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THE ARCHITECTURAL RECORD

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"Woodstock," Southern Pines, North Carolina





ONE OF THREE MURAL PAINTINGS IN THE MAIN BALLROOM,
HOTEL ROOSEVELT, NEW YORK CITY.
Painted by Arthur Crisp.

The LIVERPOOL CATHEDRAL

Sir GILES GILBERT SCOTT, F.R.I.B.A., *Architect*

By

Harold Donaldson Eberlein

THE LIVERPOOL CATHEDRAL is of cardinal significance on several counts. For the architect in America, it affords an opportunity for illuminating comparisons with analogous undertakings in the United States—the Cathedral of St. John the Divine in New York, the Cathedral at Baltimore, and the Cathedral at Mount St. Alban, in Washington. Like these outstanding examples of ecclesiastical architecture in America, the Liverpool Cathedral is only partially completed. There is enough, however, to present a substantial earnest of what the finished structure will be. Like the American cathedrals, also, the Liverpool Cathedral is in a fair way of being pushed to completion in as short a time as physical circumstances will permit.

For England, the erection of this great building marks an epoch in the annals of national architecture and the ultimate realization of the enterprise is a matter of national interest.

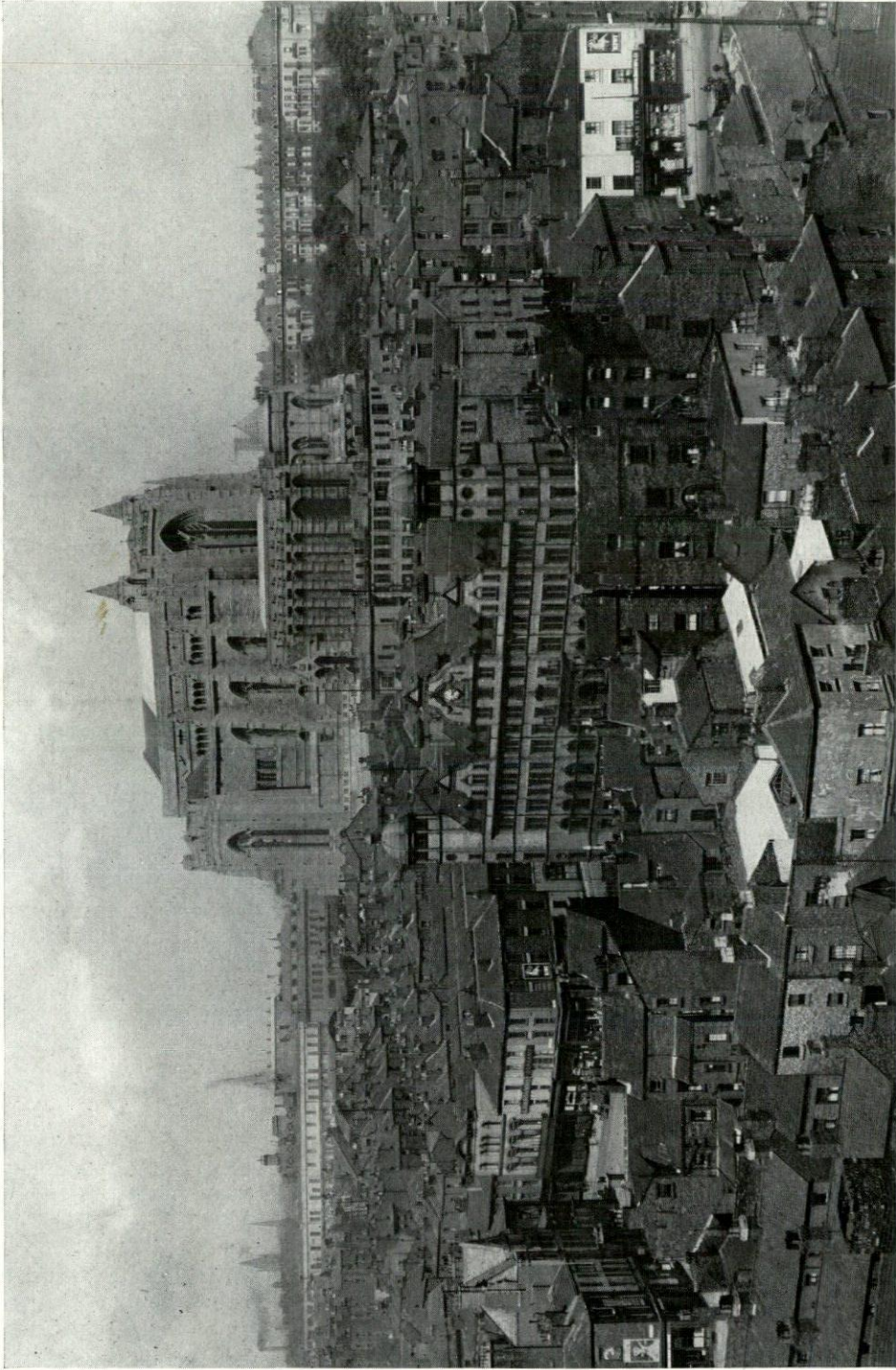
For both British and American architects it supplies a striking instance of the perennial vitality of the Gothic mode and its capacity for flexible adaptation to modern requirements without either abandoning the fundamental spirit of Gothic inspiration or slavishly following the minutiae of historic precedent and tradition.

The site of the Cathedral is as satisfactory as could be obtained in a large city. St. James's Hill rises well above the river level so that the dominating mass of the buildings overtops everything in the vicinity; it is within a few minutes of the centre of the city, and there is sufficient open space around it for unobstructed views on all sides. An abandoned quarry, to the northeast, was years ago converted into a cemetery. The deep depression and the hillside occupied by this cemetery are within the Cathedral

precincts and not only give additional open space in that quarter, but also serve to accentuate the commanding height of the choir, tower and north transept.

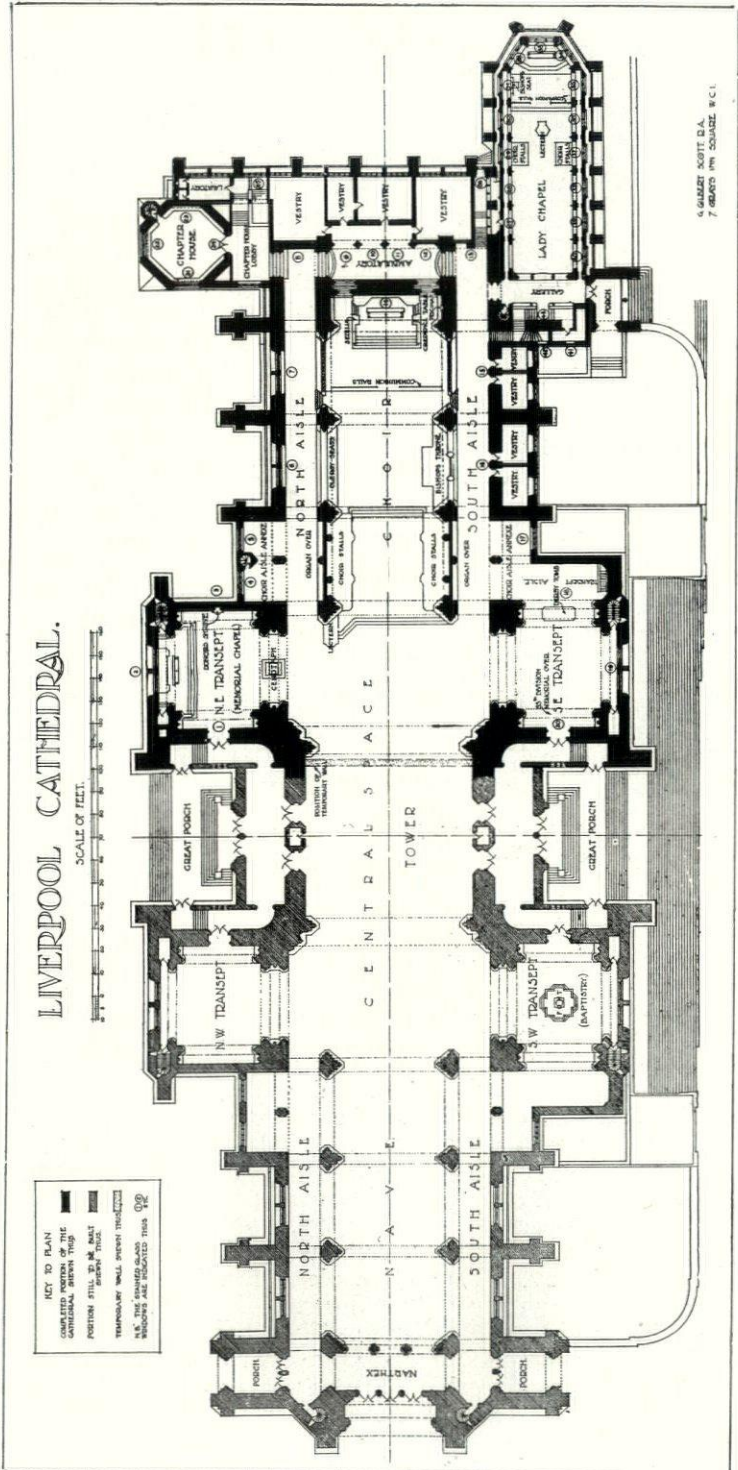
The portion of the Cathedral so far completed consists of the Lady Chapel, the Choir, the Chapter House, and the northeastern and southeastern sections of the transepts with the part of the crossing between them, the future opening for the great central tower being filled by a temporary brick wall. The accompanying plan conveys a clear conception of the entire scheme and renders it possible to visualize the composition in all its relations.

It will be seen that the architect has made a radical departure from traditional practice in the general arrangement. While adhering, in a broad way, to the time-honored cruciform shape of plan, he has in reality exaggerated the exterior breadth of the arms of the cross or transepts as integral projecting masses, inserting independent and deeply recessed porches between the two transept divisions of each side, and, at the same time, has minimized and almost wholly abrogated their interior function by making their customary area subservient to achieving a great central space at the crossing and beneath the tower, unimpeded by piers or divisions of any sort. For the fulfillment of this purpose, the lines of the nave piers, corresponding with the piers in the choir, are boldly interrupted so that the additional width of the aisles is thrown into the open area on both sides. By this device he has secured a much larger unencumbered area for congregations than would have been possible had he observed the strictly traditional methods of design without modification. He has, in effect, produced a space compar-

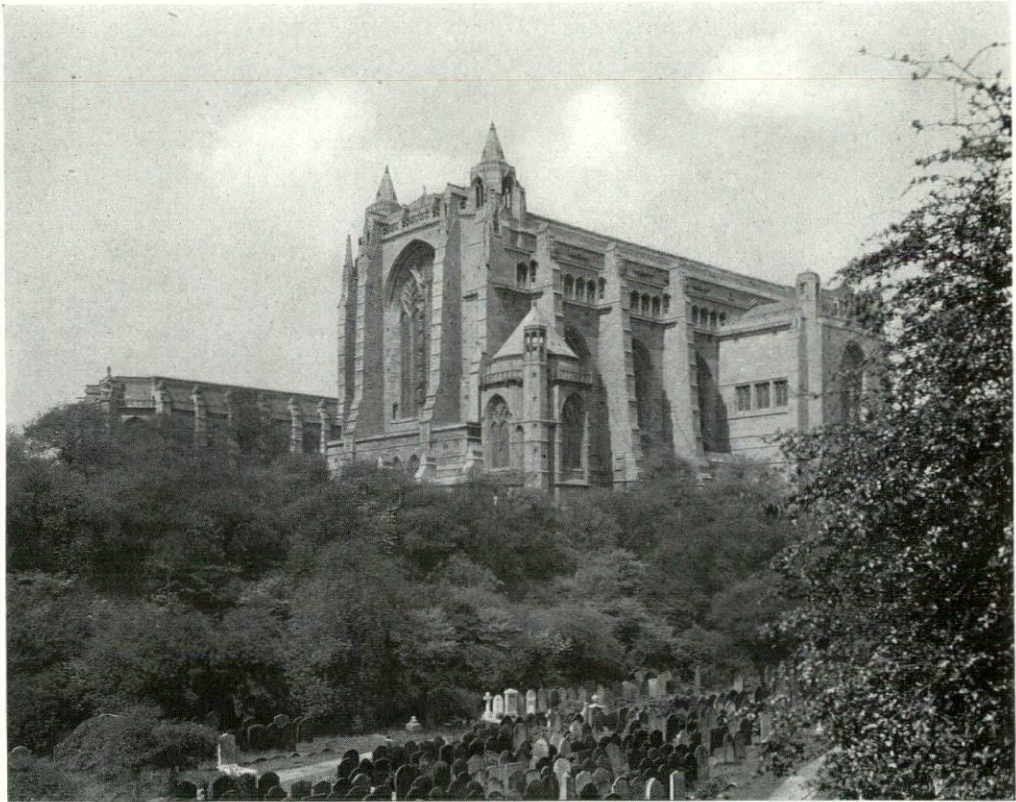


Stewart Bale, Liverpool

View Across City
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Floor Plan Showing Completed Portion
 LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
 Sir Giles Gilbert Scott, Architect



Stewart Bale, Liverpool

View Across St. James' Cemetery
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect

able in extent to the free area beneath a vast dome, although it is rectangular instead of circular in form.

Furthermore, in examining the interior, it will be seen that the choir and nave aisles have been completely subordinated to another feature on which special emphasis is laid, the breadth of unobscured space in the nave. As a matter of fact, the aisles being thus reduced to their lowest terms, their function is merely to serve as communicating corridors and no provision is made in them for worshippers. The choir aisles especially, along with the ambulatory, figure chiefly as means of access to the different vestries, the Chapter House, and the Lady Chapel. Inasmuch as great importance is attached to the central space for large congregations beneath the tower and crossings, it

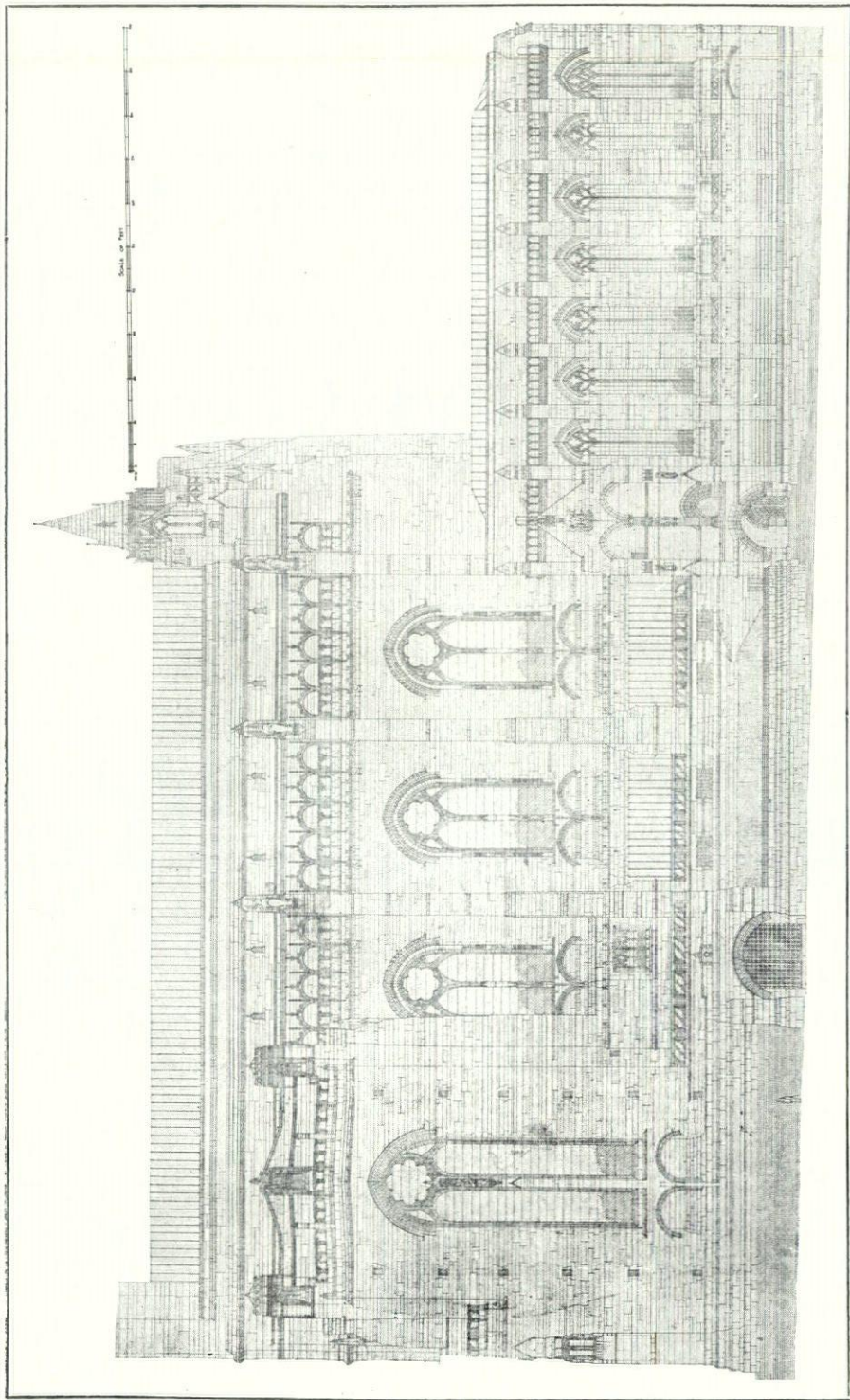
is quite appropriate that the main entrance should be by the transept doors rather than by the west door.

Another feature bound to arouse interested comparison with customary Gothic usage is the manner in which the walls of the aisles have been carried all the way to the parapet of the roof, thus altogether eliminating a clerestory. As a matter of actual fact, the transverse arches of the aisles are virtually nothing but low piercings through the great buttresses which, along with the choir and nave piers, sustain the vast weight and the thrust of the vaulting above choir and nave. Thus the piers of the choir and nave, together with the corresponding buttresses on each side, become to all intents and purposes so many enormous transverse walls of almost continuously solid masonry, buttresses outside the

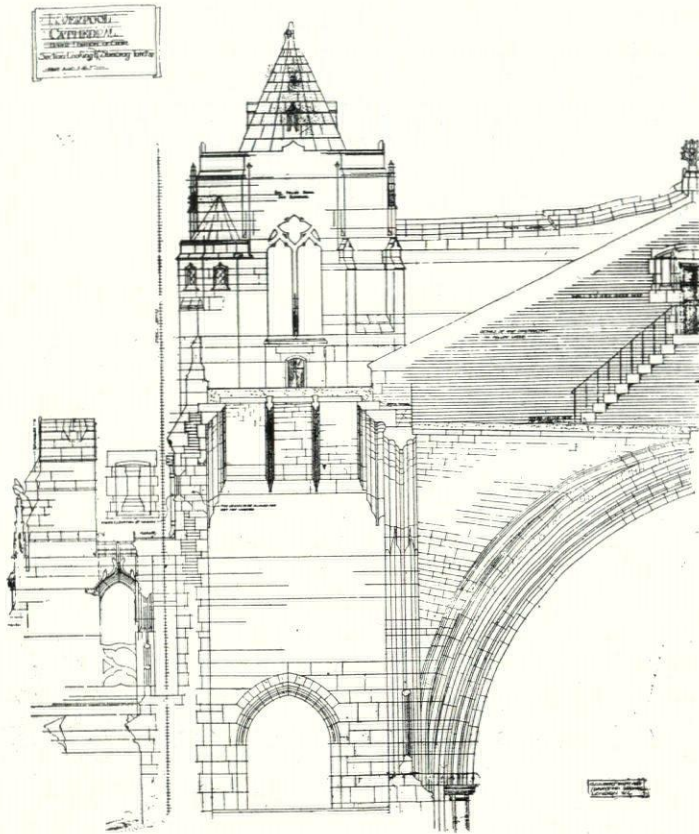


Stewart Bale, Liverpool

Southeast Transept
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Scale Drawing of Eastern Portion
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Upper Portion of Choir Section Looking East

building and piers within, a remarkable case of the merged identity of two ordinarily distinct members.

This arrangement does away with flying buttresses outside; the flight is really made intra-mural, and tremendous reinforcement is gained. The principles of counter-thrust and support remain unchanged; only their mode of visible expression is different. Furthermore, this departure from traditional usage permits an arcade of extraordinary height between the aisles, on one hand, and the choir and nave on the other. Here the arches spring from capitals at a height of fifty-five and a half feet above the floor of the cathedral, while the transverse arches across choir and nave take their spring eighty-four and a half feet above the floor.

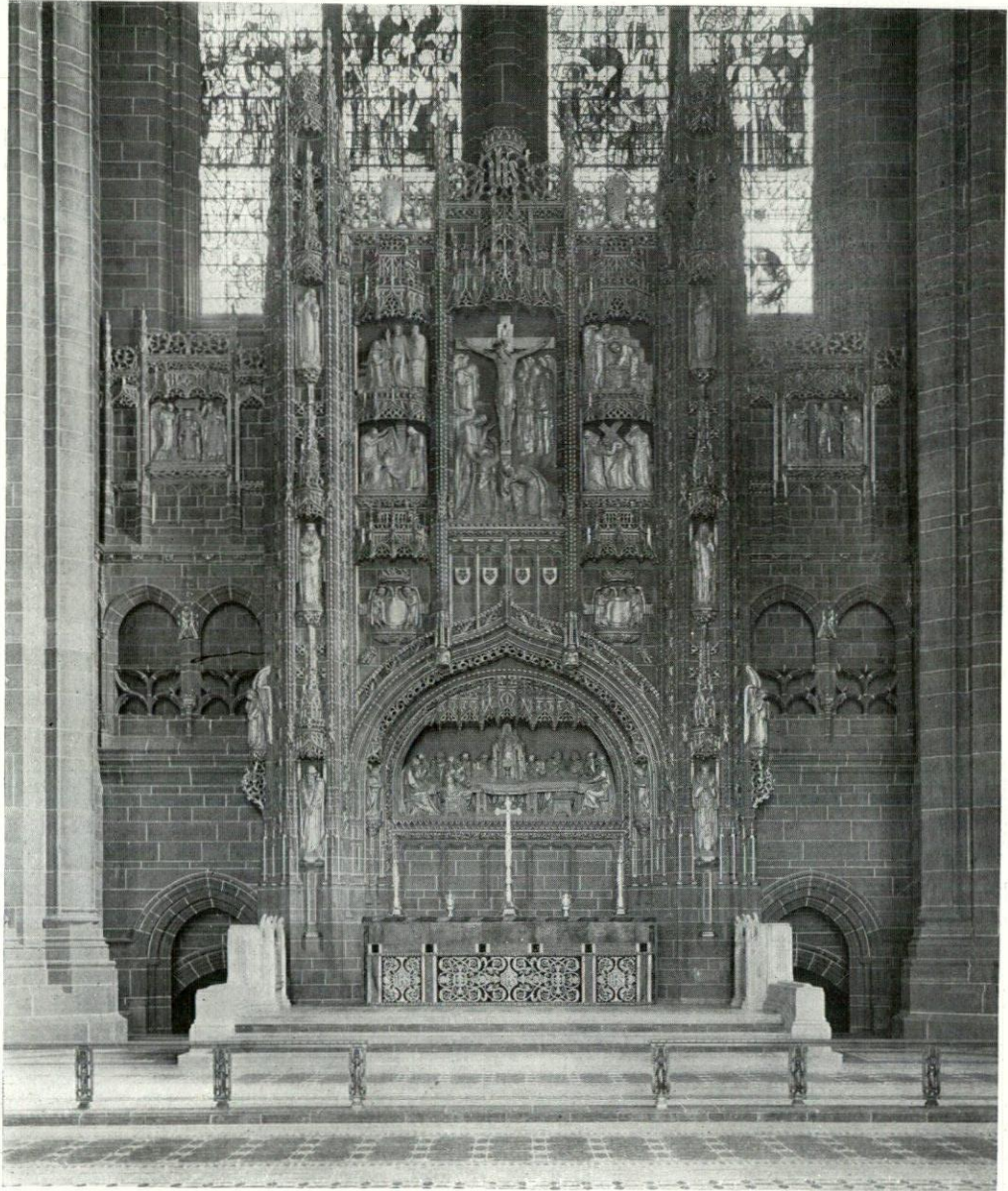
The buttresses on the exterior, while by no means lacking in sufficient bulk to

impart dignity and stability to the composition, display neither the proportions nor the contour usually associated with the construction of a lofty visible clerestory. Between the buttresses, the outer walls of the aisles, which really constitute curtain walls between vast piers, are pierced with tall windows that flood the choir and nave with light, the actual volume of light admitted being comparable to, if not in fact greater than, the amount entering through aisles and clerestory windows in their traditional arrangement.

These aisle windows rise to the height of the arches between the aisles and the choir, and in width externally they nearly fill the bays between the

buttresses. When the great central space is eventually completed its main lighting will be by means of clerestory windows whose sills will be approximately on a level with the top of the choir arcade.

Having disposed of the choir and nave aisles and clerestory at one sweep by an ingenious combination, there still remained the very considerable space between the crown of the arches in the aisle arcades and the crown of the choir vaulting to be accounted for. In this space the architect has introduced a triforium gallery of which the width is co-equal with that of the aisles beneath, while its expression in the uppermost portion of the choir walls consists of two arches within each choir bay, separated by shafts which are continued upward to form the secondary transverse supports of the choir vaulting. Each main bay of the choir vaulting is thus divided trans-



Stewart Bale, Liverpool

The Reredos

LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect

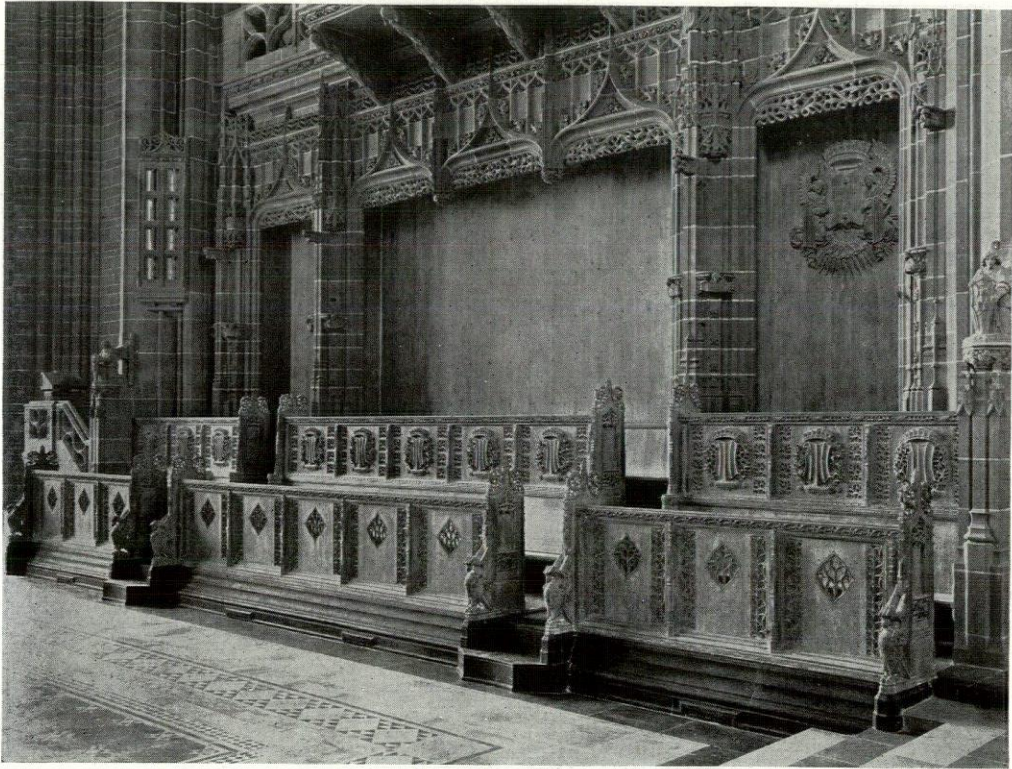


Stewart Bale, Liverpool

The Lady Chapel

LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND

Sir Giles Gilbert Scott, Architect

*Stewart Bale, Liverpool*

The Choir Stalls

versely into two oblong compartments which are, in turn, subdivided by diagonal ribs with carved bosses at the points of intersection. Though the ridge of the vault appears from below to be a straight line, each bay in reality is slightly domical, the highest point being the apex of the subsidiary arches, which are pointed like the main arches. The diagonal ribs are nearly semi-circular in contour. Like the vaulting of the aisles, the vaulting of the triforium runs at right angles to the main axis of the building.

As noted before, the exterior walls of the aisles extend from the ground to the parapet of the roof without structural interruption, and there are no windows in the triforium as the outer walls at this point are unpierced. The roof, rising at the middle about twenty feet above the crown of the interior vaulting in the choir, is supported partly on transverse walls carried by the main arches of the inner vault and partly on walls

resting upon the arches of the triforium. Between the parapet and the supporting walls resting on the triforium arches, for the width of the triforium on each side, there is no roof other than the exteriors of the barrel vaults above the triforium. These are covered with asphalt and drain from the valleys through the parapets. Throughout the roof is of ferro-concrete construction in order to eliminate all possible risk of fire. In this connection, it is of interest to note that nowhere else in the fabric are there any structural steel beams employed nor any concealed structural metal work, but that the vaulting derives its stability wholly from the design.

So much for a synopsis of the structural system. It is a sincere expression of design and structure wholly concurrent. It is adroit but altogether honest and free of all suspicion of subterfuge or of recourse to any specious tricks for the sake of ultimate effect.

The material used, both outside and in-



Stewart Bale, Liverpool

North Side of Choir

LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Stewart Bale, Liverpool

War Memorial Transept
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Stewart Bale, Liverpool

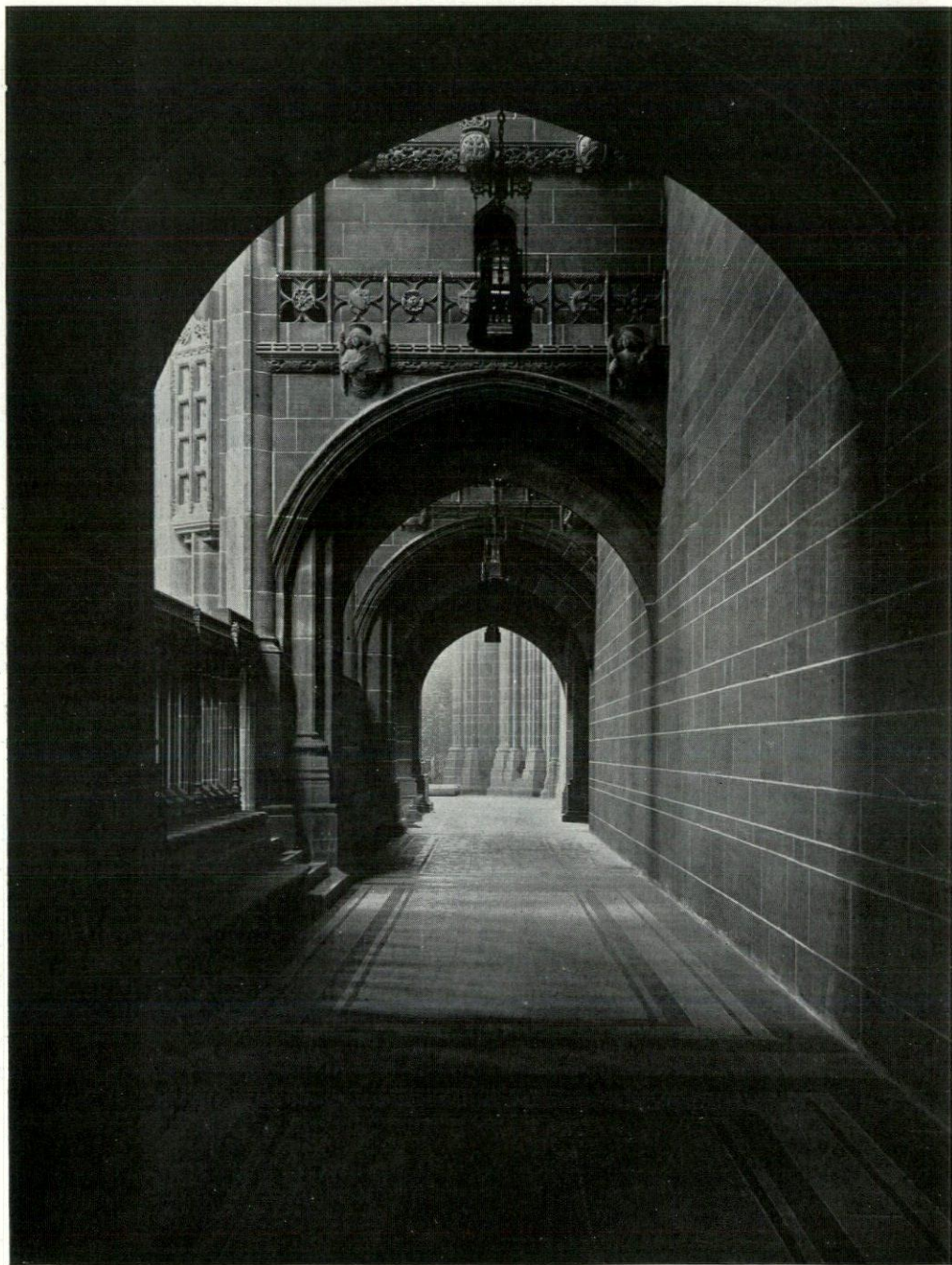
The Chapter House Doorway

side, is the local red sandstone of a warm, mellow hue, save for the floors, which are of marble. Except where the special emphasis of pattern was desired, as in the choir and in the War Memorial chapel in the north transept, the floor decoration has been confined to wide borders of geometric design in black marble dividing the area into rectangular panels, paved with grey Hopton Wood marble, corresponding in shape with the main divisions of the vaulting overhead. In the choir, the groundwork of the floor is black marble, while the grey is employed more sparingly, with an occasional dash of color imparted by yellow Sienna marble. At the central bay, within a lozenge, the arms of the diocese are wrought in marbles of divers colors. Grey Hopton Wood marble occurs again in the reredos above the altar in the War Memorial chapel. The choir stalls and the bishop's

throne are of richly carved oak; the light pendants are of bronze.

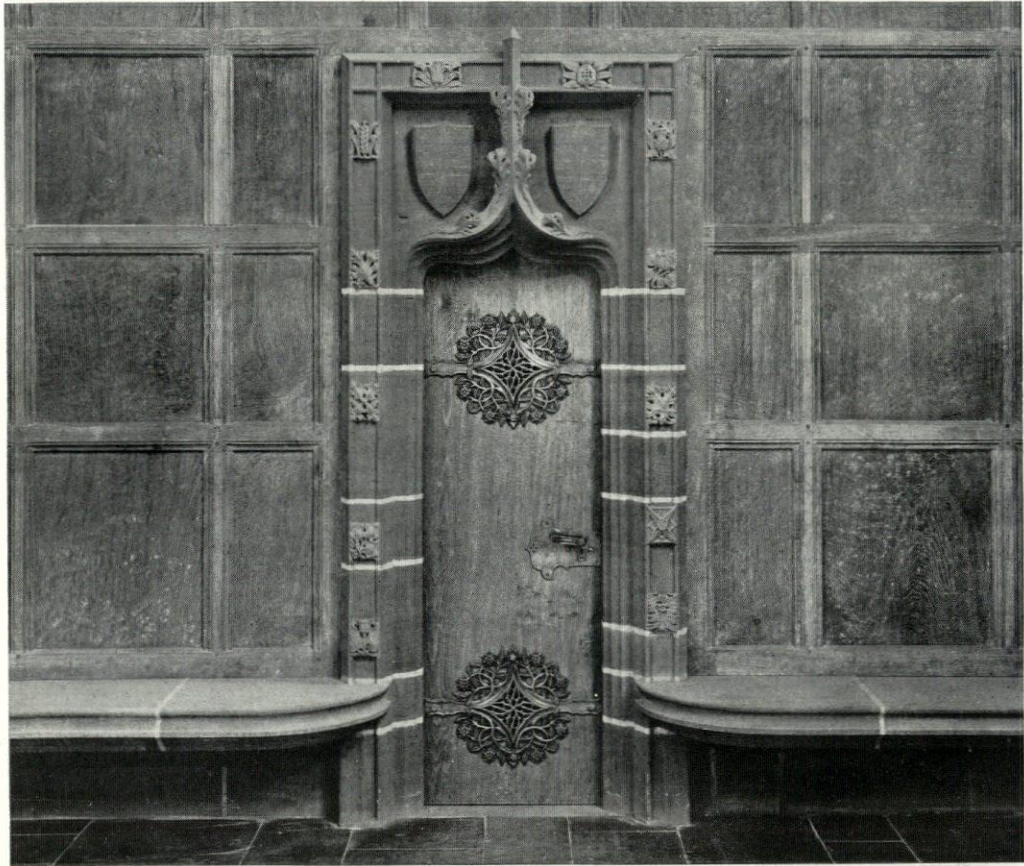
In the design of the details, the architect has shown a broad and accurate knowledge of Gothic precedent. More than that, however, he has shown facility, independence and discretion in adapting precedent to his purposes. It is obvious that he was saturated with the whole vocabulary of Gothic detail until it was a part of his very being; it is also obvious that, because of this saturation, he was able to design with freedom in the spirit of Gothic embellishment rather than in slavish bondage to the letter of authentically labeled prototypes. The entire gamut of Gothic detail was a storehouse of inspiration from which to draw and choose and combine, with assured liberty and understanding.

Acting upon the maxim that "decoration is the ritual of architecture," that it "should emphasize and not obscure the principles it seeks to glorify," in his distribution of enrichments Sir Giles Scott has maintained becoming and logical reticence, bringing the interior scheme to culmination in the reredos of the high altar where the effect of the sculpture and rich foliage is further enhanced by partial gilding. The one unfortunate feature in connection with the reredos and the carved enrichment of the east wall is the apparently undue prominence given the mortar joints of the masonry. It is quite true that the architect desired to stress the character of the reredos as an integral part of the structure, but its fashion and form would have carried this conviction without the accentuation of the joints which, as they now stand, impair the continuity of the composition



Stewart Bale, Liverpool

North Choir Aisle
LIVERPOOL CATHEDRAL, LIVERPOOL, ENGLAND
Sir Giles Gilbert Scott, Architect



Stewart Bale, Liverpool

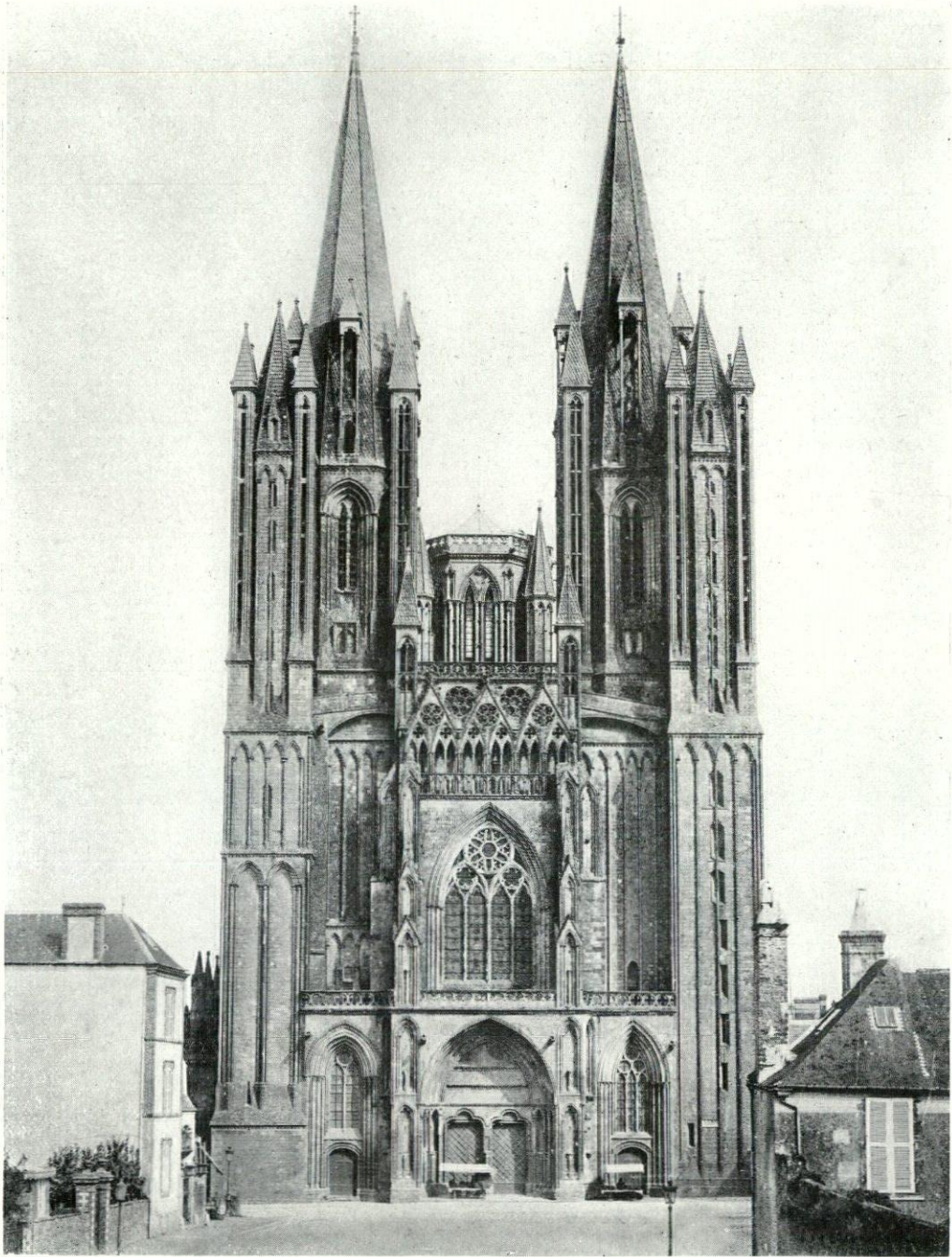
Door from Chapter House to Turret Staircase

and present a disturbing element to the eye. Aside from this defect, which is easily remediable, the work can excite only commendation. Externally, the ornament is reserved for the emphasis of structural features.

In designing such a building as Liverpool Cathedral, two courses were open, either to make it a vast achievement of archaeological erudition, or else to accept the spirit of tradition and interpret that spirit in a purely modern way. The latter course was the one chosen. For that reason it would be well-nigh impossible to make a criticism respecting style, other than to allude to the definition of style as the direct achievement of the end proposed, without permitting the distraction

of irrelevancies. On this score no critic can deny the success of the conception, whatever preferences for one type of expression or another may be individually entertained.

Whatever may be one's preference in ecclesiastical architecture, all must agree respecting Liverpool Cathedral that Sir Giles Scott has not only met and fully satisfied all the material requirements of the complex problem, but that he has also created a truly great work both instinct with individual impress and eloquent of the fact that the Gothic mode is not fossilized and incapable of organic growth but is still susceptible of flexible rational expression, full of vigorous vitality.



The Architectural Record

January, 1925

West Front
CATHEDRAL OF NOTRE DAME, COUTANCES, FRANCE

CONCERNING CHURCH ARCHITECTURE



By *E Donald Robb*

PART II

GOING BACK over the work of our leading church architects during the past twenty-five years, we notice an increasing appreciation of scale, especially in the small church. Some one has been measuring old work, or carefully studying illustrations of old work in the numerous books of measured drawings. No longer do we find the heavy window mullions or gable copings, or clumsy buttress offsets that characterize those early attempts. In those days the suggestion to make the lights of the aisle windows sixteen inches wide and the mullions four and one-half inches would not have passed the "boss." In those days the classic architects, following the latest dictum from Paris, were doing the colossal in cornice, string and base, hoping to reduce all neighboring façades to a condition of servitude, by contrast. Window frames were placed on the very inside of the wall to impress the world with the thickness of the masonry. It was difficult to get the glass nearer the outside than the inside of the wall, where it should be to get the maximum of light with the minimum of glass. And the mouldings of arcades, doors and windows,—these have also gone through a refining process which has been good for their health.

We have certainly learned something about scale, after repeated visits to Europe—or the library—but what about some of the things we haven't learned—yet? Consult measured drawings, plans, elevations and sections of some English churches of unquestioned charm in "The Architectural Association Sketch Book" or Bowman and Crowther's "Churches of the Middle Ages." What is the secret of this charm, and how can we introduce some of it into our work? We should be able to reproduce that charm which is indwelling in the design, if we can dis-

cover where it lies hidden. We have all resorted to simulating age by sandblasting stone and woodwork, by chipping edges of mouldings and arrises, or by specially trained insects and artificial moss effects. This is not only inexcusable but is seldom, if ever, effective. The tricks are all so well known that we fail to deceive anyone interested enough to notice.

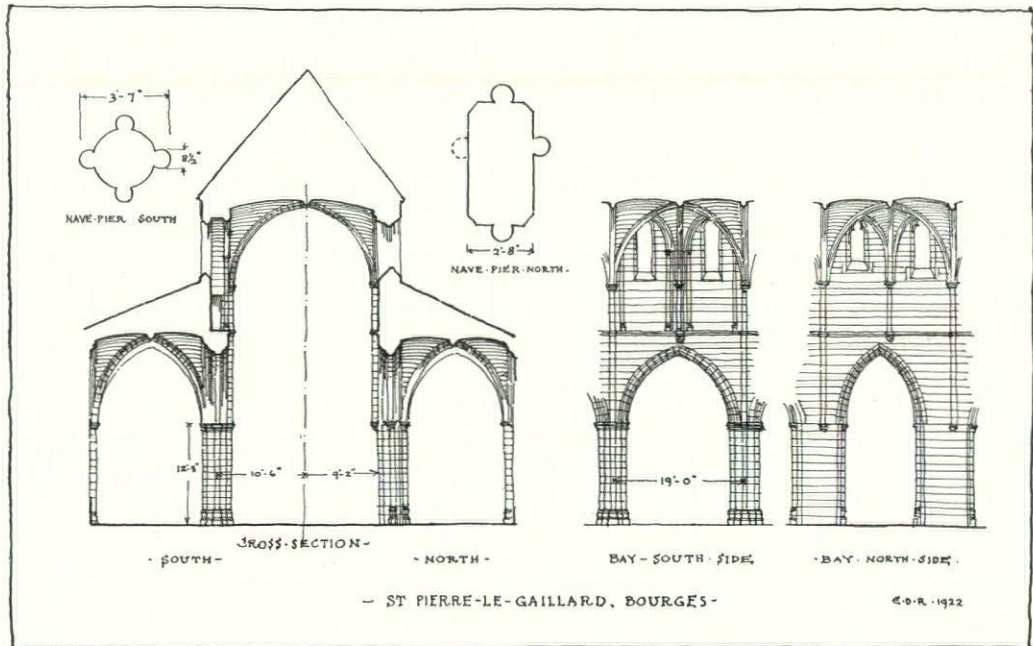
But our measured drawings show none of the softening and mellowing due to centuries of exposure to the weather, or to the use and abuse by many generations, and yet we cannot deny a positive charm in the mechanical drawings before us. They have a different facial expression from the recently completed quarter scales for Grace Church, Pretty Prairie. Our dividers will tell us many interesting things. They show us that, whereas Grace Church has seven bays in the nave all spaced exactly 14' 2" c. to c., worked out to five rows of pews per bay spaced 2' 10" back to back, the ancient example is not the result of any such cut and dried mechanical operation, but a thing full of freedom and with a fine disregard of axial lines, centre lines, and many other tricks and conventions held sacred in the draughting room. We shall probably find that no two bays are exactly the same width; possibly—yes, probably—those columns of the north arcade are not directly opposite to those of the south. And is there any good reason why they should be? If such a reason existed it would have been respected by the builders, of that you may be sure.

In the example before us, St. Peter's, Threckingham, Lincolnshire, a church seating about 350, we find the bay spacing down one side from east to west:—

12' 9", 14' 3½", 14' 5", 14' 5", 14' 1½"

and on the other side

13' 1½", 12' 6½", 12' 6½", 15' 6¾", 16' 2"



SECTIONAL DRAWING OF ST. PIERRE LE GAILLARD, BOURGES

No two columns are directly opposite each other, and no buttress is directly opposite any column. There are three different types of columns used, and two different kinds of engaged piers at the ends of the arcade. Just for the sake of being different, one arcade dies into a plain square corner. The south aisle appears to have wandered about three feet farther east than the north aisle; and it is difficult to tell whether the south porch belongs to the first or second bay. A glance at the longitudinal section reveals the fact that two of the bays contain semi-circular arches. The aisles differ in width by about eighteen inches, and the chancel tapers about one foot in its thirty-one feet of length. It is a nice little church and has served its parish well for six hundred years.

One of the most intriguing lines of investigation that can be followed during a tour of the Gothic cathedrals and churches of France and England, more particularly France, is just this; and it is safe to promise that the investigator will be rewarded in some measure in every genuine early mediaeval building he ex-

amines. It will not always be necessary for him to take measurements for enlightenment, for the variations are often obvious, sometimes all too obvious, as in the nave of Lincoln where the spacing of columns is in this order: 25' 10", 26' 6", 26' 7", 26' 3", 26' 8", 21' 4", 21' 2", to the great detriment of good proportion in some of the bays; for good proportion will not stretch to such limits and remain good. A refinement can easily degenerate into a vulgarity. But there are many other ways in which mediaeval builders produced that pleasing variety which goes far toward giving charm and interest to their work.

The bent axis, symbolically and aesthetically good, occurs everywhere among the old buildings. By means of this, all horizontal lines in perspective, take on a slight curve; and it is astonishing how easily the eye is deceived into thinking the whole interior is built to a curve. One bend will create the illusion, remove a vast deal of stiffness from the interior and make problems for the draughtsmen. In some ancient churches this bend is quite apparent, in others it has to be

sought. A good average deviation is one in fifty.

Much of the charm of the old work, that human quality, is the result of piecing together constructions dating from different centuries, done in different periods of architecture, and with little attempt to make things fit. In this mechanical age we find it difficult, if not impossible, to force ourselves into such a free-hand method of building, much as we may admire that quality in ancient work. Our office methods, our modern drawing instruments, the human instruments we must make use of in the persons of contractor, sub-contractor and workmen, the building committee and usually our own courage have made any departure from the mechanical a rather large undertaking. Twenty-five years ago we would not have dared to suggest graduated slate or uneven plaster. Now, the suggestions come from the clients, the material men advertise every kind of roof but the kind we used to specify; and as for uneven plaster surfaces, there is no end to the variations we now have on the market. Our specifications cards are all up to date in these respects, and the draughtsmen have the system of laying out graduated slate reduced to a fine art. In fact we have gone so far in this respect that there is danger of that very sophistication from which we are trying to escape.

In spite of the many improvements in this line, we have not yet learned to apply the same methods to bettering other things of equal importance in the building. Our eyes and our clients' eyes have been made to see the beauty of slates irregularly spaced, but they are still unable to recognize the desirability of irregularly spaced columns in a nave arcade, or unevenly spaced rafters in a roof, or panels of uneven size in a dado. Our dividers are too sharp, our triangles and scales too accurate. We have depended upon them so long that our eyes have lost their appreciation of the subtle charm of slightly uneven spacing. Why not space our columns, rafters and stiles as evenly as possible with our eyes? They and the building will be benefited and

undoubtedly beautified by the experiment.

The mediaeval builder did his utmost to avoid the (to him) unpleasing effect of the mechanical in his building. His efforts in this direction led him into doing many things which must have made his work more difficult. Any one familiar with the late Professor Goodyear's researches into this interesting field will not fail to appreciate this. For the information of any reader who wishes to pursue this study it might be well to add that these were published in THE ARCHITECTURAL RECORD, in 1895-96-97 and 98.

The mediaeval builder loved variety. When he was given a façade with two towers which for the sake of dignity should be alike in general effect, he never failed to make them unlike in their many details—not merely details of carving a tracery, but in larger matters such as the design and size of pinnacles, buttresses, arcading, dormers, even in the height and breadth of the towers themselves. An examination of the façade of Coutances Cathedral will reveal several things of interest illustrating this point. The southwest tower rises in four unbroken panels from a low base almost on the ground, to the main cornice level; while the northwest tower is divided into two stories, the upper and smaller in four vertical panels, the lower in two, resting on a high and steeply weathered base. These two towers appear at first glance to be the same width, but a tape line shows the former to be almost two feet wider—that is, below the main course. Above this line, where they assume the octagonal form, they are practically the same width.

If we compare the wall space between these towers and the central motive of the façade we shall notice differences both in the horizontal and in the vertical divisions. The windows just below and forward of these walls are different in form and design, their sills vary in pitch, the bases of their jamb columns occur at different levels. The gently sloping passage ways connecting the corner towers to the central feature are alike to the casual observer, but quite different to the one who stops to examine. Note the



PARISH CHURCH, NORTH ALLERTON, ENGLAND

variation in the transom bars of the extremely tall and slender openings in the corner turrets. The southwest tower shows six windows in its octagonal story, the northwest tower but five; and there are differences in the relation of each cornice to the arches below. The great western towers likewise show a varied treatment of belfry windows, and a considerable difference exists between the dormers attached to the spires. Even the finials vary in design.

If we compare this façade with the modern one by Gregoire at St. Ouen, Rouen, we shall soon learn why the former exerts an ever-increasing hold on our affections, while the latter leaves us cold. Each visit to Coutances begets another, while one to St. Ouen is enough as far as the façade is concerned.

It is not our intention to convey the impression that this peculiarity is the only mark of distinction between the genuine and the imitation in Gothic architecture. It is, nevertheless, one of the most important. The modern church

with "repeat" written everywhere, within and without, is merely exemplifying the modern spirit of business for profit. The Gothic cathedrals and churches could never have been produced if their builders had been prompted by this spirit; neither can our work today approach in quality that of the middle ages unless the motives and ideals are similar.

There were other ways in which the church builder of the middle ages avoided the mechanical exactness and regularity which characterize buildings of our own day. We have mentioned curvatures in plan, or bent axes. This idea was frequently carried still further by building walls to a curved line. For example, the walls of the cloister at Winchester College, designed by William of Wykeham, are all built to a curve. The cloister is about 130 ft. square, and the maximum inward deflection in plan is approximately six inches. This is also the case with the clerestory walls of Nôtre Dame, Paris, of Rheims, of Lichfield, England, and others.

The outward, and sometimes the inward curvature of piers, wall and vaulting shafts is common among the great cathedrals and many smaller churches of France. The English did not adopt the practice to any degree, possibly because their masons were less skilled, and their aesthetic sense less keen. As might be expected, this outward curvature is attributed by many to the thrust of the upper vaults. This, however, does not account for the inward lean of the choir of Paris, nor the westward lean of the westernmost piers in the nave of Paris and other important cathedrals; nor does it explain many other phenomena brought to light by the exhaustive researches of Professor Goodyear.

Variations in diameter and contours of columns, as well as their spacing, differences in the radii of their superimposed arches resulting in unlevel apexes, are ways and means we can adopt without undergoing too much mental or financial strain. Vertical curvatures unless carried consistently throughout the interior in every vertical line and plane will show to a decided disadvantage. This form of refinement is without question the most expensive and difficult to carry out, and it is doubtful if the gain is worth the effort.

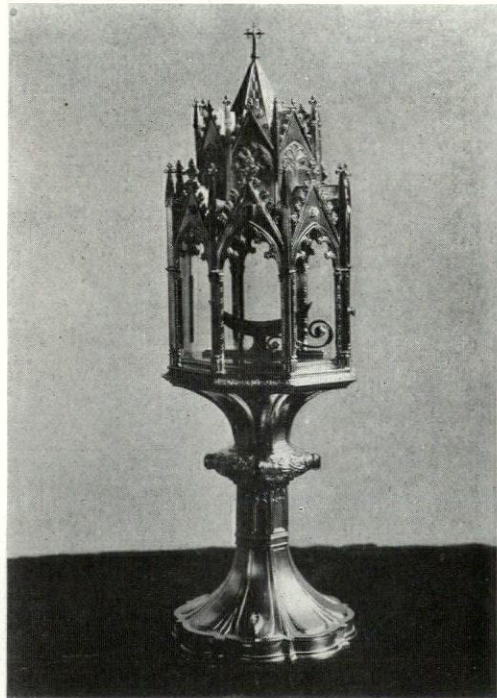
The sloping floor may be employed as a means of elevating the chancel in cases where many steps are undesirable or impossible. This however does not admit the theatrical downward slope of the floor into the class of things acceptable in the Church.

From what has been said above it will be seen that given good proportion, scale, texture, color and honesty of construction, it is most desirable to obtain, by a scrupulous avoidance of that word "repeat," the positive charm which always results from great, but not too obvious variety, in combination with dignified uniformity.

To treat with any thoroughness the large question of the decorative elements in the church, its carving, sculpture, painted walls and roofs and stained glass windows, would soon overstep the limits assigned to this paper. The elaborate

system of symbolic decoration developed by the doctors and artists of the church prior to the 14th century, forms an interesting study for the church architect, and one of no small consequence if he is to become a master of his subject.

In its significance and purpose, Gothic decoration stands in sharp contrast to most of the conventional ornament which adorned the Greek and Roman temples. It was both symbolic and didactic. Its location, arrangement and treatment were governed by rules laid down by the ecclesiastical authorities and, during the middle ages, strictly adhered to. In the days when few could read, the sculpture and other decorations of the church meant much to the people. With the passing of illiteracy we have lost sight of the value of ornament as a mental stimulus and, as a rule, we now regard it only aesthetically. After trying in vain to discover the significance of scores of lion heads (all alike) protruding from the

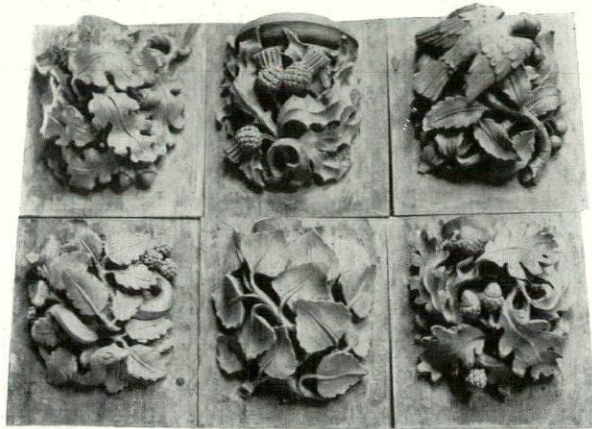


Silver and Gilt Monstrance
CHRIST CHURCH, NEW HAVEN, CONN.
Frohman, Robb & Little, Architects

cornice of a public library, or of two others regarding the passing traffic from pedestals at the entrance, we turn with relief and satisfaction to the decoration on the neighboring church, where time and patient thought have been bestowed on this subject. There the grape, the lily, the passion flower and the pelican, the ox and the lion have a purpose above and in addition to their value as decoration.

The symbolism which gives life and value to the decorations of mediaeval churches was based by the early doctors largely on the more or less obvious relationship which exists between spiritual and natural things, partly on scriptural analogies and partly on arbitrary fancy or legend. Some ideas of the theology in mediaeval ornament would not be acceptable today, but there is much which could not be objectionable even to the ultra modernist. When we and our clients divest our minds of all that savours of foolish prejudice, much of the ornament which former Protestant generations have been in the habit of regarding as "Romish" will reappear on our churches, to their great benefit.

The system developed by the mediaeval churchmen determined the form and ornamentation of the churches, as well as matters of minor import. From earliest times Christians have adopted the cruciform plan with major axis laid east and west, enabling worshipers to face that quarter of the heavens held by all peoples as the holiest—the quarter of the rising sun. On the north, the side of darkness and cold, the subjects for decoration were taken from the Old Testament; while the south, bathed in warm sunshine,



Label Bosses—Subjects Taken from Local Flora and Fauna
WASHINGTON CATHEDRAL, WASHINGTON, D. C.
Frohman, Robb & Little, Architects

was devoted to the New. The western façade, catching the rays of the setting sun, was reserved for a representation of the Last Judgment, the evening of the world's history.

Relative positions, to the right or left, above or below, were always considered in the grouping of figure sculpture, the more being disposed above and to the right.

The significance of numbers was interesting and important in mediaeval symbolism, the numbers three, seven and twelve being considered the most sacred. As Christ chose twelve apostles, twelve denotes the universal Christian Church. Furthermore, it is the product of three by four; three, the number in the Trinity, is the holiest number, and denotes all spiritual things. The number four represented things of the earth—the four elements, the four quarters of the compass, etc. To multiply three by four was to infuse matter with spirit, that is, to establish the Church in the world. It was observed, also, that seven is the sum of three and four, and therefore stands for man in his dual nature. All that relates to him is ordered in series of sevens. The number eight signified regeneration, for as the first creation was accomplished in seven days, the next number, eight, was significative of the new birth. Hence the baptismal font is so frequently octagonal.

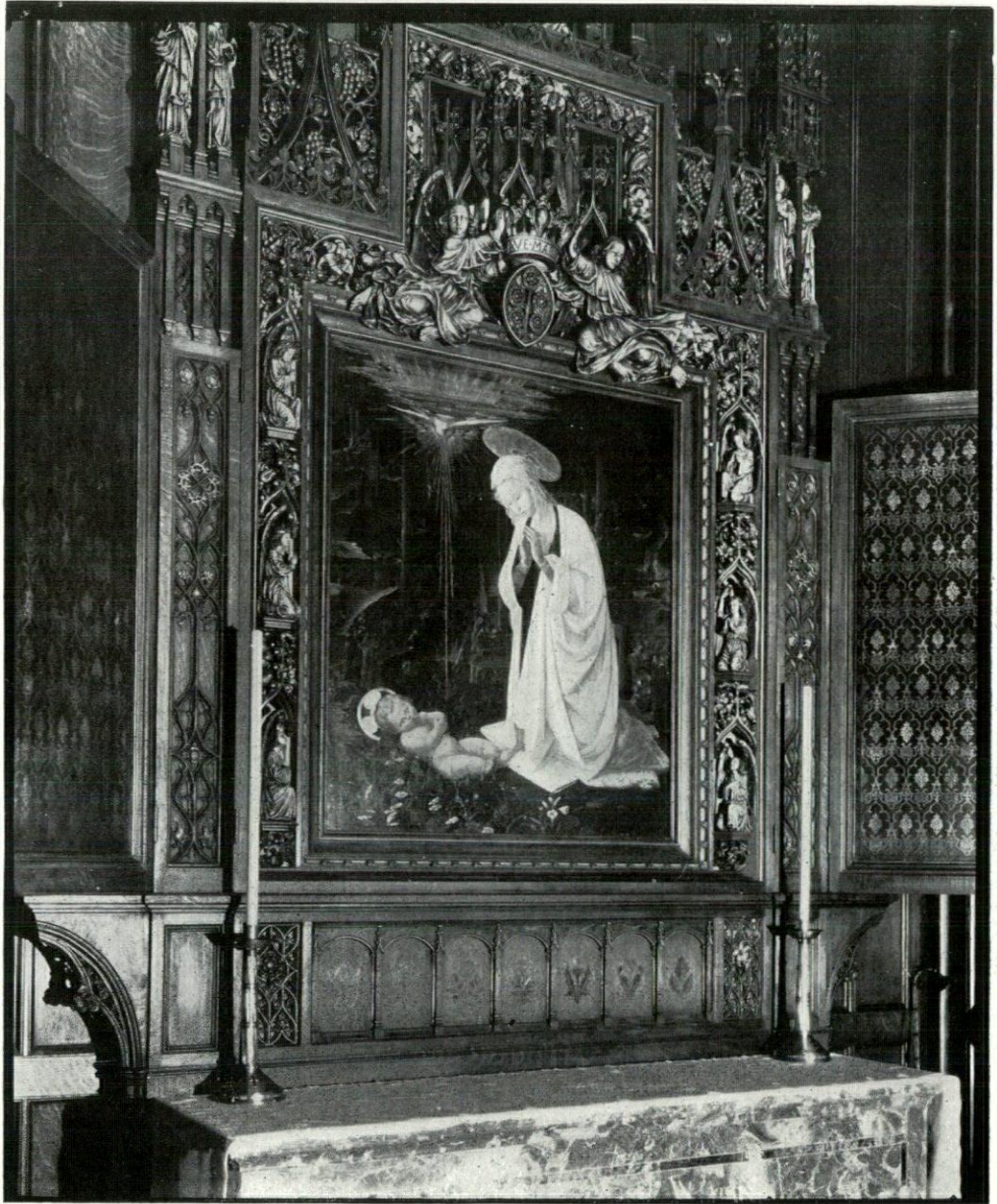
William Durandus, a writer of the 13th century, has much to say on the subject of symbolism and its application to church architecture in his work, "Rationale Divinorum Officiorum," the first book after the Scriptures to pass through the printing press. His observations are



The Architectural Record

January, 1925

PARISH HOUSE, EMMANUEL CHURCH, BALTIMORE, MARYLAND
Woldemar H. Ritter, Architect



The Architectural Record

January, 1925

Chapel Altar

GRACE AND ST. PETER'S CHURCH, BALTIMORE, MD.

Woldemar H. Ritter, Architect

quaint, ingenuous and full of interesting matter for the church architect. For example, the word church, he reminds us, is used to denote first a material building in which Divine offices are celebrated, and secondly, "A spiritual fabric which is a collection of the faithful . . . for as the material church is constructed from the joining together of various stones, so is the Spiritual Church by that of various men." After explaining the symbolism of the lime and sand which bind the stones together only after water has been added, he proceeds to explain the meaning of the various parts of the building.

Among the animals sculptured in the Gothic churches the ones most frequently met with are the four Beasts around the Throne seen by the Prophet Ezekiel and later by St. John at Patmos. Since the earliest times these Beasts have been regarded as symbols of the Four Evangelists. The emblem of St. Matthew is the man, for his gospel begins with the genealogical table of the ancestors of Joseph. The lion signified St. Mark, for his opening verse speaks of the "voice of one crying in the wilderness." The ox, the sacrificial animal, stands for St. Luke, whose gospel opens with the sacrifice offered by Zacharias. The eagle, who alone of created things is able to look full at the sun, is the emblem of St. John. But, besides representing the Four Evangelists, they pictured the four great mysteries of the Saviour's life—His Incarnation, represented by the man; His sacrifice, by the ox; His resurrection, by the lion, who sleeps with open eyes; and His ascension, by the eagle. They symbolize also the fact that man embraces the Christian life: first, by virtue of his reason; second, by

self-sacrifice; third, by his strength and courage in struggling against evil; and, fourth, by living above the sordid things of the world and by keeping his vision fixed on things eternal.

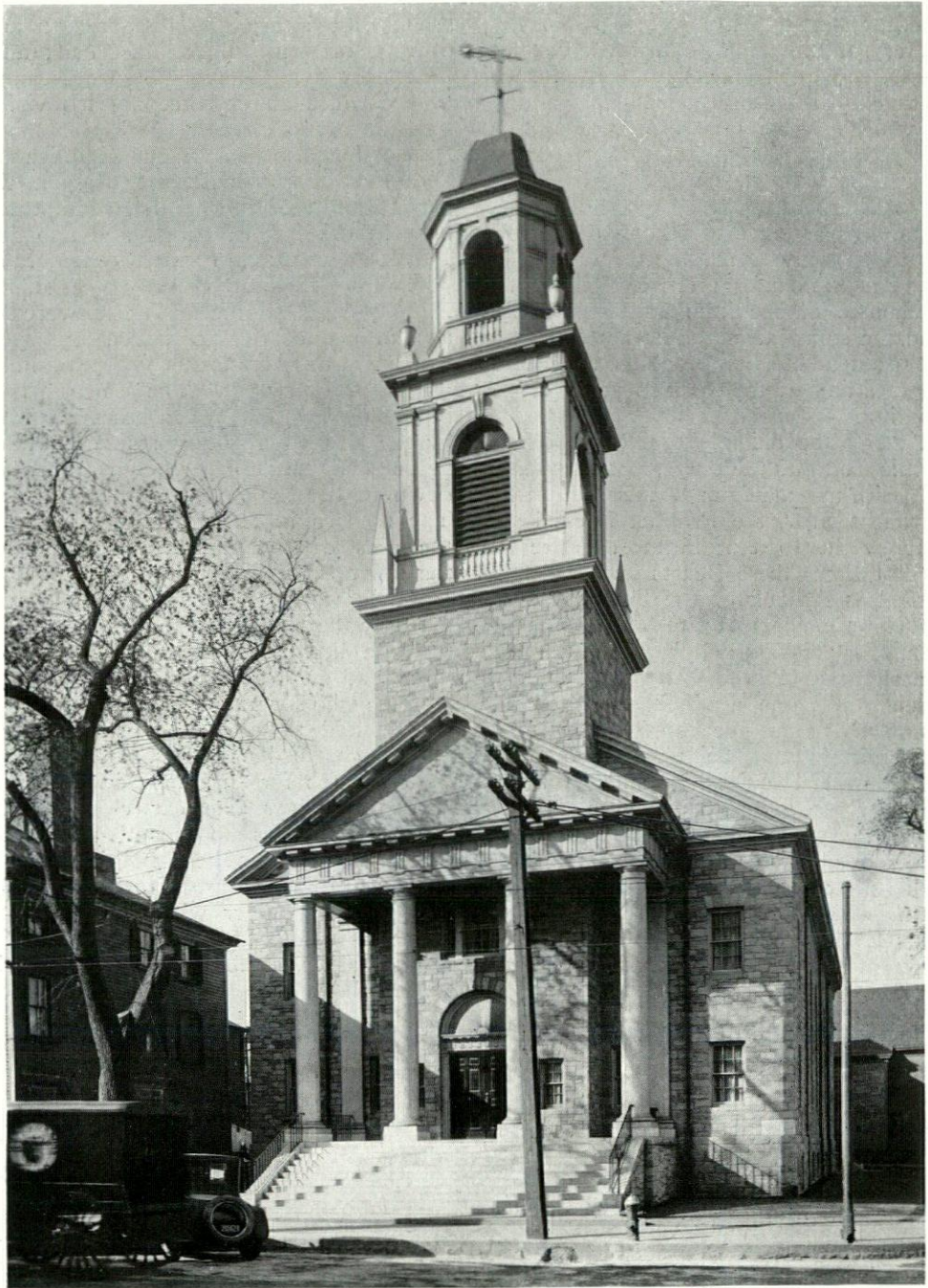
The lion also has an evil significance, and, in company with the dragon, the basilisk and the adder, is often sculptured beneath the feet of saints and apostles. Fabulous creatures form a considerable portion of the animal sculpture of the Middle Ages. Some of these were of ancient origin, full of interesting symbolism. Says Honorius of Autun, a writer of that day: "The unicorn is a beast so savage that it can be caught only by the help of a young maiden. When he sees her the creature comes and lies down in her lap and yields to capture. The unicorn is Christ, and the horn in the midst of its forehead is a symbol of the universal might of the son of God. He took refuge with a virgin and was taken by the huntsmen; that is to say, He took on human form in the womb of Mary and surrendered Himself willingly to those who sought Him.

"The adder is a kind of dragon which may be charmed by songs, but it is ever on the watch for charmers, and when it hears them lays one ear close to the ground and stops up the other with its tail, so that it can hear nothing and is safe from incantations. The adder is the image of the sinner who closes his ear to the words of life."

The basilisk, symbol of spiritual death, was a cock with a serpent's tail, according to the natural history of the day. The owl, which has eyes which cannot see clearly in the daylight, was a type of the Jews who, in their blindness, shut their eyes to the sun. The gargoyles, fantastic creatures, part bird, part beast, part rep-



Label Bosses—Subjects Taken from Local Flora and Fauna
WASHINGTON CATHEDRAL, WASHINGTON, D. C.
Frohman, Robb & Little, Architects



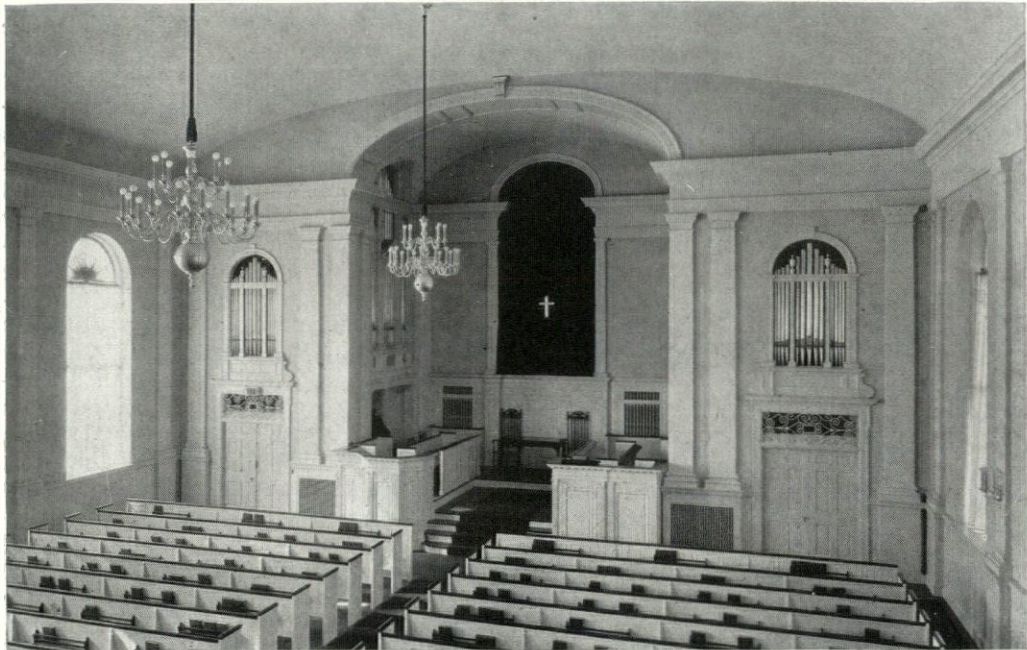
The Architectural Record

January, 1925

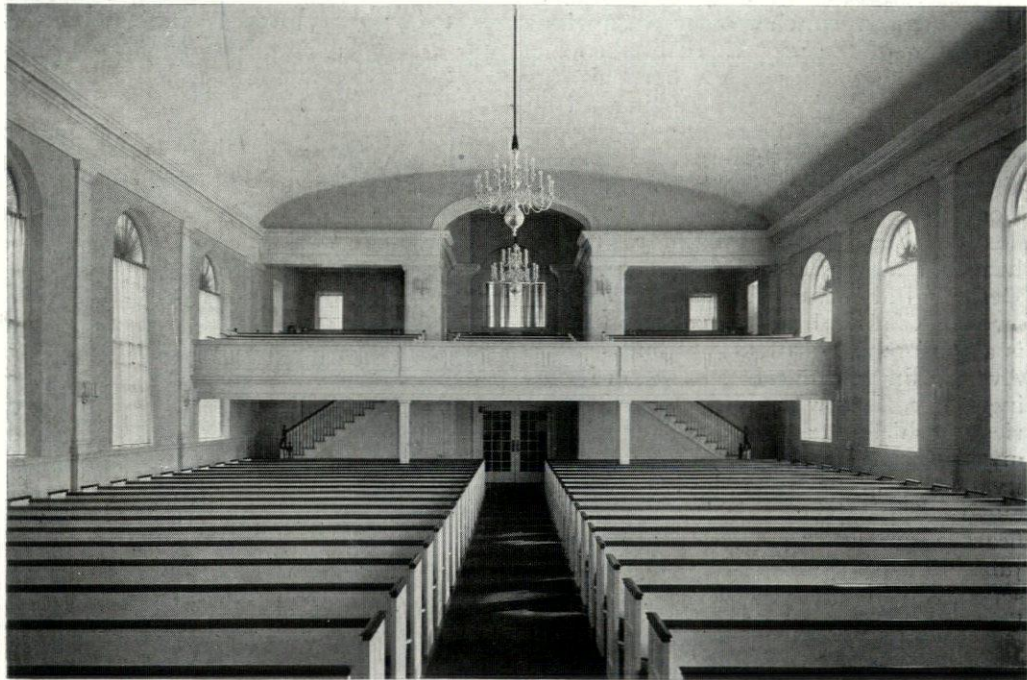
Façade

TABERNACLE CONGREGATIONAL CHURCH, SALEM, MASSACHUSETTS
Smith & Walker, Architects

[26]



View toward the Choir



The Architectural Record

View Toward the Gallery

January, 1925

TABERNACLE CONGREGATIONAL CHURCH, SALEM, MASSACHUSETTS
Smith & Walker, Architects



Vaulting Boss
"JACOB WRESTLING WITH THE ANGEL"

tile, springing from the tops of towers, or gathering in swarms high among the flying buttresses, were the spirits of evil driven from the church by the prayers of the faithful.

The virtues and vices were usually represented symbolically, in stone or glass, in all the great cathedrals. If in stone, they were sculptured on one or more of the great portals, where they were within easy view of the people. In the series at Amiens the virtues are draped figures, seated in medallions and holding shields on which their emblems are shown; the cross and chalice representing Faith, above a medallion in which is seen a man worshipping a monkey, Idolatry. In the next, Hope gazes longingly toward heaven and reaches for a crown, while Despair deals herself a death blow with a sword. Charity bears a shield on which is a sheep, symbol of unselfishness, while Avarice finds infernal satisfaction in filling her coffers with gold. Chastity carries a shield bearing a salamander, a mythical animal reputed to have the ability to live in flames and even to extinguish them. The shield of Prudence bears a serpent, recalling the Lord's injunction to His Apostles: "Be ye wise as serpents." Humility, Fortitude, Patience, Sweetness, Concord, Obedience and Per-

severance, with their opposing vices, are shown in like manner.

It is this symbolic treatment that makes the great cathedrals inexhaustible mines for study. The thought that lies behind each sculptured stone or painted glass is beyond our comprehension; and this thought, the theology and philosophy of that day, expressed with such unerring taste, places the churches of the 13th century in the front rank of architectural achievement. It will be seen from the illustrations given above, that the mediaeval artist and theologian understood the real value of symbolic art as a means, not only of expressing doctrine, but of preserving it from profanation. Moreover, the people understood this language of symbol, and were able to interpret in their simple way the carved and painted decorations on the churches and cathedrals. To them the lion, the dragon, the lamb and the pelican were something more than mere ornamental details, and their storied windows than pleasant arrangement of color. Art in that day was truly the handmaid of religion, supplementing the work of the clergy and making the churches and cathedrals veritable sermons in stone.



Vaulting Boss
"PENTACOST"

The LIBRARY OF THE ARCHITECT



By
A Lawrence Kocher

PART V

SELECTED LIST OF STANDARD WORKS RELATING TO ARCHITECTURE AND INTENDED FOR OFFICES OF ARCHITECTS

This list of books on architecture was prepared with the advice of prominent architects of the United States and England and is intended to include such fundamental works as the practicing architect and the draftsman will find helpful. It is not a complete bibliography of the subject, but rather an approved list of the most useful standard publications.

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A pioneer work for the history of architecture but with many errors of statement and conclusion.

FLETCHER, SIR BANISTER FLIGHT. A history of architecture on the comparative method for students, craftsmen and amateurs. 6th ed. London, 1921. \$12.00.

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The orders of architecture and examples of classical buildings clearly presented.

GUPTILL, ARTHUR L. *Sketching and*

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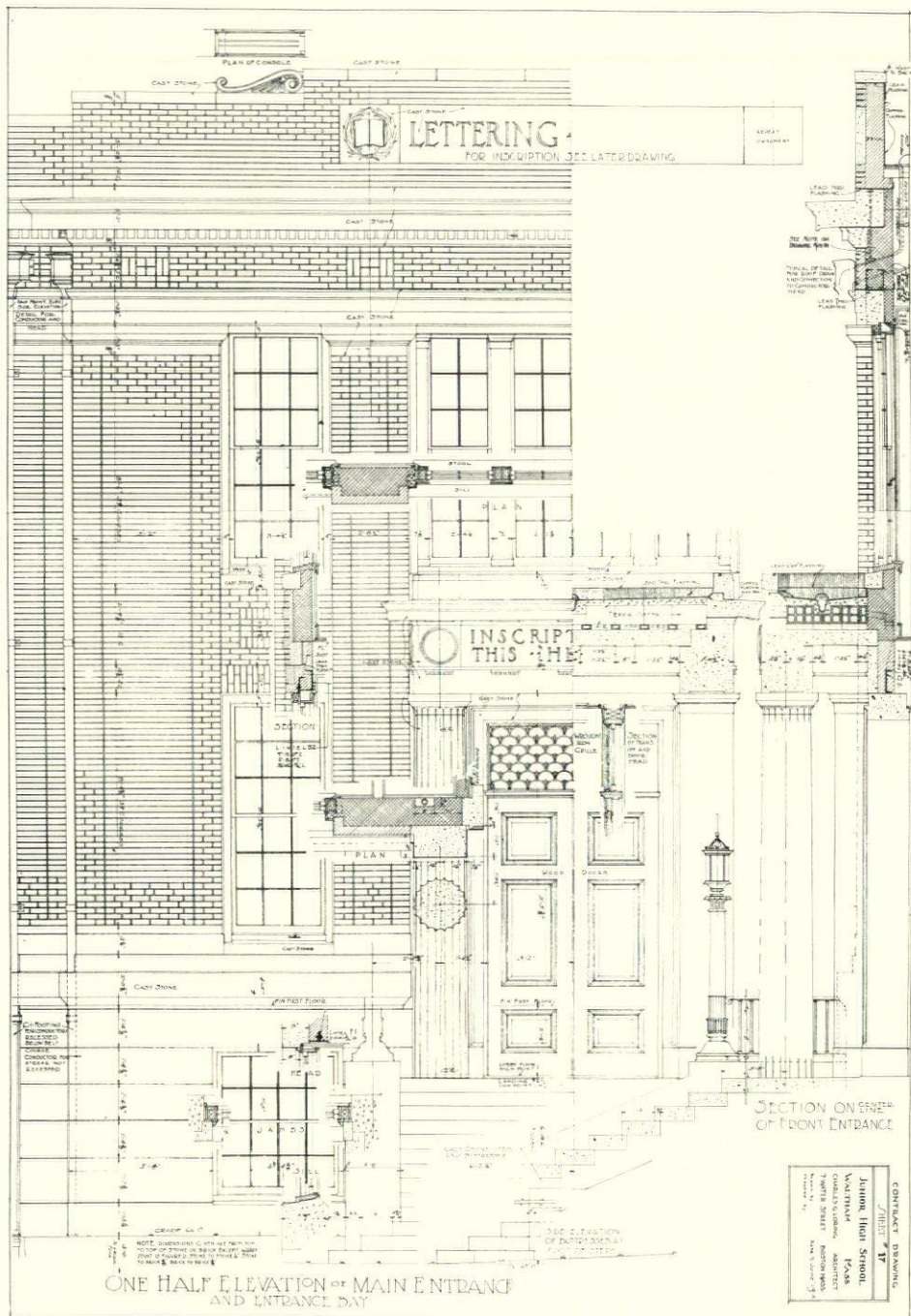
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P O R T F O L I O
C V R R E N T A R C H I T E C T V R E



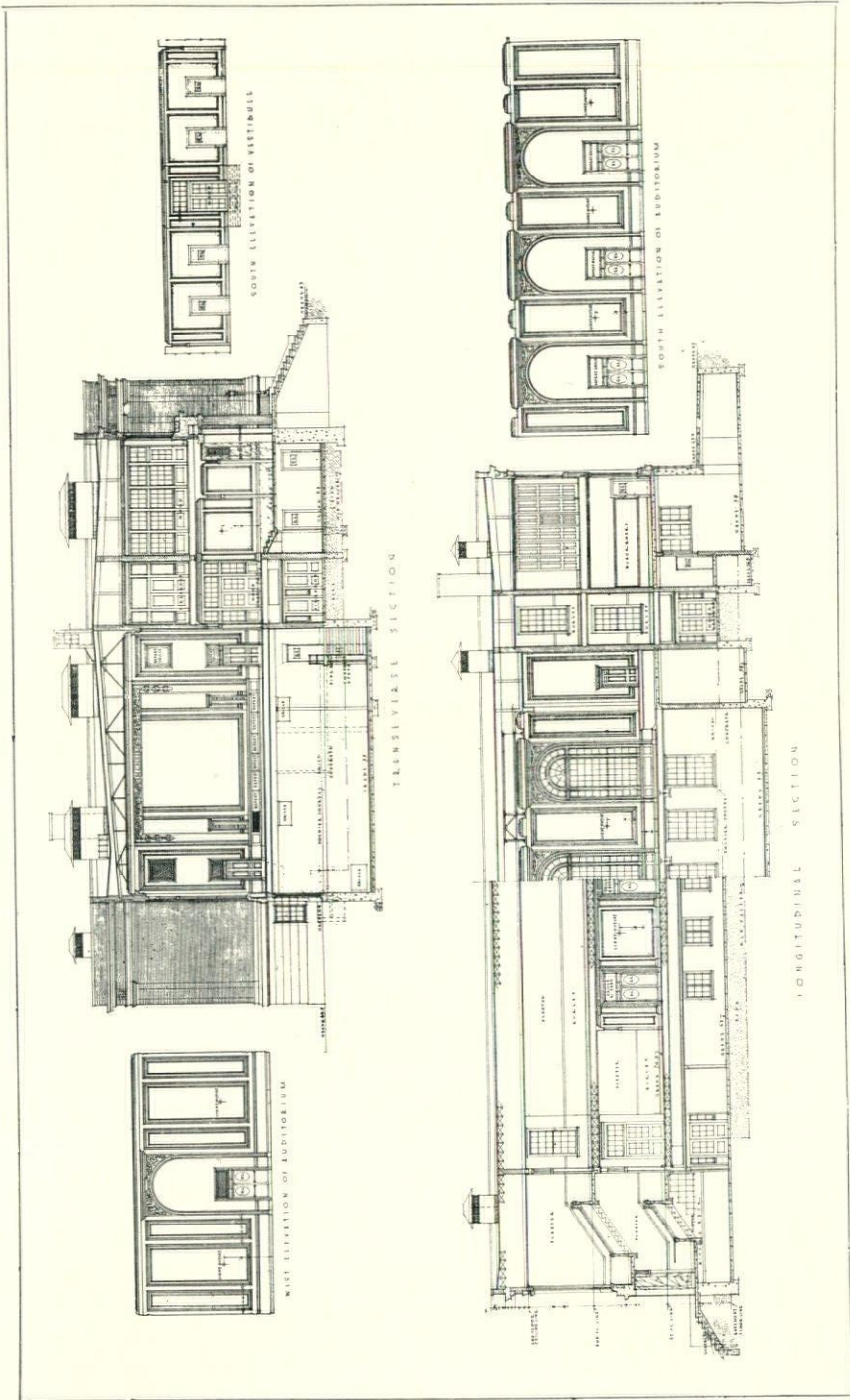
Entrance Detail
NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
Charles G. Loring, Architect



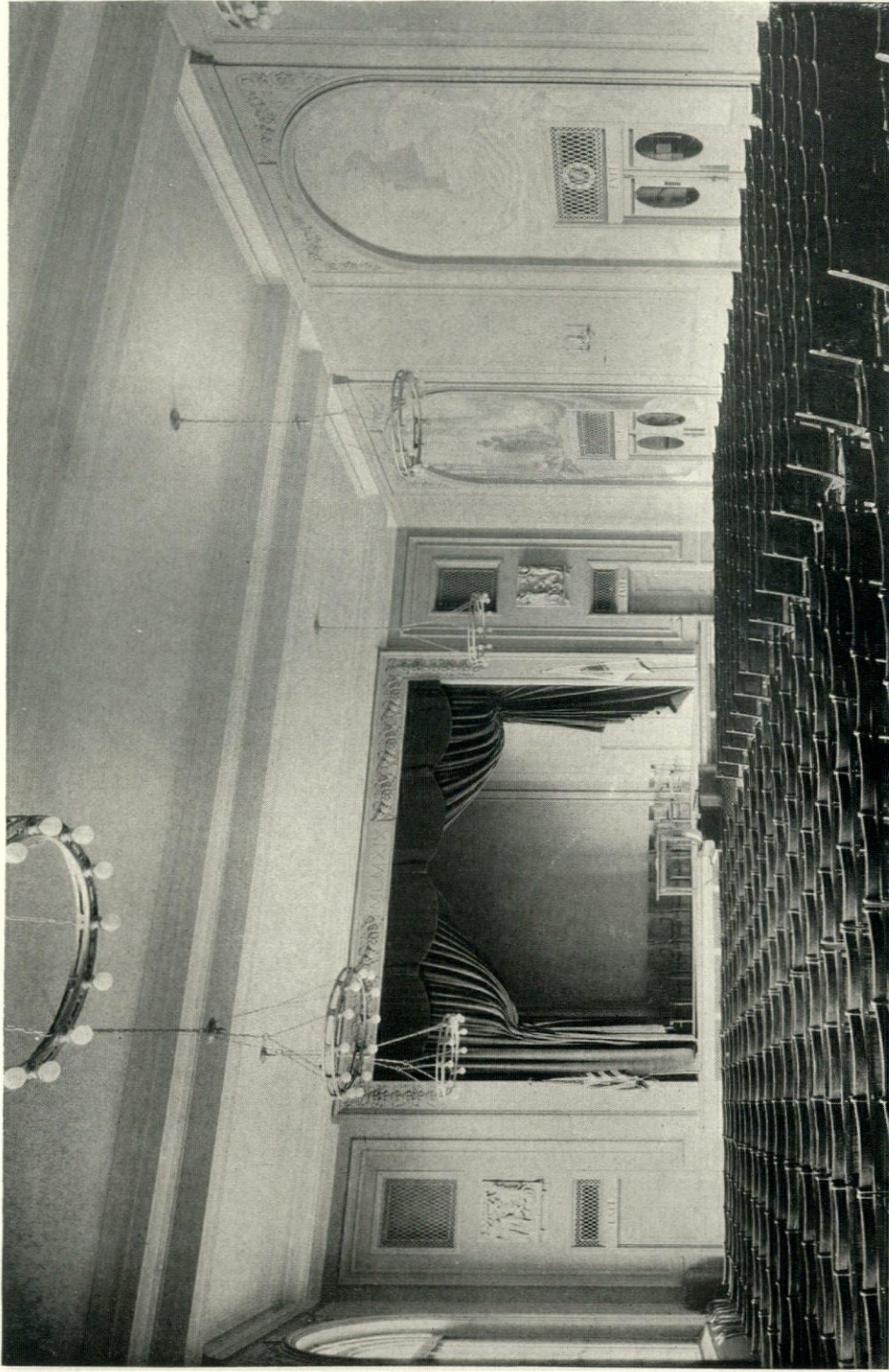
NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
 Charles G. Loring, Architect



Façade
NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
Charles G. Loring, Architect



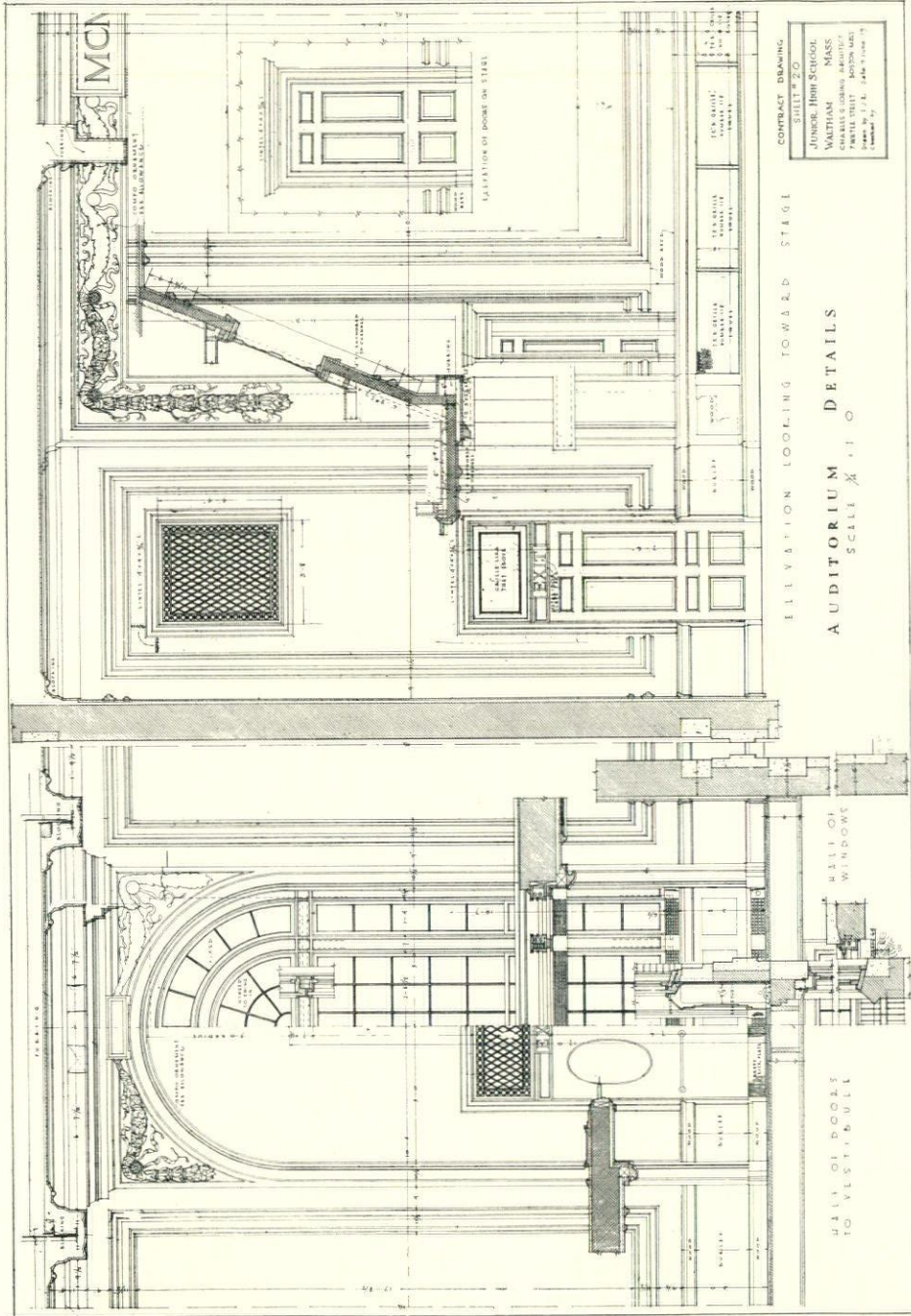
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 Charles G. Loring, Architect



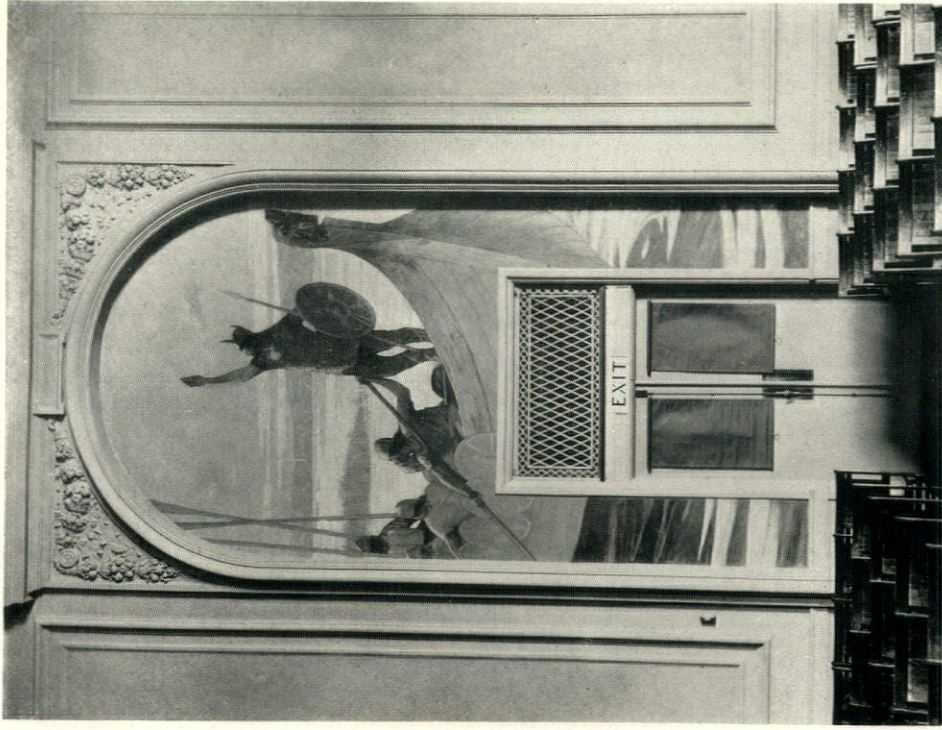
Auditorium

NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS

Charles G. Loring, Architect



NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
 Charles G. Loring, Architect

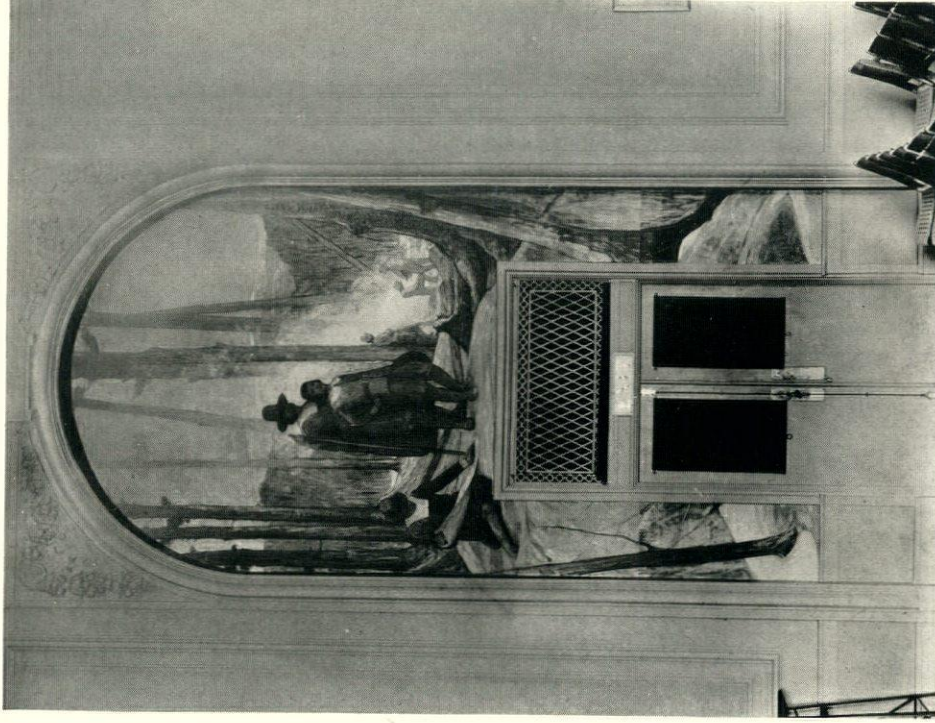


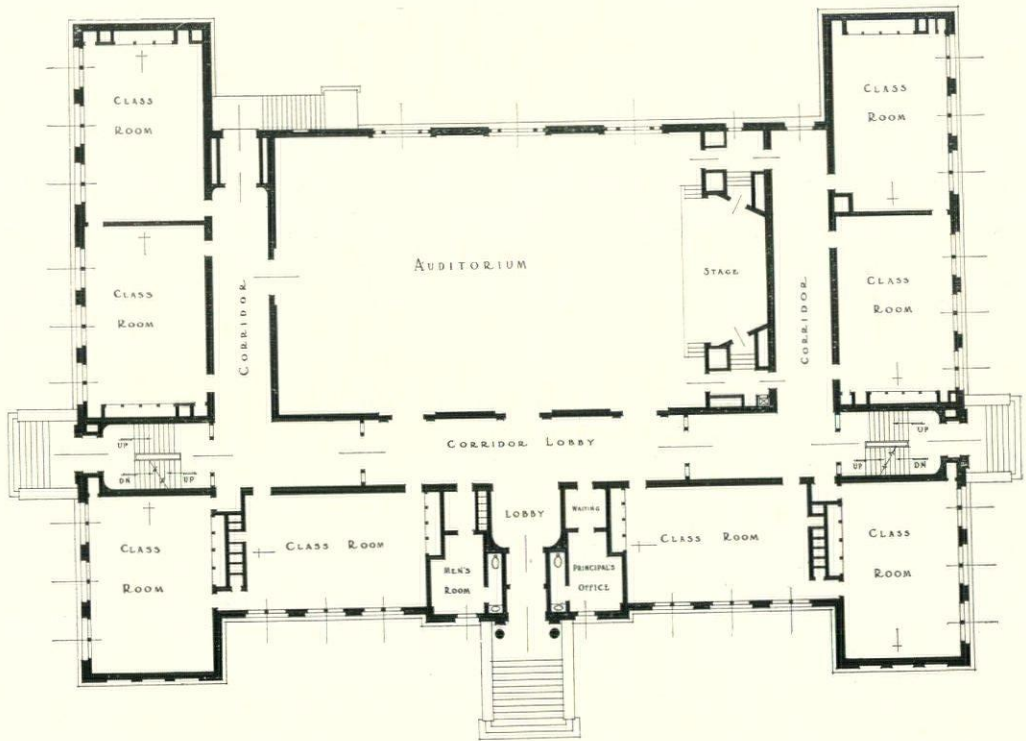
Mural Paintings in Auditorium

NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS

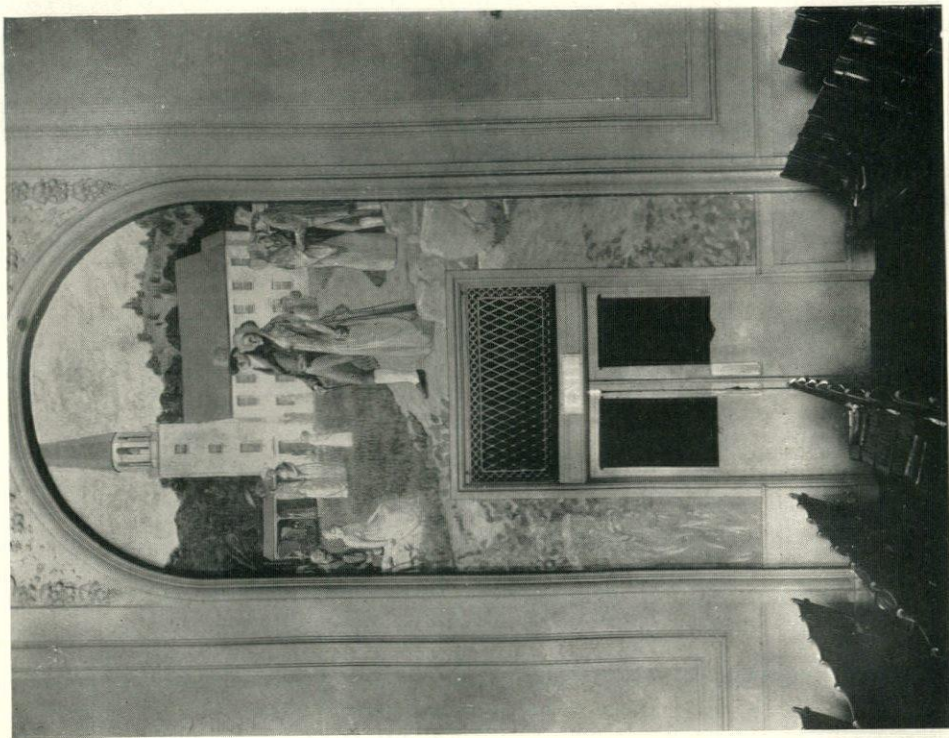
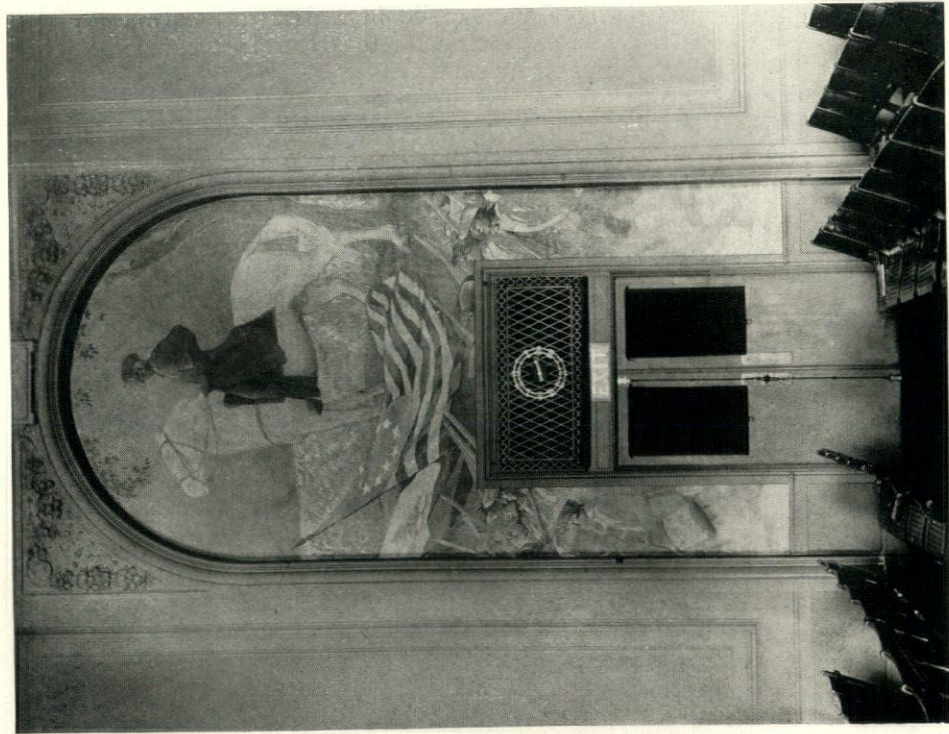
Charles G. Loring, Architect

Paintings by Russell T. Hyde





Floor Plan
 NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
 Charles G. Loring, Architect



Mural Paintings in Auditorium
NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASSACHUSETTS
Charles G. Loring, Architect
Paintings by Russell T. Hyde

THE MURAL PAINTINGS IN THE NORTH JUNIOR HIGH SCHOOL, WALTHAM, MASS.

At the time the North Junior High School in Waltham was planned, there was no municipal hall capable of seating seven hundred, so the School Committee decided to develop this unit larger than was actually needed by the five hundred and fifty pupils now enrolled. A public spirited citizen, in conjunction with the painter, Mr. Russell T. Hyde, agreed to install four mural paintings without expense to the city. The Auditorium is 75 x 50 feet over all, with a stage and two ante-rooms. On one side are three arched windows and facing them three arched panels with a fourth at the end opposite the stage. The windows and paintings are fifteen feet high and eight feet wide.

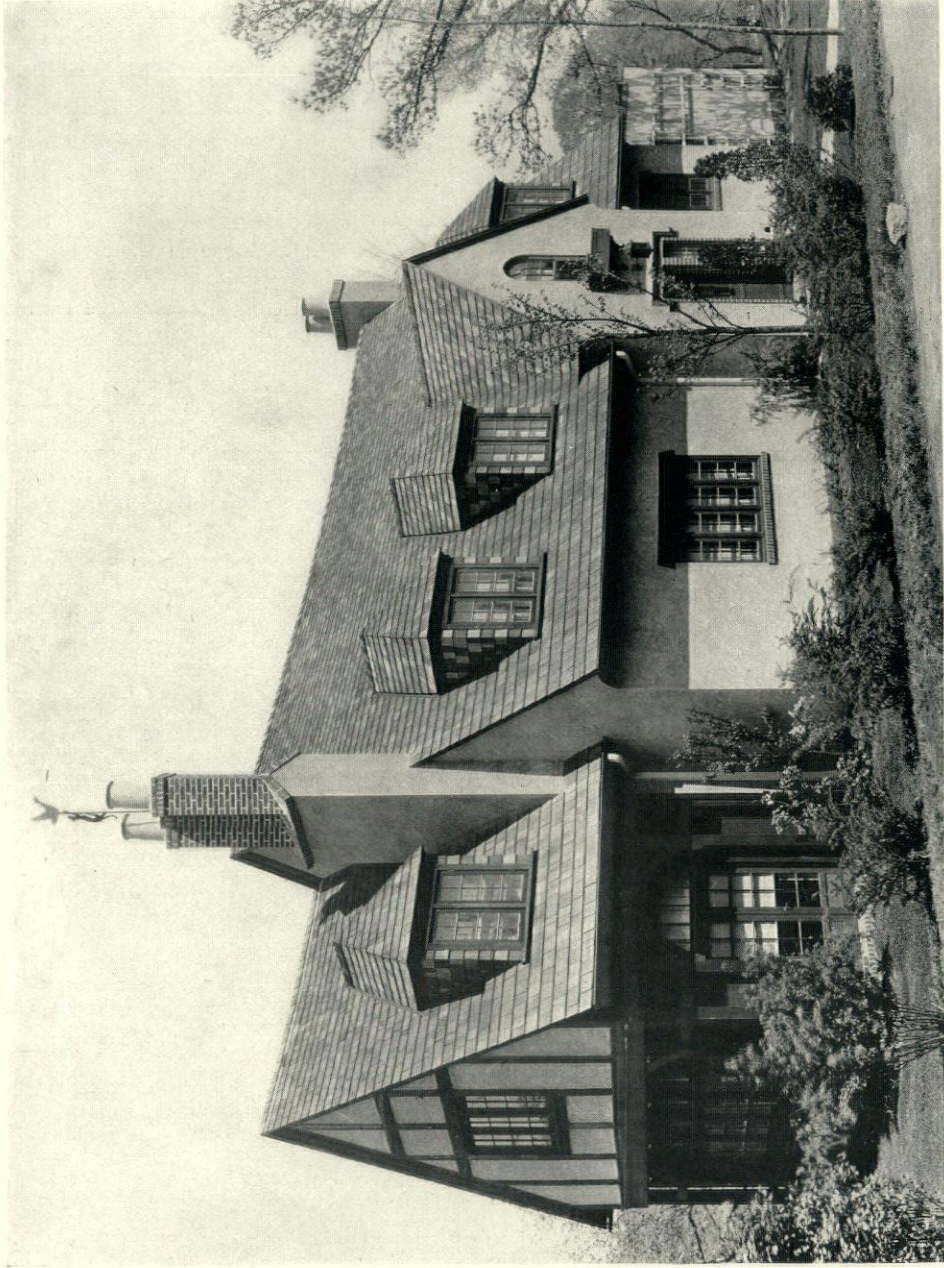
The choice of subjects is worthy of general note as it was based on the education of the pupils through their interest in the incidents depicted. The natural first reaction from the World War was to select military subjects, the struggle with the Indians, the Revolution, the Civil War and the War with Germany. It was decided that this laid too much emphasis on militant history. A series of studies were then prepared showing the peaceful developments which originated in this country in Waltham, including the first school for trained nurses, watch-making and the like, but these events did not lend themselves readily to dramatic presentation. Finally, four incidents in the history of Waltham were selected, although one, the landing of the Norsemen on the banks of the Charles River should perhaps be called mythical rather than historical.

The first painting depicts Leif Erikson, the Norseman who is reported to have sailed up the Charles River and landed in a part of Waltham called Norumbega. He is shown beckoning across the river in the neighborhood of Fox Island to a group of Indians.

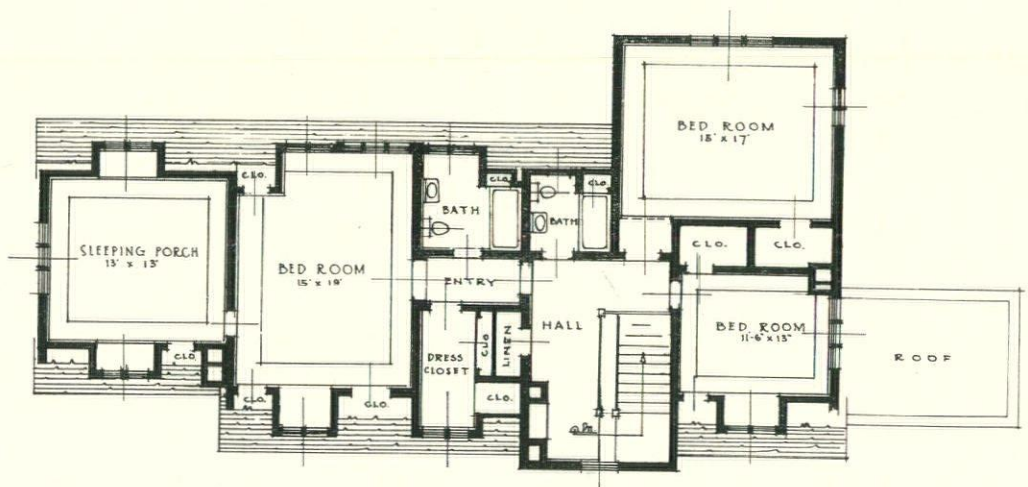
The second picture shows Governor Winthrop and his son, who penetrated one time as far as the present Banks Square in Waltham for the purpose of surveying a road. An entry in the diary of Governor Winthrop naïvely says "this is probably as far west as a road will ever have to be built."

The third shows the Continental Army passing in review before George Washington, who paused to rest in Waltham while on his way to take command of the Continental Army.

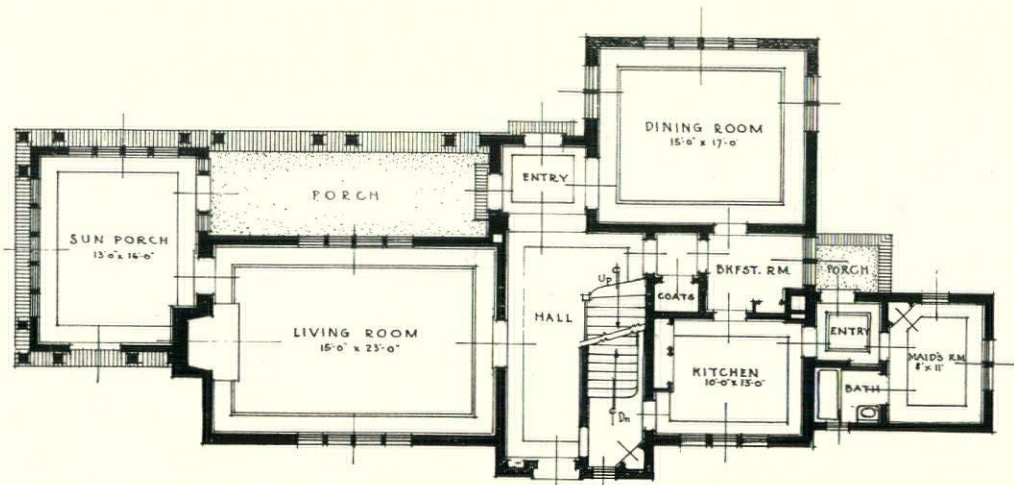
The fourth picture shows the first church built in Waltham near what is at present the corner of Beaver and Lyman Streets. The costumes of this period date back to the time of Governor Gore, who was a resident of Waltham and was one of the first civil authorities to refuse instructions from the established church.



WEST HOUSE, KANSAS CITY, MISSOURI
Edward Buchler Delk, Architect



Second Floor Plan

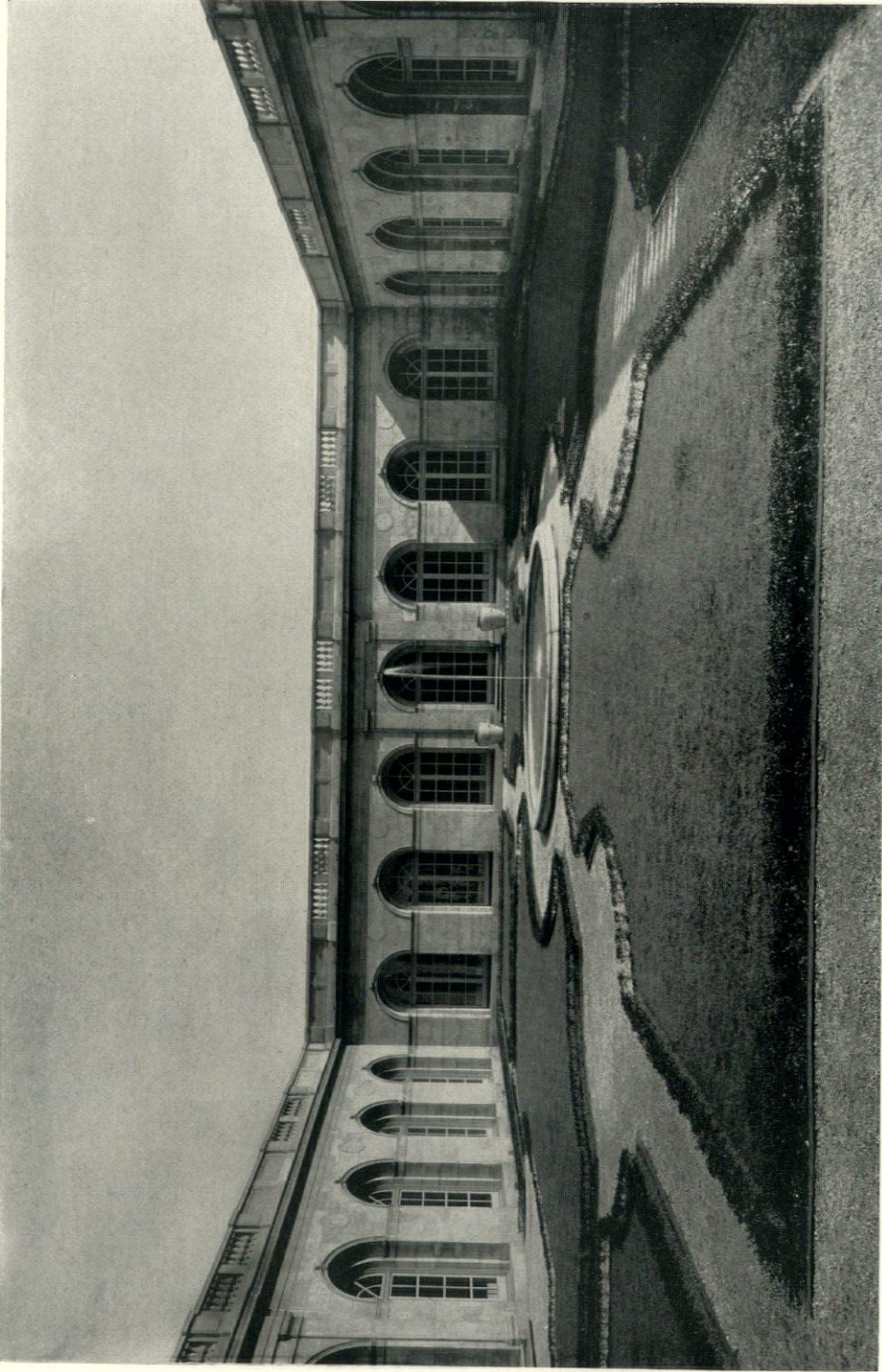


First Floor Plan

WEST HOUSE, KANSAS CITY, MISSOURI
Edward Buehler Delk, Architect



WEST HOUSE, KANSAS CITY, MISSOURI
Edward Buehler Delk, Architect



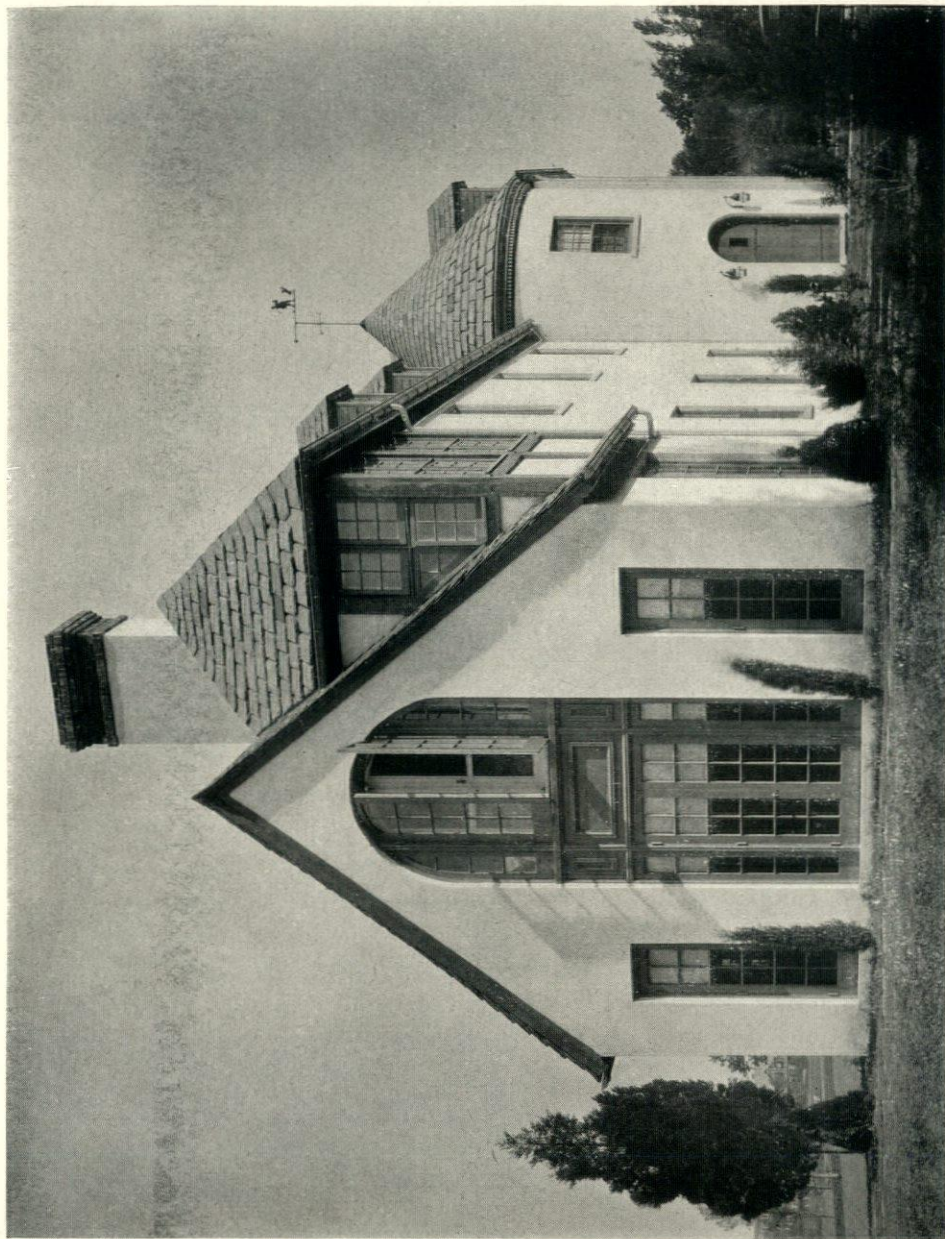
GEORGE ALEXANDER MCKINLOCK MEMORIAL COURT, ART INSTITUTE OF CHICAGO
CHICAGO, ILLINOIS

Coolidge & Hodgdon, Architects

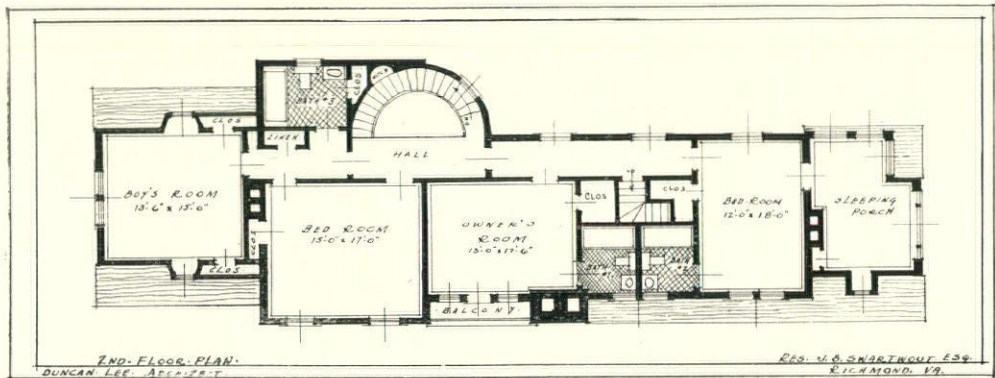


Façade

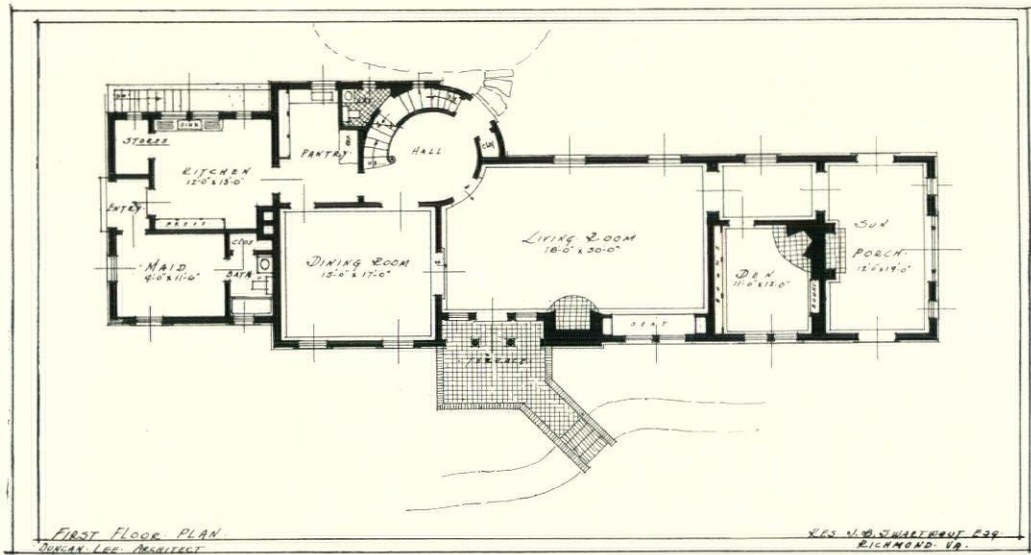
MULVANE ART MUSEUM, WASHBURN COLLEGE, TOPEKA, KANSAS
Thomas W. Williamson & Company, Architects



RESIDENCE OF J. B. SWARTWOUT, ESQ., RICHMOND, VIRGINIA
Duncan Lee, Architect

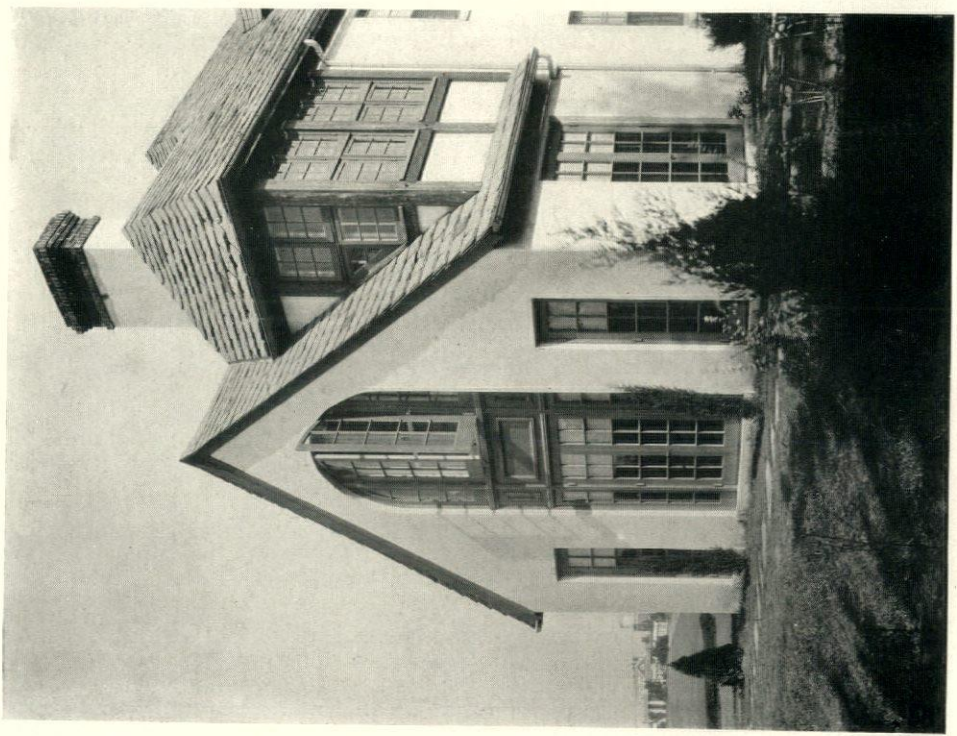


Second Floor Plan



First Floor Plan

RESIDENCE OF J. B. SWARTWOUT, ESQ., RICHMOND, VIRGINIA
Duncan Lee, Architect



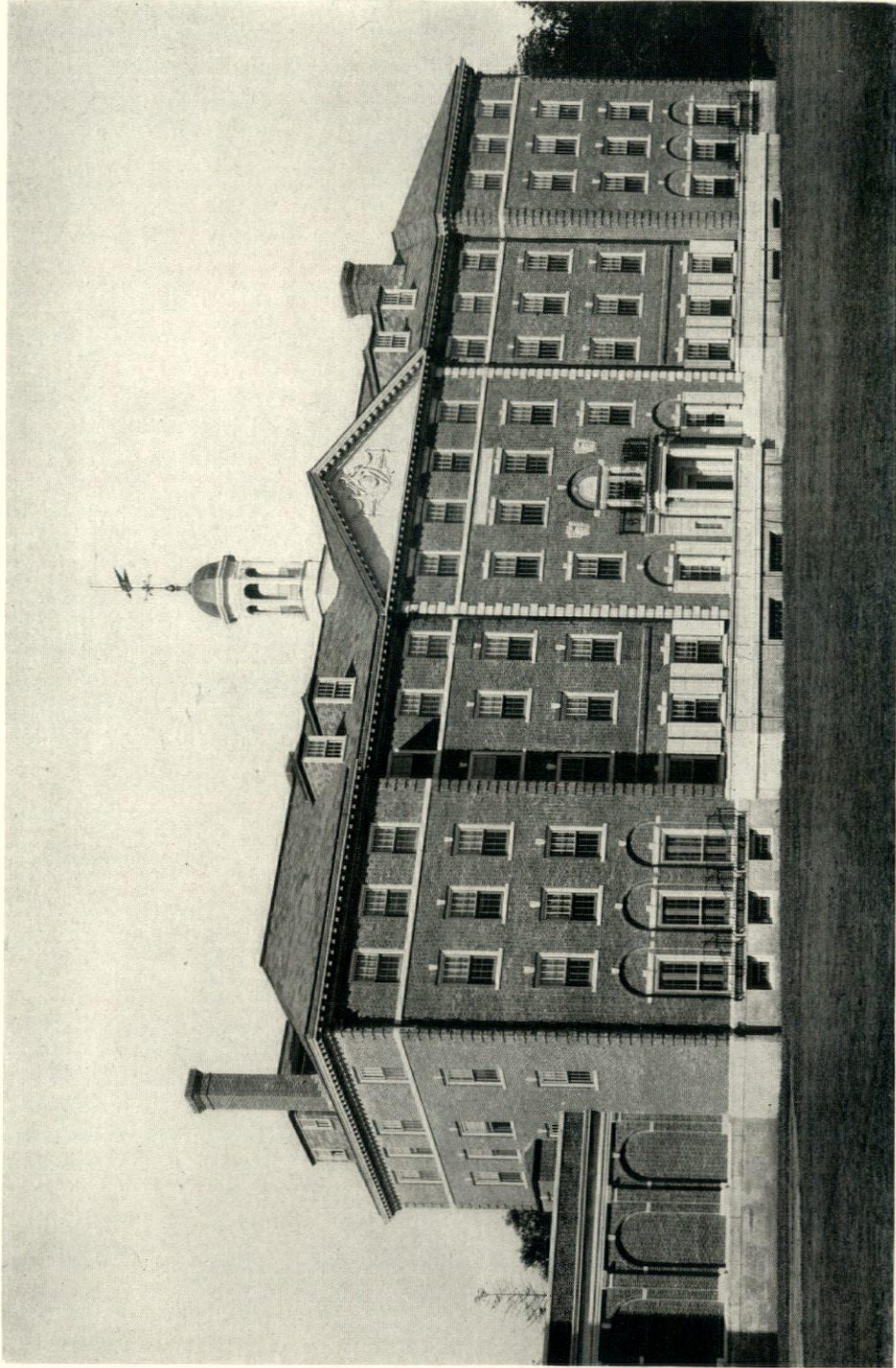
Bay



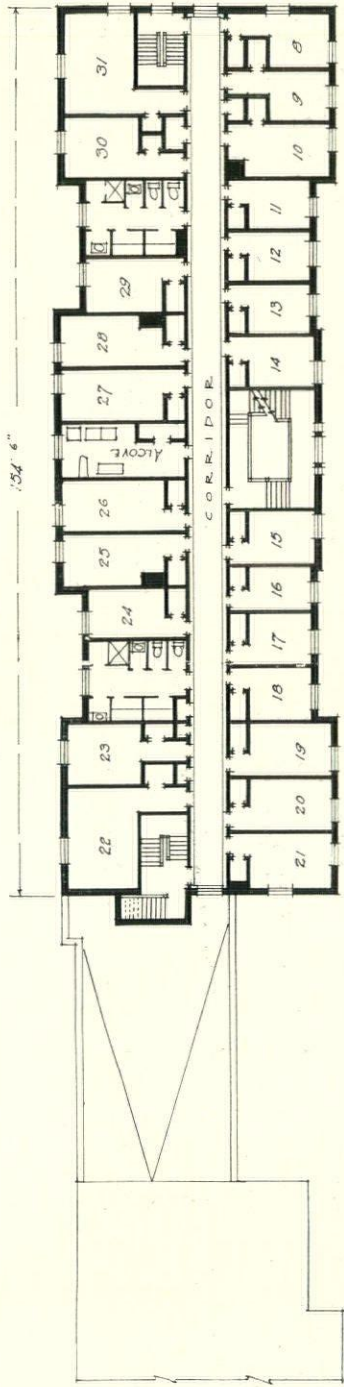
Entrance Detail

RESIDENCE OF J. B. SWARTWOUT, ESQ., RICHMOND, VIRGINIA

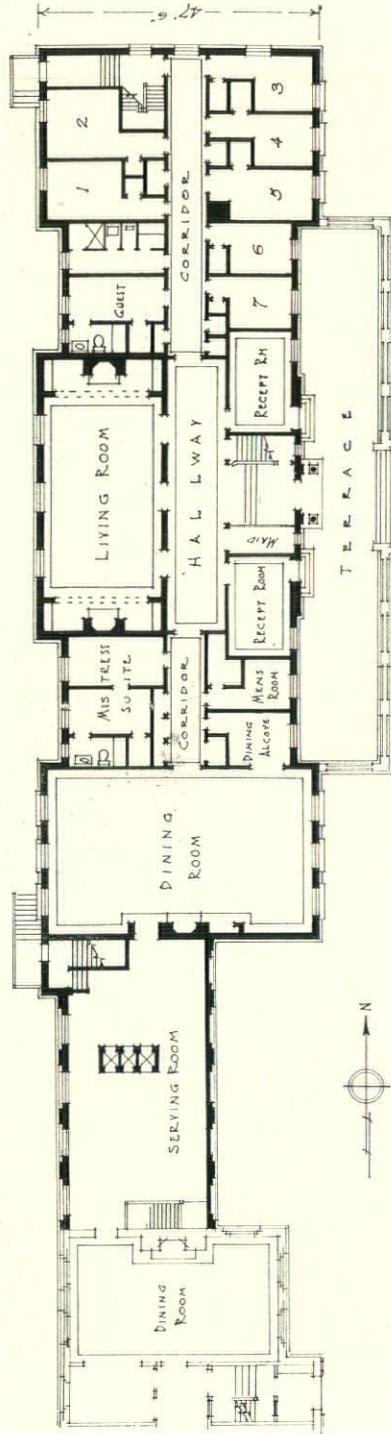
Duncan Lee, Architect



Le Baron R. Briggs Hall, Radcliffe College, Cambridge, Massachusetts
Blackall & Elwell, Architects



SECOND FLOOR PLAN



FIRST FLOOR PLAN

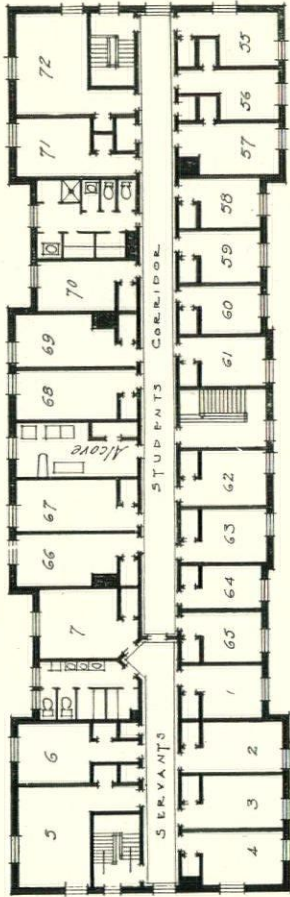
Blackall C. Elwell Architects Boston Mass

LE BARON R. BRIGGS HALL, RADCLIFFE COLLEGE, CAMBRIDGE, MASSACHUSETTS
 Blackall & Elwell, Architects

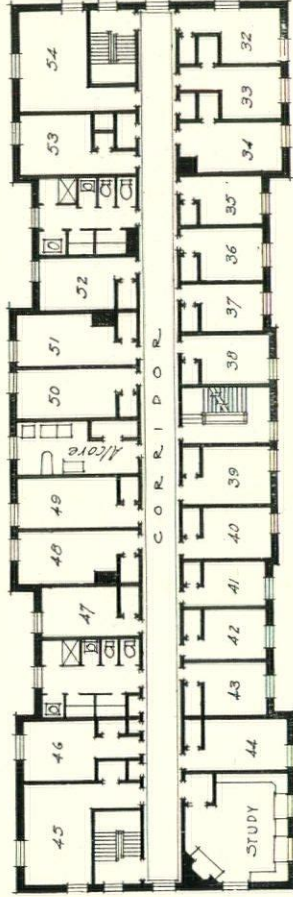


Entrance Detail

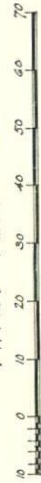
LE BARON R. BRIGGS HALL, RADCLIFFE COLLEGE, CAMBRIDGE, MASSACHUSETTS
Blackall & Elwell, Architects



FOURTH FLOOR PLAN



THIRD FLOOR PLAN



Blackall C. Elwell Architects Boston Mass

LE. BARON R. BRIGGS HALL, RADCLIFFE COLLEGE, CAMBRIDGE, MASSACHUSETTS
 Blackall & Elwell, Architects



Second Floor Hall



Living Room

LE BARON R. BRIGGS HALL, RADCLIFFE COLLEGE, CAMBRIDGE, MASSACHUSETTS
Blackall & Elwell, Architects

LE BARON R. BRIGGS HALL, RADCLIFFE COLLEGE,
CAMBRIDGE, MASSACHUSETTS

A new dormitory for Radcliffe College has been built in honor of LeBaron Russell Briggs, president of Radcliffe College from 1903 to 1923.

Two things governed the design of this building. First, it had to be connected to the present Barnard Hall so that one kitchen and one heating unit would serve both buildings. Second, it must accommodate 75 students.

These requirements necessitated placing a common serving room between both halls, and the dining room of Briggs Hall and the servants' rooms on the south end of the building, to afford direct communication with the serving room.

Much time was spent on the size of the students' bedrooms, as this would determine the size of the building. It was decided to use a 10'0" x 14'0" room. Later, when the bids were received, this was reduced to 9'0" wide and in spite of certain misgivings, has proved satisfactory.

The special features in the building include an alcove on each floor used by the students for cooking, washing, etc. It has a tile floor and hard plaster walls. On the second and fourth floors a drying closet has been placed. On the third floor the closet is enlarged to form a store, run by the student government, where small articles may be purchased. A small suite for guests of the college has been placed on the first floor. A dining alcove connected to the dining room has been provided for the students' use for birthday parties or informal gatherings. On the third floor is a study given by Margaret Coleman Waites, where her library is kept, and where students may retire for study. Many of the rooms have been furnished by the Alumnae or friends of the college, the living room having a memorial fireplace to President Briggs and Martha Carter Cutler.

To control the entrance to the hall a maid's station is placed at the front door, where the public telephone, the dormitory telephone reaching all parts of the building, a system of call bells to each of the students' rooms, the fire alarm and other signals are concentrated.



Brush Memorial
LAKE VIEW CEMETERY, CLEVELAND, OHIO
Wright & Hohl, Architects



Brush Memorial
LAKE VIEW CEMETERY, CLEVELAND, OHIO
Wright & Hohl, Architects

The FUTURE OF LOW-RENTAL HOUSING IN AMERICA ~

By
Frank Chouteau Brown

WHAT IS TO BE the future of low-rental housing in the United States? Now that we have made entrance into this country from Europe so difficult, restricted the number of immigrants, and taken steps to select them almost exclusively from the more skilled workmen of the northern nations, are we prepared to meet even the minimum housing requirements to which these workmen have been accustomed? If so, what have we done, or even planned to do, in that connection? Bear in mind that these restricted immigration laws are in actual operation. These workmen are arriving on our shores. Where can they go to find good, cheap housing in your community, Mr. Reader? It is you who are responsible for thus restricting and selecting our immigration; for thus raising the bars and, as we hope, the living standards, of our citizen aspirants. What have you contributed toward clean, sanitary living accommodations, at a proper cost?

One nation whose immigrants we are particularly inviting to come to us is Germany. Germany has been for years more than any other country (except perhaps England) an exponent of paternalism in providing for the health and housing of her workingmen. In large part this has been done by corporations; but in Berlin, and other cities, it was the Government that directly interested itself in seeing that the slum districts were cleaned out, and all the old houses in them replaced by new tenements of superior convenience and at low rentals.

Last month we saw what had, in part, been done in England, Belgium, Holland, Norway and Sweden, by Governments, Municipalities, Workmen's Societies and others. Some idea also was given of the large scale on which Government, State and City funds were being used to pro-

vide better housing for the lower paid laborers. It was made evident that, in Europe at least, there is by now a widespread realization of the responsibilities of the individual and the Government toward the human elements entering into their economic working machine.

Where the trade does not provide a living wage and that trade is necessary to the wellbeing of a group, the general funds are taken to make up this economic deficit; and the taxpayer is called upon to guarantee the amount necessary for that purpose. His final responsibility is not for a moment questioned. In some part, the individual employer, the organized workmen's unions in these various trades, are also engaged in meeting the situation. But when their efforts fail, or when the matter of housing the unemployed, or crippled soldiers is concerned, the common funds are turned to.

These modern methods have been long established and are well worked out by now. Amsterdam built houses for rental as early as 1874, but, even in England, the speculative builder was the principal source of supply of new housing up to the beginning of the world war, and the only definitely organized housing schemes on any adequate scale, were the enterprises of the more enlightened employing corporations, and these were of course restricted to the towns where their activities were localized.

Such has also been the situation in this country. We have been willing generally to allow the speculative builder to buy land and erect houses on it, in all our cities and suburbs, and this he was content to do as long as he was able to bring in a return sufficient to repay him for his time and energy.

But with recent increases in the prices of labor and materials, the specu-

lative builder has found it profitable to supply only higher priced housing. In that field alone has he found sufficient remuneration to encourage him to continue. The rents the lower paid classes could afford are no longer attractive to these speculators, so they no longer are concerned with building to meet the needs of the lower rental tenants.

The speculative builder has regarded it as his province to buy a tract of land as cheaply as possible, divide it into as small lots as possible, build on it as inexpensively, and sell the resulting product at as high a profit as the traffic would bear. It is the more remarkable that our wealthier home owners have been so ready to contribute to his profits by buying their houses of him.

In the meanwhile, however, he has forsaken altogether the field of the low-rental houses, the low-cost multiple dwelling. As the costs of living have steadily advanced, so has he as steadily progressed from low-rental to high-rental prospects; until we have reached the present impasse—a matter not generally realized.

We must now recognize that the rental of a small, respectable house or apartment, built under present conditions, if producing any sufficient income on the investment, is necessarily too high for the majority of our labor or clerking class to pay from the wages they receive. We must, therefore, concern ourselves with a solution of this economic problem.

The situation is inescapable. If we do not pay workmen enough to live on (and despite the yearly advances demanded by unions, there is still no prospect of their pay advancing in many trades to any amount that *will* be adequate), then either the employers must meet the deficit in some other way, or the community itself *must* do so. The employer abroad has recognized this responsibility and has tried to meet the need, with only partial success. In this country, as we have seen, he has entirely failed, as a class, in realizing even that he has any responsibility in the matter. And so has the community, both as a whole, and in its component parts!

As a stream can rise no higher than its source, so we cannot expect the commu-

nity, city, state, or national government to recognize any problem of the body politic, until *after* it has become the concern of the majority of the individual members. That is the pressing nature of the present situation. The problem is one of long standing. We have wilfully complicated it by recent legislation, and we have not even begun to realize the inevitable results. So, how much time must elapse before we can convince our representatives of this government of the seriousness of the situation? Can this be done before our entire social system has been inoculated with the bacillus of Bolshevism, or widespread social discontent?

Having tried every avenue of escape without success, can it be that we are being driven into Government ownership? We have had experience in the practical workings of Government ownership in our railroads, and even in housing itself during the war; and as a nation, we are convinced of the fact that, in a democracy, at least, it is neither an economical nor an efficient method of administration. By and large, we are convinced that most business enterprises, even Public Utilities, are better administered by individuals directly responsible to their stockholders, than by public servants, who do not seem to realize their responsibilities to the abstract "public" they represent.

When private capital will no longer enter the legitimate business of building and selling or renting houses, and there exist many members of our body politic who are demanding, and are entitled by our constitution to have healthful homes, what is to be done? We have already tried out any number of schemes, and found them inadequate. We have experimented in all manner of ways to reduce building expense, and despite them all have been forced to acknowledge that it is likely to continue increasing year after year. Again we turn to Europe.

In Europe it is now accepted that, failing any other resources, the Government *must* assume the responsibility of housing those who cannot find adequate accommodations for the price they can afford to pay. It is also recognized that the time probably will never return when



Fig. 51

Eight Family, Double Apartment, Cottage Type of Municipal Dwelling in the Schalkburgerstraat, Amsterdam
J. Gratama, Architect

private enterprises will make enough profit in building for the majority of the people, to again engage in that business. Therefore, it is probable that it will be in the future, always the task of the Government to provide housing for the greater part of the population.

Besides the Government, either national or local, only one other means of providing low-rental housing has proved successful in Europe. This is the "Public Utility Society." It is worth while to give a more exact idea of this means of relief in England, for instance.

A Public Utility Society is a "limited company" formed to comply with Treasury limitations, registered, and under the same Government control as other Charitable and Provident Societies. It may be formed for various objects, but the power to deal in land, and provide and manage houses is usually included, while the tenants are generally shareholders in the Society. This fact removes a large part of its "charity" onus and makes the securing of housing relief expressive of individual independence and initiative, therefore an aid rather than a deterrent

to the desired building of character.

Recently, the Government has lent up to 75% of the construction costs, but with increased restrictions as to sizes of houses, designs and rents, and interest at 4½ to 6½%. On this basis either the tenants or the promoters subscribed the remainder of the capital, or an additional amount was made up in "loan stock." Even with this Government aid, however, it has been found that the middle class rather than the actual workingman benefit most from the housing actually built.

Early in 1923 an Act was passed granting a definite sum per house per year for a twenty-year period, by the aid of which it is hoped these societies may be enabled to provide housing at lower cost to the working classes, and at the same time obtain a small but certain return on the money invested. A net 3%, however, is all that is expected in this sort of company abroad. Every energy is exerted toward obtaining the most for the worker-tenant. The members of such a society are not concerned with making profits for themselves or their stockholders. They are building for the perma-

ment social betterment of the individual, the family and their community or country. The capital employed barely pays its way; the members borrow the greater proportion of the needed funds at the lowest possible rate from the city or country. They obtain for their tenants all the results of efficient administration; of quality buying of material, of working in "stock" units or "repeats." They employ all the devices of the speculative builder in purchasing property and building up large tracts in a uniform development, and besides save far more from the low rates at which money expended for public good is obtained from Government agencies.

This "Public Utility Society" is not the only means utilized. The scheme employed in England was used as an illustration because of the more nearly parallel methods of thought common to the two English speaking countries. Let us look at other European countries not so generally regarded as "advanced."

Czecho-Slovakia had over one hundred societies operating in this field before the war; now there are more than 850. Before the war 3,386 houses had been built at a cost of about 25 million kronen. Between the end of the war and June 30, 1923, 14,953 houses were added at a cost of about 1,500 million crowns. In addition to the money available from members' shares, and from savings deposits, the loans from other institutions are guaranteed by the state. Up to 1918 this guarantee extended to 90% of the cost of building. Since that date the state obligates itself to pay the loan if called in, and any annual deficit up to its proportionate part of the loan. From 1919 to 1922 the amount that could thus be secured amounted to 90% of tenement house costs, and 80% of private dwellings. Since 1923 it has amounted to 70% of both. The maximum area allowed for rooms (net) in buildings to which this Government assistance is to be extended, is 80 square metres.

In France the financial resources available for encouraging workingmen's dwelling construction comes not only from the shares of members of the societies themselves, but also from state

loans at 2% to 2½%, repayable in upwards of 40 years in amounts extending up to 75% of the cost of housing not directly subsidized, and to 52% of those subsidized. An amount equal to one-third of the cost of houses is available for large families, provided two-thirds of the investment are for dwellings of this type, and rents are established at not less than half the maximum letting value prescribed by law. The state has 30 million francs available yearly for these purposes. The "Coöperative Societies" have not used their funds so much for houses of this type as "Public Offices for Cheap Houses" who have built many dwellings for large families. Members desiring to own houses subscribe for shares to the amount of 10% at joining, and pay the remainder in from seven to twenty years. State departments may subscribe to an amount of two-thirds of the paid-up capital of members. The houses cannot be sold under cost nor let at less than 60% of maximum values established by law, or 50% to families with four or more children.

It will be seen that France, particularly, aims to assist the large family, which, in her fear of a lowering birthrate, is understandable. The architectural expression of the Slovak or French idea may seem strange to us, while English achievement in this line is perhaps too familiar. What has been done by Germany of late years has not been so well nor so thoroughly done as before the war. Nevertheless, from a review of these nations, it appears that the paternalistic form of Government possesses certain advantages in advancing the cause of humanity, that do not appertain naturally to a democratic form.

Holland provides most comprehensible illustration, but we must remember that in the cities of Holland are still to be found some of the earliest, as well as of the latest and most successful exponents of both the "Society" and Government low-rental housing. First let us take two similar examples, one from each type, and place them side by side. Fig. 51 is a municipally built and rented house in Amsterdam, controlled by the Housing Department. Fig. 52 is owned by a "Pub-

lic Utility Society," the "Algemeene Woningbouwvereenging."

These illustrations show how the effect of the cottage type may be embodied in the low-rental city apartment plan, such as appears in Figs. 53 and 54 in both the single and double width plan. These apartments contain five rooms; three bedrooms, one of which may be used as a dining room, a living room—with or without a bay—and a kitchen. They open

tectural expression. These examples are offered in comparison to the two- and three "decker" tenements of American custom, which, so far at least, have been our height of achievement. The rental of our wooden substitutes averages from \$30 to \$50 a month, in contrast to the comparatively expensive rentals of from \$10 to \$15 for the houses shown. Others nearly as good are available for rentals as low as \$6 to \$7 a month.



Fig. 52

Eight Family, Double Apartment Cottage Type of Dwelling in Rows
Public Utility Society Building, Amsterdam
J. C. Van Epen, Architect

at the rear on the balcony, and are as simple and economical a use of the space as is possible, the variations being largely those governed by the sizes of the rooms.

In the dwellings shown these plans are reproduced on two, and occasionally on the third, or attic floor. In the apparently double family unit shown in Fig. 51, for instance, at least eight families are accommodated and each has its individual entrance and balcony. Fig. 52 shows how these double units may be lined together in longer rows, after the prevailing European fashion, varied by occasional bays and by disposition around open squares, a permanently appealing archi-

These plans may also be utilized for taller structures (Fig. 55) where a more modern type of architectural design is exemplified. Here the individual entrance is abandoned and the apartments are reached from a common stairway (Fig. 54). Fig. 56 is another illustration of the taller building and lower rental type, but here we can see the balcony as an occasional element in the architectural design, a detail that has been more interestingly developed in some still more recent architectural designs in the Netherlands.

The real value of the balcony is better illustrated in Fig. 57, from a snapshot made this summer by Mr. Frank A.

Bourne in Holland. This is no set and formal picture, but gives an intimate glimpse of the life of the inhabitants, gossiping in the rear block passage, with balconies in use in both the upper center and the extreme left. This view shows the rears of some of the smaller, lower-priced dwellings, just as Fig. 58 illustrates a more communal treatment of the space inside a block of taller dwellings. Finally, to illustrate again the modern tendencies in architectural treatment, Fig. 59 shows an unhackneyed but directly practical handling of the corner lot, with a modified bay treatment, evidently planned to secure exposure and sunlight against somewhat adverse conditions, an interesting experiment that does not demand a reduction in the number of stories, an element generally presented by such a problem. This and Figs. 55 and 56 portray some of the tendencies of the younger school of European architectural designers.

All these views illustrate the application of similar plans and designs to a common problem in both city built and owned structures and those of the "Public Utility Societies." Thus we have in our mind's eye some idea of the accomplishments in Europe along the lines we have been indicating.

As far as the writer has discovered, more experiments along the lines of low-rental housing by State and Municipal assistance have been made in Massachusetts than in any other state in the Union. They are therefore here briefly related.

First among these was the passage in 1911, after several years of effort, of the Act creating a "Homestead Commission" in Massachusetts, an experiment in housing with the aid of state funds. In addition it was to foster city planning in the smaller communities. After the Commission was established, Lowell was selected as a representative mill-town. A tract of seven acres was secured within walking distance of city industries, and an appropriation of \$50,000 was made with the expectation of more to be furnished by the state as it was needed. Twelve thousand five hundred dollars was paid for the land, and twelve four and five-room cottages were started. All

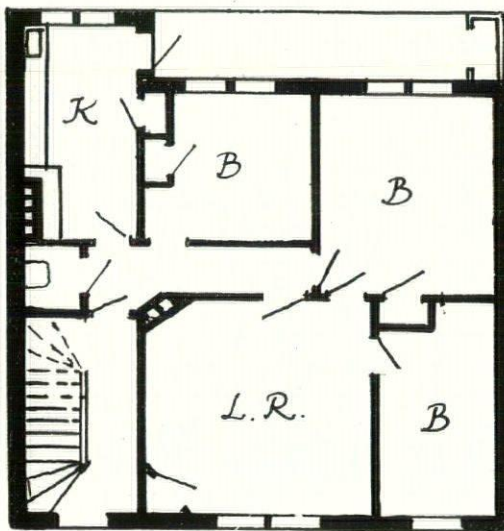


Fig. 53
Typical Single Unit, Five Room Apartment Plan
Housing Department of Amsterdam

the houses built were sold either before or immediately after completion. The preference of the purchasers was for the single dwellings even at a higher price. The selling prices ranged from \$2,400 to \$3,100 a house. In addition to an initial payment of \$100, monthly payments of from \$17.63 to \$22.88 paid for the houses in about 17 years. The money, as repaid, was to revert to the State. The Legislature failed to appropriate the additional amounts necessary to construct forty or more houses, as intended; and this alone prevented the completion of the experiment. Although the element of wartime costs entered into the demonstration, the houses were actually built at an average cost per room of \$500 for the five-room houses, and a considerably lower rate for the four-room semi-detached dwellings.

Even though the project has never been completed, the Commission believes it has demonstrated "the possibilities of constructing, by the use of State funds, houses on fair sized lots of land to be sold on a long-term amortization plan, returning to the State its investment with interest." The Commission also believes that the state should appropriate the money necessary to utilize the land originally purchased, by constructing the

thirty-five additional houses. They also believe that until the whole group has been completed it will not be possible to demonstrate any of the advantages of community spirit.

The Commission also made a study of conditions in various localities in the state, and, as long ago as 1918 reported that "types of dwellings under construction in sections now suburban but rap-

to learn whether or not it is possible to build wholesome houses within the means of low-paid workers."

During the acute housing shortage following the war another act was passed in Massachusetts "To authorize Cities and Towns to provide shelter for their inhabitants in case of emergency."

Section 1. A city or town in which the Mayor or majority of the board of select-

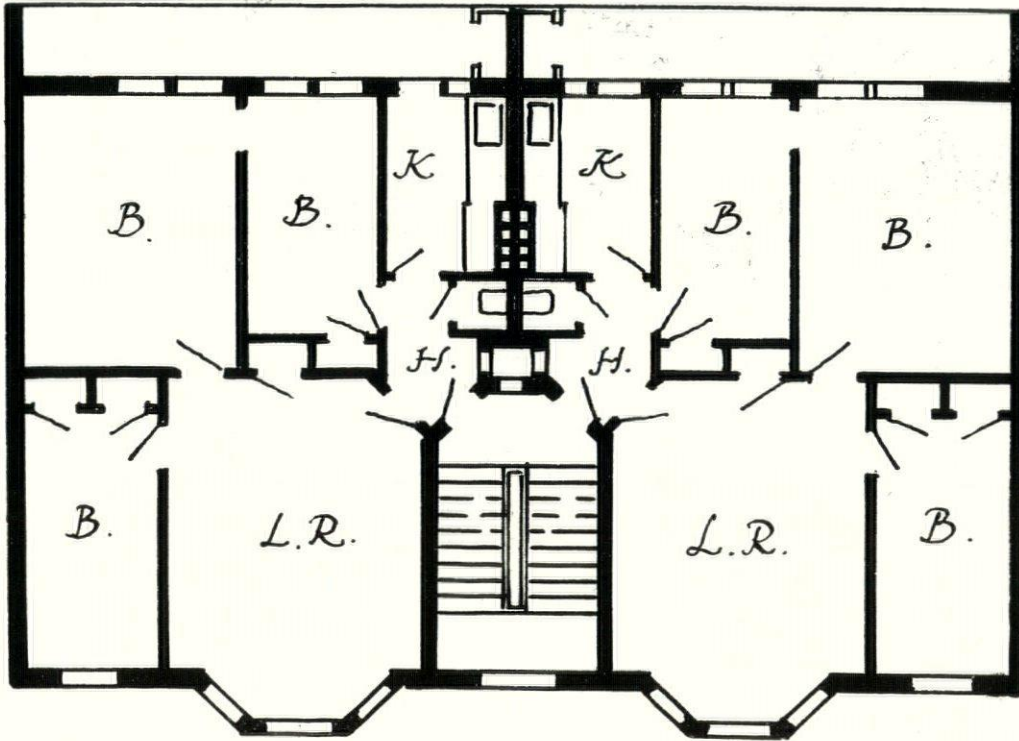


Fig. 54

Typical Double Unit, Five Room Apartment Plan, Housing Department of Amsterdam

idly becoming central clearly demonstrated the failure of capital to realize and provide for the real need of the inhabitants."

In summing up their recommendations for action by the Legislature that year (1918) the Commission stated as follows:

"There are not enough wholesome low-cost dwellings.

"There is no prospect that present methods will ever supply enough, unless the state encourages their construction.

"Therefore the state should experiment

men proclaim that a public exigency or emergency or public distress exists because of an insufficient supply of shelter or available dwellings for its inhabitants may acquire by purchase, or take by right of eminent domain, unimproved or improved real property in fee or for any less estate, and improve or dispose of same in such a manner as to provide shelter for its inhabitants and to afford adequate relief in case of a public exigency, or public distress, as aforesaid.

Section 2. In case a city or town takes property hereunder by right of eminent domain and is unable to agree with the owners as to the damages to be paid there-

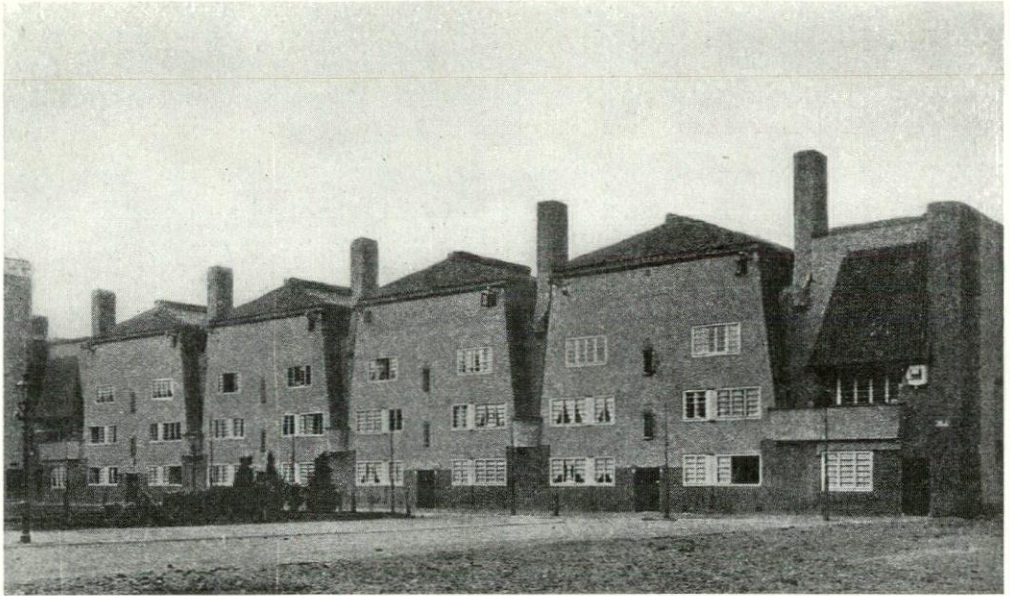


Fig. 55

Apartments in the Henriette Ronnerstraat, Public Utility Society "De Dageraad," Amsterdam
M. de Klerk, Architect

for, the same shall be assessed as in the case of land taken for highway purposes, and shall be paid by the city or town.

Section 3. For the purpose of this act, a city or town may borrow such sums, in excess of a statutory limit of indebtedness, as may be necessary, but not exceeding one per cent. of its assessed valuation, and may issue therefor bonds or notes for periods not exceeding ten years, and otherwise subject to the provisions of chapter 719 of the acts of 1913 and amendments thereof, so far as applicable.

Has any other state in the Union gone as far as this? Or any city or town, either? It is on record that in Milwaukee in 1920 a "Coöperative Garden Homes Company" was organized under a special law permitting Municipal and County authorities to subscribe to shares, with prospective tenants and others interested, somewhat along the line of the ordinary coöperative bank or building society.

In Massachusetts there has been another attempt in this direction. Mayor James M. Curley of Boston organized a "Boston Conservation Bureau," intended originally to carry on several activities that the city had been conducting since the end of the war, and appointed Mr. M.

Douglas Flattery chairman. This bureau intended to carry on some outdoor "Park Shows," study means of relieving the housing shortage and the transportation problem in Boston, and experiment along certain lines of public preventive medicine and hospitalization—all valuable and altruistic public betterments of health, education and living conditions.

A study was made of housing conditions, and the possibilities of municipal aid for them. A special loan was proposed as a relief, at low rates of interest to the city, of a sum of money (\$1,000,000 annually was the amount under consideration), that could be used to build large blocks of houses, all of a "unit plan," similar to that popular in the vicinity of Philadelphia. Each unit would consist of a self-contained two-family dwelling, five rooms to each floor, on narrow lots, between party walls, with exterior brick walls. These could be built at a cost that would enable the tenants to gradually pay for the building from their monthly rentals. Then, as soon as the investment had been placed on a customary bank-loan basis (i. e., the equity

in the property brought by the series of payments to the point when the owner had paid for about one-third of the total cost of his unit) the mortgage would be privately placed, and the sum repaid to the original loan fund. By this means it was intended to make the original loan turn over again and again, in the development of new tracts of property, until an appreciable relief in the housing situation was apparent.

It was not proposed to have these funds used or the developments carried out under the usual municipal auspices, but by a committee of experts, so that the occupants might have all the possible benefits from building in large units, buying property at low prices, etc., even saving over the methods of the speculative builder, as the city could borrow at rates much lower than would be possible from private sources.

As to the occupants and future owners, what of them? It was planned to select them carefully from among the working group only, in families whose total income would be under an established yearly sum appropriate to such a type of house.

They would have to be respectable families, citizens of not less than five years residence, preference given to families with at least five children. It was planned to make the monthly rental low enough to be on a better basis than the ordinary rental common in this class, even though it would take much longer to pay for the house.

The owner was to be restricted in his price to his tenant, and compelled to maintain his sub-rental rate at the sum established by the bureau, as long as he owed for any part of his dwelling. This practically gave control over the property for upwards of twenty years. If, during that time, any occupants should complete payments, they would hardly be able to obtain any higher rental for their second apartment than was the "going rate" elsewhere in the community group—and finally, the very fact of the rentals being established at a definite rate, would go far to place all similar housing accommodations in other parts of that general district at approximately the same rentals unless there still existed a considerable shortage,

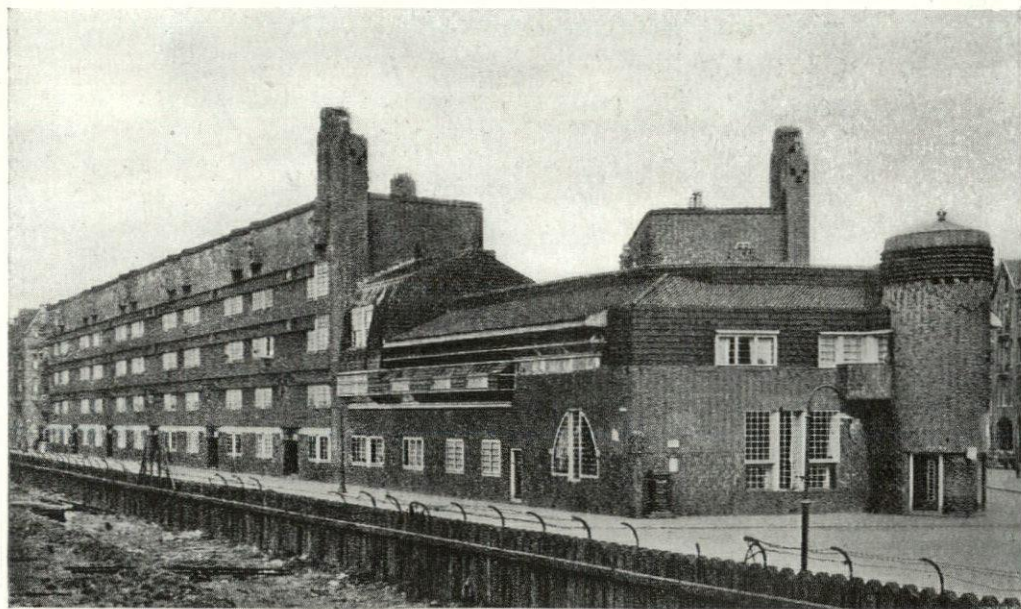


Fig. 56

Apartments in the Zaanstraat, Public Utility Society "Eigen Haard," Amsterdam
M. de Klerk, Architect

in which event it would be the purpose of the bureau to continue supplying housing as fast as it could be absorbed until the entire community would have equal rentals, on an efficient current building cost basis of fair return on the investment, thus placing the whole venture on a normal economic relation to costs, supply and demand.

It is obvious that once this process was in operation, the private builder would be

economic rate for all the property owners concerned.

This project advanced far enough to make definite plans, to estimate them and to secure options on two large areas of land in central Boston on a basis that would have made possible the sale for about \$150 of a lot of about 3,000 square feet, deep enough to carry a two-car garage.

It was figured that a million dollars



Fig. 57

View in Rear of Low-Rental Tenements Showing Yards and Balconies
Housing Department of Amsterdam

driven out of this particular low-rental building field; but he did not exist at that time as an element. Holders of old property could still derive a rental income based on the cost of remodeling their property at current prices. Even after many of the occupants had purchased their homes, the rental values could be maintained by building from time to time a block of new houses, to keep even with the growth of the demand, putting the new property on the market at a rental that should continue to maintain a fair

yearly would build about 200 homes, and that each appropriation would have been repaid in about five years, as the payment of only 5% in addition to the annual interest payments, would reduce the mortgage to the point where it would be then available for refinancing the houses, on the basis customary in savings bank mortgages.

It was expected that the city could finance these operations by loaning the money at about 5%, and still make a small profit over what it would have to

pay for the money itself. Money that was at first considered available for this use, was afterwards found legally unavailable. The project, therefore, is still in abeyance. This seems to be the entire record of accomplishment in this country.

It has been the purpose of this series to preach individual responsibility in this vital matter. Accepting this, it must appear that we should invent some new, or make use of some existing, means of uniting to improve the bad housing conditions we know to exist.

We have been unable to find any practical existing means to effect this purpose. We have been unable to discover much of assistance in any of our experiments, except on the basis of individual economical administration of public funds along such lines as have been shown to be in practical use abroad. But we have still to devise, and pass, the laws making such large sums of public money available. That accomplished, it is apparent from what we have already done in this country, that we should not have much difficulty in organizing its proper employment. Much of the necessary machinery and experience already exists. The social worker, the city planner, the architect, all stand ready, as never before. Unfortunately, we can expect little aid from organized labor. They do not possess either the vision or the intelligence to reason beyond their hours of labor and the price per hour. Union labor is at last entering the field of finance on its own responsibility. It may yet find there the means of self-education as to its own position in the social scheme.

A bank for the exclusive use of the farmer is organized, to be run with Government money; in other words, your money and mine! Why, therefore, cannot the Government make loans to builders, thus perhaps avoiding the lament of the builder that he cannot compete with Government capital, if it is invested in his business of building and renting. Instead of competing, let the Government money be used to aid him; that is, if he is disposed to enter the field of low-rental housing. This makes the low paid workingman a favored class, perhaps. Who more than he, deserves it? If we do not



Fig. 58
Community Garden in Rear of Apartments in the
Vaartstraat, Public Utility Society "Patrimonium,"
Housing Department of Amsterdam
Kuipers & Ingwersen, Architects

pay him a fair working wage, are we not in duty bound to provide him with a healthful habitation, if only that he may rear his family to be good citizens?

The National Housing Association has stated that three vital factors are blocking low-rental building today—high interest rates, high cost of building material, high cost of labor. Let us briefly consider these factors. A permanent loan can be secured today as low as $5\frac{1}{2}\%$, on well secured risks. This is not low enough for the class of housing we are interested in. Government credit has got to be extended to help the situation. In England the original financing on work of this kind has rarely been more than $3\frac{1}{2}\%$, and often as low as 2% . We can expect no private money in America to become engaged on as low a percentage as this.

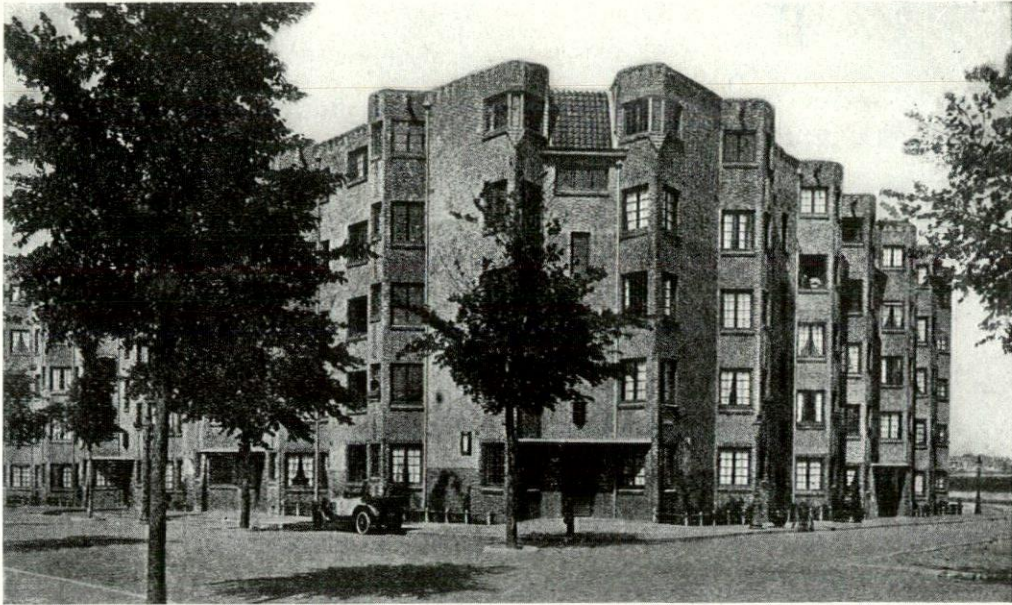


Fig. 59

Corner Apartment in the Amstelveenschweg, Public Utility Society Building
Housing Department of Amsterdam

J. C. Van Epen, Architect

High cost of building material and labor is the next factor. These causes are one and the same. Building material is more costly because of the higher cost of the labor that goes into its manufacture. The cost of brick, clay or iron metal, in the earth, is no more now than when the world was made, but the process of mining, manufacturing, transportation and erection, is continued only by the use of more and more costly labor, year after year. It has been said that 75% of a building cost is labor cost. If all labor could be estimated back to the source, it is more likely that it would bear a 90% to 95% ratio to the total.

It is this labor cost that remains the real crux of the situation. The only way to reduce that would be by the formation of a "Union to resist Unions," and a refusal to undertake *any* building operations until the more expensive grades of labor were forced again to give an adequate day's work for a fair day's pay.

To obtain good housing at low cost the utmost benefits from coöperative buying of land and materials in large

quantities are necessary. Economical building has to be undertaken on a large scale, by building groups of at least a hundred houses at a time, with all detailed parts as consistently standardized as possible. The land must be secured in large areas, and laid out to obtain the utmost advantage from its natural resources. Unnecessary luxuries must be eliminated; planning must be skilful, looking toward economical construction; stock lengths of lumber and materials must be used; the arrangements of baths and plumbing must be judicious—in short, there must be the thoughtful consideration of all those elements that the skilled designer always regards in planning economically and well.

Furthermore, it must by now be apparent that Government assistance, National, State or Municipal, in the financing of such large projects is essential to their ultimate success. Are we prepared to accept and work for this conclusion now? Or shall we be forced into it too late? The next few years will tell.

— The —
ENGLISH PARISH CHURCH
AND ITS DETAILS

By
Robert M Blackall

Measured Drawings and Photographs by the Author

CHURCH OF ST. MICHAEL'S
AT SOPLEY

The Church of St. Michael's at Sopley is planned for a larger number of people than could usually be taken care of by a single nave and apse. Although aisles have been added, they are only six feet wide and are not really to increase the seating capacity, but are more structural aisles, probably built at the same time as the nave. In this church, to get the increased seating capacity, wings similar to transepts have been placed, allowing more seats than the narrow aisles afforded. While in plan the transepts appear structural, in actuality there is no crossing in the nave, as it runs continuous from the apse arch to the rear. It is only when one is in the front of the church that one becomes cognizant of the transepts. The section shows the plain wooden roof supported by a king post truss, and sloping roof over the aisles.

CHURCH AT SWALCLIFFE,
OXFORDSHIRE

Like the church at Sopley, that at Swalcliffe has three aisles, being planned for a larger number of people than could be accommodated in the single nave and single aisle. It marks the third development in plan from the simple nave. It gives a balanced plan, and is the type more commonly used in America for a small church. It is interesting to note that the tower has been made an integral part of the church by being placed somewhat inside the interior and not simply attached at the end. In cross section the church again is thoroughly English. Relatively flat roofs, with parapets, as strongly contrasted to the English church with steep

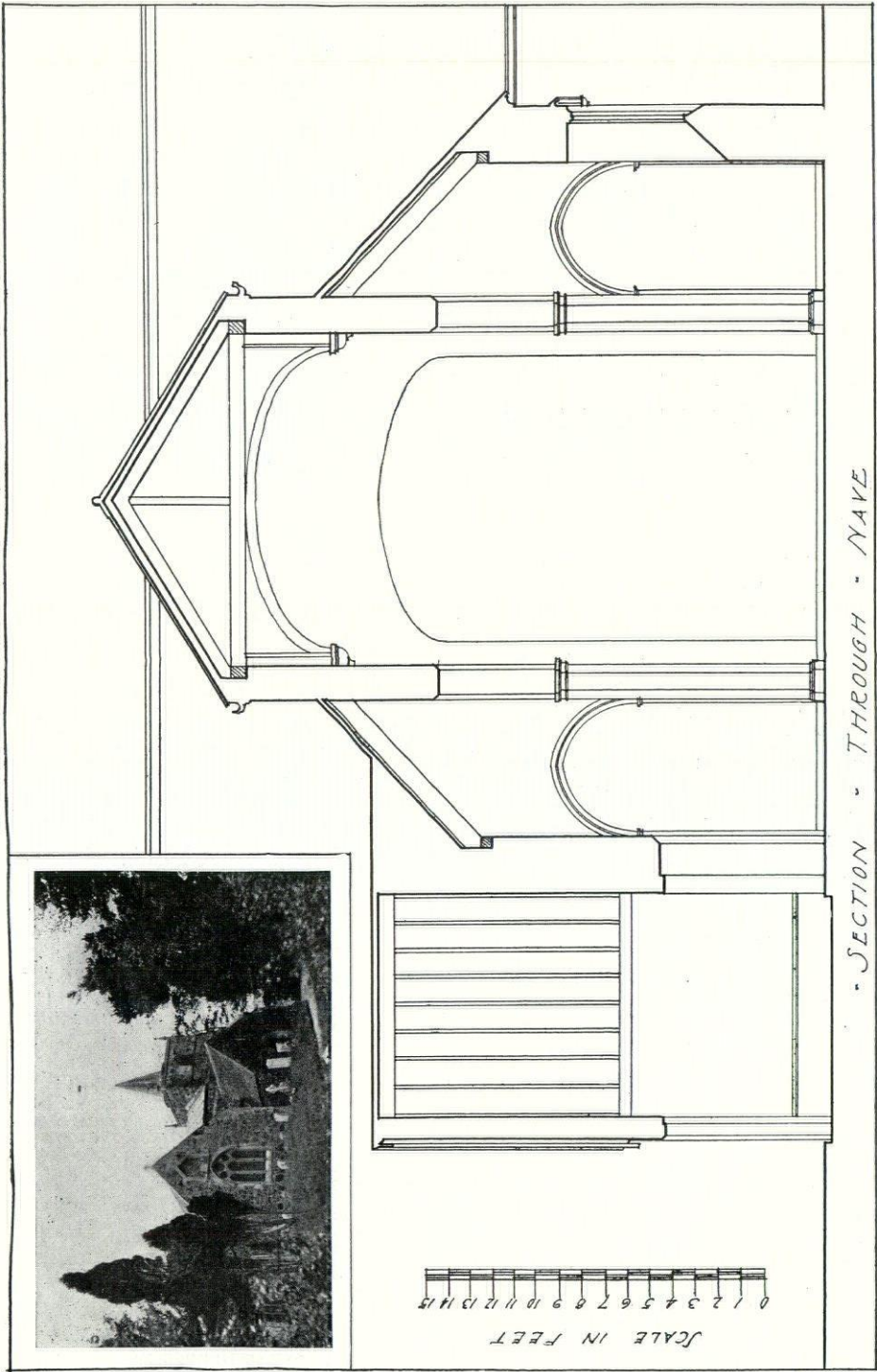
roofs—this may be called the simplest of the single apse three aisle churches. It will seat approximately four hundred people.

THE CHURCH AT FORDINGBRIDGE,
HAMPSHIRE

The church at Fordingbridge, Hampshire, in sharp contrast to that at Sopley, is plainly a growth. Perhaps the aisles and the central apse were built at the same time, but not only has the tower been placed in a peculiar location, being in the left aisle, but the second apse has been added to form a small chapel. This marks the step from a one apse, three aisle church to a three apse, three aisle church. It is interesting to note, also, that the tower, which usually is placed at the end of the church on the main axis, is built in the centre on one side. A rare feature are the two porches, one on each side and another addition are the rooms for the clergy, at the right of the main aisle.

In the sections we note there is no structural connection in placing the trusses to center over the piers, but they have been spaced evenly, regardless of the location of the piers. In the cross section the roof has a decided pitch, and not the usual flat surface as is seen in the aisles. Over the central apse is a beautiful arch braced rafter ceiling, similar to the hull of a ship. This does not seem unusual, as Fordingbridge is close to the sea, and like the little church in Hingham, Mass., was perhaps built by shipbuilders.

The roof of the left aisle, a photograph of which appears at the end of this series, is a beautiful example of carved hammer beam trusses. The seating capacity of this church is approximately 350.

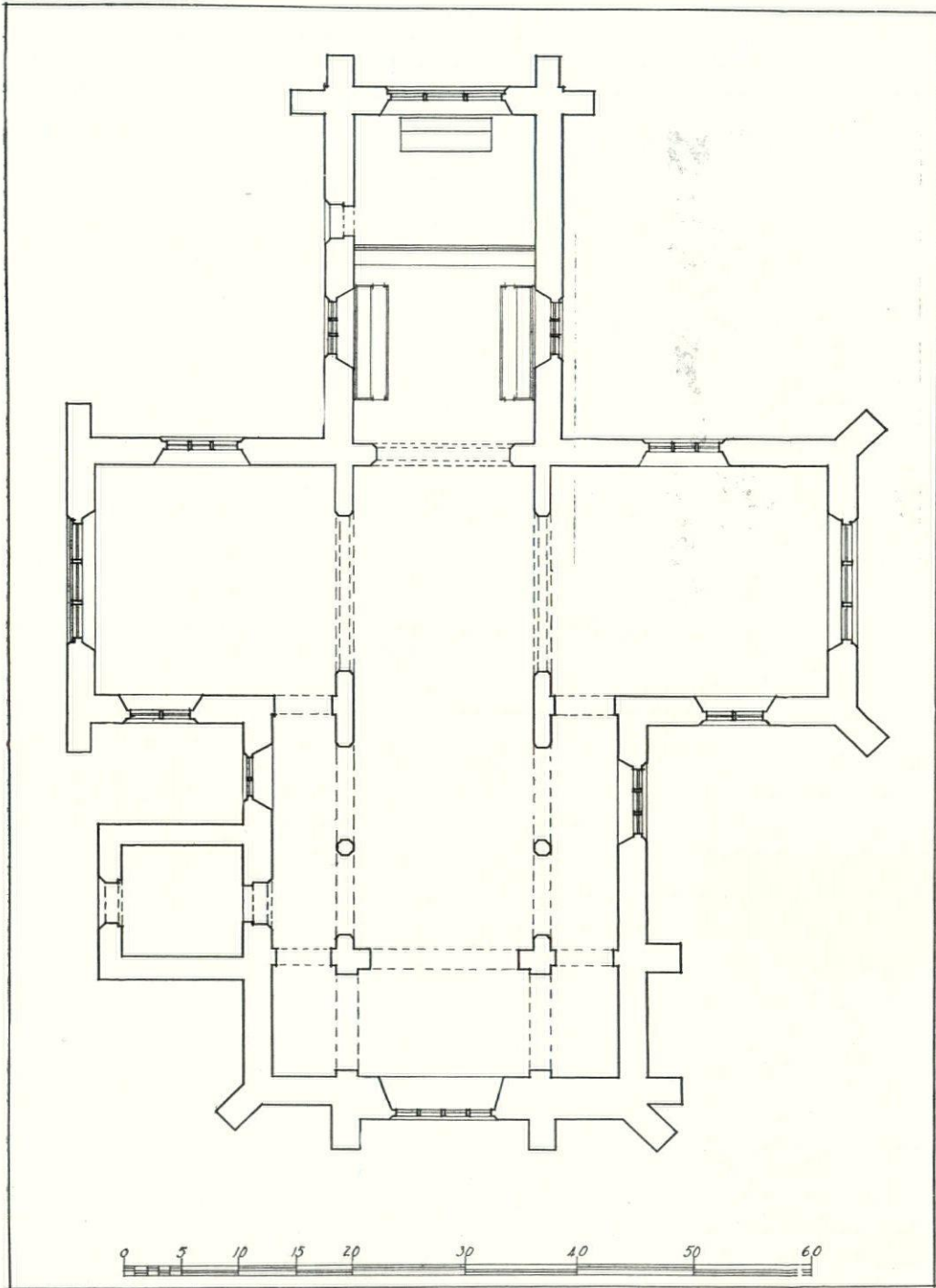


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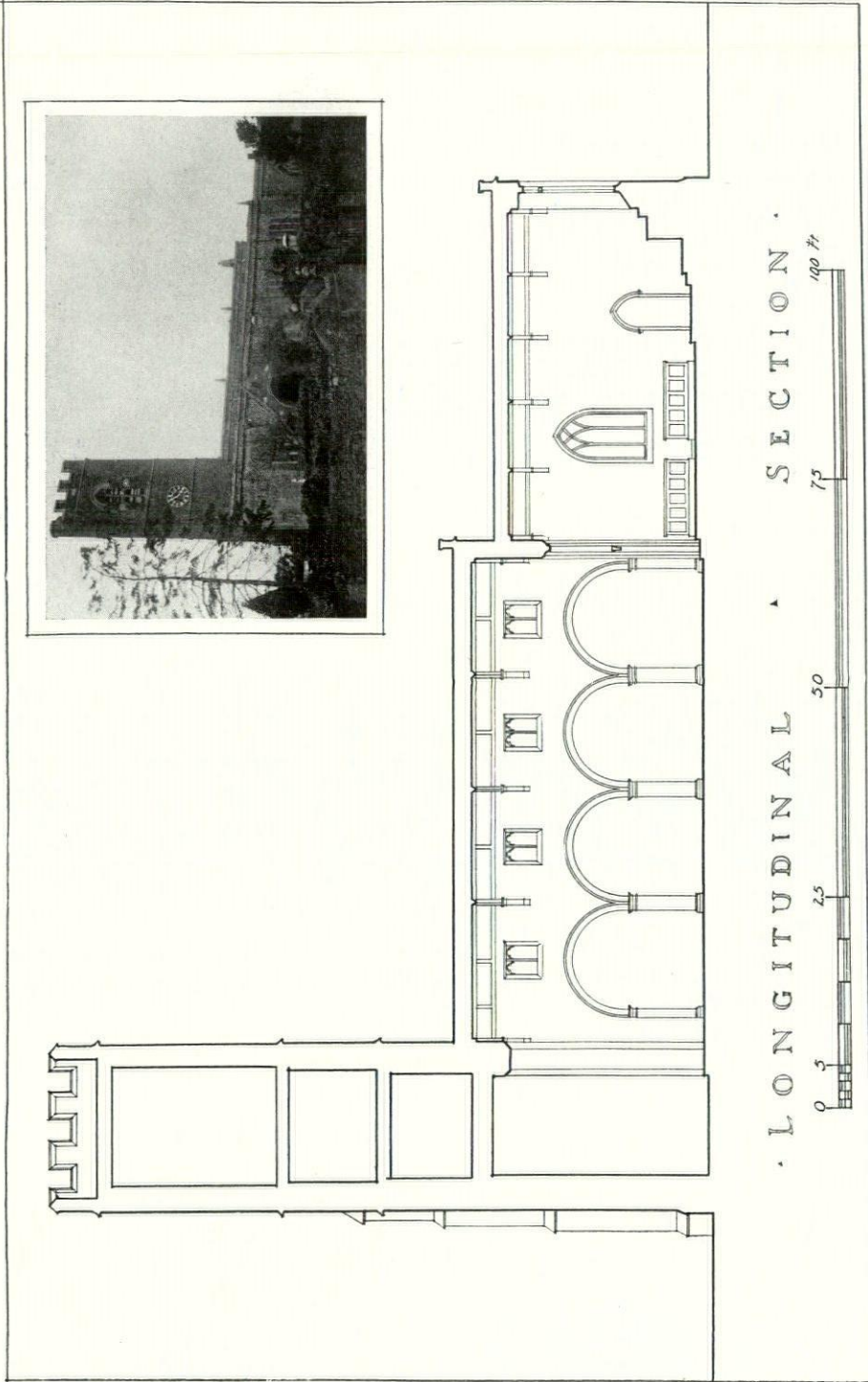
CHURCH OF SAINT MICHAEL'S AT SOPLEX, HAMPSHIRE

Photograph and Drawing by Robert M. Blackall

The Architectural Record



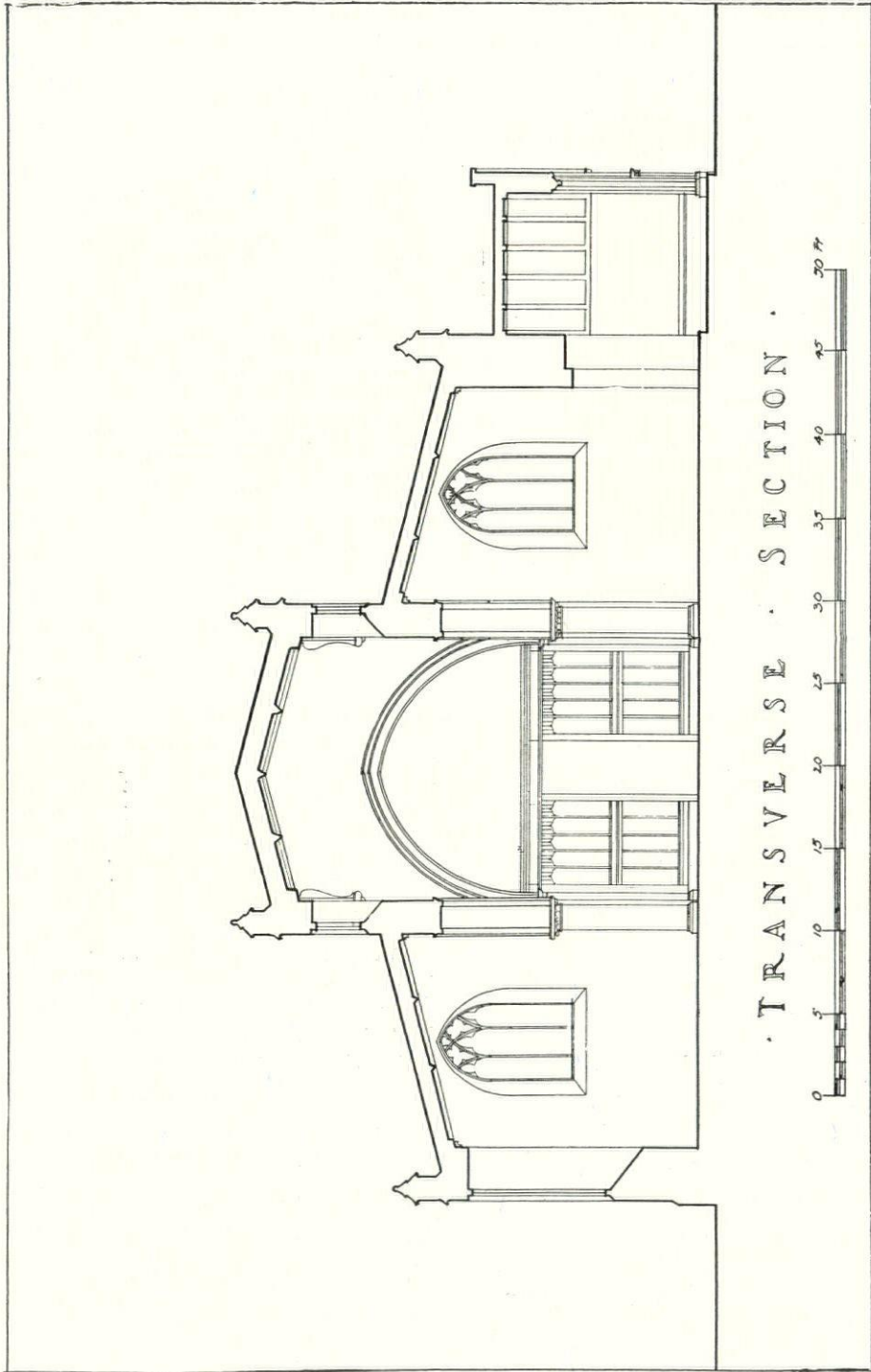
Floor Plan
CHURCH OF SAINT MICHAEL'S AT SOPLEY, HAMPSHIRE
Measured and Drawn by Robert M. Blackall



The Architectural Record

CHURCH AT SWALCLIFFE, OXFORDSHIRE
 Photograph and Drawing by Robert M. Blackall

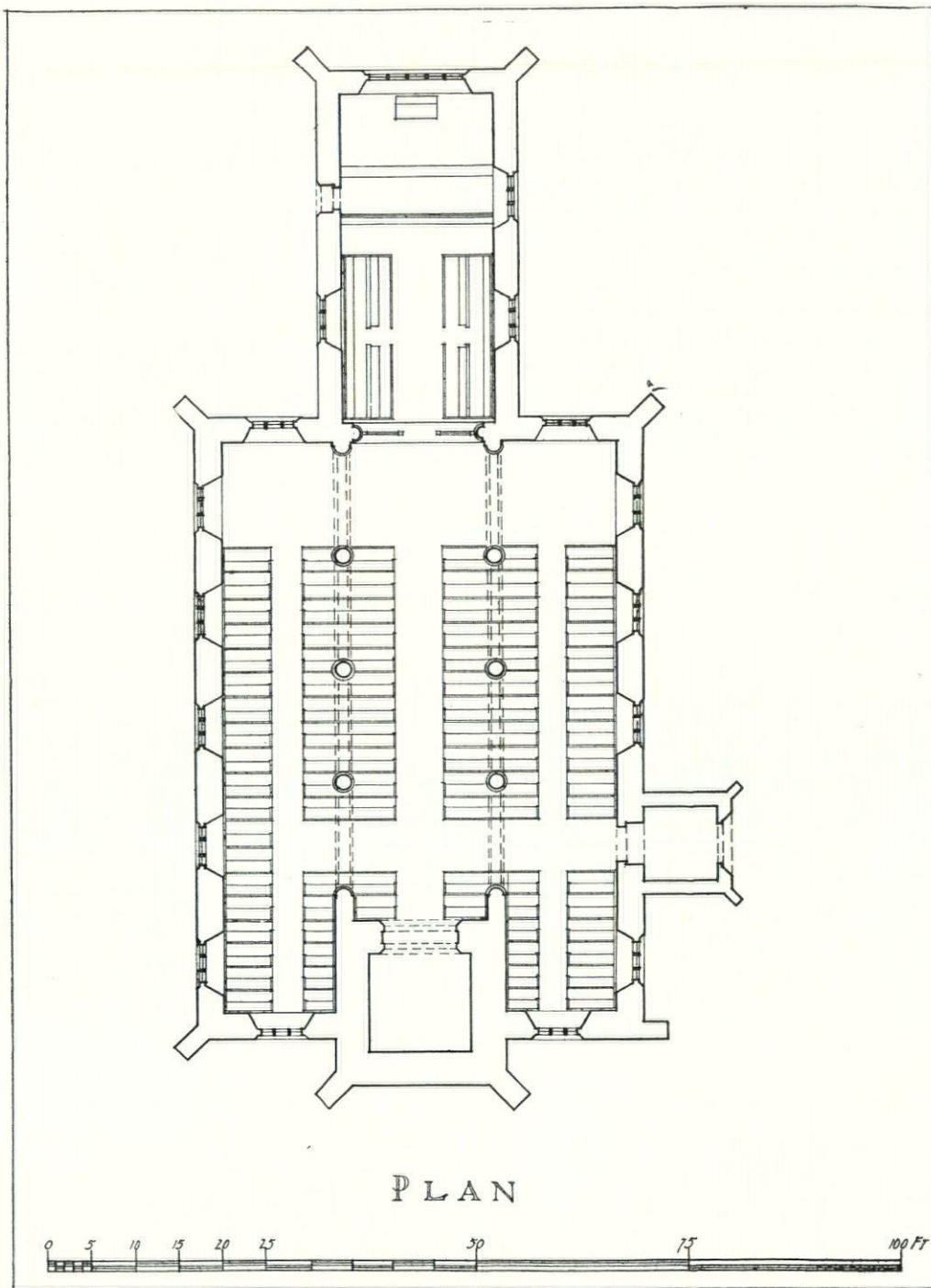
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The Architectural Record

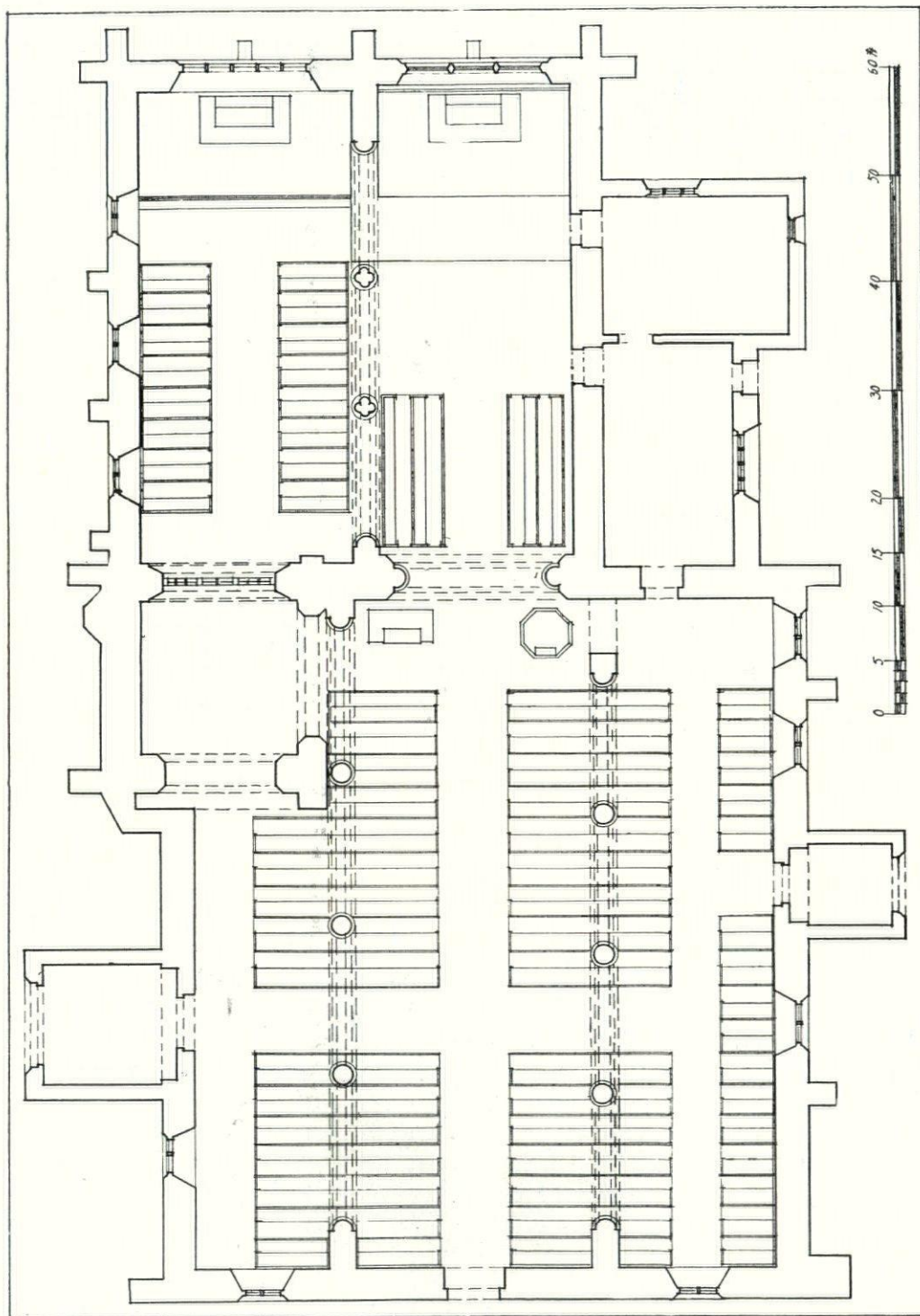
CHURCH AT SWALCLIFFE, OXFORDSHIRE
 Measured and Drawn by Robert M. Blackall

January, 1925

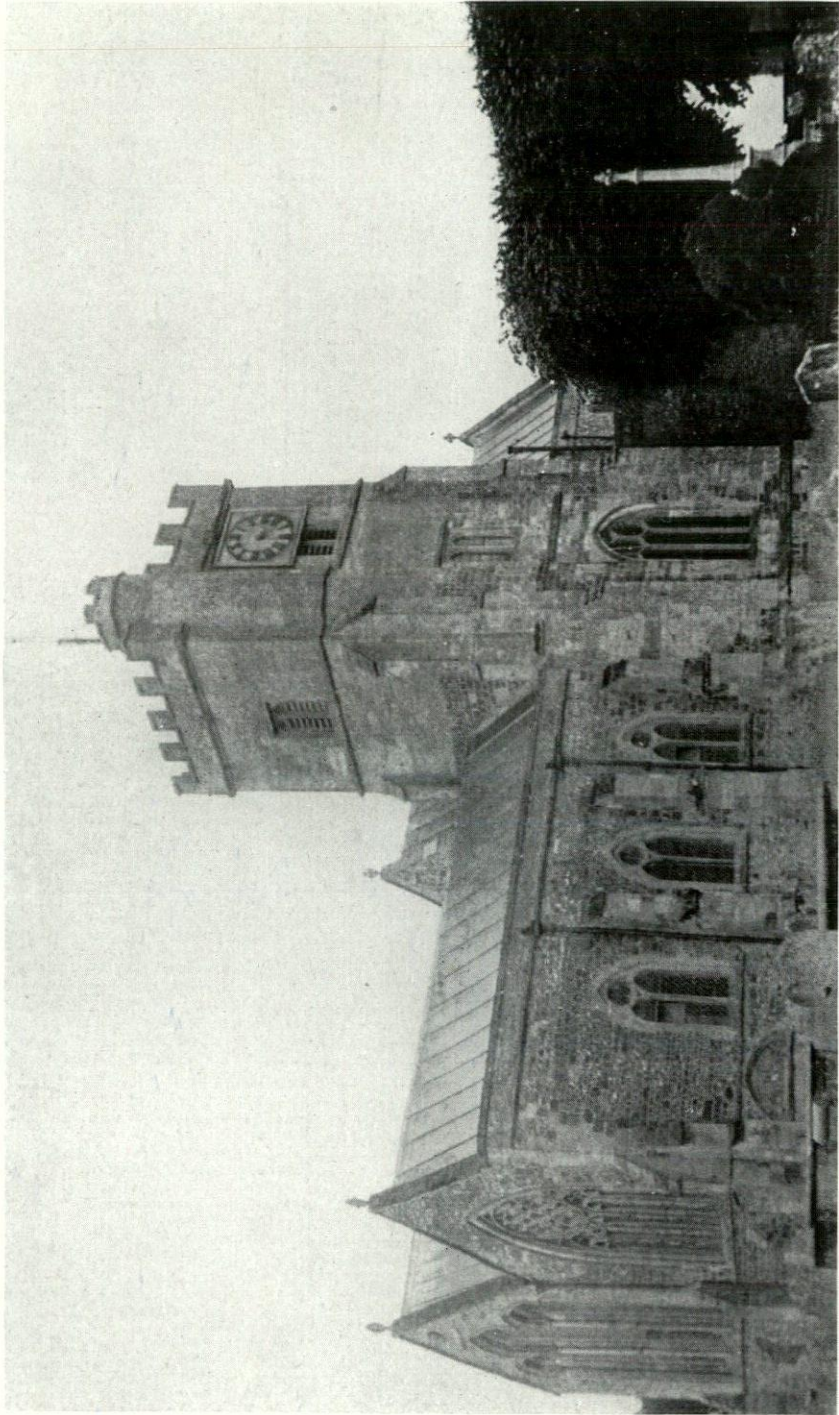


CHURCH AT SWALCLIFFE, OXFORDSHIRE

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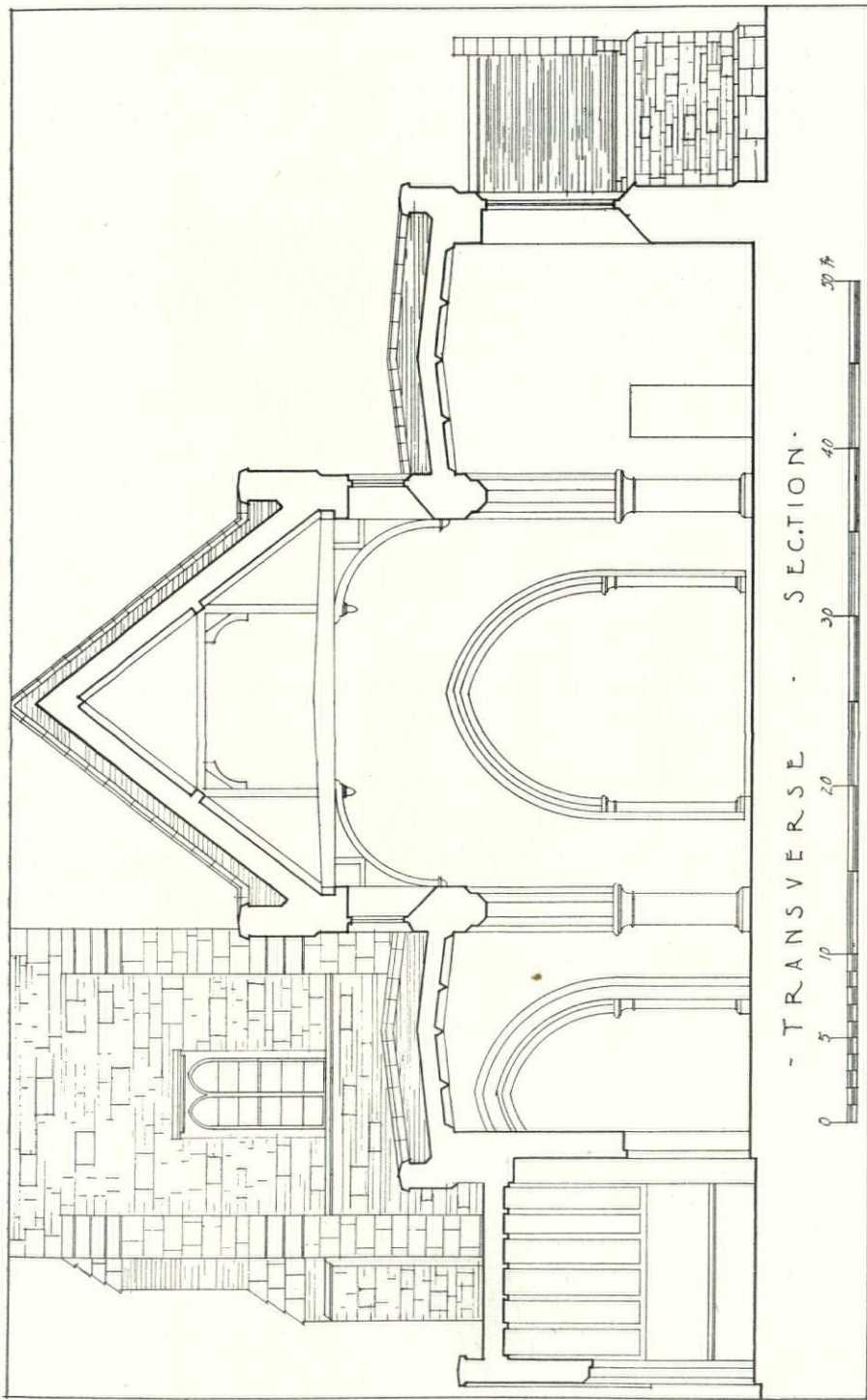
CHURCH AT FORDINGBRIDGE, HAMPSHIRE
Measured and Drawn by Robert M. Blackall



The Architectural Record

CHURCH AT FORDINGBRIDGE, HAMPSHIRE
Photograph by Robert M. Blackall

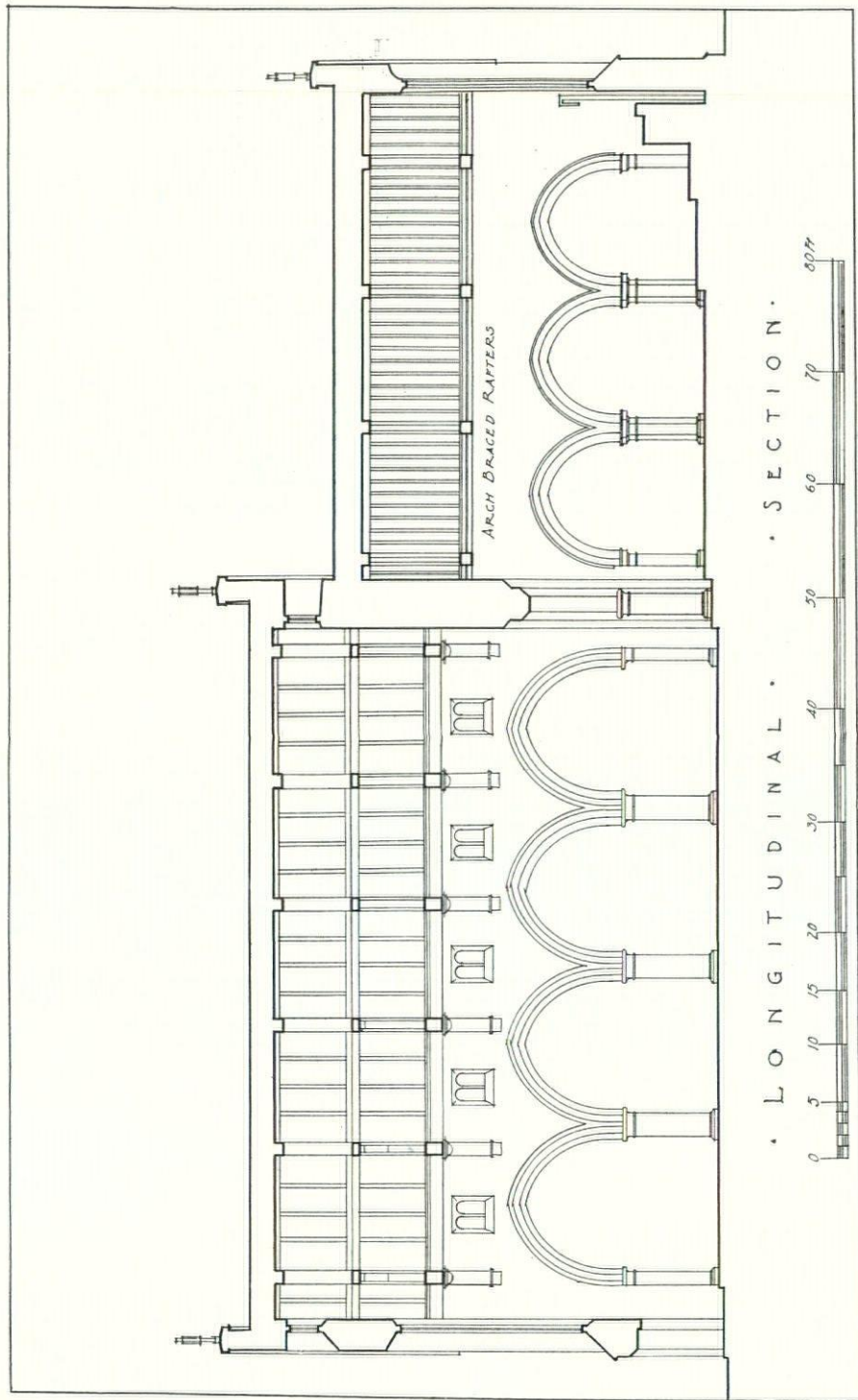
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The Architectural Record

CHURCH AT FORDINGBRIDGE, HAMPSHIRE
 Measured and Drawn by Robert M. Blackall

January, 1925



CHURCH AT FORDINGBRIDGE, HAMPSHIRE
 Measured and Drawn by Robert M. Blackall

THE BUILDING OUTLOOK FOR 1925

By WILLFORD I. KING, PH.D.

THE YEAR 1924 has proved a puzzle to forecasters, for some of the tried and trusted curves that are almost counted on to foretell the future have gone sadly astray. There is no doubt, on the other hand, that a number of the indicators of business conditions have run true to form. For example, the curve showing the value of factory production could scarcely have fit in better with the normal forty-months cycle had it been made to order. The activities of the mines and railways have oscillated almost in unison with the changes in factory output. Factory employment naturally has shown fluctuations similar to those of factory production. Wholesale price indices have likewise moved in sympathy. Most of the curves purporting to show general business conditions, being dominated by the items just enumerated, have given a picture corresponding to our idea of a strictly orthodox cycle.

But there is a fly in every ointment, and the intruder troubling the forecaster in this case is the erratic behavior of the security markets and also of the various factors pertaining to the construction industry. The normal thing is for stock prices, accompanied by the building curve, to attain their highest level a few months preceding the time when manufacturing, mining, and railroading are at the crest of the wave. Chart I shows us that, in the present instance, the volume of building contracts let reached an unusually high pinnacle at the beginning of 1924. This would lead us to expect great activity in manufacturing and the allied fields in the summer of 1924. Strangely enough, this is almost exactly the reverse of the truth, for that date represents the lowest point yet attained in the recent depression. One cannot well accuse the factories of misbehavior, for, as before stated, they have adhered closely to the orthodox forty-months cycle. It is the building industry that has been recalcitrant and has ignored its time schedule.

This departure makes it extremely difficult to guess what is going to happen, for who can tell whether this erratic movement is transitory and will be followed by a prompt return to the normal course, or whether, instead, it indicates that some new, unmeasured, and precedent-breaking force has entered the field with the intention of remaining indefinitely? Under such circumstances, is it worth while even to consider making a forecast for 1925? That is hard to say. It may be of interest to turn back to my article in *THE ARCHITECTURAL RECORD* for January, 1924, and see how well or how badly the guesses made at that time have turned out.

In that article, I expressed the opinion that interest rates had nearly reached a peak and that they would be falling during the latter part of 1924. Chart I shows that, as a matter of fact, they were at their highest point at about the time the article was written and that they have been falling consistently ever since.

In regard to the general business outlook, I expressed my views thus: "The depression of 1924 promises, then, to be mild in comparison to the terrific smash of 1920-21." At present, this prediction seems to have been accurately fulfilled.

Further on, I said, "If the construction deficit is to be made up soon, it would appear not unlikely that, even in 1924, building might remain active. The chances are, however, that part of the deficit will remain, either permanently or for a considerable time." As a matter of fact, Chart III shows that 1924 has been the first year in which any headway has been made in eliminating the building deficit accumulated during the war and immediately thereafter. Even now, we are by no means sure that this deficit will ever be made up. Last year's article puts the matter this way: "In the great cities, rents and construction costs have both increased somewhat more than the prices of other commodities and the incomes of tenants have not proved equal

ESTIMATED VOLUME OF CONSTRUCTION IN THE CONTINENTAL UNITED STATES AS COMPARED TO THE ESTIMATED CUSTOMARY REQUIREMENTS FOR NEW AND OLD POPULATION

1902-1924, Inclusive

A Year	B Money Cost of Buildings (Millions of Current Dollars)	C Index of Construction Costs	D Cost of Buildings at Prices of 1913 (Millions) $B \div C$	E Improvements Demanded by Existing Population (Millions of 1913 Dollars) ^a	F Improvements for Additional Population (Millions) $D - E$	G Increase in Population (Thousands)	H Construction per Person Added to Population (Prices of 1913) $F \div G$	I Customary Construction in Millions at Prices of 1913		J Construction for All Purposes $E + I$
								For Additional Population ^b	For All Purposes $E + I$	
1902.....	\$1,513	.729	\$2,075	\$671	\$1,404	1,452	\$967	\$1,729	\$2,400	
1903.....	1,632	.807	2,023	688	1,335	1,467	909	1,747	2,435	
1904.....	1,893	.794	2,384	700	1,684	1,474	1,142	1,755	2,455	
1905.....	2,603	.831	3,132	714	2,418	1,752	1,380	2,087	2,801	
1906.....	2,743	.905	3,030	731	2,299	2,077	1,107	2,474	3,205	
1907.....	2,527	.951	2,657	749	1,908	1,846	1,033	2,198	2,947	
1908.....	2,214	.914	2,422	761	1,661	1,356	1,225	1,615	2,376	
1909.....	3,026	.934	3,240	778	2,462	2,173	1,133	2,588	3,366	
1910.....	2,905	.964	3,014	794	2,220	1,635	1,358	1,947	2,741	
1911.....	2,829	.970	2,917	806	2,111	1,293	1,632	1,540	2,346	
1912.....	3,009	.981	3,068	819	2,249	1,686	1,334	2,008	2,827	
1913.....	2,805	1.000	2,805	834	1,971	2,069	952	2,464	3,298	
1914.....	2,606	.968	2,693	850	1,843	1,497	1,230	1,783	2,633	
1915.....	2,651	.984	2,694	862	1,832	1,345	1,362	1,602	2,464	
1916.....	3,275	1.168	2,804	874	1,930	1,535	1,257	1,828	2,702	
1917.....	2,754	1.440	1,912	887	1,025	1,262	812	1,503	2,390	
1918.....	2,349	1.604	1,464	897	567	672	845	800	1,697	
1919.....	3,893	1.896	2,053	902	1,151	1,186	970	1,413	2,315	
1920.....	3,775	2.430	1,553	914	639	1,701	376	2,026	2,940	
1921.....	3,107	1.749	1,777	931	846	1,723	491	2,052	2,983	
1922.....	4,798	1.704	2,816	943	1,873	1,585	1,182	1,888	2,831	
1923.....	5,306	1.890	2,807	958	1,849	1,943	952	2,314	3,272	
1924.....	5,900 ^c	1.870 ^c	3,155 ^c	974	2,181 ^c	1,560 ^c	1,398 ^c	1,858	2,832	
Total								58,495	Total	62,256

^aAverage Population multiplied by \$8.59.
^bIncrease in Population multiplied by \$1,191.00.
^cRough preliminary estimate.

to the added strain. People have become injured to a greater degree of crowding.”

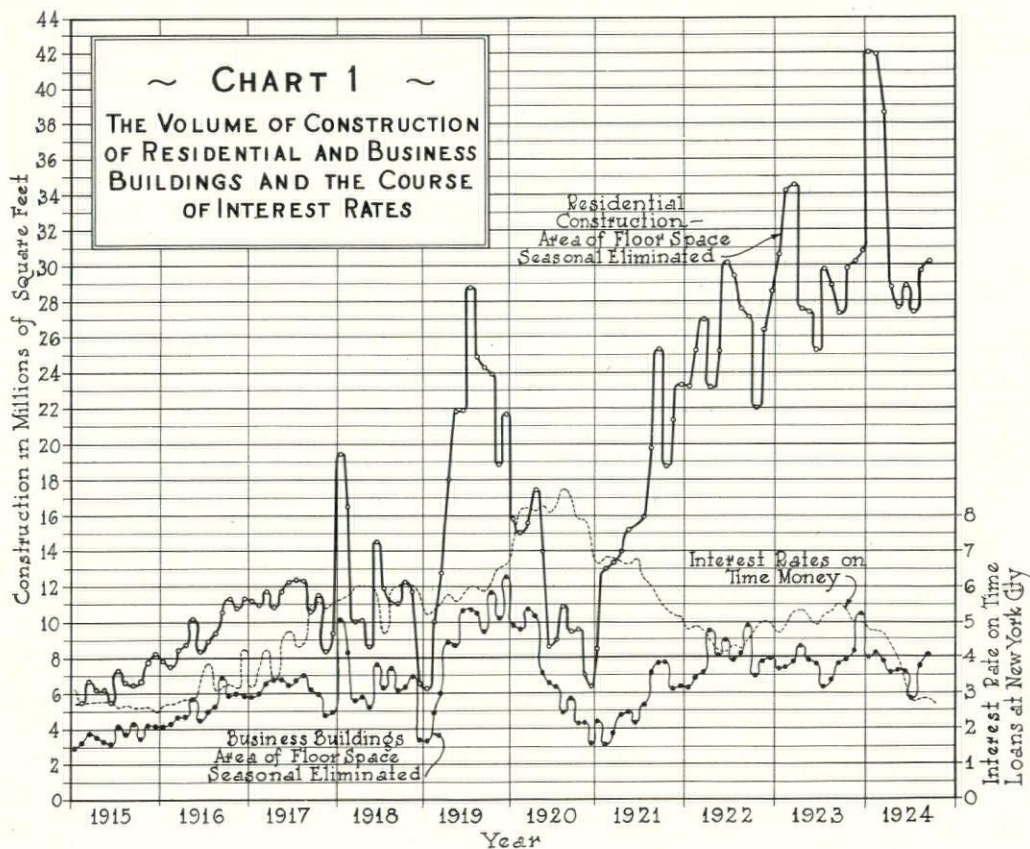
In last year's forecast, I stated that it seemed improbable that the rally in building construction occurring in the autumn would long continue. As a matter of fact, business building continued upward only until December, but residence building held out for two months longer before beginning an abrupt decline.

When one considers the number of important forces involved and the difficulty of measuring the intensity of each, he must conclude that the 1924 forecast came as close to complete fulfilment as one can ordinarily expect. Could we foretell

what is going to happen next year with the same degree of accuracy that we describe the occurrences of last year, it is quite certain that business would be a very different thing from what it is today. With uncertainty removed, risk would be eliminated or reduced to a minimum and profits would be much more secure than at present. However, we cannot be sure that this could be considered entirely a net gain. Were there no risk, business would be a tame affair, and presumably competition for every penny would be so keen that profits would be meagre at best. At present, the man who is most adept at the art of

guessing is rewarded by a major share of the spoils. The most skillful guesser is the one who makes the best use of the experiences of the past. All that the statistician can do for the business man is to broaden his knowledge of the way different factors have been related in previous years. The wider the scope of

volume of residential building, while the lower curve shows the number of contracts let for business buildings. The normal seasonal fluctuation has been eliminated by means of the new method described by the present writer in the Journal of the American Statistical Association for September, 1924. As stated in



such knowledge, the more likely is one to anticipate just what events and conditions will actually occur. The only sensible procedure, then, for one who wishes to make a forecast of what is going to happen in 1925, is to begin by studying the fundamental influences as they now exist. A few of these are portrayed in the accompanying table and charts.

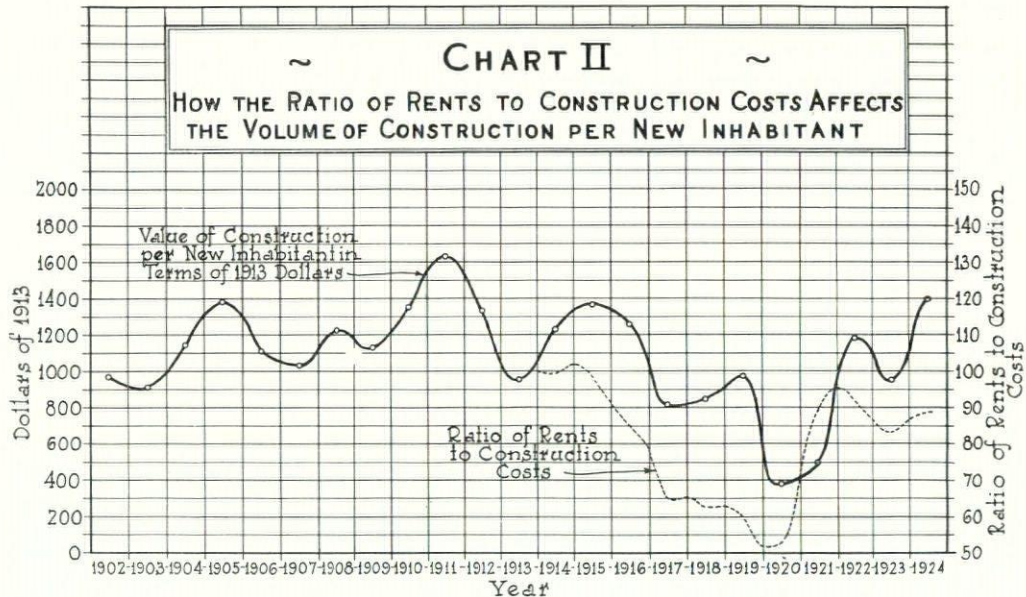
Chart I presents a picture of the movements in the number of square feet of building space contracted for, as shown by the records of the F. W. Dodge Corporation. The upper curve records the

that article, it is impossible to eliminate the actual seasonal fluctuations in the given month. The best that can be done is to get rid of the normal variations. It is possible, therefore, that some of the minor oscillations shown in the curve in Chart I represent residuals of seasonal movements, but the chances are that most of the fluctuations of any size are really cyclical.

It is apparent from the chart that, in general, the volumes of construction of residential and business buildings fluctuate together, although the high and low

points do not necessarily occur in the same month. Thus, we see that residential construction reached an exceptionally high point in the first two months of 1924, while business construction was at a peak in December of 1923. Had the volume of construction lived up to its common reputation by forecasting business conditions, we would doubtless have found business attaining a high point in

the brink before taking a serious downward plunge. We have seen what the facts are. If we can find a reason for the anomalies that have occurred, we may be in a better position to forecast the future. How are the occurrences of 1924 to be explained? Why did the 1924 building record run above normal at the same time that the great organized industries were seriously depressed?



the Spring of 1924. As a matter of fact, a number of the business indicators do show a distinct hump about February, 1924, but this temporary rise was quickly turned into a decline which continued at a rapid rate until June, at which date industry was far below normal.

The volume of construction, as measured by the number of square feet covered by contracts, declined sharply between February and May, but it did not fall far enough to bring the volume down even to normal. Since July, there has been a distinct recovery, both in residential and business construction, and most of the business indicators have also risen materially. The question of interest to architects and builders is whether this upward tendency is to continue throughout 1925, or whether we are hesitating on

In an article appearing in the American Contractor of April 28, 1923, I pointed out that the volume of building appears to be affected materially by the loan market. Chart I, here presented, contains curves similar to those upon which the conclusion just mentioned was based. The dotted line represents the rate of interest on "time money" at New York City. While, it is true, loans of this type are not made for building purposes, the fact remains that the two classes of interest rates are so closely related that the movement of the curves here given reflects the state of the market for building loans with a reasonable degree of precision. Although the correlations are by no means close, doubtless because this is only one of the casual factors at work, there seems, nevertheless, to be a distinct

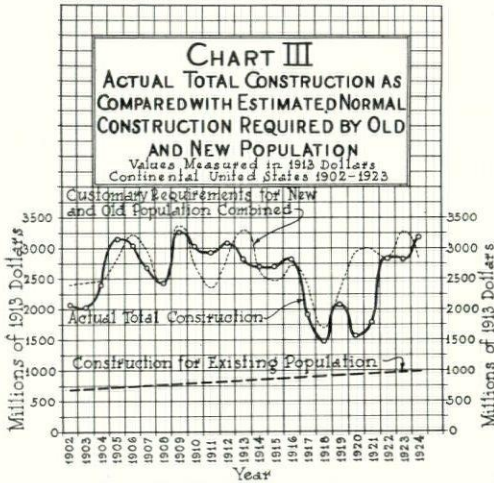
tendency for "easy money" to stimulate building and for "tight money" to put a damper on construction. The reasons for this are so simple as to be apparent to every builder. Since September, 1923, interest rates have been declining steadily along a steep gradient, with the result

movements of the curve representing the ratio of the house rents to construction costs tend to precede somewhat the corresponding movements in the volume of construction per new inhabitant. In general, however, we see that the long decline from 1915 to 1920 in the rent-construction ratio was accompanied by a similar falling-off in the volume of construction per new inhabitant added to the population. Since 1920, the ratio of house rents to construction costs has tended upward, and likewise the average value of building space constructed for each additional member of the population has increased. It appears, then, that this ratio of house rents to construction costs may have been a most important factor in forcing the construction of residential and business buildings to rise to such an unusual altitude in the early part of 1924.

Chart III has been constructed on the assumption that the pre-war volume of construction represents the normal plane to which we may well be expected to return when the effects of the war and the financial disturbance accompanying it have disappeared. Perhaps this assumption is contrary to fact. Perhaps we shall normally build less in the future than in the past. Perhaps, on the other hand, the reverse may be the case.

On the basis of the figures shown in the accompanying table, it appears that, in pre-war times, measured in terms of 1913 dollars, the average inhabitant already in the United States called for only \$8.59 worth of new buildings per year, while, for every person added to the population, additional construction to the extent of \$1,191.00 was demanded. It is, then, easy to see that the great bulk of the construction work of the country is required to supply the needs of the newcomers and that the rate of growth of the population is a major factor in determining the amount of new construction that will be undertaken.

Clearly, interest rates are low in comparison to what they have been in recent years. In fact, they are lower than at any time since 1915. There seems to be little question that, other things being equal, low interest rates stimulate building. From the point of view of the loan



that the rate charged on time money in New York is now only about half as high as it was in the autumn of 1923. This, then, is doubtless one of the forces that is tending to maintain residential construction at a high level.

Chart II introduces two other factors which have important influence on the construction industry—namely, house rents and construction costs. The dotted line indicates the ratio of The United States Bureau of Labor Statistics index of house rents to an index of construction costs. The heavy curve above gives us an estimate, taken from Column H of the accompanying table, of the volume of construction for each new inhabitant added to the population of the United States. The dotted line evidently tends to rise when rents go up or construction costs fall, and to decline when housing becomes cheaper or whenever it costs more to construct buildings of the average type. It goes without saying that, when house rents are low, the value of houses also tends to fall, and, when they are worth little, construction is discouraged. It is evident from the chart that the

market, therefore, 1925 should be a good year for the construction industry.

The curve recording the degree of activity prevailing in manufacturing, mining, and transportation is moving upward, and if it pursues its normal course, it will continue along a generally rising trend during the larger part of 1925. Activity in these lines means larger payments for wages and larger wage payments are commonly reflected in a stronger demand for homes. Furthermore, as industry expands, more factory buildings are likely to be necessary to take care of the growing business. The improving condition of the farmer is also likely to add something to the demand for buildings in 1925.

Chart III gives us a picture of the estimated total value of construction, as measured in terms of dollars having a purchasing power equal to that of 1913, in comparison to the customary amount of construction required to meet the needs of the population on the basis of their pre-war demands. As previously stated, the evidence is that, during recent years, the amount of construction per capita has been distinctly less than it was during the period preceding 1916. Should we decide to bring our building supply up to the pre-war level, it appears, from the figures given in Columns D and J of the accompanying table, that we should need to add buildings worth, on the 1913 basis, about $3\frac{3}{4}$ billions of dollars. If this figure is converted to dollars of present value, a deficit of 7 billions of dollars is indicated, or considerably more than the total value of the buildings erected in 1924. The existence of this deficit is always calculated to encourage the optimists, for they believe it is certain to be eliminated in the near future and that building must proceed at a rapid rate during the next few years.

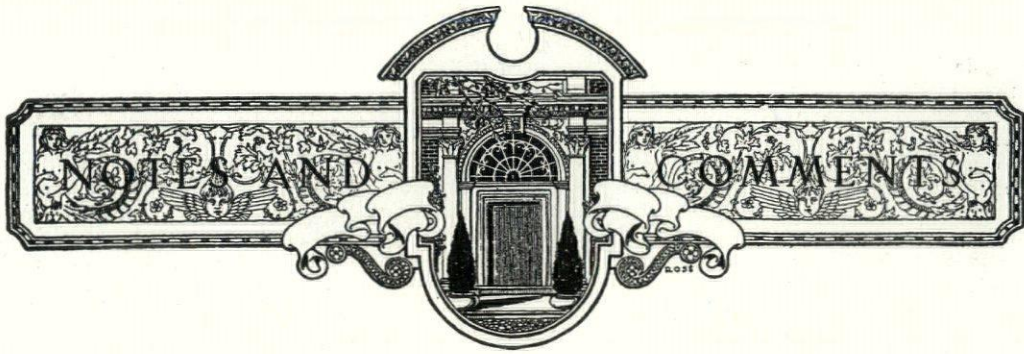
In some other respects, however, the outlook for 1925 is not so roseate. For the first time since the latter part of 1922, the index of house rents prepared by the National Industrial Conference Board has ceased to rise and, in fact, has even shown a slight decline. Reports from different cities ranging all the way from New York to Los Angeles indicate an increase in the number of vacant houses and a distinctly slower movement

of real estate. Such conditions are certainly not calculated to inspire a great volume of residential building. Not infrequently, they have marked the beginning of a slump in that field of activity.

There is also another unfavorable factor that must be taken into account. As previously indicated, the bulk of new construction is called for by the needs of newcomers—by the demand arising from the accretions to the existing population—and therefore the rate of population growth largely dominates the volume of construction. Not long ago, Congress passed a new law intended further to restrict the flow of immigration to our shores. At present, the available records do not cover a period long enough to show just what the ultimate effect of this legislation will be, but the early figures indicate that it will, to some degree, lessen the rapidity of population growth. If so, this slowing up will doubtless have its counterpart in the construction industry, though the effect may not be visible as early as 1925.

But this is not all, for the pessimist has still another argument at his disposal. From the solid curve in Chart III, we see that the volume of construction in 1924 reached a distinctly high level, higher, in fact, than any other attained since 1909. The figures in Column H of the accompanying table show that, in 1911 alone, has the volume of construction per new inhabitant been as large as the preliminary estimates for 1924 indicate it to be for that year. There is no proverb more applicable to business than the old saying that "all that goes up must come down." Is not the present a case in point?

In view of the conflicting influences at work, it appears rash to make a positive forecast for 1925. In the field of residential construction, the unfavorable factors seem to outweigh somewhat the favorable ones. The outlook for industrial and public utility construction and for the erection of public buildings is more encouraging to the builder. If the total value of all buildings constructed in 1925 equals the figure for 1924, architects and contractors can certainly have no legitimate cause for complaint but they should, instead, feel that Fortune has been on their side.



A NEW DIMENSION IN ARCHITECTURAL EFFECTS

American architecture in its most conspicuous achievement, the skyscraper, has been the subject of much foolish complacency and much unintelligent abuse, but after years of essentially irrelevant criticism of this kind it has gradually triumphed over both its favorable and unfavorable critics. It continues to exhibit in an exaggerated form the faults of which it has been accused. It continues in most cases to employ inappropriate forms and obsolete conventions, and it continues to be barren of those balances, proportions and refinements, which characterized the successful architecture of the past. The skyscraper, compared to the temple, the church, the palace or any previous architectural type is a sheer monstrosity. But just because it is a monstrosity, it has already achieved results which are novel and exciting and which their designers frequently do not intend. Its sheer size and the relationship which by its size and height it establishes with the atmosphere, the horizon and with the whole vast luminous perspective of the sky have in a sense created a new dimension in architectural effects.

Americans, and New Yorkers in particular, tend to take for granted the unfamiliar and unearthly beauties which loom and shimmer about their skyscrapers, but occasionally foreigners visit New York who are more sensitive and alert to the spectacular and bewildering aspects of its tall buildings. One of them, Miss Rebecca West, the English novelist, describes the appearance of New York as at once the most exciting in the world and the most monotonous. "The skyscrapers," she says, "are making an astonishing revelation of new beauty to the English eye." "They have a magical beauty of material" in that "they offer so large a surface to the reflection of light and shade that they cease to represent the solid appearance of masonry and seem to be of a living substance like that of flowers."

Miss West remarks, of course, upon the increased opportunities which the architects of skyscrapers have obtained as the result of the Zoning Law. The necessity of setting back the upper stories of tall buildings has in her opinion "set the architect a problem which he has solved frequently with the most poetic invention." On Lexington Avenue there is a vast apartment house which rears its dark masses like the Pyramids and which like them is an example of "mystery-making" in stone. "On Forty-second Street there is an office building which with perfect simplicity of form, with nothing but deep grooving for its walls and clean cut spires, contrives to give the emotions of a Gothic cathedral. And on Madison Avenue is one of the sights of the world by reason of a certain building which story by story is shaped by an increasingly strange and rich fancy till on its heights it is transformed into an Arabian Nights' palace of domes and minarets. "On its architecture alone," says Miss West, "America can claim to be one of the greatest artistic nations in the world."

While agreeing in the main with these somewhat magnificent comments on the skyscrapers of New York, we must register a dissent from the strict accuracy of the last assertion. Great art is conscious and it is free; and the art of the American skyscraper is only semi-conscious and is not at all free. It is bound by practical necessities which, while they create, also severely circumscribe the opportunities of the architect. Take the Shelton on Lexington Avenue, for instance, which Miss West praises so highly and so deservedly. Its mass is overpowering and its height imposing from every point of view, but as it is seen from the distance up or down Lexington Avenue its silhouette is usually uninteresting and even stupid. The architect may well have foreseen what a commonplace form the outline of his towering structure would from many directions present to the far-seeing eye, but whether he foresaw it or not, he was not in a position to improve

its design. The guilty relation between the two sets of lines was given when it was decided to build a structure of a certain height upon a certain size plot. He could not make the silhouette of the building contribute positively to the effect of stupendous mass and its atmospheric mysteries without asking his employers for a larger site or a less economical relation of height to girth.

But the outline or the silhouette of these buildings, important as it is, is less important than their ability to reflect light and to absorb color. It is the opportunity which a skyscraper, standing free from the neighboring structures and seen from a distance, offers of placing solid luminous and colored masses into scenery provided by the atmosphere, the horizon and the arch of the heavens which is what the American architect has most to be thankful for, but up to date he has not taken much advantage of it. The beauties to which Miss West calls attention are only in part beauties of design. They are more frequently beauties of accident or necessity whichever you choose to call it. But the time will come when the upper stories of these buildings will be composed of materials or covered with a surface which will glow, flame and glisten rather than merely submit to the fluctuating magic of its surroundings. The gilded upper stories of the new American Radiator Building on 40th Street, although not particularly successful in itself, may give the New York reader some glimpse of what we mean. The gilding of these stories, crude as it is, suggests bewildering possibilities as to the future use of surfaces with colors, glows and lights in order to convert the high places of New York, as seen from distant streets, into a wonderland of elaborate, fanciful and vivid masses and patterns.

HERBERT CROLY

COMPETITIONS FOR AMERICAN ACADEMY IN ROME FELLOWSHIPS

The American Academy in Rome has announced its annual competitions for Fellowships in architecture, painting, sculpture, musical composition and classical studies. The awards will be made after competitions, which, in the case of the fine arts, are open to unmarried men who are citizens of the United States; in classical studies, to unmarried citizens, men or women. It should be noted that in painting, sculpture, and musical composition there is to be no formal competition involving the execution of work on prescribed subjects, but these Fellowships will be awarded by direct selection after a

thorough investigation of the artistic ability and personal qualifications of the candidates. Applicants are required to submit examples of their work and such other evidence as will assist the juries in making the selections.

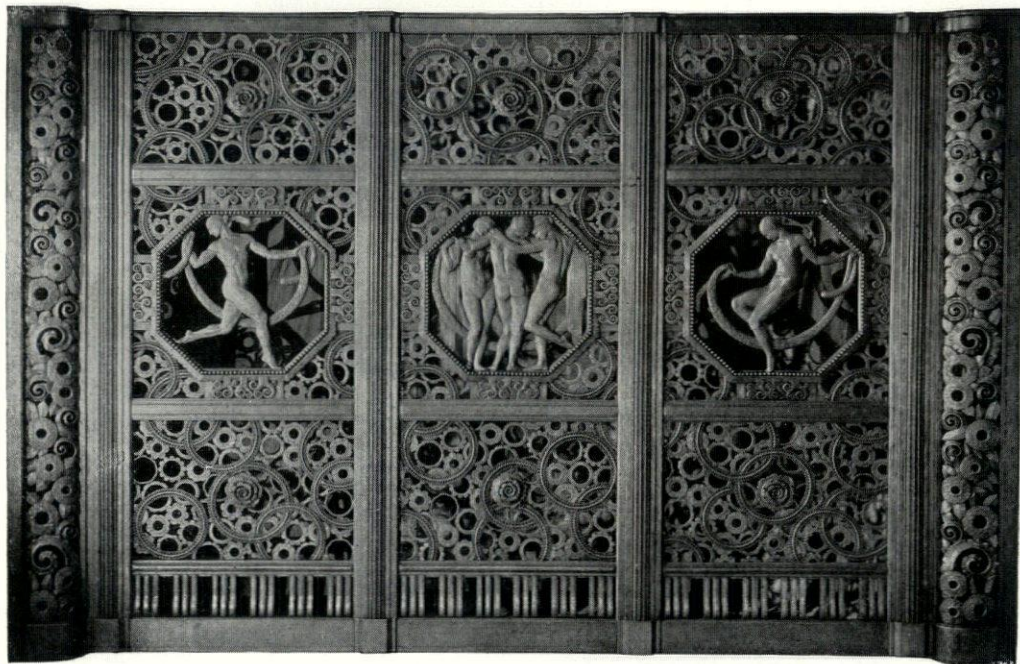
For the Fellowship in painting, the stipend is provided by the Jacob H. Lazarus Fund of the Metropolitan Museum of Art of New York City, established by Mrs. Amelia B. Lazarus and Miss Emilie Lazarus. For each Fellowship in the fine arts the stipend is \$1,000 a year for three years; in classical studies there is a Fellowship for one year with a stipend of \$1,000 and a Fellowship paying \$1,000 a year for two years. All Fellows have opportunity for travel, and Fellows in musical composition, of whom an extra amount of travel is required in visiting the leading musical centers of Europe, receive an additional allowance of \$1,000 a year for traveling expenses. In the case of all Fellowships, residence and studio (or study) are provided free of charge at the Academy.

Entries will be received until March first. For circulars of information and application blanks, address Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park Avenue, New York City.

THE WORK OF EDGAR BRANDT

A WELCOME DEPARTURE FROM CONVENTION IN THE IRON-WORKERS' CRAFT

The iron-workers' craft, in this country, has travelled for some time in the rut of the stylistic convention due probably to the necessity for conforming to the historic requirements of the architects. We begin to realize that excellently executed modern examples of Italian and Spanish Renaissance wrought-iron, are about to pall through surfeit; that surprise has exhausted itself which we first experienced, at finding that the spirit of that period could be recuscitated, and its technique equalled by Yellin and others. There is no craft associated with our architecture that has achieved such general excellence as wrought-iron work, but evidence of spontaneity in the concept of form and its distribution in design are astonishingly lacking in view of its high degree of technical achievement. With the growing tendency towards more independent expression in architectural design, it is necessary that the architect keep in touch with those craftsmen who are capable of thinking along parallel lines; hitherto the trouble has been that, when freedom of thought has been indulged by the craftsman, he has been so oblivious of architectonic requirements, that the consider-



WROUGHT IRON GATE WITH FIGURES IN GILDED IRON

ation of his work for architectural incorporation has been out of the question. A recent exhibition of the wrought-iron work of Edgar Brandt* caused us to realise the imaginative deficiencies of the native efforts in that craft, and to expect that this excellent work will exert a salutary influence. We were greatly impressed by the originality in design which the exhibitor showed, which is the outcome of a healthy and normal mind, free from any effort to surprise the observer even in its most unusual demonstrations. Brandt's technique is of the highest order, rendered individual by unusual methods in the manipulation of substance, surface, and color in patine and finish; the manner in which gold is used to enhance the color of the iron is of the greatest interest. He has no hesitation in devising new ornamental forms which have evolved through his intimate knowledge of the capacity of his material for decorative pliability; these are so thoroughly suitable that surprise is felt they have never been developed before. Every form, texture, and manner of ornamental growth, is an exposition of the capacity of the material to become a precious substance in the hand of its artist. The feeling which

actuates these designs is essentially French, but it possesses a quality of virility which is rare in the decorative work of that nation at the present time. The artistic impulses re-



AN INTERESTING EXAMPLE OF NEW TECHNIQUE IN WROUGHT IRON

*Ferronnier d'Art, Paris.

sponsible for the evolution of ornamental form and arrangement are singularly complex; they appear to trace ancestry to the early work of Grasset and his confrères, but Brandt's work is entirely free from the overwhelming deficiency of ornamental composition (in the structural sense) of that school. It is particularly the power which he displays in the statement of ornamental growth which compels admiration, and places him in the class of the historic creators. There is evidently a sound acquaintance with the historic modes underlying his imaginative exuberance, which influences his arrangement of mass and contrivance of form, and renders his work a valuable adjunct to the more modern phases of American architecture.

LEON V. SOLON

REGIONAL ARCHITECTURE OF THE WEST OF ENGLAND

Of the new architectural books of the year, one of the most significant is *The Regional Architecture of the West of England*, by Professor A. E. Richardson, F.R.I.B.A., of University College, London, and his partner in practice, C. Lovett Gill, F.R.I.B.A., published by Ernest Benn, Ltd., London.

Although, as the title denotes, the volume is devoted to an analysis of architecture in only one part of England, Devonshire and Cornwall, the value and interest of its subject matter are by no means restricted within local bounds. While the historical appeal may primarily concern British readers, the book has so many other conspicuous aspects of general and present pertinence that it cannot fail to be genuinely useful to American architects and also to laymen who have an intelligent appreciation of architecture.

Of the ten chapters, one each is devoted to the City of Exeter, Princetown, the Isles of Scilly, and Plymouth considered together with Stonehouse and Devonport, while there are also chapters on the general characteristics of the Western Region, the development of regional tradition and the materials commonly employed, the Middle Period (1730-1780), the Late Period (1780-1810), and the Regency and Early Victorian Modes (1810-1850).

The illustrations deserve especial mention, both because of their quality and the manner in which they are presented, a combination that greatly enhances the utility of the volume.

There are 173 half-tone illustrations, of which a fair proportion are of full page size, with due attention to enlargements in order adequately to show detail and texture. There are also 39 small line cuts inserted in the text, made from hastily drawn pen and ink sketches. These sketches have the quality of catching, in the fewest possible lines, the essentials of composition and detail while completely omitting whatever is irrelevant. For this reason they constitute a convincing method of illustration, in welcome complement to the half-tones. The subjects include both domestic and civil architecture, the former being considerably preponderant; ecclesiastical architecture is not exemplified and is alluded to only here and there in the course of the text.

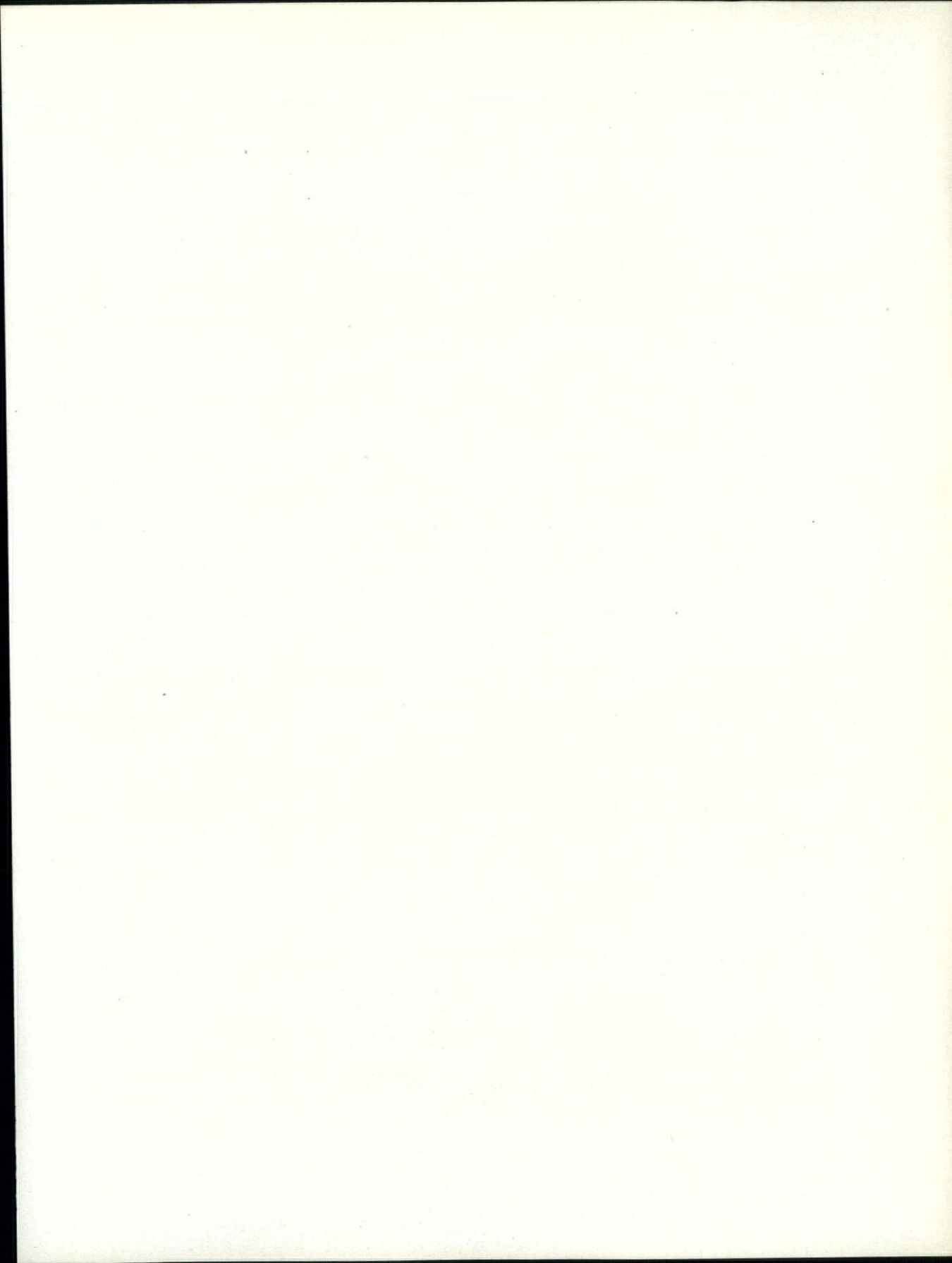
For a long period the authors have enjoyed unrivalled opportunity to study their field at close range, while planning and superintending work for the Duchy of Cornwall. The book, therefore, is not a mere set of hastily gathered and somewhat detached impressions, but a comprehensive and faithful record of facts, critically analyzed and presented in a maturely considered and authoritative digest.

It will become apparent, upon perusal, that the major portion of illustrations and text bears upon the implanting and development of the Classic tradition in the West Country, and upon the vigorous and healthy local interpretation as affected by the assimilation of varied strains of influence and by their ingenious and often highly original adaptation to the individual requirements of the place and moment. Curiously enough, in this respect it is not only possible to trace but impossible to avoid seeing a process analogous to, and often closely resembling, what was going on in eighteenth century America. The same sort of resourcefulness and common-sense in adaptation were brought into play in both spheres, and a kinship in the outcome resulted.

Besides calling attention to the healthy vigor of the West Country tradition because it was so readily assimilative, the authors lay stress on the refreshing diversity of composition so successfully attained without doing violence to the spirit of traditional principles. In so doing they have put emphasis upon a much-needed lesson.

These two last-named features of the book invest it with special interest and suggestive value to the American architect.

HAROLD DONALDSON EBERLEIN





PANELS IN AETCO FAÏENCE
FOR INSERTING IN ROUGH STUCCO WALLS.

HARRIETTE G. BINGHAM,
Sculptor.

