading of the aggregate is most important.

In fact, to determine the various quantities that should be used of the materials on hand, some method must be adopted to give the quantity of cement necessary to fill the voids in the sand and the quantity of cement and sand neces-

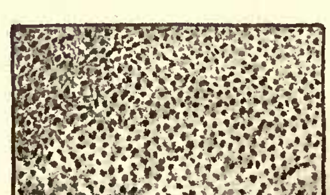
(*Continued on page* 156.)



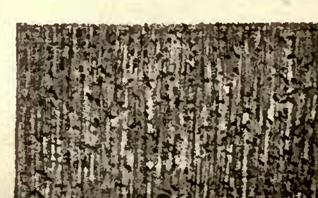
Rough Cast Finish or Splatter Dash



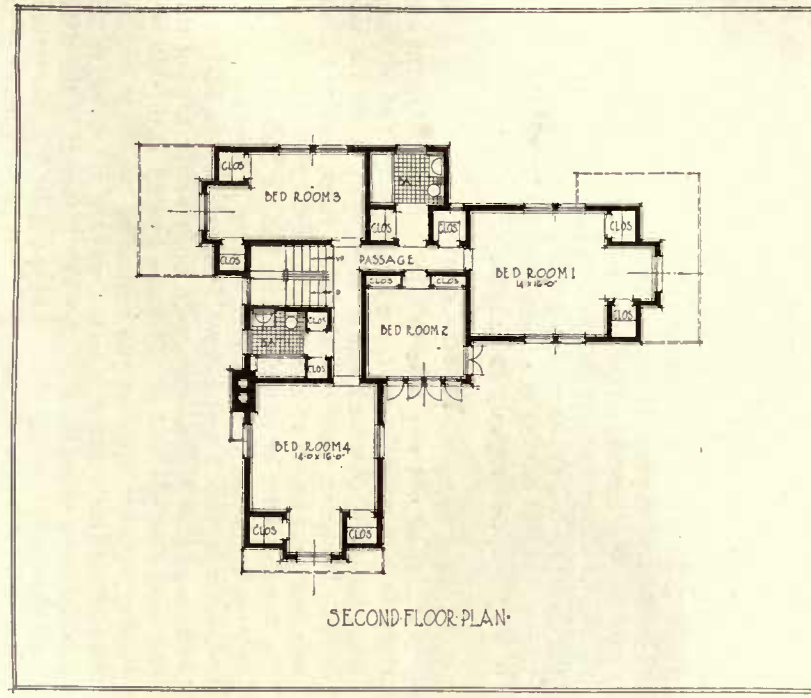
Finish made by the Painter

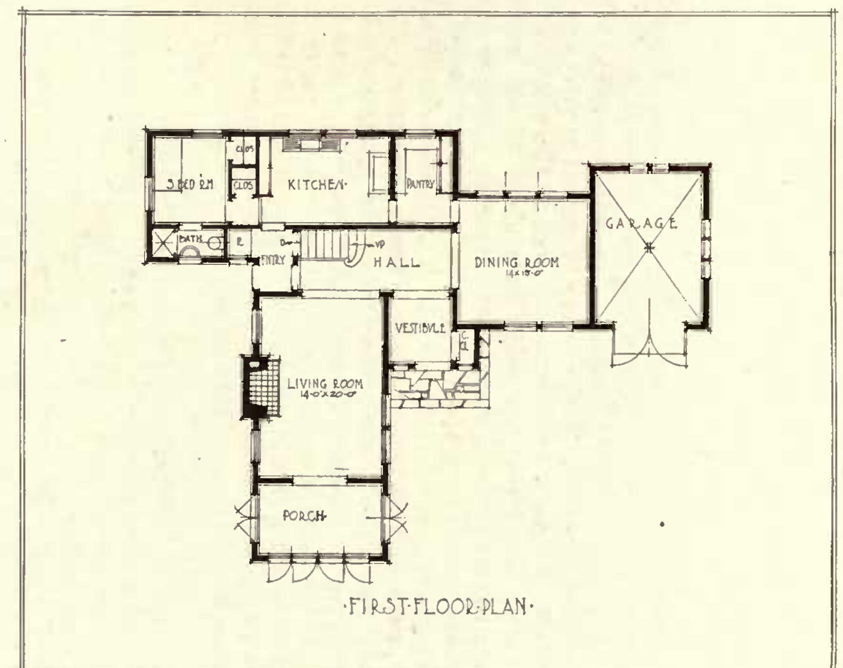


Pebble Dash



Finish made by the Bush Hammer





HOUSE, DION W. KENNEDY, LARCHMONT GARDENS, N. Y.

C. C. Wendeback, Architect.

(*Continued from page* 154)

sary to fill the voids in the aggregate. A rather crude way of doing this is to employ water as the measure of the voids. Fill a pail with sand, and then pour water into it until the water, which is absorbed by the sand, comes to the same level as the sand. Note the quantity of water used up. If it represented 45 per cent of the volume of the sand, then it is known roughly that about 50 per cent of the volume of the sand ought to be the quantity of cement needed to fill in the voids of the sand. Thus one part of cement to two parts of sand. If now the gravel is measured in the same way and it is found that the voids show about 40 per cent of the volume of the aggregate, then assuming a little more than the water shows, about 50 per cent of sand and cement will be required to fill up these voids. That is, there should be just twice as much stone as there is cement and sand. We finally then arrive at the proportion for the concrete as follows: 1 part of cement to 2 parts of sand to 4 parts of gravel.

The amount of water which is added to make the mixture of concrete should not be too much. It should be of such a quantity that the mix is mushy but not watery, even when it is to be poured into forms.

Sidewalks and Porch Floors

It is generally recognized that one-course concrete sidewalks are the most successful when built by the average workman, for the slab is of one uniform body and not two layers, which might not have knitted together properly. For porch floors and walks three slabs should be 5 inches thick and laid on a good foundation. It is best to excavate 4 inches for the depth of the walk, tamp the gound, and pour water over it, to note whether it is absorbed or stays on top. If it is not readily drained off, it ought not to be used as the foundation of the walk, but should be excavated to a depth of 10 inches to 12 inches. In this excavation should then be tamped gravel or cinders, and some provision should be made by which any water that would seep through this gravel may be drained off. The timbers used for the forms along the edges of the walk may be 2 x 6's held in position with pegs. Slabs should then be determined for length. Usually they should not be in excess of 6 feet in any one direction and ¼-inch expansion joints should be placed in the walks every 25 feet. If alternate slabs are laid, the forms can be removed, so that the intermediate slabs can be poured between them. Of course, a partial bond will be developed between slabs in this way, but these joints will be the weakest point in the walk and if settlement takes place unequally and one slab breaks from the other the crack will develop at this joint and not appear on the face. The expansion joints should, however, be real separations, made with strips of asphaltic felt set between slabs. The usual mixture for concrete walks should be 1 part cement to 2 parts sand to 3 parts of gravel. The mixture should not have too much water in it, and when poured into the forms the top should be levelled off with a straight stick stretched across from one side of the form to the other. Too much trowelling should be avoided, since this is apt to draw excess water to the surface and also cement, which will show hair cracks when hardened. It is best not to use a metal trowel but a wooden one, so that a partial sandy surface is made. After the walk has been laid it should be protected from drying out too quickly by laying over it 4 inches of earth or two or three layers of burlap, which should be wet down about twice a day for a week. All walks and porch floors should have graded tops, so that water will run off of them. This is usually ¼ inch to the foot.

Sometimes porch floors give trouble from "dusting" and wearing away of the surface to a gritty and rough condition. This may have been caused by allowing the floor to dry too quickly or by having trowelled it too much and drawn cement to the surface. It may be remedied by using some one of the commercial floor hardeners or by painting the floor with water-glass solution or boiled linseed-oil. Water-glass solution should be diluted with 4 to 6 parts of water and applied with a brush in as many coats as the concrete will absorb. When boiled linseed-oil is used, it should be allowed to dry between coats, and as many coats should be added as the concrete will absorb. Both of these treatments will darken the floor, but the latter will darken it the most, and appears to be more effective.

Tennis-Court

In laying out any other platform construction of concrete, such as a tennis-court, the same principles of construction should be observed which were given above for sidewalks. However, more care should be taken with the drainage and foundation of the tennis-court. Not only should the 6-inch cinder or gravel bed be laid, but all around the outer edge of the court should be dug a trench about 18 inches wide and 3 feet deep. There should be laid at the bottom of this a drain-pipe, with open joints, sloping from the centre of one end of the court around both sides and joining together again at the middle of the other end and connected with another pipe to carry off the water of that drain-pipe to some lower level. The diameter of the drain-pipe should be about 5 inches and the slope 6 inches from its highest level to its lowest level. The upper surface of the court itself should slope across from one long side to the other with a pitch of 2 inches. The division lines of the slabs should follow as closely as possible the division lines of the tennis-court. The length of the concrete platform should be 21 feet greater at each end than the length of the court and the width 12 feet wider each side. This makes the entire concrete court 60 feet by 120 feet.

Concrete Driveway

Such driveways may lead to the garage or up to the porch of the house. One of the cheapest types to the garage is a double runway for the wheels of the automobile. These runways should be about 4 feet 8 inches on centres and made 18 inches wide. They should be constructed in the same way that walks are built.

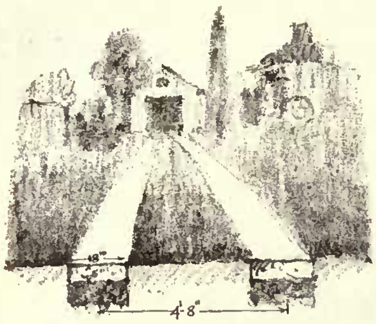
Where a full-width concrete driveway is built, it should be made about 6 inches thick at the centre and 5 inches at the edges, sloping from the centre out. At intervals of every 25 feet expansion joints should be built as was specified for walks.

Concrete Steps

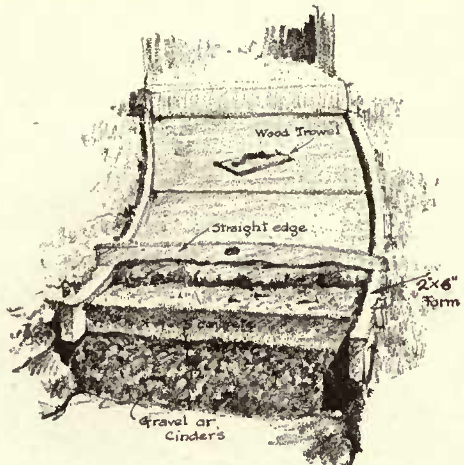
The only difficult problem in the construction of concrete steps is the making of forms. These should be well braced to prevent bulging when the concrete is tamped into them. The aggregate ought not to be over ¾ inch diameter, so that as the material is tamped into the forms and the sides spaded a good surface will be left when the forms are removed. If the aggregate is too large, some pieces may catch along the forms and when they are removed large holes will be found in the risers of the steps. The treads should be finished with a wood trowel.

Small Retaining Walls

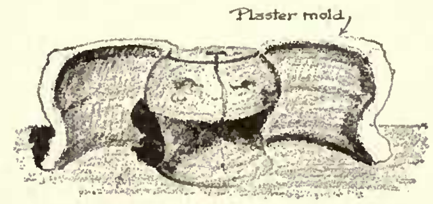
Wherever terraces or lawns need the support of a small retaining wall, concrete is excellent for this purpose. The foundations of such walls should be carried down below the frost-line. The usual mixture is 1 : 2 : 4. Drains should be built at intervals along the lower part of the wall to allow the seeping ground water to come out. At intervals of about



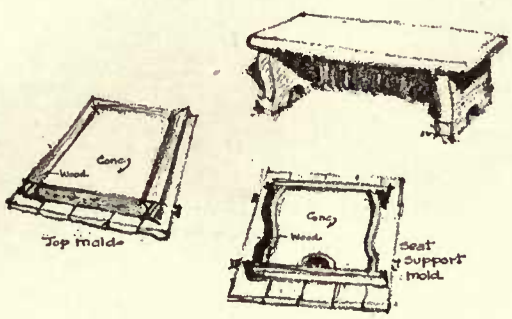
Concrete Runways to Garage



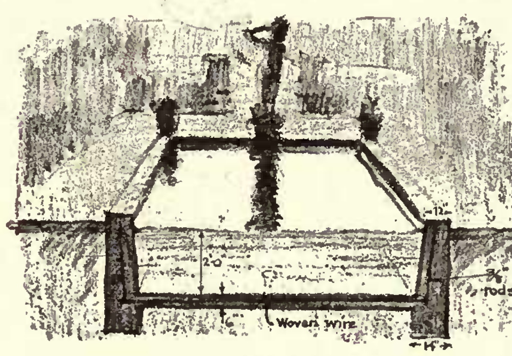
Concrete Sidewalk



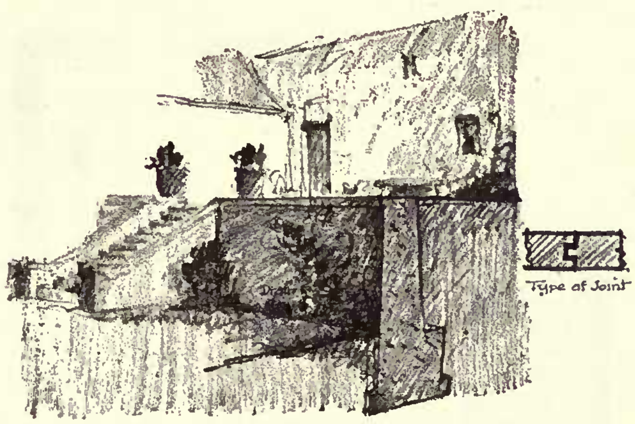
Concrete Vase for Garden



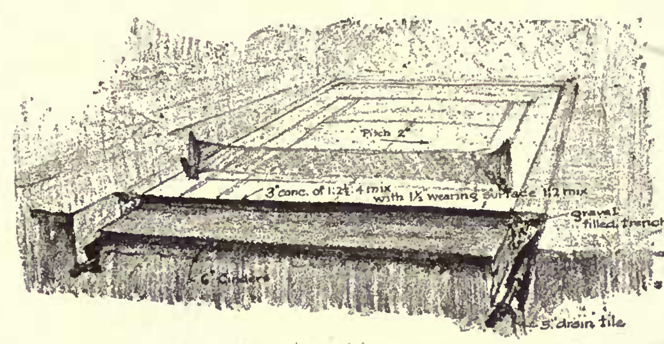
Simple Types of Concrete Garden Seats



Concrete Pool



Concrete Garden Retaining Wall



Concrete Tennis Court

every 25 feet expansion joints should be made, somewhat the shape of the tongue and groove in flooring. The base of such a retaining wall should be at least as wide as four-tenths the height of wall.

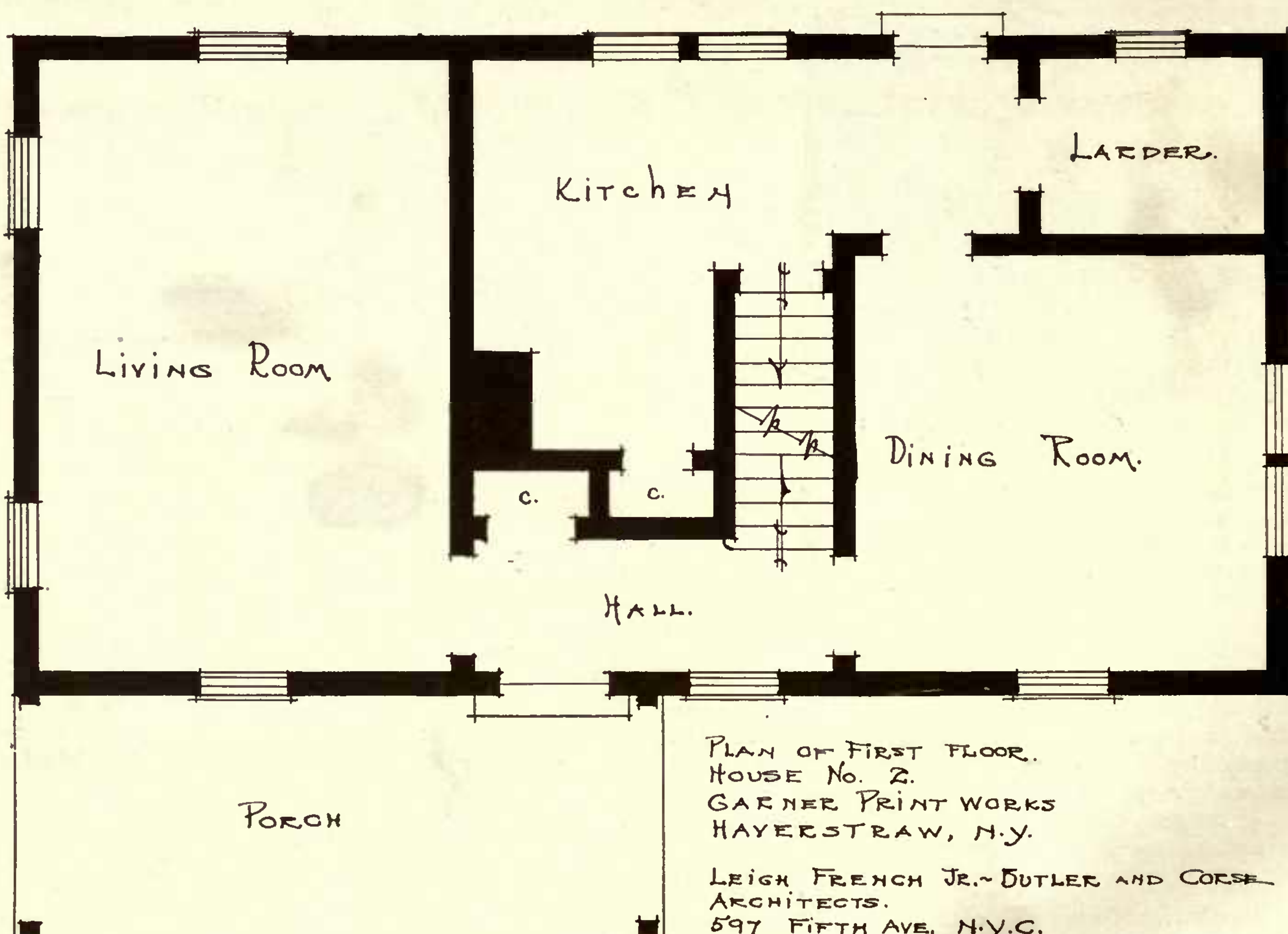
Pools and Fountain-Basins

Such ornaments to the garden are not entirely outside of the possibilities of the small house-owner's pocket-book. They should have the exterior walls carried down below frost-level, and the bottom and sides reinforced with steel. For the bottom woven-wire reinforcement will answer the purpose and for the sides ⅜-inch reinforcing rods should be used. These pools ought not to be more than about 2 feet deep, in which case the bottoms may be made 6 inches thick and the sides 12 inches at the top and 14 inches at the bottom.

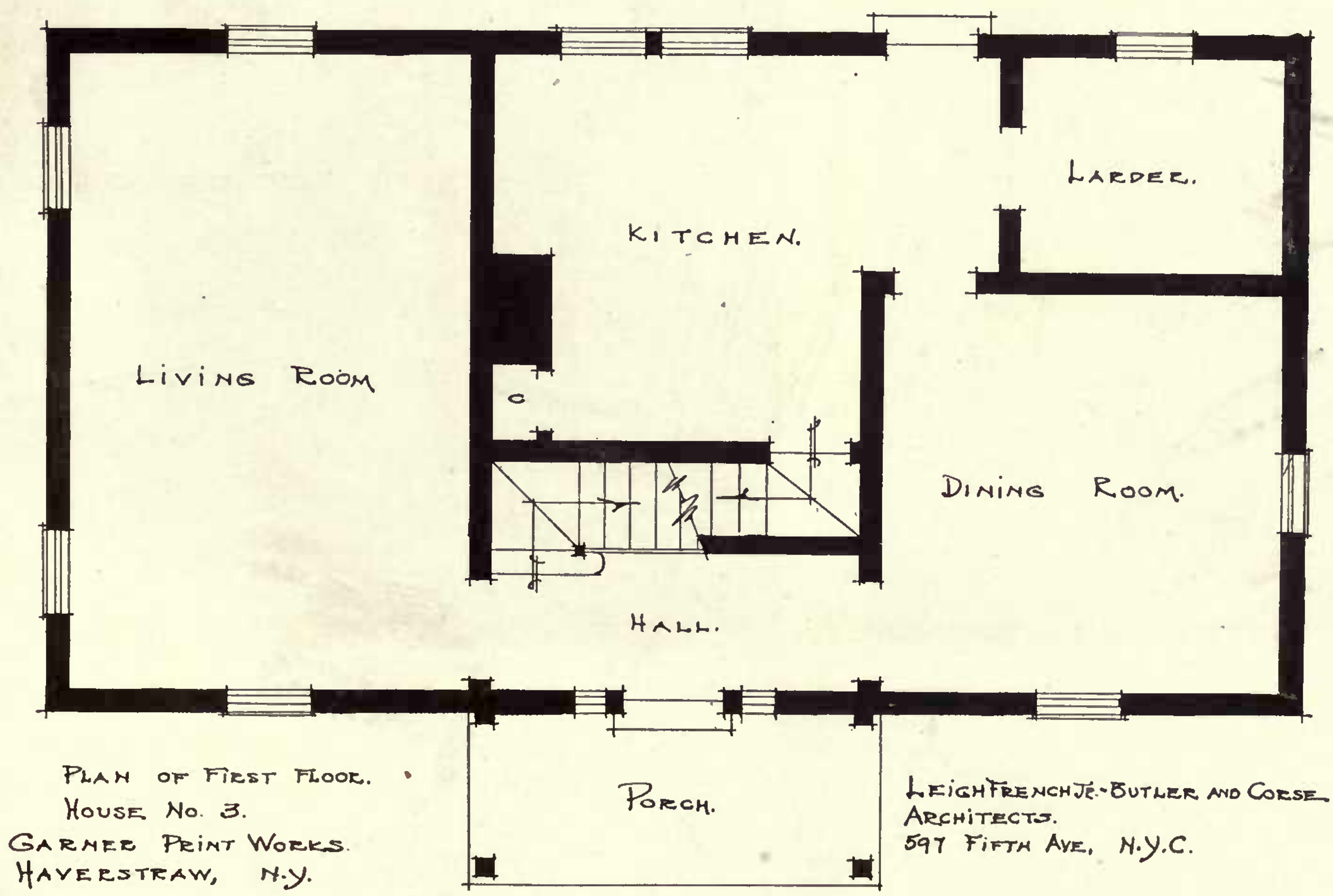
Ornamental Garden Furniture of Concrete

There is no great difficulty or secret in making simple garden furniture of concrete. Generally where the furniture is of simple lines, the mould can be made of wood. If, say, a bench is to be made, the top might be moulded as a slab of concrete, and the legs at the ends as slabs, and all fitted together. If flower-boxes are desired, the mould would necessarily have to be a little more complicated, but not greatly so. The one thing to remember in making any of these moulded bits of concrete is that they should always have embedded inside of them reinforcing wire lath.

Of course the making of ornamental pots and vases is rather difficult and takes some skill. Here the original shape must be modelled in clay, and a plaster mould made of it, which is shellacked inside and greased. Special cores must also be designed, and where fine surfaces are desired various processes of mixing ingredients must be resorted to. This is a special field of itself, and men who do this kind of work generally have studied out methods of their own. Some examples of this kind of work are illustrated.



A HOUSE OF SEVEN ROOMS AND ONE BATH.



A HOUSE OF SEVEN ROOMS AND ONE BATH.

4TH SERIES

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STVDIES IN SPAIN ~ FRANÇIS HÕWARD

E. A fountain of colored tile in middle of broad walk.
F. Simple iron-railing ground pool with pots of plants on the posts.

G. Winding paths bordered with boxwood and accented by fountains.
H. Circles of evergreen around orange-trees, with simple fountain in centre of gravel paths.

The Disposal of Sewage from the Isolated Country Estate

By William C. Tucker

THE disposal of sewage from the isolated country estate must be accomplished in a thoroughly scientific manner, in full accord with the laws of hygiene and sanitation and at low cost.

The theory is elementary in principle, simple in operation, and based upon bacterial reaction upon the fresh sewage, demanding a period of comparative quiescence, with a leisurely regular movement during its passage through the tanks to final disposal. During the period of rest, fermentation develops, which is greatly aided by the warmth of the sewage, breaking down the nitrogenous compounds into their component parts; the gases escaping to the air, the heavy insoluble portions settling to the bottom in the form of a thick viscous mass. The resulting effluent is nearly free of all solid matter and must be disposed of as quickly as possible before putrefaction may develop. The period for completing the cycle of the bacterial purification has been greatly shortened as a result of study and improvement in structural design.

The disposal of sewage through the means of the leaching cesspool, or any means of similar principle, must not be considered. Such methods are an abomination, a relict of barbarism, an offense against the sense of sight and smell, and a constant menace to health. Primitive methods or those lacking in absolute scientific security must not be allowed. Cesspools found upon the property must be abandoned, their contents removed and hygienically destroyed, and the sides and bottom of the excavation thoroughly powdered with chloride of lime and left exposed to the sunlight and air for three or four days, after which it must be filled with clean dry material containing no matter which may produce decomposition.

Sewage is water containing household wastes in suspension or solution, and consists of the refuse from the kitchen, fouled water from the laundry and bathroom and that from cleaning.

A sewage-disposal system of simple design and construction, shown in Fig. 1, consists of three elements—the septic tanks, the series of pipe sewers with branches to the different buildings, and the disposal field. All these must co-ordinate, and when scientifically designed and well constructed will function in a natural, orderly manner. A disposal system, be it small or large, will demand careful and thorough study. At the inception of the work, a topographical survey of the property of approximate accuracy must be made along the lines of the proposed sewers, and in the vicinity of the tentative position of the septic tanks and disposal field, upon which must be indicated all prominent features of interest. From this a definite scheme may be evolved, and satisfactory positions for the different elements selected, which must avoid rock indications, healthy large trees, attractive groups of shrubbery, streams, and brooks, which will greatly reduce cost of installation. All data relating to the project must be accurate, deductions and conclusions concise and explicit, tempered with good judgment and experience.

The sewage-disposal system should be placed at some point rather remote from habitation. The disposal field must be located so that there may not be the slightest fear or apprehension concerning the permanent security of the source of the water-supply, which must be kept absolutely free from remote possibility of pollution.

The controlling factor which determines the general design and size of a disposal system is the water consumption for domestic purposes upon the estate, which, for purposes of computation from observation, may be assumed at a maximum of one hundred gallons per capita per day, depending upon the character and size of the establishment, its social position, and amount of entertaining enjoyed.

Sewer Lines

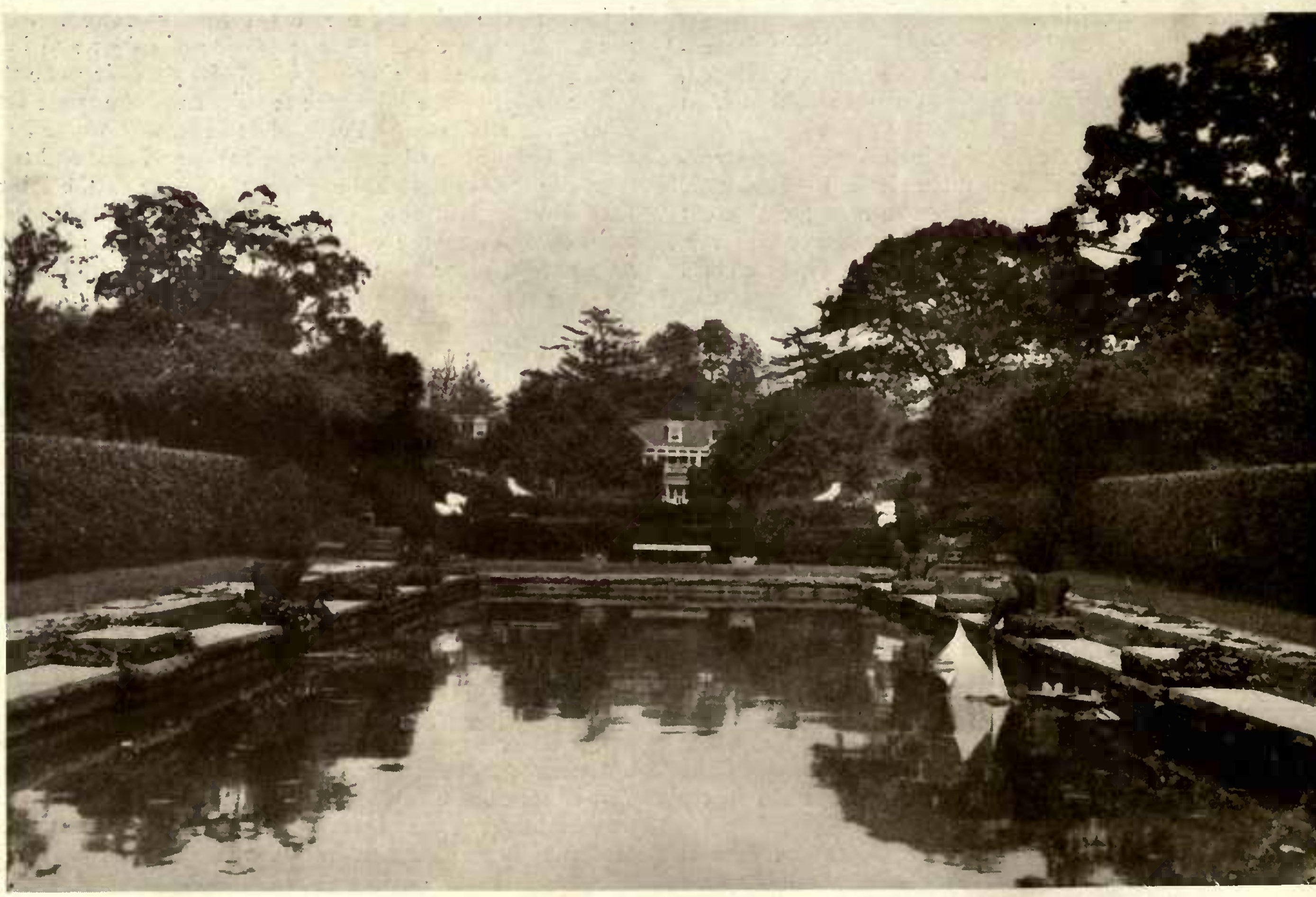
The lines of sewers to the septic tanks must be true to line and grade between certain predetermined points, which will be suggested from a study of the topographical survey. There must not be any curves nor bends. The sewers should be laid at least three feet deep to prevent freezing in very cold weather, particularly where of necessity the lines may be laid with slight fall, producing sluggish flow. The pipe may be either iron or tile—the former is more desirable on account of its strength, and the length of each piece five feet, necessitating fewer joints, but its cost makes it prohibitive for general use. Tile-pipe must be hub and spigot, salt-glazed, vitrified earthenware, sound, truly cylindrical, and straight and free from blister, check, or other defects, and must be carefully tested upon bank before use.

The pipe should be laid up-hill with hubs uppermost. The joints must be carefully made, particularly should wet or insecure ground be encountered, to provide against the possibility of seepage entering the pipe, either during or after construction. The pipe must be thoroughly cleaned before laying and kept so during the work, and open end closed water-tight with wooden plug and gunny sack before leaving the work for the day. The correct method of pipe-laying is most simple: a length is laid hub up-hill, into which is inserted the spigot of the next, carefully centred. About the annular space between the outside of spigot and inside of hub is calked a ring of picked oakum filling one-third of the depth of the joint, the remainder of the space being filled with stiff, strong Portland cement, well worked with tool and gloved hand, and joint left true and neat and tapering. Before laying another pipe, the inside of the joint of that already laid should be carefully cleaned with long-handled swab to the end of which is securely attached a gunny sack, to remove any cement which might be forced into the pipe when the joint was made. After joints have thoroughly set, a wedge of soft earth should be carefully packed under each pipe at centre to hold them firmly in space, and trench refilled in six-inch layers, for the first two feet, care being taken not to disturb work already laid. Trench should be refilled evenly and well tamped with tool or puddling and left well mounded. No work should be left exposed overnight for fear of injury from loosened falling material from sides of trench. Joints of pipe in proximity to trees should be coated outside with hot tar to prevent root tendrils forcing their entrance, forming an ever-increasing wad, finally causing complete stoppage.

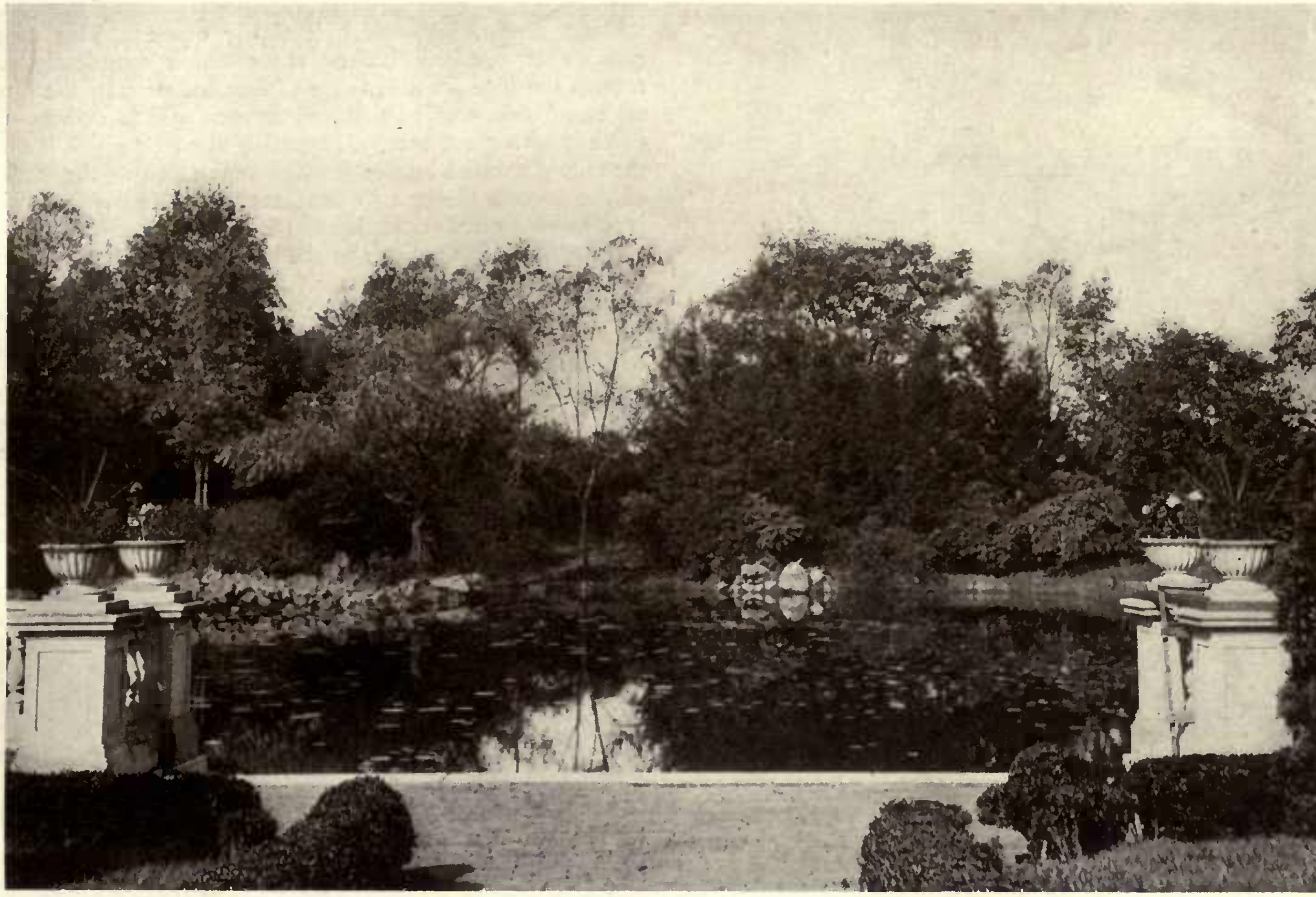
The trenches for the sewers should be carefully excavated, the material thrown on one side, leaving the other free for the work. They should be cut true and straight with slightly sloping sides when in firm soil, and braced where water or unsafe material may be encountered. The bottom should be six inches wider than the over-all dimension of sewer at hub and should be most carefully cut true to established grade of work, so that pipe-laying may proceed rapidly and without interruption and that joints may

(*Continued on page* 164)

POOL WITH WATER-LILIES IN LOWER GARDEN, ESTATE H. W. CROFT, GREENWICH, CONN.
Mrs. Ellen M. Shipman, Landscape Architect.

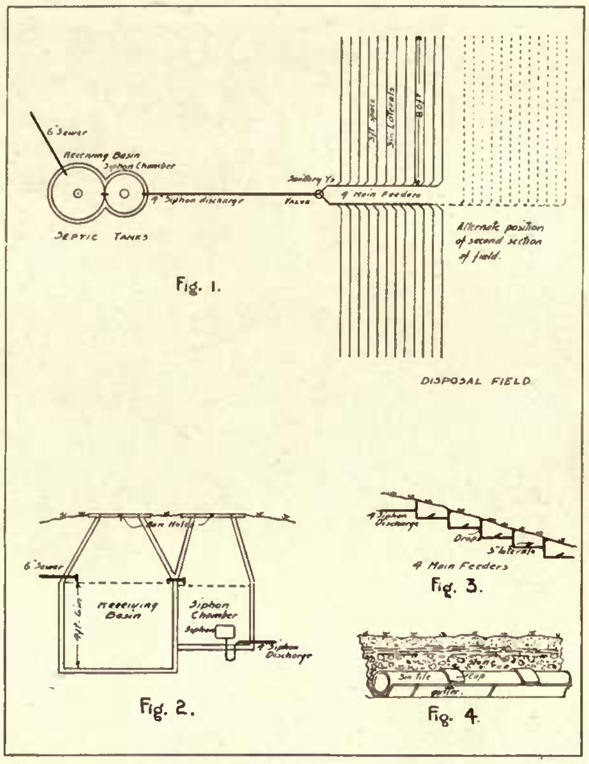


POOL IN LOWER GARDEN, ESTATE MRS. WILLARD D. STRAIGHT, ROSLYN, LONG ISLAND.
Beatrice Jones Farrand, Landscape Architect.



POND FROM STEPS OF GARDEN, ESTATE GEORGE D. BARRON, RYE, N. Y. Charles Wellford Leavitt, Landscape Engineer.

POND ACROSS THE LAWN FROM HOUSE, ESTATE MRS. MOSES TAYLOR PYNE, PRINCETON, N. J.
Daniel W. Langton, Architect.



(*Continued from page* 161)

be made in a thorough manner. Excavation for the trench work may be started at several points, to gain time, and should be run up-hill so that drainage always may be free and not impede the progress of the work.

The Septic Tanks

The septic or settling tanks shown in Fig. 2 are chambers into which the sewers empty and in which bacterial reaction develops. They are built of water-tight masonry to withstand pressure from without as well as from within, and are generally placed adjoining each other for economy of construction, and have inner surface of Portland cement brush smooth. These basins, if scientifically designed and well constructed, will function automatically in a continuous and normal manner, requiring little or no fixed attention but periodic inspection. The first or receiving basin should have a capacity for one day's sewer discharge, which may demand dimensions at variance with economical construction, in which case a supplemental tank may be added.

From the receiving-basin the effluent flows into the siphon chamber, as shown in Fig. 2, of smaller size, in which sedimentation continues, and in which is built a siphon which automatically discharges the entire contents of the chamber at one flush when it may have reached a determined height.

Stall drainage and waste water from the carriage-wash should not enter the disposal system. The finely masticated food of the farm animals does not settle out in the septic tanks, but is carried in suspension, causing stoppage in the laterals at the disposal field. The silt from the carriage-wash settles in the bottom of tanks, interfering with the bacterial reaction, and finally has to be removed.

The Disposal Field

The effluent from the septic tanks, having undergone complete bacterial change, is now in a safe condition for final disposal. This operation is based upon physiological laws, and resembles closely similar action within the human lungs. At the disposal field, it is led into lateral lines of pipes of small size, shown in Fig. 4, which are surrounded by a non-absorbent media, into which it slowly exudes. This media consists of one-inch broken stone which completely surrounds the pipe for a distance of four inches. In the interstices of this media is stored oxygen which attacks the effluent with great energy, liberating nitrogen which is most greedily devoured by the growing vegetation at the surface of the ground through its root tendrils, and oxygen which is retained for a continuation of the cycle of operation. The clarified fluid is readily absorbed by the surrounding earth lying beyond the stone media.

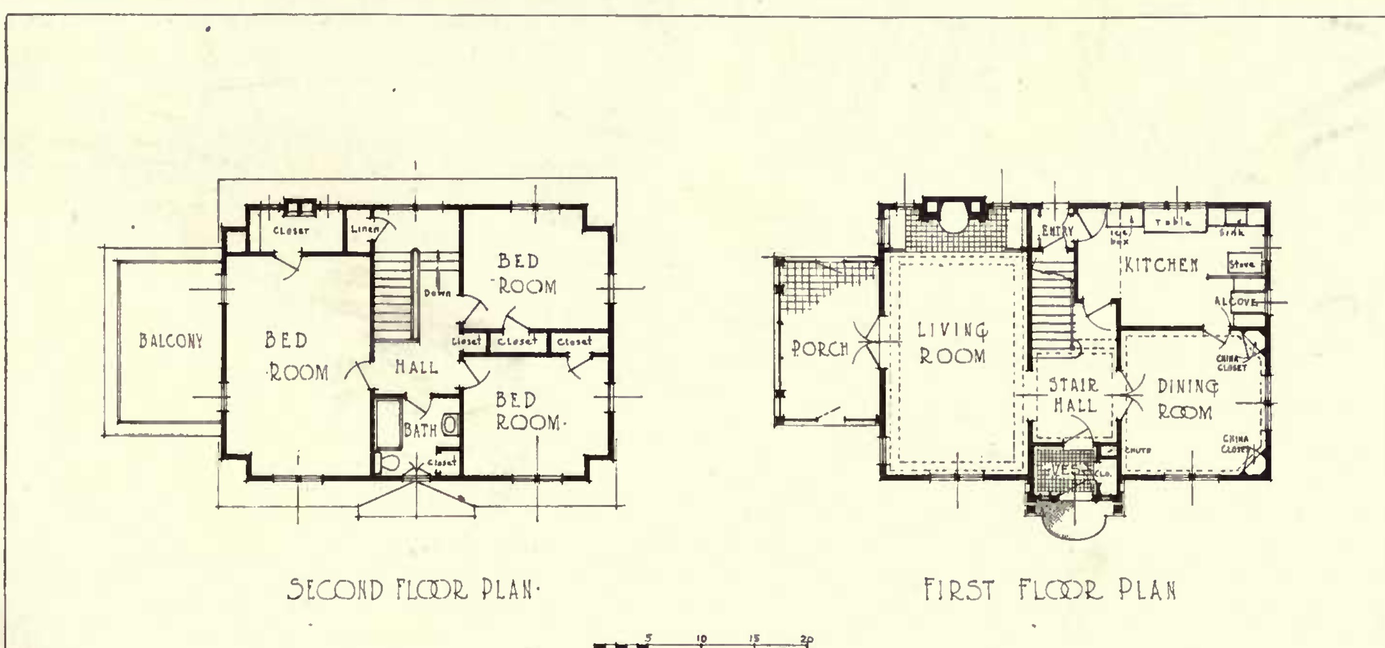
From the septic tanks the effluent is led to the disposal field through four-inch-main feeders of vitrified tile-pipe with cement joints, shown in Fig. 1, at which point are inserted, right and left, sanitary Y's at intervals of three feet, with three-inch outlets, the inverts of which are at the same level as that of the body of the pipe. The grade of these mains must be such that the flush from the siphon is not allowed to rush with great velocity to the end of the line, but held in check so that each lateral may be completely filled. Should this be impossible on account of the slope of the surface of the ground, without extending the pipe-lines to a depth contrary to good practice, "steps" or "drops" may be employed, as shown in Fig. 3, which may be obtained at any pipe-yard, and are made with such "drop" as the work demands.

A typical disposal field is well illustrated in Fig. 1. For economy of operation it should be separated into two or more sections of equal size, dependent upon the size of the project, which are controlled by a diverting valve, and which are used alternately so that one section may be at rest while the other may be in service, which method of functioning has become general from observation. The period of activity of a section should be limited to two weeks. The position of the sections will be largely governed by conditions at the site, but it will generally be found advisable for ease of inspection and relocation that they be placed either directly opposite to or adjoining each other as shown.

The surface of the disposal field should consist of a firm rich top-soil for the encouragement of the growth of hardy grasses. The subsoil should be coarse sand or gravel free from loam. The field should have a gentle slope so that drainage may be free. The drainage of the subsoil must be excellent; where this is not so, underdrainage will have to be provided.

The disposal field under no circumstances should be cultivated for garden or other purposes, nor should trucking across this area be permitted, for fear of injury to the small subsurface pipe-lines.

From the three-inch branches of the main feeders are extended lateral lines as shown. These are a most important feature of the disposal system and largely determine its efficiency. The bacterial action upon the sewage in the septic tanks is of vital importance, but it is largely physiologic, while the demanded high efficiency of the laterals is almost entirely dependent upon mechanical skill. These lines consist of three-inch drainage-tile in one-foot lengths, laid upon gutters, with open joints protected and kept free from clogging by the loose trench material, by loosely fitting caps, as well shown in Fig. 4. Tiles, gutters, and caps are all of the same material—hard-burnt, unglazed earthenware. The laterals are laid in shallow trenches, ten inches deep and one foot wide at bottom, which are carefully dug true to line and grade. The operation of running the lines is simple; the gutters are laid first, carefully, upon which are placed the tile, caps covering the joints, about which is then placed four inches of one-inch broken stone, free from dust and screenings, completely surrounding the work, care being taken not to disturb the work already in place. Over the broken stone is spread a thick layer of salt hay to prevent trench material filling the interstices of the stone. The lines should not extend over eighty feet in length, and must be laid quite flat, not over four inches per hundred feet, so that each siphon flush completely fills the lines, from which it slowly exudes through the open joints.



HOUSE, J. L. SCHNIER, ST. PAUL, MINN. Damon, O'Meara & Hills, Architects.

Book Reviews

A HISTORY OF FRENCH ARCHITECTURE, FROM THE DEATH OF MAZARIN TILL THE DEATH OF LOUIS XV, 1661–1774. By SIR REGINALD BLOMFIELD, R.A., Litt.D., M.A., F.S.A., Honorable Fellow of Exeter College, Oxford; Officier de l'Ordre de la Couronne, and Officier de l'Ordre de Leopold II of Belgium; Officier de l'Instruction Publique, and Honorable Corresponding Member of the Société des Architectes Diplômes de France. Author of "A History of French Architecture, 1494–1661," with Drawings by the Author and Other Illustrations. Charles Scribner's Sons, New York.

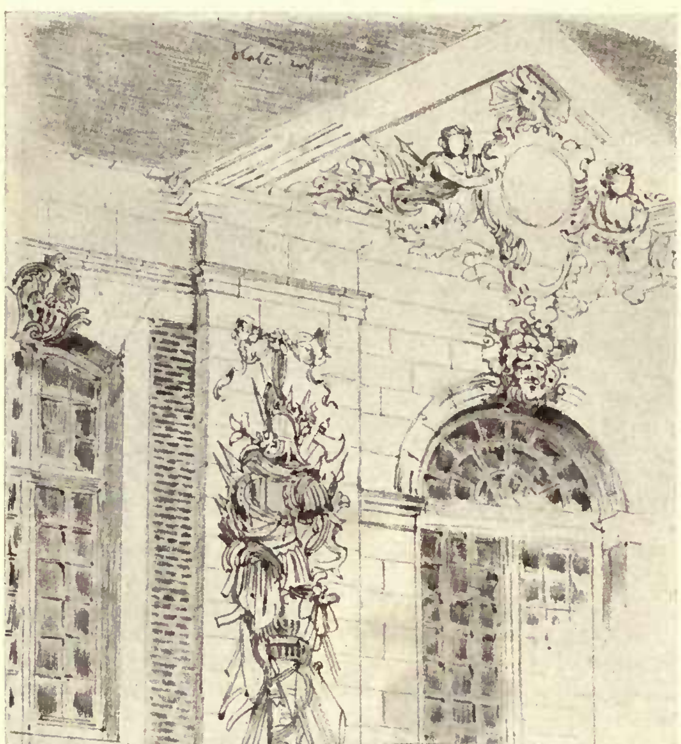
Louis XIV, Colbert, and the Academies, The Academy of Architecture, The French Academy at Rome, The Royal Building Staff, Louis le Vau, François d'Orbay, Richer, Lambert, and the Last of the Old Régime, The Completion of the Louvre, Bernini and Claude Perrault. Claude Perrault, François Blondel, Errard, Mignard, La Valfenière, and Le Pautre, Cottart, Richer, Robelin, De Lisle, Leve, Girard, Gobert, Leduc, Gittard, Bruant, Bullet.

The draftsmen: Jean Marot, Daniel Marot, Jean le Pautre, Pierre le Pautre, Le Blond, Berain, Le Clerc, Israël Silvestre, and Adam Perelle.

Andre le Notre, Jules Hardouin Mansart.

The Architecture of the Reign of Louis XIV, Daviler and Desgodetz, Mansart's Staff: L'Assurance, Le Roux, and Audry, Robert de Cotte, Jacques Jules Gabriel, De La Maire, Aubert, Courtonne, Cartaud, Oppenord, Meissonier, the Cuvilies, Le Blond, Boffrand, Servandoni, Here, Ange Jacques Gabriel, Soufflot and Constant D'Ivry, Blondel, Patte, Mique, French Architecture in the Reign of Louis XV, Civic Architecture in the Reigns of Louis XIV and Louis XV, The End of a Great Tradition.

"In these two volumes I have endeavored to complete my account of French architecture of the old régime ('A History of French Architecture, 1494–1661'), taking up its history from the death of Mazarin, the date of the real beginning of the reign of Louis XIV, and carrying it down to the end of the reign of Louis XV. At that date the old tradition was rapidly breaking up. The revival of the antique prepared the way for the revivalists who have reduced the art of architecture to a game of battledore and shuttlecock. I make no apology for closing my study of French architecture at the date 1774."



Detail of Hôtel de Ville, Abbeville, 1685. From drawing by Reginald Blomfield.

Those who have read the author's earlier volumes need not be told that he is a man of convictions, with a keen sense for summing up not only what he thinks the outstanding features of the architecture of the time, but as well with a lively appreciation of personalities and historic backgrounds.

When Mazarin died and Louis became king, the latter was but twenty-two years old, "ignorant and uneducated, but with a highly developed ego and an intelligence that needed only development." His ambitions were limitless, and his pride in himself was identical with his pride in France. He was on the forefront of everything.

To Louis and his great minister Colbert we owe the foundations of the unrivalled glory in the arts that we associate with France of the seventeenth and eighteenth centuries. Under Colbert were founded the Academy of Architecture and the French Academy at Rome, and the influence of these institutions governed the work and careers of practically every one concerned in the architecture of the time.

The Academy of Painting and Sculpture was founded in 1648, a close corporation conducted somewhat on modern trades-union ideas. In 1663 Le Brun, dictator of the arts for many years, obtained a royal decree that no painter or sculptor was entitled to call himself painter or sculptor to the king unless he were a member of the Academy. The Academy was a powerful influence for the betterment of French arts, but like all academies it had its enemies, both without and within. As the author well says: "Academies are very much open to attack." This is as true of our day as of the days of Louis.

The Academy of Architecture grew out of Colbert's appointment as "Surintenant des Bâtiments." He already had in mind the completion of the Louvre and "beaucoup de monuments à la gloire du roi, comme des arcs de triomphe, des obélisques, des pyramides, des mausolées, car il n'y a rien de grand ni de magnifique qu'il ne se proposat d'exécuter."

In 1686 the Academy declared that "les mêmes sentiments que l'on a toujours eus qu'il y a trois choses nécessaires à observer dans les bâtiments, qui est la solidité, la commodité et la beauté, et que la perfection de ces trois parties depend de la grandeur du génie de l'architecte." And with great wisdom they added that there were no rules infallible.

The French Academy at Rome began under the direction of Charles Errard and made a brilliant start. Its troubles came with lack of money and the jealousy and intrigues of those near the king. Chief among these was Jules Hardouin Mansart, whose extraordinary success in his career was due to "his relentless pursuit of his own interests."

The author again and again refers to Mansart, and his characterization of him in a special chapter makes interesting reading, with the savor of spicy personality.

Like so many other observers of art these days, the author is inclined to be rather pessimistic. He blames conditions on the tendency toward specialization in science.

"Serious Art turns no votes, and the authorities content themselves with half-hearted experiments which leave matters where they were, and waste the money of the taxpayer. At our public schools and universities the Arts are barely considered as a side issue, and they have in recent years been thrust still farther into the background by the overpowering claims—one might even say the insistent self-assertion—of specialized science. It is this dreary specialization that has obliterated the humanism of earlier generations, and made people forget that the graphic and plastic Arts are, in their way, the expression of human emotion and imagination not less than music and literature."

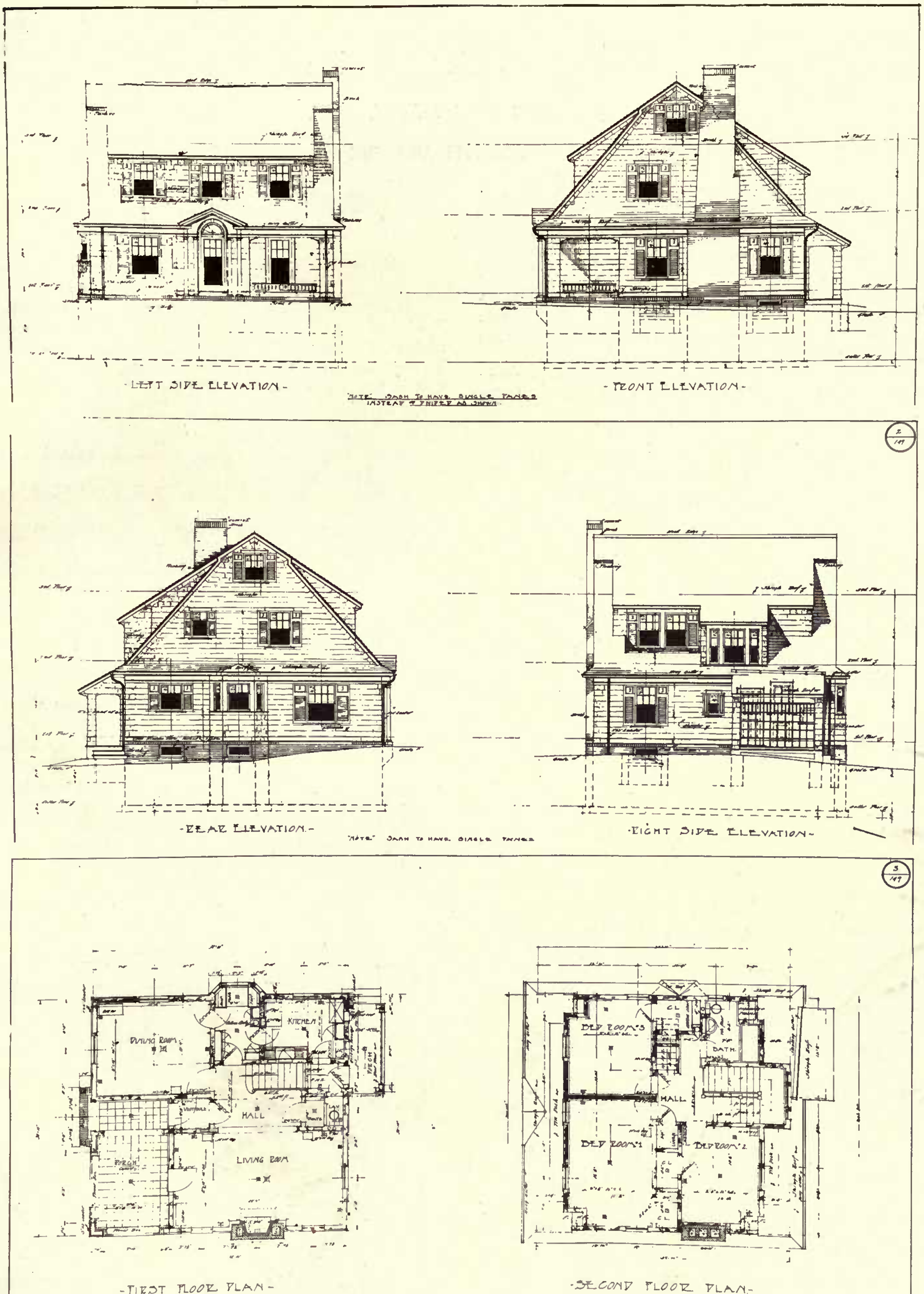
The illustrations are profuse and include contemporary work engraved by famous French engravers as well as many admirable drawings by the author.

YEAR BOOK NEW YORK SOCIETY OF ARCHITECTS, 1922. Eleventh Edition. Published by The New York Society of Architects, 29 West 39th Street, New York. 8vo. Bound in leather.

Contents: Advisory Board on Public Buildings, Monuments and Memorials; Architects in New York City, Manhattan and Bronx; Archit cts in Brooklyn; Architects in Queens by Post-Office Address, Architects Long Island outside of Queens, Architects in Richmond, Architects in New York State, Architects (Members) in other States, Board of Appeals, Board of Standards and Appeals, Board of Standards and Appeals Rules, Building Code, New York City; Building Zone Resolution, Classified Index of Building Trades, Code of Ethics, New York Society of Architects, Code of Professional Practice, New York Society of Architects, Committees, New York Society of Architects, Mailing Chute Regulations, Mechanics' Lien Law, Officers, New York Society of Architects, Plumbing Drainage Rules and Regulations, Registration of Architects (Law for), Signs and Show Bills, Code of Ordinances, State Industrial Laws Relating to Buildings, Tenement House Law.

In presenting herewith its "Code of Ethics" and "Professional Practice and Schedule of Reasonable Charges" for the use of its members, this society hopes that these codes will favorably influence the personal or professional intercourse between the members of the great architectural family and its allies and clients.

This book is of value as a reference to all concerned with the practice of architecture and building.



HOUSE, MRS. EVA H. BREWSTER, SYRACUSE, N. Y. Webster C Moulton, Architect.

Concrete Construction

By DeWitt Clinton Pond, M.A.

THIRTEENTH ARTICLE

IN the twelfth article the design of a flat slab for a panel measuring 19 feet, 9 inches by 21 feet, 9½ inches was developed. A diagrammatic layout of such a panel is shown in Fig. XII and an actual steel layout is shown in Fig. XIII. This last type of drawing must be filed with the structural drawings when application is made for a building permit from the Bureaus of Buildings in New York. The method used in making such a drawing and the details which must be considered will be discussed later.

As a comparison of the two-way and the four-way systems is to be made, it will be necessary to determine

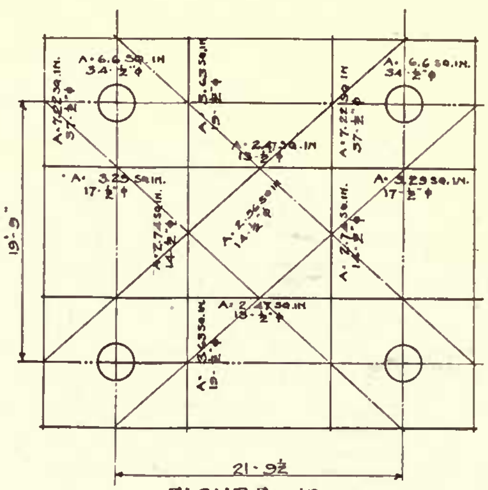


FIGURE 12

the areas of steel required in the bands and suspended panel if the slab were designed for two-way reinforcement.

By referring to previous articles it will be noted that there is no difference in the formulas for the design of steel in the column-head and mid-sections in either two-way or four-way systems. The negative moments are the same in either case. This is not true of the formula for finding the positive moment in the outer section nor for the positive moment in the inner section.

The positive moments in the outer sections are given by the formula $M = \frac{1}{80} WL$.

$$M = \tfrac{1}{80} \times 141{,}000 \times 19.75 \times 12 = 417{,}800$$

$$M = \tfrac{1}{80} \times 141{,}000 \times 21.8 \times 12 = 461{,}100$$

$$A_{s_1} = \frac{417{,}800 \times 8}{7 \times 16{,}000 \times 7.25} = 4.1 \text{ square inches.}$$

$$A_{s_2} = \frac{461{,}100 \times 8}{7 \times 16{,}000 \times 7.25} = 4.53 \text{ square inches.}$$

The positive moment in the inner section is determined by the formula:

$$M = \tfrac{1}{133} WL$$

$$M = \tfrac{1}{133} \times 141{,}000 \times 19.75 \times 12 = 251{,}200$$

$$M = \tfrac{1}{133} \times 141{,}000 \times 21.8 \times 12 = 277{,}300$$

$$A_{s_1} = \frac{251{,}200 \times 8}{7 \times 16{,}000 \times 7.25} = 2.46 \text{ square inches.}$$

$$A_{s_2} = \frac{277{,}300 \times 8}{7 \times 16{,}000 \times 7.25} = 2.72 \text{ square inches.}$$

By observing the results found above and in Article Twelve giving the areas of steel and also noting the number of bars required, the following figures may be compared. The calculations based upon the formulas for the four-way system result in areas given below.

- Direct bands—long dimension—3.63 square inches, 19 ½-inch round rods.
- Direct bands—short dimension—3.29 square inches, 17 ½-inch round rods.
- Diagonal bands—2.56 square inches, 14 ½-inch round rods.
- Across direct bands — long dimension — 2.74 square inches, 14 ½-inch round rods.
- Across direct bands — short dimension — 2.47 square inches, 13 ½-inch round rods.

The calculations based upon the formulas for the two-way system result in the following areas.

- Direct bands—long dimension—4.53 square inches, 24 ½-inch round rods.
- Direct bands—short dimension—4.1 square inches, 21 ½-inch round rods.
- Slab steel—long dimension—2.72 square inches, 14 ½-inch round rods.
- Slab steel—short dimension—2.46 square inches, 14 ½-inch round rods.
- Across direct bands—long dimension — 2.74 square inches, 14 ½-inch round rods.
- Across direct bands — short dimension — 2.47 square inches, 13 ½-inch round rods.

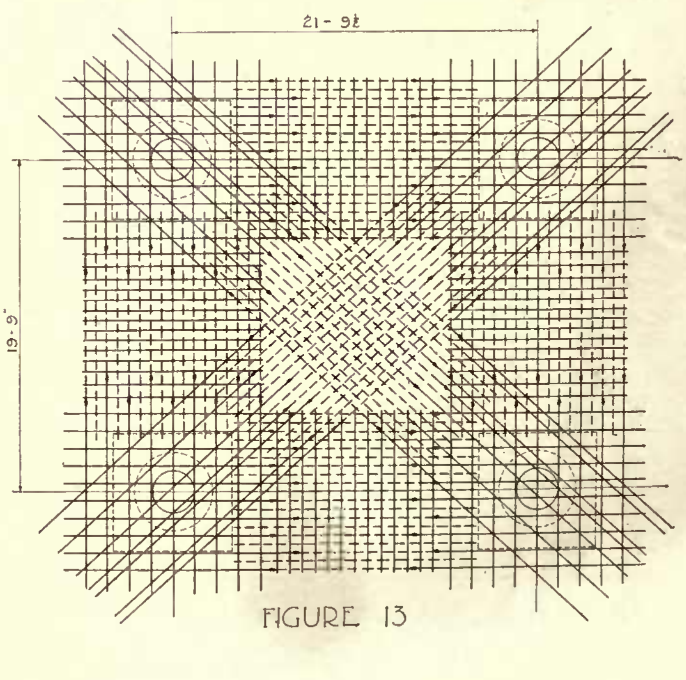


FIGURE 13

These areas are shown in Fig. XII and in Fig. XIV, and the areas required at the column-head sections are also shown. In the case of the four-way system the areas of steel required at the column-head section are such that only one-half the steel in the bands must be bent up. According to the code the point of contraflexure must be considered as being located at three-tenths of the distance, centre to centre, of columns for slabs with drops, and at one-fourth this distance for slabs without drops. In the present case the three-tenths point will be used.

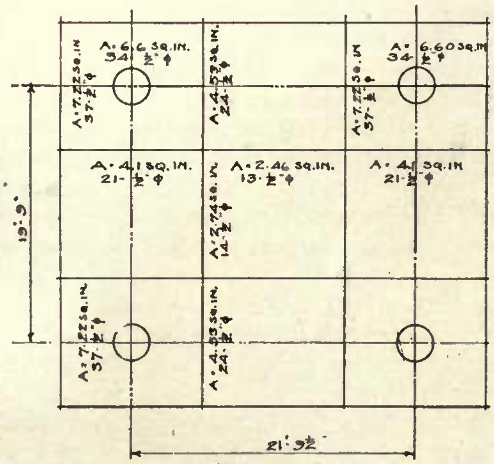


FIGURE 14

In the two-way system there are so many bars required in the direct bands that not all need to be turned up. If 18 are bent up from one band and 19 from the adjacent one there will be enough steel over each column. The remaining bars may be only long enough to develop a proper bond stress.

The steel layouts show how this steel is placed and from such a drawing it is possible to estimate the weight of steel in each panel. In order to make such a drawing it is necessary to know the requirements as to the lengths of the bars in the panel. Such requirements are stated in Section *B* of Rule 9 in the Amendment. This rule is given below:

"Splices in bars may be made wherever convenient but preferably at points of minimum stress. The length of any splice shall be not less than eighty (80) bar diameters and in no case less than two (2) feet. The splicing of adjacent bars shall be avoided as far as possible. Slab bars which are lapped over the column, the sectional area of both being included in the calculation for negative moment, shall extend to the lines of inflection beyond the column centre."

Section *C* also bears upon this subject:

"When the reinforcement is arranged in bands, at least fifty (50) per cent of the bars in any band shall be of a length not less than the distance centre to centre of columns measured rectangularly and diagonally; no bars used as positive reinforcement shall be of a length less than half ($\frac{1}{2}$) the panel length plus forty (40) bar diameters for cross bands, or less than seven-tenths ($\frac{7}{10}$) of the panel length plus forty (40) bar diameters for diagonal bands and no bars used as negative reinforcement shall be of a length less than half ($\frac{1}{2}$) the panel length. All reinforcement framing perpendicular to the wall in exterior panels shall extend to the outer edge of the panel and shall be hooked or otherwise anchored."

Section *D* of this rule simply states that "adequate means shall be provided for properly maintaining all slab reinforcement in the position assumed by the computations.

In the four-way system, shown in Fig. XIII, one-half the band steel is bent up and carried to the point of inflection in the adjacent band. The length of the bent-up steel must be estimated as well as the length of the straight bars. It might be noted that in this design the steel is bent up in the same manner as in the two-way system. In some offices it is the practice to "drape" the steel and to have it run through, splicing only where necessary. In this case all the steel would be bent up, but many engineers do not believe that this is good practice. In the two-way system about half the steel is bent up, also. It will be noted that the figures show only the steel required for one panel and does not show the steel bent up from the adjacent panels. As both figures are alike in this arrangement a comparison of the two will be a proper one. When such a steel layout is to be submitted to the Bureau of Buildings, however, all the steel must be shown, and, as will be explained later, the adjacent panels must be included in the drawing.

In order to determine the weights of steel in each panel it is necessary to determine the number of bars, their lengths and diameters. In the present case all bars are made $\frac{1}{2}$ inch round in order to make comparison easy, but under ordinary circumstances $\frac{5}{8}$-inch rounds are often used and in the two-way systems $\frac{3}{4}$-inch bars are used in the direct bonds.

By estimating the weight of steel in each panel it will be found that there are 1,332 pounds in the two-way panel, and 1,365 pounds in the four-way panel. It can be seen that there is a slight saving on steel in favor of the two-way system, as far as these panels are concerned.

Although this design has been developed for the purpose of comparing the two types of reinforcing and the steel layouts were made for this purpose, these may be used as examples of the type of drawing which must be used as one of the drawings submitted for approval of the building department. The drawings submitted must show, however, not only the steel in a typical interior panel, but also the reinforcement in a typical exterior panel as well. There should also be submitted a section showing a typical column head, drop, and the position of the steel in the slab.

In order to complete the design it may be well to check the shear at the edge of the column capital and at the edge of the drop.

The area of the panel is $21.8 \times 19.75 = 430$ square

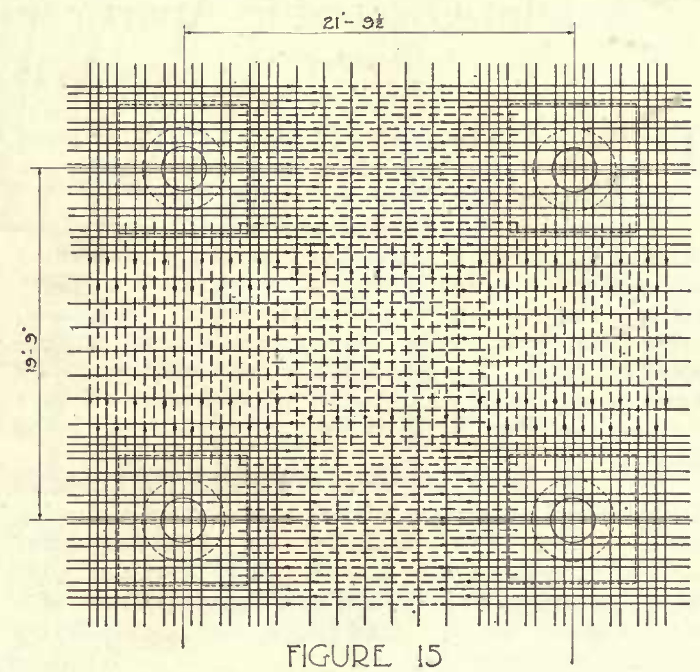


FIGURE 15

feet. The area of the drop is 49 square feet, and the area of the column capital is 17.1 square feet.

The weight which will cause the tendency toward shearing at the edge of the drop can be found by subtracting the area of the drop from the area of the panel and multiplying the remaining area by 322 pounds—the unit weight found in the last article.

$$(430 - 49) \times 322 = 122{,}700 \text{ pounds.}$$

As has been stated in previous articles the shear at the edge of the drop is determined on the *bjd* section around the perimeter, or, in other words, the area of concrete which will be considered as resisting shear is found by multiplying the distance around the perimeter of the drop by $\frac{7}{8}$ of the effective depth at that point. The distance around the perimeter is $4 \times 84 = 336$ inches, which is the value of b in the formula. jd will equal $\frac{7}{8} \times 6.5 = 5.7$ and bjd will be found to be 1,915 square inches. Dividing this into 122,700 pounds the result will be 64 pounds shear. The allowable shear is given in the code as 60 pounds, so the drop must be increased in size. It will be found that if the drop measures 7 feet 2 inches it will be large enough. It might be noted that in the two-way system the depth will be greater than given above as there are only two layers of steel instead of four. In this case the original dimensions of the drop would be correct.

The weight which will tend to produce shearing at the edge of the column capital can be found in the same manner as that which caused a tendency toward shearing at the edge of the drop. It must be borne in mind that the area of the column capital is 17.1 square feet.

$$(430 - 17.1) \times 322 = 133{,}000 \text{ pounds.}$$

In the present case the *bd* section is used, and as the diameter of the capital is 4 feet 8 inches the b dimension will be 175.9 inches. The d dimension will be 10.75 as determined in the last article. bd will equal 1,881 square inches and the unit shear is 77 pounds. The allowable shear at this point is 120 pounds per square inch, so the drop thickness and column cap diameter are correct.

The calculations given above have involved the application of parts of nearly all the rules dealing with flat-slab construction, excepting those dealing with column design. However, the conditions found in the design of an exterior panel have not been referred to and as these are important, section *c* of Rule 12 will be given below.

"The negative moments at the first interior row of columns and the positive moments at the centre of the exterior panels on moment sections parallel to the wall shall be increased twenty (20) per cent over those specified above for interior panels. The negative moment on moment sections at the wall and parallel thereto shall be determined by the conditions of restraint, but the negative moment on the mid section shall never be considered less than fifty (50) per cent and the negative moment on the column-head section never less than eighty (80) per cent of the corresponding moment at the first interior row of columns."

As has been stated, the drawing showing the steel layout which is submitted to the Bureau of Buildings must show a typical exterior as well as a typical interior panel. This drawing must show that there is 20 per cent more steel over the first interior columns than over the typical interior ones. It must also show that the steel in the direct band, spanning from the first interior column to the exterior column, and, in a four-way system, the diagonal band for the same span have areas 20 per cent greater than the corresponding areas in interior panels. The negative moments at the wall will have to be at least 80 per cent as great as over the first interior bands and columns. The wall-bands are only half as wide as the typical band and only require one-half as much steel except at the corners of the building, where the same increase is made as in the exterior panels and over the first interior columns.

The last three articles have dealt with the requirements of the New York Building Code with regard to flat-slab construction. The next article will deal with the application of these requirements to the design of a section of a typical floor in the 395 Hudson Street Building. This should be in the nature of a review of all the rules given in these articles.

A Joint-Ownership Apartment-House in Baltimore, Maryland

Roy G. Pratt, Architect

THIS apartment-house will be known as "Number Three Somerset Road," and will be built in the northern section of Baltimore, Md., known as "Roland Park."

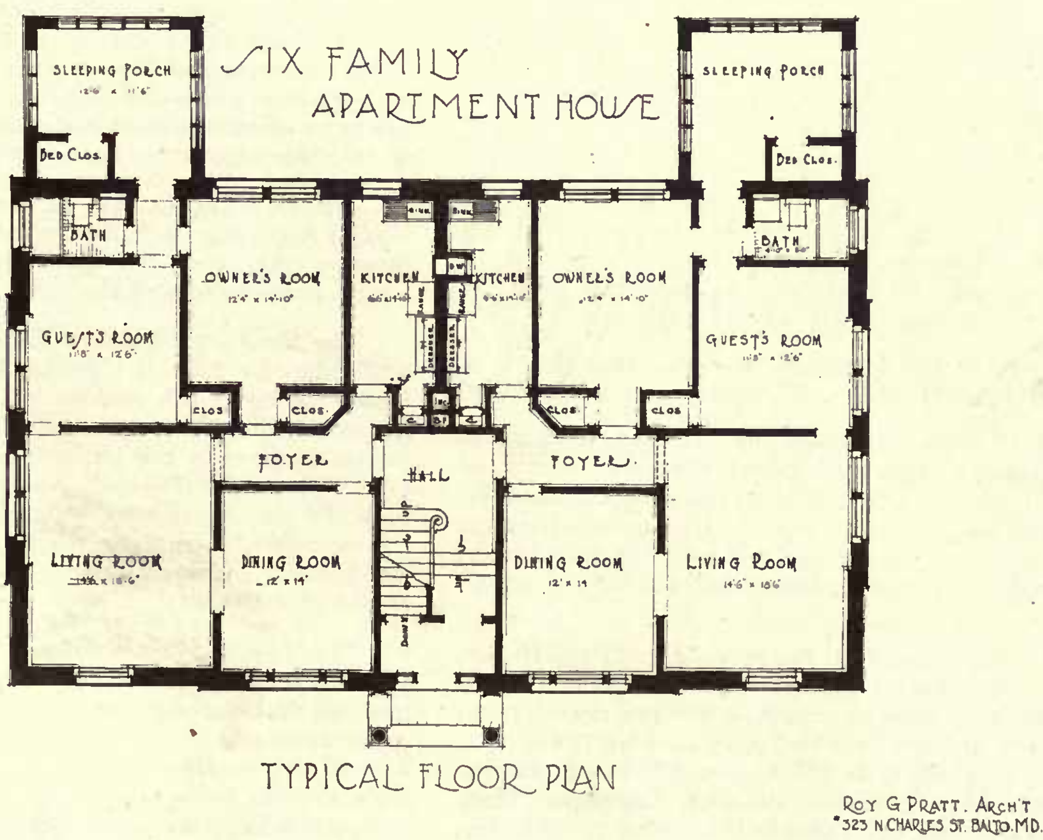
The building will be erected by The Joint-Owners Construction Company. It will be four stories high, faced with a buff tapestry brick, and be of fireproof construction. There will be six apartments, in suites of six rooms—living-room, dining-room, foyer, kitchen, two bedrooms, bath, and enclosed sun-porch. The dimensions of the various rooms are shown on the typical floor plan. Each apartment will have a servant's room on the fourth floor, also a locker-room in the basement.

Each apartment will have an enclosed porch with a disappearing bed, thereby making a combination sleeping and sun porch. There will also be a large brick fireplace in each living-room. Other features will be concealed wall-safes, connections for individual ice-making machines, electric bathroom heaters, laundry-tubs, and clothes-drying machines in basement.

The six apartments will be individually owned. A stock company will be formed and each owner will purchase an amount of stock equal to the cost of his apartment. The six owners will constitute a board of directors who will look after the management of the building. The total expenses of running the apartment-house for the year will be divided among the six owners and will be paid for in monthly instalments. If the owner wishes to rent or sell his apartment, he must submit the name of the prospective tenant or purchaser, and this person must be approved of by the board of directors.

There are a number of privileges however, that are allowed to the purchaser of an apartment.

Many advantages are derived from the "joint-ownership" plan. Among them are the benefits in saving of the constructing of one co-ordinated apartment-house rather than six individual homes, the proportionate saving in running expenses, the exclusive location, and the savings in rent of approximately 16 per cent per annum on the investment.



SIX-FAMILY CO-OPERATIVE APARTMENT-HOUSE, BALTIMORE, MD. Roy G. Pratt, Architect.

Announcements

We have received from the Machen Electric Manufacturing Company the circular covering their "No-lus-plug" type of Standard Receptacles. The construction of this receptacle is new and overcomes a very serious defect that formerly existed. The circular shows the construction of practically all standard receptacles now on the market. We believe that all users of electricity will be interested in knowing about this device.

Mr. Charles Downing Lay, landscape architect and town planner, announces his removal to the Architects' Building, 101 Park Avenue, New York.

At the annual stockholders' meeting of the National Fire Proofing Company the following directors were re-elected for three years, their terms having expired: W. M. Scaife, E. W. Gwinner, and E. H. Straub. Sidney F. Hickert, a director, presided. President H. M. Keasbey reviewed the building conditions of last year and pictured a promising year for 1922, based on the manner in which business is being offered. He said the orders received last month for building tile were twice as large as the same month last year and the unfilled tonnage on the books also is larger. The present outlook was for a normal business year. The plants of the company are at the highest state of efficiency. The government is taking great interest in clay industries in order to improve the burning of kilns, and the company, Mr. Keasbey said, had kept up to the latest in everything and this would be demonstrated in the new East Liverpool, O., plant. Mr. Heckert said he felt the company was never in better condition physically to show good earnings provided it gets the business, and the outlook is encouraging. The stockholders gave the directors a vote of confidence.

The Deschanel Cableway is a patented apparatus designed especially for the purpose of meeting handling problems such as are confronting industrial plants and coal dealers, when unloading material directly from railroad cars and barges to ground storage, other secondary storage, or direct to boiler-house, bunkers, and coal-bins. The Deschanel Cableway, when installed in a power-plant, can be used for reclaiming coal from storage and delivering it direct to coal-bunkers or boiler-room floor, and removing ashes from boiler-room to railroad cars, truck, ground, or overhead storage. All operations are performed with the same equipment, without any change whatsoever.

Adden & Parker, architects, announce the removal of their offices, March 1, 1922, to 177 State Street, Boston, Mass.

Robert Whitten announces that he has opened offices at 4614 Prospect Avenue, Cleveland, Ohio, for professional practice in general city planning and city zoning. Mr. Whitten will be associated with A. D. Taylor, landscape architect and town planner, and will have the assistance of his thoroughly equipped technical and engineering organization.

Layton Allen, architect, Indianapolis, Ind., and Hubert M. Garriott, architect, Logansport, Ind., are pleased to announce that they have associated in the practice of architecture. The new firm will be known as Allen & Garriott, Architects, with offices at 401 Lombard Building, Indianapolis, Ind., and 4 Masonic Building, Logansport, Ind. Catalogues and data are desired in both offices to bring files up to date.

Hobart Upjohn, in opening his new offices in the Grand Central Terminal, New York City, takes pleasure in announcing that in his practice of architecture he will have associated with him Aaron G. Alexander and Otto F. Langmann.

H. T. Lindeberg, architect, 2 West 47th Street, New York City, announces the opening of a branch office under the management of his associate, Mr. John F. Staub, in the Union National Bank Building, Houston, Texas.

W. Henry Mayer, architect and engineer, has moved to his new and more spacious offices in "The Regis," 3327 Montgomery Road, Cincinnati, Ohio.

"Zinc as a Paint Pigment," an address by W. Homer Hendricks, general sales engineer of the New Jersey Zinc Company, contains facts of interest on the relative values of certain paint pigments.

We have received the valuable and attractive Portfolio of Plates of Architectural Details in Brickwork from The American Face Brick Association, Chicago. This should prove a most desirable collection of plates for the architect's reference library.

Copper for Roofing.—A roof should be light but strong, everlasting, proof against fire and lightning, sun and snow or torrential rains. It should not rust; neither should it cost a penny after it is installed. The material should be easy to form, and itself be made in a form easy and inexpensive to apply. A roof should be beautiful with a beauty that endures—a beauty that harmonizes perfectly with the house beneath it and the environment. A roof should not cost too much, yet should cost enough to insure perfect service forever. Anaconda copper roofings are said to meet these qualifications.

A recent number of "The Mosler Messenger," published by the Mosler Safe Company, contains a number of interesting illustrations of some of their recent safety equipment for well-known financial institutions. In these days the assurance of an impregnable steel fortress for the protection of valuables seems more than ever necessary.

The Bulletin No. 246 of the Sturtevant Generator Cooling Apparatus, B. F. Sturtevant Co., Hyde Park, Mass., contains information of interest to architects. It is handsomely printed and well illustrated.

The Pittsburgh Builders' Exchange has established a scholarship for $300 at Carnegie Institute of Technology. Under the terms this amount will be available each year during the life of the scholarship to be awarded to meritorious students in the Department of Building Construction, College of Industries. Awards will be made on the basis of scholastic standing, good character, and evidence of the exceptional promise for success in the building construction industry. The scholarship may be divided at the discretion of the faculty.

The Lyons Manufacturing Company, New Haven, Conn., is sending out a folder giving information about their new interlock casement-window adjuster—an interlock adjuster consisting of simple telescoping parts, fitted with a friction lock that holds the window in any position. Just move the window in or out and it *stays*. No clamp screws to tighten or catch draperies. No slotted bars to fill with dirt.

(*Continued on page* 174)

Simple Facts About Paint and Varnish

By David B. Emerson

OF all the many elements which enter into the construction of a building there is hardly one of which the young architect and draftsman know less about than paints and varnishes. It all appears to be shrouded in mystery and surrounded by deep secrecy. The fact is, there is nothing mysterious nor secret about it at all, the only condition being that we generally see the finished result and do not take the pains to learn the methods by which this result has been obtained.

Now it is not the writer's intention to enter into a long technical discussion of the chemistry of paints and varnishes, as he lays no claim to being a chemist, but merely to state in a simple manner the general facts about paint and varnish which may be of interest to the draftsman, architect, or architectural student.

Paint and varnish have a twofold purpose: the protection and preservation of the surfaces to which they are applied and the decoration of those surfaces. They have been used for these two purposes for centuries, and will probably continue to be used for centuries to come. The two constituent parts of all paints are pigments and vehicles. The pigments are the solid portion and give to the paint its opacity or covering power and its color. The vehicle is the liquid portion—that is, the oil, dryers, and volatile thinners. The principal pigment used in painting, the base of practically all paint, is white lead, technically basic lead carbonate, and the principal vehicle is linseed-oil. But as the mixture of lead and oil alone does not make a satisfactory paint other ingredients are necessary. Lead has a lack of spreading power and a tendency to "chalk" and dust off after a short space of time; also, sulphide gases in the atmosphere, especially in cities, cause it to turn black. These defects in white lead may be corrected by the addition of "zinc white," which is zinc oxide, which possesses extreme whiteness, high spreading power, permanency of color, and durability, qualities which white lead does not contain. On the other hand, zinc white is deficient in opacity as compared with white lead, producing a hard and brittle film when used alone; therefore, one acts perfectly as a corrective to the other.

In specifying white lead one should specify that the lead should be basic lead carbonate; otherwise, if only "white lead" is specified basic lead sulphate or sublime white lead, which has not the qualities of lead carbonate, may be used, or a lead carbonate produced by the "quick" or "mild" processes, which are not equal to the "Old Dutch" process, may be used. Zinc white may be specified to be made either by the "American" or direct process, or the "French" or indirect process. Generally, the American process is used for ordinary house painting and the French process is used for interior work and decorative paints. For special work imported French zinc is frequently used.

Linseed-oil is a drying oil—that is, it forms a firm weather-resisting film by oxidation, thereby binding the pigment which is held in suspension solidly to the surface over which it has been applied. It is without a doubt the best vehicle obtainable for general painting purposes. Raw linseed-oil is most generally used, but for special purposes, particularly where quick drying is desired, boiled linseed-oil is used.

To facilitate spreading and to make the paint work better under the brush, it is necessary to add a volatile thinner to the paints. There are a number of such thinners in use, the principal ones being turpentine, mineral spirit, and benzine. Probably the best of these is turpentine. Volatile thinners evaporate quickly and accelerate drying, also they assist in the penetration of the priming coat into the wood, and by destroying the gloss of the undercoat they improve the adhesion of the subsequent coat.

In addition to drying oils and volatile thinners, driers which are oxides of lead and manganese dissolved in linseed-oil are used. There are two kinds of driers—"liquid driers," which contain turpentine and benzine in addition to the oils, and "Japan driers," which contain also gums and gum resins. Driers should always be used very sparingly, as too much drier, by hastening the oxidation of the paint film, destroys the life of it.

So far we have only discussed white paint, but added to the white lead and the zinc white we must, if we are going to have any color, have colored pigments if we wish tints. These form but a small part of the paint, as a very little colored pigment will tint a large amount of paint. These colored pigments are natural earths, such as siennas, umbers, and ochres, which are washed, dried, burned, ground, and otherwise treated; metallic oxides, and the different chemical colors.

There are many other forms of paint in addition to the white lead and oil mixture, which are used for various special purposes, such as anti-corrosive paints for steel and iron, damp-proof paints, acid-proof paints, flat-wall paints, and a great many others. One of the best anti-corrosive paints is a mixture of red lead, which is an oxide of lead, mixed with raw linseed-oil, mineral spirits, and drier. On account of the tendency of red lead to harden, red-lead paints must be mixed as used, and never more than enough to last twenty-four hours should be mixed at any one time. Another good anti-corrosive paint is now being made from a base of "cotton rubber," a by-product of the cotton-seed oil industry, which resists corrosion and also resists acid fumes, etc. Red-lead paint, when used to protect iron or steel, should always be given a protective coat, and one of the best in general use is one in which the pigment is graphite, which pigment is also the base of many acid and alkali proof paints.

Most damp-proof paints are made up with an asphalt base, with the addition of volatile thinners. Flat-wall paints almost invariably have as a pigment lithophone, which is a zinc pigment, being a combination of zinc sulphide and barium sulphate and a small quantity of magnesium silicate or talc, which acts as a binder. The vehicle in these paints is China wood, or tung oil, which is an oil expressed from the nuts of the tung-tree which grows in China. China wood-oil is much more waterproof than linseed-oil, and it is also used in the manufacture of varnishes.

Varnish has been defined as a solution or fluid, usually transparent or translucent, and occasionally opaque, which, when spread upon a surface in a thin film dries partly by evaporation and partly by oxidation, forming a protective coating, which may be either highly lustrous or practically devoid of lustre. It should consist of fossil resins, which are copal, etc.; drying oils, either linseed or China wood-oil, which render the varnish elastic or durable; metallic driers, which are lead and manganese salts incorporated with the oil to hasten the drying of the varnish film by oxidation, and the volatile solvents, turpentine, benzine, or a combination of both, which aid the spreading of the varnish upon the work. The first three ingredients are cooked together and then thinned with the solvents. In the finishing of woodwork, besides varnish it is also necessary to use stains, fillers, and shellac, to obtain the proper results.

Stains are used to darken woods, to change their color, and to produce the effect of the more expensive woods, where the commoner and cheaper woods are used. There are four classes of stains in general use, as follows: aniline oil stains, which penetrate the wood and give good color, but their great fault is bleeding through the varnish, which is caused by the alcohol and thinner dissolving the dye. Aniline spirit stains, which are hard to work, being almost impossible to apply to any large surface. Their great fault is the same as oil stains, bleeding; also they fade. Pigment oil stains, which are made by grinding color pigments in linseed-oil and thinning with spirits of turpentine. These are no more than a thin paint; they do not penetrate as do the anilines, but they do not bleed nor fade; also, having a linseed-oil base, they have a certain tendency to preserve the wood. Acid stains; this name is a misnomer, as they are made by dissolving certain dyes in water. Some manufacturers have begun to frankly call them "water stains." They are a perfectly clear solution, work very easily under the brush, and may be spread out over a large surface with a great degree of evenness. They have very little tendency toward bleeding, and are very permanent as regards fading, for the reason that alcohol and thinners do not pick up the dye, which is soluble in water. For almost all purposes acid stains are the best for general use, but they should never be used on yellow pine, as they raise the grain of that wood and make it very difficult to finish it properly.

Fillers are necessary in the finishing of all open-grained woods, such as ash, oak, chestnut, walnut, mahogany, rosewood, teak, elm, and butternut, which must be filled before varnishing. There are two classes of fillers, liquid fillers and paste fillers. Liquid fillers are composed of gloss oil, which is a preparation of naphtha and resin, a small quantity of linseed-oil, and pigment, which is generally asbestine or china clay. They should never be used for floors nor on any exterior woodwork. Paste fillers are made by grinding together pigment, linseed-oil, and Japan drier. The best pigment is silex, which is powdered quartz. Shellac is valuable as an undercoat for varnish, as it prevents the stain from bleeding through. It should be a pure gum shellac dissolved in alcohol, and should contain no resin.

There are many types of varnish at present on the market; in fact, some manufacturers list as many as one hundred and fifty, but we will only consider a very few of the types which are most generally used. They are divided into two classes, one containing a large proportion of oil and known as "long oil" varnish, the other containing a preponderance of gums, and known as "short oil" varnish. The types of varnishes which are most commonly used in architectural work are interior varnishes, rubbing varnishes, spar varnishes, floor varnishes, flat varnishes, and enamels. Interior varnishes should have a fair body, a fairly light color, permanency of lustre, moderate hardness, be moderately rapid in drying, and be indifferent to occasional moisture. Rubbing varnishes should be hard and comparatively brittle, and should not soften under the heat generated by the friction of rubbing, nor should they be affected by the oil or water used in the process; also, they should be capable of taking a glass-like polish. Spar varnishes are a tough, elastic, long-oil varnish, drying rather slowly, having a moderate lustre, remaining elastic, and having a pronounced resistance to moisture. Possessing these qualities, they are used mostly on exteriors and other places where there will be an exposure to the weather or to an excess of moisture. Floor varnishes, as their name indicates, are designed primarily for use on floors, and they must be very tough, able to resist shock or abrasion, should be medium quick in hardening, and should not be affected by moderate contact with moisture; in fact, they should possess the general qualities of spar varnish, except that they should harden more quickly and more completely. Flat varnishes are varnishes which are designed to produce a matt or lustreless finish. They are special products and are generally of a complex composition.

Enamels, generally speaking, are varnishes to which color and opacity have been given by the addition of pigments, what might be called pigment varnishes, or varnish paints. There are three classes of enamels: gloss, egg-shell, and flat. The pigments generally used in enamels are zinc white and lithophone, the vehicle is linseed-oil highly refined in the high-grade enamels, and China wood-oil, or a mixture of China wood-oil and linseed-oil in the cheaper grades. Some enamels also contain varnish gum. The best enamels are long-oil enamels. Gloss enamel is more durable than egg-shell or flat. If a flat effect is desired in enamel, it is better to use a gloss enamel and then rub it to a flat finish, but this is, of course, quite expensive. In rubbing enamels they must always be rubbed with pumice stone and water; whereas varnishes may be rubbed either with oil or water.

Varnishes should never be thinned on the job, as the thinners are added to the varnish while it is hot during the process of manufacture, and any attempt to thin it afterward will ruin the varnish. Varnish should never be applied in very cold or very damp weather. The ideal temperature is around seventy degrees Fahrenheit. Also rooms should be well ventilated when varnishing is being done.

The foregoing is but a brief outline, but may possibly give to the draftsman or young architect a better knowledge of paints and varnishes, and assist him in the specifying of them.

Announcements

(*Continued from page 172*)

The Arden Gallery, 599 Fifth Avenue, announces an exhibition and sale of summer furnishings for house and garden, to continue until August. Iron furniture for porch and terrace, especially designed and made by Mr. Morgan Colt, of New Hope, will be shown, as well as bridge and tea tables, decorative paintings, screens, hangings and original painted furniture of Arden design. These form only a part of the exhibition, which will be made continuously interesting by frequent additions and changes.

For Better Street Lighting.—Better street lighting that is not only practical but also ornamental and suitable from the architectural standpoint, is the aim of the educational campaign in behalf of better street lighting being conducted by the Westinghouse Electric and Manufacturing Company. Throughout the movement, which is national in scope, the architectural requirements in street lighting are being stressed.

J. Hunter McDonnell and Howard B. Peare announce the establishment of a partnership for the general practice of architecture under the firm name of McDonnell & Peare, at 101 Park Avenue, New York City. Manufacturers' catalogues and samples requested.

Herman M. Sohn, architect, announces the removal of his offices to the Winfield Building, 469 Fifth Avenue, New York City.

THE PARK AVENUE BAPTIST CHURCH, NEW YORK.
Henry C. Pelton, New York; Allen & Collens, Boston, Associate Architects.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLV JVNE, 1922 NO. 6

The Park Avenue Baptist Church

Henry C. Pelton, New York, and Allen & Collens, Boston, Associate Architects

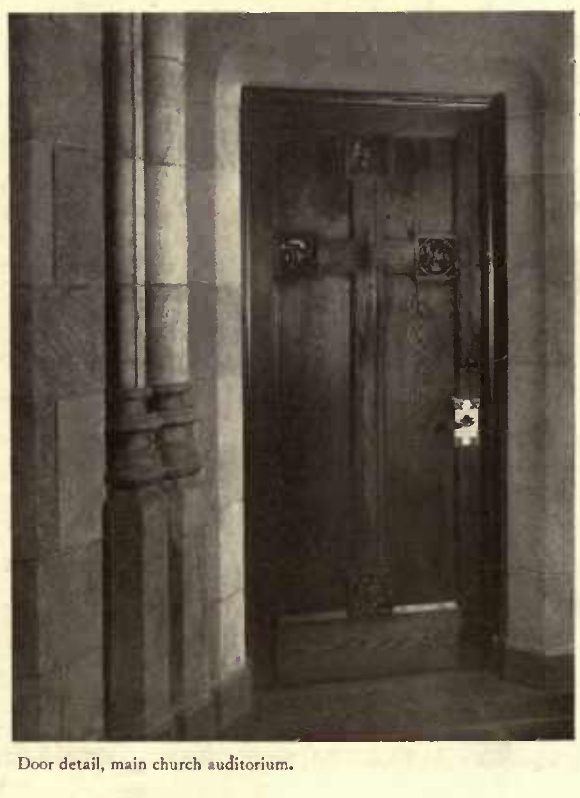
Church spire.

DURING the past twenty-five years ecclesiastical architecture in this country has developed to a remarkable extent. In place of the uninspired buildings which were prevalent during the nineteenth century, there are rising throughout the country numerous buildings showing the evidence of a real knowledge of church architecture and a true feeling of the fundamentals which go to make up a structure in which the religious element is inherent in the architecture itself. To the small number of such churches in New York has recently been added another, the Park Avenue Baptist Church, at the corner of Park Avenue and 64th Street.

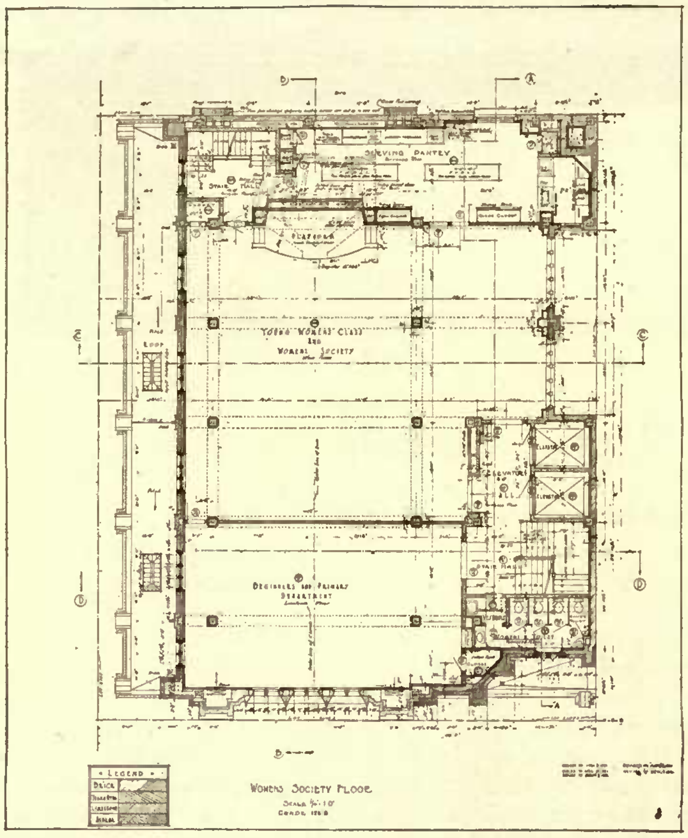
The requirements of this church presented a very unusual problem. Given a lot only 80 feet by 100 feet on which to construct a church, parish house, and Sunday-school, made it necessary to plan these elements one above the other, a motif somewhat unique in this type of work. The essence of the problem comes in the attempt to create a typical church exterior with these superimposed features. To do that the architects used the customary motifs of aisle, clear-story, and attic, the church proper occupying the aisle motif, the Women's Society rooms the clear-story, and the Sunday-school the attic, while the Men's Society rooms are in a high basement under the church auditorium.

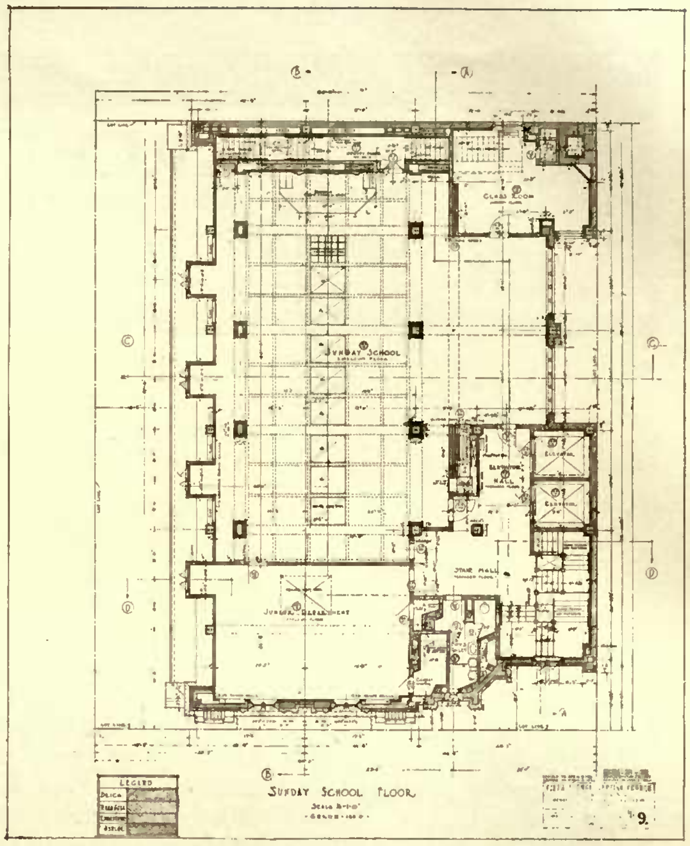
The length of the lot, only 100 feet, made a central entrance to the church an impossibility, as the various steps and vestibules would have occupied too much space, so that the main entrance to church and parish house was combined at one side in a large vestibule leading on the left to the church narthex, and on the other side opening direct into the main stairs and the two large elevators which connect the various floors of the church offices, social rooms, and Sunday-school.

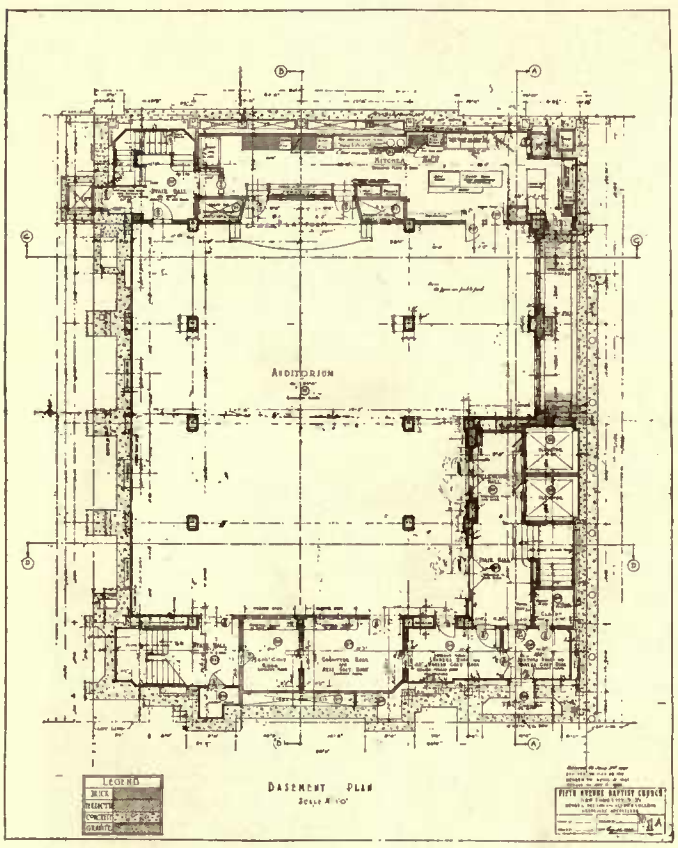
The building is designed in Gothic, using those elements of French and English Gothic best adapted to create a harmonious exterior with the restrictions imposed by the unusual plan. The front is supported by two large buttresses, somewhat wide to counteract the lack of depth made necessary by restricted space. Between these buttresses is the large nave window, divided in turn by deep secondary buttresses required to support the large mass of masonry above the window, and to carry the lines of tracery up through the upper stories and so tie the detail together as to counteract to some extent the necessary placing of the large window so low in the façade. This window is surrounded by carvings and ecclesiastical symbols, while over the whole in the centre of the gable is a canopied niche sheltering an angel. To the right of the façade, over the

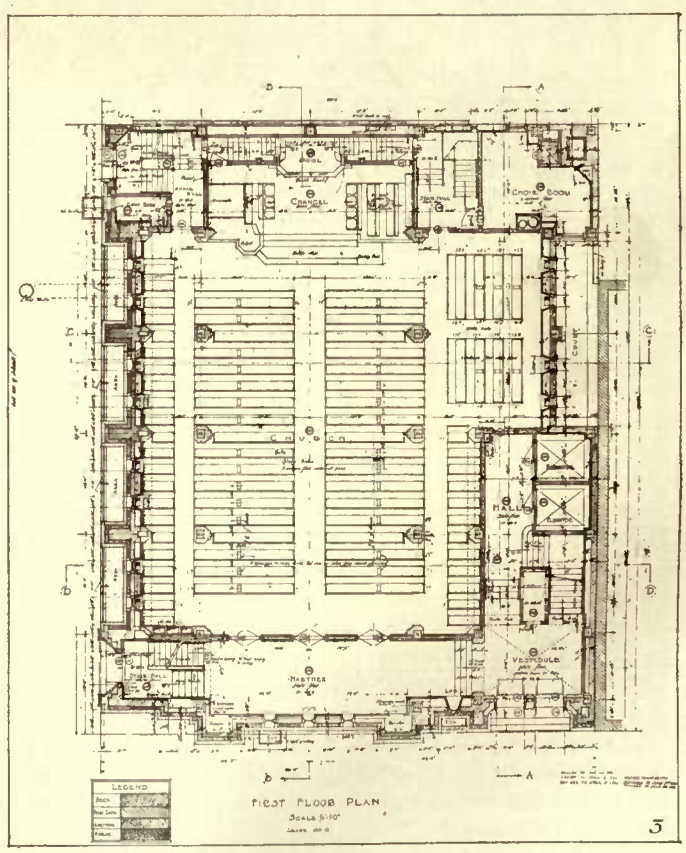


Door detail, main church auditorium.









PLANS, PARK AVENUE BAPTIST CHURCH, NEW YORK. Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

main entrance, are various stories of church offices, and the tower buttresses which pass through various transitions into the octagonal belfry with its upper crown and traceried windows. This belfry will later house a complete chime of bells. The side elevation on 64th Street has five bays divided by deep buttresses. Each bay is subdivided into two double lancet windows in order to increase the effect of length by a duplication of motif.

No attempt was made to develop a tower motif in connection with this church, as it was felt that the high buildings which would ultimately surround the church would necessarily dwarf any tower that could be designed in proportion to the building itself. The tower as an element in municipal church architecture loses its point of dominating over the surrounding landscape.

While the building was in course of erection, considerable publicity was given the symbolic ornamentation and carving of some of the church architecture of this city. Care was exercised in the selection of the symbols employed, so that there were none used of other than a purely ecclesiastical nature. On the exterior in the band about the large window on the front appear the ecclesiastical floral emblems—the rose, the passion-flower, the ivy, and the oak, alternated on one side with the eagle of St. John, the bull of St. Luke, the lion of St. Mark, and the angel of St. Matthew; on the other side are the same floral symbols, alternated with the pelican for piety, the hart for humility, the unicorn for chastity, and the peacock for immortality. In the carved band at the top of the window are wolves attacking sheep, and vultures attacking doves, both symbolizing the struggle between good and evil. Directly over the centre of the window are the symbols of Christ and baptism. On the buttresses at either side of the large window are shields, in one of which is a cathedral symbolizing architecture and the church, and in the other a book symbolizing the spoken word. On the large corner buttress are the shields of the United States and the State of New York. The four ecclesiastical floral emblems again appear in a billet course above the aisle windows on 64th Street.

Detail, Men's auditorium, Rockefeller Bible class.

The church interior is treated in stone finish, the lofty columns supporting a vault over nave, aisles, and chancel. To the right of the chancel opens out a galleried transept. The arrangement of the chancel is in accordance with the best ecclesiastical precedent. On the left of the chancel steps is an octagonal oak pulpit; on the right the reading-desk. Chancel-rail, choir and deacons' stalls, organ console and dado are all of oak beautifully carved and treated with just enough color to vary the darker tone of the stained wood. In the centre of the chancel, the focal point in the church is the baptistry, the marble front of which is used as the communion table. The lofty reredos enclosing the pool is surmounted by the cross.

The chancel and reredos are as yet incomplete, in that the east window has not been installed, red velvet hangings being draped back of this window temporarily. The dossal curtain which will hang in the pool opening in the reredos and which is a necessary part of the design is still to be hung in place.

The west window is a perpendicular Gothic window comprising six lights with tracery and was designed by Henry Wynd Young to portray some of the leading characters in Baptist church history. There are six historical figures commencing on the south with Milton, Bunyan, and Carey comprising the English side of the church, and Williams, Judson, and Wayland representing the American, while below Carey and Williams are medallions illustrating the special work associated with their lives. The medallion below the Carey likeness has two figures representing India and holding a small model of the church that Carey built and where he carried on his labors among the natives of India. The one below the figure of Williams has a form of a red Indian chief and of a Puritan with the facsimile of the deed transferring Rhode Island to Williams. Just above the shoulders of each of the portrait figures is a quotation characteristic of each of the men represented. These quotations are, beginning with the one for Milton, "Of man's first disobedience"; for Bunyan, "I dreamed a dream"; for Carey, "To them that sit in darkness"; for Williams, "A man zealous and godly"; for Judson, "Be a disciple of Christ"; and for Wayland, "Respect your own conceptions." The whole window is built up in a strong grisaille with spots of pure color running up into very rich blues and purples in the tracery. It is the intention when the chancel-window is installed, to carry it to a very high point of excellence, so that it will be in keeping with the rest of the glass. The clear-story windows are also done in grisaille based on that in the church of St. Serge at Angers, France, so that all the interior glass is well balanced.

On the right side of the chancel is the organ, with a screen opening into the chancel, and an organ-case occupying the arch over the transept gallery. On the left of the west gallery is an echo organ with a fine wood screen in the organ opening.

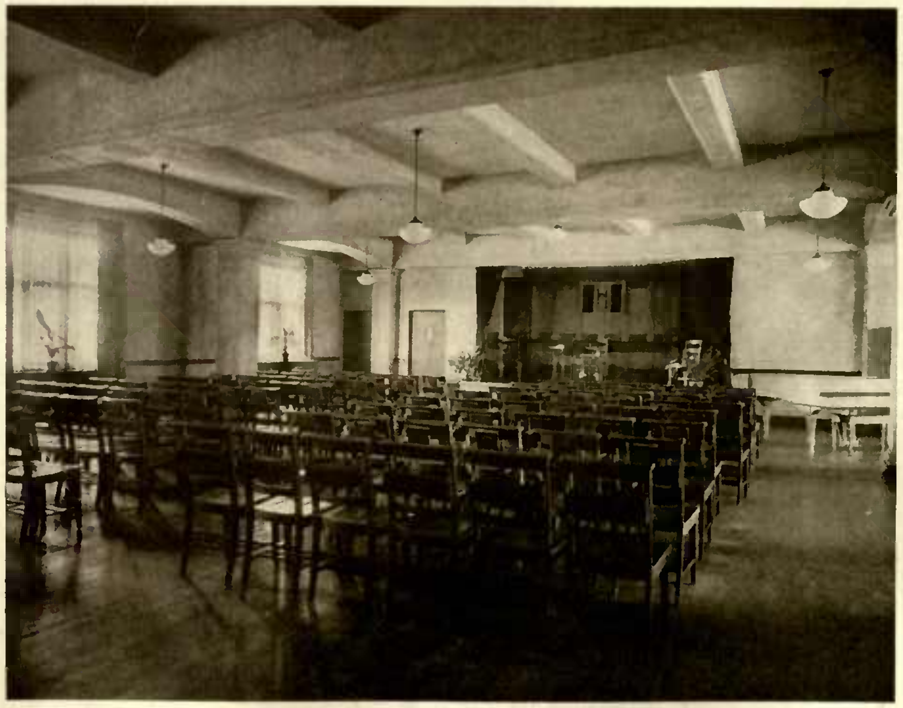
Underneath the gallery fronts are beam heads of angels, each angel holding a shield of one of the apostles.

The building had its structural problems as well as its problems in plan and design. The old city maps show that the building site was a pond years ago and that water might be encountered. It was the intention to excavate the site with a steam-shovel, but this was out of the question when it was discovered that the entire property was practically studded with piles under the foundations of the buildings which had been removed. It was necessary to rig up a derrick and excavate by means of buckets filled by hand-shovels. The rock runs practically level over the entire property at a depth of approximately 35 feet below the curb, and while it was first the intention to carry the exterior walls

DR. WOELFKIN'S STUDY.

LOUNGE ALCOVE IN YOUNG WOMEN'S CLASS.

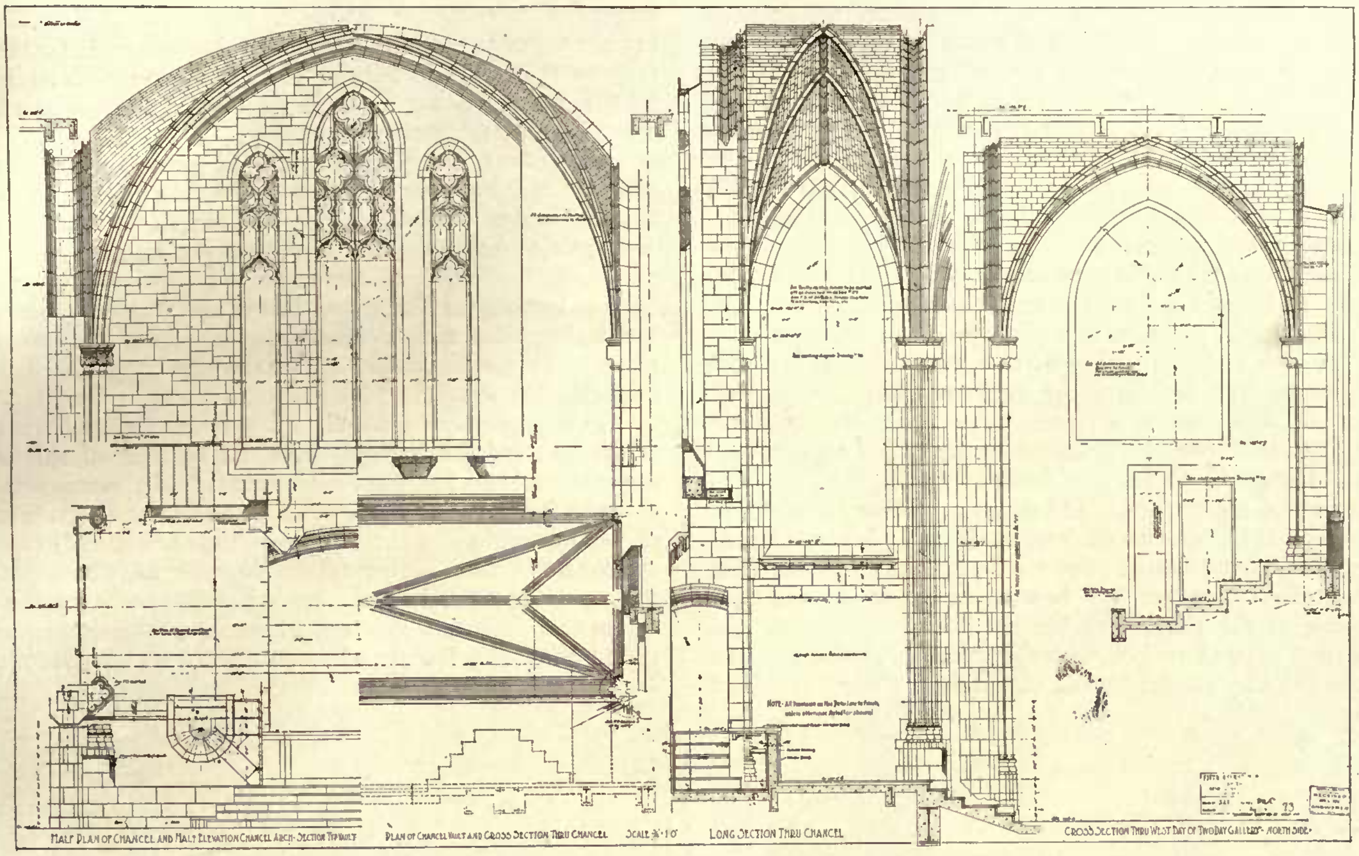
SUNDAY-SCHOOL CHAPEL.

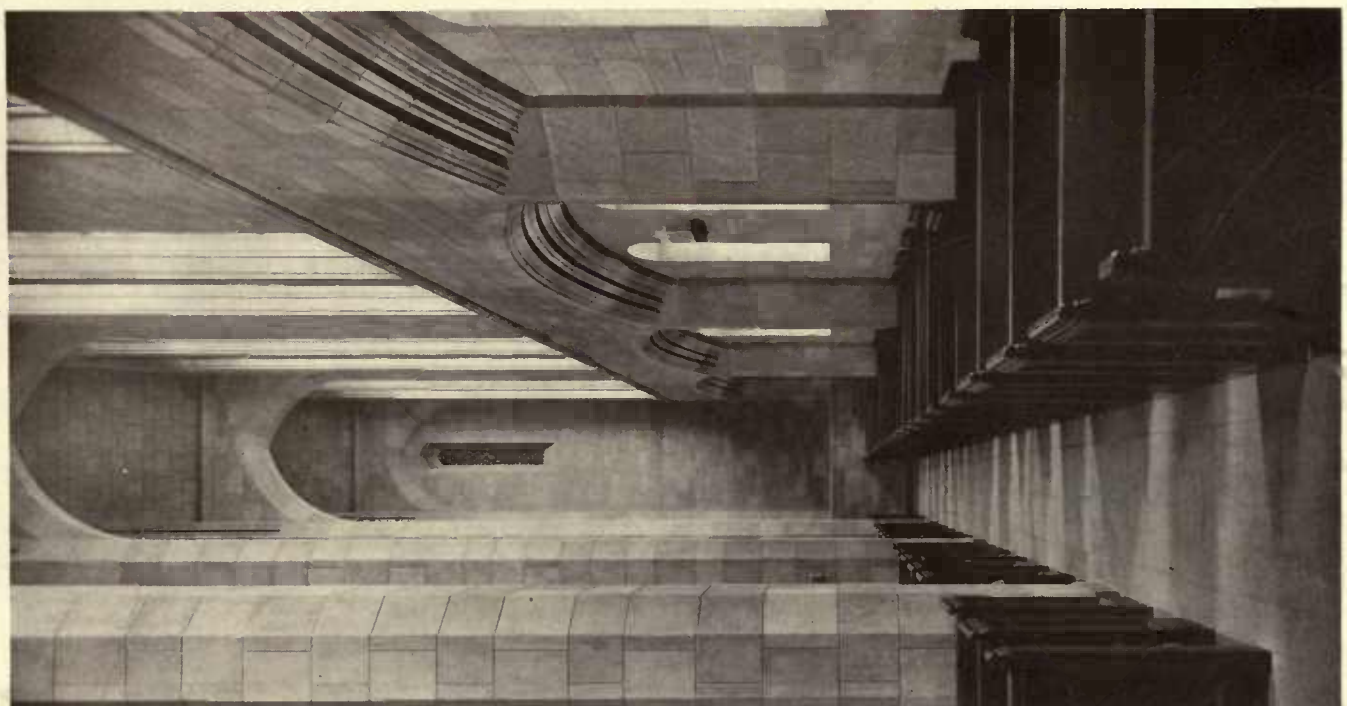


YOUNG WOMEN'S CLASS.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York; Allen & Collens, Boston, Associate Architects.





VIEW OF NORTH AISLE.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York; Allen & Collens, Boston, Associate Architects.

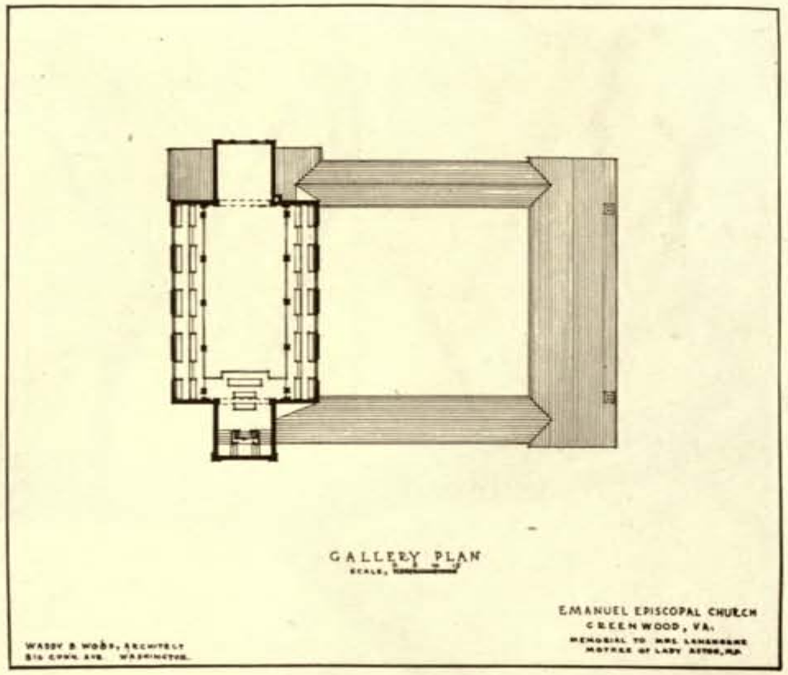
down to rock and make a sort of coffer-dam of the foundation, this scheme was found to be out of the question when it developed that the source of the water was not only in the strata of quicksand between the rock below and clay above, but water was found to be flowing freely through numerous seams in the rock itself. When this was found to be the case, it was decided that the most economical solution would be to sink steel pipes by hydraulic jacks and fill them with concrete for the support of all column footings. The foundation walls were built of reinforced concrete from the footings up to the grade and spanned from one cluster of concrete-filled steel pipes to another, instead of trying to get down to rock with the entire length of wall, due to the water encountered and to the great expense. The composition of the clay which was excavated was such that surface water would stand in the pier-holes under the adjoining walls at a level 10 feet or 15 feet higher than the level of the general excavation of the lot. The clay was excavated to within a few feet of the quicksand, and in doing so it was decided to dig down between the piles to the desired level and then cut the piles off, rather than to withdraw them, as was tried with one of the piles, with the result that the water and quicksand started to boil into the excavation through the hole in the clay caused by the withdrawal of the pile. The scheme of carrying the column footings on steel pipes allowing the water to flow freely under the building made it necessary to reinforce the floor of the sub-basement in addition to the walls, making a reinforced-concrete box under and around which the water would flow.

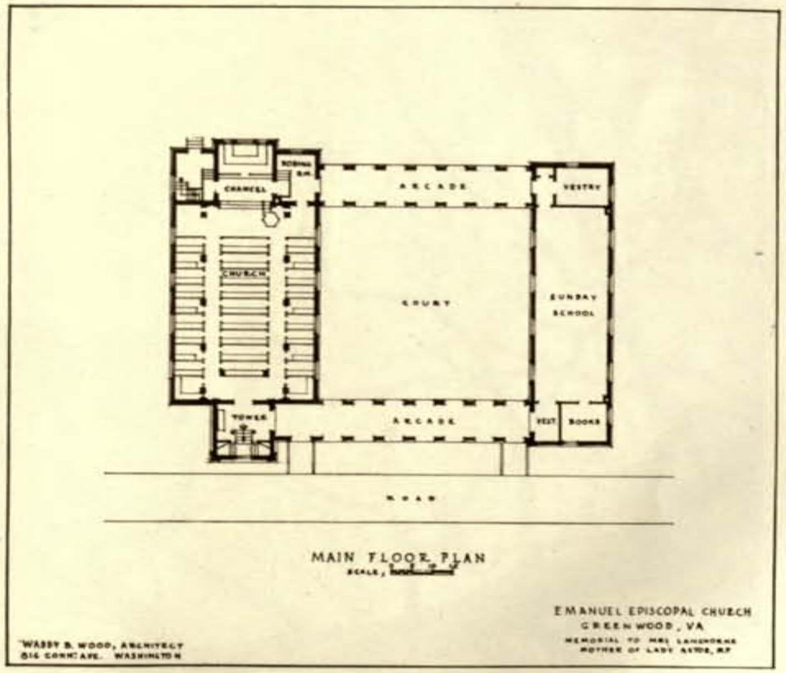
In spite of the intricacy and the care with which the detail of this building has been worked out, and in spite of the difficulties encountered in the foundations, the close co-operation between the committee, the builders, and the architects made it possible to save approximately ten per cent on the original estimated cost of the church. This may well be regarded as an achievement, in view of the fact that a part of the work was done during the high costs immediately following the war.

It is generally conceded, not only by the architectural critics but by the laymen, that the solution of this very unusual problem has been most satisfactorily accomplished, and the Park Avenue Baptist Church is to be congratulated on having realized an entirely new type of church in which the old tradition of horizontal development has been changed to one of vertical development without destroying the ecclesiastical feeling which the world for centuries has associated with the Gothic elements of aisle, clear-story, and attic.

Milton. Bunyan. Carey. Williams. Judson. Wayland.

EMANUEL EPISCOPAL CHURCH, GREENWOOD, VA. (FOR LADY ASTOR, M. P.) Waddy B. Wood, Architect.



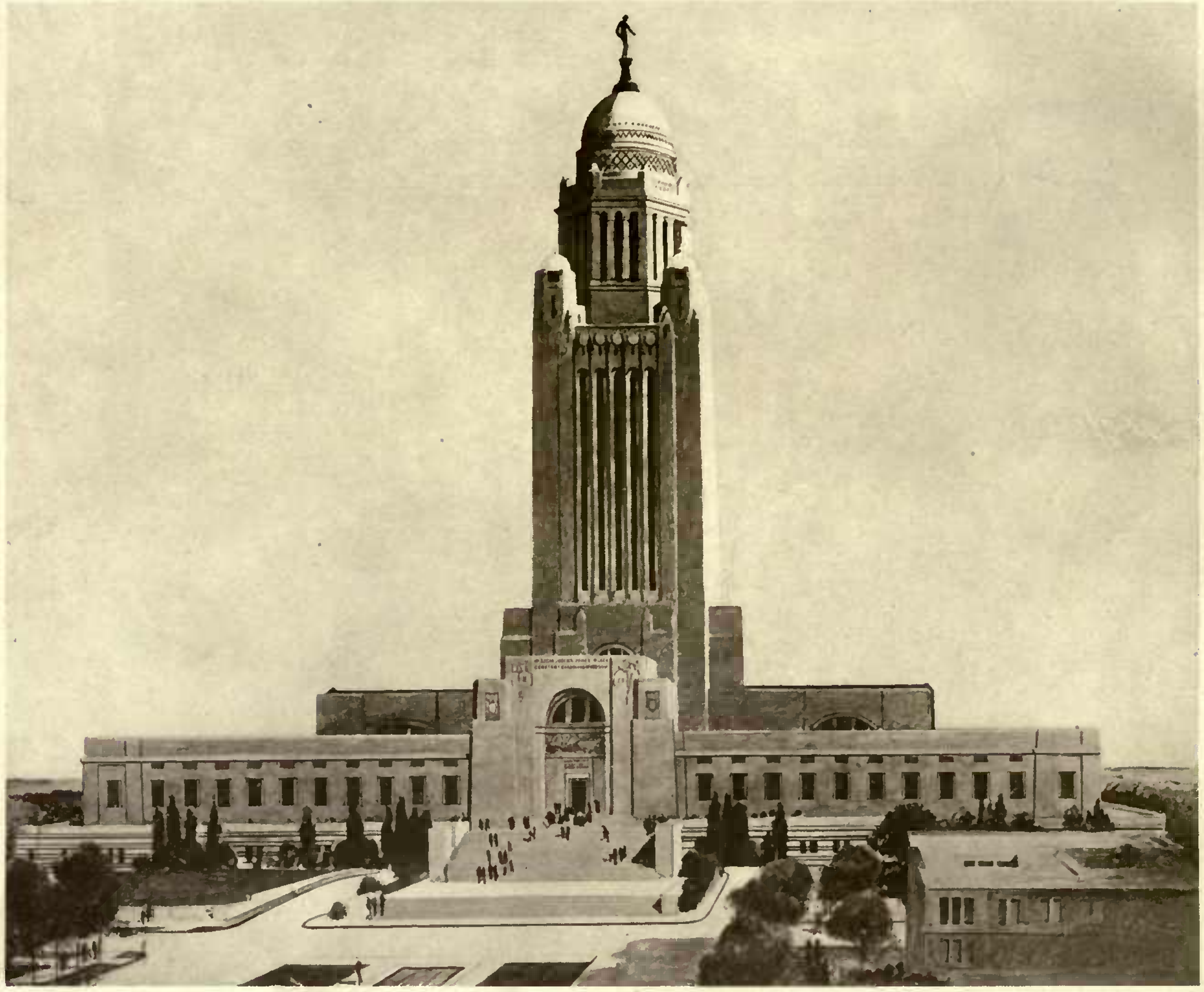


CHURCH AUDITORIUM.

EMANUEL EPISCOPAL CHURCH, GREENWOOD, VA.

Waddy B. Wood, Architect.

EMANUEL EPISCOPAL CHURCH, GREENWOOD, VA. Waddy B. Wood, Architect.



STATE CAPITOL, LINCOLN, NEB. Bertram G. Goodhue, Architect.

THE building is in the form of an exact square of which each face is 437 feet long, including the terraces. The greater part of the exterior is rather low (two stories and attic, with basement underneath), broken at the centre of each side by a somewhat higher mass, each of which is the termination of a cross-shaped structure from the centre of which raises a great tower, 80 feet square and 400 feet high from the ground to the top of the figure on the dome. Thanks to the four courts contained within this area, every office and every room in the building receives abundant light and this without the aid of skylights and light wells.

The Nebraska capitol marks the greatest departure ever made in American statehouse architecture. The plan was secured through a series of competitions given under the auspices of the American Institute of Architects. Three Nebraska men were selected in a preliminary competition in which the economic and political aspects of the problem were considered as well as architectural requirements. Seven firms of national reputation outside of Nebraska joined in the competition, which resulted in June, 1920, in the selection of Bertram G. Goodhue, of New York, as the architect of the commission.

ONE OF THE INTERIOR COURTYARDS AND A CORNER OF THE TOWER.

Each of these courts is a rectangle, 87 feet by 100 feet. It is open to the sky.

SENATE CHAMBER.

The walls here are of stone, though it is proposed to introduce in panel form and also in the ceiling a different material of high absorbent power for the sake of its acoustic effect. As elsewhere, the ceiling, which here takes the form of a pendentive dome, is decorated with gold and colored tile. Beneath the galleries that extend around the entire room is a passage separated from the Senate Chamber proper by screens on three sides and with marble columns on fourth, behind the speaker's desk and platform.

Editorial and Other Comment

If It Should Be Dreaming True—The Russell Sage Foundation Plan for New York and Environs

WE are constantly being told that architecture is a business and has little to do with art; that this is a day of facts, not dreams; that what we need is not more idealism but more of the combination with which brass tacks are made. And we are not of those who would scornfully deny the truth of this point of view, nor would we omit to say that there is a lot of so-called idealism that is nothing more than an attempt to evade honest realities and hard work and hide behind vague emotions that in their last analysis are the result of being mollycoddled, or sheer inability to put up a good fight. With this as a preface we want to call attention to one of the greatest dreams of modern times, a dream that means an awakening after long years of dormancy and when conditions would seem overwhelmingly against success.

But with money and brains and unselfish devotion to a great cause all things seem possible, even when the thing dreamed means making over for the greater good of millions of human beings the congested region of New York City and its environs.

No one can think of the city and its suburbs without realizing the terrible waste on every side, the shocking congestion of population and sacrifice of human life, the lack of co-ordination and unity on all sides.

Something will have to be done as the city grows; present conditions have about reached the limit of toleration, and the pressure upon its limited space is fast becoming that of a stream of human beings pushed to economic and physical destruction.

The trustees of the great Russell Sage Foundation have formulated a plan for developing a comprehensive "Regional Plan of New York and Its Environs."

They have appointed a committee consisting of Charles D. Norton, chairman, Robert W. de Forest, Frederic A. Delano, John M. Glenn, Dwight W. Morrow, and Frank L. Polk, with Frederick P. Keppel as secretary and Flavel Shurtleff assistant secretary, to organize the work and to that end to co-operate with groups of citizens and public officials in the boroughs, municipalities, and local communities throughout the whole area.

Avoiding duplication of effort, the committee propose to approach their difficult problem by first organizing a series of preliminary inquiries with a view to developing and recording those basic facts and fundamental considerations which are requisite to inform public opinion and to guide the future city planners. There will be organized at least four such inquiries, as follows:

1. ECONOMIC AND INDUSTRIAL: An analysis of the fundamental reasons for the existence of this great centre of industry and commerce, its potentialities and the sound limitations on its future development; an inquiry into economic and occupational activities, those that create populous districts and those that follow population; a study of the land within the area, its use and taxation.

2. PHYSICAL: The mapping of existing topographical and other physical conditions, including railway and water transportation, harbor, "free port" and terminal facilities, bridges, ferries, main highways, park and recreation spaces, public and quasi-public buildings, and density and distribution of day and night population; the compiling of existing local schemes for improvement.

3. LEGAL: A study of existing law as it controls or affects a plan for the area which includes portions of three states; an analysis of the law of zoning, excess condemnation, stabilization of official city maps, shore rights and land under water, and other subjects relating to city planning.

4. SOCIAL AND LIVING CONDITIONS: Studies designed to bring to the attention of the city planners those factors which have direct bearing upon human values and social welfare, and make for healthful and satisfactory housing and home surroundings, efficient work and wholesome leisure time.

After these inquiries have laid solid foundations upon which to base sound planning, the man, or the group of men, will be found to plan for New York and its environs as George Washington and Pierre l'Enfant planned for Washington, or Burnham and Bennett and their committees of business men planned for Chicago; to create a plan which, with wide public participation and approval, shall embody and record the best thought of our engineers, our artists and architects, our public servants, our social workers and economists, and far-seeing business men.

Plans, when sufficiently advanced, will be submitted to the public at large for study and criticism through groups of citizens representative of each community in the great area involved. They will be offered in no arbitrary spirit, but rather in the faith that the public will welcome comprehensive planning, and will endeavor through the proper public authorities and citizen organizations to realize to the utmost, as the decades pass, the social, the industrial, the commercial, and the artistic values of this great world capital and port.

The committee will propose no abnormal expansion of public expenditure. With a wisely conceived plan public funds which will be expended in any event can be directed into projects of permanent constructive value; without a plan millions are likely to be wasted in desultory or ill-considered public works.

This project was presented for the first time to a representative conference of public officials, engineers, architects, artists, and other public-spirited citizens, for here it is that we must find the love of order and of beauty, the lofty vision, and the skilled hands which shall depict for a vast population the dramatic and stirring possibilities of the centuries to come.

If such a rejuvenation is possible about New York, it is even more possible with some of our other great centres of population. It will take great courage, immense sums of money, and the unselfish and clear thinking of many minds with both vision and practical experience in planning.

The Convention of the American Institute

WE go to press too early with this number to publish any of the proceedings of the convention that will be held in Chicago, June 7–9, but we shall be on the ground and will have a report to make for our next issue. The convention promises to be specially interesting this year, and instead of the customary formal papers there will be a more general discussion of questions relating to architecture and industrial relations in general. Something of value should result from the pre-convention conference, June 5–6, on the question of better advertising methods for architects.

A Book for the Times

THERE is a wealth of suggestion and material especially adapted for the designer of small houses in the book on "Small French Buildings" recently published. It deals with the French architecture off the beaten track, "the farm-houses, farm groups, peasant cottages, the little and more suggestive town houses." Many of these minor buildings have charming elements of the picturesque in design and material and are easily adaptable to our local conditions. As the authors say in their Preface, "it is our hope that others may appreciate these little buildings and find in them some freshness and inspiration." We believe this is just what every architect will find in looking over the many plates made from original photographs chosen for the charm and interest of their subjects.

Atlanta Adopts Zoning

ATLANTA adopted a zoning ordinance in 1922 by a nearly unanimous vote of the council. The ordinance divides the city into dwelling-house, apartment-house, business, and industrial districts. Three classes of height districts are established with limits of 50 feet, 100 feet, and 150 feet, respectively. Building line, side yard, and rear yard requirements are established for all buildings in the residence districts. Lot area requirements are based on the number of housekeeping units for which the residence building is arranged; 5,000 square feet of lot area per family is required for much of the dwelling-house area, and 2,500 square feet of lot area per family for the areas suited to double or two-family-house development. In most of the apartment-house areas only 625 square feet per family is required, while in the limited hotel and elevator-apartment sections there is no minimum lot area requirement, though side, rear, and front yards are required.

The zoning plan and ordinance were prepared for the Atlanta Plan Commission by Robert Whitten, city planner, Cleveland, Ohio. The initial indifference or opposition of the public was overcome by an intensive educational campaign in which newspaper articles, editorials, and cartoons played an important part. Five thousand copies of a tentative zoning map and of an attractive illustrated pamphlet describing the proposed zoning and giving the reasons why zoning is necessary were distributed. Work on the zoning was started by Mr. Whitten in May, 1921, and the zoning ordinance became effective in April, 1922, a little less than a year from the time the work started. Atlanta maintains its reputation for progressiveness by being the first Southern city to adopt a comprehensive zoning plan.

Timber Surveys by Air

THAT he obtained more information regarding the timber and waterways of the country over which he had flown as the result of a few hours' air trip than he could have secured by years of travel on foot was the recent statement of a timber expert in Quebec. A flying-boat was used for this exploration and survey of the forests of the northern part of the Province, the trip of eight hundred and fifty miles being completed in twelve and one-half hours of flying. Several stops were made to complete reports of the country travelled over as well as to secure more fuel. Besides the pilot and logging expert, the party included an aerial photographer.

The results of this and similar journeys have added to the conviction of lumbermen that aircraft was extremely useful in the timber industry. In the woods of northern Quebec alone this season, four thousand miles have been explored in flying trips. A complete camping outfit is carried on these flying-boats, including a tent, canoe, and a plentiful supply of food.

San Francisco's "American Plan"

THE general public may be interested in learning that the American Plan, as established and enforced in San Francisco by the Industrial Association, is something distinct and different from the old-time, so-called open shop. Whereas the open shop wherever enforced usually has meant the entire absence of all restriction or restraint upon employers with respect to wages paid, hours of work, and other conditions of employment—thereby giving opportunity for unscrupulous employers to deal unfairly—the American Plan in San Francisco has set up machinery for reasonable control of these matters in the interest of the public.

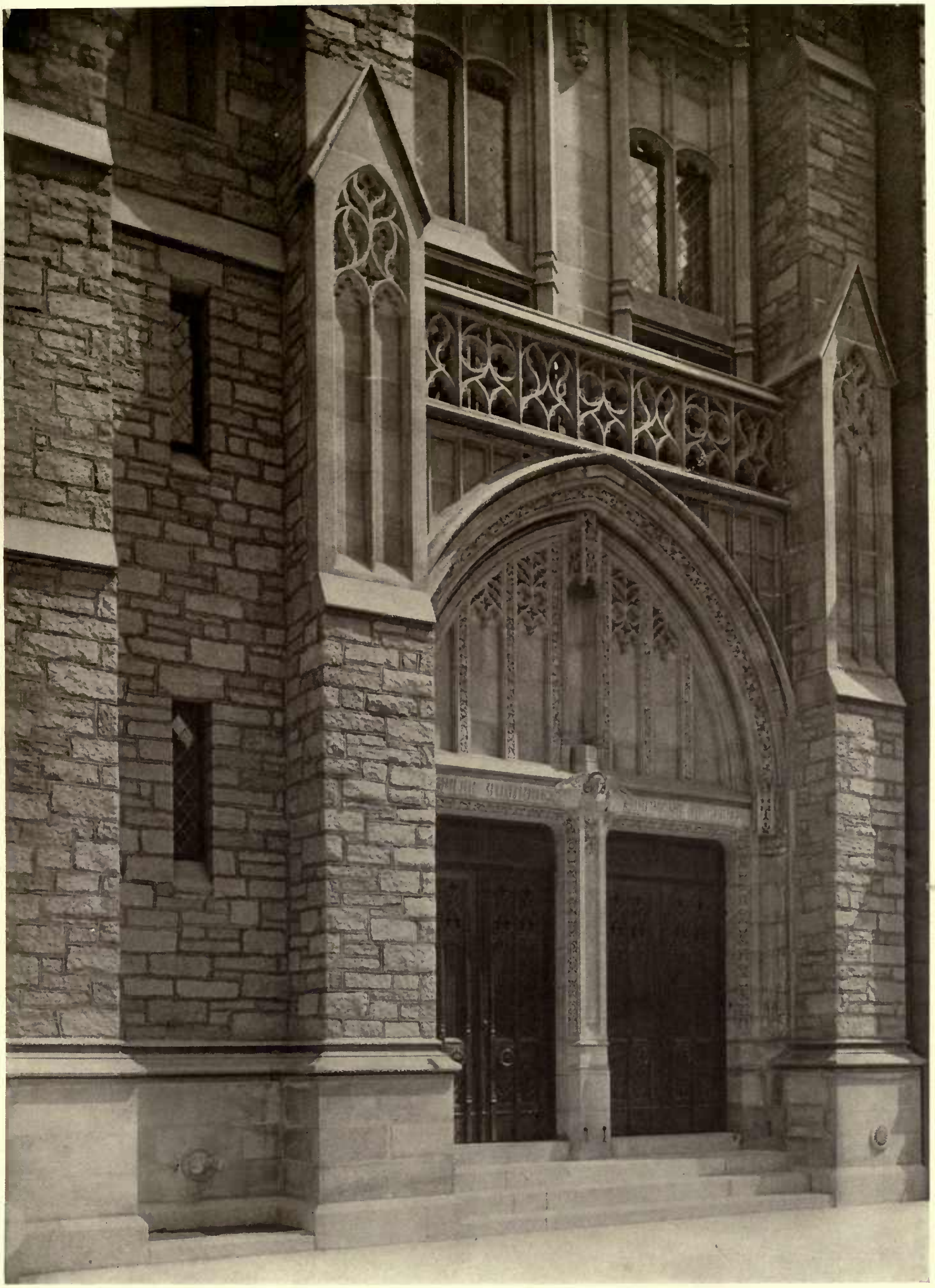
In other words, it really has been a *Plan*, definitely conceived and definitely carried out, in the interest not of any special group or faction, but in the interest of the three parties to industrial relations: the public, labor, and the employers.

The American Plan is predicated upon the proposition that the public interest is paramount to that of any other community element, and that neither labor nor capital, nor any other faction or class, should be allowed to take action that will jeopardize that interest. And, as the public interest actually would be jeopardized as much by unfairness of any kind visited by the employers upon labor or consumers as by autocratic labor-union control of industry, the American Plan prevents either of these things taking place.

The American Plan says to labor: "You cannot be allowed to secure an autocratic, selfish, and restrictive control over industry, for the result is that not only the industry itself but the whole public is seriously injured thereby." It says to the employer: "You cannot be permitted to beat down labor, for, when labor receives less than that to which it is justly entitled, not only labor but the whole public suffers seriously and is permanently injured—and we will not give you such unlimited backing that you can enter into combinations with your competitors and get a monopolistic control in your industry under cover of a community-wide organization."

Then, turning again to labor, it says: "You are entitled to an equitable wage, to reasonable hours, and to decent working conditions, but in turn you must be willing to give to your employers honest, loyal, and efficient service." And turning once more to the employer, it says: "You have the right to demand honest, loyal, and efficient service from *all* your employees. You are entitled to the right of hiring and discharging employees individually on merit, without outside interference, so long as on all occasions that right is exercised only upon broad principles of justice; and to the right of rewarding individual merit in employees, but in turn you must recognize the obligation of the management to the employees generally, and particularly to co-operate in providing, so far as possible, continuous employment."

Roughly and in brief that *is* the American Plan as established and enforced in the building industry of San Francisco by the Industrial Association. Theoretically fair, it stands proven as practically fair as well. It has freed labor from the self-imposed but misconceived restraint of selfish leadership, has emancipated employers from the throttling control of labor-unions, and has guaranteed to the public, to labor, and to the employer that all their legitimate rights will be protected at all times.



DETAIL, MAIN ENTRANCE, PARK AVENUE.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

DETAIL, NORTHEAST ENTRANCE, 64TH STREET.

DETAIL, NORTHWEST ENTRANCE, 64TH STREET.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

NAVE, MAIN CHURCH, LOOKING TOWARD CHANCEL.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

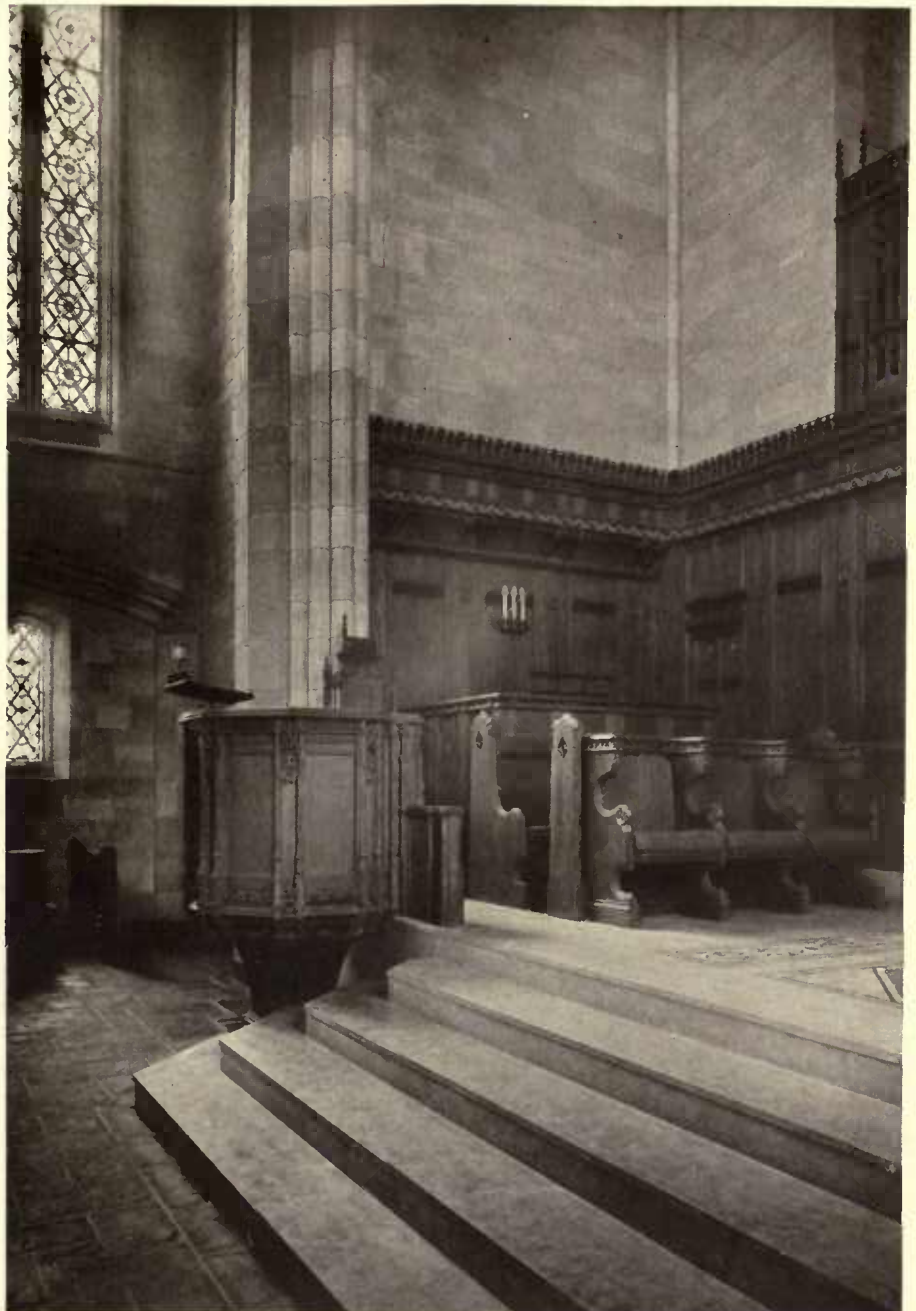
Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

NOTE.—The memorial window over reredos and dossal curtain in baptismal pool opening in reredos are still to be installed.

NAVE, MAIN CHURCH, LOOKING TOWARD NARTHEX.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

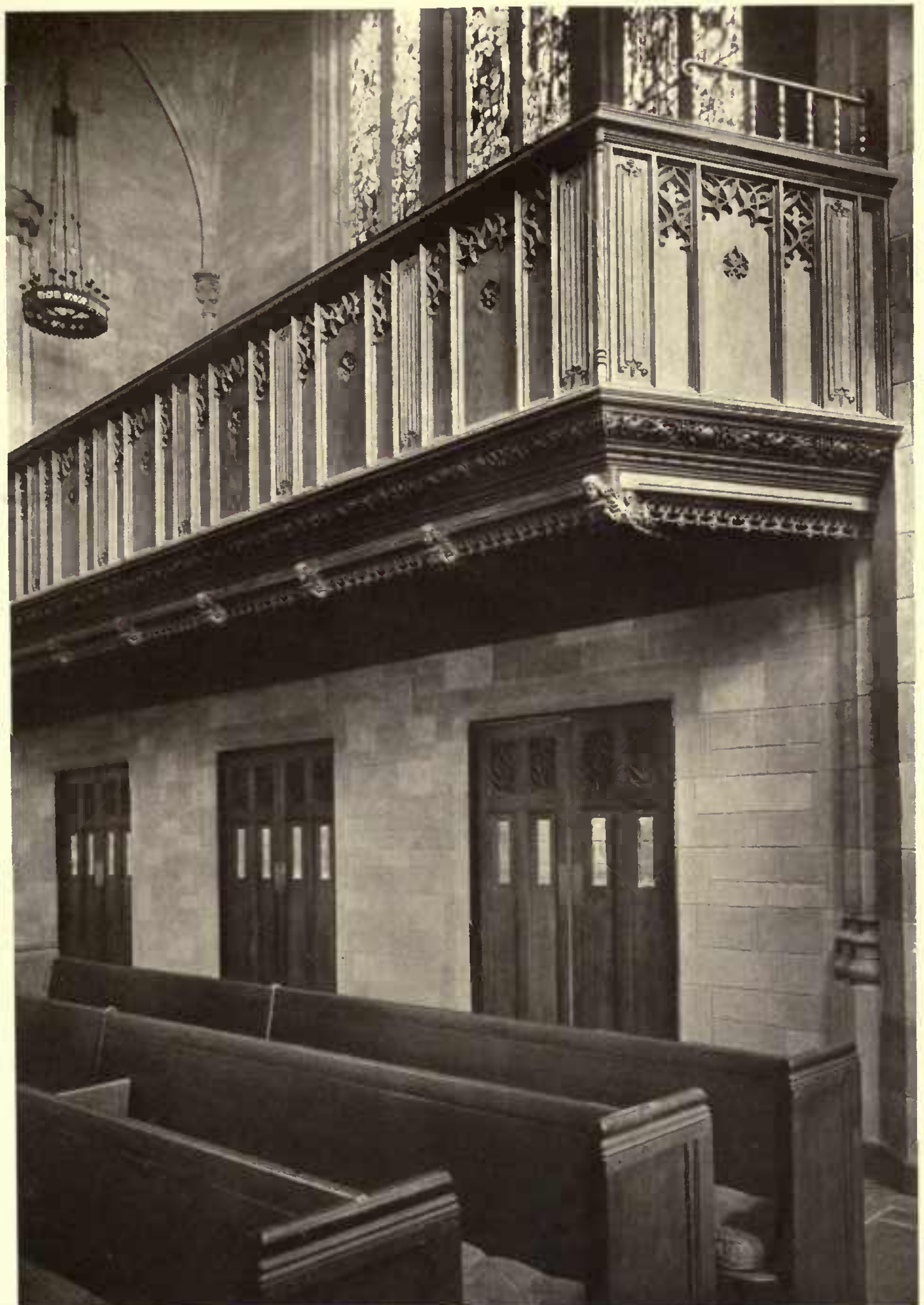


DETAIL, PULPIT AND ORGAN CONSOLE.

DETAIL, LECTERN, CHOIR-STALLS, AND DEACONS' SEATS.

PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

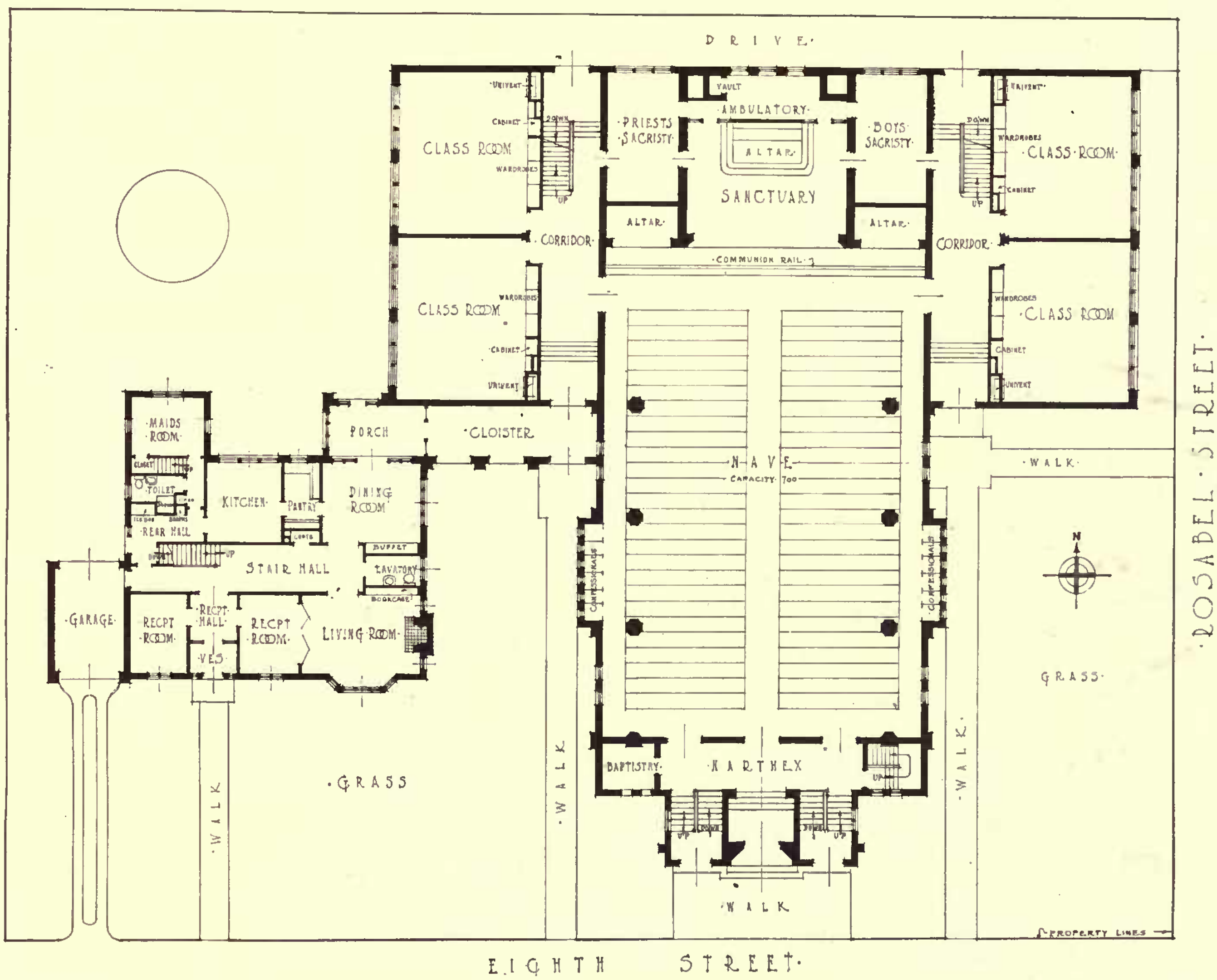


DETAIL OF WEST GALLERY.

VIEW OF TRANSEPT.

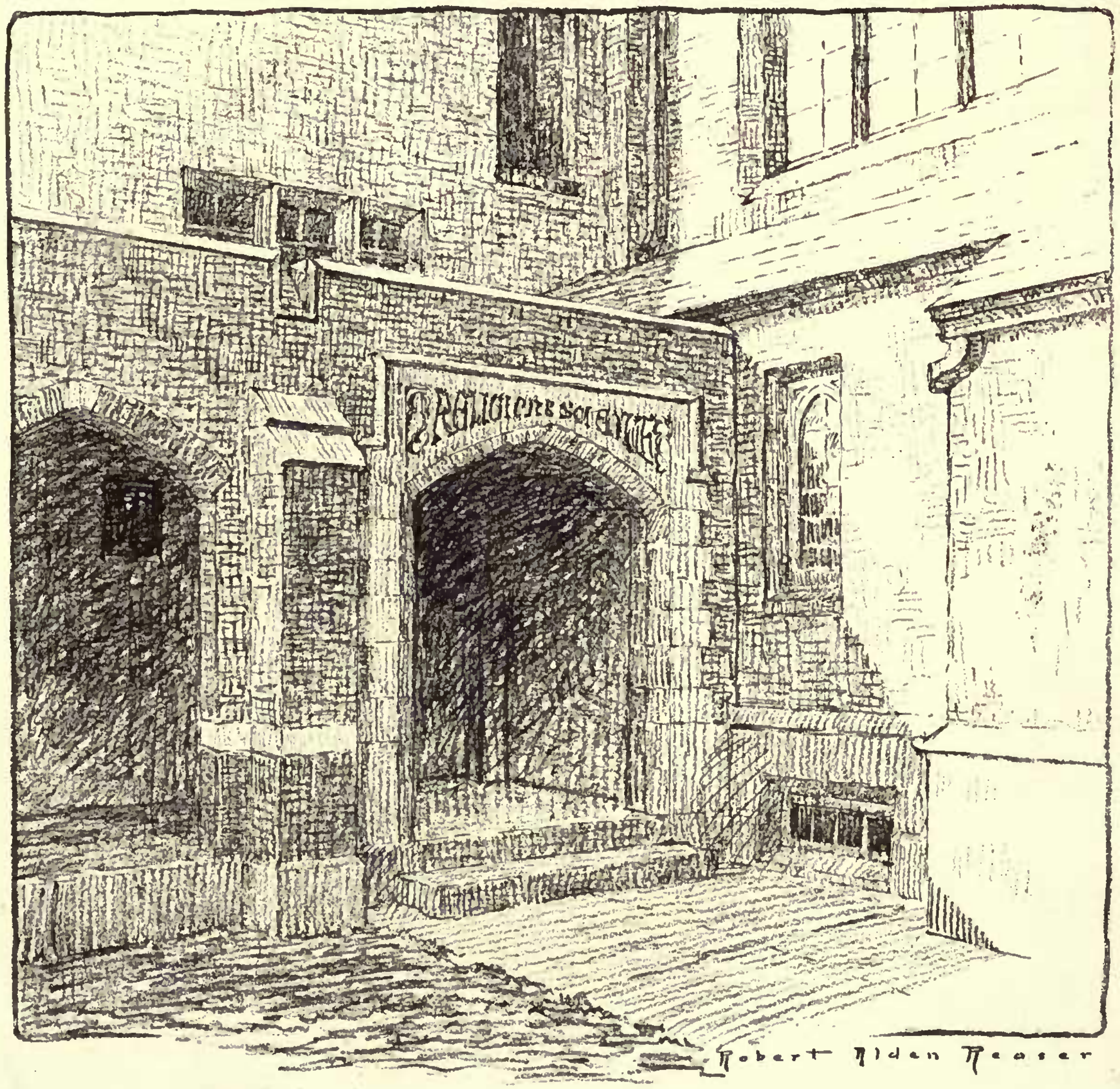
PARK AVENUE BAPTIST CHURCH, NEW YORK.

Henry C. Pelton, New York, Allen & Collens, Boston, Associate Architects.

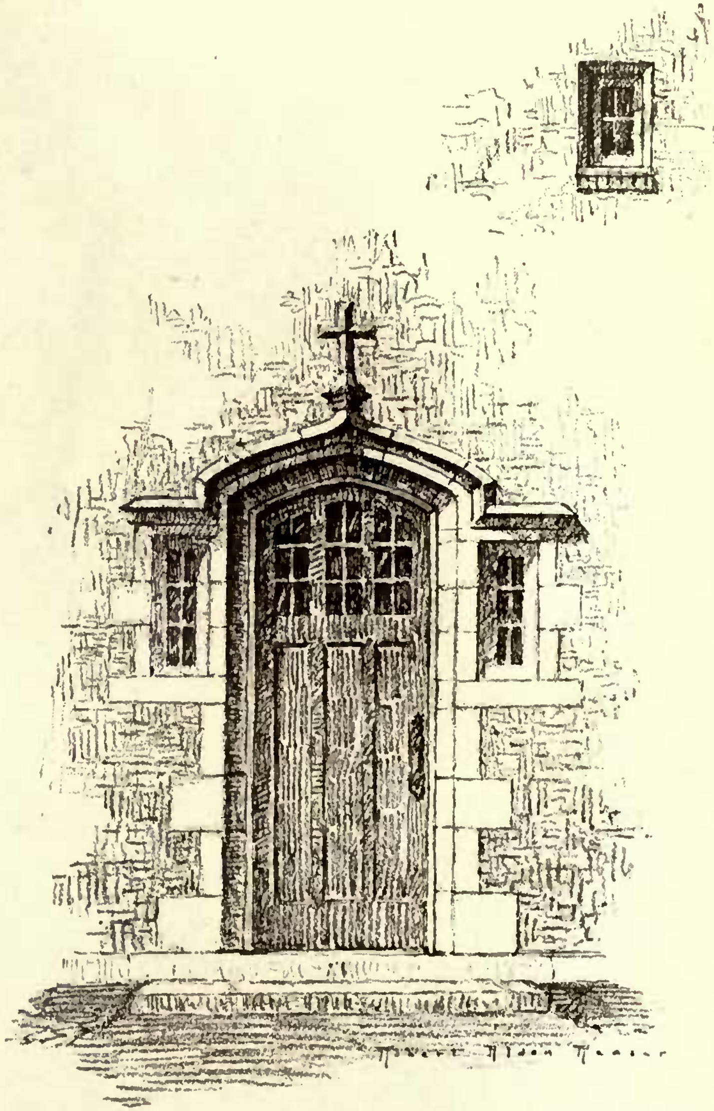


THE CHURCH OF ST. MARY, R. C., ST. PAUL, MINN.

Damon, O'Meara & Hills, Architects.



DETAIL OF ENTRANCE TO SCHOOL AND CLOISTER.



DETAIL OF RECTORY ENTRANCE.

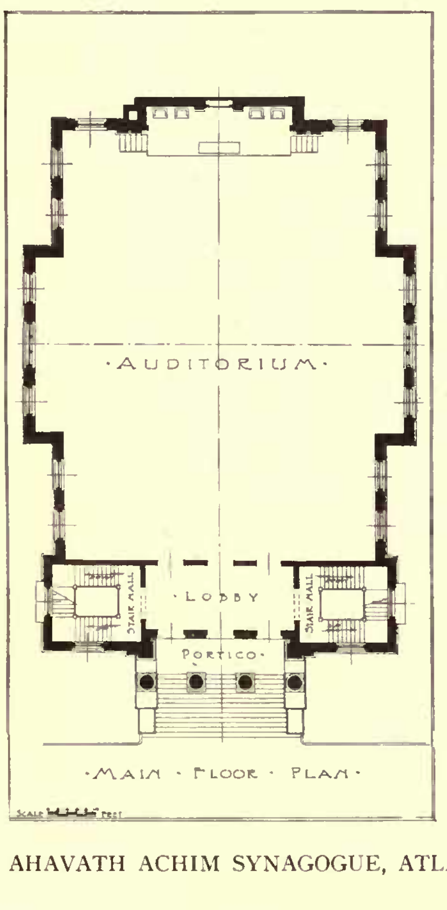
THE CHURCH OF ST. MARY, R. C., ST. PAUL, MINN.

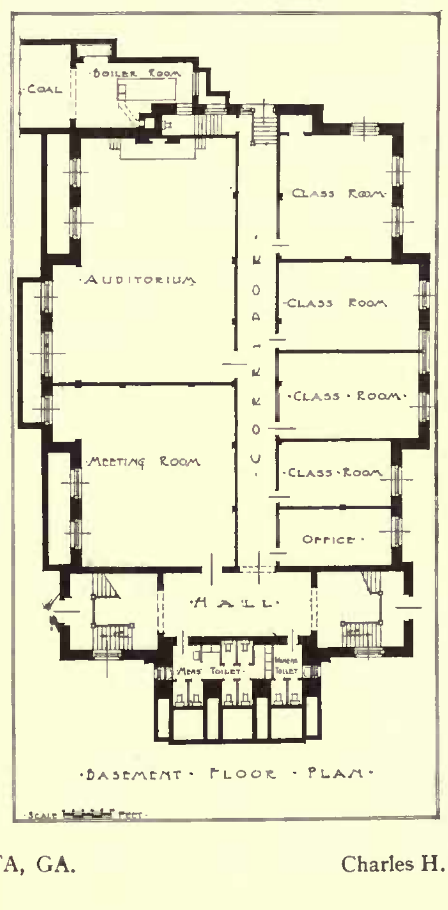
Damon, O'Meara & Hills, Architects.

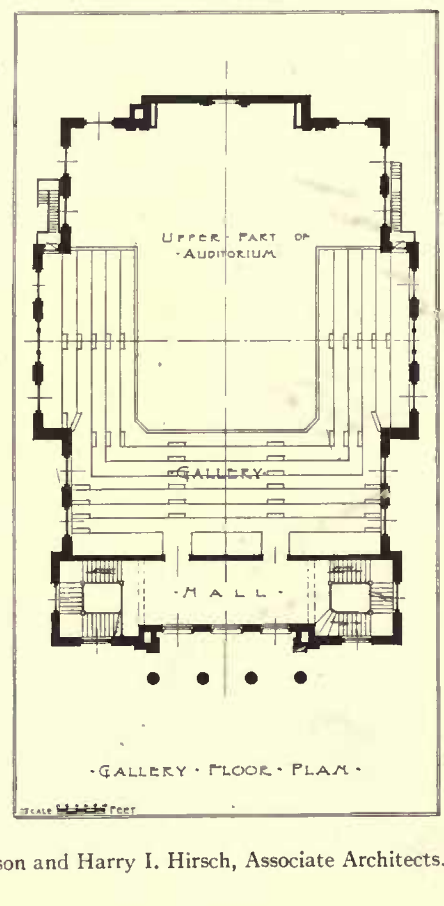
DETAIL OF PORTICO.

Charles H. Hopson and Harry I. Hirsch, Associate Architects.

AHAVATH ACHIM SYNAGOGUE, ATLANTA, GA.







AHAVATH ACHIM SYNAGOGUE, ATLANTA, GA.

Charles H. Hopson and Harry I. Hirsch, Associate Architects.

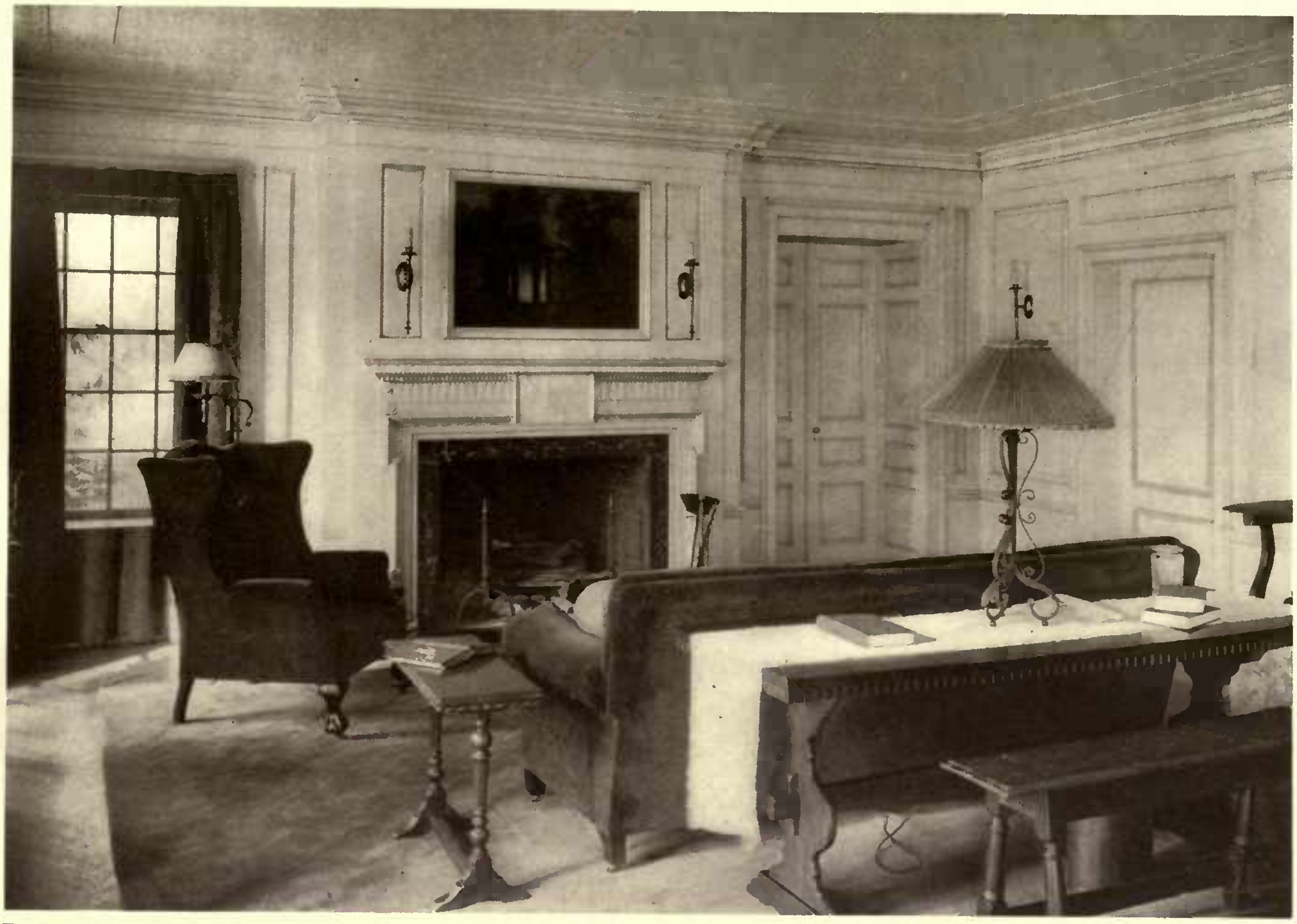
RESIDENCE, GEORGE G. PIERIE, JR., OGONTZ, PA. Tilden & Register, Architects.

PORTICO AND FRONT DOOR.

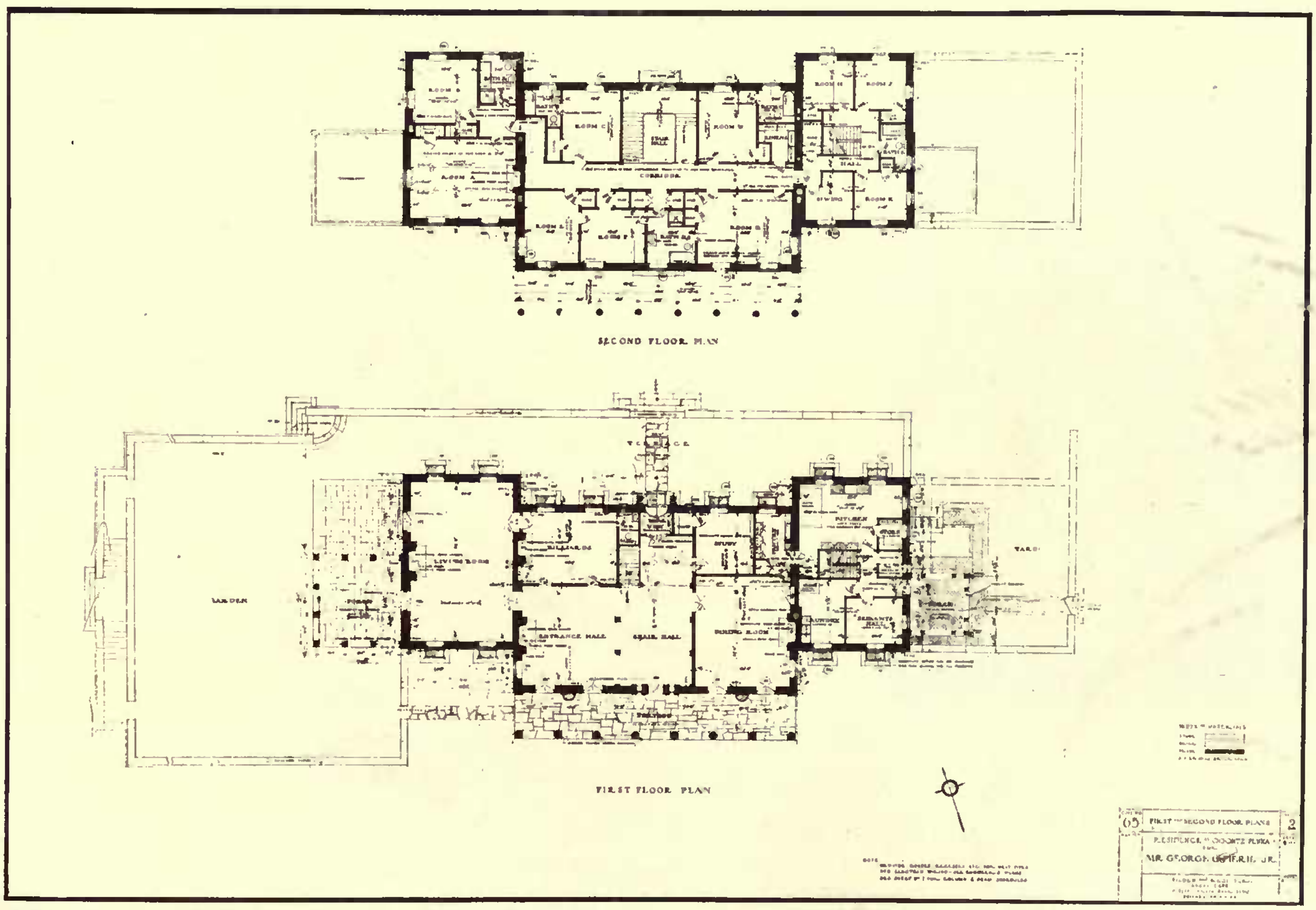
STAIR-HALL.

Tilden & Register, Architects.

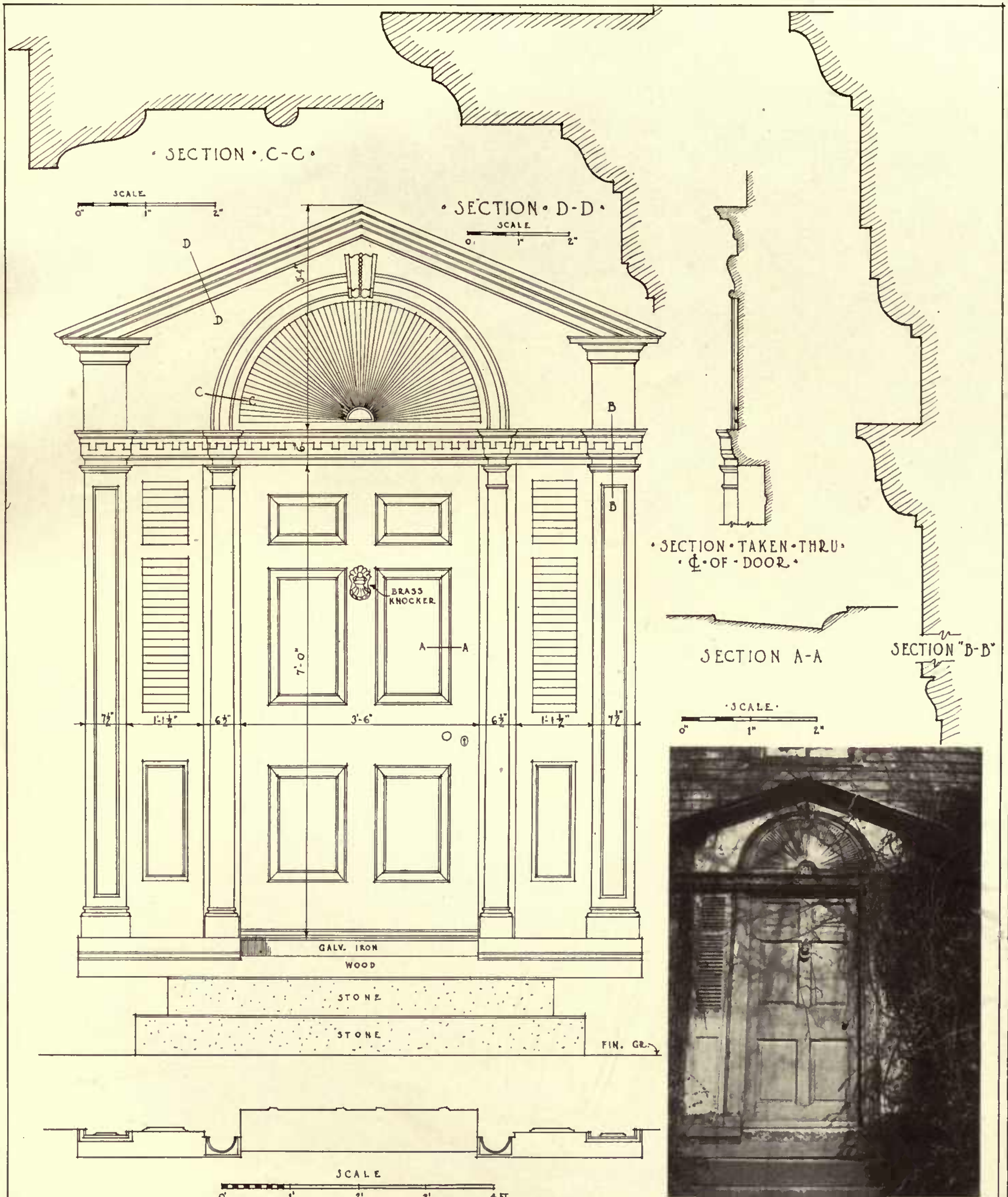
RESIDENCE, GEORGE G. PIERIE, JR., OGONTZ, PA.



ENTRANCE-HALL.



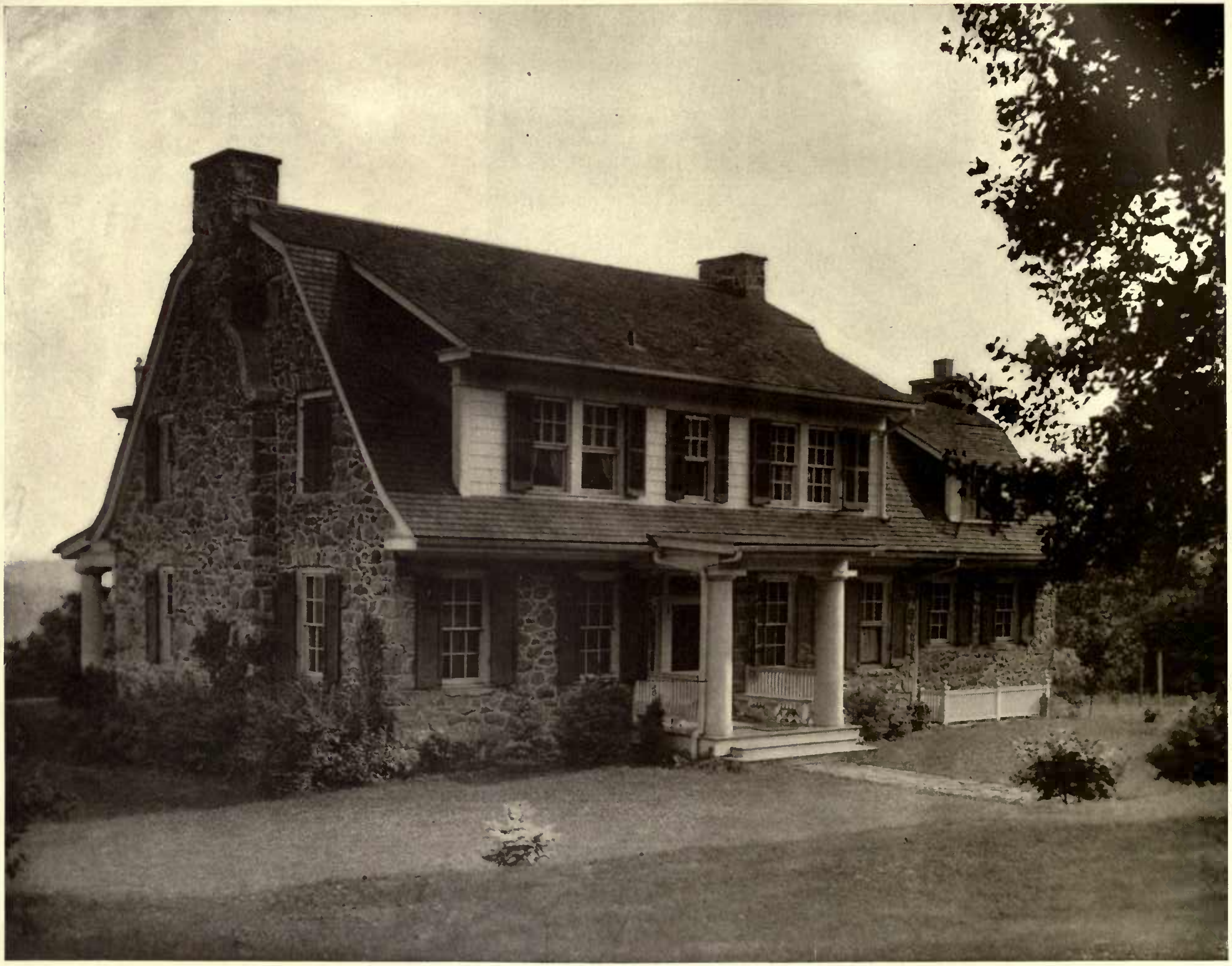
RESIDENCE, GEORGE G. PIERIE, JR., OGONTZ, PA. Tilden & Register, Architects.



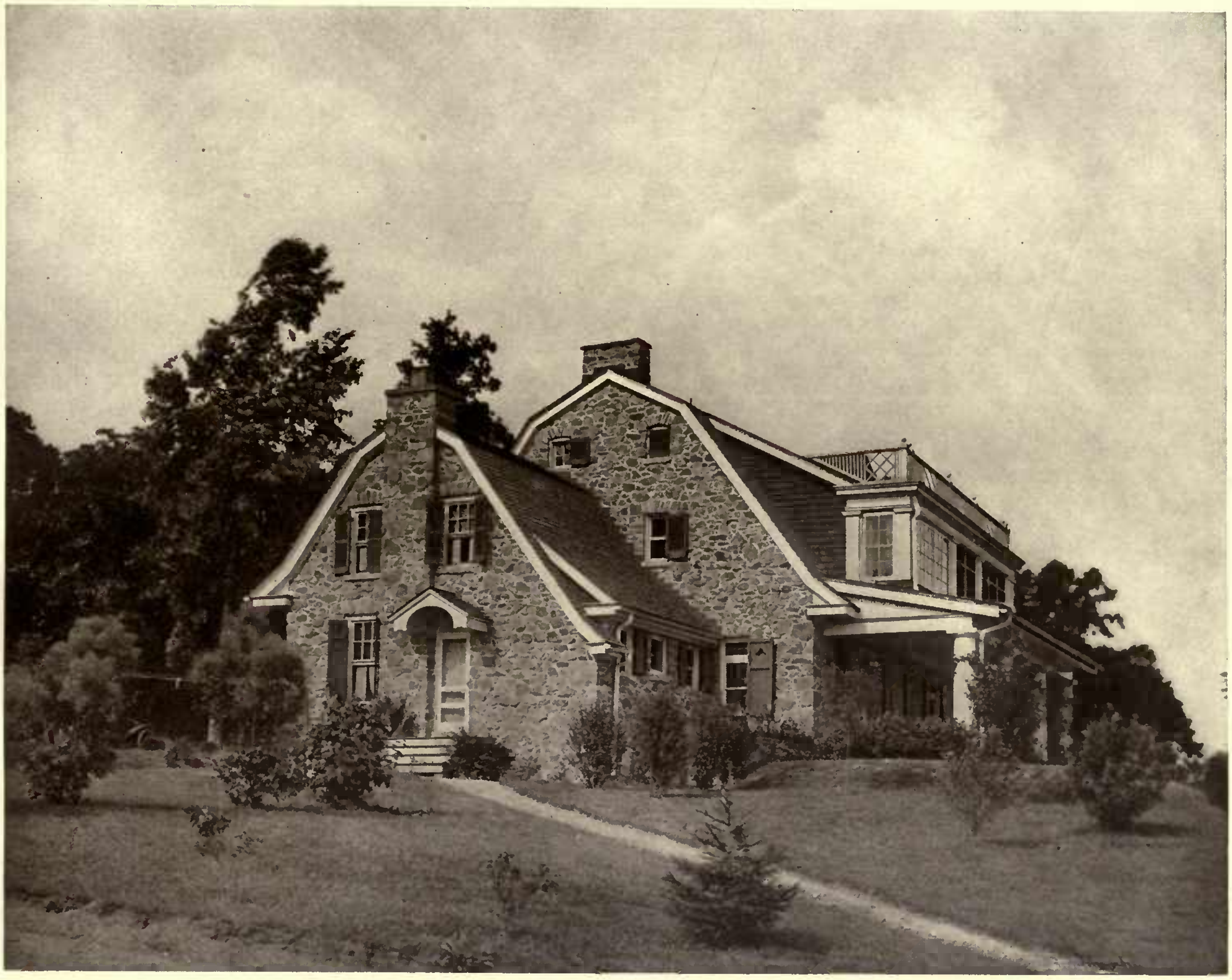
EARLY COLONIAL ARCHITECTURE OF THE OHIO VALLEY

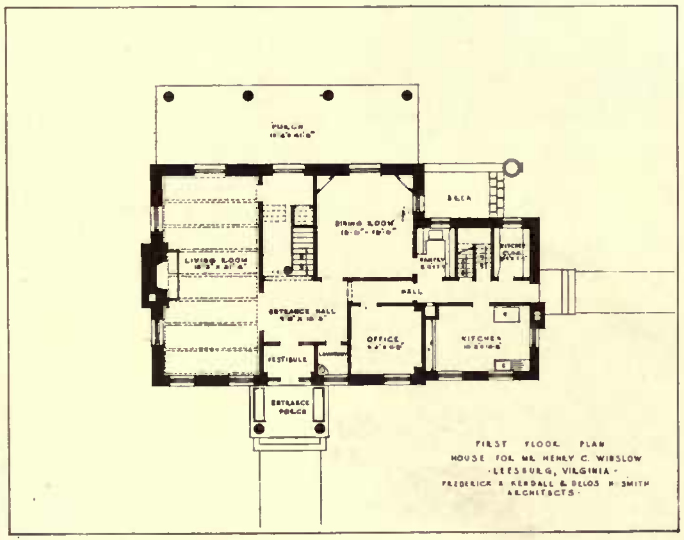
A DOORWAY TO AN OLD RESIDENCE NEWARK OHIO

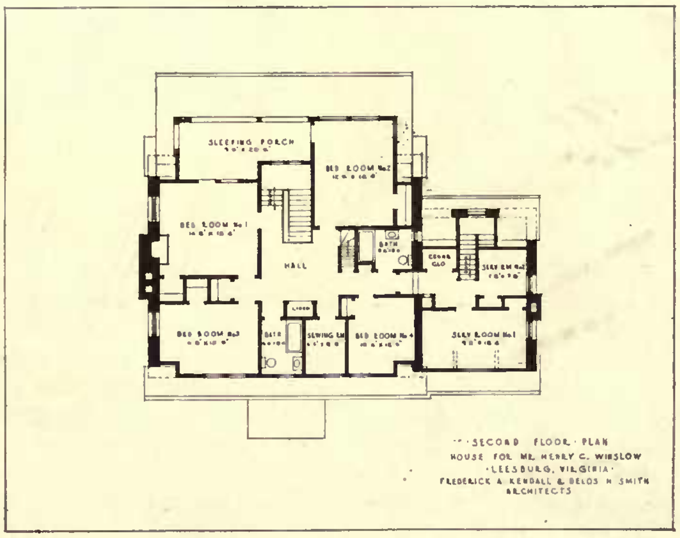
MEASURED & DRAWN BY *Daniel W. Weiny*



HOUSE, HENRY C. WINSLOW, LEESBURG, VA. Frederick A. Kendall and Delos H. Smith, Architects.







HOUSE, HENRY C. WINSLOW, LEESBURG, VA. Frederick A. Kendall and Delos H. Smith, Architects.

The Chase and Chester Apartments and the Chase Hotel

Preston J. Bradshaw, Architect

LESS than a year ago there stood at the intersection of two of Saint Louis's principal boulevards, Kingshighway and Lindell, one of the city's show places—the Bixby Mansion. This home, with its beautiful setting and spacious grounds, never failed to attract the attention of visitors.

To-day the old mansion is a memory. On its site stand the Chase and the Chester Apartments, and the adjacent Chase Hotel is fast nearing completion. They form a noteworthy group of buildings.

The Chase, which is the larger of the two apartment-buildings, is a structure of brick and terra-cotta on a substructure of reinforced concrete. The building faces the south, and presents a dignified and well-proportioned façade.

The two lower stories are in a light terra-cotta, embellished with well-studied detail in low relief. This forms a base for the succeeding stories of mat brick in a pleasing blend of reds.

In the upper stories terra-cotta is again introduced to frame the eighth-story windows, and the entire structure is crowned with a cornice of the same material. The designer has endeavored to minimize all projections, relying on the proportions of the light and dark masses, and on the detail of his ornament, for effect.

The arched entrance doorway, with its iron grilles, leads into an entrance-hall and elevator-lobby done in low-relief plaster and tavernelle marble.

Entrance-hall and stairs, Chase Apartment.

The building contains eight floors of two ten-room suites per floor. Each suite comprises: living-room, dining-room, solarium, two master bedrooms with bath, two guest-rooms with bath, two servant's rooms with bath, kitchen, etc. All rooms are large and well lighted. The living-rooms are 19′ x 30′, and contain a mantel in carved stone. All the principal rooms have plaster cornices, and all floors throughout are of oak. The bathrooms have tile wainscoting and floors. The master's bathroom is also equipped with shower-bath. Extra large closets are plentifully provided.

Every detail of arrangement for the tenant's comfort has been long and carefully studied, and strict attention has been paid to the workmanship and materials.

The building is equipped with passenger and freight elevators, the former of high-speed, manual control, with micro-levering device; the latter arranged conveniently to the service portion of the house, reached by an open balcony extending between the wings on the rear. This balcony also gives access to the fire-exit stair and the incinerators.

The Chester Apartment, situated to the west of the Chase, is designed to care for the needs of that class of tenant who does not require many rooms, and still likes the atmosphere of refinement and comfort which this building and its exclusive location provide.

In architectural treatment and construction this building is in harmony with its neighbor, varying only in the details of its embellishment.

The building consists of thirty-two three-room and seven two-room units of the studio type. The three-room units have a large living-room, one bedroom, dining-room, kitchenette, and bath. In the two-room units, the bedroom is omitted. Both units are equipped with closet beds.

Bed-closets and kitchenettes are provided with mechanical ventilation, a very necessary feature in this type of structure.

Both freight and passenger elevator service of the highest standard is provided as in the other building.

This building is flanked on the west by the new Chase Hotel, a high-class residential structure which is now under construction and which completes the group.

The Chester building and the hotel will be joined by an underground passage, which will enable the tenants to pass from one building to the other, giving them the advantage of hotel service and accommodation while living in their own apartments.

Every feature of modern apartment-house design is included in the building. It is well worth mentioning that in the erection of these buildings, which were completed within ninety working days, a record has been established for structures of this type.

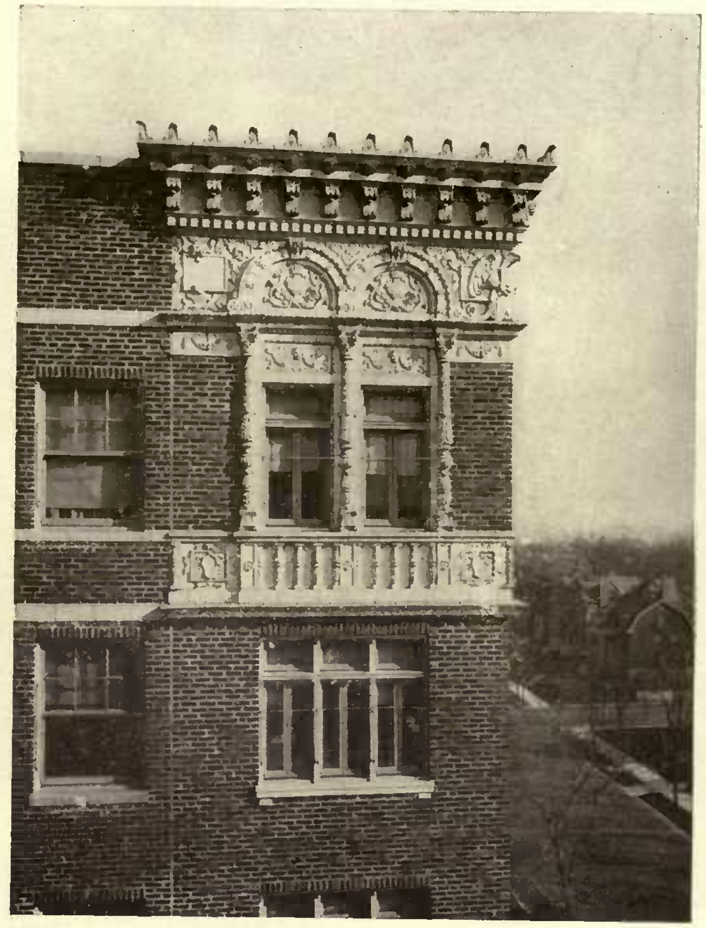
These buildings were erected by the segregated, or sub-let method, by which all contracts were let by the architect for the owner, and the speed and efficiency obtained in erection speak well for this method of operation.

CHASE HOTEL (DESIGN).

CHASE AND CHESTER APARTMENTS, ST. LOUIS, MO.

Preston J. Bradshaw, Architect.

UPPER STORIES, CHESTER APARTMENT.



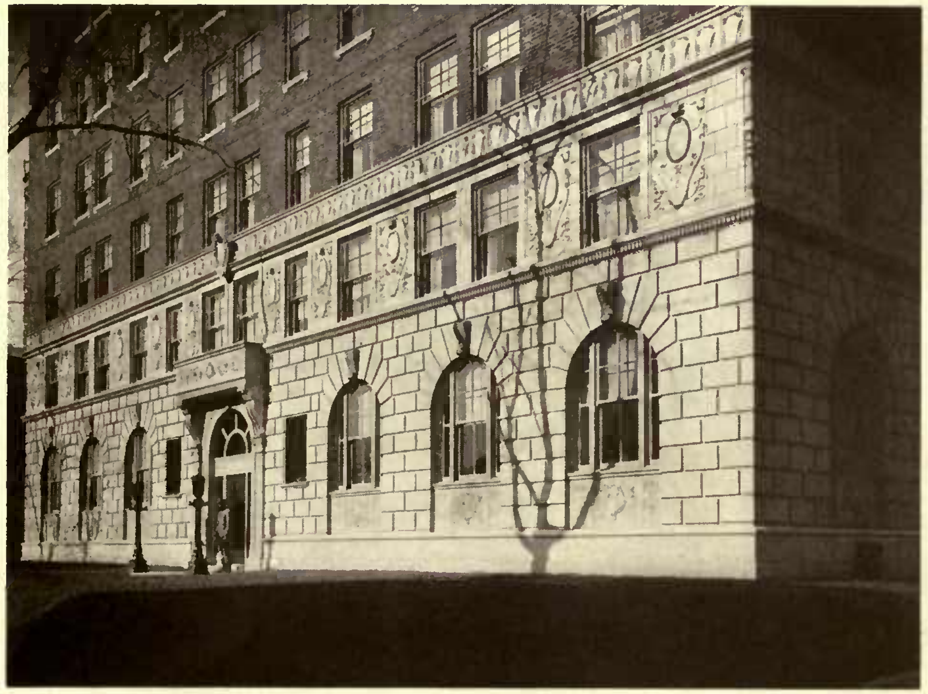
UPPER STORIES, CHASE APARTMENT.

ENTRANCE, CHESTER APARTMENT.

ENTRANCE, CHASE APARTMENT.

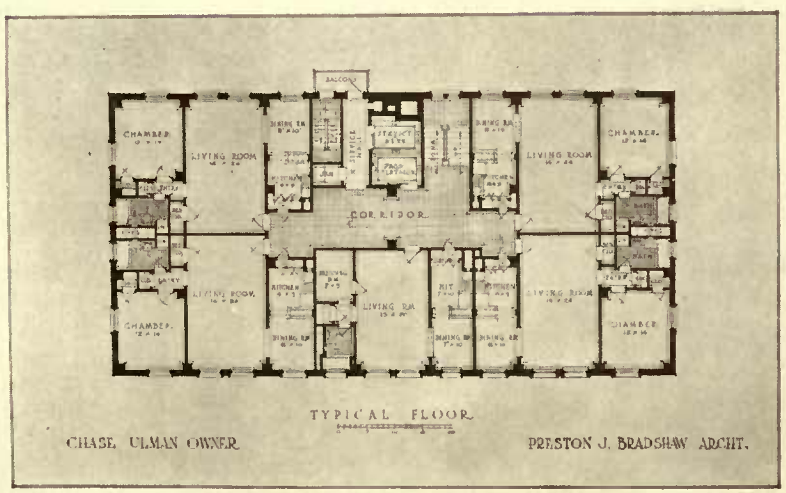
Preston J. Bradshaw, Architect.

CHASE AND CHESTER APARTMENTS, ST. LOUIS, MO.

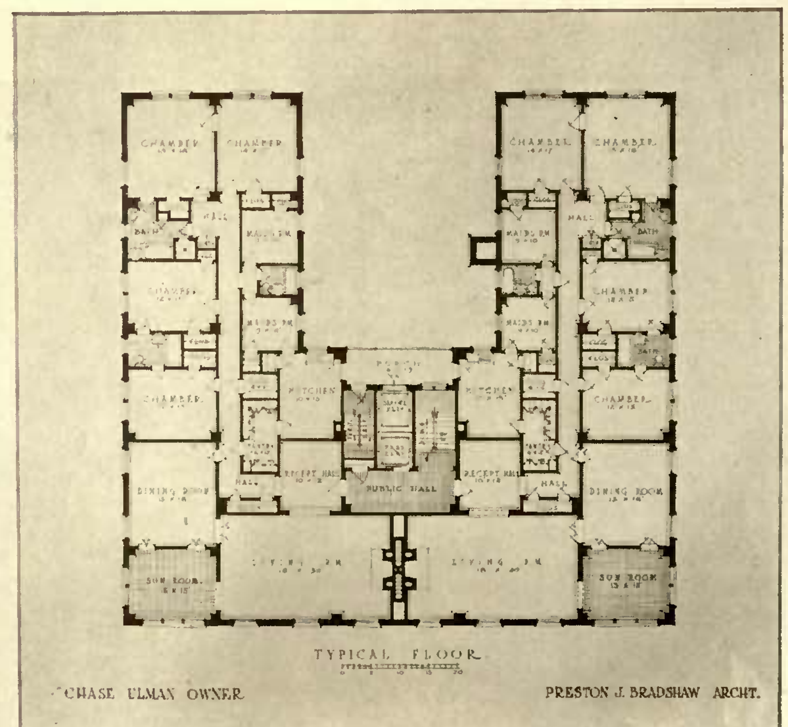


DETAIL, LOWER STORIES, CHESTER APARTMENT.

DETAIL, LOWER STORIES, CHASE APARTMENT.



TYPICAL FLOOR PLAN, CHESTER APARTMENT.



TYPICAL FLOOR PLAN, CHASE APARTMENT.

Preston J. Bradshaw, Architect.

CHASE AND CHESTER APARTMENTS, ST. LOUIS, MO.

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Architecture as a Human Document—Renaissance and Modern Works

By Albert C. Phelps, A. I. A.

Professor of Architecture, Cornell University

From a lecture delivered at the Metropolitan Museum of Art

II

IN my first article I discussed architecture as a human document with special reference to ancient and mediæval styles. In this one I shall attempt to show that Renaissance and modern works reflect no less surely the methods of thought and action, the ideals and aspirations, of their authors. Owing to the complexity of modern life and to long-taught prejudices concerning the Renaissance, it is not always easy to distinguish the leading motives or to clear our vision when considering these later structures.

We are coming to see that the Renaissance was not so much an act of emancipation as a natural development; the succession in its due time of the age of thought to the age of action. The ideal of all-round culture that formed the scheme and groundwork of classic thought is precisely the ideal that we find reasserting itself as the scheme of Renaissance thought. Breadth, spaciousness are essential qualities of Renaissance architecture, just as they are of the structures of classic times, and this is but a reflection of the people of those times.

St. Paul's school chapel, Concord, N. H. Henry Vaughan, Architect.

While the art of the Renaissance has much in common with the classic, there is always a difference corresponding with the difference between the pseudo-pagans of the fifteenth century and the ancients. The former never succeeded in establishing an intellectual ethical system to control conduct and action, but were always haunted by a somewhat vague but spiritually conceived faith in God; and while in architecture there is an obvious turning to the study and imitation of classic works, the style was for long fundamentally mediæval and Christian.

In the dome of Florence Cathedral we have a splendid monument to the genius as well as the patient persistence of Brunelleschi, the first great Renaissance architect. Inspired by the spacious grandeur of the classic Roman structures, he built a modern work, harmoniously completing a mediæval building but conceived entirely in the spirit of his time.

The dwellings of the nobility, such as the Medici Palace at Florence, the Vendramini at Venice, and the Farnese at Rome, display the same continuity of development, coupled with a tenacious adherence to modern ideals. In the Medici, or what is more commonly known as the Riccardi, Palace the idea of security is especially evident, recalling the fact that intramural feuds and consequent warfare were by no means outgrown, while the open treatment of the Venetian palace indicates that personal security depended upon centralized government and naval strength, the individual being left to enjoy light, air, and particularly the pageantry of the Grand Canal by means of large window openings and balconies. In the Farnese Palace we find expressed the growing wealth, power, and influence of church dignitaries.

The Italian villas reflect the admiration of their builders for the antique and yet they were far from being direct imitations of imperial works. The Chigi or Farnesina, the Medici, and the Este, at or near Rome, illustrate this phase of architectural progress.

Such interiors as Raphael's Stanze in the Vatican show the intellectual culture of the sixteenth century in mural decorations of the highest order, and in the splendid interiors of the Ducal Palace at Venice we have a fitting background for the stately but gorgeous costumes of doges and senators.

In St. Peter's at Rome, a work of many minds, but especially bearing the impress of the master mind of the Renaissance, Michael Angelo, we see not so much a Christian church, imbued with the mystery and sanctity of a mediæval cathedral, as the legitimate successor of a great pagan shrine, setting forth with pomp and ceremony the grandeur and dignity, as well as the power, of the "Church Triumphant." And in such later buildings as the Church of the Salutation at Venice we see reflected the joyousness and thanksgiving of the Venetian populace more than the sincere and reverent devotion of an earlier age.

No more favorable field for studying architecture as a human document could well be found than France from the time of Charles VIII to the great cataclysm of the

Saltonstall house, Ipswich, Mass. W. G. French, photo.

Revolution. The introduction of the Renaissance from Italy under Louis XII and Francis I and its development under Henry II present no sudden revolution in style, but a gradual change marking step by step the corresponding intellectual development of the ruling classes.

The châteaux of the Loire Valley, such as the Louis XII and Francis I wings at Blois, the châteaux of Chambord, Chenonceaux, and Azay-le-Rideau illustrate the emancipation from the requirements of mediæval defense and the greater elegance in the mode of living, introduced largely as a result of the contact of the French nobility with Italian culture, due to three successive invasions of Italy at the close of the fifteenth century and the beginning of the sixteenth.

The Château d'Anet, built for Diana of Poitiers, the rival of Catherine de Medici, about the middle of the sixteenth century, is truly a document of its time. Diana is said to have stipulated that her palace should be exclusively the product of French designers and French craftsmen. This wish was not literally observed, but the work is much more nearly national than that at Fontainebleau, where the Italian influence was always strong.

When, toward the close of the sixteenth century, Henry IV, the first Bourbon monarch, found himself seated on the throne of France, classicism became established as the ideal of the French artists. It was some time, however, before it was clearly understood, and yet the architecture and decoration display a rugged picturesqueness, which, though at times coupled with a grotesque richness, does not lack a definite charm. The old houses of the Place des Vosges, formerly the Place Royale, and the Hotel La Vallette in Paris are good examples of the work of the time.

Perhaps there is no pleasanter way to refresh our memory concerning the spirit of the first half of the seventeenth century than by recalling the atmosphere of daring adventure of Dumas's "Three Musketeers" and "Twenty Years After." The architecture of the time formed a perfect background for those stirring scenes that the great writer depicted so vividly.

Under Louis XIV a style was developed reflecting more directly than that of any other period the personal taste and qualities of the reigning sovereign. One needs but visit the gardens of Versailles or wander through the *salons* of that stupendous palace to appreciate more keenly than would be possible by long months of serious study of the literature of the time the real greatness of the period as well as its pompous insincerity.

The styles of the Louis were largely artificial, as they were apart from the people and developed in turn in an atmosphere of punctilious ceremony, voluptuous license, and affected naturalism or archæological pedantry. But, notwithstanding this unreality, they are easily among the most brilliant and charming productions of any age.

One needs but take a similar bird's-eye view of English architecture from the time of Elizabeth to the end of the eighteenth century to trace the somewhat crude but evident sincerity of the earlier customs as reflected in the quaint manor-houses, the later pompousness as seen in Palladian architecture, and the pedantic or unaffected elegance expressed in the Georgian interiors and furniture design.

When we come to nineteenth-century architecture, we are at first confronted with revivals. The Roman revival under Napoleon, that appears so artificial now, when viewed from a distance, was certainly a reflection of the ideal of the First Empire, comprising the revival of Roman imperialism in state and society. Notwithstanding the fact that legislators clad themselves in Roman togas, that ladies of fashion adopted classic garb, and that churches took the form of temples and commemorative monuments of triumphal arches, contemporaneous influences were not and could not be ignored. The propriety and refinement of the old régime were generally lacking, and in Josephine's home at Malmaison one sees revived classicism curiously mingled with forms inspired by military campaigns, as in the council-chamber, designed to look like the inside of a tent.

The Néo-Grec movement and the Gothic revival succeeded the Empire style in France; the one leading to greater refinement in detail, the other to greater frankness in treatment and more sincerity in the use of materials, and underlying both was much of the rationalism advocated by Viollet-le-Duc and so sadly misunderstood by many of his contemporaries.

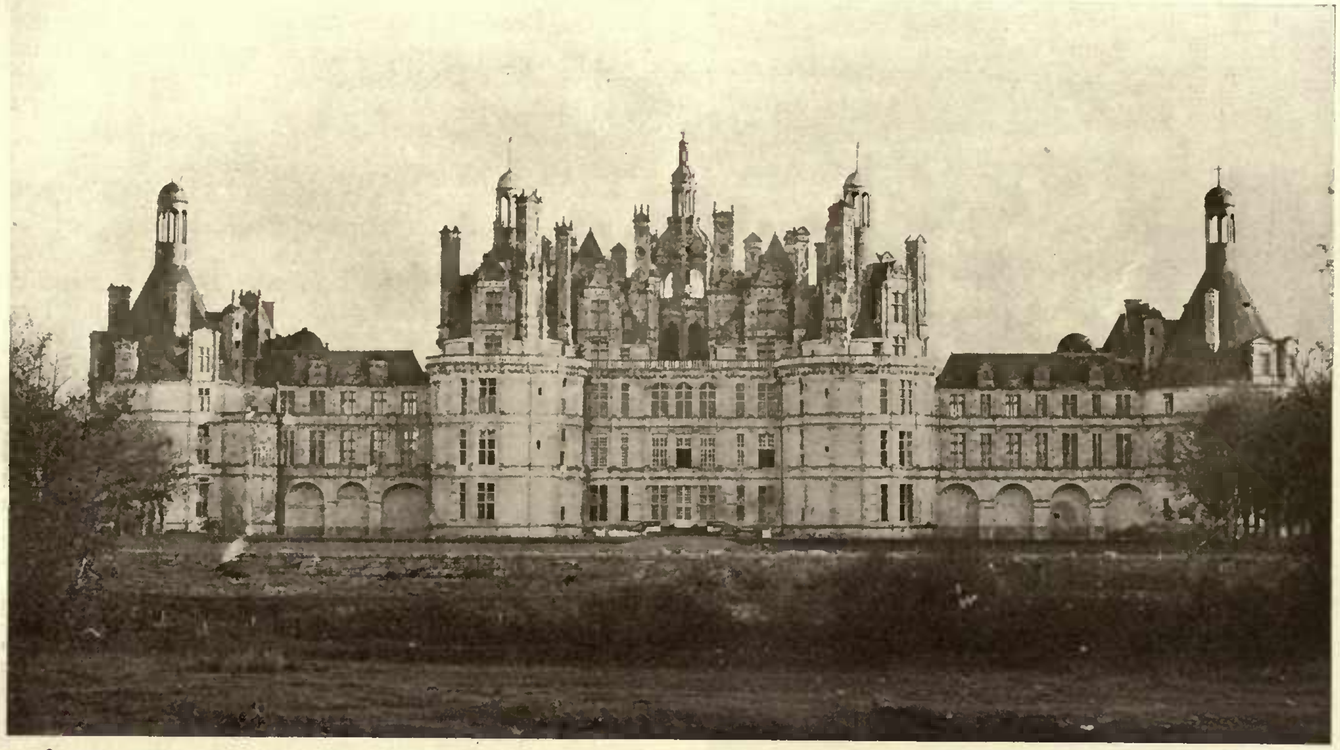
In spite of certain vagaries that have appeared from time to time, and the manifestation of sufficient individuality, the modern architecture of France presents great unity of style and sincerity of purpose, and her splendid public buildings exhibit that nobility of character so clearly but unostentatiously displayed by the French people under their recent trials.

In Great Britain and Germany the classic revival was much more strictly archæological, and therefore, on the whole, more artificial. Although producing some notable monuments, such as St. George's Hall at Liverpool and the Old Museum at Berlin, too many of the structures were less appropriate, in spite of the fact that they were the result of an earnest striving for monumental dignity. Among the latter may be mentioned the high school at Edinburgh, the Walhalla at Regensburg, the Ruhmeshalle, Propylæa, and Glyptothek at Munich.

The Gothic revival in England at first produced such

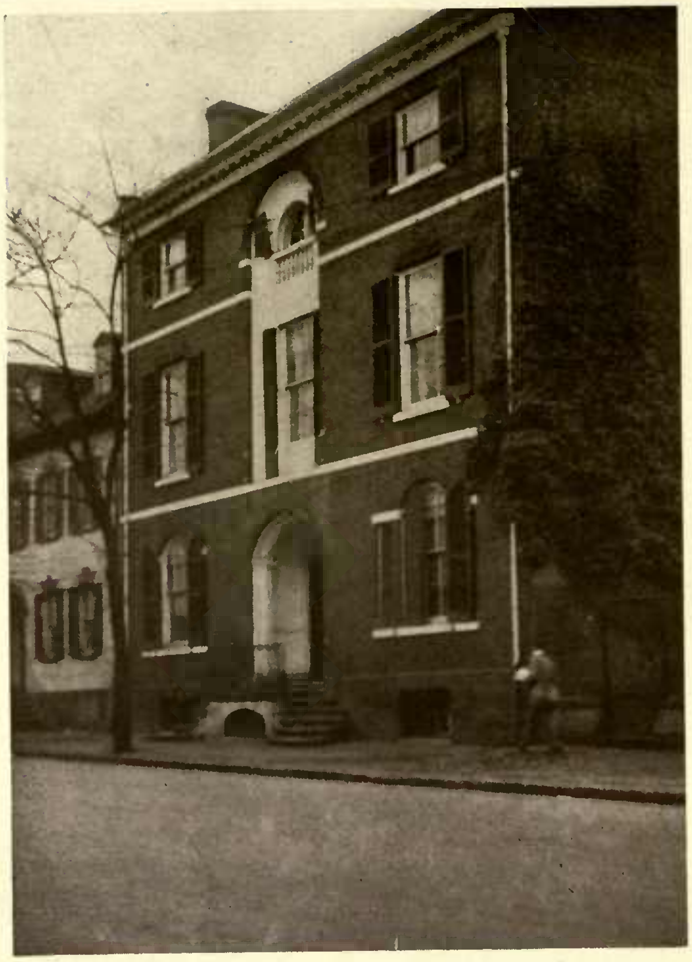
(*Continued on page* 194)

Piermont, N. J. W. G. French, photo



CHÂTEAU DE CHAMBORD.

ROMA. PALAZZO AND PIAZZA FARNESE.



Alexandria, Va. W. G. French, photo.

(*Continued from page* 192)

curious structures as the manor-house, Fonthill Abbey, known as "Beckford's Folly." Beckford is said to have instructed his architect to design "an ornamental building that should have the appearance of a convent, be partly in ruins, and yet contain some weather-proof apartments." The High Church or Tractarian movement gave a great impetus to the Gothic revival till critics and a large body of the public came to look upon the pointed arch, the buttress, and other features of the Gothic style as inherently sacred and the forms of classic architecture as pagan if not really idolatrous. Some earnest and capable men worked in the style, among whom should be mentioned Sir Charles Barry, Sir Gilbert Scott, and George Edmond Street, who, in the Parliament Houses at Westminster, the restoration of numerous cathedrals, and the law-courts of London, showed great archæological knowledge and some skill in clothing modern structures in a mediæval garb. Geoffrey Scott, discussing the Gothic revival in his "Architecture of Humanism," says, with considerable keenness of insight: "Technic, organization, vigor, understanding—everything, in fact, were wanting to it. It illustrates, as abundantly as one could wish, the effect upon architecture of an exclusively literary attitude of mind."

A comprehensive review of recent British architecture remains to be written. Although much of an uncomplimentary character might be said of the mid-Victorian work, the last decade of the nineteenth century and the period immediately preceding the Great War saw a revival in both taste and creative ability on the part of public and practitioner. Much inspiring and sincere work was done, as evidenced by churches and houses in all parts of the kingdom. Bentley's great Roman Catholic Cathedral at Westminster, Bodley's church at Hoar Cross, and Lorimer's delightful chapel of the Order of the Thistle at Edinburgh occur to all; while the domestic works of Lutyens, Lorimer, Voysey, Dawber, Willmott, and others are too numerous to mention. Something of French logic and monumentality seems gradually to be finding its way into English architecture, without displacing the traditions of Wren and Gibbs, in many public works, or the delightful feeling for surfaces and textures in the lesser structures.

The history of architecture in America I hardly need review. Our Colonial work was based largely upon Georgian precedent, but was handled with a propriety and understanding that arouse the envy and admiration of many present-day architects. One needs but travel along the Eastern seaboard from Portsmouth to Charleston, South Carolina, to perceive the frankness with which the climatical conditions and social requirements were met in the different localities, and the cleverness, even elegance, incorporated in buildings of various kinds.

In the work of the classic revival there was, doubtless, a pedantry and a forcing of the practical solution of the problem to fit a preconceived exterior, but after all there is a fine dignity in these old structures which makes it hard for us to understand how popular taste and architectural fashion could stoop to the atrocities of the period succeeding the Civil War that has been designated as the "Reign of Terror" of our architectural history. Mr. Winston Churchill's comments on the house of a rich man, in "The Celebrity," would fit many buildings that we all can remember. The rich man says: "I had all these ideas I gathered knocking about the world, and I gave them to Willis of Philadelphia to put together for me. But he's honest enough not to claim the house. Take, for instance, that minaret business on the west; I picked that up from a mosque in Algiers. The oriel just this side is whole cloth from Haddon Hall, and the galleried porch next it from a Florentine villa. The conical capped towers I got from a French château, and some of the features on the south from a Buddhist temple in Japan. Only a little blending and grouping were necessary, and Willis calls himself an architect and wasn't equal to it. Now," he added, "get the effect. Did you ever see another house like it?"

The Gothic revival, well shown in Grace and Trinity Churches and St. Patrick's Cathedral, was largely a counterpart of the same movement in Europe. Such later Gothic buildings as the Church of St. Thomas and certain collegiate works are hardly to be classed in this group, for the spirit of the old style has been so merged in our present-day life that the work exhibits great vitality and appropriateness.

Our recent architecture has shown a decided tendency toward eclecticism, with a leaning at one time to the French Romanesque, as in the works of Richardson and his followers; later to the Italian Renaissance under the able leadership of McKim, Mead & White, Charles Platt, and others; and has also been influenced by modern French, Elizabethan, Georgian, and even the Secession work of Germany.

Notwithstanding all this eclecticism and apparent lack of conviction, American architects have succeeded in developing new and logical methods of construction and in producing not only impressive and practical tall buildings but civic structures and homes rarely equalled among European works. Some of us feel that there is an underlying principle of unity gradually taking shape in American architecture, and if the much-vaunted and perhaps, too consciously desired American style has not appeared, who can say that it is not in process of formation? A recent writer has said truly: "If there is anything that a survey of the history of architecture shows clearly, it is that all that is great in architecture has arisen from the desire to do something fine and noble for its own sake; and where there is not that desire there will be no great architecture."

Probably we are too near present-day work fully to understand it, but we may be sure that, whether we will it or not, our architecture is a record of our progress. Whether it shall record our best aspirations or, as too often happens in America, an overwhelming mediocrity, depends by no means solely upon our architects, but upon the development of an appreciative interest on the part of cultured people generally, and especially of our leaders in thought and action.

Exhibition building. Propylæa, Munich. Glyptothek.

Announcements

Oscar T. Lang, Arnold I. Raugland, and Carroll E. Lewis announce the opening of an office for the practice of architecture and engineering under the name of Lang, Raugland & Lewis, Architects and Engineers, 627 Metropolitan Bank Building, Minneapolis, Minn. Manufacturers' catalogues and samples desired.

Andrew J. Thomas, architect, announces that, beginning May 1, 1922, his office will be located at 15 East 47th Street, New York City.

Thomas Pringle, M. A. I. A., registered architect, announces the removal of his offices to 705–706 Renshaw Building, 217 Ninth Street, Pittsburgh, Pa.

R. Guastavino Co., announce the removal of their New York office to the St. James Building, 1133 Broadway, New York, on May 1, 1922.

Richard E. Schmidt, Garden & Martin, architects, announce the removal of their offices on May 1, from the 11th to the 15th and 16th floors of the Monroe Building (entrance at room 1515), 104 South Michigan Avenue, Chicago, Ill.

Charles Glenn, building construction, announces the removal of his office to 252 West 46th Street, New York.

"How to Build a Better Home," is the title of a book on building issued for free distribution by the Copper and Brass Research Association of 25 Broadway, New York City. The book is attractively illustrated and contains information of value to every prospective home-builder. Each phase of the home is dealt with in a most thorough manner. It offers various suggestions as well as answering many questions that confront the home-builder. A chapter is devoted to the roofing problem. Illustrations show various types and the proper manner to apply the material. One of the striking features in this chapter is a picture of a copper down spout that has been in use for seventy-six years and is in a perfect state of preservation. Another picture shows a costly junk pile of discarded galvanized iron down spouts that had only been in use a few years when the weather brought them to ruin. Another interesting chapter pertains to plumbing; one to hardware fixtures; one to heating and another to decorations, etc. The contention is made that the everlasting metals—copper, brass, and bronze—would be universally used if it were not for their slightly higher cost.

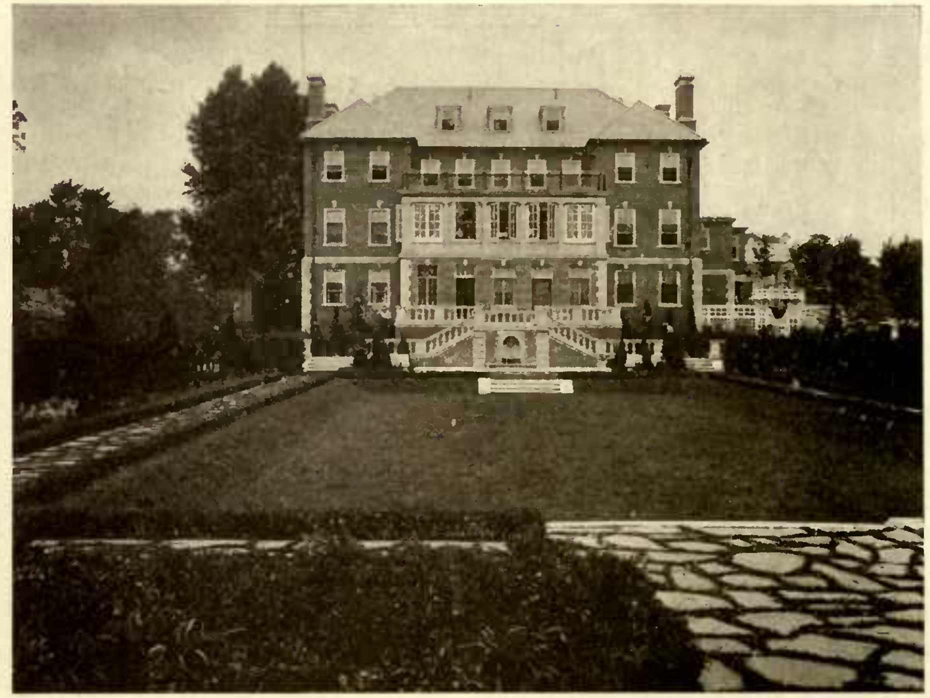
James Chillman, Jr., has been appointed assistant professor in architectual design at Carnegie Institute of Technology, Pittsburgh. Mr. Chillman, for the past three years, has been studying at the American Academy at Rome, as the holder of the Roman Prize Fellowship. His work at Carnegie Tech will begin next September.

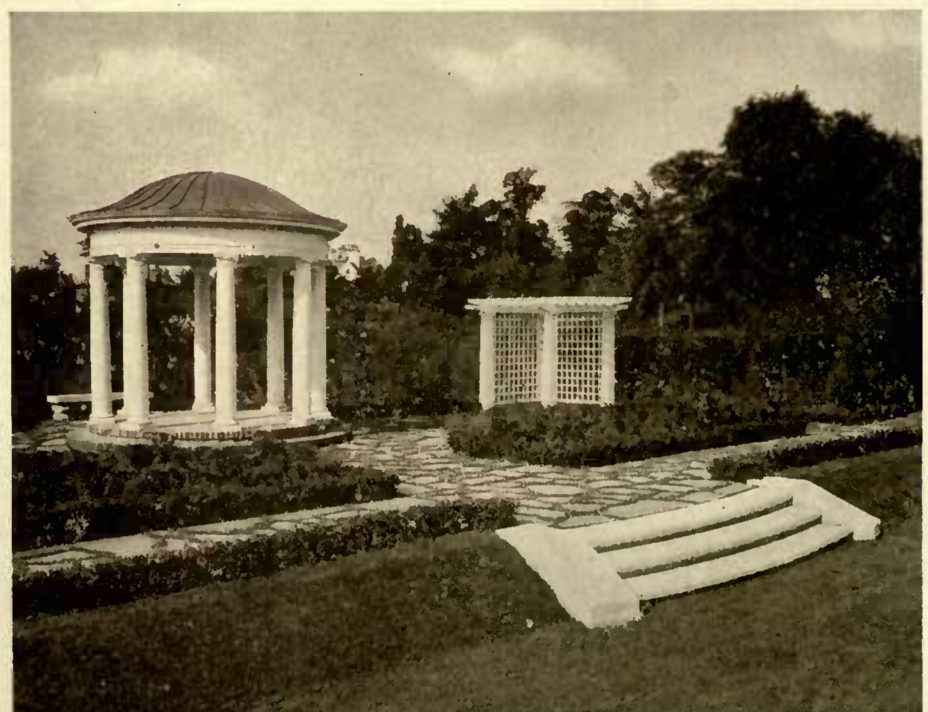
He is a graduate of University of Pennsylvania in the class of 1914, with the degree of Master of Arts. For some time he was an instructor at the University of Pennsylvania, and for several years was instructor in architecture at the Rice Institute, Houston, Texas.

His studies in Rome have been of the Italian Renaissance in its relation to Colonial architecture. Mr. Chillman has also done some important research and restoration work at Hadrian's Villa, in Tivoli. The appointment of Mr. Chillman is expected to add strength to an already strong department.

Mr. Bickel, formerly of May Building, Pittsburgh, Pa., announces his new address, Walter J. Bickel, registered architect, Box 197, Route 3, Phœnix, Arizona.

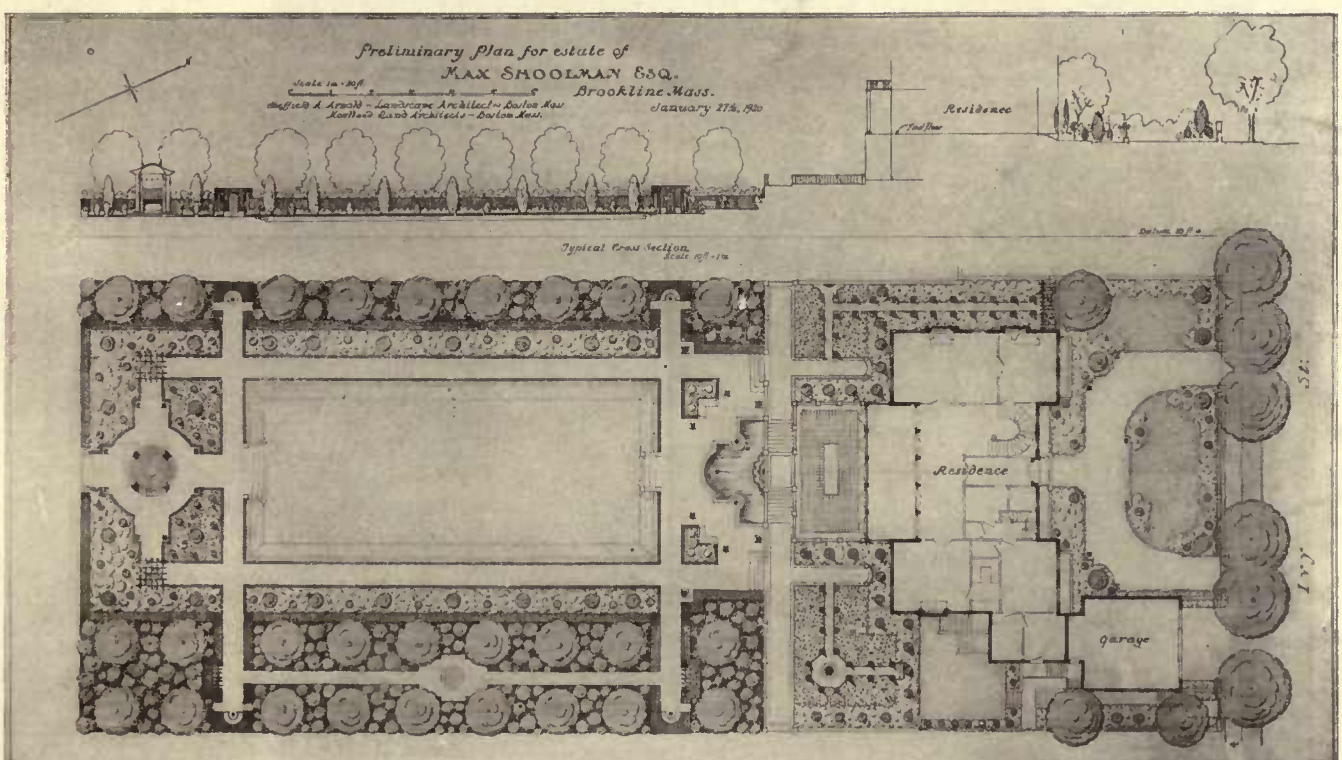
Welsey P. Ridenour announces the opening of an office for the practice of the profession of architecture in room 711, First National Bank Building, Portsmouth, Ohio.





RESIDENCE, MAX SHOOLMAN, BROOKLINE, MASS.

Mowll & Rand, Architects. Sheffield A. Arnold, Landscape Architect.



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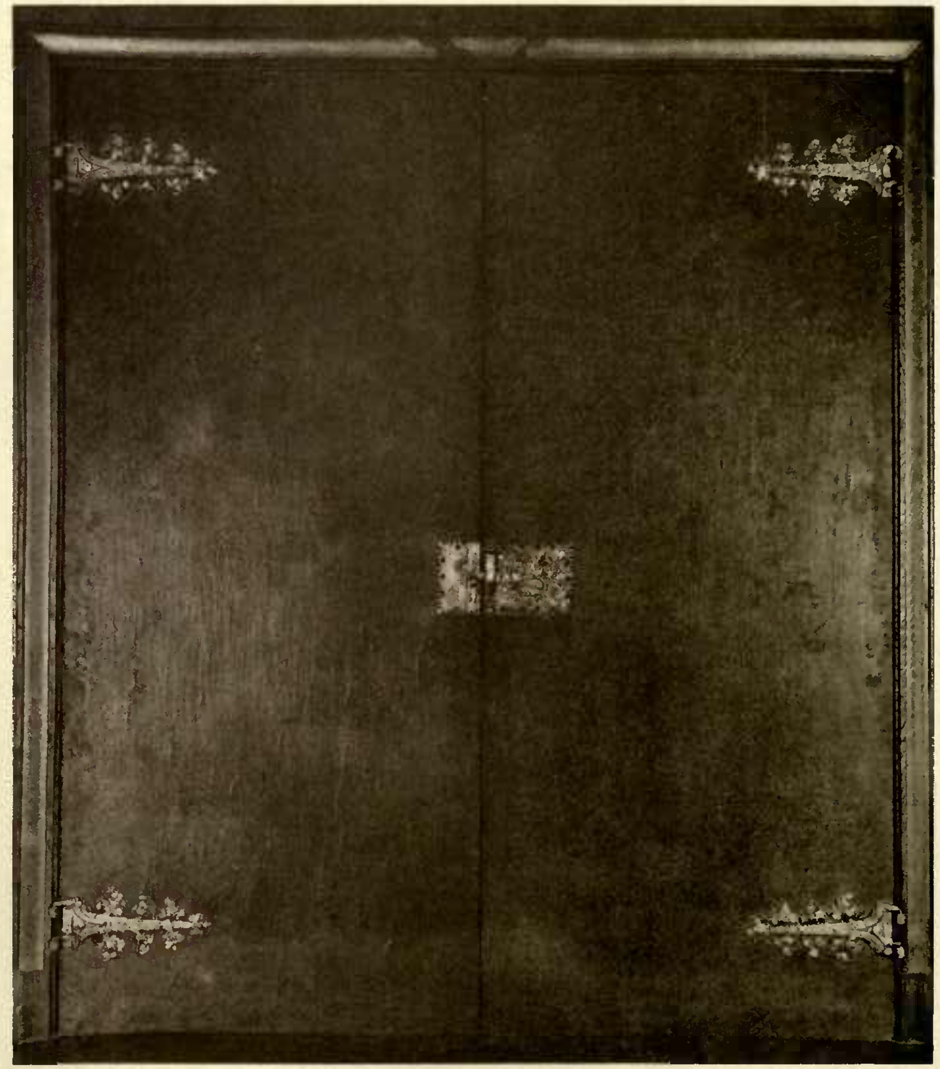


A PAIR OF PAINTED DOORS. By Eyre de Lanux (Mrs. Pierre de Lanux).

The painted doors consist of six panels, representing the life of Sainte Marie l'Egyptienne (now the patron saint of the gypsies). On the margin of the four smaller ones, the story of the saint is written in old French, with letters found on a Lombardian manuscript of 1337 at the Morgan Library. The subjects of the panels are the following:

I. Marie leaves home, at the age of twelve, going to Alexandria.

II. In Alexandria, Marie lives as a courtesan and receives a brilliant company.

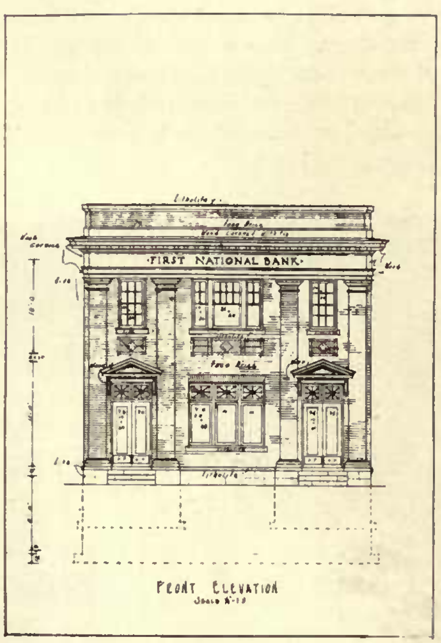
III. Marie crosses the sea with some pilgrims, bound for Jerusalem.

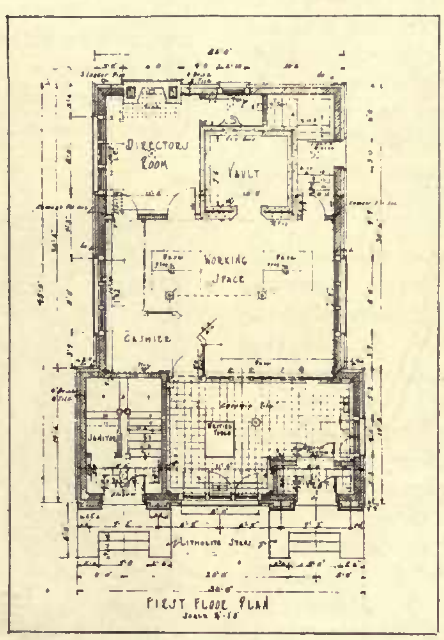
IV. Marie is found dead in the desert by Zosimus, after she has lived a holy life there for many years. A lion helps Zosimus to bury the corpse.

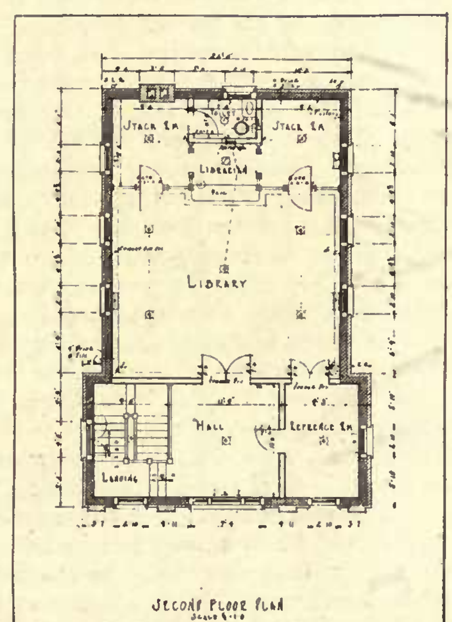
V. (Large panel in the centre of the left door.) Marie enters Jerusalem and walks toward the temple.

VI. (Large panel of the right door.) Marie in heaven, among the elect.

The doors, of seasoned oak, have been first gessoed, according to the old teaching, then painted in tempera, with a frequent use of gold-leafing for the backgrounds, garments of wealthy persons, etc. Special latches and hinges have been designed.







FIRST NATIONAL BANK

BANK AND LIBRARY BUILDING, MARCELLUS, N. Y. Harry D. Phœnix, Architect.

Use of Models in the Study of Architecture

By Professor William Alciphron Boring
Director, School of Architecture, Columbia University

No. 1. Painting the elevations of the various sides of the model upon mounted Whatman paper.

THE teaching of architecture, like all thorough instruction, is directed more to training the student to use his imagination, to think soundly, and to visualize correctly than it is to give them facility in technic. If we can inculcate a high ideal, a logical method of solving a problem, and a respect for beautiful form, we will have accomplished the main purpose, and the student can safely be left to pursue his work alone after he leaves the university.

Architecture is a subject which as a matter of convenience must be taught by drawings and models as well as by observation of the erected buildings, but the end and aim of architectural instruction is to teach the students to build good buildings rather than to make beautiful drawings. To this end they must be able to visualize their conceptions in form of three dimensions instead of thinking of them as drawings. Drawing usually teaches the student to think in two dimensions, like plane geometry, but architecture really exists in three dimensions, like solid geometry.

Facility in drawing is necessary as one of the processes of study, but after the process passes a certain point the importance of the drawings grows less, and the actual round form of the building becomes more important. At this stage it appears advisable to introduce the making of models which really represent, in small scale, the building "in the round," and permit a study of the structure from all points of view. The nearest approach to a correct concept of the finished structure is thus given in a practicable form.

If it were not too expensive in time and money all buildings should be first tried out in full-sized models properly colored, so that they could be studied carefully before the work is executed. It is a common practice to have the cornice erected in model and studied from the street level before the actual cornice is built. Since it is impractical, however, to carry out this plan for the usual problem, the most feasible substitute is a small-scale model which represents the design.

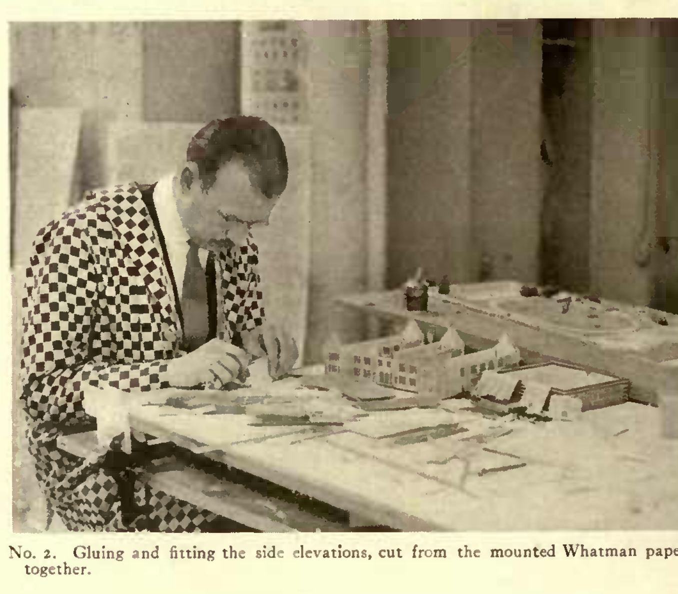
Drawings of a building, after all, might be considered as guesses as to how to represent a thing in drawings which will look well in a finished building, except in cases where a known and tested detail is used, and the best architect is the man who can best guess as to what will be the effect in the round of a drawing in the flat.

The Japanese architects for their simple buildings draw plans and elevations of their buildings on one sheet so arranged that the sides fold up, thus forming a model of the house with the roof folding over the side walls. The details of the exterior are drawn on the outside of the sheet, making an exterior model, and the insides of the rooms are drawn on the inside of the sheet, showing the actual detail of the interior. These drawings fold down flat in a neat package, but when shown to the workman or client are set up to form a good model of the real structure. We, having more complicated buildings, cannot follow this method exactly, but we can with cardboard make models which will serve a similar purpose.

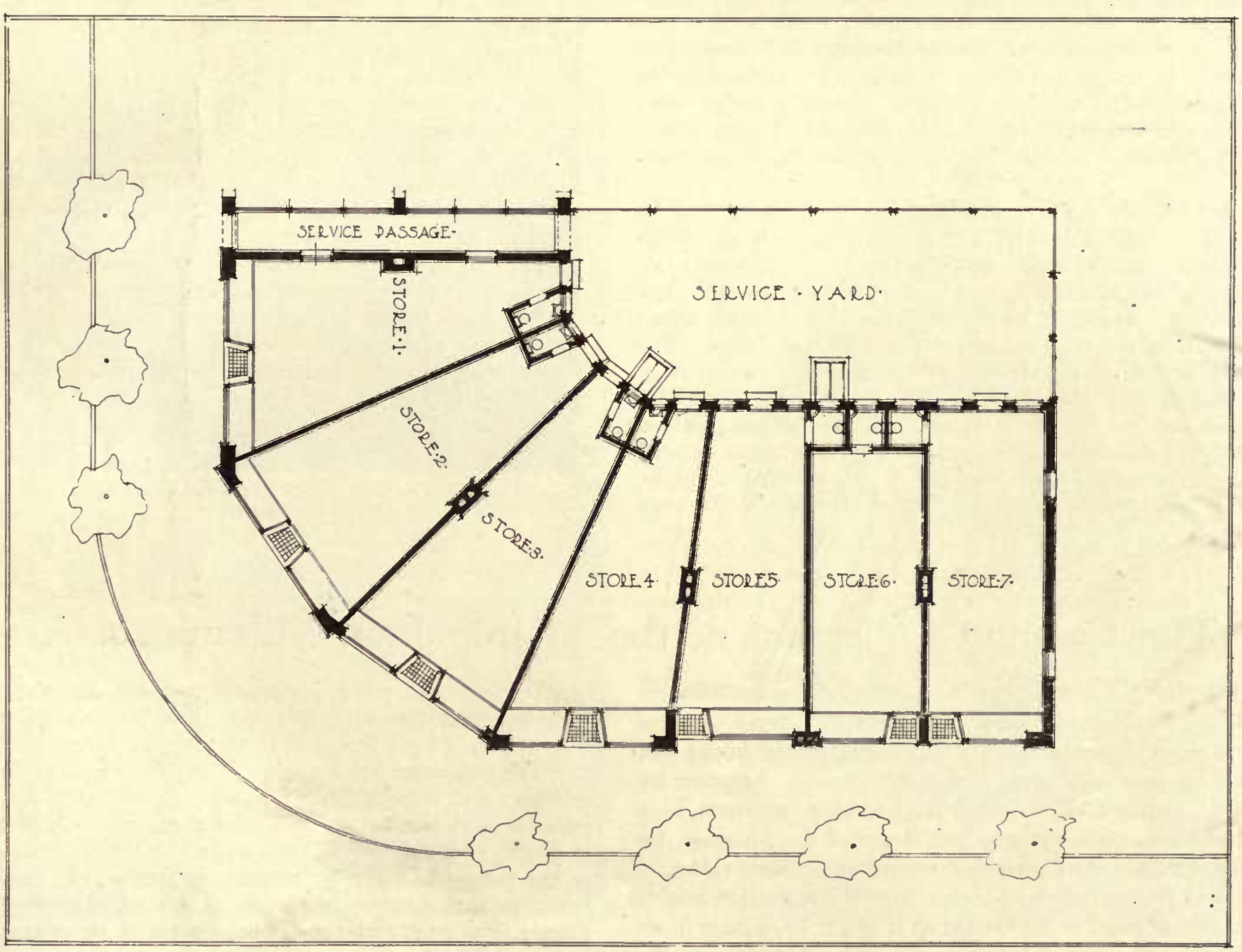
In the olden times, when there were competitions for important buildings, competing architects always submitted models. A very elaborate one is still in existence in St. Peter's at Rome, and in the museums of Italy will be found numerous models on a small scale. These models were usually made laboriously of wood. In religious paintings we often see pictures of models of churches rather than drawings of churches. The old masters did not make elaborate drawings as we do to-day, but depended more upon the use of simple outline drawings and modelling for the working out of problems.

The greatest value of a model is to show the scale of the projections of parts and details of buildings which cannot well be shown by drawings. Perspective drawings show well from one point of view, but a model shows accurately from every point of view, giving the exact relation of projections which can be judged more accurately from a model

(Continued on page 202)



No. 2. Gluing and fitting the side elevations, cut from the mounted Whatman paper, together.



GROUP OF SMALL SHOPS, MONTCLAIR, N. J. C. C. Wendehack, Architect.

No. 3. A group of three models of a schoolhouse group with gymnasium made by competing teams of students. They show three different solutions of the same problem.

(*Continued from page* 200)

than from any drawing. If a completed model is observed with the eye at the correct level, particularly if viewed through a small hole in a card, the simulation of the completed building in the natural size is convincing and a correct method of criticising and judging the design. The model is useful especially in Gothic work, which involves the use of many planes at various angles that cannot well be shown in drawings.

If he has a natural facility in drawing, the student is likely to become enamored of that phase of the study of architecture, and is inclined to permit the pleasure of representation to crowd out the real study of the actual appearance of the building represented, and for that reason the School of Architecture of Columbia University is emphasizing the necessity of close observation and comparison of actual buildings and forms. Students are trained to see buildings and to think in terms of buildings rather than in terms of drawings, but this is not carried to a degree which detracts from the true value of drawing in composition.

Models are easily made, they are inexpensive, can be colored without difficulty, and surrounded with all of the accessories, such as trees, walks, grass, etc., they give a fair picture of the building as it will be when completed. The making of a model of an ordinary building occupies about one-third of the time necessary to make the design. The plan is accurately drawn to scale on cardboard, and cut on the outside line, the elevations are drawn with details indicated and erected on the plan, and over this the roof is fitted. The student thus goes through the same general motions pursued by the builder in constructing a house, that is, first the foundation is built, then the walls, then the roof. If some part does not satisfy the critic, it is easily changed in the model until a perfect result is attained with precision, provided the designer is capable of producing a good building. There are two kinds of models which the student should learn. One is the scale model of the building which will show in its entirety a large structure in a model not too large for a table-top; and the other is the accurate modelling of the details of ornament which are to form parts of the building.

In developing the detail models we have in Columbia a sculptor of marked ability in charge of instruction in modelling, who gives the students in this course a correct idea of the beauty of form and design in clay-modelling.

The wonderfully facile drawing of architecture taught by the French school of to-day does not give a correct idea of the building when built, because it is not studied from the point of view of the constructed building, but from the point of view of a picture. It is noticeable that men from the Ecole des Beaux Arts usually go through a moulting season when they return to America, dropping much of their facile indication and substituting careful study of real form and simplicity.

Our best architects have never been known as great picture-makers, and our most successful practitioners lay the greatest stress upon the building itself as studied in model as well as drawings. Study of the drawings by the great masters of the Renaissance in the Uffizi Gallery at Florence and of the models made for their buildings easily convinces one that this method of study and representation is necessary if one is to produce a beautiful building.

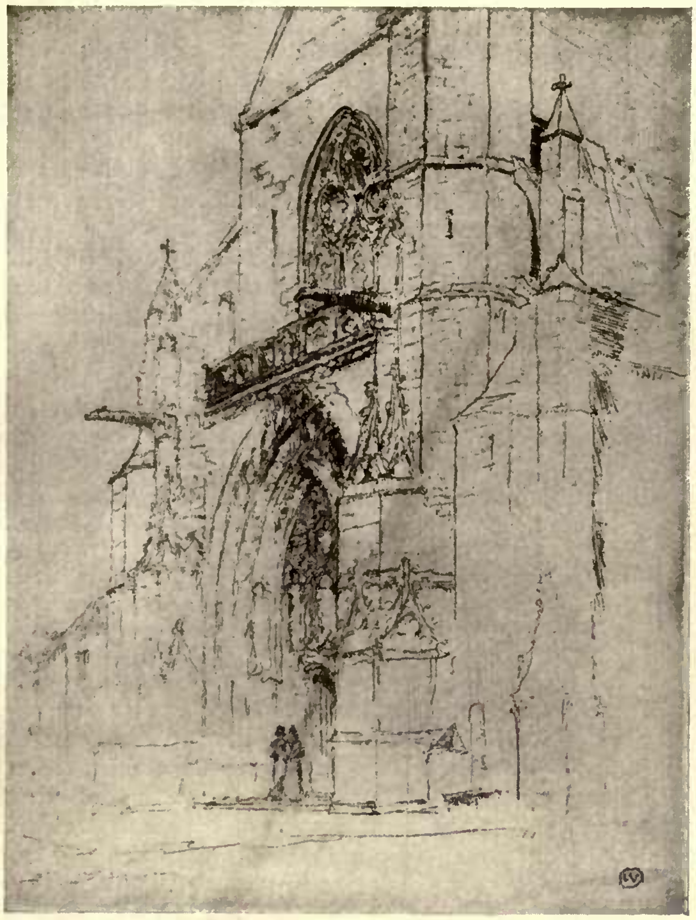
No. 4. A close view of the model of one of the schoolhouses, showing the realistic effect that painting and shadow will produce in the details.

The Codman Collection at the Metropolitan Museum of Art

AMONG the little-known advantages for manufacturers and designers which are almost within arm's reach of the desk or drafting-room, is the collection of books and prints of ornament lent to the Metropolitan Museum by Ogden Codman. This collection has been arranged in a special room adjoining the Print Room of the Museum, for which Mr. Codman provided bookcases, chairs, tables, a rug, and framed prints, in order that the collection might, as nearly as possible, be housed as it might have been in an architect's or interior decorator's working library. As the collection is intended only as a reference collection for mature students and practising members of the several professions that use this kind of material, it is proposed to let those persons have free access to the shelves.

The collection was made for his own use by a practising architect and interior decorator who happens also to be a collector and bibliophile, and who therefore took pleasure in adding to his shelves as need and opportunity arose many of the rarer and more noteworthy as well as the more familiar printed documents bearing on his art as practised in France, England, and the United States in the eighteenth and early nineteenth centuries.

From the Bulletin of the Metropolitan Museum of Art.



A CHURCH IN FRANCE.

SOISSONS CATHEDRAL BEFORE THE WAR.

OLD BRIDGE AT TOURNAI, BELGIUM.

GATE—ROTHENBERG.

Etchings by Lester E. Varian, Architect, Denver, Colo.

Uniting the Construction Industry for the Common Good

FOR the first time in the history of American industrial development a great industry has united all its elements—manufacturers, labor, and the professional branches—in a great effort to raise the standards and efficiency of the industry and improve the service which it renders the public. It dips down into the industry and brings together for conference, for betterment of understanding, and for common action, the architects, the engineers, labor contractors, materials manufacturers and dealers, bankers, and insurance men—all elements concerned with building work of any description and with the construction of public works, railroads, bridges, irrigation works, etc.

It is stipulated that all the work of the council must square with the public welfare, and so dominant has this idea been in the preliminary conferences that Secretary of Commerce Hoover, seeing the benefits that will result, has taken the responsibility of presiding at the formal organizing meeting in Washington, D. C., June 19 and 20, and Franklin D. Roosevelt, of New York, former assistant secretary of the navy, has agreed to accept the presidency of the organization.

The possibilities of the new organization are tremendous. If the reader were asked to tell what construction really is, the reply would probably be, "housing" or "plant construction and commercial building" or "highways and bridges, railroads and canals" or perhaps "terminals for railroads and ship traffic or irrigation and reclamation projects." Yet all of these are merely divisions or classifications of a single industry and should always be included in the thought of the whole.

Instead of thinking of the building of houses as the individual expression of the fancy of the individual citizens, of the building of highways and railroads as merely the means of an industry we call transportation, of factory building and hydroelectric construction as isolated enterprises embarked in by isolated groups of individuals for private gain, we must think of construction as we do of agriculture, or of mining, or of manufacturing—as one of the great creators of permanent wealth, as one of the foundation-stones in our civilization on which our progress is built.

Already indications of this are evident. Construction reports have become equal to crop reports as barometric indicators of the material prosperity of the country. On their rise and fall depends the well-being of millions of our people, the success of great enterprises, the future welfare of our citizens.

The popular belief is that American industry is divided into four basic industries: (1) agriculture, (2) manufacture, (3) transportation and communication, (4) mining and forestry. Such a classification leaves out of consideration, however, what has been demonstrated after investigation to be the second most important industry in the country, namely, construction. When considered from the standpoint of the yearly volume and money involved, this comes second only to agriculture and is among the first of all industries when expressed in terms of the labor. Investigation has shown that the number of workers, who together with their families depend upon the construction industry for a livelihood, totals approximately 11,000,000 persons. It was conservatively estimated that 24 per cent of our annual capital accumulation and over 50 per cent of our national savings are absorbed by this great industry every normal year. Approximately nine-tenths of all iron, copper, and zinc and 95 per cent of all the lead produced in this country are consumed in construction.

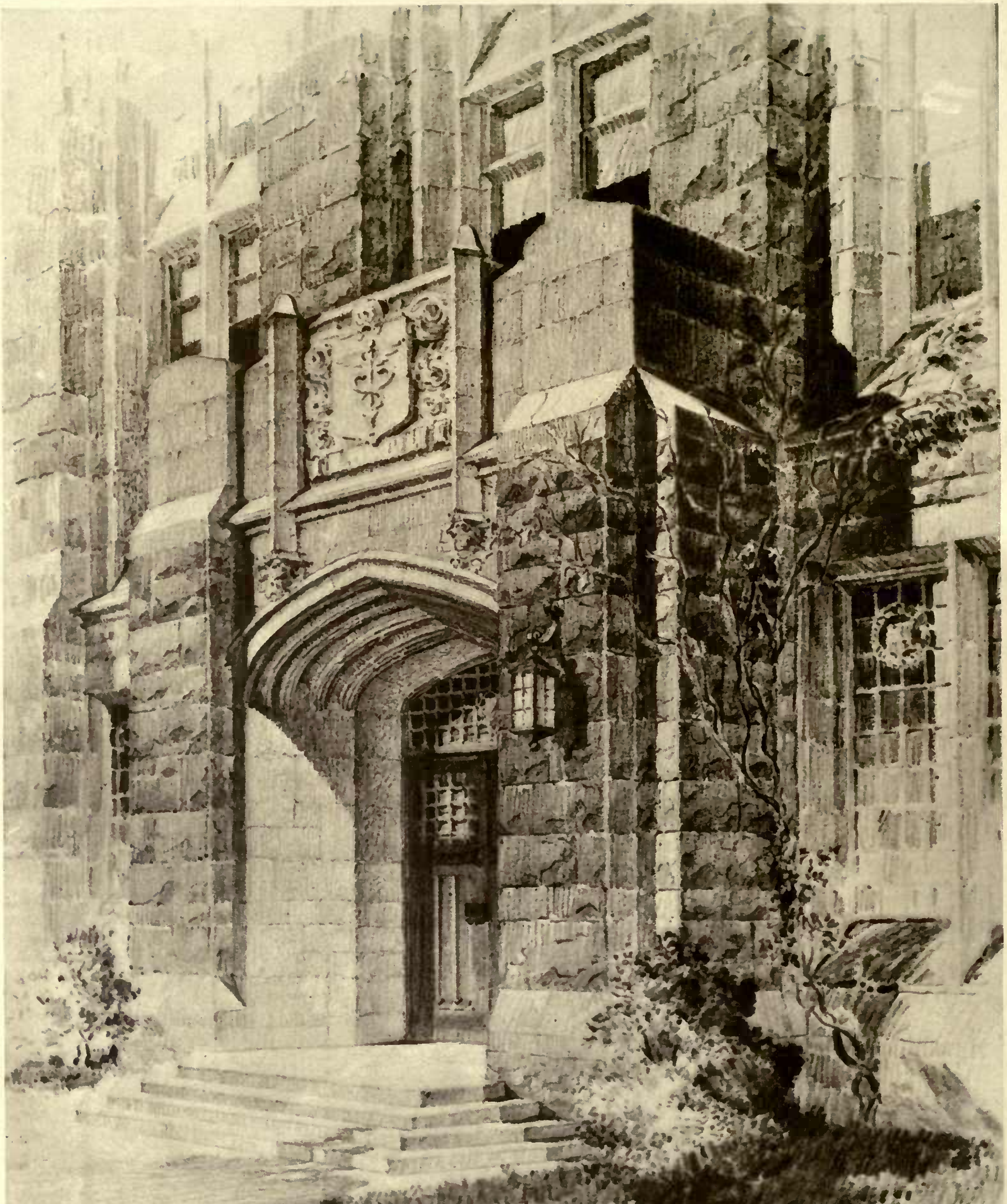
The support given to agriculture and to trade by the annual expenditures of this great number of persons is almost too apparent to need discussion. The following table shows the way in which over $5,000,000,000 are disbursed and gives an excellent idea of the wide range of benefit from the expenditure of wages paid in the construction industry. The proportions are those established by the National Industrial Conference Board.

Rent	$756,500,000
Fuel and light	214,500,000
Food	1,598,500,000
Clothing	663,000,000
Medical attention	113,000,000
Reading matter	41,500,000
Church and charity	46,500,000
Furniture, furnishings, and general supplies	126,000,000
Recreation	229,500,000
Savings	600,000,000
Unclassified	601,000,000

Yet in this mighty industry each element has, with rare exceptions, acted by itself, looking after its own interest, neglectful generally of the rights of the other elements, and often indifferent to the rights of the public.

Since the war this lack of co-ordination, of actual understanding, and of consideration of the service rendered the public has stood out more strongly than before. During the war it was necessary to postpone all but essential construction, leaving us, at the close of 1919, with an enormous deferred volume of construction work. In 1920 we began to catch up, to fall back again in 1921; to-day we have a deferred total valued by students of the industry at $10,000,000,000. Of the housing shortage, an important part of this deferred construction, the general public is well aware. Yet the shortage exists in every line of construction. We have not enough office-buildings or schools, railroads or highways, while sewerage, water-supply systems, and paving are far behind present needs. This shortage has put great pressure on every branch of the industry and has forced it to study anew its relationship to the whole. Moreover, the public has lacked confidence in the fairness of building costs and this has added to the pressure put upon the industry. Not only has each of the elements been re-examining its position and responsibility, but efforts at co-ordinated work have been made. The National Federation of Construction Industries, a war-born organization, was continued after the armistice in an effort to pull the industry together nationally, and has achieved some excellent results. The building congresses, with notable successes at New York, Seattle, and Portland, Oregon, attacked the problem locally. The National Board for Jurisdictional Awards representing labor, contractors, architects, and engineers, and the Joint Conferences of Engineers, Architects, and Contractors on Estimating and on Standard Contracts have each tackled specific problems common to the whole industry and demonstrated the need as well as the practicability of co-operation for the good of all.

THE premiated design for the great north window of the West Point Military Chapel is being carried out at the Willet Studios in Philadelphia. The window is to be a memorial for the alumni who died in the World War. The design is the collaborative work of the late William Willet and Annie Lee Willet.



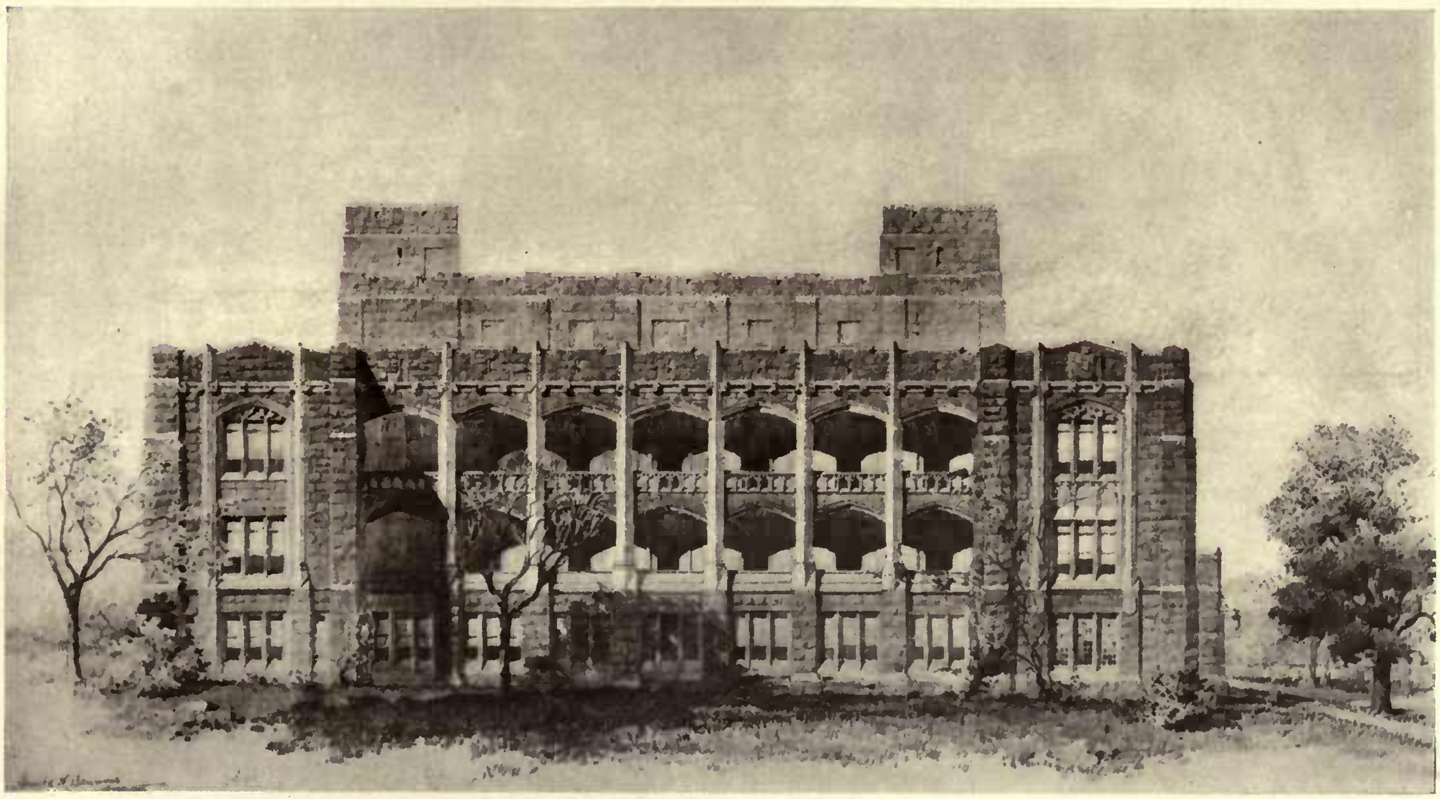
MAIN ENTRANCE, CADET HOSPITAL, UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y.

Arnold W. Brunner, Architect

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI JVLY, 1922 NO. 1

Cadet Hospital, U. S. Military Academy, West Point, N. Y.

Arnold W. Brunner, Architect



South elevation, Cadet Hospital, U. S. Military Academy, West Point, N. Y.

THE United States Military Academy at West Point occupies a commanding site on the west bank of the Hudson River and when viewed from a distance presents a most unusual and picturesque appearance.

When we approach it from the steamboat-landing we follow the road that skirts the Riding Hall, winds around the Administration Building and Post Headquarters, passes under a great arch and curves up to a plateau on the higher level.

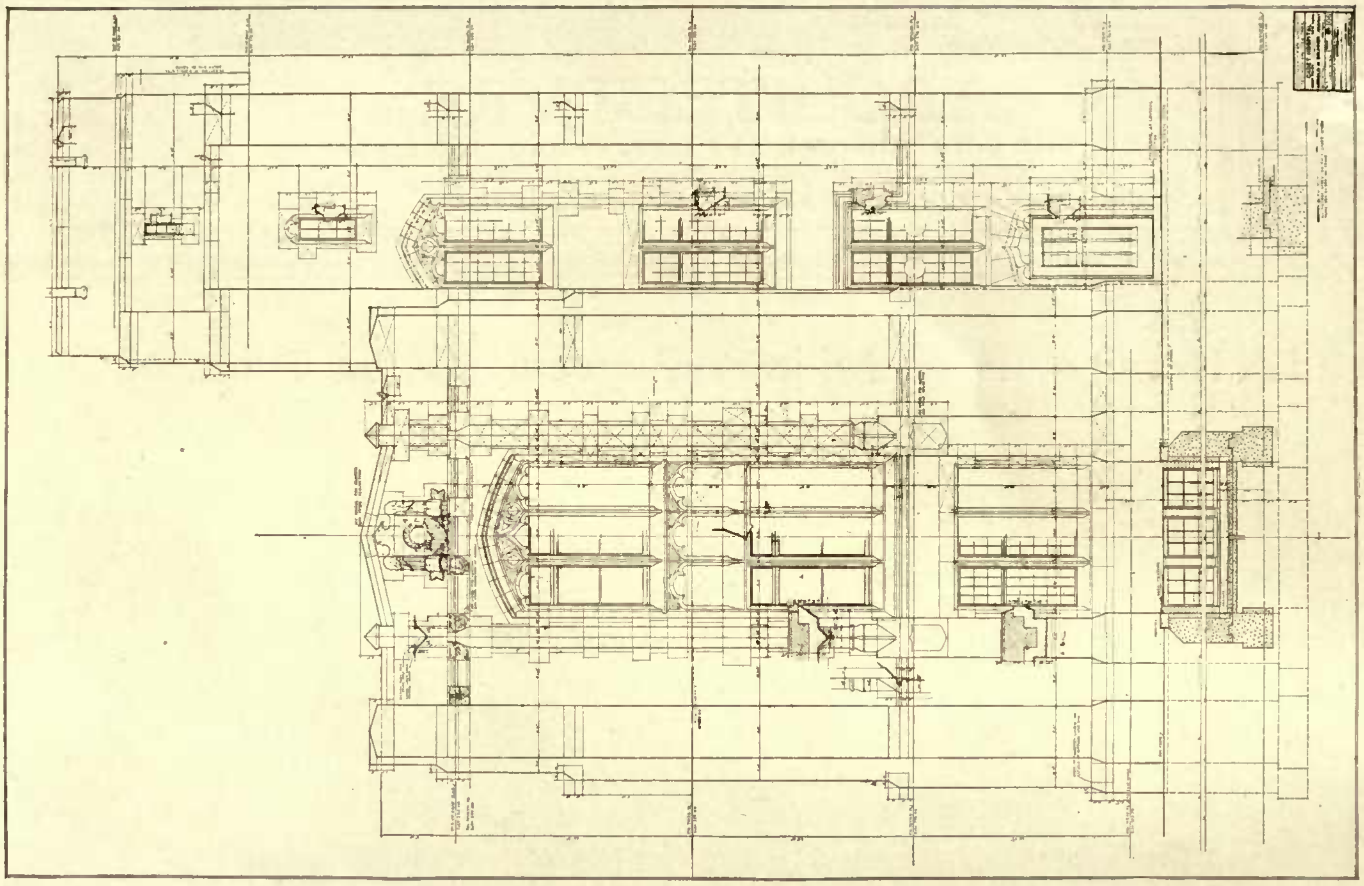
Here we find the Academic Buildings massed around great open spaces, the Parade, the Athletic Field, perfect roads and splendid trees. Many of the buildings are of considerable age, others of more recent date, and they form a notable group, remarkable for a certain quality, difficult to define, but essentially characteristic of West Point.

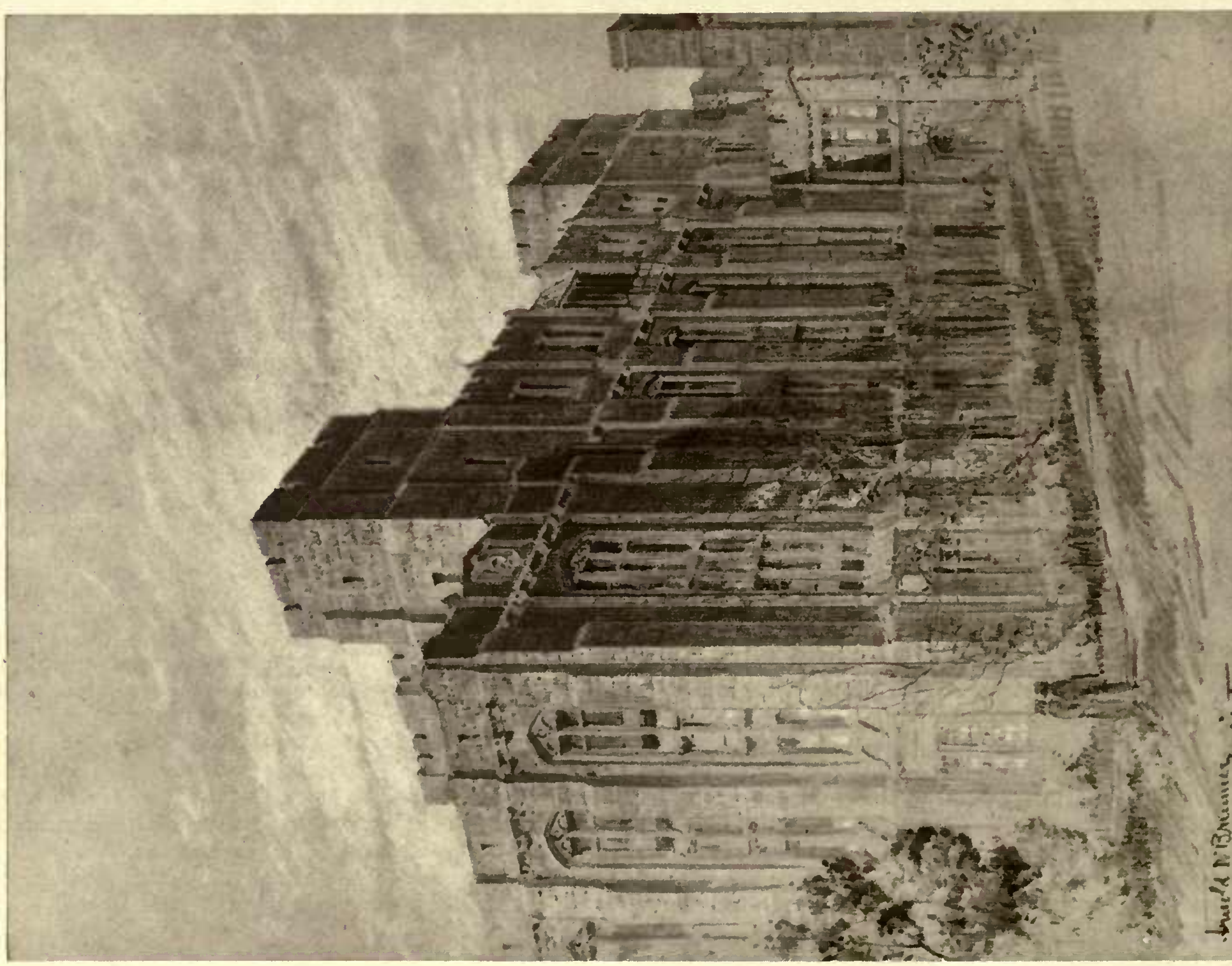
This picturesque quality which is so marked when the group is viewed from the river is not lost on closer inspection. With few exceptions these buildings are what may be called "Military Gothic," or variations of it, and a serious effort has been made to design the new Cadet Hospital so that it will conform to the spirit of the group, harmonize with it, and take its place in the composition without quarrelling with its neighbors.

The same materials have been employed in its construction and the same combination of rough native stone with tooled limestone that have been generally used are here adopted so the new hospital will not appear as an architectural stranger.

Military Gothic, or any variety of Gothic, did not at first seem to be exactly suitable for a hospital, but after considerable study it was found entirely possible to retain the essentials of the style and at the same time meet the requirements of modern hospital construction.

As may be seen by the plan the wards and private rooms are properly proportioned and well lighted. The



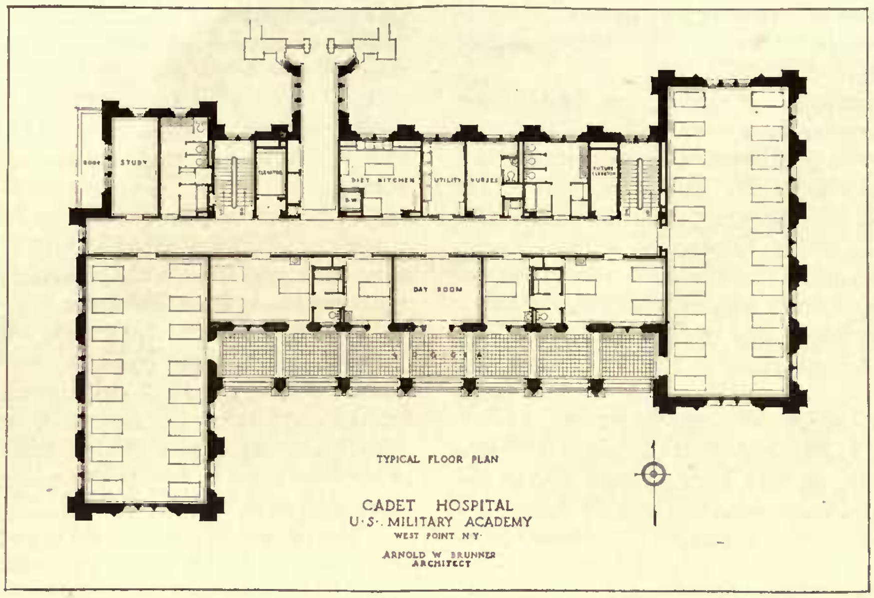


PERSPECTIVE, NORTHEAST CORNER, CADET HOSPITAL, U. S. MILITARY ACADEMY, WEST POINT, N. Y.

Arnold W. Brunner, Architect.

windows present on the inside square heads with the necessary transoms. The towers are not merely for ornament but are utilized for stairs and elevators. Generally there are no dark corners, no waste spaces, and no unnecessary extravagance.

Very little carving has been used on the exterior; what there is of it, such as the ornamentation of the entrance-porch and the stone corbels in the moulded course above the third story, has been skilfully modelled by Mr. C. H. Humphriss, who has caught the Gothic spirit.



The present hospital is not to be abandoned, but its interior arrangement will be altered, and it will be connected with the new building, which will adjoin it on the south.

The enlargement of the Cadet Hospital at West Point was made necessary by the very considerable increase in the corps of cadets in recent years. Facilities were also much needed to carry on X-ray and other diagnostic and treatment procedures, which were not provided for at the time the present building was constructed, many years ago. The new building is, in effect, a complete hospital. The old building will be made use of for dental clinics, offices, quarters for personnel, and for storage of supplies.

The hospital is intended to provide all the facilities for the treatment of cases of illness and injury which may arise among the corps of cadets and among the officers and civilian population, which number altogether about three thousand. The bed capacity will be about one hundred, with the possibility of expansion in emergency to about one hundred and forty beds.

The basement provides for storage of medical and surgical supplies, an issue storeroom, a clothing-room, a post-mortem room, and a morgue.

The first floor contains administrative and record offices and the out-patient clinic. Near the ambulance entrance at the rear is located the admission ward, with provision for the care of medical and surgical emergencies, and with beds for isolation and observation. A room is provided in which physical examinations of men in large groups can be carried on. Adequate provision is made for electro and hydro therapeutic treatment, eye, ear, nose and throat, and X-ray work. The laboratory will furnish facilities for carrying on the usual work of a hospital of this size.

Both the second and third floors are ward floors. Each has two main wards with four smaller wards, or private rooms. Large doors open from all wards and private rooms on to porches, with southern exposure. Two study rooms are provided on each floor. Diets will be taken from the main kitchen in insulated containers, carried by dumbwaiter to the diet-kitchens, where the trays will be prepared. Diet-kitchens will be provided with gas-range, with oven and plate-warmer, serving-table, refrigerator, dish-closet, tray-racks, and carriages. Utility rooms will be fully equipped with the usual number of approved fixtures.

On the fourth floor is located the operating suite, consisting of operating-room, sterilizing, dressing, and instrument rooms, and a room for the treatment of septic cases. At either end of the suite are dressing-rooms for nurses and surgeon, each provided with lockers, showers, and lavatory. A roof-garden is provided for on this floor, with southern exposure, readily accessible by elevator.

Work on the new hospital is progressing rapidly, and it is expected that the building will be ready for occupancy in the fall. The quality of both materials and workmanship is distinctly above the average, as it is being erected under the supervision of the constructing quartermaster, Colonel E. J. Timberlake, who is giving his personal supervision to all of the details. Colonel Timberlake is assisted by Mr. Wm. F. Goding, superintendent of construction.

The plans were made in consultation with Colonel F. P. Reynolds, chief medical officer, and received the benefit of his advice and experience. Colonel Reynolds, who saw extensive service in the World War, is thoroughly familiar with West Point conditions, so there is no doubt that the new hospital will perfectly fit the requirements.

Stone carvings, Cadet Hospital, U. S. Military Academy, West Point, N. Y.

The Fifty-fifth Annual Convention of the American Institute of Architects

"TO organize and unite in fellowship the architects of the United States of America, to combine their efforts so as to promote the æsthetic, scientific, and practical efficiency of the profession, and to make the profession of ever-increasing service to the country."

The above declaration of the purposes of the Institute were never made more manifest than at the convention that was held this year in Chicago, June 7, 8, 9.

It was the general impression that it was one of the livest and most *unified* conventions ever held.

Thanks are due to the gentlemen who constituted the Convention Committee, Daniel H. Burnham, Edwin H. Clark, F. S. Davidson, N. Max Dunning, Alfred H. Granger, John Holabird, Elmer C. Jensen, George W. Maher, Irving K. Pond, Charles H. Prindeville, Francis W. Puckey, Howard Shaw, Clark C. Wright, Albert Moore Saxe, W. Stanley Parker, C. Hendrick Hammond, and especially to Mr. E. C. Kemper, the efficient and experienced executive secretary of the Institute.

The new officers elected are: William B. Faville, of San Francisco, president; E. J. Russell, of St. Louis, first vice-president; Robert D. Kohn, of New York, second vice-president. New directors: First District, William B. Emerson, Boston; W. L. Steele, Sioux City, Iowa; B. W. Morris, New York.

The retiring president, Henry H. Kendall, of Boston, presided with genial good nature combined with a decision that kept the house in order and the sessions moving with smoothness and without unnecessary waste of time. He announced that the anonymous gift a year ago of $25,000 to the Institute, now amounting to $27,000, was hereafter to be known as the Waid Educational Fund, the gift of D. Everett Waid, the Institute's treasurer, and Mrs. Wade, his partner, who by the way made a most graceful and engaging address in response to the enthusiastic demand.

No doubt the Chicago men will be given full credit for the snap and interest displayed in the proceedings, and certainly it would be hard for any one to miss the inspiration and vitality of this wonderful city of the Lakes. It was a Chicago convention in the best sense of the term and went at the work and engaged in the various discussions with a real Chicago spirit.

Not even the great heat of the convention hall could diminish the ardor and good nature of those concerned.

Some would have to go out now and then for air, but came back into the room with a determination to see it through in spite of a little matter of a thermometer that was trying to hit the ceiling. The windows that looked out on the beautiful colors of Lake Michigan were early pre-empted, but the breezes that came fitfully in were not from a lake of cold water, rather from one that the late Mr. Dante knew so well how to describe.

One of the delightful treats in connection with the sessions was the afternoon given to a motor tour of the beautiful North Shore, a vertiable revelation to those who had never before had the privilege of seeing the country that extends along the shore northward with ever-enticing vistas of the opalescent, ever-changing colors of the lake.

Through the kindness of many friends who generously offered their private cars for the purpose, this excursion, covering nearly eighty miles, was most interesting and instructive. The guests were privileged to inspect the beautiful private homes of Mr. Stonehill, Stonehill House, designed by Mr. Howard Shaw; the Harold McCormick House, by Charles A. Platt; and the Edward Ryerson House, also by Mr. Shaw. All of these had special and individual architectural features of great interest, and few will ever forget the beautiful gardens and lovely landscape vistas that added such a note of friendly intimacy to the Ryerson estate. House and grounds composed a harmony that made you feel that despite their luxury and cost, there was yet embodied the human motive that made it a real home.

A supper was served at the Indian Hill Golf Club in a landscape environment that was lovely in its quiet setting, with the broad sweeps of lawn relieved by the gleam of water and clusters of beautiful trees.

One of the fortunate guests wishes to again give thanks for this journey that included some instruction and a great big lot of the joy that only lovely landscape and pleasant human companionship can really bring.

It was an appreciative crowd that climbed out of the cars to visit the show-places and spend the twilight enjoying the hospitality of the golf club.

Men from all parts of the country met at the convention in a friendly interchange of impressions and ideas about their profession, and here, away from the formalities, they sat at table or walked about in a mood that no city environment could ever bring.

The gold medal of the Institute was awarded to Henry Bacon for his great contribution to our national memorials in the designing of the magnificent Lincoln Memorial.

Other medals awarded were to Arthur F. Matthews, of San Francisco, for decorative painting, and Mr. F. W. Goudy for his work in artistic typography.

The convention closed with a dinner in the old Fine Arts Building, designed for the World's Fair by C. B. Atwood, a thing of beauty in its day, of almost greater beauty in its dilapidation and decay. It is exquisite in color and its noble setting and dignity of mass and detail filled one's thoughts with memories of the old temples of Greece.

The membership of the institute has greatly increased, and Mr. W. B. Ittner, of St. Louis, proposed a plan by which the membership might in five years be increased to four thousand.

Membership.—It is recommended that the same five-year outlook be sought as to the institute's membership. It is believed that if this is done the institute will receive the predetermined annual increments in its membership without the waste inherent in intensive membership campaigns and other more or less spasmodic efforts. It is a bad policy for the institute to drift and thus to neglect the legitimate development of its membership as it would be to invite increased membership through any lowering of our standards. We believe a determinate policy is the only safe course. It can apparently be established statistically that there are over ten thousand men in the United States possessing, technically at any rate, the requirements for membership in the institute. This number, of course, is constantly growing. For instance, over two hundred are graduated out of the colleges into the profession every year. Especially in view of this growth in the number of those practising architecture it would seem to be conservative to plan tentatively to have in our membership five years from now 40 per cent of those meeting our specifications at the present time. If this is done we cannot only decide on the total annual increase, but divide this increment into geographical quotas and so guard against unwarranted pressure for membership at any point. Assuming that this plan is adopted, the membership would stand at fixed dates as follows:

Oct. 1, 1921	Jan. 1, 1922	Jan. 1, 1923	Jan. 1, 1924	Jan. 1, 1925	Jan. 1, 1926	Jan. 1, 1927
2276	2300	2525	2825	3175	3575	4000
Yearly increase provided for..........		225	300	350	400	425
Percentage increase...		10%	12%	12%	13%	12%

Ten per cent annual increase is considered only normal in growing enterprises. A study of the rates of growth in technical and scientific bodies comparable to our own shows the proposed rate of growth well below the average. In the eleven months between November 5, 1920, and October 1, 1921, the membership rose from one thousand five hundred and thirty-six to two thousand two hundred and seventy-six, an increase of seven hundred and forty, or at the rate of over 50 per cent annually.

The problem will be further simplified if we provide a junior class to which graduates of recognized schools of architecture are eligible. Apparently the only objection which might be raised to this proposal is that in the public mind there might arise some doubt as to the importance of this type of membership. If there is any substance to the contention that "junior" would impose upon the public it can be largely met by providing (1) in some detail as to how the term junior shall be used and (2) that before the junior becomes thirty years of age he shall change his grade of membership or withdraw.

From an institute standpoint it seems unfortunate to allow these graduate students to drift away before they are definitely affiliated with the national organization of their profession. Through the accession of these young men just entering the profession seems to be the most logical way for the institute to obtain its growth.

PRESIDENT HENRY H. KENDALL'S ADDRESS

In again coming before you to present an account of our stewardship of your affairs during a year's activities, I am anxious to impress upon you the fact that the officers of the institute are responsible to you, its chapters and members, for what they do and to impress upon you again that what is done is carried out in the belief and intent of obeying your instructions.

May I briefly review the system under which the institute is organized and its affairs managed? In 1913, at the convention in New Orleans, the institute adopted a number of amendments, tending to establish a more democratic form of government.

The convention, made up of duly appointed delegates from the chapters, is the supreme authority.

Its decisions, on matters of general policy and professional principle, are final and are binding upon all its chapters.

As the convention cannot sit continuously, its decrees are committed, between sessions, to the President and the Board of Directors and these in turn are assisted by the Executive Committee and by standing and special committees.

In this way many men are working at all times upon the problems of the profession.

These committees are reinforced and supplemented by the executives and committees of the several chapters, who are practically supreme in their several districts.

In order to secure a reasonable territorial representation we have, by a gentleman's agreement, provided that our directors shall be so elected that there shall be a representative of each region at all times upon the Board. There being nine Directors, there are nine regions or districts, somewhat irregular in area and population, but intended to secure a proportional representation.

The Institute has fifty-one chapters distributed all over the country. These chapters represent widely varying conditions and customs. The problem of a central administration would be almost unsolvable were it required to legislate upon all questions arising in all these differing conditions and localities. Wisely, therefore, the local administration is confined to the chapter and the Executive seeks only a general supervision and guidance. Even this at times seems to some among us to be too paternal and restrictive.

This organization machinery on the one hand and the large field of chapter independence on the other hand, bound closely together by mutual interests, and by representative committee personnels, have made the institute a powerful influence in national and local affairs. Our standards, our ideals, and our rulings are increasingly recognized and our judgment is deferred to.

With our increased membership we should greatly increase our influence. We are relatively a small group compared to our population, but with a real appreciation of our opportunities and of the real value of our service we may claim and expect to be accorded an influence most potent for good in all public affairs.

Every architect has reason to be proud of the institute and ought to wear with as great a pride as that of any fraternal order the badge of membership. Whatever may be our shortcomings we have enough of achievement to justify our pride.

Believing that a great many of our members concern themselves so little with Institute affairs that the announcement of our activities and decisions comes with a shock to their nervous systems, if it comes at all, I am tempted to rehearse some of the things which have been done during the thirteen months since we last met in convention, in the hope that in this form they may have greater publicity than the more formal reports which will be placed before you by your officers and committees.

Our campaign for membership has continued with gratifying additions to our numbers. One thousand and thirty-two new members in two years and we now have in round numbers two thousand five hundred members. An increasing desire for getting together is shown by the organization of new chapters, eleven in two years, in new territory in some instances, and in other cases in sections where it has been impossible for members to attend chapter meetings at headquarters on account of distance and expense of travel. These new agencies will, I believe, be new centres of activity for promoting fellowship, for upholding professional standards, and developing a comradeship not otherwise possible. We welcome these new bodies to our fellowship and wish for them all prosperity.

An embarrassment arising out of our increased membership is the increased size of our conventions. If the old standard of representation is to prevail, a convention membership of three hundred to four hundred will result, making a somewhat unwieldy body, particularly so, if every one is to be permitted to voice his opinion on all topics presented for discussion.

Especially will this increase bear heavily upon the chapter treasuries, which bear a part at least of the expense of sending delegates to the conventions. The Directors have, therefore, with the assent of the chapters, limited the attendance to this present convention and will suggest a revision of the by-laws reducing for the future the number of delegates which shall be appointed, which will automatically reduce these expenses.

There has been an increasing recognition of the institute by public bodies having to do with the building, artistic, and economic questions of the day. The Department of Commerce has been most generous in recognizing the value of the architects' advice and assistance and has given adequate recognition to members of our profession in forming committees and commissions for the study of economic problems.

Our members serve in these groups at great personal sacrifice, for the honor of the profession, and from the highest motives. We should accord them every recognition and approval.

The association formed two years ago to bring together all classes interested in building, ably directed and fostered by leading men of the profession, and called by them the "Congress of the Building Industry," has gone forward with its work. Local bodies have been formed in our larger cities and frequent conferences are held to study the problems of the industries involved and find a common ground of agreement and promote efficiency in building matters.

Other related services, such as the Small House Corporations, have carried forward their work. New divisions have been organized and are developing plans and service programmes. It should not be forgotten that this is not a scheme for profit and is carefully safeguarded from ever being used in that way. It is to give to those who could not otherwise have it an expert professional service at a cost impossible except by such a combination. It has not appealed to some of our members, who have felt it unwise and will so express themselves to you. This will be a matter for you to decide and I ask from you its thoughtful consideration.

The Board of Jurisdictional Awards has continued its work, and "work" very adequately describes its task during the year. Its decisions in the past have not always commended themselves to some of you. Some have felt that they, in their happy situation of Veni, vidi, vici, could not give their adherence to these agreements. How glad I am that you are free from the very troubles that the Jurisdictional Board was constituted to avert. How considerate we wish you would be to those of us who, still under the harrow, are glad of any ruling that will divert the particular prong which menaces us to another direction, or remove it altogether.

In so great a country as ours there are many varying conditions. Not all of us have a Landis, or a united citizen opinion supporting our efforts for fair play and equal opportunity, and what is good in one case may not always prove the best in all others.

I beseech your tolerant, sympathetic patience and assistance.

The institute is continuously asked to join in organizations for altruistic, co-operative, constructive effort and to many of these which promise real service for the country we have given our moral and material support, asking many of our most active and efficient members to attend and give their service and, with regret I confess it, pay their own expenses. This should not be necessary and I hope the Directors will be able to find some way in the near future to meet these really necessary expenses. It is often hard for representatives of other organizations, which give considerable sums to finance these operations, to understand why we cannot do our part as well as they.

The subject of competitions has been, as always, a troublesome one and much time and anxious thought have been given to it. The most serious consideration was given to charges brought against an advisor and the standing committee, by a chapter, which grew out of a permission to waive "essential conditions" so called, and resulted in great dissatisfaction and the simultaneous withdrawal of a number of men who were not satisfied with the verdict. The Directors and the Committee on Competitions gave most serious consideration to the limitation of the authority of the committee; but in view of the tendency of legislatures and other bodies to embody in statute or ordinance conditions which are incompatible with what we call essential conditions, an insistence upon which would prevent public improvements of importance, or result in throwing them into incompetent hands, it seems as if the authority must be continued for the committee to still use its discretion.

The Directors were asked by the last convention to formulate rules for recognizing special ability and service by the conferring of Fellowship upon members of the institute. At first this seemed an easy matter to adjust and suggestions for nominations were invited, to be acted upon by the Jury of Fellows as now constituted.

When, however, the jury approached consideration of its task it soon became convinced that while Fellowship, as a recognition of special service, or fitness, was desirable, the selection of candidates ought to be made by an independent committee, not engrossed with other duties, but free to give careful and deliberate consideration to all claims made and such investigation as might be necessary to thoroughly establish the worth of every nominee. An amendment to the by-laws to establish such a jury will be presented for your approval.

Some years ago a new form of badge indicating membership was adopted, but until the last convention it had never been directed to be made. The Board was directed to prepare it and place it on sale. It is to be had from the executive secretary at the Octagon, and I hope whenever I meet you in future, even if your name or face be unknown to me, to be able to identify you as one of the fraternity and so to be on friendly terms at once without further formality.

During the year our Committee on Foreign Building Co-operation organized an exhibition of American Architecture at the Paris Salon, and it was afterward sent to London at the request of the Royal Institute of British Architects and by special request was retained for some months for exhibition in other cities. The report of the committee will cite the satisfaction and appreciation with which it was everywhere received.

The finances of the institute will be appropriately reviewed in the report of our treasurer, to whom you will soon listen. So quiet and unobtrusive a gentleman is he, that you scarcely realize how important a factor he is in our counsels and activities. Let me tell you, however, that we never, if possible, hold a meeting without him, and that when he disapproves we hesitate twice ere we override his opinion.

A year ago a generous gift of $25,000 to the institute was announced, the income to be applied to educational purposes. The gift was in fact $27,000 and the bonds in which it is invested have a market value at last reports of $28,000. It was the hope of the donor that this fund might be the nucleus of similar gifts which in time would prove a substantial and permanent endowment; the income of which would be a potent factor in the educational work of the institute.

It is my privilege to recommend to you that this fund be now named, in honor of its donor,

THE WAID EDUCATIONAL FUND

and so carried on all our records.

That his hope for additional gifts may soon become a certainty, I commend to your attention.

The central offices of the institute are in the Octagon House. The ownership of this historic building, so intimately connected with the history of our country, was made possible by the generous gifts of architects who realized the desirability of a permanent home for the institute.

The increasing difficulty of finding suitable meeting-places for our convention has prompted the study of possible improvements in the Octagon property and the erection of such buildings thereon as shall provide a carrying income and a suitable place for our meetings and exhibitions. Studies for this development will be presented to the convention and will deserve your consideration.

There are many other activities to which I might as properly call your attention. The work of our Education Committee, the Committees on Public Information, Contracts, Registration Laws, Historic Monuments, War Memorials, Community Planning, Fire Prevention, and others, are all worthy of consideration, and I hope you will give them your attention in due course.

I should fail utterly did I attempt to put into words an adequate expression of the hearty co-operation, the gracious acceptance of committee assignments, and the unswerving loyalty with which you have met and aided my efforts to carry on the presidential office. It has been a revelation of good fellowship, real friendships, and co-operation, such as I did not dream I could evoke and I cannot express my appreciation. To Mr. Parker, who does everything he should, and many things I should, so well and so satisfactorily, that I would far rather he did them than I; to Mr. Kemper, whose unfailing vigilance and accurate mind keep us all posted as to our duties, whose enthusiasm for the institute and loyalty make him so effective an executive, to the Directors and the other officers, who have so thoughtfully assisted me, I owe a never-to-be-paid debt of thanks. It must go on interest; I can never discharge it; and finally, to you all, who have given me two years of great responsibility, but years of privilege and opportunity, I make my grateful acknowledgments.

The Canon of Ethics. Canon 11 of the Canons of Ethics which reads as follows: "To compete knowingly with a fellow architect for employment on the basis of professional charges" was stricken out and to Paragraph 4 of the Circular of Advice, entitled "On the Architect's Charges" a second paragraph was added, to read as follows:

"To compete knowingly with a fellow architect for employment on a basis of professional charges is inconsistent with the spirit of this code. An architect should take reasonable steps to ascertain if other architects are also under consideration, and in no event should he depart from his own or any general standard of charges for the purpose of underbidding some competitor."

FOR THE RESTORATION OF THE OLD FINE ARTS BUILDING

Mr. George W. Maher outlined the plan of the Illinois Chapter of the American Institute of Architects for the restoration of the building:

Perhaps as important an instance of service on the part of the Illinois Chapter, A. I. A., is the effort now being made to save and perpetuate the Fine Arts Building of the World's Columbian Exposition.

This magnificent structure, as you are aware, is the last remaining memorial of this great art achievement. An achievement that undoubtedly stimulated America to a broader interest in art, architecture, city planning, and general beautification. It, therefore, possesses a distinct significance that is of value not only to Chicago but to the nation.

The great international exposition of 1893 also marked in a notable way America's first world-wide association with peoples and nations from abroad. Since then other great events of international significance have occurred, but it may properly be claimed that the first international attempt was successfully achieved at this great World's Columbian Exposition.

The Fine Arts Building was the very heart of this great exposition and has the distinction, in addition to this historic significance, of being one of the most beautiful examples of classic architecture in this country, if not in the world. It is a pure type of design, "Greek in spirit," and has met with universal approval from art critics of note here and abroad.

(*Continued on page* xxxv)

The Mary Imogene Bassett Hospital, Cooperstown, N. Y.

AT a time when epidemics were prevalent throughout the greater part of the Eastern States, it was found that the capacity of the then existing hospital at Cooperstown was by far inadequate to accommodate one-half the

The Old Mills at Index (near Cooperstown).

contagious cases. The excess number had to be cared for in near-by houses.

Realizing this condition, Mr. Edward S. Clark decided to build an Isolation Pavilion adjacent to the present hospital. A sketch was made of this idea and the location of the same arranged in such a way that it would be one unit of a future scheme for the whole. This idea grew to such proportions that it was finally decided to build an entire new hospital which would accommodate the needs of probably the entire community.

The old ball-field of Cooperstown was purchased for the site, it being a sufficient distance from the village to satisfy all the demands of open air and beautiful surrounding country. Cooperstown having been the original home of baseball, this field was given up with great reluctance—but, realizing that it was for the good of the community, another site has since been given to this great American sport.

The donor of this hospital has been very generous in going to extra expense to preserve in its outward appearance that feeling of Colonial architecture which prevails in Cooperstown and the surrounding country; and for this reason the native building stone was chosen as keeping the character of some of the best buildings in the town. The architect, Mr. Frank P. Whiting, has employed the tradition of the country in his design.

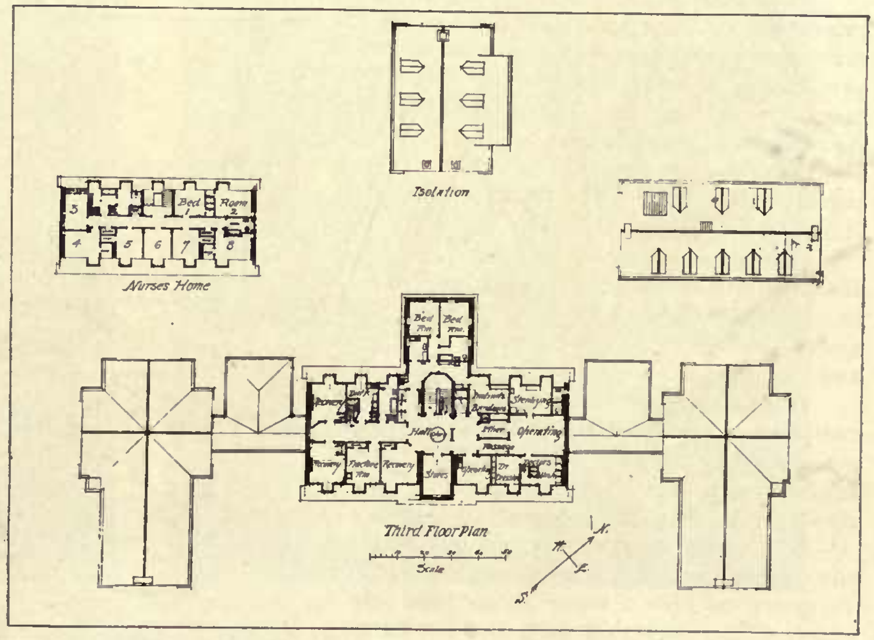
It would have been quite an undertaking to quarry all the stone for such a piece of work, so one or two old mills which were landmarks at Index were purchased, particularly for the stone. These buildings were going to decay very rapidly, and it was very much better to have the stone embodied in this memorial hospital than that it should finally be lost in a heap of dêbris.

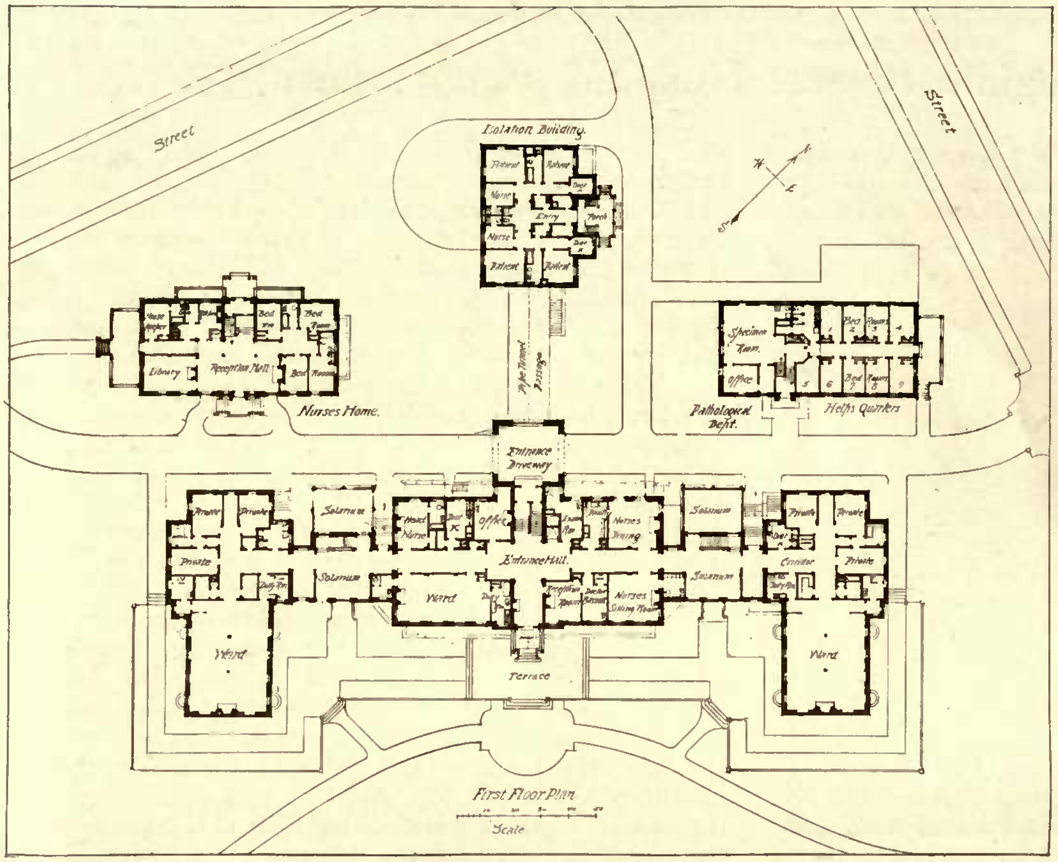
Old solid pine beams, twelve feet by twelve feet by sixty feet, were found in these mills in perfect preservation, and are now used in some of the barns of Fenimore Farm. It was often quite a picturesque sight to see trucks (which, by the way, were manufactured in near-by towns) hauling this stone from a distance of three and four miles.

The photographs fully show the beautiful nature of the local stone, and particularly of that from the old mills. They seem to have found a naturally flat stone which gives more the texture of brick than that of heavy, cumbersome stonework.

Cooperstown has produced, from one generation to another, men who, from the very love of the work, have become some of the very best journeymen, mechanics, farmers, and men of all trades; and it is for this reason that this entire group of buildings was completed through the efforts of Cooperstown men. The stonework was laid by masons who had been trained from boyhood to lay just this kind and quality of stone; carpenters who had been trained to build the beautiful Colonial examples which abound throughout this section; plumbers and electricians who understood everything in their line from public water-works to wiring for communities. Of course there were many things for which the labor had to be imported, such as composition floors, linoleum floors, tile and marble wainscoting, and some of the plumbing; but, outside of these, the entire result has been accomplished by men in this community which is tucked away from the general line of travel and which has preserved its unique charm up to the present date.

The main hospital with its wings was planned to accommodate seventy-five persons. The main or central building containing the administration, private patients' rooms, operating-rooms, recovery-room, doctors' and interns' rooms, is located between two wings, each separated from the central building by solariums and fresh-air cut-offs. These cut-offs are cross corridors ventilated by transoms over the





windows, so that persons passing through the main buildings to the wings must necessarily come into different air from that contained in any other section of the building.

There is no artificial ventilation throughout the entire hospital; all wards and private rooms have fireplaces.

The east wing has two wards for men and private rooms, diet kitchens, duty rooms, and accessories.

The west wing contains one women's ward, with private rooms, diet kitchens, duty rooms, etc.

The second floor is given up entirely to obstetric cases, the same having a separate operating-room, utility-room, two recovery-rooms, babies' room, and a ward for six patients.

The main hospital group is composed principally of three buildings, each of which may be operated separately with its own dependencies. These buildings are all of fireproof construction, with the exception of the doors and windows; but the corridor doors are all double-acting fireproof, so that patients would always have access in case of fire to staircases in back of the solariums.

Directly in back of the Administration Building and at a level between the first and second floors is a good-sized lecture-room, under which is a covered entrance for patients and visitors.

In the basement of this group there is a complete X-ray department with the most modern apparatus, a therapeutic department, kitchens with their dependencies, and dining-rooms for doctors and nurses.

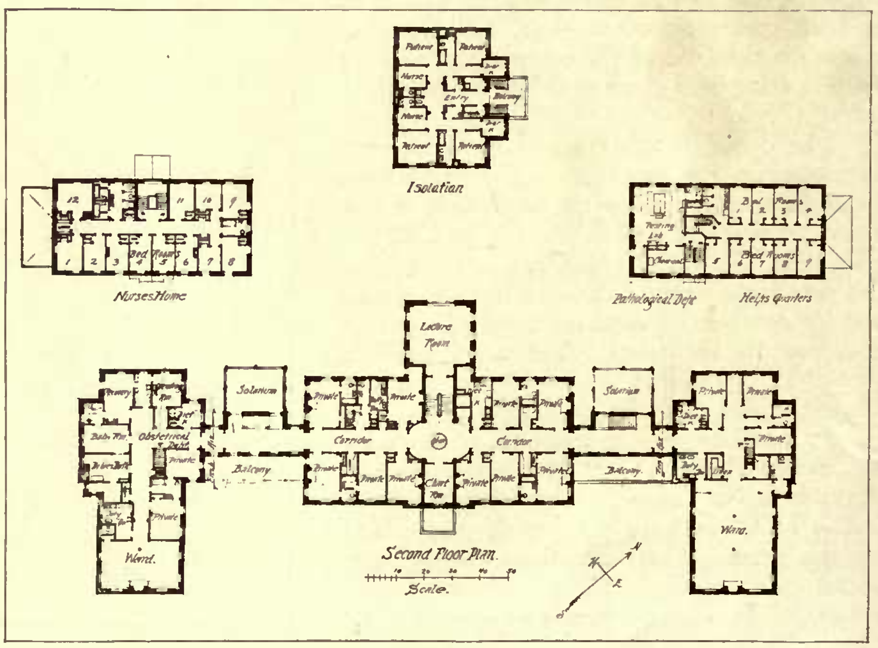
The rather isolated position of Cooperstown away from the railroad centre made it necessary to plan a nurses' home and help's quarters in connection with the institution, and a separate building for isolation cases provided to take the place of that projected near the old hospital.

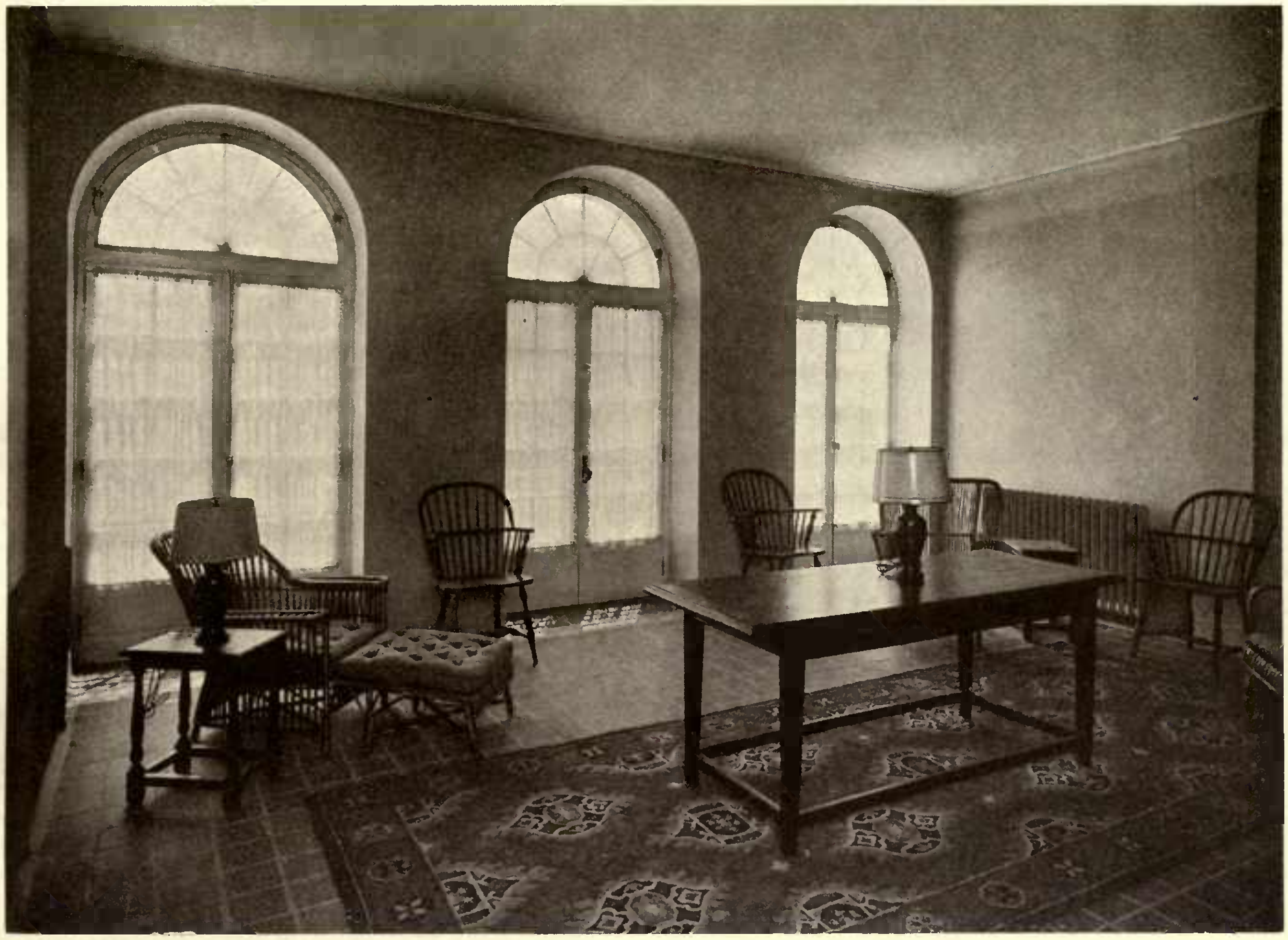
The nurses' home will accommodate twenty-five nurses and includes reception-hall, library, housekeeper, kitchen, gymnasium, and sun-porches. In fact, this little building is almost a complete home, each room having an unobstructed view down the Susquehanna River Valley.

The Pathological Building is an exact complement of the nurses' home in size, but the western portion, which is entirely cut off from the help's quarters, contains a complete pathological and research department. In the basement there is a complete laundry equipped with all the apparatus for hospital work, and next to this—on the same floor—is a sterilizing department, where all linens are sterilized before entering the laundry.

On the first, second, and third floors, and that portion of the building not occupied by the pathological department, there are rooms for the accommodation of men and women help, to the number of twenty-five.

Centrally located some distance back of the tower is the Isolation Building. This contains all the heating apparatus for the group, sterilizing steam, electric switchboard, vacuum-pumps, high-pressure boilers which operate the vacuum system that heats the entire group of buildings at seventy degrees in the most severe of Cooperstown weather—which sometimes goes to thirty degrees below zero. The upper floors of the Isolation Building are sufficient to accommodate twenty-five patients, and a unique arrangement of each floor was necessary to accomplish three things:





SOLARIUM.

ENTRANCE-HALL.

STAIRCASE TO LECTURE-HALL.

INTERIORS, THE MARY IMOGENE BASSETT HOSPITAL, COOPERSTOWN, N. Y.
Frank P. Whiting, Architect. Interior Furnishing, Louise Rennie.

Operating-room.

first, that the attendant nurse should have her own room and bath; second, that a person entering the apartment should leave his clothes and enter, returning by a separate entrance into the outside air; third, each apartment to have its own diet-kitchen, bathroom, and sterilizing apparatus.

The stairways are entirely outside of the building, so that there is no interior communication from one floor to another.

The buildings have been furnished throughout under the direction of Louise Rennie. The furnishings are simple and in keeping with the general soft tones used in the treatment of walls and floor coverings.

In presenting an unoccupied group of buildings of this nature, it is difficult to impart the sympathetic sense that attaches to any work where the noble qualities of mercy and tenderness are called into being. But in seeing this Cooperstown Hospital one already feels the generous emotions that will be called forth by its occupancy—and the busy movement and life within its walls.

It is gratifying to remark that in some recent hospital buildings much beauty and interest has been added to the interiors by a wise use of some form of color decoration, and it has proved a source of cheer to many of the inmates, both of the staff and the patients, some of whom are still apt to approach a hospital with a sense of fear and dread of the horrible, although this is very quickly dispelled after entry. There is no doubt that the skilful use and choice of colorful decoration in certain places is an asset.

The accompanying picture is quite a contrast between the town of 1862 before the fire and the present thriving community where there is to-day one of the most complete and comfortable hotels, with two hundred rooms; where they have one of the finest libraries, village clubs, gymnasiums, a lake nine miles long that offers wonderful advantages for both winter and summer sports. We presume that James

Fenimore Cooper was often a visitor at the Eagle Hotel shown on the cut; and one will find some very interesting reading in the history of this quaint old town which was made famous by the author of "The Leatherstocking Tales" and "The Last of the Mohicans."

Haphazard Construction of Homes

A PROMINENT Ohio citizen was not especially enthusiastic about a building ordinance for his city, reports one of the field men of the National Lumber Manufacturers Association, until he inspected recently the construction of thirty-two houses out of a total of forty-two now under erection in the town. The local dealer who is erecting these houses has violated nearly every possible law of good building. The foundations to grade are concrete poured dry and are cracked. From grade to sill cement blocks are set together without even a pretense of mortar in joints. He fills the joints inside and out after the building is up. The posts in the basement are misplaced. The spiked bearing member in his floor was in the way of a furnace pipe, so he cut into the member and laid a short run pipe against the bearing member without any insulation. If the register above is shut off with a hot fire going and possibly children sleeping in the house, it would not take an expert to forecast the probable result. If a joist interfered with placing a register box, he would cut out the joist and use two-by-four headers spiked in. The woodwork was spiked to the flue—this alone being sufficient to condemn the structure so far as fire safety is concerned.

Even a novice in building laws can see the fire hazard in such houses, and the urgent need of city building regulations which would not permit such careless construction. And yet if such a dwelling should be burned, many would thoughtlessly lay the old-time blame upon frame construction or shingle roofs, whereas the fault should be absolutely credited to the violation of almost every law of building known to the profession.

Editorial and Other Comment

The Human Aspects of the Institute Convention at Chicago

WE are all of us more or less apt to shut ourselves up in our little narrow ways of life and to stick pretty close to the environment with which we are familiar and accustomed. It is only when we break loose and get out into the world that we discover how much we miss and how very human all the world can be if we will only give it a chance.

If the convention of the American Institute of Architects meant no more than bringing its members together to shake hands and look into each other's faces, it would be accomplishing much.

The Chicago convention seemed exceptionally happy in regard to the more intimate fraternizing of all concerned or interested. Mr. N. Max Dunning's comments in *The Bulletin of the Illinois Society of Architects*, published in May in anticipation of the convention, most happily expressed the feeling that pervaded the sessions and it is this impression that every one carried away with him.

"We think of many architects only as abstract names, as symbols of great achievements, and we conjure up in our minds pictures of austere—exclusive—awe-inspiring men. At conventions we meet these men and we find them to be unpretentious, lovable flesh-and-blood individuals who are struggling with the same problems we are trying to solve, and who are just as anxious to know us and get our point of view as we are anxious to know them. Through these meetings, we make acquaintances, cement friendships and gain a new enthusiasm for our work and a new love and respect for our profession that helps to smooth out some of the hills we all have to climb and that transcends in importance what we may have gained in technical knowledge important though this knowledge may be."

No one could look over the faces of the men assembled in the convention hall or at the informal midday luncheons and not be impressed with the fact that here was a body of men that stood for something besides facts.

How much these men brought and how much they took away in new impressions of individuals and of what the architects of the country really represent.

Of course, architecture is a business as well as an art, but we believe that at bottom there is not an architect who would deny that the thing we call art is the inspiration and background even of his business. He wants to build beauty into his work though too often his client denies him this privilege.

As Mr. Dunning said, the big men, the men whose names we reverence and look up to as great leaders are not posing on any pedestals with barbed wire around them. As a matter of fact, it is the big men in the world everywhere who can afford to be simple, because they know by hard struggle the problems that confront every one who aspires to be something beyond a mere cog in the wheel of the world's materialistic machine, and well indeed such men know the shortness of time for achievement. We are one of those who believe the architect's work should be as widely known as the work of the sculptor and painter. His is the handwriting on the wall for all to see and read, and he, more than any one else, is in a position to carry the message of beauty, fitness, and good taste to the man on the street.

We were interested especially in noting at the convention an unusual number of professors from the various architectural schools.

$100,000 in Prizes

PRESIDENT KENDALL announced at the dinner given to the American Institute in the old Fine Arts Building, Chicago, the Chicago *Tribune* offer of prizes amounting to one hundred thousand dollars.

Their purpose is manifold:

1. The erection of a structure of enduring beauty which shall be at once a glory to journalism and to the city, and a model of practicality. *The Tribune* seeks, in short, artistic nobility and business effectiveness.

2. The providing of new quarters for the rapidly extending demands of a newspaper which, though it looks back this morning on seventy-five fruitful years, lives in an unparalleled present.

3. The offering of financial encouragement so emphatic and so prompt that it will give fresh impetus to the great cause of commercial architecture in America. Whether this encouragement will discover and develop new talent, or give added recognition to men whose fame is already established, the result of this competition will show.

4. The addition to the assured architectural splendors of the new North Michigan boulevard of a building which will give the tone and tendency to a thoroughfare that soon will be the most impressive street in the western world.

Certainly a generous and appealing offer. The prizes are as follows: One of $50,000 for the design selected by the jury, one of $20,000 for the design ranking second, $10,000 for the third design, and ten prizes of $2,000 each to be awarded to architects especially invited to enter this project.

In connection with the offer we can't help remarking the general indifference of the Chicago papers to the proceedings of the convention of the Institute. We looked in vain, even in *The Tribune*, for any adequate comment and we were not alone in wondering why this was so.

No one who visits Chicago's splendid Art Institute and learns something of the great work it is doing can say that Chicago is lacking in appreciation of the arts. Has it not been well said that architecture is the mother of them all?

The Lincoln Memorial

THE recent dedication of the impressive and nobly designed Lincoln Memorial at Washington, emphasized with consummate good taste and a fervent spirit of quiet and dignified patriotism, especially in President Harding's words, the things that express our nation's being and growth.

In the beautiful simplicity and yet grandeur of the memorial are embodied the very characteristics of the man whose image in stone the sculptor, Daniel Chester French, has seated in his temple.

We owe a debt of gratitude to the men who placed the building of this majestic structure in the hands of so able and competent an architect as Mr. Henry Bacon. He brought to his task a great love and reverence for the man Lincoln, and he was wise in his choice of his collaborators, Mr. French and Mr. Guérin.

And it was a happy thought to invite Mr. Royal Cortissoz to write the inscriptions that are chiselled in the wall behind and above the statue.

IN THIS TEMPLE
AS IN THE HEARTS OF THE PEOPLE
FOR WHOM HE SAVED THE UNION
THE MEMORY OF ABRAHAM LINCOLN
IS ENSHRINED FOREVER

Speaking of his conception of the memorial, Mr. Bacon has said:

"From the beginning of my study I believed that this memorial of Abraham Lincoln should be composed of four features: a statue of the man, a memorial of his Gettysburg speech, a memorial of his Second Inaugural address, and a symbol of the Union of the United States, which he stated it was his paramount object to save and which he did save. Each feature is related to the others by means of its design and position, and each is so arranged that it becomes an integral part of the whole in order to attain a unity and simplicity in the appearance of the monument.

"The most important object is the statue of Lincoln, in which is expressed as far as possible the gentleness, power, and intelligence of the man."

But it is not the figure alone that dominates, though it is the living, vital element of the whole majestic conception. Beautiful symmetry, perfectly co-ordinated proportions of the masses and of details make this tribute to our most beloved national hero one of the noblest monuments of the world.

How quickly we forget, though, in the finished achievement the years of thought, the concentrated energies, the thousand difficulties, the misgivings, the possible fear of failure that perhaps beset the creator of such a monument.

It was a stupendous responsibility, and how splendidly it has been met by Mr. Bacon and his associates.

In these latter days when chaos seems to have come back to most of the world, when our own country never more needed the wise and tolerant deliberation, infinite patience and human sympathy, that the memory and face of Lincoln so touchingly express, this memorial will be a thrilling if silent testimony to the longing of our hearts.

May it bring to the minds of the thousands who will see it the thought that we must all live more than ever in the faith and charity of Lincoln, in the faith, serene hope, and strength of that other, who lies at Mount Vernon.

The following resolution was read by Electus D. Litchfield and adopted by the convention of the American Institute of Architects at Chicago:

Resolved that, Nothing that we can do here will add to the fame and glory of Henry Bacon; he is already with the immortals. Modest and unassuming as he is, the great monument which he has built for us to the memory of Abraham Lincoln has written his name large at the foot of the Mall Plan—that great Honor Roll of American Architects—there it will be remembered with the names of L'Enfant, Burnham, and McKim—whatever we here may say and do—safe in the affectionate keeping of the people. Those who have seen the Lincoln Memorial know well that this is true; to those who have not, we may well say that truly under the Providence of God have Bacon and French and Guérin built a memorial—a shrine—worthy of that greatest American and of the place that his character holds in the hearts of the American people.

The American Institute of Architects cannot add to the glory which is Bacon's, but it will honor itself in honoring him. We may well be proud and happy to-day in this his great achievement. Consider how great would be our shame and unhappiness had he not measured up to his great task. But to-day we may repeat with reverence the words in Genesis: "And God saw that it was all very good."

And it is, indeed, right and decorous that the Institute in convention assembled honor him. We may not add to his glory—but much to his happiness. Sweet, indeed, is the heart-felt praise of one's fellow architects who know as no one else can the struggles, the disappointments; but for this very reason they can appreciate, as others cannot, the infinite pains incident to a great success. Let us, therefore, with love and with gratitude make to Henry Bacon this our highest award, as a token of our appreciation of his great achievement.

Book Reviews

THE MODERN COUNTRY HOUSE IN THE NETHERLANDS. By J. H. W. LELIMAN and K. SLUYTERMAN. With Many Illustrations, Including Elevations and Plans of Typical Houses. Published by Martinus Nijhoff, The Hague, Holland.

The text of this book is in Dutch.

Our readers who know Holland will find here many familiar high-peaked roofs of tile, the houses mostly of brick; and while there is a certain picturesqueness of effect in many of the houses shown, the impression one gets is that there are few restful spaces left in the façades, and too many openings and broken lines. The thatched-roof effect is naturally a popular one where real thatched roofs are much in evidence. Some of our readers will recall those in the little town of Laren, beloved by many American painters, but thatched roofs lose their charm when broken up with queer-shaped gables and aggressively ornamented dormer-windows.

Among the smaller houses are a number that are quite charming in their simplicity and quaintness.

HISTORIC HOUSES OF SOUTH AFRICA. By DOROTHEA FAIRBRIDGE. With a Preface by General J. C. Smuts. With many illustrations, including a number of full pages in color.

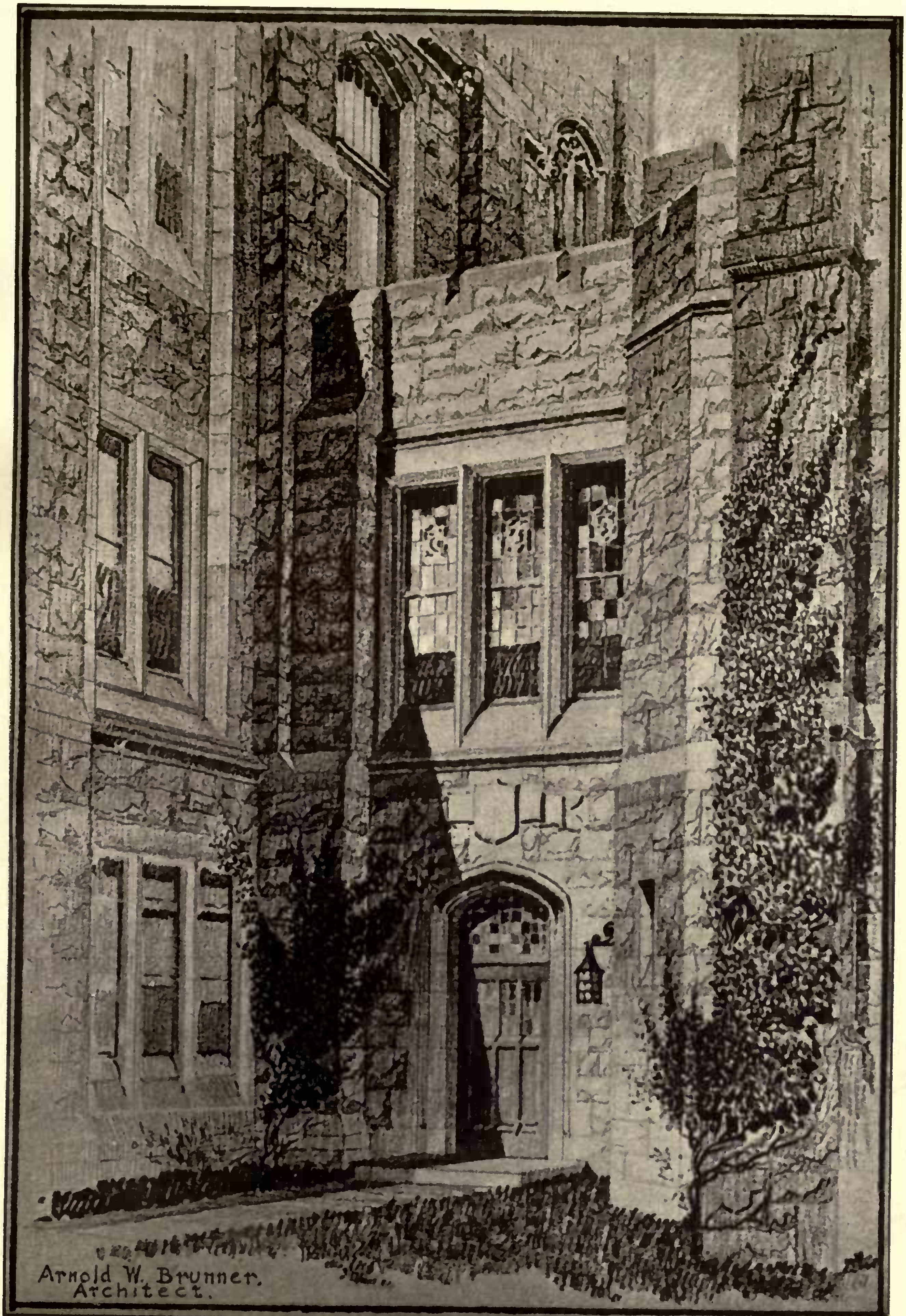
No doubt the historical and personal part of the text of this handsome book will have interest for South Africans, for many of the English and old Dutch families associated with the settlement of the country. It should have an interest, as well, for every one who likes to follow the effects of transplanting an old artistic tradition to a new country. There is much to remind one of the architecture of old Dutch homesteads, and also familiar features of many famous English houses.

There is special charm in the farm groups shown, and architects will find interest in the pages of drawings of architectural details and furniture.

There are chapters on Old Dutch Furniture and the Decorative Arts, with many attractive illustrations.

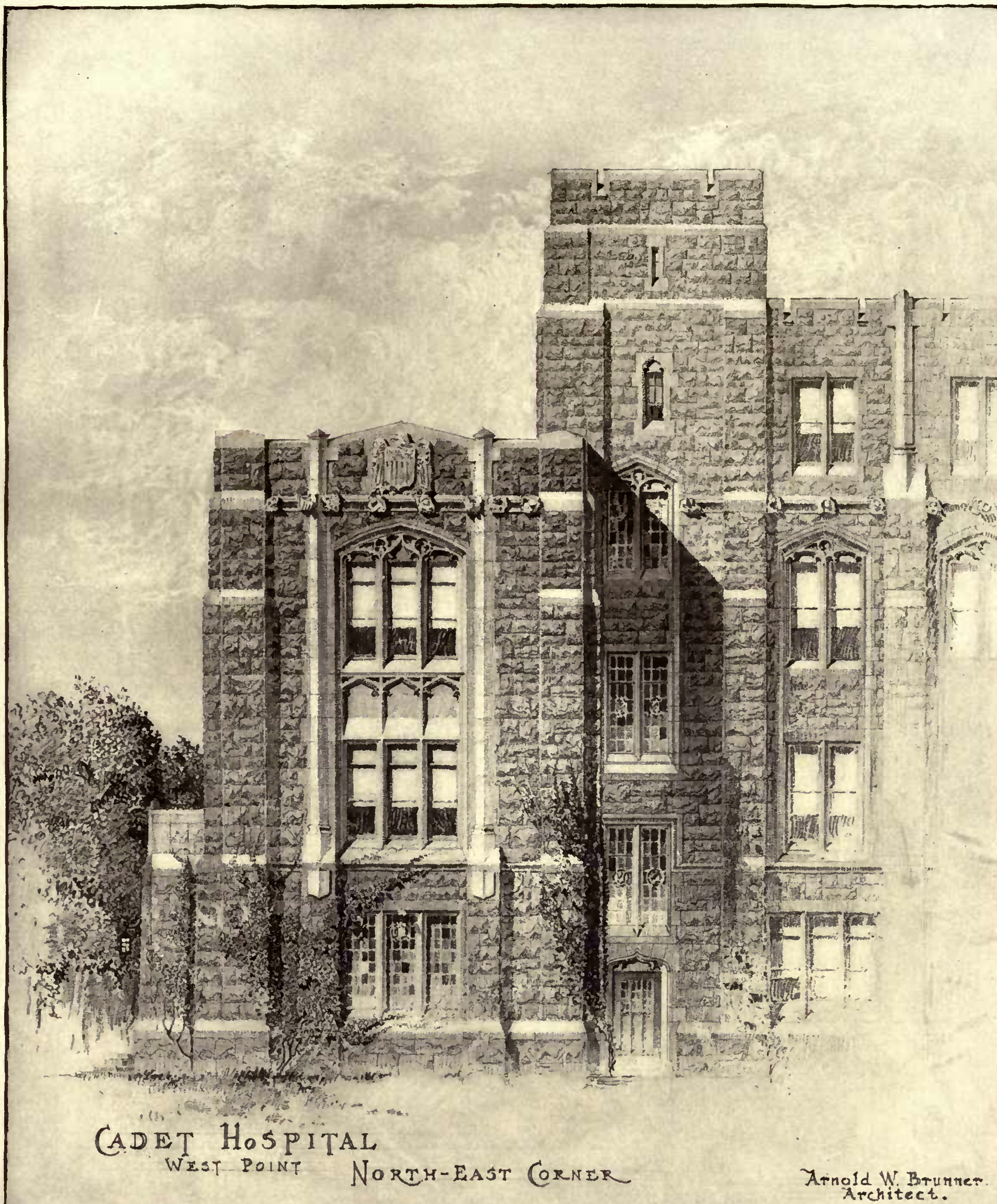
DESCRIPTIVE GEOMETRY. By GEORGE YOUNG, JR., Professor of Architecture, Cornell University, and HUBERT EUGENE BAXTER, Assistant Professor of Architecture, Cornell University. The Macmillan Co., New York.

Both the text and many drawings in this admirable book should make it a welcome addition to the draftsman's and student's library, and a valued text-book for schools and the colleges of architecture.

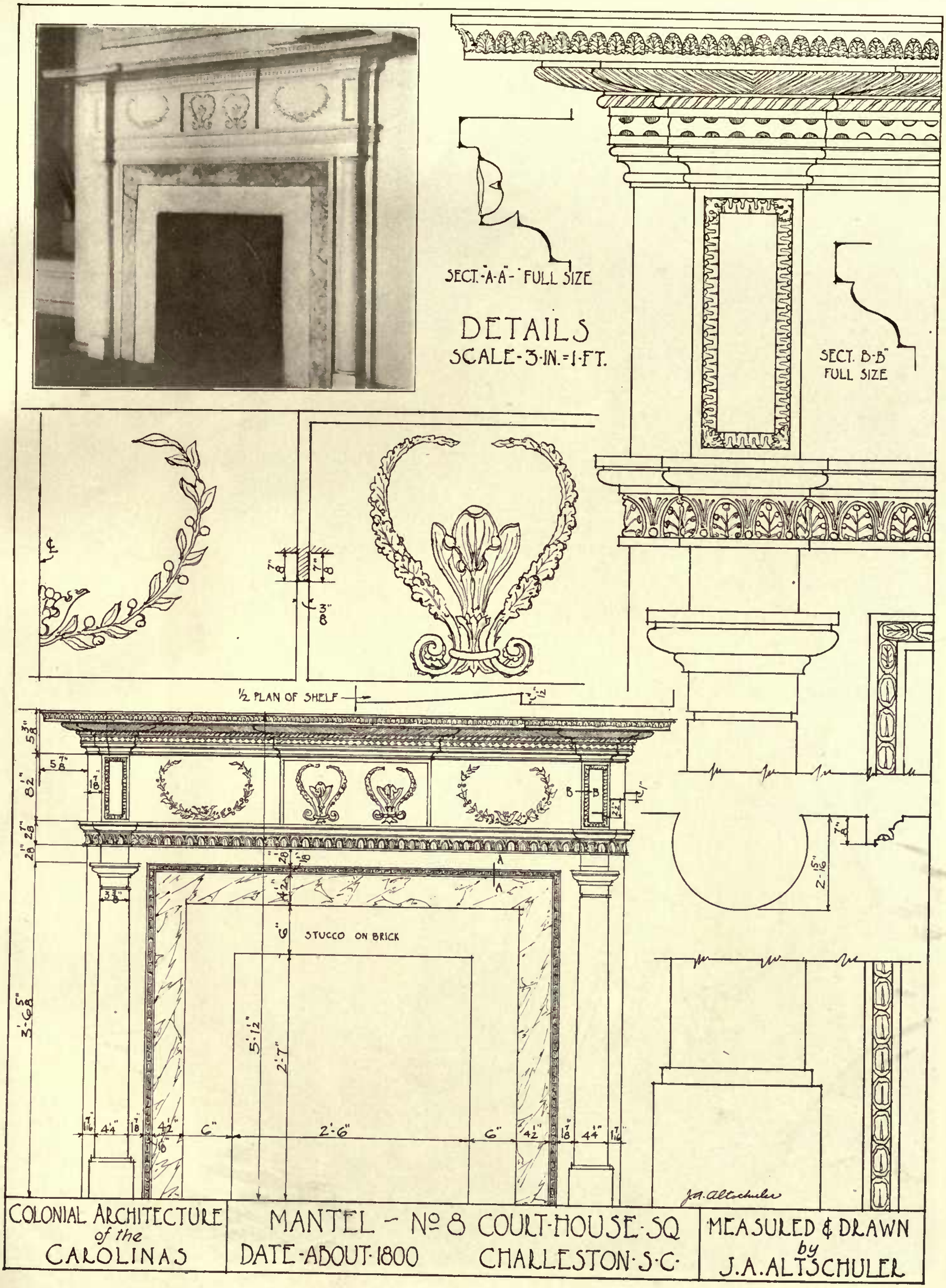


CORRIDOR CONNECTING NEW HOSPITAL WITH PRESENT BUILDING.

CADET HOSPITAL, UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y.

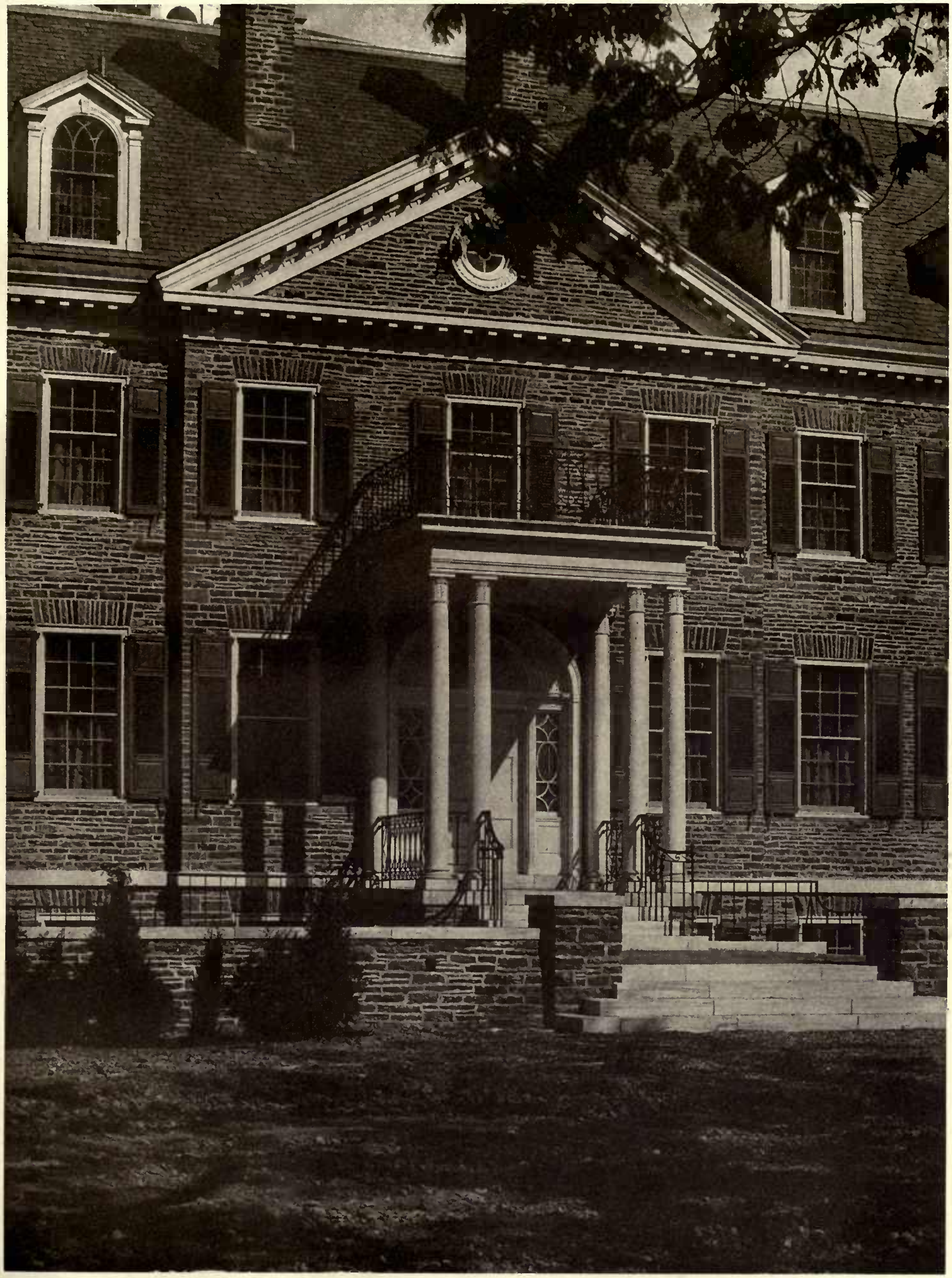


UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y.


SECT. "A-A" FULL SIZE
DETAILS
SCALE-3-IN.=1-FT.
SECT. B-B FULL SIZE
½ PLAN OF SHELF
STUCCO ON BRICK
COLONIAL ARCHITECTURE of the CAROLINAS
MANTEL - No 8 COURT-HOUSE-SQ
DATE-ABOUT-1800
CHARLESTON-S-C-
MEASURED & DRAWN by J.A.ALTSCHULER

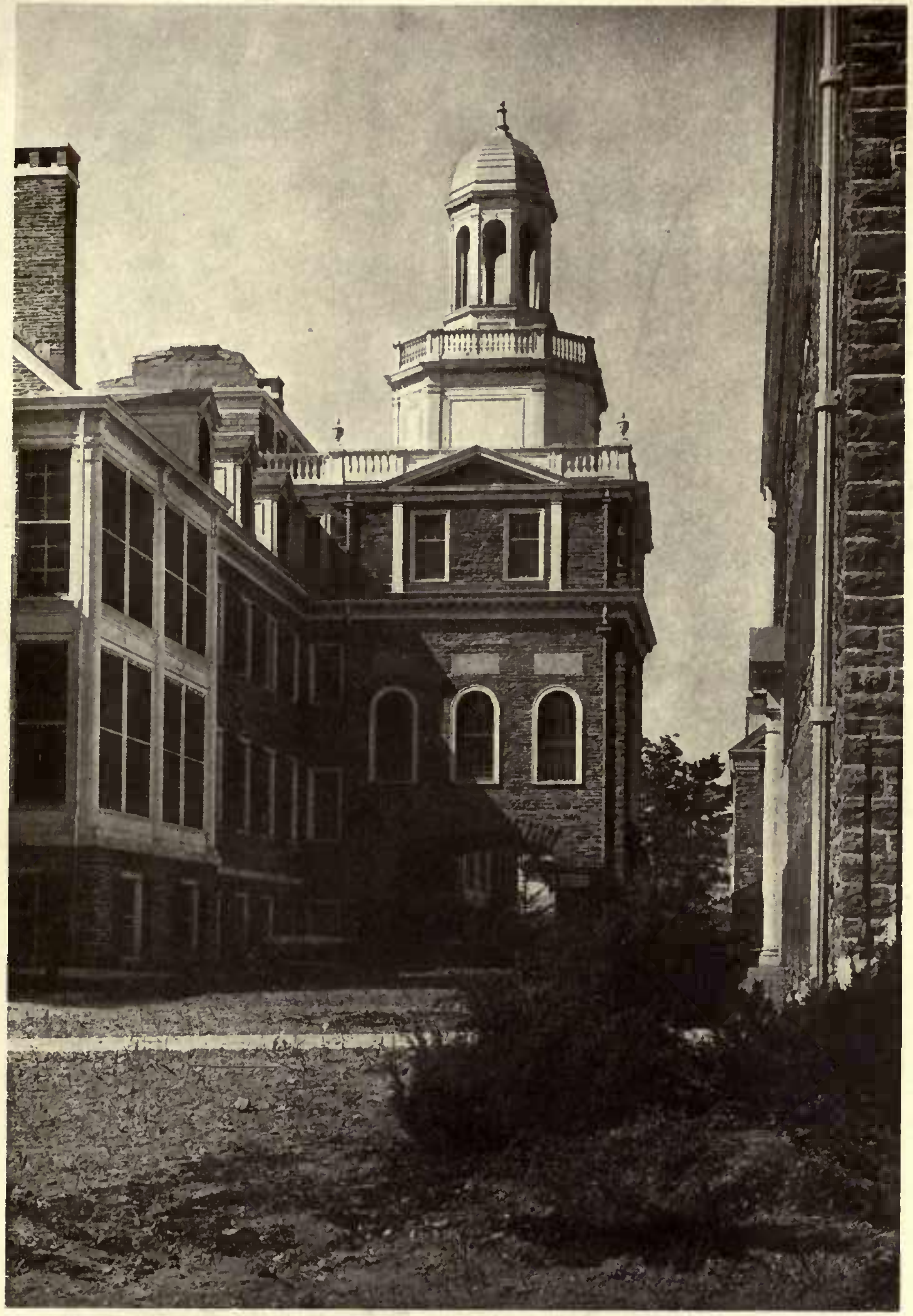
THE MARY IMOGENE BASSETT HOSPITAL, COOPERSTOWN, N. Y.

Frank P. Whiting, Architect.



ENTRANCE TO ADMINISTRATION BUILDING. Frank P. Whiting, Architect.

THE MARY IMOGENE BASSETT HOSPITAL, COOPERSTOWN, N. Y.

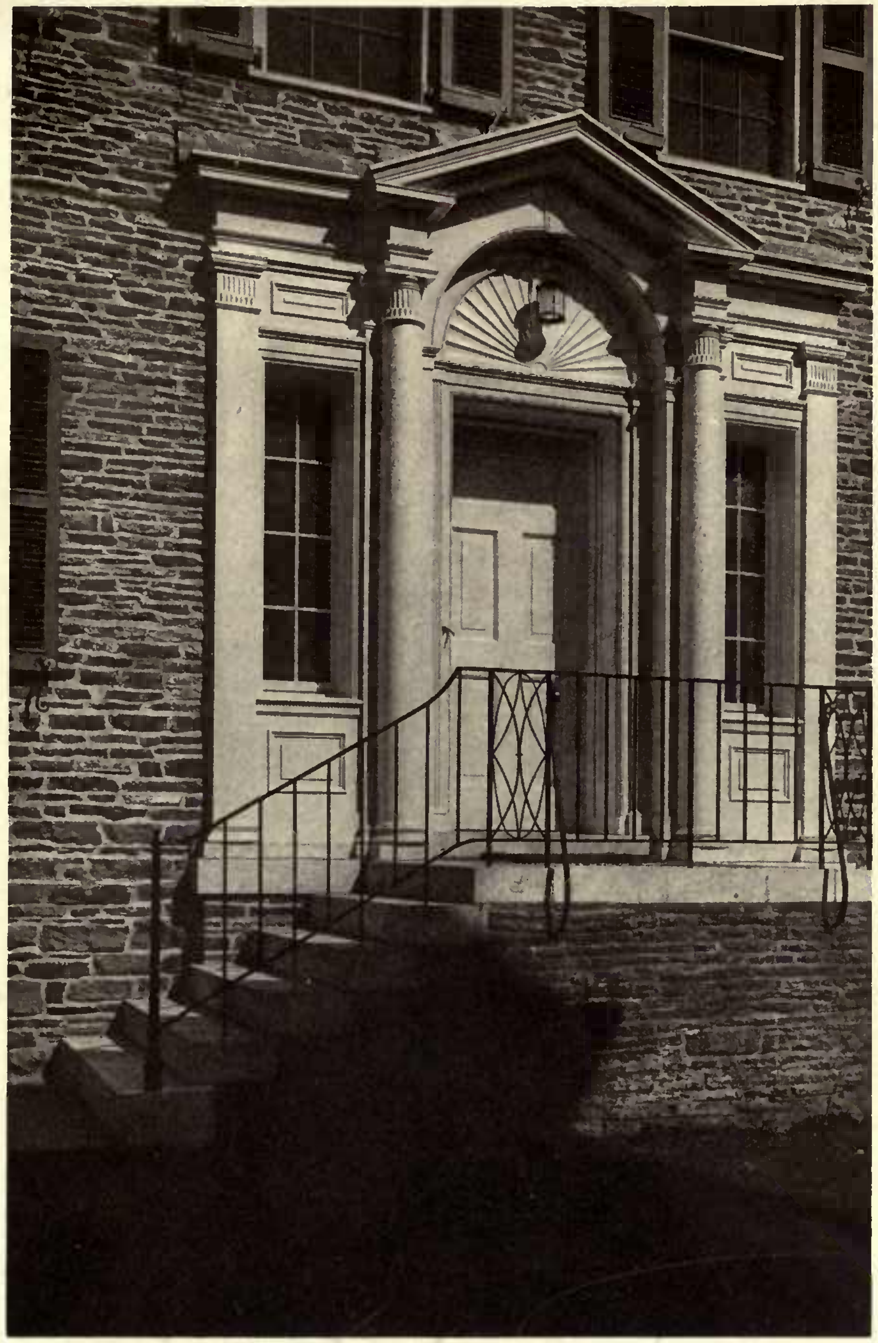


ENTRANCE DRIVEWAY AND COURT BETWEEN BUILDINGS OF GROUP.

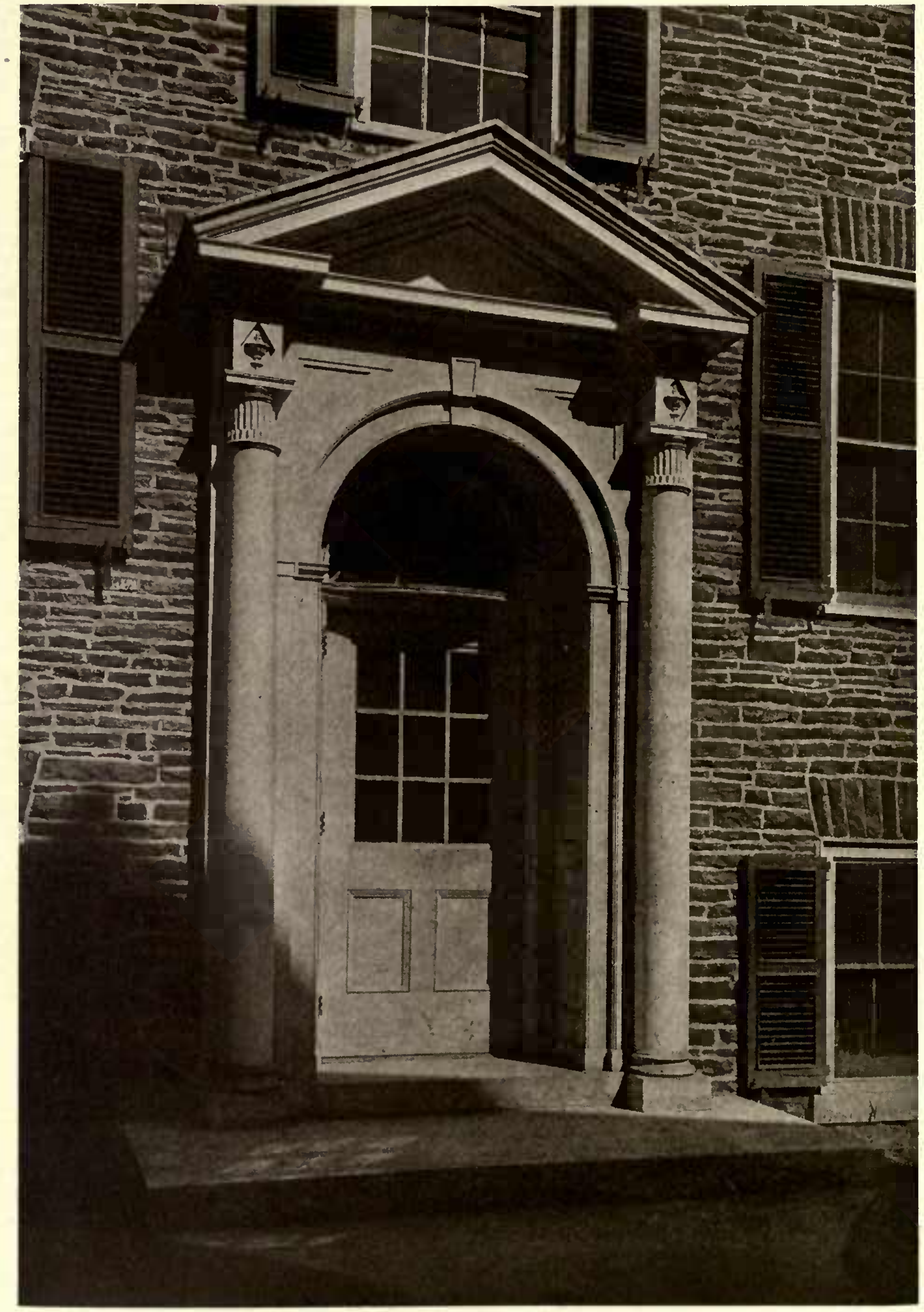
SOLARIUM AND BALCONY WITH RAMP TO TERRACE.

THE MARY IMOGENE BASSETT HOSPITAL, COOPERSTOWN, N. Y.

Frank P. Whiting, Architect.



ENTRANCE TO NURSES' HOME.



ENTRANCE TO PATHOLOGICAL DEPARTMENT. Frank P. Whiting, Architect.

THE MARY IMOGENE BASSETT HOSPITAL, COOPERSTOWN, N. Y.

RESIDENCE, HAROLD I. PRATT, PARK AVENUE, NEW YORK. Delano & Aldrich, Architects.

In this house, though the forms are traditional Georgian, the working out of them is individual and modern. In the cornice a great cyma, decorated with dolphins, takes the place of the usual bed mould and modillions.

VESTIBULE.

UPPER HALL.

Delano & Aldrich, Architects.

RESIDENCE, HAROLD I. PRATT, PARK AVENUE, NEW YORK.

The details of interiors demonstrate a thorough knowledge and sympathy with the crafts, which characterize the work of this firm.


DINING-ROOM.


LIBRARY.

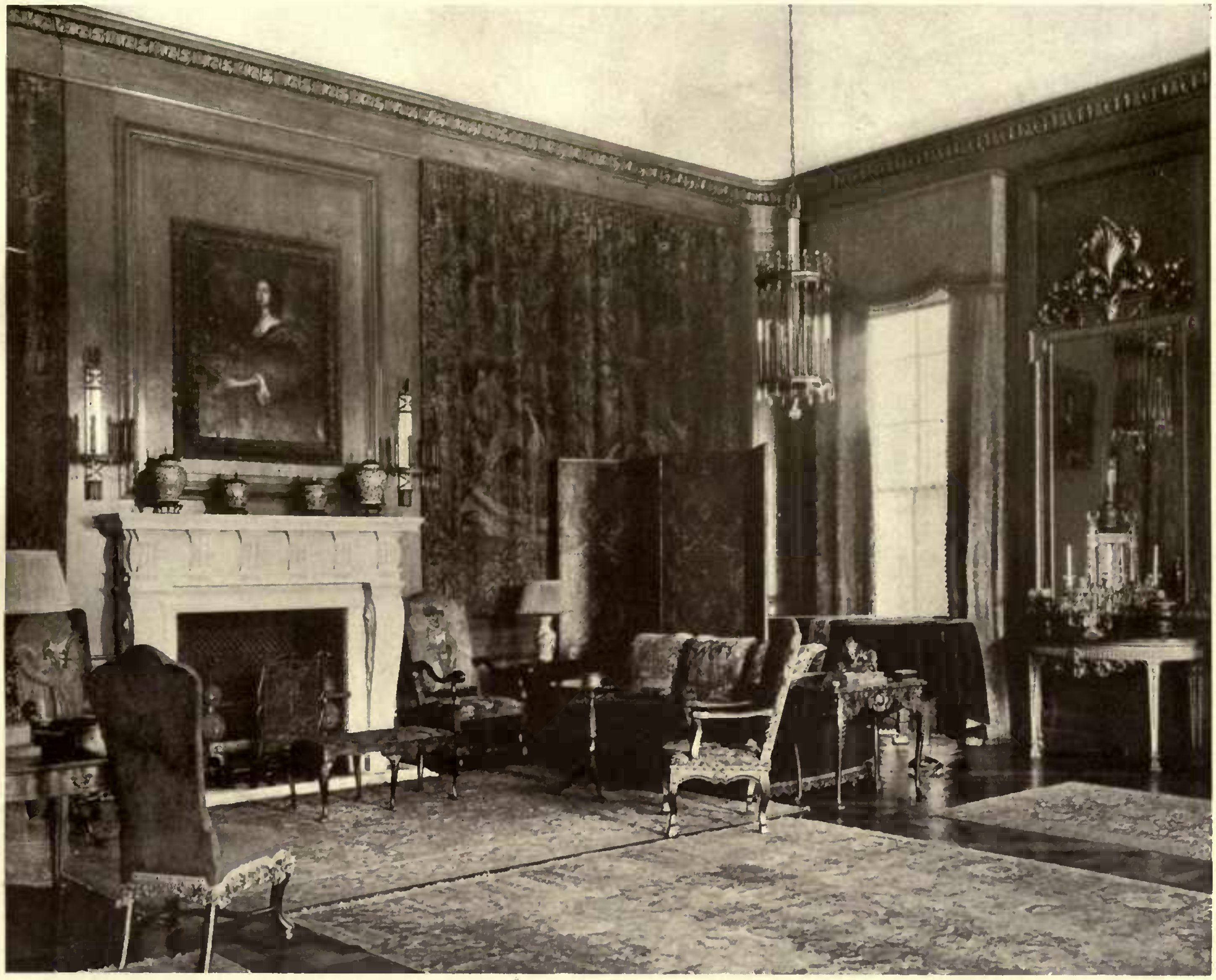
Delano & Aldrich, Architects.

RESIDENCE, HAROLD I. PRATT, PARK AVENUE, NEW YORK.

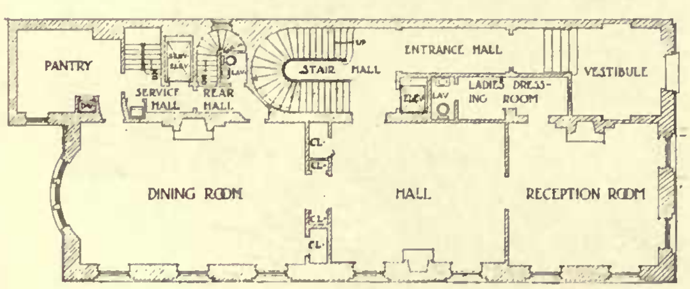
DOOR IN BIG ROOM LEADING TO HALL AND LIBRARY BEYOND. Delano & Aldrich, Architects.

RESIDENCE, HAROLD I. PRATT, PARK AVENUE, NEW YORK.

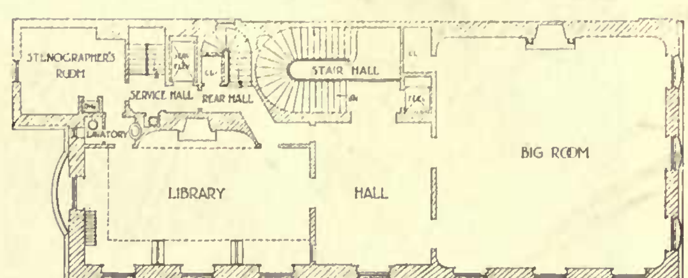
This room is panelled in deal.



BIG ROOM.



GROUND FLOOR



PLAN OF FIRST FLOOR

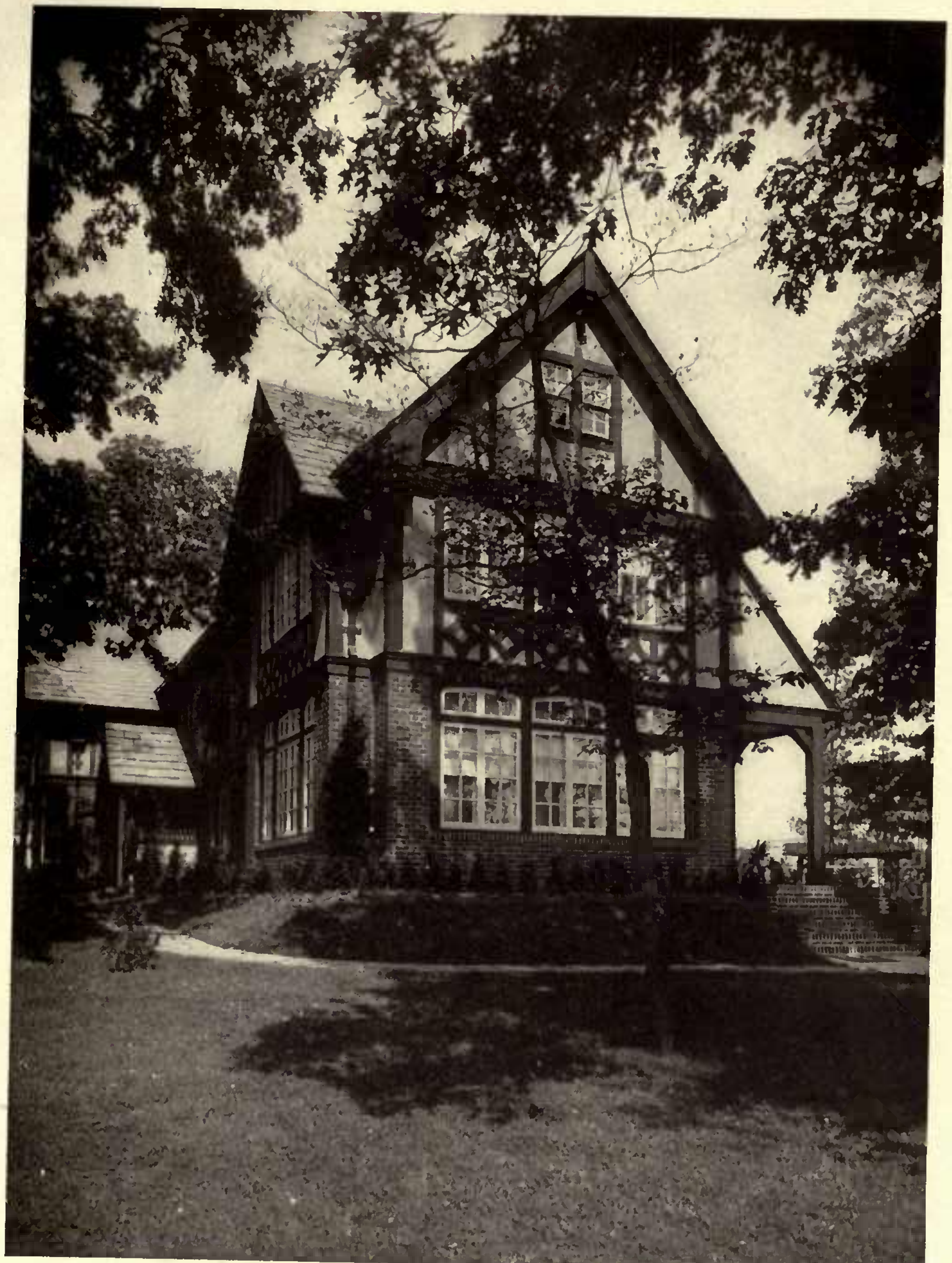
PLANS.

Delano & Aldrich, Architects.

RESIDENCE, HAROLD I. PRATT, PARK AVENUE, NEW YORK.

In the interior a freshness of detail animates the traditional forms in such features, for instance, as the electric-light fixtures, all of which were especially designed by the architects and made under their direction.

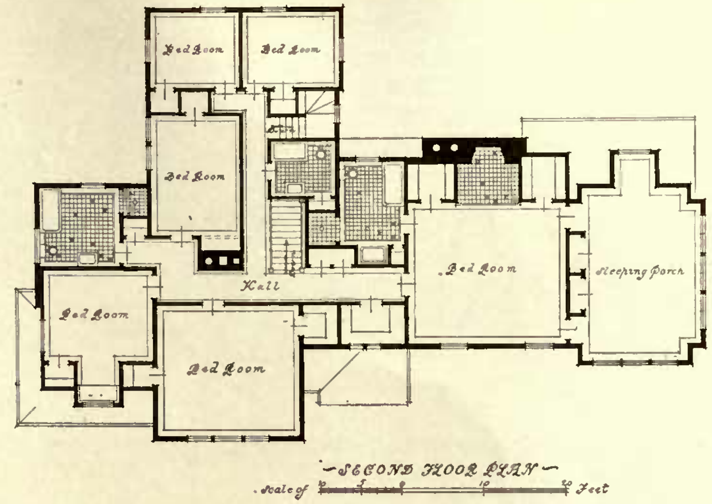
HOUSE, HARRY F. WEBER, MT. VERNON, N. Y. S. A. Guttenberg, Architect.

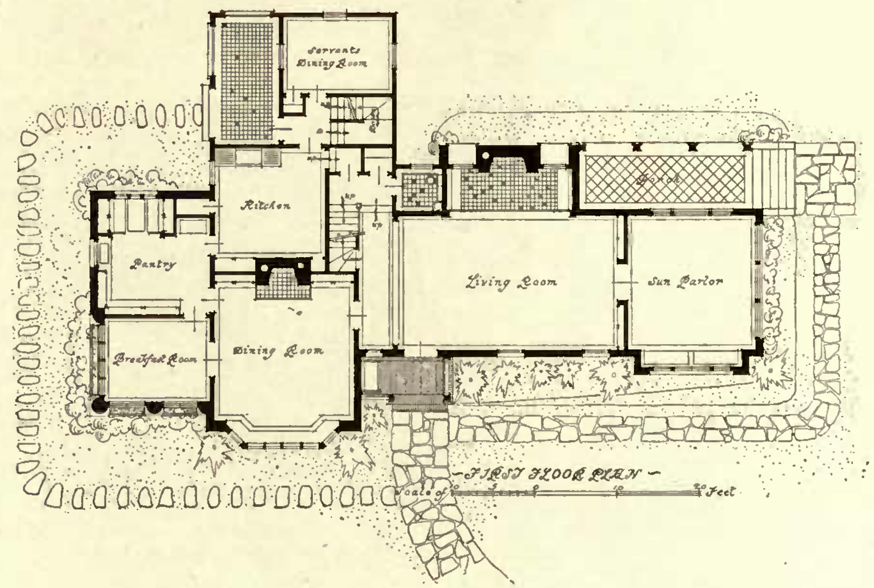


HOUSE, HARRY F. WEBER, MT. VERNON, N. Y.

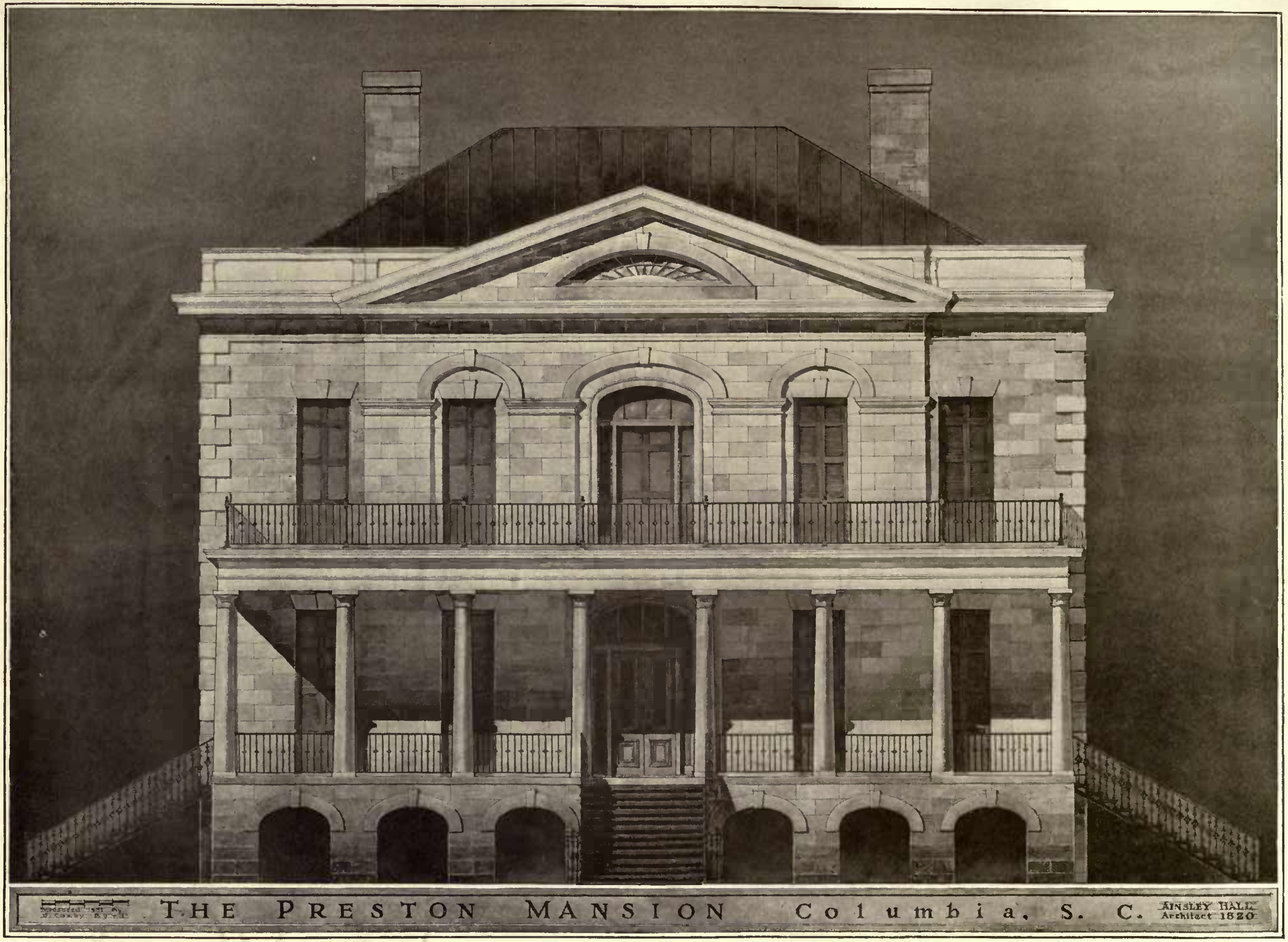
S. A. Guttenberg, Architect.

ENTRANCE PORCH, HOUSE, HARRY F. WEBER, MT. VERNON, N. Y.



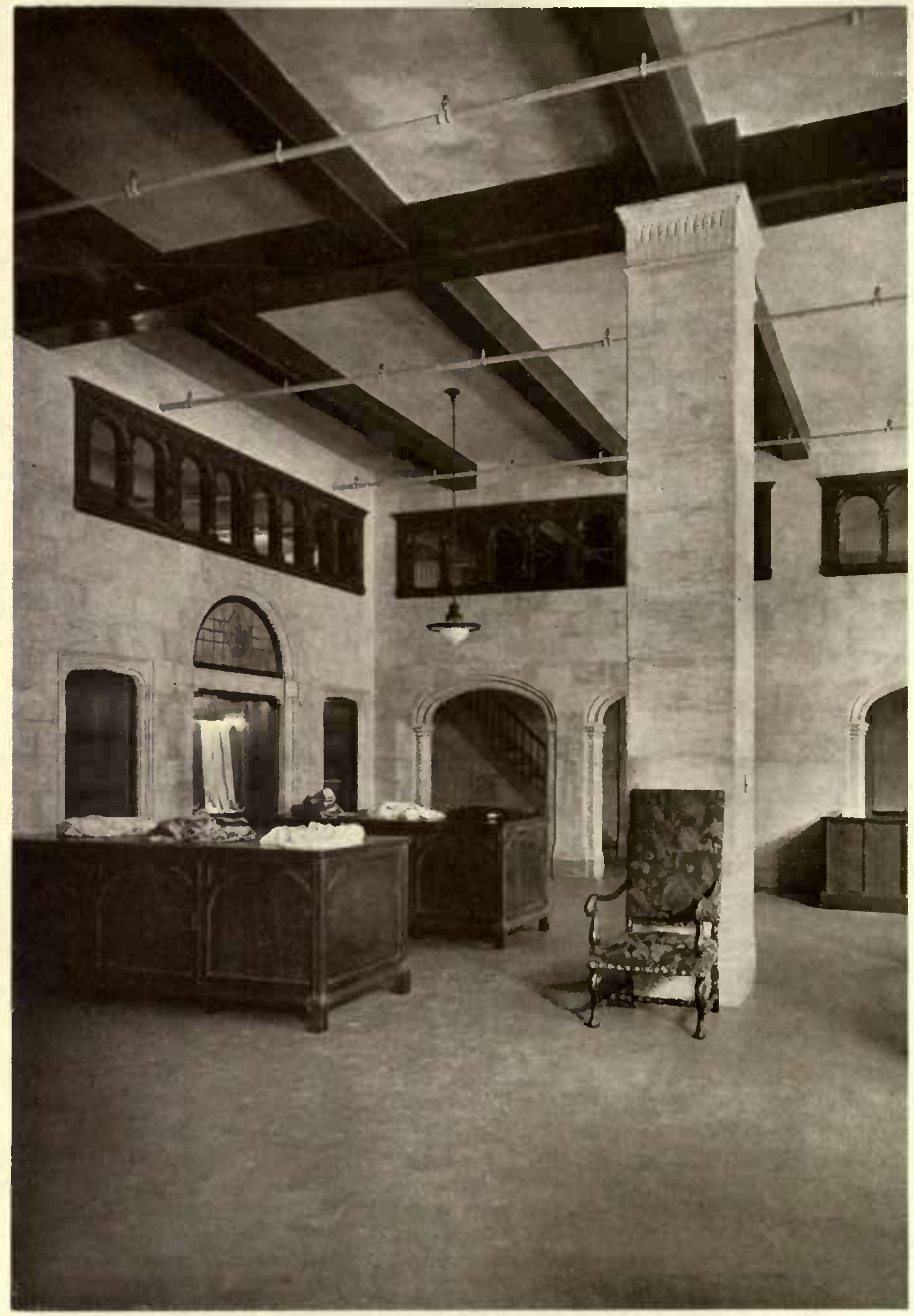


S. A. Guttenberg, Architect.



Measured by J. Cozby Byrd, 1921.

VIEW THROUGH ENTRANCE-HALL INTO MAIN DISPLAY-ROOM.



MAIN DISPLAY-ROOM, SHOWING TREATMENT OF DISPLAY-CASES.

Alfred Freeman, Architect.

SALESROOMS OF HESS, GOLDSMITH & CO., 36 EAST 31ST STREET, NEW YORK.

MR. HARRY GOLDSMITH'S PRIVATE OFFICE.

MR. JAMES GOLDSMITH'S PRIVATE OFFICE.

PRIVATE SALESROOM.

BOARD ROOM.

Alfred Freeman, Architect.

SALESROOMS OF HESS, GOLDSMITH & CO., 36 EAST 31st STREET, NEW YORK.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Architectural School, Columbia University

Article XIX

CLASSIFICATION AND CONSTRUCTION OF THE ARCHITECTURAL MOTIFS USED IN SMALL-HOUSE DESIGNING

THERE are not many architectural motifs that can be used in designing the small house, and the ones which are employed over and over again are fundamentally a part of the construction. The plan must build up into block forms, because of the requirements of construction, and the designer has only a handful of shapes that make good roofs, for the same reason. The varieties of dormer windows that he can put on the roof are limited to a few that are capable of being reasonably constructed. He cannot be original in the forms he selects, for they have all been thought out before. He should know them as he does the alphabet and build with them as he builds words with letters.

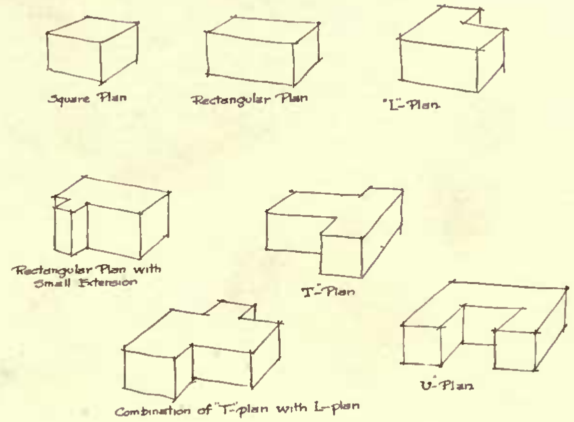
For example, take the plan of the small house. Can there be much room for originality here? Usually there are at the most four rooms which must be arranged on the ground floor of the small house: the living-room, dining-room, kitchen, and pantry. On the second floor are generally placed the bedrooms. Does it not seem reasonable to assume that all of the best combinations of so few rooms must be quite limited in number, and that the chances are that they have already been thought out? Many a young designer has labored enthusiastically upon what he believes is his original layout for a small house only to find later that his solution has been already worked out and perhaps a trifle better. When an inventor tackles any particular problem, his first step, if he is wise, is to consult the patents which have previously been issued along this line, and then he will know what has been done.

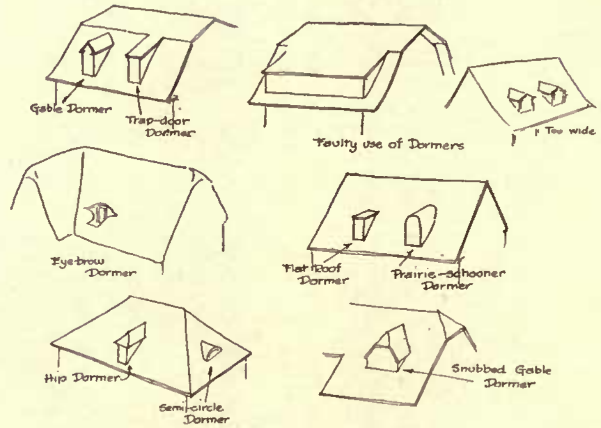
Try as hard as he will, no designer can get away from the fact that the cheapest arrangement of rooms in his small-house plan makes a square unit and builds a square block-house, but that such a plan is one of the most difficult forms to make pleasing to the eye. For this reason the room arrangement which gives a rectangular-shaped house is more often adopted. But we often tire of too much repetition of the rectangular house, and designers try to vary it a little. There is not much leeway here, however. By adding a wing at right angles to the main rectangle of the house, we can have an L-shaped plan which is easier to give architectural variety to, but very uneconomical, for the number of linear feet of exterior wall for a house of this shape is just as great as that for a house which is a rectangle in plan, as long as the L and as wide. This also holds true of the U-shaped plan and the T-shaped plan and the combination of the T and the L shaped plan. In fact, as soon as the designer tries to get away from the simplest rectangular shapes in the small house, the economic reins pull him back, and he must go slow in selecting too picturesque plans. Limited therefore in his possible scope, the real work of the designer should be one of perfecting the acceptable solutions which have been already worked out. Only once in a generation are absolutely new arrangements stumbled on.

On top of these various-shaped blocks, which these plans will form, a roof must be erected. Here again, one would think that the architectural motifs would be quite varied, and yet when the matter is studied it is not the case. There are only five fundamental shapes of roofs which can be placed upon these blocks, and two of these types are really the same, and another ought not to be employed, so that, after all, there are actually only three fundamental roof motifs to use. These are the gable roof, the gambrel roof, and the hip roof. The wall-gable roof is merely a type of end treatment for the gable roof, and the flat roof is not suited to the average small house in the country or suburbs, because of traditions.

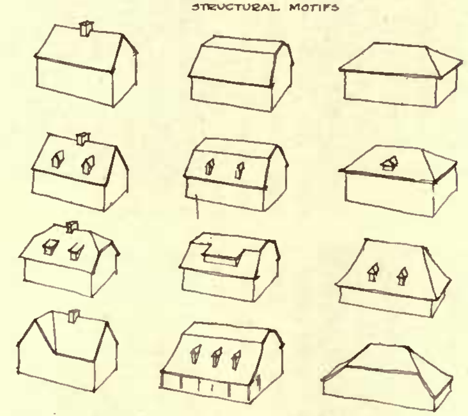
In the small house the designer has the choice of either placing these roofs above the second floor or placing the second floor within the roof. Where the former is selected he sets for himself a very difficult architectural problem—that of trying to make the proportions of a house limited in ground area fit under a roof placed too high. This has rarely been solved with any satisfaction, for in nearly all cases the house looks too high and stilted. The comparative drawings show how true this is. Notice how house *A* and *B* look stilted, while house *C* has a charm which no manner of designing would ever add to the former. Is it not a fact to be reckoned with that the small house is best solved architecturally if the second floor is placed within the roof? Economy of material is certainly secured in this way, and the construction is greatly simplified. The chief difficulties are to properly ventilate these rooms under the roof, and to give them good lighting without making too many and too large dormers. This is a hard problem, but it has been solved successfully. The Dutch gambrel roof was developed for this purpose, and there has been no doubt as to its beauty, except when wrongly used by placing it above the second story or poking the second floor through it in one long single dormer.

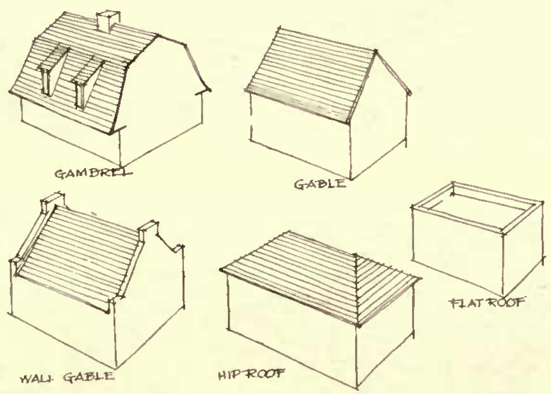
It is quite evident from the above how important the roof designing is in the small house. It goes without saying that the simplest arrangement of roofs is the cheapest to build and the easiest to maintain. Every valley means a leak at some later date, for as careful as may be the builder, the history of roof valleys shows that they leak sooner or later. The designer cannot freely mix his roofs either. Gambrel roofs, hip roofs, and gabled roofs do not go together harmoniously, without considerable study, and as a general rule they should not be required to do so. The usual methods of construction of these types of roofs are indicated well enough in the drawings and need no explanation. The ridgepoles in all cases are not of any structural importance, but act as alignments for rafters. For this reason they are made only an inch thick. Hip rafters have much the same function in hip roofs. Whenever valley rafters are needed, these must be designed like floor girders. If dormers are built into the roof, it is customary to double the rafters around the openings. Where gable dormers are constructed, one





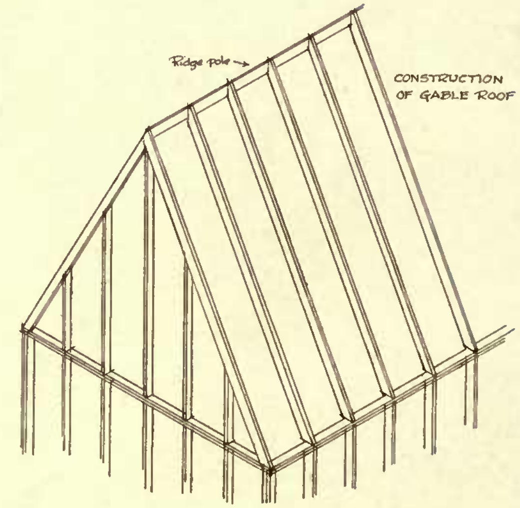
VARIATIONS OF DESIGN DEVELOPED FROM THE FEW FUNDAMENTAL STRUCTURAL MOTIFS



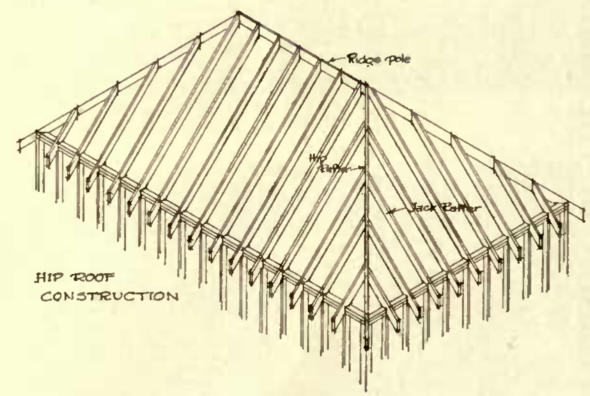


These two houses are ugly as sin, yet are considered very practical. All rooms on 2nd floor are square and cellars are high and dry.

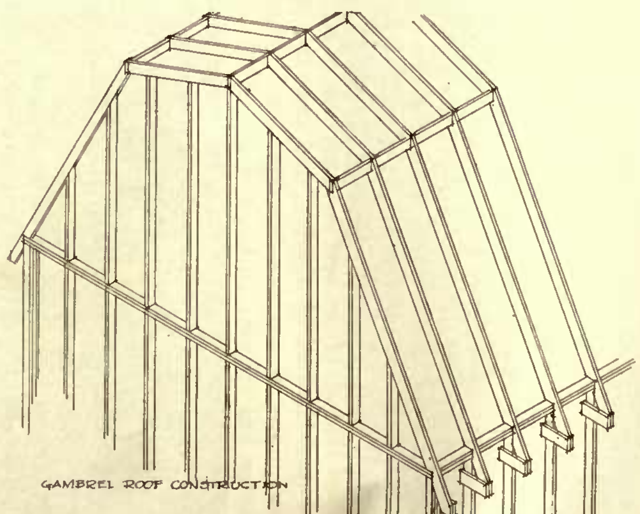
This house is considered impractical, because rooms on 2nd floor are not square and are lighted with dormers, and the cellar is low and partly omitted. But architecturally something can be said of it.



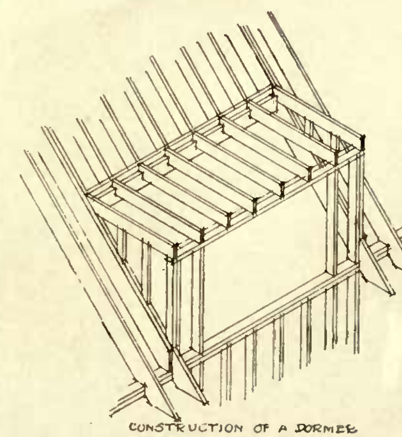
CONSTRUCTION OF GABLE ROOF



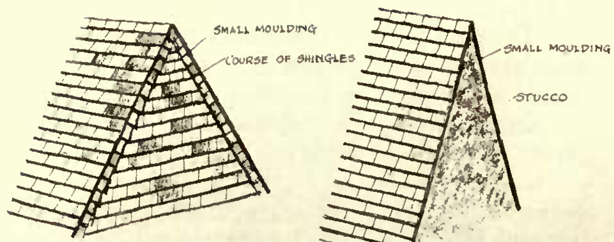
HIP ROOF CONSTRUCTION



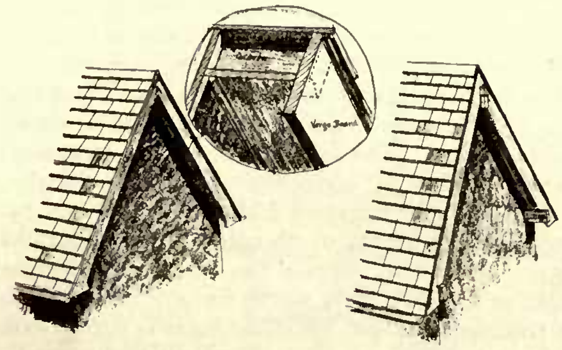
GAMBREL ROOF CONSTRUCTION



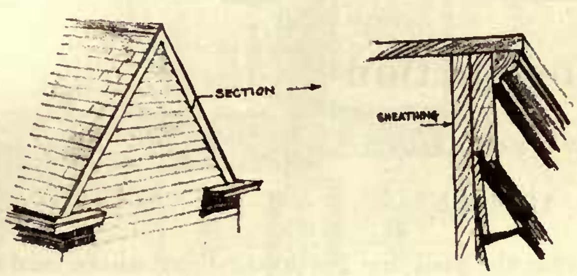
CONSTRUCTION OF A DORMER



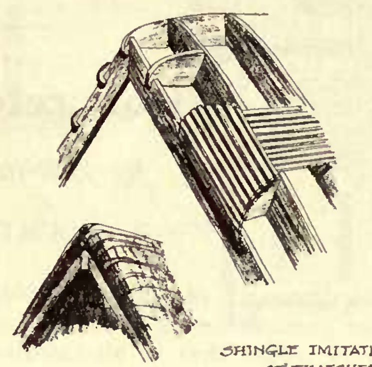
FLAT TREATMENT OF GABLE END



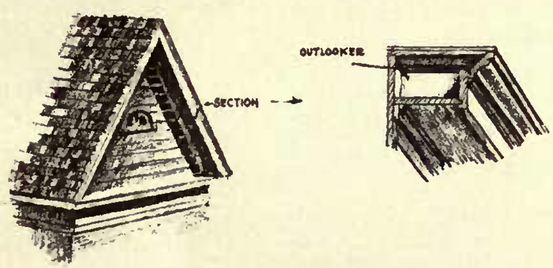
VERGE BOARD TREATMENT OF GABLE END



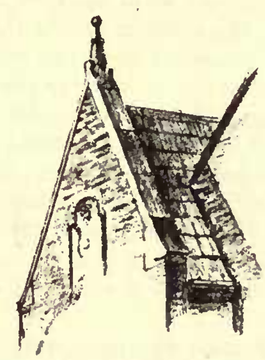
FLAT·TREATMENT OF GABLE·END·



SHINGLE IMITATING GABLE END OF THATCHED ROOF



ADAPTATION OF CLASSIC PEDIMENT



WALL GABLE

of the valley rafters must be extended to the ridge-pole, or else the rafters will collapse.

Even when it comes to the design of dormer-windows, the limits of originality are quite restricted. The drawings show all of the possible types that have been used with any success. Variations in the proportions and the details of these motifs is about all that the designer can hope for, and yet this is one of the hardest problems to solve. The correct designing of dormer-windows is a very rare thing to be seen. How many houses of modern Colonial style have ugly dormers. They are usually made too large and too wide and fat. The dormer-windows used in the old Colonial houses were narrow and high, and in those proportions were their charming appeals. To-day a double-hung window with weight-boxes is used in these dormers, and the whole width made too wide because of these additions to the sides. This is a warning that the designer should be careful in adopting old motifs to modern requirements. This particular problem has been correctly solved with the use of the weight-box, but how many times it has not been solved is evident on all sides. Another unfortunate use of the dormer-window motif is the extension of the second floor up through the lower slope of the gambrel roof. This cuts away any legitimate lower section of the gambrel roof, and in order to preserve it, the designer projects it outward from the ends of the house, and has it skirt by the side of the second floor like an added toboggan-slide with no earthly reason for its existence. Then, too, the prairie-schooner dormer, the semicircle one, and the eyebrow dormer are certainly types to be used with great care, for they can become eyesores without effort, and they cost a good deal to construct. Where the dormer is to be made inconspicuous the flat-roof type has been successfully employed, but the roofing material on it should be tin or copper. In some of the trap-door types of dormers where the pitch is very slight, the roofing material ought to be of sheet metal. The sides of dormers are made less conspicuous by covering them with the same material as used on the roof, but this is not always desirable. However, all vertical joints of dormers with the roof should be carefully flashed to prevent leaks.

The treatment of the gable ends of dormers is practically the same as that required for the treatment of the gable ends of the main roof. Here again, although on the face of it there seem to be innumerable ways of treating the gable ends of roofs, yet there are comparatively few methods. The drawings show about all the possible ways, and any types which appear to differ from these can be shown to be merely variations. The simplest method of treatment is to place a small moulding under the ends of the shingles. A variation of this can be made by adding a wide board below the moulding or a course of shingles running parallel with the edge. The classic cornice can be used, but great taste is needed in handling this motif, for any pitch which is not of the traditional classic pediment form is apt to look badly. The verge-board motif comes from half-timber traditions, and is generally used in a very careless fashion. In general, it usually looks best when some visible means of support is made a part of the design.

The shingle imitation of the thatched-roof gable is one of those amusing architectural fads which do not have very deep roots, and sooner or later are forgotten.

The wall-gable treatment is very dignified, but is usually associated with larger houses, but when simplified it has a charm which none of the other motifs can offer.

Other than these few, there are no common motifs to use in adorning the gable end of a roof. This with the previous statements only go to prove that the originality of design in the small house is limited within a narrow scope, and that the real beauty is not obtained in trying to find different forms, but in trying to use the traditional structural forms in the best proportions and giving careful attention to the details. In fact it has been said that house designing is largely an assembling, into pleasing general proportions, of carefully designed traditional details.

Concrete Construction

By DeWitt Clinton Pond, M.A.

FOURTEENTH ARTICLE

WITH regard to the discussion of design of columns, footings, and floor construction in the 395 Hudson Street Building, it may be noted that in all calculations given in the previous articles very little reference has been made to flat-slab design. As almost all of the floor construction is of this type of design, the calculations in this article may be regarded as typical for most of the work throughout the building. Fig. XVI shows the structural plan of the section of the second floor which has been selected for consideration. Figs. XVII and XVIII show the band and slab schedules which should accompany such a plan. It will be noticed that the plan calls for two-way reinforcing and that the bands are designated as *A*1, *A*2, etc., and that the slabs are noted as *S*1, *S*2, etc. The bands include the outer and column-head sections, and the slabs correspond with the inner sections.

In the typical floor construction there were 2 inches of fill and 1 inch of finish over the slab. By referring to Fig. XVI, it will be noted that the panels are about all the same size, measuring 20 feet by 20 feet square, and that drop panels are indicated on the plan. The first calculation will be for the determination of the thickness of the slab, and the formula $t = .02 \times L \times \sqrt{w} + 1$ will be used. It will be necessary to determine the value of w. As the live load for the typical floor was taken as 200 pounds, and as the slab will be assumed to be 8 inches thick, the unit live and dead load on the floor can be found by adding the following loads:

Live load....................	200	pounds.
Slab........................	96	"
Finish......................	25	"
	321	"

It is now possible to substitute in the formula and determine the thickness of the typical slab.

$$t = .02 \times 20 \times \sqrt{321} + 1$$
$$t = 8.2$$

From this result it will be decided to make the typical slab $8\frac{1}{2}$ inches thick. The effective depth will be determined upon the basis that $\frac{3}{4}$-inch round rods will be used and placed 1 inch above the bottom of the slab. From the top of the slab to the centre of the steel the distance will be 7.12 inches. The next step taken by engineers in carrying out their design was the determination of the stress in the steel in a typical band. The formula for the moment in the outer section is $M = \frac{1}{80} \times WL$. W—determined upon the basis of an $8\frac{1}{2}$-inch slab—is found by means of the following calculations:

Total load per bay = 327 × 400 =	130,800	pounds.
Weight of drop panel =	1,600	"
	132,400	"

$$f_s = \frac{132{,}400 \times 20 \times 12 \times 8}{80 \times 7 \times 7.12} = 63{,}700 \text{ pounds.}$$

$$A_s = \frac{63{,}700}{16{,}000} = 4 \text{ square inches.}$$

At the time the building was under construction it was more difficult to obtain $\frac{3}{4}$-inch rods than $\frac{5}{8}$-inch bars, so $\frac{5}{8}$-inch square bars were used.

$$4 \div .3906 = 10.2$$

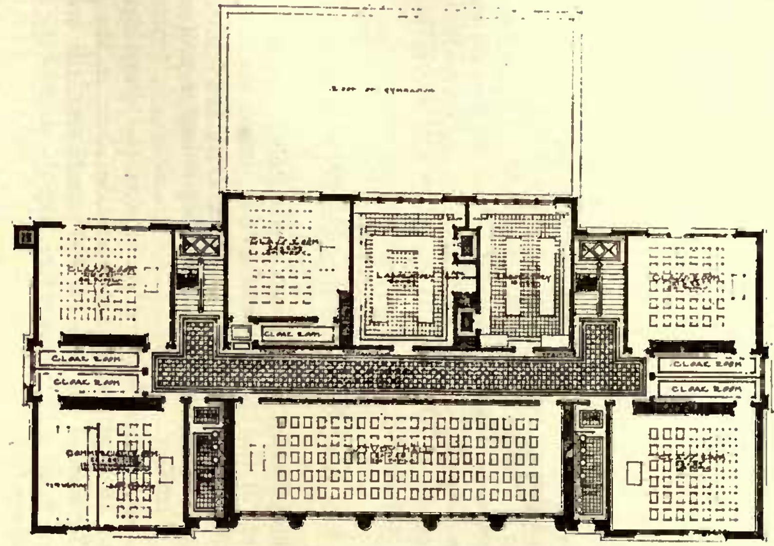
11 $\frac{5}{8}$-inch square bars will be used.

By referring to Fig. XVII it will be seen that the typical band, which is denoted by the letter *A*1, has this number of bars.

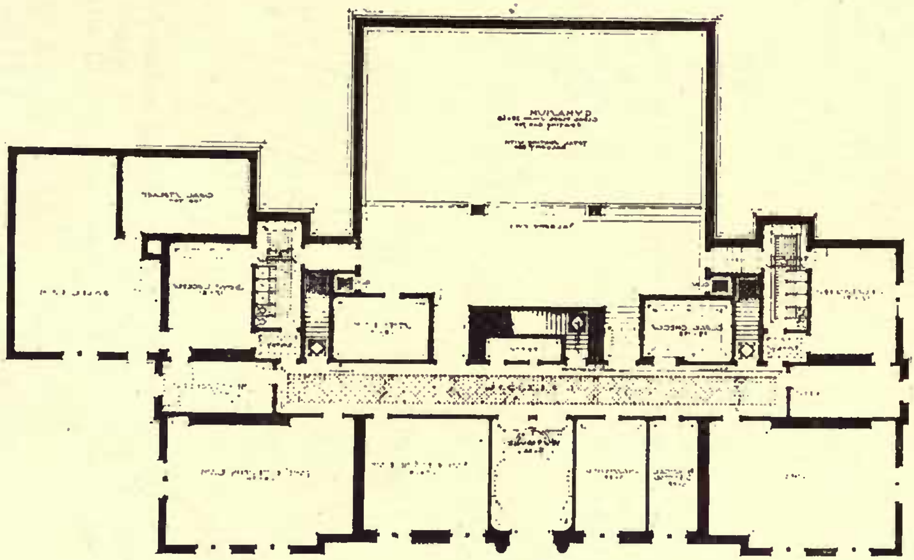
It will be noted that the calculations given above do not follow the order of the calculations given in Articles Twelve and Thirteen. In the present case the author is following the order used by the engineers who designed the concrete work for the 395 Hudson Street Building.

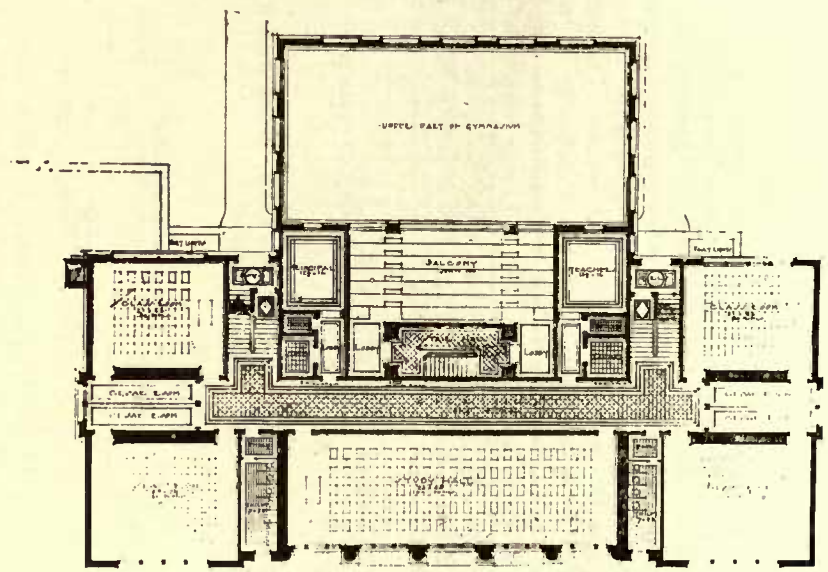
The next calculation is for the purpose of determining the area of steel required in the semicontinuous bands. The moment in the outer section of an exterior panel must be

(*Continued on page* 224)



·SECOND·FLOOR·PLAN·





·FIRST·FLOOR·PLAN·

HIGH SCHOOL, GROTON, N. Y.

C. W. Clark, Architect.

(*Continued from page 222*)

increased 20 per cent, but as the panel is somewhat smaller than the interior ones and the span is not as great, it is usually only necessary to add one bar to the typical band steel, as will be shown in the following calculations.

Fig. XVI shows the typical exterior panels as having a dimension of 20 feet from the column centre line to the building line. The columns are set back 5 inches from the building line. The columns have an average dimension perpendicular to building line of 1 foot 10 inches, and the distance between column centre lines is 18 feet 8 inches. The average exterior panel will measure 18 feet 8 inches by 20 feet. The ratio—n—is less than 1.1, so the calculations will be the same as for a square panel, with L having a value of 19 feet 4 inches. As the slab extends to within 5 inches of the building line, the load on the panel will be taken as for an interior one.

$$f_s = \frac{132{,}400 \times 19.33 \times 12 \times 8}{80 \times 7 \times 7.12} = 61{,}600 \text{ pounds.}$$

If 20 per cent is added to this the stress in the steel will become $61{,}600 \times 1.20 = 74{,}000$ pounds.

$$A_s = \frac{74{,}000}{16{,}000} = 4.62 \text{ square inches.}$$

$$4.62 \div .3906 = 11.8$$

For $A2$ use 12 $\frac{5}{8}$-inch square bars. It will be seen that this number is only one more than that required for the typical interior band.

The next step is the determination of bending in the column-head section, or, in the present case, the engineers have combined their calculations and have determined the stress in the steel. It will be recalled that in a previous article the thickness of the drop panel was determined, after which the area of steel was found. In the present case the engineers have assumed the thickness of the drop, determined the area of steel and then checked to find if the compression developed by the concrete would be equal to or greater than the tension in the steel. Assuming a $3\frac{1}{2}$-inch drop, the total thickness, from the top of the slab to the bottom of the drop, is 12 inches, and as there are two layers of steel, d becomes $10\frac{1}{4}$ inches. The formula for bending in the column-head section is $M = \frac{1}{32} WL$, and by dividing this by $\frac{7}{8}$ of the depth it is possible to determine the stress in the steel.

$$f_s = \frac{132{,}400 \times 20 \times 12 \times 8}{32 \times 7 \times 10.25} = 110{,}700 \text{ pounds.}$$

$$A_s = \frac{110{,}700}{16{,}000} = 6.92 \text{ square inches.}$$

Use 18 $\frac{5}{8}$-inch square bars.

In the last article attention was called to the requirement that the negative moment over the first interior row of columns must be increased 20 per cent over those specified for corresponding interior panels.

The area of steel required over the first interior columns will be 8.30 square inches. Twenty-one bars, $\frac{5}{8}$-inch square, will be required.

Another requirement, which was mentioned in the last article, was that the negative moment at the wall on the column-head section shall never be considered as less than 80 per cent of the corresponding moment at the first interior row of columns. In accordance with this rule there will be 6.65 square inches of steel required over exterior columns. In this case it will be necessary to use 17 $\frac{5}{8}$-inch square bars.

The next step in the design is checking the allowable compression in the concrete. As a side of a drop panel must be at least one-third as long as the panel length, in the present case the drop will measure 6 feet 8 inches square. The area of concrete in compression will be as wide as the drop and as deep as three-eighths of the slab depth. The allowable unit stress on the concrete as given in the code for this condition is 750 pounds per square inch. The *average* allowable stress will be 375 pounds. With an area 80 inches wide, three-eighths of 10.25 inches deep, and an allowable average stress of 375 pounds, the allowable stress in the concrete is given by the following calculations:

$$\tfrac{3}{8} \times 10.25 \times 80 \times 375 = 115{,}300 \text{ pounds.}$$

In the previous calculations f_s was found to equal 110,700 pounds at the column-head section, so, as the concrete can withstand a compressive stress greater than this, the depth of $3\frac{1}{2}$ inches assumed at the beginning as proper for the drop is correct.

The next check is to determine if the drop is large enough to develop proper unit resisting shear in the concrete. The area of the panel is 400 square feet, the area of the column head is 15.9 square feet, and the area of the drop is 44.4 square feet.

Checking the shear at the edge of the drop the following results will be obtained:

$$(400 - 44.4) \times 321 = 114{,}100 \text{ pounds.}$$
$$b = 4 \times 80 = 320 \text{ inches.}$$
$$d = 6.87 \text{ and } \tfrac{7}{8} \times d = 6.00 \text{ inches.}$$
$$bjd = 1{,}920 \text{ square inches.}$$
$$114{,}100 \div 1{,}920 = 59.5 \text{ pounds.}$$

As the allowable unit shear is 60 pounds, the drop is large enough as far as its area is concerned.

Under ordinary circumstances it is customary to check the shear as the column capital, but in the present case the capital was made much larger than required for the panels under consideration. There are other panels in the building which are larger than the ones designed in these articles. The capitals for these panels had to measure 5 feet and 6 inches in diameter. In order to speed the work of erection the engineers decided to keep the capitals all the same size, so, although the code would call for capitals measuring only 4 feet 6 inches in diameter, they were made 1 foot larger. From the calculations in previous articles it is obvious that there would be no danger of failure through punching shear at the column capital.

The next item on the design sheet of the engineers is the design of the slab steel. This is simply the steel in the inner section. The formula for determining the bending moment is $M = \frac{1}{133} \times WL$.

$$f_s = \frac{132{,}400 \times 20 \times 12 \times 8}{7 \times 133 \times 7.12} = 38{,}300$$

$$A_s = \frac{38{,}300}{16{,}000} = 2.39$$

Use 10 $\frac{1}{2}$-inch square bars.

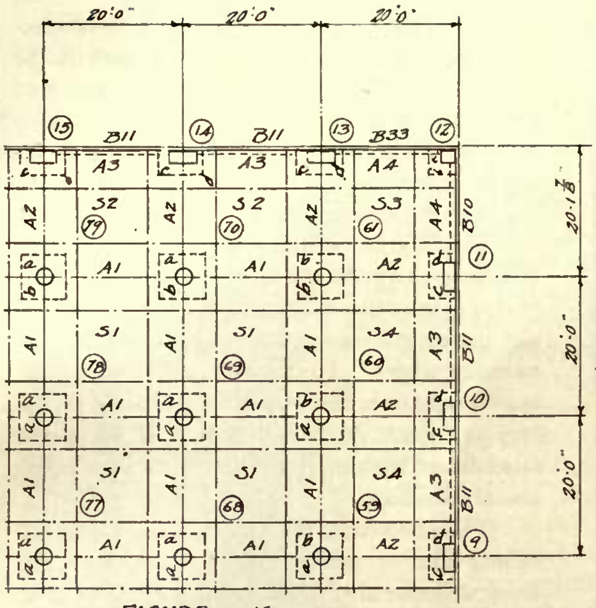


FIGURE 16

Band Schedule			Note: Lap = Lap Beyond ℄ of Column.												
Mk.	Total No	Width	Square Steel											Remarks	Near Col.
			Total No	Size	No	Length	Lap	No	Length	Lap	No	Length	Lap		
A1	120	10'0"	11	5/8	11	20'0"	6'0"								94
A2	36	10'0"	12	5/8"	6	26'3"	6'0"	6"	14'3"						10
A3	30	5'8"	6	5/8"	6	20'0"	6'0"								14
A4	6	5'8"	7	5/8"	3	26'3	6'0"	4	14'3						12

FIGURE 17

Slab Schedule					Note: All Slab Bars to Lap 9" Beyond ℄ of Column.					
Mk.	Total No Slabs	Slab Thickness	Steel						Remarks	Near Col.
			Bars Run N. & S.			Bars Run E & W.				
			No	Size	Length	No	Size	Length		
S1	51	8½"	10	½"□	20'0"	10	½"□	20'0"		111
S2	30	8½"	6 5	½"□	14'3 26'3	10	½"□	20'0"		49
S3	2	8½"	6 5	½"□	14'3 26'3	5 6	½"□	26'3 14'3		12
S4	17	8½"	10	½"□	20'0"	5 6	½"□	26'3 14'3		158

FIGURE 18

Additional Steel in Top of Slabs, Beams and Girders at Supports				
Location	No	Square Steel		
		No	Size	Length
a	132	7	5/8"□	12'0"
b	53	9	5/8"□	12'0"
c	35	4	5/8"□	12'0"
d	30	5	5/8"□	6'9
i	2	2	5/8"□	6'9

FIGURE 19

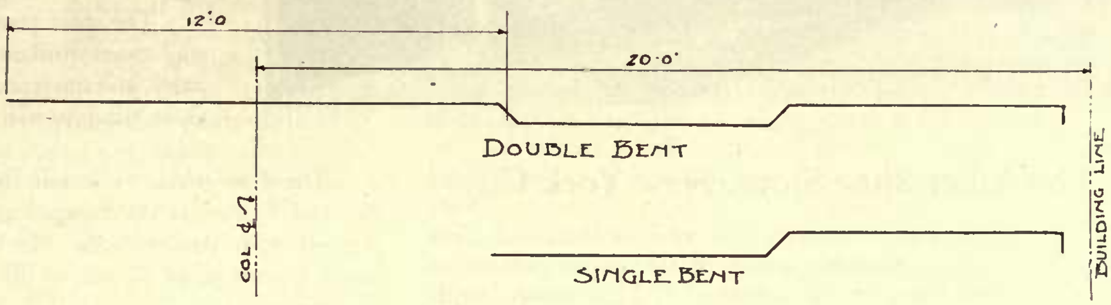


FIGURE 20

In the semicontinuous slabs, adjacent to the wall, the calculations will be slightly different, as the panel is smaller.

$$f = \frac{132.400 \times 19.33 \times 12 \times 8}{7 \times 133 \times 7.12} = 37{,}100 \text{ pounds.}$$

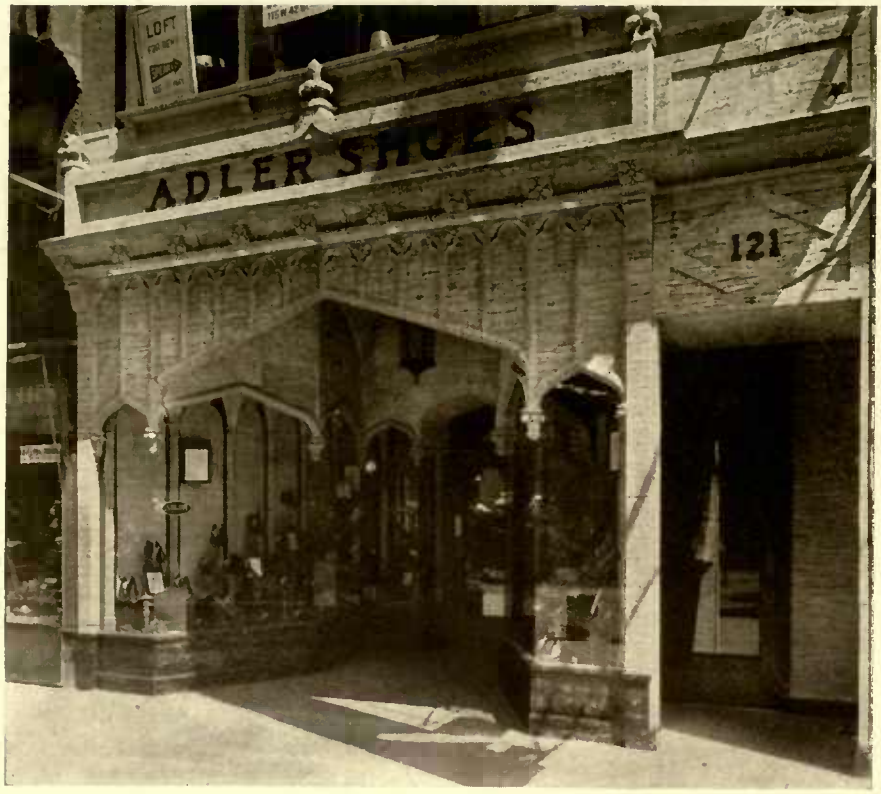
If 20 per cent is added to this the stress in the steel will become 44,500 pounds, and A_s will equal 2.78 square inches, and 11 ½-inch square bars will be required.

This completes the calculations for such slabs and bands as are shown in Fig. XVI. In Fig. XVII the number and size of the bars in the bands are given. In the half-bands at the walls, which are noted in the figure as 5 feet 8 inches wide, one more than one-half the number of bars in the full bands are called for. The lengths called for in the schedule depend upon the method of bending the steel. In the case under consideration single-bent bars are used and are carried from point of contraflexure to point of contraflexure. These will be 20 feet long, in the typical interior bands. In the semicontinuous bands one-half the steel is double bent and the other half single bent. The half which is double bent extends beyond the first line of interior columns to the point of contraflexure at one end, and to within 3 inches of the edge of the slab at the other end, where it is hooked 6 inches. In the present case the engineers did not select the point of contraflexure as at one-quarter of the span length, but at a point located at three-tenths of this distance, which gives a lap of 6 feet. Adding this dimension to the span length, and allowing for the length taken up by the bends and the hook, the total length of the double-bent bars will be 26 feet 3 inches. The single-bent bars will only extend to the point of contraflexure on the exterior side of the first line of columns, so these will be 12 feet shorter than the double-bent bars. This will give a length of 14 feet 3 inches, as shown in Fig. XX.

With this method of laying out steel it is necessary to add bars over the tops of columns, which in this case will run from one three-tenths point to the other three-tenths point, a length of 12 feet. These bars are called for in the schedule shown in Fig. XIX. Over the interior columns there will be required 18 bars. Six will be bent up from one side and 5 from the other, which will give a total of 11 bars. There will be 7 more required as called for at *a*. At the first interior line of columns, however, there will be 21 bars required. As there will be 12 bars bent up, there will be 9 additional bars needed, as noted at *b*. At *c* only one more than half the number required at *a* will be used, or 4. At *d*, 17 bars are called for in accordance with the calculations given above. As 12 are bent up, 5 more will be added.

At column 12, 6 bars will be bent up from *A*4, and as 8 are required, 2 will be called for at *i*.

The slab schedule will need no explanation, as the length of the bars are determined upon the same basis as the length of band steel.



The unsightliness of the majority of electric signs and the tendency on the part of the city authorities to eliminate them as much as possible was an incentive to include the sign in with the store-front design, thereby making for harmony and at the same time retaining the commercial feature.

One of the points which can be severely criticised in a great many of the modern store-fronts is that the space between the glass and the under portion of the sign is not illuminated at night. To obviate this trouble concealed reflectors are placed in the soffit of the cornice, shedding a diffused light over the store-front, making it attractive without being unduly brilliant.

The show-window entrance has a groined ceiling also of travertine. Coming into the store we enter an entrance or foyer hall treated with travertine walls and vaulted ceiling, which work rests on a Botticino marble base.

The store proper, or selling space, has the wall-cases broken up by travertine display-cases, and the rear wall is arranged with a centre show-window with staved-up doors on either side.

The Adler Shoe Store, New York City

THE Adler Shoe Company has various stores in New York City, the construction of the upper portion of the show-front being entirely of wood and the design tending toward Gothic.

In laying out their new store at 121 West 42d Street the idea uppermost was to construct the front of a material more lasting and more beautiful than the wood used in the other stores and still retain a somewhat similar line. This was accomplished by the use of imitation or cast travertine stone designed in English Gothic.

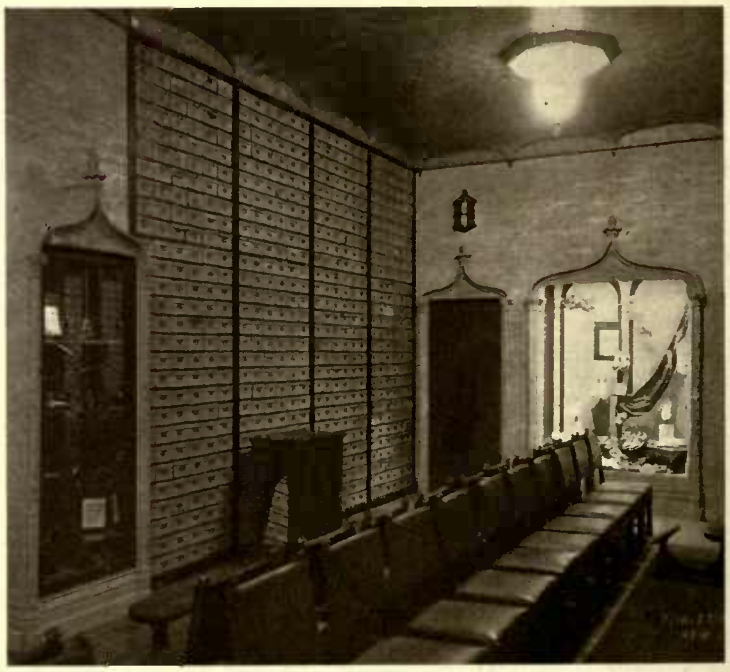
The show-windows both in the front and the rear are laid out with three-quarter engaged columns with a coved ceiling pierced with penetrations. In these penetrations are set wood frames so as to relieve the monotony of a wall, all of travertine.

The woodwork throughout is of chestnut finished like old English oak.

The store ceiling and cornice is hand-finished antique finished in old ivory.

The work was designed by Elias, Rothschild & Co., Inc., of which Henry S. Lion is the architect.

Foyer.



Salesroom.

An Office-Building in South America

Robert M. Farrington, Architect

Entrance to Banco de Bogota.

THE Edificio Lopez, or Lopez Building, at Bogota, Colombia, South America, in addition to its other attributes, can boast of the following record-breaking facts: It is the highest business building in Colombia. It is the first reinforced-concrete building in Bogota. It contains the first elevators operated in Colombia, and it is the largest business building in the country.

The building was erected by Pedro A. Lopez & Co. at Bogota, which is the capital of the country. Bogota is eight thousand seven hundred feet above sea-level; it is the land of perpetual spring. The city was settled by the Spaniards in 1540, is six hundred miles from the coast, and has no railroad connection. Consequently when the river is dry or low, as it frequently is, much difficulty is encountered in getting material to Bogota. Specifications are practically useless, for starting out with the idea of using one material and being unable to procure it at the time, something else must be substituted.

There are no general contractors in Bogota and no trade-unions; all work is done by sort of a day's work process. There are no sash and door factories and no planing-mills. All this sort of work is done in small shops, of which there are a thousand and one, where a man can turn out only a small amount of work. We maintained a sort of training-school on the job, and taught the men to make the forms for the concrete, to bend the steel, and to mix the concrete, as well as many other things. We had a sample door made and a sample window of each type, fixing the value according to the time it took to make, and gave out about twenty contracts to as many different men, all work being done on the premises. On another job which the architect had in Bogota, where it was necessary to have about two hundred windows turned out in a reasonably short time, he had a sample window made and invited several carpenters to come and inspect it before making up their own lot; the result was that we had many different windows, as the various men only carried away a general idea of what was wanted, and finished the work according to their own taste.

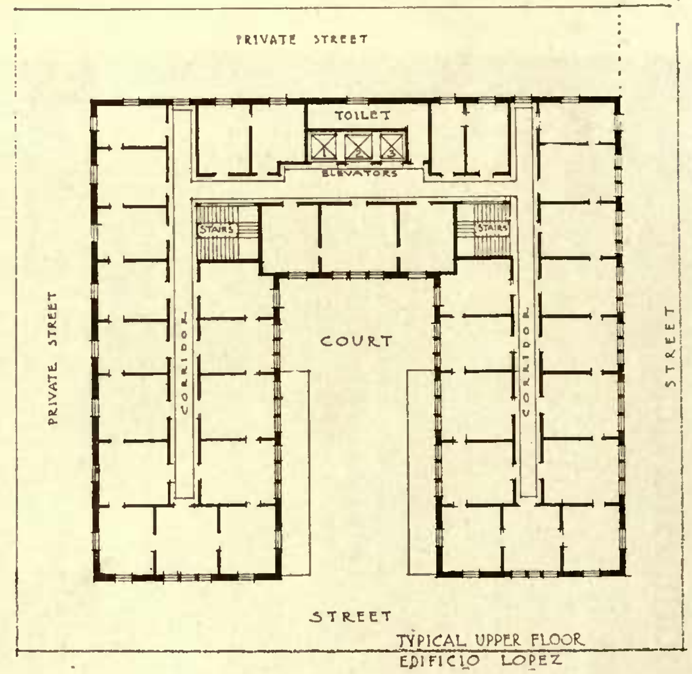
The entire piping system was ordered from the States, but did not arrive in time, so when ready to install the fixtures, the following method had to be invented to carry the waste and soil. All of the upright pipes are of terra-cotta and all of the connecting and horizontal pipes are of copper. The copper pipes are exposed on the ceilings below and are regularly polished and present a rather artistic effect. It was fortunate, however, that the building was not a hotel with a hundred or more bathrooms, as this copper work was a long and tedious job. On the other hand, it only goes to prove that resourcefulness is sometimes better than a good specification. There are no vent-pipes in connection with the plumbing work of this building.

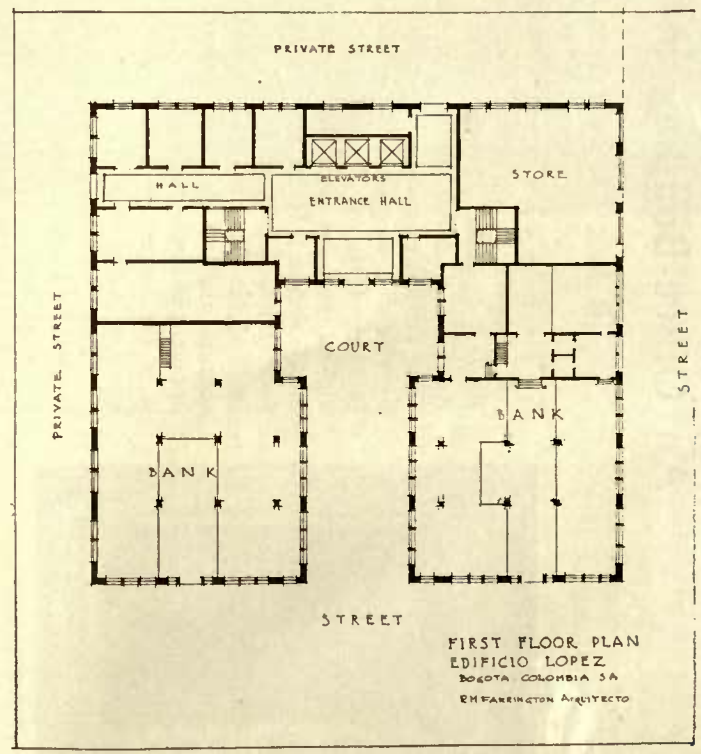
We tried a small sample of electric conduit work, and finally gave it up as a bad job. The wires are run below the floors supported to the wood sleepers by china insulators. The usual method here is to run all wires exposed. To instruct a body of inexperienced workmen, especially with a limited knowledge of the Spanish language, in all the intricacies of conduit work was proved impracticable.

Most of the ordinary door-locks made in the States are what is known as reversible; that is, by taking them apart you can turn the strike over and make it fit a left-hand or right-hand door. Possibly many locks came here from Europe that were not reversible, or perhaps the Colombian carpenters never knew they could reverse a lock; at any rate, the usual process is to put the lock on the door, and if the door is a right-hand door and the lock is a left-hand lock, the lock is put on upside down, which is the only way it could be put on. It is safe to say that half the door-locks in Bogota are upside down. The architect was obliged to correct 90 per cent of them in the Lopez Building.

Entrance to Edificio Lopez.

Entrance to Banco Lopez.





EDIFICIO LOPEZ, BOGOTA, COLOMBIA, S. A. Robert M. Farrington, Architect. Abell, Smalley & Myers, Equipment Engineers.

The Lopez Building is entirely of reinforced concrete, with curtain walls of brick between the columns, forming the exterior walls. It is approximately two hundred feet square, is on a corner of two streets, and has a private street on each of the other two sides.

BANKING-ROOM, BANCO LOPEZ.

CONFERENCE-ROOM, BANCO LOPEZ.

BANKING-ROOM, BANCO LOPEZ.

BANKING-ROOM, THE COMMERCIAL BANK OF SPANISH AMERICA.
Robert M. Farrington, Architect. Abell, Smalley & Myers, Equipment Engineers.

There are two banks on the main floor, one a local bank, the Banco Lopez, and the other a branch of the Commercial Bank of Spanish America. The upper floors contain about one hundred offices, which are occupied by lawyers, oil companies, etc.

Announcements

According to a recent survey of the Copper and Brass Association, the aggregate annual repair bill of home-owners in this country will this year amount to $540,041,769 for one item alone—the replacement of rusted sheet-metal work, including leaders and gutters, valleys and flashings.

It is estimated that there are in use in this country at the present time 5,175,000,000 feet of leaders and gutters and that about 1,000,000,000 feet is renewed annually.

The cost of replacements of rusted iron and steel pipe in plumbing is placed at $86,500,000 annually, making a total annual rust bill of approximately $626,500,000.

Of every dollar spent in residence construction, 36.1 cents is spent for masonry, 29.1 cents for carpentry, 8.7 cents for heating, 6.5 cents for painting, 6 cents for electrical work, 6 cents for plumbing, 3.5 cents for sheet-metal work, 2.9 cents for roofing, and 1.2 cents for hardware.

The survey shows that the four last-named items—plumbing, sheet-metal work, roofing, and hardware—are the heaviest contributors to the nation's annual repair bill.

It is estimated that between four and five billion dollars will be spent this year in new construction, a large part of it residential.

Of this amount, approximately $240,000,000 will be spent for plumbing, $140,000,000 for sheet-metal work, $116,000,000 for roofing, and $48,000,000 for hardware.

R. S. Pringle, architect, announces that on June 1, 1922, Francis P. Smith, formerly Professor of Architecture at Georgia School of Technology, became associated with him for the practice of architecture under the firm name of Pringle & Smith, 1417–1421 Atlanta Trust Company Building, Atlanta, Ga.

A specification handbook, rewritten and revised, has been issued by the Truscon Laboratories, Detroit, Mich. It contains complete specification data and forms on integral waterproofings, damp-proofings, cement floor hardeners, wood preservatives, steel paints, mill white paints, and architectural varnishes. Because of the value of the book, general distribution is impossible. Copies will be mailed, on written request, to architects, engineers, contractors, factory managers, and others sufficiently interested.

A National Slate Association

To give the public greater knowledge as well as to extend and promote the use of their products, the slate-producers of the country met in New York in April, and organized the National Slate Association.

O. Bowles, of the U. S. Bureau of Mines, pointed out some of the advantages that would accrue to the slate industry through the activities of an organization.

The ability to effectively meet outside competition is one of the most prominent advantages, for new competitors are constantly appearing. Organization also enables manufacturers to standardize and simplify products, to find new uses for waste, and to exchange ideas on the most modern methods and equipment.

W. A. Durgin, chief of the Division of Simplified Practice of the U. S. Department of Commerce, outlined the service to industry his division was prepared to give. The report of W. H. Smith on the freight-rate situation showed that slate is suffering under a handicap of a higher freight cost than all other construction materials. He believed that the industry's plea before the Interstate Commerce Commission for relief will be favorably acted upon for the benefit of the public.

Sullivan W. Jones, chairman of the Structural Service Committee of the American Institute of Architects, on behalf of that body offered its co-operation to the producers of slate in the service of the public. Mr. D. Knickerbacker Boyd, structural standardist of Philadelphia, outlined many of the steps already taken by the slate industry to eliminate excess varieties of sizes on types of slate installations.

Mr. L. E. Kern, of the American Institute of Architects, also discussed co-operation between architects, producers, and the public.

Trade Association Progress Shown at Building Conference

One of the interesting features of the recent Building Conference meeting held by the National Federation of Construction Industries at the Drake Hotel, Chicago, was the several comprehensive displays illustrating the progress that has been made by the various Trade Associations.

Apart from the larger displays by the Bureau of Standards and Federated Engineering Societies, one particularly commended was that installed by Mr. H. S. Brightly, Service Engineer for the Indiana Limestone Quarrymen's Association, Bedford, Indiana, which showed the progress that has been made in the adoption of a uniform classification for a building stone, standard specifications, and standard practice relating to the furnishing of samples.

A noteworthy feature of this display was the absence of all matter not relevant to the subject of standardization, simplification, and elimination of waste.

Industrial Construction Increasing

The volume of industrial construction, which has been lagging behind during the past year, is now gradually increasing, according to Louis H. Bean, Vice-President of Dwight P. Robinson & Company.

Mr. Bean says: "An increasing demand for goods is gradually taking up the slack in available manufacturing space and many industrial companies are now proceeding with new plants and extensions, as indicated by new contracts we received during the month of March. We have been authorized by the Denkmann Lumber Company to design and construct a complete electrically driven sawmill at Denco, Miss., together with a village of about fifty houses, schools, churches, etc., and additional work at the Denkmann plants at Canton and Pelahatachie, Miss., and also to design and construct a new sulphur mining plant at Hoskins Mound, Texas, for the Freeport Sulphur Company. This latter work will be done under the direction of Cloyd M. Chapman."

THE DORMITORY BUILDING.

THE ENTRANCE-HALL TO DORMITORY. Frank Jackson, Sr., Architect.

BLISS ELECTRICAL SCHOOL, TACOMA PARK, WASHINGTON, D. C.

THE DINING-HALL.

DINING-ROOM.

Frank Jackson, Sr., Architect.

BLISS ELECTRICAL SCHOOL, TACOMA PARK, WASHINGTON, D. C.

(*Continued from page* 210.)

The façade is broad and generous in extent, of inspiring ensemble, and is admirably located in one of Chicago's most attractive parks. The structure, due to its superb location, amid wide stretches of open park areas, can be seen over lagoon and from spacious driveways in proper perspective, and presents at a glance its broad extent of plan, also beauty of proportion and of architecture.

The centrally located dome dominates in a striking way, yet with rare charm and grace. The entire structure, and the combination of columns, colonnades, refinement of architectural detail and of sculpture make it a most noteworthy building and worthy of preservation for all time.

It was designed by Charles B. Atwood, an architect of eminence, who was associated with Daniel H. Burnham, the directing architect in general of the World's Columbian Exposition. The main central pavilion was suggested by Bénard's "Grand Prix de Rome" drawing, but Mr. Atwood refined and changed the detail. He designed the structure in accordance with this central motif and produced a result that will live as long as art has any direct appeal to mankind.

The building has been used since the World's Fair period to house a great collection of natural history and was temporarily known as the Field Museum. This great collection has been recently moved to its spacious new home in Grant Park.

The exterior of the Fine Arts Building is in a state of disintegration due to the condition of the plaster veneer, which was not originally intended to be permanent. This has led to the general belief on the part of the public that the building was no longer safe and that, due to its seemingly dilapidated condition, it would soon be wrecked. This brought forth many expressions of regret, but there was no movement to counteract this impression, and in consequence there was great danger that the building would be destroyed. It was at this critical time that the Municipal Art Committee of the Illinois Chapter took active interest in the project to preserve the structure, and as a first move brought to the attention of the public the actual condition of the building.

The Fine Arts Building was erected to house priceless works of art in which foreign governments were particularly interested, therefore care was exercised in its construction. The main walls are of brick, two feet thick, resting on concrete foundations and the general structural features are sound.

It would be especially appropriate for a great school of industrial design. Its purity of style, expressing a universality of art and architecture, would be an inspiration to the student, stimulating him to greater effort, and thereby encourage a creative art worthy of American genius.

True progress must be founded on a knowledge of the great past and of those principles underlying all enduring art. It is, therefore, fitting that such a noteworthy building that embodies these necessary requisites, also historic significance and opportunity for service, should be of particular interest to the American Institute of Architects.

It is their responsibility—their opportunity—to lead the thought of America in matters of this nature.

It is with pleasure, therefore, that I am able to state for the Illinois Chapter, A. I. A., that the movement toward restoration of this famous building is under way.

The public, the press, civic organizations, and prominent clubs have strongly indorsed the project as proposed by the Municipal Art Committee, and the movement is gaining strength.

The Second Congressional District, Illinois Federation of Women's Clubs, have led the way and have tendered the Illinois Chapter the first instalment of money necessary to restore the northeast corner of the east pavilion as it appeared originally. The purpose of the first restoration is to show the contrast between a section as it appeared during the World's Fair and the present dilapidated condition of the building. This striking contrast, together with the publicity and education already entered into, will bring the issue clearly before the public for decision.

JUNIOR CLASS.

Any graduate in architecture of a school recognized by the Institute is eligible as a Junior upon submission of proof of his graduation, provided application is made within one year of graduation.

The Junior affiliation shall expire automatically when the Junior reaches the age of thirty, unless previously terminated by the advancement of the Junior to Membership or Chapter Associateship, or by his resignation, or by the Board of Directors for any cause it may deem sufficient.

In his application the Junior shall agree to be bound by the disciplinary rules of the American Institute of Architects, and it shall be competent for the disciplinary committees to consider and dispose of any charge of unprofessional conduct made against a Junior under the established disciplinary procedure of the Institute.

Every person desiring to be admitted as a Junior shall submit his application to the Board of Directors, upon a form authorized by the Board. The annual dues of $5, or a pro rata portion thereof on a quarterly basis must accompany the application.

When an application, in proper form, is received by the Secretary of the Institute the applicant shall be declared elected a Junior and the membership of the Institute shall be notified accordingly.

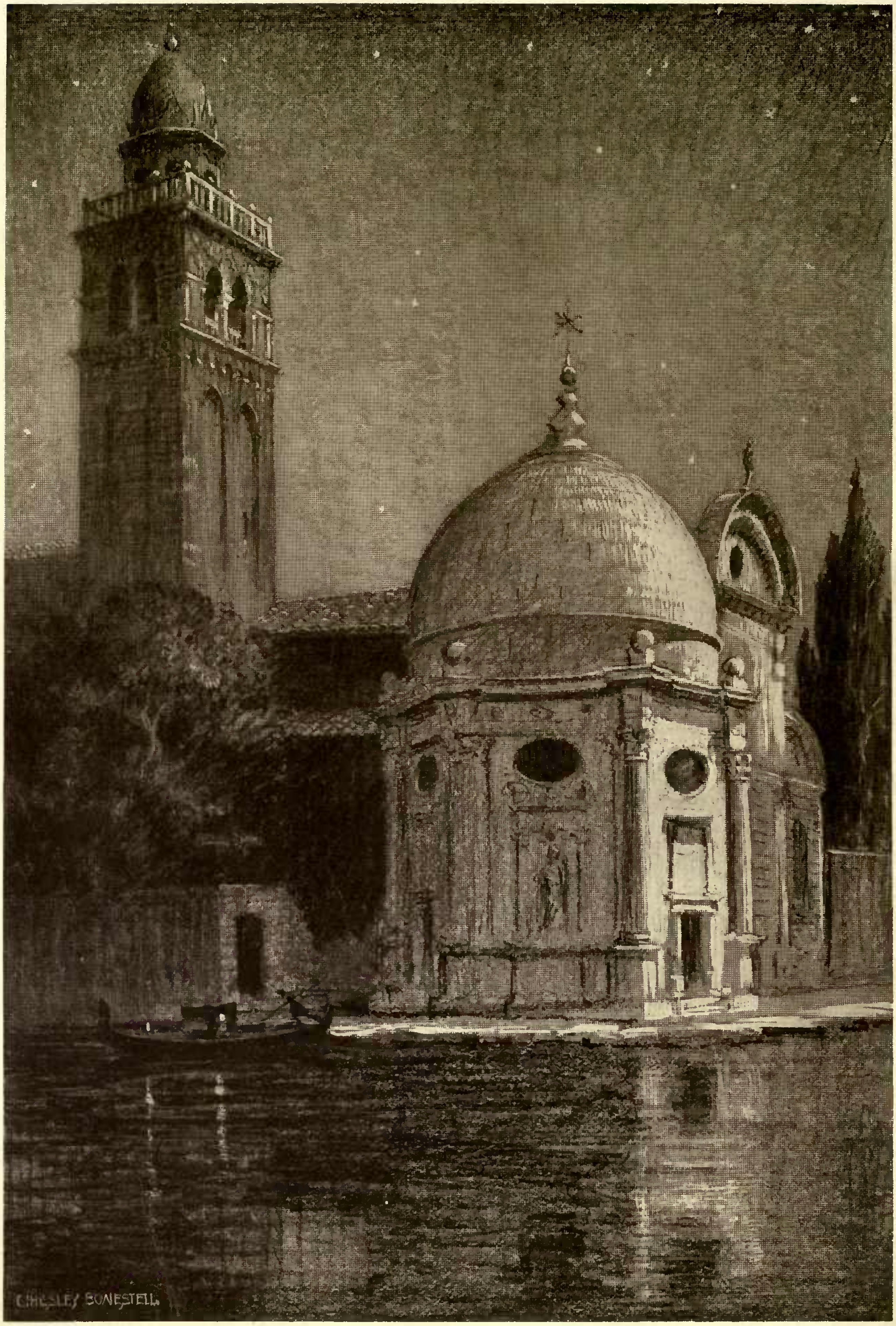
Juniors shall receive the Journal of the Institute. They shall also receive the Proceedings of Conventions and such other Institute documents as the Board may direct. A Junior may use after his name the unabbreviated affix "Junior, American Institute of Architects."

A Junior shall not be a corporate member of the Institute, nor shall he have any interest in or claim against the property of the American Institute of Architects, nor be entitled to vote in any Convention of the Institute except on the sense of the meeting. He shall not be entitled solely on account of his Juniorship to claim affiliation with any Institute Chapter except that he shall have the privilege of attending meetings. He shall not exercise any privileges granted to Members in these By-Laws, except those specifically granted to him.

Juniors shall be designated by the affix "Junior, American Institute of Architects."

The disciplinary procedure set forth in this section shall apply in principle to Juniors with the exception of the fourth paragraph, which has no application to Juniors inasmuch as they have no relationship with the Chapters and are not amenable to Chapter disciplinary action.

The annual dues of a Junior shall be Five Dollars, which will include one year's subscription to the Journal.



ISLE OF SAN MICHELE, VENICE.

Formerly a convent, used as a cemetery since 1830. Church built in 1470. Small round chapel built 1510.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI AVGVST, 1922 NO. 2

Peking and the Pagoda

By Helen Churchill Candee

Ten Ling Ssu belonged to old Buddhist temple.

WE have to thank the Buddhist for the pagoda. The impulse is to thank somebody for very joy when the first pagoda creeps into one's consciousness from its far enthronement. While a thrill is given to the nerves, the eyes blink with unbelief at the strange beauty, aloof and distant, of something never seen before, some fantastic furnishing of a fairy-tale.

To Buddha were the first pagodas built, and under them or within them were placed relics of the Worshipful. But after a time the bones of the minor saints were considered sufficient excuse for the erection of the exquisite tower of religious intent. It might be thought that no excuse at all was necessary for the creation of an architecture so gracefully ornate. More recent pagodas have been built for the most human of reasons—put up to bring luck to a community. More delightfully in keeping with the Chinese temperament, they have been built for pure joy, to enliven the neighborhood, to heighten the people's morale. An idea lies in this for both architects and public to consider. Do we ever, with a burst of joy, order the erection of a purely beautiful tower in a barren spot?

The Chinese roof is a matter for the erudite. In its history is found the tent, which was the beginning of man-made shelters. Bamboo poles naturally sustained the tent, and increased in number when tiles replaced the covering of skins or fabric. And thus the roof became the builder's fondest architectural care.

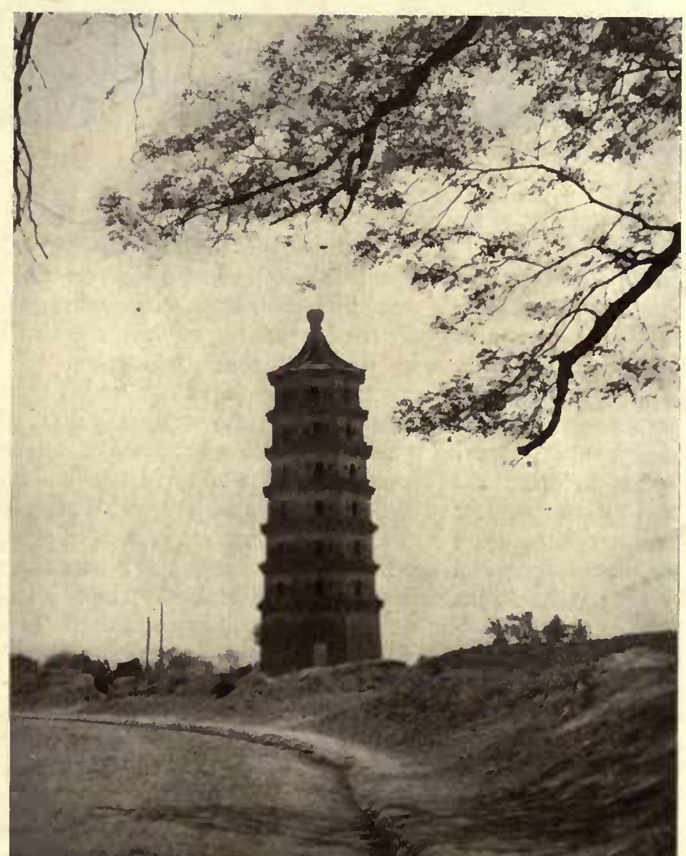
A study of the Chinese roof may seem inappropriate to the pagoda, but after scrutiny the roof proves to be its main decoration, and, next to the tower itself, it is the chief architectural feature. A pagoda is at the last analysis a series of roofs placed like a series of ornamental rings around the tower.

These roofs are invariably of an odd number, and run from three to thirteen. Is it true that in this multiplicity of roofs in the building, the offering to Buddha counts as the erection of many buildings?

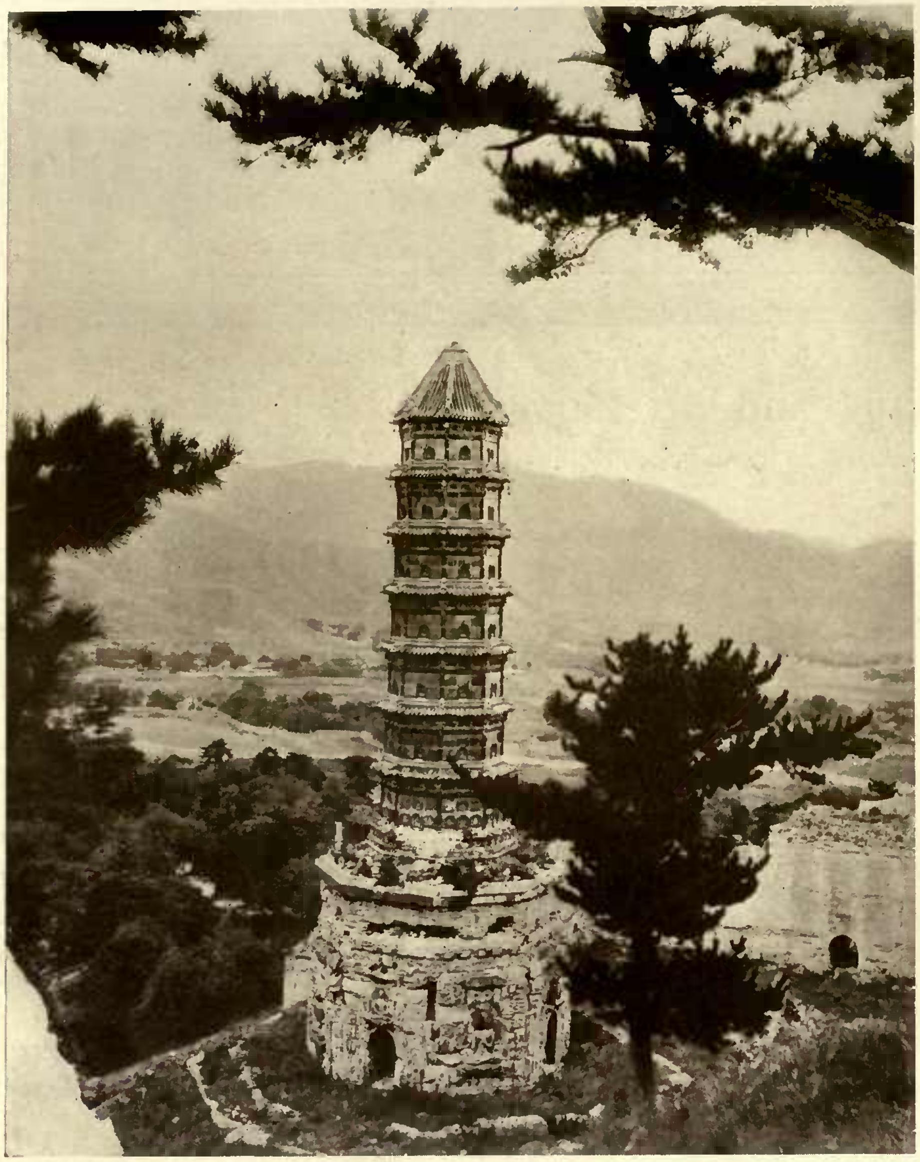
The tower of Ten Ling Ssu on the outskirts of Peking shows the massed beauty of the maximum of thirteen roofs. Its pedestal holds an entrance door guarded by the gods who, with their stupendously hideous appearance, affright the spirits of evil. This in carved marble, while above, the structure is laid with a bewildering arrangement of brick, and glazed tiles cover the thirteen roofs and a symbolic finial raises its harmony to heaven.

The tower of Fa Ta Ssu, on the other hand, is simplicity itself, girded with but seven roofs and finished with an ovoid finial.

It is the group in the western hills that draws the lover of the pagoda. The Old Buddha, as her admiring detractors call the late Empress, knew the value of the region, knew the repose lying on the rocky heights of the treeless mountains rising from the Chi-li plain under twenty miles from Peking, and she set near by the summer palace with its bewil-



Pagoda of Fa Ta Ssu.



Buddhist pagoda decaying in the Western Hills.

Each story carries panels of Buddha, but it is the series of roofs which by their elaborate perfection give this tower a surpassing loveliness. A lavish number of conventionalized bamboo poles support row on row of glazed tiles in color, forming a series of scallops or festoons. Added to all this harmonious detail are the ridge-poles—if they might be so called—to which is given the almost prehistoric decoration of a line of animals, some fabled, some domestic, which tradition sets as a protection against marauders—the civilized ghosts of the house-dogs of primitive man.

The Pagoda of the Jade Fountain carries as its crown a finial like unto a dagoba, and that in turn shows trace of remembered roofs, always of an odd number. But the subject of dagobas, stupas, and the like is another tale, one too long for a brief digressing.

That the pagoda roofs are not always evenly spaced one knows by the first glance at an ornate tower that stands in lovely protest against the ruin amid which it springs. Unlike the Jade Fountain, it is set in the dignity of a beautifully composed approach and pedestal. The roofs are seven, in groups of two and three, between which groups the panels of the octagon rise in elaborate repeated ornament, the loved figure of the Thibetan Buddha, each harbored in its own close niche.

The finial is worth a study, for it is of metal, umbrella-shaped, with hanging bells which delight the ear with joyous tinkling at the touch of the wind. This golden umbrella with bells is a royal emblem, and although it reaches North China from Thibet, it is seen on the ancient pictured legends cut in stone, not as a symbol, but as a reality.

Between the western hills and Peking stands the Pagoda of the Five Towers, which is not a pagoda according to our ideas, nor are the towers as much towers as pyramids. Yet even here the dominant architectural detail is the roof, or the eaves of the roof, many times repeated. On the carved

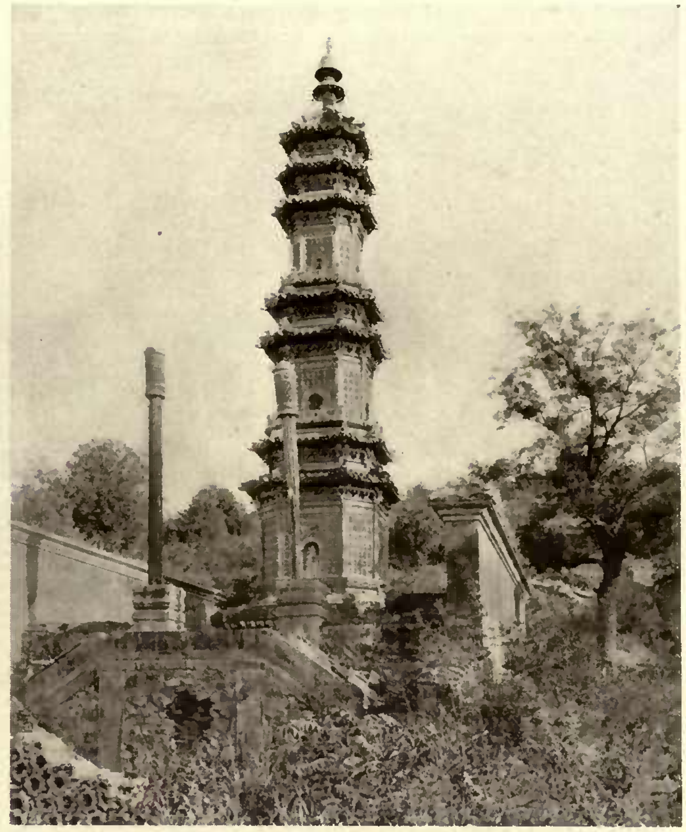
dering variety of buildings, terraces, and pergolas. Beyond the palace, where the mountains rise tentatively in little spurs, stand pagodas of enthralling beauty, not one alone, pointing the pilgrim's way, but several, each revealed from different points along the road, standing against the sky in fixed forms of grace with power to thrill, to inspire.

Part of an old monastery or temple is one which raises its seven roofs among the pines of the western hills. Its base is rapidly tumbling to pieces, fallen brick and displaced stones littering the ground; yet the shaft itself endures bravely the neglect which poverty and a republican government force upon it. On each story are niches in which are placed figures of the Llama Buddha, that Thibetan note in art so often dominating the true Chinese. Time has destroyed the finial, but tinkling bells still ornament the three upper roofs.

Beautifully preserved is the pagoda of the alluring name, the Pagoda of the Jade Fountain. Its surroundings are of the roughest, but it stands, an exquisite gem, a testament to the power of beauty. On a carved base rests an expanded lotus in the fulness of its bloom. From the heart of this wide flower springs the high light tower of carved marble and colorful tile, octagonal in shape, rising story upon story until seven roofs have spread their shining beauty to be completed by a symbolic finial.

Pagoda of the Five Towers.

Pagoda of the Jade Fountain.



Pagoda of a ruined Buddhist temple.

marble temple seven lines obtrude, and on each of the five pyramidal structures above are eleven or thirteen. The rest of the detail speaks of Thibet with the slender figure of Sakya Muni many, many times carved in encircling rows.

In these latter days we are not blind as in the past to the wondrous beauty of Chinese art. More and more eager we are to adapt if not adopt certain Eastern architectural ideas and details. With so much rich beauty vested in the pagoda of North China, it were a pity could not some of our designers pluck a thought or two from the architecture of a grand old race, the only one whose art has for five thousand years never known obliteration or decay.

The Way Chicago is Solving the Labor Problem—The Landis Award

The Biggest Building Boom the City Has Ever Known

ONE of the most interesting addresses made at the recent convention of the American Institute of Architects was that of Mr. T. J. Donnelly, chairman of the Citizens' Committee of Chicago, on "Industrial Relations." He was introduced by Mr. Robert D. Kohn.

I don't think it is necessary for me to tell you what the conditions in the building trades of Chicago have been. The building industry of the last five or ten years was such, through the combinations of labor and capital, the combinations of contractors, the combinations of materialmen, limitations of materials, the wasteful practices of unions, sympathetic strikes, and the attendant graft cost, that building costs grew so large that business could not afford to build, and it was absolutely beyond the hope of the poor man or the ordinary man in industry to think of owning his own home.

A year ago this May the contractors in Chicago, attempting to revive the building interests, tried to reduce the scale from $1.25—the flat scale of $1.25—to $1.00 an hour. This resulted in a strike of some six weeks. As a result of that strike the unions suggested arbitration, which was finally accepted, and they suggested the name of Judge Landis, which was also accepted. I think the contractors and the business public looked upon the selection askance. Judge Landis is a man of tremendous human interest and sympathy, and they thought he might give the best of it in every way to the working man. Judge Landis, however, performed a very remarkable piece of work in his decision.

I understand there was an article in the paper called *The New Republic*, which I never read, which said that Judge Landis exceeded his authority when he went into the question of conditions. Now, the man who wrote that article has not read the arbitration agreement, because in that agreement the Judge was not only to fix the wage-scale but also to fix the conditions and try to eliminate the conditions which had been so serious in the building industry of Chicago. In fact, we had built up here in Chicago, through years of unholy alliances and crookedness, conditions of which even the better unions themselves were ashamed, and I think both the union leaders and contractors and the public were all anxious to get a clean slate so the thing could be swept aside.

I want to emphasize the fact Judge Landis had authority to go into the conditions. He very soon saw a reduction of 20 per cent in wages would make only a difference of about 5 per cent in the cost of building. What was keeping the cost of building up was the combination of sympathetic strikes and graft. He accepted the fact that the building industry in Chicago had been a mo-

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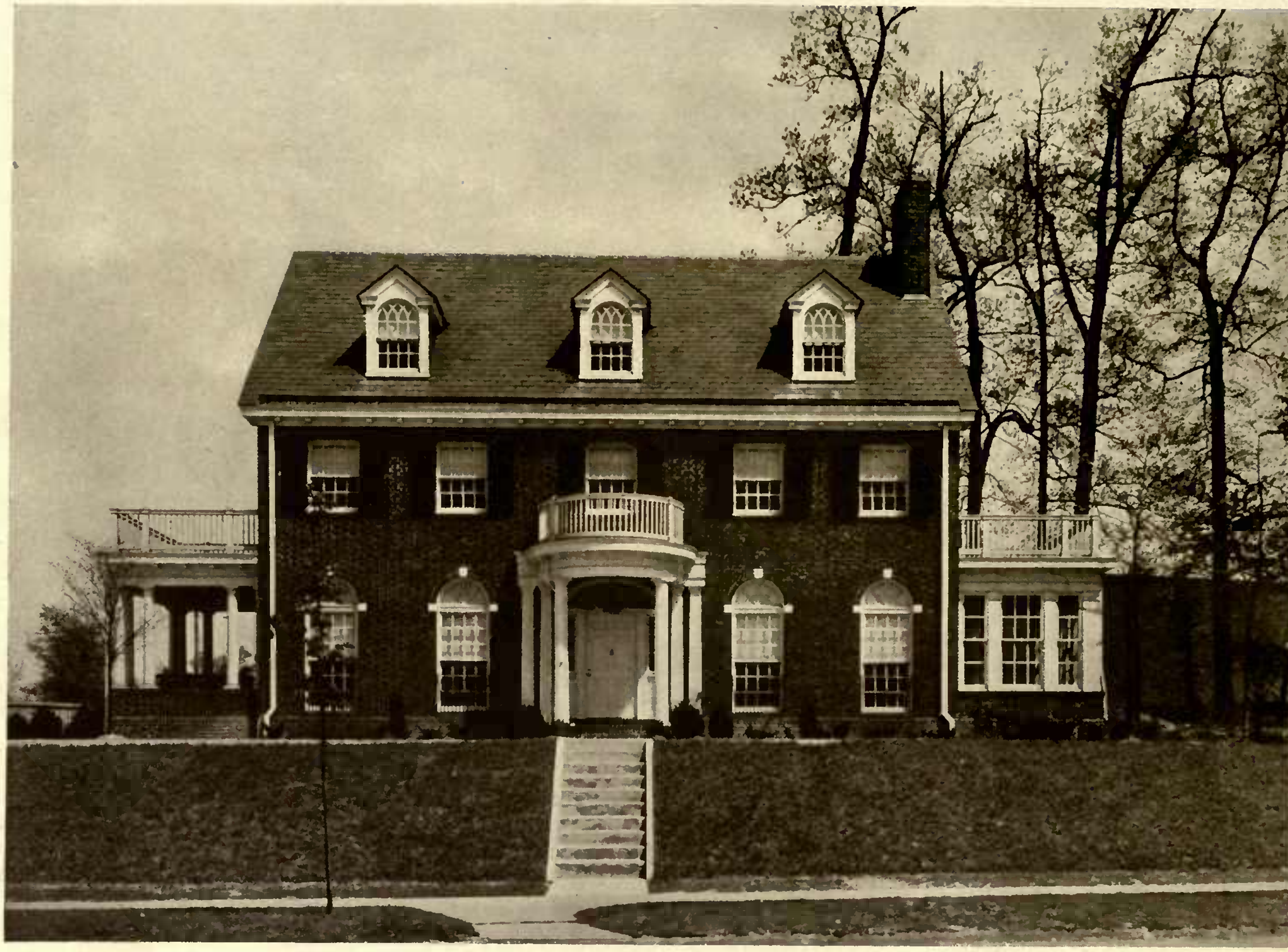
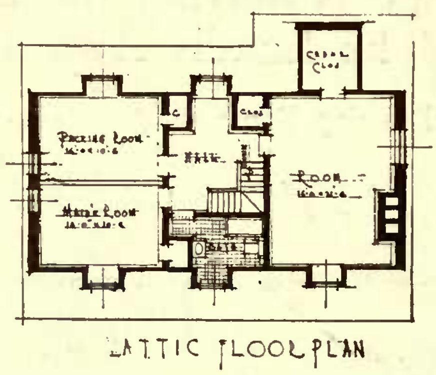
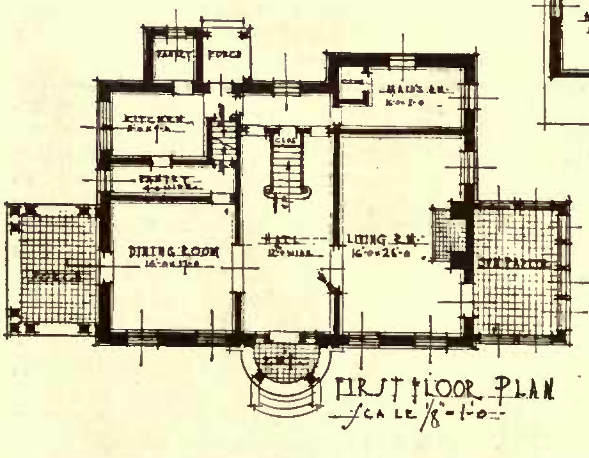
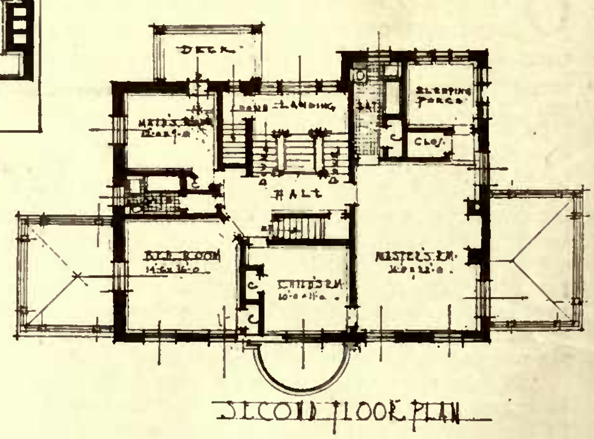








HOUSE, JOS. K. HUBBARD, GUILFORD, BALTIMORE, MD.

Roy G. Pratt, Architect.

(*Continued from page* 235)

nopoly, and his idea was to surround that monopoly with such guaranties to the public that there would be a square deal, and I think when you read the award of the Judge that you will find it was as just and fair an adjustment of a labor dispute as you could expect.

As the carpenters were not members of that arbitration agreement, they said their rules were better, but it was agreed between the carpenters and contractors when the decision was handed down that the Judge's decision would be the basis for negotiation. The Judge not only set the wage-scale of those twenty-five or thirty trades which had agreed to arbitrate but he also made a scale which would be a fair scale if the other unions had been in arbitration, because this whole scale had to be treated in its entirety. You could not expect one trade to get an advantage over another trade —the whole thing had to be taken in.

The carpenters getting $1.00 an hour—previously getting $1.25 an hour—after some negotiations with the contractors said that they would sign their names on the bottom of the paper, and they, the carpenters, would set their own rate. I am glad to say the carpenters realized that they had a public service to perform, and if they accepted the $1.25 they could not expect the masons, the steam-fitters, and all the other trades that had accepted this award in good faith to be penalized by observing that, and consequently they decided to put the carpenters in open shop. They collected about $125,000 and finally found they had a job too big for them. We presented the situation and showed these gentlemen this was the challenge to the citizenship of Chicago. Was Chicago going to continue to be in the grasp of a lot of criminal labor leaders or did we have enough red blood in Chicago to free ourselves of this domination?

A committee was appointed, of which I have the fortune to be a member, and we canvassed the situation in Chicago, with the purpose of cleaning up the situation. In our talks to certain people we found this: we were told the citizens of Chicago, the business men in Chicago, were not interested in the fight between the carpenters and contractors, it was simply a fight for settlement. It meant no matter what the settlement was, the carpenters were still in control of the industry and in three or four years the situation would be as bad as it was before, because no matter what the settlement was the next year or the next year would see the carpenters making a new demand and the contractors in settlement of the strike would give in two years what they would not give now. But they did say that this was a fight to clean up the situation in Chicago and give citizens in Chicago a permanent, sensible peace in the building industry that was worth any cost.

On the strength of that we went back to the committee and said we would undertake to organize a Citizens' Committee and raise the money if they made certain guaranties to us. These were that those unions that went along with the Landis award would be supported; those trades, however, that refused to accept the Landis award, when they put men on those trades willing to work under the Landis terms, would stay on—there would be an open-shop condition, there would be no settlement, no association —the only way for men to come back for permanent work would be non-union, and at least 50 per cent of the men on the job would be non-union.

On the basis of this one Friday night at twelve o'clock invitations to two hundred and fifty leaders in industry, finance, and professions were invited to join the Citizens' Committee. By twelve o'clock the next day we had over one hundred and seventy-four telephone acceptances upon this committee. The committee now consists of one hundred and sixty-nine people. We organized, incorporated, and started out to raise $3,000,000. Our principles were just exactly as we laid them out with the contractors, we were to support those unions that had gone along; those unions that did not go along were to be put on the open-shop basis and continued on the open-shop basis. We inherited the strike of the carpenters. There were at that time eight other unions not living up to the Landis award. In each case the committee spent anywhere from three weeks to six months negotiating with the leaders of these unions, trying to persuade them to accept the Landis award. We spent anywhere from six weeks to three months attempting to bring pressure to have these unions accept the Landis award. We brought the national presidents here, we had what we supposed were secret ballots—we gave the unions a chance to come in and be good. The only one that came in was the plasterers, and the rest refused to do so.

The Executive Committee of this Citizens' Committee is made up of eight people, five of whom are manufacturers, one a merchant with his establishment entirely non-union, the manufacturers running non-union shops, another a banker, and a retired Board of Trade operator.

In making up that committee we realized we were throwing ourselves open to criticism, all interested in fighting unions, but we felt the time had come when we must look to the future. It was easy enough to win a battle but more important to see after you had won the war that the terms of peace were such that you would not have a recurrence of that war within the next two or three years. So we purposely made up this committee of the people who had been in the game for years.

It has been claimed this was a movement to put Chicago on the open-shop basis. It was no such thing. We on that committee realize that we have a public trust and we no more let our personal ideas influence the work of this committee than we would think of using the money which has been subscribed so liberally to carry on. But we did feel when we promised the citizens of Chicago we were going to deliver them a permanent peace that it was necessary to see in the final settlement that terms of permanent peace could be guaranteed.

I suppose you are wondering what we are spending all this money for. In the first place we are importing men—we have imported twelve thousand. We are guarding men on the job. We have had as much as six hundred guards on the job protecting the men on the job and in their homes, and we insure them against vandalism, explosions, etc. Of course we have a large expense and we have a large overhead operating expense of our offices. We started out with the idea that we were going to try to clean up an industrial situation, but we very soon found that instead of an industrial situation we had a criminal situation.

To-day we have twenty unions playing with us and we are backing them up 100 per cent. We have twelve unions on the open-shop basis. The reason these people are fighting to retain their grip on the situation is because they realize if the Landis award is put over they will lose their opportunity of calling sympathetic strikes and jurisdictional strikes, and therefore lose the opportunity of putting on graft that has amounted to hundreds of thousands, and millions of dollars a year. We have had a good deal of bombing—even the contractors have had their homes bombed. Of course the buildings bombed are all covered by insurance. We have had men shot at; fortunately not killed. We have had men slugged; but it is all incidental to the fight.

Just recently the thing came to a head by the killing of two policemen. The situation in Chicago had gotten to the place where criminals who had injected themselves into the unions and taken possession of them and could bring strong-arm methods to bear thought through the supposed political influence of the labor vote that the police, the state's attorney, the judges, and even the juries were afraid to convict them, and I am sorry to say the history of the last four or five years in Chicago proves that that is so. And they absolutely thought they had control of this town, and had no more compunction of shooting men than you or I would have of walking into that room and taking our supper. As a result of this, we obtained one thousand more police, $100,000 more in funds, more prosecuting attorneys whom we select, more judges sent to the criminal courts to try these crimes, and while we had no intention of cleaning up a criminal situation, we are now in a situation where we have also to guaranty to this town that a crime committed in the name of labor unionism will be prosecuted just as any other crime.

We are in the biggest building boom Chicago has ever had. A year ago building was in the dark. Last month was the biggest month of building permits Chicago had ever issued; this month will exceed by a good many million dollars. It has been very embarrassing for us to fight this kind of a fight when every man laid off in one trade is taken by somebody else. We are operating about 60 per cent of the jobs in money in the city of Chicago. If anybody said we would have building going on in Chicago where twenty unions were working peaceably with twelve trades on the open-shop basis, they would have said we were crazy, but that is the situation. We have not had a strike in Chicago for eight months of any kind whatsoever.

To the best of our knowledge no graft has been paid in Chicago for the last eight months. Our control has been almost entirely through the architects, for without the architects we could not have done anything.

The architects in Chicago have stood behind this committee almost to the man.

LAND FAÇADE.

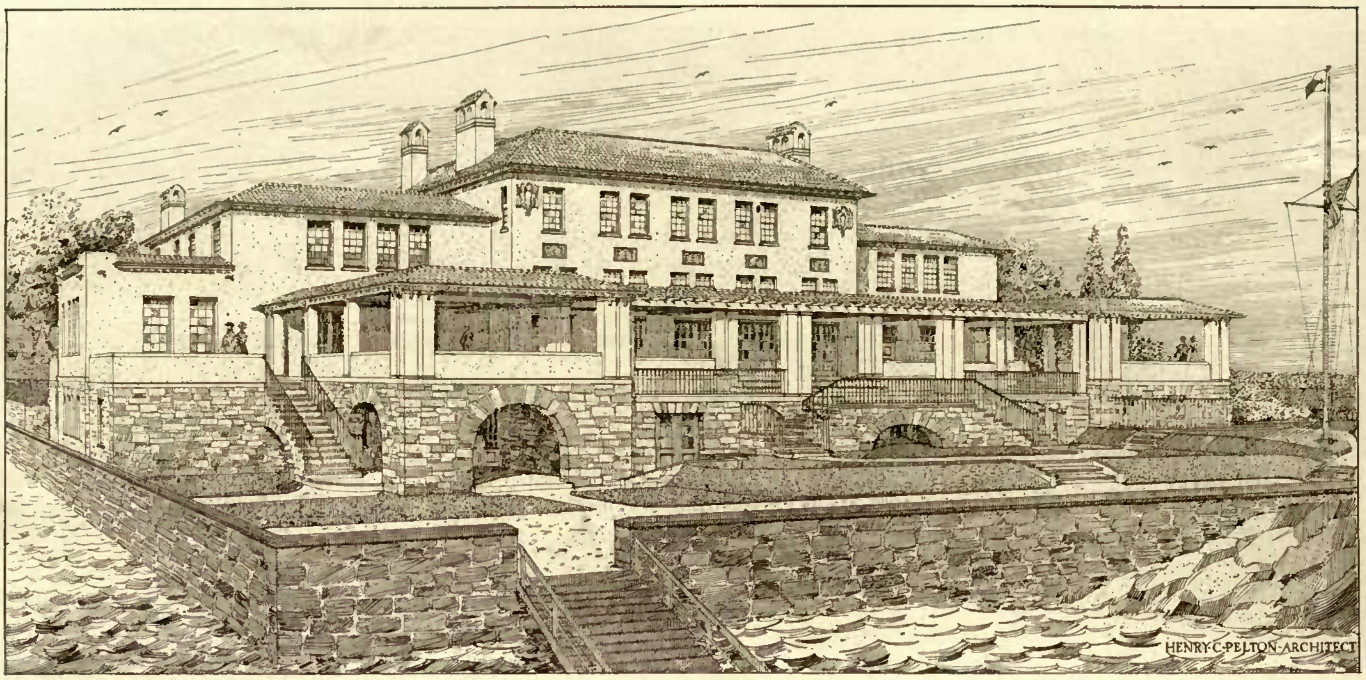
THE LOUNGE PORCH.

Henry C. Pelton, Architect.

INDIAN HARBOR YACHT CLUB, GREENWICH, CONN.

HARBOR FAÇADE, INDIAN HARBOR YACHT CLUB, GREENWICH, CONN.

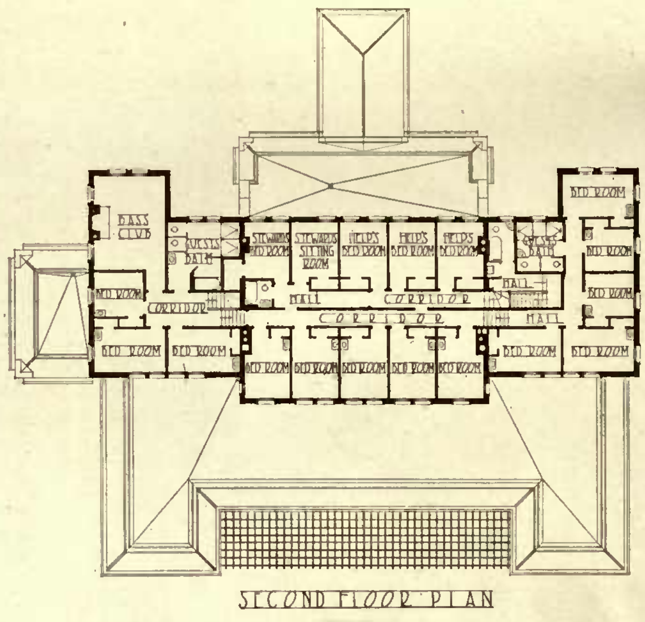
Henry C. Pelton, Architect.

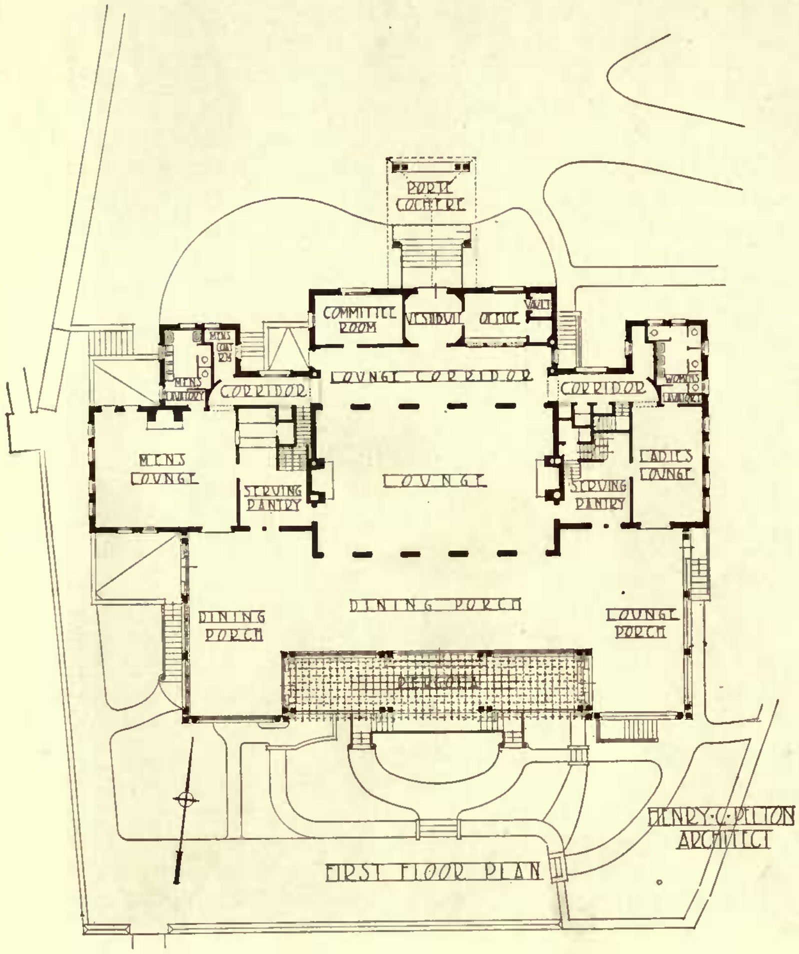


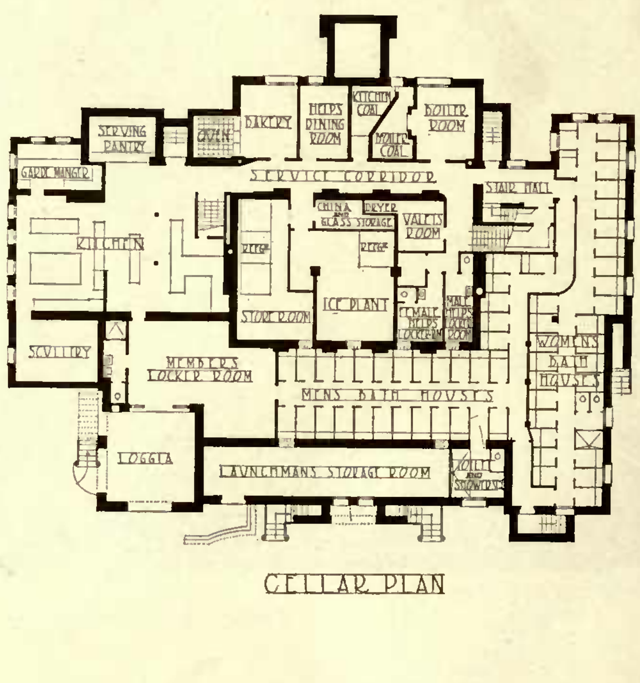
SKETCH AND PLANS FOR
INDIAN HARBOR YACHT CLUB,

GREENWICH, CONN.

Henry C. Pelton, Architect.





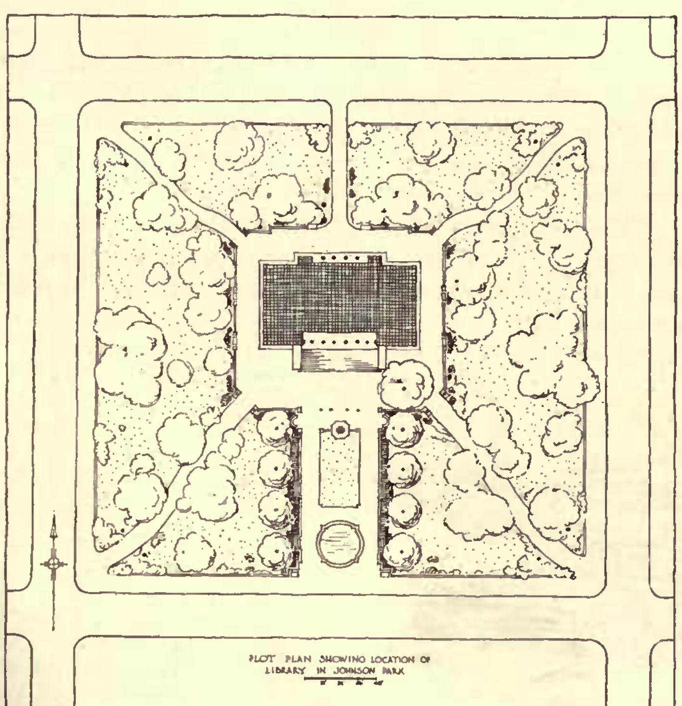


Cooper Branch, Free Public Library, Camden, N. J.

The Cooper Branch Library in Johnson Park, Camden, N. J.

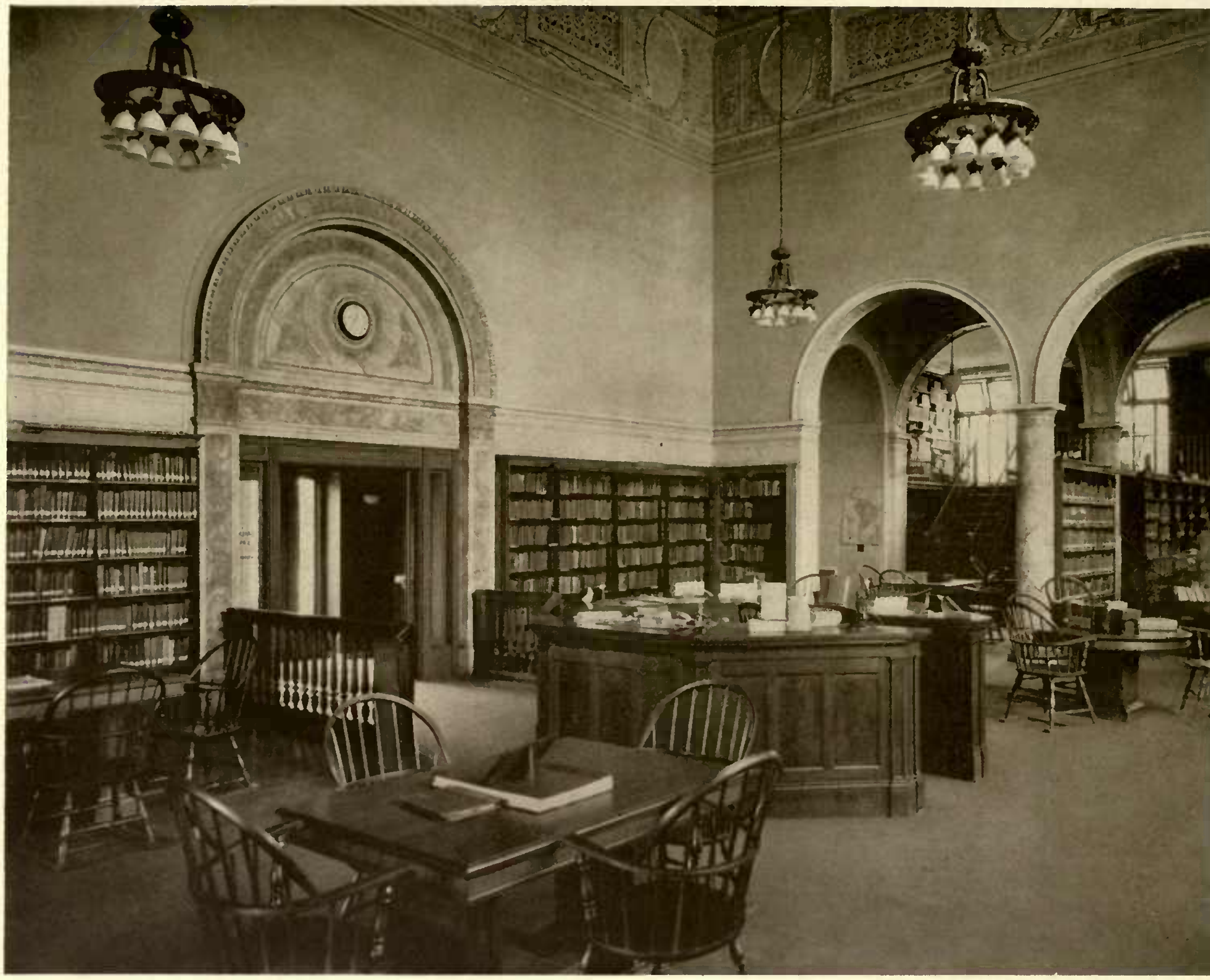
Walter T. Karcher and Livingston Smith, Architects

THIS building and the development of the park were the gift of Mr. Eldridge R. Johnson to the city of Camden. The library replaces the smaller cramped quarters formerly situated on the same site. The district was at one time entirely residential but is now giving way to industrial plants. The main purpose in the donor's mind was to endeavor to maintain as a place of beauty one of the few remaining open spaces in the city. He hoped also to create a mental attraction for some of the thousands of workers in his own plant near by. Both of these purposes have been accomplished.



The square was the typical small city square with the central flower-bed and radiating diagonal paths. Like all city squares it had the occasional shade trees and almost no appropriation for anything beyond the initial planting. It boasted an elm, a scion of the Penn Treaty Tree in Philadelphia, which was kept sacred and undisturbed. The building was set back of the centre of the square to miss this tree, the central flower-bed uprooted and an "entourage" substituted, the diagonal paths were retained leading into this, and a broad approach to the main front created. In this approach were placed an ornamental fountain, a grass carpet, and a mirror pool, which last has developed into a more useful existence as a wading-pool for the children, who immediately appropriated it. Stone benches and balustrading, evergreens and new lighting completed the development of the square. The fountain is unique in that the dry, purely architectural ornament has been entirely eliminated in favor of marine animals and objects, and has a distinct color note in the rich tawny pink of its stone.

The library is of buff limestone with monolithic columns. An attempt was successfully made to enrich the shadow of the portico with color. A glass mosaic frieze seven feet high picturing an allegorical theme forms a band across the front and sides of the portico, and it is believed this is the only



The reading and delivery rooms.

example of its size where this method of color enrichment is used on the exterior of a building in this country.

The open-shelf distribution type was the type desired for the library. The main reading and distribution room goes two stories, the full height of the building, and opens off on opposite sides into a children's room and a reference-room of one story each. In the story over these two latter are study-rooms and an auditorium. Separate access and exit can be had to the auditorium and the children's room without going through the main library-room.

This main room is lighted by both skylight and north window across one full side of the room, and has a rich ceiling and frieze in colored plaster, the shields in the latter bearing the quaint characters of the printer's marks of the Renaissance.

The doors and trim are practically the only wood in the building—the bookcases are of steel, window-frames and sash of bronze, and stairs of bronze and marble. The floors are cork tile.

Editorial and Other Comment

In Behalf of Art

IN presenting Doctor Howard Walker with the gold medal of the American Institute of Architects for his most helpful and valuable work in behalf of art, the Institute honored itself as well and made manifest very clearly that, after all, architecture and art are always one.

Now and then some one tells us to "drop all that high-brow stuff and talk facts, write facts, live facts, eat them if possible." Some of us do, or try to, for a time, and then suffer from an acute attack of indigestion and take a big dose of some spiritual stuff (no, not hooch) as an antidote for facts. Maybe this dose will be a day spent in the Metropolitan Museum of Art or in one of the museums of our other cities—the Inness room at Chicago, for instance—or a day in looking over our photographs of beautiful architecture and paintings.

Doctor Walker's address in accepting the honor was one of the specifics for too much dwelling on facts and things that facts stand for. In his travels he visited and spoke at a number of educational institutions, carrying his message of art and trying to get from them their views on the best methods of making art a part of every well-regulated university course.

> I spoke to the presidents and the faculties, and no two of them were alike. There was only one common bond between them, and that was that they were entirely sympathetic and enthusiastic; so much so that I almost wondered why I was there. But I found that while the condition of enthusiasm existed, there was absolutely no organization.
>
> The argument that I used which seemed to occasion the most response was this: that I had been talking with a French officer who was speaking of our men abroad. He said that the American soldier trained well, died well, but he went beyond his objective and had too many casualties. And I said that in our desire and our hunger to get ideas, especially in regard to art, we were going, and had gone, before our objective because we did not properly train. I took one college professor and said: "Look down on that street and you will observe the casualties on both sides as far as you can see."
>
> There was another point, and I think this point is an extremely serious one, one that I pressed hard. There are not more than ten per cent, hardly that, in colleges such as Harvard who take a post-graduate or graduate course in art. The other ninety per cent are going out, however, as supposedly well-rounded college men. Some of them will become the heads of large financial interests, many of them chairmen of village improvement societies.
>
> "A little learning is a dangerous thing,
> Drink deep, or taste not the Pierian spring."
>
> These are the men controlling funds with whom you will deal in committees, they will be in control, and the constant desire on our part will be to satisfy them, and at the same time teach them. But they don't like to be taught, even if they have had no education in art.

It will be the duty and, we feel sure, the ambition of every architect in the country to let his light so shine that even those with closed eyes may at least sense the flash. Doctor Walker talked in Chicago, but his message will be spread from the Atlantic to the Pacific and from the North to the South by architects who attended the convention and their fellows.

From the far coast we hear from Willis Polk: "Every country, in achieving commercial supremacy, has always in so doing become a patron of the fine arts. The United States is in that position to-day, and it is certain that the impending American renaissance in art is destined to be the greatest in history." Hear, hear! we say, for it is by such faith that miracles are done.

Zoning—Chicago's Need

THAT New York has been blessed with her zoning system is generally conceded. It has put an end to irresponsible building and utter lack of consideration of the property rights of others, and been a great stabilizer of real-estate values. The protection of certain residential districts from the inroads of factory and loft buildings has led many home-seekers to invest in houses and added much to the architectural interest and charm of many side-streets off the line of the congested districts.

Many old brown-stone houses, the inheritance of New York's worst era of residential building, have been altered into attractive apartments or residences, and the tendency in this direction is increasing with the demand for city homes of a moderate cost.

Few cities in the country have grown with the rapidity of Chicago and few have been blessed with so much space to expand in without overcrowding or the need of piling story on story in order to make the land a profitable investment.

A recent trip over the roads that lead along the beautiful North Shore revealed the fact that the inroads of business in that section promise before long to bring about the same conditions that have done away with the ancient grandeur of New York's Fifth Avenue, and also driven many from the quieter charm of Madison Avenue.

Homes along the North Shore are giving way to business, and there is every indication that in a few years the mansions of the rich in that section that once were the boast of the windy city will be no more.

Their places will be occupied by tall blocks devoted to trade. Cheap apartment-houses with stores on the ground floors are now going up as fast as the speculative builders can find the materials and workmen, and it does seem a pity that those who have long made the region one of beautiful homes should be driven out.

Trade knows no law but the law of profit or loss, and trade has apparently decided that the trend of the small retail business is northward, and that it will be good business to move while the moving is good and before the city wakes up to the realization that one of her chief claims to fame has vanished.

Chicago has not been used to do things by halves; she has marked out her own destiny and followed her own ways with marvellous results and with a dynamic force that nothing can ever stop.

It is high time that she took thought of her future in the way of self-determination in this matter of zoning.

Now is the appointed time, for to wait is only to make the problem more difficult, if not impossible.

She has shown what she can do in her wonderful system of parks, the envy of all New Yorkers and of other cities that have not had her vision.

The city has been too busy, maybe, to take time to think of this matter of zoning, but even those who have believed that she could do no wrong, when it meant civic pride, have begun to wonder why this big question of zoning has not before now been given the consideration that it deserves.

The city is engaged in one of the greatest building booms in its history, and this in spite of the labor troubles that have menaced construction all over the country. Since the Landis award she has taken things into her own hands with characteristic vigor, and nothing can prevent, apparently, the carrying out of her plans to complete the great work in hand.

In another part of this number we print the address of Mr. Donnelly, the chairman of the Citizens' Committee, and evidently it is to be a fight to the finish.

Chicago has had her trials, and she has met them with vigor and the kind of courage that does not know the word defeat. All she needs is a start; the rest follows as a matter of course and leads to the ends desired.

Chicago too, by the way, has her traffic problem to solve; even a greater one than is presented in New York. The congestion in The Loop and on Michigan Avenue at times makes Fifth Avenue look well regulated, and we must say that we are always inclined to take off our hats to the splendid work of our own traffic police, who are handling a tremendous problem with both patience and good sense.

Mr. Hastings Honored

AN American architect and American architecture have again been highly honored by the presentation of the Royal Gold Medal for Architecture by King George to Thomas Hastings. The late Charles F. McKim received the medal in 1903. Mr. Hastings designed the great Victory Arch that was so much admired when it stood at Fifth Avenue and Madison Square, the Memorial Amphitheatre at Arlington where the unknown soldier rests, and the firm of Carrère & Hastings designed the New York Public Library and other notable buildings.

Effect of the American Plan in San Francisco

By Warren H. McBryde

President, Industrial Association of San Francisco

ANY suggestion that the American plan in any manner has injured the worker or prejudiced his legitimate interest is disproved irrefragably by figures and data recently compiled. These figures and data, secured from reliable sources and put to the most rigid test of authentication, show that the building-trades mechanic of San Francisco is at least 10 per cent better off to-day than at any previous time since as far back as 1913. Not that wages are higher now than ever before, but that the margin between wages and the cost of living is less, and that steady work is far more plentiful than at any time during the past nine years.

During the period from 1913 to and including 1920, throughout all of which time the unions exercised the most complete control over wages and working conditions, the mean margin between the average wage of the building-trades mechanic and the average cost of living was approximately 25 per cent. Furthermore, during this time, and because of frequent strikes and the resultant lack of confidence of the public, there was far less steady work available for the building-trades mechanic than there is at the present time.

It is interesting, also, to observe that these same figures and data show a 10 to 15 per cent increase (over 1918, 1919, and 1920) in the efficiency and skill of the average building-trades craftsmen. This gratifying increase is, of course, simply the result of the abrogation of all those rules and regulations, designed to limit output by curtailing efficiency, which prevailed prior to the effectuation of the American plan.

The New Haven Architectural Club

AT a special meeting of the board of directors of the Architectural Club of New Haven, William J. Allen, architect of that city, was unanimously elected president of the club in place of Louis L. Norton, resigned.

A. M. Thomas, who has been the efficient and zealous chairman of the entertainment committee and chairman of the nominating committee, was unanimously elected to the secretaryship of the club. Theodore O. Appel and Alfred W. Boylen were unanimously elected members of the board of directors.

The Dallas Architectural Club

WE acknowledge with pleasure the receipt of the interesting "Year Book of the Dallas Architectural Club and Catalogue of the First Exhibition."

"It presents the best examples of the present-day Texas Architecture" and the allied arts, and we hasten to say that the various exhibits are well worth showing, and reflect great credit upon the architects and others who are represented.

The Alfred C. Bossom Medal was awarded to S. C. P. Vosper for his design for the Year Book cover, a study of an old Spanish mission church. The jury of award was composed of Clarence C. Bulger, C. D. Hill, and Frank O. Witchell.

Book Reviews

GOOD HOUSES. TYPICAL ARCHITECTURAL STYLES FOR MODERN WOOD-BUILT HOMES. By Russell T. Whitehead, Architect. Illustrations by Birch Burdette Long, Delineator, Weyerhauser Forest Products, St. Paul, Minnesota.

Mr. Whitehead has gathered together a most interesting number of fine old houses, and included some modern examples built to type.

The selections are admirable, and printing them in tint adds much to the charm of the illustrations.

There are examples of American Colonial, Dutch Colonial, Southern Colonial, Pennsylvania Colonial, American Georgian, Transition Period, The Classical Revival, English, Italian Renaissance, Spanish, Swiss, American Prairie, Bungalow, etc.

The letter-press deals with Good Houses, Styles of Architecture, Why a House of Wood, Your Selection of a Style, Planning the House, The Proper Use of Lumber. The book is attractively bound in cloth, and makes a desirable addition to the architect's library, and should prove of especial value to all concerned in house-building.

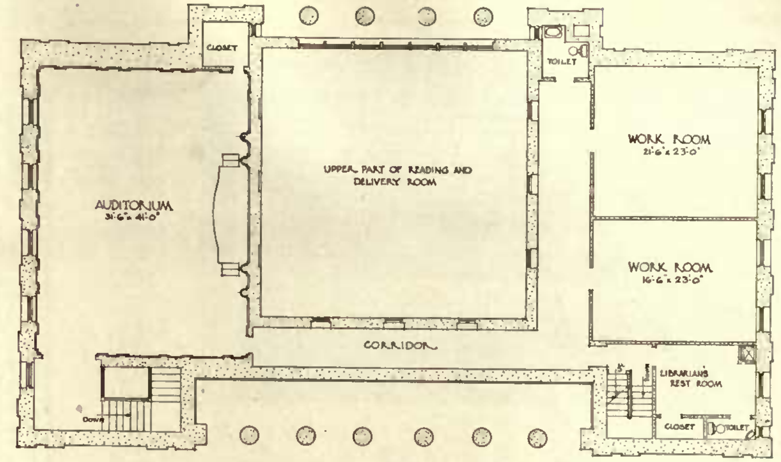
MAIN FAÇADE, COOPER BRANCH, FREE PUBLIC LIBRARY, CAMDEN, N. J.

Walter T. Karcher and Livingston Smith, Architects.

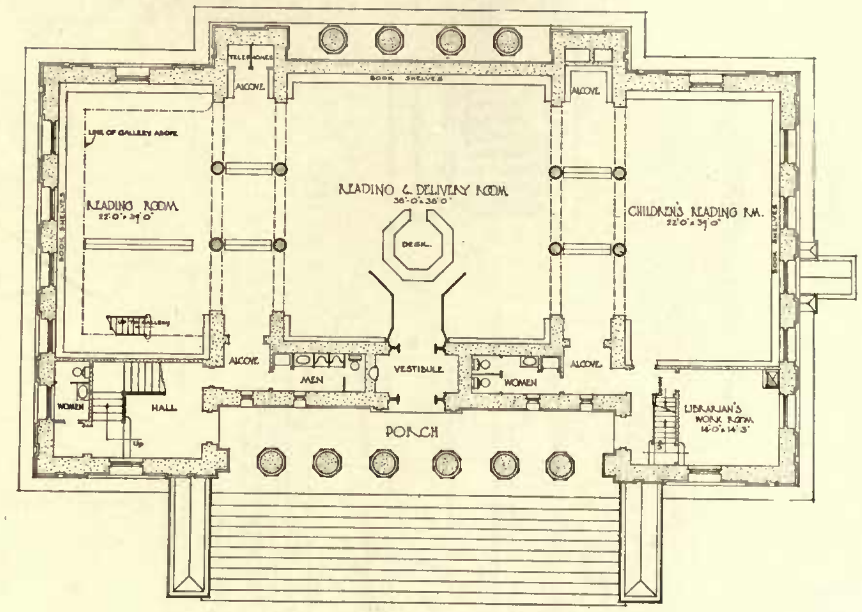
REAR OF BUILDING, COOPER BRANCH, FREE PUBLIC LIBRARY, CAMDEN, N. J.

Walter T. Karcher and Livingston Smith, Architects.

ENTRANCE DOORWAY, READING AND DELIVERY ROOM.



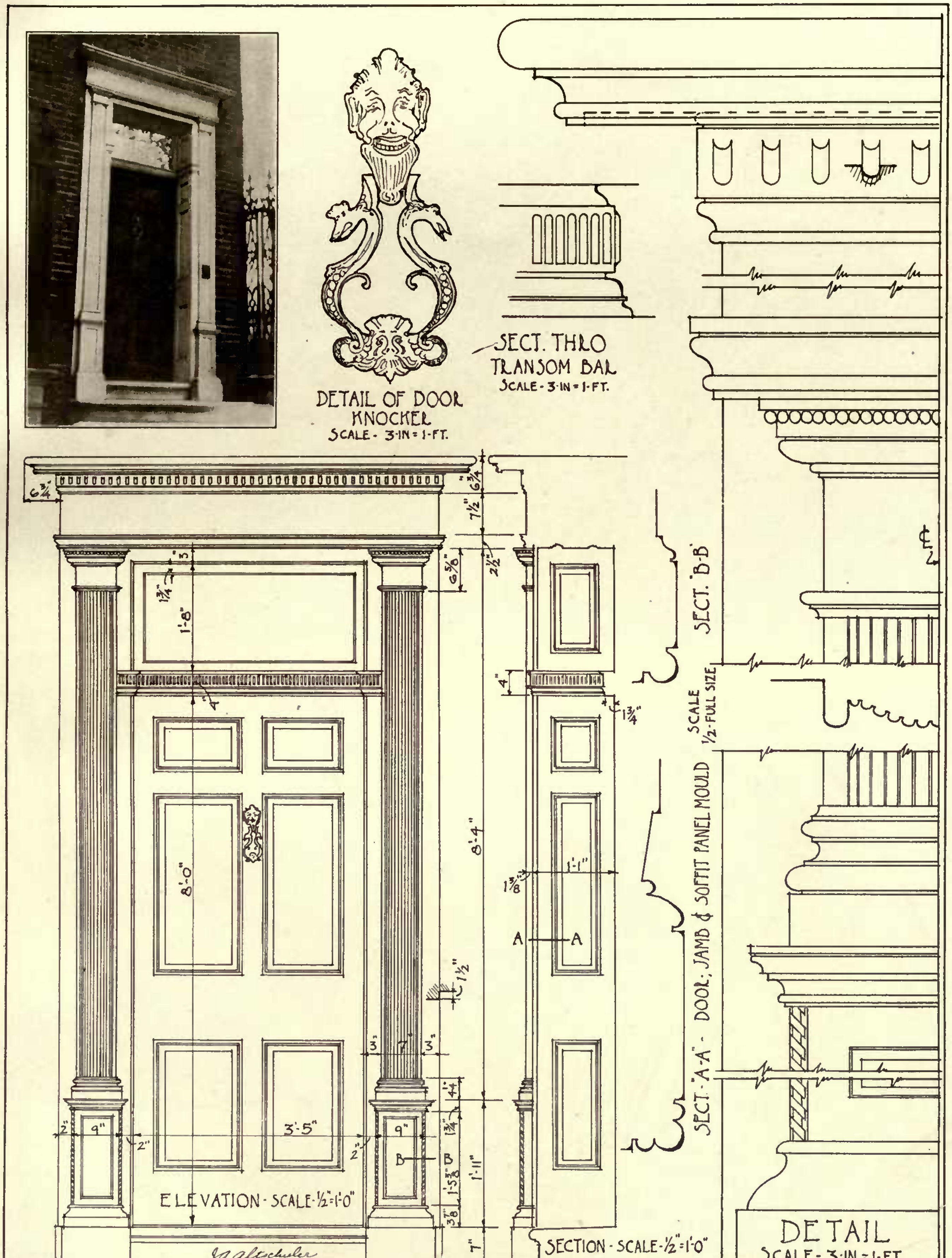
SECOND FLOOR PLAN



FIRST FLOOR PLAN

PLANS. Walter T. Karcher and Livingston Smith, Architects.

COOPER BRANCH, FREE PUBLIC LIBRARY, CAMDEN, N. J.



COLONIAL ARCHITECTURE of the CAROLINAS	DOORWAY - 14 LEGARE ST. DATE-ABOUT-1802 CHARLESTON-S.C.	MEASURED & DRAWN by J.A. ALTSCHULER

A COMPREHENSIVE EXTERIOR VIEW, SHOWING MEN'S LOCKER-ROOM, DINING-ROOM, AND LIVING-ROOM.

GENERAL EXTERIOR VIEW, WITH PORCH CONSTRUCTED OF RUSTIC TIMBERS.

Harry Allan Jacobs, Architect.

NORWOOD GOLF CLUB, LONG BRANCH, N. J.

View of garden, showing the end of the dining-room and men's locker-room. A mixture of stone, rustic timbers, and the half timber and stucco, with gray-brown shingle roof.

Interior of living-room, the high ceiling taking advantage of the entire roof height and showing large wood trusses of highly decorative value. Orchestra balcony between dining-room and living-room.

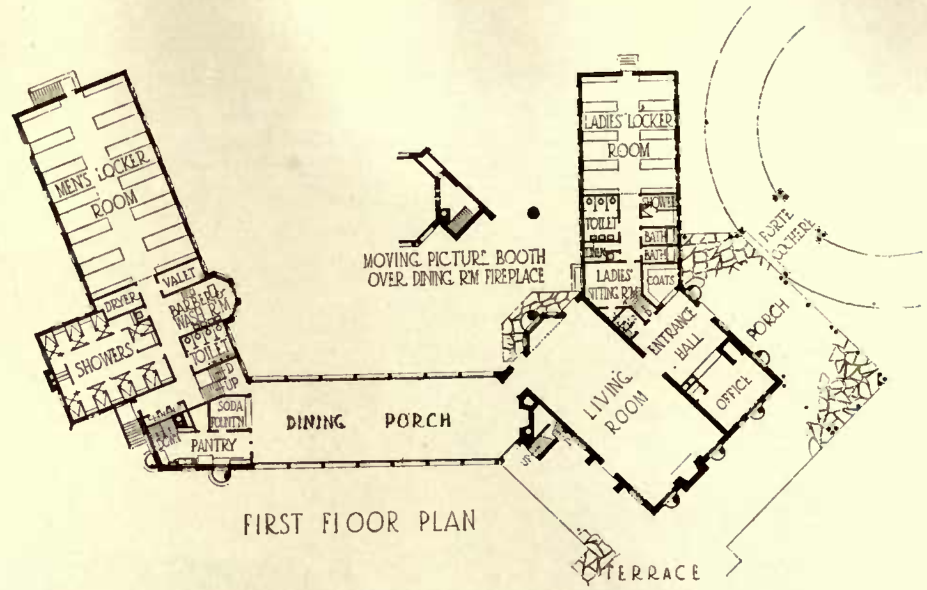
The end of the living-room and entrance porch. The buttresses counteract the thrust of the heavy trusses on the inside of the living-room.

Tall fireplace in living-room, built of Princeton stone.

Harry Allan Jacobs, Architect.

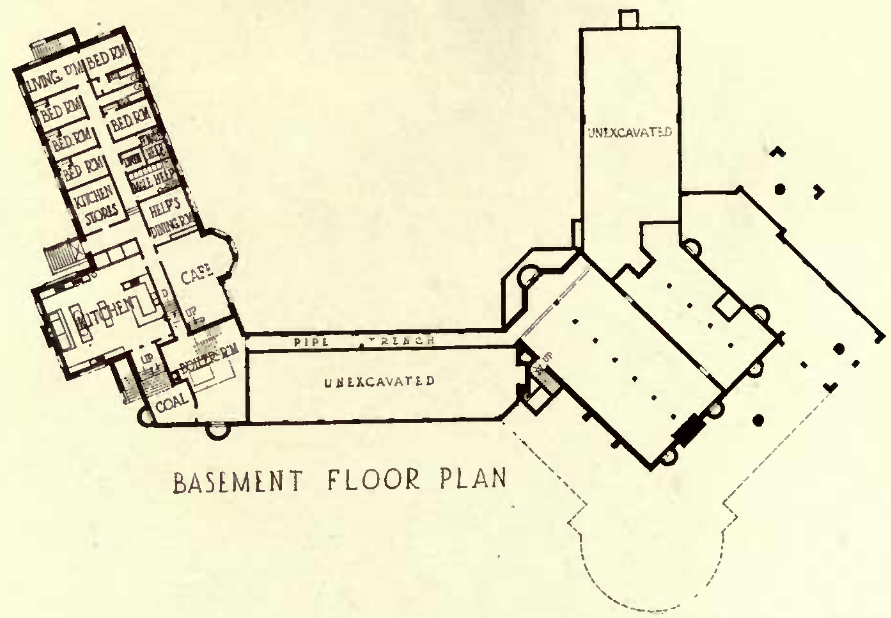
NORWOOD GOLF CLUB, LONG BRANCH, N. J.

Garden surrounded by ladies' locker-room, and rustic porch happily tying in with conventional architecture.



NORWOOD GOLF CLUB, LONG BRANCH, N. J.
Harry Allan Jacobs Architect

The dining-room going back to nature, has trusses of rustic logs cut from the woods in the vicinity.



Harry Allan Jacobs, Architect.

NORWOOD GOLF CLUB, LONG BRANCH, N. J.

SOUTH HILLS COUNTRY CLUB, PITTSBURGH, PA.

Ernest Wilson Boyer, Architect.

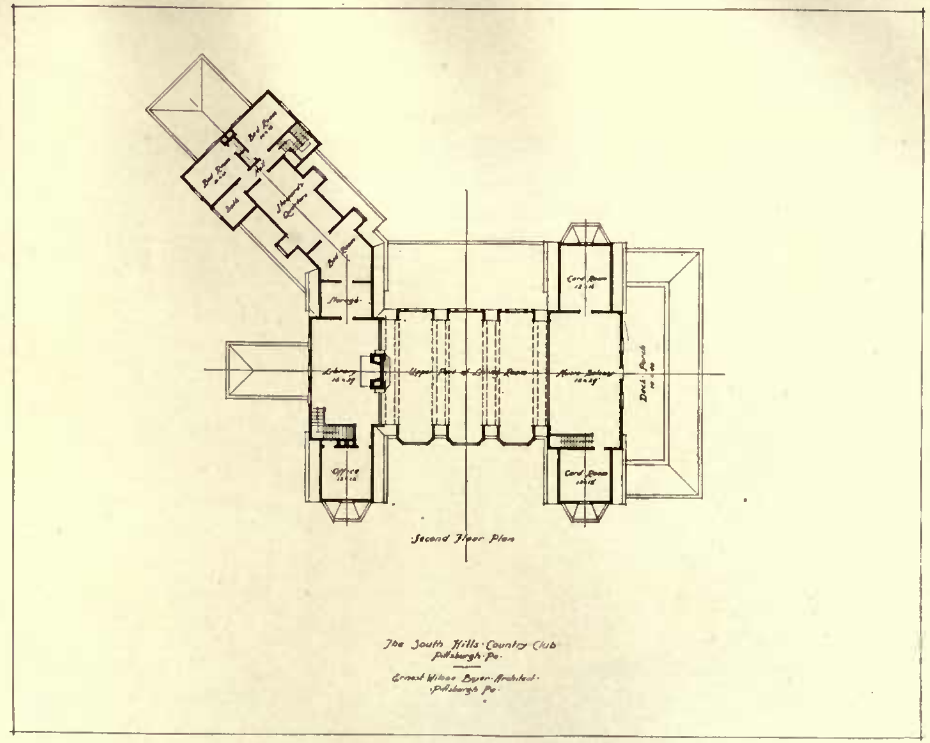
FACING PRACTICE PUTTING–GREEN.

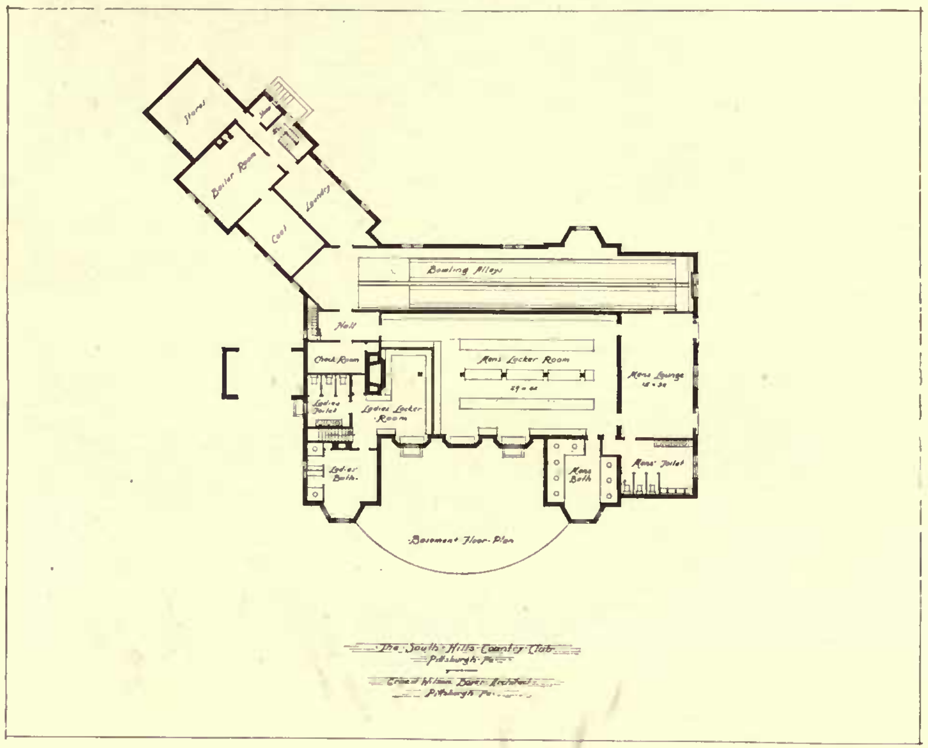
LIVING–ROOM AND BALLROOM.

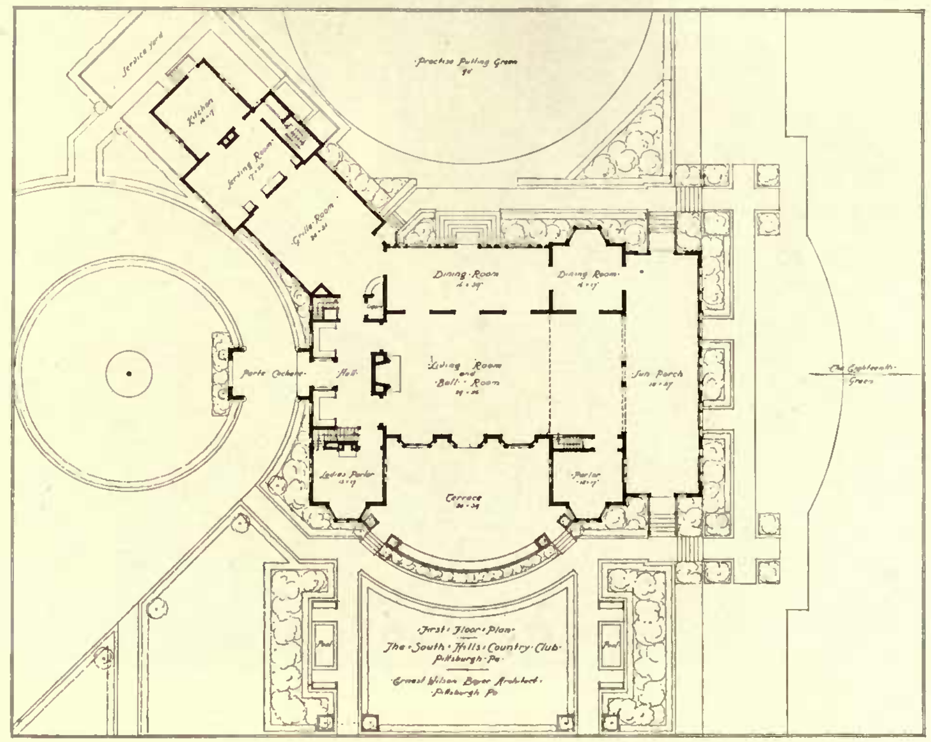
Ernest Wilson Boyer, Architect.

SOUTH HILLS COUNTRY CLUB, PITTSBURGH, PA.

SUN PORCH.

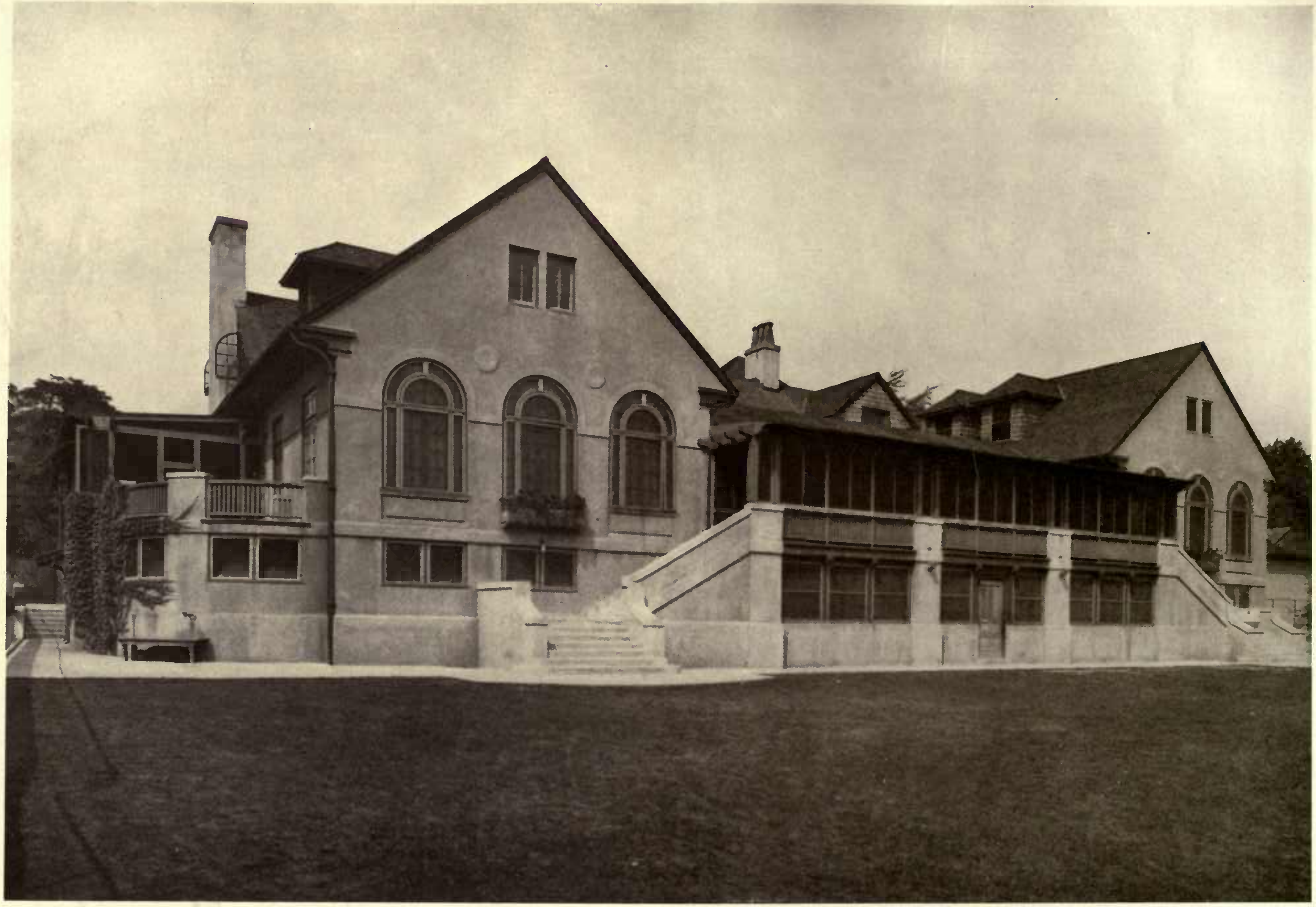






SOUTH HILLS COUNTRY CLUB, PITTSBURGH, PA.

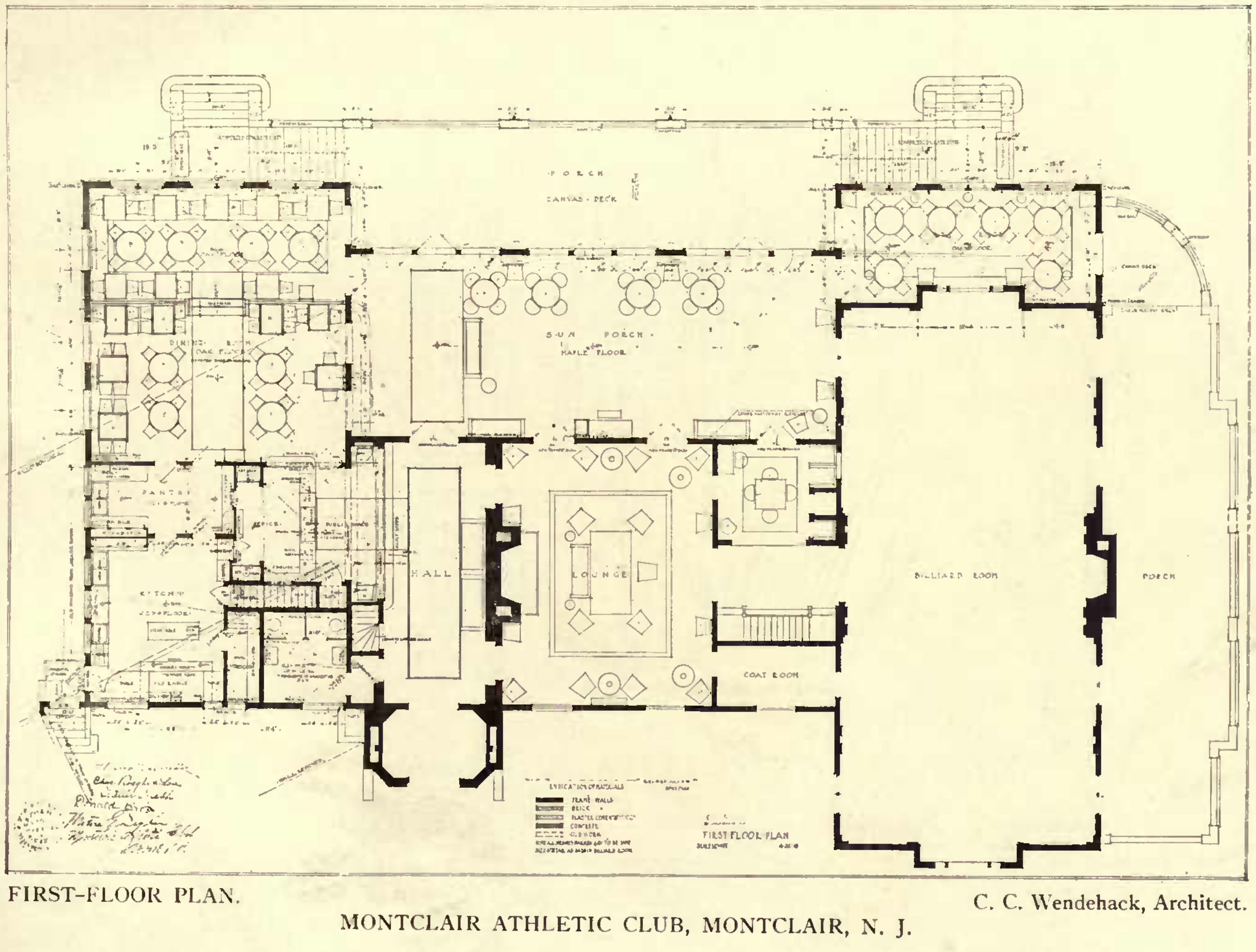
Ernest Wilson Boyer, Architect.



MONTCLAIR ATHLETIC CLUB, MONTCLAIR, N. J.

C. C. Wendehack, Architect.

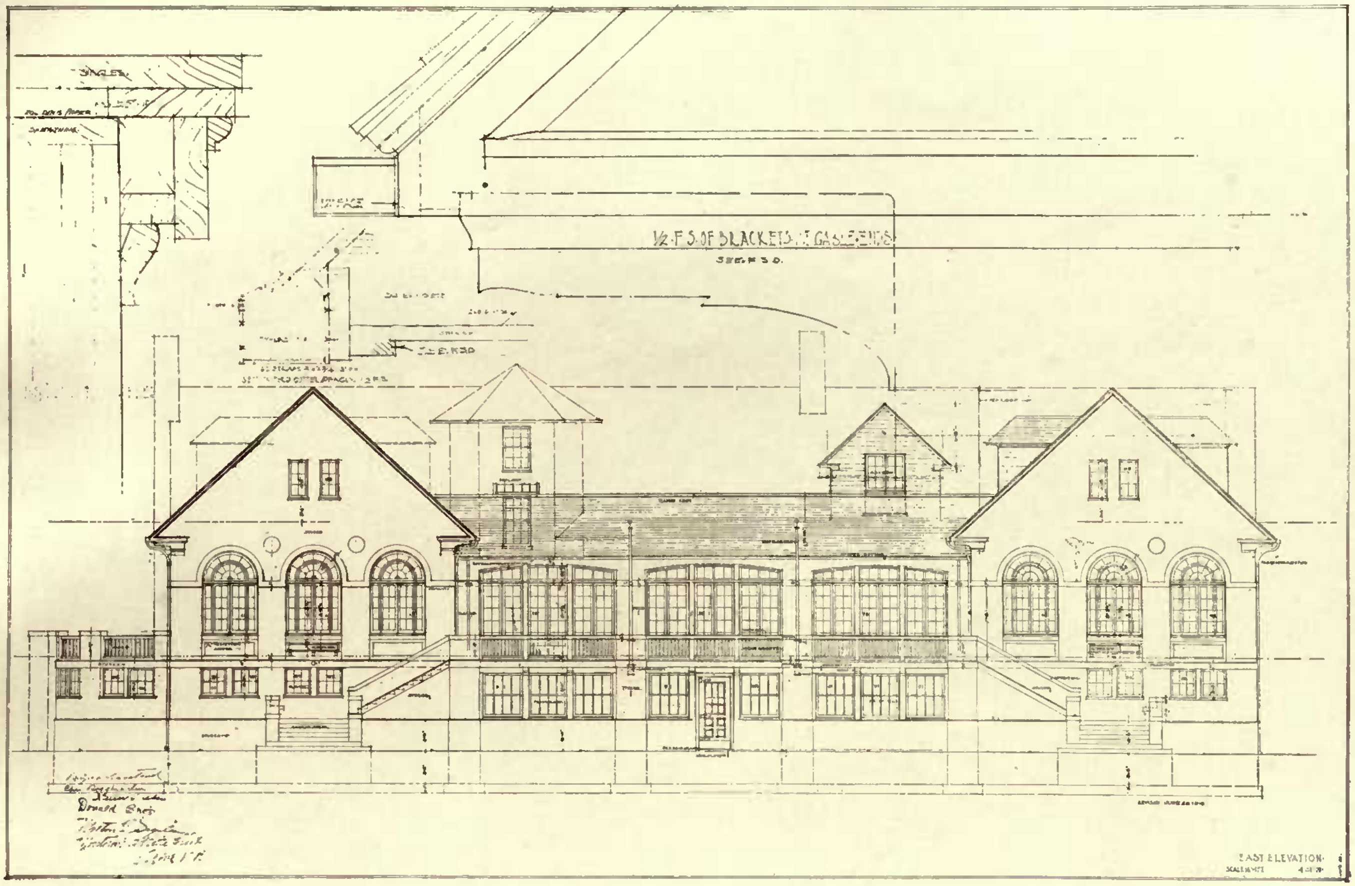
SUN PORCH.



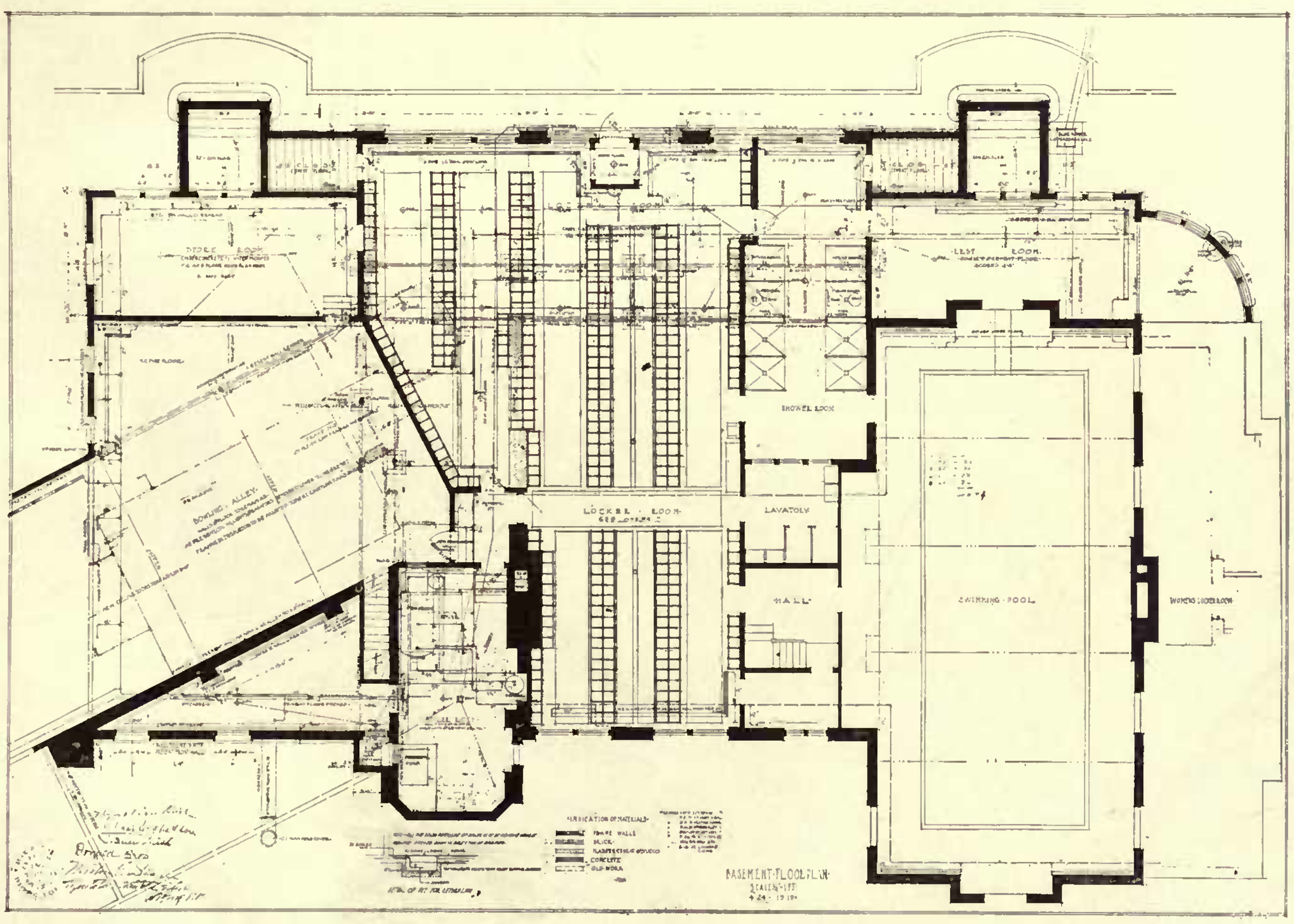
FIRST-FLOOR PLAN.

C. C. Wendehack, Architect.

MONTCLAIR ATHLETIC CLUB, MONTCLAIR, N. J.



EAST ELEVATION.

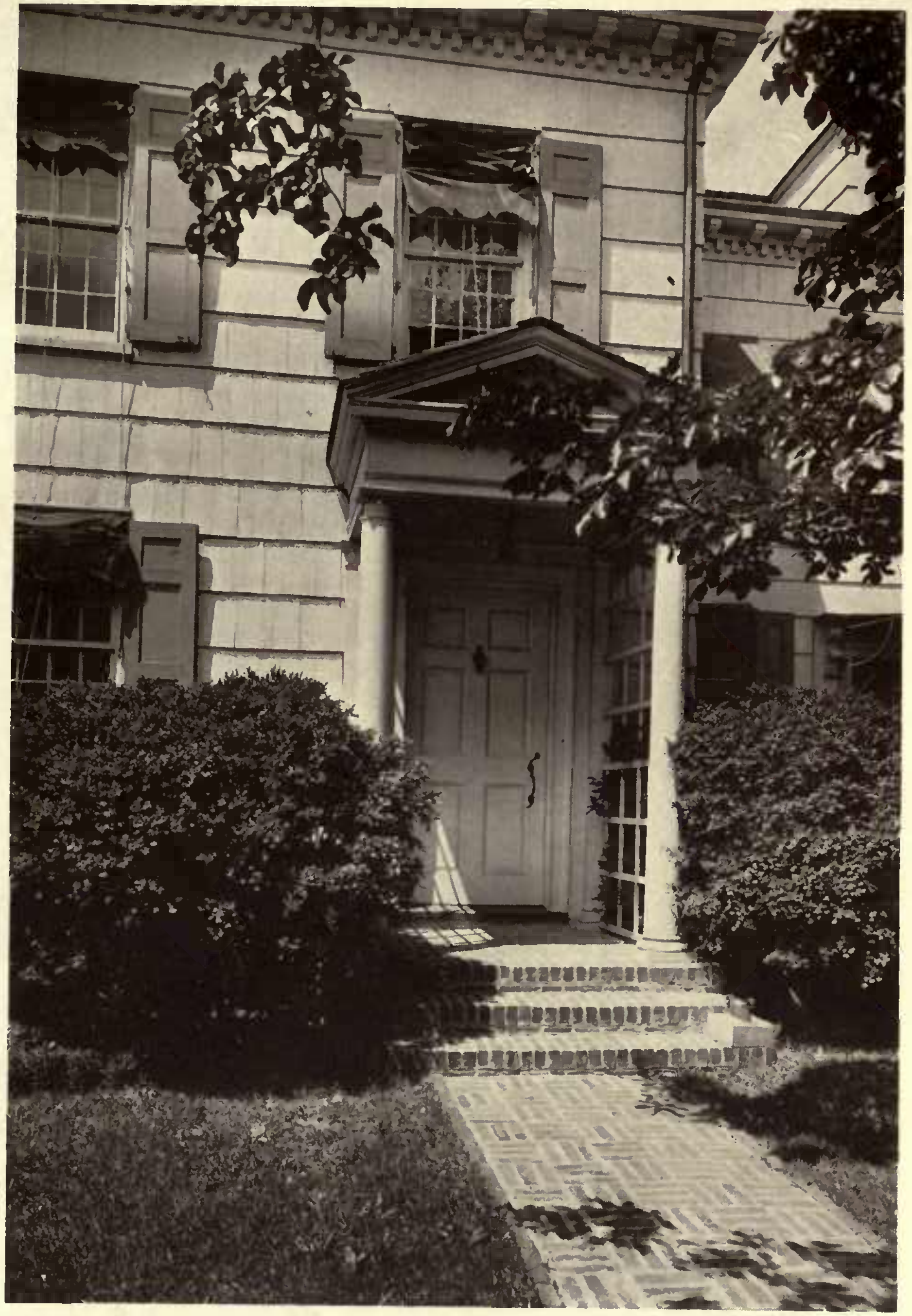


BASEMENT PLAN, MONTCLAIR ATHLETIC CLUB, MONTCLAIR, N. J.

C. C. Wendehack, Architect.

HOUSE, MRS. LYDIG HOYT, WOODBURY, LONG ISLAND. ("MULBERRY CORNER," BUILT 1735.)

Remodelled by Delano & Aldrich, Architects.



DETAIL.

HALL AND STAIRWAY. Remodelled by Delano & Aldrich, Architects.

HOUSE, MRS. LYDIG HOYT, WOODBURY, LONG ISLAND. ("MULBERRY CORNER," BUILT 1735.)

LIVING-ROOM.

DRESSING-ROOM.

Remodelled by Delano & Aldrich, Architects.

HOUSE, MRS. LYDIG HOYT, WOODBURY, LONG ISLAND. ("MULBERRY CORNER," BUILT 1735.)

SITTING–ROOM.

DINING–ROOM.

DINING–ROOM.

DINING–ROOM.

Remodelled by Delano & Aldrich., Architects

HOUSE, MRS. LYDIG HOYT, WOODBURY, LONG ISLAND. (MULBERRY CORNER, BUILT 1735.)

Nicolas Lavreince (1737-1807)

By Henry Coleman May

"EVERY man is not born in his own country" is a Persian saying which defines those special mentalities whose "patrie intellectuelle" lies beyond the confines of their native land.

It is, of course, the most comprehensible thing in the world that certain individuals should possess temperaments corresponding more exactly to a civilization other than their own, and whose capabilities and tastes expand only in the atmosphere suitable to their development. The average American thinks it more or less monstrous that any of his compatriots should elect to live abroad, although he considers it perfectly natural and proper that foreigners should forsake their own homes in order to transplant themselves to these shores. Luckily this limited comprehension has never existed in Europe, and a lack of fundamental patriotism is rarely presupposed in those who are impelled to seek new horizons.

In the eighteenth century France and Italy were the centres to which the intellectuals and artists of the time were irresistibly drawn. Rome was full of Englishmen, while northern Europeans eagerly sought the refinements of a more developed "esprit" in the varied centres of Parisian society.

"L'Assemblée au concert."

Not all of these travellers were "grands seigneurs" or younger sons. Maurice de Saxe and the romantic Count Fersen did not represent the only class whose duty or inclination led them to the banks of the Seine. From Holland, Germany, and Sweden came great numbers of obscure artists and artisans, attracted by the culture and luxury of the French capital. Many of them succeeded notably in the lines of their endeavor, and, which is much more interesting and unexpected, several of these foreigners, imbued with the soul of their new surroundings, have come to represent in their work the very essence of French taste. The names of Oeben, Slotdz, Reisener, Schwerdfeger, and Roentgen could never be mistaken for Gallic ones, and yet their creations are French to an extreme degree.

To Paris from the snows of Stockholm, over which Gustavus III was casting the exotic light of his brilliant and curious court, came a young and totally unknown Swede, Nicolas Lafrensen by name.

Born in October, 1737, he seems to have left his native land toward his nineteenth year. His early efforts remain up to the present unknown, as apparently no documents exist relating to this first period of his career.

It was not extraordinary that the desire for Paris should be born in a Swede of artistic tendencies. Thanks primarily to the activities of Count Tessin, ambassador to the court of Louis XV, Stockholm was becoming imbued with French culture. We see to-day evidences of this throughout the entire country, and in the capital itself there are many masterpieces of French art, in painting, sculpture, and decoration, dating from the middle period of the eighteenth century. Lavreince remained in France until just before the outbreak of the Revolution, when he returned to Sweden, dying in Stockholm on December 6, 1807.

His art belongs to that class produced for the "fermiers généraux," and which, with the downfall of the ancient régime, disappeared with its patrons. His paintings are now dispersed in various collections. In the museum at Stockholm there are three gouaches, two representing genre subjects in seventeenth-century costume, quite unlike his more familiar style and which probably antedate his Parisian manner. In 1899, twenty original pictures, having belonged to the celebrated Mühlbacher collection, were sold in Paris, two of which, the pair of famous "Assemblées," are among his most important. There are sixty-three known engravings after paintings by Lavreince, and, besides this number, ten others can be practically positively attributed to the Swedish artist, although, principally on account of their somewhat "risqué" character, these latter remained unsigned. Some of the last are not only very well known, but much sought after, such as, for instance, the delightful compositions entitled "Le Joli Chien" and "Si tu Voulais."

Lavreince did not confine himself entirely to interiors. At least two portraits are due to his brush; one of Gustavus III, the other a likeness of the Baron de Staël, the husband of the famous authoress whom Napoleon so cordially detested. He left several out-of-door scenes, two of which were popularized through their engravers, "La Promenade du Bois de Vincennes" and "Le Mercure de France," both of these showing contemporary scenes. "La Balançoire Mystérieuse" and "Les Nymphes Scrupuleuses" are examples of the nude among sylvan surroundings, and I believe his only two specimens in this style.

From time to time drawings and paintings, miniatures as well as lacquer and gold snuff-boxes enriched with designs by Lavreince, have appeared in the salesrooms. Several col-

"Le restaurant."

lections can boast of possessing authentic gouaches and sepias, the best known having been among those accumulated by the late Edmond de Goncourt, Baron Pichon, and the Baron E. de Rothschild.

It was inevitable that Lavreince should attempt to use his art for the illustrating of popular fiction. Two drawings of his represent episodes from that most remarkable, pernicious and brilliant novel, "Les Liaisons Dangereuses," a book terrifying and enthralling in its cynicism and elegance and strangely compelling in the realism of its analysis. The characters of this story seem to have exerted a fascination over illustrators from Lavreince down to Aubrey Beardsley, whose sinister delineation of the Vicomte de Valmont has nothing in common with eighteenth-century portrayals of that corrupt though charming personage.

During the decade before France was plunged into the vortex of chaos and disruption, Lavreince's work, by that time thoroughly French in conception and technic, became extremely popular. His usual medium was water-color and gouache, and his pictures, for which there was an instant and unceasing demand, were at once engraved by such masters of the "burin" as de Launay, Hemlan, Dequevauviller, and the aquatintist Janinet. His drawings were by this method immediately popularized, and there is no one, with the notable exception of Moreau le Jeune, whose plates are more descriptive of rakish or aristocratic circles within Parisian society.

Lavreince, to use the Gallicized spelling under which his name became and has remained known, possessed that subtle quality so wholly French, which can only be described by a totally inadequate word known as "chic." In our own day we find this note in the drawings of Helleu and of Drian; in an earlier period we see it in canvases of a great master such as Fragonard, or in the delightful renderings of eighteenth-century life which Baudoin and Longhi have bequeathed to posterity. It is that quality which comes from an affined feeling for "nuance" and attitude, for just the necessary restraint and exactness of line. It is in the knowledge of the proper accessories, the background that is precisely right, the arrangement which precludes a bourgeois suggestion. The touch is light, the mentality a result of those indefinable essences which seem to have come down to its interpreters from Watteau's astonishing sketches. Majesty and prestige, elegance even, existed before, but "chic" was invented in the seventeen hundreds.

To the student of history and of manners, Lavreince offers an invaluable source of documentation. Many of his pages show purely imaginary scenes, such as his famous ones, familiar to all and so brilliantly engraved by Janinet, "l'Indiscretion," with "La Comparaison" and "l'Aveu Difficile," but there are other drawings depicting actual places. The first of that celebrated pair "l'Assemblée au Salon" and "l'Assemblée au Concert" (engraved by Dequevauviller) represents a room in the Paris House of the Duc de Luynes. To the architect the appeal is immediate and evident. Here we have the society of the time framed with interiors resulting from the newly developed classic revival. In all Lavreince's work not even a suggestion of the rococo remains; his backgrounds, the furniture introduced, are all what we call purely "Louis-Seize." The greater number show rooms of simple design, eminently suitable for modern adaptation, and in studying his pictures we can form a very accurate idea of the average eighteenth-century interior.

Let us consider these compositions purely from the point of view of their architectural value as applied to interiors, and we will see that even from this, their perhaps

"La soubrette confidante."

less important side, we have before us invaluable documents, full of inspiration and suggestion.

In "l'Indiscrétion" we find a bed, surmounted by a blue-green canopy in a semicircular alcove, the walls of which are treated with pilasters. The gilded furniture, covered with sapphire-blue velvet, blends harmoniously with the whites, pale water-greens, and salmon color of the two women's dresses. The two companion pieces, "l'Aveu Difficile" and "La Comparaison," delicate in coloring and delightful in composition and rendering, possess no real architectural features.

"Les Offres Séduisantes" shows a small Louis XVI room, far more suitable as a boudoir than the man's writing-room it is supposed to represent. The walls, uniformly panelled, are sparingly treated with garlands of flowers in low relief. The window embrasure is deep, with its thin silk curtains drawn completely aside to admit as much light as possible, a fashion which could be copied to advantage in most American houses where windows are, as a rule, swathed in illogical coverings, thereby at once defeating their object.

"Le Restaurant" depicts a scene which comes under the heading of "sujets galants." Here the surroundings are more voluptuous than in the preceding pictures, and the alcove, in which is placed a deep sofa of typical Louis XVI design, is hung with a somewhat complicated though highly effective drapery whose graceful folds are light enough to prevent an impression of stuffiness. A pleasing note, carrying out a scheme of occult balance, is the introduction on one side of the alcove, behind the sofa, of a niche in which is placed an urn on a pedestal—most probably a "calorifère," another suggestion which might be followed in our day of disfiguring heaters and radiators. In "l'Assemblée au Concert" we have a background eminently suitable for a dining as well as a music room. The stove in the centre is of the most decorative kind possible and could be very logically used in modern rooms where heating apparatus is always unavoidable and a fireplace sometimes superfluous. Its companion piece shows a "grand salon," with splendidly large windows, the general scheme being very much the same as that shown in "Le Billet Doux." This, with its "pendant," "qu'en dit l'Abbé," is a composition of such wide-spread popularity that any description would seem superfluous. The four above-named pictures, with "l'Heureux Moment" and "La Consolation de l'Absence" form an epitome of luxury and taste, combined with great richness of decoration. In many others of Lavreince's compositions we see rooms of a far simpler character. Such, for instance, is that in "l'Ecole de Danse" where the entire effect is made by the happy proportions of the very simple panelling and the generous size of the doors and windows. In "La Soubrette Confidente" and "La Leçon Interrompue" the walls are simply covered with a uniform material on which hang a few paintings, while the door is surmounted by a decorative "grisaille."

" Le billet doux."

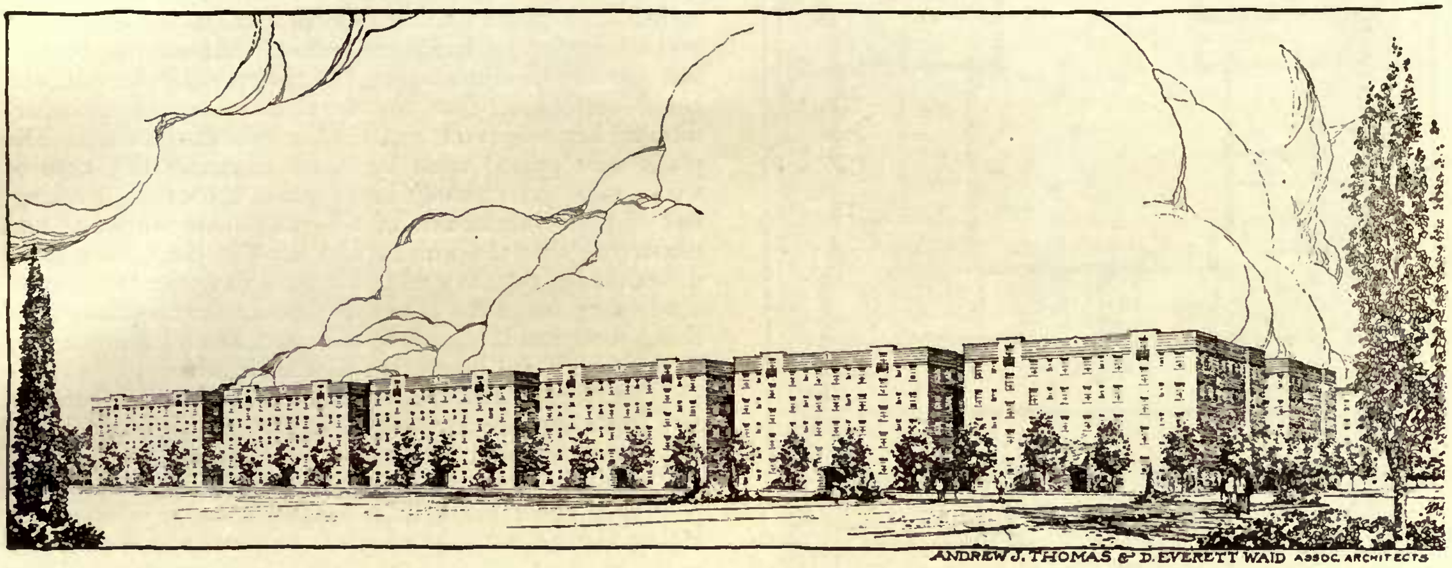
Perhaps the severest criticism of Lavreince might be made on the score of his lack of versatility, but it is probably just because of this limitation that he is so descriptive within his particular province. His world is that of the drawing-room, of the boudoir, of the discreet salons where lovers meet their mistresses; he leaves these places only to visit the airy ateliers where dancing-lessons are given, or the lively bedrooms of light-hearted damsels. His tact and his taste are certain, his interpretation thoroughly disarming. In him we cannot expect to find the mastery which pervades Watteau's drawings, the astonishing virtuosity of Boucher's designs, or even the prodigious invention displayed throughout Eisen's work. We must think of Lavreince only within his sphere, and we are not comparing him with the real masters of the epoch. He is admittedly less facile than Baudoin; his line is not as unerring, as triumphant as Moreau's, but he possesses a certain limpid quality which makes him perhaps the most charming of all the contemporary "petits-maîtres."

It cannot be denied that the artist's work gains sometimes when translated onto copper, but this is true of almost all eighteenth-century art of this class, so supreme was the skill of their engravers.

Mr. H. W. Lawrence in his brilliant and sumptuous work on French engravers says: ". . . Lavreince painted in Gouache and in transparent color with remarkable skill, but de Launay has introduced into his work an airiness which is absent in the opaque medium and he has thus arrived at more pleasing effects than is shown in many of the original drawings." Nevertheless, it is their originator to whom we are indebted for these fascinating glimpses of Parisian eighteenth-century life with all its charm and refinement. Lavreince shows us the interiors of those houses of which Hubert Robert painted the gardens and pavilions. We can imagine his frivolous young women leaving their rooms to wander about in the company of a gallant, under the shade of propitious "bosquets," seating themselves perhaps at the foot of a sphinx, whose smiling head, after the likeness of Madame de Pompadour, emerges from a sombre mass of leaves starred with pale blossoms. Everywhere there is a quiet gaiety, that "Dolce far niente" which, instead of going into nothing, culminated, alas, into the most terrible of storms. In the meantime, only music was heard in the distance, blending with the sound of subdued cascades, while within, perfumes from priceless cassolettes ascended calmly in spirals of scented smoke into the expectant air.

New Housing Project for the Metropolitan Life Insurance Company, New York

Andrew J. Thomas and D. Everett Waid, Associate Architects



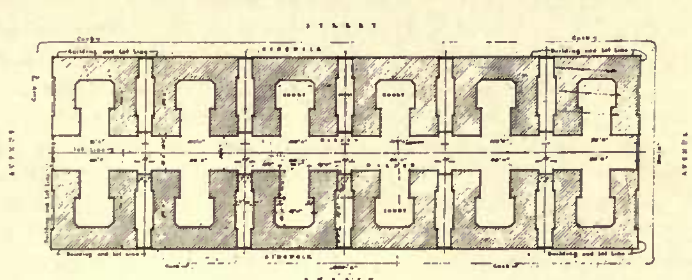
ANDREW J. THOMAS & D. EVERETT WAID ASSOC. ARCHITECTS

THIS housing project of the Metropolitan Life Insurance Company marks the beginning, we hope, of a new era in the architecture of American housing. It promises to create a new standard in multifamily housing. What this means to the dwellers of our crowded cities may be realized by comparing it with the standards which have been established in the housing of individual dwellings in small towns and suburbs.

The last thirty years have seen a wonderful progress in small-town housing, and the American who lives in the small house of the best type enjoys in comfort and convenience by far the highest standard of living in the world.

But his city brother has not been nearly so well off. Hasty speculative methods of building characterized by the unenlightened copying of out-of-date models have blocked any real improvement up to a few years ago. Since the war progress has been more rapid, and now the Metropolitan Life Insurance Company has taken advantage of recent improvements to bring out this new model housing.

There are necessarily many sides to such a vast project, with its countless technical ramifications, but the appeal for

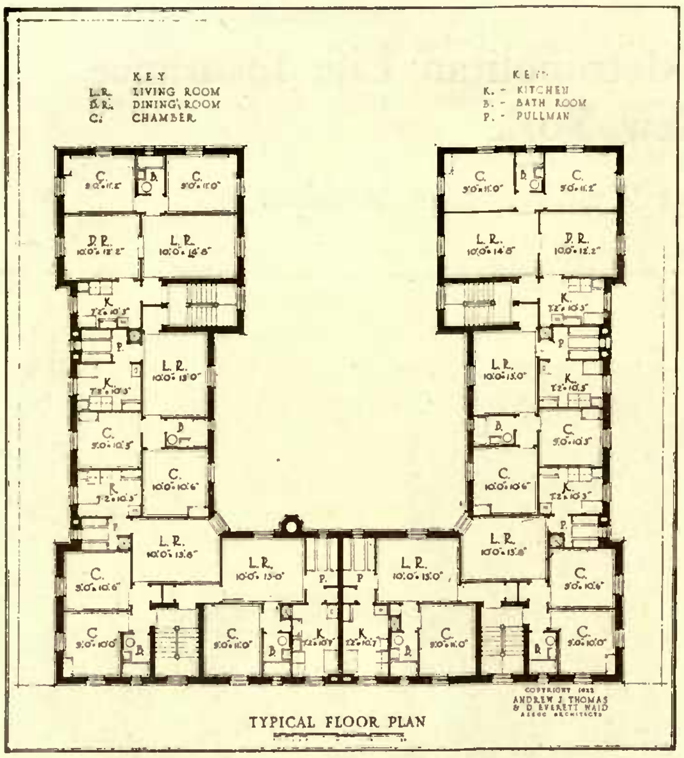


the public, as well as the professional housing experts, will lay in the practical sides. The vastness of the scale of the operation is shown by the fact that it comprises 50 buildings, each housing 39 families, a total of 1,950 families, occupying 8,250 rooms.

The economics which have been worked out in the design are extraordinary, extending from the main essentials down to the smallest details of architecture. More than anything else, it is the vast scale of the operation which creates the biggest savings. The benefits of large-scale operation and organization are just as great in housing as in any other form of production. They extend to design and construction, the buying of materials, the systematizing of erection, and—equally important—to maintenance and operation of the houses after they are completed. The design of these apartment-houses has been worked out to establish the maximum economy in all respects.

In these economics, the repetition of the one unit fifty times permits the design of that unit to be perfected with infinite pains, in a manner which would not be possible because too expensive if a single unit only were to be built. Every possible saving, large or small, has been made through intensive study of the design on the part of Mr. Thomas and Mr. Waid, with the help of expert building technicians and housing experts whom they have consulted, and will be repeated fifty times and its cost distributed over fifty buildings. Concentration of space, compactness of details, the splendid openness of the plan, the careful consideration of every brick and every piece of timber and trim, the use of stock details, and the careful working out of the mechanical features of heating, plumbing, and electricity, where every foot of piping and each valve has been calculated as to cost and efficiency—these are only a few of the advantages created. As examples, the excavation work has been almost eliminated by placing the heating plant along the fronts of the building, requiring only one long trench on each street, which is made by a steam-shovel. Windows are generally of one size.

Great as these benefits are, however, they are not so important as those advantages gained by big-scale planning of the city block as a whole—the highest point which housing economics can reach.



TYPICAL FLOOR PLAN

Because of this concentration of space, with its absolute elimination of non-rent-paying space in the form of public corridors, in the apartments themselves the plan of the buildings has been opened up to give the maximum of sunshine, of circulation of air, and of cheerful outlook. Each unit stands free, as the picture shows, dividing the usual solid street wall into twelve buildings, housing thirty-nine families each. Together they occupy approximately only 50 per cent of the area of the block. This type of design, together with the U-shaped plan of each unit, makes possible three great features. The first of these is the great interior garden, about 36 feet wide and 600 feet long, extending through the centre block, affording a beautiful outlook over green lawns and planting. This garden is infinitely preferable to the hot, dirty, and noisy street. Second is the series of twelve U-shaped courts, opening into this great garden and thereby creating cross-gardens, so to speak, each about 154 feet by 40 feet at the widest point. And, thirdly, there are the passageways between buildings at intervals of 100 feet into the interior garden. These passageways have several advantages. Together with the courts, they bring outside light into the buildings and they add a large number of corner bedrooms and create splendid cross-ventilation in the individual apartments. They permit the fire-escapes —those disfiguring features which encroach on the sidewalks and ruin the appearance of New York City streets—to be placed in them, almost out of sight. Furthermore, they are important from a fire-risk standpoint, because they cut down the risk by breaking up the solid building mass along the street with open passages.

The remarkable openness of this arrangement of isolated buildings, with interior garden, rear courts, and side passageways, develops to the full the great principle which Mr. Thomas calls "block circulation." He first brought this idea out in two blocks of buildings, designed one at Jackson Heights for the Queensboro Corporation, and the other in a district of Brooklyn, for the City and Suburban Homes Company. Its value may be appreciated by visiting these properties, particularly the Jackson Heights group. There any one, standing in the interior garden on a day without any wind, will be astonished at the steady current of air circulating through the passages between the buildings.

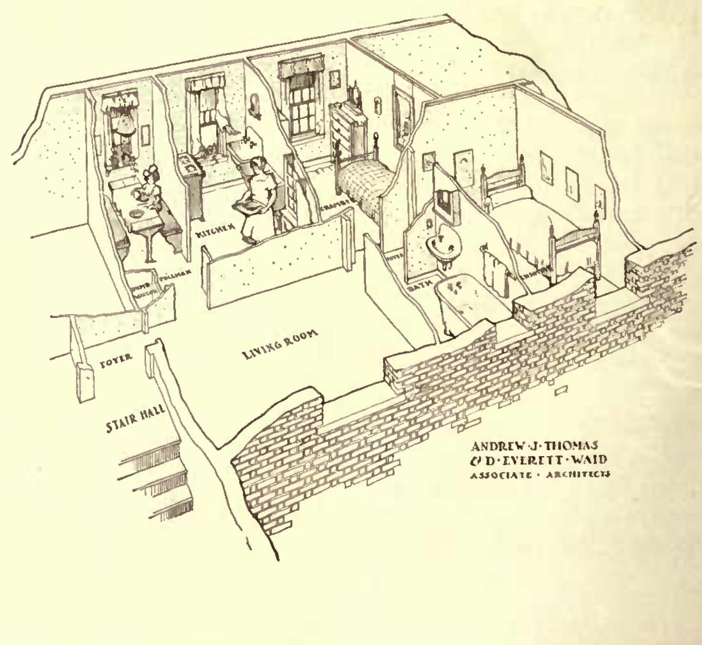
The value of this plan to the individual tenant is easily seen. To begin with, one apartment is as good as another.

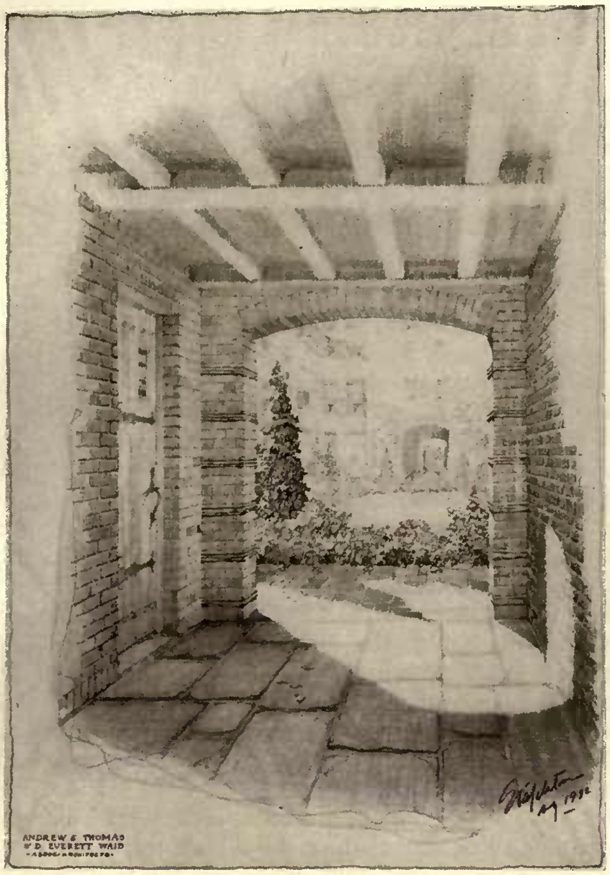
The cheerfulness and homelike character and the outlook and outdoor air and sunshine were, as explained above, paramount. Every apartment has perfect cross-ventilation and corner rooms are frequent on the plan. There are always two and sometimes three exposures to each apartment, like a country house. When it came to the domestic arrangements, the architects realized that the one to consult was not alone the expert, but the housewife herself, who could count better than any one else the steps saved in performing her housework and the time she economized. The plans were passed upon by ladies expert in this type of work, who had carefully investigated the actual working-out of the arrangements of the model tenements and had discovered that the women who lived in them were much dissatisfied with many of the living arrangements. Particularly they found much complaint over the combination of living-room and kitchen into one room, as adding immensely to their work and interfering with their privacy.

The typical arrangement is shown in the little perspective of an apartment interior. It shows a triple division of each apartment into living-room, kitchen, and dining facilities, and bedroom portions—an aid both to operation and to privacy. There are only two apartments to a stair-hall, aiding further to the privacy of the plan, and each living-room is separated from the hall by a little foyer. The kitchen part is separated from the living-room, and contains the latest improvements in domestic equipment. A gas cooking-range with hood; a sink and two wash-tubs with white enamelled metal cover, hinged to swing up against the wall when the tubs are in use, and serving as a drain-board for the sink at other times; a dresser, a refrigerator, and a dumbwaiter are the principal features. All is arranged to save the housewife steps, and a little space is provided, screened off from the rest of the kitchen, for eating.

The chambers, together with the bathroom, are screened off from the living-room. All the interior details are simple but in good architectural taste. The rooms are of good size for this type of work, well above the minimum sizes allowed by law.

Still another great advance in living standards is the mechanical features. Although steam heat, hot water, and electricity are not usually provided at these rentals, they could be included in the plan because of the savings made





in other ways. What this means in the economics of the single family may be realized that only a little more than two tons of coal will be required to heat one apartment, as compared with six or more tons needed to heat the five-room individual dwelling.

This is a splendid beginning and gives promise of a development that will put an end to the intolerable conditions that have so long prevailed.

The Committee on Housing of the Women's City Club of New York recently made an appeal to those in authority and all public-spirited citizens to waken to the real dangers of the present condition. Under the guise of the poor man's need of a home and inability to pay high rent, standards which have taken years of right effort to erect are being broken down and bad-type tenements are being built which, following the old dumb-bell form, provide insufficient light and air for most of the rooms, and no privacy. No attention is given to sane city planning in the new sections, and the result must be future slums.

If new energetic attention is given to this problem a new and beautiful city will grow up in these new districts. This is economically possible.

A Helpful Building and Housing Service

FOR several years there has been developing a feeling that some agency of the federal government should interest itself in building and housing. The Congress of the United States made an appropriation for such activities for the year 1921–1922. The Act appropriating the funds says, among other things, "That as much of this sum as necessary shall be used to collect and disseminate such scientific, practical, and statistical information as may be procured, showing or tending to show approved methods in building, planning, and construction, standardization, and adaptability of structural units, including building materials, and codes, economy in the manufacture and utilization of building materials and supplies, and such other matters as may tend to encourage, improve, and cheapen construction and housing."

Accordingly, Secretary Hoover created the Division of Building and Housing, which co-operates with all groups interested in housing and construction, such as architects, builders, building material producers and dealers, building trades labor, contractors, builders' exchanges, realtors, building and loan associations, building inspectors, city officials, and others.

The Division has helped local communities in successfully solving their housing problems. It collects and publishes monthly prices of twenty-four items of building materials as paid by contractors in different cities. It also makes reports on building activity, such as building permits and contracts awarded, and on general building and housing conditions in the country.

Mr. Hoover has appointed two main committees which co-operate with the Division of Building and Housing. The Advisory Committee on Building Codes, with a Subcommittee on Plumbing, is drafting minimum code requirements for building construction. The Advisory Committee on Zoning is making studies of State enabling acts and zoning ordinances. Its reports should be of distinct aid to communities interested in the promotion of the public welfare and the protection of property values.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Columbia University School of Architecture

Article XX

TRADITIONS OF BUILDING FROM WHICH OUR MODERN METHODS ARE DERIVED

Importance of Tradition

THE art of building has grown by evolution, like other things in this world. The carpenter who builds in wood to-day builds according to certain customs which come down to him from centuries of carpenters. Modern methods of constructing the small house have all human history for their background. When we speak of modern methods, we merely refer to those which are used at this time, as they have evolved from past experience and been considered satisfactory. To hear some architects and builders talk, one would think that modern America had the monopoly on good construction, and that our system of building was newly invented. How often have we heard remarks like the following from the self-styled practical man: "The genius of the present age is eminently practical, and constructive. Improvements of every kind, and ingenious contrivances for easily effecting results, which in past ages were only accomplished by slow laborious effort . . . . . . etc."

But they were saying this kind of thing in 1858, for the above is quoted from a book of this date, so that even the practical man is traditional in his remarks about building.

There are also too many young men to-day wasting their time discovering what they think are new ways of building, but which have been known for centuries and discarded as unsatisfactory. If they would only study what had already been done, they would save themselves a lot of trouble.

Styles of Design Change, but Construction the Same

The styles in designing houses may change from year to year, or more likely from generation to generation, but the methods of building and the traditions in back of them continue on, with only slight changes which mark the evolution of the art. In as brief a period as we have had in this country to produce domestic architecture, we can notice very distinct styles of design, but running through them all are similar ways of building. Our earliest Colonial houses were built according to traditions brought over from England. These traditions in turn had deep roots in Europe, back to primitive days, when houses were not much more than temporary, movable shacks.

There is, however, one general trend through which building methods seem to pass. First, we have rather heavy, clumsy ways of building; this is followed by a long period of experimental cutting down of the materials of construction and standardization of parts; following this comes the stage of extreme lightness of construction, when the builders go as near the limit of safety as possible, and then accidents occur which tend to discredit the system, and decay sets in.

The early English houses were built of heavy oak-trees. Later half-timber houses used smaller structural members and more standard sizes. These traditions were brought to this country, but it was soon found that heavy oak was not necessary for their stability, but that some of the native soft woods would answer the purpose. The thinning-down process continued, until we developed the frame dwelling of balloon construction which is practically built of 2 x 4 pieces throughout.

We are now having a building code formulated by the United States Department of Commerce which is intended to establish the minimum requirements for small-house construction, so that greatest economy of material can be secured, but also a precedent set for the minimum cutting down of material in building. In the compilation of this code this tendency to reduce the quantity of material used was very evident in the discussions which centred around the problem of whether the brick walls for small houses should be 12 or 8 inches thick. In Colonial days they thought nothing of building them 2 feet thick. To-day we hesitate at building them as thick as 12 inches. In fact, our building codes show no uniformity of opinion on the matter, and our experts disagree. The preliminary form of the above-mentioned code has settled upon an 8-inch thickness for walls not exceeding 30 feet, and made additional allowance for an extra 5 feet in height on the gable end of the building.

The process of thinning down is still going on, as this indicates.

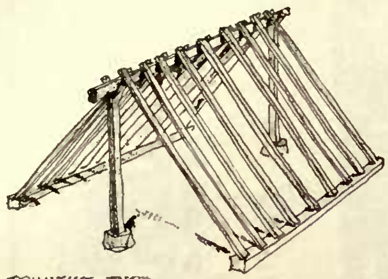
The illustration representing briefly the historical progress of styles in domestic architecture in the United States is given to show how these styles have varied, and impress the reader with the rather constant undercurrent of construction methods throughout these changes.

In the early Colonial houses the wooden frames were built of heavy oak timbers which were hewn into shape and dressed down with the adz. Sometimes rafters and joists were sawn, and the further along we progress in time the more we find the saw being used.

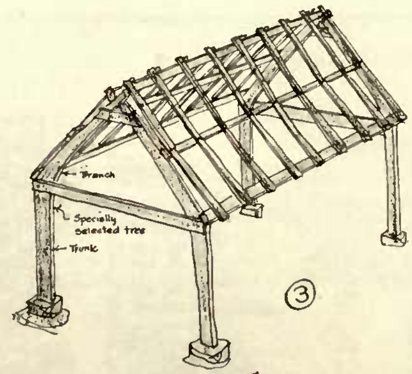
If we now jump to the period between 1865 and 1889, we find that the awful atrocities of architecture were being built in the East with similar heavy frames, although slightly less massive. Where tradition was less strong in the West, the balloon frame had grown up, but during the same period houses of equally bad design were built with one or the other systems, showing that the system of construction had very little to do with the style of architecture. Even consider the variety of styles used in modern domestic work, and then realize that all of these different types of buildings are built much in the same way. Good design has apparently little relation to good construction, although good design is improved when it expresses the construction. We often see very beautiful houses set up for moving-picture plays, but these are built of flimsy stage scenery. We have also seen very ugly houses which make us curse the builder for having built them so well.

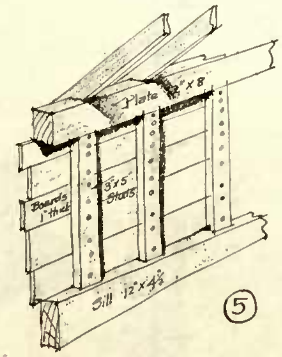
Fundamental Building Traditions Inherited from England

It is from England that we have inherited most of our building traditions of domestic work. The earliest methods of constructing a home were much the same for all Euro-

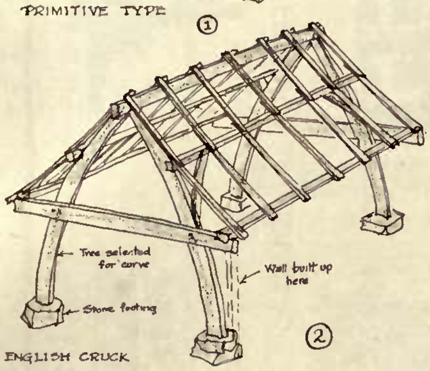


PRIMITIVE TYPE ①

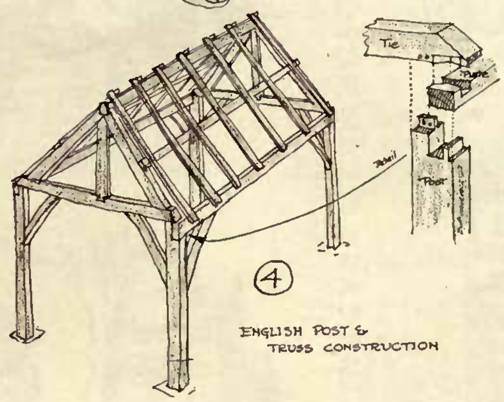




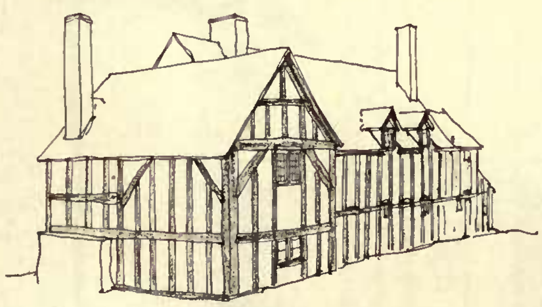
⑤ — TYPE OF ANCIENT — WOODEN WALL



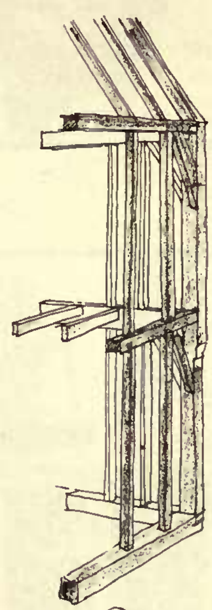
OLD ENGLISH CRUCK CONSTRUCTION ②



④ ENGLISH POST & TRUSS CONSTRUCTION



⑥ ENGLISH HALF TIMBER CONSTRUCTION



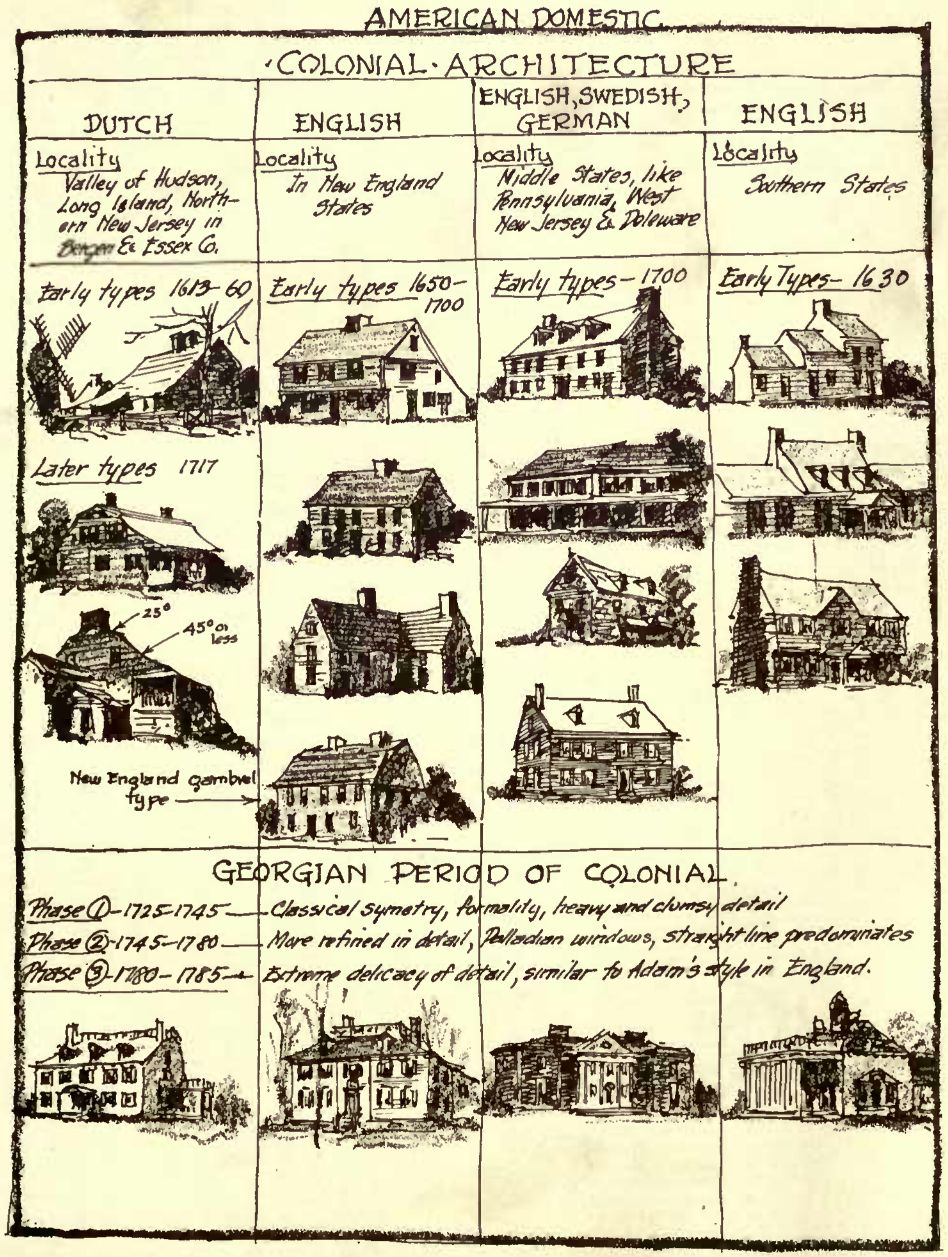
⑦ TYPE OF FRAMING FOR COLONIAL — OF FIRST PERIOD —

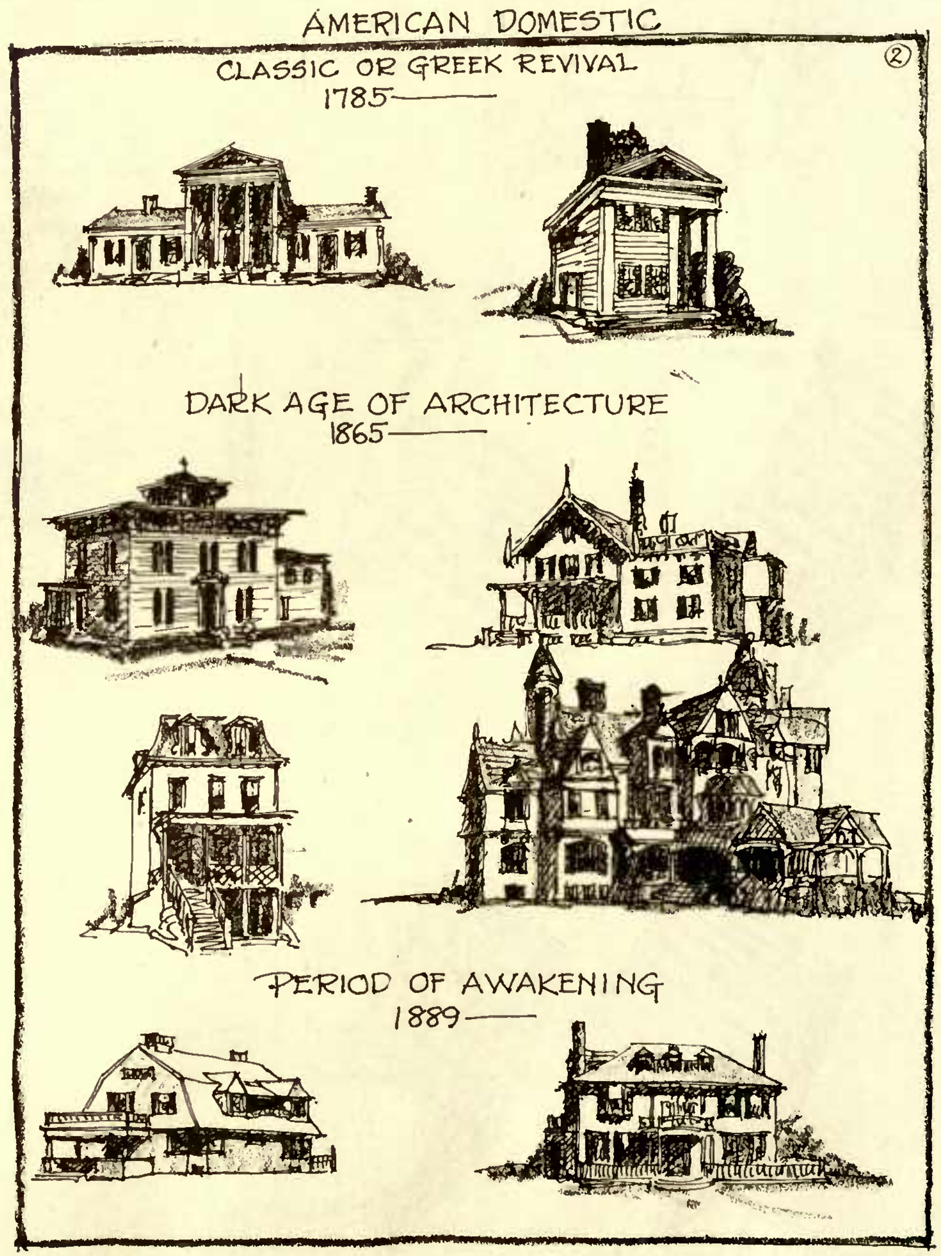
⑧ BRACED FRAME AS DEVELOPED FROM NEW ENGLAND COLONIAL

pean countries. Woven brushwood of the crudest sort was undoubtedly the first beginnings of domestic construction. The next step in advance was, according to a German theory, invented by a woman. It consisted of erecting leaning poles and stakes and filling the space between with inwoven wattlework. The shapes were conical, like the Indian tents, but later the gable-roof shape was adopted because of the greater interior space allowed.

In building the gable-shaped houses the early builders used very heavy and massive construction for the ridge-pole and its support, for they believed that this upheld the rafters. This tradition was kept alive until quite recent times, but now we know that when rafters are supported at their base, the ridge-pole practically takes none of the weight and need only be used for ease of erection.

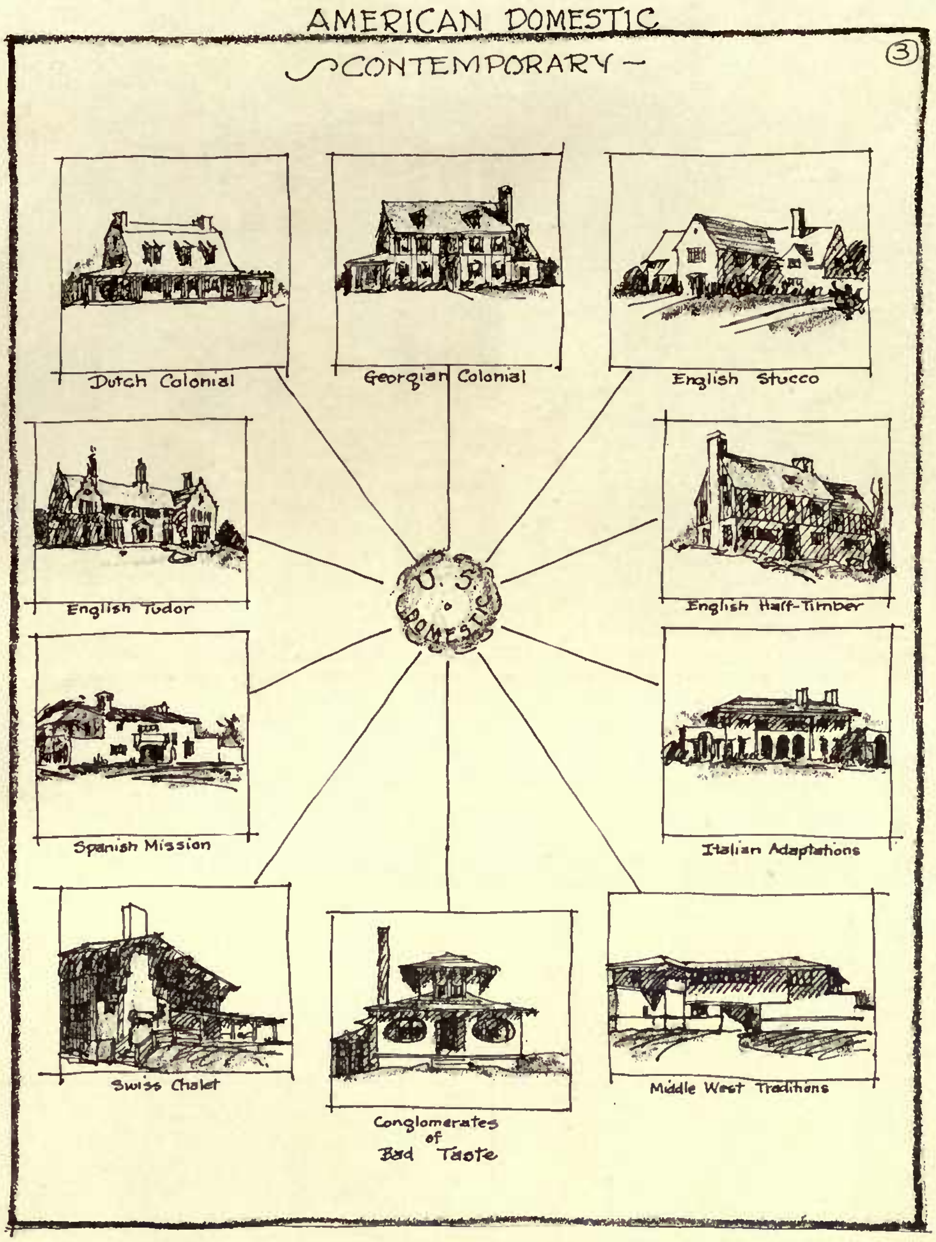
But to our ancestors the important problem in first erecting the house was to secure the substantial support of the ridge-pole. Obviously the erection of two forked trees at either end of the ridge-pole made an excellent solution, but when the room was long, this meant that the interior had to be cluttered up with interior posts. We find then that one of the primitive methods in England of eliminating the interior posts was the adoption of the cruck system of construction which is shown in Fig. 2. By selecting two bent trees and placing them together in a shape like a wishbone, the ridge-pole could be well supported without interior


AMERICAN DOMESTIC
·COLONIAL·ARCHITECTURE
DUTCH
ENGLISH
ENGLISH, SWEDISH, GERMAN
ENGLISH
Locality
Valley of Hudson, Long Island, Northern New Jersey in Bergen & Essex Co.
Locality
In New England States
Locality
Middle States, like Pennsylvania, West New Jersey & Delaware
Locality
Southern States
Early types 1613-60
Early types 1650-1700
Early types-1700
Early Types-1630
Later types 1717
25°
45° or less
New England gambrel type
GEORGIAN PERIOD OF COLONIAL
Phase ①-1725-1745—Classical symetry, formality, heavy and clumsy detail
Phase ②-1745-1780—More refined in detail, Palladian windows, straight line predominates
Phase ③-1780-1785—Extreme delicacy of detail, similar to Adam's style in England.


AMERICAN DOMESTIC
②
CLASSIC OR GREEK REVIVAL
1785
DARK AGE OF ARCHITECTURE
1865
PERIOD OF AWAKENING
1889

columns. By placing cross-tie beams on these bent trees and extending them outward, the plates for supporting the lower ends of the rafters could be held in position. This permitted the carpenters to erect the exterior walls independently of the roof, a thing which they seem to have desired.

There is another variation of the above method of supporting the ridge-pole, and that is shown in Fig. 3. Instead of selecting a bent tree, one was secured which was upright for a certain height, and then which bent to one side with a branch. By placing two of these trees together, a perfect end was formed for the house. However, this was not a very good type, since it meant the selecting of very unusual-shaped trees.



For this reason, the system of post-and-truss construction which is shown in Fig. 4 was the natural outcome of the above. Diagonal bracing at the corners evidently was found to be useful in resisting high wind-storms, and it was usually employed.

There apparently remained a distrust of masonry walls among the carpenters, for they continued to support the roofs entirely upon heavy timber framing, and records show that the exterior walls were built up after the roof-framing had been completed. There are evidences that the early types of walls, after the primitive woven brushwood walls proved insecure, were made like a barricade of trees; that is, they were merely a continuous line of vertically placed tree-trunks. This, of course, was a ruinously expensive type of wall when timber became scarce, and it is no wonder that it grew to a system of construction like that shown in Fig. 5. Even this required a good deal of wood, so that the filling of the space between the timbers rather logically became masonry or plaster on lath. However, the method of building shown in Fig. 5 has all of the elements of the system of construction used in framing modern exterior walls. The most important difference is in the size of the timbers used.

The half-timber construction of the Middle Ages was only the artistic treatment of this crude system of building. In drawing number 6 is a very simple half-timber house which shows practically no attempt at all to decorate. The construction is perfectly evident, and there are no curves and carving used to ornament the building, as can be seen on some of the more elaborate houses of the cities. This simple building system was the traditional background of the English carpenter, and it is not at all extraordinary that he brought his methods of building over to this country.

Even the custom of calling in the neighbors and feasting them when a house-raising was celebrated came directly from English traditions. The old post-and-truss construction of the early English houses required framing on the ground and then lifting into position afterward. Records show that the people from the surrounding countryside were called in to help, and their wages of hire were paid by the house-owner with a huge feast. In early Colonial days the nearest neighbors were likewise called in to help raise the frame, and the host was supposed to feed the gathering, after the work was finished, and make a jolly party of eating and drinking—a sort of social debt, but not looked upon as wages as in older days.

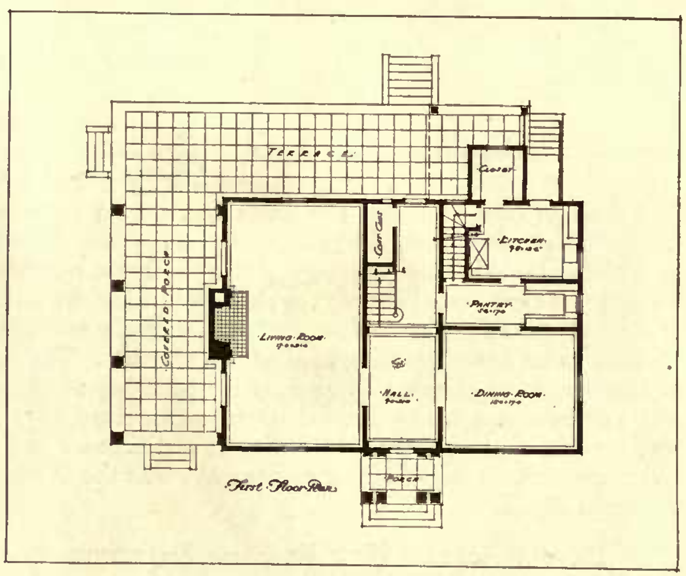
The hard climate which the earliest American colonists had to face and also the abundant supply of wood which lay at their very doors were factors which slightly altered the traditions of building. After the house had been framed and the spaces between the timbers filled with plaster or masonry, the exterior was covered over with clapboards or shingles as an extra covering against the weather. The use of clapboards or shingles as an exterior covering of course was not new, for many English farmhouses show that it was used in that country. But with this difference in exterior appearance, the framing underneath was the same as shown in Fig. 7.

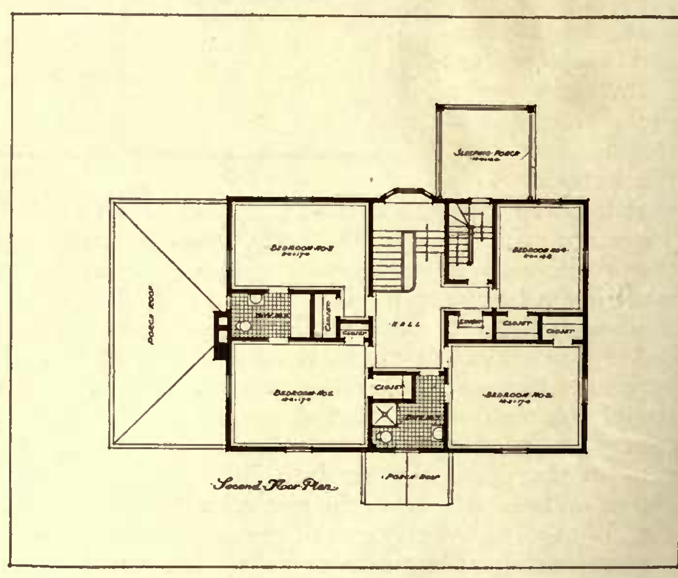
Revolt Against New England Traditions

It was only a matter of time when the thinning-down process began to make itself evident in the traditions of

(*Continued on page* 258)

FRONT.





PLANS. Delos H. Smith, Architect.

HOUSE, MRS. S. LAWRENCE HEAP, CHEVY CHASE, MD.

REAR OF HOUSE.

LIVING-ROOM.

Delos H. Smith, Architect.

HOUSE, MRS. S. LAWRENCE HEAP, CHEVY CHASE, MD.

(*Continued from page* 255)

Colonial carpentry, and from its clumsy beginnings it evolved into the more or less standard form of construction which we call the brace-frame.

The difficulty of securing good labor in the West, and also the increasing use of the power sawmill, made it possible and necessary to standardize a quick and easy method of building which would meet the great demand for houses in rapidly growing communities.

Quoting from the New York *Tribune* of January 18, 1855, we have a very interesting account of the conditions which were then prevalent that brought about this later variation of the wooden-frame structure. The conditions there described seem almost like our modern difficulties with labor and materials.

"Mr. Robinson said: . . . I would saw all my timbers for a frame house, or ordinary frame outbuilding, of the following dimensions: 2 x 8 inches; 2 x 4; 2 x 1. I have, however, built them, when I lived on the Grand Prairie of Indiana, many miles from sawmills, nearly all of split and hewed stuff, making use of rails or round poles, reduced to straight lines and even thickness on two sides, for studs and rafters. But sawed stuff is much the easiest, though in a timber country the other is far the cheapest. First, level your foundation, and lay down two of the 2 x 8 pieces, flatwise, for side-walls. Upon these set the floor-sleepers, on edge, 32 inches apart. Fasten one at each end, and perhaps one or two in the middle, if the building is large, with a wooden pin. These end-sleepers are the end-sills. Now lay the floor, unless you design to have one that would be likely to be injured by the weather before you get on the roof. It is a great saving, though, of labor to begin at the bottom of a house and build up. In laying the floor first, you have no studs to cut and fit around, and can let your boards run out over the ends, just as it happens, and afterward saw them off smooth by the sill. Now set up a corner-post, which is nothing but one of the 2 x 4 studs, fastening the bottom by four nails; make it plumb, and stay it each way. Set another at the other corner, and then mark off your door and window places and set up the side-studs and put in the frames. Fill up with studs between, 16 inches apart, supporting the top by a line or strip of board from corner to corner, or stayed studs between. Now cover that side with rough sheeting boards, unless you intend to side-up with clapboards on the studs, which I never would do, except for a small, common building. Make no calculation about the top of your studs; wait till you get up that high. You may use them of any length, with broken or stub-shot ends, no matter. When you have got this side boarded as high as you can reach, proceed to set up another. In the meantime, other workmen can be lathing the first side. When you have got the sides all up, fix upon the height of your upper floor, and strike a line upon the studs for the under side of the joist. Cut out a joist 4 inches wide, half-inch deep, and nail on firmly one of the inch strips. Upon these strips rest the chamber floor joist. Cut out a joist 1 inch deep, in the lower edge, and lock it on the strip, and nail each joist to each stud. Now lay this floor, and go on to build the upper story, as you did the lower one; splicing on and lengthening out studs wherever needed, until you get high enough for the plate. Splice studs or joists by simply butting the ends together, and nailing strips on each side. Strike a line and saw off the top of the studs even upon each side—not the ends—and nail on one of the inch strips. That is the plate. Cut the ends of the upper joist the bevel of the pitch of the roof, and nail them fast to the plate, placing the end ones inside the studs, which you will let run up promiscuously, to be cut off by the rafter. Now lay the garret floor by all means before you put on the roof, and you will find that you have saved 50 per cent of hard labor. The rafters, if supported so as not to be over 10 feet long, will be strong enough of the 2 x 4 stuff. Bevel the ends and nail fast to the joist. Then there is no strain upon the sides by the weight of the roof, which may be covered with shingles or other materials—the cheapest being composition or cement roofs. To make one of this kind, take soft, spongy, thick paper, and tack it upon the boards in courses like shingles. Commence at the top with hot tar and saturate the paper, upon which sift evenly fine gravel, pressing it in while hot—that is, while tar and gravel are both hot. One coat will make a tight roof; two coats will make it more durable. Put up your partitions of stuff 1 x 4, unless where you want to support the upper joist—then use stuff 2 x 4, with strips nailed on top, for the joist to rest upon, fastening altogether by nails, wherever timbers touch. Thus you will have a frame without a tenon or mortise, or brace, and yet it is far cheaper, and incalculably stronger when finished, than though it was composed of timbers 10 inches square, with a thousand auger holes and a hundred days' work with the chisel and adz, making holes and pins to fill them.

"To lay out and frame a building so that all its parts will come together requires the skill of a master mechanic, and a host of men and a deal of hard work to lift the great sticks of timber into position. To erect a balloon building requires about as much mechanical skill as it does to build a board fence. Any farmer who is handy with the saw, iron square and hammer, with one of his boys or a common laborer to assist him, can go to work and put up a frame for an outbuilding, and finish it off with his own labor, just as well as to hire a carpenter to score and hew great oak sticks and fill them full of mortises, all by the science of the 'square rule.' It is a waste of labor that we should all lend our aid to put a stop to. Besides, it will enable many a farmer to improve his place with new buildings, who, though he has long needed them, has shuddered at the thought of cutting down half of the best trees in his wood-lot, and then giving half a year's work to hauling it home and paying for what I do know is the wholly useless labor of framing. If it had not been for the knowledge of balloon frames, Chicago and San Francisco could never have arisen, as they did, from little villages to great cities in a single year. It is not alone city buildings, which are supported by one another, that may be thus erected, but those upon the open prairie, where the wind has a sweep from Mackinaw to the Mississippi, for there they are built, and stand as firm as any of the old frames of New England, with posts and beams 16 inches square."

The above address, which was delivered before the American Institute Farmers' Club, has been quoted in detail because of the interesting point of view of the days of 1855 which it reveals. When Mr. Robinson had finished there were other comments, especially one by Mr. Youmans, in which he described early conditions of building in San Francisco. He also said that he had adopted this plan of building on his farm in Saratoga County, where he found great difficulty in getting carpenters that would do as he wished. They could not give up tenons and mortises, and braces and big timbers, for the light ribs, 2 x 4 inches, of a balloon frame. Does this not remind the modern reader of comments he has heard upon all sides these days concerning labor which will not do what is wanted but insists on doing things in the old way?

Some pertinent remarks were also made by a Mr. Stillman, who testified that he had seen whole blocks of houses built in two weeks at San Francisco, and better frames he never saw. He said they were put up a story at a time, the first two floors often being framed and sided in and lived in before the upper part of the house was up. Have we any such housing crisis as this, in these days, or did we do any quicker building of war villages than that described above?

And now we read from the Preliminary Report on the Building Code Committee of the United States Department of Commerce the crystallized tradition of this system of wooden-frame construction which was evolved so many years ago that we sometimes forget the conditions of its making:

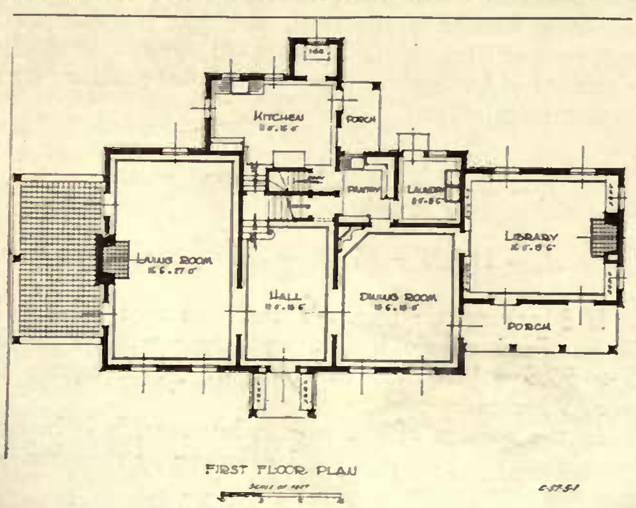
"*Exterior Walls.*

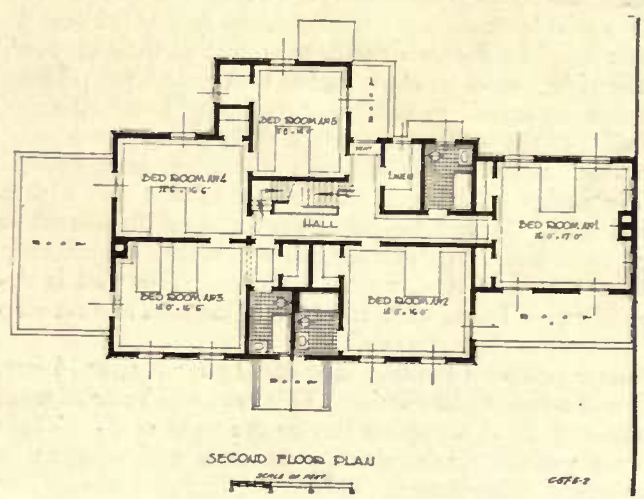
"1. Wood studding shall be 2 x 4 inches nominal size or larger and spaced not to exceed 16 inches on centres. All walls shall be securely braced at corners. The minimum sizes specified in these requirements shall in all cases be understood as referring to nominal sizes of such timbers.

"2. Exterior walls, except those of dwellings or parts thereof not more than one-story high, shall be sheated with boards not less than $\frac{7}{8}$-inch thick. Sheathing boards shall be laid tight and properly nailed to each stud with not less than 2 tenpenny nails. Where the sheathing is omitted all corners shall be diagonally braced and such other measures taken to secure rigidity as may be necessary.

"3. Wood 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.

"4. When joists are supported on ledger or ribbon boards, such boards shall not be less than 1 x 4 inches, shall be laid into the studs and securely nailed with not less than 2 nails to each stud. The floor joists shall be well spiked to the sides of the studs."





HOUSE, V. A. WILSON, TENAFLY, N. J.

R. C. Hunter & Bro., Architects.

Concrete Construction

By DeWitt Clinton Pond, M.A.

FIFTEENTH ARTICLE

In the construction of the 395 Hudson Street Building there are two more items to be considered. The first is the design of the basement walls and the second is the design of the stairs. The considerations involved in basement-wall construction are those found in retaining-wall design, and, although this type of construction in theory calls for complicated formulas, actually for every-day use a very much simplified procedure is adopted.

According to the assumptions made in this procedure the earth-pressure against the wall varies directly with the depth of the wall. Earth is considered as weighing 100 pounds per cubic foot, and the horizontal pressure against the wall is taken as 30 pounds per foot of depth. The first foot will cause a pressure of 30 pounds, the next 60 pounds, and in this manner the load increases directly with the depth. At the grade there is a sidewalk load to be considered. The code requires that the live load on a sidewalk shall be 300 pounds per square foot. If this is considered in terms of earth-pressure it will be equivalent to a load of earth 3 feet high. These 3 feet of earth will cause a pressure of 90 pounds at the grade.

With these considerations in mind it is possible to proceed with the actual work of design of the basement walls in the section of the building which has furnished the basis for our former discussions.

The plan of the basement wall is shown in Figure 21. The first section of wall to be considered will be that between columns 9 and 12. This is designated in the plan as section H-H and is shown in Figure 22.

The finished basement floor is 16 feet below the finished first floor. The grade at this point is 2 feet below the first-floor level, so that there will be 14 feet of wall over which there will be a pressure caused by the earth. The pressure at grade will be 90 pounds for each lineal foot, as stated above, due to the requirement that there will be a surcharge of 300 pounds per square foot upon the sidewalk. At the bottom of the wall there will be an additional pressure due to the earth of $14 \times 30 = 420$ pounds, and this will make the total pressure at the bottom of the wall $420 + 90 = 510$ pounds, as shown in the diagram in Figure 23. It will be noticed that the diagram is similar to that of a simple beam with a variable continuous load over 14 feet of its length. The left reaction, R_1, is in the present case at the first floor, and the right reaction, R_2, is at the basement level. These two floors are considered as supports at top and bottom of the wall. If the wall were an area wall, then a beam must be provided at the top to take up the reaction at this point.

The design of the wall resembles that of a slab with a varying load. It will be noted that the reinforcement is placed vertically. Where the bars are placed horizontally a different type of design must be used. The wall is designed in strips 1 foot wide and 16 feet long. The first step is to determine the reactions.

There will be a uniform load of 90 pounds over 14 feet, which will weigh 1,260 pounds. This load will be considered as concentrated at a point 9 feet to the right of R_1. There will be a variable load, starting at zero and reaching a magnitude of 420 pounds. This load will equal $420 \times 7 =$ 2,940 pounds, and will be applied at a distance equal to two-thirds of 14 feet plus 2 feet, or $9.33 + 2 = 11.33$ feet. The moment around R_1 will equal the sum of the products of the two loads multiplied by the respective distances between the centres of gravity and R_1.

$$\begin{array}{lll} 1{,}260 \times 9 & = & 11{,}340 \\ 2{,}940 \times 11.33 & = & 33{,}310 \\ \hline 4{,}200 & & 44{,}650 \text{ foot-pounds.} \end{array}$$

$$R_2 = 44{,}650 \div 16 = 2{,}790 \text{ pounds.}$$

$$R_1 = 4{,}200 - 2{,}790 = 1{,}410 \text{ pounds.}$$

The method of finding the point of no shear, which is the next step, is somewhat complicated by the fact that the load varies. If the shear diagram is laid out graphically, as shown in Figure 24, it will be seen that the shear changes as a curved line, and the point of no shear is found to be located at a distance of 6 feet 10 inches from R_2. At this point the earth-pressure is $30 \times 6.84 = 205$ pounds less than the 510 pounds at R_2, or 305 pounds. The loads at the right of the point of no shear can be considered as two loads; one a uniformly distributed load weighing 305 pounds per running foot, and one a variable load starting at zero and reaching a value of 205 pounds at R_2. The centre of gravity of the first load will be at a distance equal to one-half of 6.84 feet from the point of no shear, and the centre of gravity of the second load will be at a distance equal to two-thirds of the distance. The moment at point of no shear will be given by the following calculations:

$$M = (2{,}790 \times 6.84) - [(305 \times 6.84 \times 3.42) + (205 \times 3.42 \times 4.56)]$$

$$M = 19{,}083 - (7{,}135 + 3{,}197) = 8{,}751 \text{ foot-pounds.}$$

Engineers often assume a thickness of wall, and on the basis of this assumed depth and the moment as determined above find the required reinforcing. If it were assumed that the wall will be 1 foot thick, that there will be $1\frac{1}{2}$ inches of fireproofing outside of the steel, and that the rods will be $\frac{3}{4}$-inch rods or bars, then d becomes $10\frac{1}{8}$ inches. In this case the method of finding the stress in the steel is shown by the following calculations:

$$f_s = \frac{8{,}751 \times 12 \times 8}{7 \times 10\frac{1}{8}} = 11{,}820$$

$$A_s = 11{,}820 \div 16{,}000 = .74 \text{ square inches.}$$

If $\frac{3}{4}$-inch square bars are used, the area of each bar will be .5625 square inches, and there will be required $.75 \div .5625 = 1.32$ bars per foot, or $\frac{3}{4}$-inch square bars spaced 9 inches on centres.

In the opinion of the author, however, it is better to determine the thickness of the wall in exactly the same manner as the thickness of a slab is found.

The maximum moment was found to be 8,751 foot-pounds, or 105,010 inch-pounds.

$$d^2 = \frac{105{,}010}{1{,}279.5} = 82.2$$

$$d = 9.1$$
$$t = 11 \text{ inches.}$$

In the present case, owing to a variation in grade, the wall was made $11\frac{1}{2}$ inches thick. Under this condition d becomes 9.6 inches, and in order to find f_s and the spacing of the steel the following calculations are required:

$$f_s = \frac{105{,}010 \times 8}{7 \times 9.6}$$
$$= 12{,}500 \text{ pounds.}$$

$A_s = 12{,}500 \div 16{,}000 = .78$ square inches.

Under the conditions prevailing at the time when the building was under construction it was more easy to obtain $\frac{5}{8}$-inch square bars, so these were used. The area of these bars is .3906 inches, and the number required in each foot of length becomes $.78 \div .3906 = 2.00$. If $\frac{5}{8}$-inch square bars are spaced 6 inches on centres, the proper area of steel will be supplied.

It will be noticed that in Figure 22 this is the spacing of bars called for. There are also $\frac{3}{8}$-inch square bars called for, which act as distributing bars and are spaced 2 feet on centres. It will also be noticed that the wall is notched into the footing, and is braced at the bottom by the basement floor. Owing to the fact that the exterior of the building is of brick, a recess is made at the top of the wall to receive the brick. The method of making this recess is shown in the figure.

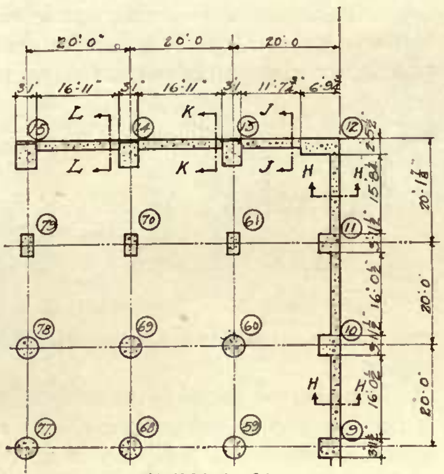


FIGURE 21

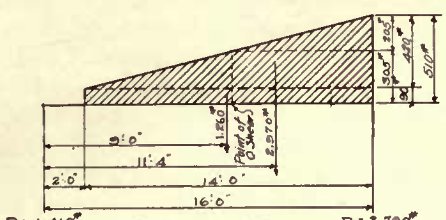


FIGURE 23

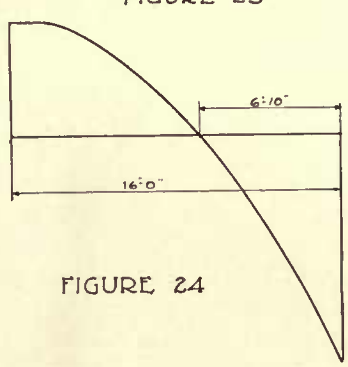
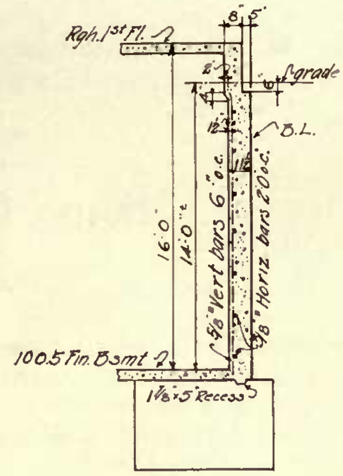


FIGURE 24

The next section of wall under consideration is that shown in Figure 25. This wall is between columns 12 and 13. Owing to the small span between these two columns, the reinforcement was placed horizontally. It will be noticed that the wall is divided into horizontal strips 2 feet wide. In the upper strips the bars are spaced 1 foot 2 inches on centres, and in the lower strip they are spaced $5\frac{1}{2}$ inches on centres. The reason for this variation of spacing is that the load increases with the depth of the wall. Owing to the fact that the first floor of the building pitches slightly, the distance between the finished first and basement floors at this point is 16 feet $2\frac{1}{2}$ inches. Also the grade varies and the distance from the grade to the basement floor is 14 feet 6 inches. The load per running foot, owing to the 300-pound surcharge, is 90 pounds at the grade. The load at the bottom is 90 pounds plus 14.5 multiplied by 30, or a total of 525 pounds. At a point 2 feet above the basement floor this load per lineal foot will be 465 pounds. The average load on the 2-foot strip is 495 pounds. The length of the slab between columns is 11 feet $7\frac{3}{4}$ inches. Although the average load is taken for a strip 2 feet wide, the slab is designed in 1-foot widths, as is customary in the average slab design. The load is considered as applied to the clear span of 11 feet $7\frac{3}{4}$ inches, but the span of the slab is taken as this length plus the thickness of the slab as required by the code. Assuming a slab thickness of 1 foot, the span becomes 12 feet $7\frac{3}{4}$ inches, or 12.65 feet. In order to determine the moment in the slab the following calculation is required:



Section H-H
bet Cols 8 & 12
FIGURE 22

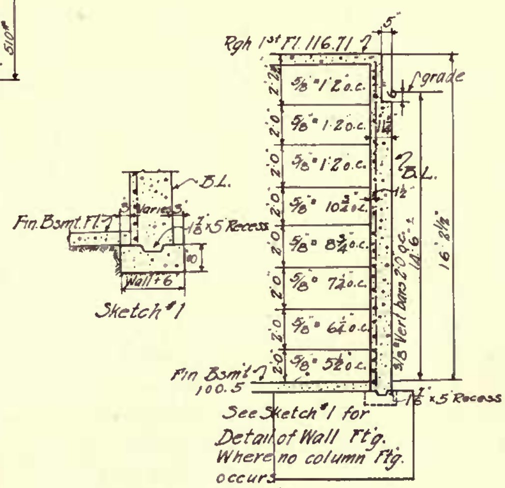


FIGURE 25 Section J-J

$$M = \frac{495 \times 11.65 \times 12.65 \times 12}{8}$$
$$= 109{,}500$$

$$d^2 = \frac{109{,}500}{1{,}297.5} = 85.6$$

$$d = 9.25$$
$$t = 11.12$$

The thickness of the wall will be made $11\frac{1}{4}$ inches and d will be 9.37. To find f_s the usual formulas are applied:

$$f_s = \frac{109{,}500 \times 8}{7 \times 9.37} = 13{,}350$$

$$A_s = \frac{13{,}350}{16{,}000} = .83$$

$$.83 \div .3906 = 2.14.$$

If $\frac{5}{8}$-inch square bars are spaced $5\frac{1}{2}$ inches on centres, they will provide the proper area of steel in the lowest 2-foot section. It might be worth noting that some engineers would have used the larger unit load of 525 pounds instead of the average load of 495 pounds. It is suggested that the reader may check through the calculations given above, using the larger load, and determine for himself if there is enough difference to require this procedure.

The strip above the one last designed will have an average load upon it of 435 pounds. The same type of calculations can be carried through as shown above, and it will be found that the bars should be spaced $6\frac{1}{4}$ inches on centres. The load decreases for each 2-foot strip by 60 pounds and the spacing increases until the distance on centres reaches 1 foot 2 inches, beyond which it is not safe to go.

In the case of horizontal reinforcing, the distributing bars are placed vertically. In the case of this particular section of wall, a small footing must be provided where the column footing does not extend under it. This small footing is shown in the sketch.

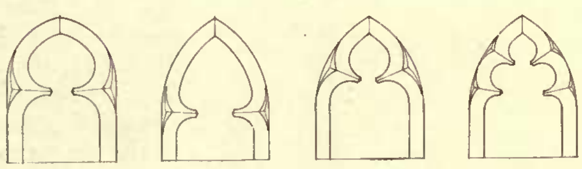
The other parts of the wall are very similar to the one shown in Figure 22, and no further discussion is necessary to explain the design.

Tables can be developed for walls of the type shown in the figures which can give the height, thickness, reactions, steel spacing, and distance from bottom of the wall to the centre of gravity of the load, for walls with vertical reinforcing. Such a table can be made without much difficulty, but its use is limited usually, as the assumption made when the calculations are carried out is that the grade is at the top of the wall. As in the cases shown above, this assumption is not always correct for certain walls.

Some Gothic Fallacies

By David B. Emerson

DURING the past few years, particularly in New York City, there has been a decided tendency toward what has been called Gothic design. The most of this so-called Gothic design has been exploited in office buildings and apartment houses, and much of it has been bad. It was neither French Gothic, English Gothic, nor Flemish Gothic,



A B C D

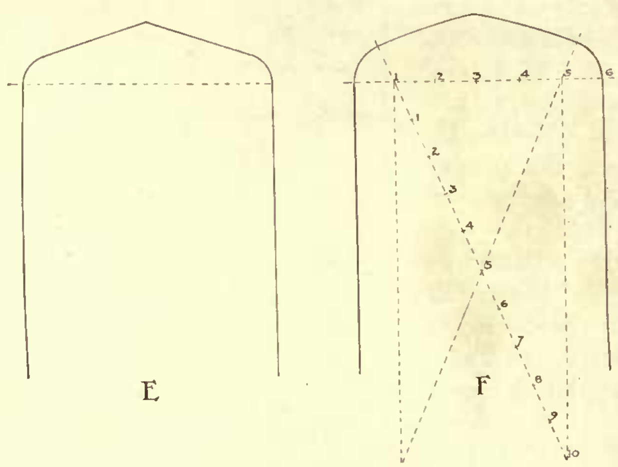
not even "Carpenters' Gothic," "Strawberry Hill Gothic," nor Victorian Gothic, just simply plain twentieth-century American skyscraper Gothic.

Fundamentally, the idea of the Gothic skyscraper is wrong. Such authorities as A. Kingsley Porter, or Professor Moore, would probably say that they were not Gothic at all, inasmuch as they were, insofar as the architecture was concerned, absolutely non-constructive. The buttresses resisted no thrusts, the pinnacles held down nothing, and the arches were supported by the steel frame and supported nothing themselves. All this was bad enough, but what was worse the detail was a sad hodge-podge of all of the periods and none of the periods, jumbled together without rhyme or reason, and with an absolute disregard for scale.

At the same time that this Gothic architecture was going on, some of the architects who were doing this work were designing buildings along classic lines, which were excellent, the details of which were meticulously correct. One of the most frequent aberrations to be seen in this work was the cusping of arches, either in openings or in panels. "A" and "B" are very common types of what is frequently seen, and "C" and "D" are the types which are commonly found in ancient examples. As will be noticed in the early examples, the cusping always started either at the spring line of the enclosing arch, or above it, whereas in these American twentieth-century types it very often started below the spring line. Where "B" had its origin the writer has no idea, but "A" was originated in a Grand Rapids furniture factory, and was the ornament on the legs of a "near-Gothic" table, which was extensively advertised about twenty years ago, and a number of the aspiring Gothicists of the period copied it!

Another of the glowing evils of the misuse of the style is the method of constructing Tudor arches. The method which is frequently followed is as shown in "E." An arc with a very small radius is struck at the haunch of the arch, and then a straight line tangent to this arc is run to the apex of the arch, making something which is neither constructive nor beautiful. Contrasting this with "F," which is correctly struck from four centres, it will be very easy to note the difference.

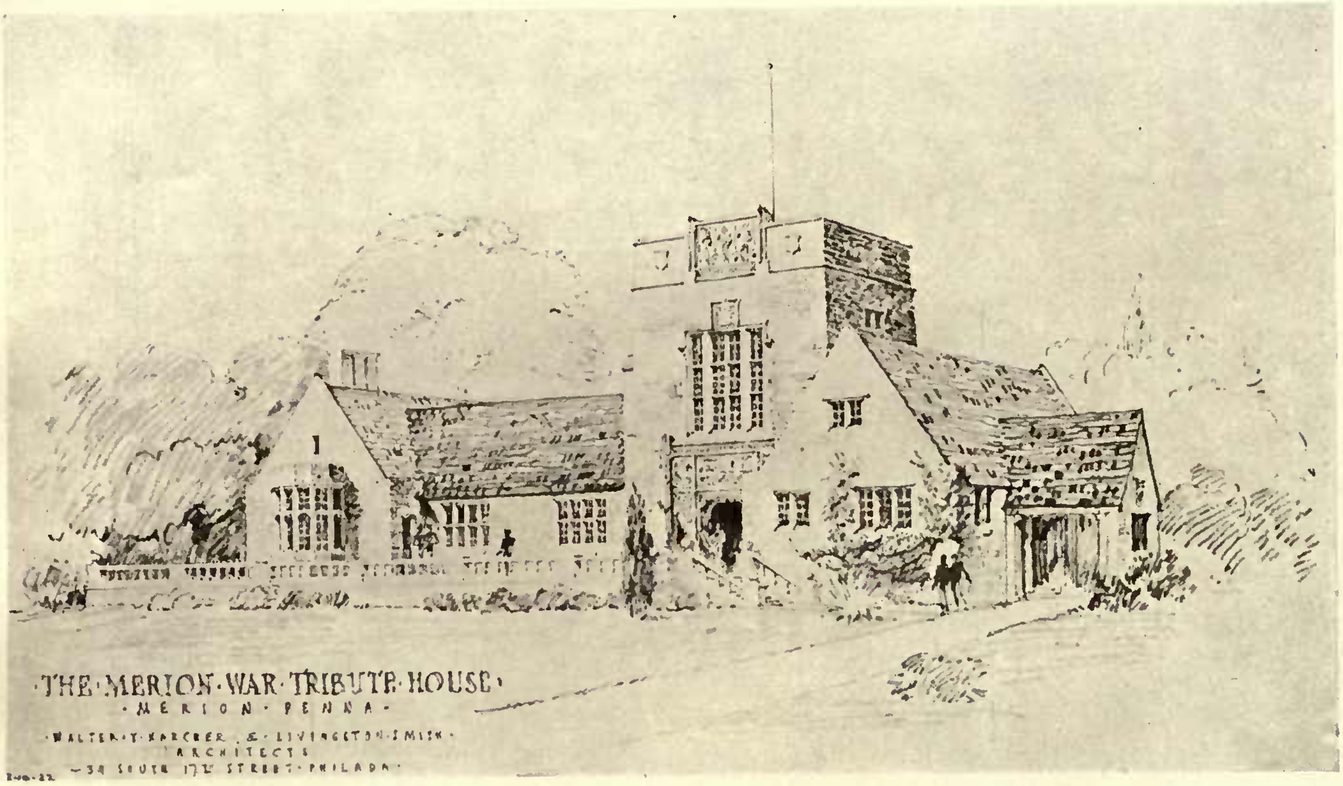
Not only are these faults found in this commercial Gothic, but ecclesiastical and collegiate Gothic have been infected with them, although the standard of church and

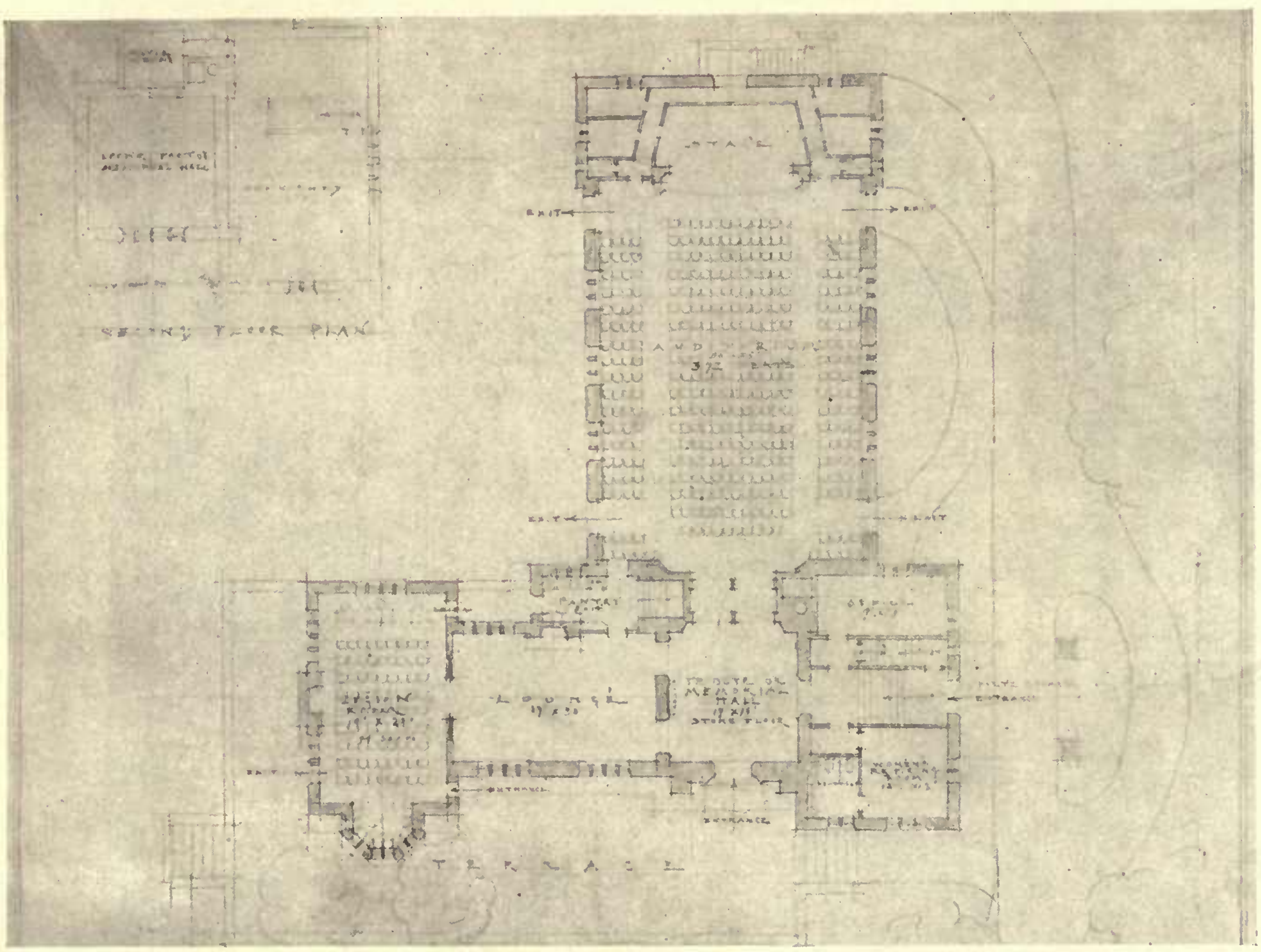


E F

collegiate architecture has, thanks to a few zealous, scholarly architects, been kept at a generally high standard. Still, evils have crept into good work. One of the most recent, and most beautiful of the numerous Gothic college buildings, would, if it were not for what seems to me an anachronism, be very nearly perfect. The introduction of a round-arched arcade with classic columns, a distinctly Renaissance doorway flanked with Ionic columns, and a balustrade which is far more suggestive of Italian Renaissance influence than of English Gothic, took something from the true Gothic character of an otherwise almost perfect piece of work. Some

(*Continued on page* xxxvi)

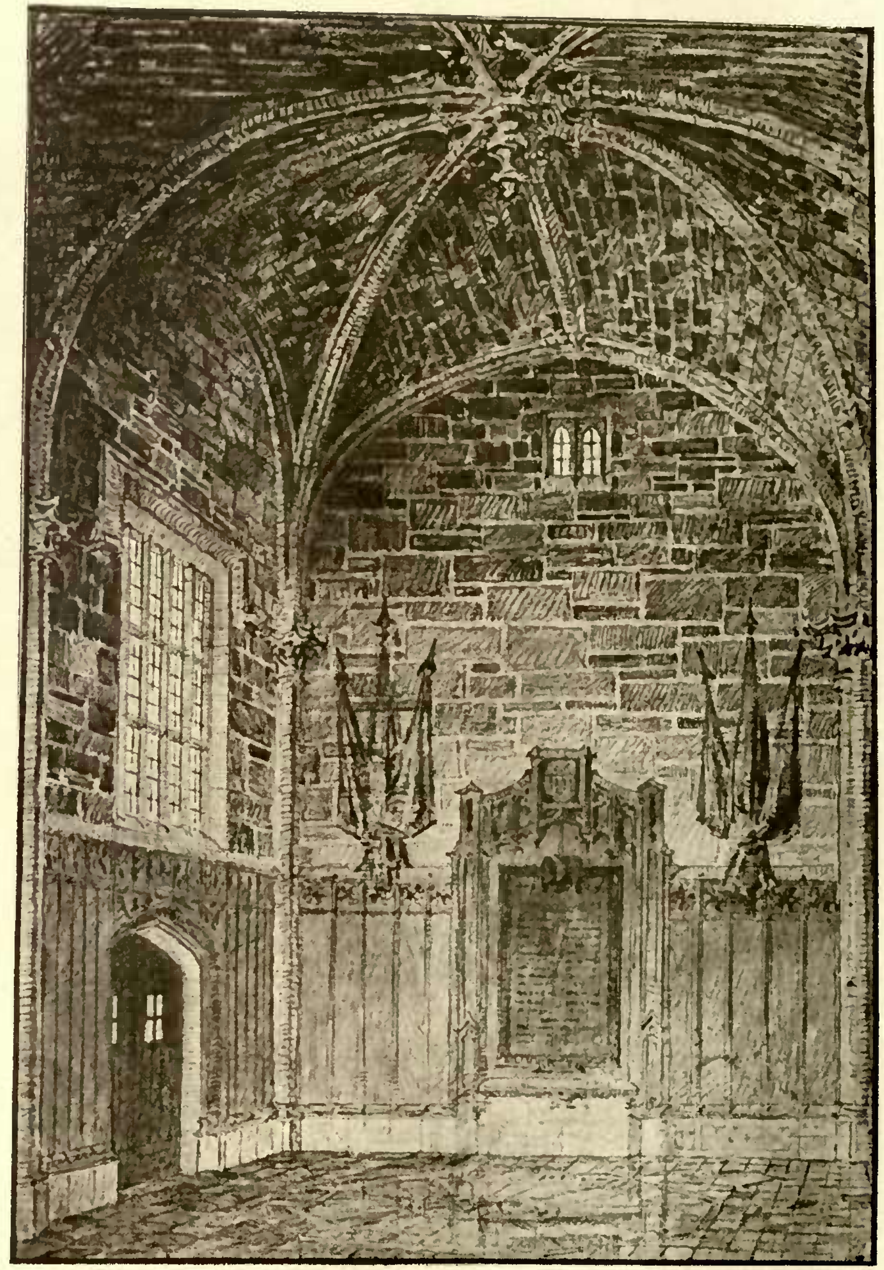




FIRST FLOOR PLAN. Walter T. Karcher and Livingston Smith, Architects.

THE MERION WAR TRIBUTE HOUSE, MERION, PA.

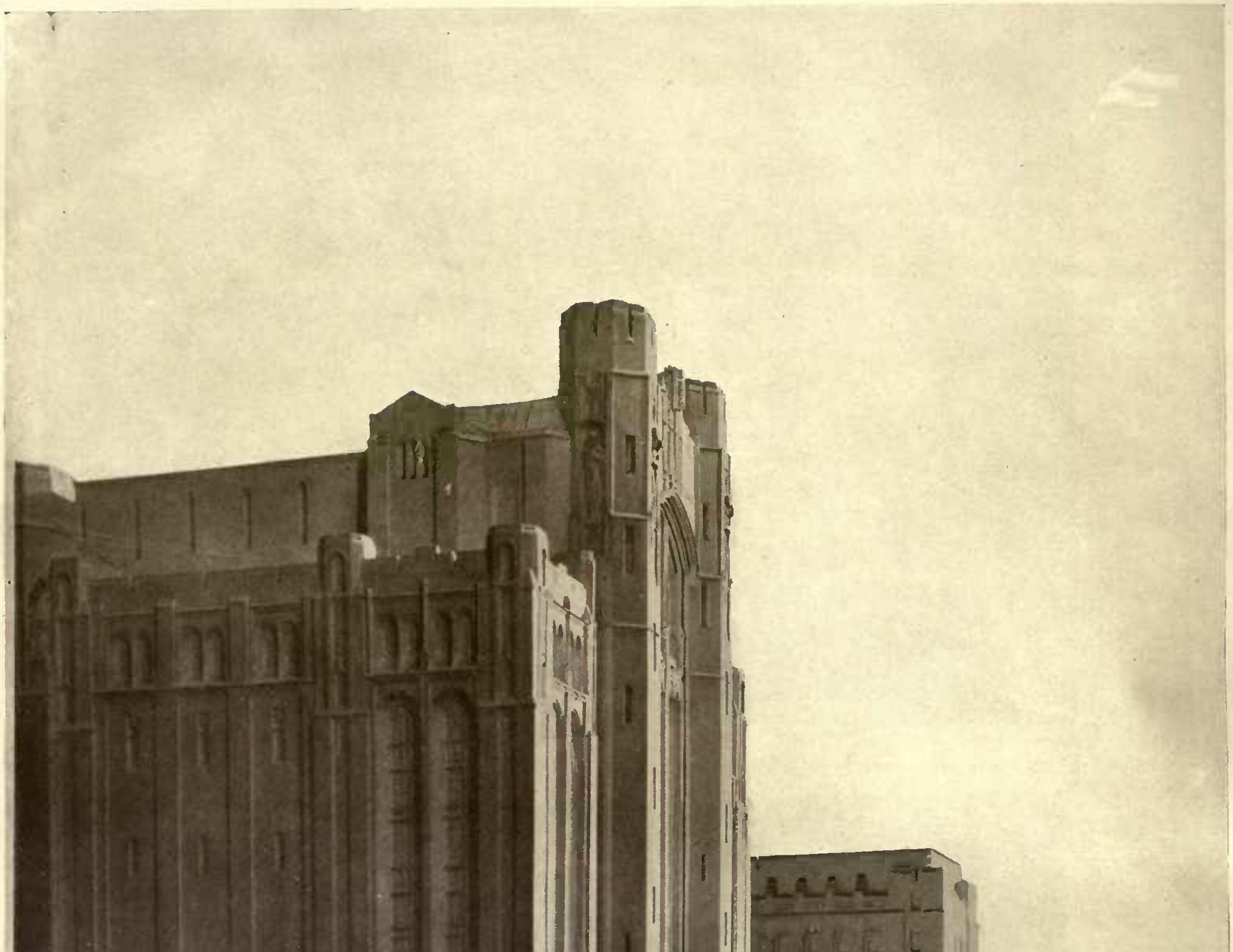
MEMORIAL TOWER.



INTERIOR OF TRIBUTE HALL.

MERION WAR TRIBUTE HOUSE, MERION, PA.

Walter T. Karcher and Livingston Smith, Architects.



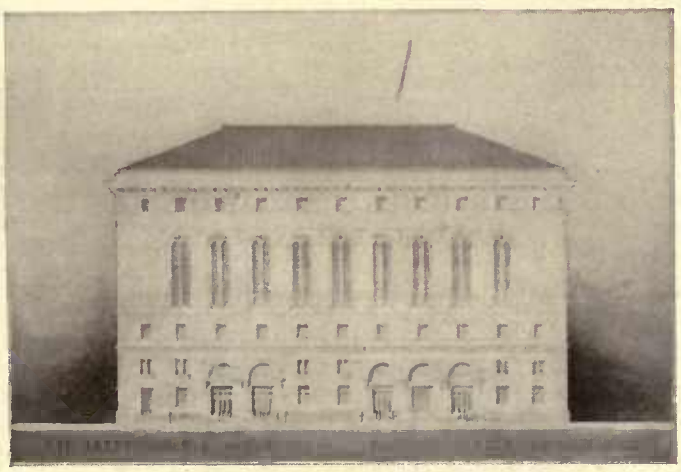
THREE-SIXTEENTH-INCH-SCALE MODEL OF THE DETROIT MASONIC TEMPLE, DETROIT, MICH.
George D. Mason & Co., Architects.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI SEPTEMBER, 1922 NO. 3

Notes on the Preliminary Studies for the Great Masonic Temple at Detroit

George D. Mason & Co., Architects

THE fact that the proposed Masonic Temple at Detroit has attracted the attention of architects and laymen throughout the country would seem to indicate that there is a growing demand for more adequate housing of Masonic fraternities. The Detroit temple will be the largest in the world, containing 11,070,000 cubic feet, and will house all



Elevation of the original scheme—which contemplated facing the old brick structure with marble.

the bodies which form the association, viz: twenty-six Blue Lodges, the Royal Arch Chapters, the Council, Detroit and Damascus Commanderies, Michigan Sovereign Consistory, and the Moslem Shrine, which ordinarily exists as an isolated auditorium, the playground of Masonry.

At the present writing the steel frame for the structure is rapidly going up, the principal contracts have been let, and it is confidently expected that the building will be completed as designed to the last detail. A retrospect of the various stages which led to the adoption of a certain plan, the innumerable ideas, sketches, suggestions thrown aside would be disheartening were it not for the feeling that at last a complete structure fulfilling certain definite needs is in sight.

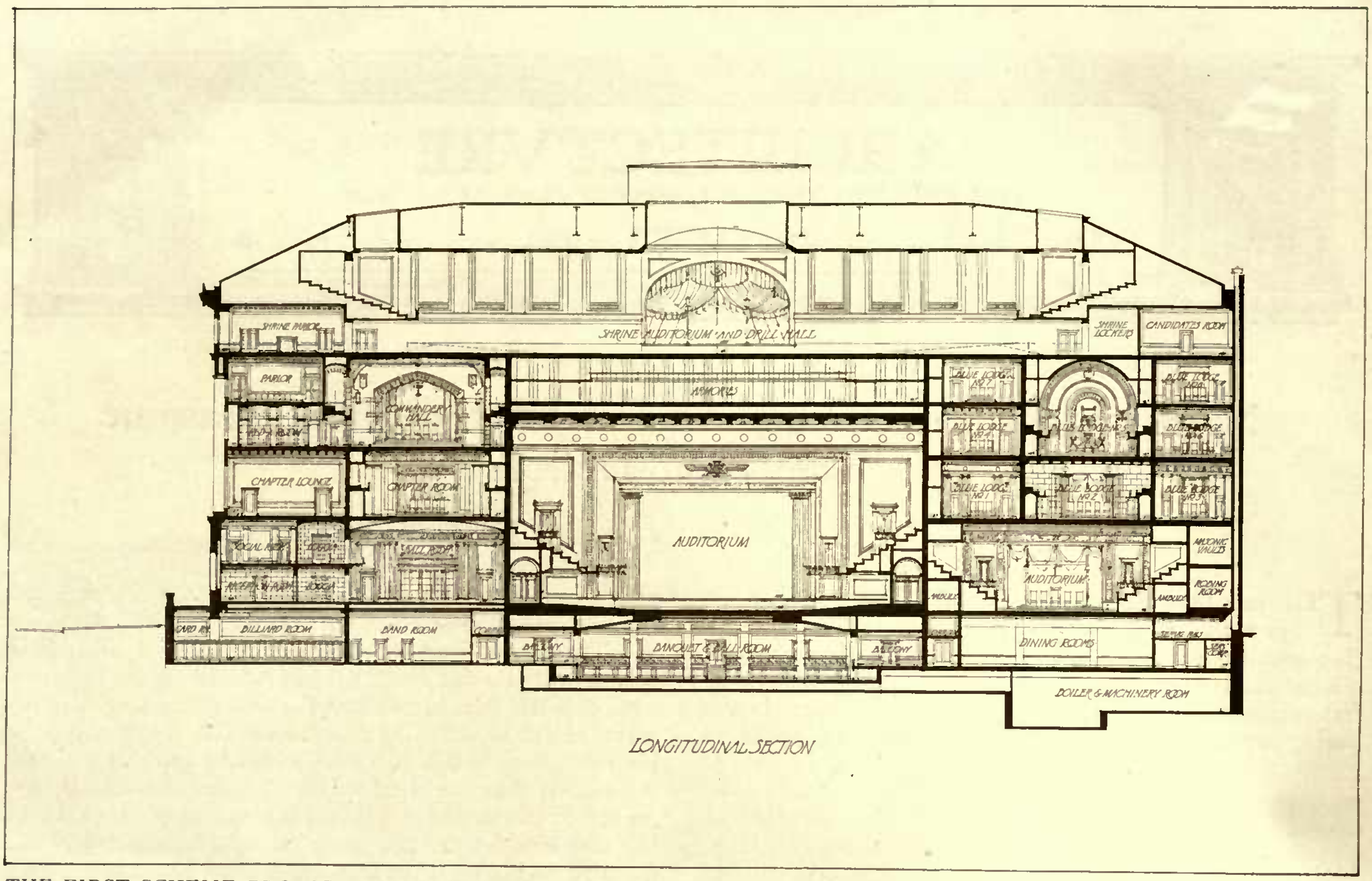
Large bodies move slowly, and so with the association, and it was provident that no decided action was taken at an early date, for the unprecedented growth of the city and the great increase in membership were beyond the calculation of the first committee, and so while the project was under consideration and innumerable schemes developed, the needs and the ideals of the fraternity grew.

The original idea of the committee, as far back as 1915, was to purchase additional property adjoining the old structure, of which Mr. Mason was the architect. By rearrangements in the old building and the erection on the adjoining property of an auditorium with a seating capacity of 2,000, it was felt that the needs of the fraternity would be met for some years to come. It was planned to face the old building with marble, and the complete structure as a unit was quite successful from the standpoint of design, and provided in a smaller way most of the essentials incorporated in the final scheme.

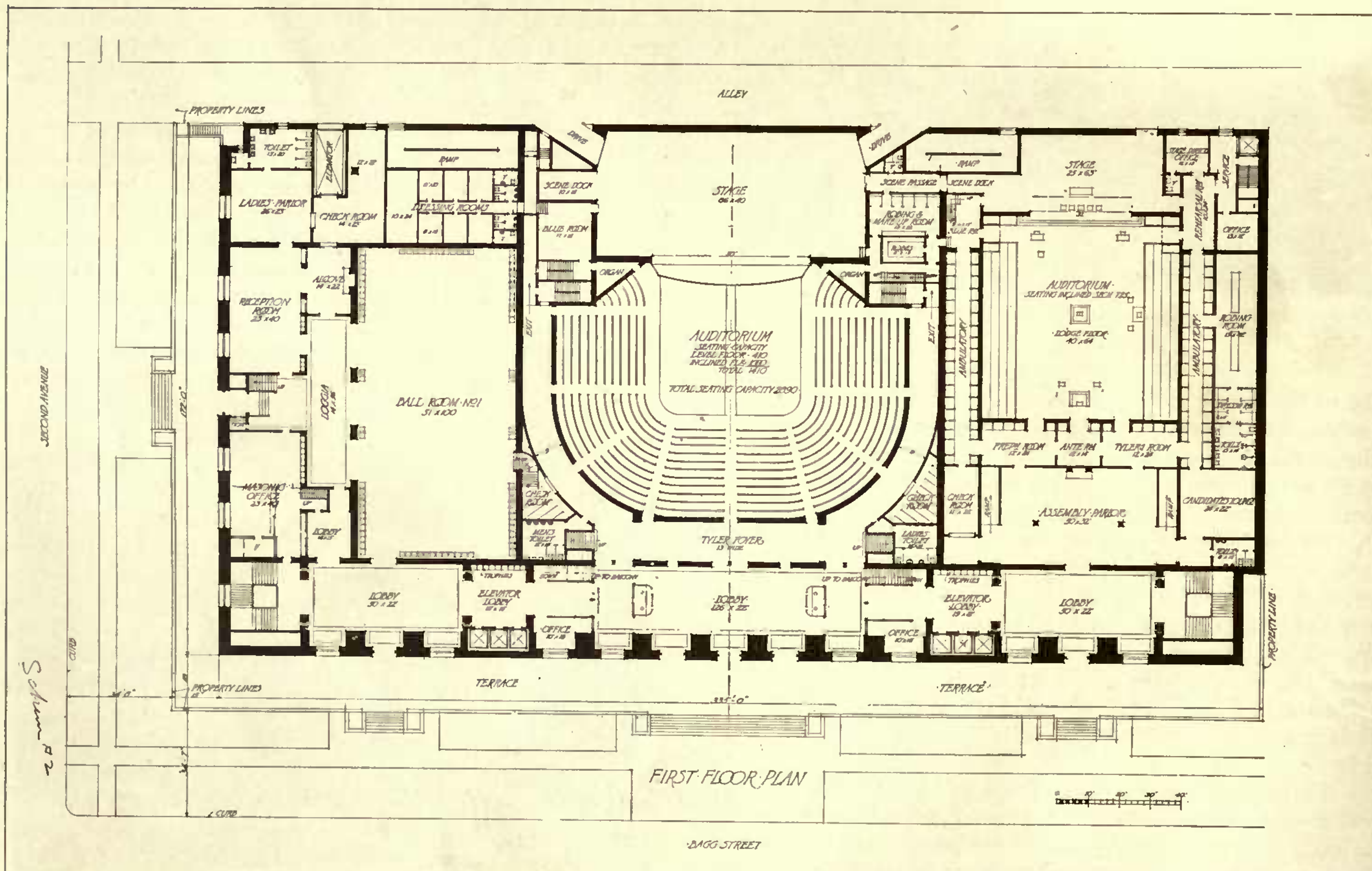
This original scheme was abandoned and a new site purchased facing Cass Park, the plat being 200 by 350 feet. Later the association purchased an additional 50 feet, making a total frontage on Temple Avenue of 400 feet.

While the original scheme proved inadequate, it served to bring out the principal requirements and some original ideas in the planning of the various units. The planning of these units with their accessories and details is quite definitely laid down according to the ritual, but the arrangements desired have not always been met satisfactorily. These points were carefully studied at this time and various suggestions incorporated. The great departure in planning of one of these units was in the case of the so-called "Third Degree Blue Lodge." Due to the fact that the exemplifica-

End elevation for the first scheme proposed on the larger site.



THE FIRST SCHEME PROPOSED ON THE NEW SITE.



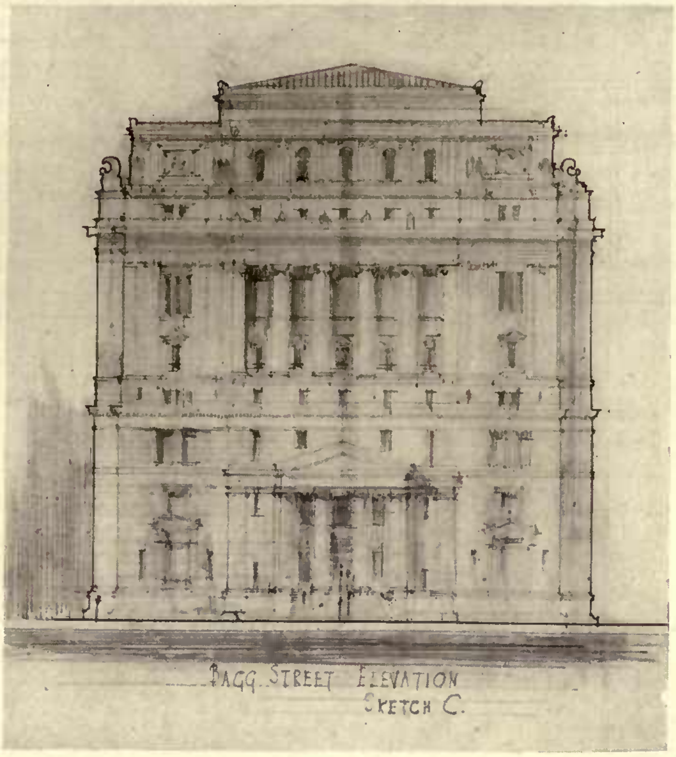
THE FIRST SCHEME PROPOSED ON THE NEW SITE.

tion of this degree draws the largest attendance and for proper presentation requires some scenery, a parti was developed comprising three units: the seating space, the lodge proper with one side removed, and the stage—very similar in arrangement to some of the later moving-picture theatres.

One of the most important and certainly the most perplexing of the general problems presented, and which had its origin in the original scheme, was adequate provision for the growing need for club facilities and social functions. In the final scheme these have been provided for in every detail—a standard swimming-pool, 4 ballrooms, 24 billiard-tables, 8 bowling-alleys, library, also reception-rooms and parlors, for every division, also the very important banquet-rooms with a combined seating capacity of 4,700, with kitchen and serving-room area equal to that of some of the largest hotels. In addition to this, the Shrine end of the building houses a complete club with 100 individual sleeping-rooms and a large dormitory.

It was thought that this site, 200 by 350 feet, would be ample for a monumental building expressing a single structure, and preliminary plans were worked out in detail. This was abandoned as the feeling grew that provision for the Shrine auditorium was inadequate. It was proposed in this scheme to resort to temporary seating on the drill-hall floor, which is the top floor of the building, and inasmuch as the Shrine ceremonials take place but four times during the year, it was felt that this arrangement might be practical. It was argued, however, that a large auditorium on the ground floor would serve other purposes and provide for the numerous benefit circuses, operas, and other entertainments put on by the Shrine and the Grotto, which are now given at the armory and at Orchestra Hall.

With this requirement in mind another scheme was developed by which the auditorium, seating 2,800, became a principal element of the plan with axis parallel to the main street, and demanded a tall building for the ritual portion of the building. Architecturally, this was ideal considering all the factors entering into the problem, but it was not developed in detail, for the reason that it was not possible to increase the seating capacity without the addition of a gallery to the auditorium. For ordinary conditions this could have been done, but in the work of the Shrine considerable of the main-floor space is occupied by an apron extension to the stage floor on which various drills, etc., are staged. To obtain a sight line from the gallery to this flat floor would increase the height of the auditorium to such an extent as to make impossible any effective architectural handling of the interior. At this time it became evident that the needs of the Shrine would require a seating capacity of 5,000, and the development of the final scheme accomplished this end and was adopted.



One of the preliminary sketches for the ritual portion of the final scheme.

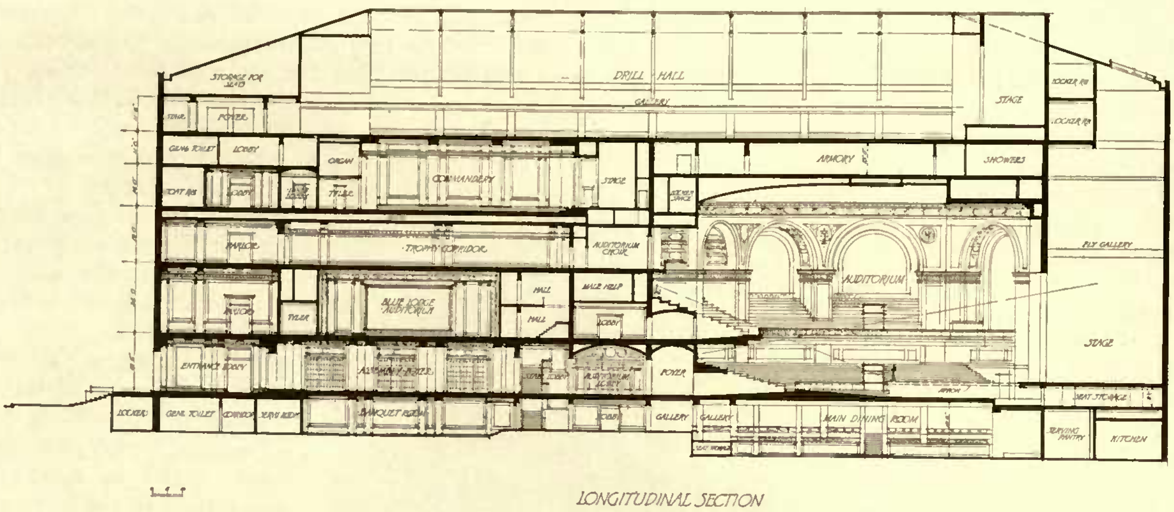
During this period of the study of the plan many minor arrangements were perfected and the character of the interiors determined upon. Among the more important and by far the most perplexing difficulty was the isolation of the Consistory portion of the building. It was required that the Consistory auditorium should be in the form of a nave with side-aisles and exterior lighting and a seating capacity of 1,700 with a large stage—to have its own separate entrance, lounge, parlors, and offices, and still have easy access to the rooms devoted to social functions. A reference to the plan will show that it was necessary to encroach upon the main auditorium with the stage of the Consistory, involving considerable complication, yet utilizing an area which would otherwise have been superfluous.

Up to this time the question of the power-plant had been held in abeyance, and was not considered in the preliminary studies, as the association owned a plot to the rear of the stage of the large auditorium, on which, in case it was necessary, the power-plant could be erected and something in the nature of a hotel would also be provided for. When the plans were fully under way, however, an additional 50 feet on Temple Avenue became available and the power-plant was definitely located on the rear end of this plat, the remainder to be devoted to an additional unit to be known as the Shrine Club, in which are housed the ordinary athletic-club features. Another complication occurred at this time, caused by the addition to the main building of two additional stories providing two large lodge-rooms and additional banquet-rooms seating 850. The requirements of the building code as to exits, stairways, seating, etc., were carefully considered, and with some minor changes all serious obstacles were avoided.

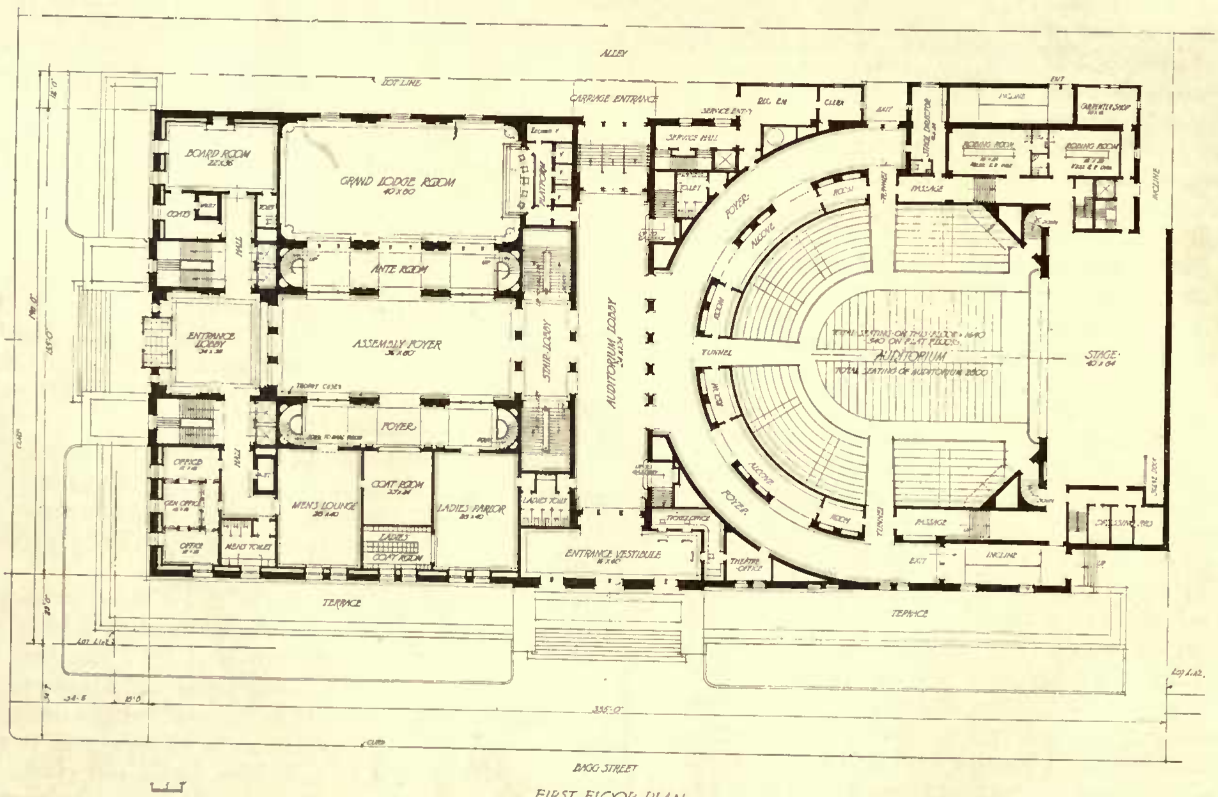
On June 17, 1920, the final preliminary drawings were approved and the architects ordered to proceed with the working drawings. The view-point of the Building Committee in regard to the plans together with a general description of the first-floor plan is embodied in the report of the chairman as follows:

"It is the culmination of their efforts of the past three years and it is their hope that now they can present plans that will meet with the approval and requirements of every organization affiliated with the Masonic Temple Association.

"Many drawings were made to induce discussion and criticism in order that the specific needs of each body might be disclosed, considered, and provided for. The final selection and adoption of the various plans and ideas presented a wealth of material that had to be combined in one organic whole, and its subdivisions had to be so separated one from the other that coincident activities would not clash. This divisional feature was made to apply not only to the requirements of purely Masonic work but to club and social



SECOND SCHEME.



SECOND SCHEME.

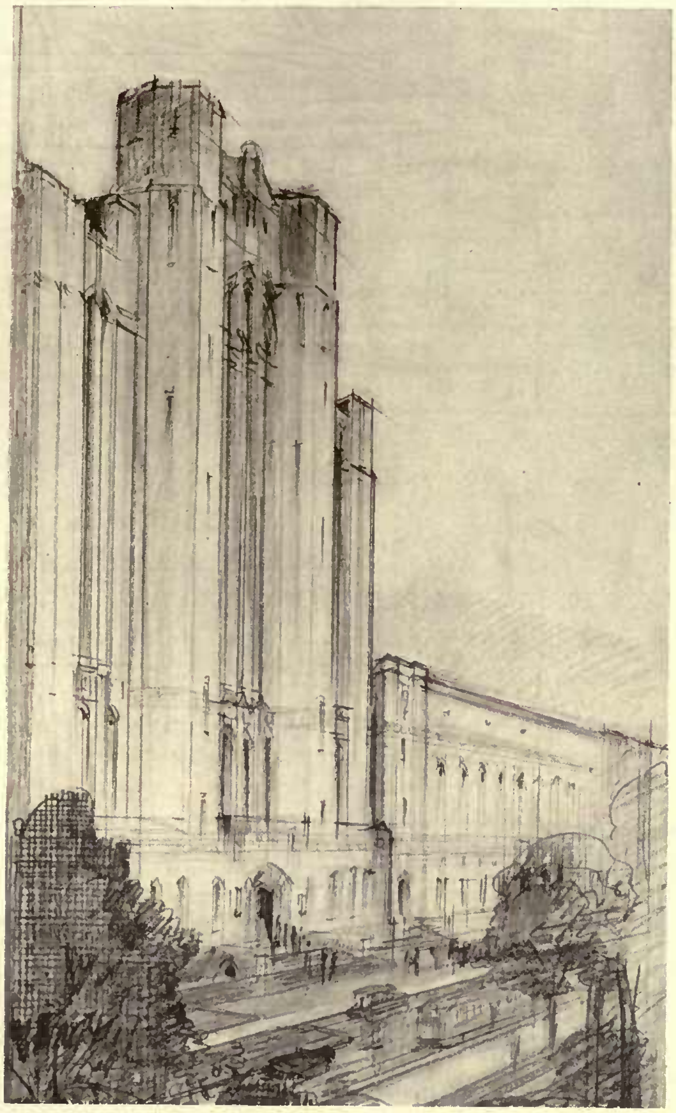
activities as well; one must not interfere with the other and yet both might be under full sway at one and the same time.

"It was also necessary to so co-relate the various divisions that free and easy access might be had from one to the other should their joint use be found necessary on special occasions.

"It has been the constant aim to so locate the various divisions that those which must necessarily accommodate large crowds be placed in the lower portions of the building. By this arrangement the number of elevators could be lessened as well as the cost of operating them, and proper provision made for social gatherings at any time without interference with Masonic work.

"The plans as now presented will be found to contain the number and size of rooms that will amply provide for the operations of all the bodies concerned, and although no attempt has been made to show all the minor details and fittings that will eventually be provided for the convenience and comfort of the workers, the number of cubic feet of space required for each body has been allotted, thereby allowing for slight modifications in details should same be thought advisable before final construction is begun.

"The reason for both the general and the particular arrangement of the first-floor plan was primarily to have three entrances—one for the Scottish Rite, one for the York Rite, and one for the auditorium, in order that each might control the entrance and exit to its own apartments, and so that each could carry on its work at any desired time without any possible interference with the other bodies.



First sketch made for a Gothic type structure, which was adopted.

"Bear in mind, however, that, notwithstanding the fact of the apparent isolation of each division, they are so closely related that convenient corridors of generous width afford easy communication from one to the other.

"The portion devoted to the Consistory is two stories in height, fronts on Second Avenue and extends east about 150 feet, affording ample length for a cathedral suitable for the work and seating about 1,500. A part of this space is also planned for a fully equipped stage 32 by 54 feet, with large property and robing rooms, located on the stage level and also on a mezzanine directly overhead.

"Upon the right, entering the Consistory from Second Avenue, are the offices, and to the left the lounging-room and parlor. Back of the lounging-room are the coat and toilet rooms and the corridor leading to the auditorium.

"From the lounging-room stairways lead to the banquet-room in the basement and up to the Candidates' Room and Board Offices on the second floor.

"The west entrance on Temple Avenue opens into a lobby 23 feet by 60 feet, affording access to six passenger-elevators and two large stairways leading to the rooms of the York Rite bodies on the floors above.

"At the east end of this lobby are the business offices of the York Rite bodies, Shrine and Grotto, provided with vaults and other necessary modern office equipment.

"The easterly half of this floor, covering a space approximately 168 feet by 200 feet, is allotted to the auditorium. The main entrances and foyer open out to Temple Avenue, and parlors and coat-rooms that properly belong with such an auditorium extend along to the main south front.

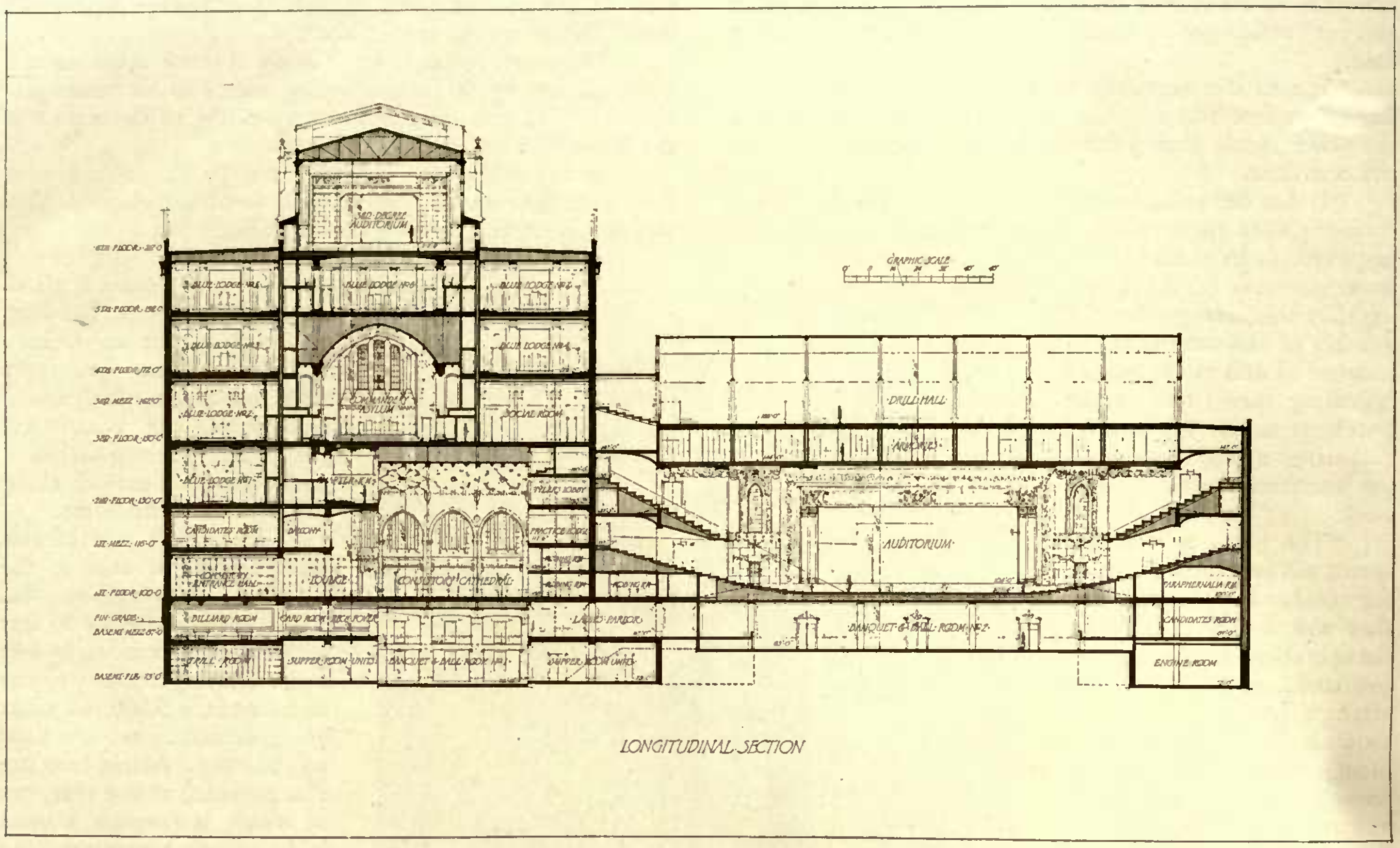
"The north side of this section is given over to the stage and dressing-rooms. This stage is 50 feet by 95 feet with a curtain opening 64 feet wide. Seating capacity of the auditorium is 5,000, all seats being located on the first floor and balcony. Ample exits are also provided at the rear, one of which is through a large lobby where motor-cars can load under cover.

"While it is true that the cost of the building according to the plans as adopted was based substantially at 25 cents a cubic foot, we are now confronted with a cost of approximately 45 cents. For this increase the board is in no wise responsible, and it is due entirely to economic conditions. Still, I think the increase can and will be met promptly by the fraternity when once given the opportunity.

"Some of our influential and active workers are of the opinion that we should segregate the Masonic section of the proposed building from the auditorium occupied by the Shrine and Grotto, making each a separate building, acting independently and under separate management. While I yield to the force of their logic and readily admit of its soundness for many reasons, still the advantages accrued by uniting the two units are apparent. There are many utilities that must be provided to accommodate the craft that are interlocking, and no one building is of sufficient proportions to furnish them.

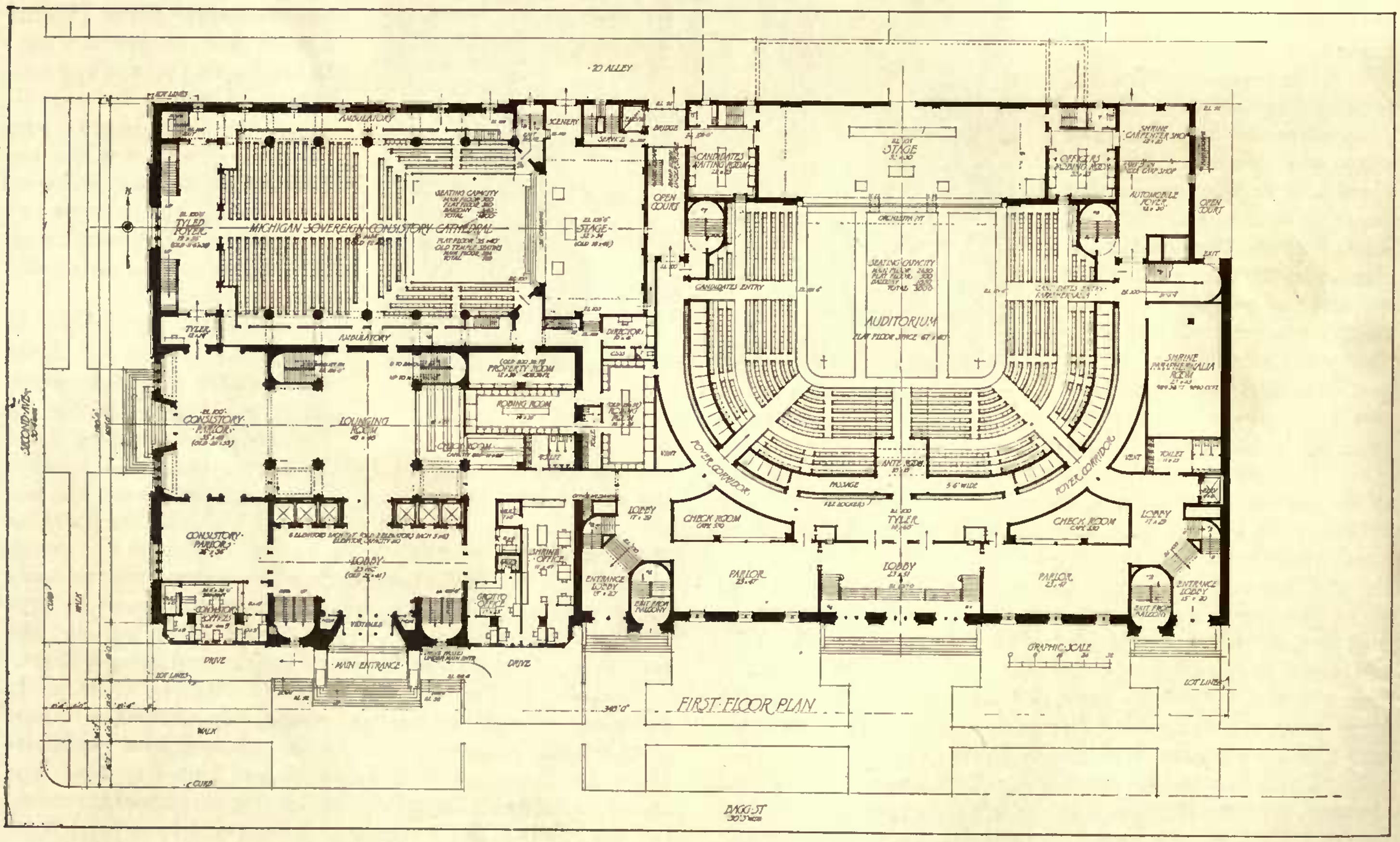
"Take, for instance, the banquet facilities. Collectively our plans provide for the accommodation of 4,700. A part of this space is convertible into a ballroom, the remainder of the basement set aside for social and club features. The accommodations as planned could by no process of reasoning be crowded into one building or subdivided by a brick wall.

"The same condition confronts us relative to the location assigned for the 5,280 lockers, shower-baths, swimming-



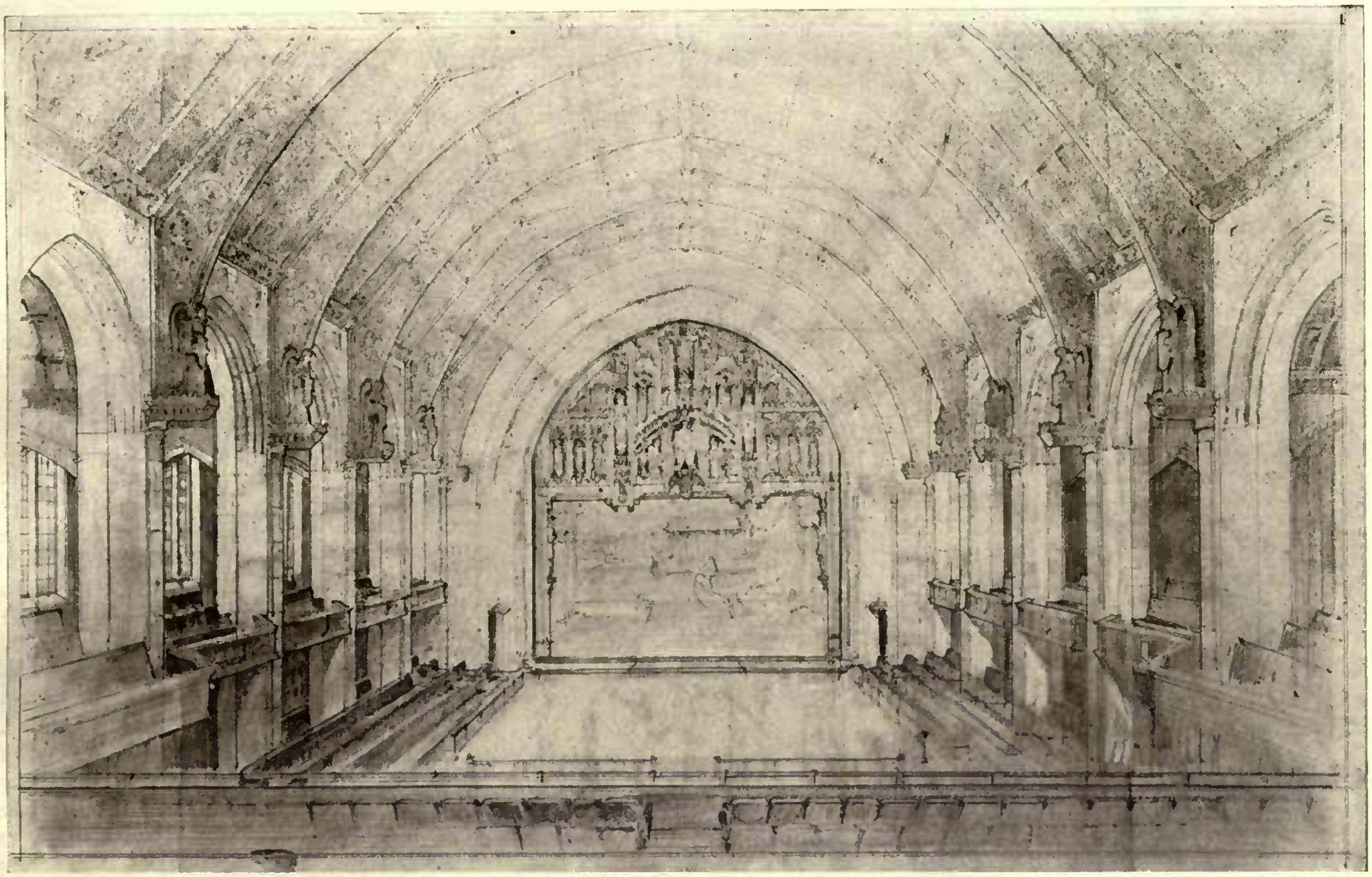
FINAL SCHEME AS ADOPTED IN THE PRELIMINARY STAGE.

This does not show the two additional stories which were added to the Ritual Building, making a total height of 208 feet for this portion of the building.

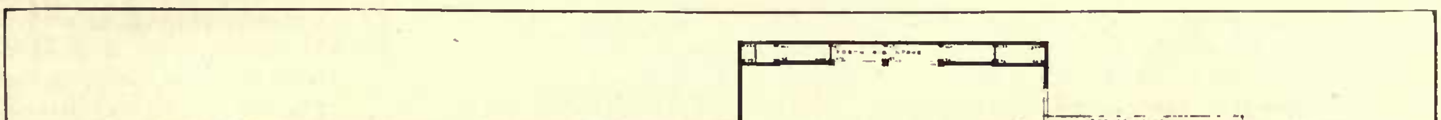


FINAL SCHEME AS ADOPTED IN THE PRELIMINARY STAGE.

This does not show the additional 50 feet on which the Shrine Club has been planned.



ONE OF THE PRELIMINARY SKETCHES FOR THE CONSISTORY CATHEDRAL.



FIRST-FLOOR PLAN AS FINALLY DEVELOPED.

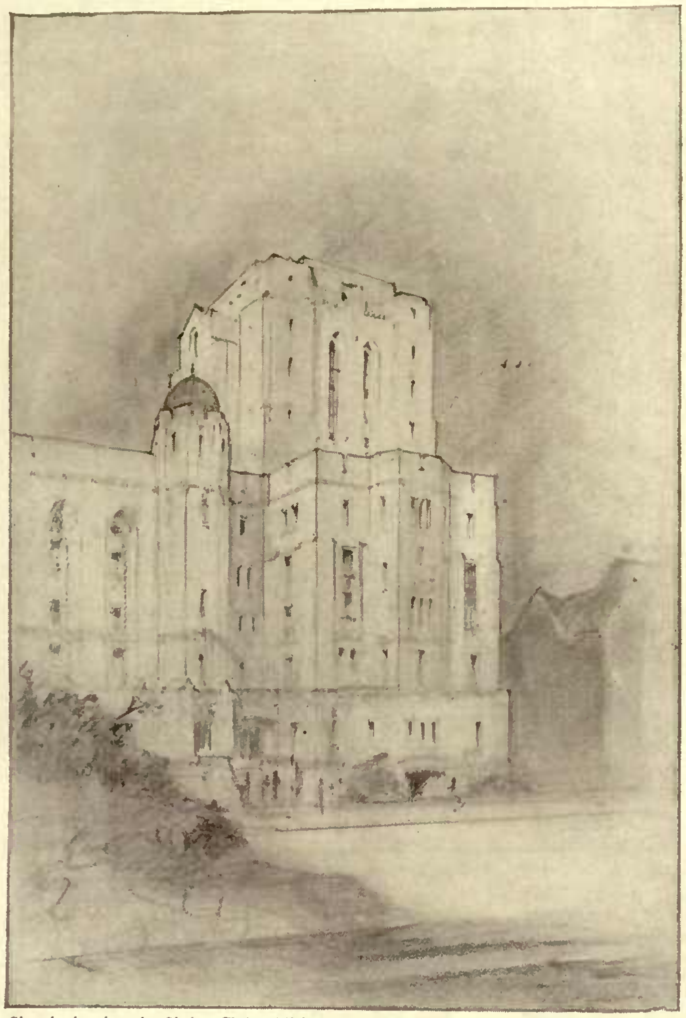
Showing Shrine Club and power-house, the larger stage in the Shrine Auditorium, and the extension of the driveway.

pool, and drill hall, which are over the auditorium and in direct communication with the Masonic unit.

"It must be obvious to all that in order to make these necessary utilities function perfectly and supply the needs of our great membership, we will be compelled to use both units, one in conjunction with the other.

"Another advantage is that we would avoid duplication in many things that enter into maintenance cost, which is of itself vital."

"Quite early in the consideration of the exterior a decided preference for the Gothic was evident and was expressed both by the committee and the general public. Yet, the architects having in mind the beautiful refinement of the Temple at Washington made numerous studies along classic lines but ultimately selected the Gothic as the conviction grew upon them that it best expressed the general sentiment and tradition of Masonry in its active form, Solomon's Temple and that at Washington to the contrary notwithstanding. The spirit and tradition of the Knight Templars was unquestionably Romanesque or Gothic, and operative Masonry having its origin in the guilds in Europe had the tradition of the great cathedrals of which they were the builders."



Sketch showing the Shrine Club addition.

The hard and fast demands of the plan prevented any great freedom in the handling of masses. Yet it was felt that the sky-line and the bold reveals would give the structure the proper character. While the splayed reveals measuring 30 inches in depth seemed at first excessive, an examination of the working drawings at this time shows the furred spaces, necessitated by these reveals, in some cases completely filled with ducts, in others utilized as closet spaces, recesses for lockers, small stairways, etc.

The additional 50 feet which was added later and which provides for the Shrine Club was a fortunate acquisition, from the standpoint of design, as it provided a termination to the auditorium unit which has a somewhat horizontal effect.

As finally designed, there are three units fronting on Temple Avenue—the Ritual Building, 208 feet high, the Shrine auditorium, 100 feet high, the Shrine Club, 145 feet high. While from the natural restrictions of the site it will be impossible to view these buildings as a unit, the sky-line of these varying heights should be interesting and impressive.

As the plans developed in detail the flexibility of the Gothic style showed itself in several features which add to the interest and give character to the structure. For example, the requirement of additional space on the first floor of the Ritual Building was met by projecting bays at either side of the octagonal towers, and in the case of the Shrine auditorium it was found necessary to eliminate the stairs from the seating and circulation area. This was done by the addition of the towers which terminate the façade of the unit. In general, there has been no straining for effect nor masking of difficulties in either façade, as would have been inevitable in either the classic or Renaissance styles.

Some time before the working drawings were finally settled upon, a $\frac{3}{16}$-inch-scale model of the group was prepared and exhibited. Several minor changes were made, but in the main the design seemed satisfactory. This model has been useful as a reference in the detailing of the stone-work.

It would appear then from this general description of the difficulties of an unusual problem that a definite programme was not evolved until definite action became imperative. There was no precedent or anything in any way similar, and as the plan is unusual, so is the steel structure of 8,000 tons with its variety of spans and heavy girder construction; the heating and ventilating with unusually intricate duct systems; the lighting and power with a load of 1,000 kilowatt; and the use of a great number of unusual lighting effects in the various lodge-rooms and auditoriums. Provision has also been made for over 400 telephones and 75 electric clocks, and it has also been planned to floodlight the entire building.

HOUSE, J. F. SCHWARZENBACH, HICKSVILLE, LONG ISLAND, N. Y. (ALTERATION).

Polhemus & Coffin, Architects.

HOUSE, J. F. SCHWARZENBACH, HICKSVILLE, LONG ISLAND, N. Y. (ALTERATION). Polhemus & Coffin, Architects.

Editorial and Other Comment

The Influence of Two Famous Firms on Our Architectural History

WE are all interested in the how and why of individual achievement, and to-day we are deluged with the personal histories of the wise and aspiring, the thrifty and the lucky, not to say the unscrupulous, who have turned two dollars and fifty cents into two million. Most of these human-interest stories deal with successful men, men who have got there, estimated in the coin of the land. They are dollar-marks on the great road of human progress.

We are not envious of these fine fellows, for many of them are "the salt of the earth" and go about doing good, spreading the gospel of industry, opportunity, thrift—and shrewdness.

There is a lot of success that would never have been recorded but for the happy chance of suitable environment, for we are all dependent to a large degree upon our associates, and in no profession does this more signify than in the profession of architecture.

How true this is was made very clear in Mr. Donn Barber's recent letter to the New York *Herald*, and the facts are so interesting that we feel like passing them on to our readers who may not have seen them. And we especially like to do this because the kind of success referred to means something beyond the mere accumulation of money. These men have left and are leaving their impress upon our national art.

The offices of all of our architects are the training-schools for the leading architects of the future. Hundreds of young men have found and are finding inspiration and encouragement in beginning their careers in the offices of the older men.

Mr. Barber's letter was prompted by the recent giving of the medal of the Royal Institute of British Architects to Mr. Thomas Hastings.

As he well says, a most important part of our architectural history will be founded on the records of the two great firms he refers to—McKim, Mead & White and Carrère & Hastings.

"In looking over the list of successful and prominent firms it is surprising to find how many men composing them began their apprenticeship and received their earlier inspiration and training in the offices cited. These were the offices of McKim, Mead & White and Carrère & Hastings. Both Mr. Carrère and Mr. Hastings after they had finished their studies in Paris were members of the staff of McKim, Mead & White before starting in business on their own account.

"It is unnecessary here to go into the interesting history of these two great firms other than to state generally that McKim, Mead & White have followed the influence of Italian design, and that Carrère & Hastings have followed the influence of French design as taught by the École des Beaux Arts. The students of both offices have quite naturally reflected their training in their personal work, but to-day we find the two earlier distinct foreign influences merged in such a way that a newer style has resulted that is being created of a distinctly American character.

"When our history of architecture comes to be written the far-reaching effect of the work of the two older firms on the development of our architectural expression must be fully recognized.

"The following are a few of the well-known architects who were brought up in the office of McKim, Mead & White: John M. Carrère, Thomas Hastings, Edward P. York, Philip Sawyer, Lewis Colt Albro, Harrie C. Lindeberg, Evarts Tracy, Egerton Swartwout, Cass Gilbert, Henry Bacon, William A. Boring, Edward L. Tilton, John Mead Howells, H. Van Buren Magonigle.

"The following were connected with the early staff of Carrère & Hastings: William Adams Delano, Chester H. Aldrich, William Welles Bosworth, Donn Barber, Benjamin Wistar Morris, Henry F. Hornbostel, Electus D. Litchfield, Charles Ewing, John Van Pelt, Nathan C. Wyeth, John W. Ingle, C. W. Stoughton, Charles Butler, F. B. Hoffman, Jr.

"This newer generation of offices are in turn giving of their best to their younger men, first as apprentices, then as equals, and finally as successors—so are principles handed down unbroken.

"Some years ago the medal of the Royal Institute of British Architects was awarded to Charles Follen McKim, so that now it seems only proper and fitting that it should be awarded to one of his most distinguished pupils."

From Coast to Coast

IN these busy days it is very pleasant for an editor to receive a letter now and then, some word of interest and appreciation, or even friendly criticism. If his subscription list keeps up to standard and the business pages show a healthy growth, no doubt he should be content and let well enough alone. But we all have a personal interest and pride in our work if we are worth our salt, and a bit of encouragement, a good suggestion comes in mighty handy.

We are indebted to Mr. Willis Polk, of San Francisco, for a letter suggested by our editorial "In Behalf of Art," comment on the fine work Dr. C. Howard Walker is doing in this direction. Mr. Polk suggests our advocating a "course in art as a part of the curriculum of all educational institutions," theological schools included. "The glory of the mediæval cathedrals and the bewildering charm of the Renaissance were mostly due to the patronage of the church. To the shame of the church of to-day (all denominations) art finds its feeblest expression in modern church buildings."

We wish any word we might say could help even a little bit in the campaign for a more general appreciation of the value of a study of art in our schools. Mr. Polk may be assured that we are with him and with all who believe that even in these days of science, materialism, and grab the humanities are yet an essential element in any well-rounded education.

There is a very large element in our population that seems to think that almost any interest in the arts means a loss of aggressiveness, a weakening of the power "to get there," but Colonel Roosevelt had a very keen appreciation of art and did much in its behalf.

The trouble is that art is too often confused with a meaningless pose or vapid sentiment; in its sincerest manifestations it never lacks vigor, purpose, and great determination.

Too Much "Bunkum"

WE have been reading a little book made up of addresses and articles by W. R. Lethaby, of London, an architect and a scholarly writer on the subject. The title "Form in Civilization" doesn't sound attractive or suggest anything better than a rather dry and professional preachment. But there is meat here for strong men, for honestly thinking men, for men who have grown tired of cant in talking about architecture and art.

"It is just because I want a true artistic or human-nature content given to our buildings that I would sweep away the teaching of grandiose bunkum as architectural style. Although a good bunkum may be jolly sometimes, I want a due proportion of tenderness, gravity, sweetness, and even dulness. I want the most exquisite beauty, but I do not see how this Institute is to teach how to produce it. Therefore I say train us to practical power, make us great builders and adventurous experimenters, then each of us can supply his own poetry to taste. In fact, looking at Holborn and the Strand as they are, I venture to say it would be a sort of poetry to get rid of sham poetry. One of the most sad wastes of power to which men of good-will are subject is vain strife about words, especially when pairs of words have been allowed to come into opposition—as faith and works, art and science. There is really no opposition between art and science. Show me your art, as St. James might have said, and I will show you your science. Art is the active side of things, science the contemplative. The most of art is science in operation, and a large part of science is reflection upon art. Properly, only science can be taught, for you cannot teach beyond knowledge, and every fresh activity is a sort of creation. This is art—the works whereby we show our science. It is our false idea that art is a sort of ghost which frightens us off true work. It is just this talk about the styles which leads to—Holborn. I know as well as anybody that conception, style, design are essential requirements in all that men do, from guiding the state to laying out a railway or preaching a sermon, but they cannot be supplied by Act of Parliament or by this Institute. While we have been having these meetings another conference was held, the members of which were eager to assure Mr. Neville Chamberlain that architects were not to be thought of as hairdressers in the styles but as men of power as practical builders. Individuals, unfortunately, may make their way by claiming to be the priests of mystery architecture and talking tall art to Mrs. Jones, but to do so is a grave injury to the whole body, which must stand on reasonable service. It has, in fact, betrayed us to the caricature of Pecksniff. Modern architects have to deal with very complex and technical matters, the building on congested sites of great hotels, railway stations, factories, business premises, and the like, and for this it is clear to me there must be highly organized scientific training. What are the main divisions into which different faculties might run? There seem to me to be about five: (1) the expert constructor and planner, (2) the finisher and furnisher, (3) the expert in old buildings, (4) the man of business, (5) the country builder and general practitioner. There is no sharp distinction, but I think most men gravitate to one or other of these classes or to a combination of two or even three of them, and there is room for high attainment in any one. The first and the last should be the main concern of this Institute. Probably the standard for a time should be that of the general practitioner, but ways must be found to stimulate specialization beyond the minimum course—a point to which I shall return in touching on education."

A Great Loss to the Profession

WE have received the following notice of the death of Mr. William A. Bates, of the firm of Bates & How, and join in the most sincere regret at the loss of so good and able a man. He was an honor to the profession of which he was a distinguished member and his work will be remembered and valued.

With deepest sorrow we announce the death of our senior partner, Mr. William A. Bates, on Thursday, July 27, 1922. The business will be continued by the surviving partner under the same name as heretofore.

BATES & HOW.

Kenneth G. How.

Correct Piling of Lumber

The simple expedient of correct piling of oak will prevent a very expensive source of waste to chair manufacturers, according to the Forest Products Laboratory. Season checks particularly to plain sawed oak have caused great loss, one chair manufacturer stating that fifty per cent of his cabinet repair costs are due to season checks. This loss has often been regarded by the practical lumberman as a necessary evil, but the Forest Products Laboratory contends that these wasteful and costly checks can be prevented during yard seasoning by correct piling, and it is proving this contention by experiments.

The primary cause of the trouble is that the plain-sawed surfaces of the stock are left exposed to the drying action of the sun and winds; the surfaces tend to shrink as they dry, but the interior of the stock, which is not drying so rapidly, resists the shrinkage on the surface, and the result is a surface check or crack.

Proper piling will reduce and control the rate of drying from the plain-sawed surfaces. If the quarter-sawed surfaces, which do not appreciably check even under severe drying conditions, are on the top and bottom, next to the supports, and the plain-sawed, or sides of the pieces, are brought closely together within, the drying will be controlled and the surface checking prevented.

Timber Preservation

The most notable progress recorded in the pressure treatment of timber to prevent decay was recently made, according to a report issued by the service bureau of the American Wood-Preservers' Association.

The report states that the 112 active pressure wood-preserving plants scattered throughout the country used in 1920 50,000,000 pounds of zinc chloride and 69,000,000 gallons of creosote-oil for the treatment of over 2,000,000,000 board feet of timber.

The treated material consisted mainly of railway-ties, construction timbers for wharf, bridge, highway, mining, and building purposes, piling, telephone and power poles, fence-posts, wood blocks for street-paving and for factory floors, and lumber for miscellaneous uses.

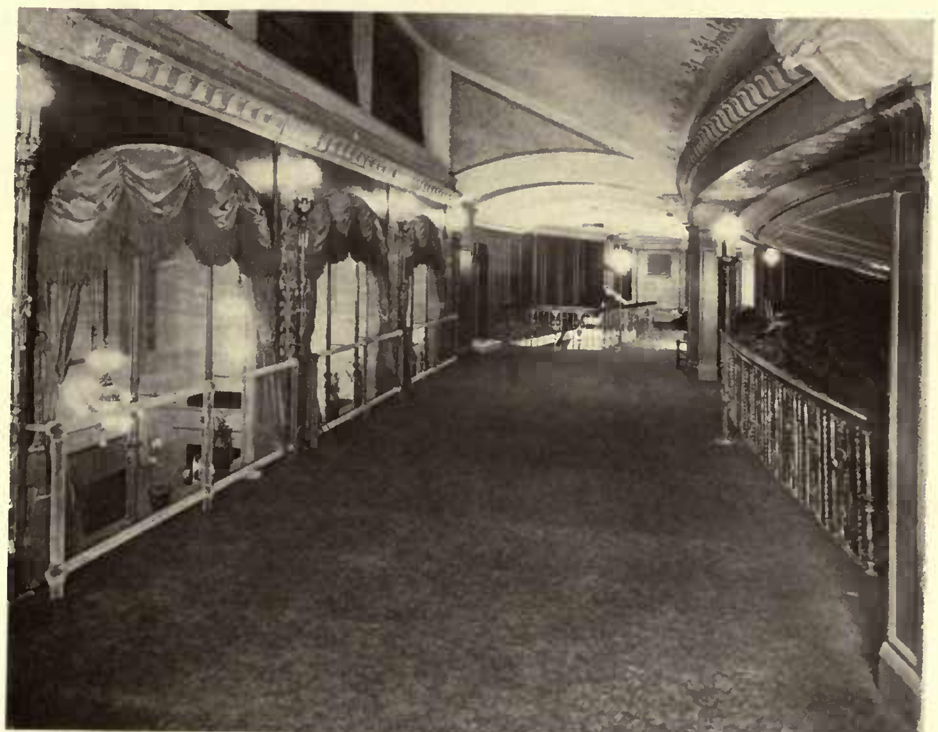
Decay, which can be prevented by proper preservative treatment, destroys more wood annually than any other agent. The desire for permanence at low cost is given as the reason for the increased demand for well-treated timber.

WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.

LOBBY.

PROMENADE (AUDITORIUM).



PROMENADE (MEZZANINE).

LOUNGE.

WORLD THEATRE, OMAHA, NEB.

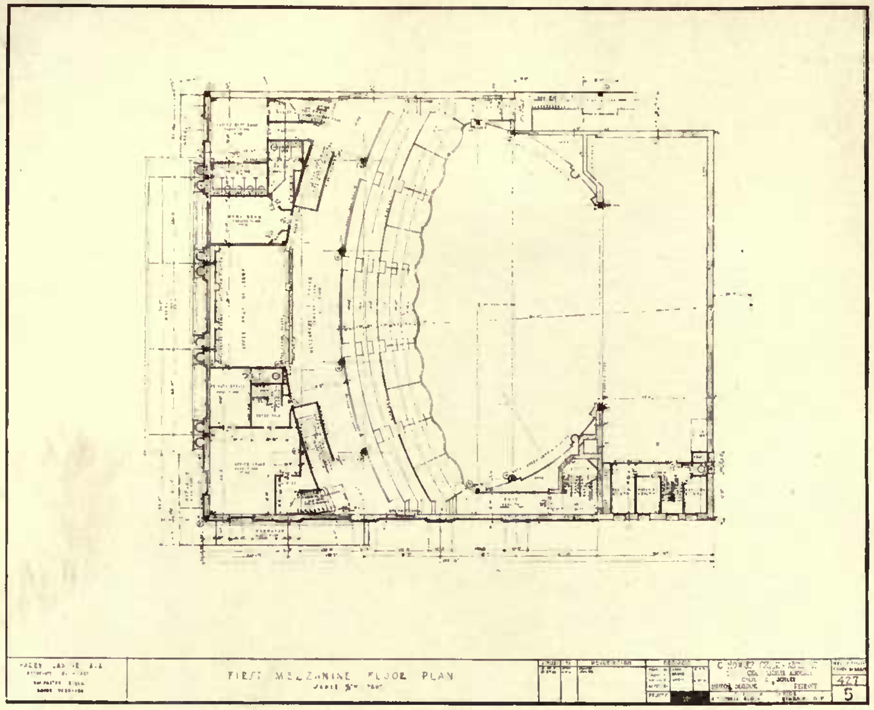
C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.

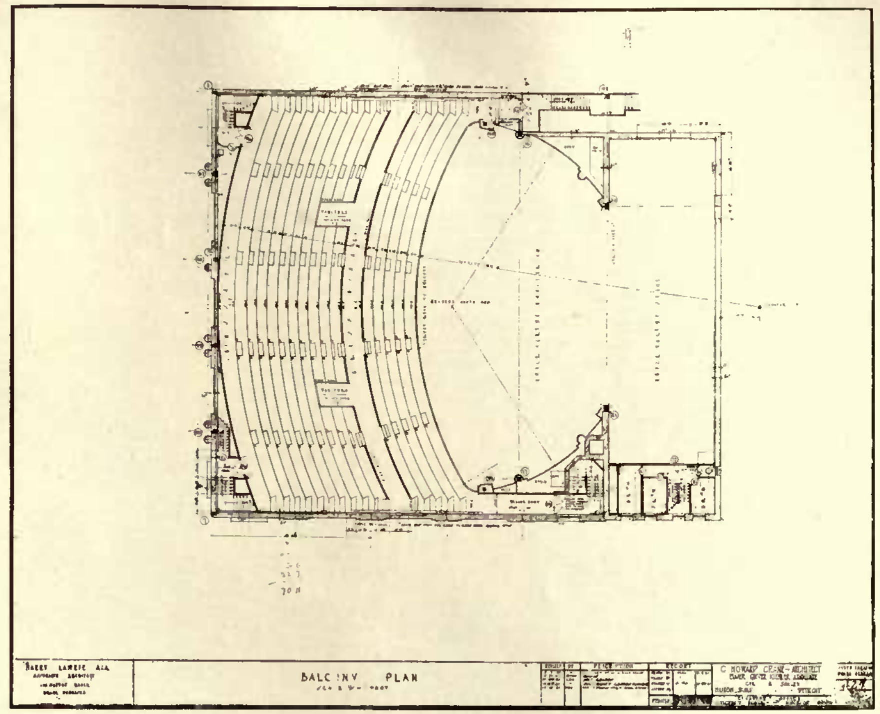
AUDITORIUM.

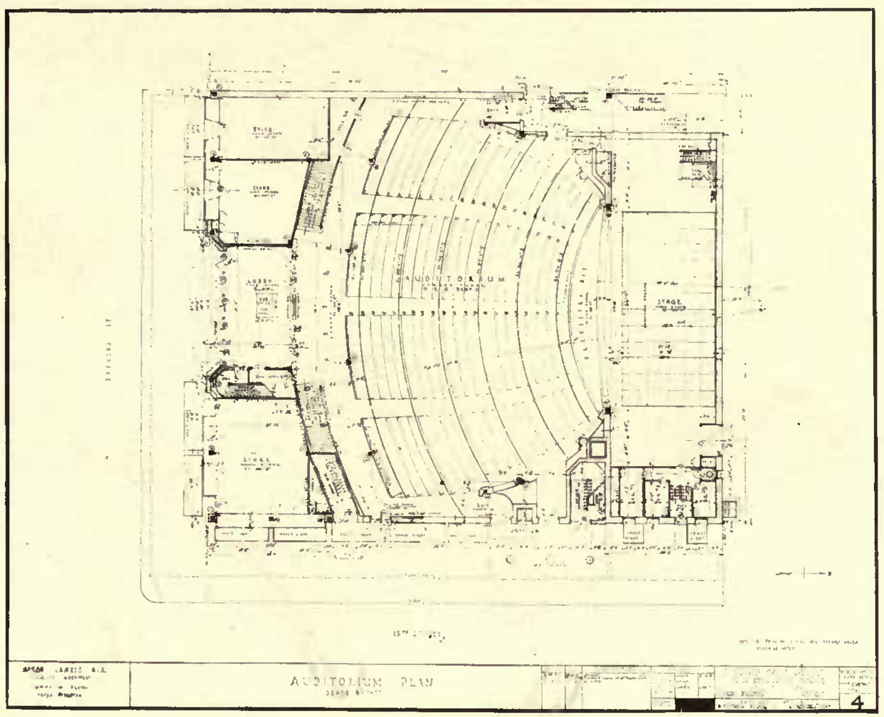
STAGE.

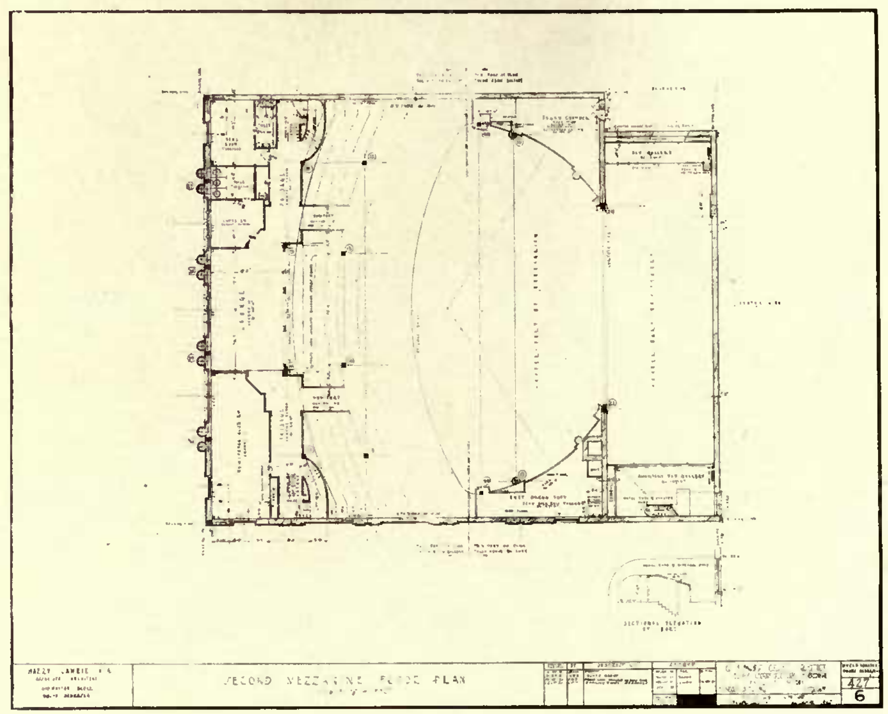
WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.









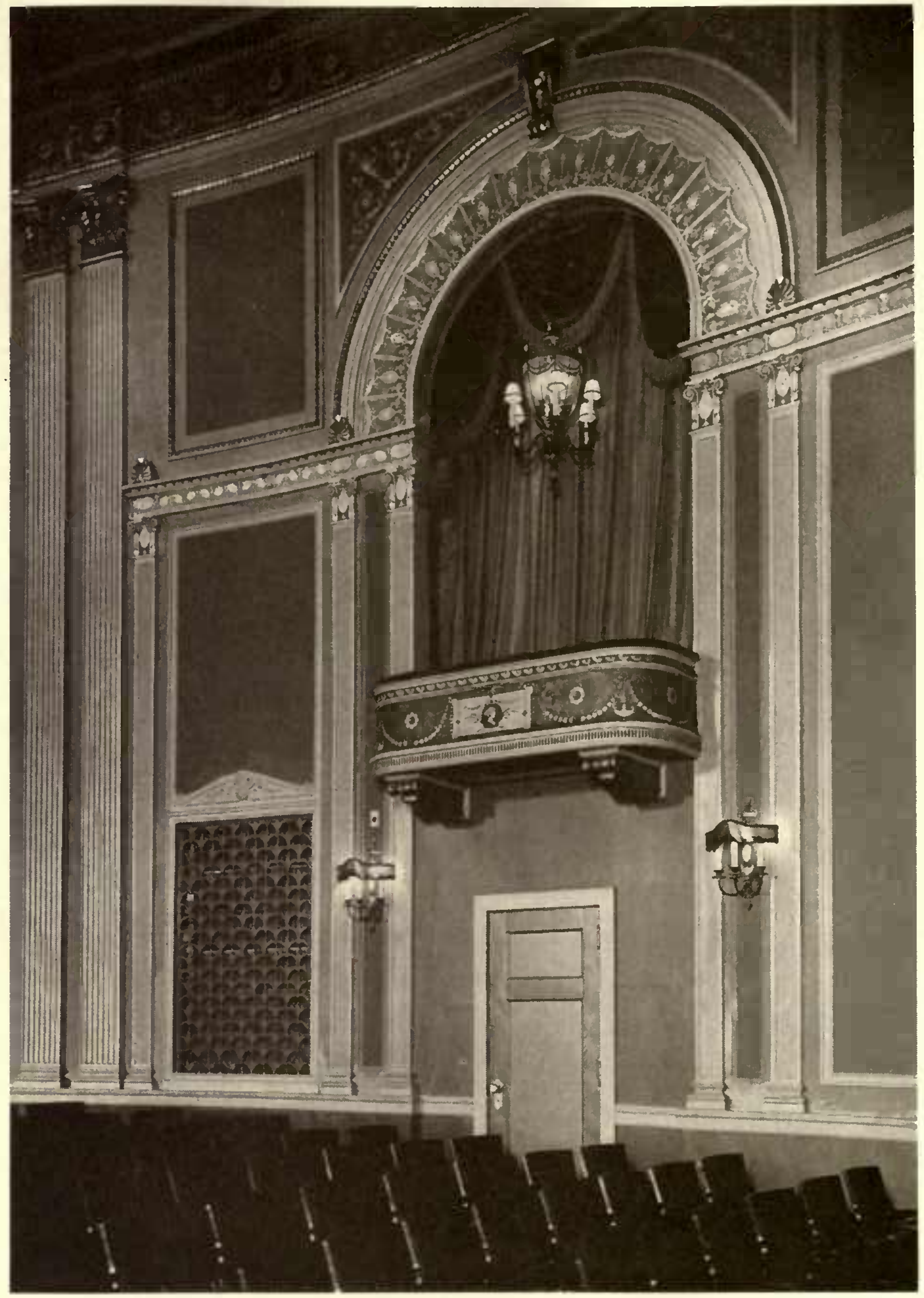
PLANS, WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.

STATE THEATRE, MIDDLETOWN, N. Y.

Eugene De Rosa, Robert R. Graham, Associated Architects.

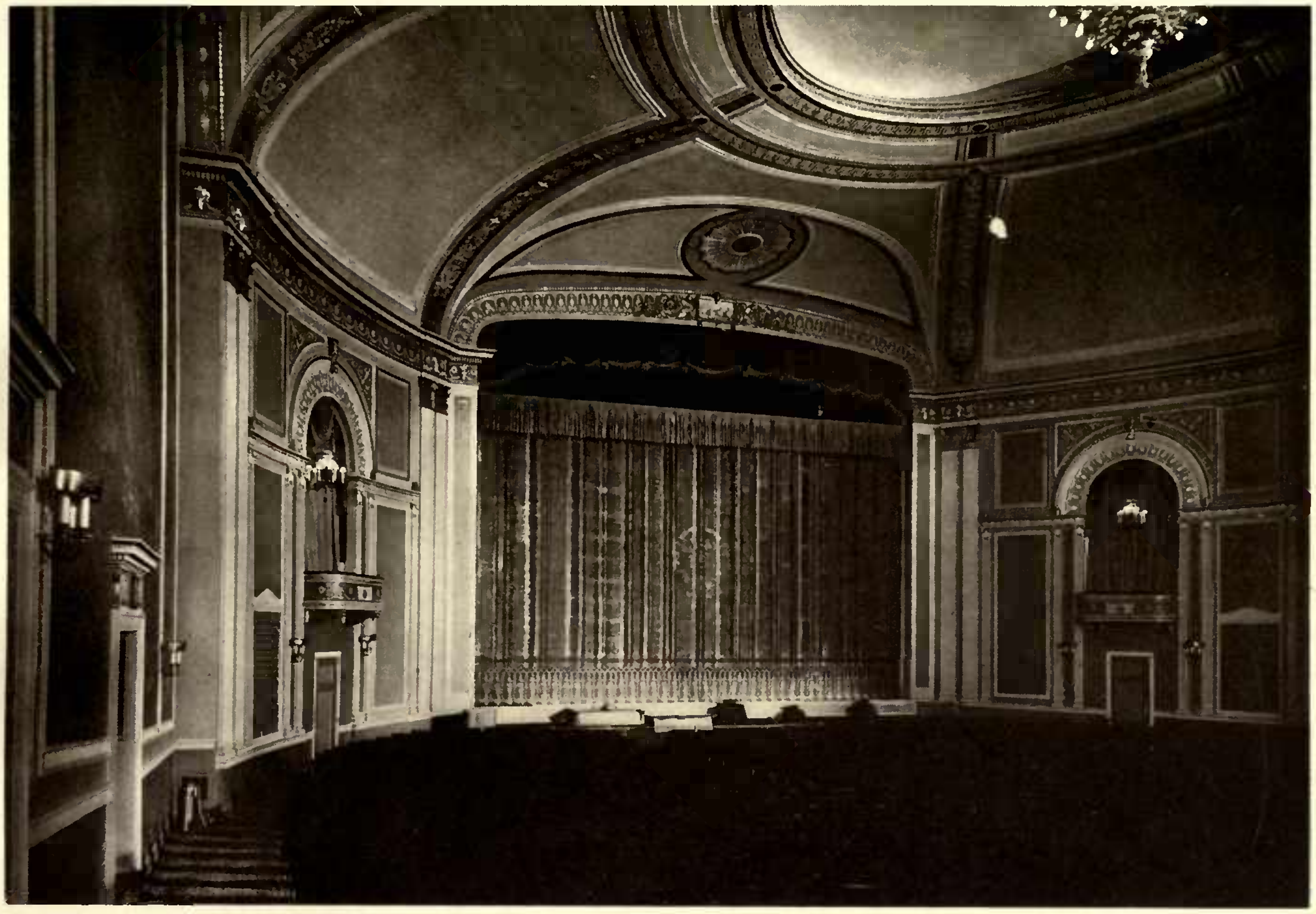
PROMENADE.



DETAIL OF BOX.

STATE THEATRE, MIDDLETOWN, N. Y.

Eugene De Rosa, Robert R. Graham, Associated Architects.

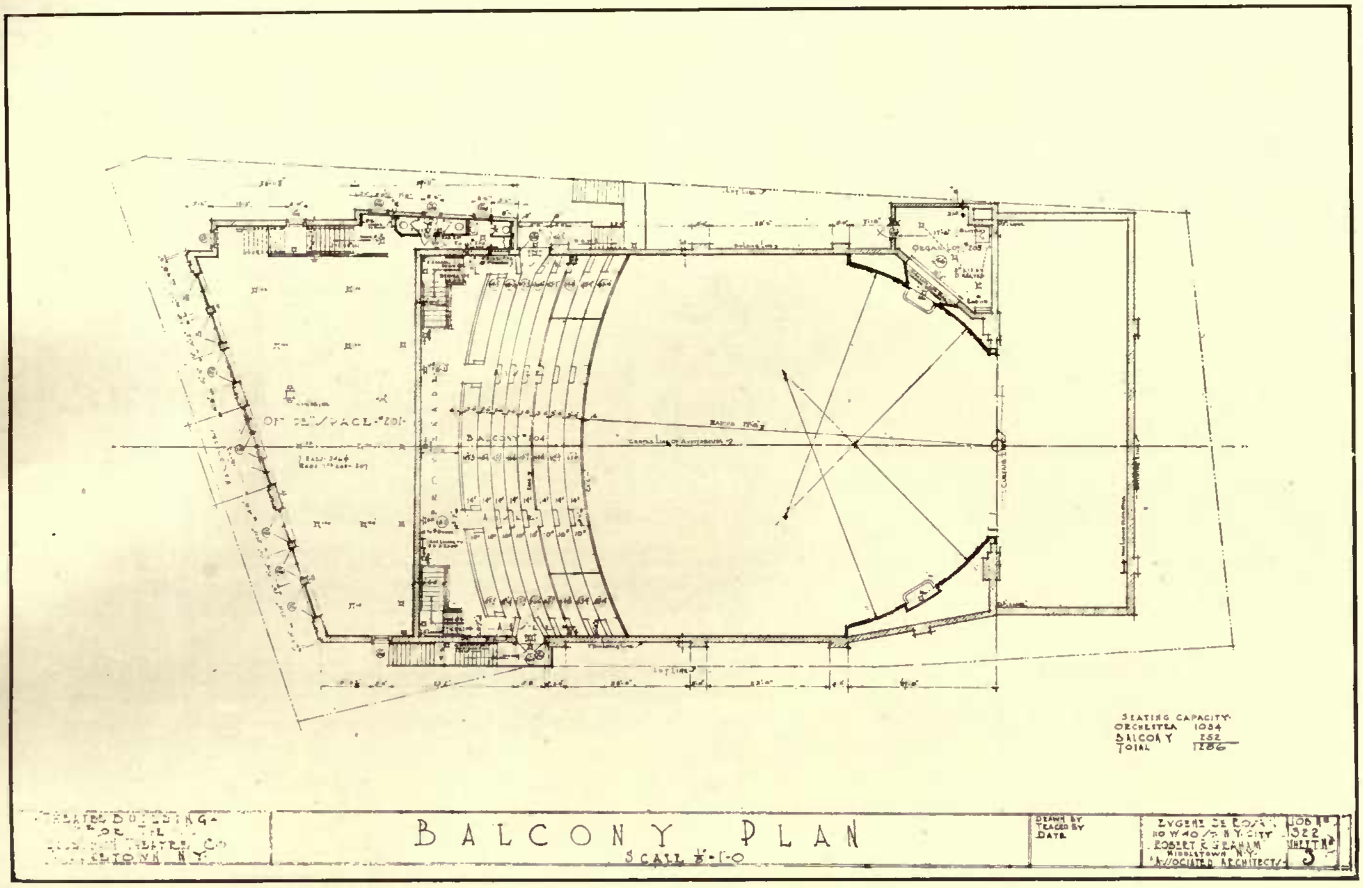


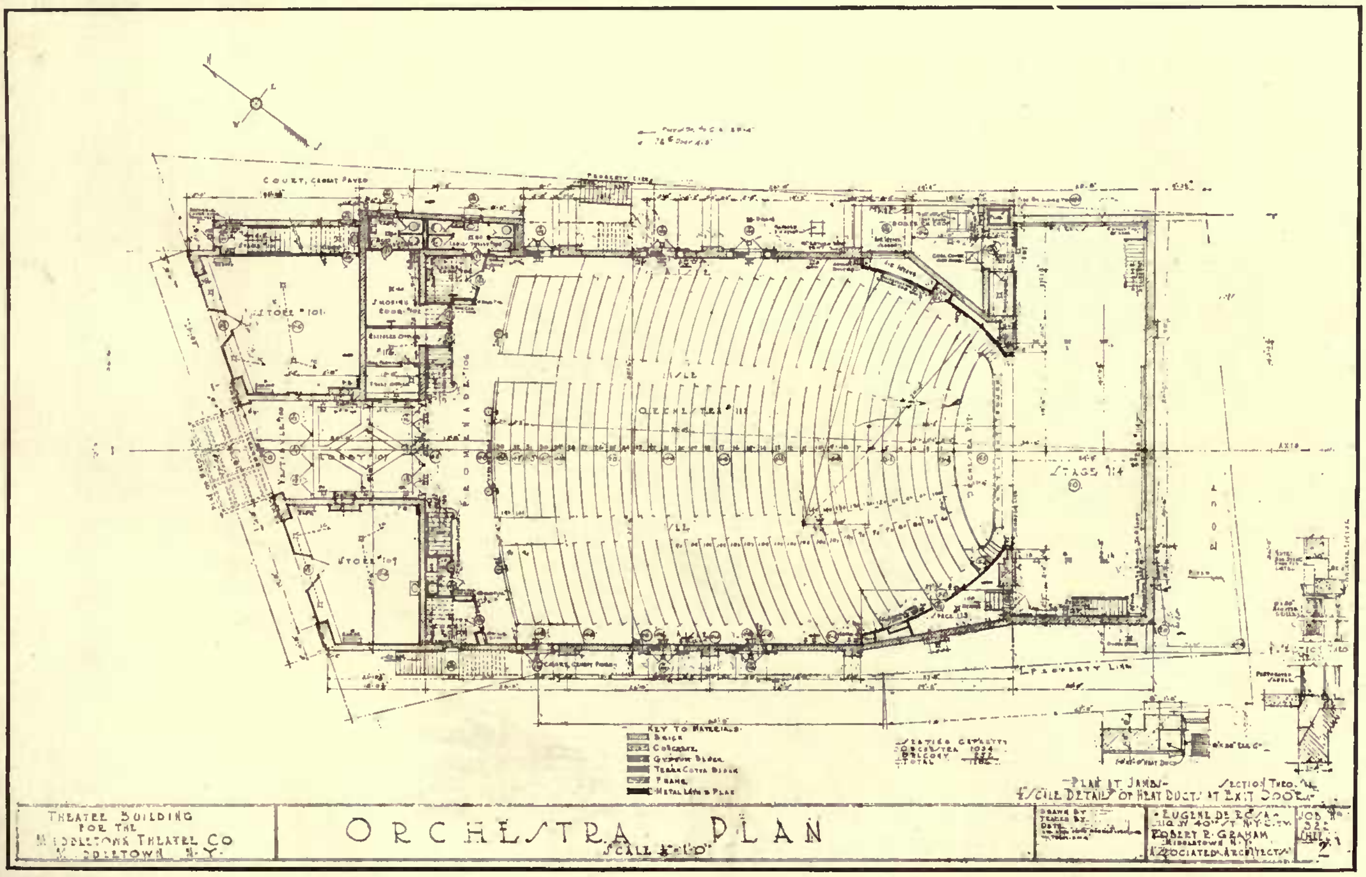
AUDITORIUM (TOWARD STAGE).

AUDITORIUM (TOWARD BALCONY).

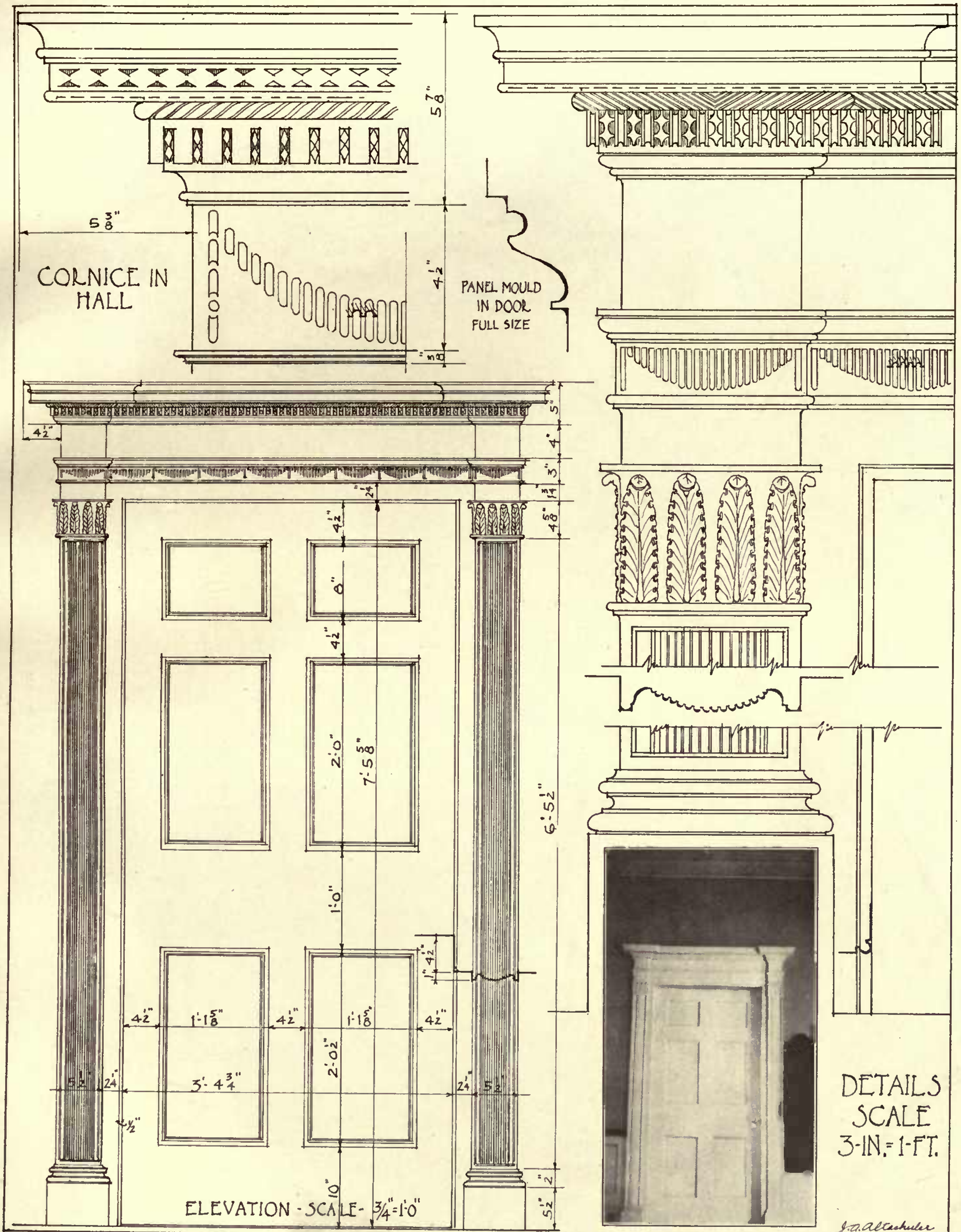
Eugene De Rosa, Robert R. Graham, Associated Architects.

STATE THEATRE, MIDDLETOWN, N. Y.





STATE THEATRE, MIDDLETOWN, N. Y. Eugene De Rosa, Robert R. Graham, Associated Architects.



COLONIAL ARCHITECTURE *of the* CAROLINAS

INTERIOR DOOR & CORNICE 113-ASHLEY AVE.
DATE ABOUT 1810 CHARLESTON - S.C.

MEASURED & DRAWN by J.A. ALTSCHULER

BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.

John H. Phillips, Architect.

LOUNGE.

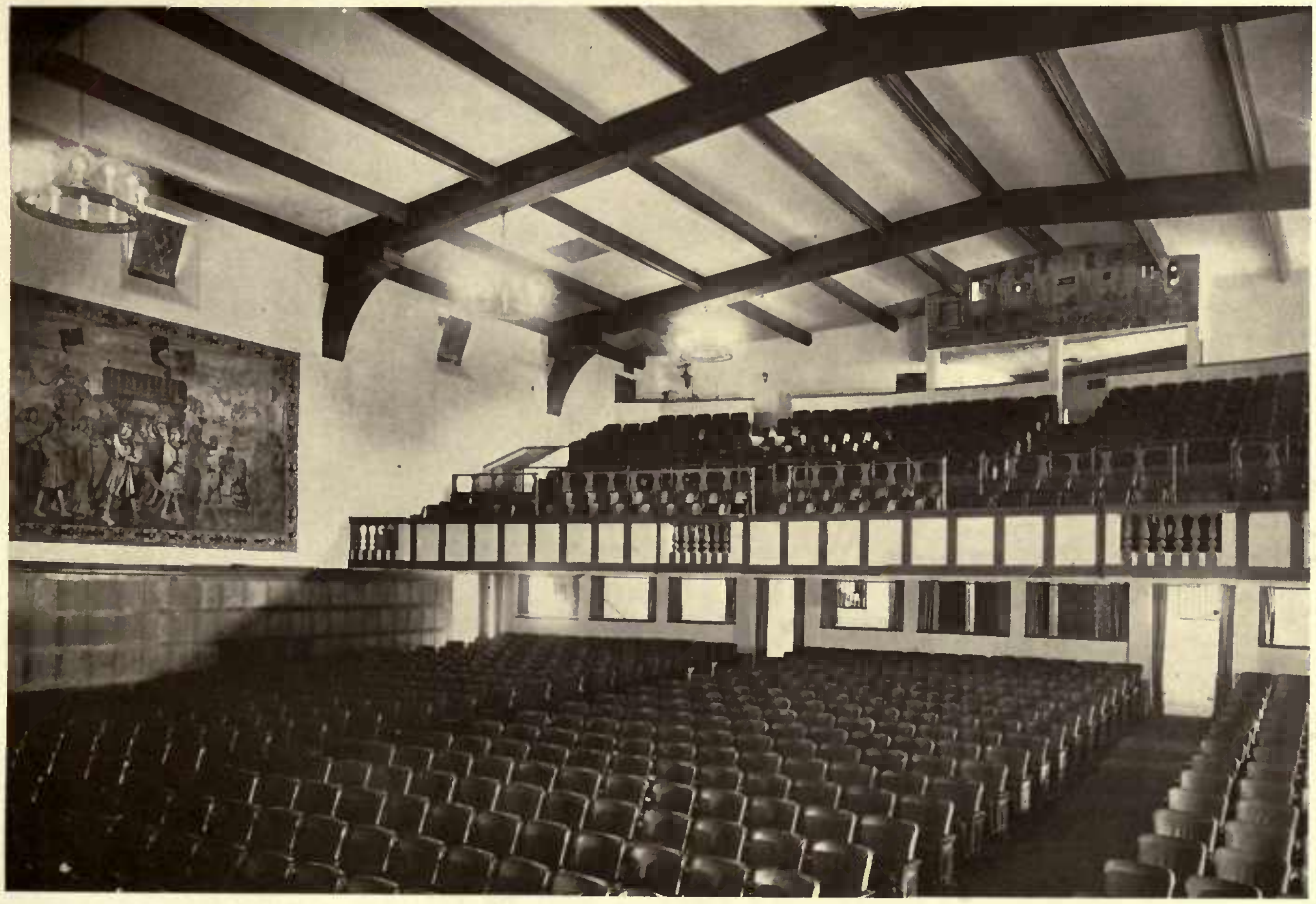
LOBBY.

FOYER.

John H. Phillips, Architect.

BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.

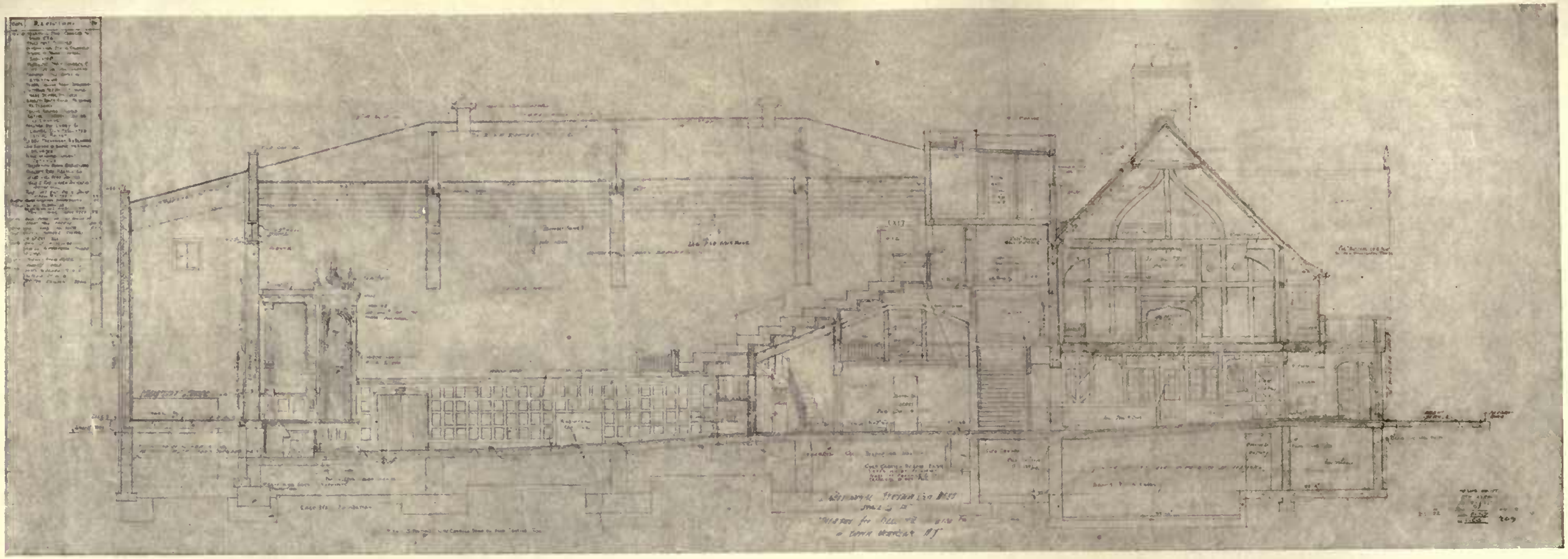
AUDITORIUM (TOWARD STAGE).



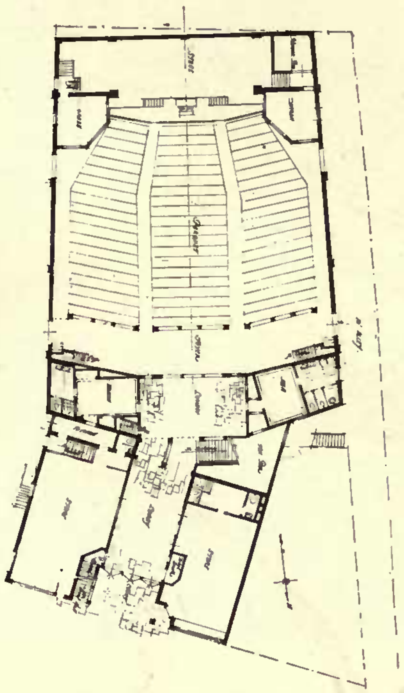
AUDITORIUM (TOWARD BALCONY).

John H. Phillips, Architect.

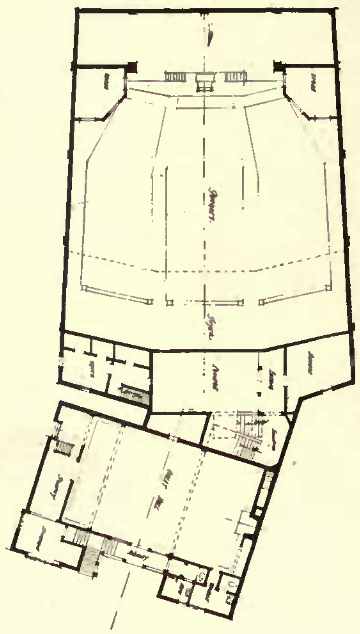
BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.



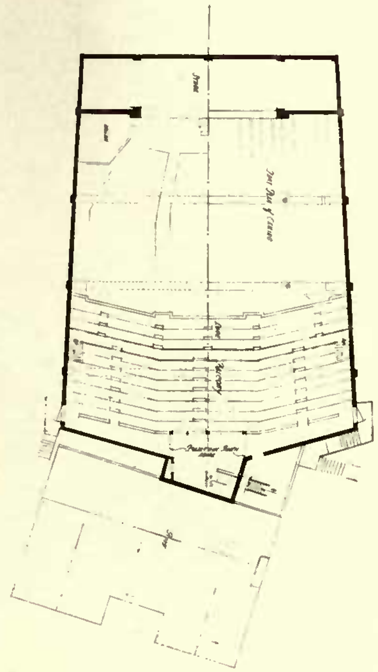
LONGITUDINAL SECTION.



PLAN MAIN FLOOR.



PLAN MEZZANINE.



PLAN BALCONY.

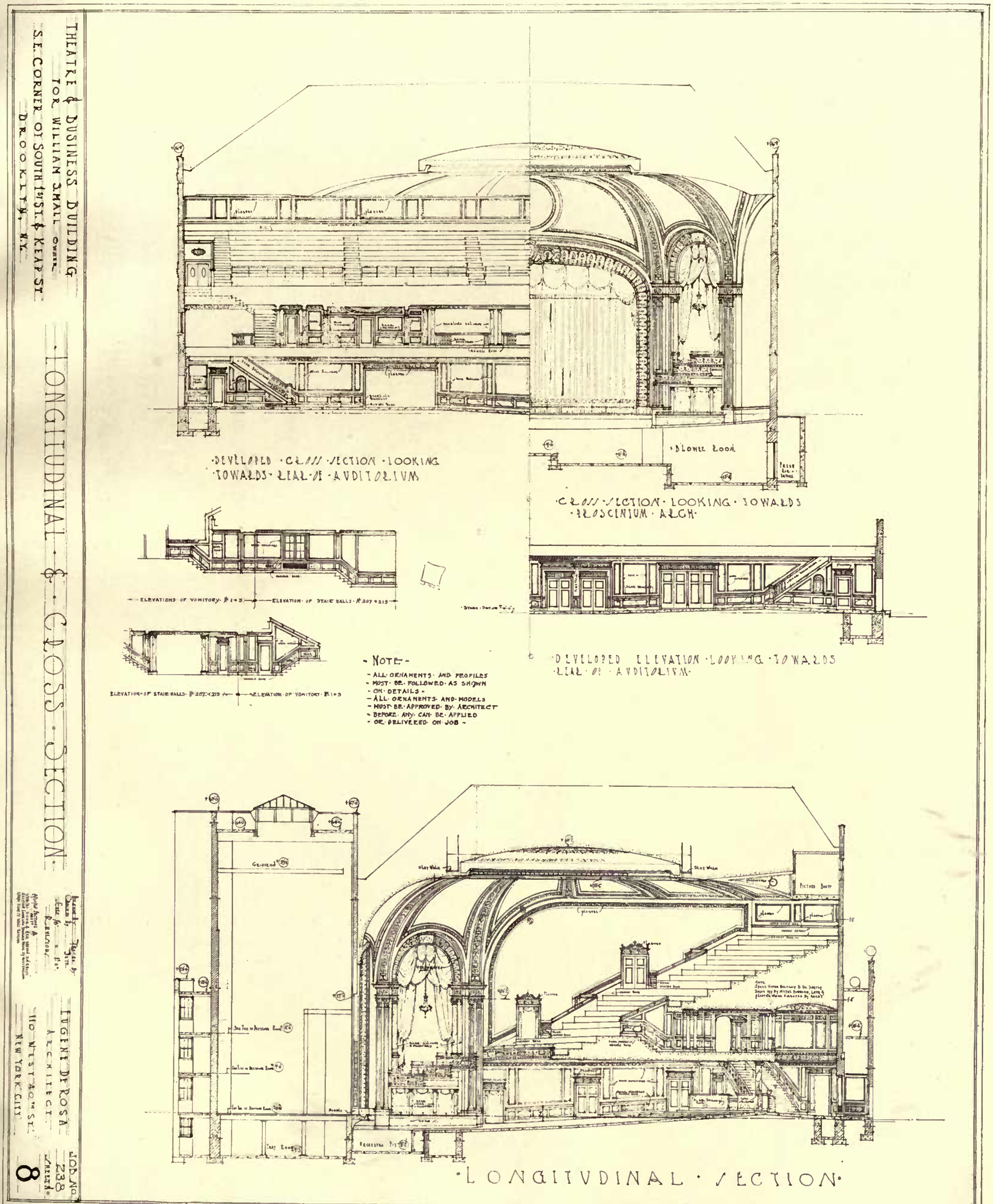
BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.

John H. Phillips, Architect.

EXTERIOR.

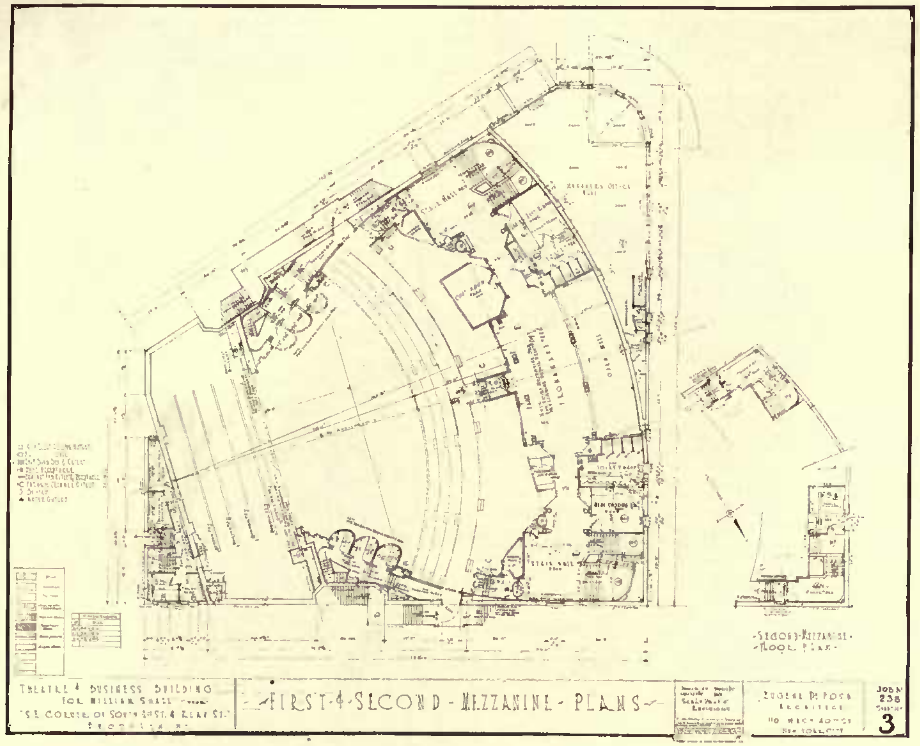
AUDITORIUM.

REPUBLIC THEATRE, BROOKLYN, N. Y.
Eugene De Rosa, Architect.



REPUBLIC THEATRE, BROOKLYN, N. Y.

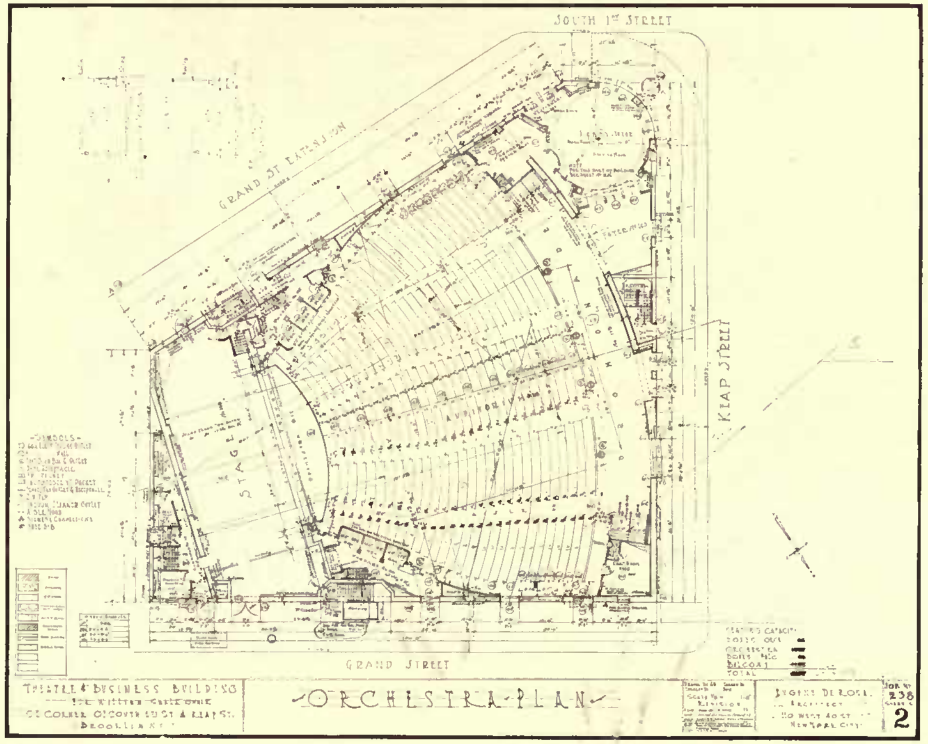
Eugene De Rosa, Architect.

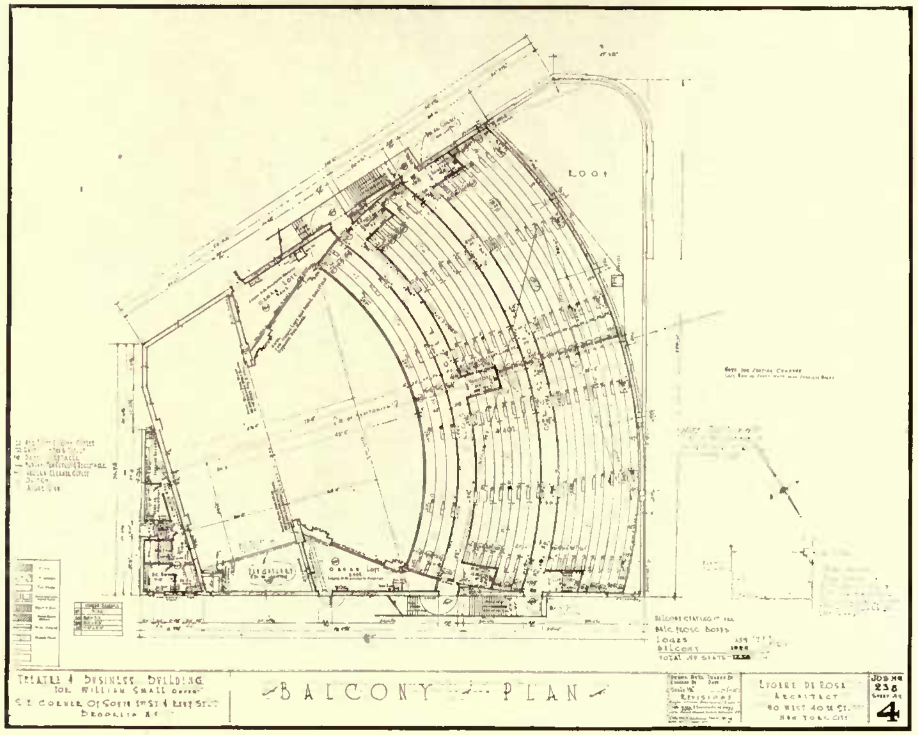


The Republic Theatre Building Brooklyn, N. Y.

Eugene De Rosa, Architect

OCCASIONALLY an architect, through some peculiar circumstance of site or special requirements, has an opportunity to design a motion-picture house that affords the advantage of an especially good plan and increased seating capacity. Here the plot permitted an economical plan that gave eight hundred extra seats, all with a full view of stage. The ordinary rectangular motion-picture auditorium can provide only about two thousand satisfactory seats. The interior of the Republic is treated as a unit in decoration with dome-shaped ceiling.





MAJESTIC THEATRE, DALLAS, TEXAS.

John Eberson, Architect.

The New Majestic Theatre, Dallas, Texas

John Eberson, Architect

THE New Majestic Theatre, at Dallas, Texas, represents one of the most complete theatrical building units in the country. It is a fireproof structure and has been carefully planned to fill every conceivable need in front of the curtain line as well as back of the curtain.

A reinforced concrete and steel structure five stories high, it has a façade executed in polychrome glazed terra-cotta, in modern semiclassical architectural style, with a seating capacity of 2,800.

The floor-plan arrangement provides spacious lobbies and foyers, and all of the anterooms are decorated in Louis XVI style, while the auditorium proper was treated in an exterior scheme representing a Roman garden, with garden walls and houses and an elaborate pergola ceiling. A multicolored lighting scheme, with dimmers controlling all of the auditorium circuits, permits the stage electrician to throw hues on side walls and ceiling giving the auditorium most natural and surprising color effects designed to represent southern Roman skies with all their burning sunshine glory, or the calm and quiet moonlight nights.

The main floor of the theatre is shaped in double-bowl fashion, affording most excellent sight lines. A very complete ventilating and cooling system has been installed. Temperature, volume, and humidity of the air in this auditorium are absolutely under the control of mechanical apparatus.

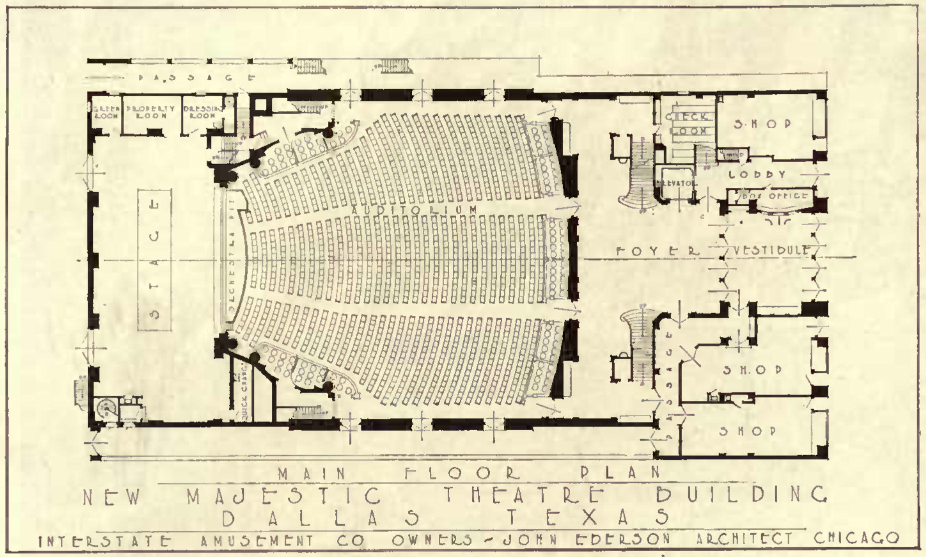
A high-speed electric elevator of considerable capacity has been installed to serve both balconies. The electric and scenic equipment of the stage is most elaborate and substantial. The comfort of the dressing-rooms cannot be rivalled by the best hostelries. All dressing-rooms have outside windows, and are provided with handsome furniture and wardrobes. Each dressing-room contains a shower-bath and private wash-rooms, equipped with ventilating fans, glass shelves, intercommunicating telephone and signal systems, affording comforts of the private boudoir.

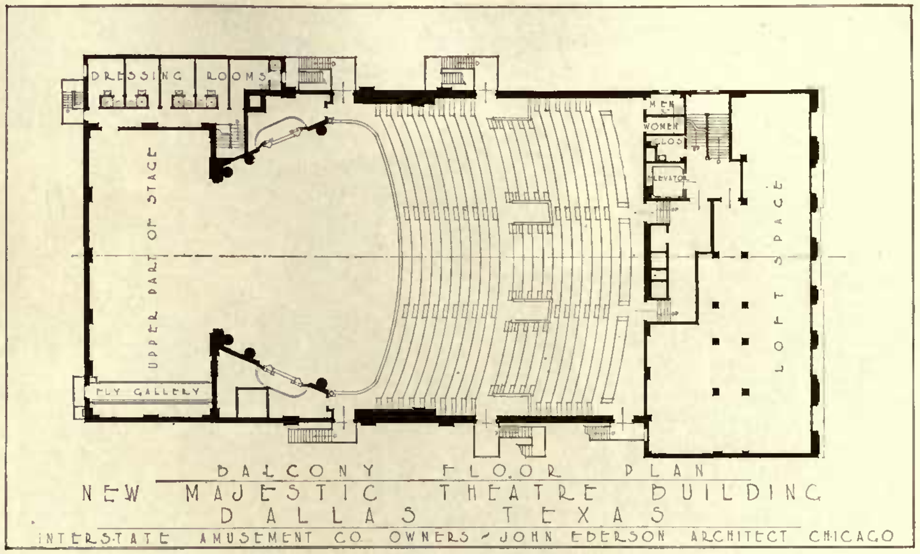
The theatre is manned by a large and experienced staff of attendants whose costumes were also designed by the owner and architect, and are in keeping with the period style of architecture used.

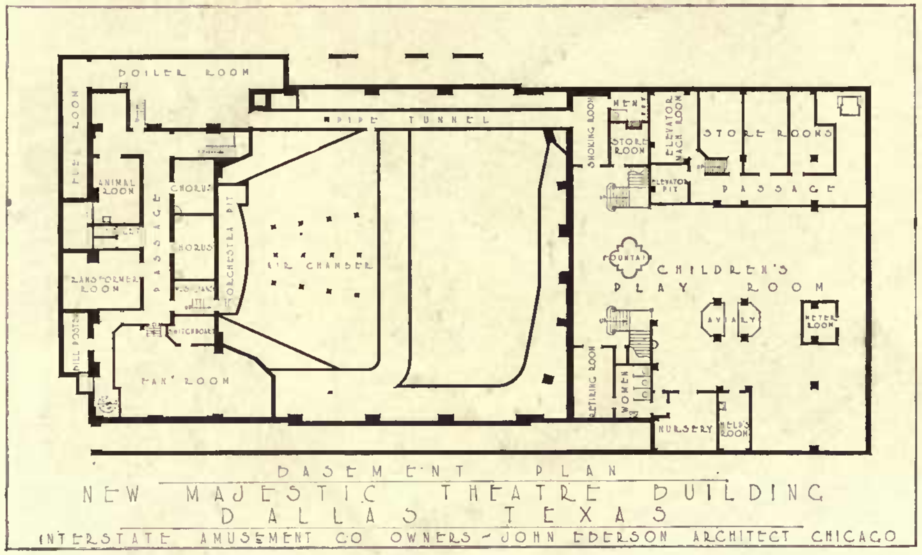
The outside lobbies are executed in Casaba marble with bronze fixtures and doors.

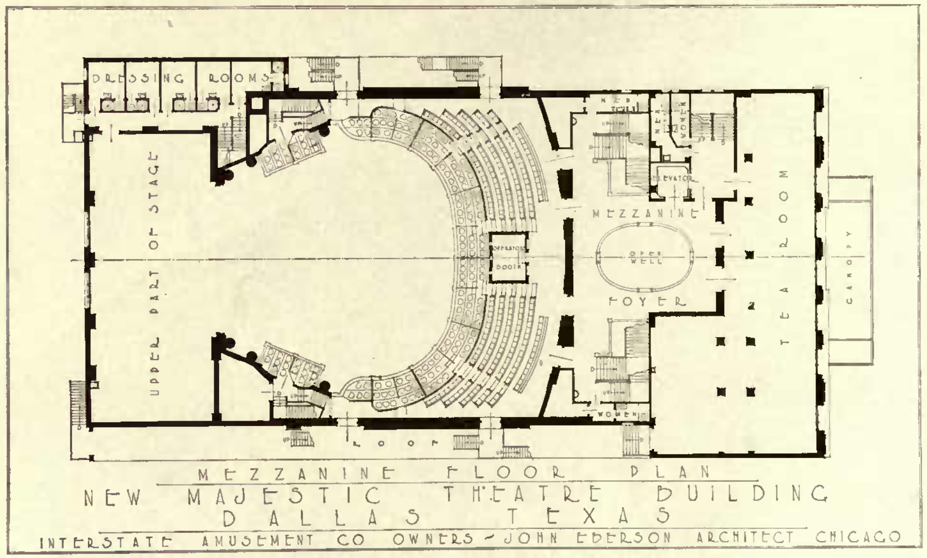
The basement contains a large playroom with all that is interesting to children, from a duck pond to a fairy castle; from a merry-go-round to a doll-house; from a miniature menagerie to a sand-pile and chute. A practical nursery in charge of four nurses contains eighteen baby cribs, and it has been found that this playroom is visited and used by not less than 1,000 children a week, it having become necessary to employ more than a dozen attendants to watch the children at play while their parents are enjoying the performances in the theatre.

Auditorium, from stage.









PLANS, MAJESTIC THEATRE, DALLAS, TEXAS.

John Eberson, Architect.

DETAIL OF BOX AND BALCONY.

FOYER AND MEZZANINE.

John Eberson, Architect.

MAJESTIC THEATRE, DALLAS, TEXAS.

Byzantine Art

By Professor C. R. Morey
Princeton University

I

HISTORIANS use the word Byzantine to mean the Eastern Roman Empire, separated from the Western in 395 at the death of Theodosius the Great, and maintaining a separate existence down to the capture of Constantinople in 1453. During this period—roughly from the fourth to the fifteenth century—there grew up and flourished within the area of this Eastern empire the art which we call Byzantine. Broadly speaking, however, the limits of space and time above indicated do not hold for Byzantine art, for it continued even after that date, and extended beyond the empire's boundaries, both east and west, as the art of the Orthodox or Greek Church. It is still the style practised in the religious art of the Balkan States and Russia to-day. The language of the Eastern empire and the Eastern church was Greek, and the traditional Greek culture was the determining factor as well in Byzantine art, in contrast to the mediæval art of the Western empire, where the greater inroads and the lasting settlements of the barbarian invaders eventually transformed the Latin culture into one that was predominantly Teutonic. The art that issued from this mixture of Teuton and Latin in the West was Gothic, the final expression of Latin Christianity, as the Byzantine was the final expression of the Christianity of the East. One can gauge the wide divergence of the two by showing what each did with an old classic type—the group of mother and child—well represented by the "Peace and Wealth" of Kephisodotos. In the "Golden Virgin" of Amiens (Fig. 1) of the thirteenth century we see the transformation of the type into terms of Frankish emotion—the Virgin is a great lady and a queen, but one sung by troubadours rather than by monks, and utterly unclassic in the aura of romance which she carries with her. The Byzantine painter who did the Virgin (Fig. 2) of the same thirteenth century to which the Gothic Madonna belongs is still Greek in his intellectual clearness; his Mother of God is all dogma; and a dogma unobscured by the feminine mystery in which it is embodied. His Mary is no doubt divine, but she is not, like the French work, divinely feminine.

Fig. 1. Amiens cathedral. The Virgin of the Golden Portal.

There is then in this Byzantine art a Hellenic quality which stamps it as of the same race to which the "Peace and Wealth" belongs, in spite of the seventeen centuries that separate the two. But what shall we say of its flatness, this suppression of the third dimension which destroys reality and makes the figure so abstract and immaterial? It is a difference from the robust naturalism of Greek art which is not explained by the word "decadence," since, in point of fact, the Byzantine artist has a decorative sense and a power of spiritual expression superior to that of his ancient confrère. It is rather the indication of a new point of view and an altered artistic purpose—the result of some un-Greek factor acting upon Hellenic tradition. This factor is the second component of Byzantine style, an element difficult to isolate and trace to any particular source, but without question Oriental. Byzantine art, in fact, may be summarily described as the Orientalizing of Greek style.

By Orient in this connection we mean, of course, the Nearer East—Persia, Mesopotamia, Syria, and Egypt. When we think of the conquests of Alexander, and of the Greek dynasties that inherited his power—the Seleucid kings of Syria, the Ptolemies of Egypt, the Attalids of Asia Minor, or when we consider the Roman Empire that finally fell heir to these Eastern kingdoms—we sometimes forget the Oriental populations over which the Greek and Roman despots or governors ruled. Nevertheless, these ancient peoples still existed, clinging to old beliefs and practices that defied the civilizing efforts of Greek dynast and Roman emperor. The Greek culture imported into the East by Alexander and his successors, and fostered by the Romans, was concentrated in the capital cities like Antioch in Syria and Alexandria in Egypt; back of these oases of Hellenistic culture we must imagine a vast native hinterland into which the strange ideas found it difficult to penetrate. Alexandria, for example, produced a most brilliant Greek civilization, but the native Egyptian that inhabited the country districts up the Nile successfully resisted this influence, as he has resisted every other foreign culture ever since. Greeks, Ro-

Fig. 2. Venice. St. Mark's Madonna and Saints, thirteenth century.

mans, Arabs, and Englishmen have tried to convert him, but the habits of mind of the Egyptian fellahin are apparently still about what they were in the days of Rameses. So also throughout the eastern portions of the Roman empire, while the language was Greek, and while Greek dress and fashion obtained in the cities, there still remained a substratum of Oriental character that was ready to emerge when something cracked the Hellenistic veneer.

As the cracks began to appear, as the grip of Roman power weakened and Hellenistic culture began to lose its prestige, we see here and there the symptoms of a renaissance of Oriental thought. One such is the trend toward monotheistic cults in religion—for example, the sun-worship that swept the empire in the third century of our era. Another is the triumph of Christianity itself, an Eastern cult that was born in the most Oriental of Eastern lands. A simpler example is afforded by the mere change in the fashions of dress. Compare, for example, a Roman imperial lady of the first century with an empress of the sixth century in the person of Theodora, wife of Justinian, as she is represented with her suite in a mosaic of S. Vitale in Ravenna, offering a chalice to the church. We have here a fairly accurate index of the extent to which the Orient has transformed the classic point of view; the classic indifference to nudity is replaced in the costume of the Byzantine empress by a Semitic prudery that demands the complete concealment of the body; instead of the Roman simplicity of linen tunic and woollen mantle the sixth century has arrived at the jewelled brocades of the East.

This small example helps us to realize the change that six centuries wrought in the manners and customs of the Hellenistic East, but the transformation was, of course, too fundamental to be measured in mere externals of dress. It amounted to a substitution of a new attitude on the part of man toward his environment. For the Oriental point of view opposed to Greek monism a dualism of the most pronounced character. In religion the Oriental was a mystic; the Greek a materialist. The Oriental felt a contrast and separation between the human and the divine, the body and the soul, the material and the immaterial. The Greek did not. His gods were only greater men, and his world contained nothing that could not be measured in human terms. Hence he tended to deify mankind, and succeeded in his art in clothing humanity with a dignity which no other race has ever imparted to it, while the Orientals were forever despising the flesh, and by contrast attaining a more and more abstract conception of things spiritual. We recognize these Eastern traits in Christianity, with its strong sense of sin, and its severity toward material joys in which the Greek found so great beauty. The Hermes of Olympia contrasts strangely with the gods of Egypt and Assyria. These lose their human selves in a multiplicity of symbols, or become fantastic creatures whose material existence would be impossible to conceive. The Oriental notion of deity, purified by the religious genius of the Jews, finally reached a point of abstraction where God was conceivable only as a name, and passed in this form into primitive Christianity.

Now Byzantine art, and Byzantine civilization in general, consist of the reconciliation of these two widely divergent points of view. It is obvious that a long time was required for the assimilation, but we can see the leaven of the Orient working in Hellenistic art even as early as the first century of our era. From that time on its effect can be traced by a steady tendency toward a more abstract view of nature and an increasingly greater demand upon the imagination of the beholder. In relief, for example, the Greek rule is to appeal to the sense of touch and to the eye at the same time, *i. e.*, the observer is imagined to be at what may be called the normal standpoint, a distance far enough away to enable him to grasp the composition as a whole, yet not so far that he cannot follow the details of modelling. Hence the main gradations of plane, the general rise and fall of the surface of the flesh, and the essential folds of the drapery, are fully rendered in a Greek relief; a blind man, running his fingers over its surface, could derive a fairly accurate impression of its subject.

As time goes on, however, we find that the viewpoint moves farther away, so much so that the impression made upon the observer is entirely optical, *i. e.*, the impressions of form and mass are conveyed simply by the contrast of light and shade. The artist gives us no fine gradations of plane, but only broadly lighted surfaces defined by sharp outlines of shadow, and the values of depth and thickness have to be supplied by the imagination alone. In such reliefs of the third and fourth century the surfaces are flat (Fig. 3), and the depressions are mere grooves, corresponding to the heavy masses of shadow laid on by a painter to give the illusion of form. This technic is known as colorism, and constitutes the most obvious feature of Byzantine style.

Colorism denatures Greek design. A comparison of a Roman capital of the second century with one from the church of S. Vitale in Ravenna, dating in the sixth century, will be instructive in this connection. In the Roman capital Greek proportional design is retained in the differing heights of the leaves, which also project from the bell and conform to nature in their droop and thickness. In the proto-Byzantine capital the surface is as flat as a painting, and we realize the leaves merely as broad spots of light set off sharply by intervening spots of darkness. In fact, it is clear that the artist does not much care whether we realize

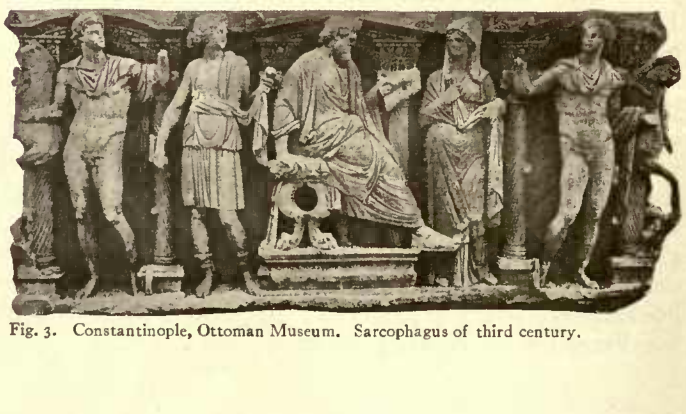


Fig. 3. Constantinople, Ottoman Museum. Sarcophagus of third century.

the leaves at all; he is concerned chiefly with his pleasing alternation of light and shade, with the result that he nearly cuts loose from nature altogether, in order to produce a charming pattern of abstract and geometrical design.

The beginnings of Byzantine can thus be described, so far as design is concerned, as the change from an ideal of stability and proportion, which was Greek, toward one of movement, and rhythmic alternation of light and shade, which was Oriental (Fig. 4). The proto-Byzantine artists still employ the Greek motifs, but they squeeze the naturalism out of them, and make them serve an un-Greek purpose.

But when we come to speak of the subject-matter of this developing Byzantine art, the iconography that it used when it took up the task of rendering biblical history, it will be to develop an apparent paradox. For we shall find that although Byzantine design, as we have seen, tended toward abstraction, the Byzantine artists who about the fifth century of our era began to reorganize the cycle of Christian imagery that had grown up in the first four centuries of Christianity, gave a narrative turn to their scenes, and added a wealth of detail that makes their paintings and reliefs seem at first sight very realistic.

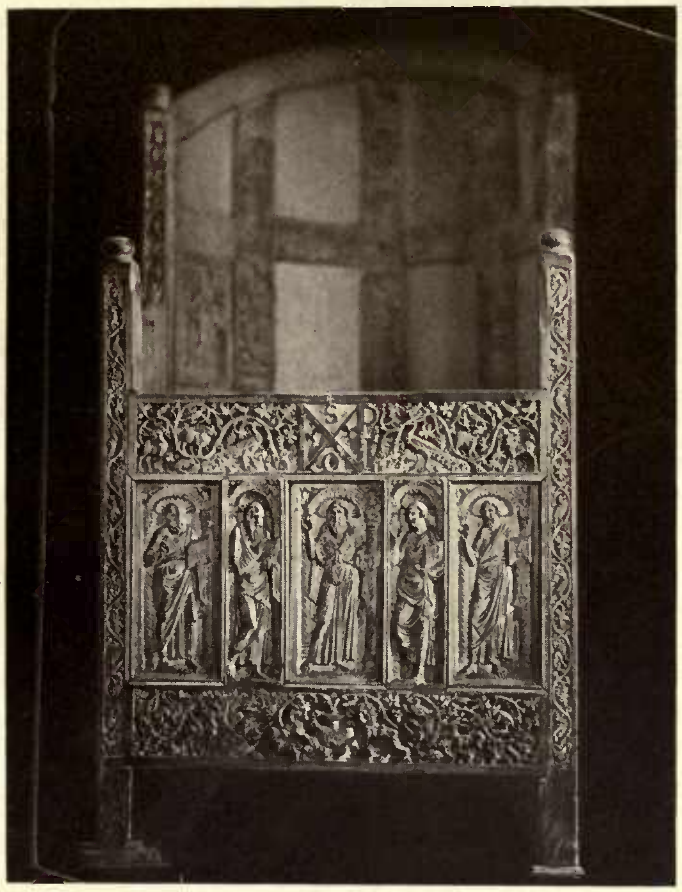


Fig. 4. Ravenna, Museum. Ivory throne of Maximianus, sixth century.

As if to increase the paradox, we find on the other hand that during the primitive ages of the church, when the new faith was first spreading among the Hellenic populations of the great cities of the empire—in the Hellenistic period of Christianity, in short—the episodes of the life of Christ and of the Old Testament are conceived in a very symbolic manner Here lies an apparent contradiction: Hellenistic design being natural, and Byzantine abstract; Hellenistic iconography being abstract, and Byzantine literal.

The reason for this is not, however, far to seek, and the paradox is more apparent than real. We must remember the Greek aversion to the commonplace, and recall that it is very hard to find historical events, or actual renderings of other than mythological episodes in Greek art early or late. Its essential idealism prevented their occurrence; instead of giving you the actual event, the Greek artists had recourse to something parallel in his mythology, or an allegory. Thus the Athenians celebrated their victory over the Persians by filling the metopes of the Parthenon with gods conquering giants, Greeks Amazons, and Lapiths vanquishing centaurs, and the chief monument to the victory of the kings of Pergamon over the Gauls of Asia Minor is the wonderful frieze of the Battle of Gods and Giants which decorated the Pergamene Altar of Zeus. The "Peace and Wealth" of Kephisodotos is a thoroughly Greek creation in this respect, and to this tendency to sublimate human achievement, avoiding the details thereof, we owe the most beautiful type that Greek art has left us, the "Winged Victory."

Christianity, as we have said, spread first among the Hellenized Jews and Gentiles of the eastern cities of the empire, and our earliest Christian art is, therefore, the result of the Hellenic spirit reacting to the new faith. It was Hellenism that gave Christianity its art, for the Jews that gave us Christianity had no representative art in which to clothe its dogmas and stories. Thus it happens that for the first four centuries of the church, its art bears the unmistakable impress of the allegorical habit of the Hellenistic mind. The earliest Christian scenes we have, in the frescoes of the catacombs of Rome, are very brief, and limited as to subject, because they are conceived not so much as real episodes, but as symbols of salvation, put upon his tomb by the individual believer as a guaranty of his own immortality and deliverance from sin. Such is the story of Jonah, repeated one hundred and fifty times in the catacombs, the deliverance of Isaac from the hand of his father, Abraham, the saving of Noah from the Flood, and of Daniel from the Den of Lions, etc. The healing miracles of Christ have the same significance, and show it by omitting Christ at times altogether, as in the Healing of the Paralytic, which consists solely of the paralytic obeying the Lord's command, and walking off with his bed upon his back.

As time goes on these Hellenistic scenes acquire some slight detail, particularly when we arrive at the fourth century and see them again upon the sarcophagi. But even here they are so brief that ten or so have to be used to fill up the front. Even when the church took hold of the new Christian artistic cycle, and began to use it in the decoration of the churches that multiplied all over the empire after the recognition of Christianity by Constantine at the beginning of the fourth century, the symbolic stamp is still apparent. See, for instance, the Parting of Lot and Abraham (Fig. 5), executed in mosaic on the walls of S. Maria Maggiore at Rome, in which the figure of Isaac is introduced, although he was not born until long after the event represented. He is here because he symbolizes Christ, and leads his church, in the person of Abraham and his family, away from Lot, who is the Jewish synagogue, and is doomed to Sodom and destruction.

It is in the fifth century, when Christianity was no longer a city cult, and had spread into the Oriental hinterlands of Syria and Egypt, that the effect of the Eastern point of view begins to show itself in Christian iconography. It transpires in the Oriental love of a story, clearly seen, for instance, in the earliest illustrated Genesis, painted in Asia Minor in the fifth century, and now in the Library of Vienna. The story of Joseph's Dream is here related with all neces-

Fig. 5. Rome. S. Maria Maggiore, mosaic.

sary detail and not a bit of symbolism. We can, in fact, trace the gradual encroachment of Eastern narrative on Hellenistic allegory through the whole course of Christian art from the time of Constantine to the sixth century by looking at successive examples of the rendering of almost any episode in the Life of Christ. Take, for example, the Entry into Jerusalem. On the sarcophagi of the fourth century Christ rides astride the ass upon a mantle spread before him by a man, and little more is ever added to the scene. But a century later, in Egypt, we find Him riding side-saddle as Eastern people ride, and an Eastern rug has replaced the mantle, while from the Gospel story the artist has added also the children strewing palm branches in His way. Hellenistic allegory still clings to the scene, in the cross that Christ carries, and the personification of the city of Jerusalem that comes to meet Him. But even these reminiscences disappear when the Byzantine scene is finally formed, which reproduces the story with faithful adherence to the Gospel account. We see the city itself, the disciples that followed the Lord, the children that strew branches in His path, and all the details of the Feast of Palms.

An early example of Byzantine handling of the Christian story may be seen in a fragment of the Gospel of Matthew, now in the Bibliothèque Nationale at Paris. It was found by a French officer at Sinope, and is known as the Sinope fragment (Fig. 6). We see on one of its pages the tragedy of John the Baptist, whose decapitated body lies in a prison to the right, and is mourned by two of his comrades in prison, while to the left Herod, wearing the diadem of a Byzantine emperor, reclines at his feast, and Herodias receives the head of the Baptist. Moses and David flank the scene; on David's scroll appears the extract from Psalms that alludes to the scene: "Precious before the Lord is the death of His saints."

Thus the little scene is still an allegory by virtue of the Old Testament allusions inserted at the sides. But you will notice that the union of the two elements—the literal narrative of the East and the Hellenistic allegory—is mechanical. The personifications of the earlier period, the old Greek idealizing of the theme, is totally absent in the episode itself. These little figures are Oriental through and through, the richness of their costumes, the trappings of the couch, the very facial types are at home in the East. Lastly, however well the story is told, the actors therein are no more than puppets; the figures are as flat as paper, cast no shadow, and stand on nothing. With all the literal detail, a general air of unreality pervades the picture.

Here then is the solution of our paradox. The pseudo-realism of this proto-Byzantine art is simply the paraphernalia of the Oriental story-teller; the figures themselves are little more alive than hieroglyphs. Christian art of the Hellenistic period may have a symbolic conception of its episodes, but the actors therein retain a modicum of Greek vitality; in Byzantine art this vitality is lost, however literally the story be told. We shall see later how this contrast between the realistic conception of the scene as a whole and the curious abstraction of the personages thereof lends a surprising spiritual quality to the Byzantine art of later periods, when the Hellenic factor becomes more potent, and the figures increase in size and dignity. But in the sixth century, when the Gospel of Sinope was written and illuminated, one can hardly feel the Hellenic element in the art at all; the very purple of the vellum and the gold in which the text is written seems to dazzle our eyes with Oriental magnificence.

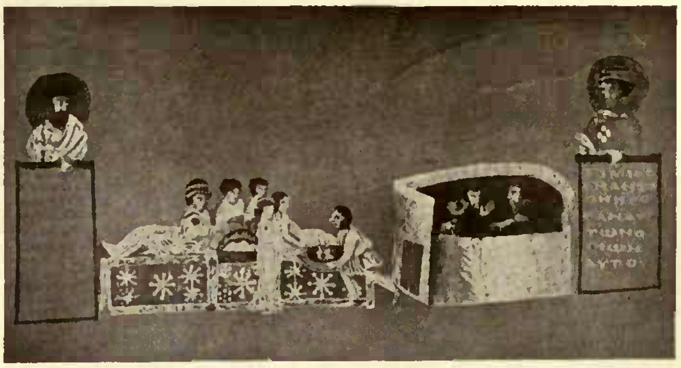


Fig. 6. Paris, Bibliothèque Nationale. Miniature of the Sinope Gospel.

(*To be continued*)

Pennsylvania State College to Enlarge the Architectural Department

ANNOUNCEMENT was made recently that a committee of prominent Pennsylvania architects, headed by M. I. Kast, after making a study of the Departments of Architecture and Architectural Engineering of the Pennsylvania State College, has indorsed the work done by these divisions of the College School of Engineering and made recommendations for various changes in the departments as soon as money is available. If the course were extended to five years instead of four, the committee stated, artistic training and appreciation of art could be stressed more than at present.

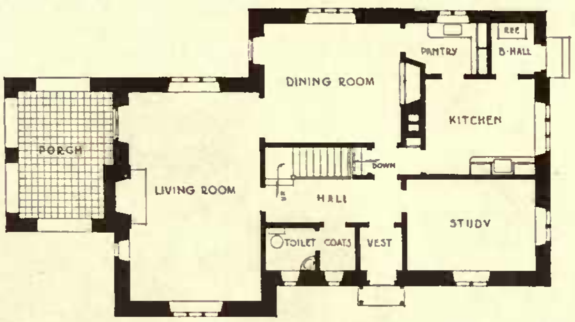
Plans are now under way for raising a $2,000,000 health-and-welfare building fund that will enable the college to admit a larger number of students to the architectural courses and will mark the first step toward the development of the college into the Pennsylvania State University, capable of accommodating an enrolment of 10,000 students.

FRONT ELEVATION.

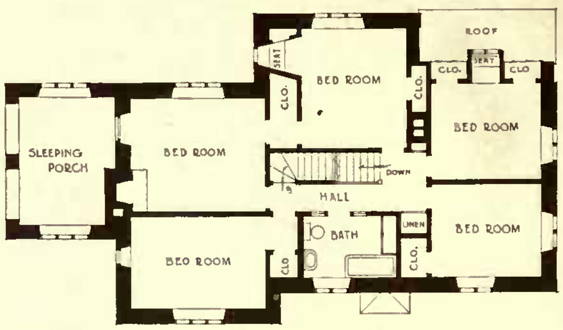
Walker & Carswell, Architects.

HOUSE, LEONARD E. GYLLENHAAL, BRYN ATHYN, PA.

REAR ELEVATION.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

0 5 10 15 20
SCALE 1/8 INCH = 1 FOOT.

HOUSE FOR MR. L. E. GYLLENHAAL
BRYN ATHYN PENNSYLVANIA
WALKER AND CARSWELL ARCHITECTS
BRYN ATHYN PENNSYLVANIA

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Small Mission-Style Church of Three Floors

By Charles Alma Byers

THIS attractive little church building, representing a modification of the mission style of architecture, actually possesses, to all intents and purposes, three floors. It is therefore unusually complete and commodious, making of it quite a model church plan. The general outside appearance is also exceptionally pleasing.

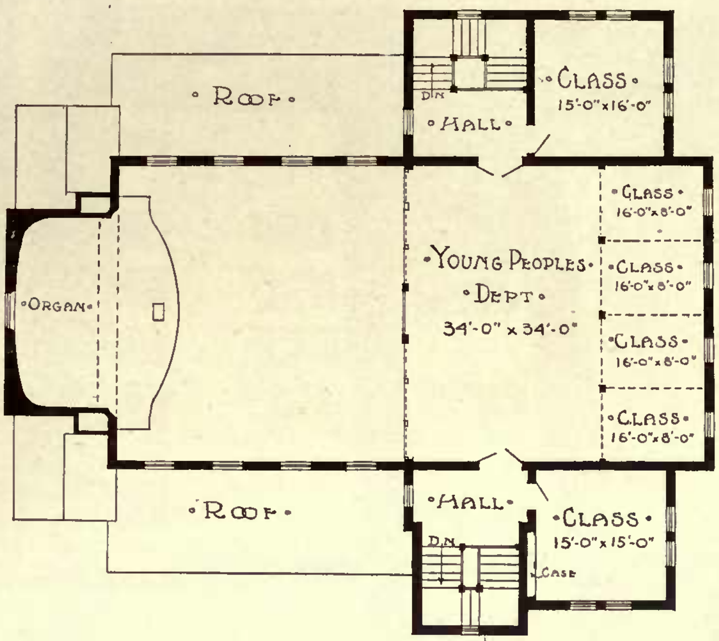
For the regular church services it is capable of accommodating a total of 386, as follows: main auditorium, 176; choir, 30; Sunday-school department, 90; auditorium-balcony portion of young people's department, 90. In the basement is a large social hall, with stage and dressing-rooms, which seats 350. This hall also serves as a banquet-room, when it will accommodate 250 at tables, and is further used as a junior department. There are numerous classrooms, a well-planned kitchen, pastor's study, choir-room, boys' clubroom, secretary's office, and various other divisions. The equipment includes gas-radiators for heating, a ventilating system, pipe-organ, and so forth.

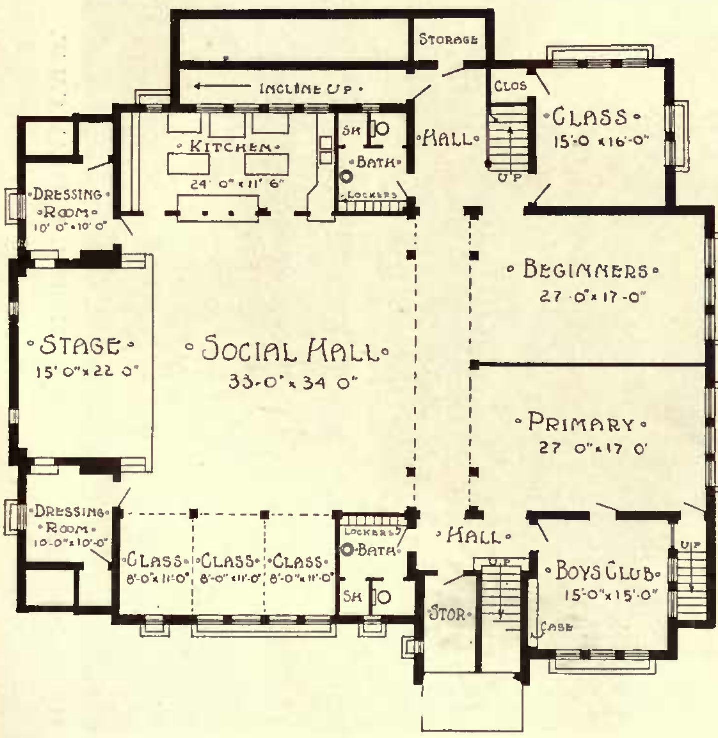
The building is of frame construction, with the outside walls consisting of pure white cement stucco. The roof is of red roofing tile, and the wood trimming is painted pearl gray.

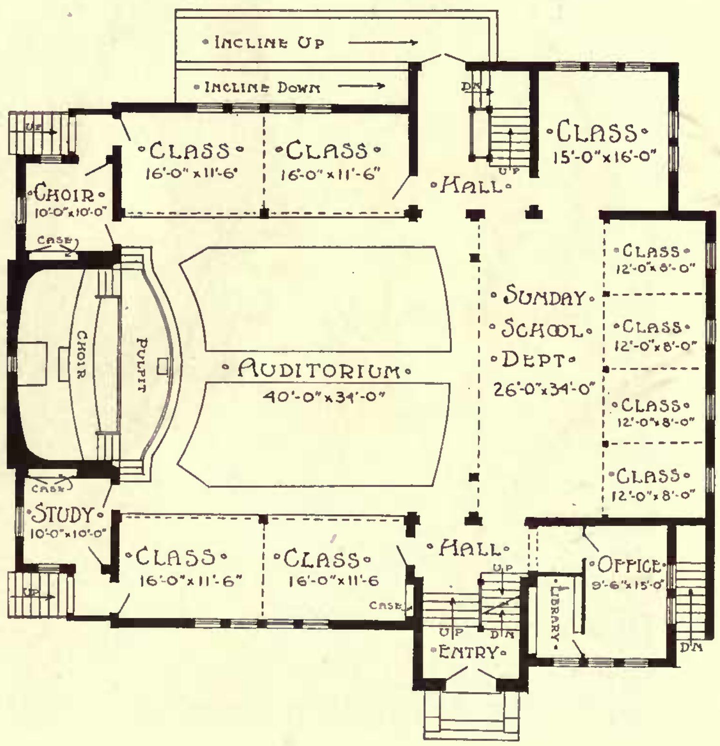
The foundation and basement walls are of concrete, the basement walls being finished inside with plaster.

The interior finish consists of Oregon pine woodwork throughout, which is finished in oak stain. The woodwork in the kitchen, however, is in white enamel. The pews are of natural oak, and the pulpit is furnished to match. All walls are plastered and tinted, and the floors of the main and second floors are of pine, while the basement is floored with cement.

The building is located in Artesia, California, and is the edifice of the First Methodist Episcopal Church. It was designed by Arthur G. Lindley, of Los Angeles. The building has just been completed at a total cost of about $30,000, exclusive of the equipment and furnishing.







FIRST METHODIST EPISCOPAL CHURCH, ARTESIA, CALIF. Arthur G. Lindley, Architect.

Construction of the Small House

By H. Vandervoort Walsh
Instructor, Architectural School, Columbia University, New York

Article XXI

TRADITIONS OF THE CONSTRUCTION OF DOORS AND WINDOWS

Windows

WHAT are the elements of design in the elevations of the small house? Surely they are not the five classical orders, as commonly used in monumental architecture, but rather they are the doors and windows. The walls would be plain and uninteresting but for the holes where the doors and windows are placed. The fenestration cannot be too large or too small, and here is the problem. We desire plenty of light and air, but we must also recognize that windows which are too large leave little wall space in the rooms, are cold in winter, and appear less homelike than smaller and snugger appearing ones. Then, too, windows which are of plain, clear glass in very large sheets make these holes appear open and black, and this is quite contrary to our traditions of the windows of a home which should be safe and cozy. The omission of muntins from the windows of small houses is a great mistake in design, even though these small panes require a little more work to wash.

Our traditions of door and window construction come, as do other structural traditions, from England. Undoubtedly the earliest structures had no windows at all, but were lighted by the openings through the defective construction of the walls and also through the door. Our ancestors of those days were more interested in protecting themselves from outside intruders than they were in fresh air and sunshine in their rooms. When it was safe to build windows they were only holes in the walls. Some of the old huts, built on crucks, a construction previously described, had holes in the roofs for windows which served the double purpose of letting in light and letting out the smoke of the fire. We get an inkling of what a window was from the very derivation of the word itself, which comes from the old Norse word "wind-auga" or wind-eye. This does not sound like a glazed sash, nor does the other Anglo-Saxon term for window, "wind-dur," meaning wind-door, suggest a closed aperture. Of course these windows were undoubtedly closed in some way or other in stormy weather or when danger was outside. Probably a wooden board or shutter was used, which had a small peep-hole cut in it. These were hung from the top, and when opened were held in position with a prop on the outside.

There is no certainty of when the smaller domestic houses of England began to use glazed windows. In 1519 William Horman wrote: "I wyll haue a latesse before the glasse for brekynge." This would suggest that windows of latticework were preferred because of the cost of glass, and this might have been filled instead with canvas, horn, or tile to let in some light. But another writer in 1562 says: "Lattice keepeth out the light and letteth in the winde." When glass windows were used, however, the small bits of glass were held in position by lead in diamond-shaped patterns which probably were adopted from the form of the old lattice windows, although later it was found that rectangular panes were cheaper. But the use of glass in small housees is comparatively modern, for, before the reign of Henry VIII, glass windows were rare except in churches and gentlemen's houses.

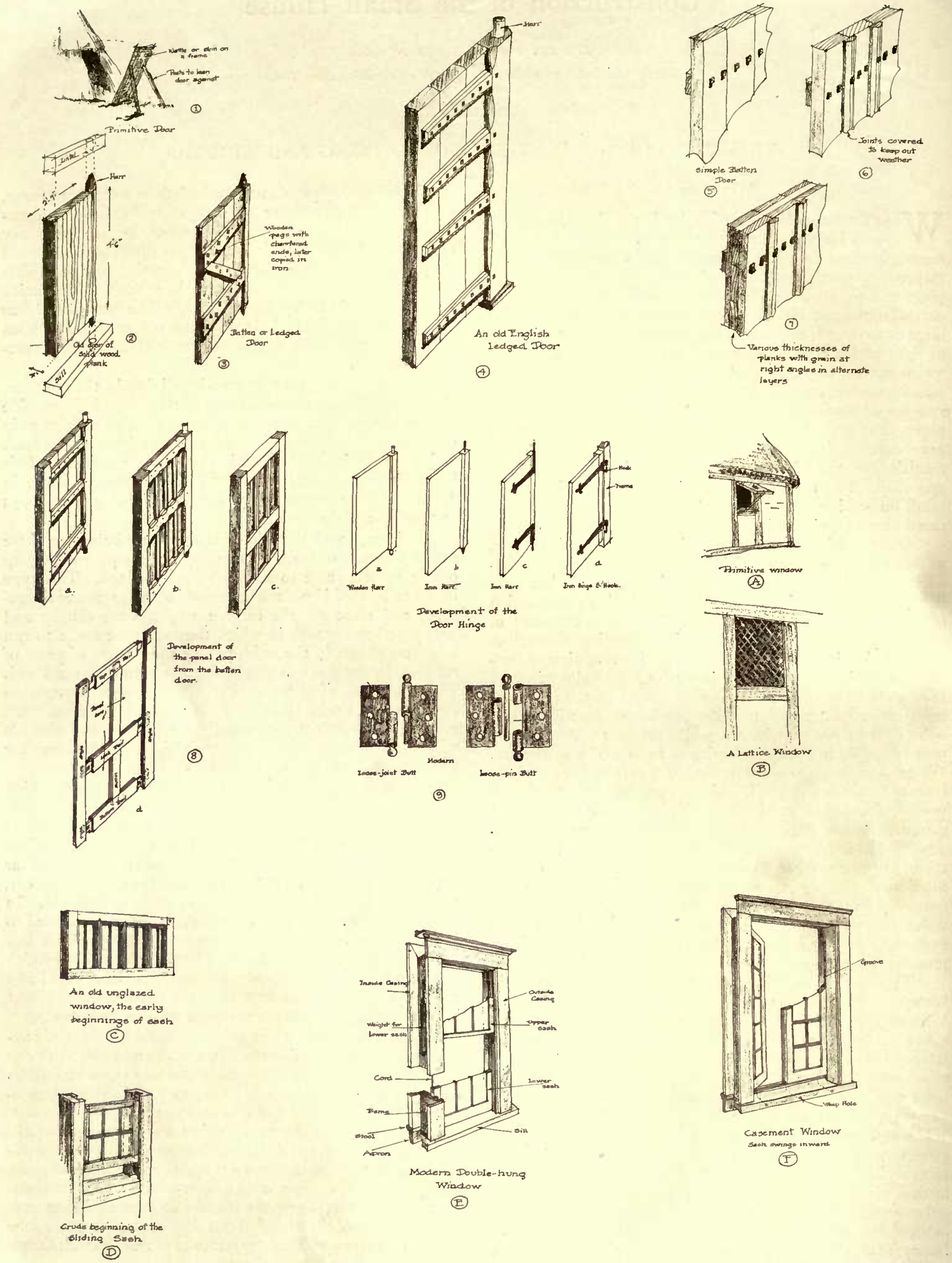
Traditions of stone mullioned windows were very strong, and these brought about a system of building wooden, unglazed sash which had mullions made of oak, set in a heavy oak frame. One of these is shown in the drawings. The word "sash" is derived from the French "chassis," and its earliest spelling was "shas" or "shash." In a book, "Mechanick Exercises," written by Moxon in 1700, he mentions "shas frames and shas lights." It was these old, unglazed wooden sash which gave birth to the modern double-hung and casement window.

As first made, they opened by sliding in their frames, either horizontally or vertically. If they were built to slide vertically they were not counterbalanced with weights as in our modern windows, but were held in position with a hook which caught in notches cut in the side of the frame. It is interesting to quote here what William Horman wrote in 1519: "I haue many prety wyndowes shette with louys goynge up and downe."

It is supposed that the idea of counterbalancing these sash by means of weights, attached by a cord running up over a pulley, came to England from Holland. This type began to be used about the latter half of the seventeenth century, and although the early examples were clumsy and heavy and the groove in which the sash were made to run was worked out in the solid, yet by the process of years of refinement the modern double-hung window was evolved. The traditions of these sliding windows were brought to America in Colonial days, and they proved to be the most suitable types for our rigorous climate, whereas the windows which swung like doors from their sides, called casement windows, did not prove so weather-resisting.

To hear some individuals talk, one would almost think that the double-hung window was a modern, American invention of artistic atrociousness, and that the casement window was peculiarly English, having the sole right to artistic merit. As a matter of fact, the fashion in England for casement windows was an imported one from the Continent, which never reached certain farm sections of England. In fact, some years ago certain agricultural laborers refused to live in cottages fitted with casement windows which had been built by a district council. The Georgian revival which had so much influence upon our early Colonial work, and which is also very much alive to-day in this country, brought into fashion again the traditional double-hung window.

Of course there is much to be said against the artistic appearance of the double-hung window as compared with the casement window, but when all is said and done we still go on using more double-hung windows than casement windows, for in the majority of cases they prove to be more substantial in resisting the heavy winds and storms of our climate. Every now and again we hear some prominent architect urging the use of casement windows, and we can find plenty of manufacturers of casement-window hardware telling us to use them, and the makers of steel casement sash drum in our ears the practical qualities of steel sash, and one is led to wonder why they are not used more. But traditions are stronger than advertisements.



The successful placing and careful detailing of the doors and windows of a small house will have more to do with the architectural attractiveness of the structure than anything else, for, after all, the most important part of any elevation is the treatment of the holes in it.

Doors

There is an ancient English expression, "put t' duur i' t' hoile" (put the door in the hole), which comes down from the times when the door was not fastened by hinges and did not swing into place, but had to be lifted up and placed over the door opening. When the door was opened it leaned against two stakes driven into the ground, or some similar support. These old doors were very small, as compared with our modern doors, and were probably made of light wattle, for we read in some old rhymes of throwing doors and windows on the attacking enemy. Even when solid-wood doors were used they were made of one piece of wood. Doors made of a number of planks of wood fastened together by battens or ledges were a later type. It was noticed that these sagged when hung in position and cross bracing was found necessary. These old batten or ledged doors were swung on pivots of wood which rested in sockets bored into the lintel and the sill. These pivots were called harrs, and later were made of iron. The evolution of the hinge idea from the harr is shown in a series of drawings. For many years these great hinges became a very decorative part of the door, and great care was taken with their designing. Our modern butt is quite the opposite in its characteristics, for instead of being a feature upon the face of the door it is completely hidden, except the socket and pin.

In building the old ledged doors, the planks were set vertically and held together with battens through which were driven wooden pegs. The ends of these pegs were chamfered, and a curious mark of tradition can be noted in the later doors which were fastened with iron pins that were also chamfered on the ends, like the wooden pins. Later construction of doors shows the use of weather-stripping over the vertical joints and also the use of various layers of planks, with their grains running at right angles in each alternate layer. The end timber upon which the harr was placed was thicker than the planking, and later the timber upon the opposite side was made heavier in order to strengthen the crude locks. With this change and the moving of the battens to the upper and lower edges of the door, and the introduction of weather-stripping over the cracks between planks, there was created the prototype for the modern panelled door. It was only a slight step from this, to frame the styles, top and bottom rails, and lock rails around the panels between them.

Another type of door that was of traditional construction, and from the name of which we derive our word hatch, was the so-called "heck-door." This door corresponds to the common "Dutch-door," which is familiar to us in Dutch Colonial houses. It was capable of being opened in two halves, the upper half could be swung in without the lower half. This type of door was invented from the necessity of protection against the sudden intrusion of strangers and also small animals, like pigs and hens.

The oldest method of fastening doors was to draw a long bar across them on the inside, very much like the bars which were used in Colonial houses in this country. A hole was cut into the jamb into which this bar could be run when locked, and in the opposite jamb was another hole into which it could be slid out of the way. The disadvantage of this type of door fastening was that it could only be fastened and unfastened from the inside. This led to other devices, such as a bolt that could be operated from the outside and a latch that could be lifted by a string, or a hole was cut in the door through which a small bit of metal could be passed that could be used as a lift for the latch.

To-day we think of locks and bolts and latches as distinct, but this was not so at the time they were being evolved. Our word lock was used in the sense of securing the door in any manner. But gradually, as, step by step, the various mechanisms for locking a door were developed, the word became limited in its meaning, although we sometimes use it to-day in the sense of closing the door.

Facts from a Survey of Residence Lighting

By M. Luckiesh

THOSE acquainted with lighting and its possibilities in residences know that in general the wiring is inadequate and the lighting is deplorable. There is much improvement in these factors in middle-class homes which are being built at the present time, but by no means can it be said that wholly adequate wiring and proper lighting are being provided in many of the new houses and apartments. The writer has been conducting an extensive detailed survey of wiring and lighting as it exists to-day in the urban middle-class home, from which some data of interest to the architect, builder, and householder have been obtained.

Only one-third of the homes existing at the present time are wired for electricity, so that a large field exists in providing electric lighting for the 14,000,000 unwired homes as well as in raising the standard of lighting in the 7,000,000 wired homes. These phases and many other details of the survey are not of direct interest to the readers of this journal, so they will not be discussed, with the exception of some which will help the architect, builder, and householder to appreciate more fully the past and present shortcomings.

Large groups of wired urban middle-class homes in various cities have been studied. The aggregate represents equal numbers of rented homes and of homes owned by the occupant. This appears quite fair because the census of 1920 revealed the fact that 54 per cent of the population of this country live in rented homes. So far only urban middle-class homes have been considered, but the conclusions can be extended safely to homes in towns, villages, and rural districts. At any rate, about one-half the population of this country live in places of 2,500 or more inhabitants.

Certain interesting facts pertaining to rented homes and to homes occupied by the owner were obtained, particularly as related to the number of rooms in the home. In Fig. I are plotted the relative number of rented and of "owned" homes against the number of rooms. These represent two large groups of equal numbers of rented homes and of homes occupied by the owner. It is seen then that the maximum of the rented group is at about 5.8 rooms per home. In other words, the most popular size of a rented home is about six rooms. The maximum for the "owned" group is at about 7.3 rooms per home, indicating that the most popular home occupied by the owner has approximately seven rooms.

A diagrammatic view of this is presented in Fig. II. Here the percentage of rented and of owned homes has

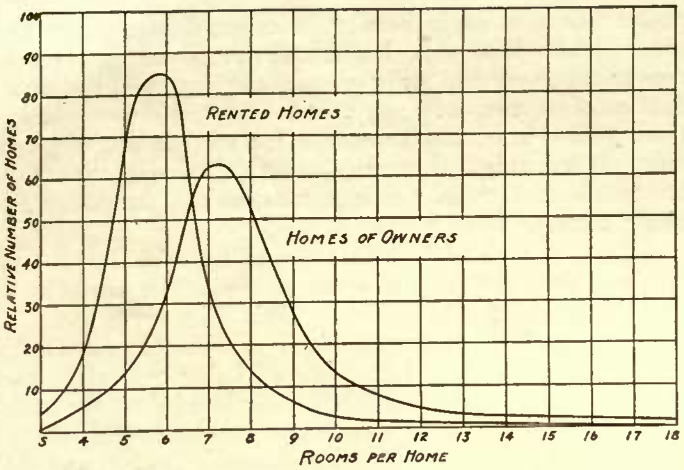


Fig. I.

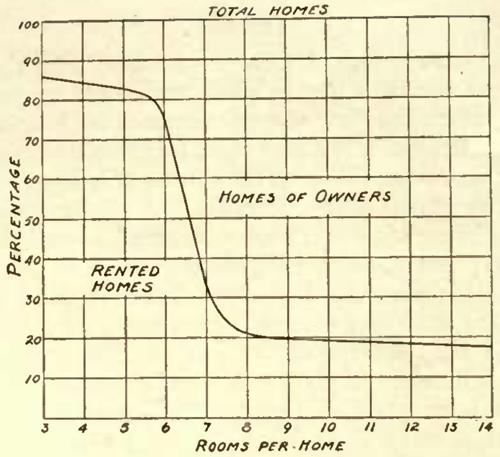


Fig. II

been computed for each size of home. The transition between predominantly rented homes and homes occupied by the owner takes place in the region of six rooms per home. For example, 77 per cent of the homes having six rooms or less are rented and 75 per cent of the homes having more than six rooms are owned by the occupant. Fig. II shows plainly that the homes having a small number of rooms are predominantly rented, and as we pass from the six-room home to the seven-room home we pass from the region of predominantly rented to the region of predominantly owned. In Fig. II the central portion of the diagram is more dependable than the extreme portions because of the enormously greater number of homes of the medium sizes represented in the survey. However, the diagram can safely be used to represent the approximate conditions as determined by the groups of homes which have been analyzed.

Some data pertaining to the newer houses showed fairly definite desires on the part of the owners or prospective owners of modern single houses. In the case of bungalows it appears that a size of five rooms is the most popular, with the six-room bungalow a close second. One-and-one-half-story houses of seven rooms appear to rank first, with six rooms ranking second, and eight rooms third. For the two-story house seven rooms are most popular, with eight rooms next, and six rooms ranking third. Frame houses are of course still more numerous among the new houses, but there appears to be a strong tendency to desire stucco and brick construction. If we have interpreted the tendency correctly, the desire for stucco houses in the middle class is pressing that for frame houses closely, with brick a fair third in rank. Breakfast nooks, sleeping-porches, pantries, and sunrooms are much in evidence in the present tendency.

A detailed analysis of the survey data provided an average home in respect to all the details studied. Conservative wiring and lighting were then designed for this average urban middle-class home and this was termed the "conservative ideal." From this the present status of lighting in this class of homes was determined. Some of the chief facts are presented in Table I.

TABLE I

The Status of Various Phases of Wiring and Lighting in Per Cent of the Conservative Ideal

Total wattage of lamp per home	40 per cent
Consumption of electricity for lighting	50 "
Convenience outlets per home	33 "
Portable lamps	25 "
Ceiling fixtures (regardless of design)	100 "
Satisfactory ceiling fixtures	50 "
Wall brackets (utilitarian)	27 "

A brief interpretation of Table I appears desirable. The total watts of lamps per home must be increased 150 per cent on the average if lighting is to be brought to the level of the conservative standard. This does not mean that all the lamps will be operated at the same time in any given room, but rather that lighting to suit various activities or moods will be available as desired.

Convenience outlets are far too few at present, particularly in the smaller homes having from three to eight rooms. For the average home, nine is a conservative number. This means there is one for each room in a seven-room home with two extra for the living-room. There is a growing tendency—and well there should be—toward a greater use of portable lamps. For this reason a conservative rule is one convenience outlet for each fifty square feet in the living-room. The new duplex convenience outlet should be widely adopted because it permits two connections to each outlet.

An average of only two portable lamps per home was revealed. When we consider the decorative possibilities of small portables on the buffet or mantel and the usefulness of a library lamp on the reading-table, a floor lamp, a piano lamp, a desk lamp, and pairs of portables on the dressing-tables it is easy to account for eight portables in the average home. Hence portables should be increased to four times their present number. Convenience outlets must be provided for them.

The use of ceiling fixtures is quite complete, although many of them are far from satisfactory from the standpoint of eye comfort. Best practice demands that all lamps be shaded or concealed from the eye in some manner. Inasmuch as the use of ceiling fixtures seem to be sufficiently extensive it only remains to use correct ones in which the lamps are shaded. For the dining-room the ceiling fixture should be such as to illuminate the table predominantly without the light sources being visible to the diners. The survey shows that 25 per cent of the ceiling fixtures in use in dining-rooms are suspended bowls. These do not provide predominant light on the table. More than 10 per cent of the ceiling fixtures in use do not have shades. It appears that half the total number of ceiling fixtures in use should either be improved by proper shades or replaced by modern fixtures.

It is evident that useful wall-brackets have not been utilized in the home to the degree that they should be used. In the average existing wired home their number could be increased about 300 per cent in order to provide the best in lighting. Two brackets spanning the mirror in the bathroom, two placed similarly in respect to the dressers in each of the three bedrooms, and one over the sink in the kitchen account for nine brackets in the average home, where on an average only two exist to-day. In this "conservative ideal" average home only eight brackets are specified. In the foregoing mention of nine brackets we did not include any used chiefly for decorative purposes. In the living-room several wall-brackets can be used with satisfaction in a purely decorative manner. Thus it is seen that eight brackets can be readily used in the average home.

In the foregoing paragraphs some of the chief points revealed by this residence lighting survey have been presented which should be of interest to the architect, builder, and householder. The lighting and wiring conditions which exist to-day are not to be used as a standard, but rather to show, in comparison with a conservative ideal, that residence lighting and wiring in general is lagging far behind what lighting experts know to be good practice. The survey also has shown the influence of the number of rooms on the percentage of rented homes as determined by data obtained from large groups of wired urban middle-class homes.

Concrete Construction

By DeWitt Clinton Pond, M.A.

SIXTEENTH ARTICLE

IN order to complete the study of the 395 Hudson Street Building, it will be necessary to investigate the design of typical stair construction. In a steel building, stair design is included in the ornamental or architectural ironwork, and all the structural designer has to provide are the beams which will carry the stair construction. In a concrete building the stairs themselves are of concrete and among the other structural drawings there are those which give the details of the stairs.

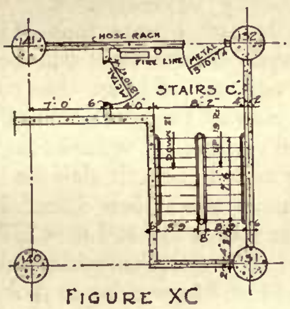


FIGURE XC

In the part of the 395 Hudson Street Building which has been furnishing the basis for other discussions there are no stairs, so for the purpose of this investigation, another part will be selected. In a portion of the building, included between Columns 131, 132, 140, and 141 will be found Stair *C*, which is as typical as any in the building. Figure XC shows the plan of this stairway at the second floor, and Figures XCI and XCII show the structural plan and section. In Figure XCIII is shown the structural floor plan and the method of framing around the stair well. In the plan and section it can be seen that there are 19 risers from floor to floor. There are 10 to the platform and 9 from the platform to the floor above. In the longer run there are 10 risers and 9 treads. The treads measure 10 inches wide, so the horizontal distance from the first riser to the platform is 90 inches, or 7 feet 6 inches. The beams at the floor and platform are $3\frac{1}{2}$ inches away from the risers, which makes the horizontal distance between beams 8 feet 1 inch. Assuming the beams to be 6 inches wide, the distance between centres of supports will be taken as 8 feet 7 inches. In the design of stairs the horizontal distance is always used.

In carrying out the design the stairs are divided into two parts—the slab which is under the treads and risers, and the treads and risers themselves. The slab is considered as being the only structural member; the treads and risers are simply triangular prisms of concrete resting upon this slab. The first step in the design is the determination of the thickness of the slab. In order to do this, it is necessary to determine the load, and the thickness of the slab must be assumed. The assumption will be made that this is a 6-inch slab weighing 72 pounds per foot.

As has been stated, the treads and risers are formed by triangular prisms of concrete, and the transverse sections of these prisms are inverted right triangles with the bases measuring 10 inches and with altitudes measuring $7\frac{5}{8}$ inches. One-half of the altitude will be $3\frac{3}{4}$ inches. If the treads and risers were spread out over the slab as a layer of concrete, this layer would measure $3\frac{3}{4}$ inches thick and would weigh 45 pounds per square foot. So far the unit weight of the slab and the weight of the treads and risers have been found. The only remaining load will be the live load of 100 pounds. The loads can be listed as follows:

Treads........	45	pounds per square foot.
Slab.........	72	" "
Live load.....	100	" "
Total......	217	" "

The thickness of the structural slab is determined in the same manner as the thickness of an ordinary slab. It might be well to note that the figures given in the calculations do not always agree with those shown in Figures XCI and XCII. The calculations are made before the structural drawings and in many cases the dimensions must be assumed. When the structural drawings are made exact dimensions are determined, and if these do not alter the assumed figures so as to increase the spans, or add to the loads, it is not considered necessary to recheck the design calculations. As a case which illustrates this it will be noted that the distance between supports, as shown in Figure XCI, and measured horizontally, is found by adding 6 inches, 7 feet 6 inches, and $3\frac{1}{2}$ inches. This gives a total of 8 feet $3\frac{1}{2}$ inches, which is less than the assumed distance of 8 feet 7 inches. As these discussions are carried out on the basis of the engineers' calculations, the latter figure will be used, and the clear span will be taken as 8 feet 1 inch. The load per square foot has been found to be 217 pounds, so the load on the slab will be $217 \times 8.1 = 1{,}757$ pounds. As the slab is considered as a simple beam the formula for bending will be $M = \frac{1}{8}wl$. The bending moment is determined by the following calculations.

$$M = \frac{1{,}757 \times 8.6 \times 12}{8} = 22{,}700 \text{ inch-pounds.}$$

As has been determined in previous discussions, the depth of the slab can be found by—first, dividing the moment in inch-pounds by 1,279.5, and, second, by extracting the square root of the result.

$$\frac{22{,}700}{1{,}280} = 17.17 = d^2$$

$$d = 4.2$$

Adding $1\frac{1}{4}$ inches to this figure will give a slab thickness of $5\frac{1}{2}$ inches as shown in the figure.

The next step is the determination of the area of the steel. As the slab thickness has been decreased by one-half an inch, the weight per square foot of the slab will be decreased by 6 pounds and the unit load will be 211 pounds. In order to find the required area of steel, it will be better to use this load and carry through the calculations for the

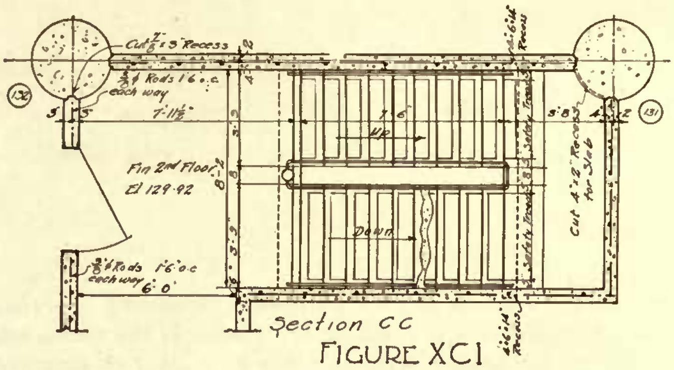


FIGURE XCI

purpose of finding the proper moment. In this connection it may be well to note that some engineers use the formula $M = \frac{1}{8}\,wl^2$ in which w is used to denote the *unit* load, which in this case is 211 pounds. They also combine this with the formula $M = f_s \times \frac{7}{8} \times d$ in order to determine f_s, the stress in the steel, in one operation of the slide rule. Combined, these two formulas become

$$f_s = \frac{w \times l^2}{8 \times \frac{7}{8} \times d}$$

In order to simplify the calculations still more and to find A_s—the area of the steel—in one operation, the value of steel in tension, or 16,000 pounds per square inch, is introduced into the denominator. The formula then becomes

$$A_s = \frac{w \times l^2}{8 \times \frac{7}{8} \times d \times 16{,}000}$$

Now $\frac{7}{8} \times 16{,}000$ equals 14,000 pounds, so the formula may be simplified to

$$A_s = \frac{w \times l^2}{8 \times d \times 14{,}000}$$

As L is usually given in feet rather than inches, it further simplifies the problem to have the formula written as follows:

$$A_s = \frac{w \times L^2 \times 12}{8 \times d \times 14{,}000}$$

In this formula the length of the span is written in feet, and as 12 divided by 8 becomes 1.5, the final form of the formula becomes

$$A_s = \frac{w \times L^2 \times 1.5}{d \times 14{,}000}$$

The only step which remains to be taken is the determination of A_s in the problem under consideration. As has been stated w equals 211 pounds per square foot. The distance between supports has been found to be 8.6 feet. This is represented by L. If t is taken as $5\frac{1}{2}$ inches, then d becomes $4\frac{1}{4}$ inches. Substituting in the formula, the following problem can be carried through very quickly by the use of the slide rule.

$$A_s = \frac{211 \times 8.6 \times 8.6 \times 1.5}{4.25 \times 14{,}000} = .39$$

A $\frac{3}{8}$-inch square bar has a sectional area of .1406 square inch, and there will be required 2.76 in each foot of slab, or if these bars are spaced $4\frac{1}{4}$ inches on centres the required area will be supplied. It will be noticed in the figure that the bars are spaced $4\frac{1}{2}$ inches on centres. This is due to the fact that when the actual dimensions were determined it was found that for a shorter span the wider spacing is all that will be required.

It will be noticed that the run of stairs from the platform to the upper floor calls for only a 5-inch slab and that the spacing is only $5\frac{1}{4}$ inches on centres. This is due to the fact that the span is shorter.

The next step is the design of the beam noted as $B2$ in Figure XCII. The depth of this beam is determined to a certain extent by the point of intersection of the stair slab with the beam. It cannot be less than 1 foot 2 inches, as shown in the figure. To determine the load per lineal foot which is supported by the beam, it will be necessary to add one-half the stair load, one-half the load of the slab, and the weight of a foot of beam.

The stair load was found to be per square foot 211 pounds. One-half the horizontal span of the stair will be assumed to be 4 feet, so the load per foot of beam due to the stair will be 844 pounds. The slab at the platform will be a 4-inch slab, which will weigh 48 pounds per square foot, and if the live load of 100 pounds is added the unit slab load will be 148 pounds. The clear span of the slab is 3 feet 2 inches, so the load per foot due to the slab is $148 \times 1.6 = 237$ pounds. The beam will be assumed to be 6 inches wide and 14 inches deep, and will weigh $6 \times 14 = 84$ pounds per foot, and the addition of 50 pounds live load will give a total of 134 pounds. The total load per foot of beam will be as shown below.

Stair load..................	844	pounds.
Slab "	237	"
Beam "	134	"
	1,215	"

By substituting in the formula given above, the area of steel required in the beam can be found directly.

$$A_s = \frac{1{,}215 \times 8.66 \times 8.66 \times 1.5}{12 \times 14{,}000} = .81$$

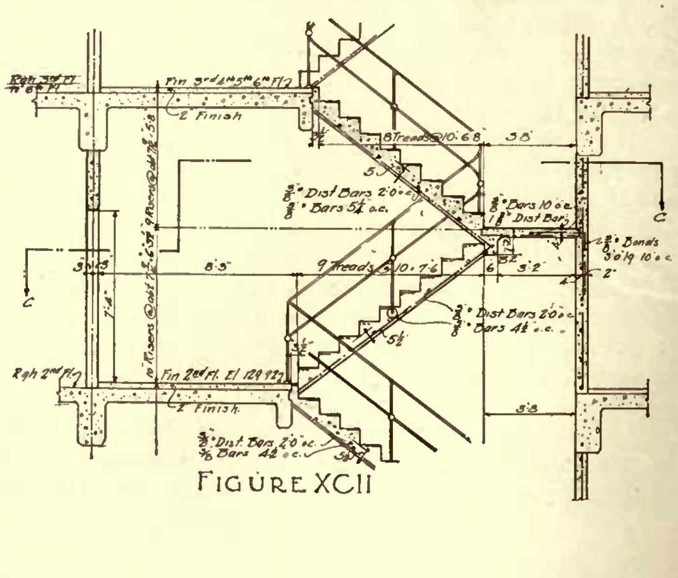


FIGURE XCII

This area can be supplied if two $\frac{3}{4}$-inch round rods are used.

The only remaining calculation is the one required for the design of the slab at the platform. The span of this slab is so short and the load is so light that the problem resolves itself into determining the smallest practical bar to be used and the largest allowable spacing. As all the bars throughout the construction of all the stairs have been $\frac{3}{8}$-inch square bars these will be used in the slab construction. As the maximum spacing according to law is two and one-half times the thickness of the slab, this spacing will be made 10 inches, as shown in the figure. This reinforcement is more than enough to support the load on the slab.

An interesting feature of the particular stair construction found in the 395 Hudson Street Building is that all the stair shafts are inclosed in 6-inch reinforced concrete walls. These walls support the stair platform and it will be noted in Figure XCI that a recess is called for measuring $4 \times 6 \times 14$ inches to act as supports for the beam in the walls, and that a recess is left in the column for the slab.

Bond bars must be left in beams corresponding to $B15$, Figure XCIII, and in the wall as shown in Figure XCII. In case the platform is not carried on the wall, then struts must be provided to carry the platform beams.

This completes the study of the typical stair construction and, as the principles outlined with regard to this design are common to the design of all the stairs, it is unnecessary to investigate the design of the other stairs in the building.

This also completes the study of the design of the 395 Hudson Street Building. In this study there has been investigated the actual design of slabs, beams, girders, columns, footings, flat slabs, basement walls, and stair construction—practically every type of design that an engineer encounters in every-day practice. There are, of course, special problems which will be encountered in the design of almost every building, and which cannot be touched upon in a work of this kind. The problems which have been outlined have shown the use of principles which can be applied to all the problems encountered in general practice, however, and it is difficult to bring to mind any type of construction found in the ordinary building which cannot be solved by the use of these principles.

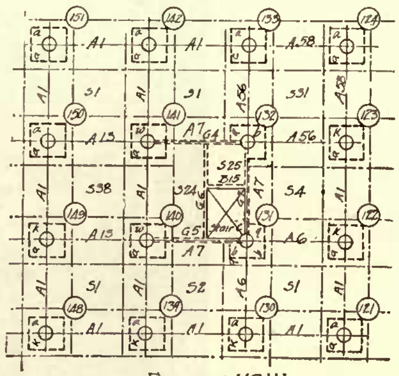


FIGURE XCIII

Announcements

We have been much interested in reading an article by Mr. Ernest M. Skinner, on "The Proper Placing of Organs in Public Buildings." The problem is one for an expert to solve, and Mr. Skinner qualifies in this respect. He has some valuable suggestions for those who are building movie theatres and other places of public entertainment.

Mr. Peter Campbell, treasurer of the Nairn Linoleum Company, of Newark, N. J., sailed recently for a visit to Kirkcaldy, Scotland, where was established the original linoleum business of Michael Nairn & Co., Ltd. He will visit France and spend some time in London in connection with the joint affairs of the Greenwich Linoleum Co., recently consolidated with the Michael Nairn Co.

"Copper Roofing—Information for Architects and Roofing Contractors," is the title of a booklet just published by the Copper and Brass Research Association. It contains general information about copper, including a table of weights of various roofing materials for each 100 square feet laid, 16-ounce standing seam copper weighing 125 pounds, and copper shingles 84 to 100 pounds to the square, as compared with 1,200 to 1,800 pounds for shingle tile, 450 to 675 pounds for slate, and 300 to 650 for asbestos shingles. The use of copper on flat roofs, as well as the ribbed seam and standing seam methods, is discussed. Information concerning copper shingles, flashings, gutters, and eaves-trough is also given, together with some suggestions concerning the natural coloring of copper, a peculiar advantage which copper has over other roofing materials. Condensed specifications covering copper roofing, cornices, flashings, etc., are supplied, accompanied by four drawings, containing 26 figures giving helpful detail. The booklet is compact and thoroughly indexed. Copies are furnished by the Building Service Department of the Copper and Brass Research Association, 25 Broadway, New York, and in a prefatory note the services of that department are offered to architects and roofing contractors.

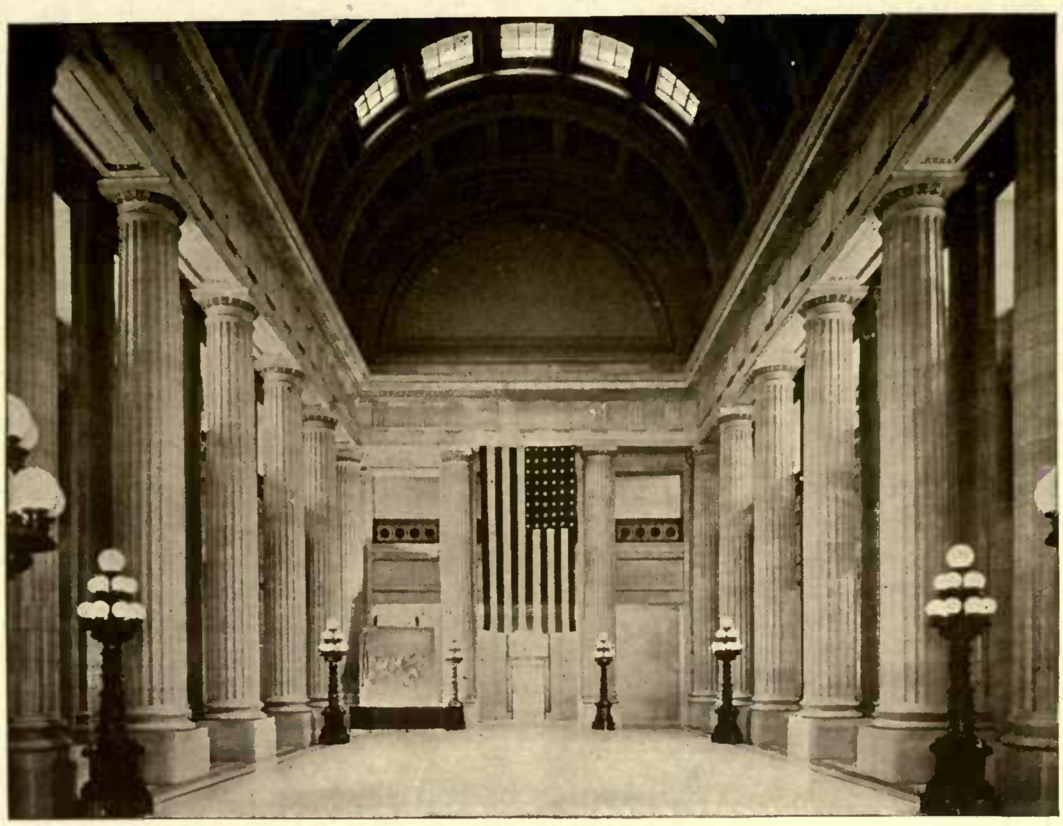
Benton S. Russell, architect, advises us that his address is now 1948 Grand Central Terminal, New York, N. Y., and desires manufacturers' catalogues and samples.

Benjamin Driesler announces that he has removed his office to 186 Remsen Street, Brooklyn (Temple Bar Annex) room 702, where he will continue his profession as an architect in association with Wm. C. Winters, 106 Van Sicklen Avenue. Tel. Main 4135—same as before.

The B. F. Sturtevant Company, Boston, have favored us with an interesting article, "Catch the Cinders," descriptive of their new Cinder Eliminating Fan. The fan may be adapted to collect many other kinds of material.

We have received from The Barrett Co. their booklet on "Holt Roof Leader and Vent Connections." It explains just what the Holt Roof Connections are, that they are designed for use with either kind of flat roof or saw-tooth construction, and for any place where there are vent pipes, leader lines, steam-stacks, flag-poles, any fixtures passing through roofs which require flashings. It minutely describes the eight types of Barrett Holt Roof Connections, and shows half-tone illustrations of the connections, together with a cross-section view of each type.

The "Little Giant" Pipe wrench, a new wrench with several interesting improvements, has just been put on the market. The "Little Giant" wrench has the "end opening" feature which is familiar to users of machinists' wrenches. Its application to pipe-turning can readily be seen. The new wrench is a product of the Greenfield Tap & Die Corporation, Greenfield, Mass., "Little Giant" is one of their trade-marks, well known throughout the trade to all users of screw-plates, taps, and dies.



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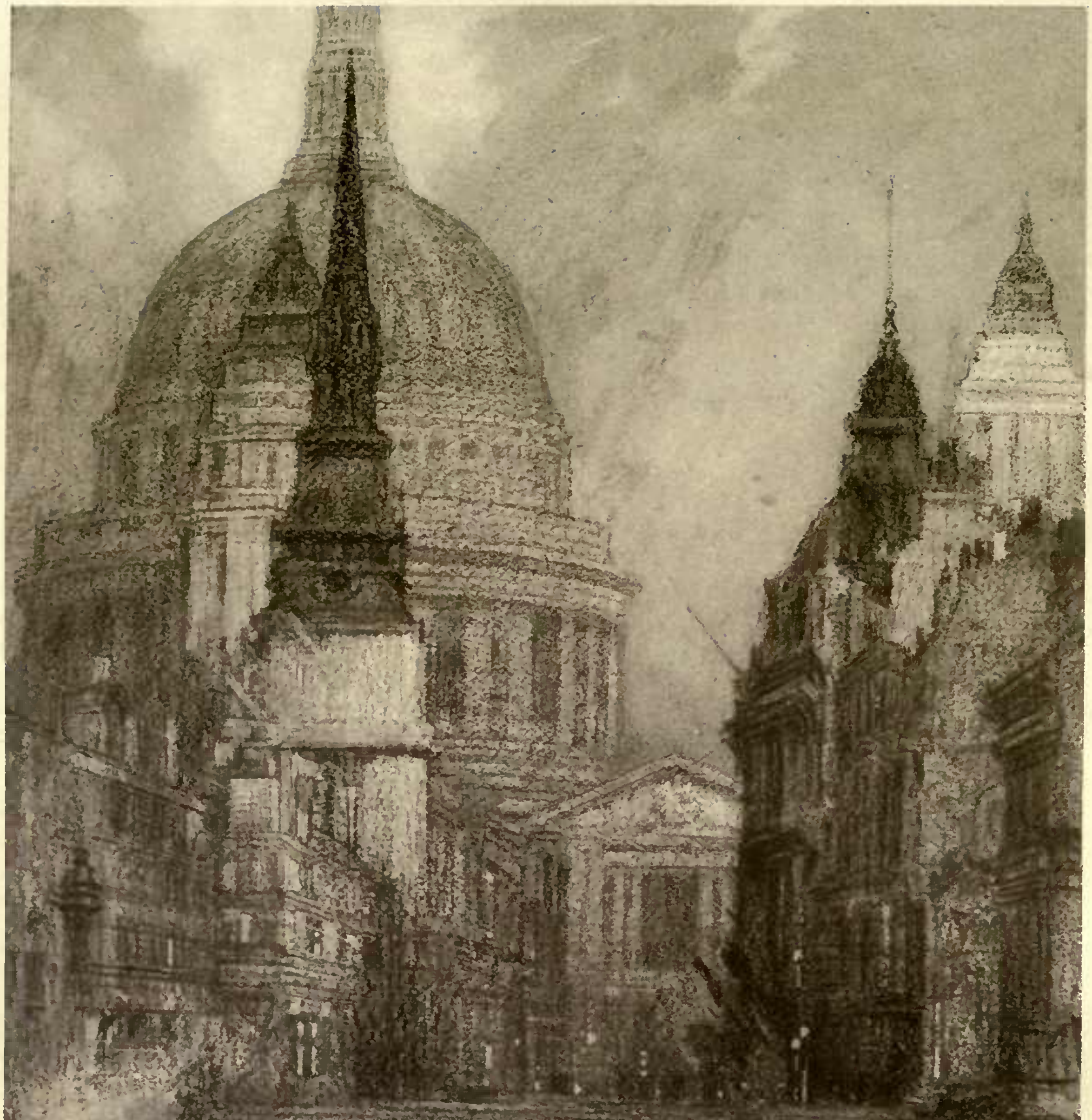


From the drawing by George Wharton Edwards.

ST. PAUL'S FROM HOLBORN VIADUCT.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI OCTOBER, 1922 NO. 4

Byzantine Art

By Professor C. R. Morey
Princeton University

SECOND ARTICLE

THE first stage of Byzantine art, represented by such products of Asia Minor as the Sinope miniature, amounts to the Orientalization of Greek art; a nearly complete submergence of classic form in Eastern color. How the Greek element was saved from disappearing altogether, how the dignity which Greek art accorded the human form was finally retained in Byzantine art, and how the two elements of Oriental color and Greek form were integrated anew—is the subject of the present article. We shall find that three things were mainly instrumental in producing the curious change from the proto-Byzantine to the developed Byzantine style: viz., the Arab conquest, the iconoclastic controversy, and the early Christian school of Alexandria.

The Arab conquest came in the first half of the seventh century. A century earlier, under Justinian, the Eastern empire had reached its widest extent, so wide indeed that it nearly realized the dream of Justinian of uniting and reviving the old Roman empire as it was before the separation of East and West. Its dominions in the sixth century embraced a strip of southern Spain, north Africa, Egypt, Italy, the Balkan peninsula, Asia Minor, Syria, and Egypt.

Two centuries later, when the successors of Mohammed had finished their conquests, two-thirds of Justinian's realm was gone. The Eastern or Byzantine Empire in the eighth century had lost everything except the Balkan peninsula and Asia Minor, and it is worthy of note for later reference, that it took the Mohammedans less than twenty-five years to subdue and assimilate the provinces of Syria and Egypt. Syria had been the centre from which flowed those Eastern influences which had so completely devitalized the Hellenistic art of Asia Minor, and turned it into the coloristic style we know as proto-Byzantine. Syria had been the meeting-point of the Eastern caravans, and the distributing point for the textiles from Persia and the farther East, by which the new colorism had been passed on into Asia Minor; when Syria passed into hostile control, this influence was checked. The Byzantine Empire of the eighth century, moreover, was reduced to an area primarily Greek, and its style was forced to refresh itself at the traditional sources of Greek art. We find in this one reason for the later revival of Hellenism in Byzantine.

The second thing which brought about this revival was the secularizing of art through the medium of the quarrel of the Images, or the Iconoclastic controversy. This strange dispute, partly religious and partly political, convulsed the empire for over a century, from 726, the date of the decree of the emperor Leo the Isaurian which forbade the worship of the images of sacred persons as represented in sculpture and painting, to the final removal of all restrictions upon image-worship by the Empress Theodora in 842. It is hard for us to realize the far-reaching effect which was exerted by differing conceptions of dogma in those days when dogma was made. In the case of the Iconoclastic controversy the difference of opinion was nothing less than the abyss separating the Oriental from the Greek philosophy.

We have already noted the contrast between the Oriental and the Greek point of view, in that the Greek was a materialist, recognizing no difference in essence between the ideal and the real, or the divine and human, while the Oriental, particularly in the Semitic countries, reached a very high degree of abstraction in his conception of God. It is in fact this abstract tendency of the Eastern mind when dealing with ideal concepts that makes him in his search for ideal beauty strive to eliminate the naturalism in Greek figures and ornamental design. That is why the Orientalizing of Greek art into the proto-Byzantine style meant as we have seen a change from real figures to unreal ones, and from natural ornament to geometrical pattern. So also when the Christian faith passed into the phase when it began to be formulated in definite dogma, the Greek and Oriental parted company on a very fundamental doctrine of the orthodox faith.

This was the doctrine of the dual nature of Christ. When the doctrine was first promulgated in the fourth century, and Christians throughout the Roman Empire were invited to believe that Christ was both Man and God, the Hellenistic mind had no difficulty with the apparent contradiction, accustomed as it was to clothe its gods with human form, but the Oriental populations of Syria and Egypt, and of Eastern Asia Minor, found themselves unable to conceive their God in any but a spiritual sense. Hence, a great part of these peoples were heretics from the start, adhering to one unorthodox creed after another, but always one that included in its tenets the monophysite belief that the nature of Christ was one, and that one divine. This undoubtedly had much to do with the ease with which the Mohammedans spread their doctrine of "One God, Allah" in Syria and Egypt, and pacified those provinces within twenty-five years after their separation from Christendom. The simple Moslem monotheism appealed to the Oriental mind, wearied of the metaphysical subtleties by which the Greeks explained the dual personality of Christ.

The same impatience with Greek materialism underlay the efforts of the image-breakers to banish the carved and painted representations of Christ and the saints from the churches. The movement had its political and economic aspects as well, for the emperors viewed with concern the growing concentration of property in the hands of the monks, and, in attempting to undermine the cult of images, they were aiming as well at the monasteries that profited by the superstitious reverence of the people. They were seconded for the same reason by a fair proportion of the secular clergy, and the monks included both emperor and bishop in the invectives which they hurled at the iconoclasts. A curious echo of the fight appears in many of the monastic psalters, illustrated editions of psalms which were made for the use of Byzantine monasteries from the ninth century on, and one of these illustrations shows the iconoclasts painting out an image of the Saviour, the proceeding being superintended by an emperor and a bishop. A little black devil encourages the emperor in the horrid work. Another result of the controversy was the exportation of numerous sacred images of Christ and the Virgin to Italy in an effort to save them; their unheralded appearance here gave rise to various legends of their origin, and many an early Byzantine picture in Italy owes its presence there to the iconoclastic controversy, although the guide may tell you that it was brought by angels, or painted by St. Luke, or was miraculously ferried from Asia or Constantinople to the peninsula. But the important outcome of the iconoclastic controversy from our point of view is that during the period of its continuance—the last half of the eighth century and the first half of the ninth—the old proto-Byzantine Oriental art suffered a check because of the stoppage of production of religious art, or at least was confined to the monasteries where the rebellious monks continued to make their pictures in defiance of the law. When Byzantine art revived, the thread of tradition which connected it with its first phase was broken, and the new ateliers of Constantinople and Asia Minor were receptive to the Hellenistic style.

The old proto-Byzantine thus continues only as a monastic manner, and is chiefly represented in later Byzantine art by those monastic psalters which we have just mentioned. The earliest examples of this class of illustrated manuscripts that we now have date from the ninth century, but the tradition continues far into modern times; Byzantine art is still the religious style of Russia, and we find monastic psalters written and illustrated in Russian monasteries even as late as the eighteenth century, using also the same old subjects, and much the same style, as were in vogue in the ninth century. The scenes consist of allegorical or moral applications of the verses of Psalms to the acts of Christ or the monkish life. When a passage alludes, for example, to the striking of water from the Rock of Horeb by Moses, the Rock is made to mean Christ as the source of the water of Life, and a little figure of the Saviour is perched upon its summit. There is little to remind one of the Hellenistic in these vignettes; their tendency is rather to debase and misunderstand the classic forms. The style is still that of the proto-Byzantine period, and not essentially different from the miniatures of the manuscripts of the sixth century produced in Asia Minor like the fragment from Sinope. The figures are small and lack convincing movement, and color suppresses the forms to such an extent that all reproductions of the scenes in these psalters make the figures look like silhouettes. Thus in the long run the monastic psalters represent the continuation of the proto-Byzantine style of Asia Minor, and are more Oriental than Greek.

Contrast with this a scene from what Ainaloff calls the "aristocratic" type of psalter, which began to be made about the same time as the monastic variety, but for the edification of court and aristocracy. Here there are depth and locality, the postures are classic, and the figures also have recovered the size, importance, and dignity of Hellenic art. We know that the Orient devitalized the monastic style. What agency kept alive the Hellenistic that it should enter so powerfully into Byzantine art at this late date?

In my own opinion, this was the school of Alexandria. Alexandria in Egypt was the chief stronghold in later classic times of the Hellenistic style, and its early Christian school, during the early Middle Ages, maintained the Hellenistic tradition, which, after the iconoclastic controversy, succeeded in re-Hellenizing the art of the whole Christian East.

By Hellenistic style we mean that free naturalism which we find in Greek works of the Roman period. It is the last phase of pure Greek art, before the Orient began to transform it into a flat colorism. It is the sort of thing we find, for instance, in the wall-paintings of Pompeii, and in such reliefs as the well-known peasant driving a cow to market. Fond of picturesque detail, with backgrounds of architecture of pseudo-landscape; free of movement, with a preference for boldly rounded forms and a three-quarters turn to the face and figure, it retains a Greek freshness and materialism in strange contrast to the spiritual abstractions of Christianity that it will be called upon presently to embody.

Its evolution under Christian influence can be traced in the early church art of Alexandria. An ivory pyxis of Berlin, for example, has lately been proved to be a product of the Alexandrian ateliers by Miss Alison Smith, who has demonstrated that the altar used in the sacrifice of Isaac is a form peculiar to Egypt, being the shape employed in the worship of Isis. The Hellenistic inspiration of the work is sufficiently indicated by the lively movement and freedom of posture which we see in the Christ and his apostles, as well as in the resemblance of the Abraham in the Sacrifice to the figure of Calchas in a fresco of Pompeii representing the Sacrifice of Iphigenia. We should probably date the Berlin pyx in the fifth century; the sixth-century style which succeeds it is illustrated by a famous throne of Bishop Maximianus (reproduced in the preceding article), of Alexandrian

Fig. 1. Rome, Vatican Library. Miniature of the Joshua Roll. Joshua and the angel of the Lord.

Fig. 2. Paris, Bibliothèque Nationale. Miniatures of a Byzantine manuscript of the ninth century.

workmanship. The figures here have acquired a new solemnity that befits their Christian function, and are of ampler proportions than one finds in Asia Minor works of the same sixth century, as we may see by comparing them with the puppets of Herod's Feast. There is also a fulness and roundness to the forms that is absent in Asia Minor, and the impressionism that in the Asiatic works results in colored flat silhouettes produces here rather the illusion of shape. One notes, for instance, the clever semblance of the eye which is gotten by the rough cutting of a little block beneath the eyebrow.

The persistence of the Alexandrian style can be traced in the illustration of a number of manuscripts written in the period succeeding the Throne of Maximianus, such as the Joshua Roll of the Vatican Library (Fig. 1), which dates in the seventh or eighth century according to its latest editions. It is a parchment roll about thirty feet long, filled with scenes from the book of Joshua, to which a later scribe has added extracts from the book which explain the scenes. The episode shown in Fig. 1 is the appearance of the angel of the Lord to Joshua, who stands in astonishment at the celestial vision, and then prostrates himself at the feet of the angel. Around about these figures are the rocks and trees of a Pompeian landscape done in the brisk impressionism of contrasting lights and shades, the city of Jericho in the background represented in actuality, and again in Hellenistic fashion as the personification with a mural crown that sits on a pedestal behind the standing figure of Joshua. There was practically no color in the drawings as originally conceived; the broad shading is used for the sole purpose of bringing out the forms, and this and the impressionistic drawing are plain survivals of Hellenistic style.

This art was exiled by the Arab conquest of Egypt in the first half of the seventh century. The capture of Alexandria, in 651, must have broken up the ateliers of the city as well as its schools. The craftsmen that had been preserving the Greek tradition in such works as the Throne of Maximianus and the Berlin pyxis could not have failed to emigrate at the time of the Arab conquest, to some extent at least, and it is probably no mere coincidence that in the latter part of the seventh century and the beginning of the eighth we find at Rome occasional examples of fresco in pure Greek style which contrast in their superior impressionism and brisk drawing with the halting productions of the local school. Some of these artists must have gone to Constantinople too. It is certainly to some such fresh infusion of Hellenism that we can attribute the appearance in the ninth and tenth centuries at Constantinople, after the close of the iconoclastic controversy, of a style that is almost purely Hellenistic.

The best-known examples of this style are those "aristocratic" psalters which we were just now comparing with the "monastic" variety. They are illustrated with full-page inserts quite different from the little marginal vignettes of the monastic type, and quite pagan in feeling and tradition, as in a picture of "David the Harper," charming the beasts like Orpheus in the midst of a Pompeian landscape, with the mountain god of Bethlehem in the foreground and Echo peeping around the fountain in the rear. Besides these personifications which are reminiscent of classical antiquity, we find a feature which is absent in the monastic psalters, but is very characteristic of these Hellenistic works of art in the Byzantine period, viz., the embodiment in the human figure of an abstract idea, such as the Melody who sits beside the Psalmist. Throughout these manuscripts we find a freedom of posture, a breadth and dignity in the figures, which are big and fill the scene, contrasting markedly with

Fig. 3. Daphni, mosaic. Crucifixion, with Mary and John.

Fig. 4. Constantinople, Kahrie Djami, mosaic. Mary receiving the wool for the temple veil.

the Orientalized pictures we see in the school of Asia Minor (Sinope Gospel) of the sixth century, or the continuation thereof in the monastic psalters.

The Asiatic school could not fail to be influenced by this revival of Hellenism, especially when its productions were not so severely limited in scope and purpose as the monastic psalters, and were made to appeal to a less conservative taste. The shift of the Asiatic style toward the Alexandrian can first be seen in a famous ninth-century manuscript of the Bibliothèque Nationale at Paris, illuminated in Constantinople and containing the commentaries of St. Gregory of Nazianzus. The Raising of Lazarus and the Entry into Jerusalem (Fig. 2) are still in the tradition of the primitive school of Asia Minor, and from such early works as the Gospel of Sinope it retains the oblong illustration instead of the full-page picture. The figures too are flat and quiet as to pose, preserving curiously that tradition of the earlier Praxitelean and un-Hellenistic style which was peculiar to the works of Asia. But the new Hellenism has made the figures larger and more significant, and a sense of locality is evident in the more convincing city of Jerusalem.

Thus we see in this manuscript the beginning of that process which I have called the re-Hellenization of Byzantine art through the medium of the Alexandrian style. In the eleventh century the process is complete, and Byzantine art is finally integrated. In the mosaics of the monastery of Daphni, near Athens, the Asiatic and Alexandrian have combined into something new and very beautiful, which can properly be called the climax of Byzantine art (Fig. 3). Hellenistic is the nudity of the Christ of the Crucifixion, and the size and dignity of the Mary and John beside the cross. Oriental taste, however, dictated the broad color effects and the background of gold, and the quiet Praxitelean pose of the figures comes from the Asiatic tradition of early Byzantine art. In composition and design the rhythm of the East is combined with the proportion and symmetry of Greek art.

As we pass into the twelfth century this delicate mingling of Greek dignity and Oriental decorative beauty settles into formula, and particularly in scenes demanding action we find a more mechanical movement, as in the mosaics of St. Mark's at Venice of about 1100. The rhythmic symmetry of the eleventh century becomes a rigid one in the twelfth, and the form-revealing drapery of the earlier period flattens into planes, whose folds are rendered with gold hatching. The woodenness of this drapery makes the heavy mantles assume the aspect of a beetle's wings, and this becomes the salient characteristic of twelfth-century drawing. The rigidity that thus is gradually freezing the Byzantine style is due of course to its didactic purpose; dedicated as it is to the rendering of spiritual truth, it had no interest in truth to nature. It is no part of the priest's business to preach the joy of living.

The Gothic revival in Italy and France seems to have created a stir in the bleak tradition of the Byzantine, in such works as this mosaic of Kahrie Djami at Constantinople. In Fig. 4 we see the episode, drawn from the apocryphal gospel of James, in which the High Priest singles out Mary from among the virgins as the one who shall spin the purple veil for the temple, and consigns to her the purple flock of wool. The deepening backgrounds of Italian painting may have inspired this artist to open up his space, and we also see that in addition to the usual radiating perspective of Byzantine tradition he has tried a bit of scientific foreshortening in the roof of the building to the right. The postures of the priests as well show a sudden energy, as if mechanical dolls were set in motion by an electric current. But, aside from such mechanical imitations of life, the Renaissance of the West left the Byzantine style unaffected, and it went on its hieratic way into the religious art of the modern Greek Church oblivious of the natural beauty which was revealed to the artists of the rest of Europe.

It had adopted in any case certain processes of technic which were ill suited to naturalism. The rigidity of its figures, and the geometric quality of its beautiful design, had early made mosaic its favorite medium, and later on the kindred art of cloisonné enamel. The Morgan collection in the Metropolitan Museum contains some fine examples of the latter technic as practised by the Byzantines, and practically monopolized by them. It consists of covering a metal plaque with a linear design, figured or otherwise, and then incising the contours, into which are then fitted little gold partitions forming tiny canals or cells into which the enamel of various colors is poured. The resulting drawing is all in gold, and the colors have the brilliance of enamel added to their natural beauty, so that the whole effect is very magnificent indeed. Mosaic, enamel, and the delicate process of manuscript illumination are the favorite technics of the Byzantine craftsman; his sense of beauty, barred by tradition and the didactic purpose of his art from the imitation

Fig. 5. Palermo, Cappella Palatina, mosaic. Christ entering Jerusalem.

of nature, takes refuge in color, and the elaboration of a design which in its balance of Greek proportion and Oriental rhythm was the pattern of all Europe until the rise of Gothic art.

It is by contrast with Gothic that we understand the Byzantine best. The difference between the two is summed up in the way each treated the saints; the holy men of the East are usually white-haired patriarchs, while even the patriarchs are youths in Gothic art. The Gothic was in truth an art of youth, and its salient characteristic is that it is always growing; the Byzantine was born old and could not change. It repeats the same compositions century after century; when Didron first explored the libraries of Mt. Athos he found a manual used by the painters of the monasteries there which dated from the eighteenth century and reduces to a formula the rendering of any scene that a monk might be called upon to paint. The description of the Entry into Jerusalem which is found in this textbook almost exactly fits the mosaic scene in the church of Monreale (Fig. 5), executed six centuries before: "Paint the walls of a city (the manual directs) and a mountain outside thereof. Christ is seated on an ass and blesses. Behind Him, the apostles, in front of Him a tree on the mountain. Children cut the branches of the tree and throw them on the ground. . . . Below, near the ass, are other children; some carry branches, others jostle each other, others throw branches beneath His feet, etc., etc."

What is it that gives this scene, so unoriginal, so unreal that the ass's feet do not even touch the ground, the power to move our admiration? It does not move our feelings; the appeal is wholly mental so far as the actual episode is concerned; what lyric quality there is in Byzantine art comes from the design and the color. The effect comes, I think, from the very unreality of these dignified figures. They are so portentous in height and rigidity that we lend them significance in spite of ourselves, and this significance, being wholly unconnected with their physical existence (since one cannot imagine them alive) is finally realized as spiritual. They seem to be enacting some solemn moment in a liturgy, and every gesture is symbolic of dogma, like the movements of the priest in the mass. It is this power of spiritual expression that makes Byzantine art so impressive, through all its contradictions of nature, and indeed because of them. Add to this dominant theme the emotional accompaniment of color and rhythmic design, and one possesses the Byzantine effect *in toto*.

The comparison with Gothic art again suggests itself, and we can best sum up the impression gained by this brief survey by comparing again the two Madonnas with which it opened. The French Mary is very much a woman, though undoubtedly a noblewoman, an ideal of chivalry rather than of asceticism, and surrounded by the halo of romance rather than of piety. Her exaggerated pose, and that of her Child, and the smile on her face, have all the exuberant irresponsibility of youth. Some young layman made that statue, with no interference from any churchman, and he was not thinking about the dogma of the Incarnation when he did it.

Her Byzantine sister is flanked by elderly saints and is stiff and straight. There is none of the feminine mystery about her that makes the Golden Virgin so enigmatic. Her meaning is perfectly plain; the very rigidity of mother and child express the unchangeable dogma that they represent. The Incarnation of God is here presented, in true Greek fashion, to your mind, not your heart; you believe it or you don't, but if you don't the woman here represented has no further interest save as part of the decorative pattern. The Madonna of Amiens may be called an emotional reality; the Byzantine Virgin of St. Mark's is surely an intellectual abstraction.

Prizes for a Small Hospital Design

THREE cash prizes of $500, $300 and $200 will be awarded and two honorable mentions made.

The purposes of this competition are (a) to stimulate the building of small hospitals that are efficiently arranged, suitable for smaller communities and are architecturally creditable; (b) to bring to the trustees of small hospitals floor plans that shall combine simplicity of design and good taste with a compact arrangement of the various departments of the hospital now regarded as essential to the efficient, scientific care and treatment of the sick.

Copies of the general programme may be obtained from the Modern Hospital Publishing Co., Inc., 22 East Ontario Street, Chicago.

Prizes for Designs on Time

BELIEVING that the art of clock designing has failed to keep pace with the general advance in decorative and commercial art, awards amounting to $1,200 are being offered by the Cloister Clock Corporation, of Buffalo, N. Y., for the best designs of clock cases in three general classes. A distinguished jury has been selected to make the awards in the competition. It consists of Charles Dana Gibson; Richard F. Bach, Metropolitan Museum of Art; Albert M. Kohn, jeweller; C. Matlack Price, editor and art critic; and Russell F. Whitehead, secretary of the Architectural League.

The fact that the clock designs of the Willards and Eli Terry, who completed their work over a century ago, are still recognized as supreme in the field of clock design in America makes it apparent that clock designers have not developed their art on a plane worthy of the inspiration and impetus so early given. The donors of the prizes in the present competition believe that this has been due to lack of incentive rather than the exhaustion of the field or a lack of ability on the part of designers to produce new and finer conceptions. The purpose, in the competition, is to supply this incentive.

The awards include three first prizes of $250 each, three second prizes of $100 each, three third prizes of $50 each, and nine honorable mentions. The prize-winning designs become the property of the Cloister Clock Corporation, which also reserves the right to purchase at a fair price any designs which do not win prizes. The competition closes October 23.

One set of prizes is offered for an upright mantel clock case of wood, greater in height than breadth, and another for a case of the same general proportions, in metal. The third set is offered for a mantel clock case of wood greater in breadth, at the base, than in height. The cases must have a minimum inside height of seven and a half inches, an inside breadth of four inches, and an inside depth of four inches.

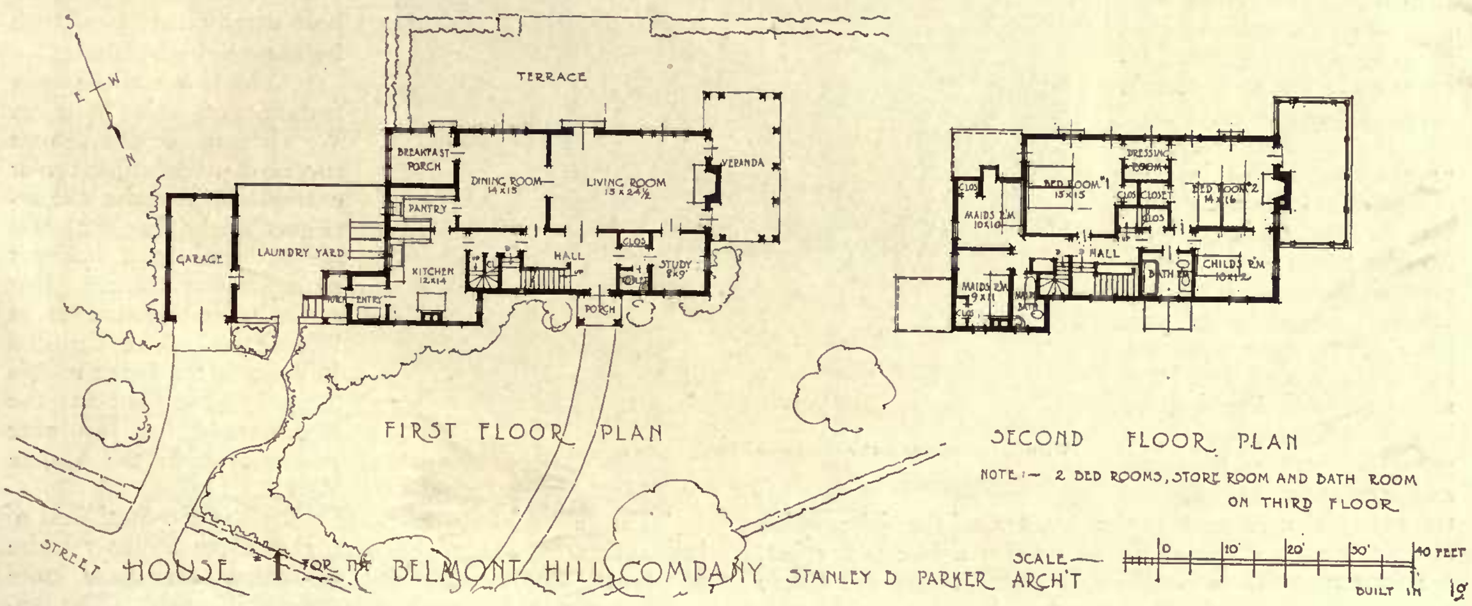
While open to every one, the competition is expected to be of particular interest to artists, architects, designers, and draftsmen.

HOUSE FOR THE BELMONT HILL COMPANY, BELMONT HILL, MASS.

Stanley B. Parker, Architect.

VIEW FROM THE STREET

GARDEN SIDE



The Hardware Mutual Insurance Building, Stevens Point, Wis.

Childs & Smith, Architects

Detail showing one of the lighting fixtures flanking the entrance, also one of the flower-vases on the first-floor level. The spandrel section shows in the centre the insignia of the State of Illinois. In the Greek fret are shown the national eagle, the keys and padlock, which is the insignia of the Hardware Mutual Insurance Company, and the pelican, the insignia of insurance.

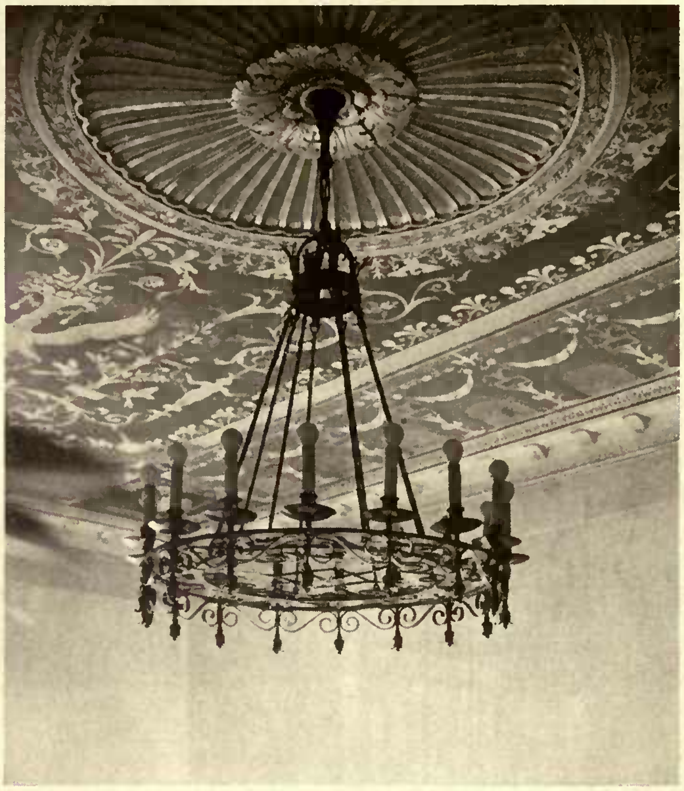
CAN an imposing home insurance building be practical, at the same time monumental and not cost more than other average business structures? "We think that it can," said one of the members of Childs & Smith, alluding especially to the Hardware Mutual Insurance Building at Stevens Point, Wis. This building cost a year ago fifty-six cents a cubic foot. It includes every modern business convenience in its plan and equipment, and the best craftsmen in America contributed to its successful completion. Any possible criticism on the ground of extravagance offered for such an elaborate building ceases when its real cost is known.

The main reason why a building of this type could be erected at such a moderate figure is because its decorative portion, which has the same architectural expression as the Villa Madama or the Papa Julio in Italy, measures in square area only 4 per cent of the total square floor area of the entire building. The remaining 96 per cent is built as simply as the office factories of the national department buildings in Washington. Such contrasts accentuate decoration, even as some simple Spanish façades make fine backgrounds for ornate entrances.

The architects were apparently influenced in their design of the main entrance by the composition of the Morgan tablet in the Metropolitan Museum. The door jambs 2 feet 8 inches wide have not a single moulding, but are decorated with three niches on each side in which in high relief are sculptured personifications of hardware and insurance. The delicate tracery which ornaments the borders around the niches which contain these sculptured figures creates a lacework effect, the scale of which is in charming contrast with the simple boldness of the figures. The figures are the creation of Ulysses Ricci of New York. The stone carving has been beautifully executed. The jambs and lintel of this entrance form a beautiful framework for the wrought-iron grill entrance by Samuel Yellin, one of the best of his examples of Renaissance wrought-iron work.

This entrance door and the highly decorative entrance lobby shown in the plans give the monumental touch necessary to a building of this character. The entrance lobby has been called the "Employees' Room" because in the ceiling, the decoration of which was inspired by the Villa Madama ceiling, the various attributes of a successful employee are depicted by figures. The strength of color in this ceiling recalls the mural work of the Cunard Building in New York, of the Detroit Public Library, of the Morgan Library in New York, etc.

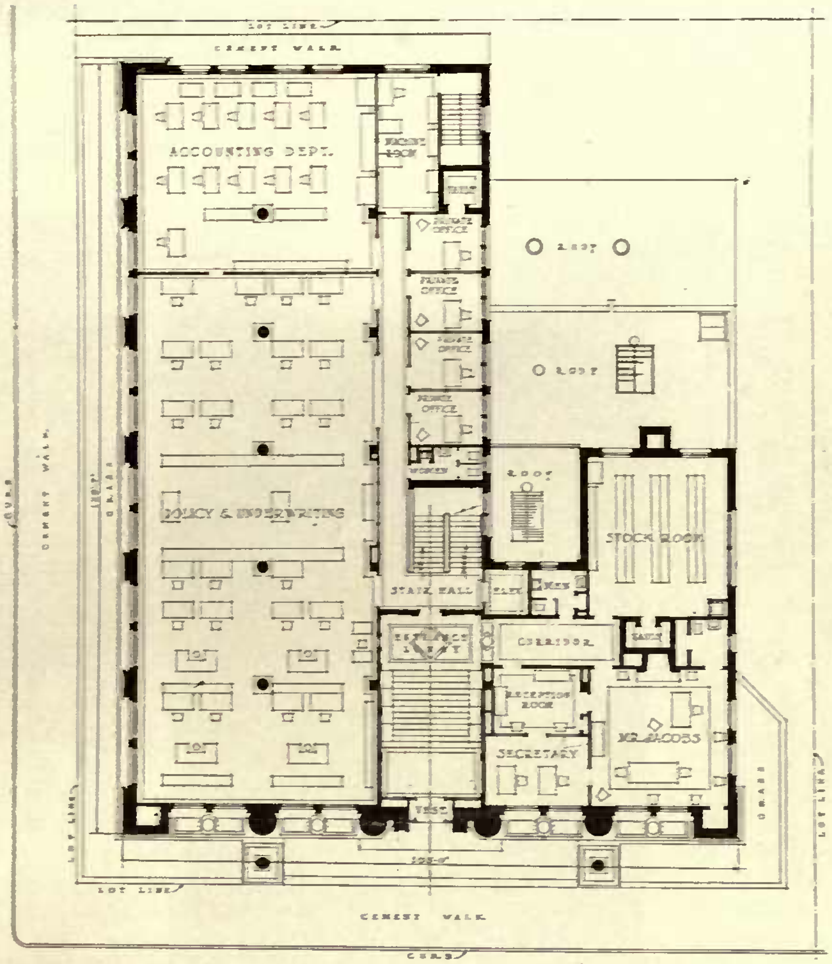
Symbolism has been used with great effect in this building, both on the exterior and interior. Every possible opportunity was seized to give this building a particularly individual touch which would make it interesting. The seals in the frieze on the exterior are those of the H. M. I.—Hardware Mutual Insurance—the seal of the United States, and the seal of Canada. In the spandrel sections on the exterior are shown the seals of the various States of the Union. The Greek fret of the base shows the national eagle, the pelican of the insurance, and the keys and padlock of the hardware industry. The tile floor shows the seasons of the year, the states of South America, the symbols of various industries, etc. Every portion of the equipment and decoration has some mark of the Hardware Mutual Insurance Company upon it. The old idea of useless decoration has been utterly done away with by these living symbols.



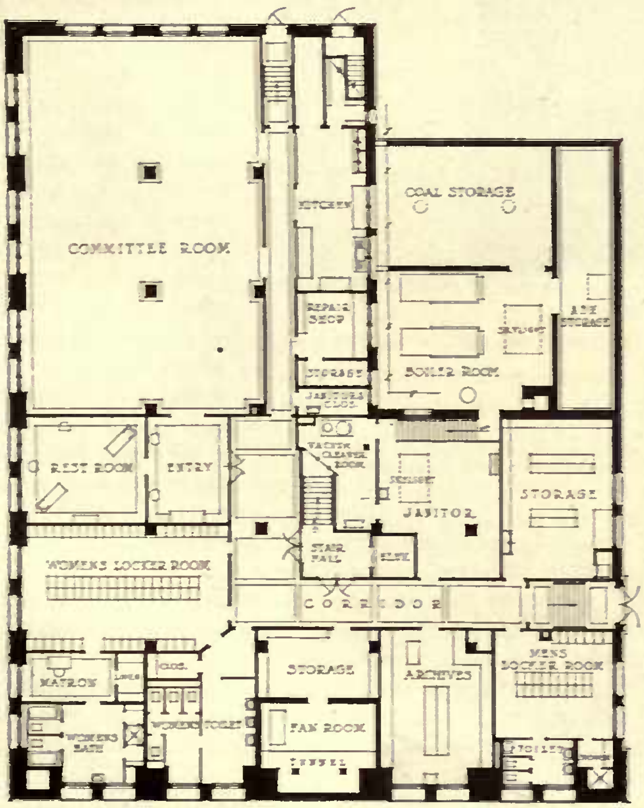
Wrought-iron lighting fixture in entrance lobby.

Color is one of the main features of this building. Were it not for the proven success of other brilliant color examples in America the architect might fear that this use of color in a business structure was extreme. But color in architecture is in "demand." The Cunard Building is the result of this "urge" in the East and the Hardware Mutual Insurance reinforces it in the Middle West.

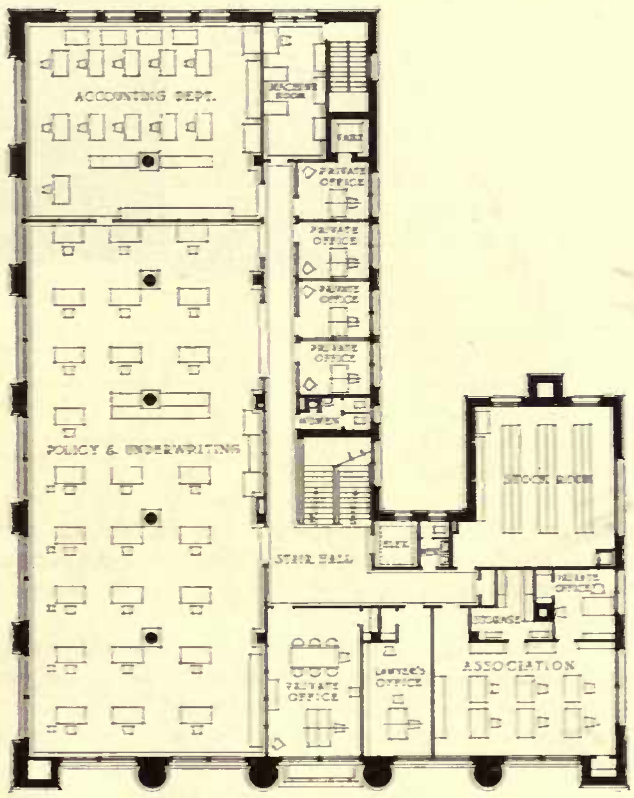
The ceiling of the entrance lobby has a central field of brilliant vermilion, grayed with arabesques of ivory white antiqued. The ivory white decorations are made more brilliant with gold accents throughout this field. The cen-



MAIN FLOOR (FIRST).



BASEMENT FLOOR.



TYPICAL SECOND AND THIRD FLOOR.

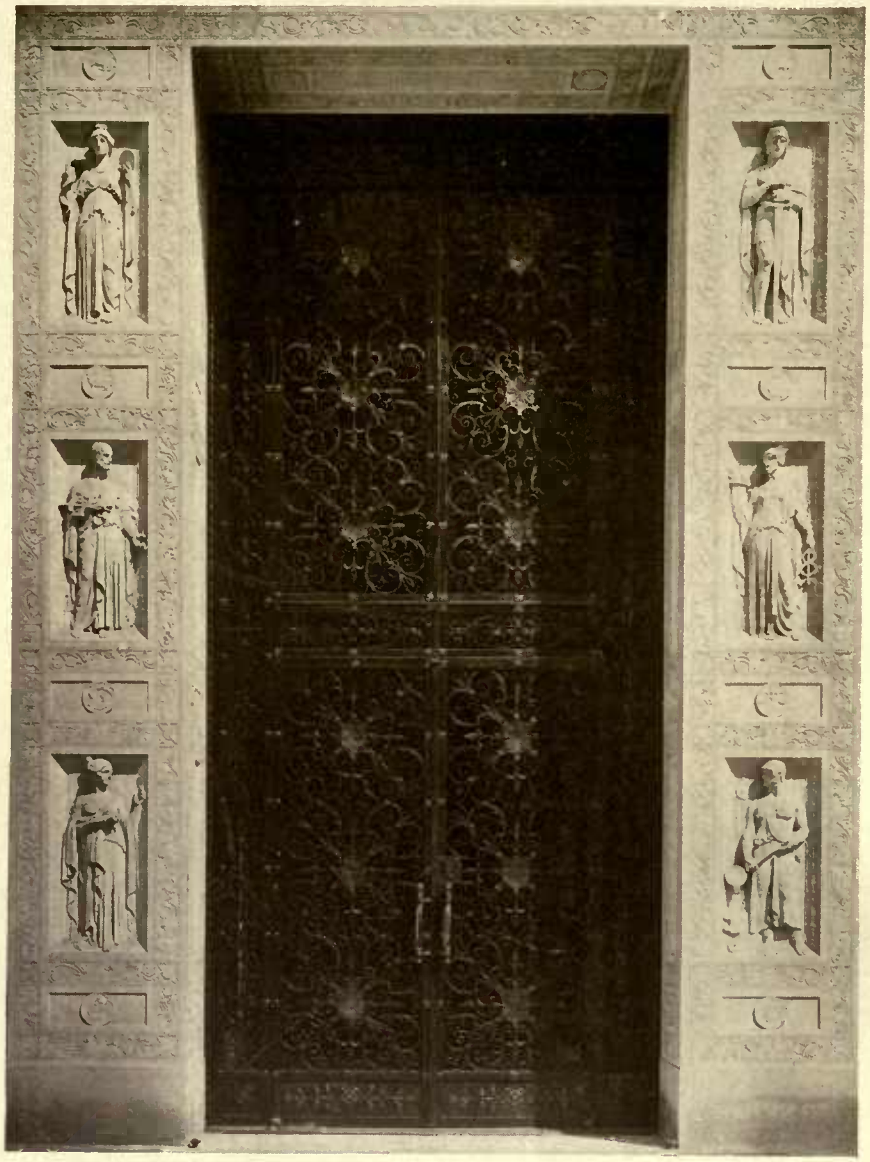
PLANS, THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

Childs & Smith, Architects.

tral portion of the ceiling has the inverted shell motive, similar to the semi-dome of the Villa Madama. This inverted shell is in the deep peacock blue, with a centre acanthus leaf rosette of light green and gold. From the centre of this acanthus leaf is suspended a wrought-iron fixture, one of Yellin's interesting types. The border around the central shell of the ceiling has a general color of deep navy blue with decorations of gold, green, and red. The corner motives of the ceiling which break into this border are of black, vermilion red, gold, and ivory white. The beautiful warm green of the Botticino marble walls contrasts nicely with the brilliancy of this ceiling.

The secretary's room is rather startling in its color effect. The ceiling is composed of large stars, approximately four feet across. The legs of the stars are of a brilliant vermilion red, the leaves in brilliant red, surrounding an acanthus leaf of gold. The centre of the star is of a deep navy blue, surrounded by gold. The background for the stars is of a warm ochre with an acanthus rosette of gold, which gives the whole ceiling a rather warm ochre general effect, accentuated by the brilliant reds and blues of the stars. The border around this field of stars is of a deep navy blue and gold. The other color effects of the room are further enriched by the beautiful gray tile colors which Mr. Mercer has so well arranged. The general effect of this tile border is of a Maltese white with accents of deep greens, blues, and red-grays.

The stained glass of the reception-room adds still another color note to the general scheme. This is one of the best examples of "commercial" stained-glass windows in the country. It leaves an effect extremely decorative and quieting.



DETAIL OF MAIN ENTRANCE.

The models of the door, commencing with the lower left, then going to the lower right, the middle left to the middle right, the upper left to the upper right, are as follows:

(Lower left.) The typification of the insurance company presenting the protection of the scroll of insurance to the labor of the hardware industry.

(Middle left.) The worker of the hardware industries presenting the results of his labor to commerce and industry on the right hand.

(Upper left.) Prudence and wisdom, the basis of insurance, standing as the attributes of the company and on the right the typification of the guardian of the financial interests of the hardware group.

Color was expressed in the furniture wherever possible, such as the introduction of a Gros Point tapestry in the guest chair of the secretary's room and in the covers of the tables. The wrought-iron work brought out this color by introducing brass accents wherever possible.

There is a great breadth about this building, an intentional avoidance of anything small, which is reflected not only in its architecture but in the policy of the officials of the company. The exterior is very simple—of the same type as the Lincoln Memorial in Washington—its entrance and hallways are large and ample, its working units are purposely large and joined together with offices only separated from these large units in such a way that the officials governing them will not be disturbed by the noise.

The "open" policy is particularly evident in the basement, which is given up to the use of the employees—a large community room served by a kitchen fully equipped, if necessary, for regular use; a ladies' rest-room, furnished with unusual taste in a French gray general tone with Medici reproductions on the walls. The women employees are provided with large locker rooms, lavatories, etc., and in addition have a separate bath department with showers, baths, hair-dryer, and presided over by a matron. Likewise the men have their locker room, showers, and lavatories.

The modern demand for good craftsmanship has been met fully. Under the influence of the highly skilled craftsmen who directed the work every one concerned on the building took the greatest interest. There was an intimate and sympathetic co-operation, a feeling of pride in a fine achievement, in which all participated from architect to laborer.

Editorial and Other Comment

American Architecture

AMERICAN architecture has been receiving considerably more than its usual share of comment in the English journals. In the *London Architectural Review* of recent date there was an admirable and well-balanced article by H. M. Fletcher on the subject, brought forth by the exhibition of American work last autumn at the Royal Institute of British Architects and by the address made by Mr. Goodhue at that time.

"What has America to teach us? First of all, because it is the lesson we most need—lucidity, the excision of the superfluous. Many of these buildings are reduced to the bare bones of wall, doors, windows, and roof, and in most the proportion of mouldings and features to the square foot of wall-space is absurdly small, judged by our standard. But how clear and emphatic is the statement, and how much the rare features gain in value by contrast with the surrounding spaces! It is no easy matter to attain such economy without crudity and ungracefulness."

We cannot resist quoting his fine description of the Washington Monument. So many of our people look upon it with the passing casualness of the passenger on a sightseeing bus, and only the few stop long enough or take the time to study its beauty in the early morning or at twilight. It is something that loses its significance in a crowd of hurried tourists; it needs the feeling of intimacy that comes only from an uninterrupted and silent contemplation—

> "Thou, silent form, doth tease us out of thought
> As doth eternity."

We do not remember reading a better or more expressive description of the monument than this by Mr. Fletcher in the article referred to above:

"This is a simple, featureless obelisk, which is yet perhaps the sublimest monument in the world, but unappreciated and unappreciable by those who have not seen it, for no drawing or photograph can convey its grandeur. It makes its effect by sheer size, being 55 feet square at the base, 35 feet square at the top of the shaft, and 550 feet high to the point. At first sight the scale is hard to realize, for there is no feature to judge by and no building near enough for comparison. You must live with it for a day or two, and note how the morning mists from the river will veil 150 feet or so at the base, while the apex shoots up sharp and definite into a clearer atmosphere, or how 100 feet at the top will glow in the sunset after the base and the surrounding trees have settled into darkness, or how at any hour the whole structure will change from ethereal blue to golden pink as you travel round from the shady to the sunny side. So by degrees, but surely, you come to feel the might of this austere masterpiece."

For a Wider Appreciation of Architecture

WE have been reading also in the *London Mercury*, a magazine devoted to letters and the arts, about the first quarterly dinner of the Architecture Club. The club has for its purpose the awakening of the public at large to a wider appreciation and better understanding of the familiar architecture of our day.

We dare say that none of the arts is of less interest to the average man in the street, and none less understood. Here and there, of course, the big show building attracts attention by sheer power of mass and height; but how many of the thousands who yearly make a pilgrimage to the Woolworth Building, to look up at its tower against the skies or to count its dizzy stories, ever stop to see and *appreciate* the wonderful beauty of its details, understand why it is called a Gothic Temple of Business? This is only one example that is a perennial reproach to our general lack of intelligent interest in our architecture. What a fine text-book on the history of architecture is presented by Fifth Avenue from the Washington Arch to the Carnegie mansion. Here the observer may see manifested in various good and bad examples the olden styles commingled with the purely modern commercial building built for "trade," with little thought for architecture beyond the elemental principles of space and light.

Colonial, Italian and French Renaissance, Gothic may be studied in some notably fine examples, and if one cares to go in for details there are enough to occupy and repay days of careful study.

All this is carrying coals to Newcastle to most of our readers, we'll admit, but we refer to these things to point a moral—that it is our own fault if architecture is not taken more seriously by the lay public. Would it not be a good idea to have an Architecture Club along the following lines in this country.

"The Architecture Club grew out of certain private meetings held last winter by a number of architects (mostly of what is called the younger generation), journalists, and men of letters. During these conversations there emerged a general belief that a good deal of admirable architectural work had been done in recent years; but it was also agreed that the good work might be far commoner than it is if full use were made of the best architectural brains of the country. It was felt that the public, even the cultivated public, was very much out of touch with contemporary architecture; that intelligent criticism of architecture was scarcely ever to be found in the non-technical press, and that there was generally a lack of contact between the most enthusiastic architects and those critics and workers in other arts most capable of giving them stimulus and receiving stimulus from them. In the end it was decided to form a club to promote public interest in architecture, particularly modern architecture, and to foment intelligent criticism of the art.

"The club is to consist of three hundred members, of which one-third are to be architects and the rest writers and other persons interested in architecture. This admixture is also visible on the executive committee, which includes architects such as Mr. Gilbert Scott, R.A., and Mr. Ralph Knott (the designer of the new County Hall), and several laymen—amongst them are Mr. Clutton-Brock and Sir Lawrence Weaver. It will be interesting to follow the steps which are taken to promote the interests of the club. What nobody could dispute is that they stand in considerable need of promotion. Nobody can compel us to hang daubs in our drawing-rooms, but every day some beautiful rural landscape or village street or some fine urban sight is defaced by an architectural daub which will afflict us and our posterity for generations. Everybody complains of this, but only active and co-operative endeavor will do anything to improve the situation."

For Coming Numbers

WE are glad to say that we have arranged for a new series of articles by Mr. DeWitt Clinton Pond that will be addressed to and of special interest to the younger men of the profession, and a new series by Mr. H. Vandervoort Walsh of timely and practical interest to all our readers.

A little later we hope to announce something of particular interest to students and the young men who are beginning their careers in the various offices.

The Elks' National Memorial Headquarters

THE competition for this monumental building has been decided, the award going to Mr. Egerton Swartwout for his characteristically finely balanced and dignified design. All of the designs submitted had distinction, but we think the decision of the jury of award will be generally approved, and congratulate both the Elks and Mr. Swartwout.

Our Frontispiece

WE are much indebted to the artist, George Wharton Edwards, for the privilege of reproducing as a frontispiece for this number his beautiful drawing of St. Paul's. He has recently made a most distinguished series of London views, of which this is one. Mr. Edwards is too well known, both by his books and his art, to our readers to need an extensive introduction. Honors have come to him in rapid succession. Awarded medal Order of King Albert of Belgium, conferred by the King, 1920; gold palms of l'Académie Française, for art, and made Officer of Public Instruction, France, 1921.

Awards by the Society of Beaux-Arts Architects

THE committee announces the results of the final competition for the Fifteenth Paris Prize of the Society of Beaux-Arts Architects as follows:

Subject: A city hall.

Jury of Awards: F. L. Ackerman, L. Ayres, R. P. Bellows, P. P. Cret, J. M. Howells, J. H. Hunt, J. G. Rogers, H. R. Sedgwick, and H. O. Milliken, chairman.

Awards: Prize and First Medal: Roger Bailey. *Patrons*: Professor E. V. Meeks and Mr. O. Faelton, Bronxville, N. Y.

Placed Second and First Medal: E. W. Burkhardt, Columbia University, New York City. *Patrons:* Messrs. M. Prevot and H. W. Corbett.

Placed Third and Second Medal: L. Fentnor. *Patron:* Mr. F. C. Hirons, New York City.

Placed Fourth and Second Medal: J. G. Schuhmann, Jr., Columbia University, New York City. *Patrons:* Messrs. M. Prevot; H. W. Corbett, and J. V. Van Pelt.

Placed Fifth and Second Medal: E. L. Babitsky, John Huntington Polytechnic Institute, Cleveland, Ohio. *Patron:* Mr. J. Wynkoop, New York City.

What the City Hall of To-Day Should Be

A city hall is the chief edifice of a city and should unite perfectly the necessary and the beautiful. It should have sufficient room to house the administration spaciously, in a manner fitting to a great municipality, and architecturally to give a dignified expression of its purpose and of its plan.

In former times such a building dominated its city by size, height, or the richness of its material and decoration. To-day office-buildings or hotels may easily dwarf it and other means than mere height and size must be used to give it distinction. The site and approaches are of great importance.

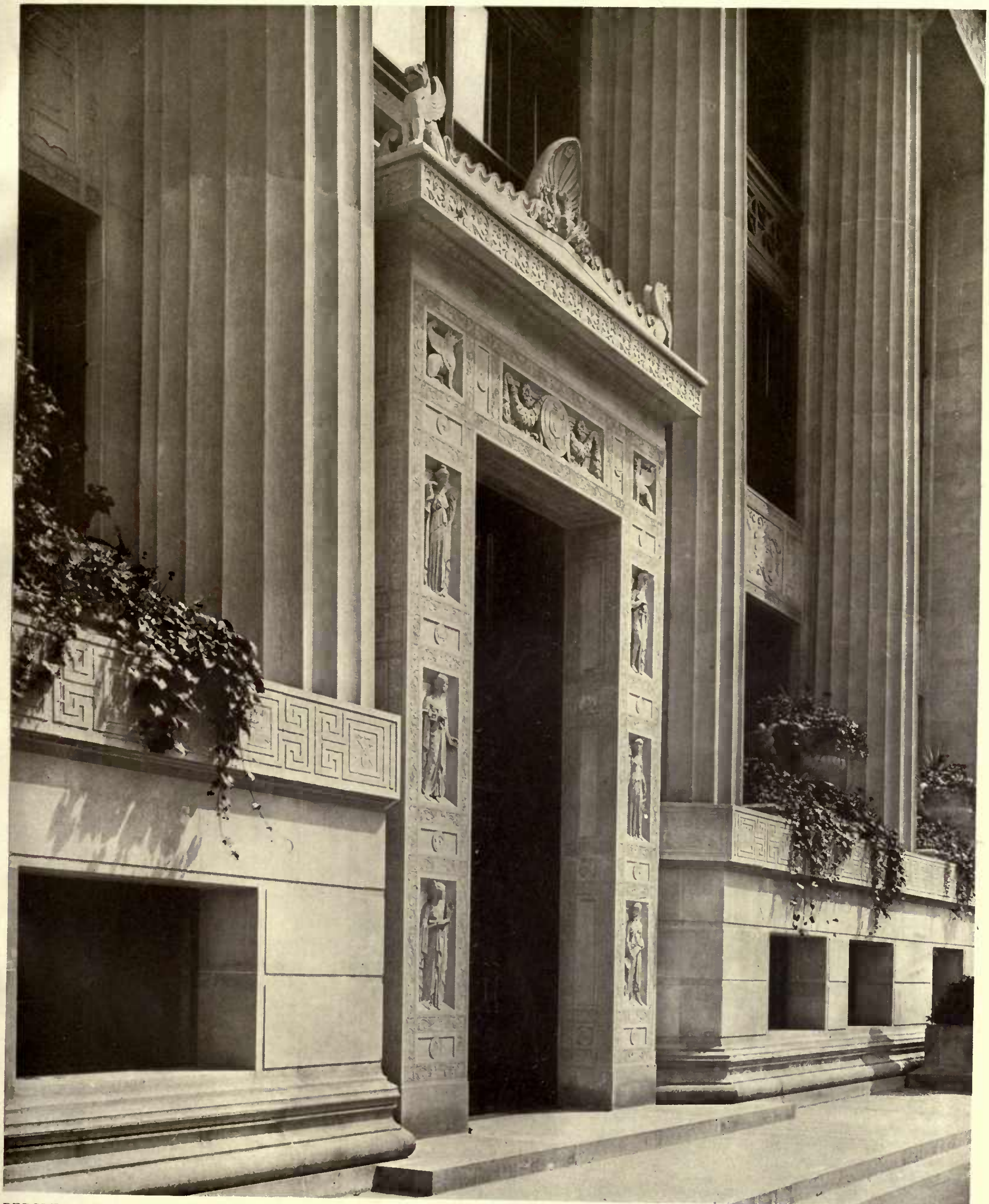
In modern cities the business administration has grown to very great proportions; new departments have been created and the older ones have enlarged to meet the more complex needs of our civilization. Because of their interdependence it is preferable to keep these offices under one roof.

With the broadening of our international relationships another function of the government has developed in the last few years, to such an extent as to suggest an interesting treatment of the city hall which has not previously been envisaged, and which gives a particular character to this programme. The mayor, on behalf of the citizens, may frequently be called on to receive delegations, or the most eminent statesmen and warriors, from the great foreign nations, and occasionally to bestow the freedom of the city. This should be done impressively, in keeping with the dignity of a great metropolis, a great centre of art and commerce, one of the most important in the country. It seems preferable to give to this function a separate building, distinct from the administration, although in connection with it.

The group will be erected on a lot 400 by 400, facing a public square suitably treated for the great crowds which will gather in it at times. This public square will also be 400 by 400. The reception building will face this park and also be on the axis of a large transversal avenue. The arrangement of the other avenues reaching the square is left to the liberty of the competitors.

Mr. D. Everett Waid, president of the State Board for the Registration of Architects, advises us that *New York Architects Must Re-Register.* All architects practising in New York State will be subject to fine if they have not made application for re-registration. Application blanks can be secured by writing to the State Board of Examiners and Registration of Architects, Education Building, Albany, N. Y.

Professor Raymond J. Richardson has been appointed assistant professor in the department of architecture at Carnegie Institute of Technology, Pittsburgh. His duties begin with the fall semester of 1922. Mr. Richardson is a native Pennsylvanian and a graduate of the University of Pennsylvania, receiving his B.S. degree in architecture in 1914 and his M.S. degree in 1915. The following year he was with J. E. R. Carpenter, architect, of New York City, and for another year was with McKim, Mead & White, architects, also of New York City. He then entered the United States navy and saw about eighteen months of service as ensign with the Camouflage Division. After the war Mr. Richardson was associated for two years with Edward Z. Scholl, architect, of Reading, Pa., and was then awarded the Henry Gillette Woodman Travelling Fellowship at the University of Pennsylvania. Since May, 1921, until July, 1922, he was abroad studying as holder of the fellowship.



PERSPECTIVE OF MAIN ENTRANCE DOORWAY.

Childs & Smith, Architects.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

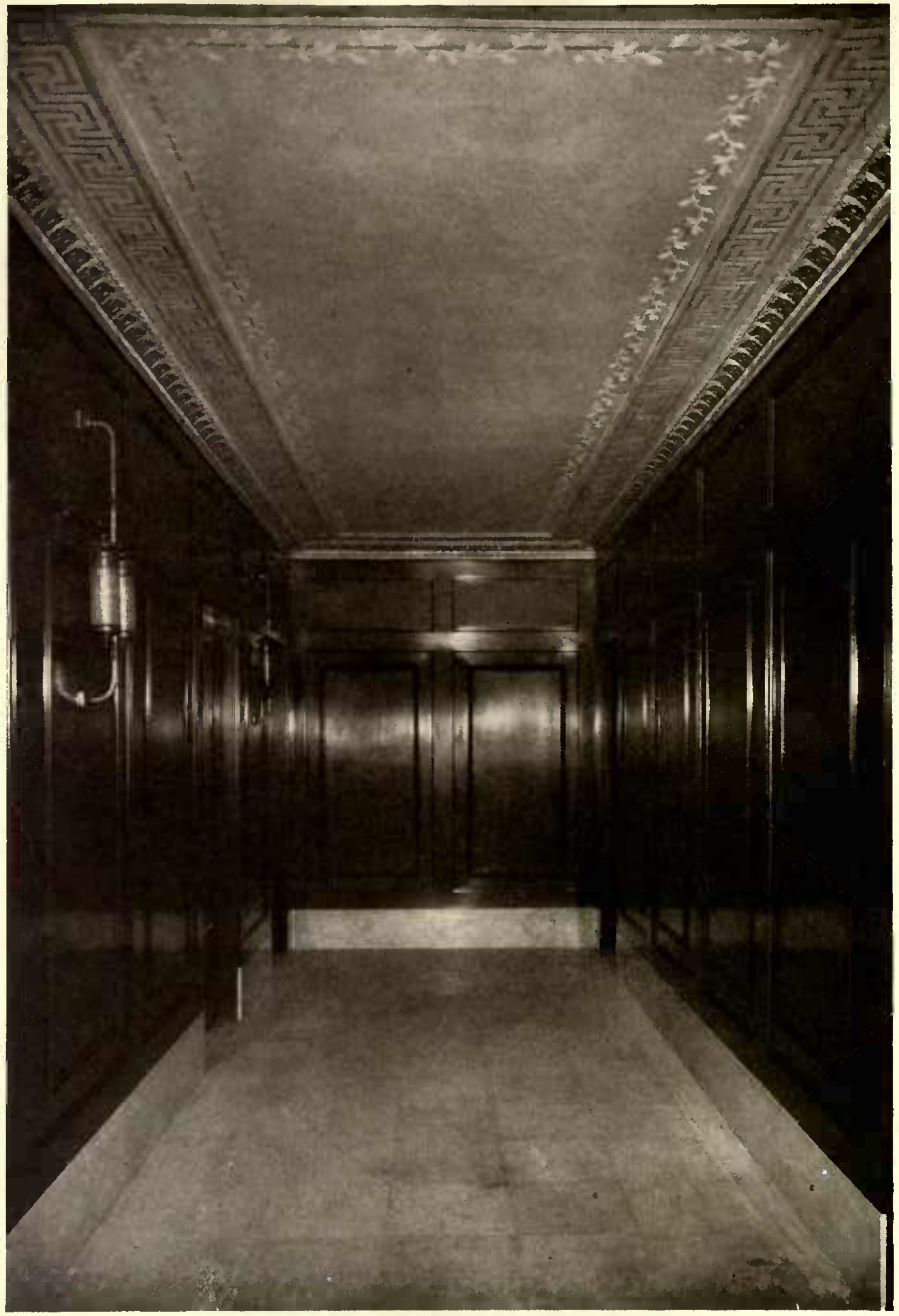
Childs & Smith, Architects.

ENTRANCE LOBBY SHOWING STAIRWAY LEADING TO THE EXECUTIVE OFFICES AND TO THE FIRST-FLOOR UNDERWRITING AND ACCOUNTING ROOMS.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

Childs & Smith, Architects.

TOP OF STAIRWAY IN ENTRANCE LOBBY.



CORRIDOR LEADING TO EXECUTIVE OFFICES FROM MAIN ENTRANCE LOBBY.

Childs & Smith, Architects.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

WORKING OFFICES.

RECEPTION-ROOM, ENTRANCE TO PRIVATE OFFICE.

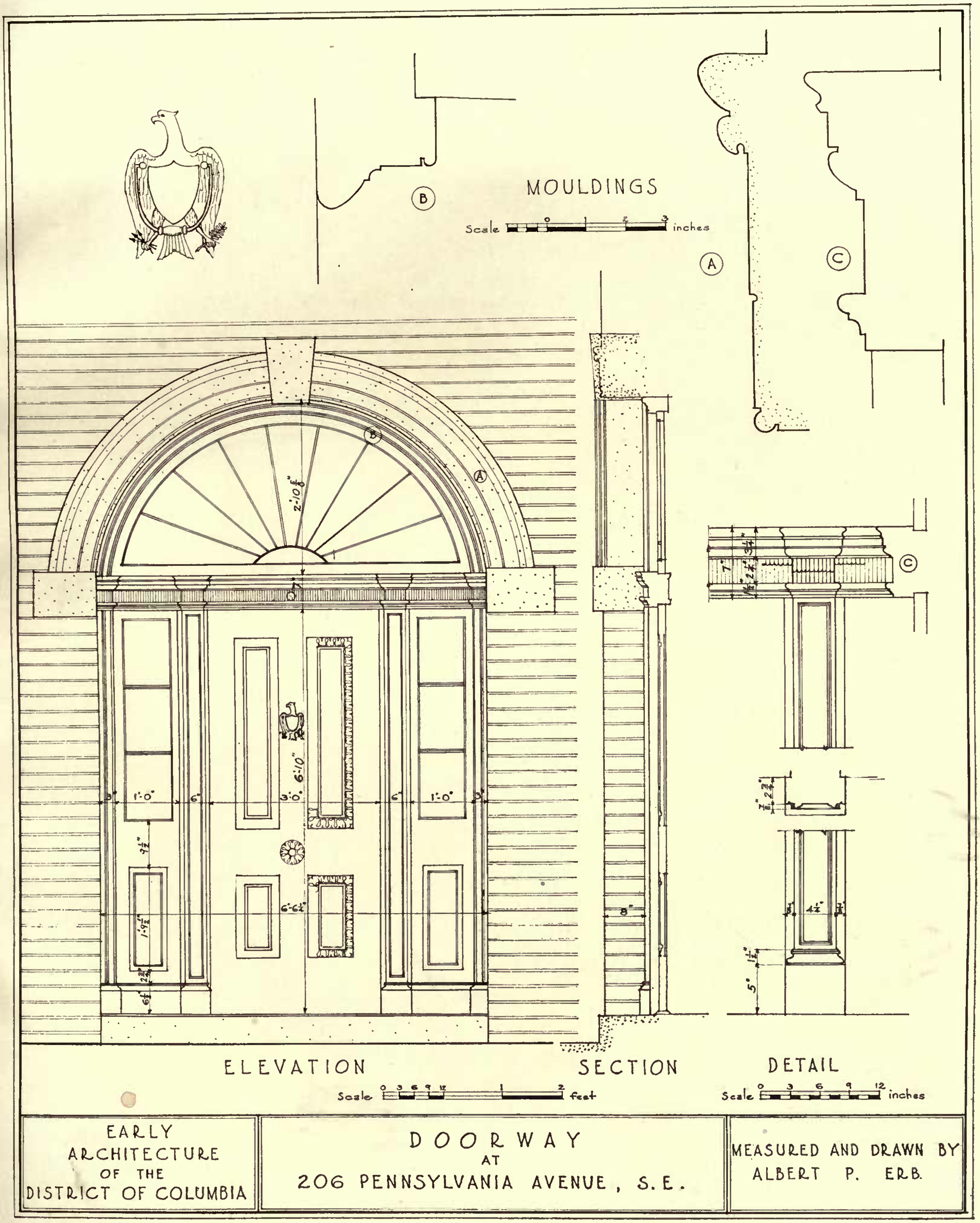
Childs & Smith, Architects.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.

PRIVATE OFFICE, MR. P. J. JACOBS.

Childs & Smith, Architects.

THE HARDWARE MUTUAL INSURANCE BUILDING, STEVENS POINT, WIS.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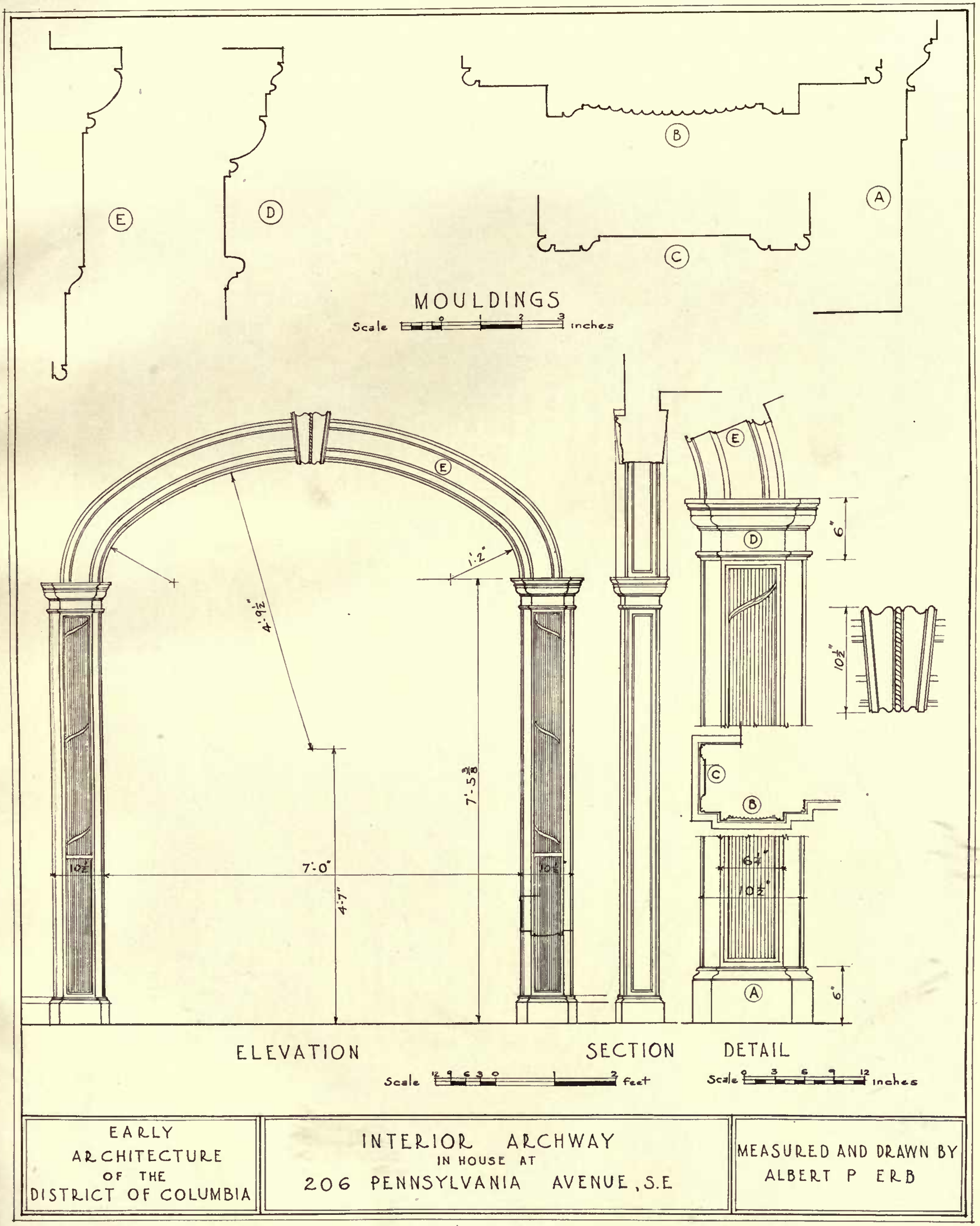
EARLY ARCHITECTURE OF THE DISTRICT OF COLUMBIA
DOORWAY AT 206 PENNSYLVANIA AVENUE, S.E.
MEASURED AND DRAWN BY ALBERT P. ERB.


MOULDINGS
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7'-0"
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10½"
6"
ELEVATION
SECTION
DETAIL
Scale 12 9 6 3 0 1 2 feet
Scale 0 3 6 9 12 inches
EARLY ARCHITECTURE OF THE DISTRICT OF COLUMBIA
INTERIOR ARCHWAY
IN HOUSE AT
206 PENNSYLVANIA AVENUE, S.E
MEASURED AND DRAWN BY
ALBERT P ERB

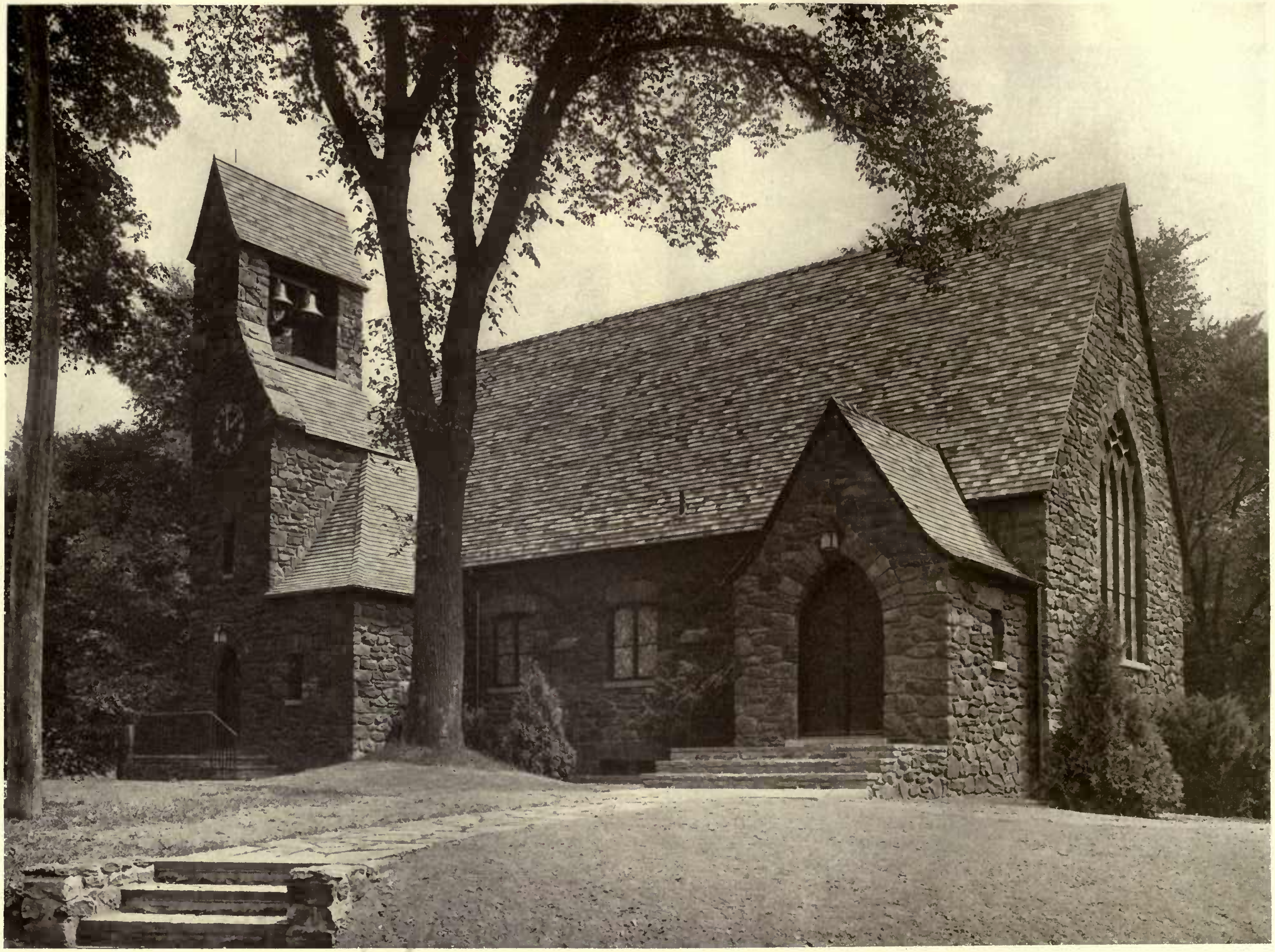
SOUTHERN PACIFIC OFFICE-BUILDING, SAN FRANCISCO, CAL. Bliss & Faville, Architects.

ENTRANCE DETAIL.

DETAIL, CORNER PAVILION.

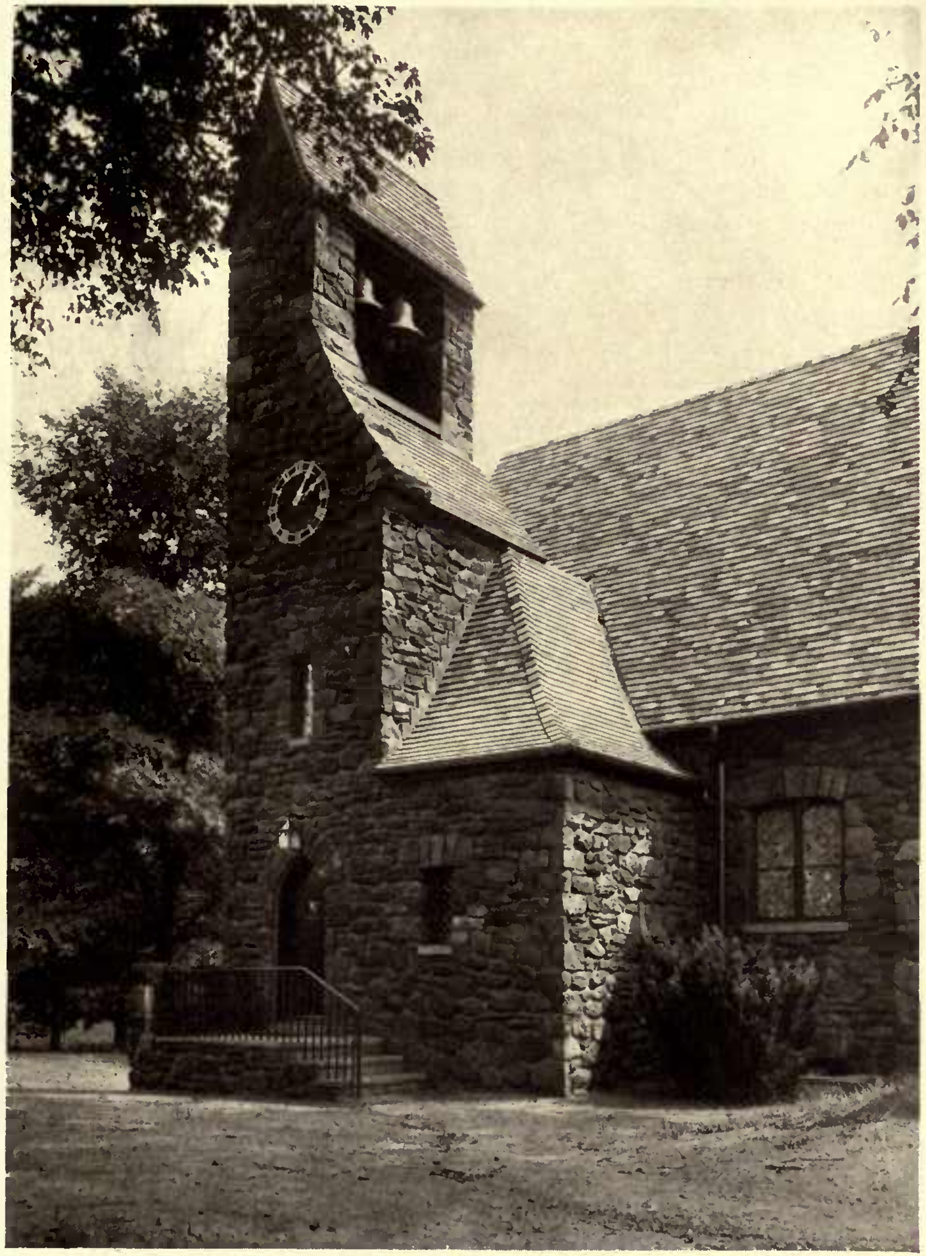
Bliss & Faville, Architects

SOUTHERN PACIFIC OFFICE-BUILDING, SAN FRANCISCO, CAL.

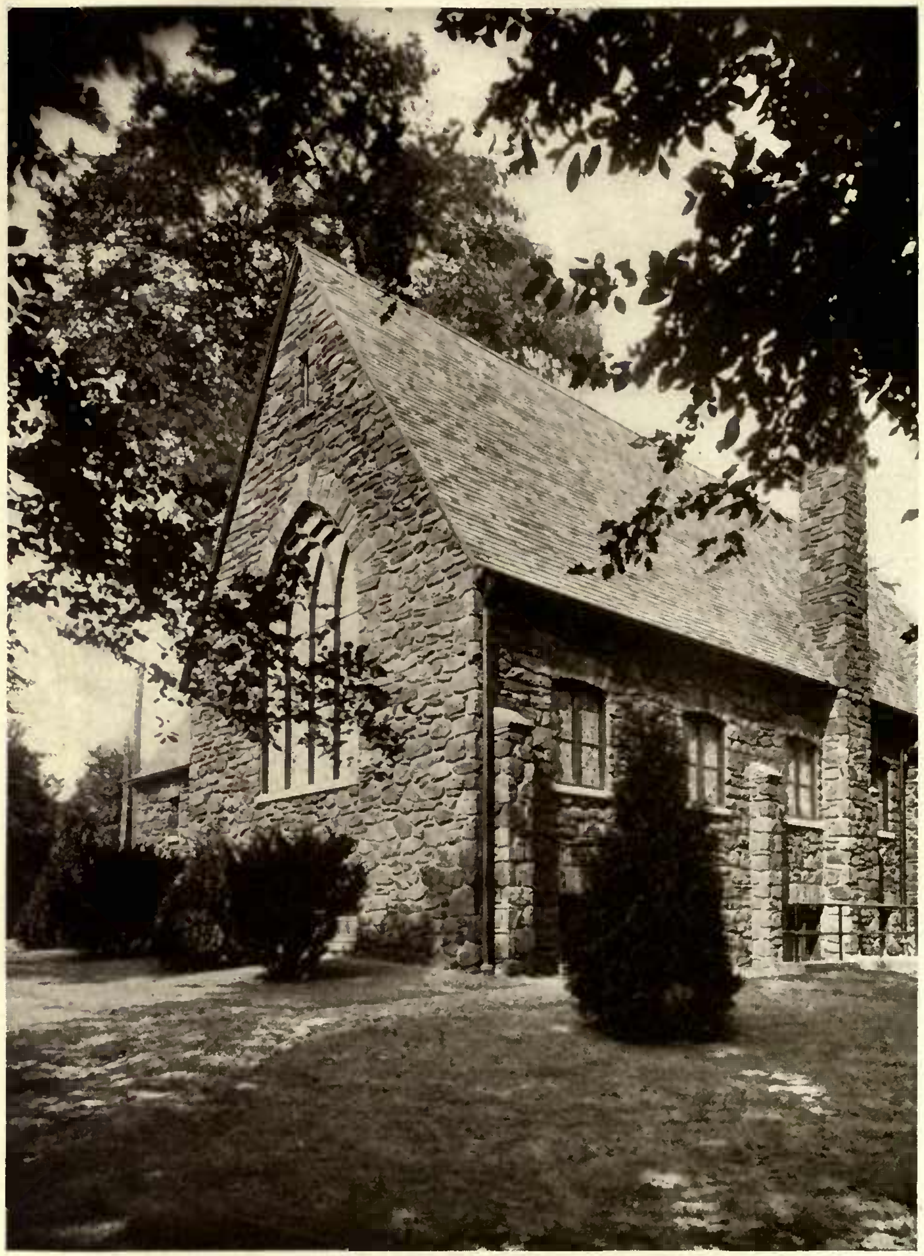


THE UNION CHURCH OF POCANTICO HILLS, N. Y.

L. W. Eisinger, Architect.



DETAIL OF TOWER.

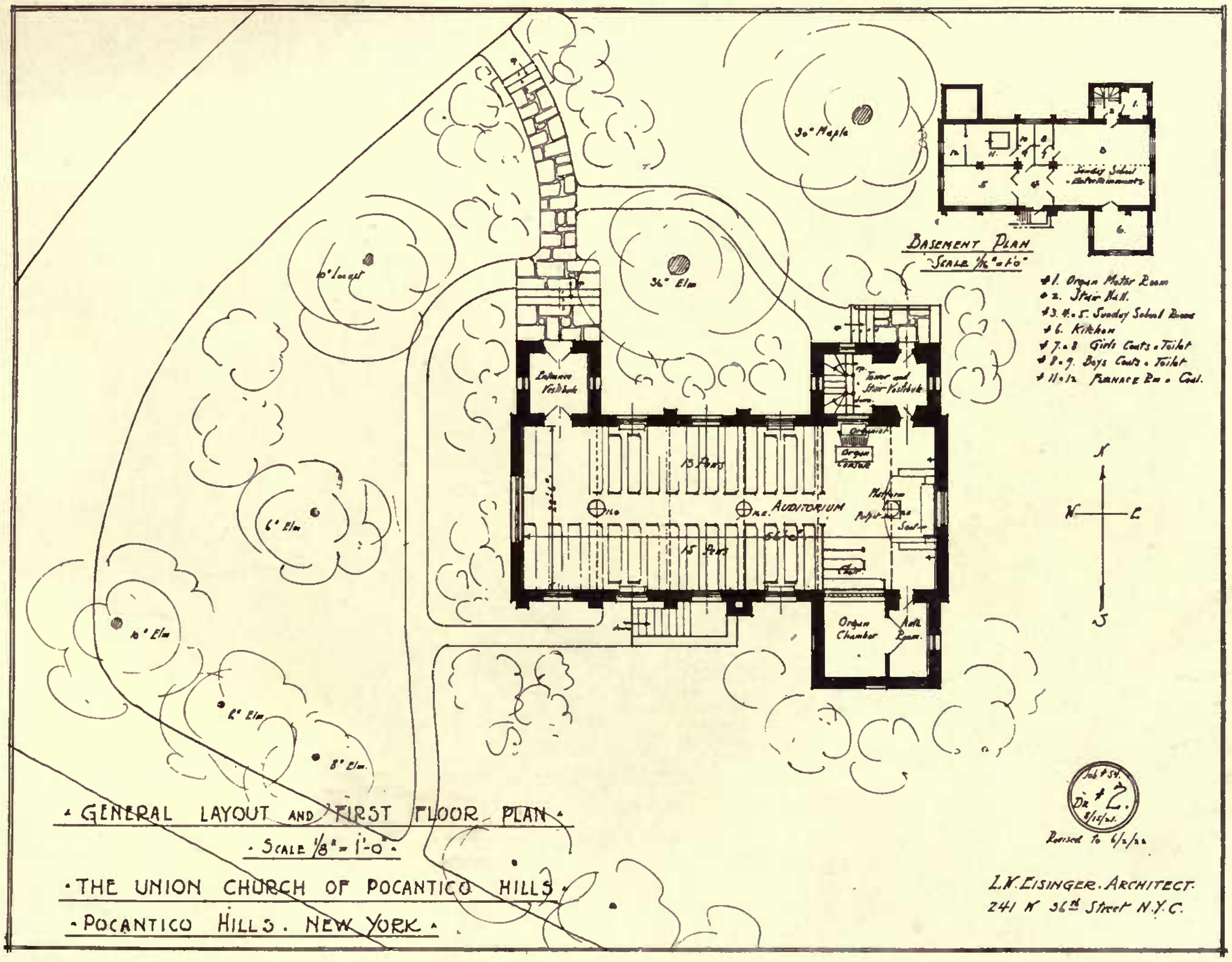


DETAIL.

L. W. Eisinger, Architect.

THE UNION CHURCH OF POCANTICO HILLS, N. Y.

AUDITORIUM.



THE UNION CHURCH OF POCANTICO HILLS, N. Y. L. W. Eisinger, Architect.

STUDIO HOME, KENNETH B. WORTHEN, ST. PAUL, MINN.

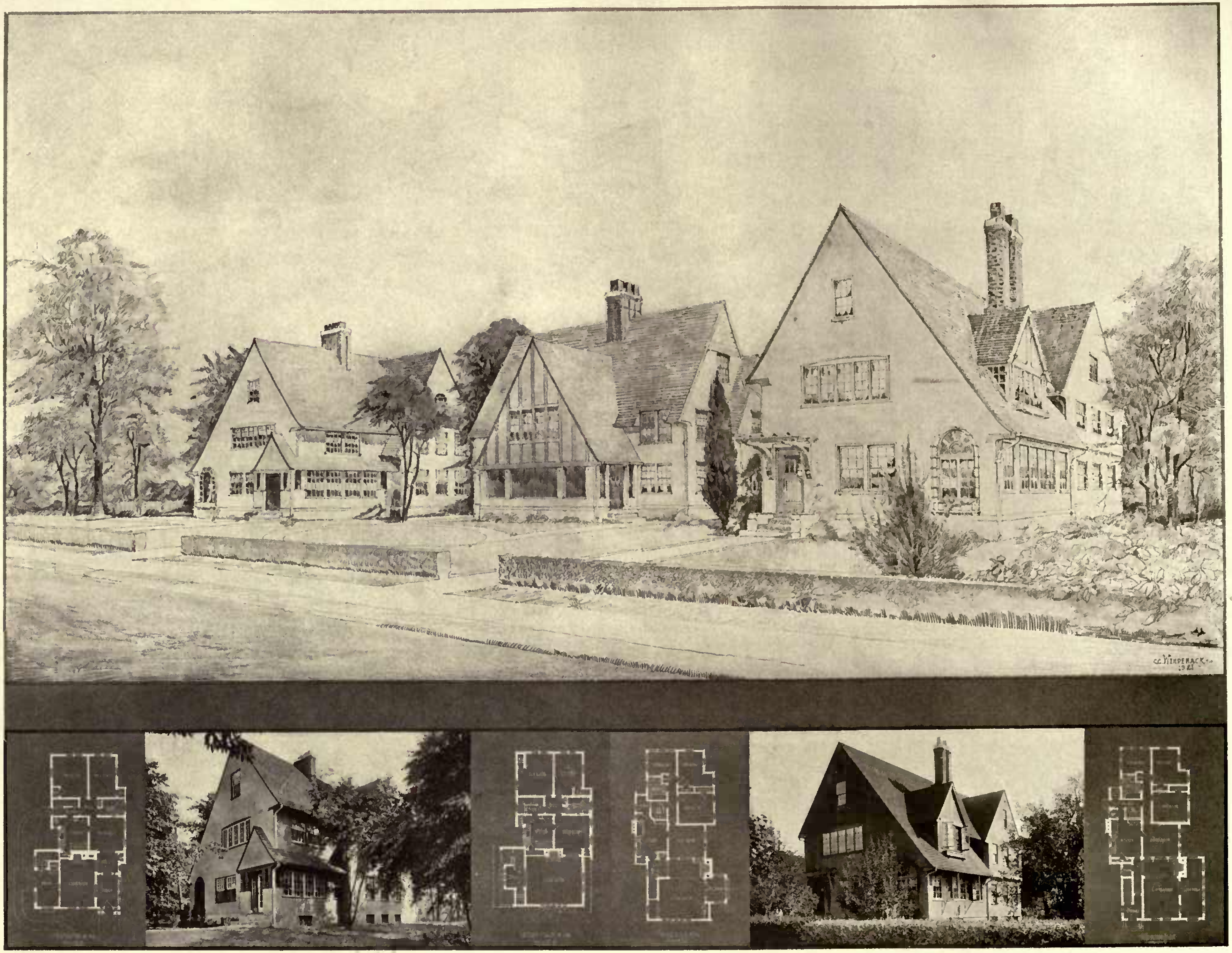
Kenneth B. Worthen, Architect.

INTERIOR.

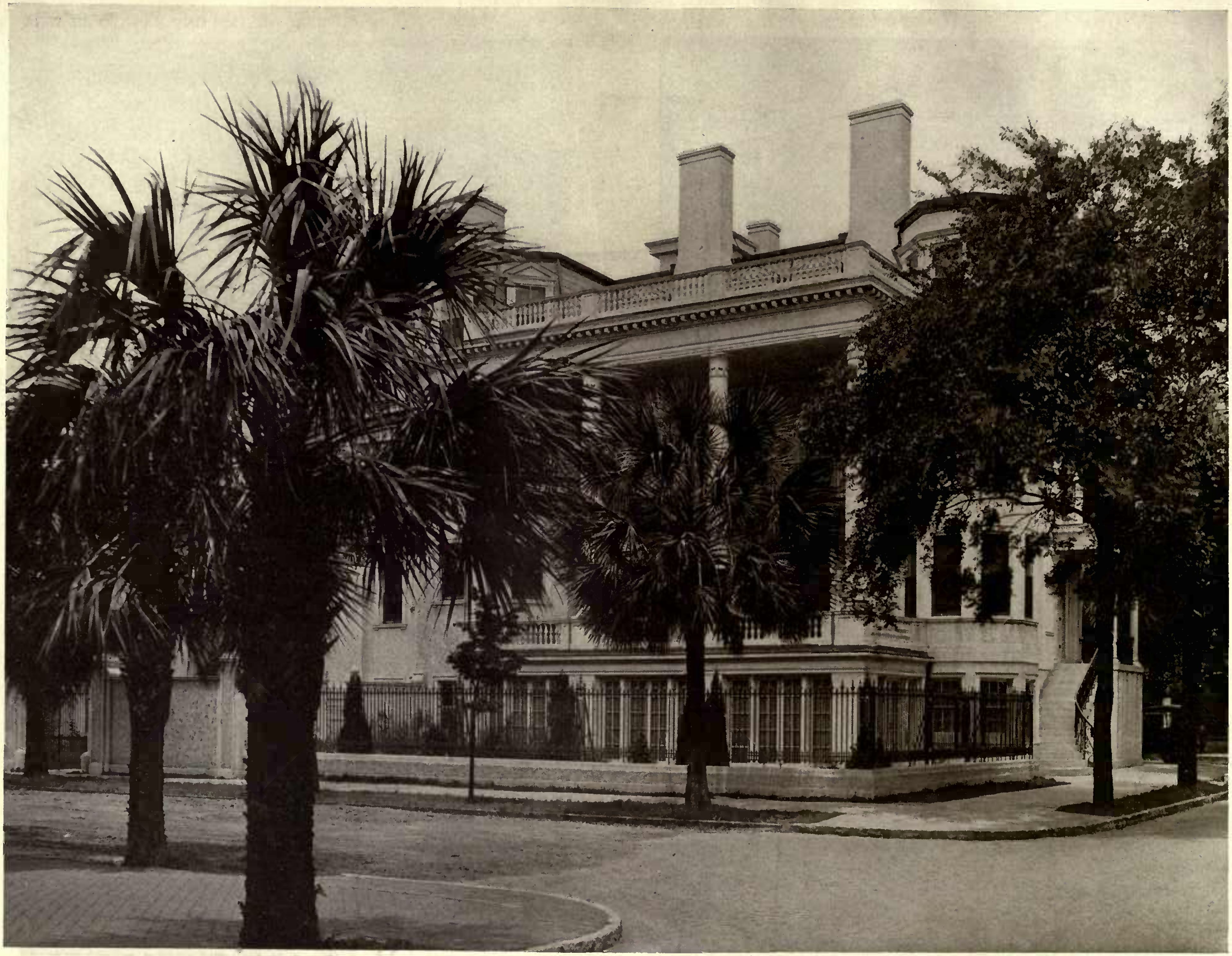
DETAIL OF ENTRANCE.

Kenneth B. Worthen, Architect.

STUDIO HOME, KENNETH B. WORTHEN, ST. PAUL, MINN.



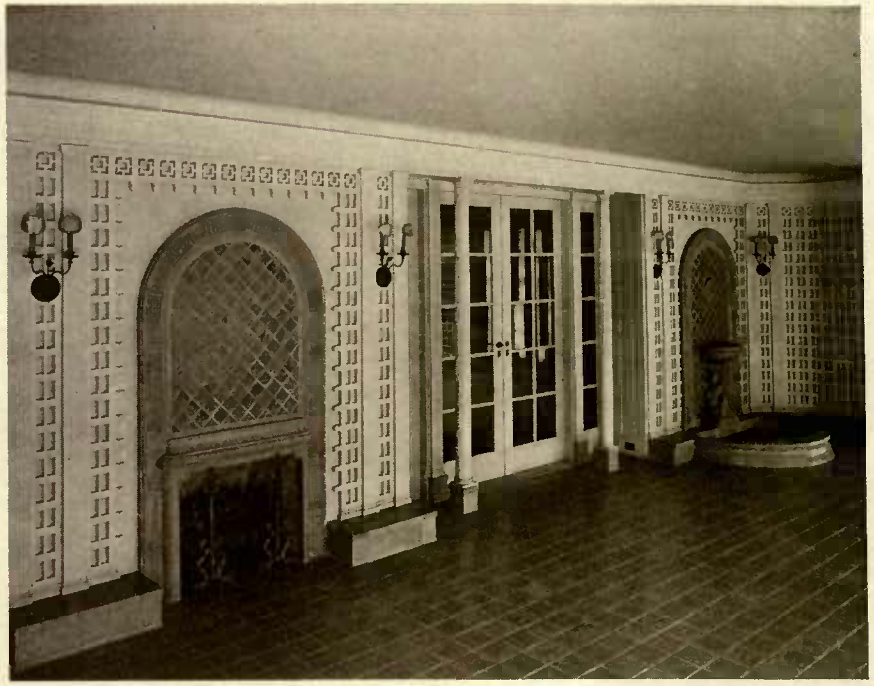
GROUP OF TWO-FAMILY HOUSES, MONTCLAIR, N. J. C. C. Wendehack, Architect.



RESIDENCE, CARL ESPY, SAVANNAH, GA.

Henrik Wallin and E. Lynn Drummond, Associate Architects, Savannah, Ga.

SOUTHERN VIEW, SHOWING GARDEN WALL.



FIREPLACE AND FOUNTAIN IN LOGGIA.

VIEW OF GARDEN AND LIVING-PORCH.

MANTEL IN RECEPTION-ROOM.

RESIDENCE, CARL ESPY, SAVANNAH, GA.

Henrik Wallin and E. Lynn Drummond, Associate Architects, Savannah, Ga.

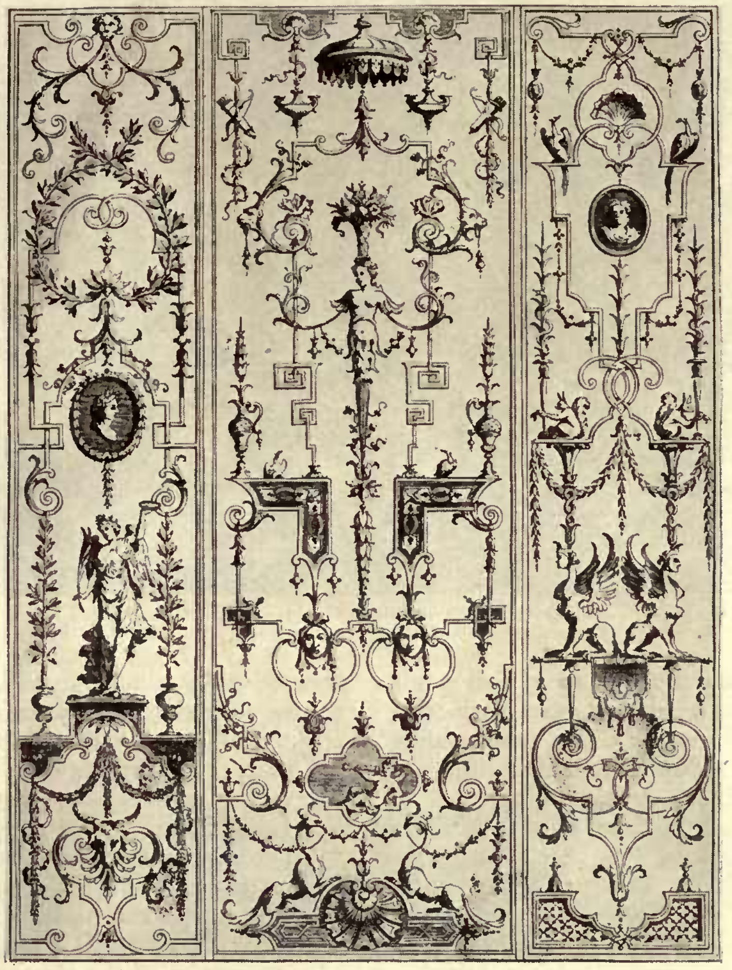
"La Décoration Clarie"*

A Phase of French Mural Painting from 1663 to 1788, and Some of Its Exponents

By Henry Coleman May

THE early years of the nineteenth century marked a decline, resulting shortly in a practically complete disappearance, of mural painting as applied to domestic interior architecture. Vestiges of a former fashion still persisted, it is true, but in so debased a form that it is impossible to consider the stencilled walls and ceilings of the Victorian era as continuations of what had once been a brilliant and flourishing art. In the twenties and thirties we still find faint echoes of Angelica Kauffman's innocuous decorations, and characterless reminiscences of frescoes designed by the Brothers Adam, while in France there lingered vanishing echoes of Percier and Fontaine's ultraclassical ornamentation.

All this is indeed a far cry from the sumptuously painted rooms of Dutch and Italian seventeenth and eighteenth century houses; from the spirited compositions that enlivened the four walls of English and French contemporary salons. After 1830 overdoors and mirror-pieces, radiant with exuberant flowers and fanciful birds, panels showing scenes on land and sea, of known and unknown countries, were replaced by plain spaces spotted for the most part with meaningless framed pictures or covered with wall-papers of depressing design. As time went on, stodgy damasks, repeating on their respectable surfaces motives redolent of the artistic sensibilities of Manchester and Birmingham, or describing in Lyons silks the indigestible taste of the "époque Louis-Philippe," were spread from wainscot to cornice, forming backgrounds for the massive gilding surrounding, perhaps, some unexpectedly charming Winterhalter.



I. Bérain. Engraved design for three panels (1667).

The delicate Neo-Pompeian motifs of a Dugourc, of a Rousseau de la Rottière, even the affected classicism of the Napoleonic era, were despised, and the magical walls painted by a Fragonard or an Hubert Robert were relegated to something resembling oblivion by the arbiters of a period fantastic for its phenomenal lack of taste.

To-day there would seem to be a reawkened interest in mural decoration. A certain number of modern rooms have been very successfully frescoed, not to mention the innumerable others from which silks and papers have been discarded in order to return to the panel paintings of an earlier age. In houses of a more modest description papers bearing continuous scenes, dating for the most part from the early nineteenth century, have been satisfactorily revived. Many of these latter, copied from the classic documents of David, or from the Oriental or Romantic imaginings of somewhat later artists, make most delightful backgrounds, and are, after all, direct if humble descendants of their richer and nobler prototypes.

There is something extraordinarily satisfying about a painted room. One has a feeling of completeness which can never exist in an apartment hung with framed pictures of varying sizes, no matter how marvellous these latter may be in themselves. Since we are on this subject, it may be as well to remark the fact of how often people seem to forget that all framed pictures should be hung coherently in regard to the decoration of a room, the features of which ought, primarily, to create a feeling of continuity. Framed paintings should be considered as one might a window, out of which one gains a glimpse of a stranger and more beautiful world, or the sudden vision of a swift and thrilling scene. This was well understood in eighteenth-century England and France, where their masterpieces in portraiture were not considered too important to play a part in the general decorative scheme of a room, but rather to be enhanced by their harmonious framing. One of the best examples of this is the celebrated Double Cube Room at Wilton, where the sumptuous Van Dykes are deliberately incorporated in the general composition of the walls. The great difficulty, however, with much modern art is that it is apt to disregard all laws of composition. One sees that the picture begins inside of the frame, but one feels that most of it continues far outside of these limits. An unrelated episode is practically impossible of proper placing within any interior, but had better be left in a garden or hung on the walls of a veranda! The passion

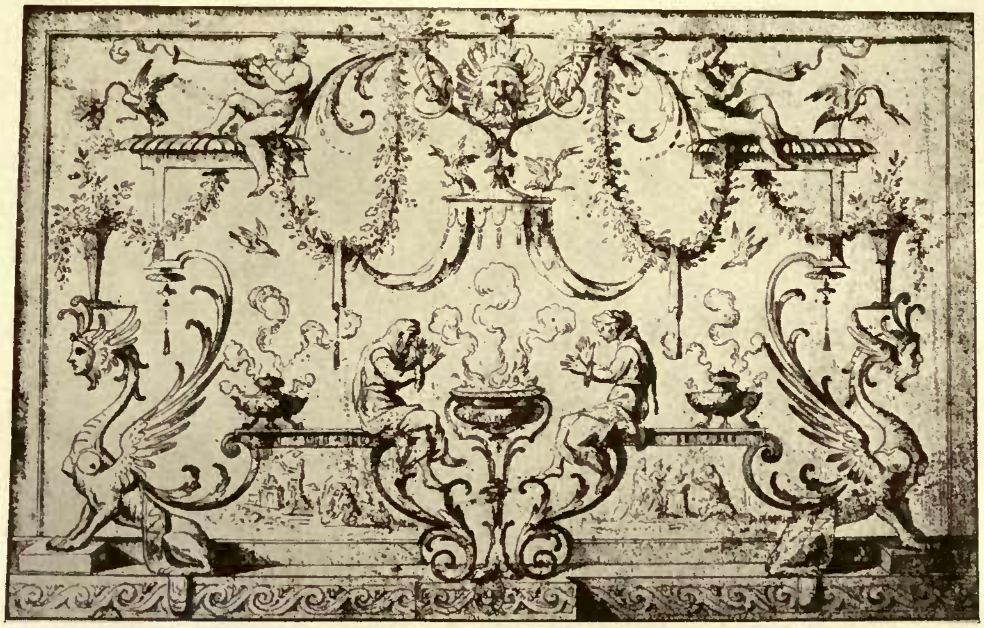
* I have retained the French appellation because its exact sense is only translatable in English by a sentence, instead of by a title.

for great art, the recognition of a supreme creation, should not blind one to the exigencies of good taste or cause one to lose one's sense of measure. One is so often surprised to discover appreciation unaccompanied by taste.

It would, of course, be absurd to pretend that the greatest pictorial art does not exist separately, and within frames, but many of the brushes which touched the large surfaces of entire rooms were impelled by the hands of masters.

The early Italians bear witness to this. In their time the "tableau de chevalet" had not been invented; their walls became pictures, and it was only much later that rooms were decorated with conventionalized painting, marking a step forward in domestic ornament, and one which did not correspond exactly to the pictured room of an earlier epoch or the sumptuous tapestries of mediæval and ante-Renaissance Europe. In the fifteenth and sixteenth centuries we find numerous examples of painted panels. In the latter part of the fifteen hundreds small panels profusely decorated with arabesques and other conventionalized designs were extremely popular. During the era of Louis XIV, Bérain brought these motives to a high point of perfection, infusing into them a new and more distinctive character. He was closely followed by Gillot, whose fancy waned before the imagery which flowed from the brushes of Pillement and of Christophe Huet. As time progressed so did this very special and delightful form of art, until we find its apotheosis in the celebrated Fragonard Room, at present the property of Mrs. Frick. The panels painted for Bagatelle by Hubert Robert, now forming a part of the dispersed Morgan Collection and on view in the Metropolitan Museum of New York, are typical of the last important phase of related mural decoration and describe that return to nature, so called, which characterized the final efflorescence of French decorative art before the Revolution.

It is not illogical to consider Bérain as the first real originator of a special form of wall decoration, that of rooms painted in a spirited yet thoroughly conventionalized manner, introducing free and fanciful subjects surrounded and restrained by confining arabesques. His creations were not, as in the case of the Dutch and Italian artists and of some of the later French masters, a series of framed and related pictures occupying all the available surfaces of a room; they consisted in a series of light compositions painted on the walls, the latter being still visible. In a word, he ornamented the walls, and did not turn them into pictures. This manner was called at the time "la décoration claire," and the three first plates accompanying this article clearly illustrate how Bérain handled the type in question.



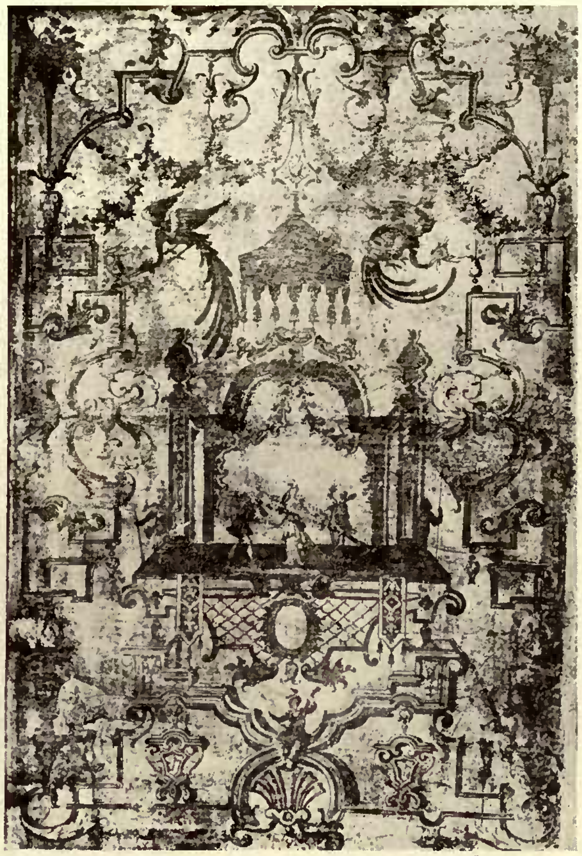
II. Bérain. Design for panel. Pen drawing touched with sepia (Bibliothèque Nationale Collection, Paris (1663).

Jean Bérain, "déssinateur de la Chambre et du Cabinet du Roi," was born at Saint-Mihiel in 1638, and enjoyed throughout his entire career the greatest possible vogue. Nothing seemed to be done that was not either after his manner or else directly taken from his own designs, of which he published an enormous number. His ornamentation serves as a type of Louis XIV decoration, for Bérain lived and worked through practically the entire reign of that monarch, at least so far as its fixed artistic style is concerned, and his activities continued almost up to the day of his death. His earliest work bears the date of 1663; he died in Paris on December 18, 1711. Like all other masters of decoration of his time, and those of the succeeding reigns, his designs were extremely varied in character. They did not consist merely in decorative suggestions for flat surfaces, but included drawings for furniture, bronzes, carriages, gardens, and all the minor related objects to these things. He had a particular fondness for fanciful subjects. Within his arabesques, among the sprays of foliage and conventionalized vegetation, we see curious birds and beasts, figures in contemporary dress, Chinamen in brilliant costumes. Slender sphinxes and caryatides play their constructive part among allegories and mythologies. Portraits appear in central medallions, birds and monkeys disport themselves, flying past, and clinging to the graceful tendrils of exotic plants.

In description these compositions would seem precisely to correspond with those of a later time, but it must be remembered that though the subjects are analogous the manner is totally different. With all his fancy there is something serious in Bérain. His hand has lightened the precision of his forerunners of the Renaissance, but it remained for his eighteenth-century successors to transform this light precision into an airy freedom of composition.

If one were to describe the designs due to the brush of Jean Pillement, who was born nine years after the death of Jean Bérain, and who lived until the year 1808, the elements forming the subjects of his compositions would appear to be but a repetition of those used by the earlier master. Yet nothing could be more different, though necessarily the idea is the same.

Pillement was thoroughly and absolutely Louis XV, just as Bérain was typically Louis XIV, and the comparison of the two is most illuminating and amusing. The latter, as we have seen, spent his entire career in Paris, whereas the former worked not only in that capital but passed a great deal of his time in London. He died in Lyons in the Napoleonic epoch and, though he had lived throughout the whole reign of the sixteenth Louis, his manner up to the very last continued to be that of Louis XV. His brushwork was broad and free; his composition ignored that obvious balance which seemed indispensable to the taste of his predecessors; his touch was airy and spontaneous. He was officially described as an "engraver and painter of flowers," and had been given the title of "First Painter to the King of Poland." He published numerous volumes containing suggestions and models for mural decoration, one of which, published in London in 1755, was entitled "A New Book of Chinese Ornaments." His predilection for the exotic is seen in the names of many of his collected creations, and the titles themselves evoke fascinating pictures of would-be Oriental imagery. "Fleurs persanes," "Cahier d'oiseaux chinois," as well as "Balançoires chinoises" and "Parasols d'Orient" are combined with what the artist himself called "fleurs singulières, mélangés de paysages et motifs fantaisistes, de rinceaux de rocaille et de plantes étranges."



III. Bérain. Painted panel (1674).

Christophe Huet with his brother Nicolas were contemporaries of Pillement. Their style was more conservative than the latter's, and in their touch something of the Regency and of Watteau persisted. Their work, less original and facile, more highly finished and important, has remained to us in its most brilliant phase on the celebrated walls of drawing-rooms within the Hôtel de Rohan and the château of Chantilly (Plate VII). Of the two, Christophe was undoubtedly superior in talent as well as in popularity, though Nicolas has left us many charming examples of his art, of which Plate VIII is a good specimen.

When Madame de Pompadour leased the Château de Champs from the Duc de la Vallière she, notwithstanding that her occupancy of the house was but temporary, spent there more than two hundred thousand French pounds on alterations, improvements, and decoration. Among the painters commissioned to beautify the rooms were both Pillement and Huet, who worked in collaboration, covering the walls with graceful imagery. These paintings survived the ravages of the Revolution, and the small sitting-room decorated by both of these artists serves as an excellent example of mid-eighteenth-century light decoration. It has an airy and pleasing character, and one can imagine nothing but the brightest and gayest of conversations taking place therein.

Plates IV and V are descriptive of Pillement's Chinese manner. They exemplify his lightness of handling and his independent though balanced treatment of line. It is unfortunately impossible for a photograph to do justice to this artist's broad and spontaneous brushwork as well as to the extraordinary charm of his coloring. In a composition such as that shown in Plate VI, we have but a suggestion of what is his most typical manner. He painted very often in off tones of blue and green, illuminated here and there with brilliant touches of color. I do not believe that any of his paintings exist in America save those, similar in composition to the last-mentioned illustration, forming the walls of a very remarkable room in the Washington residence of Mr. Perry Belmont.

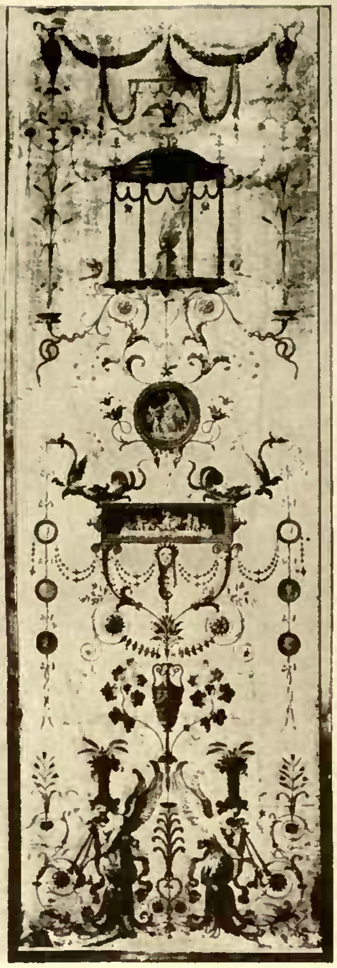
V. Pillement. Engraved design for a panel in the Chinese taste (1755).

VI. Pillement. Painted panel (1750–60).

IV. Pillement. Engraved design for a panel in the Chinese taste (1755).

VII. Christophe Huet. Painted panel. Chinese scene framed in arabesques (1745).

VIII. Jean-Baptiste Huet. Painted panel (1760).



X. Painted panel. Pompeian style typical of late Louis XVI manner (1788).

Although Pillement's style was distinctly personal, though his compositions would seem, and indeed were, wholly dissimilar to the ordered fancy which regulated Bérain's inventions, yet the latter's formula had never disappeared. Gillot, Cuviller, the Huets, and numerous others employed it. With the advent of Louis XVI we see its characteristics more definitely renewed. All styles which have their genesis in tradition are essentially constituted, not by absolute innovation, but by modification typical of the existing order of things. With Salembier, Rousseau de la Rottière, and Jean-Démosthène Dugourc, we see at once the continuation, in transposition, of Bérain's method. We find the same arabesques, affined and less positive, framing the usual accessories; medallions, chimeras, terminal figures, fanciful

IX. Three small panels from the doors of Marie Antoinette's Turkish boudoir in the palace of Versailles. Medallions painted in Grisaille, surrounded by arabesques birds, beasts, masks, incense-burners, and figures in exotic or contemporary dress.

Plate IX shows us three small panels at present in the Museum of Decorative Arts in Paris. They were formerly at Versailles in the Turkish Boudoir of Marie Antoinette. No better illustrations could be found to exemplify the early Louis-Seize manner. There is a grace, a lightness of touch, which is full of movement and charm. We are still far from that immobility which obtained in the latter years of the reign. These decorations also possess an amusing quality which shows us that the "esprit" of the preceding period had not been forgotten, even though classicism had begun to encroach on its exuberance. Similar designs may be found in the charming interiors composed by Moreau le Jeune, Eisen, and Saint Aubin as a background to their compositions. They belong to the best moment of the epoch, and are a happy combination of fanciful elements with classical arabesques. A slightly later style is that of the paintings which decorate the famous round salon of the château of Bagatelle. These are attributed to Dugourc and they represent the most successful moments of the pseudoclassic reaction. Other panels belonging to the same years are preserved in London in the South Kensington Museum. They are the work of Rousseau de la Rottière, who was responsible as well for the marvellous bedchamber of Marie Antoinette in the palace of Compiègne. These two rooms, with their decorations, have been minutely and brilliantly described by Lady Dilke in her monumental work on French art of the time.

The last phase of this particular art, before its colorless revival under Napoleon, we have exemplified in Plate X. Here we see the final echo of Bérain's creations imbued with the spirit of Pompeii and Piranesi. Yet all one has to do is to glance at the first of our series of illustrations to see how the tradition has persisted, how logical and faithful is its continuation. We are also inclined to believe that this formula still has possibilities, and that it would make an interesting vehicle for the furthering of modern domestic interior decoration.

Construction of the Small House

By H. Vandervoort Walsh

Instructor, Architectural School, Columbia University

Article XXII

BUILDING THE SETTING FOR THE HOUSE

Theoretical Features of Ground Arrangement

THERE are five fundamentals which should be considered in finishing the grounds about the small house, for it must not be forgotten that the finest jem of domestic design will be lost unless it is placed in the right setting. These five principles are the production of an intimate relation between house and grounds, the formation of a natural frame about the house, the building of interesting approaches, the planting for seasonal effects, and the growing of interesting and beautiful vistas as viewed from the house.

1.—*Intimate Relation Between House and Grounds*

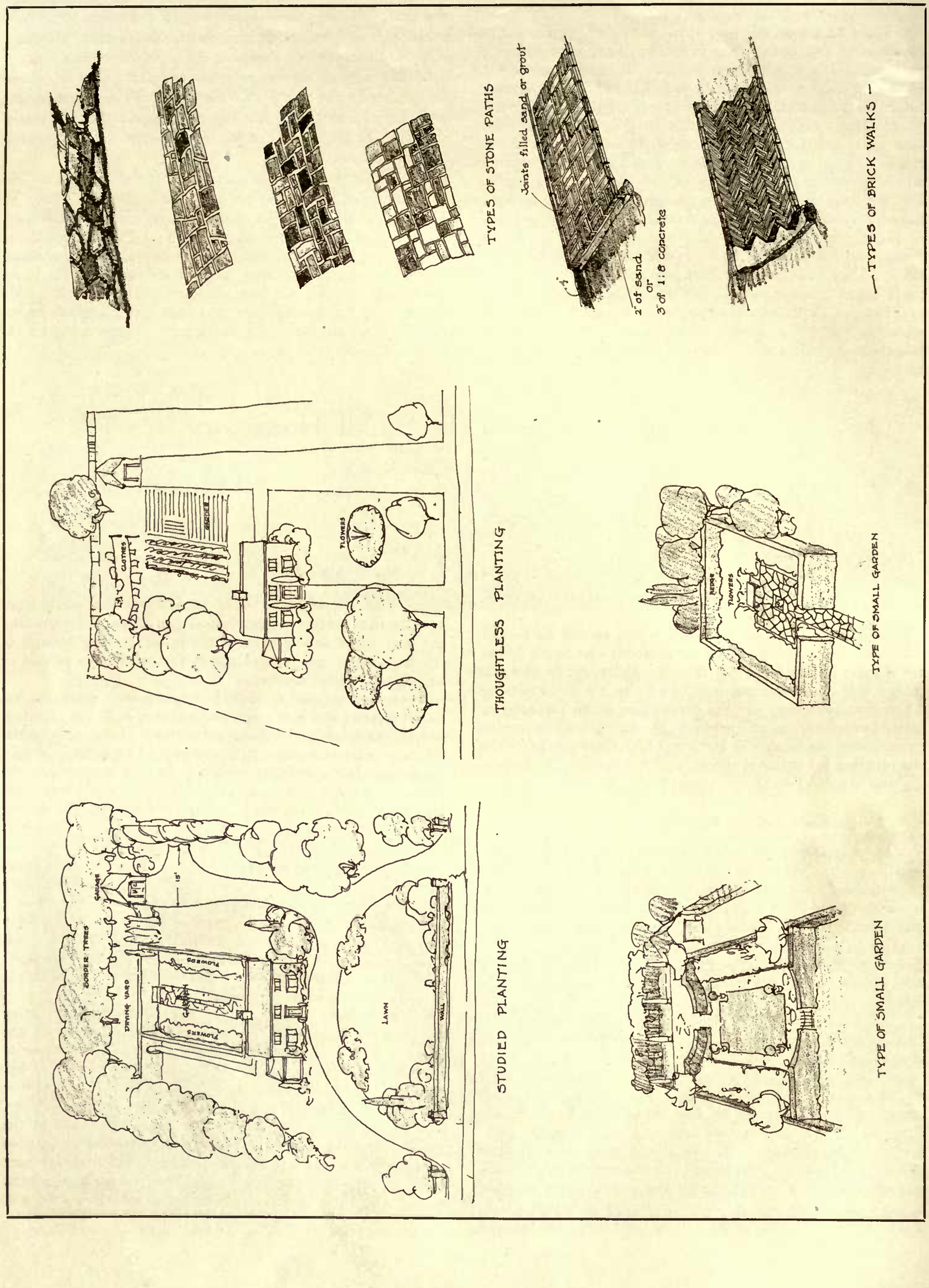
In considering this part of the problem, the designer must begin at the very outset to solve it. If the plot is level or capable of easy conversion into terraces, then the character of the house itself may be somewhat formal, symmetrical, and dignified; but it would be wrong to build a house of this kind upon a rolling and rollicking site. This latter kind of ground demands the picturesque type of house, and the roof lines should be planned to carry up some of the curves of the hillocks.

In all cases, however, it is generally recognized that the small house can best be tied into the surroundings by making it low, say, a story and a half or one story, for one of two stories or even two and a half offers an ungainly elevation for an architectural composition. In rare instances have houses of this proportion been artistically finished. At any rate, the house should be kept as low as possible in the front, and the ugly, stilted foundations should not protrude above the level of the lawn. Nothing is so effective in producing a feeling of intimacy between house and grounds as to keep the level of the first floor only about six inches above the grade. This, of course, makes it difficult to light and ventilate the cellar, since any windows in the foundation walls would have to open into areas. A compromise can be made by grading the lawn down at the back of the house, so that enough of the foundation can extend above the ground to permit of well-lighted cellar windows.

Another method by which an intimate connection between ground and house can be produced is in the blending of wall materials and foundation stones. If the walls of the house are of stucco, and the lower part of them built of rubble-stone, then a gradual transition can be made from the stone to the stucco by carrying the stucco down over certain parts of the stone work, so that it flows into the mortar joints—like the waters of a lake flow into the little indentations of a rocky shore. This will eliminate any sharp horizontal line where the foundation wall of stone ends and upper wall of stucco begins. As the stone has a natural intimacy with the soil, it easily makes the transition with the ground, and its effectiveness is very marked where the site is hilly and parts of the foundation are built upon little rocky juttings. This same easy transition can be made from stone foundation to brick wall. It is not possible to do it with the wooden wall, however.

But perhaps the most widely used method of producing an intimate connection between ground and walls of the house is with foundation planting. There is much abuse of this method. To surround the base of the house with billowy clumps of shrubbery, so that it appears almost as if it were springing from a bed of clouds, is not at all satisfying. Nor should the owner have to be everlastingly kept at the job of trimming down these plants or removing dead ones which refuse to grow in the poor soil and bad drainage next to the cellar. And the house should not be made to mourn behind a bed of evergreens, protected at intervals with sen-

(*Continued on page* 317)


TYPES OF STONE PATHS
Joints filled sand or grout
2" of sand or 3" of 1:8 concrete
— TYPES OF BRICK WALKS —
THOUGHTLESS PLANTING
CLOTHES
FLOWERS
TYPE OF SMALL GARDEN
HEDGE
FLOWERS
STUDIED PLANTING
BORDER TREES
GARAGE
DRYING YARD
GARDEN
FLOWERS
FLOWERS
15'
LAWN
WALL
TYPE OF SMALL GARDEN

(*Continued from page* 315)

tinel-like cedars, dark and forboding, against the wall and sighing and whining in the wind. Rather should a delicate use be made of foundation planting by using vines, and now and then a small shrub or little evergreen. The object should be to make a shading and transition from the green lawn to the walls of the house by carrying upward upon the walls or against them some of the climbing plants, that the green of the ground may fade gradually into the white of the stucco or the red of the brick wall. Public buildings need massive and impressive foundations, but the small house should be nestled in Nature's lap.

2.—*Natural Framing for House*

When viewed by the passer-by in the street the planting around the house should be so arranged that it makes a natural frame for it and creates a composition for a picture. Regarded from this angle there should be background trees, trees and shrubbery flanking the sides along the edge of the plot, a green open lawn stretching forward to the street, some columnar-shaped trees or lacelike trees wisely placed to suggest the middle ground, and then a wall or low hedge with low plantings to make a foreground.

The background trees should be tall and mixed in character, so that their sky-line is not stiff and wall like. The trees which run along the edge of the lot ought also to be varied in type. Low shrubs should fill in the spaces between their trunks, but as they come forward on the property they should be more scattered, lower and thinner, so that the neighboring property can be seen, and finally they should end, allowing a blended connection between the lawns on either side. There are some who advocate that the site should be completely walled in with shrubs or fences and separated entirely from the neighboring plots, but this is not quite in harmony with our traditions, and ought not to be carried to this individual exclusiveness, although the rear of the lot may be so screened in.

The green lawn should not be broken with flower-beds, for, taken at its largest, it is bound to be little, and nothing should be introduced to break it up. The windings of the front path may be such that clumps of low shrubbery and a few columnar trees, like cedars or Lombardy poplars, can be placed along its edge and produce a motif for the middle ground, like a moving silhouette against the elevation of the house as one passes by.

The building up of the foreground should be with some low planting over which one can look. The use of fence or wall is legitimate if it does not cut off the view. Gates are a little out of harmony with our American traditions, for they mean that they should be attended by a gatekeeper, a human tool that is quite extinct in the average home, and especially in the small one.

3.—*Interesting Approaches*

Generally speaking, due to the smallness of the average plot upon which the little house is erected, the building of a pathway to the front door directly in a straight line from the street, cutting the lawn and the property in two equal halves, is quite wrong. The lawn will be small enough as it is without chopping it into two pieces. Then, too, the straight approach has not the mystery and picturesque quality of one which curves around the outside of the lawn, and is framed in with planting so that the view of the house is constantly changing as one proceeds. But it is quite essential to plant shrubbery at the bends in a path of this kind, otherwise one will instinctively resent the longer distance created by the curve and start to walk across the lawn. But by erected barriers of low plants, the mind feels that the path is following the way of least resistance, just as one follows contentedly the rambling curves of the Indian trails in the woods to avoid this fallen tree or that high rock and the like, although all of these détours make a longer way to the distant point ahead.

The roadway to the garage might also be the way to the house. Nothing looks uglier than the straight cut from street to garage. Planning the location of this service building so that it cannot be seen from the street is an excellent step in the right direction.

The material of which these paths and roads should be constructed ought to be in harmony with the house. Brick paths look well with brick houses, stone paths and gravel paths look well with stone houses, concrete paths and roads go well with concrete and stucco houses, for one naturally associates these materials as being left over from the building. It is the most natural thing in the world to use up a few of the bricks for the paths after one gets through building the brick house, or laying some of the stones to walk upon, after finishing the house of stone, or using up a few odd barrels of cement for the walks when the job on the concrete house is over. And being so natural a thing, there is a likable gesture in doing it.

4.—*Planting for the Seasons*

The composition of the picture, which is the aim in all of this work about the house, should not be spoiled by careless selection of plants for the various seasons of the year. It is very unwise to place in the front of the house tender shrubs and flowers which wither and die in the winter months or which have to be wrapped in swaddling-clothes. Is there anything more forlorn than to see a lot of burlap-wrapped or hay-packed mummy trees or shrubs, standing out on the cold wintry lawn in front of the house? A few evergreen-trees and a few broad-leaf trees which show delicate limbs, when bare, and a few shrubs that hold the snows that settle upon them are the things to plant in the front of the house. Leave the tender plants to the garden in the rear.

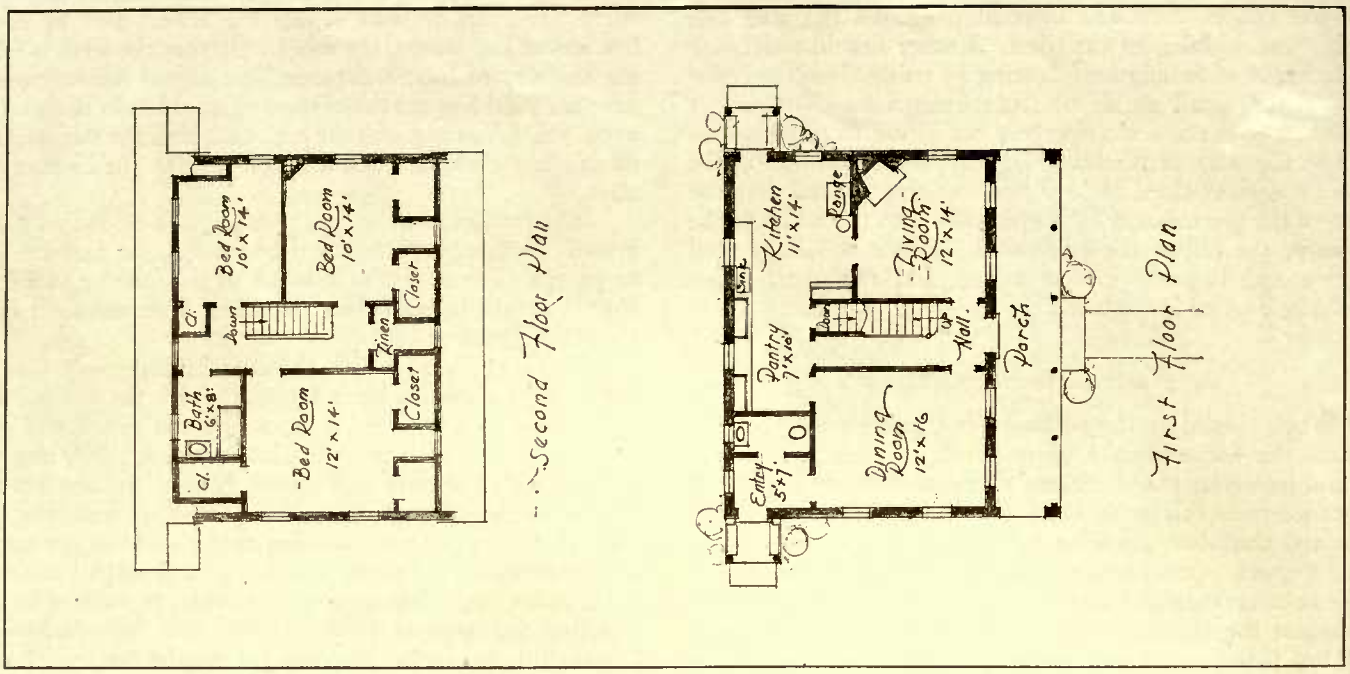
And this garden at the back of the house should be treated in the most private way. It should be surrounded with a wall or high hedge. There should be walks, border plantings, a little touch of water, and a seat in the smallest garden. It should be located so that it can be viewed from the house and enjoyed. Here all of the fine, delicate, and colorful flowers and plants can be placed. In the winter months the protected plants with their ugly clothes will not seem so out of place in this secreted patch of ground.

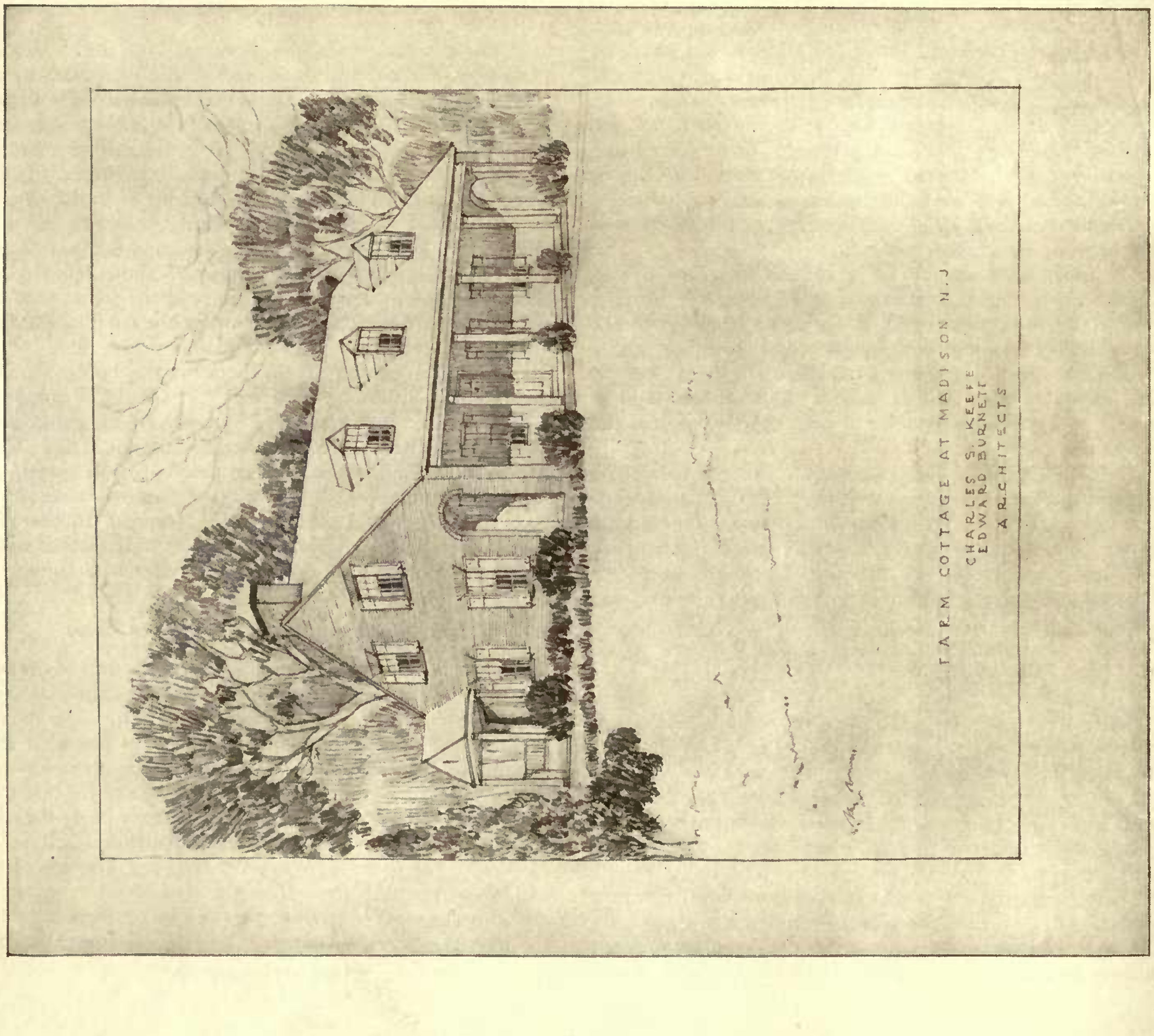
5.—*Improving the View from the House*

Next in importance to planning the setting of the house and its appearance from the street should be the planning of the views from windows of the house itself. The development of the private garden at the back is one help which was previously alluded to, but there are generally ugly things which can be seen from the windows of the house that need screening out. These ugly objects may be on the neighboring property, or they may be the drying-yard for the clothes, or the garage. Whatever they are, a screen of trees can be used to shut them from the view.

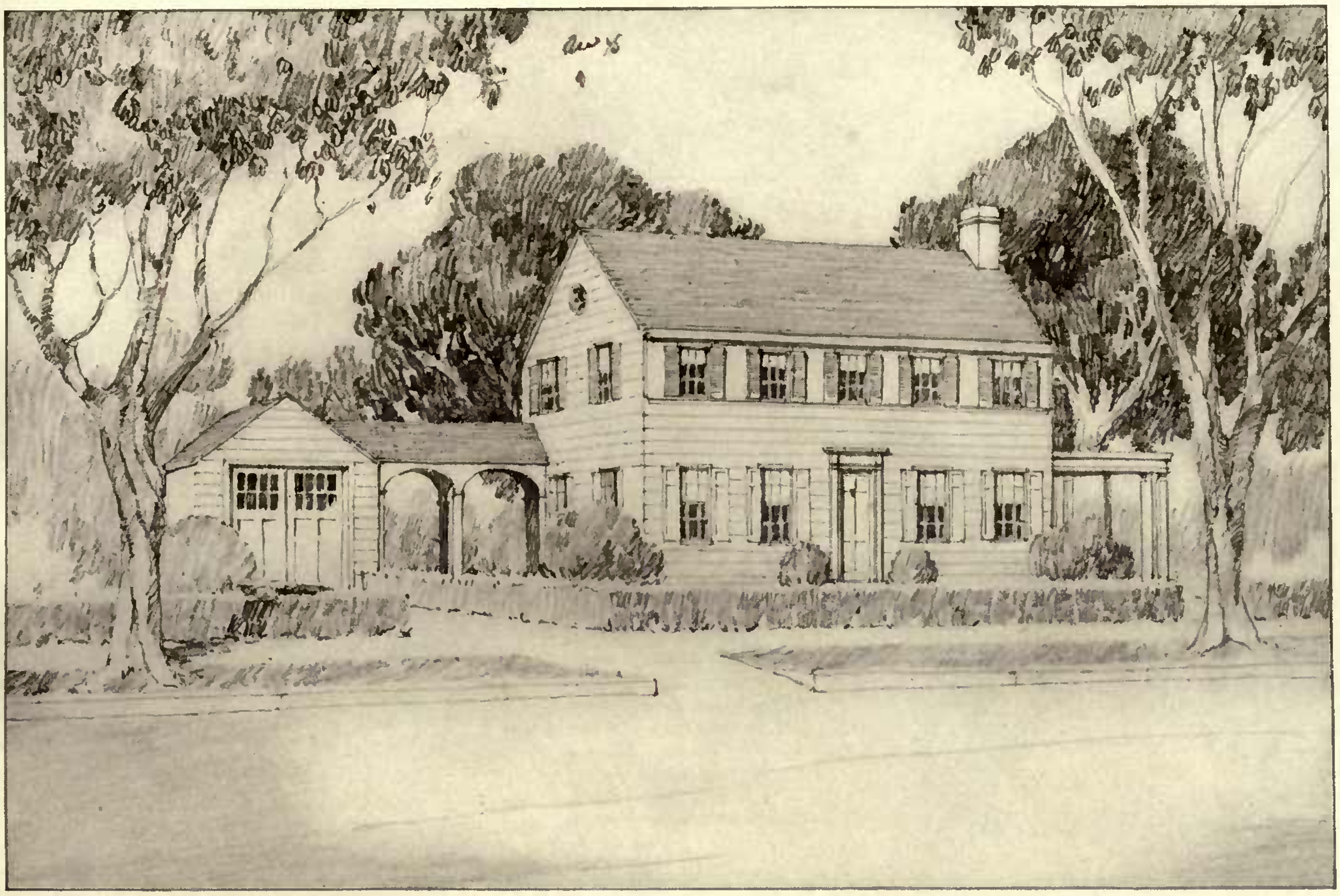
But the most important part of this problem is to make the best of any view that may be possible from the house.

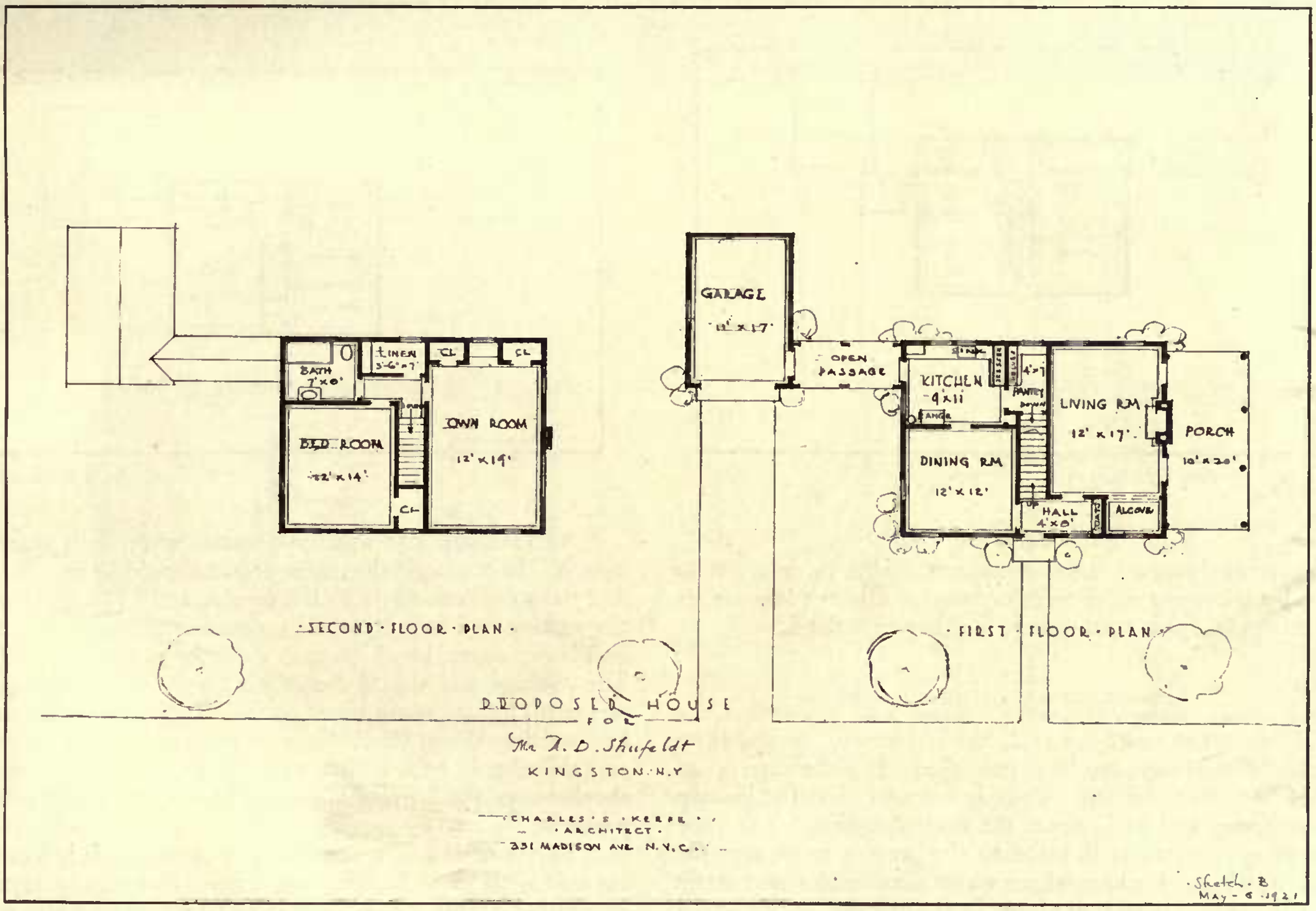
(*Continued on page* 320)



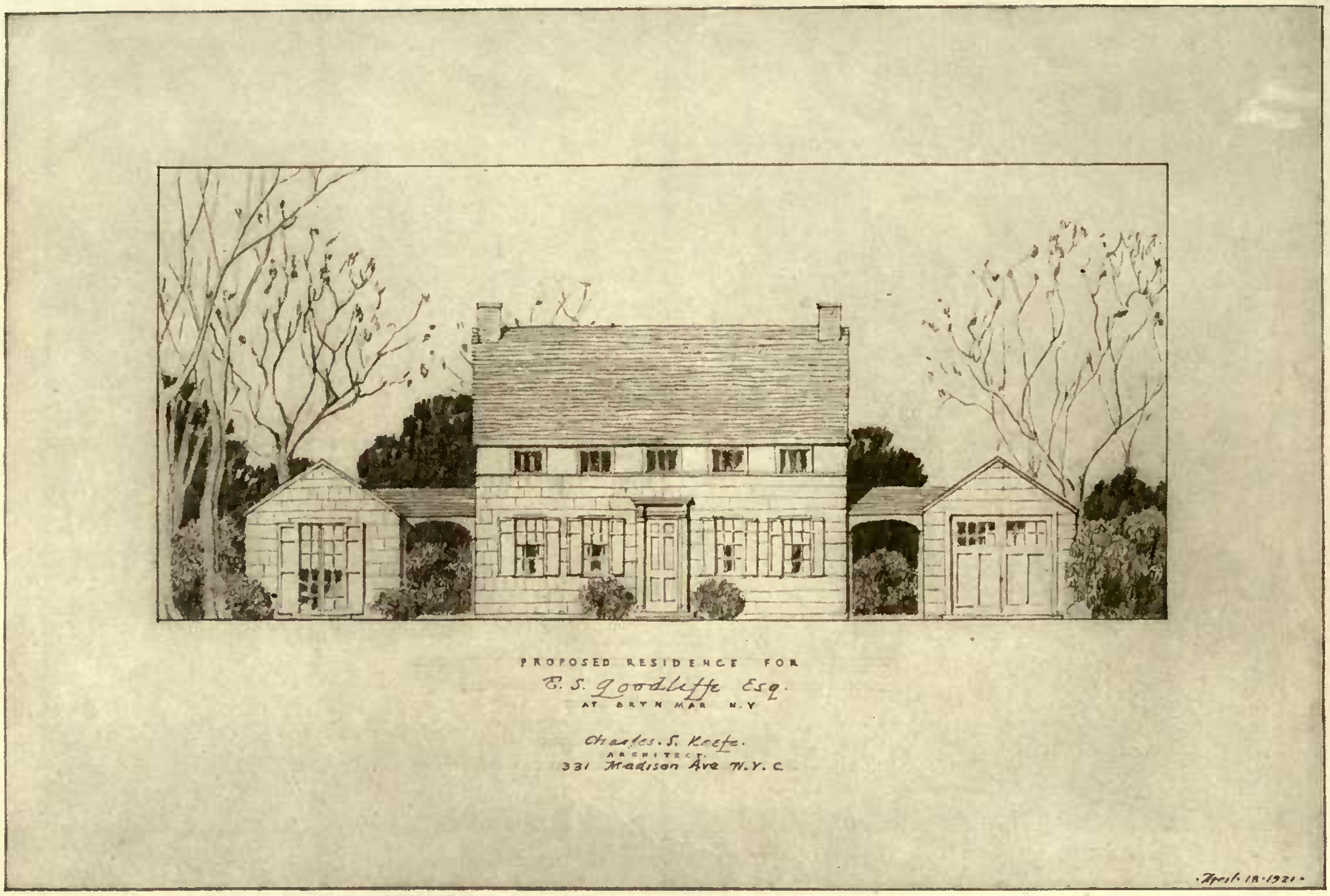


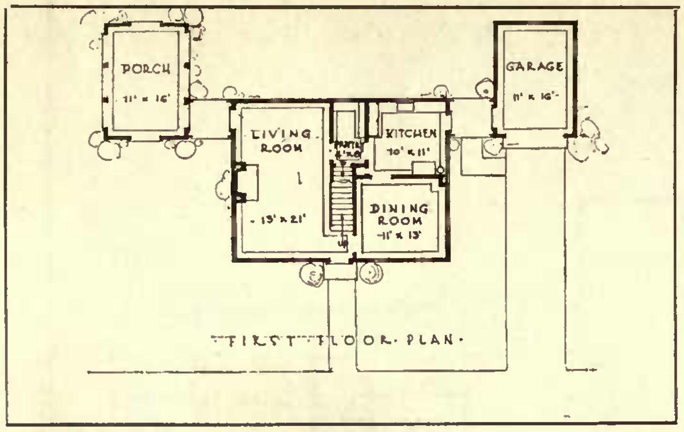
FARM COTTAGE AT MADISON N.J
CHARLES S. KEEFE
EDWARD BURNETT
ARCHITECTS

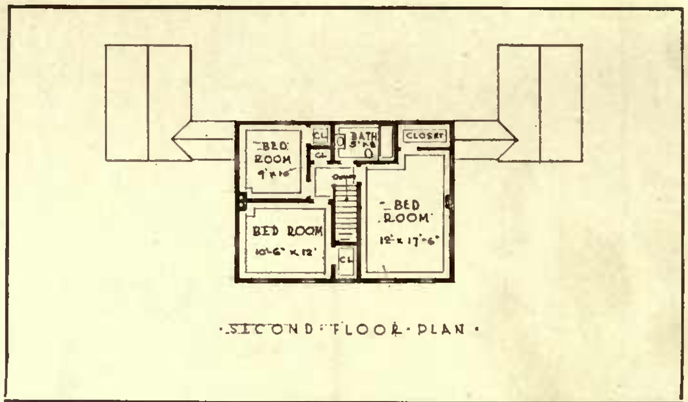




HOUSE, A. D. SHUFELDT, KINGSTON, N. Y. Charles S. Keefe, Architect.







House, E. S. Goodliffe, Bryn Mar, N. Y. Charles S. Keefe, Architect.

(*Continued from page* 317)

A far-away river, a hill, or a meadow might be brought to sight by trimming some trees or brush. Distant landscapes are most satisfying to the eyes, for they rest them.

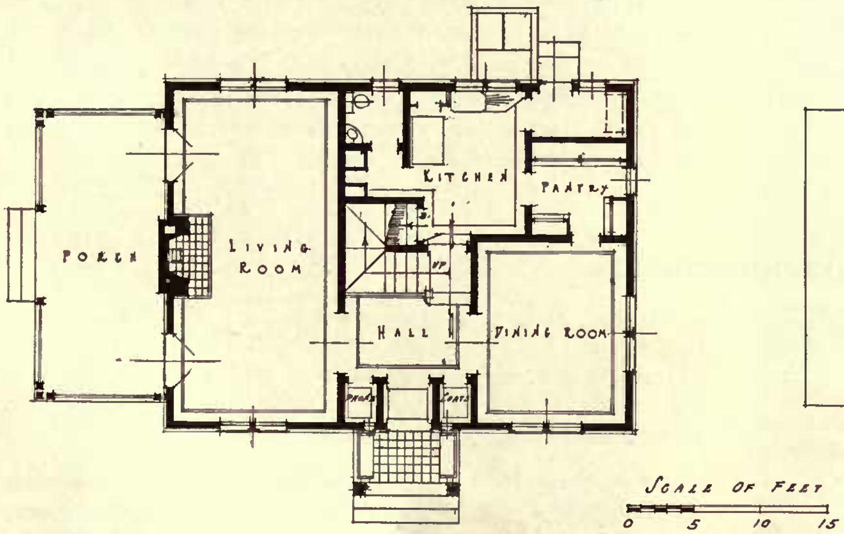
Construction of the Lawn

From what has been said, the importance of the lawn in front of the house can be appreciated. It is the rug spread out before the jewel-box. Over it one can view the beauty of the home, and so it needs the best attention. The very first thing to consider in building the lawn is to arrange for good drainage. Pockets where water may collect and settle must be drained with tiles placed in the ground. The surface water should be carefully distributed away from the house.

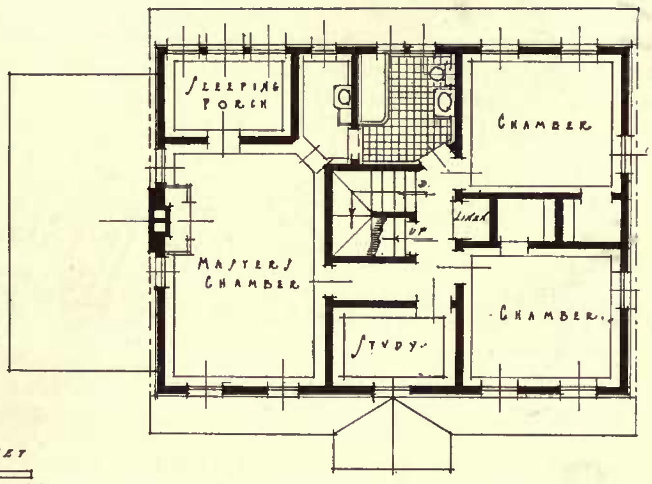
An ordinary site will have stones and weeds scattered over it. In the beginning these stones should be carted away and the weeds cut down with a scythe, and a plough run over the surface to a foot in depth, unless the subsoil is not sandy and holds water, in which case a deeper ploughing is better. Then stones and weeds should be taken out of this earth, not once, but as many times as the earth delivers up stones and weeds. When this is done, the grading may be started, and this should be with long, easy grades. Where trees and shrubs edge the lawn, a slight hollow in the grade will improve it.

This graded soil is not ready for grass until it has been covered with 25 to 50 loads per acre of thoroughly decayed, composted stable manure, or if not this, bone-dust, wood-

(*Continued on page* 322)



· FIRST FLOOR PLAN ·



· SECOND FLOOR PLAN ·

RESIDENCE, PROFESSOR D. C. MACINTOSH, NEW HAVEN, CONN.

J. Frederick Kelly, Architect.

(*Continued from page* 320)

ashes, superphosphates of lime, nitrate of ammonia, etc. This dressing should be raked into the top-soil with the harrow and hand rake, and whatever weeds and stones come up with this operation should be removed.

Grass seed should then be selected which will give the most rugged growth for the particular conditions of the site. Often this can best be accomplished by using a mixture of seed. The different kinds of grass have qualities suited to certain types of soil. For example, Kentucky blue-grass, while coarse and not so attractive as some others, grows vigorously and holds its own in sandy soil. Rhode Island bent-grass makes good sod in moist climates, and redtop is apt to die off in a drought.

This seed must be sown liberally to make allowances for loss in germination, and evenly to prevent patchy growth. About six bushels per acre is considered enough. All of this must be raked under with a fine-toothed iron rake and pressed down with a heavy roller. As soon as the blades are tall enough to be caught in the mower, this new grass should be cut, for this helps to make it grow thicker and keep down the weeds. But work on the lawn does not end here. Constant care is the price of a good one.

Construction of Roads and Paths

Attention has already been called to the use of materials for paths and roads which harmonize with the materials of the house. In a previous discussion, details were given on the construction of concrete paths and roads. Therefore other types will be considered here, such as brick, gravel, and stone.

The driveway to the garage ought to be about 10 feet wide and flare out to a 15-foot width at the house where the car is driven up to the entrance, so that an incoming car can pass by any which is standing in front of the door. This roadway should widen out into a Y shape in front of the garage, as shown in the drawings, to permit of backing out and turning around. A round turning area in front of the garage may be substituted for this Y-shaped arrangement. Any curves made in the driveway should have a radius from centre of the curve to outside edge of the road of 30 feet 6 inches, although a Ford car can run on a road having a radius of only 14 feet.

If the driveway is to be of gravel and the subsoil is wet or clayey, drainage must be arranged for along the edges. Trenches 3 feet to 4 feet deep should be dug on either side and 3-inch diameter agricultural tile laid at the bottom with open joints covered with collars, then a layer of sod, and then 6 inches of field stone or gravel, and finally top-soil. Wherever there are pockets that would collect surface water, outlets should be constructed, and covered with iron grating. All the subsoil tile should connect with one main tile and drain off at some low point.

For ordinary light traffic the road itself may be built with a foundation of stones to a depth of 2 feet. This should be covered with a layer of coarse gravel 2½ inches thick, a top layer of finer gravel 4 inches thick, and rolled with a heavy roller after water or some bituminous binder has been sprinkled over it. A crown of ½ inch to the foot should be made, and any grades ought to be kept about 5 feet in 100 feet, and at the most 10 feet in 100 feet.

In the construction of gravel walks, the grade should be kept to within 12 feet in 100 feet and be crowned ¼ inch per foot.

The success of the brick walk depends upon the foundation used. A poor one will permit the bricks to settle unevenly, crack, and break away at the edges. The bricks themselves may be laid in any number of different and interesting patterns, such as the basket weave or the herring-bone. A row of bricks on edge along the outside of the walk makes an excellent finish.

The foundations of the brick walk may be built of sand, cinders, or concrete. The first two give a walk somewhat irregular, and grass can be made to grow in the joints. To begin the laying of a brick walk, the earth should be excavated to a depth of 4 inches, and either a bed of sand 2 inches thick or a concrete of one part cement to eight parts sand 3 inches thick should be spread. When the bricks have been arranged on this bed, sand should be worked into the joints between them by leaving a layer on the walk for a few days and brushing it into the crevices.

Where concrete is used for the base, a more rigid walk will result, and in such types it is customary to use mortar to fill the joints. A thin 1.3 grout can be brushed into these joints and the little that is smeared over the surface can be washed off with scrubbing-brush, water, and 5-per-cent muriatic acid. A better method is to pour grout into the joints, wiping the brick clean before the mortar sets.

There are a number of different types of stone walks that can be used, depending upon the character of the stone in the neighborhood. Flat flagstone walks are usually rather uninteresting and many prefer the picturesque effect which is produced by stepping stones. These ought to be placed about 22 inches apart to make walking easy on them. A very interesting and much-used walk is made by setting flat stones of different shapes together, like the pieces of a cut-out puzzle, but leaving a small space between each stone in which grass or moss can be grown.

Announcements

Frank J. Ricker, architect, now occupies his new office at 612 Bergenline Avenue, West New York, N. J. Catalogues desired.

C. Kenneth Bell, architect, is now located at 2316 Dime Bank Building, Detroit. John Scott, consulting architect.

John Scott & Company, architects, have removed their offices from No. 2326 to 2316 Dime Bank Building, Detroit. C. Kenneth Bell, formerly connected with the firm, will continue as associate architect.

Norman Hatton, 321–2 O. R. C. Bldg., Cedar Rapids, Iowa, begs to announce that the partnership formerly known as Hatton, Holmes & Anthony has been dissolved by mutual agreement. He wishes to thank all clients for past patronage and hopes to be favored with their future commissions. He will continue the practice of engineering and architecture in the same location.

Every architect will want to have for his reference files the Batchelder Tiles Catalogue of Mantel Designs. These beautiful tiles have made a distinct reputation for themselves and incidentally, of course, they contribute another factor to California's fame as a home of the arts and crafts. The address of the Batchelder-Wilson Company is 2633 Artesian Street, Los Angeles.

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A Modern Business Building

Samuel A. Hertz, Architect

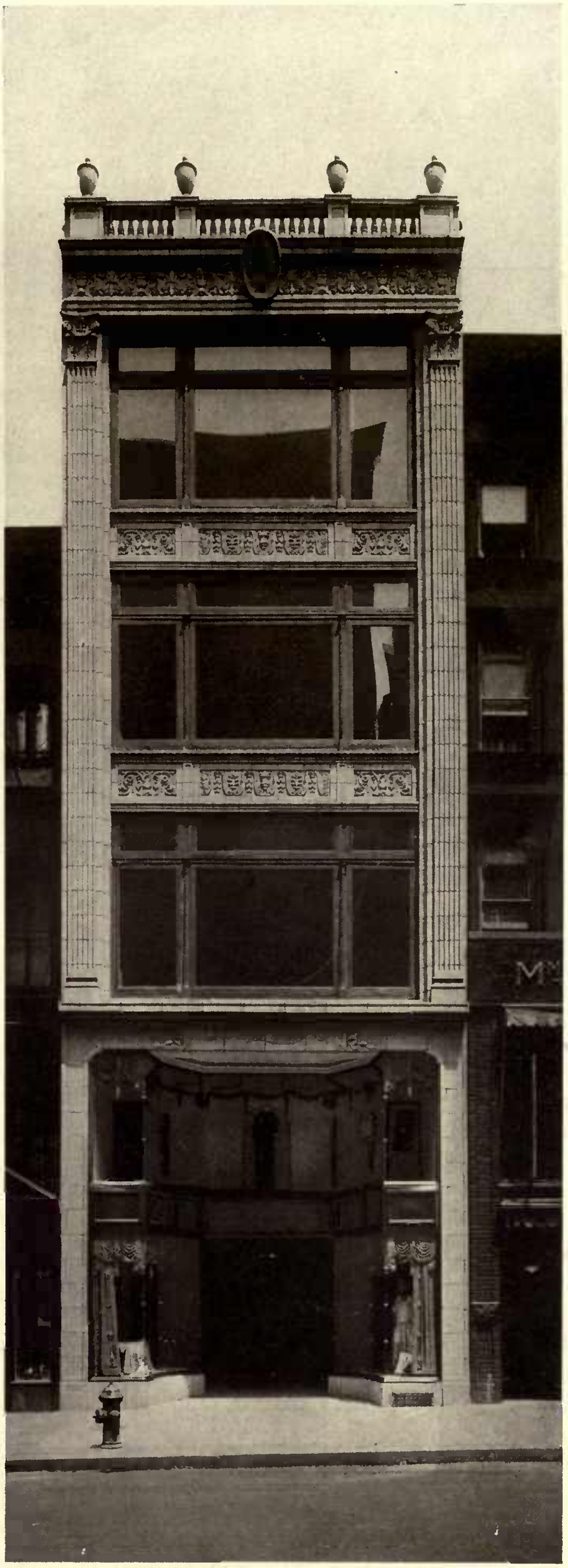
THIS building is erected on an interior lot 20 feet wide. The lower portion of front is of granite terra-cotta and the upper portion of limestone terra-cotta.

The natural-light problem was solved by an interior court 4 feet wide at the rear of the building for lighting cellar and first floor. Natural light is acquired from both sides by installing lot-line fireproof windows and from the top by studio windows.

The second means of exit is a fire passage hung from second-floor ceiling beams.

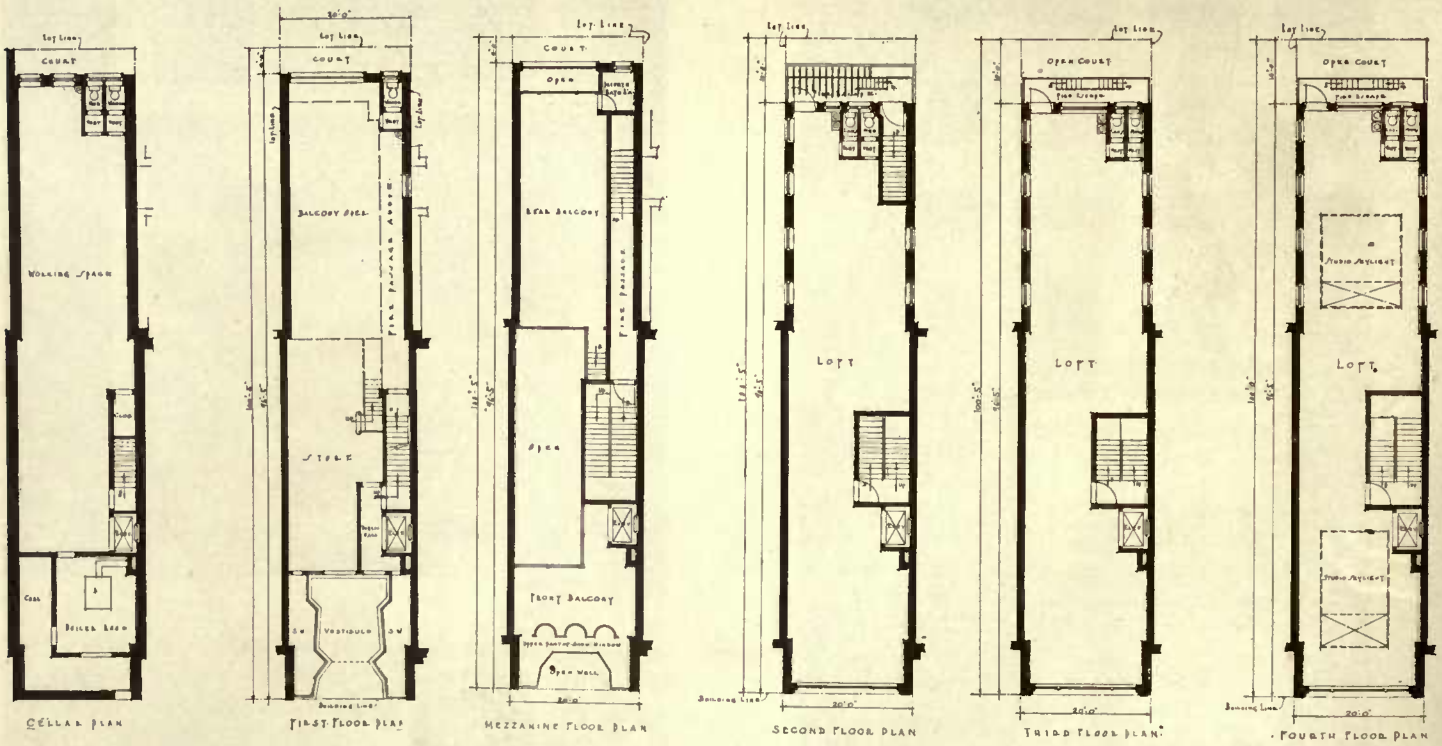
Terra-cotta cap.

Old building, 131 West 45th Street, New York.



New business building, 131 West 45th Street, New York.

STORE, FIRST FLOOR.



PLANS, NEW BUSINESS BUILDING, 131 WEST 45TH STREET, NEW YORK.

Samuel A. Hertz, Architect.

Integral Waterproofing: A Practical Discussion

By Samuel R. T. Very, Architect

A PERTINENT and impertinent deal has been written, said, and thought upon the subject of this article, which has to do with the use of integral waterproofing compounds in portland-cement plasters, mortars, and concrete masonry as used in architecture. The exposition by zealous waterproofing-compound manufacturers of the merits of their products and the dissension by earnest portland-cement manufacturers have been so convincing that no bewildered architect who has followed the controversy can fail to appreciate the humbuggery of some of the opposing views, whichever side they state. Scientific writers on the subject have not shed much light upon the facts; as a rule they are hopelessly cautious, or their observations are so elaborate, or meticulous, or involved with other research as to discount their authority; and sometimes they, too, are fiercely partisan. But all of the wrangling gentlemen are in truth engaged in a controversy which has little to do with the point; and it is the intention of this brief to illuminate this point and settle the controversy. Waterproofing compounds are exactly what both sides claim they are: unnecessary when ideal and perfect mixtures, conditions, and labor are employed, but necessary at all other times (which is nearly always). It is a fact that the personal equation of workmen is the principal field condition which prevents ordinary portland-cement concrete, properly mixed, and ordinary stuccos from being as waterproof without a good compound as with it.

Identical claims of both sides have been proven and disproven by laboratory tests, which, however, are usually open to serious faults. Like Darwin's remarkable study of pigeons, observation of more specimens than can be available to any one laboratory worker would be necessary to draw an infallible conclusion. The overrefinement of laboratory specimens of untreated concrete sometimes has shown them up the equal of the "waterproofed" specimens; it is astonishing that the keen observers employed by certain representative cement companies and by the United States Bureau of Standards do not appreciate the importance of that fact. There is also an utter difference between laboratory-test conditions and field, or job, conditions. Tests upon specimens mixed in the laboratory do not determine the practical efficiency of waterproofing compounds to be used in the field, where the personal equation of workmen is so variable. This last is the cause of the practical impossibility of untreated portland-cement concrete being uniformly, homogeneously waterproof. It is a matter of such universal knowledge that it seems silly to take space to say it, but in view of the misleading findings from trained, conscientious, and truthful laboratory workers, it should be noted here that when concrete foundations leak, it is rarely a homogeneous leak—a veritable sponge that appears; some spots are dry; some portions are better than the rest. A whole lot of well-made laboratory specimens may be good, bad, or indifferent without proving a criterion for the field. The laboratory worker with his profound erudition in explaining the humbuggery of his opponent's views (whatever they are), with his integrity of effort to purge the gullible world of fraud, goes conscientiously to work mixing his little pats just so, eliminating the tiniest exotic. He sets his hair-weight scales and blows from the heavier pan with an air-washed blast the speck of dust just landed, and smiles exultant in having thus saved to the world a true and "typical" specimen. This specimen, remember, is about to be compared to the average work of those great thumb-fingered, gawky, red-necked foreigners at the mixing-box, measuring their masses with dented buckets, and barrels sometimes stove in and patched; measuring what? The nice, pure, uniform, round white globules of Ottawa laboratory-testing sand, and some brand-new portland cement, selected for its test-safety? Oh, no! They measure what the boss has got to buy for the least outlay the specifications will allow (and sometimes less than that). And they are not very fussy, either, to fleck away the speck of dust. They slap the stones and sand and cement together in a mixer, pour in the water, and it comes out mud, and they treat it so. And then those unsentimental fellows with tremendous shoes tamp down the mass in the trenches (if the red-necked boss is looking), and call for their pay on the stroke of twelve next Saturday.

In the year 1915 the United States Bureau of Standards made two large-sized integrally waterproofed stucco panels for field-tests. The panels are described in Technological Papers No. 70, printed in 1917; but no published report has yet been made concerning the efficacy of the integral compounds used; nor would it be possible to make any conclusive decision as to the efficacy of the compounds from a study of these two panels alone.

The writer is an architect; therefore presumably temperamental, and with the poetry of his profession surging through his veins; an example of what some one has called the short-haired variety of artist. But notwithstanding that handicap, before waterproofing compounds were the subject of controversy, he was convinced of the importance of properly mixing cement for any operation, whether in concrete, or stucco, or in ordinary masonry mortar. He is still convinced that it is the exception in structural work that efficient mixing and placing are done, but those faults are common to mixes treated and untreated with waterproofing compounds. While the study of such faults is valuable, it is out of place in this paper except in so far as the use of waterproofing compounds tends to decrease the dangers from faulty manipulation in form or surface usage. It is the writer's conviction, after a rather careful study of the subject for ten or twelve years, that at present owners are too indifferent or unaware of the importance of the subject, and that contractors are too obsessed with their mastery of the practical manipulation of cement, to properly weigh the merits of the biassed opposing claims concerning waterproofing.

It is absurd, of course, to expect even a good waterproofing compound to cure bad masonry. Unfortunately, the earlier tests made by the United States Bureau of Standards (not those above referred to) were upon mixtures so ridiculously lean that they would never be used in good stucco practice, as lean as 1 part of cement to 8 parts of sand. No waterproofing compound ever devised could work best under such conditions; yet these tests were summarized by substantially this conclusion: "Portland-cement mortar and concrete can be made practically water-tight or impermeable to any hydrostatic head up to 40 feet without the use of any of the so-called integral waterproofing materials." But the only method suggested, nevertheless, is a rich mixture and especial care in the field manipulation. That is almost the equivalent of saying you won't get drunk if you don't drink. Everybody admits that a combination waterproof to all practical purposes can be obtained by perfect grading, thorough mixing, and ideal placing and tamping of concrete mixtures, even without the use of any waterproofing compound; but the Bureau of Standards overlook the important fact that this necessitates everlasting vigilance, costly labor, and excessively expensive supervision, which it is partly the attempt of integral waterproofing compounds to avoid. Indeed, the value of these United States Bureau of Standards experiments reported in 1911 may be doubted altogether, so far as they concern waterproofing compounds, for the following reasons: Their observations indicate that "any mortar richer than a 1 to 4 proportion was impervious in itself under a hydrostatic pressure of 20 pounds to the square inch." Yet it is a matter of common observation and grave architectural concern that stuccos richer than that are sometimes veritable sieves unwaterproofed. Arrayed against their evidence, the proceedings of the American Concrete Institute, in a report of the same year (1911) on the treatment of concrete surfaces, may be quoted: "The integral method of waterproofing by means of a powder, paste, or liquid added to the mass of the concrete . . . is probably the most logical . . . some of these materials have considerable virtue. . . ." It is true, however, that that institute has never unqualifiedly indorsed their usage. A number of years ago they published the following: "Practice varies widely in the mixture and application of stuccos. The use of . . . waterproofing materials will stand further investigation." That still appears to be the opinion of most of their members interested in the subject. A great deal of harm has been done to the justice of this subject by misleading wide-spread advertisements of some of the manufacturers of cement, who quoted the United States report above mentioned in the parts unfavorable to waterproofing; and waterproofing-compound manufacturers, very unfortunately for all, used to employ, almost universally, salesmen and architects' representatives who seemed disposed to believe their products cure-alls for cement-masonry ills. Even reputable manufacturers disseminated literature of a decidedly misleading character. One, especially zealous, claimed for his very good compound that its use "involved no extra labor expense," and that it made concrete and cement "absolutely water-tight, even under the most extreme water-pressure," both statements technically accurate if qualified, but unqualified being susceptible of a misleading interpretation.

The combination of these distracting circumstances, at first, when waterproofing compounds made their appearance, quite confused the average architect, who thought he had been born with a little common sense, but who hesitated to admit it in the face of contradictory evidence from such authoritative sources. Certainly, he could not decide alone the virtues of the opposing claims. In consequence, the writer being one of them, after reading as much of the subject as his professional leisure permitted (which was a good deal), and after discussions of the waterproofing qualities of particular compounds with fellow practitioners, none of whom seemed to know certainly about the truth, and most of whom knew nothing whatever, decided to figuratively roll up his own forensic sleeves, and debate the issue with every manufacturer of cements and cement waterproofing compounds in the world; and he ended by actually rolling up his linen sleeves, and mixing and testing a large number of specimens of portland and natural cements, some treated and others untreated with various alleged waterproofing compounds.

These tests were then, and still are, so far as the writer is aware, unique in these respects. They were not made with any greater care than would obtain in the field "on the job." They were not conducted for scientific results, but to obtain, as nearly as possible, job conditions and comparisons. No manufacturer was present at the mixing.

No concrete was tested, because stuccos were far simpler to manipulate, and they were quite as satisfactory for the purposes intended: to find out whether cement mixtures are made more nearly waterproof through the use of integral waterproofing compounds.

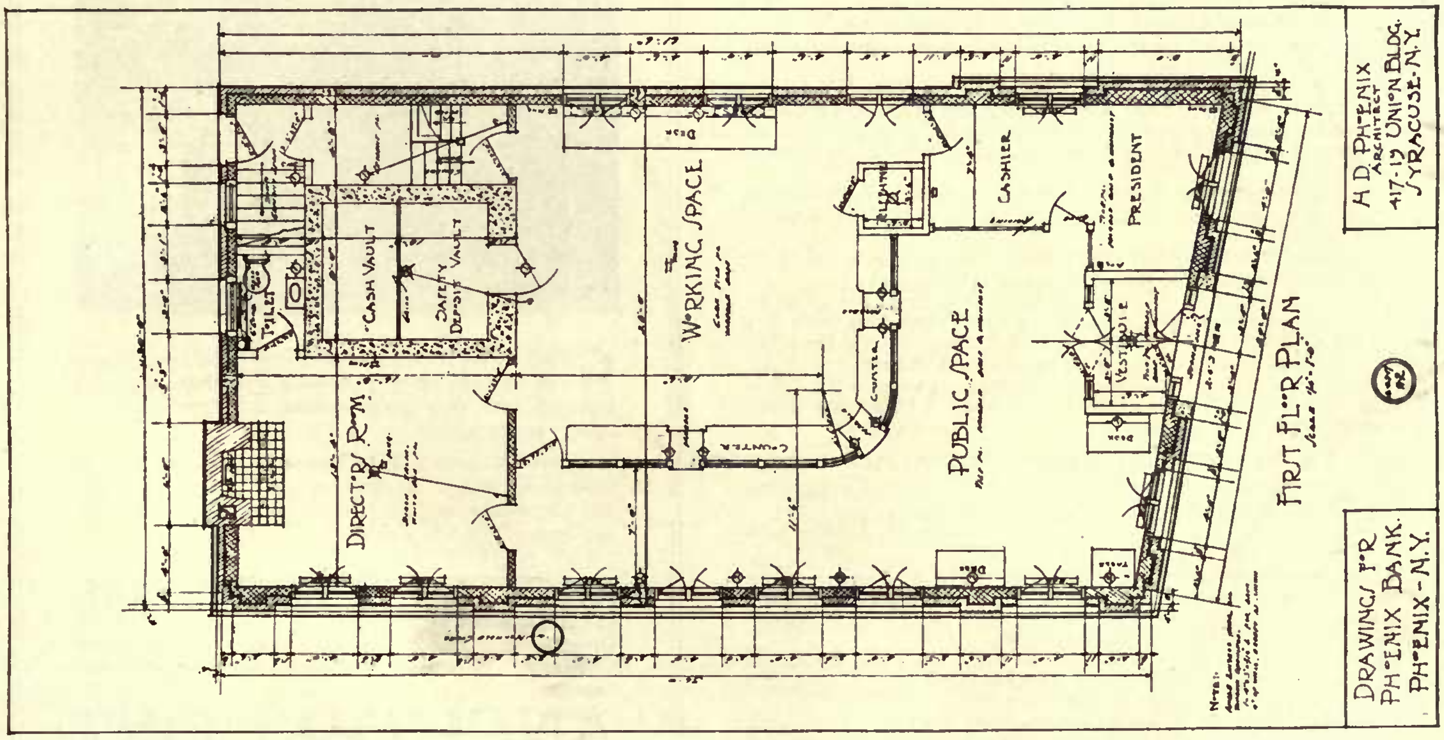
The results of these tests prove the writer's acumen prior to their undertaking, which, owing to the controversy between factions whose interests were apparently not antagonistic he was beginning to seriously doubt. He discovered the phenomenon that a waterproofing compound is a waterproofing compound. In addition, the results disclosed some very interesting facts concerning the deleterious effects some compounds have upon stucco mixtures, which, while probably waterproofed with them in the sense that their introduction under practical working conditions would make the batter less permeable, are weakened by them, and in some cases shrunk.

The courtesy shown by the manufacturers who submitted their compounds for test (there are ten times their number to-day), the assistance by cement companies in furnishing cement, and the co-operation of a manufacturer who loaned a hydrostatic machine and other paraphernalia for the test specimens, combined to furnish unusual testing advantages.

The apparatus for mixing the specimens was purposely chosen for its unlaboratory character, for its similarity in crudeness to job or field conditions. No hair-scales were used, nor superdented buckets, for that matter; average job conditions were approximated. Scales akin to those likely to be found under practical working conditions were chosen, where the variation of a hundredth part of a gramme wouldn't scare the operator a hundredth of a particle. An ordinary tumbler measured out the sand and cement and some of the compounds tested. These tests were to prove or disprove the efficacy of the use of waterproofing compounds under practical working conditions, and no care whatever was taken to see that Mr. Manufacturer A's compound would theoretically exclude one drop more moisture from a hundred square feet of stucco than Mr. Manufacturer B's, although that seems to be the gist of the squabble between some compound and cement manufacturers. Care was taken, however, to mix the great batters well, as well as they could be reasonably expected to be mixed on the job—as well as a good workman with intelligence and experience, or as well as a bad workman under the guidance of a good boss. Moreover, the directions of all of the manufacturers of the waterproofing compounds used were read with only such intelligence as the writer happened to possess, but were followed as rigidly as he could expect of a cement mason who had never used the material before.

Much larger masses of dry sand and cement were mixed in a heap, and some specimens untreated and others treated with the different compounds tested were made from the same dry batter. Minute records of every operation were kept, even to the number of trowel strokes in mixing the dry mass; the quantities of water and other ingredients used were recorded; but note, all this was incidental, as ex-

(*Continued on page* 328)



PHŒNIX BANK, PHŒNIX, N. Y. H. D. Phœnix, Architect.

(*Continued from page 326*)

plained above. Now that the tests are concluded, and a number of years have elapsed during which more is known of such compounds, the records are of interest to show how silly a thing a laboratory test might be made in proving practical comparisons. For example, the specimen whose record shows most perfect laboratory proportions of ingredients proved to be more waterproof than another of identical ingredients less scientifically prepared.

Two kinds of sand were used: white Ottawa laboratory-testing sand and ordinary commercial Cow Bay sand. Right here is the place to emphasize the fact that on the job it is not common to use white Ottawa laboratory-testing sand, whose use is usual, however, for the refined tests which have proven such amazing waterproofing laboratory perfection for some unwaterproofed portland-cement concrete specimens. But if it were usual to use such sand, no workman would have taken more care in the mixing and, incidentally, no laboratory chemist less.

The cements tested were both gray and white typical commercial brands of portland cements widely used, equal to the standard specifications of the American Society for Testing Materials, and also natural American hydraulic cement, generally called Rosendale.

The integral waterproofing ingredients tested, in the opinion of the writer, were typical of the various widely used, so-called repellent, non-repellent, metallic powders, pastes, emulsions, soaps, and liquids, which one writer at that time called Unsaturated Extended and Concentrated Colloids. No mere surface coatings such as membranes or damp-proofing paints were tested. The specimens were formed and set in rings cut in 1-inch sections from a wrought-iron gas-pipe 4 inches in internal diameter, and were uniform in superficial shape and form, being thus approximately of the same mass when set, and the thickness of many stuccos. Photograph No. F 84 shows one of these empty rings.

(*To be continued*)

Book Reviews

THE STUDENT'S EDITION OF THE GEORGIAN PERIOD. Colonial Details of Measured Drawings. Portfolio. New edition. The U. P. C. Book Co., New York.

We need not repeat what has so often been said of the invaluable collection of Colonial details contained in the large edition of this work. It is in truth a monumental work, and in its comprehensiveness leaves little to be desired. As a reference it is needed in every architect's office, and no student who can afford this special edition will deny himself the privilege of looking over the plates. This condensed edition includes a carefully selected series of plates from the larger work, and it is sufficiently inclusive to afford many delightful and profitable hours of study.

The contents include in the 100 pages a great variety of just those details that are being studied for use in thousands of modern adaptations of the Colonial style.

The plates are well printed on a heavy coated paper, and the portfolio container is an attractive one.

DRAWING AND PAINTING SELF-TAUGHT. By Anson K. Cross, Instructor School of the Museum of Fine Arts, Boston; Author of "Text-Books on Art" and "The Drawing and Painting Class"; GRADED LESSONS. By Evelyn F. Cross, Supervisor of Art, Stoneham, Massachusetts. Published by A. K. Cross, Winthrop, Mass.

The way to learn to draw is to draw, as any one can tell you who imagines that art is one of those things that come as a free gift, and without effort. There are no short cuts to any real achievement in art or anything else, but there are different ways of arriving at the same result.

The author of this book has succeeded in obtaining some rather surprising results from his pupils.

The following gives a summary of his particular teaching ideas:

"The first drawings are made with a special soft crayon upon a sheet of clear window-glass, a piece of white cardboard being held behind the glass so that the drawing can be seen upon the glass as readily as it would be upon the paper.

"The test is applied by removing this cardboard back and holding up the glass to see if the lines of the drawing will appear to cover the edges of the object studied.

"I was taught to trust measurements more than my eyes, and therefore I explained in my first books the best way to measure.

"Several years after these books were written my pupils proved to me that they could see more exactly than they could measure, even when they followed my directions for measuring, and then I began to forbid the pencil measurements that prevented reliance upon more truthful eyes.

"The secret of success as draftsman, sculptor, or painter lies in thinking of and representing from the start the diameter or bulk of the object and each of its parts."

A GUIDE TO ENGLISH GOTHIC ARCHITECTURE. By S. Gardner. Illustrated with 56 Drawings in the Text and 180 Photographs. The Cambridge University Press—The Macmillan Co., New York.

This book is the outgrowth of the author's handbook, designed with special reference to schools and libraries.

It is arranged according to subjects, with the photographs following a regular chronological order. They include general exteriors, towers and spires, general interiors, doors and porches, windows, foliage, sculpture, columns and capitals, figure sculpture, sundries.

The text includes a glossary of terms in which are a number of line drawings, and Appendices dealing with Vaulting, Tracery, The Plan of a Gothic Church, Bishops, Architects, and Freemasons.

Under each illustration there is an explanatory caption.

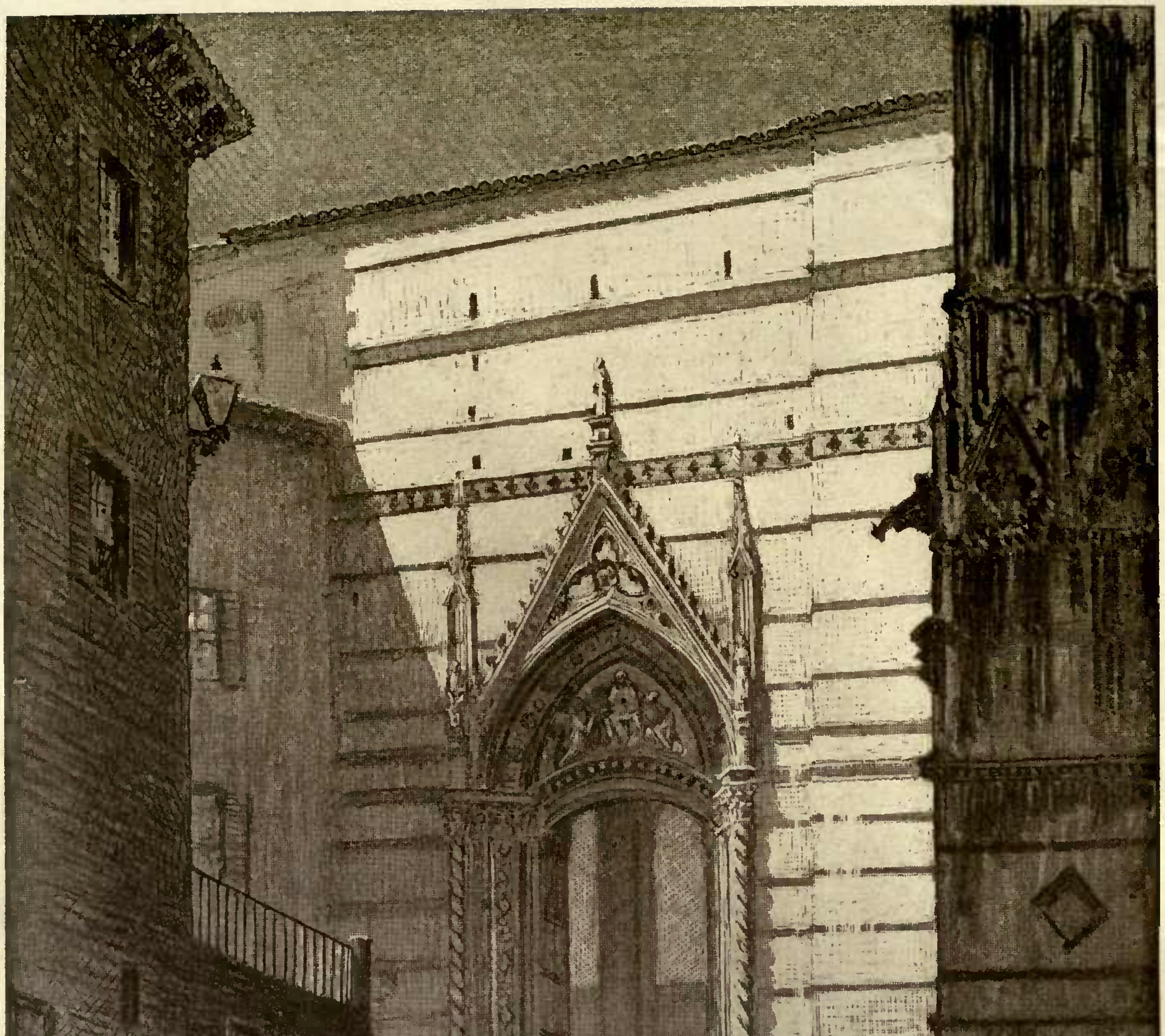
It is a good introduction to the study of Gothic and should prove of special interest to the lay student, though the many illustrations make it also a useful reference for the architect's library.

ART IN NEW YORK. A GUIDE TO THE THINGS WORTH SEEING. Florence V. Levy, Editor. Paper covers.

There are a lot of art things in New York worth seeing, but I dare say few New Yorkers know what they are, or where they are, beyond the walls of the Metropolitan Museum of Art. This little handbook will lead you into many unfamiliar ways, and point out buildings and sculpture of artistic and historic interest, statues, fountains, and other monuments, mural decorations, art museums, societies, clubs, exhibitions, art schools, art dealers, studio centres, and with the map and traffic guide you can always find how to get to places, and even learn "where you are at" when you travel in the subway.

FRAME-CONSTRUCTION DETAILS. National Lumber Manufacturers' Association, Chicago, Illinois.

A collection of plates of great practical value to every one concerned in building.



SIENNA. In 1339 it was resolved to erect a huge nave of which the present Cathedral of Sienna was to be the transept only. The project was abandoned because of the plague in 1348. The drawing shows the side entrance to the uncompleted nave, and the flight of steps leading down to the Chapel of San Giovanni. From the drawing by Chesley Bonestell.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI NOVEMBER, 1922 NO. 5

The Historic Use of Color in Architecture

By Rexford Newcomb
Professor of Architectural History, University of Illinois

From an illustrated address before the Central Illinois Chapter of the American Institute of Architects

THE genus Homo is endowed with a set of detecting organs by which various environmental facts are sensed and made cognizant to the mind. These intelligences are necessary not only to the preservation of man physically, but also to his delight and satisfaction mentally. I refer to the five means by which man receives stimuli from his environmental world. These we generally call by names that indicate their function—the senses of sight, hearing, smell, touch, and taste.


Tiles. Light and dark blue figures on a salmon-pink background. Blue Mosque, Tabriz, Persia.

The organs of the first two, the eye and the ear, by virtue of their high state of development, would seem to be the most valuable to mankind. The senses of sight and hearing are usually thought to be of a different order from the other senses. Indeed, the eyes and the ear are called the "true windows of the soul," since they not only telegraph the gathered stimuli immediately to the brain without local or physical reaction, but also deal with stimuli that have to do with man's mental and spiritual delight. I should like, therefore, to direct your attention to a consideration of the stimuli detected by these two organs.

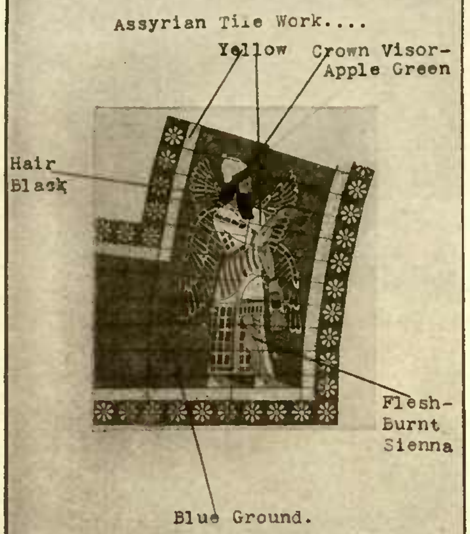
The ear detects simply sound. Man has from time immemorial reacted to sound and very early in the history of the race two "arts of sound," namely literature, the art of the spoken word, and music, the art of abstract, regular sound, made their advent. The eye detects first form, the shape of things, made definite by means of light and shade; secondly, color, and, if you will, thirdly, motion, in so far as motion may be detected by change of position or form. Early in the history of the race the plastic arts, as a means of mental and spiritual satisfaction, had their rise and as a result we have:

The Art of Form as typified by Sculpture.
The Art of Form as typified by Architecture.
The Art of Color as typified by Painting.
The Art of Motion as typified by the Æsthetic Dance.

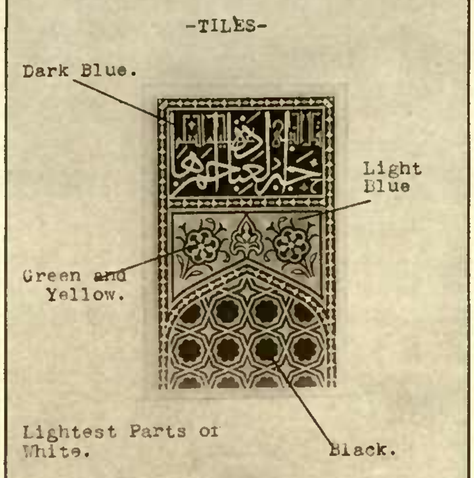
Now, while sculpture and architecture are perhaps considered primarily arts of form at the present time, they have not always been so considered, any more than painting has been or can be considered merely and simply the art of color. In the world of nature form and color are inseparably linked one to the other, and all one has to do to prove this fact is to examine any object in nature. Everything in nature has its color quite as much as it has its form, and why we as a group of designers should think of architecture largely as a colorless art of form, paying little attention to the color possibilities, almost passes understanding. Man has idealized form in architecture and continues increasingly to do so, but insists upon ignoring color, especially so far as the exterior of the building is concerned.

I have tried to account for the apparent depreciation of color and the corresponding worship of form in architecture with no very definite results. Perhaps our present notions are due to precedents that have been set for us a long time ago. In fact, I rather suspect that as far back as the days of the Romans the tendency to accentuate form and neglect color had its beginnings. Viollet-le-Duc has remarked that "the Romans of the Empire seem to have been the first people who erected buildings of white marble or stone without color: as to their stucco work this was always colored whether inside or out." Of course, we know the part that color played in the exterior as well as the interior architecture all during the Middle Ages. With the revival of the classics during the Italian Renaissance, since the Roman was the principal source of inspiration of the designers of that day, color was pretty largely lost sight of, and indeed Palladio, the guiding spirit of the late Renaissance and the man responsible for many of the ideas that eventually filtered into England and through England into our own colonies, may have considerable to answer for in this connection. It

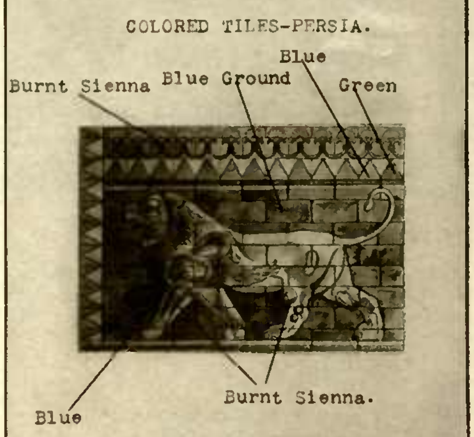

Tiles. Light and dark blue figures on a salmon ground. Blue Mosque, Tabriz, Persia.



Polychrome Tiles from Palace of Sargon, Krorsabad.



Mosque at Ardebil, Persia.



Portion of the Lions Frieze Palace at Susa- Persia...

was he who proclaimed in defense of his white buildings that "white was more acceptable to the gods." I need not remind my readers of his undoubted influence upon English and consequently upon our own architecture. This fact, coupled with the further sobering influence of Puritanism, not only in the mother country but also in our own land, may account for our extreme timidity in the use of color upon the exteriors of our buildings.

With the introduction of freehand drawing and art study into the American public school, a development that gained its first impetus through the Centennial Exposition of 1876, and the subsequent production of good and cheap water-colors and crayons, we have seen the gradual awakening of a stimulated color appreciation on the part of the general public. During the same time we have witnessed the development of the synthetic dye industry and a marvellous evolution in the arts of color photography and color printing. This has all had its effect upon the popular mind, and all one has to do to convince himself of the fact that an awakened color sense has arrived is to contrast the current costumes of the street with the sober equivalents of his boyhood, or to note the colors of the cars upon the boulevard. What father of ours would have ventured forth in a canary-colored surrey or a maroon phaeton? Pick up any monthly journal and note how color printing achievements appeal to our color sense from almost every page. The public-school book is to-day enhanced with beautiful color illustrations, in great contrast to the sombre woodcuts and zinc etchings of our boyhood days.

And now we hear the cry for more color in architecture, and indeed why not? But architecture being a conservative art always lags behind popular movements. It is now twenty-four years since the first polychrome terra-cotta was used on a shop front at Perth Amboy, New Jersey, but it is very recently that we have seen any insistent attempt to use more color and brighter colors in architecture. The San Francisco Exposition has had perhaps as wide an influence in this direction as any recent event. The execution of that great architectural display in full color and the interest that it generated has had its effect upon American architecture, and although its immediate effects are more noticeable upon the Pacific Coast they are as surely as anything slowly permeating the whole country.

I wonder how many realize that expression in color far antedates man's first attempts at architectural expression at all. In the old cave-dwellings of southwestern Europe, especially in France and Spain, have come to light in recent years simply marvellous wall-paintings executed at a time when the reindeer and the mammoth were extant in that region. These wall decorations, realistic representations of the fauna of the region, were, to be sure, applied to the inner walls of these caves and in that sense were interior decorations, but the point is that they were full color and rather realistic color at that. This proves that primitive man was alive to the color appeal long before he found it necessary to construct a habitation.

It is a commonplace to-day that primitive peoples are keener about color than are their more civilized brothers. Indeed, in our rather colorless immediate past we have seemed to consider a wide use of color rather the badge of barbarism than the mark of culture. How far our tastes have been perverted in this direction, especially in western Europe and America, we are only just beginning to learn.

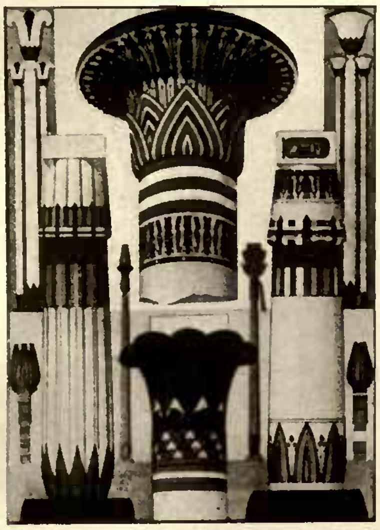
The same love of color that led to expression in the cave-dwelling days of mankind, however, led to a similar expression in architecture as soon as man left the homes provided by nature and began to fashion his own habitation. The story of the use of color in architecture is a long one, but I propose briefly to outline it for you this evening and to illustrate that outline so far as that is possible by means of monochrome illustrations.

Color in architecture is introduced by two different means:

1. It may come in as an intrinsic quality of the structural materials, or

2. It may be applied.

Most of the great styles from the beginning of history down to rather recent days have recognized and made a wise use of color, externally as well as internally. One need only to recall the architecture of the ancient Egyptians, the Persians, the Assyrians, Greeks, Etruscans, Chinese, Japanese, Mexicans, Mayas, Arabs, Moors, and Turks to have passed



Painted ornament. Egyptian columns.

before him in kaleidoscopic fashion a whole series of color impressions. Color is quite as much a part of the racial expression of these peoples as is form, and æsthetically just as necessary and interesting.

Why have all the great styles with the exception of that more or less academic and archæological vogue known as the Renaissance committed themselves to the use of color? Simply because the styles growing, as all architectural expression should, directly out of and in accordance with their environmental background, nature itself, could not separate color and form. Color in architecture was just as natural as color in any other expression because architectural forms were derived directly from nature, and nature everywhere presents color as insistently as it presents form. Art is, after all, only nature plus man's idealism. Architecture is only nature's principles expressed in the concrete, the forms and color of which are likewise only nature's forms and colors conventionalized or idealized. One has only to compare the column with the tree-trunk of the primeval forest, the roof with the eternal water-shedding hills in the landscape about us, the wall with the sheer cliffs that all men encounter some time or another. Man has always seen a relationship between the shelter that he has fashioned and the blue dome of heaven, and nearly every race from the Egyptians down to our own day has insisted upon coloring its ceilings, flat, vaulted, or domical, after the fashion of the sky with a blue field and golden stars.

In Egypt the use and value of color in architecture is apparent in every direction. Everything in Egyptian art was in some way colored. The peculiar Egyptian climate has been called in to explain the predominance of color and the comparatively simple forms. With scarcely any rainfall and with an ever-present, glaring white sun, the reflection of which from the white sands and light loam of the land practically destroys all shadows and nullifies the effect of projections, architectural expression of necessity had to make its appeal largely through the employment of color. Architecture was consequently large in conception, bold in execution, simple in form, but detailed and brilliant in color. Here is a supreme example of the relationship of climate and color in architecture. Every wall, every cornice, column, ceiling, floor was rich with a profusion of varicolored designs. We need not concern ourselves with the subject-matter of these essays, but we do need to realize that every inch (inscription, pictorial story, or symbolical decoration) was illumined in full color.

Now, while the peculiar atmospheric effects of Egypt may be held to explain the singular use of color in architecture, it cannot be held entirely responsible for the Egyptian reaction to color in the first place. The Egyptian might have accustomed himself to a comparatively colorless architecture as easily as do our modern city-dwellers. As a matter of fact, however, he lived in the great outdoor climate of Egypt and consequently was far more observant of nature's processes than is the average man of our day. As a consequence he did not develop the use of intrinsically colored materials to any great extent. His color idealism carried him beyond that. To be sure his color idealism may have been bound up with a religious symbolism (and I am of the opinion that it was), but whether it was the custom of the Egyptians to use colors, irrespective of the objects that they represent in nature, as symbols for the conveying of ideas, I have not been able to determine. In coloring his forms he seems to have adhered tenaciously to the colors these same objects presented in nature. The forms and the colors he found in nature, but both were used in a highly abstract and conventional manner.

The color combinations of Egyptian art are as peculiar to Egypt as any phase of Egyptian culture and entirely different from those of any other country. That these combinations became as traditional as did the decorative motifs themselves is entirely plain to one who makes any study of Egyptian art. A characteristic of Egyptian work was the custom of outlining ornamental forms in black or white and of using black bands to separate the reds, blues, greens, and yellows. Another Egyptian peculiarity was the habit of using bright colors upon a white background and thus achieving, by virtue of the dominance of the white, a combination of colors that if used in juxtaposition would have been very unpleasant. In other words, he "drowned" his brilliant, gem-like bits in a "sea" of white just as the Byzantines of a later time drowned their brilliant colors in a "sea" of gold, and the Italian Renaissance workers theirs in a ground of black.

Now while the Egyptians used blues, greens, and black in many combinations, I think that it may be said that the predominant colors of Egyptian work are red, yellow, and white. As a consequence his schemes may be described as warm. Color was used "flat" and not shaded in any way. There was no attempt at depth or perspective, and the walls were treated in a characteristically mural fashion as befits their nature. The Egyptian artist possessed the ability to combine color and low relief in a very intimate relationship without destroying the appeal of either means of decoration, and in this connection modern workers in polychrome terra-cotta may learn some valuable lessons. The decoration as the Egyptian used it did not, however, increase the architectural value or strengthen the structural lines, and in this sense failed in a respect in which Greek work, as we shall see, excelled.

If the principal colors of the Egyptians were red and yellow, it can be said with equal truth that the arch color of the Mesopotamian peoples (*i. e.*, the Babylonians and Assyrians) was blue. This comparison of dominants gives us the key to the architectural color schemes of the East and West of ancient days. Assyria, Babylonia, and Persia (ancient and modern) used cooler color schemes, while Egypt, Greece, the Roman world, and mediæval peoples used warmer color schemes. Perhaps nowhere has the character of Near Eastern color in architecture been better expressed than in the description of a Persian room in the "Story of the Other Wise Man," by Dr. Henry van Dyke. He says:

"The floor was laid with tiles of dark blue veined with white; pilasters of twisted silver stood out

Painted interior. Egyptian decoration.

against the blue walls; the clearstory of round-arched windows above them was hung with azure silk; the vaulted ceiling was a pavement of sapphires like the body of heaven in its clearness, sown with silver stars. From the four corners of the roof hung four golden magic wheels, called the tongues of the gods. At the eastern end, behind the altar, there were two dark-red pillars of porphyry; above them a lintel of the same stone, on which was carved the figure of a winged archer, with his arrow set to the string and the bow drawn.

"The doorway between the pillars, which opened upon the terrace of the roof, was covered with a heavy curtain of the colour of ripe pomegranate, embroidered with innumerable golden rays shooting upward from the floor. In effect the room was like a quiet, starry night, all azure and silver, flushed in the east with rosy promise of the dawn. It was, as the house of a man should be, an expression of the character and spirit of the master."

This preference for blue goes back in Mesopotamian history a long way and is perhaps best illustrated by the beautiful tiles that were recovered at the site of the palace of Sargon, at Khorsabad, by Victor Place, the French archæologist. The peculiar geological formation of the Tigris-Euphrates basin, since it is alluvial and comparatively young geologically, furnished nothing in the way of building materials except earth. As a consequence ceramic arts had their development here in very remote times, and the Babylonians, Assyrians, and their successors, the Persians, have witnessed the whole evolution of ceramic art from the first mud bricks to the beautiful tiles for which Persia is still known.

Of course, the Assyrian palette was limited by the colors that could be produced in ceramic materials, and as a consequence blues, yellows, and white are by far the most frequent. Grounds are usually blue, figures are in yellow, with flesh tints rendered in burnt sienna, while white and black are used as separators. Occasionally a touch of apple-green is to be seen in the head-dress of a king or a deity. The colors, as in Egypt, were handled in a "flat" way, not graded or shaded, and there was no attempt at representing a succession of planes.

We have noted the fidelity with which the Egyptian artist rendered his subjects in the colors of nature. The Assyrian did not do this. In the case of the animal figures upon the far-famed walls of Babylon some were yellow with white manes and others were yellow with green manes; both combinations, it will be observed, are totally at variance with nature.

Announcements

Carl R. Traner, registered architect, advises us that his address is now 125 Sibley Block, Rochester, N. Y. Gordon, Karlber, and Carl R. Traner are the architects for the new $1,500,000 Baptist Temple Building, Rochester, N. Y., consisting of a large church, auditorium, modern Sunday-school, five stores, and about 450 offices above, including a thirteen-story commercial tower. Drawings are being prepared. They desire up-to-date manufacturers' catalogues and samples.

The H. H. Winner Company, bank architects and engineers, announce the removal of their offices, October 2, 1922, to more suitable quarters, third floor Sharon Building, 55 New Montgomery Street, San Francisco.

Harry C. Child, architectural and structural engineer, has just opened an office in Sayre, Pa., and will be glad to receive general catalogues.

Alfred Bossom was recently in Scotland, where he was for a part of the time the guest of the Forty-second Highlanders, at the headquarters in Perth. He presented the regiment with a record of the work of his restoration at Fort Ticonderoga, N. Y., where the Royal Highlanders covered themselves with glory in 1758. Mr. Bossom invited, on behalf of the Architectural League of New York, the Royal Institute of British Architects to send an exhibition of drawings here for the League's annual exhibition, which takes place early in 1923. Mr. Howard Greenley, president of the League, has just returned from France, where he made a similar arrangement with the French architects. While in London Mr. Bossom was invited to judge the drawings submitted in a competition for a large commercial building, for which a gold medal is to be awarded.

Emilio Levy announces the removal of his office from 331 Madison Avenue to 17 East 49th Street, New York City.

George F. Root, 3d, announces that he has opened offices for the general practice of architecture, at 280 Madison Avenue, corner of 40th Street, New York City.

Resolution Passed by the New York Society of Architects with Reference to Building Superintendents.—After extended discussion a resolution was unanimously passed that the Society make application to the Board of Appeals to adopt a uniform method of procedure for all superintendents of buildings in approving plans by architects and others, independently of any action in granting of building permits. This resolution was passed as expressing the Society's sense of the confusion existing in the various branches of the Building Department, arising in part from the newly adopted requirements of the compensation law.

The *Atlanta Constitution's* issue of September 10, their semi-annual survey of building and business conditions in the South, contained information of a most encouraging kind. The South is evidently prospering in the building field, and the future seems to promise an assured growth of confidence. The survey, prepared by G. L. Miller & Co., shows that a quarter of a billion dollars has been spent in the sixteen Southern States during the first six months of 1922.

Taking the Mystery Out of Home Building.—A model house has been recently completed in Minneapolis, built by the *Minneapolis Journal*, to demonstrate the planning, financing, and building of an approved home at moderate cost. The feature became so popular that as high as 1,200 visitors called at the house in a single day. The home was erected by the *Journal* in collaboration with the Architects' Small House Service Bureau, Northwestern Division, Inc., to take the mystery out of home building and establish confidence in present-day home building costs.

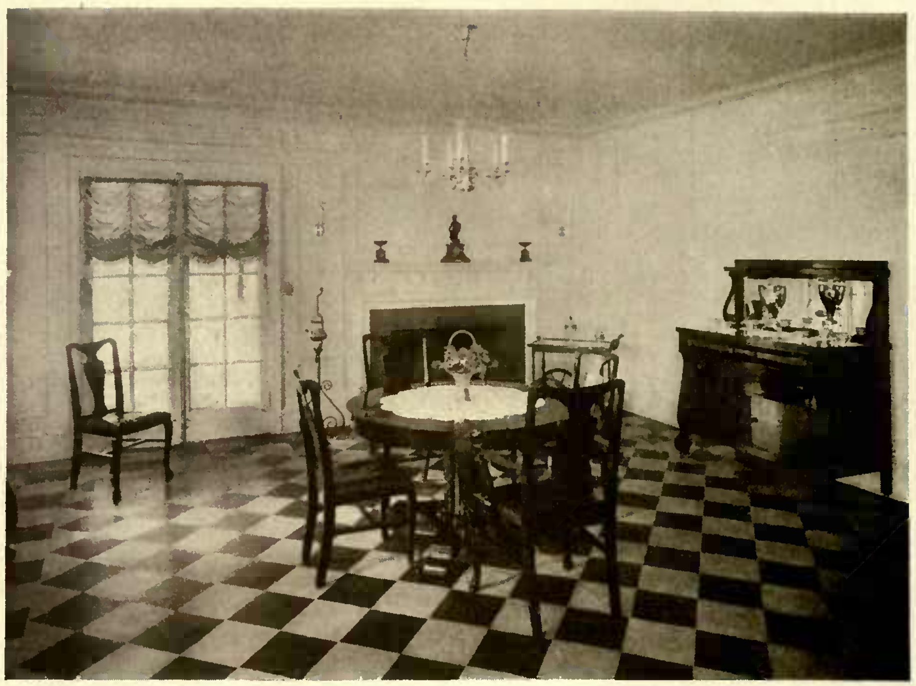
MAIN ENTRANCE.

SUN PORCH.

Dwight James Baum, Architect.

RESIDENCE, CHARLES EVANS, RIVERDALE-ON-HUDSON, N. Y.

LIVING-ROOM.



DINING-ROOM.

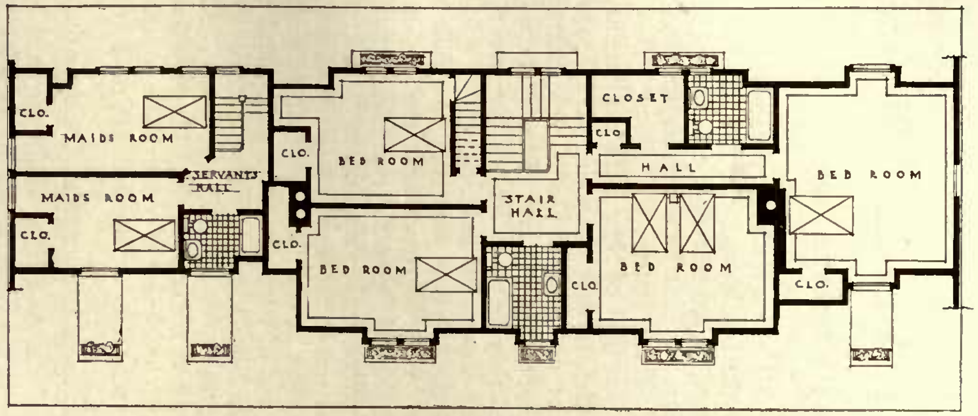
FAÇADE.

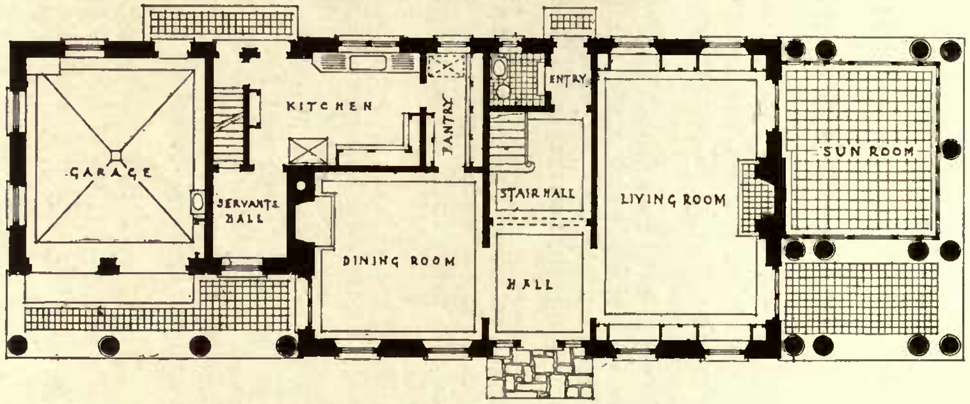
GARAGE WING.

Dwight James Baum, Architect.

RESIDENCE, CHARLES EVANS, RIVERDALE-ON-HUDSON, N. Y.

HALL.





PLANS.

Dwight James Baum, Architect.

RESIDENCE, CHARLES EVANS, RIVERDALE-ON-HUDSON, N. Y.

A Spanish Architect's Impressions of the American Skyscrapers

From an article by Roberto Fernández Balbuena in *Arquitectura,* Organo Oficial de la Sociedad de Arquitectos de Madrid

THE skyscrapers, born of unavoidable necessity as a solution of an economical problem, are themselves the expression of this purpose, and in all present construction a tendency to height is shown.

We are not informed as to the spirit which lifted up the obelisk, the sense of eternity which made the Egyptian pyramids, and there certainly does not exist in the skyscraper the fragrance of supplication that raised the mediæval spires.

The tower of the cathedral was the antenna and the gallery of a population; it was made of stone and expressed the desire of a town to purify itself, reaching above to the cleanliness of the blue.

To-day it is difficult to find in the silhouette of a modern city the mystic voice, for the civic buildings invade all with their massiveness, every day more gigantic, and the towers of churches remain buried among them in silent protest.

New York, in the region about and below the City Hall, is a wilderness of gigantic towers which rise, with brutal audacity born of practical instinct, above the rest of the buildings—museums, libraries, churches, universities, theatres.

New York, van Dyke says, is a city in which many things occur without precedent in the history of humanity. In no other city in the world does the population increase yearly 500,000 inhabitants. In no other city has there been $200,000,000 invested in buildings in one year. Rapidly some avenues have been transformed—Fourth, for example—from a group of old buildings of two or three floors to skyscrapers dedicated to commercial enterprises.

It is difficult in speaking of America in general, of New York, Chicago, Pittsburgh, in particular, to avoid the uninteresting toll of the numbers of millions that are accumulated.

In New York the municipal buildings are formidable, as are the tunnel for bringing the water from the Catskill Mountains, which cost $176,000,000; the one under the Hudson, which takes the subway to New Jersey, the work of McAdoo; the railroad lines which are constructed in improbable places.

The life in a city in which there exist 29,700 factories makes one giddy—in which the trolleys transport annually 452,000,000 passengers, the subways and elevated 2,000,000 daily; in which there is a bridge—the Brooklyn—at a height of 40 metres above the river, 2 kilometres in length, over which 25,000 persons circulate, by which 1,200 trains and 1,200 trolleys pass daily.

The need and special conditions have made New York, so recently born, synthetical in all its crudeness; organized regularly in view of a concrete effort, in which all the exaltations of mechanism, of efficiency, of the positive sense of life, of all the actual aspects, in total, have their expressions carried to an improbable limit. All this seems at first sight to present to us in the light of European civilization the characteristics of American civilization. I believe, however, that the apparent difference is born only of a difference of intensity.

Perhaps the Yankee has the mechanical instinct more developed, that of organization, of commerce. An American professor presented to his countrymen the dilemma that America signifies actual evolution, and concluded it in two invoking words: Carthage or Greece. The positiveness, the commercial spirit, the egoistical restlessness, on one side, and on the other the intellectual life, the beauty, the serenity. In those two words are treated the two forms of civilization possible to-day. Will it be necessary to admit as inevitable the Carthaginian course?

In the lower part of New York the commercial centres are accumulated; so that the whole world looks for a place there; surfaces are rapidly blotted out, acquiring at the same time improbable prices. Floors are added to old buildings, and they go up to six or eight stories, for the tall building is the economical building.

In 1860 the elevator was born; in 1880 hydraulic or steam power. In 1888 commenced the use of the electric elevator, and with the elevator everything began to elevate—buildings, prices, ambitions, hopes.

The older elevations were, however, limited for building reasons; the eight or ten floors of brick, of stone, of marble were heavy and of excessive thicknesses, and the problem was to find a minimum cost, the greatest utility of the areas, the best adaptation—in synthesis, economy, and utility.

Steel and iron are now employed in pillars and supports, and height with quickness of construction is possible. These metallic structures are covered with plates of brick, of stone, of terra-cotta.

The skyscraper is an immense armed beam nailed to the land, and the American architects have baptized the skyscrapers with the name of commercial work. With them has been born, effectively, commercial architecture, and many architects have specialized in this field, made possible, thanks to progress in and evolution of steel, brick, electricity, terra-cotta, heating and ventilating systems, and, above all, elevators.

A skyscraper is a hive of life in which thousands of people work during the day, in which there is an incessant movement of elevators, a continuous use of telephones; in which letters go up by pneumatic tubes to the last floors; in which there is no lack, in one word, of all the elements that contribute to make life somewhat giddy. In those hives are produced those millions of particles of gold which form the gigantic sphere which Gorki sees as an infinite meteor over the city, and which incessantly is pulverized to sustain the feverish activity of millions of beings.

In Chicago the first metallic structures were covered simply with light materials; simplicity being the only preoccupation.

The great merchants of Fifth Avenue, the Gorhams, Tiffany, the banks, wish luxury and style. They push the architects of New York, nearly all of them educated in European schools, to occupy themselves with academic principles of composition, to find beauty in following the criterions of European buildings.

In trying to diminish the sensation of height a system of composition is born and baptized with the name of base, shaft, and capital style.

On Fifth Avenue predominates, therefore, the gloss of the European styles; gloss made by men who have studied to the bottom what Europe did; who have, besides, a firm classical culture. These buildings manifest commercial genius, yet they have none of the merely business appearance, and this tendency signifies a parenthesis in the evolution of the skyscraper and a new type of architecture.

There has been, without doubt, in producing this phenomenon, a perfectly well-explained reason. The American architects have felt the restlessness, in all senses, of the problem of style, and on trying to decide it from traditional—European—standards they have been obliged to shuffle the historical styles to apply them to structures in which the expressive characteristics of the new materials are shown, and have found out the anachronisms which such solutions involved.

McKim, Mead and White initiated in New York the building of a new type; they looked for their inspiration, nevertheless, to the Florentine and Venetian buildings; afterward they leaned to the lessons of Greece and Rome.

Carrère and Hastings developed the correct French custom, and they are the ones that have led the younger generations of architects to the "school of Beaux-Arts." Burnham, Delano, and Aldrich, and perhaps more than any of them Goodhue, are eclectics who make and find solutions in all styles. Perhaps Warren & Wetmore, with their gigantic organization, are the ones who actually give a greater stamp of simplicity and of bareness to their constructions. Cass Gilbert, the author of the Woolworth Building, inspiring as the architecture of the Middle Age, is the creator of the "Commercial Gothic." He obtains with his gloss, in which the size and height lose the superfluous ornamental details, a type which is an example, within its traditional sense, of a modern and audacious character.

But more than they are the Chicago architects, who appear to face the problems of composition, especially in the storage-houses, with all frankness and without school prejudices. And of these Sullivan is the one who gave birth to what Bragdon calls the first American type of real value.

The same preconception of simplicity is seen in the latest buildings in New York.

Is it going, therefore, to stop at an architectural type, exempt from all the expressive traditional elements. Will this type be included in the history of architecture?

Before everything, for those of us who have been educated in the dark of the traditional, is it architecture?

And even supposing that they continue looking to the old styles for the solution of the problem, could we affirm that the works born in that way characterize our epoch and define our style?

Impressions of a New York Architect's Office

Where are the plans of these buildings prepared?

The plans are made in the offices—the French atelier.

One office is on the twentieth floor of a building; the elevator which carried us up to that floor carries some other twenty persons, who tell the boy the number of the floor they wish to get off.

The elevator goes up quickly; the air buzzes in your ears; you feel the giddiness of the height.

We arrive at a light vestibule; on the walls are some pictures, some drawings and plans; decorative plaster; a porter, and a girl in front of the switchboard.

Afterward, an ample room to receive clients, a library, typists, and the work-shop, properly ample, bright, with large, low tables at which thirty, forty, up to ninety, drawing students, architects, engineers of various specialties, work.

Every morning an employee leaves at each place a note marking the work for the day, some photographs, necessary details.

The head designer goes from one side to the other, gives orders, inspects, corrects. The chief appears in the afternoons; carries the directing of all, and at times his voice is heard in the office communicated by telephone.

Constantly the telephones are ringing; some of the students have a telephone instrument on their desk.

The typists work feverishly; perhaps some one, timidly, sings a jovial American song, an old opera air; but there is no noise, there is no loud talking heard; each one, bent over his board, exerts his efficiency, and the hours pass without seeing one another's face.

The work is perfectly distributed. Some execute the façades, others the designs, others the details in the natural size.

The engineers calculate the heating and the ventilation, the statics, distribute the elevators. Behind a counter an employee distributes ink, paper, the elements of work.

All is organized for plentiful and rapid work. In some of the offices the eraser has been adapted to an apparatus very similar to that of the dentists.

The chief architect directs in the fullest sense of the word. He explains the first ideas, corrects these in the interpretations which the assistants present.

In this way all the necessary elements unite in an office to make the finished technical work. By this system a true collaboration is started. It is not absurd to expect from such organizations, at first glimpse, something of the factory—definite and representative fruits.

Modern civilization has complicated life with new organizations; with them has been created the necessity of new buildings, which, if really derived from antecedents of other epochs, are so ideologically separated from them that they may be considered as absolutely new problems.

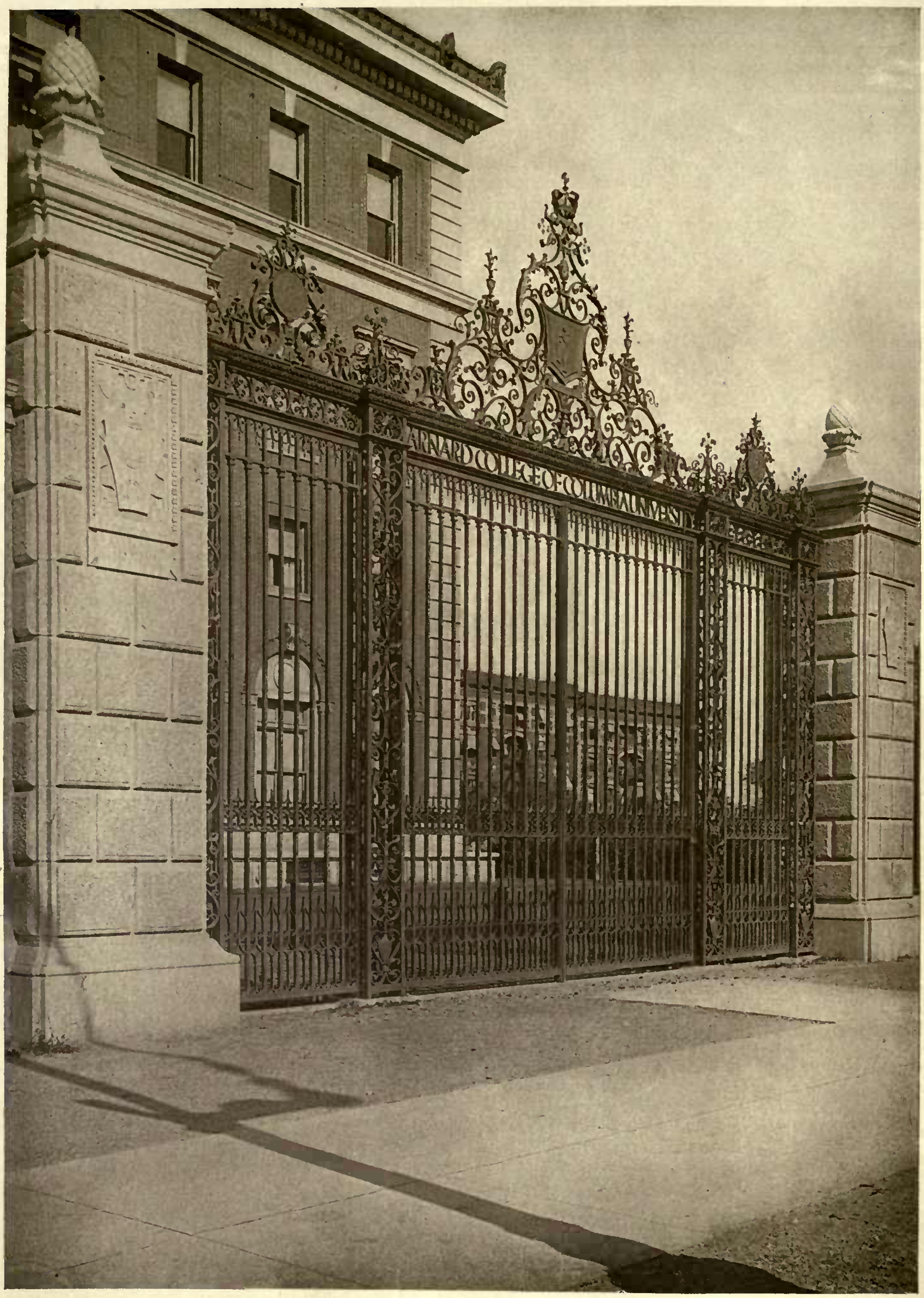
It was affirmed that until the Renaissance the æsthetical ideal of each epoch showed itself plainly in its temples. In them was buried the constructive problem, and the expression of style found there its definite forms. The temple was the ideal of all the architects.

This ideal with the collective character which it had before can be considered as dead to-day, and if actually, in the temples of the various religions, a considerable effort is displayed, it is not faith that animates them, for in many of them ostentation and the learned preoccupations enter.

All tends to a democratic sense of life, that looks for the convenience of the greater number. The slaves of to-day, the working classes, live in a way never known before.

They speak of the splendors of the pagan life. To-day a laborer of a great population enjoys conveniences which would make the life of our forefathers seem to us repugnant—without light, without the elements which modern hygiene contributes to keep victims from misspent work.

It seems that in the evolution toward democracy we can wait for an ideal beginning, more universal.



GEER MEMORIAL GATEWAY, BARNARD COLLEGE, NEW YORK. Polhemus & Coffin, Architects.

Editorial and Other Comment

Imported Architecture

If one should set out to be a critic in general of American architecture, by denying every practitioner access to the past, take all his reference books away together with his magazines, and tell him that the past is past, dead, we are living and thinking only in the present and he must invent new forms expressive of the now, we wonder what the result would be? What would happen if we made the same arrangement with the writers of books, denied them the traditions, the use of the elements of literary style, old standards of language, and demanded that they give us our stories in the polyglot vernacular, say, of a city like New York? We wonder. But there is no gainsaying, as Professor Brander Matthews points out in one of his entertaining and sparkling essays in his book "A Tocsin of Revolt," that there is a painfully disturbing cribbing of things from the past, and too often a shameless attempt to disguise the fact by variations that only emphasize it and make a host of people say that the study of architecture is only a way of finding out where to steal your ideas.

There is a lot of pertinent truth in this:

"Indefensible as is the endeavor to import architecture 'in the original package,' it is not more absurd than the attempt to borrow decoration ready-made. In trying to transplant a French chateau or an English manor-house, there is evident the desire to have at least a dwelling of a single style, however unoriginal it may be; but even more frequent of late in the United States than these homogeneous plagiarisms are the houses whose connecting rooms display a heterogeny of disparate and discordant elements each of them violently swearing at its neighbor. This is what is known as 'period' furnishing and 'period' decoration.

"A room rigidly reproducing the stiff severity of the French Empire will open into another hung with the tapestries and filled with the furniture of the reign of Louis XIV; and this in turn may lead into a third where the decoration is Adam and where the chairs are Chippendale. A Byzantine entrance may conduct the visitor to a Gothic hall on his way to a Louis XVI drawing-room and to a George II dining-room, opening out on a Spanish patio arranged as a conservatory or on an Egyptian tomb forced into service as a billiard-room. The bedrooms may be Japanese or Chinese, Hindu or Persian; and the only American room in the house is likely to be the kitchen—unless perchance the headstrong owner has insisted on making this Pompeian or Assyrian.

"Could anything be less artistic than this inconsistent medley of periods and of places? Could anything be more like an architectural crazy-quilt? Could anything be less homelike? How can anybody ever expect that his household gods will settle down comfortably in so piebald an environment? How can any twentieth century American reconcile himself to taking up his residence in an atmosphere so alien and so unfriendly? How can he feel the warmth of his own hearth when he has condemned himself to dwell in the frigidity of a portfolio of sample-plates? The most that the owner of a dwelling so motley can do is to pride himself on the accuracy of the imitations he has purchased and to be vain over his own absence of originality."

We like to believe that more often than not the architect in such cases is the victim of his client or the client's family, who show him a print from some book or a photograph of something they have seen in their travels, and remark: "I want a house like that." The architect must live, and it is money that talks in these days.

The survival of the past in our contemporary architecture, the use of the classic orders, Gothic details, seems to us, when used with knowledge and good taste, not out of keeping with our right to the heritage of beauty of all the world.

Unfortunately these things are so often but the guinea's stamp, the affectations of a scholarship that fools only the dear public.

We like to remind our readers of the enlightening series of articles that appeared in our pages by Mr. Swartwout on "The Use of the Classic Orders in Architecture."

To revert to Professor Matthews, we hope he may live to realize his dream, and may we dream with him:

"We have all of us our day-dreams; and it is one of mine that if I were a multi-millionaire, still in the prime of life and fortunate in a wife who was a helpmate and in half-a-dozen sons and daughters who might gather about the hearth of an evening, I would build a house for myself that should be truly a home, 'adapted to its occupants,' made for us and for no one else, fit for a family to grow up in and to leave with regret and to return to with unfailing joy. Moreover, it should be a dwelling at once contemporary and American, with nothing antique or imitated, and with nothing alien or exotic. It should be the product of America to-day, a genuine effort to represent our country and our time, an expression of the very best that an American architect could do with the aid of the foremost of our painters and sculptors.

"If the house of my day-dream could be completed according to this principle, it would be as absolutely native to us now as an Italian palace of the Renascence was to its owner; and it would be as spontaneous an outgrowth of our contemporary civilization as was a chateau on the Loire or as a Tudor manor-house, each in its own time and place. Its designer would not be thinking of his 'style'; and he would not be straining himself in quest of overt originality, any more than did the designers of the palace, the chateau, or the manor-house.

The Modern Hospital

We recently announced the offer of prizes by the Modern Hospital Publishing Co., for designs for a small hospital, and we hope that when they are built they will take into consideration the innovations made by the new Fifth Avenue Hospital in New York. When doctors disagree there is hope for the patient, they say, and when the builders of hospitals realize what the psychologists have long realized, that color may play an important part in the state of mind, we shall start patients on their journey through a serious illness or dangerous operation in an environment that looks less like a morgue than the average hospital room or operating-room of to-day. Of course, everything must be immaculately clean, but apparently this may be achieved and yet some vestiges of home comfort left.

The walls of the rooms of the Fifth Avenue Hospital are "in French gray, buff, or tan, with dainty, pleasing furniture." And here is a picture of the operating-room:

"Even the patient who is about to undergo an operation is considered in the furnishings. Instead of being wheeled into a huge bare room, where there is nothing but an extra stretcher or two to distract her attention from her own pain and apprehension, until the anæsthetist has done his work, the patient at the Fifth Avenue Hospital is taken to an anæsthetizing room which resembles a small parlor. In place of iron enamelled furniture sparse in quantity and utterly devoid of beauty, with which most anæsthetizing rooms are equipped, these little parlors are attractively furnished with wooden furniture and—in utter defiance of the old bare hospital tradition—they have rugs on the floors and curtains at the windows."

Planning the Philadelphia Sesqui-Centennial

Doctor Philippe Cret and E. B. Temple Are to Take Charge of the Preliminary Work of the Planning of the Philadelphia Sesqui-Centennial Exhibition.

On recommendation of the Engineers' Club of Philadelphia and the Philadelphia Chapter of the American Institute of Architects, Doctor Paul Philippe Cret and Mr. E. B. Temple have been designated as architect and engineer, respectively, to take charge of the preliminary planning of the Sesqui-Centennial Exhibition, to be held in Philadelphia in 1926, in celebration of the one hundred and fiftieth anniversary of the signing of the Declaration of Independence. In explaining the action of the Committee on Grounds and Buildings, headed by General Atterbury of the Pennsylvania Railroad, Colonel Franklin D'Olier, President of the Association, said: "The purpose of this move is to work out a tentative plan of grounds and buildings on the Parkway-Fairmount Park Site. Mr. Temple, in consultation with the Engineers' Committee, and Doctor Cret, in consultation with the Architects' Committee, and also with the approval of our Association, will select their associate engineers and architects. They will form a small, compact, rapidly working group of engineers and architects who will submit this plan at the earliest possible moment. Doctor Cret and Mr. Temple have volunteered their services as a matter of civic pride, and will act without compensation for this preliminary work." Mr. E. B. Temple is assistant chief engineer of the Pennsylvania Railway System, which position he held since 1906. He has been with the Pennsylvania since 1901, when he graduated as an engineer from Swarthmore, in the same class with Governor Sproul. He is fifty years of age, a member of the American Society of Civil Engineers, American Railway Engineering Association, the Engineers' Club of Philadelphia. He is also serving, by appointment of the governor, on the Pennsylvania State Art Commission. Doctor Paul Philippe Cret is well known as the professor of design in the School of Fine Arts in the University of Pennslyvania, to which he was called in 1903. He is a native of Lyons, France, where he was born in 1876, a graduate of the Ecole des Beaux-Arts of Lyons and also of the Ecole des Beaux-Arts of Paris, and the recipient of numerous prizes and honors in the French salons. His best-known architectural works in this country are the Pan-American Building in Washington and the Public Library at Indianapolis.

Le Brun Scholarship

The Le Brun Scholarship Committee of the New York Chapter A. I. A., Julian Clarence Levi, chairman, announces the holding of a competition for the award of this scholarship for the year 1923. The application and nomination blanks can be had of the secretary of the various chapters A. I. A., or of the Le Brun Scholarship Committee, New York Chapter, A. I. A., 215 West 57th Street. The programme will be issued the end of December, and the competition drawings will be judged about March 1, 1923.

Stabilization in Industry Reflected in Fewer Accidents

The frequency of accidents among shop employees has shown a considerable decrease, due to the stabilization in industry brought about by the present economic conditions, according to Mr. A. E. Kidd, Employment Manager of the Western Electric Company at New York. It is very probable that this condition is due to the presence of operators and mechanics of longer experience on the job.

"Employees are less restive to-day and are not moving around from job to job," he states. "The fact that many industrial organizations are releasing their employees has caused those who have jobs to hold on to them. The evidences that we see in the applicants for positions show that industrial organizations are releasing the inefficient workers.

"There is an increase in the volume of applicants, but the quality of the applicants is decidedly low. Most of those who appear at the employment office to-day are out of employment. We see very little of the type who formerly sought other positions for a change of environment or for financial improvement. The greatest surplus of workers to-day appears to exist among the unskilled mechanics or those who operate one type of machine."

In the vicinity of New York for the past few years there was great scarcity of young men to do office work of the character usually described as messenger work. These, however, are now appearing in some numbers, so that it is evident that the factories are not absorbing as many of the younger men as they formerly did.

The Western Electric Company is now employing the largest personnel in its fifty-one years of existence.

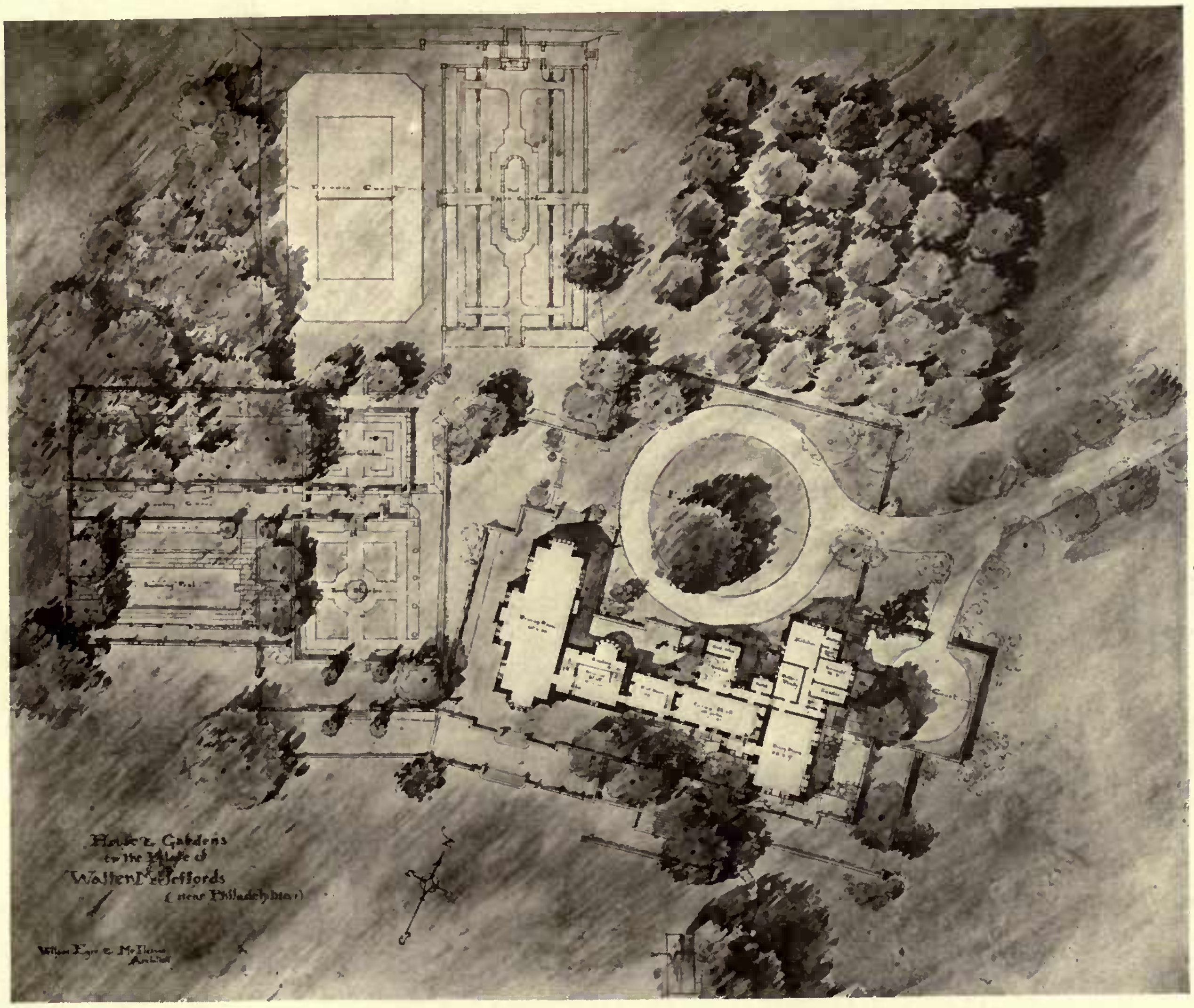
"HUNTING HILL FARM," WALTER M. JEFFORDS, NEAR MEDIA, PA.

Wilson Eyre & McIlvaine, Architects.

"HUNTING HILL FARM," WALTER M. JEFFORDS, NEAR MEDIA, PA.

Wilson Eyre & McIlvaine, Architects.

ENTRANCE COURT.



PLOT PLAN.

Wilson Eyre & McIlvaine, Architects.

"HUNTING HILL FARM," WALTER M. JEFFORDS, NEAR MEDIA, PA.

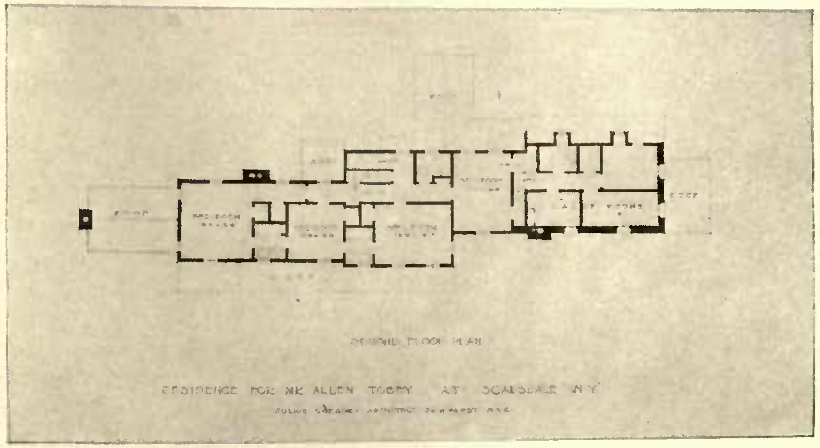
ENTRANCE FRONT.

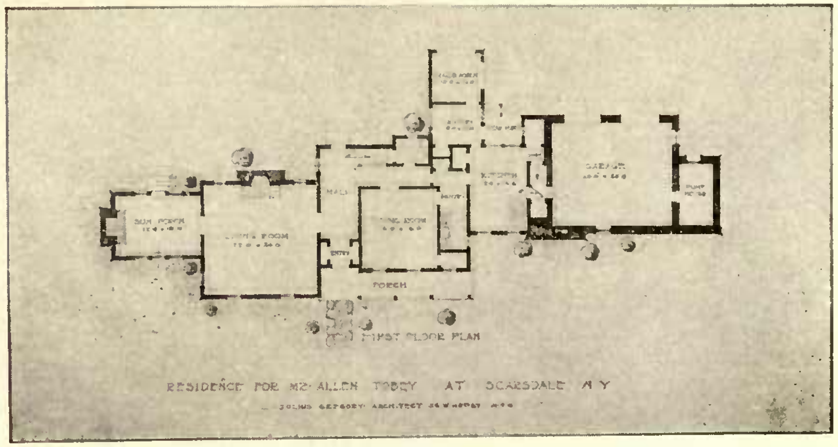
GARDEN.

RESIDENCE, ALLEN TOBEY, SCARSDALE, N. Y.

Julius Gregory, Architect.

DETAIL OF FRONT.





Julius Gregory, Architect.

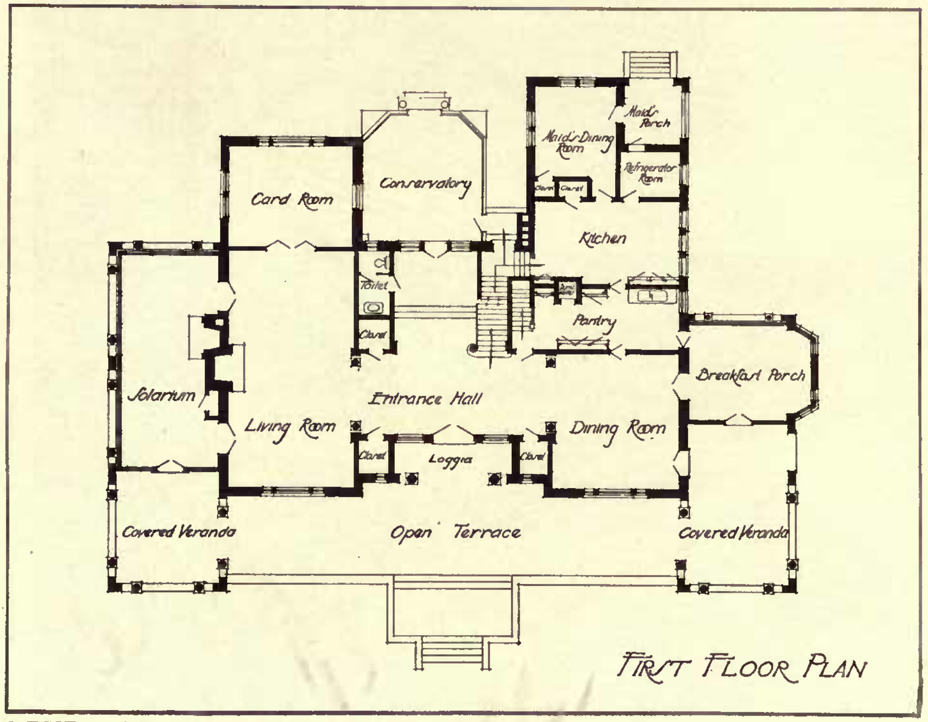
RESIDENCE, ALLEN TOBEY, SCARSDALE, N. Y.

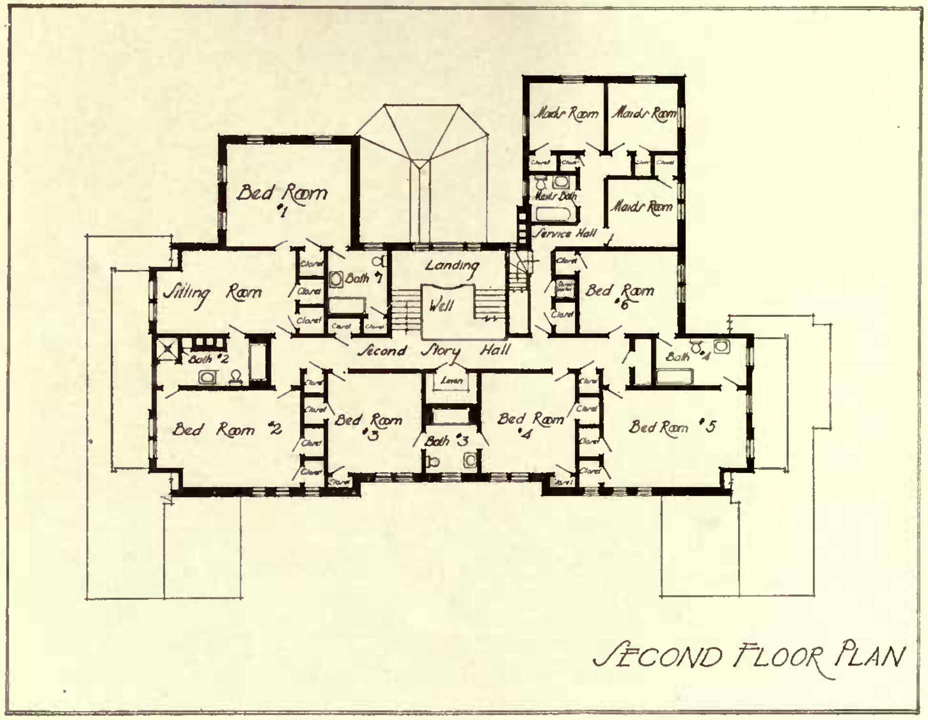
RESIDENCE, JOHN W. McDONALD, DEAL, N. J.

K. MacM. Towner, Architect.

LIVING-ROOM.

BREAKFAST-ROOM.





RESIDENCE, JOHN W. McDONALD, DEAL, N. J.

K. MacM. Towner, Architect.

HALL AND STAIRCASE.

VIEW THROUGH FIRST FLOOR.

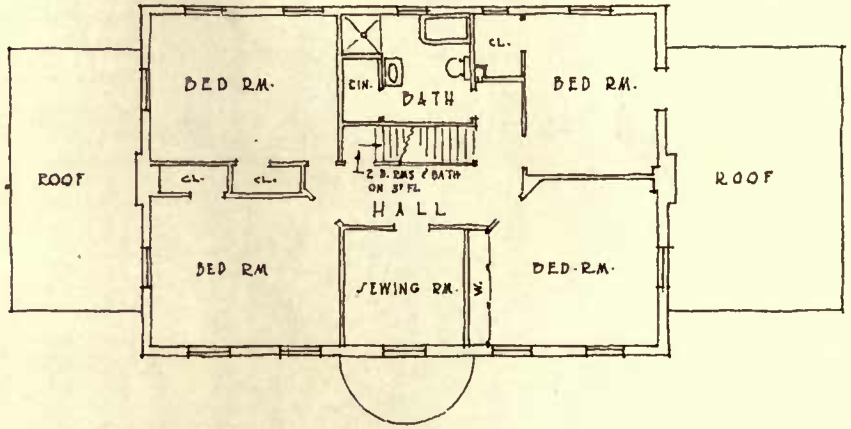
RESIDENCE, JOHN W. McDONALD, DEAL, N. J.

K. MacM. Towner, Architect.

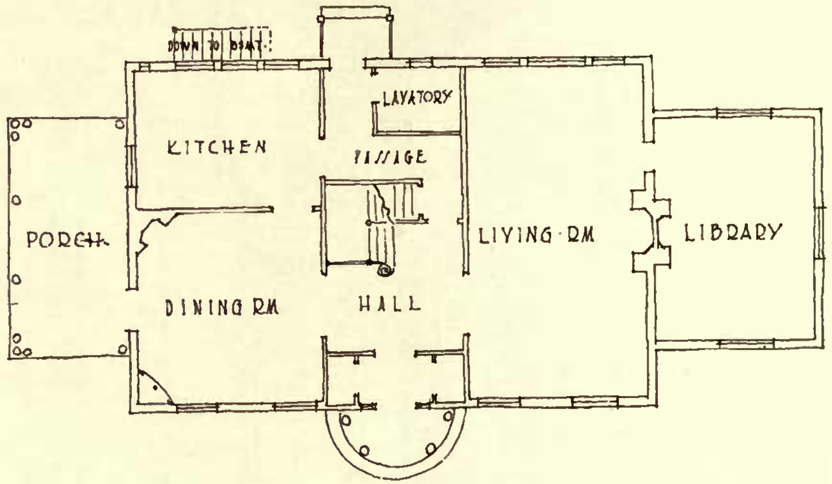
HOUSE, W. J. CAMERON, DEARBORN, MICH.

Albert Wood, Architect.

ENTRANCE, HOUSE, W. J. CAMERON, DEARBORN, MICH.

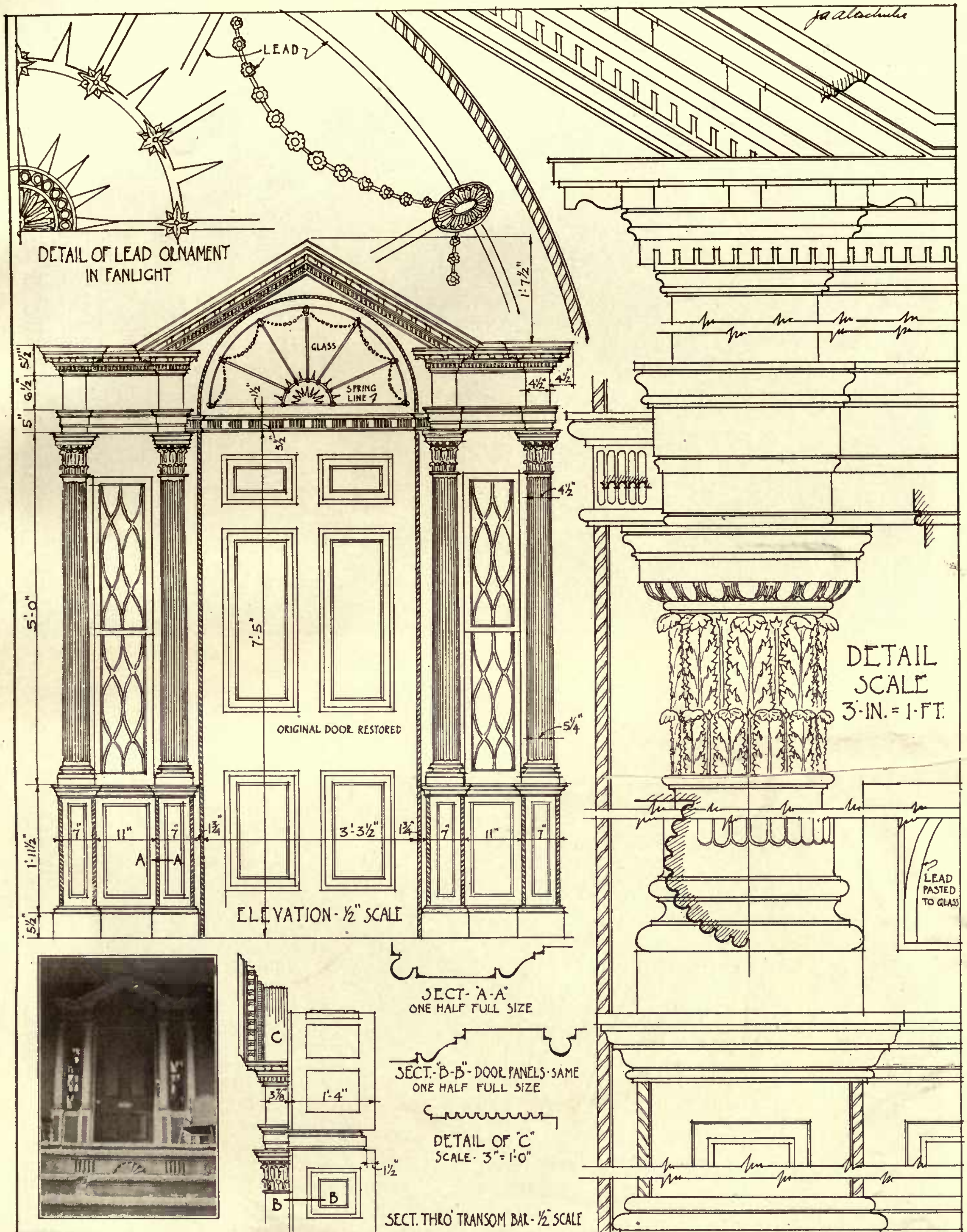


·SECOND·FLOOR·



FIRST·FLOOR PLAN

Albert Wood, Architect.



COLONIAL ARCHITECTURE *of the* CAROLINAS

DOORWAY - WELEM HOUSE
DATE - ABOUT - 1760 CHARLESTON - S.C.

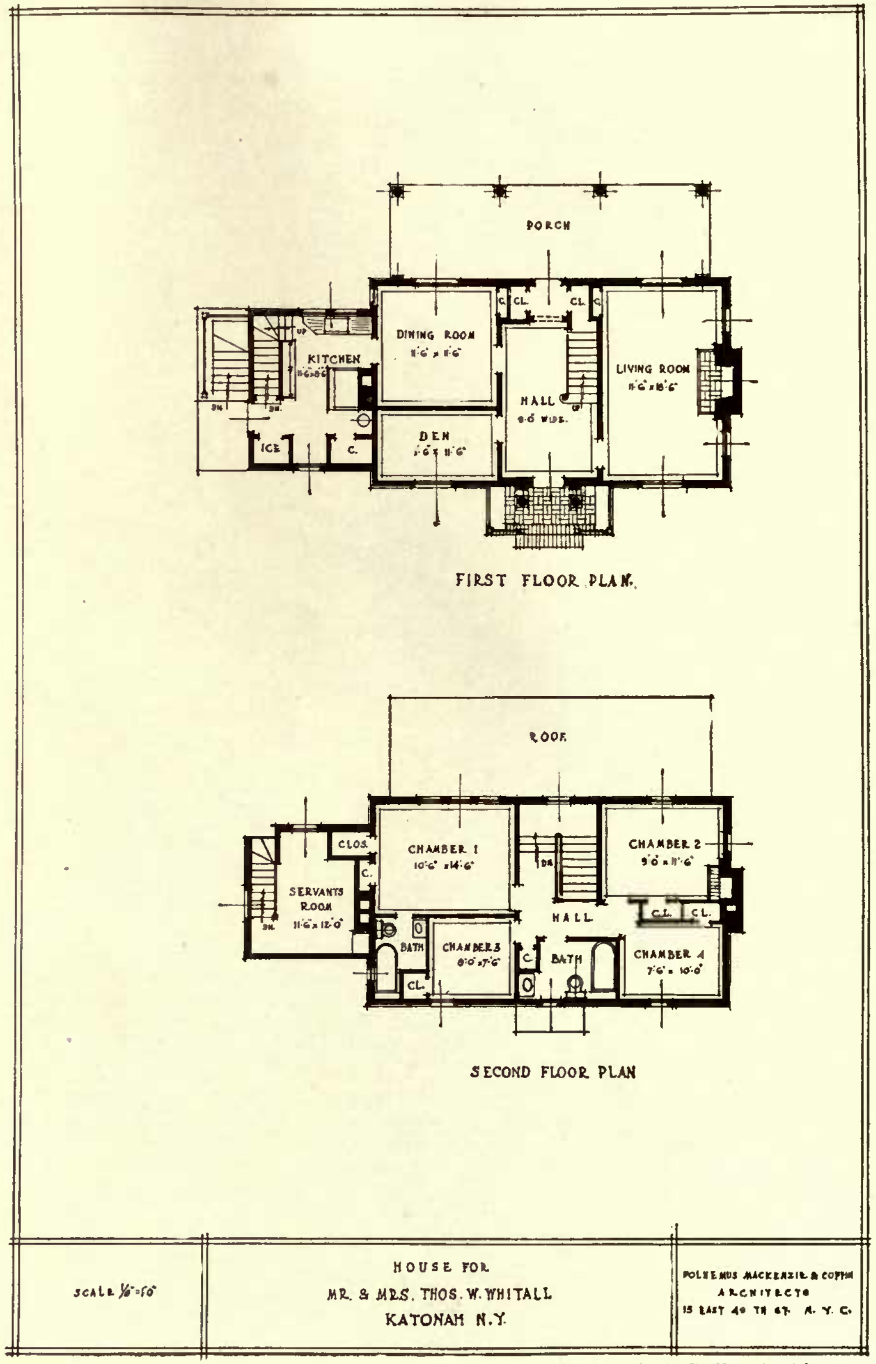
MEASURED & DRAWN *by* J. A. ALTSCHULER

REAR OF HOUSE.

FRONT OF HOUSE, THOMAS W. WHITALL, KATONAH, N. Y.

Polhemus, Mackenzie & Coffin, Architects.

DETAIL, HOUSE, THOS. W. WHITALL, KATONAH, N. Y.



Polhemus, Mackenzie & Coffin, Architects.

RESIDENCE, HOWARD BAYNE, MORRISTOWN, N. J.

Alfred C. Bossom, Architect.

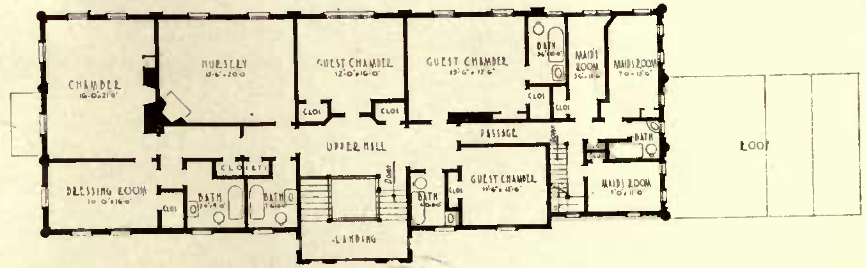
RECEPTION-HALL AND STAIRCASE.

DINING-ROOM.

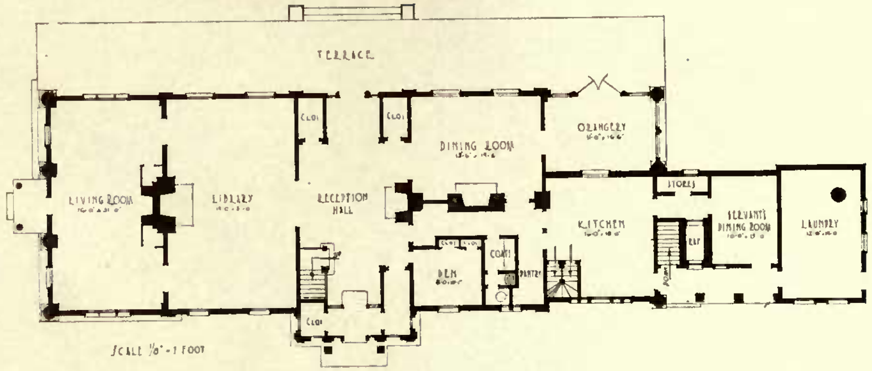
RESIDENCE, HOWARD BAYNE, MORRISTOWN, N. J.

Alfred C. Bossom, Architect.

VIEW THROUGH FIRST FLOOR.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

RESIDENCE OF HOWARD BAYNE ESQ
MORRISTOWN NEW JERSEY

ALFRED C BOSSOM
ARCHITECT
680 FIFTH AVE NYC

RESIDENCE, HOWARD BAYNE, MORRISTOWN, N. J.

Alfred C. Bossom, Architect.

Living-room, residence Howard Bayne, Morristown, N. J.

Book Reviews

ARCHITECTURAL DRAWING. By W. B. Field, Assistant Professor of Engineering Drawing, Ohio State University, with an introduction and an article on lettering by Thomas E. French, Professor of Engineering Drawing, Ohio State University. 161 pages, 9 by 12, 79 plates. $4.00. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.

The author has had experience both as a practising architect and a teacher of drawing, and has brought together those fundamental subjects in drawing that should be studied by the prospective architectural draftsman and architect, putting them in such form that they may be at hand for ready reference as he works over his designs on the board. It is therefore a text-book and a reference book.

Contents: Introduction. I.—Graphic Methods of Representation. II.—Drawing Instruments and Their Use. III.—Geometric Methods. IV.—Preliminary Sketches. V.—Scale Drawings. VI.—Detail Drawings. VII.—The Orders of Architecture. VIII.—The Acanthus Leaf. IX.—Mouldings. X.—Architectural Lettering.

SKETCHING AND RENDERING IN PENCIL. By Arthur L. Guptill. With a Preface by Howard Geenly, A. I. A. The Pencil Points Library, Eugene Clute, Editor The Pencil Points Press, New York.

We are glad to say welcome to so good a book as this, so useful a book and one so comprehensive. There isn't much literature on the subject, and nothing that we know quite as representative and of such especial value to the architectural draftsman. But it is a book that should be useful as a text-book in schools of drawing and to art students of all kinds. The pencil is such a beautiful and readily available medium, and can be made to be so expressive in the hands of a skilful and knowing worker. The book is the outcome of a series of lectures delivered at Pratt Institute. There are numerous illustrations by the author and by others. The chapter on "Sketching Animals" is illustrated by Charles Livingston Bull, whose admirable drawings are known to all.

NORTHERN ITALIAN DETAILS, DRAWINGS AND PHOTOGRAPHS. By Walter G. Thomas and John Fallon. With an Introduction by John Mead Howells. U. P. C. Book Co., New York.

These 143 plates, which have previously appeared in the *American Architect*, make a portfolio of great value as a reference.

Mr. Howells has expressed the practical service of these details in his admirable introduction:

"These fully developed details were often worked from finished architects' drawings, such as we produce to-day, and so we now come to the reverse problem, three hundred years later, of how to get these fine details back into the hands and heads of our present architects and draftsmen. The method used in this collection seems the direct and practical one—*i. e.*, that of giving photographs and measured drawings of the same detail side by side. The photograph gives the sentiment and impression of the original detail, and the drawing gives the means of reproducing it exactly. I think for our architectural health just now in America an exact reproduction of a good detail is usually better, both for the architect and for the public, than a denatured or 'improved' reproduction."

INDICATION IN ARCHITECTURAL DESIGN. A Natural Method of Studying Architectural Design with the Help of Indication as a Means of Analysis. By David Varon, Architect Diplôme, Ecole des Beaux-Arts. Second edition enlarged. William T. Comstock Co., New York.

Professor Varon's book has been for a long time a valued and stimulating book for the student, and he has added new material that increases its usefulness.

FORM IN CIVILIZATION—COLLECTED PAPERS ON ART AND LABOUR. By W. R. Lethaby. Oxford University Press (American Branch).

We wish every architect in the country could read the essays contained in this little book. They would do a lot of good and set many on the road that leads to sanity in thought and expression, and above all to sound and well-reasoned work. "The Architecture of Adventure," "Architecture and Modern Life," "Education of the Architect," "What Shall We Call Beautiful?" are some of the topics, and in all of them is to be found something to be remembered.

Some of our readers will recall Mr. Lethaby's admirable volume on "Mediæval Art from the Peace of the Church to the Eve of the Renaissance."

The Architecture of Robert and James Adam

Robert Adam, Wedgwood Cameo. Modelled by Tassin.

THE ARCHITECTURE OF ROBERT AND JAMES ADAM (1758–1794). By ARTHUR T. BOLTON, F.S.A., F.R.I., B.A. (Curator of the Sir John Soane Museum). Containing About 700 Superb Illustrations, Plans, and Drawings. 2 vols. Large Folio. Charles Scribner's Sons, Publishers, New York.

"It is the fate of the distinguished house architect that very little should be known of his finest work." How true this is in regard to distinguished architects of our own time is only too evident, and but for the showing of their current work in our architectural magazines, few indeed would ever know the names of the designers of some of our most distinguished and beautiful residences. And, in our residential work, we are leading all the world, both in plan and design.

It was fortunate for the Adam brothers that their interests and manifestations were so varied, that they won fame not only for their buildings but quite as much so for their work in the decorative arts associated with their architecture. Robert Adam, the more distinguished and many-sided of the brothers, derived his training from an intensive study of the Italian Renaissance, and all his tendencies were toward a greater refinement and a departure to more vigorous and individual work of his great predecessors, Sir Christopher Wren and Inigo Jones.

No architect ever had a greater vogue among the wealthy and fashionable society of his day, and none has left behind a more enduring tradition, a more vital lesson for succeeding generations. The story of his life and of the brothers' Adam is a story of the development of a new era in design, and of the part played in a successful career by the cultivation of the social graces.

The author of this fine book says: "It is certain that Robert Adam's place can only be alongside Inigo Jones, Sir Christopher Wren, Sir John Vanbrugh, and Sir Charles Barry."

This seems a fair placement in some ways; certainly in point of world fame Adam might even be put at the head of the list. But, with all his distinction, there will remain in the minds of many of his students the thought that, with all his wonderful versatility and adaptiveness, he missed the distinction that we associate with the vigor and boldness of Jones and Wren. He added tremendously to the development of luxuriant living, to the ornamentation and elegance of houses of the rich, and raised at the same time the standards of design in all things that go to the making of a house in which was manifest the wish, at least, to be surrounded by the evidences of culture and elegant taste.

There has been no book published heretofore that gives such a complete history of all the Adam enterprises, including the great speculative development and fiasco of the famous Adelphi Terrace—one of the biggest real-estate operations recorded in the life of any architect. The author has had unusual facilities in his connection with the great Soane Museum. He thoroughly examined the thousands of drawings that are housed there, heretofore but little known, and has had access to many records that have either been ignored or overlooked. A careful attempt has been made to give authentic records of all of the Adam houses and to separate from them those of doubtful attribution.

The book becomes something besides a mere record of the Adam brothers, for its complete record of their work necessarily goes into the history of houses they built and of their clients. In reading the career of Robert Adam, you read of the man with whom he was associated in his work, and you read, of course, of the enmities he made, of the petty jealousies and criticisms that are the inevitable concomitants of any successful career. Horace Walpole, one of the famous art dilettanti of the times, a supposed authority in social circles in about everything that concerned good taste, had his fling at Adam.

But no criticism could really make much difference with the success of so able a d signer, one with so much refinement of expression, such an admirably restrained sense of good design and ornament, and such a successful cultivator of wealthy and influential clients. We might almost summarize the essence of Adam's claims to distinction by saying that he was, above all, a master of those elements that we associate with the word "elegance."

These two sumptuous volumes with their profuse and beautifully printed illustrations that include a complete survey of the architecture, decoration, and furniture of the famous Adelphi Brethren, constitute not only a monument to them, but an encyclopædic reference for all concerned in architecture and the decorative arts.

Many architects will be interested in the quotations from Adam's own writings that give some of the principles upon which he made his designs.

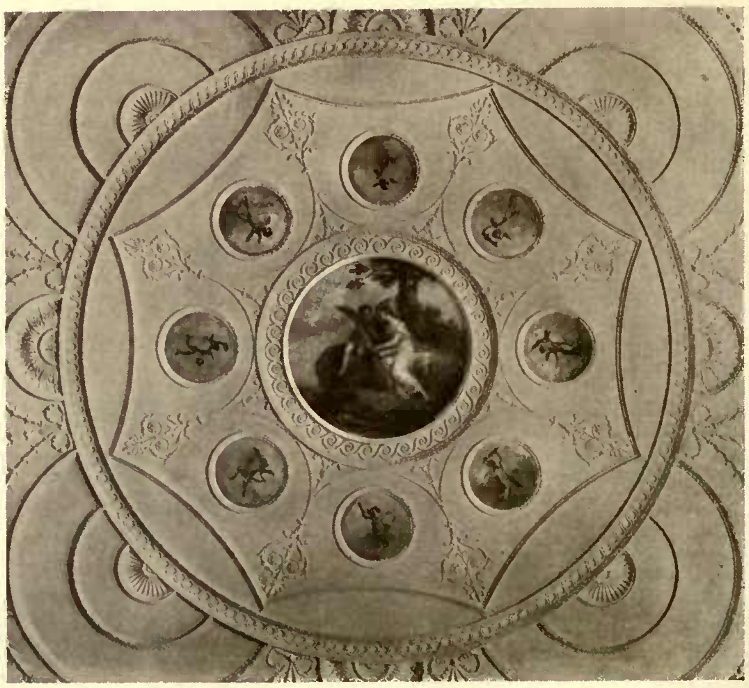
The following is his comment on ceilings and wall decorations:

"These absurd compositions (*i. e.*, the vast internal entablatures and cofferings of soffits) took their rise in Italy, under the first of their modern masters, who were no doubt led into that idea from the observations of the soffits used by the ancients in the porticos of their temples and other public works. These the ancients, with their usual skill and judgment, kept of a bold and massive style, suiting them to the strength, magnitude, and height of the building, and making an allowance for their being on the exterior part, and adjoining to other great objects: all which served to diminish and lighten the effect of these compartments. But on the inside of their edifices the ancients were extremely careful to proportion both the size and the depth of their compartments and panels, to the distance from the eye and the objects with which they were to be compared: and, with regard to the decoration of their private and bathing apartments, they were all delicacy, gaiety, grace, and beauty. If the reader is desirous to examine more minutely into these truths, let him consult the Rotunda, the Temple of Peace, the ruins of Adrian's villa, the Palace of the Emperors, and other Cryptæ at Rome, with the inimitable remains on the Baian shore. We shall only add, that from this mistake of the first modern Italian artists, all Europe has been misled, and has been servilely groaning under this load for these three centuries past."

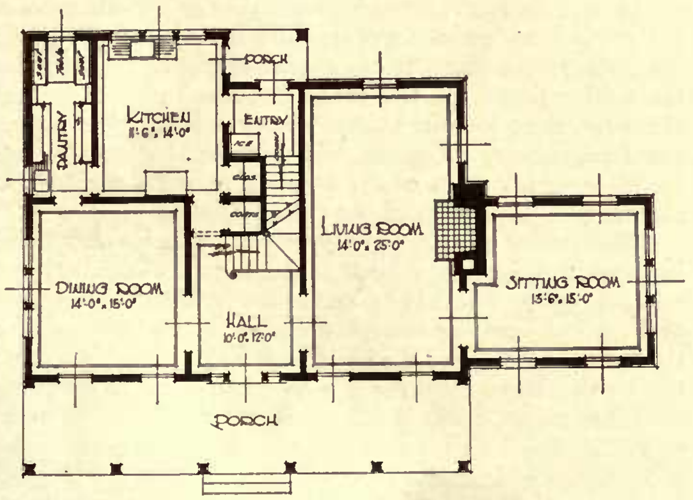
That he was a thoughtful and conscientious student of the great period of the Renaissance is evident, and he had the courage of his convictions in being ready to depart from exact forms to adapt the things he studied to agree with his own ideas of design. His was a catholic taste, and his success, taking his work by and large, was phenomenal.

That the Adam influence is still very much alive needs no saying. In New York one may study his characteristic details in many buildings, but especially in the great Vanderbilt Hotel on Park Avenue. We wonder, though, how many of the thousands who pass it or enjoy its hospitality in the course of a year are even aware that Robert Adam ever existed.

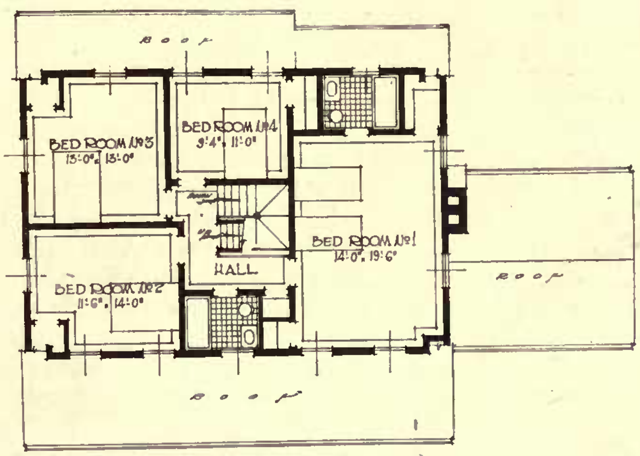
We cannot refrain from expressing the thought that in our own Stanford White we had a man who, in his day, was remindful of the career of Robert Adam. He had the versatility, the adaptability, the genius of good taste, the fine sense of proportion that were the essential qualities of his English predecessor.



Detail of drawing-room ceiling, David Garrick's house, No. 3 Adelphi Terrace.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE, FREDERICK COOKE, TENAFLY, N. J.

R. C. Hunter & Brother, Architects.

Construction of the Small House

By H. Vandervoort Walsh
Instructor, Columbia University Architectural School

ARTICLE XXIII

Financing the Construction Work

THE problem of financing the small house is a part of the problem of building and to some extent is a very personal affair, and every prospective owner has his own difficulties and personal solutions. Those who have saved for a number of years enough money to invest in this adventure of home-building are quite simply fixed, and all that they need consider is how large a house they can have for the money saved.

A method was shown in the beginning by which the approximate cost of a house could be determined when the plans were in the rough. This consisted of studying the houses built in the neighborhood where the new home was to be erected, calculating their cubical contents and dividing this into their total cost, so that their cost per cubic foot could be known. By comparing this result with the figures which the local builders had offered, a fair idea could be obtained of how much per cubic foot the new house would run. A few figures were given for the different types of construction, but nothing certain can be predicted from them, for, as was pointed out, the cost is definitely related to the locality and the time.

Once, however, having arrived at a reasonably correct cost figure for the cubic foot, the question of how big a house is to be had for the money is quickly determined. Divide this cost per cubic foot into the total sum of money which is to be used for building the house, and the allowable number of cubic feet in the new house will be found. If now the average height of the new house, from the cellar to the average height of the roof, is divided into this allowable cubic contents, the allowable ground area for the plan will be known.

For example, suppose the sum that can be invested in the house itself is $10,000, and it is found that the houses in the locality, of similar construction, cost per cubic foot about 35 cents. Dividing 35 cents into $10,000, it is found that a house having approximately 28,570 cubic feet can be constructed. If 8 feet is allowed from cellar floor to level of first floor, 9 feet from first to second floor, and 13 feet from second floor to the average height of the roof, then a total average height for the house will be found to be 30 feet. Dividing this 30 feet into 28,570 cubic feet, it will be found that a floor area of approximately 950 square feet can be had. Now as the floor area of the plan of any two-story house is determined by the area required for the second floor and not the first, the desired sizes of the various bedrooms should be approximated, and the results added together to see whether they come within the allowable floor area. Continuing this example, suppose that the master bedroom is to be approximately 14 feet by 15 feet, the other three bedrooms approximately 12 feet by 12 feet, the toilet about 7 feet by 10 feet, the hall about 8 feet by 12 feet, then by adding the area of these rooms together it will be quickly found out whether the allowable area has been exceeded.

Master bedroom, 14 feet by 15 feet	210	square feet
Three other bedrooms, 12 feet by 12 feet	432	" "
Toilet, 7 feet by 10 feet	70	" "
Hall, 8 feet by 12 feet	96	" "
Total	808	square feet

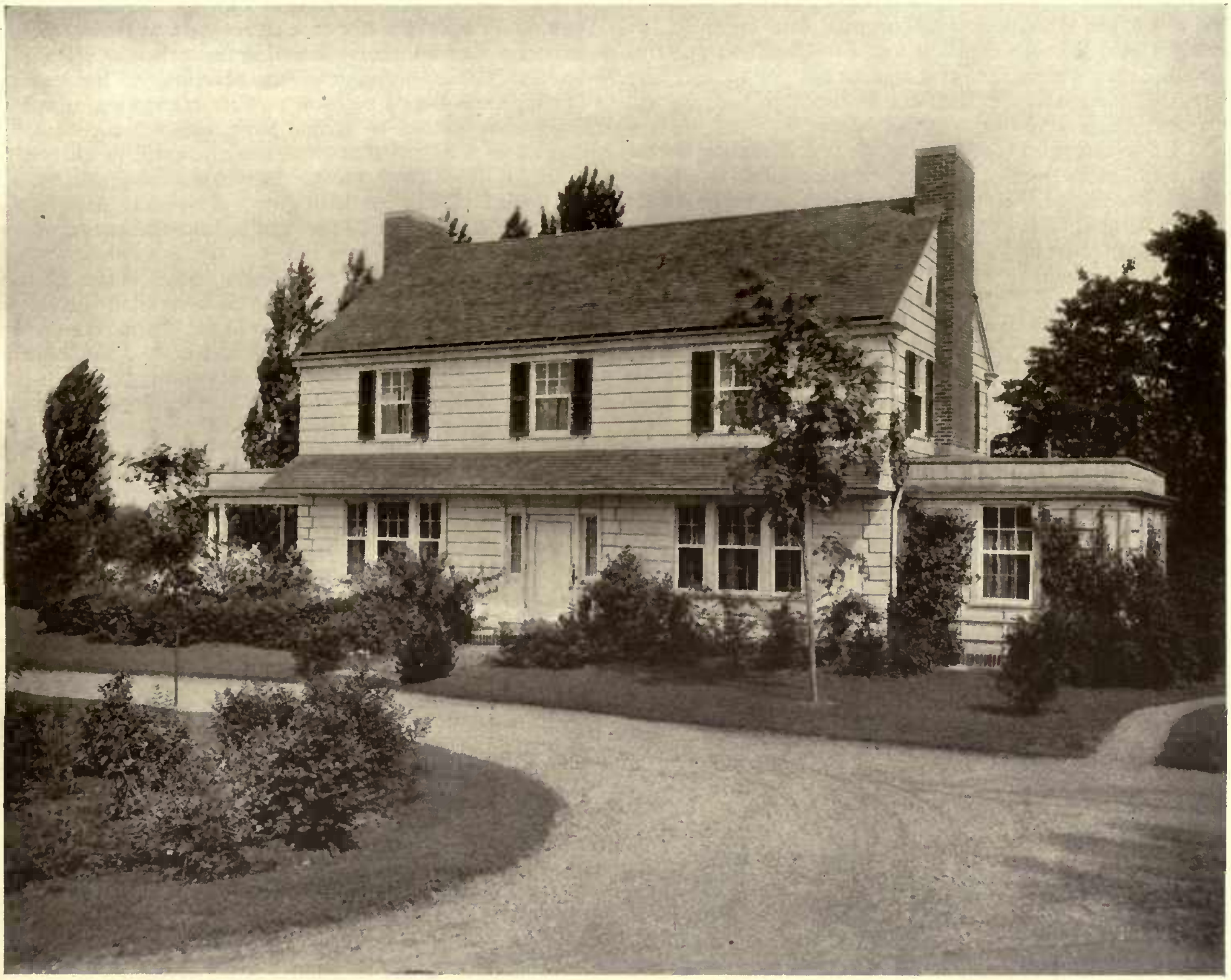
This number of square feet is within the amount allowed, which is 950, but additional area must be added to this for closets, say 3 feet by 4 feet for the closet of the master bedroom, and 3 feet by 3 feet for the closets of the other rooms, and other closets for linen and space for chimneys and the like, making about 60 square feet which should be left for this part of the plan. This makes the area about 868 square feet, and no allowance has been made for porches or passageways. It is quite evident from this that the number of bedrooms desired, their approximate size, and the size of the toilet and closets is nearly up to the maximum which the limitations of cost will permit. Working with these approximate figures, the plans of the house can be roughly prepared, the area required for the second-floor rooms being used as a basis for the allowable area of the first floor, since it is more than enough, for the second-floor area of a house, as has been said, is always greater than the minimum area for the first floor.

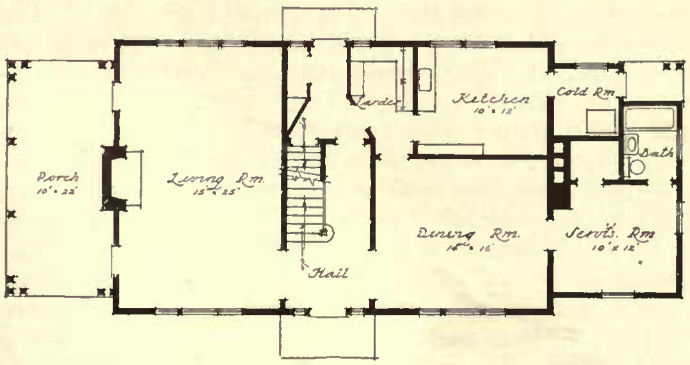
When roughly prepared plans and elevations have been arranged on this basis, the cubage can again be checked, and if it is over the allowed amount, the size should be cut down; if under, increased. The cubical contents of porches may be computed at one-quarter of the cubage of the main portion of the house, but if enclosed with glass they should be estimated at their full cubic contents.

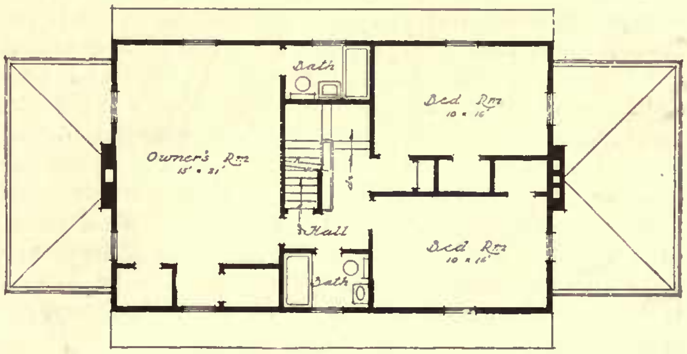
Having thus roughly arrived at the plans and elevations of the house which is within the allowed cubage, a rough outline specification should be prepared in which the essential materials, workmanship, and mechanical equipment are defined. Enough information will then be had from which a rough estimate can be secured from a local contractor, or even the architect may make an estimate, based upon previous examples of other houses. If this rough estimate comes within the allowable figure which is to be spent for construction, then the contract drawings can be safely started, and a reasonable assurance can be had that the cost of the house will not go beyond the amount of money available. As most contractors will give an outside price on any preliminary estimates of this kind, unless radical changes are made in the plans, it can almost surely be the case that the final estimate on the contract documents will be less. However, there are often times when the final figures exceed these preliminary estimates, and one should always be prepared to shrink parts of the building or withdraw some of the finest requirements of the specifications.

But one of the prime essentials in financing any building operation is to be sure that the contract drawings contain everything which is desired in the finished building, and that none or very few changes are made in the building after the contract is let and the building is in process of construction. Alterations from the original plans, after construction work has begun, come under the bugbear title for all architects, "Extras." They always mean waste of money. Likewise, things which were omitted from the plans and specifications, which are later found to be necessary, run up extraordinary bills, and the general impression which most people have that a building operation always costs more in the end than was originally counted upon is due largely to the neglect of these factors. Competent architects make

(*Continued on page* 346)







HOUSE, HARRY W. ROBERTS, UTICA, N. Y.

Bagg & Newkirk, Architects.

(*Continued from page* 344)

such complete plans and specifications, that extras of the "omission type" are avoided, but most small houses are built from plans that are not complete, or prepared by architects who sell their services at such low rates that they cannot afford to take the time to check up the plans carefully. It is right here that the architect has a real business point to give the client, namely, that if he does not pay for carefully prepared plans and specifications in the beginning, he will pay out much more in the end for extras.

Up to this point the financing of the small house, for the one who has the money, is not complicated, but this is the unusual condition, because the average person who builds the small house has not the ready cash to put into it, for that is the reason he builds a small house. The average individual who builds the small house generally has a certain amount which can be invested and the rest must be borrowed, and there are many who advise that even if one did have the whole amount to invest, it would be better to borrow some for the building operation, and keep out as much as possible for investments in other lines where the money might bring in greater returns.

The problem naturally turns upon where and how much can be borrowed for the building operation. Here again a very personal matter is involved. Some will have very close friends from whom they can secure a large first and second mortgage at a fairly reasonable rate, others may be able to secure a first mortgage from some financing institution which will be an amount equal to one-half the total cost of land and house, and then they may be able to secure a second mortgage from some friend, for most business houses are not prone to take second mortgages. Often a greater sum can be raised on the contract system, for by this method the person lending the money is more certainly assured of securing quick control of it in case of the necessity of action when payments on the interest fail. By the contract method, the individual lending the money holds the deed of the property, and can secure control of the property more quickly than if he had a mortgage and the owner held the deed. In many cases where foreclosure of mortgages are found necessary, there may be a delay of a year or more before the money-lender can secure control of the property, but if he holds the deed, the delay is shortened, and because of this fact, he is apt to lend more money than 50 per cent of the total value. Of course in the contract method the owner secures the deed to the property when his last payment is made upon the principle and he has wiped out all of his interest indebtedness.

But probably one of the most satisfactory systems yet devised for financing the small house is through the various building and loan associations which have grown to great strength in this country. These associations not only offer investment opportunities for small investors but they make excellent and easy terms for those to whom they lend money for home-building. The arrangements with these institutions make the payments on mortgages almost like the payments in monthly rents, and yet at the same time the principle is continually being reduced, so that in about twelve years it is completely paid off. Then, too, one is assured of not being in the hands of some unscrupulous money-lender, as sometimes one discovers a friend to be, however trustworthy he may have seemed before this business relation developed.

These building loan associations will lend as high as 80 per cent on the value of house and grounds, provided the character of the individual in the community warrants it. Their average-size loans have been computed to be about $4,000. If the minimum payment is adhered to, the loan is usually paid up in twelve years, although arrangements can be made by which this can be shortened. The interest charged is from 6 per cent to 8 per cent.

If the money is not secured through the above source, then it is customary to pay a commission to the agent who secures a loan from some financing institution or private investor. This commission differs, according to the locality, ranging from 1 to 4 per cent on first mortgages, and from 5 per cent upward on second mortgages. If a contract is desired on a second mortgage, the agent will be obliged to secure it from some private individual, for first-mortgage companies will not purchase them. This often leads to discounts of from 15 to 30 per cent on second mortgages and contracts.

It is well for every prospective owner, before he considers financing the construction of a small house, to sit down and figure out all of the incidental expenditures which are connected with it, for often some of the minor items are not taken into account, and they may spoil the whole scheme. Taking a typical example, the items of expense are as follows:

1. Cost of the lot.
2. Fee for title search.
3. Tax search and recording fee.
4. Possibly cost of surveying lot, but not always.
5. Broker's fee for securing mortgage.
6. Interest on each advance of the loan during erection.
7. Cost of the building less the amount borrowed.
8. Architect's fee.
9. Owner's liability insurance.
10. Fee for filing plans in Building Department.

Cost To Be Met During Year of Ownership

1. Interest on building loan.
2. Payment on reduction of loan.
3. Interest lost on owner's money which he invested in the lot and building.
4. Fire insurance.
5. Upkeep, usually about 1½ per cent.
6. Taxes on property and water-supply.
7. Possible assessments.
8. Maintenance cost, such as coal, gas, and electricity.

The above list of expenses should be frankly faced in the beginning, tabulated, and duly considered by every prospective owner of the small house. There are some architects who for fear of discouraging their clients from building will not sit down with them and show them a plain statement of the money they will have to invest, and when all of these minor items begin to pop up during the progress of the operations, the client begins to lose confidence, wonders where the next unexpected bill will come from, and blames the architect for having misrepresented conditions to him. Any prospective owner who has to be blindfolded to the costs which he must meet in order to muster up courage to build ought to be left alone, for he will do the architect no good, but considerable harm. Individuals who have their castles in the air so high that they cannot reduce their dreams to dollars and cents before they begin, ought never to build. These are the kind that start the cry that it always costs more to build than one ever figured on in the beginning.

But coming back to the question of securing the building loan, it will be found that nearly all lenders will insist that the owner put his money in first. That is, he must meet the first payments to the builder himself, until he has put in all of his share. The rest will then be taken up by the financing institution, but always enough will be held back to assure sufficient funds for the completion of the house and the payment of all bills. The lender generally states at what periods of the construction money will be passed over, and this schedule is generally adopted as the one for the periodic payments to the builder. Of course the contractor must be consulted on the matter, and his approval secured, but there will be little difficulty on this score, for he will recognize the power of the financing institution to dictate the dates of payment.

As to the matter of contracting for the construction of the small house, there is little doubt that for so small a building the method of securing one general contractor to assume the responsibility of the whole work is the best. There are many who believe in employing day labor, and hiring the services of a supervising builder. The cost is itemized and the contractor adds a percentage as his share. This insures better-class work, but in practically all cases it is more expensive, and no assurance can be had of the final cost.

When the plans are let out to various contractors for bids, there should be no obligation attached to them that the lowest bidder will secure the job. This is a protection, for the human element often enters into relations of this kind, and the lowest bidder may not be the most trustworthy personage, nor have the best reputation.

When the contract is finally let, there are a number of things which it should cover that are intended to protect the finances of the owner. For instance, the contractor should be required to maintain insurance that will protect him from the claims under workmen's compensation acts, and from any other claims for damages for personal injury, including death, which might arise from the operations of building. The owner should also maintain a similar liability insurance to protect himself.

The owner should carry a fire insurance on the entire building and materials to at least 80 per cent of the total value.

When there is doubt as to the financial strength of a contractor, he should be required to furnish a bond covering the faithful performance of the contract and the payment of all obligations.

Then, too, it is customary to set forth cash allowances in the specifications to cover certain items, like plumbing fixtures, hardware, and electric-light fixtures. The contractor should be made to declare that the contract sum includes these cash allowances.

Careful understanding with the contractor should be arranged as to the method by which he will be paid. Generally, as was previously stated, the financing institution has control over the schedule of payments, and once this is agreeable to the contractor, he should be required to submit to the architect an application for each payment with receipts and other vouchers, showing his payments for materials and labor, including payments to subcontractors, at least ten days before each payment falls due. It is the duty of the architect to determine the accuracy of each one of these applications for payment before he issues the certificate of payment for such amounts as he decides is properly due. There are some architects who make it a practice to hold back a certain percentage of the first payment, and continue this with every later payment, until the last, in order to have a club over the head of the contractor and also a factor of safety, lest the builder has rendered an application for payment in excess of the amount of labor and material delivered. This, of course, will cause hard feelings sometimes, and create friction between architect and contractor, a thing studiously to be avoided, and for this cause such procedure should be dropped when the architect knows the character of the contractor.

The architect should always reserve the right to withhold part or all of the certificate of payment when defective work is not remedied, or when any claims are filed, or there is reasonable evidence that claims will be filed, or when the contractor fails to make payments to subcontractors, or to dealers for materials, or when there is a reasonable doubt that the contract can be completed for the balance unpaid, or when any damage involving liabilities has been done by one contractor to another. The architect should also hold back the final payment if there are any liens existing against the building until they are removed.

In order to avoid many of the trivial and annoying expenses which occur in a building operation, the contractor should be required to pay for all permits and licenses (but not permanent easements) which are necessary according to local laws. The contractor should also be made to pay all royalties on patents, if there are any, and all license fees.

But, probably, the most difficult part of the building operation to finance are the extras. When something is found to have been omitted from the plans and specifications, and the contractor did not cover it in his bid, or when the owner changes his mind and requires an alteration, then this extra work must be paid for at a high rate, for nearly all contractors look upon such extras as good pickings. In fact there are some contractors who deliberately go over the plans and specifications to note what extras may be needed, and then counting upon their profits from these extras, they put in a low bid, so that they can beat their competitors, secure the job, and then proceed to make up their losses with bills which they put in for the extras. Likewise a contractor who is honest, if he finds himself losing money on any building operation, will try to ease his losses and gain profit with the extras.

There must, therefore, be some basis upon which estimates for these extras will be determined. The values for these extras or changes in the work may be determined by a submitted estimate and acceptance in a lump sum, by a unit price named in the contract or subsequently agreed upon, or by the cost and percentage, or by the fixed fee method. If the contractor claims that any instructions, by drawings or otherwise, involve extra cost under his contract, he should be required to give the architect written notice of it before proceeding to do the work, within two weeks after receiving such instructions.

A final problem of financing should be considered, and that is the emergency which might arise should the contractor neglect to prosecute the work properly or fail to perform any provision of his contract. If such is the case, the owner should reserve the right in the contract, that after three days' written notice to the contractor he may make good such deficiencies and deduct the cost from the payment due the contractor at that time. Of course every contract should provide for the owner's right to terminate the contract should the contractor fail to do his work, or prove bankrupt, or persistently disregard laws, or continually violate the provisions of the contract.

A Charming English-Style House

By Charles Alma Byers

THE English-style house is coming into much favor in this country, and, if well handled architecturally, it always makes a very attractive home. The little house of this style illustrated herewith is of exceptionally excellent design, both as to outside structural lines and in respect to interior planning. The roof, characterized by a steep pitch and a graceful sweep of long lines, is especially full of character, and the manner in which the front window bay is extended upward from the ground to the full height of the second story, to help provide room for the semi-winding staircase, lends particular charm to the front. Other delightful and enhancing features of the exterior are the open vestibule-like entrance porch on the front, the *porte-cochère* that provides complete protection to a side vestibuled entrance, and the two cement-paved terraces—one on a front corner and accessible from the living-room, and the other on a corner in the rear and accessible, through either French doors or French windows, from both the living-room and dining-room.

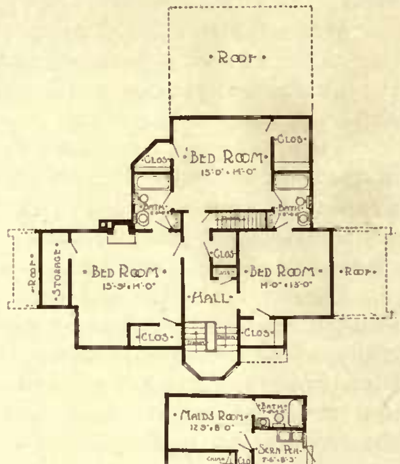
House, Mrs. Theodore Nelson, Los Angeles, Cal. Frederick J. Soper, Architect.

The house is mainly of frame construction, with the outside walls finished with light buff cement-stucco. Bright-red brickwork, however, is liberally represented about the entrance and in facing the front walls. The roof is of wood shingles, painted green, and all wood trimming is done in dark brown.

The arrangement of the interior will be observed from the accompanying floor plans. Particular notice should be taken of the large living-room, which reaches entirely across the front, and of the manner in which the staircase rises therefrom. The dining-room, it will be seen, is set sort of diagonally in the plan, and French doors connect it both with the dining-room and with a little breakfast-room, as well as with the rear terrace. On the first floor is, in addition to the other usual divisions, a conveniently located maid's room, with bath, and on the second floor are three bedrooms and two baths.

The closets and built-in features indicated in the plans particularly deserve notice. The closets, for instance, include a closet for wraps off one corner of the living-room, a broom-closet on the kitchen-entry porch, a little storage-closet in the kitchen, a clothes-closet for each of the bedrooms and for the maid's room, a large storage off one of the bedrooms, a large closet in the upstairs hall, and a linen-closet in each of the second-floor bathrooms and in the hall. The built-in features consist of china cupboards in the dining-room and breakfast-room, excellent cupboards and the other customary conveniences in the kitchen and pantry, and a medicine-case in each of the three bathrooms.

The interior woodwork consists of pine, finished in old ivory style, with mahogany trim, in the living-room and dining-room, and of pine alone, finished either in old ivory or white enamel, in all remaining divisions. The plastered walls of the living-room are given a hard finish and painted in oil, with stencilled decoration, and in the dining-room, breakfast-room, maid's room and the bedrooms they are papered. Hardwood floors prevail throughout, except in the bathrooms, kitchen, and kitchen-entry porch. The two second-floor bathrooms have tile floors, and their walls are finished with a four-foot tile wainscot.

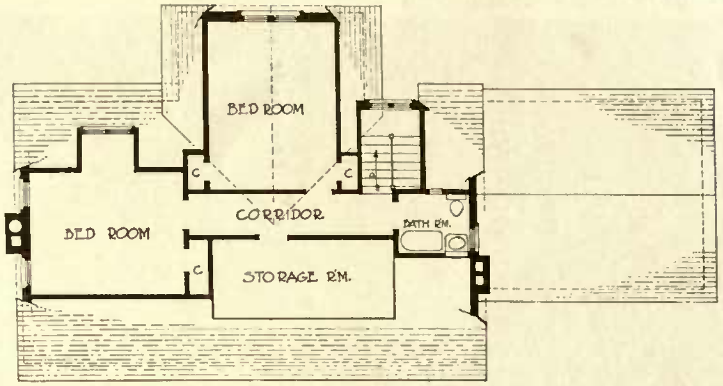


The house has a large basement, reached by a stairway off the dining-room, and off the pantry there is a back stairway to the second floor. The equipment includes a furnace and all other modern conveniences. The house is located in Los Angeles, California, and was designed by Frederick J. Soper, architect, of that city.

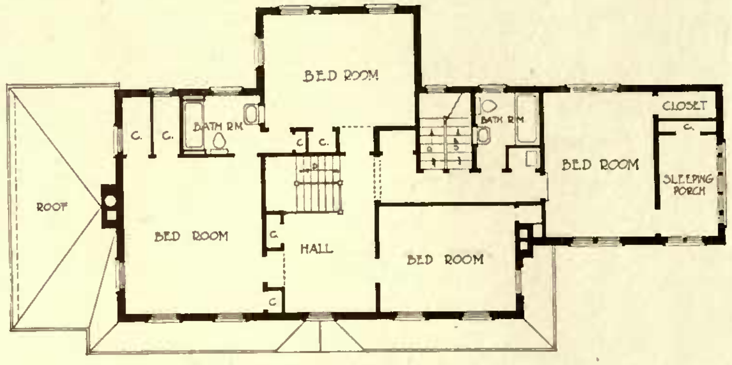
HOUSE, G. SHELDON CHAUNCEY, SOUTH ORANGE, N. J.

Edward Buehler Delk, Architect.

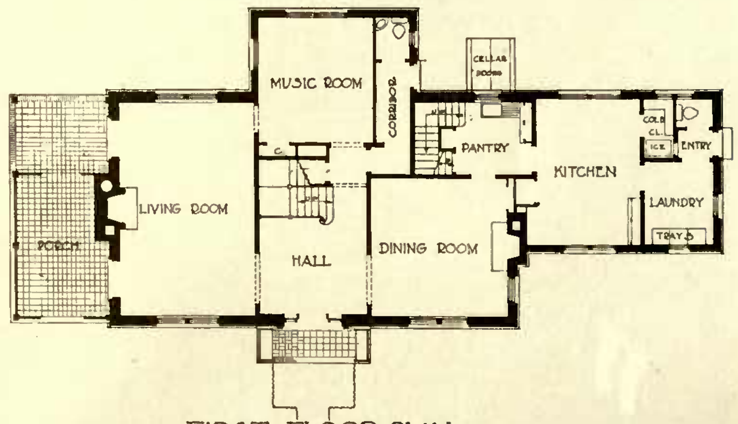
ENTRANCE DOORWAY.



THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

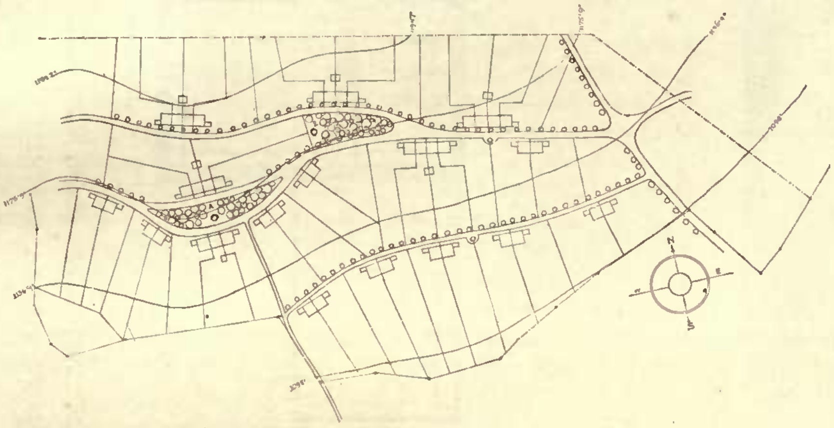
Edward Buehler Delk, Architect.

HOUSE, G. SHELDON CHAUNCEY, SOUTH ORANGE, N. J.

How Austria Is Helping to Solve the Housing Problem

By Ella Briggs, Architect

THE need for dwellings, especially small ones, had become so urgent that the government had to do something. It tried, in a new law, to offer the following solution: country, state, and city are either to give out of their own means,



Housing development near Vienna. Layout for part of grounds.

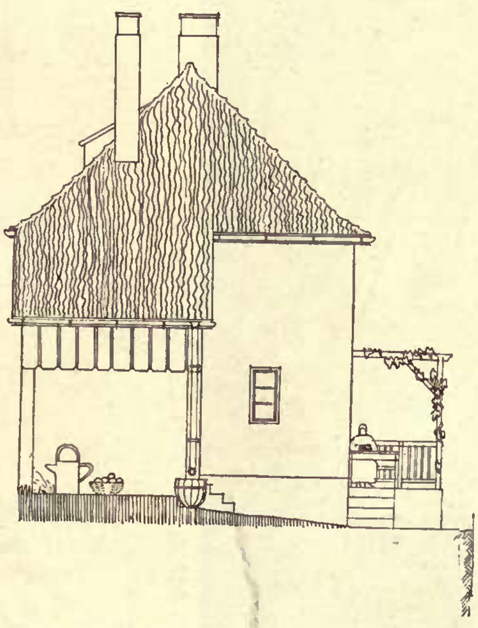
money on long terms for the building of small-sized homes, or else guarantee that a certain percentage, usually 6 per cent, is paid for the money lent by banks for the purpose of building small homes. The money plus interest is to be repaid by the owners on the long instalment plan.

The grounds are given out of public property on hereditary lease, usually for eighty years. After this time, land and the houses on it fall back to the public owner. To prevent the temporary owner from allowing the house to become dilapidated at the end of the leasehold, the Austrian law provides for paying back to him part of the appraised value of the house.

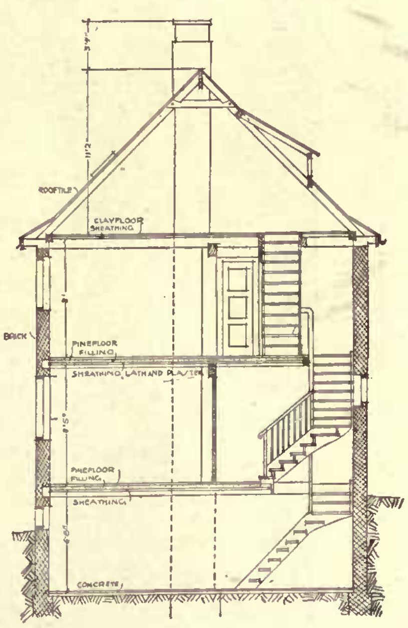
Most of these homes are built not as apartments but as family houses. Land not being scarce or as valuable in Vienna as it is in New York, it was found out that the building of small homes is not more expensive than that of apartments.

Let us look at one of these homes. The conditions for which it is meant differ widely from the American ones. They have one main room where the heat of the cooking-stove is utilized in an adjacent tiled stove. One of these kitchen and living-room combinations, though small, makes a most intimate and homelike impression. Adjoining the kitchen, there is a small scullery, where all the dirty household work is done. There stands the wash-tub and the bath-tub, which, in daytime, covered by a board, must serve as a table. Thoughtful architects will always provide for a door in the right place, or for a small window from the kitchen to the scullery to allow the housewife, while doing her work there, to peep at her cooking-pots. In building these homes, it is the aim of every architect to save the housewife every superfluous step, and by so doing, fill the first condition for the well-being of the family.

Outside the house a small stable and a small shed are provided for the farm work. Part of this is done separately in each garden and part of it in the common grounds. In fact, a main factor which made advisable the building of these houses is the truck-farming that the owners of these houses are doing on the grounds surrounding the home. The chief reason for the misery existing in Vienna is due to the fact that Austria does not produce nearly enough foodstuffs necessary for the maintenance of all its inhabitants. There are planned common fruit gardens as well as common potato acres. Each family has to work there a certain number of hours and in exchange for this work gets the part of the general crops allotted to it. The co-operative working scheme is applied in the building of these homes. The associations that have in hand the building usually prescribe to their members at least 1,500 working hours before they can own a home of their own. To develop the feeling for the community, to equalize men by making them work together, are some of the most prominent ideals of the Austrian housing development. Nevertheless, they who live there will never grow to be communists. The owning of personal property is the safest way to keep people from going into communistic excesses.



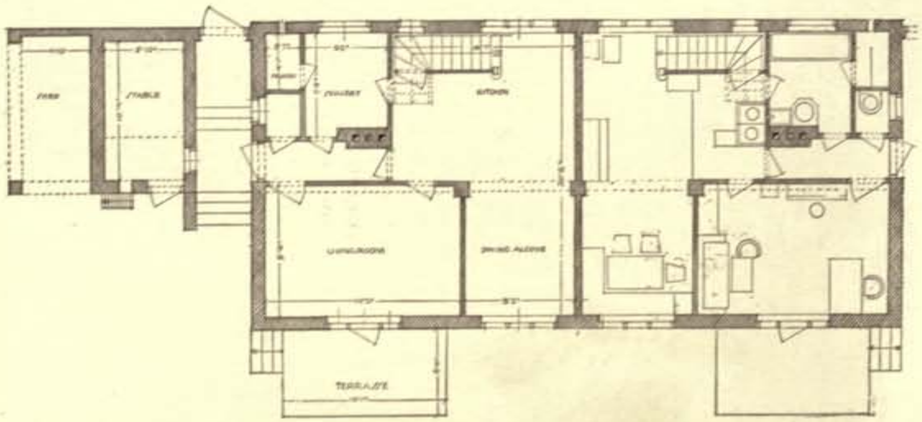
Side elevation of corner house.



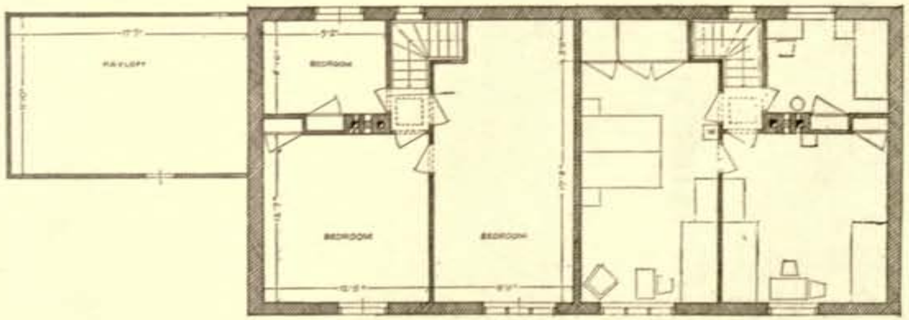
Section.

CORNER OR SEMI-DETACHED HOUSE.

INTERIOR.



FIRST-FLOOR PLAN, SEMI-DETACHED HOUSE.



SECOND-FLOOR PLAN, SEMI-DETACHED HOUSE. Ella Briggs, Architect.

GOVERNMENT HOUSING DEVELOPMENT, VIENNA, AUSTRIA.

Drafting-Room Mathematics

By DeWitt Clinton Pond, M.A.

THE two most useful branches of mathematics used in the drafting-room, with the exception of plain arithmatic, are geometry and trigonometry. Of course, in the drafting-rooms of engineers this is not altogether true, as algebra, and the solving of problems by means of algebraic formulas, has an importance which cannot be exaggerated. Architects, and architectural draftsmen, however, do not have as much use for this type of work as they do for the kind of calculations which will enable them to determine distances and angles in case their problems are complicated by designing buildings to fit irregular lots.

Most of us have had a knowledge of these two branches of the science of mathematics drilled into us during the days of our school experiences. Unfortunately, at this time our instructors did not seem to have a keen appreciation of the truly practical value of either geometry or trigonometry, with the result that many of us did not carry into our practical work a lively remembrance of even the rudiments.

The most common experience of the architectural draftsman is to be presented with a survey of a plot with at least one side which is not at right angles to its adjacent sides. The survey may be complete, or it may be of a type with which the architect may be needlessly familiar, in which not all the angles are given, few elevations are noted, and other important information is lacking. This last characteristic is more particularly true of surveys made in cities where building operations are confined to smaller structures. In this case the architect or his draftsman must determine by means of his own calculations the required information.

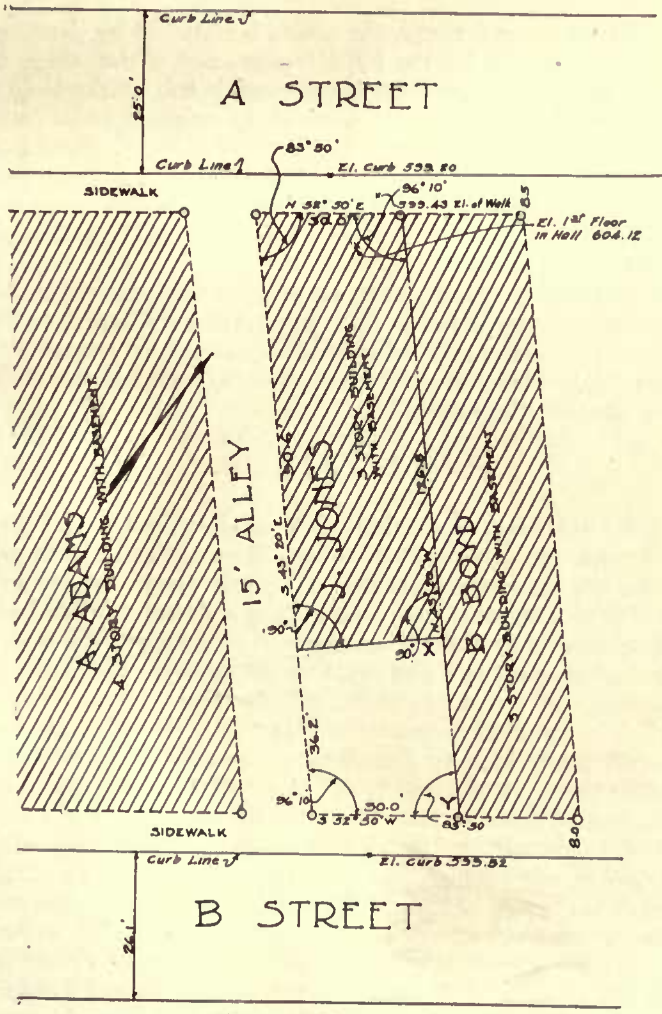


FIGURE 1

A survey which is fairly characteristic of the type which is submitted at least once or twice to every architect is shown in Fig. 1. This is not a theoretical problem but one encountered in actual practice. The names of streets and owners are assumed in this discussion. The problem presented to the architects was to draw plans and elevations for an addition to the building belonging to J. Jones which occupied part of the lot shown in the figure; the addition being planned to occupy the remaining part of the plot. It will be seen that the frontages on both A and B streets are each 30 feet, that the depth of the lot measured along the alley is 126.8 feet, and that the acute angles are given as 83 degrees and 50 minutes, and the obtuse angles as 96 degrees and 10 minutes. The lot is a parallelogram. An important dimension is not given. This is the dimension from a point, marked for convenience, X and a second point marked Y.

It would have been possible for the architect to demand that the owners furnish him with this dimension, but, as it was not a difficult problem for him to determine it himself from the information given in the survey, he did this without asking for further instructions.

In order to obtain the required dimension, as well as the distance across the lot measured perpendicularly to the alley, it was necessary for him to make use of his knowledge of trigonometry, which the dictionary defines as "mathematics treating of the relations between sides and angles of triangles."

For thousands of years it has been known that in a right triangle, such as shown in Fig. 2, there were certain constant relations which existed between the sides and the angles. No matter how long the sides of a right triangle may be the *relations* between them are always constant. It is known, for example, that if the base of a right triangle measures 1 inch and the upright leg measures 1 inch, that the angle opposite the upright leg will be 45 degrees. It does not make any difference if the length of each of the legs becomes 1 foot, or 1 mile, or any other distance; provided the same relation is maintained between them, the angle will remain 45 degrees. It is found that there are other interesting relations. It will be noticed in the triangle shown in Fig. 2 that the three angles are designated as A, B, and C, and that the sides opposite them are noted as a, b, and c respectively. Now it has been found that in a triangle similar to the one shown, if the angle A happened to be 30 degrees, the side a would always be one-half as large as the side c. Reasoning in the reverse direction, it became apparent that, no matter how long the sides were, if a were one-half of c the angle A would be 30 degrees.

It becomes evident that for any particular relation between the sides of a right triangle there will always be a definite angle. These relations—ratios—are tabulated and are known as trigonometric functions, and are given definite names. The relation determined by dividing a by c is known as the sine. If the angle A is 30 degrees, the sine is one-half, and is noted in the table of trigonometric functions as .50000. The relation determined by dividing a by b is known as the tangent. If the angle is 45 degrees the tangent is 1, as a and b are equal.

In like manner other relations known as cosine, cotangent, secant, and cosecant are determined as are listed below.

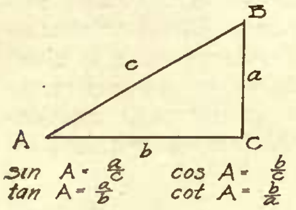


FIGURE 2

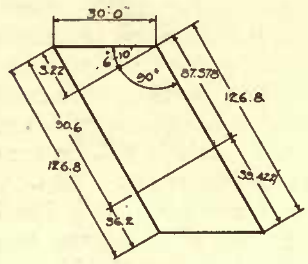


FIGURE 3

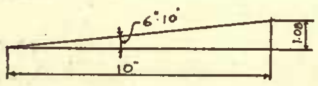


FIGURE 4

The relation determined by dividing the opposite side by the hypothenuse—a/c—is known as the sine, abbreviated as sin.

The relation determined by dividing the adjacent side by the hypothenuse—b/c—is known as the cosine, abbreviated as cos.

The relation determined by dividing the opposite side by the adjacent side—a/b—is known as the tangent, abbreviated as tan.

The relation determined by dividing the adjacent side by the opposite side—b/a—is known as the cotangent, abbreviated as cot.

The relation determined by dividing the hypothenuse by the opposite side—c/b—is known as the secant, abbreviated as sec.

The relation determined by dividing the hypothenuse by the adjacent side—c/a—is known as the cosecant, abbreviated as csc.

It is apparent that, if we know a side and an angle, other than the right angle, in such a triangle as shown in Fig. 2, it is possible to find either one of the other two sides or the remaining angle. Assuming that A is 30 degrees, and a is 10 feet, it is not very difficult to determine that c is 20 feet. If this were determined in the manner common to such calculations, the figures would be set down as follows:

$$csc\ A = c/a = 2.0000$$
$$c = csc\ A \times a$$
$$a = 10 \text{ feet}$$
$$c = 2.000 \times 10 = 20 \text{ feet}$$

In the calculations the cosecant was used, but under ordinary circumstances engineers do not make much use of this function. Those which are commonly used are the sine, cosine, tangent, and cotangent. In order to obtain the result found above by the use of the sine, it would have simply been necessary to divide a by the sine of A.

$$10 \div .5000 = 20$$

The functions of all angles are given in tables some of which are more accurate than others, and are carried out to six places beyond the decimal point. The tables which will be used with these calculations are carried to only four places beyond the decimal point, but they will be accurate enough for the purpose of showing the methods employed.

In Fig. 3 the conditions encountered in the survey as shown in Fig. 1 are presented diagrammatically with the angles exaggerated in order to make the problem clearer. It is always a good plan to draw such a diagram in solving a problem of this kind. In order to find the distance from X to Y, it is necessary first to find the distance, measured along the lot line, from A Street to the point X. It is known that the side of the building along the alley measures 90.6 feet, and that the rear wall of the building is built at a right angle to the alley. If a right triangle is drawn with the angle A at the intersection of the lot line and A Street, and the length of the side a is determined, it will be possible to find the distance from the intersection of the lot line and A Street to the point X by subtracting the length of a from 90.6 feet.

In the right triangle we know that the hypothenuse measures 30 feet, and that the angle at A is 6 degrees 10 minutes. The next step is to determine the sine and cosine of this angle which can be found in a table of natural trigonometric functions. The sine is .1074 and the cosine is .9942. These values can be checked by the reader if he refers to a book of tables or even to a Cambria or Carnegie handbook, in which tables will be found.

Now the sine is obtained by dividing the side opposite the angle by the hypothenuse, and it is apparent that if the sine is multiplied by the hypothenuse the result will be the length of the opposite side. This can be seen if the calculations given below are understood.

$$sin\ A = a/c$$
$$a/c \times c = a$$
$$sin\ A \times c = a$$

In the same manner, the cosine is obtained by dividing the adjacent side by the hypothenuse, and if the cosine is multiplied by the hypothenuse the result will be the length of the adjacent side, or the base of the triangle.

$$cos\ A = b/c$$
$$b/c \times c = b$$
$$cos\ A \times c = b$$

The next step is to make use of these values in the problem under consideration. The hypothenuse is equal to 30 feet and the sine has a value of .1074, so it is only necessary to multiply these two quantities to obtain the length of the side opposite the angle A.

$$.1074 \times 30 = 3.222 \text{ feet}$$

By referring to a table of decimal equivalents in any handbook the dimension of 3 feet $2\frac{11}{16}$ inches will be found to be the nearest to the decimal given above, which will be of practical value. Of course, even a sixteenth of an inch will be extremely difficult to measure in the length of a building, but in order to make the dimensions on the plans check, this value of 3 feet $2\frac{11}{16}$ inches will be used.

It is not always safe to use the fractions which are the nearest equivalent to the decimals if several calculations are involved, as an error is apt to result from the changing from one system of dimensions to the other.

By subtracting 3.222 feet from 90.6 feet the dimension of 87.378 is obtained, and by subtracting this from 126.8 feet it is possible to find that the wall along the lot line of the new addition will measure 39.422 feet, or 39 feet $5\frac{1}{16}$ inches.

This is an important dimension and must be placed on the plan. This explanation of the method used to obtain the dimension has taken so much space that it would seem as if it were a complicated problem. Actually it is very simple, and the figures involved would take but little space on the architect's sheet of calculations.

The other dimension, which it is important for the architect to know, is the distance across the building measured perpendicularly to the alley or lot line. This is obtained by using the cosine of the angle A, for this dimension will be the length of the base of the right triangle. The cosine was found to be .9942.

$$.9942 \times 30 = 29.826$$

This dimension will be placed on the plans as 29 feet 9⅞ inches.

This problem is a comparatively simple one, as the plot is a parallelogram and only one angle is involved. There are cases, however, where the plots have no particular shape and where the introduction of a court in a plan adds further complications. When such conditions confront the architect or engineer, he seldom uses the natural functions of the angles but the logarithms of these functions. An explanation of the use of logarithms will be taken up in a following article.

If the reader is not particularly familiar with the use of trigonometric functions it would be profitable for him to originate problems of his own in which he can assume right triangles with the dimension of one side known and one angle. By the use of the tables he can determine the length of the other side, and in order to check the result he can make use of the geometric proposition that the square of the hypothenuse of a right triangle is equal to the sum of the squares of the other two sides.

As the natural functions of angles are under discussion it might be well to make a note of the fact that the tangent of an angle can be used by the draftsman in laying out the angle in case he does not have a protractor available. The tangent of an angle is obtained by dividing the side of a right triangle adjacent to the angle by the opposite side. It is obvious, therefore, that if the tangent is multiplied by the adjacent side the result will be the dimension of the opposite side.

$$\tan A = a/b$$
$$a/b \times b = a$$
$$\tan A \times b = a$$

In case it were desirable to lay out the angle of 6 degrees 10 minutes, it is only necessary to use as a base of a right triangle a line which, for convenience, is made 10 inches long. The upright leg can be found by multiplying the tangent of 6 degrees 10 minutes, or .1080, by 10. The result will equal 1.08 inches, and if a point is found on a line perpendicular to the 10-inch line and at one end of it, and a third line is drawn through this point and the other end of the base-line, the angle which is made will be 6 degrees 10 minutes. This is shown diagrammatically in Fig. 4.

Announcements

The "Bungalow Beautiful" Show Place at Atlantic City Has Interior Trim of Genuine Figured Mahogany.—The Mahogany Association kept a careful cost-sheet on all the mahogany used in the bungalow, and also received estimates on other kinds of cabinet woods. The results are somewhat surprising. The cost of all the interior woodwork, in which are included window-casings, doors, built-in bookcases, mantel baseboards, mouldings, etc., was $880. According to the bids received, quartered oak would have cost $822; plain oak would have cost $810; birch, stained, would have cost $810; and poplar, stained, would have cost $800. In other words, the cost of installing figured mahogany trim on the entire job was only $80 more than the lowest-priced cabinet wood.

The Venus Everpointed, the perfected metal pencil manufactured by the American Lead Pencil Company, has a simplified mechanism. Its action is, consequently, both sure and permanent. Another improvement with the Venus Everpointed is that the refill leads are simply and easily inserted from the front, a year's supply being contained in the tube within the pencil head.

A new 44-page catalogue, No. 295, on air-washers, has just been published by the B. F. Sturtevant Company, of Hyde Park, Boston, Mass. It is profusely illustrated and shows the various details of construction by which the air for any building, or for any industry, is thoroughly washed and tempered before entering the building. The motors and pumps are also described and illustrated. Installations are shown in a city hall, a chocolate factory, a customs house, a theatre, as well as other types of buildings. A copy of this catalogue will be forwarded on request.

Scheid Engineering Corporation, 90 West Street, New York City, has been appointed metropolitan and export representative for the Franklin Moore Company, Winsted, Connecticut, manufacturers of material handling machinery for industrial plants.

We acknowledge the receipt of the following recent catalogues:

"Ivanhoe Brown and Pressed Design Ornamental Glassware," The Ivanhoe Regent Works of General Electric Co., Cleveland, Ohio.

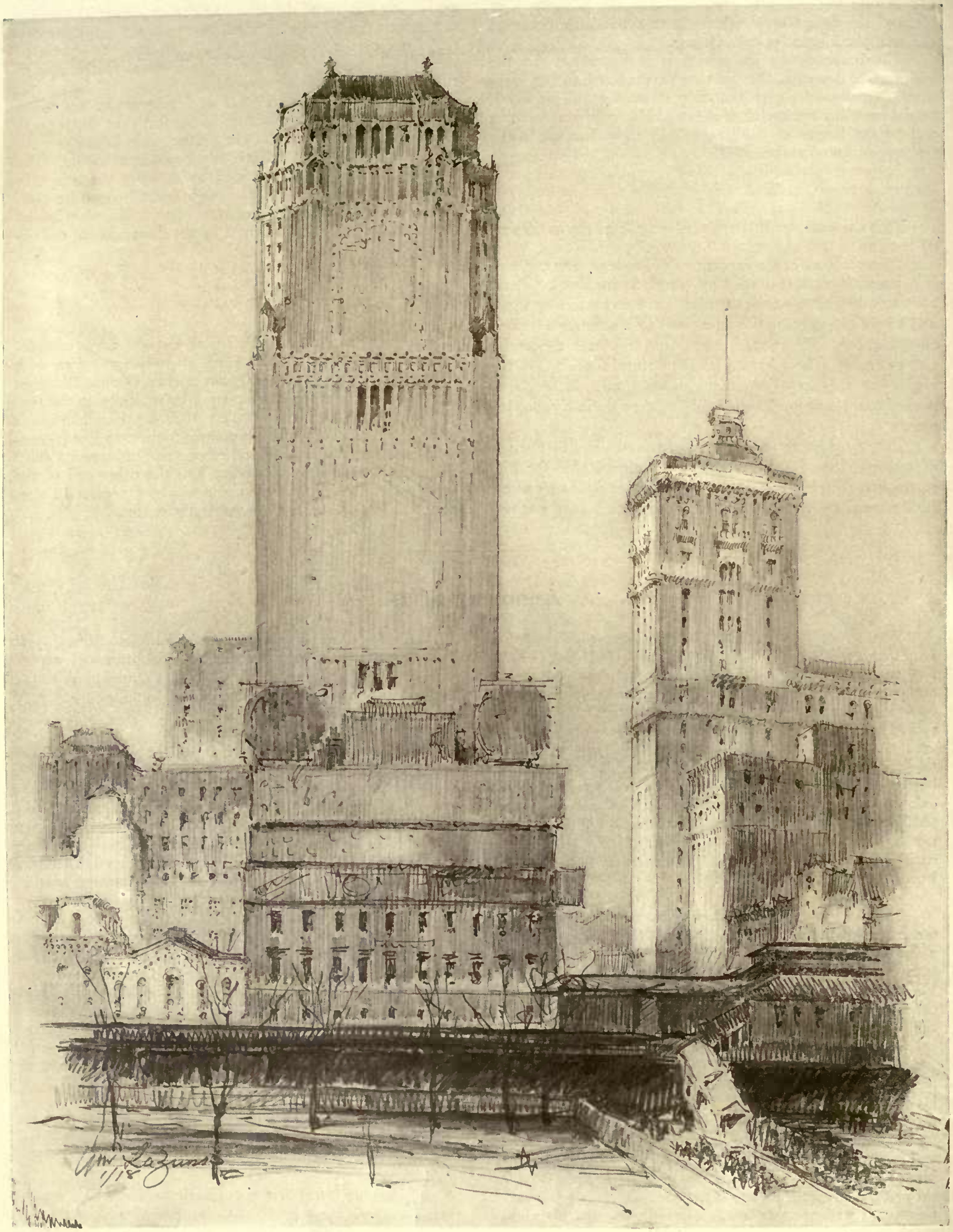
"Marks System of Gypsum Roofs—Poured-in-Place—Pre-Cast Slabs," H. E. Marks Corporation, Cleveland, Ohio.

"Appalachian Tennessee Marble," Appalachian Marble Co., Knoxville, Tenn.

The booklet of the Monarch Metals Products Company, St. Louis, incorporates all the suggestions and recommendations made by the Structural Service Committee of the A. I. A., and is a direct result of the opinions expressed at a joint conference November 10, 1921, at Indianapolis, between the A. I. A. and the material manufacturers for better advertising. It has been prepared without any exaggerated claims for the product or superlatives in sales argument of its advantages.

The Utica Heater Company's Public Building Bulletin contains information regarding their Economic Super-Smokeless Boilers of value to architects.

The Lupton Steel Windows Catalogue No. 110 is exceptionally well arranged and illustrated, and should be a valuable reference for the architect.



From a pencil sketch by Wm. La Zinsk.

THE BUSH BUILDING AND TIMES BUILDING, NEW YORK.

Integral Waterproofing: A Practical Discussion

(*Continued from October*, 1922)

By Samuel R. T. Very, Architect

THE tempering water was ordinary "Croton" water as drawn from the faucet in the New York testing laboratory, just such water as a mason would use on any ordinary New York building operation, shockingly unfiltered! And no doubt chock-full of unscientific conditions which would horrify the gentlemen who commonly perform tests similar to these. No particular overcare was used to measure with scientific accuracy ideal quantities for ideal results, but the manufacturer's requirements were nevertheless followed as rigidly as by the ordinary practical workman. Quantities used in each case were recorded merely as a matter of interest, not for scientific deduction, but the measures, gauges, scales, and other instruments used were scrupulously cleaned after each operation, and drawings, photographs, and careful descriptions of each were kept. As the object of this paper is not scientific, however, other such details will be omitted.

The samples of cement and waterproofing compounds were delivered in well-protected packages, were typical of job deliveries, were in perfect condition, and new. The quantities used were insignificant compared with their bulk as received. Before any mixture was made, the writer interviewed carefully the representatives of all of the manufacturers whose courtesy encouraged the tests, and here should be stated that almost universal and enthusiastic response was received from his request for co-operation. Their specific instructions were reviewed in their presence, as by a mason foreman receiving his initial instructions, and later were followed as rigidly as any job conditions would approximate.

To assure more or less comparative results, the same "work" was attempted in the mixing and tamping of each of the different specimens. The same tamping instrument was used for all of the specimens; it was a long cylindrical glass bottle, with a flat, circular, metallic screw-top. It was filled with sand until its weight was just one pound, then inverted, and dropped from a height of about an inch upon the pat within the ring (see photograph No. F. 91). No other person than the writer was present during the mixing, thus assuring the same "personal equation" for all the specimens. Each ring was numbered with a removable tag, which, months later, just before the testing, was each removed in the presence of all of the witnesses to the tests; and at that time, new, entirely different designating letters were marked directly upon the specimens themselves, the changes being accurately recorded and witnessed by all, without anybody present, not even the writer himself, having the slightest idea of the identity of a single specimen. Therefore, unlike the usual laboratory test, no results were being anticipated.

Great batches of dry cement and sand, many times the needed quantities, were thoroughly mixed uniformly in the quantities of 1 to 3, and the amounts necessary for specimens identical in their matrix were chosen from the same homogeneous batch (except in certain instances to be mentioned). The large superfluous balance was immediately discarded.

Seven specimens using white portland cement and white sand from the same batch were tempered and set May 3, 1914. Seven specimens using gray portland cement and white sand from the same mixed batch were tempered and set July 27. The specimens remaining, using, respectively, Rosendale cement, gray portland cement, and white portland cement, were mixed with different sands, and were tempered and set July 27 and July 28. Thick, soaked blotting-papers, themselves protected so as to evaporate slowly, were used to cover the rings without touching them, and they were allowed to dry very slowly by ordinary evaporation. The specimens were otherwise unmolested until the middle of August, the same year, when they were carefully wrapped in paper, and kept so until March, the following year, when they were unwrapped, and all placed together in a large bucket filled with water in which they remained submerged one day.

The next day, in the presence of representatives of all of the manufacturers concerned, who accepted the invitation, these specimens were remarked, as above stated, in such a manner that their cement and their waterproofing ingredients were both blind to all present, and they were tested carefully in a special hydraulic testing-machine, illustrated in photograph No. F. 91. Its construction is such that water may be forced through the whole area of a specimen without leakage about the ring circumference. Its pressure gauge is calibrated to 150 pounds per square inch of surface tested, but the pressure chosen for these tests was only two-thirds that capacity. This testing-machine is extremely simple to use with accuracy. Permeability only (as distinguished from absorption) was measured by observing the number of cubic centimetres of water forced through the specimen at a constant pressure during like periods of time (three minutes). Each reading was witnessed and approved by all the observers present, none having the slightest idea what specimen was being tested until the reading was recorded. The first experiment began at ten o'clock in the morning; the last ended at six o'clock in the afternoon of the same day.

There was not a single specimen tested which did not show porosity to some extent; but it should be noted that the pressure used was far greater than most field or job requirements. Some specimens showed porosity markedly more than others; some showed structural weaknesses, developed, no doubt, from the tremendous pressure used, which approximated a head of water 200 feet in height. Two specimens blew up, probably from inherent weakness not due in any way to the waterproofing compounds. One of these is illustrated (see specimen BB, photograph No. F. 87). There was not a single "unwaterproofed" specimen of the six tested that proved the equal of the best of the waterproofed specimens; but one of the six, specimen "S," photograph No. F. 89, which contained gray portland cement and ordinary Cow Bay sand only, tied for third place out of the whole lot with a waterproofed specimen mixed in identical proportions, 1 to 3, with white portland cement and white sand. The best of all showed absorption of only 1¾ cubic centimetres. This was waterproofed with a compound mixed with white portland cement and white Ottawa laboratory-testing sand, and is specimen "G," illustrated in photograph No. F. 86. The second best, not illustrated, was mixed with another compound. The poorest of all, specimen "Z," photograph No. F. 90, with the exception of the two which burst, and some others, referred to later, was, strangely enough, of identically the same consistency as the best untreated specimen already mentioned (specimen "S"). It absorbed 21½ cubic centimetres of water. To all superficial appearances this less-waterproofed specimen is even more perfect than its mate which absorbed but 4½ cubic centimetres of water; it was mixed the same day, with the same ingredients taken from the same packages, but not mixed dry in the same batch. It was tempered with slightly more water, but was tamped the same number of times. This observation illustrates well the writer's opinion that unwaterproofed portland-cement mortar is largely dependent for its waterproof properties upon the variable personal equation of the men mixing or placing the batch.

While permeability was the sole experimental quest in these tests, the specimens show other interesting characteristics. Four of the waterproofed specimens showed, when wet, cracks invisible when dry. Their waterproofing compounds were, respectively, a paste, a liquid, and two powders, which divide the glory impartially amongst all classes tested. The two specimens which burst probably succumbed to too great pressure for their structural efficiency rather than to any deleterious effect from their waterproofing ingredient, which was in both cases the same as the compound which proved to be the most effective one recorded.

One of the specimens which cracked is illustrated by photograph No. F. 88 of specimen "D." It distinctly shows a considerable defective area. This specimen showed a pronounced tendency to scale; its laminated structure was undoubtedly due to the peculiar action of the particular liquid compound used for its waterproofing; the other ingredients in this specimen were the same as those used in the best specimen, "G" (photograph No. F. 86), and from the same batch of dry mixture, viz., white portland cement and white Ottawa laboratory-testing sand. This same liquid waterproofing compound was used in two other specimens, both of which developed marked permeability. The cement in each was gray portland, and was mixed in one case with white Ottawa sand and in the other with Cow Bay sand. In each of these instances it is the writer's conviction that the failure of the liquid to waterproof occurred not from its ineffectiveness as a waterproofing compound, but from its acting in some manner such that laminations developed in the setting specimen, which proved structurally weak at the tremendous pressure tested; this liquid may possibly be a good waterproofing compound at ordinary pressures.

Photographs Nos. F. 82, F. 83, and F. 85 show the obverse, reverse, and edge views of a single specimen, "A," mixed with white portland cement, and white Ottawa sand without waterproofing. It was mixed from the same batch as was specimen "G" (photograph No. F. 86). It very clearly shows a porous nature, notwithstanding the work done in the kneading process of tamping twenty times with the tamping bottle, and scraping off the superfluous mortar with three strokes of the trowel. It is honeycombed with voids which some sort of waterproofing compound might tend to lessen in number or decrease in size, in which event it would be interesting to learn if it were thus made less porous or more waterproof.

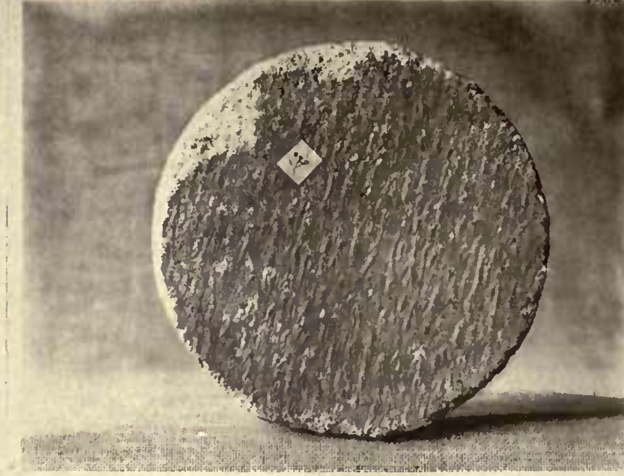
The writer did remove specimen "G" from its ring, and examined its circumference; photograph No. F. 92 shows the remarkable result. The near, right-hand specimen is specimen "G," the waterproofed specimen; the far, left-hand specimen, more honeycombed, is specimen "A," unwaterproofed; the same specimen as that photographed in Nos. F. 82, F. 83, and F. 85. The waterproofing compound used apparently tended to increase the ease of manipulation of the plastic mass, and as a direct consequence there was a decrease in size of the normal size of the voids; the cement was aided by the waterproofing compound to help itself as a void-filler. But lest the reader draws a very wrong conclusion from that part of the experiment, it is well here to correct some common misunderstandings. Voids in concrete masses frequently occupy one-fifth of the entire volume of the mass. These voids are sometimes interconnected, and in so far as they are so, they may form ducts which could permit the passage of water through them, but great caution should be used in drawing such a conclusion. Blotting-paper is porous; it contains voids; the volume of these voids exceeds the volume of the voids in the least dense masses of concrete; these voids are also interconnected, and they undoubtedly form ducts; but a tumbler of water, filled, and inverted upon a saturated piece of the most porous of blotting-paper will not leak out through it, not even when held freely suspended in the air. For the actual transmission of water through concrete some other medium than mere air-cavities is necessary. A tumbler full of air, inverted in water, will not fill with water, although it is just one huge void, apparently quite free to permit the passage of water.

In the zealous efforts of some opponents to discredit the claims for integral waterproofing compound advantages, they have strangely distorted the issues which these simple tests have served to clarify to the writer. The issues have nothing to do with tensile or compressive strength. Waterproofing compounds are not intended to increase the structural pressure resistance of cement mixtures. They are not even intended to increase the theoretical waterproofing efficiency of unwaterproofed stuccos over the practical least efficiency of treated stuccos; or to state it in a different way, they are not commercially intended to raise the laboratory-waterproofing efficiency of cement or concrete briquets. They are not theoretically intended to increase the density of the stone aggregate in concrete nor to lessen its natural absorption, except on or near its surface. They are not intended to bodily automatically replace the honeycomb voids of ill-mixed, ill-placed, badly proportioned concrete. They are not intended to act as a panacea for all waterproofing ills. They cannot convert ignorance into knowledge, and they will not change inefficiency into skill. Neither will they ruin the commercial profit of portland-cement manufacturers, who, if they only knew it, would have much better friends amongst some architects and some clients if their product could be used with the greater safety which their co-operation with, instead of antagonism to, manufacturers of good integral waterproofing compounds would warrant; there is nothing chemically deleterious to portland cement from many of these compounds, nor are they in any sense competitors of portland cement. They do, however, partly lessen the importance of the personal equation of cement-workers, who must, when using them, pay more attention to proper grading, mixing, tempering, and placing of concrete and stucco batches. They undoubtedly do bodily replace some of the imperceptible pores in even the best field specimens (there is a loss of approximately 7 per cent by weight of water evaporation from a theoretically perfect density of mix). They increase the colloidal efficiency of cement. They act somewhat as catalyzers, and cause a decrease in the normal number and natural size of the honeycomb voids; they help the mixture

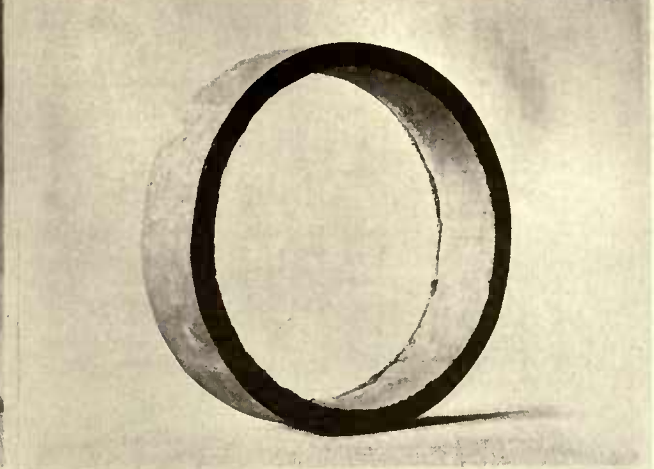
(*Continued on page* 360)

F.82.

F.83.



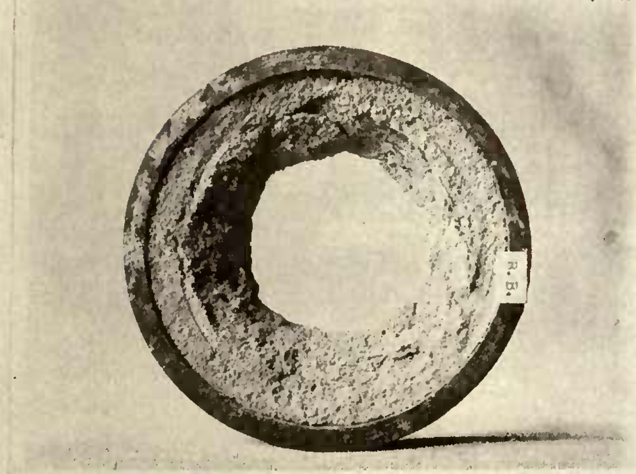
F.84.



F.85.

F.86.

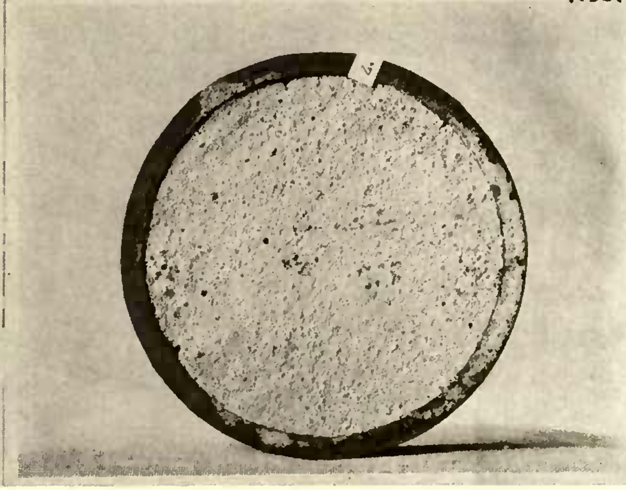
F.87.



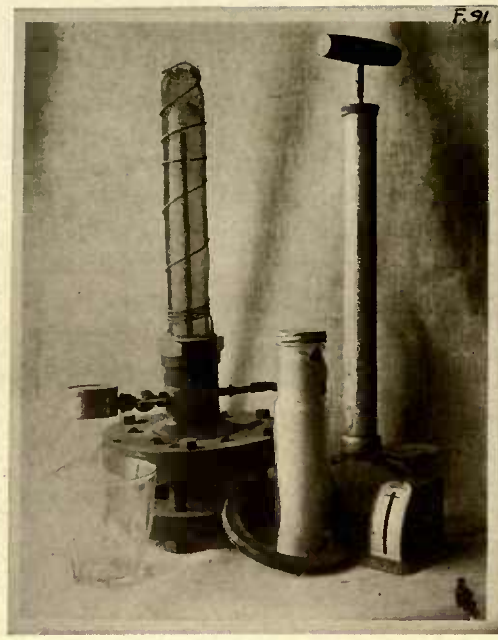
F.88.

F.89.

F.90.



(*Continued from page* 358)



to densify itself. Some of them decrease and some abolish the capillarity of concrete and cement stuccos.

And unless the writer is mistaken, they will be eventually the cause of a tremendous increase in the architectural specification of cement stucco, now often justly feared, and even dreaded, by clients who prefer other materials known to be free from the common, obvious, and prevalent faults of unwaterproofed cement work. The United States Department of Agriculture got on record as long ago as 1915 saying "no amount of care in the preparation of concrete prevents the absorption of water into the mass. The addition of some water-repelling compound appears absolutely necessary to insure this result."

This article is purposed to rouse persons interested in the discussion of integral cement waterproofing compounds to a realization of a few of the fallacies sponsored by champions of all of the current opposing claims. It has accomplished a mighty service if it has cleared away the cataract from a single biassed eye; but if by lucky chance the cataract was upon the scientific eye of one of those mischievous, theoretical, laboratory cement-testing experimenters who have promulgated and spread the false notion that cement waterproofing compounds are useless just because it is theoretically possible to make cement mixtures impermeable without them; or if by luckier chance it was blinding the avaricious eye of a manufacturer more interested in the sale of his waterproofing product than in the advancement of its merits by scrupulous adherence to fact, its service has been colossal. There is no doubt that the latter class has done more harm to the engineering advancement of integral waterproofing than the former, who at least have nothing to gain by their antagonism; indeed, they have much to lose. Conservative architects would rather take a chance with old-fashioned methods which sometimes prove efficient than with "panaceas" for their occasional faults, commercially exploited by exaggerated claims which can easily be disproven.

But there is no doubt in the mind of the writer that some of the practical disadvantages from lack of integral waterproofing such as stucco-staining, discoloration, disintegration from frost and weather, and development of hair-cracks, and also many ills from dampness due to subsurface drainage, and seepage through unwaterproofed foundations, such as mildew of food-products and other stores, bacterial disease culture environment, and metallic disintegration, can be materially lessened, and even abolished, by the proper selection and intelligent use of a suitable waterproofing compound. This claim is broad. It sounds a little visionary, possibly as theoretical as the claim of a cement manufacturer's advertisement: "Concrete when properly made is water-tight"—of course it is *when* . . . ! But the writer's simple tests have made one convert to faith in waterproofing compounds.

Announcements

We are pleased to acknowledge the receipt of a copy of the new Lupton Catalogue No. 110, describing their steel windows for all classes of buildings. The chapter on residence windows is new. The matter in the other chapters is a condensed form of that in the No. 11 Catalogue.

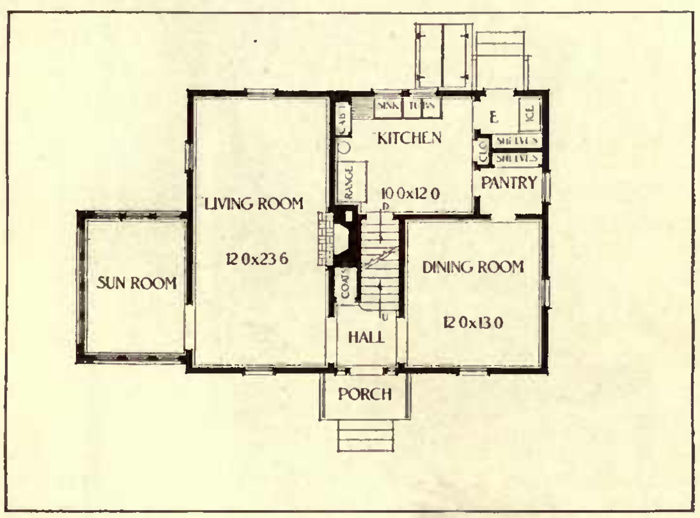
S. E. Holmes and C. B. Anthony announce the dissolution of the former partnership, Hatton, Holmes & Anthony, and that they have formed a new partnership under the name of Holmes–Anthony, architects and engineers. They will continue their practice in Rooms 307–308 O. R. C. Building, Cedar Rapids, Iowa.

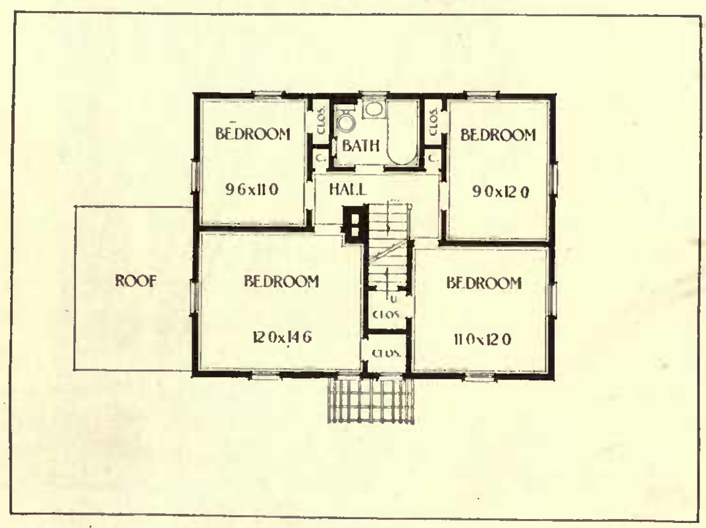
Economy Fuse and Mfg. Company has removed its Detroit, Michigan, sales office from 1012 Majestic Building to 1528 First National Bank Building.

The Atlantic Terra Cotta Company's series of illustrated monographs on famous Italian buildings, with photographs and measured details, make a valuable addition to the architect's reference library.

Announcement is made that G. Buller Colthurst, of the architectural firm of Nichols, Sheppard & Colthurst, 15 Sandwich Street, W., Windsor, Ontario, has withdrawn from the existing partnership, and will in future practise by himself at 32 Sandwich Street, W., Windsor. The present firm, under the name of Nichols & Sheppard, will continue to practise as usual at the old address.

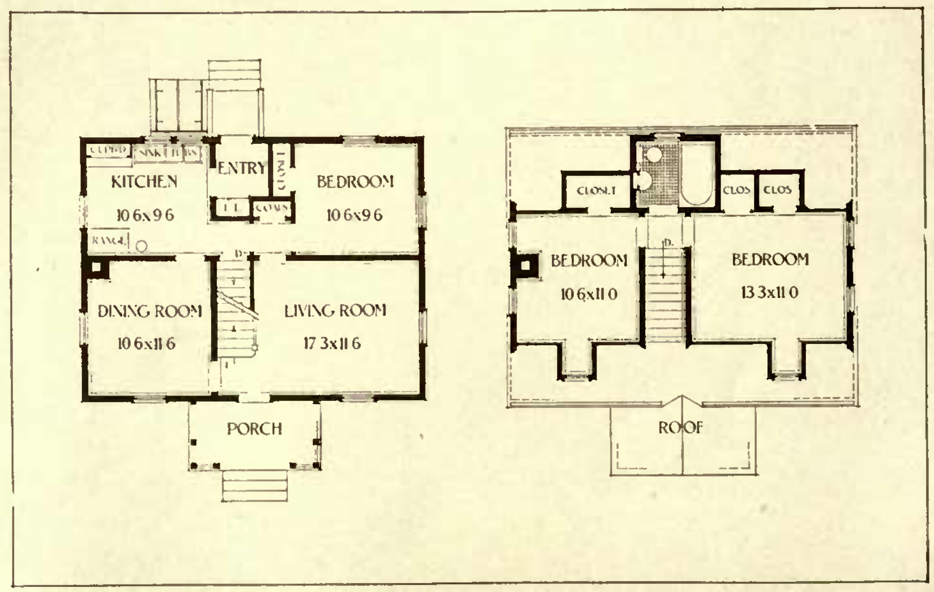
Felix Rasulo announces his removal from Proctor Building to 188 Linden Street, also that catalogues and literature are appreciated.





SEVEN-ROOM HOUSE AT MERRYMOUNT, QUINCY, MASS. McLaughlin & Burr, Architects.

Developed in gray-painted shingles, with white trim, bottle-green blinds, and a red roof.



SIX-ROOM HOUSE, WITH THREE EXTERIORS, AT QUINCY, MASS.

McLaughlin & Burr, Architects.

One in red brick, one in white clapboard, one in weathered shingles.

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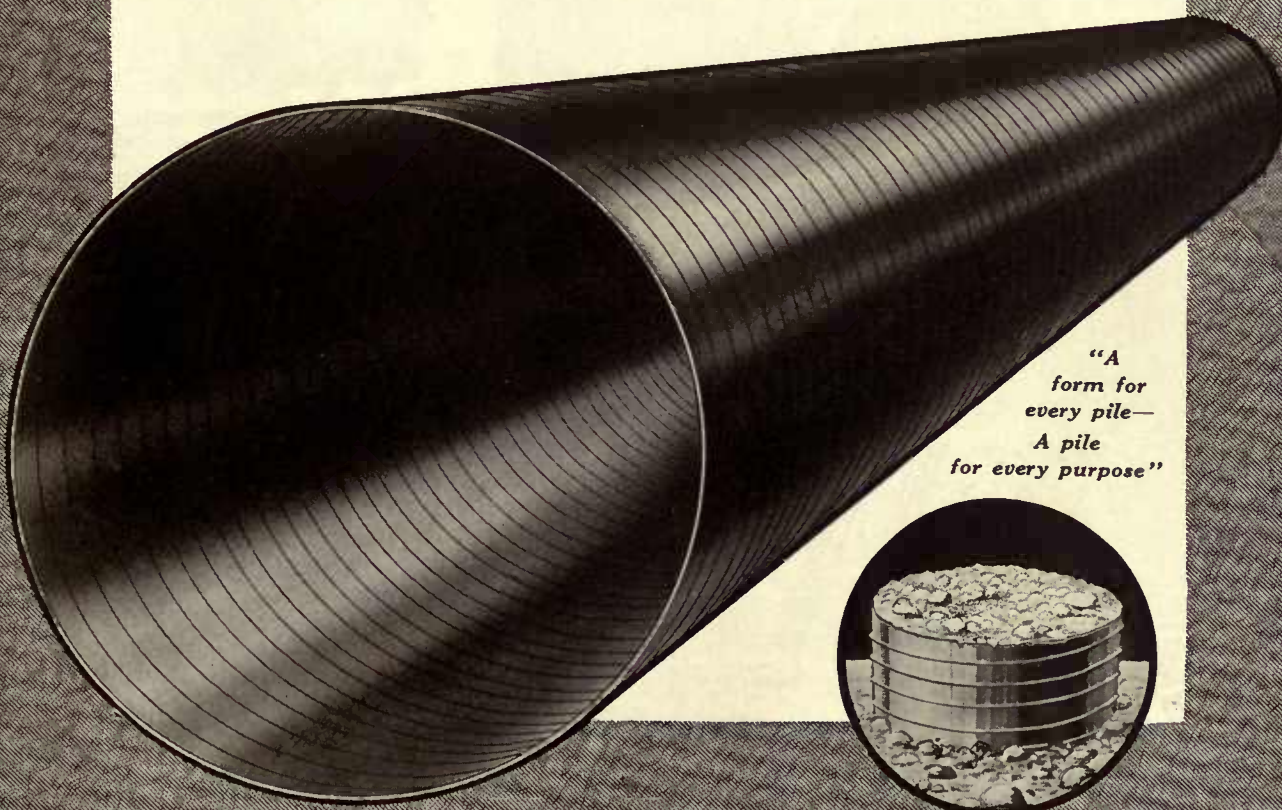

"A form for every pile— A pile for every purpose"

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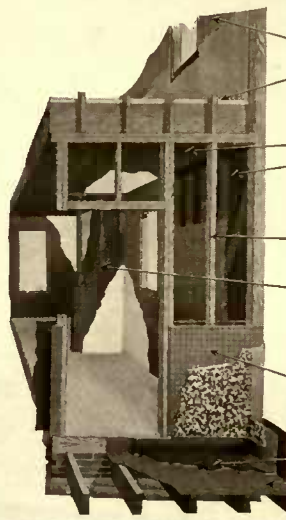

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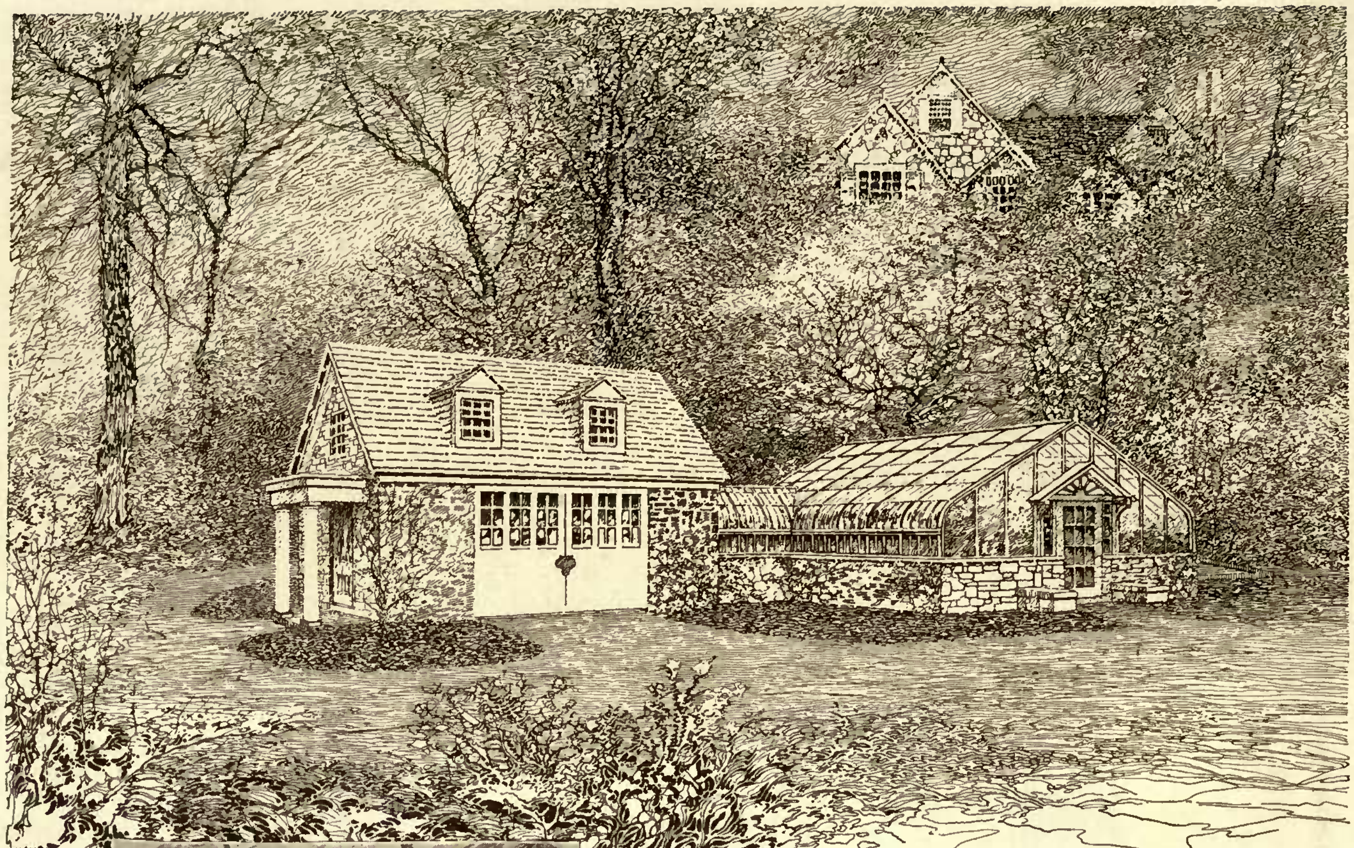

More and more the greenhouse is becoming a direct adjunct to the home. A glass garden conveniently accessible as it always has been in England.

The Advantage Of Winter Time Work For Spring Time Erection

PROMPTLY getting right down to figure facts, let us point out how your customers can take advantage of our disadvantage.

Winter is our slack time at the factory.

The time when we, regretfully, are often compelled to lay off men, many of whom we would go to considerable length to keep.

To overcome this quiet period from December till March, we have often made special price concessions on greenhouse orders placed any time before the first of February, for spring or summer erection.

Never, however, have we made the proffer general.

Some of your clients, however, may incline to take advantage of such a price concession.

Shall one of us drop around to see you about it?

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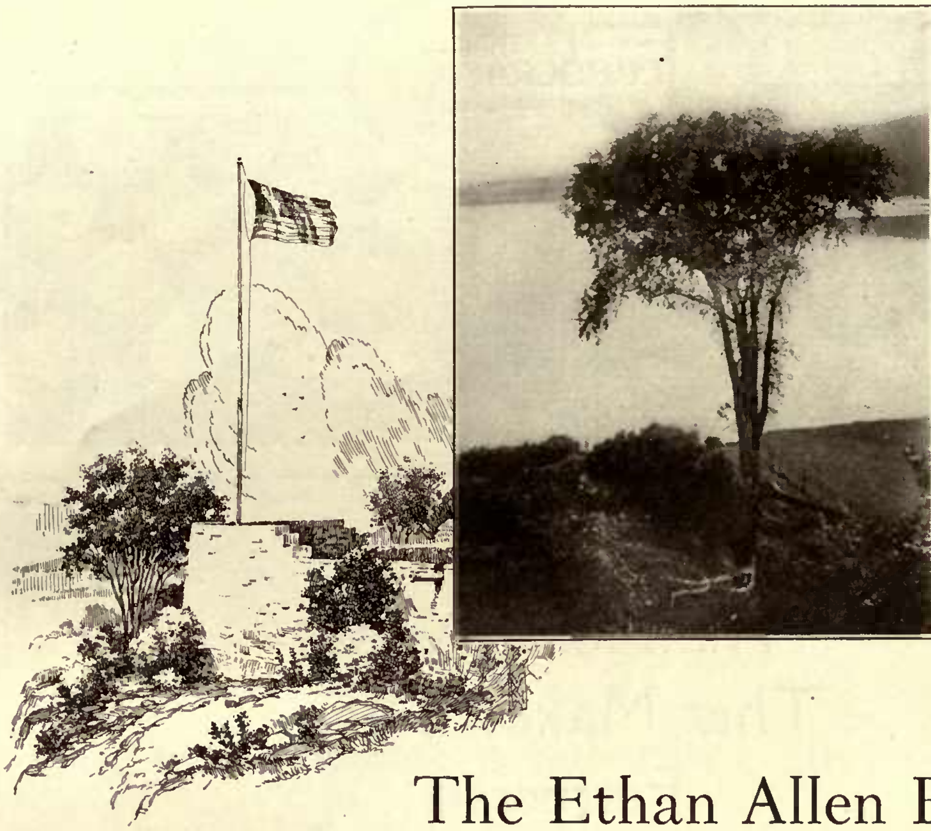

The Ethan Allen Elm At Fort Ticonderoga

Being Number 33 of Famous Tree Tales

NEVER mind if Ticonderoga is off the beaten track to the Adirondacks. At best it's only forty miles out of the way, and what is forty miles to your car?

Go to Ticonderoga and spend at least a half day at the wonderful old French-built fort.
In interest and age it is surpassed only by St. Augustine's relic of Florida's Spanish barbarities.

When you go to Ticonderoga, be sure to stop at the old French line of breastworks which are today practically the same as when made in 1758 by General Montcalm. Here it was he defeated the English and their famous "Forty-second Highlanders" and "Black Watch" regiments.

The fort itself is part ruins, part in process of faithful restoration, which is being carried on by the Pell family, who since 1806 have owned it and many acres of adjoining property.

As you pass through the main entrance to the outside fort, "Old Glory" will greet you floating from a portion of the restored outer wall.
Stepping up on the cannon emplacement and looking down towards the lake, you will see a beautiful old Elm. It was near here that Ethan Allen and his indomitable band of eighty Green Mountain Boys landed.

The entrance gate through which they passed is near by. Also the restored West Barracks, at the southern door of which Allen made his historic demand for a surrender "In the name of The Great Jehovah and the Continental Congress."

After you have seen the underground ovens, the water cistern and the underground passage, don't fail to go down to the lake and see the hull of "The Revenge," one of Benedict Arnold's fleet, which was defeated by the British in 1777.
It was but recently discovered in twenty feet of water just east of the fort.

When you leave, give another look at the Ethan Allen Elm in all its towering majesty. It is Nature's own monument to the courage and patriotism of him who so well did his part in making this United States possible.

R. Roehrs

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At The Sign of The Tree
Where Choice Nursery Stock Is Grown
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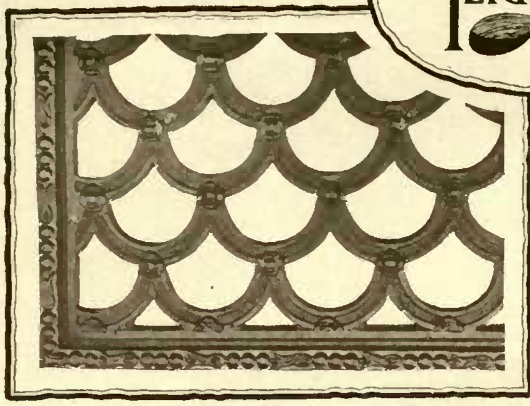
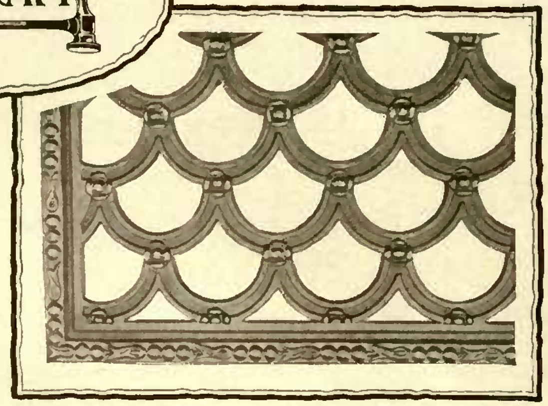
FERROCRAFT



A corner from a Ferrocraft grille just to show you how it looks as it comes from the foundry mould.



The same grille after the Ferrocrafters have hand-chased it quite after the manner of the workers in the ancient metal workers' guilds.

The Honest Craft That Makes Them Ferrocraft Grilles

WISH you could take an afternoon off some day and go with one of us over to our plant, at Brooklyn, and see our craftsmen at work on our Ferrocraft Grilles.

Wish you could see them skilfully modeling the designs in wax, rendering them in white metal, and in turn the making of the master pattern.

Wish you could see those metal crafters, with innumerable tools and a curious shaped hammer, painstakingly sharpening some spots and softening others.

Such an afternoon would dissociate in your mind forever the usual cast-iron grilles from our Ferrocraft ones. You are cordially invited to spend just such an afternoon. Our New York office would consider it a privilege to arrange for it.

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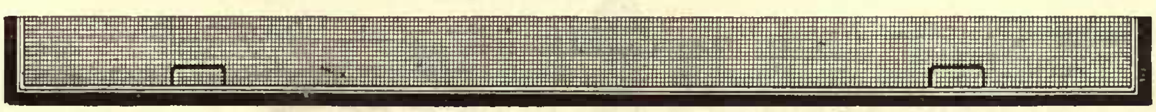

Hibernia Bank & Trust Co., New Orleans, La., 26 stories in height. Favrot & Livaudais, Architects. The George A. Fuller Company, General Contractors.

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> "A crew of 25 stone setters to be employed at the building. Stone to be set at the rate of 2½ to 3 stories a week. The erection of 3 derricks for unloading of stone. Each derrick to be equipped with a searchlight so that unloading can continue uninterruptedly both night and day."

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As a result, it has always led in sales, so that over a quarter billion square feet of new and old concrete floors have been lapidolized. Let us refer you to one in your immediate vicinity.

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the modern wood preservative, gives new life to old or new wooden floors.

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A black, tacky material for waterproofing foundations and dampproofing the interior of exposed walls. No furring or lathing necessary. Binds perfectly with plaster.

Lapidolith is the standard—specify it for new or old concrete floors, swimming pools, concrete tanks, etc.

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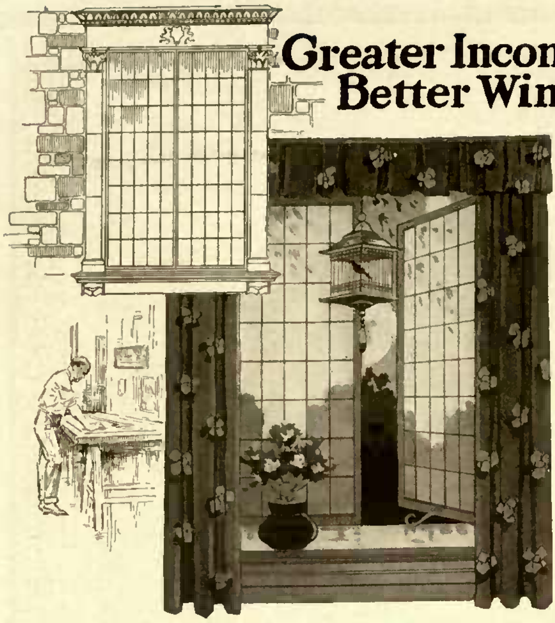

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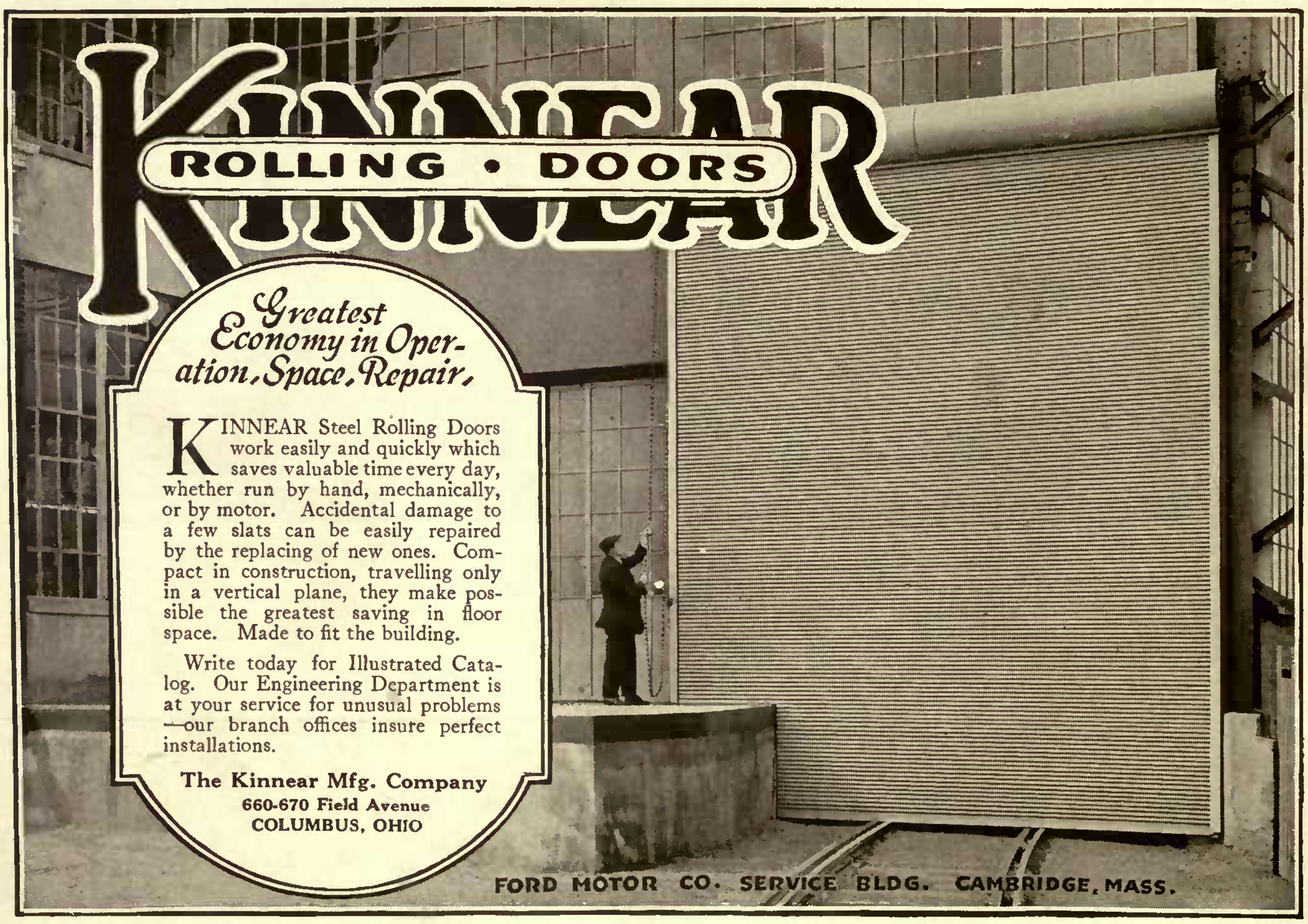

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KINNEAR Steel Rolling Doors work easily and quickly which saves valuable time every day, whether run by hand, mechanically, or by motor. Accidental damage to a few slats can be easily repaired by the replacing of new ones. Compact in construction, travelling only in a vertical plane, they make possible the greatest saving in floor space. Made to fit the building.

Write today for Illustrated Catalog. Our Engineering Department is at your service for unusual problems —our branch offices insure perfect installations.

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SEE SWEET'S PAGES 211-214

SEE OUR CATALOGUE IN SWEET'S

Full color reproductions of the six major Appalachian marbles appear on pages 211, 212, 213 and 214 of the new Sweet's Catalogue (17th Edition). Look for them, if you have on hand any job which calls for interior marble of exceptional beauty and finest quality.

APPALACHIAN MARBLE COMPANY
KNOXVILLE - TENNESSEE

The Kernerator consists of a brick incinerator, built into the base of the chimney when the building is erected, and hopper doors located in the flue on the floors above. It takes care of all household refuse — rags, sweepings, wilted flowers, broken crockery, tin cans, garbage — *without cost*, for no commercial fuel is required. Non-combustibles are dropped into the ash-pit and later removed.

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In many of the finer apartment buildings erected during the past ten years, the cost of disposing of garbage and waste is surprisingly low. This saving in operating expense is due to the foresight of architects and builders who, in planning these apartments, included the Kernerator—the modern system for the disposal of household refuse.

In apartments that are Kernerator-equipped, there is no expense for the removal of garbage and waste except for the time required to clean out ashes and tin cans every five or six weeks. There are no garbage cans and waste receptacles to be repaired or replaced each year. The janitor does not have to collect refuse every day, thus saving a large part of the janitor's time. And in addition to the economy factor, the Kernerator eliminates fouled dumb-waiters or rear-hall or back-porch garbage cans and affords tenants added comfort and convenience.

The Kernerator should be specified in the plans before construction begins. For complete information, see page 1906, *Sweet's* 1921 *Catalog.*

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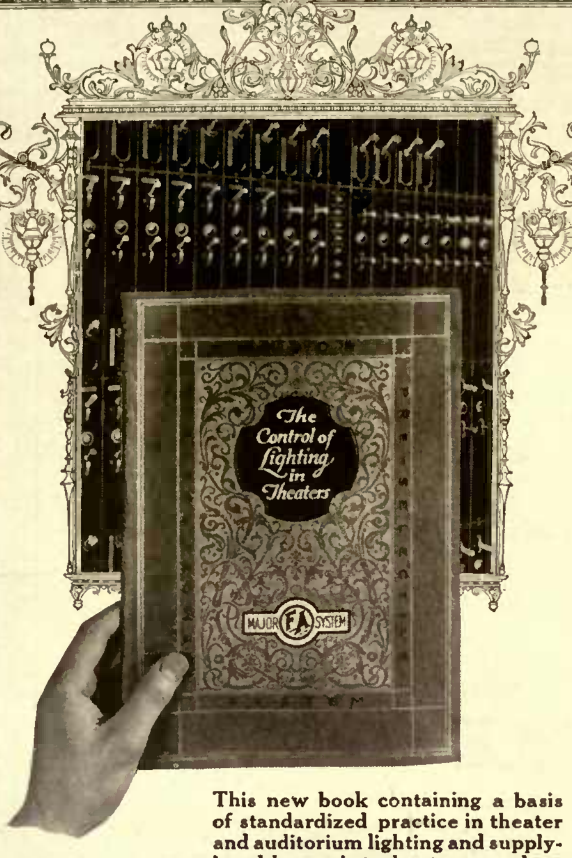

This new book containing a basis of standardized practice in theater and auditorium lighting and supplying blue print charts, complete specifications and a great fund of useful information, will be sent free of charge to every architect and specification writer who works on buildings of this type.

Theaters
Schools
Masonic Buildings
Auditoriums

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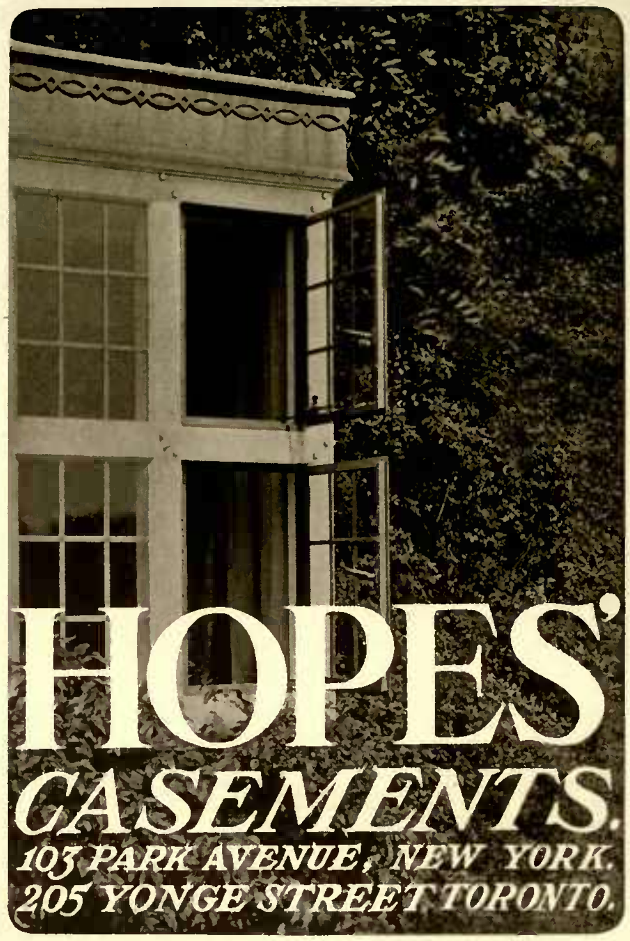

Walls finished with Cabot's Old Virginia White. Roof stained with Cabot's Creosote Stains. F. A. Cooper & Co., Architects, Chicago

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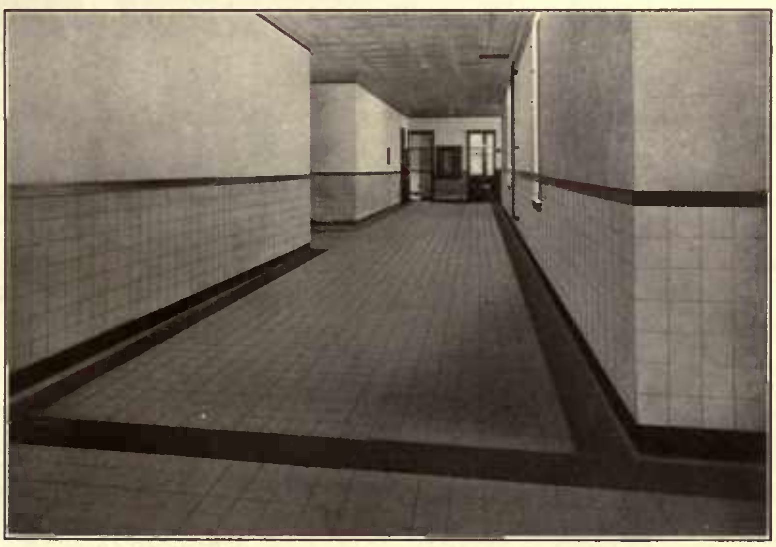

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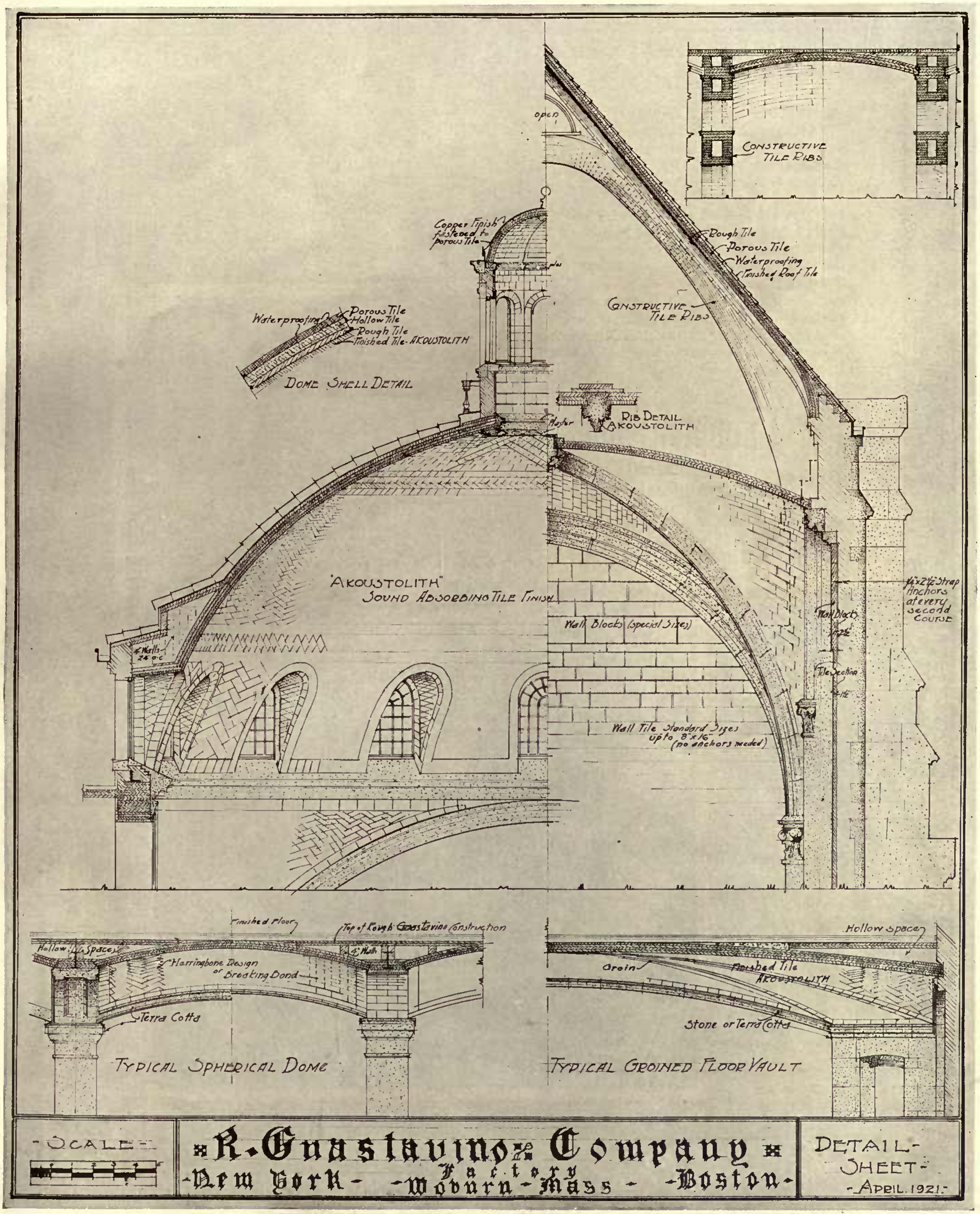
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Copper Finish fastened to porous Tile
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April 1921

ARCHITECTURE

·THE · PROFESSIONAL · ARCHITECTURAL · MONTHLY·

Vol. XLVI. | **No. 6**

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DECEMBER, 1922

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Architecture, edited in the interest of the profession, is published the twenty-fifth to the twenty-eighth of month preceding date of issue by Charles Scribner's Sons (Charles Scribner, President), Fifth Avenue at 48th Street, New York.

Price, mailed flat to any address in the United States, Mexico, or Cuba, $5.00 per annum in advance, $1.00 a number; to Canada, $6.00 per annum; to any foreign address, $7.00 per annum.

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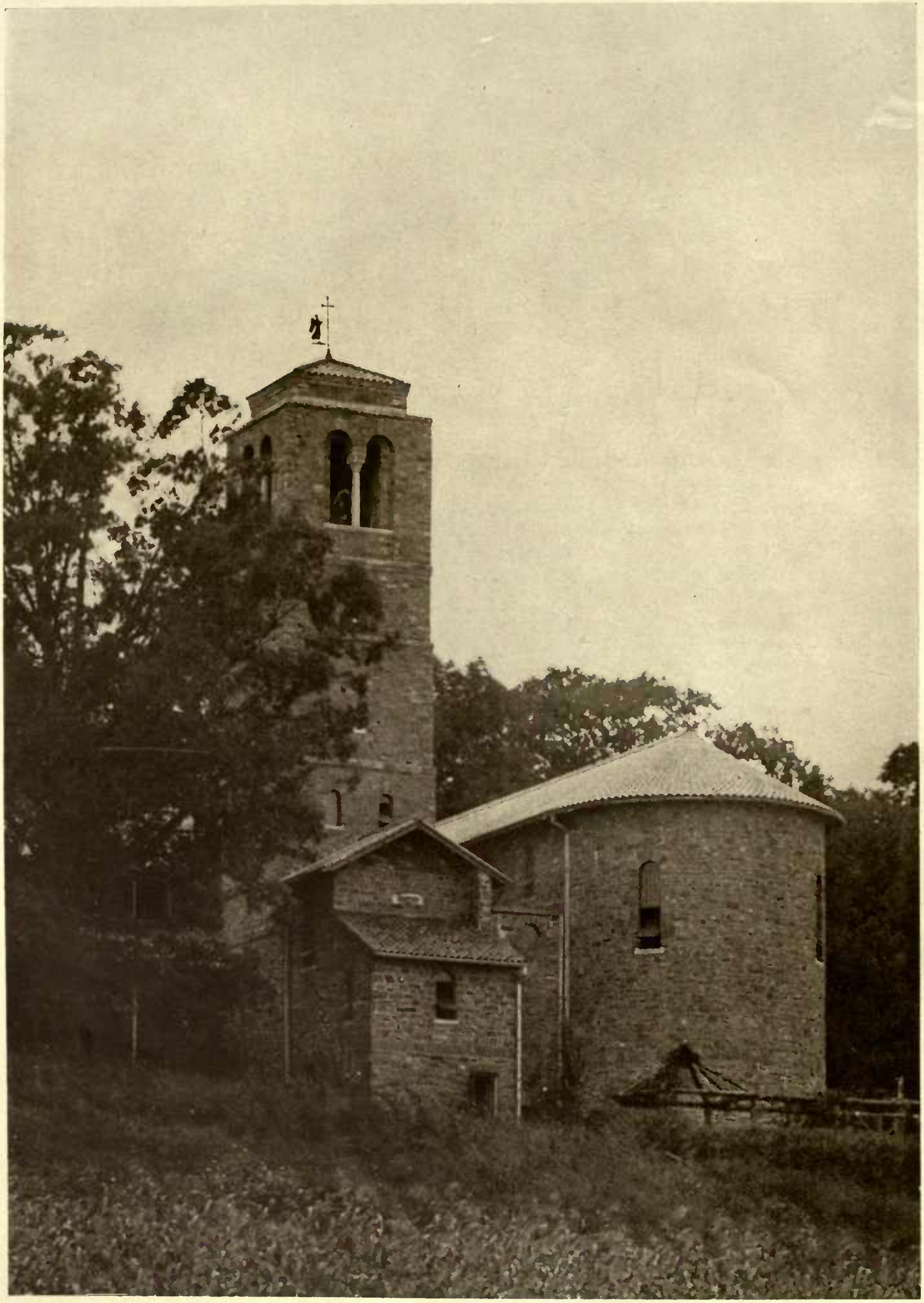


CHAPEL FOR THE ORDER OF THE HOLY CROSS, WEST PARK, N. Y. Cram & Ferguson, Architects.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVI DECEMBER, 1922 NO. 6

Three Small Chapels

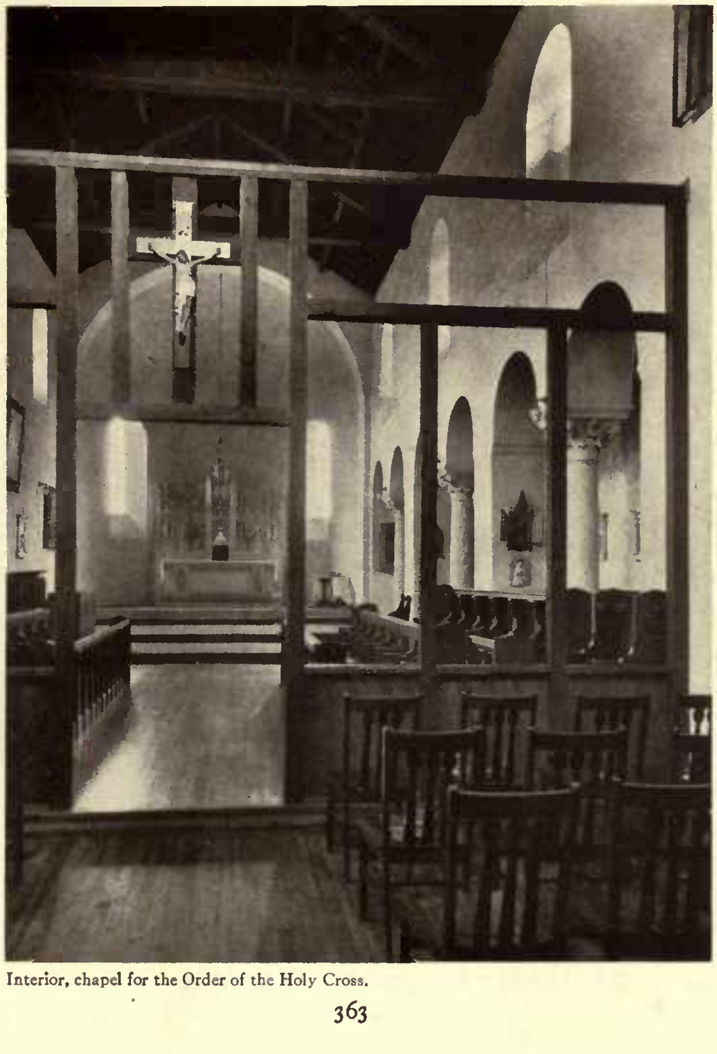
Cram & Ferguson, Architects

By Ralph Adams Cram

THE chapel for the Order of the Holy Cross at West Park, New York, is an attempt to develop a type of architecture that may be significant of its function and at the same time meet a number of varied and even opposed considerations.

In the first place, it was necessary that this chapel should be as inexpensive as was consistent with acceptable architecture and good construction. Then it was, of course, imperative that it should be a conscientious working out of purely Christian forms in art, suggestive of monastic usage and tradition, and not too aloof from an older adjoining building (the monastery) which was none too consonant with the principles outlined above.

In a way, it was the third stage in a process of development that began with a private chapel at Whitehall, Sudbury, Mass., and was continued in somewhat larger form in the chapel for the Sisters of St. Anne, at St. John's House, Arlington Heights, Mass. In each case local materials were used, and reliance was placed on form and proportion to the almost total exclusion of ornament. At the Monastery of the Holy Cross it was possible to use a rough local stone which had little promise, on the surface, of practicality, together with brick produced in the immediate neighborhood. The stone and the brick have been blended into each other in a more or less casual and yet rather carefully studied manner, after the fashion that is to be found in the Italian and Spanish building of the earlier Middle Ages.



Interior, chapel for the Order of the Holy Cross.

The style, if there is a style, is that which is found in the same places and dating from the same period, that is, the instinctive work of untrained men who, under the impulse of a new religious energy, went to work to build straightforwardly in accordance with their inherited memory of what architecture once was and, as far as they were able to do so, after the fashion of the ruinous old structures of the later Roman Empire. About all they knew was that churches were built of masonry, that they had a semicircular easterly termination, that the windows and doors had round arches while the roofs were of the simplest type of timber construction covered with tiles. There was, of course, a plentiful supply of marble columns from the dilapidated Roman buildings, together with some capitals and miscellaneous pieces of carved ornament. Working along these lines, the builders of the tenth and eleventh centuries produced simple and straightforward

(*Continued on page* 369)

CHAPEL FOR THE ORDER OF THE HOLY CROSS, WEST PARK, N. Y. Cram & Ferguson, Architects.

CHAPEL FOR THE SISTERS OF ST. ANNE, ARLINGTON HEIGHTS, MASS.

Cram & Ferguson, Architects.

DETAIL IN STONEWORK OF PORCH.

The interior walls of the Arlington chapel are of rough stone, white-washed.

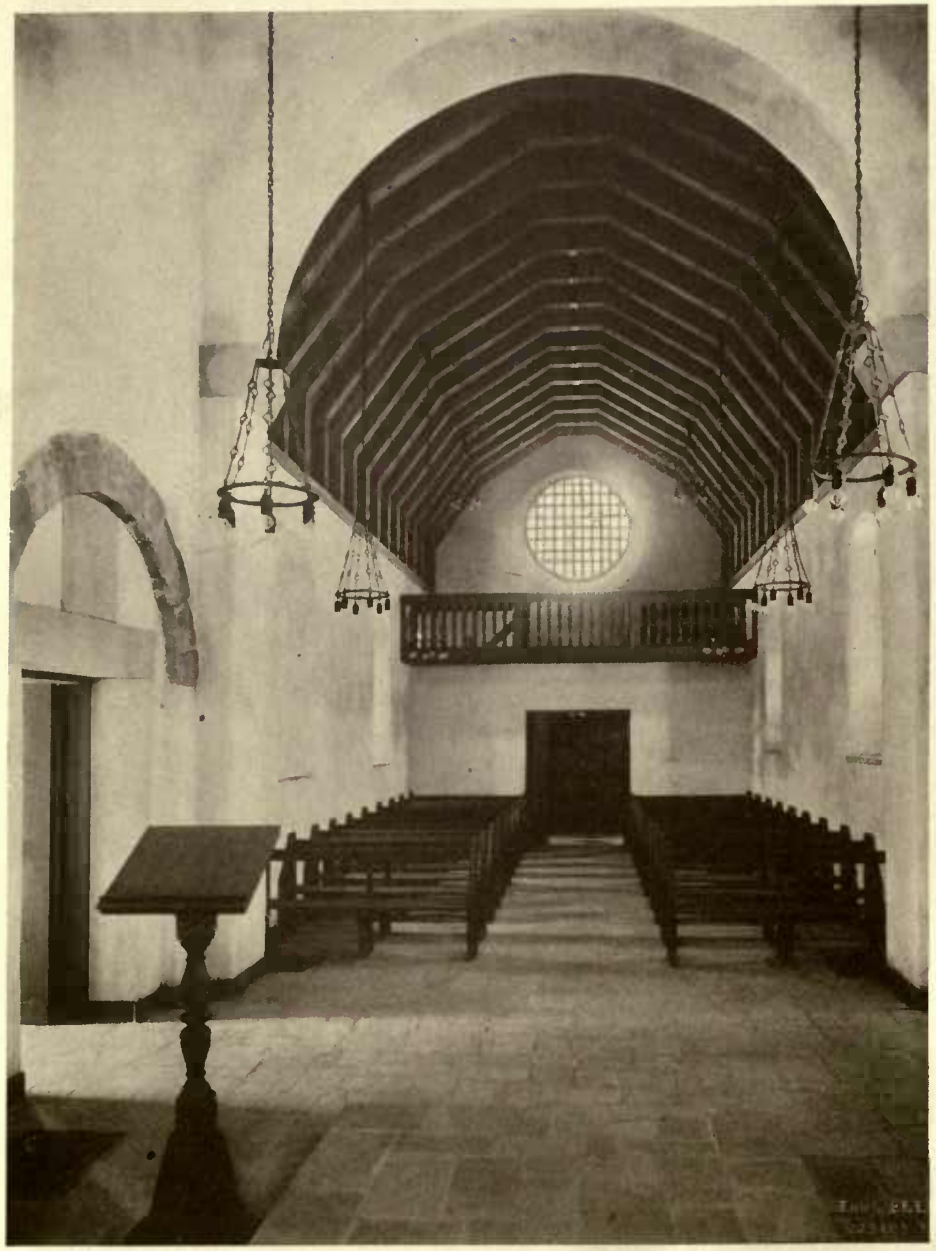
INTERIOR.

DETAIL OF EXTERIOR.

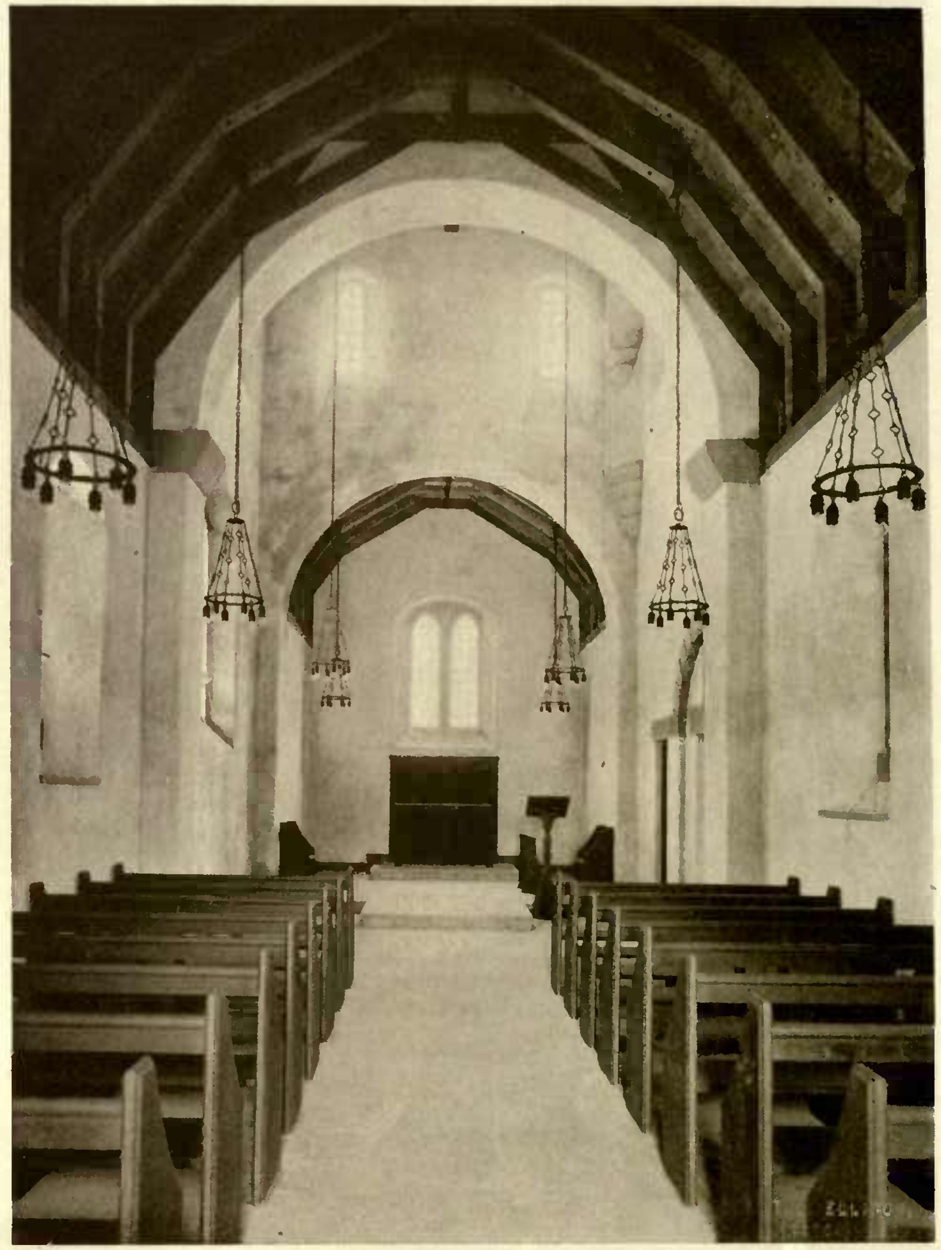
CHAPEL FOR THE SISTERS OF ST. ANNE, ARLINGTON HEIGHTS, MASS.

CEMETERY CHAPEL, NAHANT, MASS.

Cram & Ferguson, Architects.



INTERIOR.



INTERIOR.

CEMETERY CHAPEL, NAHANT, MASS.

The floor slabs are of rough slate.

(*Continued from page* 363)

structures possessed of a certain charm and a great deal of sincerity. Work of this kind is not localized. It is more or less the same whether it is found in Italy, Spain, southern France, the Rhineland, Scandinavia, or Wales. It is the beginning of the great architectural development that started under the Lombards in Italy and worked its way north and west along the trade routes and pilgrimage roads into France, Spain, Germany, and Great Britain, culminating at last, by way of Romanesque and Norman, in the fully developed Gothic of the thirteenth century.

Cemetery chapel, Nahant, Mass. Cram & Ferguson, Architects.

The chapel itself is the simplest type of basilica, with apse and semi-dome, and along one side an aisle or "processional path" separated from the chapel proper by an arcade of marble columns and round arches. Longitudinally it is divided after the monastic fashion into a sanctuary, monks' choir, ante-chapel, and women's chapel. At the end of the processional path is the shrine of Our Lady, with the necessary sacristies, etc. The crypt will in time contain other sacristies and a number of subsidiary chapels, so that several masses may—as is necessary in a monastery—be said at the same time. Near the sanctuary rises the campanile, which follows rather closely the Lombard type.

At present the fittings of the chapel are more or less temporary. The Gothic High Altar, constructed some years ago, has been taken from the temporary chapel, while the monks' stalls and the screen will serve until permanent work is installed. Ultimately it is hoped that funds may be forthcoming for filling the windows with stained glass and covering much of the walls with paintings.

A Museum of American Colonial Art

Mr. and Mrs. De Forest's Magnificent Gift of a New Wing to the Metropolitan Museum of Art

PRESIDENT ROBERT W. DE FOREST and Mrs. De Forest have given the money for the addition of a new wing for the Metropolitan Museum of Art to be devoted entirely to American art of the Colonial, Revolutionary, and early republican periods. The building, it is stated, will cost at least $200,000.

An interesting feature of the gift will be part of the south façade of the wing, where will be reconstructed the marble façade of the United States Branch Bank, familiarly known as the old United States Assay Office, which was formerly at 15 Wall Street, where the new Assay Office now stands.

This beautiful façade was preserved through the efforts of Mr. De Forest with a view to this use. The façade is dominated by a central bay, in which an applied Ionic colonnade, resting upon a rusticated basement, supports an entablature and pediment. This central bay is flanked with simpler bays carrying out the divisions of basement story, main story, and entablature. The material is Westchester marble.

In its final form the new American wing will form the north side of a quadrangle, on the south of which will be reconstructed the Wentworth-Gardner house from Portsmouth, N. H., purchased some years ago. The east and west sides of the enclosure will be formed by one-story connecting corridors, against the walls of which will be set Colonial doorways. The ground within will be treated as a Colonial garden. Plans for the structure have been prepared by Grosvenor Atterbury in collaboration with the museum authorities, who have had them under consideration since the museum's special demonstrations of Colonial art during the Hudson-Fulton celebration convinced the authorities of the immediate need of appropriate additional exhibition space.

The Historic Use of Color in Architecture

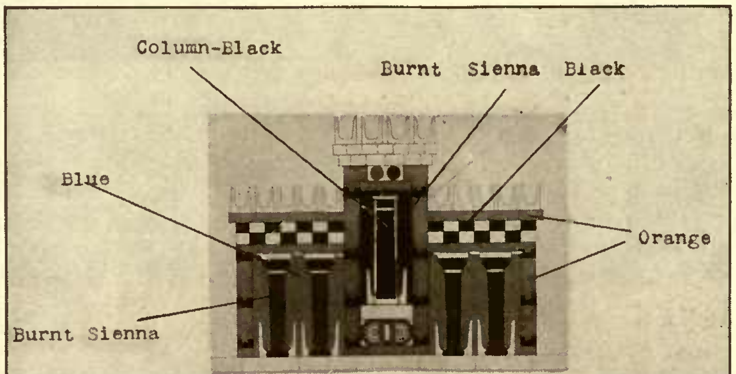
By Rexford Newcomb
Professor of Architectural History, University of Illinois

From an illustrated address before the Central Illinois Chapter of the American Institute of Architects

PART II

OUR knowledge of Greek polychromy dates from the middle of the last century, and it is only within recent years that archæologists generally admit the use of color upon the exteriors of the beautiful white marble buildings of the Greeks. With a preponderance of unmistakable evidence in this direction, however, there is no longer any serious student who disputes its use. The discoveries of Hittorff in the Doric colonies of Sicily in 1823–1824 brought forth a considerable interest in external coloration in architecture, especially in England and France, and many of the papers presented at the meetings of the Royal Institute of British Architects from 1840 on have to do with this very question.

The use of color in Greece is explained by the more brilliant light of that country, a light that, reflected, destroyed the relief and made necessary, especially upon the more diminutive portions of the entablature, some polychromatic differentiation. Now, while the Greeks of the archaic period used color very lavishly, it appears that with the perfection of form the use of color was practised with more restraint and became, in the Periclean Age, a detail handled with as much delicacy and refinement as was the beautiful profile of the Doric echinus. The wonderful Pentellican and Parian marbles had, of course, an intrinsic quality and loveliness that the æsthetic Greek desired to preserve and enhance. But the Greek was always careful not to allow a delight in things beautiful to carry him into any senseless or unreasonable profusion by its indulgence. He therefore used color in the same refined manner in which he handled form and with equal results.



Shrine from Palace of Knossos
CRETE.

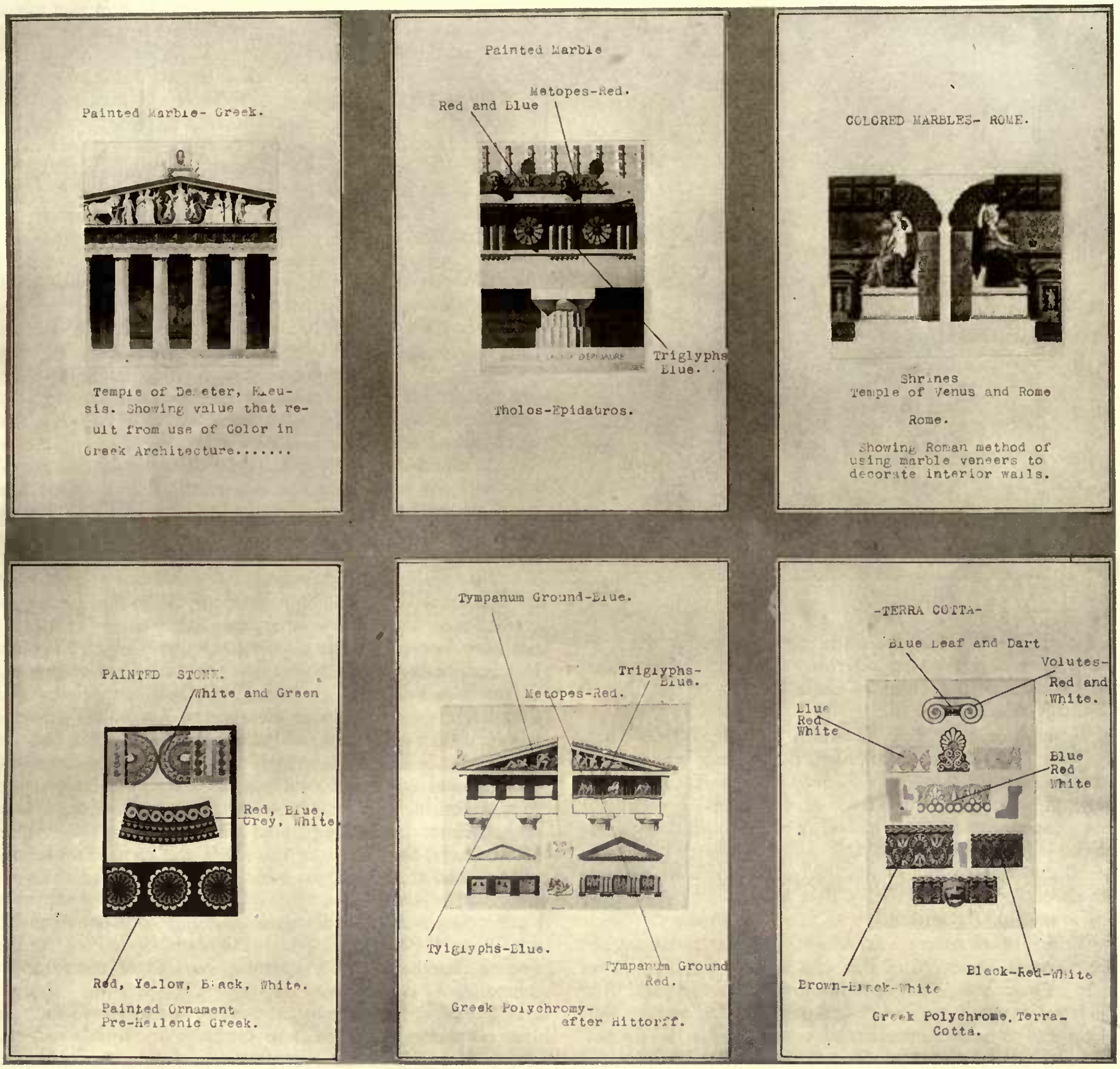
The colors generally used were red, blue, yellow, and green, but red and blue were the most prominent and used in almost equal proportions. No color was used in large fields, but was broken into bits and was alternated with the brilliant high light of Pentellic marble or relieved by the glint and shine of bronze, silver, or gold. Used thus the colors seen from a distance blended into a delightful monochrome. Some ancient traveller has described the aspect that the Acropolis presented to one approaching from Piræus as resembling a great iridescent pearl glistening in the white sunshine of Hellas.

Color decoration of structural parts was particularly worked out in connection with the Doric order and, although they became traditional to a certain extent, they did not by any means bind the Greek architect as did the hard-and-fast rules of the Egyptians. The extreme simplicity of the Doric order has recently been accounted for by the fact that it was intimately bound up with expression in color, an expression that calls for simple rather than highly involved forms. The triglyphs seem to have been preferably of blue, the mutules of blue relieved by guttæ of gold. In the metope, if decorated by sculpture, the background was red. Various facias and cymas were decorated with running honeysuckle ornament in red or red and green upon the pure white marble.

In the case of the Pan-Athenaic frieze of the Parthenon the white figures of the procession stood out upon a blue background. This was also true of the figures upon the frieze inside the peristyle of the Theseum at Athens. In the case of the Theseum, however, there is every reason to believe that the figures were also relieved by color. The ceiling of the peristyle was painted blue and decorated with golden stars.

So far as I can find there is little ground for believing that color was used much below the capital of the order, and it appears to have been almost exclusively confined to the entablature, that is to say, to those parts of the structure that by virtue of their small dimensions and distance from the eye needed a definition not afforded in so vibrant a sunlight. In this way the Greek, so sensitive to the imperfections of sight which, as we know, he sought to correct by adoption of refinements in form, found a means for overcoming the effect of diminution and reduction produced by distance and to give his structure the aspiration that always results from a use of interesting form or color above the eye. If it was necessary for the Greek to make sensible and intelligible the various members of his entablature, no farther than they were from the eye of the beholder, how much more necessary it is for us to consider a similar treatment for the upper stories of our skyscrapers. In "flowering out" at the top with his color, the Greek architect only annunciated in terms of architecture a very potent beautiful law of nature and a law that before the time of the Greeks seems to have gone unheeded, as you will agree when you recall that the walls of the Egyptians and western Asiatic peoples presented an all-over, calico effect, with as much interest at any other place as at the top.

Now, while colored marbles were used in Greek work upon some occasions, this means of introducing color into architecture was far rarer than that of applied color. Two well-defined examples of such use are to be found, however, in the pre-Hellenic Lions' Gate at Mycenæ, where the triangular



block over the lintel is of green marble, and in the more familiar example of the Erechtheum, where the white figures of the frieze were made definite against a ground of black Eleusinian marble. The introduction of colored marble, porphyries, and granites into classic architecture, upon any large scale, seems to have been due to the Romans and that introduction to have dated from the Roman subjugation of Egypt.

It will not be necessary to go into detail to prove how completely this method of color introduction took hold of the Roman architect, or to enumerate the long list of buildings decorated in one way or another with marbles of exquisite beauty imported from almost every corner of the Roman world. I believe that it is no exaggeration to say that the whole system of architectural decoration made possible by using beautifully colored materials, a system brought to a very brilliant climax by the Byzantine decorators, dates from this Roman beginning. Rome is to-day full of precious materials imported to grace the buildings of that day. To be sure, most of them no longer embellish the buildings that they were imported to decorate. This is due to the early Christian habit of using the old pagan structures as quarries from which to filch materials for the erection of Christian churches. Many a Christian church contains interior colonnades the columns of which originally graced some pagan temple or basilica, and many a basilican mosaic presents beautiful marble disks sawn from the drums of old Roman columns.

Under the influence of the Christian church polychromatic decoration upon the interiors of churches was brought to a fine climax, and the achievements of the Byzantine mosaicists are among the artistic triumphs of the race, but with the development of beautifully colored interiors came also a decline in external coloration. This decline which had already set in during the empire operated at Byzantium to produce in Sancta Sophia one of the most beautifully

COLORED MARBLES and MOSAICS

Facade of Saint Marks, Venice.

Showing use of Colored Marbles and Mosaics upon the Exterior............

decorated interiors that the world has seen, yet at the same time a very uninteresting exterior. The same observation may be made of the Tomb of Galla Placida or the Church of Saint Vitale at Ravenna.

Now while the early Christian and Byzantine buildings were generally colorful upon the interior and less so upon the exterior, this does not mean that the Italian, mediæval styles (which grew out of these vogues) present the same characteristics. One of Italy's most colorful buildings is Saint Mark's in Venice, and while that structure may generally be classed as a Byzantine building, it is to be noted that chronologically it belongs to a much later period than such a work of Byzantine art as Sancta Sophia.

Venice of all places was colorful and has produced not only colorful architecture but also a long list of painters famed as colorists. The Venetian love of color results from two facts: first, a beautiful geographical setting and, second, a long and constant commercial contact with the Orient. The exterior of Saint Mark's is as splendidly decorated as the interior. Structural parts are everywhere overlaid with shafts of porphyry and verde antico, crowned with capitals of alabaster or incrusted with bas-reliefs, carvings, and mosaics. I would have you realize that in this structure the Roman method of applying "skin-deep" loveliness comes to its fullest and most complete climax, and while there is much that assumes to be only applied decoration, there is much that masks under the guise of architectural form.

Now, while Venice has this supreme example of applied decoration, in which the colored work is executed in permanent materials, it was also the custom in Venice in mediæval days to apply paint to the façades of their beautiful stone palaces. In fact, the interesting Ca d'Oro Palace gets its name from the fact that it was made brilliant with color and gilt. While it has been recognized for years that some of the palaces show traces of paint, it was comparatively recently that the specifications for the coloring of this very façade were found by the superintendent of state archives in the papers of the procurator of Saint Mark's. While the document is extremely interesting in the matter of light that it throws upon mediæval technical processes, it is also one of our finest proofs of the practice of painted polychromy in mediæval times. There is no question as to just what parts of the façade were relieved by red, ultramarine, white, or gold.

What has been remarked of Venice in particular is in a degree true of Italy generally during the Romanesque and Gothic periods. The buildings of both ages present many examples of polychromatic variation accomplished both by means of the use of colored materials and by means of applied paint (oil or fresco). Well-known examples of the first class of variation are such churches as San Miniato and the Cathedral of Florence and various churches at Lucca, Pisa, Pistoja, and even as far east as Bologna. These buildings exhibit walls stripped or panelled in dark green and white, or dark green, black, white, or red marble, and relieved here and there by panels of brilliant mosaics upon gold grounds. With these very interesting examples of incrusted decoration we might also mention the campanile of Florence Cathedral, Santa Croce, Santa Maria Novella, Orvieto Cathedral, and many others.

As examples of the painted type of color variation should be mentioned such structures as the little church at Sparone, the Cathedral of Piacenza, and the Church of San Zenone at Verona, where we find distinct traces of applied color in the lunettes and porch of the principal entrance.

Now while we might expect color treatment in so colorful a land as Italy, we might be surprised to find color generally loved and used in the damp and somewhat gloomy northern France, or the almost perpetually foggy England. But it appears, nevertheless, that the use of color upon the exteriors in France dates back to Gallo-Roman times, and that it continued down to the time of Louis XIV, that is to say, until the influence of Palladianism was felt in France.

Viollet-le-Duc, who closely examined Notre Dame de Paris, found numerous evidences and traces of color upon that structure. Not only were the three doors of the façade with their tempana all painted and gilded, but the niches of the doors, the gallery of the kings, the arcades under the towers, and the great rose window were once radiant with color and gilding. The large gables of the transepts, also, show unmistakable evidences of painting. Similar remarks, according to Paul Sedille, might be made about most of the French churches of the thirteenth, fourteenth, and fifteenth centuries.

The glazed or enamelled pottery set in the façades or used on the roof as tiles or as crestings and finials and the gilded leadwork of the roof all contributed their quota to the color of the day and were used to enrich edifices both great and small, religious and secular. Wooden house façades with their chamfered and notched half-timbering and carved panels were illumined with bright colors.

During the Renaissance, due to Italian influence, enamelled terra-cotta was in great favor in France. The monuments of Florence, Bologna, Perugia, Pistoja, and all those cities made famous by Lucà della Robbia or his successors were sources of inspiration. Girolamo della Robbia, grandnephew of Luca, was invited to France by Francis I, and he enriched with polychrome terra-cotta the façades of the celebrated Château de Bologne (Château de Madrid).

The solemn white walls that found their first champion in Italy in the person of Palladio were passed on to France by his successors and imitators, the Jesuits and Bernini. These men imitated the classics by copying their orders; size sufficed for grandeur; form was appreciated only when in monochrome. Thus we see that the classics were not revived and restored in all their phases, simply in their forms.

(*Continued on page* 384)

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Editorial and Other Comment

American Church Architecture

THERE has been much written and even more said recently on the subject of our church architecture, and the Episcopal Church and other denominations have taken up the matter in a vigorous protest against the generally poor quality of church buildings, and organized for action toward their betterment.

The church of whatever denomination is nearly always a conspicuous landmark, and in every city and town in the country there are many examples of the way a church should not be built, looked at from any other point of view than that any place may be good enough for a house of worship.

There is no other great power for the advancement of spiritual welfare of a people that calls for a more intimate uniting of beauty of thought and beauty and fitness in its place of expression.

The old Gothic builders manifested in their ascending arches and towers and in the lovely detail in both interior and exterior the spiritual aspiration that dominated their ideas of worship, and even those beyond the pale and unresponsive to the purely religious appeal of these wonderful churches are yet moved by the dignity and perfect adaptation of these edifices for their purpose. The best art of mediæval times went into their building, the most skilled artisans gave of their best, and if not always, maybe, a labor of love combined with a feeling of reverence for the work in hand, there was apparently the pride of creation, of participation in the uplifting of a great monument of beauty.

We are a far cry from the spirit of the Gothic times, from the methods of building that prevailed in the days of the great Gothic cathedrals, but religion is still a power in the world, and houses of worship are still the centres of influence in many communities.

We are building Gothic churches to-day, and the style seems especially appropriate for the cathedral church, and in the hands of men steeped in the Gothic traditions the style takes on a noble and inspiring dignity.

Both Mr. Cram and Mr. Goodhue have given us worthy examples of modern Gothic, and they have long stood at the very front of the Gothic tradition in our contemporary church architecture.

In New England, where the Wren influence gave us so many lovely churches of quiet charm and beauty of proportion, we find models that embodied the old Puritan wish for churches that bespoke the greater simplicity and austerity of their worship, the things that marked the development of religion in the colonies.

All over the country little spires of village churches rise up above the surrounding shops and homes, and many of them, viewed from a distance, add a picturesque and homely charm to the landscape. But too many of them, alas, may only be viewed with composure and kind tolerance from afar, for near by they become horrible examples of about the worst architecture in the community.

No doubt the local building committees are chiefly responsible for this condition, and to the untrained a church is a church, no doubt, and that is enough. The little church, no matter how poor the congregation, may quite easily be made beautiful, and beauty and worship should go hand in hand.

We hope to have better things from the very fact that the church people themselves have realized the situation and are taking the lead in the demand for better design.

There is a tendency here and there in modern church building toward the combination of the church with a supporting business structure and the putting together under one roof all the many-sided activities that the up-to-date church involves.

One of the first enterprises of this kind was in New York City, the well-known Judson Memorial Church on Washington Square, designed by Stanford White, a notably beautiful church combined with a wonderfully planned apartment hotel. There is now being erected in Chicago a large church that will combine the house of worship with an extensive office-building.

These, of course, are for a large city. Our greatest need for reform is in the small-town church, and the signs of the times give us hope that the future will show a marked advance in this field of architecture.

Lloyd Warren

THERE are always men who are quietly and unobtrusively doing great public service, who are giving their means and their culture in an unselfish effort to help others, to make better understood the things that advance art and make more useful citizens. Among these men few will be more missed than Lloyd Warren, an architect, whose tragic and most untimely death is regretted by all who have at heart the ideals for which he so valiantly and generously worked.

Of his work in behalf of The Beaux Arts Institute, Mr. Cortissoz wrote in *The Tribune:*

"The Beaux Arts Institute and the School of Sculpture, Painting and Interior Decoration which Mr. Warren founded have been continuous influences for beauty in architecture and for a broader vision of all its problems. That American architecture to-day ranks with the best in the world is considerably due to their force. Through their medium the ablest architects of the country, as generous volunteers, have directly aided and developed the rising generation of architects. Chance has been given to the draftsman of talent in any part of America to receive the criticism and training which he needed. Such beauty as this labor of love on the part of Mr. Warren has created is a precious gift to the people of America and it deserves appreciation by the public as well as by the men of his profession and a memorial befitting its lasting worth."

Mr. James Gamble Rogers, the architect of the beautiful Harkness Quadrangle at Yale, said of him:

"Mr. Warren worked hard and faithfully in every department of the profession that he so greatly honored, but it was to the development of the Society of Beaux Arts Architects and the Beaux Arts Institute that his life-work was dedicated. So sincerely did he labor that now, while it may no longer receive his support and wise counsel, it has become inevitably an established organization so firmly founded as to make it in the United States as important in its relation to architectural education as is the Ecole des Beaux Arts in Paris.

"In the great influence of Mr. Lloyd Warren's example we have presented what a capable and highly intelligent man of means may accomplish—a man of high ideals, of great force of character, with the means to further his visions and make them tangible and valuable realities. Other men in other fields of education may well be inspired to follow so fine an example, and to lend their wealth and their abilities to the furthering of a great purpose, in exactly the way Mr. Warren did.

"From his first connection with the Society of Beaux Arts Architects, and at a time when it was at best but a social architectural organization, his clear vision made it possible to discern the great possibilities that might be evolved from a group of that kind. With infinite patience and at the expense of much time, Mr. Warren perfected an organization which to-day bends all of its energies and influence toward the education in architecture of the younger men in the profession."

And the following is from another friend and architect, John Mead Howells:

"It can be said without risk of platitude, that since reaching the age of manhood, Lloyd Warren has given his life and activities for other people. He did this advisedly, and while the rest of us were working professionally Warren had made up his mind to help the type of young man who wanted to study architecture, but could not, because he was without money and opportunity. Of these young students who profited by his organization and help there were hundreds, even thousands—they and their work are Lloyd Warren's monument to-day.

"The Beaux-Arts Institute, of which Mr. Warren was the creator and director, grew up around his generous sacrifices and endeavor, but it was not he that built it. It was the hundreds of students who asked hungrily for what he offered them. But for his help they had no one to turn to for an education and advice. He made it possible for these young men to send their work to the Beaux-Arts Institute and have it judged and criticised for nothing by groups of leading architects, who gave their time at Warren's instigation, for these architects loved him and knew that he was not asking anything of them that he was not giving himself."

Ernest Peixotto, the writer of the following tribute, was intimately associated with Mr. Warren in the Beaux Arts School of Design as the director of the Department of Mural Painting and also with the work of the A. E. F. Training Centre at Bellevue, France. Mr. Peixotto served as a captain overseas, and has been made a member of the Legion of Honor for his work in behalf of France.—Ed.

"By the sudden and most regrettable death of Lloyd Warren, the cause of architectural education in this country has received a very severe blow and has lost one of its leading spirits and one of its most devoted and valuable friends. The editor of Architecture has asked me to write a brief tribute to his memory and, while I feel that this tribute would come more fittingly from a member of his own profession, I cannot resist, for, during the past few years, I have been associated with him in three of his most important educational activities: the A. E. F. Art Training Centre at Bellevue, France, The Beaux-Arts Institute of Design in New York, and the proposed School of Fine Arts in Fontainebleau.

"To each one of these works he brought that careful attention to detail, that spirit of service and self-sacrifice, that quiet devotion which, though not generally recognized by those who knew him slightly, yet won him the admiration and high esteem of all those who knew him at closer range. A bachelor, with the means at his disposal to lead the life of a dilettante, he nevertheless devoted at least a portion of every day to the preparation of his papers and his programmes and to his work among the students, many of whom he personally befriended.

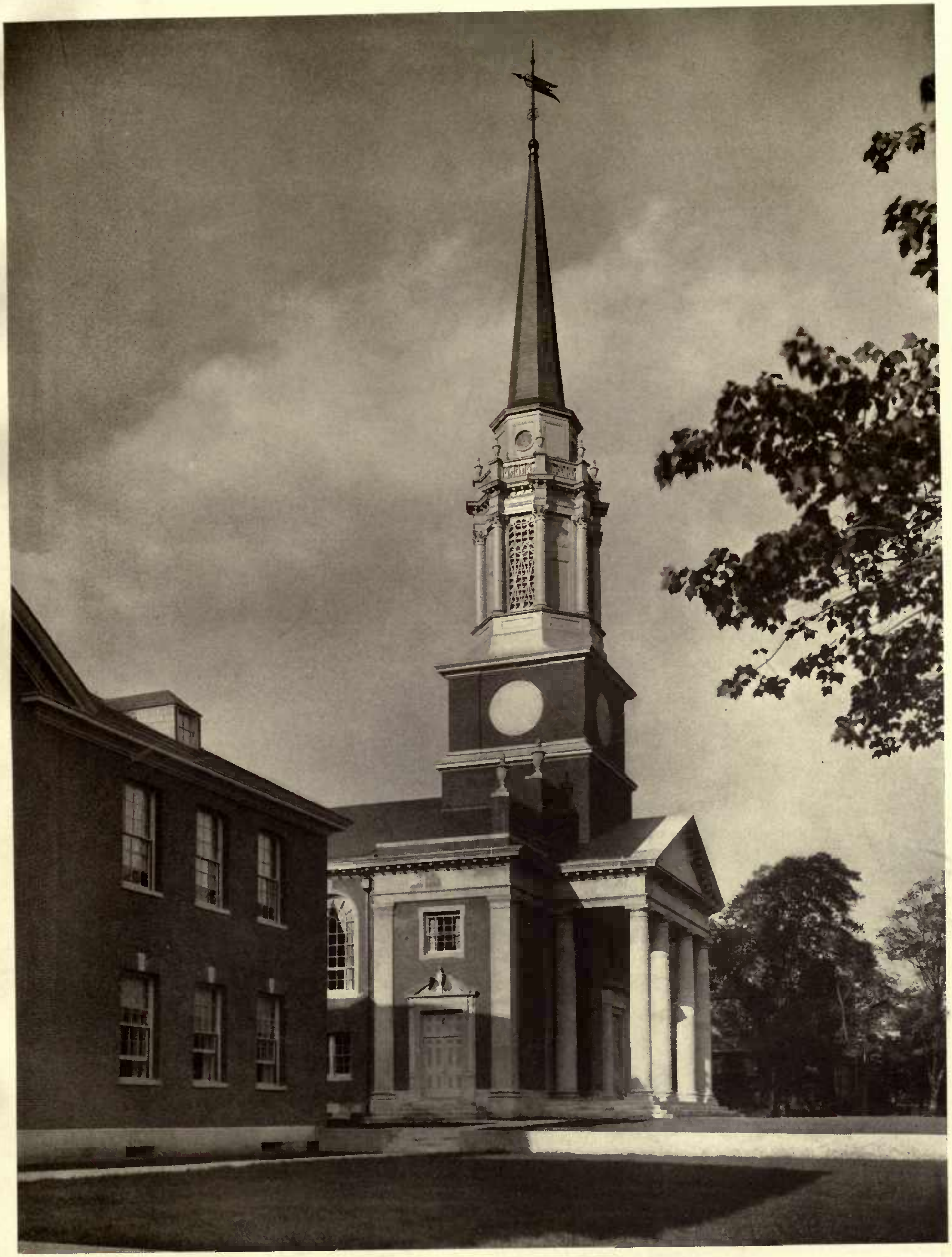
"At Bellevue his work among the soldier-artists awaiting repatriation after the armistice was considered so important that, for it, the French Government conferred upon him the red ribbon of the Legion of Honor; while the success of the Beaux Arts Institute of Design is due to a large extent to his untiring efforts in its behalf.

"Founded less than a decade ago, under the auspices of the Society of Beaux Arts Architects, and upon the competitive system used in the Ecole des Beaux Arts in Paris, this institute has become unique, I believe, among the educational institutions of our country. And, under Mr. Warren's successful directorship, its influence has become so widespread that now it enrolls a thousand students in its architectural department and its monthly programmes are being used by fifty-seven different ateliers of which twenty-six are schools of architecture in our leading universities. The spirit of competition created by its monthly 'judgments' has undoubtedly raised the standard of architectural training throughout our land, stimulating the imagination of the student and quickening his sense of design.

"The programmes of its Department of Mural Painting are likewise being used by a number of our leading art schools and colleges, and are undoubtedly tending to stimulate a serious interest in this, at present, much-neglected art, while its Department of Sculpture is certainly the largest school of its kind in the country with several hundred students enrolled upon its books.

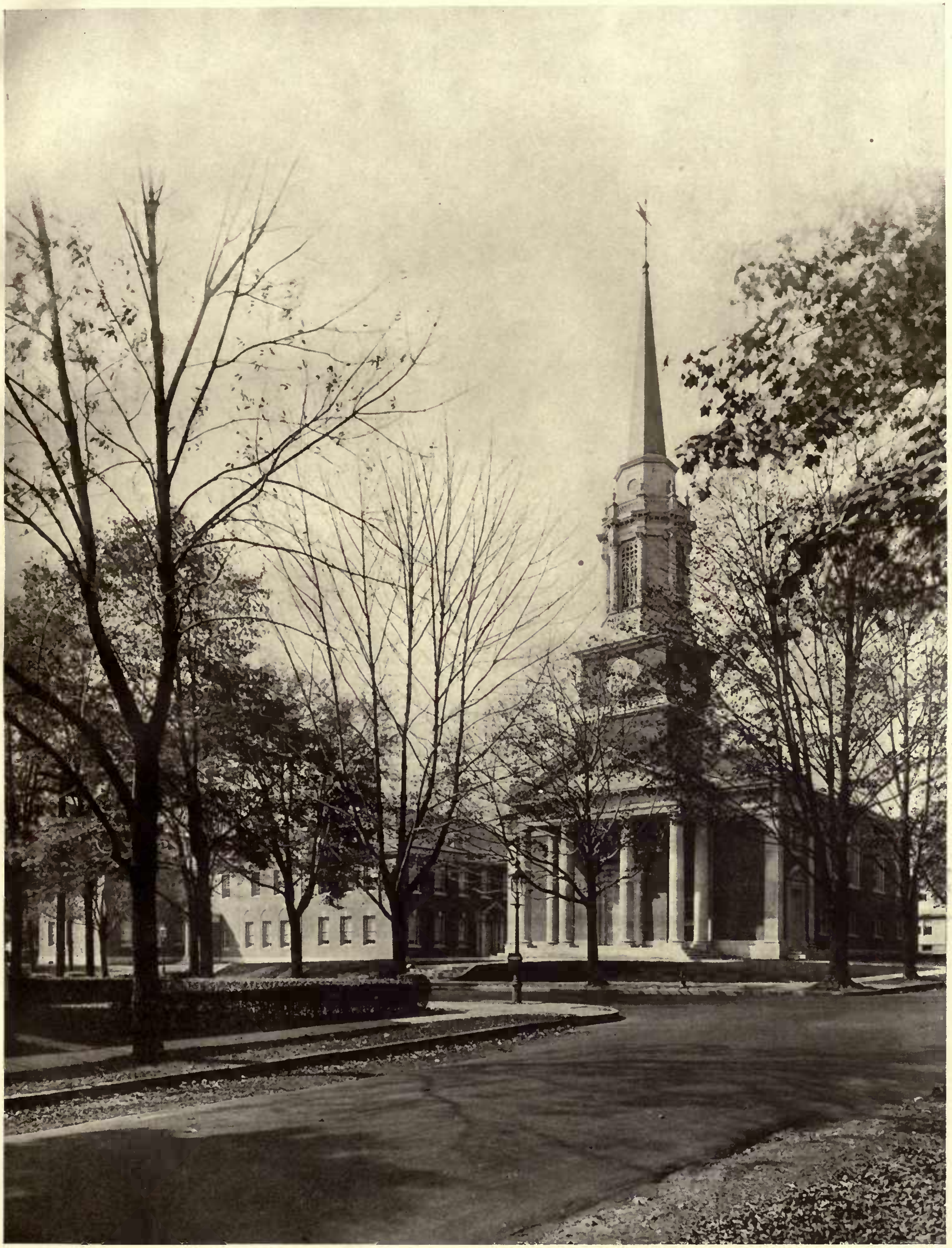
"These splendid results are due, as I have said, in a large measure to Mr. Warren's efforts, backed, as they were, by an ever-widening group of architects, painters, and sculptors who give their time and their service to the work. He also founded the Prix de Paris, which enables its recipient to spend three years in France as a pupil of the Ecole des Beaux Arts while his further love for France and his appreciation of the meticulous French methods of teaching also enlisted his early support for and interest in the Fontainebleau School of Fine Arts for painters and archictects, which in all probability will open next summer in a wing of the historic Palace itself, placed at the disposal of American students by the French Government.

"And so it will be seen that Lloyd Warren was ever unselfishly striving to aid his young compatriots and, had his life been spared, would have continued to do his very important work. His place in that work will indeed be hard to fill, but his friends and associates are convinced that the best memorial that they can rear to his memory will be the continuance of the work that he so nobly began and for which his name will long be cherished and remembered."



CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

Carrère and Hastings, Architects. Shreve, Lamb and Blake, Associated.



CHURCH AND SERVICE BUILDING, CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

Carrère and Hastings, Architects. Shreve, Lamb and Blake, Associated.

INTERIOR, TOWARD PULPIT, CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J. Carrère and Hastings, Architects. Shreve, Lamb and Blake, Associated.

INTERIOR, TOWARD ENTRANCE.

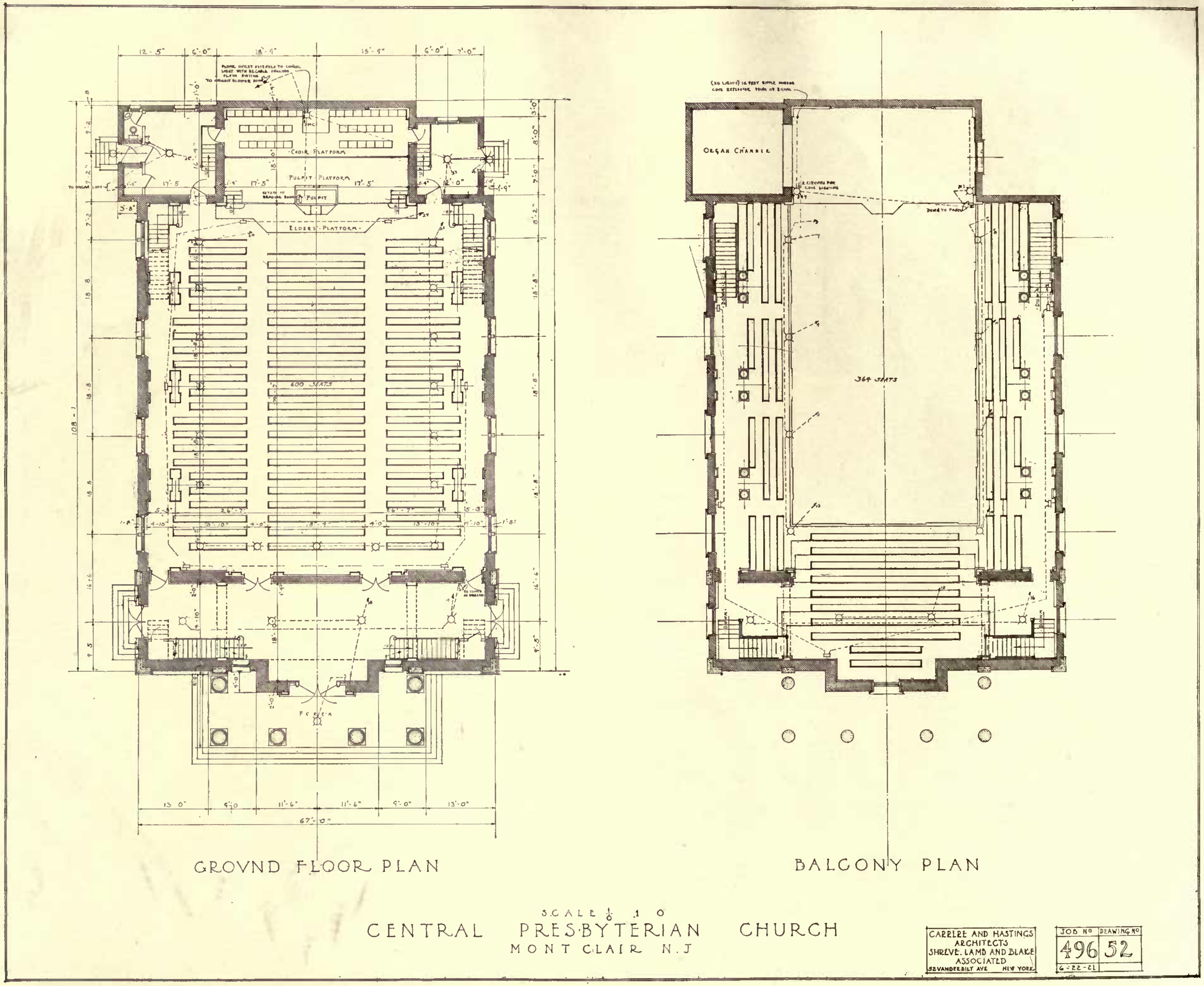
LOBBY, CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.
Carrère and Hastings, Architects. Shreve, Lamb and Blake, Associated.

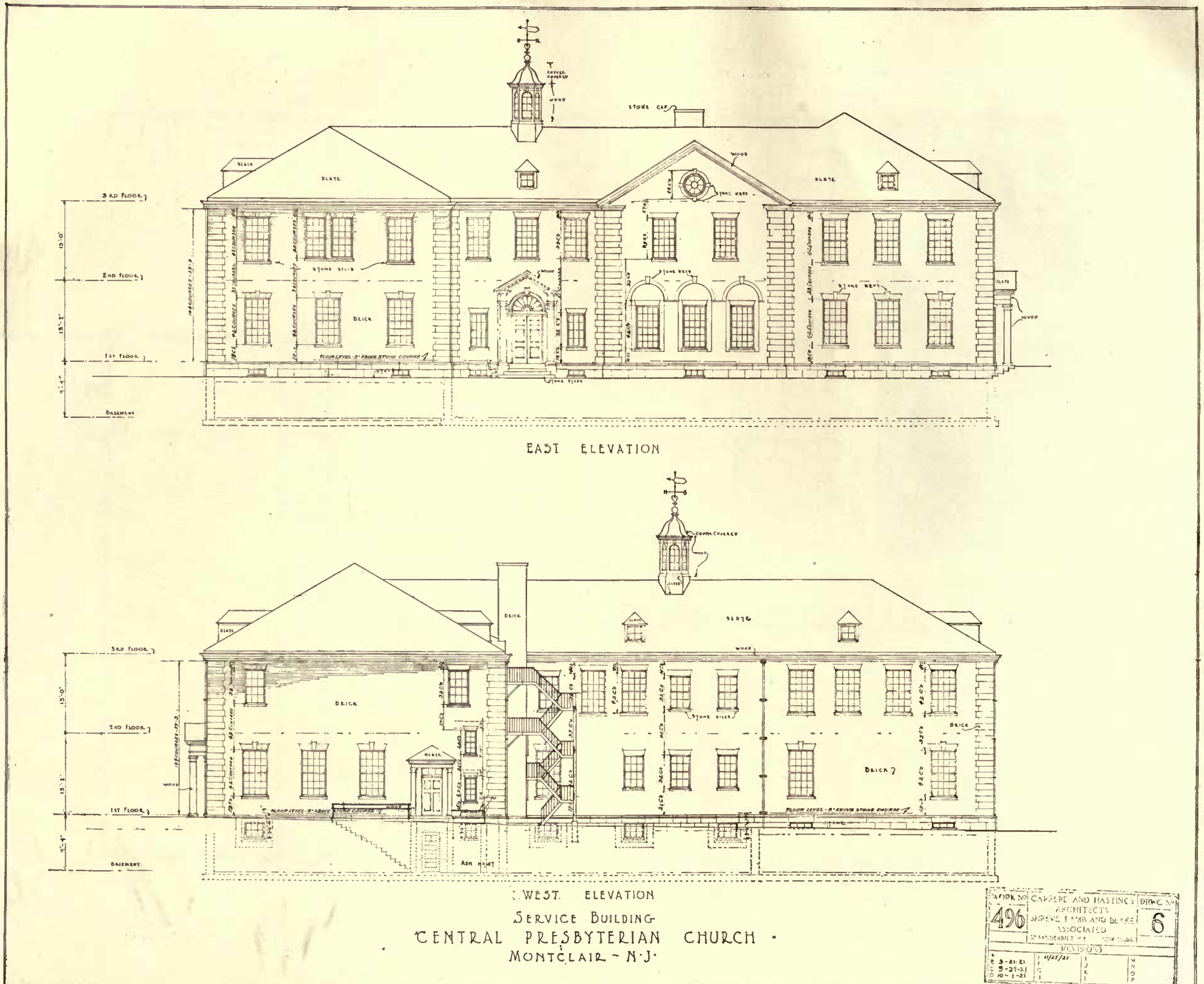
FRONT ELEVATION - CHURCH
SCALE $\frac{1}{8}$ · 1 0

CENTRAL PRESBYTERIAN CHURCH
MONT CLAIR, N J

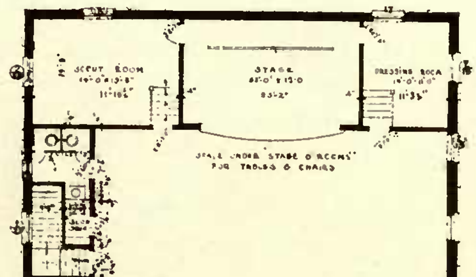
CARRERE AND HASTINGS
ARCHITECTS
SHREVE, LAMB AND BLAKE
ASSOCIATED
52 VANDERBILT AVE NEW YORK

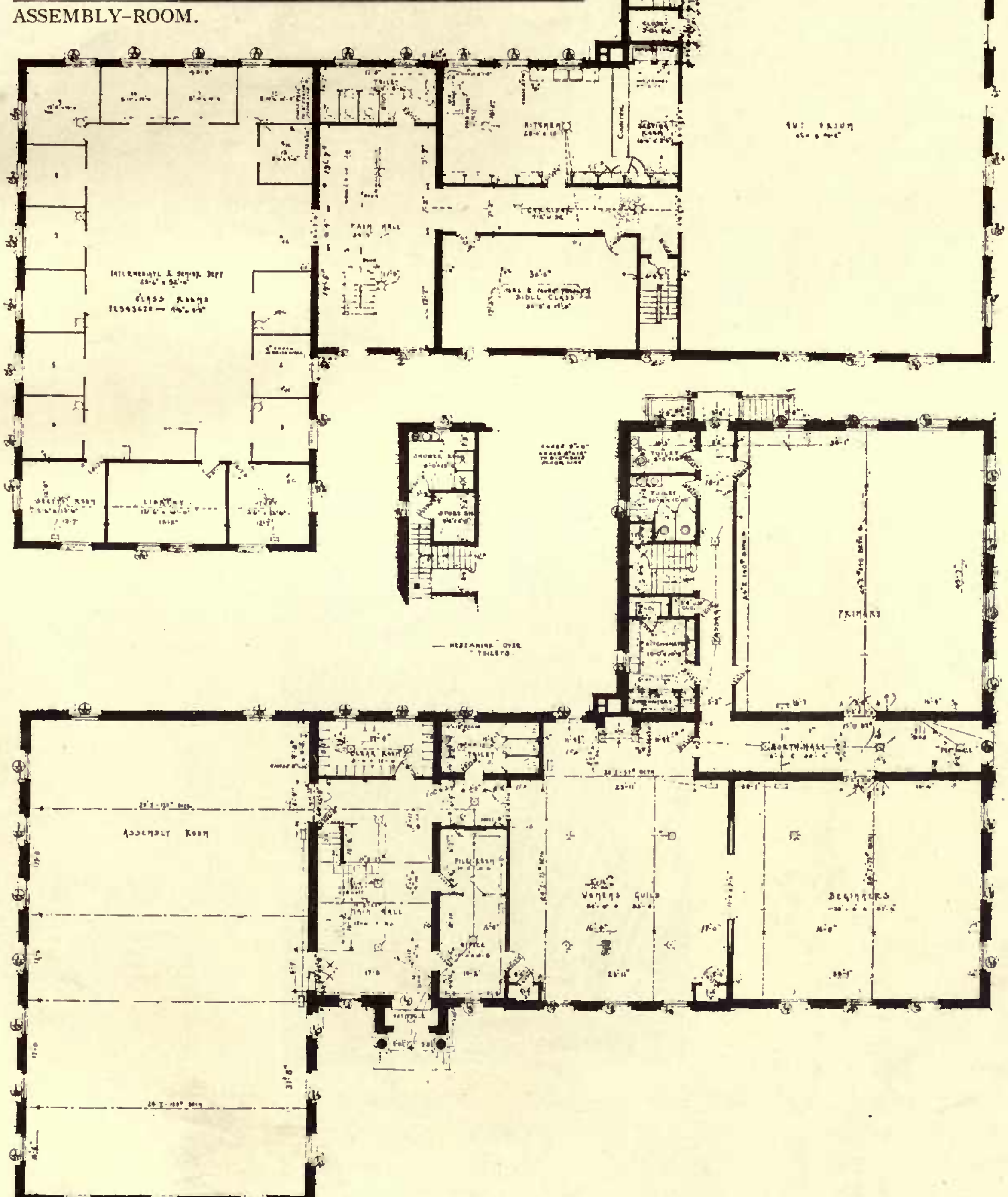
JOB No	DRAWING No
496	53
6-22-21	


Choir Platform
Pulpit Platform
Pulpit
Elders' Platform
600 Seats
Organ Chamber
364 Seats
GROUND FLOOR PLAN
BALCONY PLAN
SCALE 1/8 = 1 0
CENTRAL PRESBYTERIAN CHURCH
MONTCLAIR N.J
CARRERE AND HASTINGS
ARCHITECTS
SHREVE, LAMB AND BLAKE
ASSOCIATED
52 VANDERBILT AVE NEW YORK
JOB NO 496
DRAWING NO 52
6-22-21

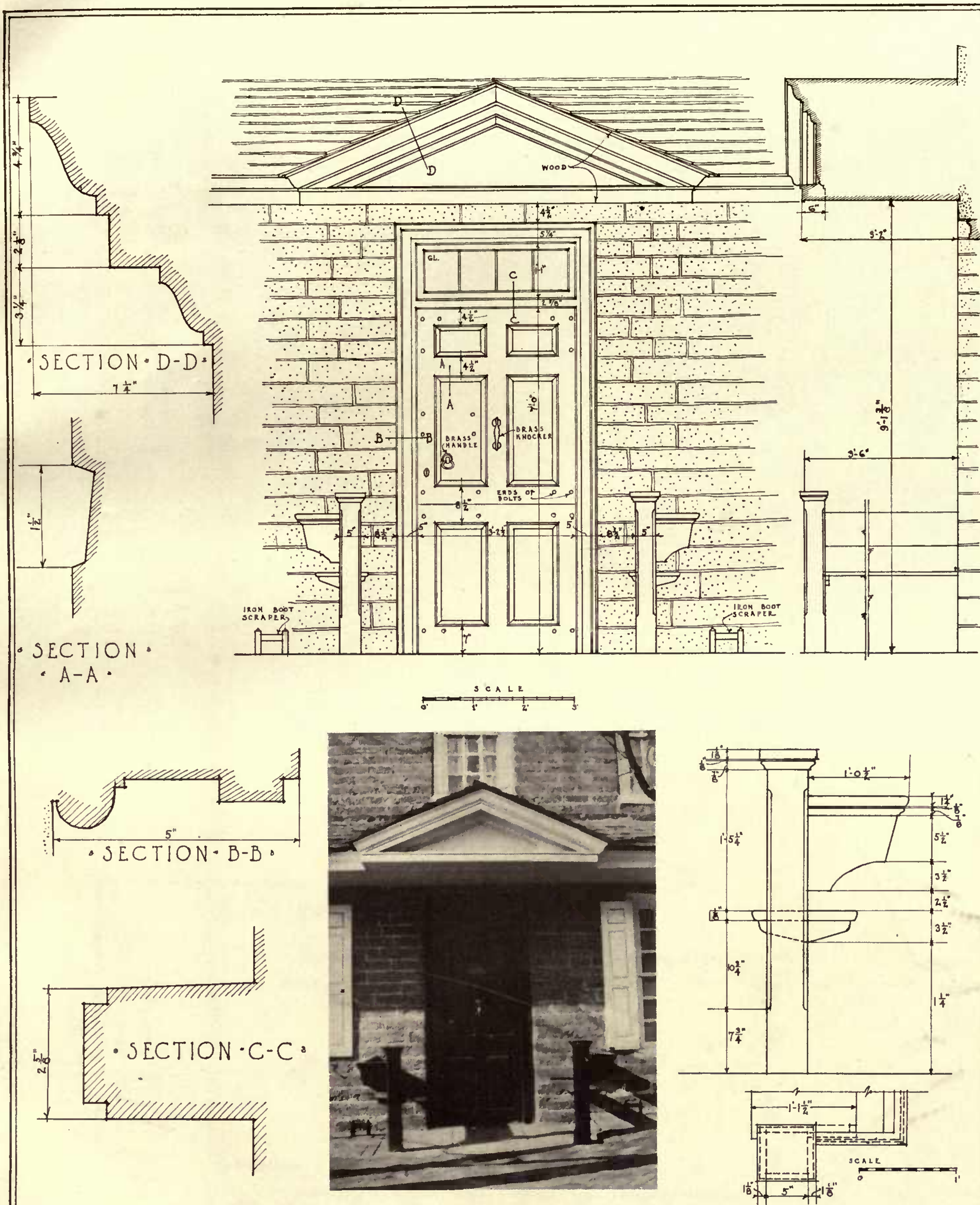

EAST ELEVATION
WEST ELEVATION
SERVICE BUILDING
CENTRAL PRESBYTERIAN CHURCH
MONTCLAIR - N.J.
WORK No 496
CARRERE AND HASTINGS ARCHITECTS
SHREVE LAMB AND BLAKE ASSOCIATED
DRWG No 6
REVISIONS
3RD FLOOR
2ND FLOOR
1ST FLOOR
BASEMENT
SLATE
BRICK
WOOD
STONE CAP
STONE SILLS
STONE KEYS
COPPER COVERED
ASH HOIST

ASSEMBLY-ROOM.

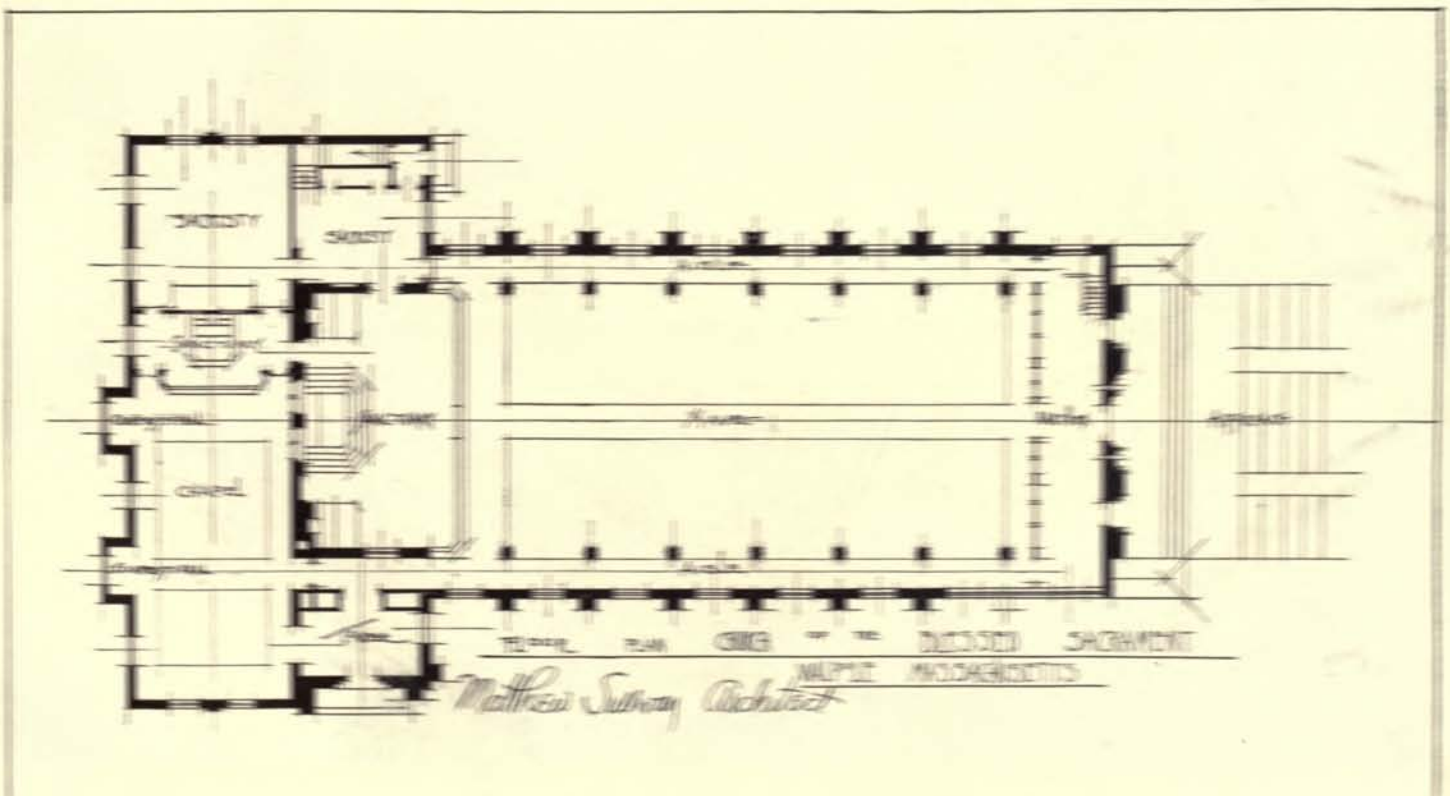




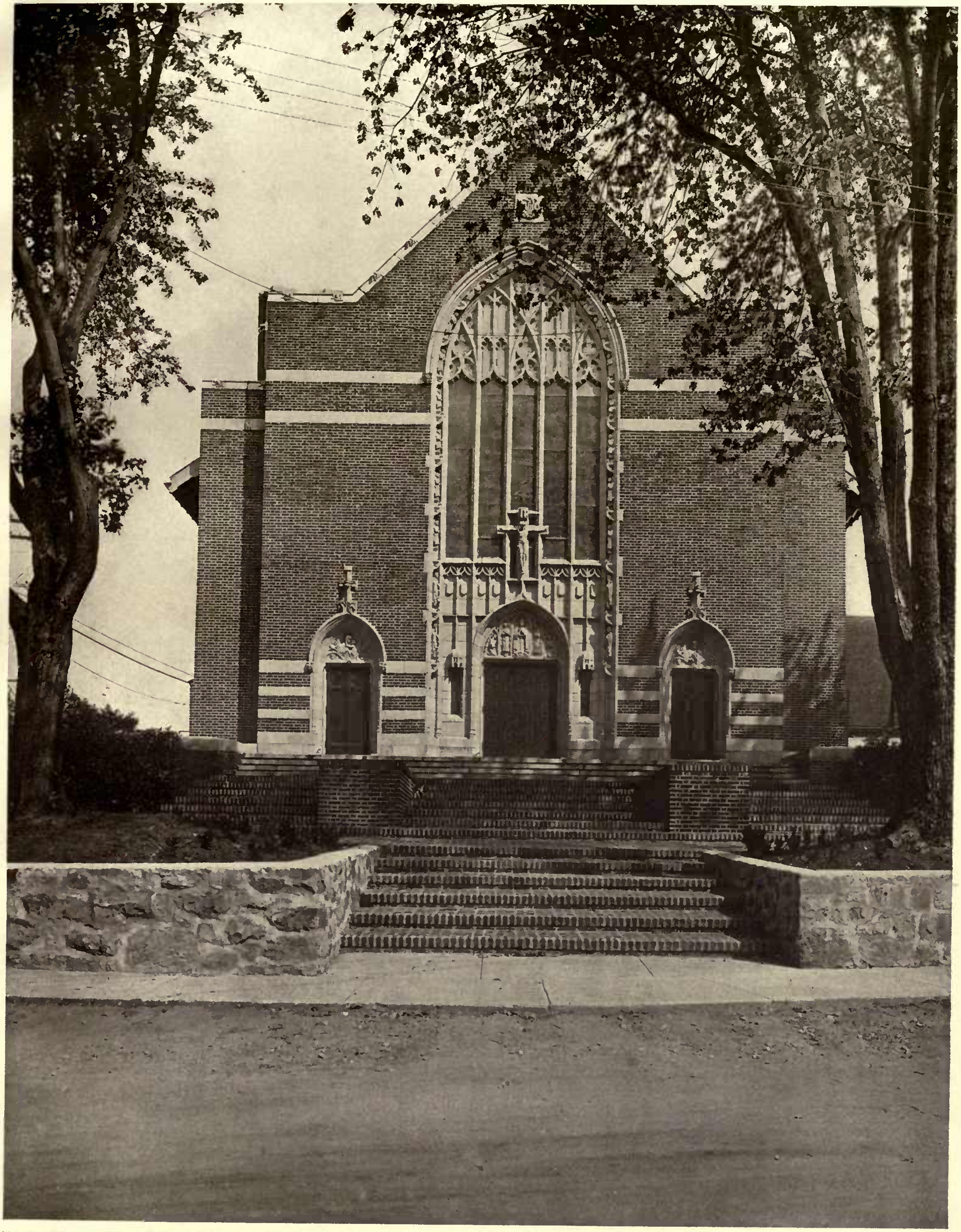
PLANS, SERVICE BUILDING, CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.
Carrère and Hastings, Architects. Shreve, Lamb and Blake, Associated.



· EARLY · ARCHITECTURE · OF · GERMANTOWN · PA. · CIRCA · 1768 ·	· DOORWAY · OF · THE · "JOHNSON" · RESIDENCE · · GERMANTOWN · PA. ·	· MEASURED · AND · · DRAWN · BY · · Daniel W. Weiny

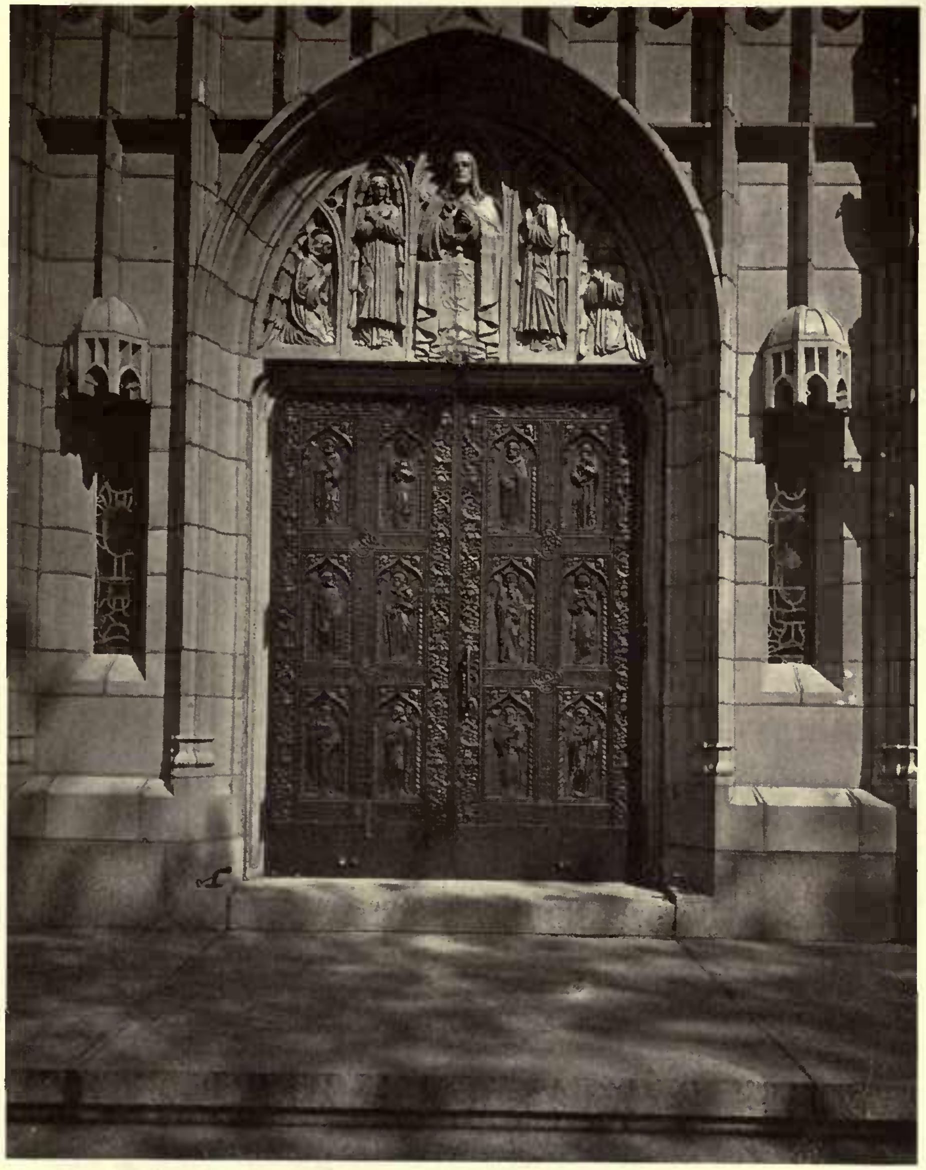


CHURCH OF THE BLESSED SACRAMENT, WALPOLE, MASS. Matthew Sullivan, Architect.

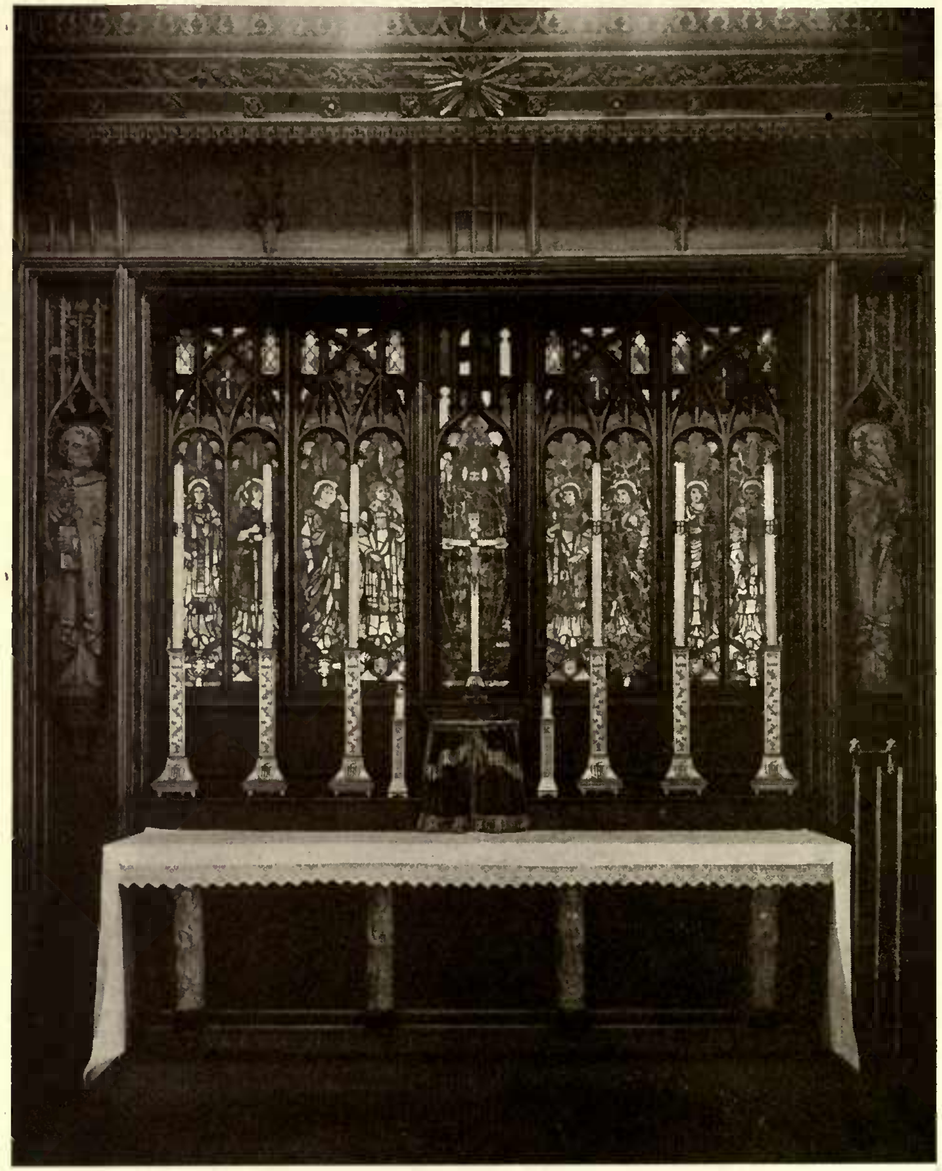


FAÇADE, CHURCH OF THE BLESSED SACRAMENT, WALPOLE, MASS.

Matthew Sullivan, Architect.



MAIN ENTRANCE.



DETAIL OF ALTAR.

Matthew Sullivan, Architect.

CHURCH OF THE BLESSED SACRAMENT, WALPOLE, MASS.

INTERIOR, TOWARD SANCTUARY.

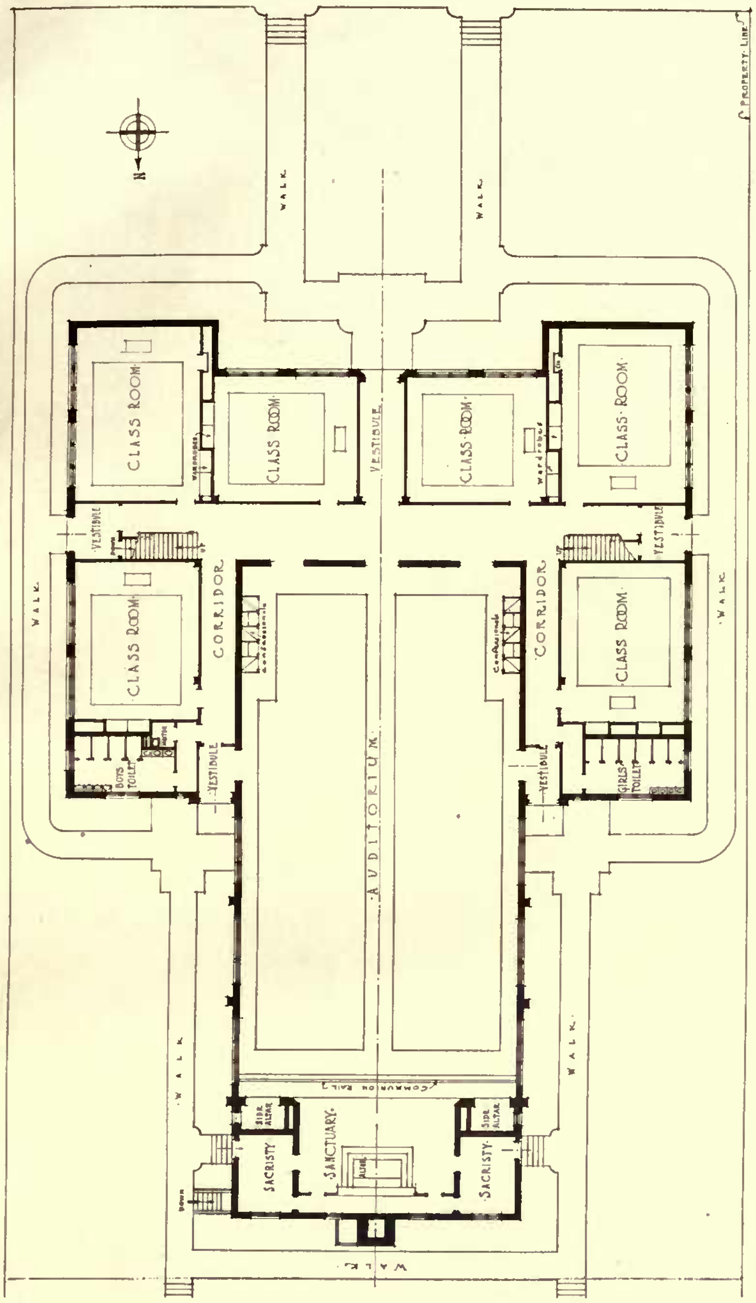
INTERIOR, TOWARD ENTRANCE.

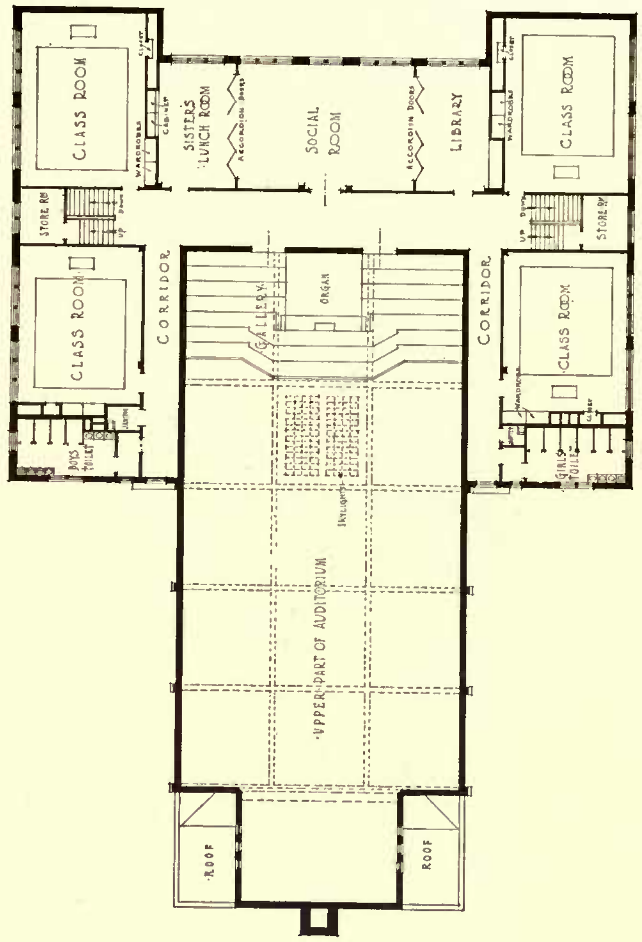
Matthew Sullivan, Architect.

CHURCH OF THE BLESSED SACRAMENT, WALPOLE, MASS.

·CHURCH AND SCHOOL OF ST. LAWRENCE, R. C., MINNEAPOLIS, MINN.

Damon, O'Meara & Hills, Architects.

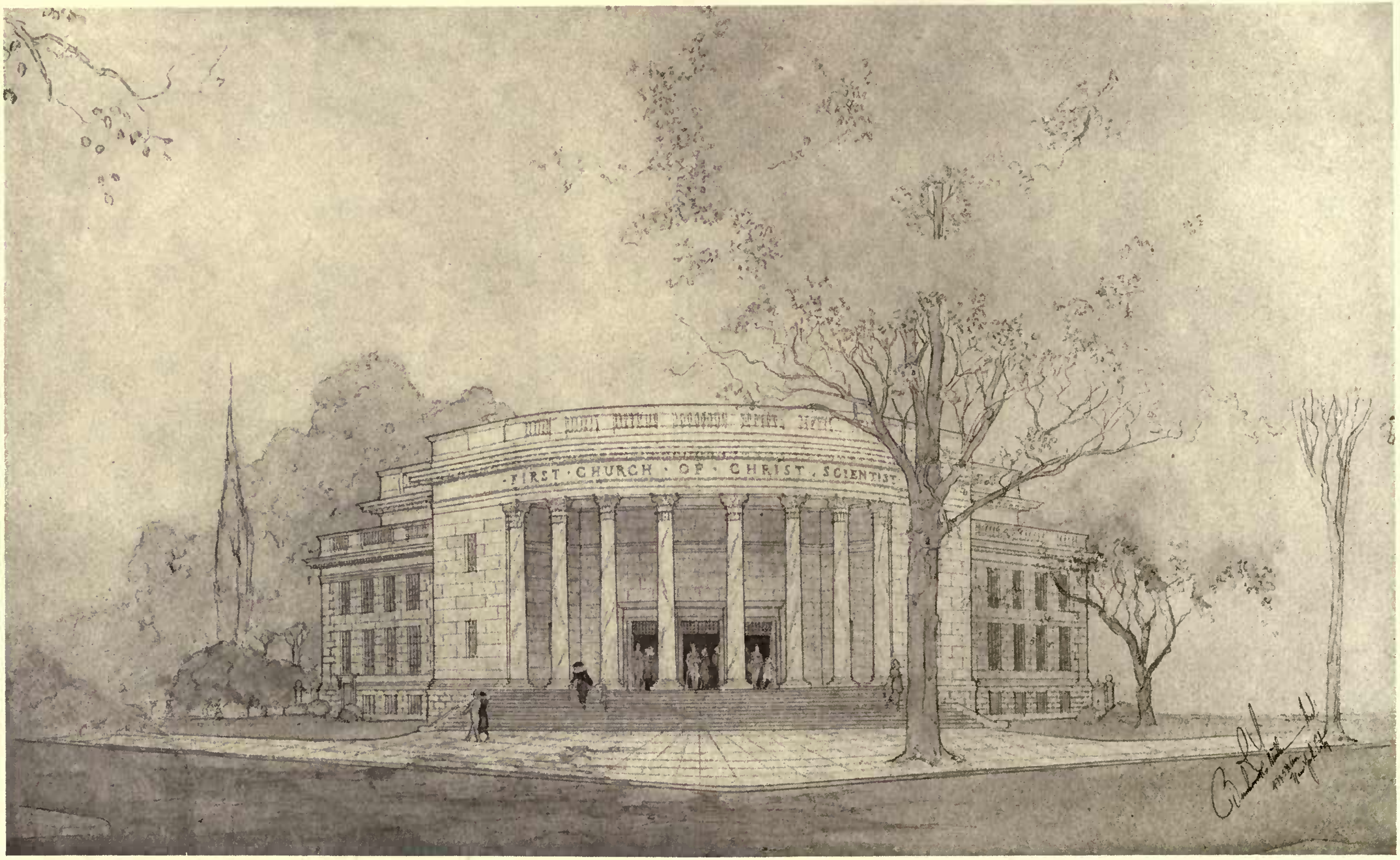




AUDITORIUM OF CHURCH.

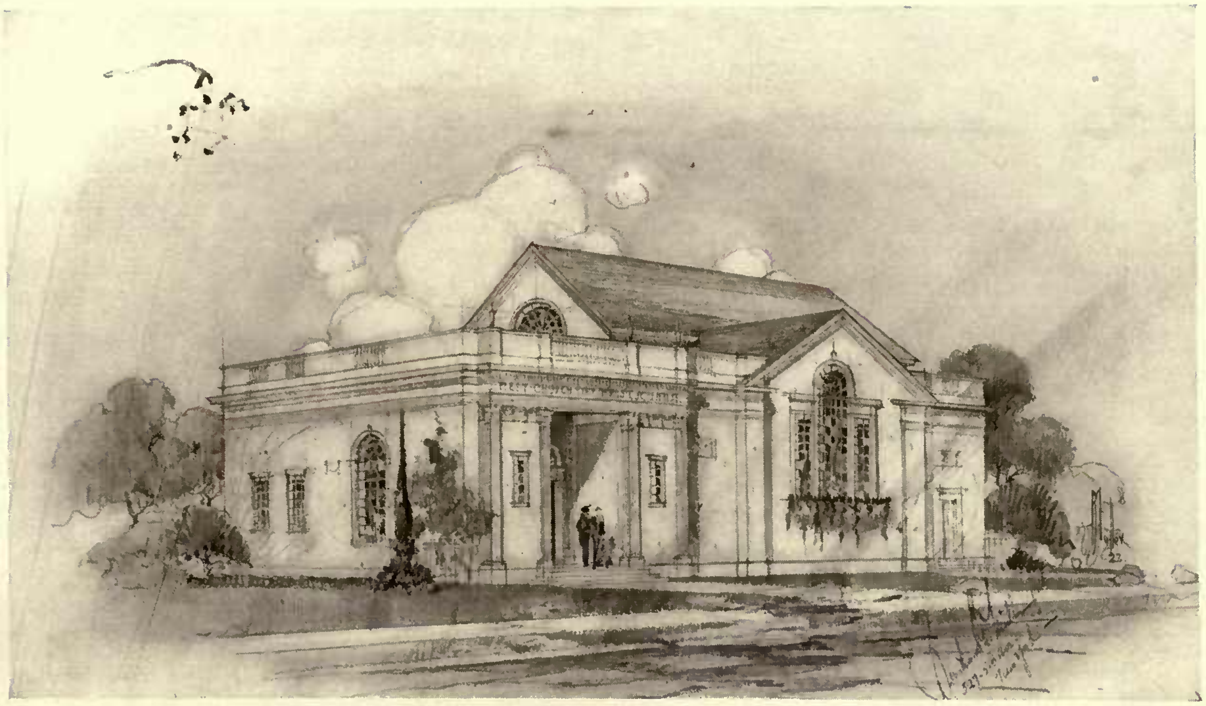
Damon, O'Meara & Hills, Architects.

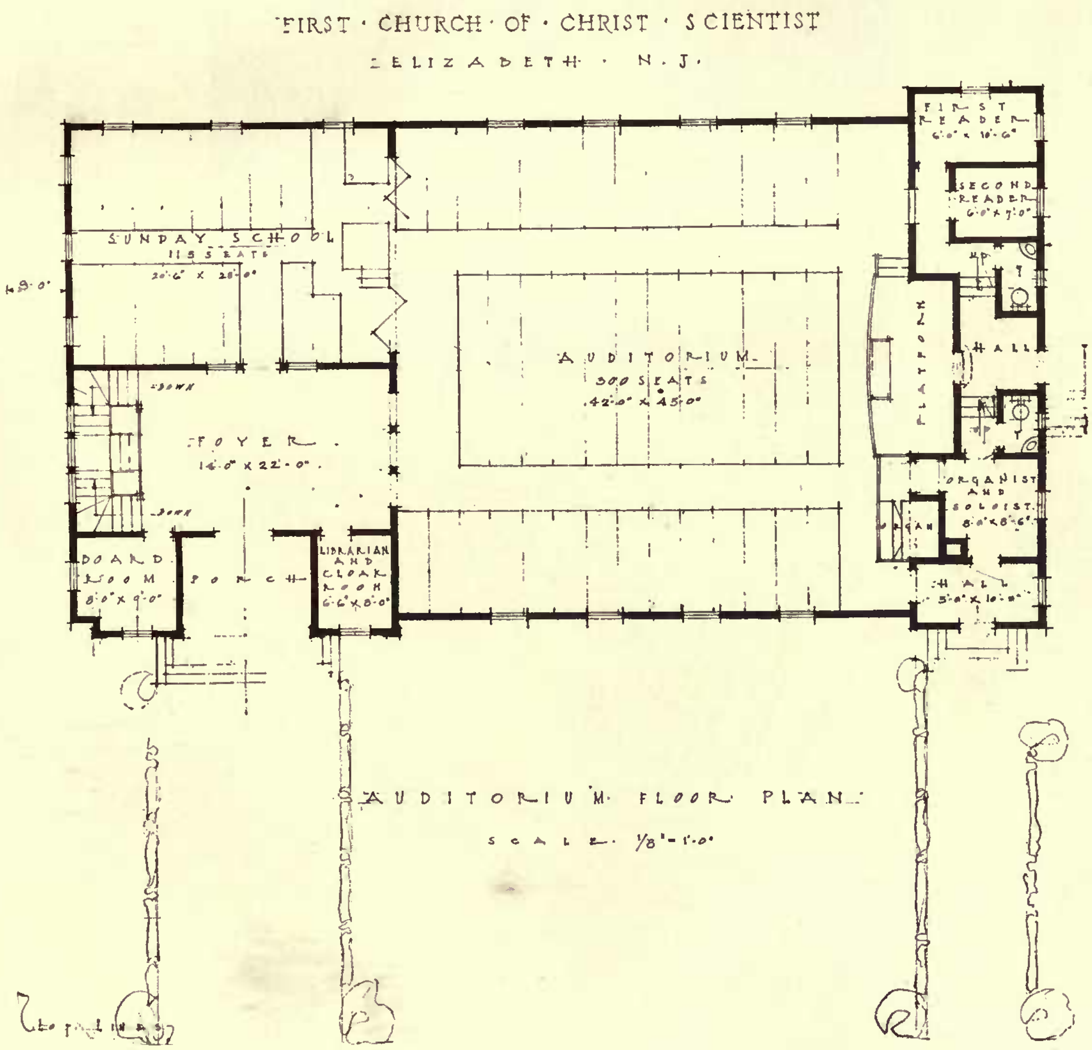
CHURCH AND SCHOOL OF ST. LAWRENCE, R. C., MINNEAPOLIS, MINN.



DESIGN FOR FIRST CHURCH OF CHRIST SCIENTIST, SCHENECTADY, N. Y.

Bernhardt Muller, Architect.





FIRST CHURCH OF CHRIST SCIENTIST, ELIZABETH, N. J.

Bernhardt E. Muller, Architect.

Book Reviews

THE PRACTICAL BOOK OF FURNISHING THE SMALL HOUSE AND APARTMENT. By EDWARD STRATTON HOLLOWAY, co-author of "The Practical Book of Interior Decoration." New volume in the "Lippincott Practical Series." Nine illustrations in color, 198 in double tone. J. B. Lippincott Co., Philadelphia.

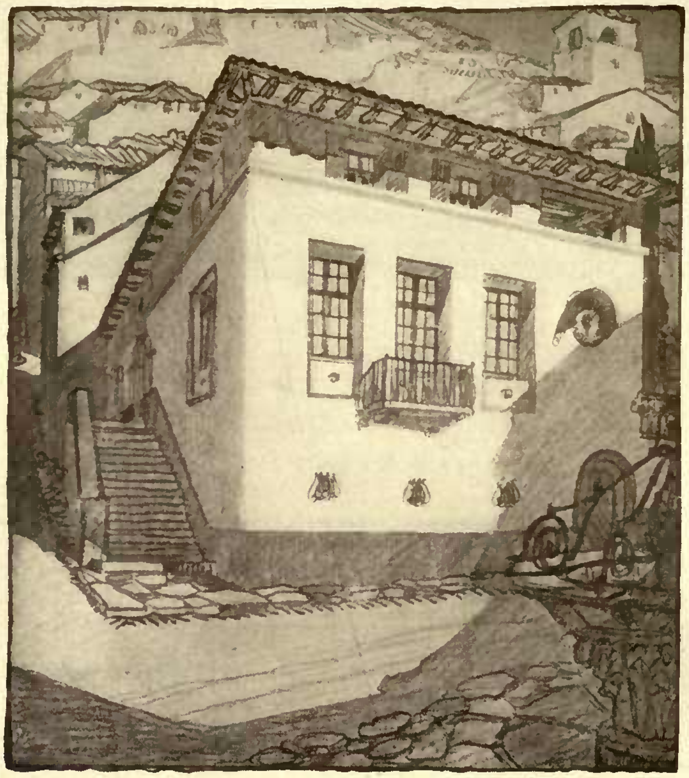
Certainly there is room for and an abundant need for books that will teach sanity and, if it be possible, good taste in furnishings. The shops are filled with tawdry stuff, the salesmen ready to help the unknowing to do their worst. This book deals with its subject in a way that should make it a helpful reference and a guide toward better things. It is comprehensive, for it includes such matters as "the furnishing of premises from the most inexpensively equipped cottage, bungalow, or flat through various grades of home, to the smart apartment or house of fair dimensions. It covers both the modern non-period mode and liberal period furnishing and according to various degrees of cost. It fully furnishes room by room a number of properties with complete wall treatment, color schemes, furniture, textiles, and accessories. The furniture illustrated is for the first time that which can be bought by the householder in the open market. The volume is based on the common sense possessed by the reader, showing him how to use the faculties he already possesses. The reason is given for every step in decoration."

Fortunately it may help to develop the "common sense" of its readers into an uncommon sense of the fitness of things. Any book that will make the "decorator and furnisher" pause and consider the principles of good taste in such matters should prove a boon to mankind. The illustrations are a valuable and helpful aid in making the text clear, even to the uninitiated.

"MURS ET TOITS." By CHARLES LETROSNE.

A new book of much interest to American architects is coming out in Paris under the caption of "Murs et Toits" (walls and roofs), by Mr. Charles Letrosne, a celebrated architect and former Prix de Rome man. It deals with all sorts of public and private buildings to be erected, especially in the small towns of France.

It has fine colored plates and many in black and white. The book will consist of four volumes containing besides the text 125 colored plates, and deals mainly with the problems of the school, the constabulary, and "mairie" (town hall) of the little towns for the various departments of France. Every one knows that in the comparatively small area of the whole of France (about one-nineteenth of the United States) there are practically all the climates of Europe according to the departments, and therefore the local forms of architecture must bear the imprints of the climate, materials, etc.



From Murs et Toits.

One feels attracted by these sketches, each one of which may serve as an inspiration. These are not suggestions for the reconstruction of the devastated area only. The author—and the government which is upholding him—seems to point to the impropriety of confining the motto of "economy" to the above-mentioned area which would mean the toleration of unabated extravagance for the rest of France. Such a policy would make the reconstructed area appear comparatively as a scar. Mr. Letrosne, a much wiser, more enlightened patriot, suggests a more general economy, practised in such a manner as to be able to face again the world with pride instead of apologies. By advocating economy on a larger scale he sets the compass in the right direction.

Mr. Letrosne does not even think of ever "applying any of the so-called period styles" to his conceptions of the modern French structures. To him this "applied art" is no more than useless luxury at this time.

Before the war, in France as everywhere else, a third or fourth rate town would try to assume more importance by erecting public buildings commensurate with its ambition rather than the place, and all those buildings would bear in their architecture a sort of official stamp not always in harmony with the local color. Officialdom in art is not the least thing that this work of Mr. Letrosne is fighting.

There is the charm of simplicity of unadorned wall spaces, of an utter avoidance of so-called period styles, that make the designs shown in this admirable book well worth our serious consideration.

The work is published in France by Dan Niestlé, 5 Rue de Vienne, Paris. David Varon, 108 East 31st Street, New York.

THE BEAUTIFUL NECESSITY. Seven Essays on Theosophy and Architecture. Second Edition. By CLAUDE BRAGDON, F. A. I. A. Alfred A. Knopf, New York.

Mr. Bragdon says that "the one important influence that has operated to modify my opinion concerning the mathematical bases of the arts of space has been the discoveries of Mr. Jay Hambidge with regard to the practice of the Greeks in those matters as exemplified in their temples and their ceramics, and named by him dynamic symmetry."

He thinks that "the entire field of research into the mathematics of beauty is of such richness that wherever a man plants his metaphysical spade he is sure to come upon 'pay dirt.' 'The Beautiful Necessity' represents the result of my own prospecting; dynamic symmetry represents the result of his."

Mr. Bragdon pays a fine compliment to Mr. Hambidge, and well he may.

Here, then, are two minds digging and finding "pay dirt" in their metaphysical and mathematical delvings.

You may follow Mr. Bragdon, and you will have to keep very close to him to avoid getting lost in his theosophic idea, "that everything is the expression of self or whatever name one may choose to give to that immanent unknown reality which forever hides behind all phenomenal life."

The chapter heads suggest that you may enter inviting portals and find yourself in a maze, led by the "theosophic idea" into passages that will absorb your interest and test your capacity for unfamiliar thinking. The world is indeed so full of a number of things, and Mr. Bragdon and Mr. Hambidge lead us into new fields of thought. Mr. Hambidge has many followers who are applying his theories to every-day work in practical designing.

While the book is a revision of an earlier work the author has not taken from it his "first fine careless rapture."

CRAIN'S MARKET DATA BOOK AND DIRECTORY OF CLASS, TRADE AND TECHNICAL PUBLICATIONS. G. D. Crain, Jr., Publisher, Chicago.

This is the second edition of Crain's Market Data Book and Dirctory of Class, Trade and Technical Publications. The first edition received a cordial welcome, which demonstrated the need of an advertisers' reference book of this character. The second edition is prepared along the same general lines, with some amplification of certain classes of material.

The basic idea of the book remains the presentation of the statistical and marketing data regarding each industry, trade, and profession, for the purpose of enabling the advertiser or merchandiser to obtain a picture of the field as a whole. The marketing information is followed by a complete list of publications covering the classification.

THE MERCHANTS' ASSOCIATION OF NEW YORK, YEAR BOOK.

The activities of the Merchants' Association of New York have grown in membership and usefulness, and their Year Book is a useful reference on the city's trades, industries, and professions.

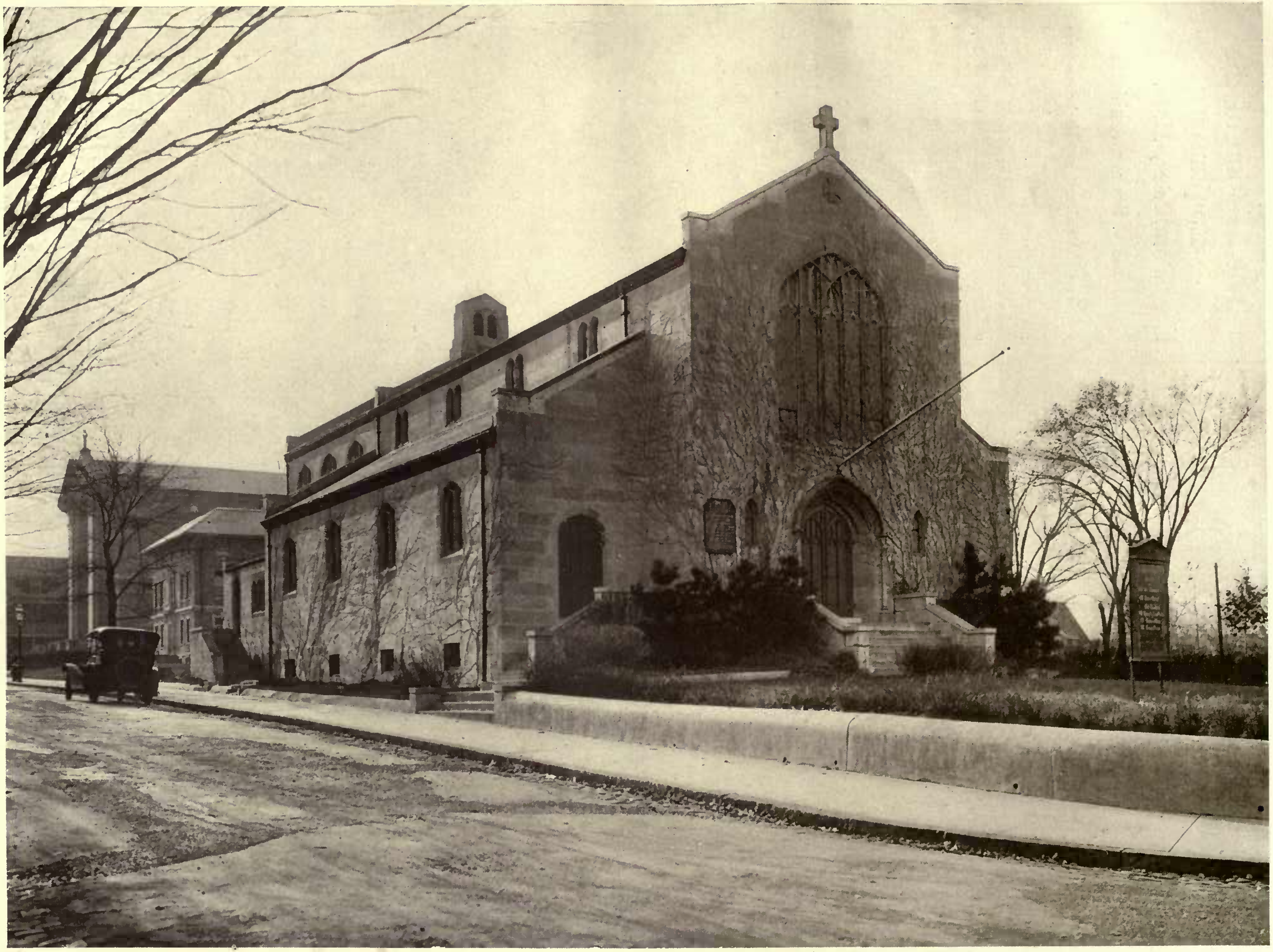
In the Index to Classification, which closes the Year Book, there are 1,133 separate listings showing the comprehensiveness of the enrolment.

As in the early years of the association's existence, the textile industry and banking still constitute the banner divisions in numbers. The membership is large and representative, in the following trades and industries:

Food products and kindred lines; men's apparel and furnishings; transportation and shipping; leather and boots and shoes; paper and paper products; insurance; heavy hardware, machinery; women's and children's wear; drugs, chemicals, colors, oils, and paints; iron and steel, metals; engineering, building, building equipment; jewelry stocks; realty.

THE AMERICAN ARCHITECT SPECIFICATION MANUAL. A Compilation of Specifications of Advertised Materials and Accessories as Prepared by Representative Manufacturers for Use by Architects and Architectural Engineers. Volume IV, 1922. Issued annually by *The American Architect.* The Architectural and Building Press, Inc., New York.

An invaluable reference for every architect's office.



THE MISSION OF THE EPIPHANY, DORCHESTER, MASS. Frank A. Bourne, Architect.

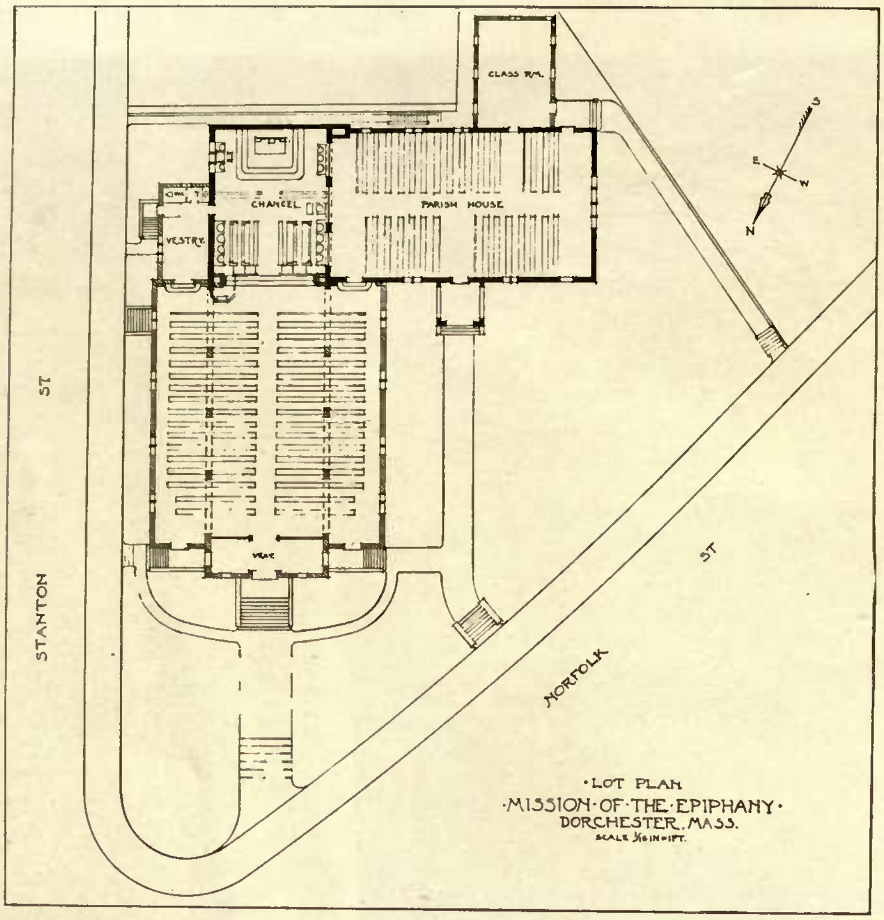
The Mission of the Epiphany

Dorchester, Mass.

Frank A. Bourne, Architect

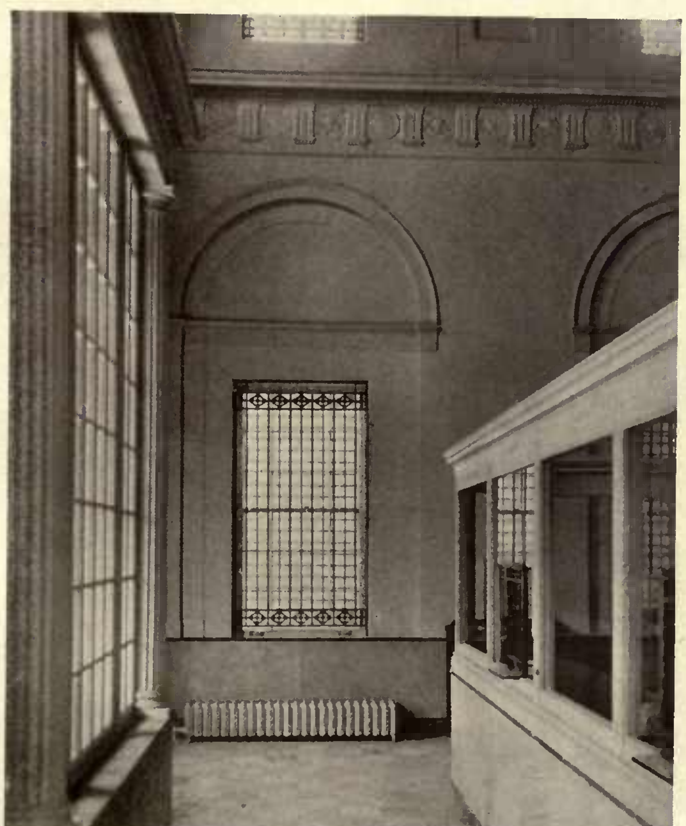
The chancel and parish house were built, and the nave of the church was added six years later.

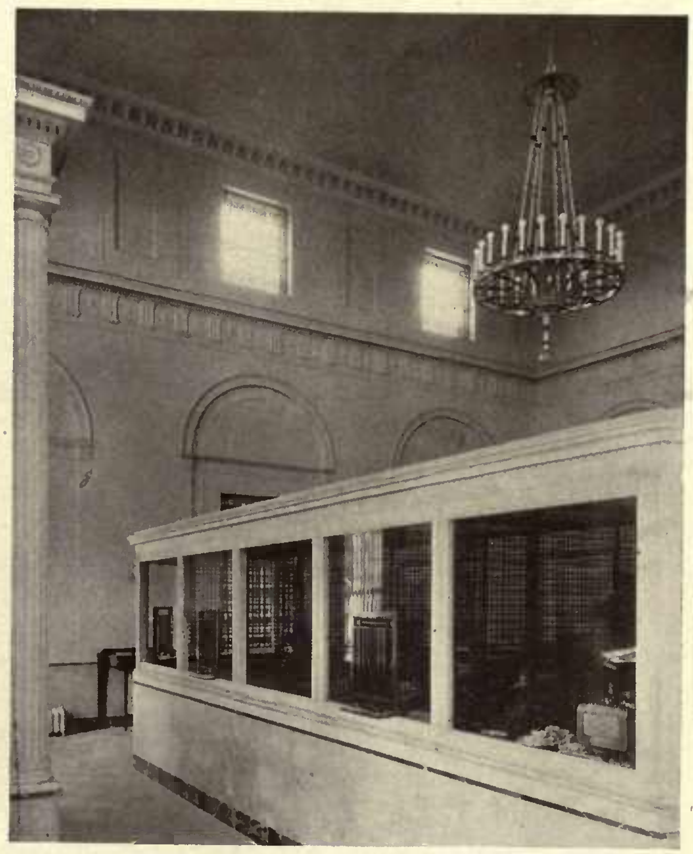
Architecturally the church is interesting, because it is built entirely of concrete, the walls being of large concrete blocks twelve inches in height, which give a dignified scale to the building. The leaded glass is set in concrete tracery. The only woodwork is the roof, the doors, and the furniture. There is no lath and plaster and no wood floor. For a church it is an excellent example of inexpensive but sincere and permanent construction.



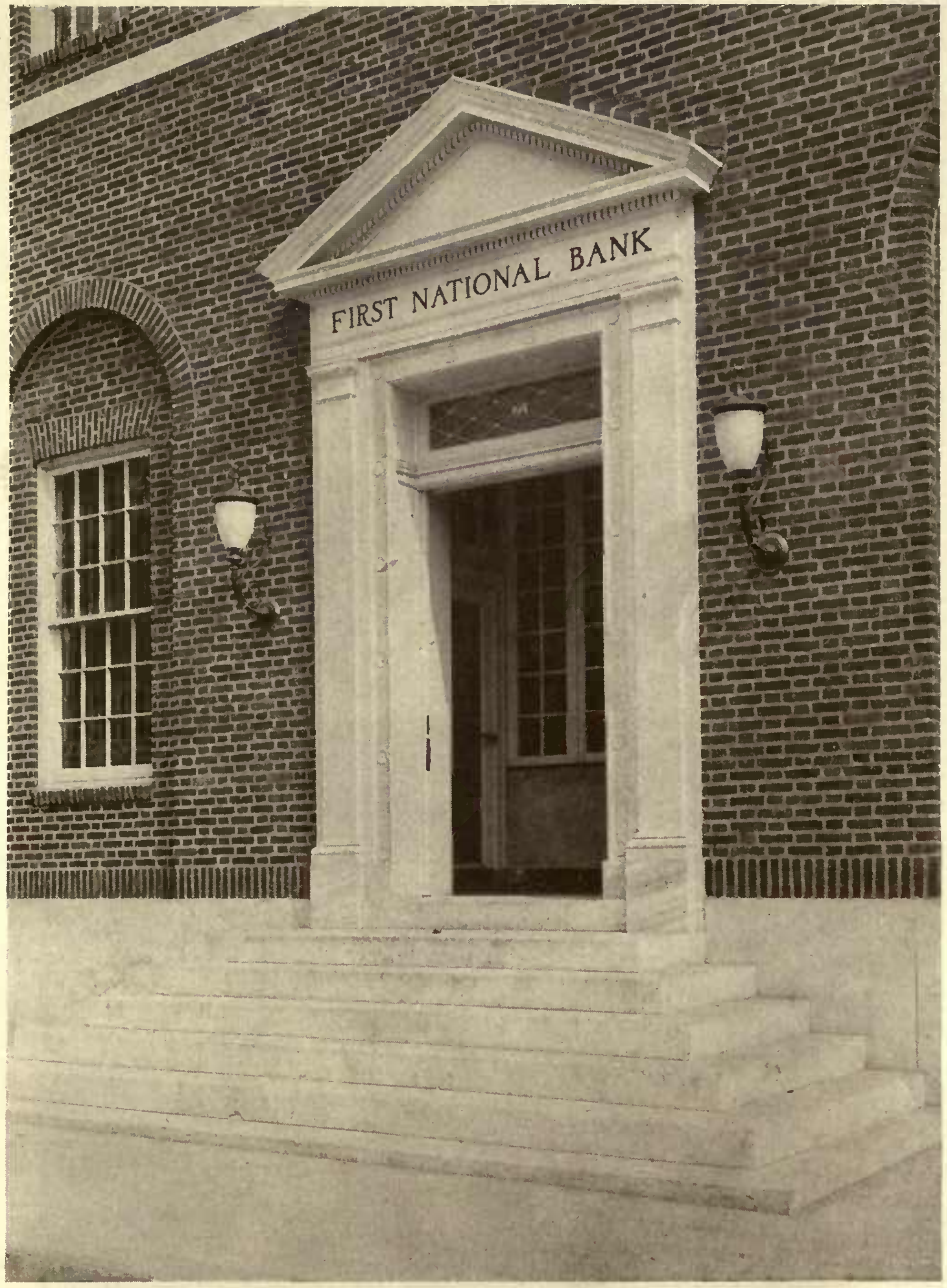
INTERIOR.

MISSION OF THE EPIPHANY, DORCHESTER, MASS.

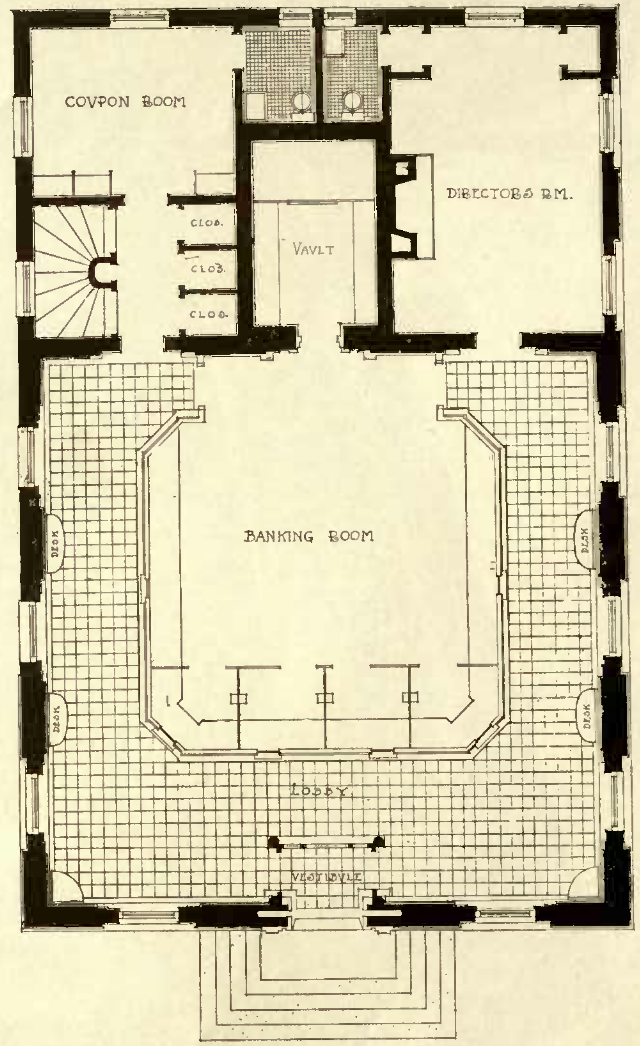




FIRST NATIONAL BANK, ABERDEEN, MD.
Henry P. Hopkins, Architect. L. H. Fowler, Associate Architect.



DETAIL OF ENTRANCE.



FIRST NATIONAL BANK
ABERDEEN MD.
HENRY P. HOPKINS ... ARCHITECT
— L. H. FOWLER ASSOCIATE ARCHITECT.
SCALE 1/8"-1'0"

LOWER BROADWAY.

From the Water-color by William Walcot. By Courtesy of the Knoedler Gallery. *See also page 383.*

The Application of Paint and Varnish

By David B. Emerson

IN an earlier article (May, 1922) I gave a general synopsis of what paints and varnishes were, and of what they were composed. In this article, I shall give some general information and advice to young architects and superintendents as to the best methods of specifying and applying them.

In painting and varnishing, good workmanship and the intelligent handling of materials are quite as necessary as are good materials, as a poor job is often done with the best of materials improperly applied; whereas, a fairly good job may sometimes be done with inferior goods if applied well and handled intelligently; but a really good and permanent job can only be obtained by the use of the best materials properly applied.

The first and most important consideration in the applying of paints and varnishes is to be sure that the surface which is to be painted over or varnished is in proper condition, and in the case of interior work, that the building is well dried out, so that the woodwork will not absorb moisture from the walls and floors. It is absolutely impossible to obtain good results when paint or varnish is applied on damp surfaces or in damp, cold buildings. One of the greatest evils in our present system of building is the "hurry-up" method of construction. Trim, wainscot, panelling, etc., are installed in the building before the plaster has had time to dry properly, floors are laid over cinder concrete fill which is only partly set, which in turn has been laid on concrete floor slabs which have very often only been allowed to stand the minimum amount of time before plastering is begun and the floors are laid. Naturally, a building which is rushed through in this manner reeks with moisture, especially in the colder months and during the rainy weather of the spring and fall. If building operations are in any way liable to be carried into the winter months, the specification writer should always call for temporary heat in the building, and the superintendent on the job should see that that particular part of the specification is complied with.

Another of the common evils of rush jobs in buildings is that the painter is allowed to work on the outside of a frame building while the plasterers are working on the inside. This should never be allowed, as the moisture from the plastering is absorbed by the woodwork, rendering the outside surfaces unfit for painting and causing the paint to blister and scale. Too much stress cannot be put on the advisability of painting the back of all trim, wainscot, and other interior woodwork. The expense is negligible and the gain is considerable, for although the plaster behind the trim may be thoroughly dry when the trim is installed, a certain amount of dampness may be absorbed from the atmosphere, and after protracted spells of rainy weather walls some time will get damp, no matter how well they have been built, and the natural result is the unprotected backs of the trim and wainscot absorb that dampness, with the attendant warping and twisting. A good coat of white lead and linseed-oil furnishes excellent protection, but when very expensive hardwood trim is used, it is better and safer to use a regular damp-proof paint made from an asphalt base. As a general rule, very little attention is paid to the priming coat of paint; almost any kind of paint will do, and it can be put on in any way and it is considered "good enough." This is decidedly wrong, as the life and the looks of the succeeding coats are very largely dependent on the material and workmanship in the priming coat.

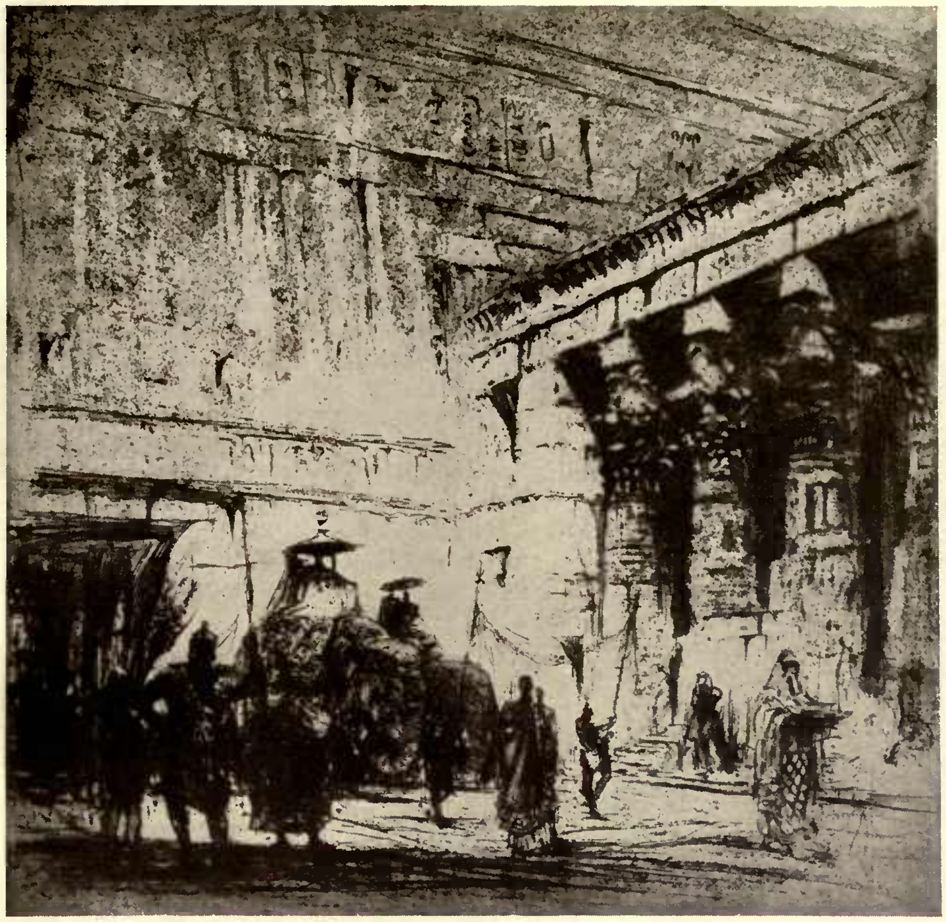
Different woods need different priming coats. Yellow pine and cypress should be primed with red lead mixed with equal parts of raw linseed-oil and turpentine for exterior work and one-third red lead and two-thirds white lead mixed with equal parts raw linseed-oil and turpentine for interior work. White pine, poplar, and other less resinous woods should be primed with white lead mixed with about two-thirds raw linseed-oil and one-third turpentine. Before priming, all woodwork should be thoroughly cleaned and well sandpapered, all knots and pitchy places should be brushed over with turpentine and then coated with shellac. In applying the priming coat, it should always be brushed on and not flowed on, and should be laid off smoothly, as brush marks left in the priming will sometimes show through the succeeding coats. The priming coat should always be allowed to dry thoroughly before the succeeding coats are applied; the longer the better; two or three weeks is not a bit too long, as linseed-oil dries by oxidation, the outer surface hardening first. Each coat should be thoroughly dry and hard before the next coat is applied.

To obtain the best results the outer coats of paint should be mixed with white lead and linseed-oil, with the addition of from fifteen to twenty per cent of zinc white, *i. e.*, zinc oxide. No woodwork should ever be given less than three coats of paint including the priming coat, and on high-class work four coats are better, and in the long run are, like all good work, an economy.

A frequent source of worry to the architect is the painting of galvanized-iron work, for if it is not done properly, the paint is very liable to peel off and leave large patches of unprotected metal. Before painting, the surface of the galvanized iron must be thoroughly cleaned. This may be done by washing with benzine and then coating the surface with a solution of copper acetate in water, using six ounces to the gallon of water, or by washing the surface with vinegar. After cleaning, prime with red lead mixed with one-third boiled linseed-oil and two-thirds raw linseed oil, and then paint with white lead and linseed-oil, the same as specified for woodwork. As a priming coat for ironwork, there is probably no better paint to resist corrosion than red lead, but it should always be given an outer coating of white lead and oil, which in turn protects the red lead.

With woodwork which is to be stained before varnishing or waxing, different woods must be treated differently. Acid stains are the best for mahogany, birch, and almost all other woods, whereas only an oil stain should be used for yellow pine, as acid or water stains raise the grain too much in this particular wood. Before staining yellow pine the wood should be given a very thin coat of linseed-oil and turpentine mixed in the proportion of one part oil to three parts turpentine. In all cases where woodwork is to be stained and varnished, it is absolutely essential that the surface of the wood should be properly prepared before applying the stain or filler. It should be thoroughly cleaned and all plaster spots, etc., removed, then sandpapered thoroughly, using a fine sandpaper, rubbing with the grain of the wood.

(*Continued on page* 384)



Antony in Egypt. The morning of the festival. *From the etching by William Walcot.*

William Walcot, Architect, Painter, Etcher

WILLIAM WALCOT, the English architect, painter, and etcher, who has been in America for some time making studies of our architecture, comes of an old English family, which for the last two generations lived abroad. He was born in Russia in 1874, and was educated in Paris. He studied architecture at the Imperial Academy of Arts, Petersburg, and also at Paris, and practised as an architect for several years before he devoted himself to the graphic interpretation of architecture.

He is a Fellow of the Royal Institute of British Architects, and is also a Fellow of the Royal Society of Painter-Etchers.

His first exhibition, held in London in 1908, brought him immediate recognition from art lovers.

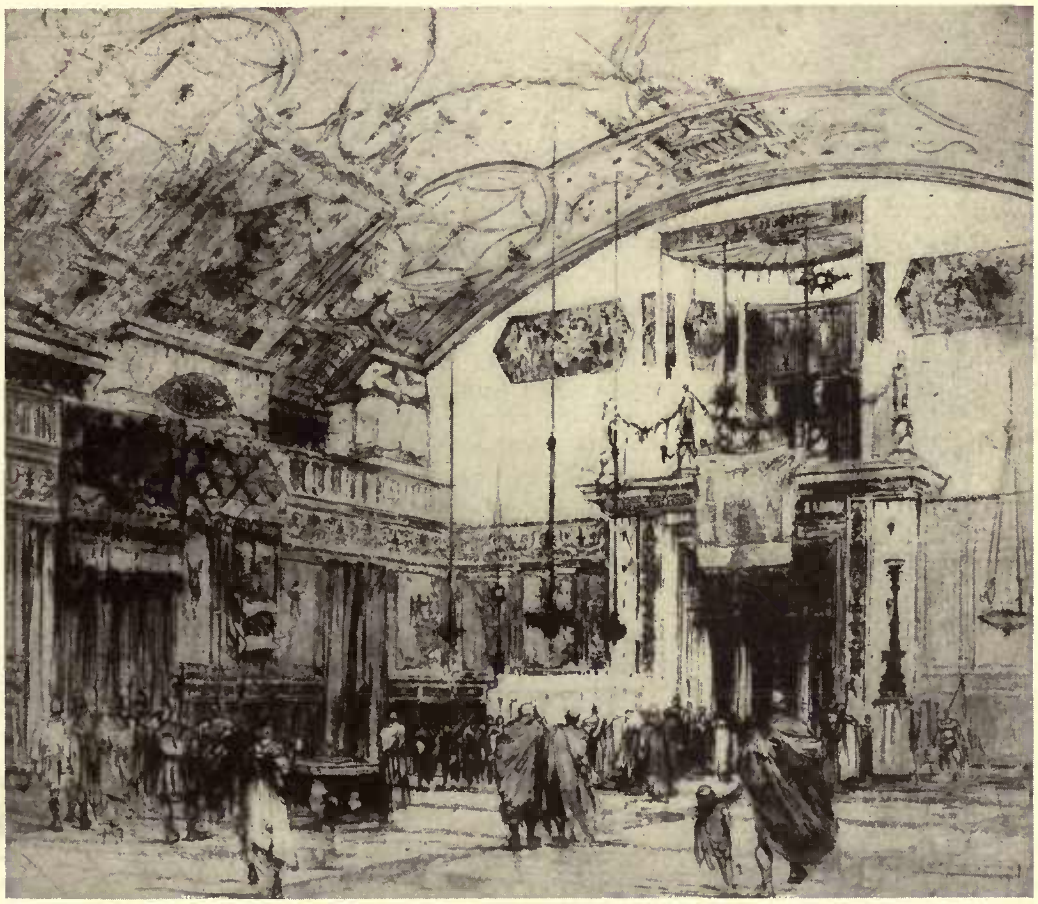
As a re-creator of the spirit of the great past he stands alone. With brush and etching-needle he depicts the glories of ancient architecture, and by his magic Greece and Rome live again as once they were.

Mr. Walcot, with the trained architect's understanding of structure, brings to his work an interpretative sense imbued with imagination and poetry. He gives the spirit and character of the scenes he depicts with essential truth and with the true artist's appreciation of the value of suggestion—knows when to omit unnecessary details.

He has made many friends while here, and the exhibition of his water-colors and etchings at the Knoedler Gallery was seen and admired by many members of the architectural profession.

We shall all be much interested in seeing more of Mr. Walcot's distinguished drawings and etchings.

His comments on our buildings, especially of course upon the unfailing and insistent topic of discussion, our skyscrapers, have been those of a man whose judgment is based on special knowledge and wide observation. He thinks we have met new conditions and solved a very difficult problem with great skill and with an especially happy use in the application of classic elements to commercial structures.



The atrium *From the etching by William Walcot.*

(*Continued from page* 382)

Work should be thoroughly and well dusted before applying the stain, taking especial care to dust out all mouldings, corners, and angles. Before applying acid stains, the woodwork should be well sponged with water, then sandpapered before staining. The reason for this is that acid stains have a certain tendency to raise the grain of wood, and sandpapering after staining will cause streaking, whereas the sponging with water will raise the grain of the wood if there is any tendency that way, and after sandpapering stains may be applied to the surface and the grain will not raise.

Some authorities recommend two coats of acid stain for high-class work, the first coat to be applied full strength, and the second coat to be diluted with one-half water, sandpapering the first coat. This also gives excellent results. Always after staining woodwork, it should be given a thin coat of pure alcohol shellac. This prevents the bleeding of the stain through the varnish.

In the finishing of open-grained woods like oak, ash, chestnut, walnut, butternut, teak, or elm, which have been stained with an oil stain and are to be filled, always shellac before filling, as the shellac will prevent the stain rubbing off when the surplus filler is wiped off. This will not be necessary when acid or water stains are used, in which case the wood may be stained, filled, and then shellacked. A most important factor in the varnishing of woodwork is the selection of the right varnish or the right place.

For exterior work which is to be exposed to the weather, an exterior varnish or a spar varnish should always be specified. Interior woodwork, if it is to be finished with a dull gloss, should be specified to be varnished with a rubbing varnish, if a high-class job is desired, but if the initial cost has to be considered, specify a dull varnish, of which there are quite a number of good makes on the market. In the finishing of church pews, assembly-room and school seats, a special hard-drying varnish which will dry without tack should be specified. If floors are to be varnished, a floor varnish should always be specified. To obtain the best results with the use of any varnish, one coat should not be applied until the preceding coat has had ample and sufficient time to dry, and each coat should be well sandpapered with OO sandpaper before the succeeding coat is applied.

One point which should always be remembered in specifying the finishing of exterior woodwork is never to specify acid stains; always specify a pigment oil stain, as acid stains must always be given a coat of shellac to prevent bleeding through, and shellac will not withstand the effects of the elements. In finishing open-grained woods, a colored filler may be used, and no stain will be required.

Of late years wax finishes on hard wood have become quite popular, and a number of the leading varnish houses are selling prepared finishing wax. Finishing by this method is in all ways similar to varnish finishing. The wood should be stained, filled, and shellacked, and then given one or two coats of wax, omitting the filler in close-grained woods. In finishing hardwood floors properly, too great care cannot be exercised if the best results are desired. In the beginning, care should be taken to see that only well-seasoned, thoroughly kiln-dried flooring is used. It should not be laid until the building is thoroughly dried out and all of the standing trim is set and ready for painting, and all other work completed, so that the mechanics will not be obliged to walk on the finished floors and carry materials over them. After the floors are laid, they should be thoroughly scraped and sandpapered, swept clean and wiped with a soft cloth till all dust is removed. They should be thoroughly protected until the rest of the painting is completed. The last work to be done should be the finishing of the floors, which should always be commenced on the top floor of the building, working out toward the stairs and down through the building, finishing at the front entrance, so that there will be no cause for travelling over the freshly finished floors. Floors may be varnished or waxed, as may be desired.

If oak or any other open-grained wood is to be varnished, it should first be stained with an oil stain, sandpapering the stain, then filled with a paste filler. After allowing the filler to set, it should be wiped off with burlap, rubbing across the grain. After the filler has thoroughly hardened, give two coats of floor varnish, sandpapering the undercoat. If a dull finish is desired, the second coat may be rubbed with pumice-stone and water. Close-grained woods, such as maple or birch, should be treated the same way, except that the filler should be omitted. When varnishing floors, never use shellac or liquid fillers as first coaters. If floors are to be waxed, they may be stained and filled in the same manner as decribed for varnished floors, and then given two coats of prepared floor-wax, each coat to be rubbed with a weighted floor-brush and polished with a soft cloth. A number of more elaborate formulas are circulated by the manufacturers of hardwood flooring, but the final results are very little if any better than those which are recommended by the varnish manufacturers, which have been quoted.

There is no doubt that one of the best adjuncts to the office of an architect whose work is not strictly commercial, and where the only idea is not to finish up every job as quickly as possible at the very lowest possible cost, but to make each piece of work something worth while, is a competent, capable, and conscientious painting contractor. Such a man can take his inspiration from the architect, experiment with finishes, produce new effects and reproduce old ones; but alas, in these days of rush and hurry, they, like all good craftsmen, are becoming rarer and rarer each year!

(*Continued from page* 372)

Sedille remarks that color which had taken refuge in the interiors of the structures in the time of Louis XIV under the form of decorative painting soon deserted the salons of Louis XV. Thenceforth all was given up to white, save only a few ceilings and door-heads, which lingered on in the scale of soft and insipid tints. Color was absolutely absent during the eighteenth century.

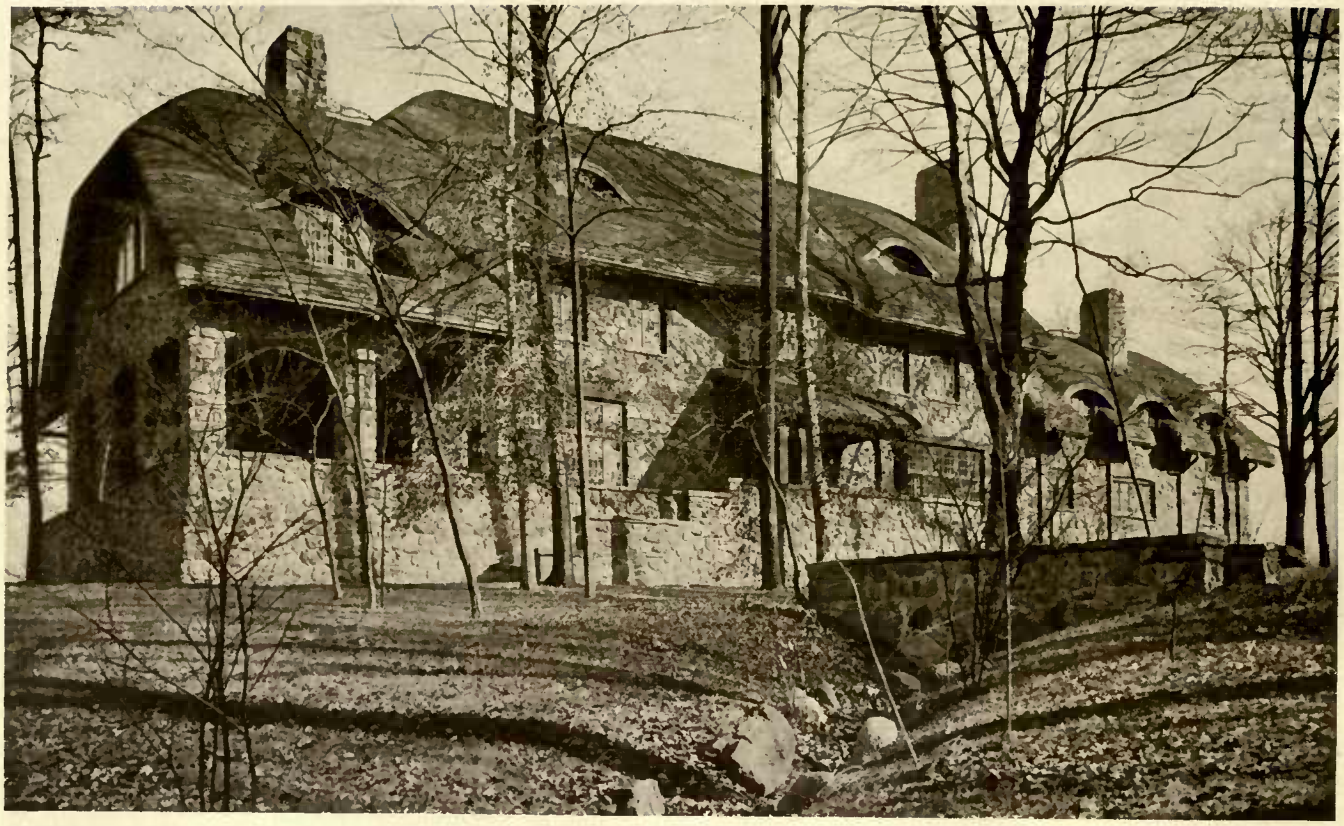
What was true of the latter Renaissance in Italy and France was also true of England, and consequently of our own work, the early inspiration of which came from England. Thus, it will be seen that a white or gray monochromatic architecture is not only unnatural but also exceptional in the history of architecture. The reaction against this tendency has already set in in America. What shall we do to solve skilfully the problem of more color in architecture?

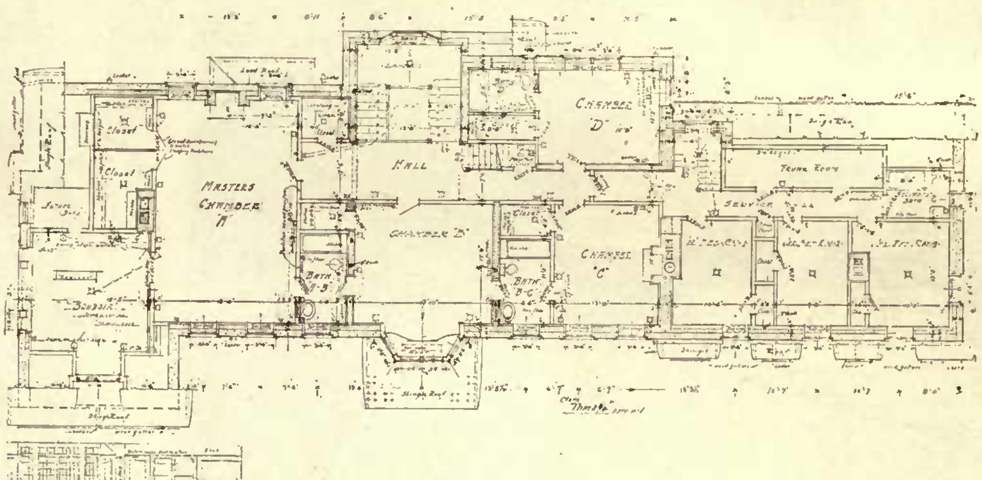
After this lengthy discussion you will probably won-

(*Continued on page* 392)

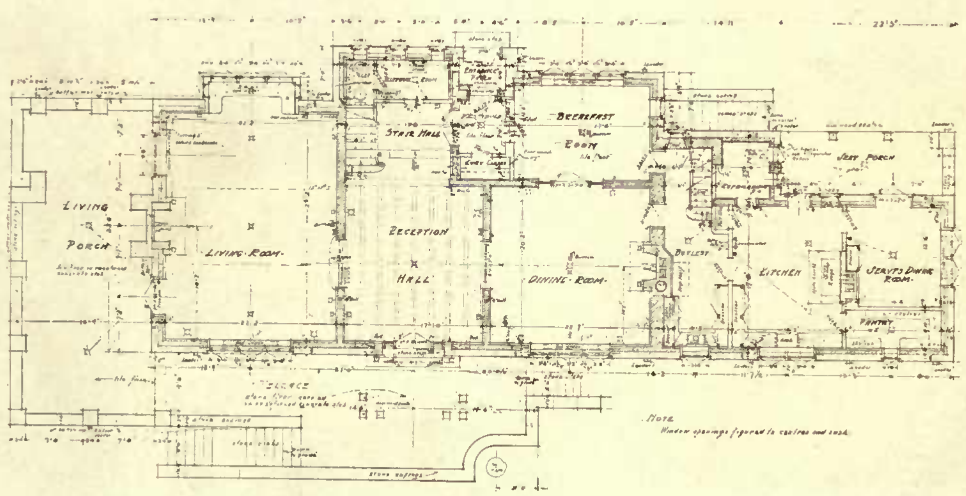
RESIDENCE, A. E. DAVIS, SCARSDALE, N. Y.

William Stanwood Phillips, Architect.





2nd FLOOR PLAN



1st FLOOR PLAN

RESIDENCE, A. E. DAVIS, SCARSDALE, N. Y.

William Stanwood Phillips, Architect.

HALL, TOWARD LIVING-ROOM.

HALL AND STAIRWAY.

DINING-ROOM.

GARAGE.

William Stanwood Phillips, Architect.

RESIDENCE, A. E. DAVIS, SCARSDALE, N. Y.

Drafting-Room Mathematics

By DeWitt Clinton Pond, M.A.

SECOND ARTICLE

ALMOST every one is familiar with the geometric proposition that the sum of the squares of two legs of a right triangle equals the square of the hypothenuse. It is a proposition not easy to prove by geometrical means and many schoolboys have puzzled over it without developing a great fondness for the men of classic times who originated that branch of mathematics.

It is not my intention to develop the proof of this proposition, but if the reader is interested in refreshing his memory he may do so by investigating Fig. 8 and demonstrating that the two triangles *A C D* and *A B J* are equal and have areas equal to one-half the area of the square *A H* and the rectangle *A K*. From this it can be seen that the square *A H* equals the rectangle *A K*. In the same manner the rectangle *K B* will be found to equal the square *B G*, and so the square *A E* must equal the sum of the two squares *A H* and *B G*.

This can be checked by means of trigonometry. There is a very useful right triangle which has sides measuring 3, 4, and 5 respectively (Fig. 9). If it is necessary to lay out a right angle, either in the field or in the drafting-room, without the customary instruments, this can be done by laying out a triangle having sides with relations similar to those in the figure. As the square of 3 is 9 and that of 4 is 16, the sum of the two squares must equal 25, which is the square of 5. Therefore, according to the geometrical proposition given above, the angle *C* must equal 90 degrees.

In order to determine the angle *A*, it is only necessary to divide *C B* or *a* by *C A* or *b*, so that the tangent of the angle will be given $3 \div 4 = .75$. By looking through a table of natural tangents of angles, it will be found that this is the tangent of 36 degrees, 52 minutes. The natural sine of this angle is .6000. In order to check that the side *B C* or *a* equals 3, it will only be necessary to multiply the sine by *A B* or *c*, which equals 5, $.6000 \times 5 = 3$. In like manner *b* can be formed to equal 4 by multiplying the cosine of 36 degrees, 52 minutes, by 5. The cosine is .8000.

$$.8000 \times 5 = 4$$

If *C* were not a right angle these figures would not check.

In all previous problems the *natural* functions of the angles have been used, but actually architectural engineers seldom use these functions. They use instead what are known as logarithmic functions.

It is rather difficult to describe just what logarithms are without giving examples. It is generally well known that the following algebraic expression is correct:

$$x^2 \times x^2 = x^4$$

Stating this in ordinary arithmetic, the expression can be written

$$2^2 \times 2^2 = 2^4$$

This may be stated in the very simplest way as

$$4 \times 4 = 16$$

In this manner it is seen that it is only necessary to add the exponents to determine the proper exponent in the result:

$$10^2 \times 10^3 \times 10^4 = 10^9$$
$$100 \times 1{,}000 \times 10{,}000 = 1{,}000{,}000{,}000$$

Now, logarithms are simply exponents showing the power to which a certain *base* is raised to equal a certain number. In the above example the logarithms are 2, 3, 4, and 9, and the *base* is 10. In ordinary logarithms, such as are used in architectural drafting-rooms, the base is always 10. Keeping the base constant as 10, it is possible to find an exponent or logarithm for any number whatsoever. It has been found that if 10 is raised to a power of 1.39794, it will equal 25, and if it is raised to the power of 2.39794, it will equal 250. This may be expressed as follows:

$$10^{1.39794} = 25$$
$$10^{2.39794} = 250$$

If it is desired to multiply 25 by 250, the calculations can be carried out in the following manner:

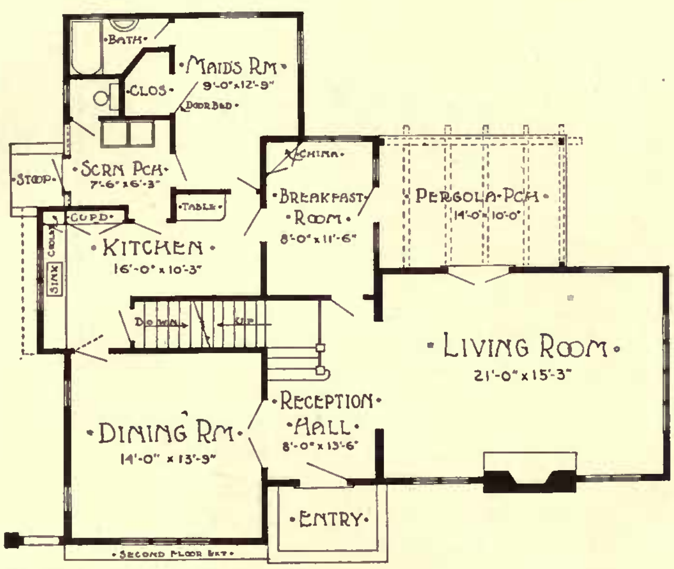
$$10^{1.39794} \times 10^{2.39794} = 10^{(1.39794 + 2.39794)} = 10^{3.79588}$$

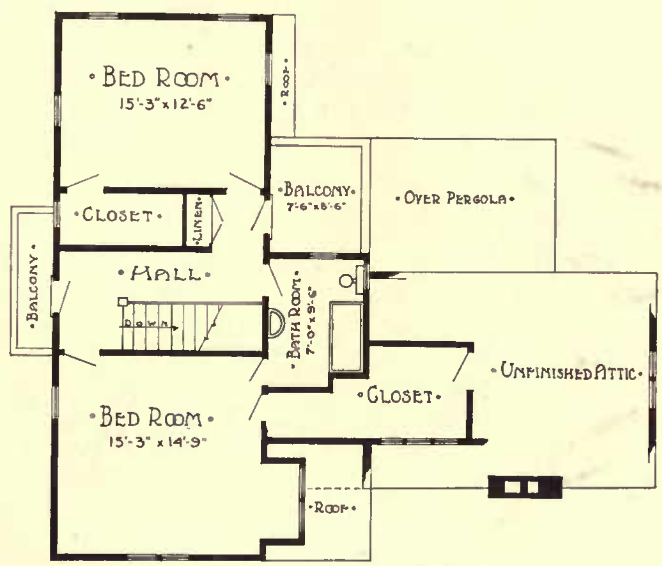
In order to find what the last expression equals, it is necessary to look up the logarithm in a table and find a corresponding number. In looking through the table the digits at the right of the decimal point are the ones which it is necessary to find. In the above case .79588 are the required digits. The corresponding number is found to be 6,250. It will be shown later that, as the characteristic—the digit in the logarithm at the *left* of the decimal point—is 3, the decimal point in the number is placed after the fourth digit from the left, or in this case directly after the zero. The answer is 6,250, and this can be checked by mathematics.

In order for the reader to follow this discussion further, it will be necessary for him to obtain a set of tables of logarithms, trigonometric functions and logarithmic functions. A very useful set of tables is "Smoley's Parallel Tables of Logarithms and Squares." There are other sets of tables which are similar to these, and some such set should be secured if it is desired to follow the methods outlined in this article.

In the previous examples it will be seen that the logarithm of 25 is 1.39794 and the logarithm of 250 is 2.139794. The only difference between the two is the number at the *left* of the decimal point. In the first place this number is 1, in the second place it is 2. These numbers are known as *characteristics*, and for any number between 1 and 100 the characteristic is 1, for any number between 100 and 1,000 the characteristic is 2, and for any number between 1,000 and 10,000 the characteristic is 3. It will be seen that the figures at the *right* of the decimal point remain the same for 25 or 250. In looking up the logarithms of ordinary numbers it will be necessary to turn to the "Table of Common

(*Continued on page* 390)





HOUSE, LOS ANGELES, CALIF.

Jack Olerich, Architect.

The outside walls of the house are of cement-stucco over metal lath and frame construction, finished in light gray. The walls on the front are, in part, surfaced with brick, all brick entering into the walls, the chimney, and the paving being bright red in color, laid in gray mortar. The wood trimming of the exterior is in darker gray than the wall stucco, and the roof covering consists of wood shingles painted dark green.

The interior finish consists of Philippine mahogany in the reception-hall, living-room, and dining-room, of pine in old ivory in the breakfast-room, maid's room, and bedrooms, and of pine in white enamel in the kitchen and two bathrooms. The walls of the kitchen and bathrooms are finished with a smooth, hard plaster surface and enamelled like the woodwork.

(*Continued from page 388*)

Logarithms" such as is found in the last part of Smoley's tables. To find the logarithm of 250, it is simply necessary to look along the column denoted at the top as N until the number is found. The logarithm is found to be .39794. It is necessary to place the proper characteristic at the left of the decimal point. In this case it is 2, and the complete logarithm is 2.39794, as given above. If the number would be 2,500, the logarithm would be 3.39794.

If the number is 2,501, then the logarithm becomes 2.39811. If it is required to find the logarithm of 3,895, look down the column N until 389 is found. Then look to the right until 5 is given at the top of the page. The number in the table will be .59051, and as the characteristic is 3, the logarithm is 3.59051. Expressed differently the expression may be written:

$$10^{3.59051} = 3{,}895$$

If the number for which the logarithm is to be found were 38.95, then the characteristic would change from 3 to 1, as 38 is less than 100. The logarithm of 38.95 is 1.39051.

The characteristic is always *one less* than the number of digits at the left of the decimal point. The logarithm of 128.5 is 2.10890.

It is possible by the methods given above to determine the logarithms of such numbers as 18.55 or 18.56, but it is often required to find the logarithms for such a number as 18.554, and this can be done by proportion. The logarithm of 18.55 is 1.26834 and that of 18.56 is 1.26858; the difference is 24. At the right in a wide column are proportional parts or the various differences between numbers. The difference of 24 is given and four-tenths of 24 is given as 9.6, and by adding this to 1.26834 the logarithm of 18.554 is found to be 1.268436.

These methods may seem to be somewhat complicated and not particularly useful, but by practice the method of finding logarithms is found to be not very difficult and their use results in a great saving of time.

Take a problem where it is necessary to find the elevations of a sidewalk at various places along the front of a building. Suppose the lot measures 87 feet 4 inches along a certain street and that the elevation at one end is 2 feet 8 inches higher than at the other end. At distances of 15 feet 6 inches, 30 feet 10 inches, and 50 feet 8 inches from the low point it is required to find the elevation. This can be done by simple arithmetic, but it may also be solved by the use of logarithms.

Stated as simple arithmetic terms the problem becomes:

$$\frac{2.5}{87.333} \times 15.5 = X$$

$$\frac{2.5}{87.333} \times 30.833 = X$$

$$\frac{2.5}{87.333} \times 50.666 = X$$

A diagram of this problem is shown in Fig. 10.

The logarithms which will be used will be those given for feet and inches found in the first part of Smoley's tables. The first step is to determine the logarithms for the various distances.

The logarithm for 2 feet 6 inches is 0.39794, that of 87 feet 4 inches is 1.94118, and those for 15 feet 6 inches, 30 feet 10 inches, and 50 feet 8 inches are 1.19033, 1.48902, and 1.70472 respectively.

In division it is necessary to subtract logarithms; in multiplication it is necessary to add them. The calculations are shown as follows:

$$\begin{array}{lll} \text{Log 2 feet 6 inches} & = & 0.39794 \\ -\ \text{Log 87 feet 4 inches} & = & 1.94118 \\ \hline & & 8.45676 - 10 \\ +\ \text{Log 15 feet 6 inches} & = & 1.19033 \\ \hline & & 9.64709 - 10 = \text{Log } 5\tfrac{5}{16} \text{ inches} \end{array}$$

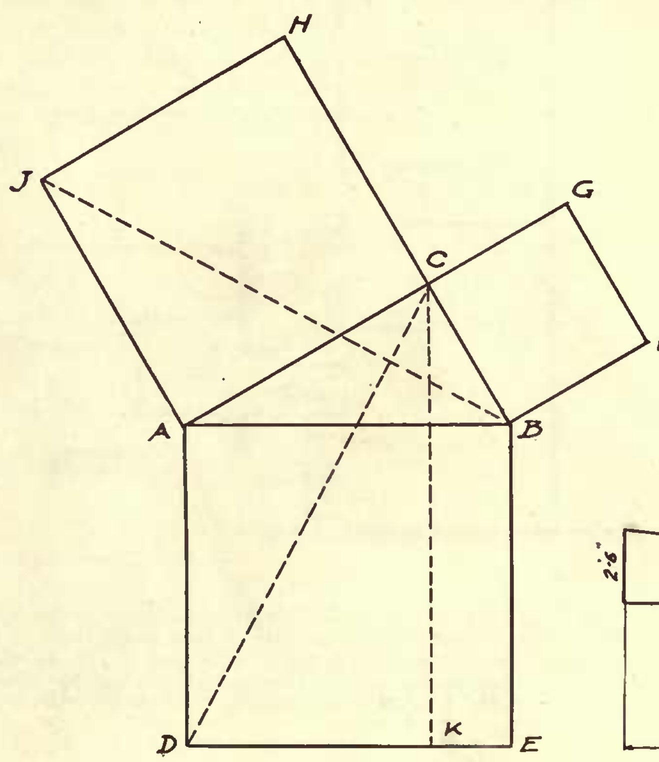


FIGURE 8

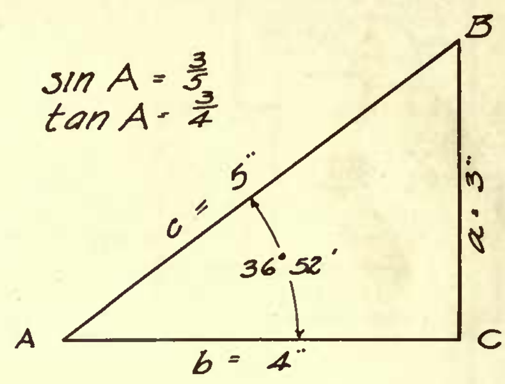


FIGURE 9

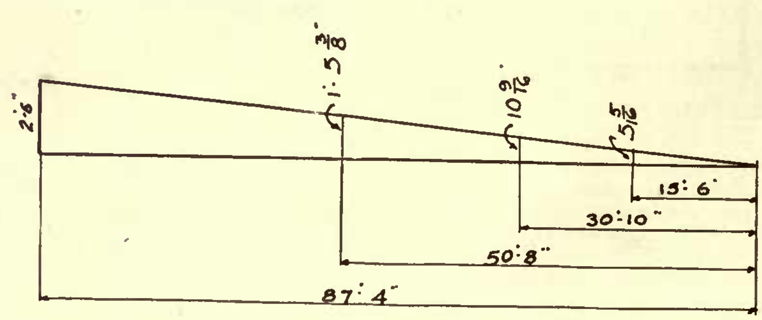


FIGURE 10

$$\begin{array}{rl} & 8.45676 - 10 \\ + \text{Log 30 feet 10 inches} = & 1.48902 \\ \hline & 9.94578 - 10 = \text{Log } 10\tfrac{9}{16} \text{ inches} \end{array}$$

$$\begin{array}{rl} & 8.45676 - 10 \\ + \text{Log 50 feet 8 inches} = & 1.70472 \\ \hline & 0.16148 = \text{Log 1 foot } 5\tfrac{3}{8} \text{ inches} \end{array}$$

If these calculations are understood it will be seen it is a much more simple proposition to add or subtract the various logarithms than to divide by such figures as 87.333 or multiply by 30.833 and then determine the corresponding equivalent in feet and inches for the answer.

It will be noticed that in the foregoing examples it was necessary to subtract from zero. In such cases zero is regarded as 10 and a figure of minus ten is placed after the logarithm. Such a logarithm as 8.45,676 − 10 would have a characteristic at the left of the decimal point of minus two. The figure which corresponds to this logarithm is .028626. From this it can be seen that the characteristic of minus two means that there should be *one* zero at the right of the decimal point. Had the characteristic been minus three, there would have been two zeros, and so on to three zeros for minus four. There is always *one less* zero than the minus characteristic. All this is baffling to the beginner, but if the method of subtracting from a zero characteristic is known, an architect will not have much difficulty in determining various characteristics.

The great advantage in the use of logarithms is formed when it is necessary to use logarithmic trigonometric functions. A table of logarithms of the sine, cosine, tangent, and cotangent for each minute is given in Smoley's Tables. The logarithm of the sine of 36 degrees and 52 minutes can be found to be 9.77812. It is necessary to find the side *a* of a triangle such as shown in Fig. 9, and for this purpose it is required that the sine be multiplied by 5. The logarithm of 5 is 0.69,897 and the computation can be developed as shown below:

$$\begin{array}{lll} \text{Log sin 36 degrees 52 min.} & = 9.77812 \\ \text{`` feet 5} \quad\quad 0 & = 0.69897 \\ \hline & 0.47709 = \text{Log 3 feet} \end{array}$$

This checks with the results given above. This example is fairly simple, but those with larger and more intricate dimensions can be solved in as simple a manner.

Announcements

The Arden Gallery, 599 Fifth Avenue, New York, announce a Christmas sale and special exhibition of durant faience, decorative paintings, and imported glass, lamps, shades, and bridge tables, and many novel and attractive holiday gifts specially designed by Arden Studios. To December 29. Mrs. John W. Alexander, Mrs. James C. Rogerson.

Seeing Your New House in the Movies.—In various parts of the country model homes have been constructed with the idea in mind of stimulating an interest in home-building. These model homes have created a great deal of interest locally, but have done little nationally. The demand for some method of giving national scope to this movement finally resulted in the Atlas Educational Film Company, of Oak Park, Illinois, being commissioned to produce a five-reel feature film showing the erection, equipping, and furnishing of a modern six-room, brick, colonial home. This film will be shown all over the country under the auspices of and with the co-operation of real-estate boards, commercial, advertising, rotary, Kiwanis, Lions, and other clubs and organizations; also through official government non-theatrical distribution bureaus (one located in almost every State, usually the State University), through churches, community centres, etc.

Aymar Embury II, Architect, announces the removal of his office to 150 East 61st Street, New York City.

Alfred S. Kellogg announces his retirement from the firm of Brainerd, Leeds & Kellogg, Architects and Engineers. He will continue the practice of engineering of power plants, heating, and ventilation, electrical, etc., at 89 Franklin Street, Boston, Mass. November 1, 1922.

Paul Starrett, formerly president of George A. Fuller Company, and W. A. Starrett, formerly a vice-president of that company, announce the formation of Starrett Brothers, Inc., Builders, with offices at 101 Park Avenue, New York City.

Anno Kolbe, Architect, is now associated with Jordan Green, 27 Chisten Street, Newark, N. J. Mr. Kolbe was for twenty years with Tracy & Swartwout, 18 West 34th Street, New York City.

Arthur T. Remick, Architect, announces the removal of his office from 52 Vanderbilt Avenue to 135 East 43d Street, New York.

Theodore L. Perrier, Architect, announces the removal of his office to 602 Tulane-Newcomb Building, 211 Camp Street, New Orleans, La.

Samuel H. Pitcher Company, Incorporated, Civil Engineers and Architects, 44 Front Street, Worcester, Massachusetts, announces that Mr. John Tempest Walker will in future, as an associated partner in the company, direct its architectural activities. Mr. Walker has had a wide experience as a practising architect in New York, Pittsburgh, and Boston.

The firm of Hawkins & Hoener, Architects, has been dissolved, the business being conducted in the future under the firm name of Earl Hawkins & Co., Architects, 400 McDaniel Building, Springfield, Missouri.

The Pittsburgh Architectural Club announces its annual exhibition to be held in the Carnegie Galleries from the 3d to 24th of December, 1922. Entry slips will be mailed during the month of November.

I. Albert Hartman, Architect, formerly in business in Scranton, Pennsylvania, for over twenty years, has moved to Rochester, New York, and has now opened an office at 1193 Culver Road, and would like manufacturers' samples and catalogues.

Henry Calder Thorne, Registered Architect, announces the opening of offices at 139 East State Street (Sage Block), Ithaca, New York, for the general practice of architecture and landscaping. Formerly with Gibb & Waltz, Architects, Ithaca, New York. Manufacturers' catalogues and samples requested.

The Winter Exhibition of the National Academy of Design

THE Winter Exhibition of the National Academy opened on the 18th of November and will continue until December 17. It is one of the best exhibitions ever shown in the galleries.

The following are the prize winners:

The first Altman prize of $1,000 to Leon Kroll's "Sleep."

The second Altman prize of $500 to Childe Hassam for his composition, "The Sun Room."

The Carnegie prize of $500 to Edward W. Redfield's "The Valley in Sprintime."

The Julia Shaw Memorial Prize of $300 to Gertrude Fiske for her "Nude."

The Thomas B. Proctor prize for the best portrait, carrying with it $200, to Giovanni B. Troccoli for "A Veteran of the Civil War." The Helen Foster Barnett prize went to Brenda Putnam for her sculpture, "Sun Dial." Harriet W. Frishmuth won the Elizabeth N. Watrous gold medal for sculpture with her "Fantasie," and Guy Wiggins was awarded the J. Francis Murphy memorial prize for his snowscape, "The Quiet Valley."

The American Art Association in Their New Building

The new building of the American Art Association on Madison Avenue brings an old and famous organization into the centre of the art zone. Their old building on Twenty-third Street and the pictures and other art that were sold there have had a notable place in the story of art in New York City. Mr. Kirby and his associates have had indeed a large influence in educating the public taste in art in general.

Prizes Offered by the College of Industries, Carnegie Institute

THE College of Industries at Carnegie Institute of Technology, Pittsburgh, announces a prize contest for the best papers written on the subject of "The Use of Vitrified Clay Pipe in Plumbing Systems," the contest to be open to plumbing experts, instructors, and students. Prizes to the amount of $250 will be awarded on April 15, 1923.

According to the announcement, the contest has been arranged to further the interest in reducing the cost of plumbing installations, and to assist the industry to become better acquainted with the development and use of vitrified clay sewer-pipe. The money has been made available by the Eastern Clay Products Association.

The contest is divided into three classes of competitors, as follows: Class A. Those who have had experience in the installation of plumbing systems or house sewers. Class B. Instructors. Class C. Students in the Carnegie Institute of Technology or other institutions of learning where house drainage is taught. Contestants are required to send in their names and class distinction before January 15 to the committee chairman, and complete papers must be in the hands of the committee before April 15.

A first prize of $100.00 will be awarded for the best paper in all classes. A second prize of $50.00 will be awarded for the second best paper in all classes. A third prize of $50.00 will be awarded for the best paper in the class which did not receive first or second prize. If first or second prizes are awarded in one class, an additional prize of $50.00 will be awarded so that two third prizes of $50.00 each will be given in each of the remaining classes.

The Contest Committee consists of: Professor S. E. Dibble, chairman, College of Industries, Carnegie Institute of Technology; William J. Woolley, manager, The National Trade Extension Bureau, Evansville, Indiana; John T. Morris, director, College of Industries, Carnegie Institute of Technology; Joseph A. Weldon, Weldon and Kelly Company, Plumbing-Sanitary Experts, Pittsburgh, Pa.

All communications regarding the contest should be addressed to Professor S. E. Dibble, Head of the Heating and Ventilating Department, College of Industries, Carnegie Institute of Technology, Pittsburgh, Pa.

A Standard Zoning Law

A STANDARD law for the assistance of those responsible for the framing of State zoning enabling acts has just been issued by the Department of Commerce. Zoning ordinances for the regulation of use, height, and area of buildings are being adopted by cities in almost every State in the Union, and in some States where there is no specific authority for zoning these ordinances may be set aside by the courts. An enabling act is advisable in all cases.

The Department of Commerce model for an enabling act under which municipalities can adopt zoning regulations is a twenty-page, mimeographed document with foot-notes covering questions which might arise in the wording of various sections and provisions. It is not a federal law, but a suggested form for State zoning enabling acts.

The publication may be obtained free of charge from the Division of Building and Housing, Department of Commerce, Washington, D. C.

(*Continued from page* 384)

der what history can offer us in the way of suggestions for the present and the future. It seems to me that if one wants to formulate for himself a method of procedure he should turn to that past style the forms and ideals of which most nearly coincide with modern forms and ideals. That style would unquestionably be the Greek. It comes nearer, in my estimation, combining form and color in a fine, logical and architectural way, than any other historic style. Color values in Greek architecture were generally chosen so that they enhanced the architectural effect. With a complete understanding of the principles of polychromatic variation as practised by the Greeks it ought to be possible for the architect of to-day to build up *his* theory and practice of color in architecture.

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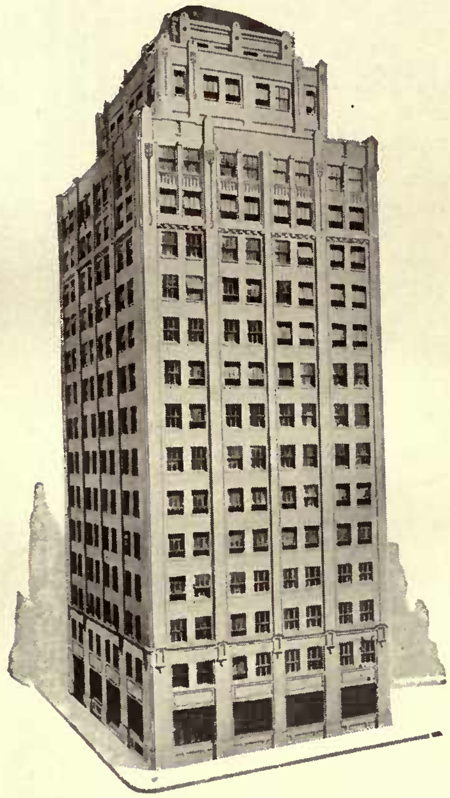

Barrett Specification 20-year Bonded Roof on Hide & Leather Realty Co. building, New York City. Eng. & Gen'l Cont.: Thompson & Binger, New York; Roofer: New York Roofing Co., New York City.

Rising 223 feet above the street level is the Hide & Leather Building of New York City (illustrated at left), the tallest all-reinforced concrete building in America. No brick, stone or structural steel was used in its construction. And its cost was considerably less than that of a structural steel building capable of sustaining equally heavy floor loads.

Below is pictured a recent addition to the Endicott-Johnson Corporation's great shoe manufacturing plant at Johnson City, N. Y. Over 700 feet in length, it is one of the longest concrete buildings in the world.

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Barrett Specification 10-year Bonded Roof on addition to Endicott-Johnson Corp. plant, Johnson City, N. Y. Eng. & Gen'l Cont.: Thompson & Binger, New York; Roofer: Central City Roofing Co., Syracuse, N. Y.

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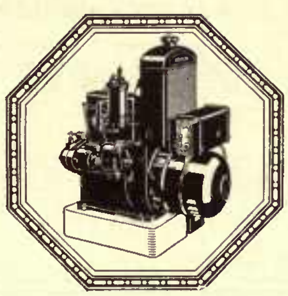
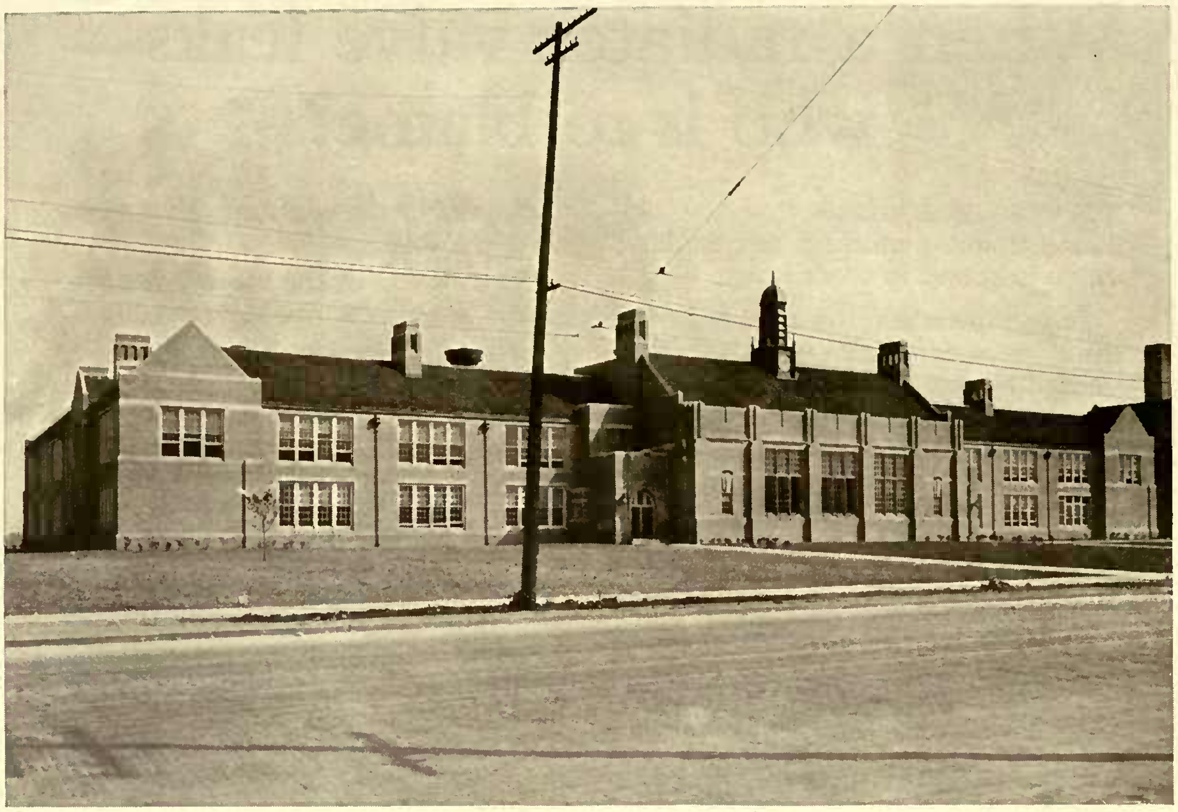




Southwestern High School, Fort Street, Detroit, Michigan. Architects, Malcomson, Higginbotham and Palmer, Detroit.

BRASS PIPE

at Almost the First Cost of Iron

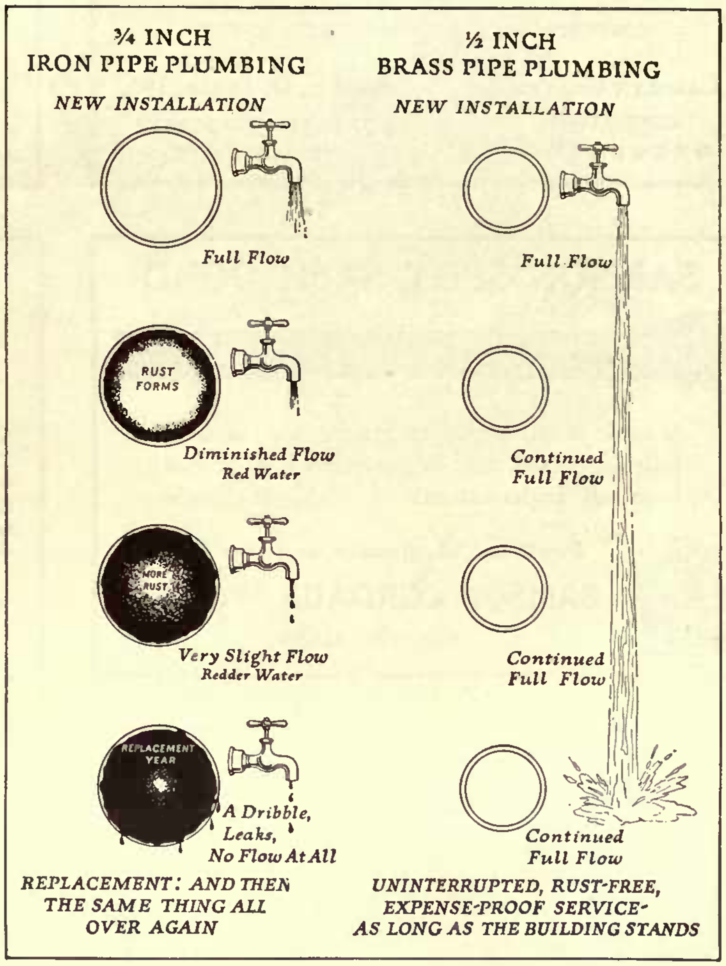
WRITING in the Plumbers Trade Journal, Mr. T. N. Thomson, sanitary engineer, compares the sizes of iron and Brass pipe required to carry the same volume of water and presents a table of sizes which, when filled in with prices by the estimator, gives a Brass installation at a cost so little in excess of iron that the difference may be ignored.

To illustrate at a glance the basis for Mr. Thomson's calculations we have prepared the diagram which appears on this page.

Deterioration of iron pipe begins the day it is made and progresses in service until the iron pipe becomes completely clogged with rust.

This corrosion, which is particularly acute in the hot water supply lines, not only discolors the water but greatly reduces or stops delivery at the fixture, and also eats away the pipe wall to such an extent that in many instances leaks appear within six years and force a renewal of the piping.

On the other hand, Brass pipe delivers at the end of any number of years of service as much water as it does on the day it comes from the mill.



Saving in Pipe Size by Use of Brass

From many years' experience on a variety of work, it would appear that reasonable differences in diameter for street service and cold water lines are as follows:

½	inch	Brass	instead	of	¾	inch	iron
¾	"	"	"	"	1	"	"
1	"	"	"	"	1¼	"	"
1¼	"	"	"	"	1½	"	"
1½	"	"	"	"	2	"	"
2	"	"	"	"	2½	"	"

For hot water lines, the following appear reasonable:

½	inch	Brass	instead	of	1	inch	iron
¾	"	"	"	"	1¼	"	"
1	"	"	"	"	1½	"	"
1¼	"	"	"	"	2	"	"
1½	"	"	"	"	2½	"	"
2	"	"	"	"	3	"	"

Reprints of Mr. Thomson's article are available upon request to the Association.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912
of ARCHITECTURE, published monthly at New York, N. Y., for October 1, 1922

State of NEW YORK, County of NEW YORK

Before me, a NOTARY PUBLIC in and for the State and county aforesaid, personally appeared CARROLL B. MERRITT, who, having been duly sworn according to law, deposes and says that he is the BUSINESS MANAGER of ARCHITECTURE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

PUBLISHER: Charles Scribner's Sons . . . 597 Fifth Ave., New York, N. Y.
EDITOR: James B. Carrington . . . . . 597 Fifth Ave., New York, N. Y.
MANAGING EDITOR: None
BUSINESS MANAGER: Carroll B. Merritt . 597 Fifth Ave., New York, N. Y.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: . . . None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

CARROLL B. MERRITT, *Business Manager.*

Sworn to and subscribed before me this 21st day of September, 1922.

JOSEPH H. POLI
Notary Public, Kings County.
[SEAL. Kings County Clerk's No. 244
Certificate filed with New York Co. Clerk No. 375.
Commission expires March 30, 1923.

INDIANA WORLD WAR MEMORIAL

Notice to Architects

Not later than March 15, 1923, the Board of Trustees of the Indiana World War Memorial will receive at its offices in the Chalfant, N. W. Corner of Pennsylvania and Michigan Streets, in the city of Indianapolis, Indiana, competitive "designs, plans and specifications" for a World War Memorial to be erected in the city of Indianapolis at an approximate cost of $2,000,000.00.

Full information in regard to the competition may be had by addressing

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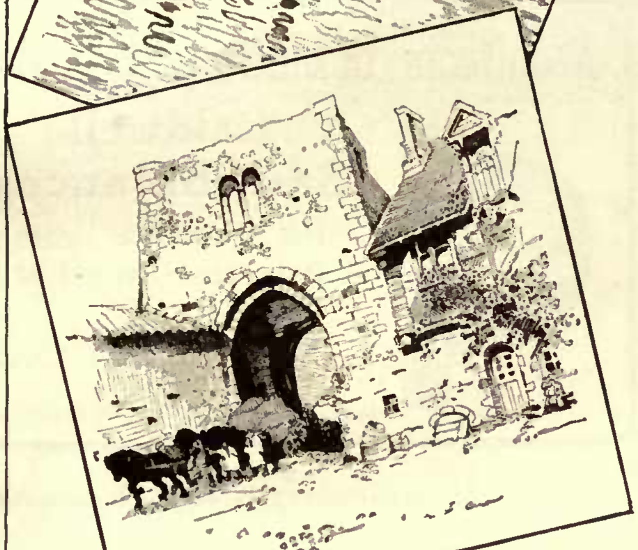

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Cliff Scene
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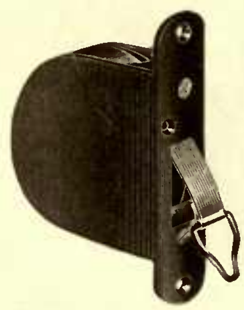

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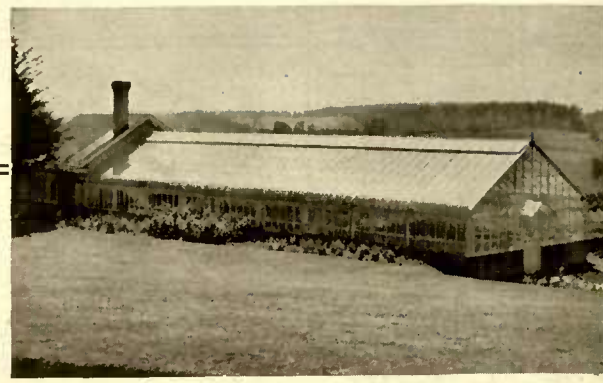

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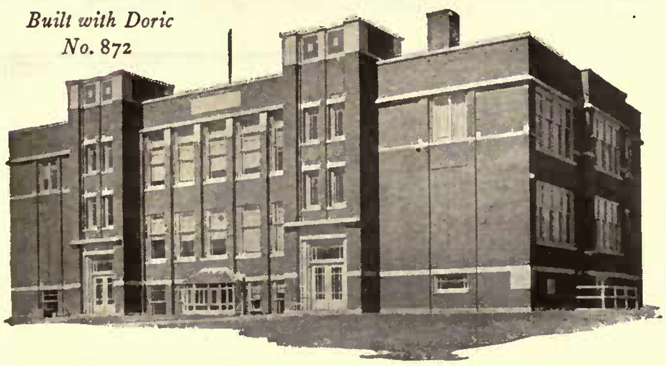

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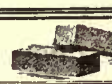

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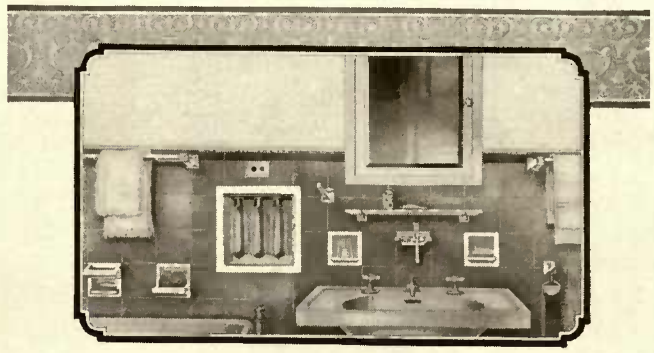

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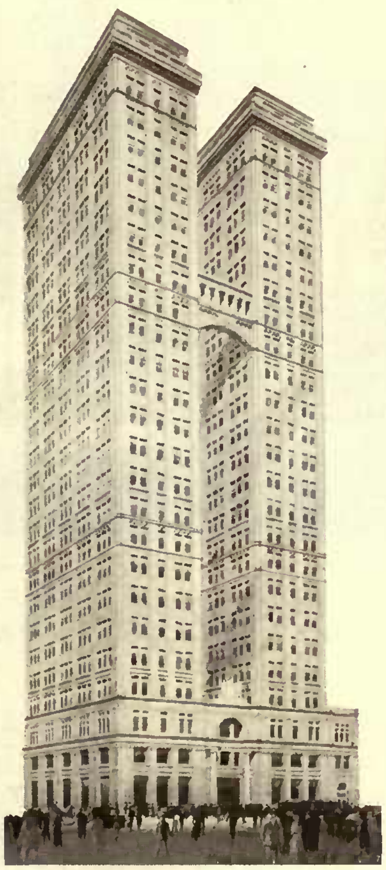

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For general specifications see Sweet's Architectural Catalogue, Page 458, 16th Edition; Page 389, 15th Edition

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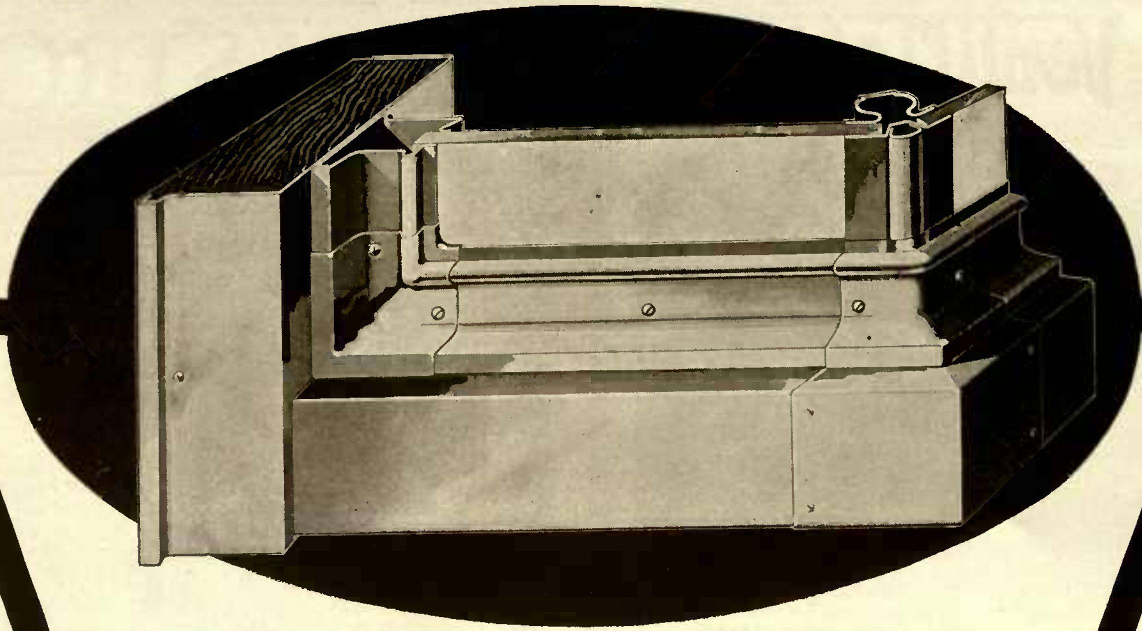

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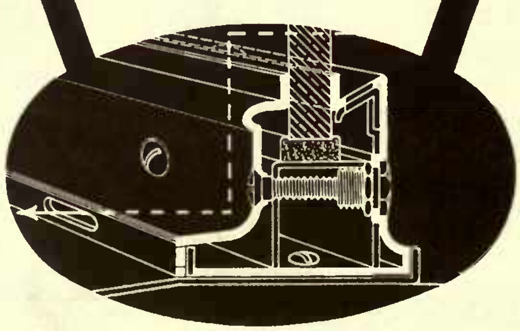
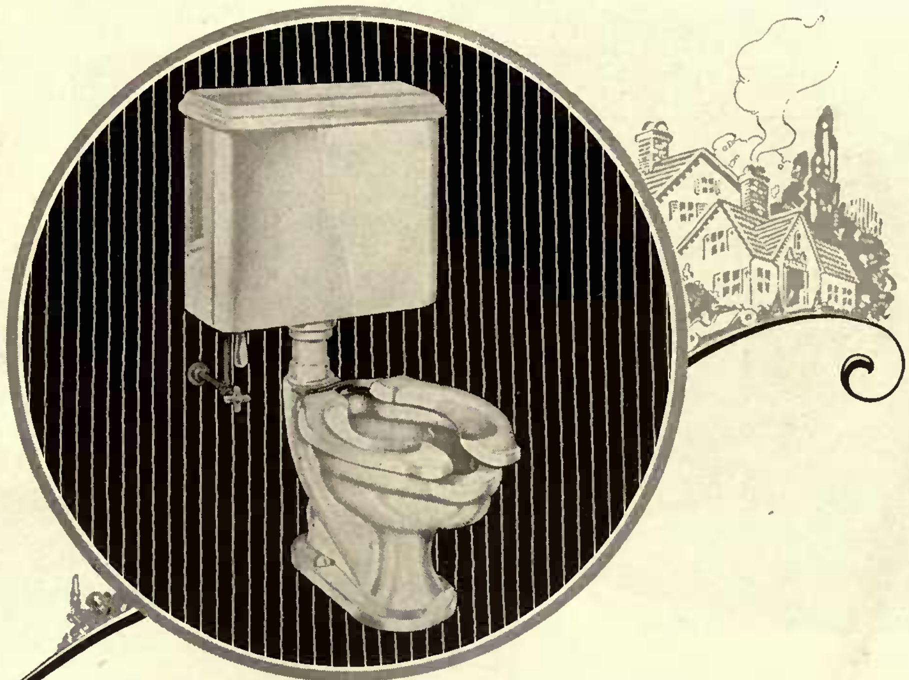


Estimates covering Kawneer store front material will be furnished gladly upon request. Just drop us a line giving details of your specification. Our estimates will be made up and sent to you promptly.



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Vitreous China will outlast any other material from which plumbing fixtures can be made. Hence, doesn't it seem good business to specify Vitreous China fixtures in order that the clients' satisfaction may be LASTING?

SPECIFICATION:

ARISTON H-2900 White Vitreous China Silent Action Syphon Jet Closet, with extended Top Inlet, Floor Outlet and 2-inch Brass Spud. Extended Front Lip and Cut-back Sanitary Rim flushed all the way around. Water surface in bowl to be not less than 14x10-inch. Fitted with White Celluloid-covered Seat, no Cover, Open Front and Back, One-piece Vitreous China Flush Pipe Cover and White Vitreous China Bolt Caps. To be flushed with Madora H-3112 White Vitreous China Low-down Tank and Cover with Under-pull Lever and Maddock guaranteed fittings.

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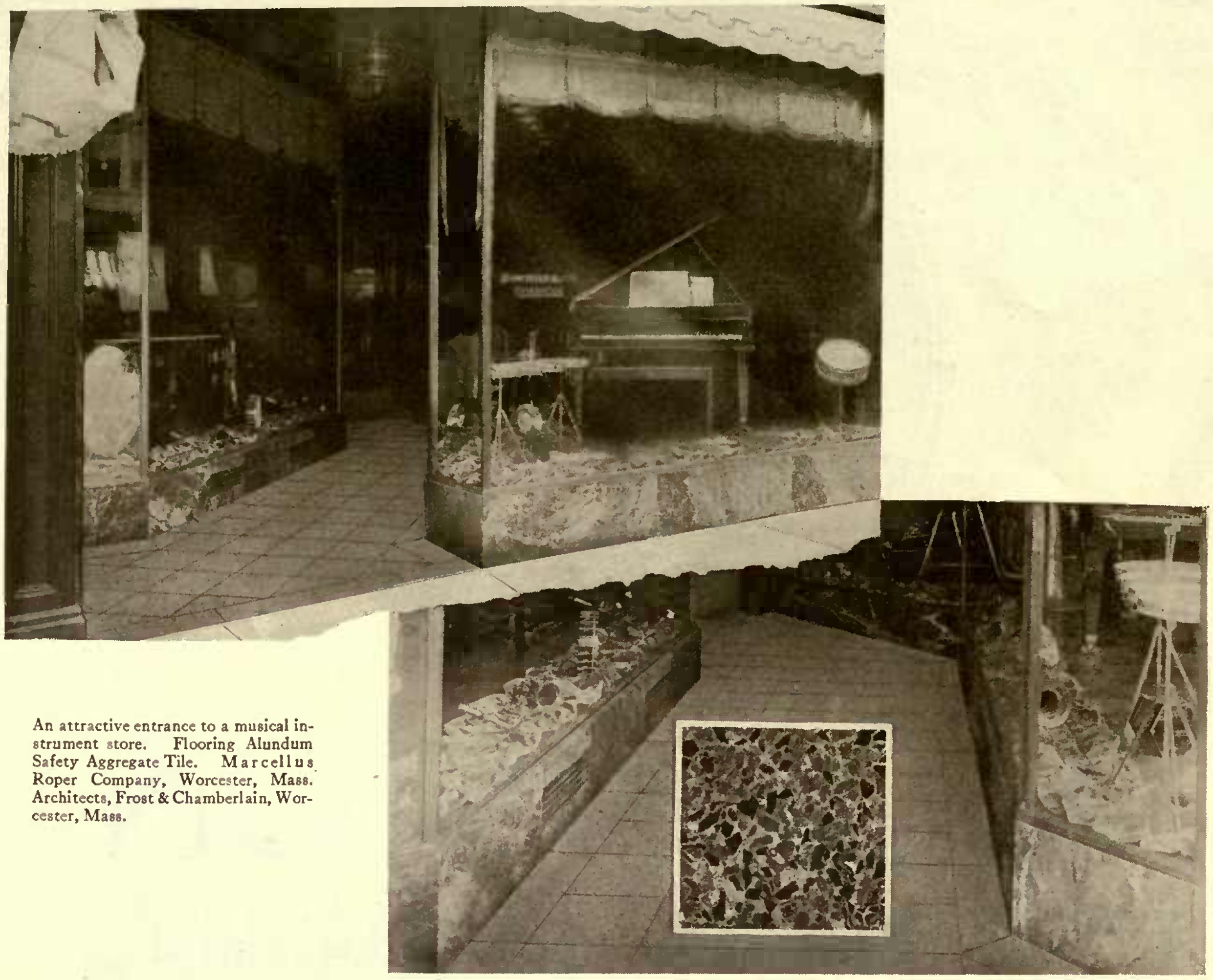

An attractive entrance to a musical instrument store. Flooring Alundum Safety Aggregate Tile. Marcellus Roper Company, Worcester, Mass. Architects, Frost & Chamberlain, Worcester, Mass.

ALUNDUM SAFETY AGGREGATE TILE

is ideal for an attractive store entrance

BECAUSE:

It can be obtained in colors that harmonize with the surroundings.

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(Pedal Flush Operation)

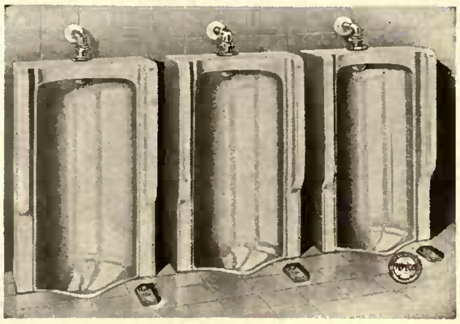

PLATE 3625–R

THE Porcelain Urinal Stall has proven itself the most suitable and satisfactory fixture for public-building use. Its popularity is testified to by the constantly increasing number of installations.

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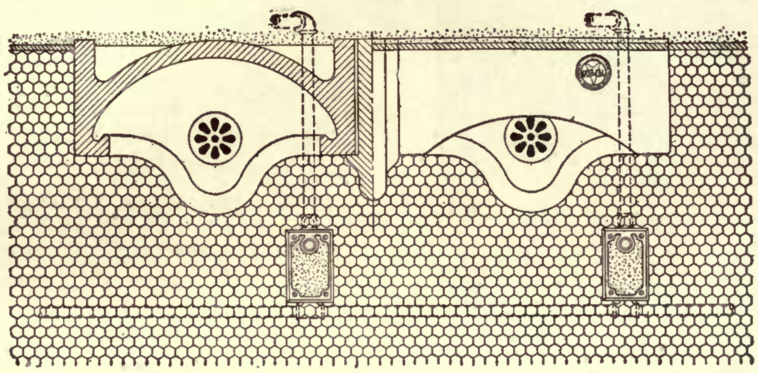

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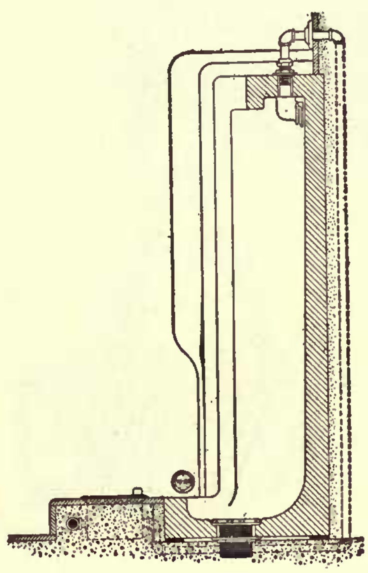

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The text is so written as to make ideal specifications on any kind of work. Not only are plumbing fixtures for every place and purpose shown, but correct method of installation illustrated.

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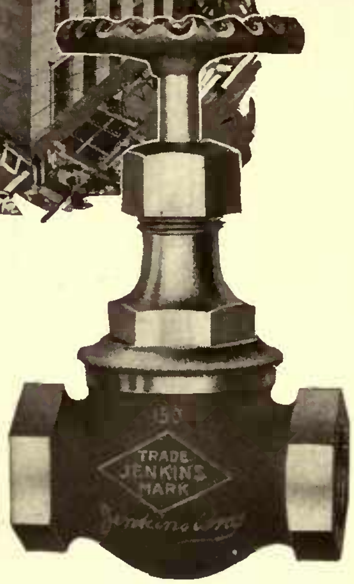
Jenkins service can only be expected from genuine Jenkins Valves—specify Jenkins "Diamond Mark" Valves, and avoid imitations.



Jenkins Valves, and ***Jenkins Only,*** *are installed throughout the new First National Bank Building, Jersey City.*

Architect: *Alfred C. Bossom, New York City;* **Plumbing and Heating Contractors:** *W. W. Farrier & Co., Jersey City.*

Fig. 106, Standard Brass Globe Valve, one of the many types of Jenkins Valves used.

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Jenkins Valves

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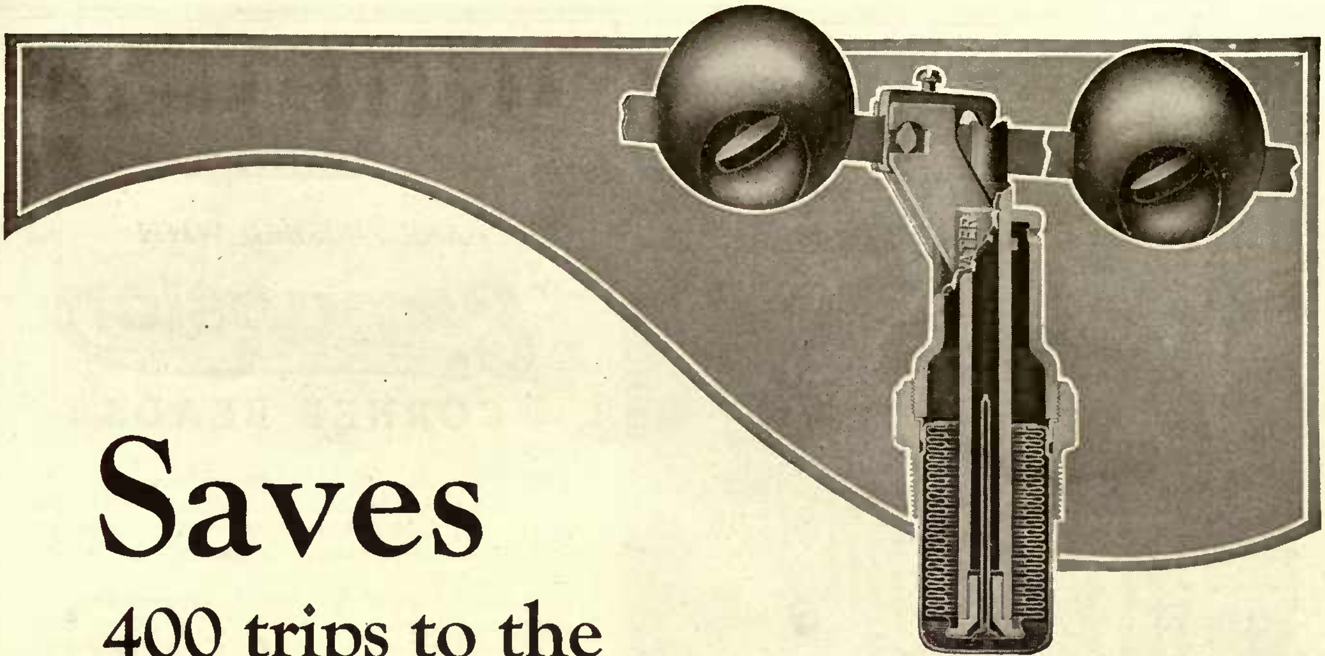

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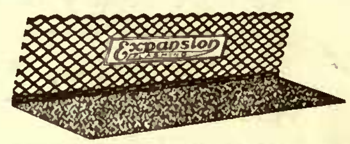

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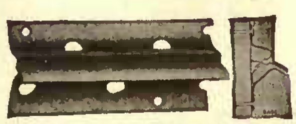

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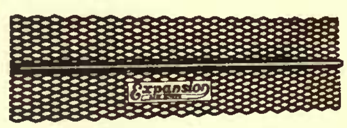

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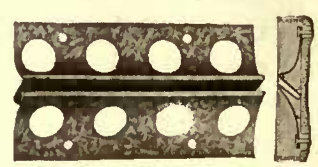

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