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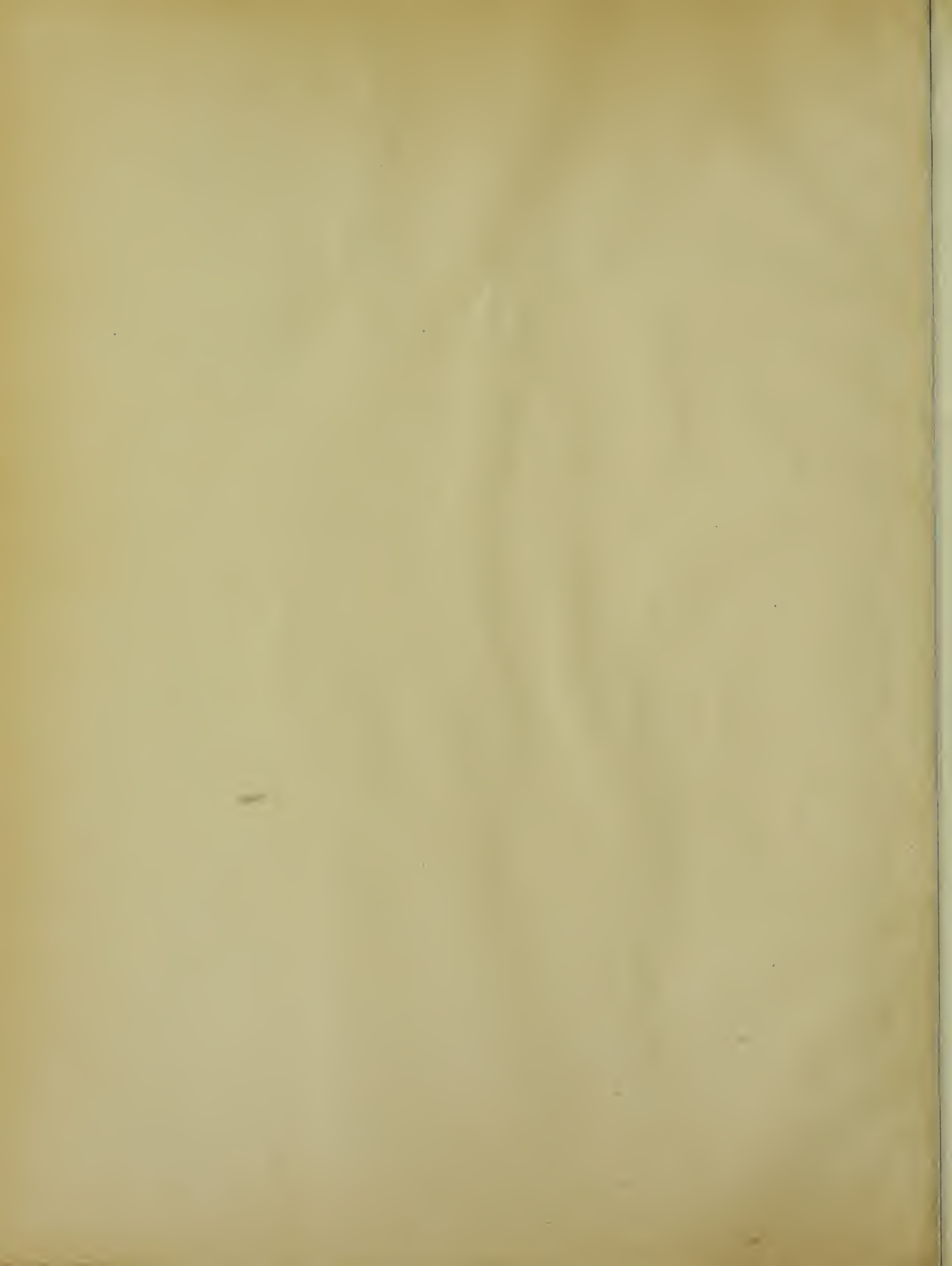
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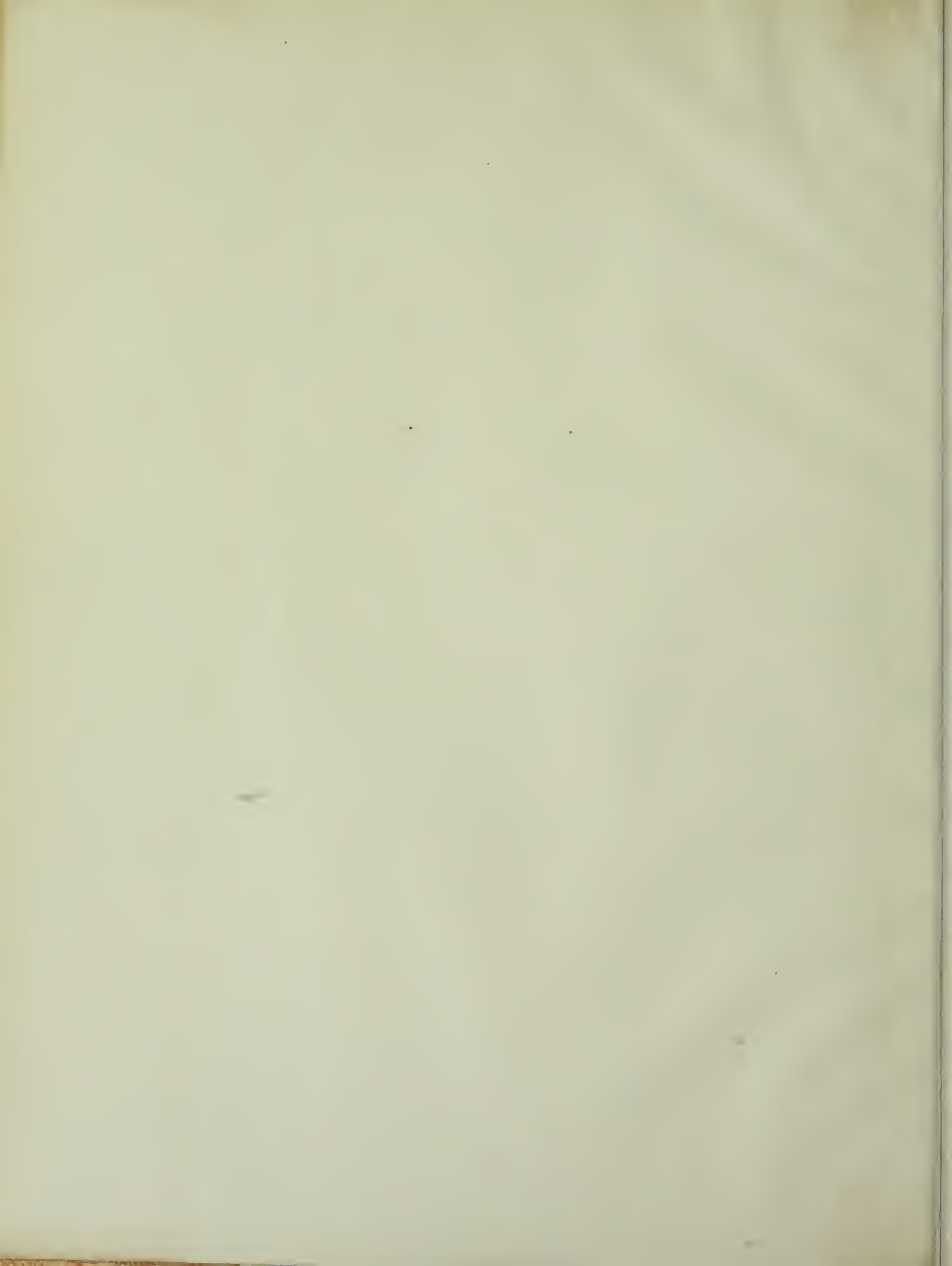
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THE BRICKBUILDER.

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Ball & Davidson	Riverbank Court, Cambridge, Mass.	2 Plates	January
Barney & Chapman	Houses, New York City	2 Plates	April
Barney & Chapman	{ Buildings, Orphan Asylum for Indian Children, } Iroquois, N. Y.	2 Plates	November
Carrere & Hastings	House, Elizabeth, N. J.	2 Plates	June
Clinton & Russell	Houses, New York City	1 Plate	October
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THE BRICKBUILDER,
JANUARY,
1901.



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NO. 1

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JAN.
1901

H. F. B.

THE BRICKBUILDER.

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Advertisements will be printed on cover pages only.

REGISTRATION FOR NEW YORK ARCHITECTS.

THE State of Illinois has for nearly three years had in operation a law obliging all architects who desire to practise to apply for a license, which is only granted upon satisfactory evidence of the applicant's ability, this ability being tested by means of an examination. The Architectural League of New York has, with most commendable zeal, taken the initiative in preparing a bill to be presented to the legislature of New York, this bill providing for a New York State Board of Architects, whose duty shall be to supervise the granting of licenses to practising architects, such licenses to be granted upon the results of an examination. A convention of the architects of the State of New York is being held at the rooms of the Architectural League as we go to press, the object of the convention being to consider the proposed bill, to awaken a more general interest, and to stimulate a more complete understanding of the subject and of the precise nature of the ends to be accomplished. A movement of this sort is to be commended in every respect. The registration law has worked admirably in Illinois, and has encountered comparatively little opposition. We can conceive of no good reason why it should be opposed by any one except from motives quite distinct from such as we would honor in our professional brethren. Indeed, we doubt if there would be any except the opposition from a political

source; for the bill as drawn and about to be presented before the convention is sufficiently elastic to adapt itself to all proper existing conditions, and if passed, could not fail to be a benefit in every way, both to the profession at large, and, what is perhaps of more real importance, to the community as a whole, which very often has to suffer through the ignorance of dishonest or incompetent practitioners. We sincerely trust that the convention will succeed in arousing sufficient enthusiasm and interest to carry this bill beyond the reach of political opposition, and to make it, or something covering the same ground, the law of the State of New York.

LEGISLATIVE COMMITTEES.

THERE was presented to the Boston Society of Architects at its last meeting a very interesting report, made by a committee from the society which has had the especial care during the past year of the interests of the profession as affected in one way or the other by the action of the legislature. This committee has made it a point to be present at all hearings on bills relating to alterations in the building law, or legislation in any way affecting real estate or building; and its members have been authorized to represent the Society in such action before committees as would seem to be for the best interest of the profession. Judging by the report, this committee has been able to exert a decided influence in the legislative halls. If there had been no other tangible results, its efforts would have been well worth while as showing our legislators that the architectural profession is entitled to consideration in matters which directly affect it or its work. We wish that the various architectural bodies throughout the country could in some such manner as this come more directly in touch with the law-making bodies. The interests involved by any meddling with building laws are so vast that the more the educated members of the profession can be brought to assist in the formative processes, the better are sure to be the results. It is the constant reproach of nearly all of our municipal building regulations that they are conceived in ignorance, and enforced without proper consideration for results. Boston has been, perhaps, more fortunate than some other cities in that its existing law was drawn up, in a large part, by a committee representing the best elements of the architectural, the real estate, and the financial professions; but the experience of the last session has shown that nothing but constant watchfulness on the part of those intimately interested can preserve the best of laws from being viciously tampered with, and the fact that architects not only are interested, but are willing to give the time and

study to legislative work of this sort is an indication that architecture is a public profession to be considered in estimating the forces which make for good or evil in metropolitan life. Not many years since, the better architects were content to leave all such work to the professional politicians, and trust to luck that the laws were not too severely strained. Building since then has become so complicated, and also so vastly increased in possibilities, that the profession has almost been forced in self-defense to take a part in these affairs, such as has been, on the whole, so courageously and efficiently taken by the real estate and Master Builders' associations.

ROCK ISLAND LIBRARY COMPETITION.

WE have received from a subscriber the terms of a competition for plans for the Rock Island Public Library Building. It is fair to assume that the Board of Directors and the librarian, who are responsible for the somewhat peculiar conditions set forth, have been actuated by a desire to obtain the best possible results. If so, the chances are that they will be doomed to complete disappointment. There surely has been enough said in the professional journals all over the country to enable an ordinary and self-respecting librarian to know better than to expect any good results to follow when terms are as herein stated. The story is an old one to us, and every year there springs up a crop of such competitions. We trust the time will come when all self-respecting architects will rigidly eschew competitions of every sort for anything less than a large and important public building; but to expect, as is evident in this case, that competent architects will waste their time over quarter-scale drawings for a building for which the appropriation is manifestly too small, and will guarantee their plans by a check for a thousand dollars to be forfeited in case the building exceeds the limits of cost set forth, and all this when there is no assurance that the selection will be a fair one, and with the positive statement that only 3 per cent. will be paid for the architect's work, means simply that the so-called competition will very likely result in the choice of a man who will be either dishonest or ignorant. We should advise the librarian to study the ethics of business honesty a little more carefully and become more thoroughly acquainted with the means by which dishonest builders or architects are able to cheat their employers, before committing the work to the care of an architect such as a competition like this will call out.

THE T Square Club Catalogue might very fairly be classed among the hardy annuals. Surely the vitality and unflagging enthusiasm of the club seems limitless, and the catalogue this year keeps up the procession of constant progress in a most satisfactory manner. As in past years, it is preceded by a certain amount of literary endeavor,—recapitulating the work of the club and enumerating the progress of the past as well as setting forth the work of the future,—Mr. William Charles Hays being the secretary and editor of this portion. Attention is called to the increase of 12 per cent. during the past year in the number of architectural clubs. This

is a most gratifying fact, the full significance of which as a factor in our national development is, we imagine, not always rightly appreciated. These architectural associations, which only a few years ago were entirely unknown, are now acting most powerfully to stimulate the younger element, and, at the same time, to educate the community and to raise the standard of popular taste.

The catalogue shows that the present exhibition must be extremely interesting. A feature new to American exhibitions is the introduction of quite a considerable amount of representative work from Germany. Every contributing architect from that part of the world is a professor of something, which, perhaps, seems strange to us, but apparently is the rule there. The work sent from Prague is particularly interesting, and the drawings from Munich and elsewhere, while showing the very strong influence of the school of Otto Rieth, are full of individuality, and show promises which are not always, unfortunately, manifested in current German work.

"THE BRICKBUILDER" COMPETITION. VII.

AN ENTRANCE TO A CITY PARK.

PROGRAM.

THE municipal authorities of a large city, in the residential portion of which is a park, have condemned adjacent property for the purpose of enlarging the park.

The present park is bordered by wide streets, devoted to traffic and car lines, none of which can be closed.

The addition to the park will be rectangular, of the same width as the present park, and separated from it by one of the streets which runs from east to west.

The purpose of this competition is to provide an entrance to each of the portions of the enlarged park, at the west end of the intersecting street, and to so treat the street that its commercial character will disappear as much as possible.

The park ground is undulating, and the general character of the roads and planting is rural.

The design for the entrance is to be such as is adapted to working out in burnt-clay products.

DRAWINGS REQUIRED: A perspective sketch design for the entrance, and a sketch plan showing treatment of the street made in black ink, with no wash work, upon a sheet measuring 18 ins. wide by 12 ins. high. The drawing is to be signed by a *nom de plume*, or device, and accompanying the same is to be a sealed envelope with the *nom de plume* on the exterior, and containing the true name and address of the contestant.

Drawings are to be delivered, flat, at the office of THE BRICKBUILDER, 85 Water Street, Boston, on or before April 1, 1901. For the four designs placed first, THE BRICKBUILDER offers prizes of fifty, twenty-five, fifteen, and ten dollars, respectively. All premiated drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish any and all drawings submitted.

The competition will be judged by Mr. Henry Bacon of the firm of Brite & Bacon, New York City.

Terra-Cotta Work in the Smaller Towns of Piedmont.

BY ALFREDO MELANI.

ITALY, so rich in marbles, where the quarries of Carrara, the Luni of the Romans, have for centuries provided architects and sculptors with quantities of



PORTAL OF CATHEDRAL OF CHIVASSO. 15TH CENTURY.

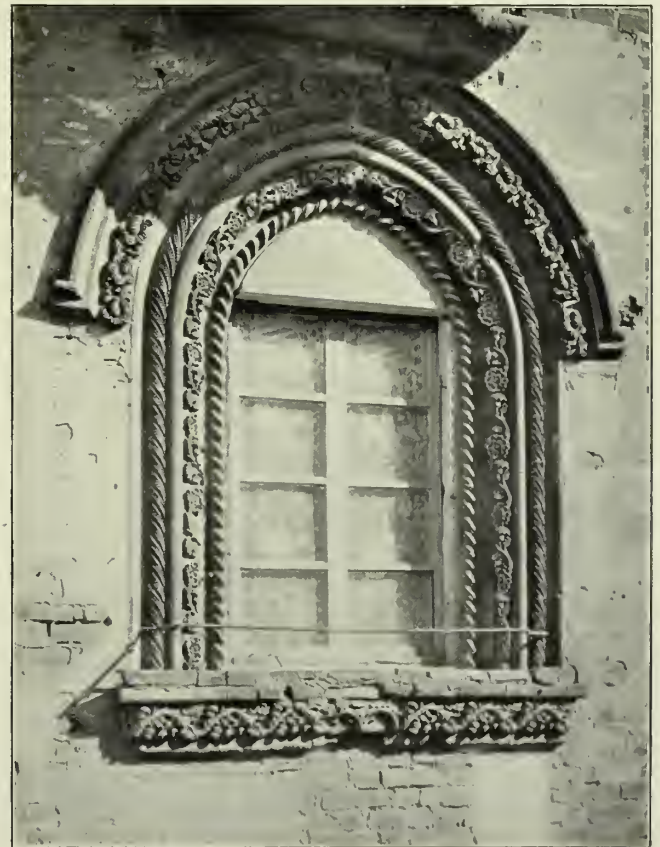
marbles of every kind, is not deficient in buildings constructed of brick; on the contrary, she possesses them in every province, where they stand beside the structures of stone and marble themselves. There exist, however, differences between one region and another, and it is well known that the most remarkable examples of terra-cotta in Italy are found in Lombardy and in the Emilia. These are precisely the two regions of which the terra-cotta has been made the object of special study, and THE BRICKBUILDER itself has at several different times illustrated specimens of these Italian productions which contributed so largely to the artistic glories of the Renaissance. The work here is mostly of the fifteenth and sixteenth centuries; and when in Italy the terra-cotta of the Renaissance is spoken of, the memory reverts at once to Lombardy and the Emilia.

But to say that all the terra-cotta work of Italy is concentrated in Lombardy and the Emilia is an exaggeration. As a matter of fact, the eye of the searcher, even in these provinces, is generally arrested at Milan, at the Certosa di Pavia, at Bologna, and at Ferrara, without seeing the treasures which exist in less important towns.

One region has certainly been forgotten: a district which lies just beside Lombardy, — Piedmont, — and I may add that from the point of view of art Piedmont has

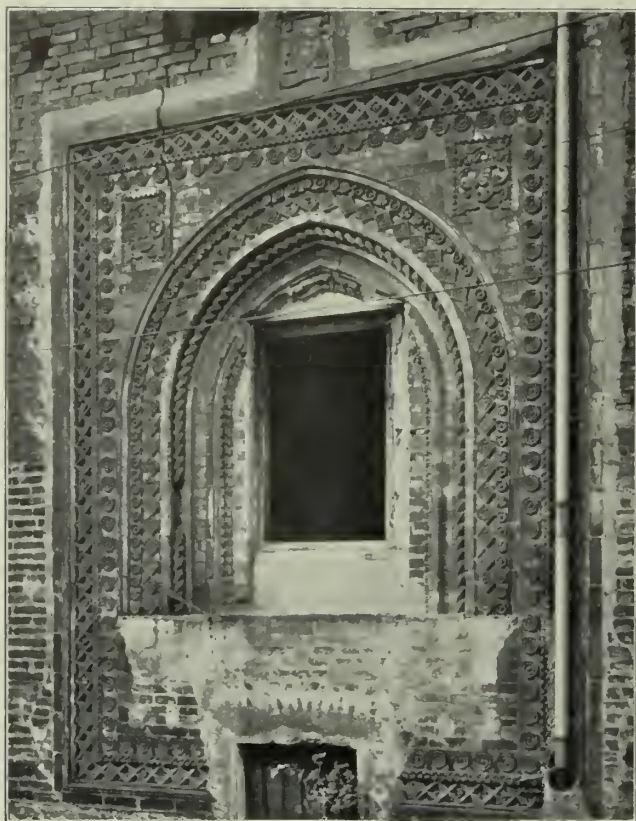
been the least studied of all the Italian provinces. "Piedmont Discovered" might be the title of an artistic work that would be successful and astonish the public. It is not generally known that some Italian students have turned a curious eye toward this region of Piedmont, and have begun to collect *le fronde sparte*, as the Divine Poet says; that is, the scattered fragments of the artistic treasures; but the organic work, the entire collection which would give the general and complete idea of artistic Piedmont, remains only a wish, the realization of which is still a long way off. Therefore, in writing in this excellent review, I shall wish to draw my material from the unpublished subjects, and look for the objects of my study in the unknown works of the smaller towns, outside the natural and easy paths of hurried travelers, and I will now ask my readers to give with me a glance at the terra-cotta work of one section of this great and picturesque surface of Piedmont, which extends from Lombardy and Liguria as far as the frontiers of France.

The foreign reader will desire me to explain to him at first the reason for the indifference and neglect to which Piedmont has been left, and I will endeavor to satisfy his wish. The historians have always considered the Piedmontese as a people instinctively devoted to the exercise of arms rather than the love of the arts, — an opinion



WINDOW IN TERRA-COTTA, MONTE DI PIETA, CARIGNANO.

which has an indisputable basis of truth; but while it is true that one cannot compare the Piedmontese with the Tuscan, or the native of Turin with the Florentine, nevertheless, Piedmont has never closed its territories to artists; and especially during the Middle Ages and during the last two centuries (seventeenth and eighteenth), it has exerted a remarkable influence on the development of the arts, having encouraged a number of artists and



WINDOW IN TERRA COTTA, PALAZZO DELLA PORTA,
NOVARA. 15TH CENTURY.

given them an opportunity of producing and executing their works in the midst of its cities, villages, and valleys.

But one of the most important and least clearly perceived reasons that account for the indifference and neglect of which we speak is the habit of judging all the work of a section from a small portion, especially if that small portion forces itself upon the attention by its conspicuous location or other advantage.

Thus, if one judges Tuscany by Florence, or Venetia by Venice, one should also judge in its art Piedmont by Turin, which is its capital, perhaps, because during the last few centuries it has been found at the head of all the progress that has been made in Piedmont. But it has been forgotten that while the arts flourished in Tuscany and Venetia, the unification of Piedmont under the dynasty of Savoy had scarcely begun. At that period art was protected by the Marquis of Saluzzo and Montferrato and the bishops of Asti and of Alba so diligently that, in their localities, much more important buildings were erected, and paintings and sculptures executed, than were seen in Turin and its environs.

It should be added that feudal customs continued in practice much longer in Piedmont than elsewhere in Italy, so that even at the end of the fifteenth century they were still in vigor. This circumstance tended to isolate Turin, and while the artists all visited Florence and Venice, they never came to the capital of Piedmont, but rather turned their attention to the smaller cities and the rural valleys of the Province. It is, moreover, true that in the expositions of ancient Piedmontese art that have been held in recent years, Turin has exhibited almost nothing, its suburbs very little, while the other

cities of Piedmont have exhibited a great deal. In the same way, when in 1884 the project was agitated of reconstructing a feudal castle in connection with a grand artistic and industrial exposition held in Turin, the architects underwent the tortures of Tantalus for the choice of motifs destined for this typical reconstruction, and they were obliged to seek inspiration in localities comparatively distant from the capital.

There is still another reason that explains this indifference toward artistic Piedmont: it is that the region has been so overrun by the artists of the baroque, who in reducing the old buildings to their own taste have destroyed several monuments of the Renaissance, and have imposed their mannerisms in such a way that Turin is to-day one of the most baroque cities of Italy — the Dresden of the peninsula. As the art of the seventeenth and eighteenth centuries has not been in favor during our own times, it has followed that Piedmont has been most injured by this unjust scorn in the past, and in her case it has been forgotten that the baroque — which, after all, has the right of respect — constitutes only a portion of her art, and that she also possesses many monuments of the Renaissance, Gothic, and even Roman periods.

I do not insist further on this point, and I will confine myself henceforth to telling you that the lovers of art will find material to satisfy their taste in Piedmont as well as in all other Italian territories, and those who are especially interested in works in terra-cotta can even look in Turin the same as the smaller Piedmontese cities, but in the latter there will be found a wider series of monuments, particularly of the mediæval period. Turin, I have remarked, is the city *par excellence* of the baroque,



WINDOW IN TERRA-COTTA, PRIORATO DI S. ORSO, AOSTA.
15TH CENTURY.

and its buildings are entirely built of brick, which is used for the walls and all the details of the doors, windows,



FRIEZE IN TERRA-COTTA, PALAZZO GIA CATENA, ASTI.
15TH CENTURY.

and cornices, following the lines and undulations of this spirited and original style.

At present I will ask the reader to follow me and keep an eye on the illustrations. Considering that we are discussing works of the fifteenth century, the reader will be at first a little disconcerted and surprised. His surprise is legitimate. The Italian art of the fifteenth century is the art of the Renaissance, and here we find ourselves considering a Gothic monument. This requires an explanation, which is easy, nevertheless, to furnish. Piedmont, a frontier region, was dominated by a family which lived for a large part of the year in France, beyond the Alps, and naturally could not receive at once the results of the new doctrines, which, thanks to Brunelleschi, turned the architecture and decoration of Italy topsy-turvy during the fifteenth century; it remained, on the contrary, insensible to the taste which renewed the æsthetic spirit of the Italians, and during the fifteenth century was more French than Italian. Thus the general character of Piedmontese art at the time of which we speak is Gothic; and although some buildings in the style of the Renaissance exist in the Piedmont of the fifteenth century, it is nevertheless true that the Piedmontese taste of this century differs from that of other parts of the peninsula, as is shown by my illustrations to which I must now return.

The most important and most curious illustration is the façade of the cathedral of Chivasso. Where is the traveler, who, arriving in Italy by Modane or Fréjus, would stop at Chivasso? Nevertheless, this little city, which is situated on the railway between Turin and Milan, even if it had only this façade, would justify the intelligent traveler in stopping. I do not exaggerate in assuring you that the façade of Chivasso is one of the most singular

monuments of Italy. Every one will see for himself the French influence in this rich, sculptural decoration, whose figures, moldings, and ornaments glitter around the pointed doorway and on the jambs which rise at its side. Abundance of sculptural and figure decoration does not exist in the Italian tradition; with us the contribution of the mediæval master figurist is always reserved; any suggestion of elaboration may be traced to the further side of the Alps rather than to this side; and in Italy, even in the monuments where sculpture and statues occupy a conspicuous place, as in the cathedrals of Orvieto and of Milan, its distribution is different. Italy, in a word, does not possess such monumental portals as those of Notre Dame de Paris, Amiens, and Rheims, and the alignment of statues in the embrasures of Chivasso is inspired by the richness of the sculpture of France. The façade of Chivasso is also interesting in that it seems to connect the French Gothic influences with the Lombard (Roman) influence, as is shown by the large and fine and elaborately molded rose which opens above the portal. All this one can see in the reproduction, but the reproduction fails to show the reader the beauty of the terra-cottas, though every one will notice at once how well they have resisted the ravages of centuries. The attention of artists will generally be attracted by the independent way in which the architect has gotten out of the affair without recourse to any horizontal lines. At the point where the side shafts (*jambrages*) are grafted on the lines of the frontis-



COURT OF CASTLE AT VINOVO.

piece, he has abandoned the statues, and commenced and followed a system of little arches, too small in scale, it may be said, beside the decoration below. Whatever it may be worth, we may accept this solution as one of great independence. A very pretty bit of work is the

angel, which, standing in an inspired attitude, holding in its hands the emblem of Christ, seems the personification of sweetness. I would have liked to add to my illustration a detail of this never-to-be-forgotten statue, but I was not able to find a photograph.

Fulness of modeling is not perhaps the principal merit of the artist of Chivasso, but it is indeed the principal merit of the author of the ornaments of the "Monte di Pietà" at Carignano. This city, near Turin, fell several times under the domination of France; but its art, of which a remarkable example is illustrated by the window reproduced herewith, is not French, or at least, if you wish, is French only in the matter of the freshness with which the ornament copied from nature is rendered by the modeler, who here has shown himself indeed a master. The frieze underneath the window, composed of branches of oak, rich in foliage and acorns, is such a piece of work that one of the master ornamentists of the most celebrated cathedrals of northern France, Paris, Amiens, Rheims, Troyes, Bourges, or Ronen, might well admit having executed it. Nor will my reader fail to notice how fully architectonic is the structure of the window of Carignano, which frames in the decoration marvelously well, marrying itself so easily to the movement of the ornamentation. We see here a work of the

fifteenth century, which, in Florence, especially, could not be found at that era, and which explains the difference in development in Italian regions, a not less interesting thing to call to the attention of foreign students. It should also be known that differences even between one city and another exist in certain regions, and that the window of Carignano, which could not have been found in Florence during the fifteenth century, could, however, have been found at Siena, the city which was the only one that through the passage of centuries resisted the influence of the splendors of Florence, I do not say victoriously, but with honor. Siena is the terra-cotta city of Tuscany, the "red city," as Bourget called it in his "Sensations d'Italie," because of the innumerable buildings of brick built there.

Returning to the window of Carignano, I may add that the pieces of terra-cotta of which it is composed are the finest that Piedmont possesses of this kind.

Of an entirely different kind are the ornaments which compose the Gothic window of the Palazzo della Porta at

Novara, a city nearer to Milan than Turin. Here we are concerned with a strictly geometric decoration, and, therefore, the window lacks the suppleness of the window of Carignano. These are two exquisite examples, but in a different and opposite taste; I might almost say that the example of Carignano is artistic, while that of Novara is industrial, and I made this choice purposely in order to show two compositions, whose only point in common is that both are made of terra-cotta. In short, the severity of the ornament in the window of Novara is not corrected by the architecture; and this severity is derived from the repetition of the same geometrical motif. The alternating of the motif scarcely exists in the window we are studying, where the over-repeated rosette motif and the other linear motif degenerate into a monotony. The example, however, may serve for

something, and the manufacturer who aims to obtain an artistic effect with the easiest and most economical means will find a model to imitate in the window of Novara. This much may be said: it is very much to be regretted that the quality of this piece of decorative architecture should not be different from what we now see; let us hope, however, that the fragment may be at least preserved just as it is to-day.

A more important example now awaits us. I found it in that valley of Aosta, which with



CASTLE OF VINOVO.

its castle of the fifteenth century is a veritable mine of artistic terra-cotta, so that I propose to submit to my readers other specimens as well as that which they will readily admire in the present reproduction. The window of the "Priorato" of Saint Orso belongs to a collection of buildings which should be visited by every intelligent traveler who goes to Aosta. We must at present confine ourselves to the "Priorato," a magnificent structure, which took this name from the fact that it was inhabited by the "priors" of the Chapter of Saint Orso from the end of the fifteenth century. This building was built at the expense of George de Challant, whose coins are seen painted on the eastern façade. There are three façades, corresponding to three ranges of buildings, which connect at a right angle; and in this *ensemble* is a profusion of admirable ornaments in terra-cotta, among which are developed the most rich and fantastic designs that one can imagine. Wishing to give an idea of these ornaments, I chose a window with cross mullions, a type which though not Italian, but French, yet occurs in Italy at Turin, Rome, Perugia,

Pistoja, etc., as well as at Aosta. But these examples have not the richness and importance of that of Aosta. This is in terra-cotta, while the others are in stone and without ornaments. The frieze which forms the jambs and architraves of the window of the "Priorato" has some points of resemblance with the window in terra-cotta of the Ospedale Maggiore of Milan; these "putti" which interlace with the foliage, whose appearance does not have that symmetrical stamp which is at the bottom of Renaissance ornament, are really pretty; though the decoration of these little cherubims in the last molding of the four empty spaces into which the window is divided is none the less done with discernment. These heads are like an embroidery around the exterior molding, and this embroidery is indeed in its right place with the abundance of ornament around all the window. Take it away and you will see that its presence is more than essential and indispensable. At the same time, the little busts which grow out of rosettes, placed at the intersection of the cross and of the lines which frame the window above the frieze, are indispensable. Not less here than in the moldings with cherubims has the master ornamentist shown a perfect knowledge of the effect of architectural decoration in connection with the conditions imposed by the use of terra-cotta, which, as in the case with all stamped ornaments, requires a certain discretion on the part of the artist. I do not speak of the great cornice which runs above the window, and which appears a little heavy beside these decorations; the windows of the "Priorato" of Aosta are supposed to have the place of honor in the façades where they are found; and all that rests above or below them, at one side or the other, has only a secondary importance. In short, the windows of which we speak are jewels, and like jewels ought to be imagined alone in a velvet box!

To those of my readers who wish to see a superb cornice in terra-cotta chosen from Piedmont, I would suggest observing that of the former Palazzo Catena at Asti; and I could cite other specimens if it were desired.

By the side of all my Gothic illustrations, there is the court of the castle of Vinovo in the style of the Renaissance. We are still in Piedmont, but my reader knows that for the richest and most interesting Italian terra-cotta of the fifteenth and sixteenth centuries he must not look in Piedmont, but in Lombardy and the Emilia. As I have already said, this is not making the statement that Piedmont is absolutely deprived of it, and the court of Vinovo shows us not only the existence of Piedmontese terra-cotta, but the existence even of a monument of the first order. I regret that the candelabra which form the trimmings of the pilasters and frieze of the arches of the portico at Vinovo are reproduced at too small a scale to be understood; a detail would show that the master modeler here far surpassed the work of the merely correct and reserved school, and that these medallions below the cornice are truly incomparable! These medallions are worthy of the most refined artists of the Renaissance, and the Lombard ornamentists, who enriched the several monuments of Milan, might well wish to have to their credit these medallions of Vinovo, — true examples of elegance and clever reality!

At the earliest opportunity, I hope to continue, as far as possible, my "gleaning" of unpublished material.

Byzantine Brickbuilding. II.

BY H. B. PENNELL.

TO fully appreciate the magnificence of Santa Sophia we must reconstruct it in our minds as it was when Justinian, on the day of its dedication, stood before the altar and exclaimed: "Thanks be to God who has judged me worthy to accomplish so great a task! Solomon, I have surpassed thee!" That was in 537, before the ravages of time and man had despoiled it; before the conquering Turks, unawed by its sanctity and bent only on plunder, dug from the walls the glittering bits of mosaic, and from the sacred vessels the precious stones; before the Mohammedans whitewashed its gorgeous walls, hung high on the piers their Koran-inscribed disks, and covered the pavement with their prayer-carpets. The Santa Sophia of to-day is the mosque "planted in the bosom and attached to the walls" of the ancient basilica. Fortunately the interior arrangement is unchanged; and aided by the descriptions of authorities like d'Amicis and Bayet our imaginations can present to us at least an approximate idea of Justinian's lavishly adorned masterpiece.

Every one knows Santa Sophia as modern photographs represent it: its tremendous nave surmounted by the great central dome and two half-domes; the small round chapels that terminate the east and west axis; the vast porticoes, themselves as large as an ordinary church, that form the north and south arms of the cross; the galleries that meet the eye wherever it turns. Innumerable columns of green breccia, of porphyry, and of marble are the spoils of all the temples of the world; placed together by chance, their capitals present a strange mixture of styles and a fantastic conglomeration of motifs in the carved "animals, leaves, crosses, and chimeras, all woven together." "Among the columns, the balustrades, the pedestals, and the slabs which remain of the ancient lining of the walls may be seen marbles from all the mines of the Archipelago, from Asia Minor, from Africa, and from Gaul. The marble of the Bosphorus, white spotted with black, contrasts with the black Celtic marble veined with white; the green marble of Laconia is reflected in the azure marble of Lybia; the speckled porphyry of Egypt, the stained granite of Thessaly, the red and white striped stone of Jassy, mingle their colors with the purple of the Phrygian marble, the rose of that of Synada, the gold of the marble of Mauritania, and the snow of the marble of Paros" (d'Amicis, "Constantinople," p. 179). To complete the basilica as Justinian knew it, we must reclothe the dingy walls with marbles which "send back reflections of gold, of ivory, of steel, of coral, of mother-of-pearl," and replace the mosaics of crystal which shine like silver and diamonds in the light from myriad windows. The capitals, the cornices, the doors, the borders of the arches, are all of gilded bronze. The vaults of portico and gallery are painted with colossal figures in a golden field. On the great domes, mosaics represent saints and angels, the Virgin, and the Cross; and on the pendentives appear the gigantic wings of cherubim, whose faces are hidden by gilded rosettes. "In front of the pilasters, in the chapels, beside the doors, among the columns, stand statues of marble and of bronze"; there are, besides, "enormous candelabra

of massive gold, gigantic evangelists bending above reading-desks resplendent as the chairs of kings, high ivory crosses, vases shining with pearls." In place of the Mussulman pulpit and the tribune of the Sultan stood the ambon, with its dome and cross of gold, and marble, and precious stones; the balustrade of the choir of gilded bronze; the priests' seats and the emperor's throne sculptured, inlaid, and set with pearls; and in the apse, "the altar, of which the table, supported on four golden columns, is made of gold, silver, pewter, and pearls all melted together; and the pyx formed of four columns of massive silver surmounted by a globe and cross of gold weighing two-hundred and sixty pounds." (*Ibid.*, p. 182-183).

One cannot wonder that Justinian was obliged to increase his taxes and resort to arbitrary measures to meet the expense of so splendid a monument. The result



VIEW FROM GALLERY, ST. SOPHIA.

satisfied his ambition to build a church whose magnificence should surpass even the reports of all that had gone before. Bayet accuses Justinian of valuing the cost more than the beauty of his edifice. "The ancient Greeks used for the walls of the Propylæa or the Parthenon the most perfect marbles because they admired their purity and luster; Justinian wished gold and silver everywhere because they are a sign of wealth" (Ch. Bayet, "L'Art Byzantin," p. 42). However, we can forgive any mercenary tendencies in view of what his architects, Anthemius and Isidorus, accomplished for their art. For without doubt the dome of Santa Sophia, which has stood for so many centuries, has been a model for constructionists, and an incentive to the careful study of methods and results in dome-building. Its solidity was not accomplished without effort, but is the result of repeated experiments. As it stands to-day it is a vast dome 105 ft. in diameter, carried on pendentives between four arches; thence the weight is carried to the ground by four huge piers of a kind of Pepperino freestone. The pendentives are filled in with a whitish stalactical mate-

rial in its rough state, and showing impressions of plants; the mortar, in joints 1 to 2 ins. thick is reddish, apparently from the addition of pounded tile. The pressure of the east and west arches is resisted by the transept walls, and semi-domes form buttresses on the north and south. During the process of building, the structure twice showed signs of weakness on the east side; the dome was rebuilt, and the piers and buttresses were strengthened. The third dome, according to ancient writers, was of pumice, or light Rhodian bricks whose weight was one fifth that of the ordinary brick. But our modern authority, Salzenberg, has found no trace of anything but the customary well-burned brick in the present dome. Further support being necessary, the arches on the north and south were filled in with clearstory walls whose windows and arcades are now prominent features of the interior.

During the next twenty years numerous earthquakes shook city and temple, fissures were made in the dome, and in 558 a portion of it fell. Justinian entrusted its reconstruction to a nephew of Isidorus, who, like his famous colleague, Anthemius, was dead. According to some writers, the consulting architects decided that the main cause of the weakness was that the wooden frames of the arches had been removed too soon in order to facilitate the work on the mosaics. Isidorus' nephew, accordingly, took great precaution, and while he somewhat increased the height of the dome, he gave greater solidity to the arches. He also left the frames and scaffolds in place a long time, and before their removal had the lower part of the church flooded in order that the pieces of wood in falling should not shake the new constructions. That dome has stood nearly thirteen centuries and a half, with the addition by the Greeks in the fourteenth century of works on the exterior to strengthen the eastern angles. All through its history it is noticeable that the substructures, not the dome, were at fault. Mr. F. W. Marks, A. R. I. B. A. (*American Architect*, Sept. 12, 1891, p. 169, *et seq.*), gives the following facts of the construction: "Whether constructed of pumice stone or of light or heavy bricks, the recent dome seems to be of homogeneous construction without separate ribs, answering, in fact, to our ordinary idea of a dome as typified by the internal brick dome of our own St. Paul's (London). The general thickness varies from about 2 ft. to 2 ft. 6 ins. It has strong buttresses as abutments (8 ft. 6 ins. thick) above the springing, and the walls under are excessively thick as compared with the thickness of the vaulting. Some of the bricks in the vaultings are 14 ins. square by 2 ins. in thickness. In the lower part of the great cupola some are 27 ins. long, 9 ins. wide, and 2 ins. thick, and others are 27 ins. square on the side. The principal cupola appears at first sight to rest upon four arches, each 100 ft. wide, but in part only those on the east and west have that span, and on the north and south the real supporting arches are reduced in width to 72 ft., and only three fourths of the circumference of these last arches has radiating joints, the parts next the springing being laid horizontally. . . . The abutments (of the arches running transversely north and south) were at first only carried up to the spring of the great arches, and were concealed beneath the roof over the side galleries, but after the fall of the dome they were raised by



DETAIL OF INTERIOR OF ST. SOPHIA.

command of Justinian, so that they are now within 18 ft. of the base of the eupola, and form the vast projecting masses called pyramids." The base of the dome consists of a crown of forty windows, which seem already to suggest the Romanesque lantern tower. "The windows project externally, and now support metal plates curved to correspond with the window-heads, but they probably once carried brick arches and served as an effective tam-bour to the eupola. The piers (between the windows) are continued as ribs on the inside of the vault (which begins with a thickness of 29 ins. over the windows); they project at first 6 ins., gradually decrease, and die away into the great central disk of the eupola. At the crown the eupola is only 24 ins. thick, measured through the holes left for suspending lamps. . . . The eupola is covered with sheets of lead $\frac{1}{4}$ in. thick, fastened to wood laths resting directly on the vault."

No wood is used in the construction of the church, and stone courses occur only in the foundation and at

columns were circular and in two parts, if the column was not over 12 ins. in diameter; in segments, if the column was larger. Like the Roman, these bricks were $1\frac{1}{2}$ ins. thick, and the mortar was $\frac{1}{2}$ in. thick. Mortar was made according to the Roman formula: $\frac{1}{3}$ rich chalk, $\frac{1}{3}$ sand, and $\frac{1}{3}$ brick-dust. The lime was carefully chosen, and the sand was taken from river-banks, not from the seashore, and was free from foreign particles. In hydraulic works the sand was omitted. They borrowed from the Arabs the kind of mortar referred to in the previous article as "Khorassan," which was brownish, and composed of hydraulic lime and fine sand, together with particles of tile. It was very similar in quality to Portland cement, and by using it the Byzantines could erect their domes at slight cost. The bricks were dampened before being laid on the mortar, as is apparent from the rough surface of the brick visible on the bed of cement. The joints were always carefully pointed to form a projecting fillet. In foundations and the cores of walls where large masses of concrete were used, the courses were laid by means of frames, or large wooden boxes without top or bottom, in which, in the case of walls, the bricks of the facing were first adjusted, then the cement was thrown in and pressed down by a rammer. When the cement was properly set, the pieces of wood were removed, leaving holes which are still to be seen in some ancient buildings.

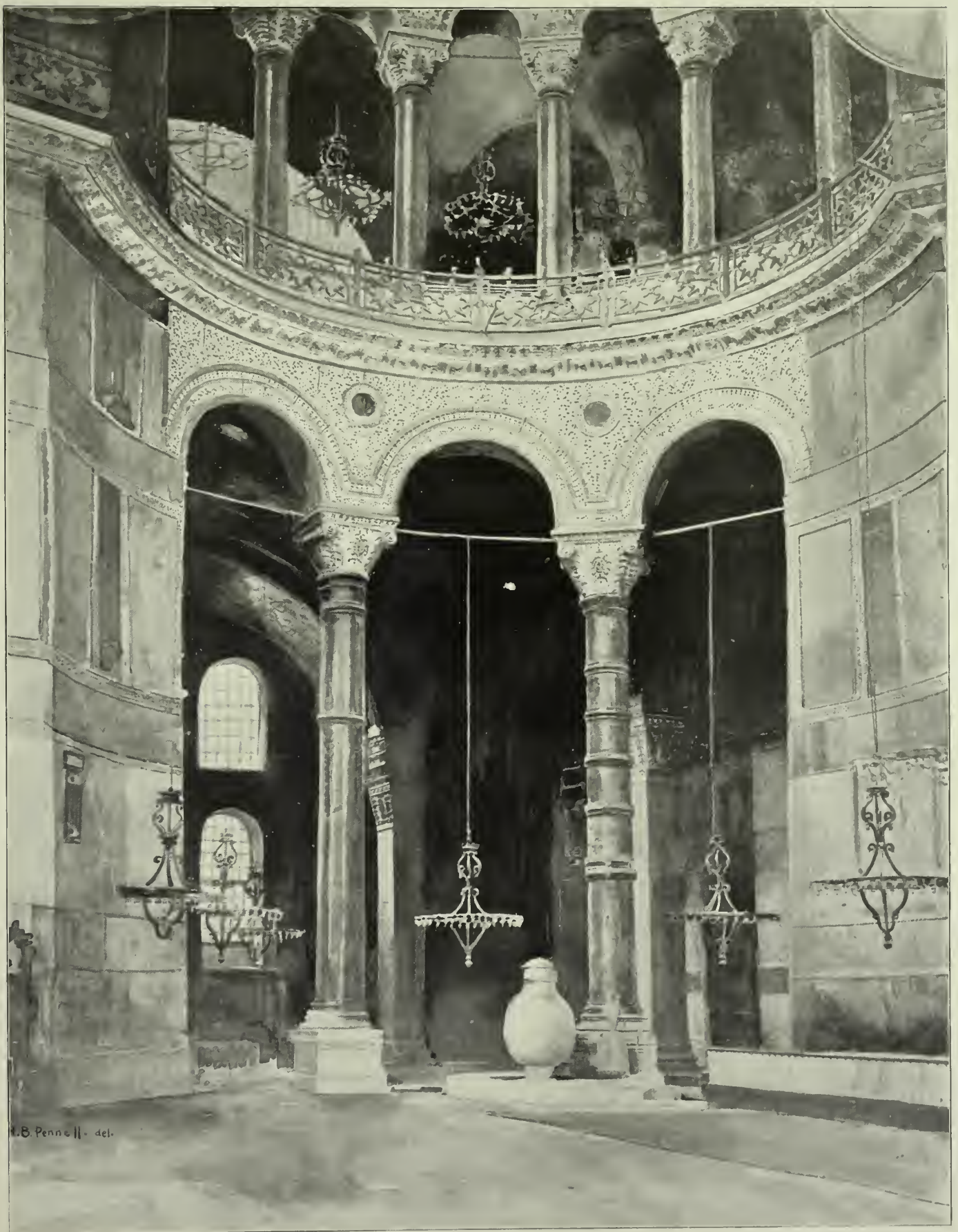
Viewed from the exterior, Santa Sophia is more mosque than basilica. One can see only the dome, flattened and unimposing, rising above Mohammedan additions, and overtopped by the four graceful minarets. The spacious atrium, once enclosed by vaulted porticoes with marble columns and piers of brick, is now surrounded with the tombs of the Sultans. The lower part of the church is hidden by small modern houses and shops, which seem to desecrate the ground purchased at a high price by Justinian in order that his church might stand in the imperial quarter, close by his Hippodrome and palace.

Santa Sophia, to M. Bayet, is the most important church of Christian art: "Notre Dame de Paris reckons its equals right in the neighboring provinces; St. Peter's at Rome lacks originality, and is Christian only in its destination. Santa Sophia, on the contrary, has a double advantage in that it marks the advent of a new style, and attained at one leap such proportions as have never been equaled in the Orient" (*op. cit.*, p. 41). While in a way it resembles the earlier church of SS. Sergius and Bacchus, from which it might have been evolved by splitting the plan in the middle and inserting a huge dome between the half-domes, in its turn it served as a model for later churches. But it has no closer imitation than the Church of the Mother of God, built in Constantinople in the ninth century. No attempt was made to copy its proportions. Architects showed their originality rather in the plans, the grouping of domes, and more decorative exteriors. The churches of Daphne and of St. Nicodemus in Athens remind us of the Hagia Theokotos and SS. Sergius and Bacchus in plan and structure, and afford illustrations of the alternation of brick and stone in the wall courses. Hagia Theokotos also shows ornamental columns and arches; and the crown of windows in the dome, first introduced by Anthemius in Santa Sophia, is here evolved into a circular drum.



INTERIOR OF ST. SOPHIA.

the base of the main dome. The bricks used for the walls are inscribed with David's words: "*Deus in medio eius non commovebitur. Adiuvabit eam Deus vultu suo.*" Customarily, Byzantine bricks were marked with a stamp to indicate their destination, those for churches bearing the cross and monogram. On Roman bricks we more frequently find the name of the maker. Some facts given in the introduction to "Byzantine Architecture" by Texier & Pullan are of interest in connection with the materials used in Santa Sophia. Bricks were made of tempered clay, pressed into molds shaped like the Roman *plinthes*, and show the prints of the feet of men and children. Cornices and moldings were formed of pieces made in molds. Bricks used for the shafts of



M.B. Pennell del.

INTERIOR OF ST. SOPHIA.

The "Village Bank" Series. III.

BY EDGAR V. SEELEK.

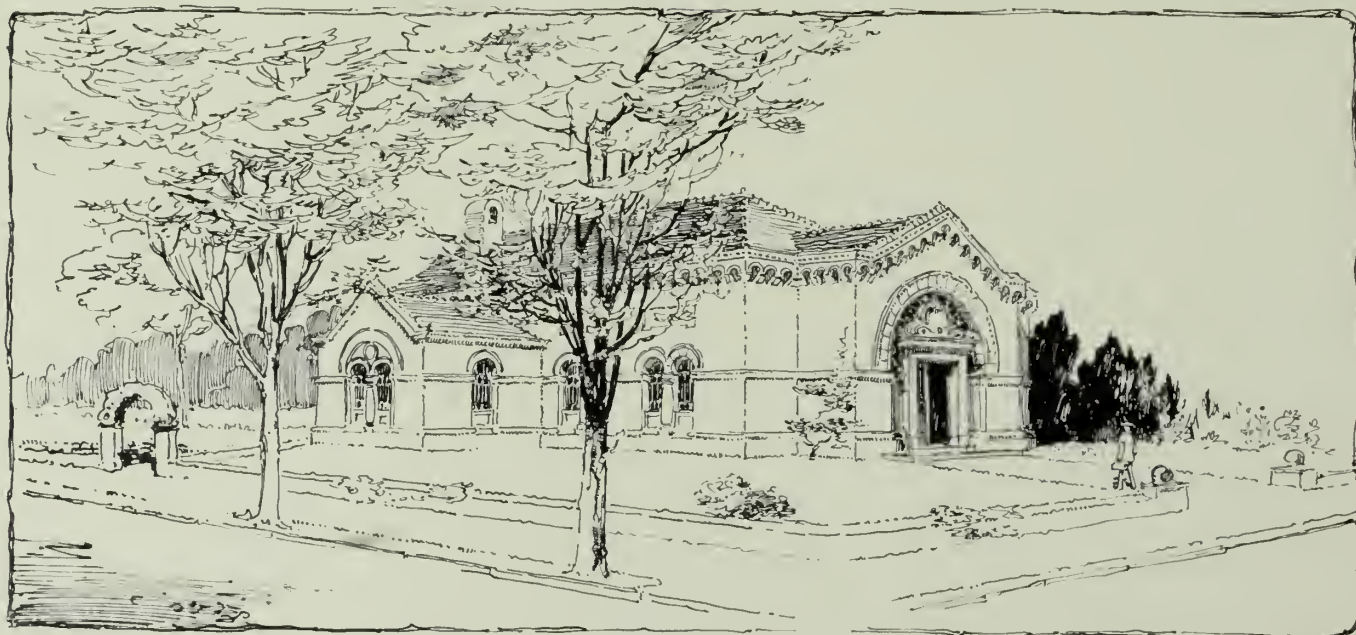
AMERICAN villages, and indeed American cities, have for the most part developed from a few scattered buildings, — the store, the inn, the public meeting-place, — set down irregularly along the main road or at a crossroads. The public square, the plaza, were unthought of, or the cost of maintenance precluded their adoption. In the more recent suburban enterprises, where the conditions might be supposed to render it possible, the open public space has by some short-sighted policy been considered too great a luxury to make the investment a profitable one. Exceptions may be found in one or two industrial towns, but the reason has been in a greater or less degree a charitable one.

The plaza must be a part of the conception of a town from the beginning, or it is difficult of realization. It is strange, too, considering the dignity, the attractiveness, and the architectural possibilities which the plaza adds to village life, that it should have been so universally neglected. Nearly every town of five thousand inhabitants

that which represents the dignity, the artistic and intellectual sentiment of the community, a composition, a correlated group, a harmony of style, color, and setting.

The bank of which this article is the immediate subject is intended to be one building of such a group. As a financial institution it can scarcely be supposed to have monumental approaches; generally speaking, banks do not put much of their capital into excess territory. And even though the general tenor of the architectural group is picturesqueness, the bank, by reason of its more serious nature, should partake less of that quality than many of the other buildings. There can be no use for towers, little need of high roofs, and ornamentation, if used, should be quiet and restricted to the constructional lines, except, perhaps, at one or two points of central interest and accent. It should correspond in color and general style to the other buildings, and in these two qualities should find its chief accord with the picturesqueness which might more reasonably be supposed to attach to them.

Color correspondence in buildings is to the mind of the average observer the most striking source of resemblance of which he is capable of taking cognizance. The



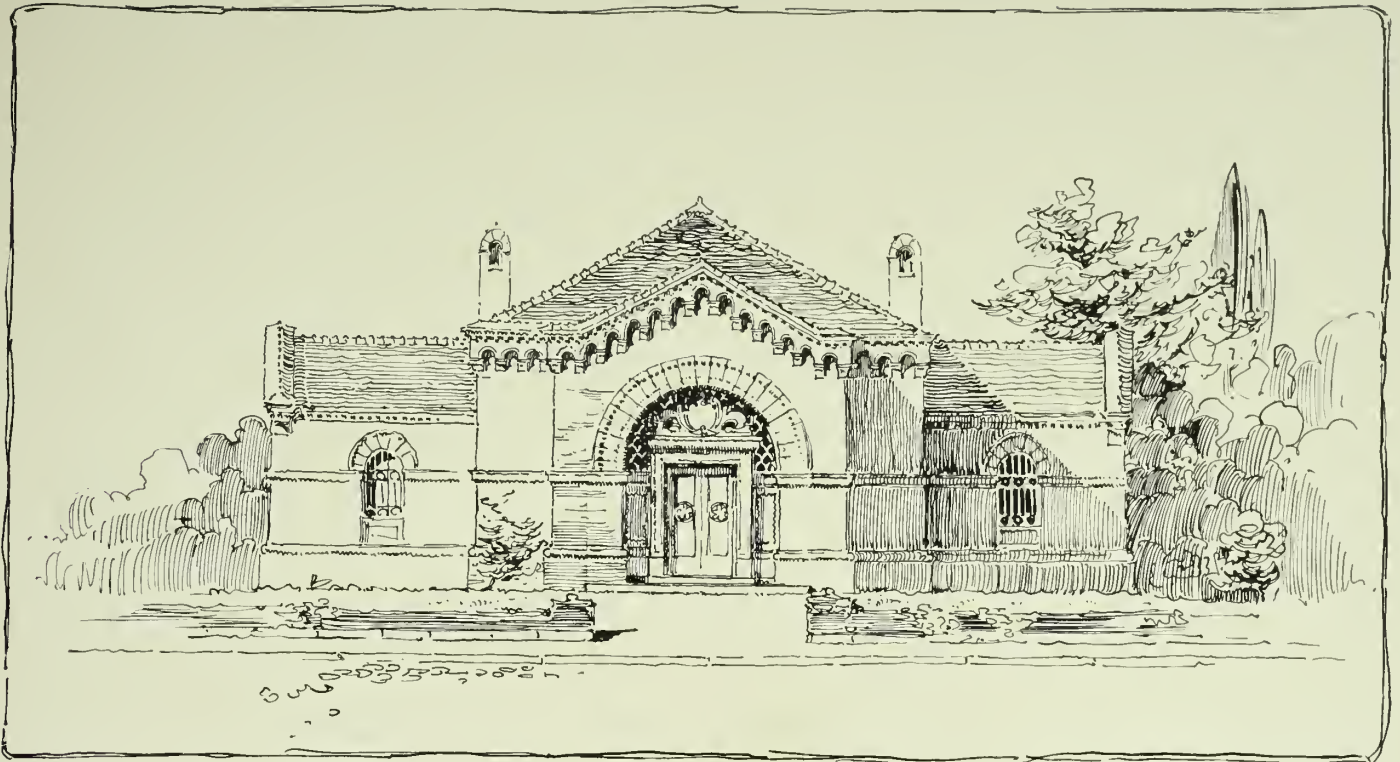
A VILLAGE BANK.

or more has a dozen buildings of public or semi-public nature, which naturally group themselves about a plaza.

This neglect may not be considered so strange either, upon second thought, if we remember that even the national Capitol has, in its development, wandered far from the fundamental principles laid down by its founders. It may be in this instance that the scheme was a vast one and difficult to carry out in the earlier and poorer days of the republic; but the erection of important buildings in out-of-the-way places, devoid of natural or artificial setting, continues, and the future looks to the perpetration of other crimes — for the importance of the case raises the offense to a crime — of the same sort.

And yet the lesser importance of the village does not relieve the architect, the engineer, the surveyor — in whosoever charge the laying out of the village rests — of the responsibility of making the center of the village,

buildings about Copley Square, Boston, before the Public Library was built, were infinitely quieter, more in key one with another than they have been since. One who has followed the architectural development of the square feels, perhaps, that the library is an intruder. He willingly, gladly, accepts the design, its proportions, its dignity, its details, its expressiveness of the purpose of the building; respects it and studies it as one of the finest buildings that America has produced. But there ever remains the wish that it might have harmonized in color with Trinity Church and the Art Museum, with the dull tones of the New Old South, with the row along the north side of the square, the buildings of the Institute of Technology, and with the various other structures in view from the square. It is unfortunate always to object without suggesting the remedy, and it is difficult to think of executing the library design in any material not similar

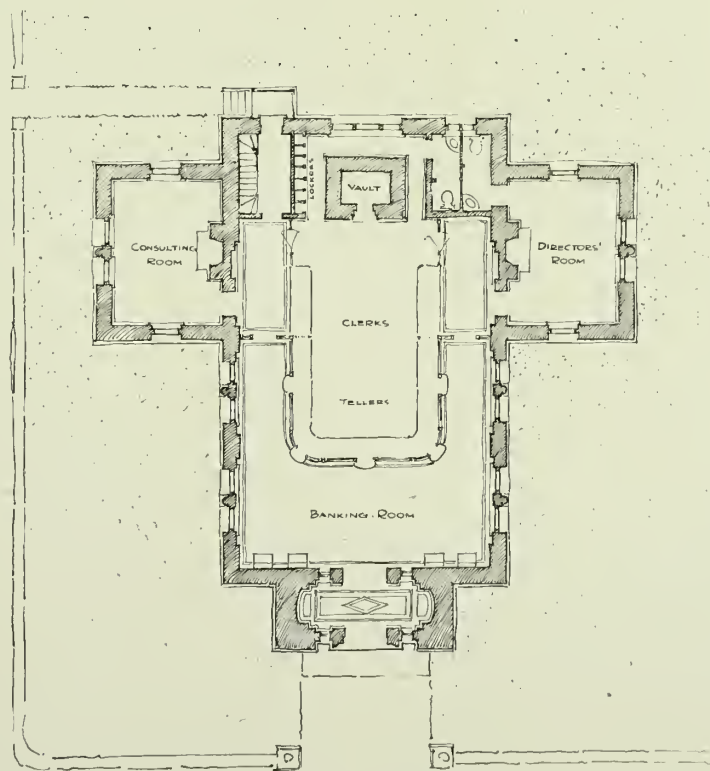


A VILLAGE BANK.

in color value to the granite of which it is laid up. It remains a fact, however, that color correspondence is the first note of harmony that the average eye asks and appreciates.

The village bank may justly be supposed to occupy a corner property, related to the public group, but certainly not on the principal axis, probably not on the secondary axis. It would balance, in a symmetric grouping, with a small office or store building, or some building of similar purpose. It is intended to be constructed of brownish brick with terracotta trimmings of the same color, and roof of dull red tiles.

It is scarcely to be assumed that all the buildings about the plaza would be designed by the same architect. There is the likelihood of their being different in style, or at least in character of detail. It is also likely that the court-house or town hall, as the center of the group, would require to be, by way of emphasis, of more strikingly colored materials than the remainder of the buildings. All of which argues in favor of the subordination of the minor structures. The natural setting of lawns and trees in addition to the character of the particular



A VILLAGE BANK.

building under consideration supports the choice of dull rich browns for the exterior finish.

In plan, the building has been kept as simple and direct as possible. The public has full access to the tellers and clerks, convenient but not free access to the officers. The officers and clerks have all the privacy they need. The rear entrance can be used by the clerks before and after banking hours, as well as by the janitor and watchman at all times.

The city bank is tending of later years towards a plate glass enclosure. It is practically open to the sweeping view of all passers, who, with the police, act as a safeguard as much as the watchmen in the bank's employ. This

system is scarcely applicable to the small town, so that the requirements of smaller windows, well grilled, and not too near the ground, are imperative. Light is another absolute essential, and can best be accomplished by the overhead system. While the design, therefore, shows a series of small windows, they are grouped interiorly within large arches, corresponding to the arch of the entrance, and the central panels of the flat caisson ceiling are glazed.

ARCHITECTURAL AND BUILDING PRACTICE
IN GREAT BRITAIN.

A RETROSPECT OF 1900.

(BY OUR SPECIAL REPRESENTATIVE.)

THE nineteenth century has ended in England without having evolved a distinctive style of its own. At the commencement there was a strong classic movement: first the old traditional classic of Chambers and his school, and then the new Greek style, carried to such a high degree of excellence by Decimus Burton; later came the enthusiastic revival of Gothic architecture; and at the present time we seem to be at the height of what is termed "English Renaissance," a style which appears to have the best chance of success in competitions. But despite the fact that the more monumental work of recent times has been disappointing, in the region of domestic building, — the small country house, — considerable success has been achieved, for a style has been developed, based on the frank recognition of domestic needs, which will outlive the English Renaissance and its more pretentious buildings. Undoubtedly, the chief architectural event of the past year has been the competition in connection with the new street (100 ft. wide) to be formed between Holborn and the Strand at a cost of \$25,000,000. London has materially suffered in the past from the fact that the architectural features of new main thoroughfares have not been adequately controlled by the authority carrying out the improvement, with the result that we possess such places as Charing Cross Road and Shaftesbury Avenue, where the buildings are utterly lacking in civic dignity and character. In order to secure a fine architectural effect, the London County Council decided to invite eight architects to submit designs for the buildings facing the crescent portion of the new street and those on the Strand frontage, agreeing to pay each architect £250 (\$1,250). The competing architects were: Messrs. Reginald Blomfield, Edward W. Mountford, Leonard Stokes, Mervyn Macartney, Ernest George, Henry T. Hare, Ernest Runtz, and William Flockhart. With one exception, the designs were more or less Palladian in style, and though several of them were very meritorious, none exhibited that massing and grouping of parts so essential to the effective treatment of large blocks of buildings and so ably represented in the works of the great French architects. The official report on the designs by Mr. Norman Shaw has not yet been published, but coming as it does from the leading architect in this country to-day, it is awaited with more than usual interest.

A proposal in connection with this new street, which attracted a great deal of attention, was made by the eminent engineer, Sir Frederick Bramwell. He suggested that the buildings facing the straight portion of the thoroughfare, which will be about a third of a mile long, should be constructed after the manner of the "Rows" at Chester; that is, with shops and a covered footway at the first-floor level, bridges spanning the side streets and stretching at intervals over the main thoroughfare. This proposal, however, did not meet with approval in professional circles, as it was considered that the buildings would not present a satisfactory appearance;

besides, the London County Council could not erect all the buildings themselves, as this would cost \$200,000,000, and there was, therefore, the question as to whether individual lessees would bear the cost.

Another large competition decided during the past year was that for the new Sessions House to be erected on the site of Newgate Prison, which is soon to be pulled down. The successful competitor was Mr. Edward W. Mountford, whose estimate amounted to \$1,125,000, this sum including \$15,000 for sculpture, \$30,000 for heating and ventilating, and \$15,000 for electric lighting and fitting. The main building comprises about 2,390,000 cu. ft. and was priced at 1s. 6d. per cu. ft.

Though competitions are well responded to, there is a growing dissatisfaction with the principle on which they are based and with the manner in which they are conducted. In several instances, the first premiated design has not been carried out, which accentuates the evil. A church competition in the south of England attracted one hundred and fifty competitors; allowing six weeks for the completion of each design, this gives a total of nine hundred weeks (or about seventeen years) of vain labor, for of what use were the one hundred and forty-nine rejected designs?

The last architectural exhibit at the Royal Academy was, taken as a whole, a very good one, the most important drawings being those of Mr. Aston Webb's building for the Royal College of Science, at South Kensington; Mr. J. M. Brydon's design for the circular court (160 ft. in diameter), which will form the chief feature in the new government offices to be erected in Whitehall; Mr. John Belcher's Eastern Telegraph Company building now in course of erection in the city; Mr. Colcutt's building for Lloyd's Registry; and the design for new Medical Schools at Cambridge by Mr. Edward S. Prior.

For the past fifty years considerable attention has been drawn to the problem of housing the working classes, which, with the increased cost of materials and labor, has assumed an alarming aspect. Attempts have been made to cope with it throughout the kingdom, with more or less success (large tenements and hundreds of cottages have been erected at Manchester, Birmingham, Liverpool, Edinburgh, Dublin, and Bradford), but it is felt that no real solution will be possible until certain modifications are granted by Parliament in regard to the tenure of land and the borrowing of money by municipal authorities. The largest scheme yet undertaken in this country has been that of the Boundary Street Area in the east of London. In the eighties, this was one of the worst places in the metropolis, crowded with houses not fit for human habitation, and occupied by thieves, ruffians, and people of the very lowest class. The widest street was barely 28 ft. across, and in the building of the hovels no mortar was used, being replaced by a material called "billy-sweet," the chief characteristic of which was that it never properly dried. The whole of this plague spot has been swept away, and on the area of fifteen acres twenty-three blocks of tenements now stand, the last of them having been opened in March by H. R. H., the Prince of Wales. The buildings are for the most part of red bricks and are quite pleasing in appearance, despite the fact that

the most stringent conditions were imposed. The majority of them were designed by Mr. Thomas Blashill, the late superintending architect to the London County Council, the remainder being the work of Mr. Rowland Plumbe. In all, 5,380 persons have been accommodated at a cost of \$2,500,000. At the present time, the Council has fifty-four dwellings open, which provide accommodation for 10,686 persons at a cost of more than \$3,000,000; in addition, buildings are nearly ready which will provide for 5,666 persons at a cost of \$1,500,000; so that altogether there is provision for 30,000 persons at a cost of \$9,000,000. It will readily be understood that schemes of such magnitude entail a vast amount of labor and difficulty, and it has recently been considered imperative to form a special Housing Department controlled by a Housing manager, whose salary will be \$4,000 per annum.

The problem of providing accommodation for the working classes is made more complex by the fact that during the last fifteen years the cost of building has increased enormously, owing to the shorter hours of labor, the increase of wages, and the rise in the price of materials. Moreover, the same amount of work is not done in a given period. The bricklayer at one time laid between 800 and 1,000 bricks a day, but now not more than 400 are laid; and when it is remembered that in a workman's dwelling there are probably about 35,000 bricks, with stone-work for windows, it is obvious that there is a great increase in the cost; in fact, a building which could have been erected for \$1,200 fifteen years ago now costs \$1,600. The following figures show the difference in the net cost, for labor only, in the several trades named for a superior workman's dwelling, the total cost of which was in 1890, \$1,860, and in 1900, \$2,525:—

	1890	1900
Bricklayer	\$120	\$210
Joiner	240	325
Mason	100	140
Plasterer	70	125

On February 23 last, the eminent architect William Butterfield died. He was the last survivor of that little group of enthusiasts who brought about the Gothic revival, and all his work was characterized by great sincerity, frank loyalty, and a striking originality. Brick was the chief material used in his buildings, and he employed it as an artist does his pigments; that is, he treated the brick not only as a building material, but as an element of color, in a manner unequaled by any of his followers. This is most markedly seen in Keble College, Oxford,—perhaps his most characteristic work,—but Jesus College, Cambridge, All Saints' Church, London, and the numerous other beautiful buildings designed by Mr. Butterfield all exhibit the same artistic treatment, and are splendid examples of brick architecture. In the list of deaths during the past year must also be included the names of William Young and Charles Barry. The former was a classic architect of repute, and the author of the new War Office design; the latter was the son of the late Sir Charles Barry, who designed the Houses of Parliament. He was an honorable and kindly man, and an able architect. Mr. Henry Curry, the architect of St. Thomas's Hospital, London, also died on November 23.

During 1900 building has been brisk, despite the fact that the prices of materials are so high.

The following prices were current in December:—

Hard Stock Bricks	36/-	(about \$8.75)	per 1000
Flettons	30/6	..	7.30 ..
Red Wire Cuts	35/6	..	8.50 ..
Best Red Pressed Ruabon Facings	105/-	..	25.10 ..
Best Blue Pressed Staffordshires	87/-	..	21.00 ..
.. Portland Cement	38/-	..	9.15 per ton
.. Ground Blue Lias Lime	24/6	..	6.00 ..
.. Plain Red Roofing Tiles	41/6	..	10.00 per 1000
.. Broseley Tiles	48/6	..	11.75 ..

During the past year the Society of Architects has continued to press forward its bill for the compulsory registration of architects; but this measure has encountered considerable opposition, and has not yet become law. Much attention in professional circles was also drawn to the present very inadequate provisions for architectural education in this country.

In January last a scheme was started for erecting Homes of Rest for discharged soldiers, particularly those disabled in the South African War. A freehold site at Bisley was given by Lord Pirbright, and an appeal was made for gifts in kind and money. This met with a hearty response from the building trades, and at the present time practically all the necessary materials have been presented and sufficient money subscribed to complete the Homes, which will form "The Building Trades' Gift to the Nation." Mr. Edwin O. Sachs, the honorary architect, is largely responsible for the success of the scheme.

The most notable books relating to architecture published during 1900 have been: "Gothic Art in England" (Prior); "The Art and Craft of Garden Making" (Mawson); "French Architects and Sculptors of the Eighteenth Century" (Lady Dilke); "Old Cottages and Farm Houses in Kent and Sussex" (Davie and Dawber); "Later Renaissance Architecture in England" (Belcher and Macartney); "Royal Tombs of the First Dynasty" (Flinders Petrie); "Pompeii" (Mau); "Homes for the Working Classes in Urban Districts" (Cranfield and Potter).

The space at my disposal does not allow reference to many other events affecting architecture which have taken place in this country during the past year, but from the particulars already given it will be seen that considerable activity both in architectural and building circles is being displayed throughout Great Britain. Let us hope for unprecedented progress in the arts and industries during the new century; let us hope for the time when

We shall rest, and — faith! we shall need it — lie down for an æon or two,
Till the Master of All Good Workmen shall put us to work anew!
And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame,
But each for the joy of the working; and each, in his separate star,
Shall draw the Thing as he sees it, for the God of Things as They are.

Fire-proofing.

PRACTICAL FIRE TESTS.

CONDUCTED BY THE BRITISH FIRE PREVENTION COMMITTEE.

A NUMBER of floor tests have been conducted by the British Fire Prevention Committee with most interesting results.

A test was made with a floor of wood joists (9 by 3 ins., spaced at 16½-in. centers) filled in with concrete; it should be noted that a third of the space was filled with concrete composed of coke-breeze and cement, a third with concrete composed of ballast and cement, and the remaining third with concrete composed of ballast, coke-breeze, and cement. Coats of plaster were put on the under side of the floor, but no laths were used, though lathing nails were driven into the exposed joists. The area of the floor was 100 ft. super, and ten weeks (winter) were allowed for construction and drying. The test was with a smoldering fire of thirty minutes' duration, followed by a fierce fire for one hour, followed by the application of water for four minutes. The floor was not loaded. During the test the joists caught alight, and certain portions of the soffit of the concrete filling were disintegrated, particularly when water was applied. The floor stood the test, but appeared seriously weakened; it collapsed five hours after the test was concluded. The floor boards were charred on the under side and in the joints, but they did not catch alight. The under side of the coke-breeze and cement concrete showed its straight, flat, original soffit; that of the ballast and cement concrete had crumbled away; and that of the coke-breeze, ballast, and cement concrete had also crumbled away.

On another occasion, the committee tested a floor of steel joists with concrete filling, the breeze and cement composing the concrete being in the proportion prescribed in March, 1899, by the London County Council in their addenda to Schedule 2 of the London Building Act. This particular floor, however, was given extra fire-resistance; firstly, by the corrugated iron centering which was used in the construction and was not removed, and, secondly, by a suspended lath and plaster ceiling. During the test (which lasted an hour and a quarter) the suspended ceiling fell, and the concrete was slightly disintegrated on the under side. The floor deflected 2¾ ins. at the center, but subsequently returned to within 1 in. of level. The fire did not pass through the floor, which had been loaded with 168 lbs. per sq. ft.

During another test a floor of steel joists and coke-breeze concrete, which the Metropolitan Building Act may be taken to describe as "fire-resisting," collapsed after a fire of less than an hour and a half, the temperature not exceeding 1,700 degs. Fahr. The composition of the concrete used was exactly as defined by the London County Council, and the most favorable form of joist —

the steel joist — was employed. This test was followed by one with a floor of deal joists and coke-breeze concrete which, while being constructed so as to comply with Section 74 of the London Building Act, did not present those features which are usually associated with "fire-proof" floors. The joists were of fir 7 by 2 ins. and were spaced at 12½-in. centers; wooden fillets were nailed to their sides. Concrete was filled in on the top of the centering and between the joists to a depth of 5 ins., and to the soffit 5½-in. tongued and grooved matchboarding was fixed, and a floor of 7⁄8-in. straight joint boards laid on top of the joists. The floor was loaded with 100 lbs. per sq. ft. distributed. The following is a summary of the effect: In fifteen minutes all the boarding to the soffit was consumed. In fifty-four minutes the flame came through the floor between the last joist and the wall. In sixty minutes the floor had deflected, and the concrete had cracked transversely. In seventy-four minutes the concrete between two of the joists fell, and in eighty-two minutes the whole floor and load collapsed. The joists were charred up 2 ins. on the under side, but the floor boards were practically uninjured.

The following is the result of a test with a floor made by the "Gypsin" Brick Company, Ltd., of London and Paris: In twenty-seven minutes small flakes dropped off the soffit in places, and the upper surface was quite cool to the touch. In thirty-four minutes further small flakes dropped, and a longitudinal crack about 5 ft. long appeared. In fifty-nine minutes, when the gas was shut off, the soffit was red-hot and vapor issued through cracks in the upper surface and from the stack of bricks forming the load. After the test, cracks surrounding the floor were observed; they were about 1⁄8 in. wide in places and went down obliquely through the floor, appearing as hair cracks on the soffit. The floor at one end had sunk about 1¼ ins. in the center. The material used crumbled away when broken for examination. Its composition was stated by the manufacturer as "a mixture, by means of water, of plaster, hydraulic lime, some sort of neutral material, such as coke, sand, etc., and a fire-proof material, such as asbestos, with an addition of sulphuric acid." The floor was 10 ft. by 3 ft. 6 in., and consisted of a single slab, without joists.

The floor erected by the Mural and Decorations Syndicate, Ltd., of London, tested by the committee, was 10 ft. sq. in the clear, and was loaded with 56 lbs. per sq. ft. distributed. Eight weeks (winter) were allowed for construction and drying. Secured to the top of the joists and covering the whole area of the floor was some patent terra-cotta wired lathing of 3⁄4-in. mesh. The thickness of the concrete varied from 2 ins. over the top of the joists to 7 ins. between the joists. Patent lathing was used for the ceiling. The fire lasted an hour and a quarter, and the result was as follows: A considerable portion of the plaster ceiling fell during the test, some of the lathing being bare before the test closed. The floor cracked at each side to the extent of 1⁄2 in., and dropped 1⁄4 in. When water was applied, smoke, steam, and sparks came through cracks in the top of the floor. One of the joists carrying the ceiling was entirely destroyed, two partially so, and one, though discolored, was practically sound.

Selected Miscellany.

NOTES FROM NEW YORK.

The last monthly meeting and dinner of the Architectural League was particularly interesting; in fact, just such a meeting as the members have been waiting for, and consequently there was a large attendance and much enthusiasm. The majority of the dinners are attended principally by those who occupy their time in conjuring up constitutional amendments, or who want to say a few words upon the ethics or psychology of architecture, or to plead the cause of women as the great architects of the future. The subject for discussion at the recent dinner was the Pan-American Exposition at Buffalo, and



MEDALLIONS, BY BARNEV & CHAPMAN, ARCHITECTS.
Atlantic Terra-Cotta Company, makers.

Turner, and Bitter, respectively. The latter two gentlemen were unable to be present, so that their part of the



RESIDENCE AT NEWARK, N. J. HOWARD & CAULDWELL, ARCHITECTS.

the subject was to be treated from the standpoint of the architect, painter, and sculptor by Messrs. Carrere,



PANEL, BY G. L. MORSE, ARCHITECT.
Excelsior Terra-Cotta Company, makers.

program was effectively outlined by Mr. Carrere as well as his own. Mr. Carrere was very enthusiastic about the approaching exposition, and gave those who were fortunate enough to have heard him a splendid idea of its scope and undoubted beauty, as well as a comprehensive understanding of the great undertaking, leaving us all with a fixed determination to "get there or bust." Among other things, Mr. Carrere said that this is the first great exposition where the entire grounds will be treated as a unit, making possible a perfect ensemble, logical and complete. The color scheme will be particularly attractive, and is under the personal direction of Mr. Turner.

The general motif of the buildings will be Southern Renaissance, but not necessarily Spanish, as many



GATE LODGE, "ARDSLEY TOWERS," ARDSLEY ON THE HUDSON, NEW YORK.

L. C. Holden, Architect.

Roofed with American S. Tile, furnished by Pfotenhauer & Nesbit, agents for New York.

suppose. There will be special attention paid to the sculpture in regard to harmonious scale and appropriateness. The groups will represent the story of man in a logical growth, from his origin to his present high state of development, starting in order from the entrance to the great Electrical Tower, the *point rouge* of the whole exposition.

Plans are being prepared for a tunnel and sub-surface terminal under the Grand Central Station. The possibilities of this innovation are a special suburban train tunnel connecting with a loop at the 42d Street Terminal; electricity as a motive power for suburban trains, and underground connection for passengers between the New York Central tunnel and the Rapid Transit subway station later; a track connection enabling trains to run through to City Hall.

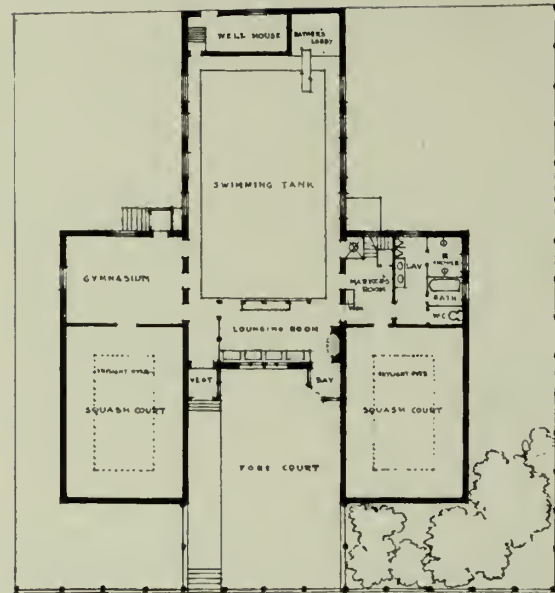
It is reported that a syndicate of which two Boston capitalists are largely interested is to build a new Hotel Brunswick in New York, and that plans are to be prepared by architect Henry Ives Cobb of Chicago. The hotel will be erected on the site of the old Brunswick on Fifth Avenue, from East 26th Street to East 27th Street,



RESIDENCE AT SHORT HILLS, N. J.

Parish & Schroeder, Architects.

Roofed with American S. Tile, furnished by Pfotenhauer & Nesbit, agents for New York.



BIG TREE SWIMMING POOL, CAMBRIDGE, MASS.
R. Clipston Sturgis, Architect.

overlooking Madison Square. The building will be eighteen stories in height.

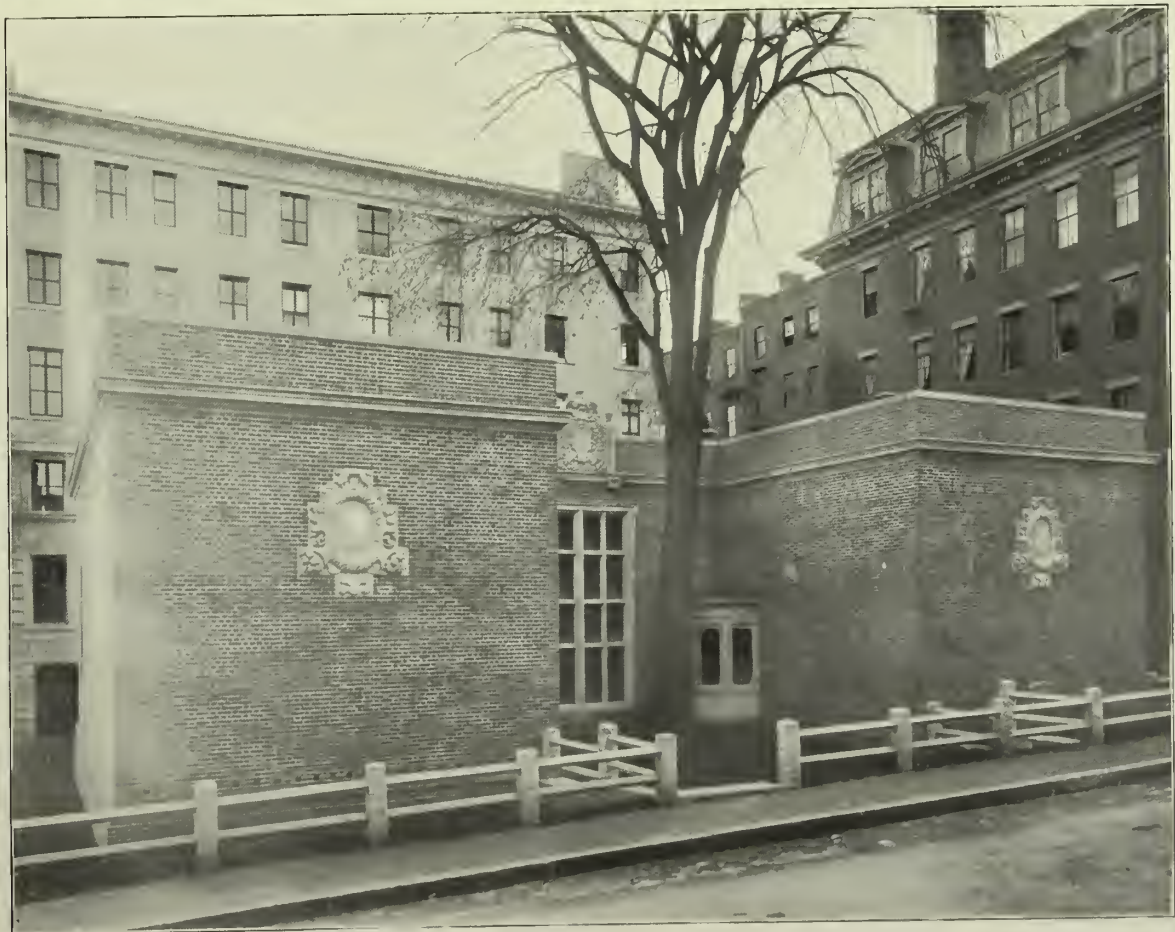
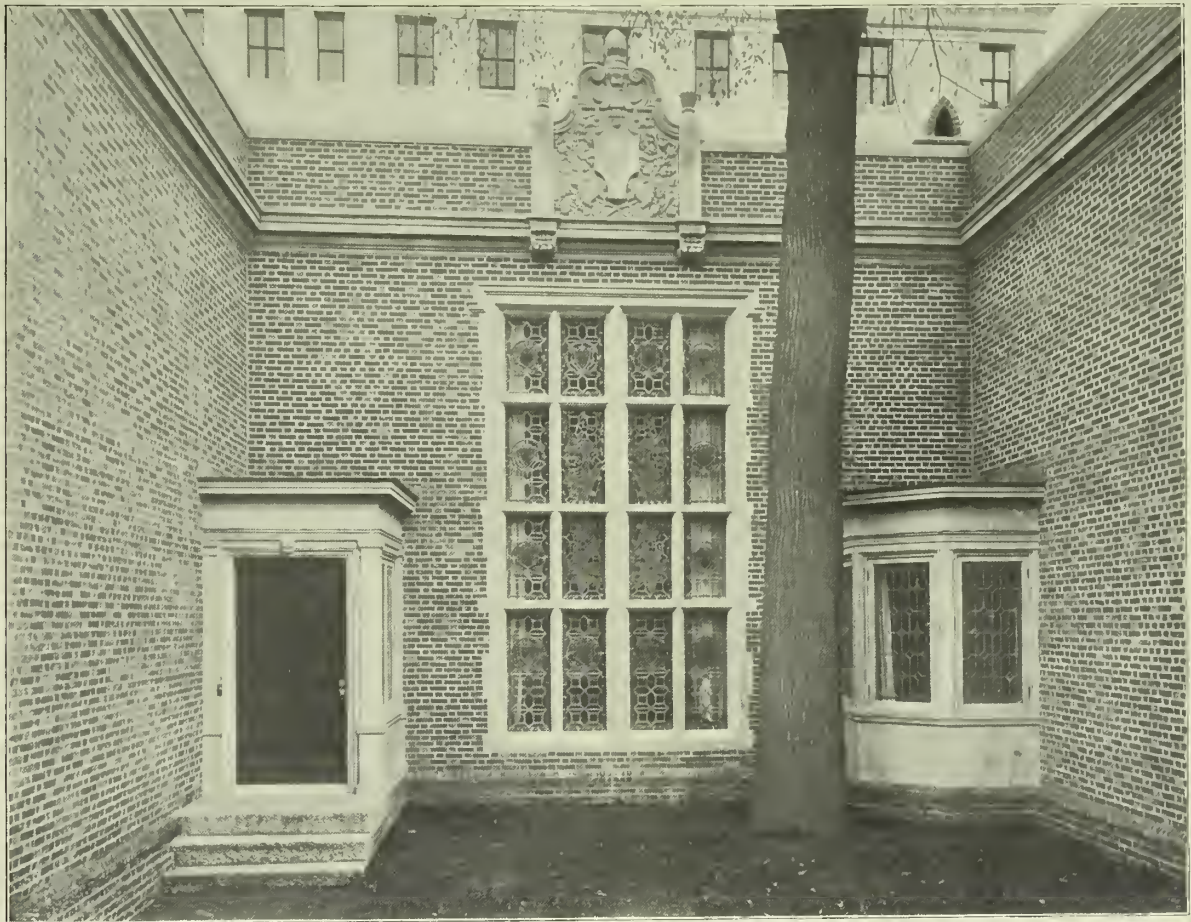
The New York Athletic Club's summer home on Travers' Island, Long Island Sound, was destroyed by fire last week, and steps will be taken immediately to rebuild on a more elaborate scale.

Mr. Richard H. Hunt, architect, announces that he has formed a partnership with his brother, Mr. Jarvis Hunt.

The Chamber of Commerce has purchased the old Real Estate Exchange on Liberty Street, and will erect their magnificent new building on that site. This is a fact to be sincerely regretted, as Liberty Street is very narrow, and the building will be as wretchedly placed as



DETAIL, BY COPE & STEWARDSON, ARCHITECTS.
Perth Amboy Terra-Cotta Company, makers.



BIG TREE SWIMMING POOL, CAMBRIDGE, MASS.
R. Clipston Sturgis, Architect.



BATTERY PARK BUILDING, NEW YORK CITY.
Fire-proofed by the National Fire-proofing Company.

the beautiful Clearing House on Pine Street, which is lost between two sky-scrapers on a narrow little alley.

We regret to announce the death of Mr. Frederick Clarke Withers, one of the oldest and most respected of New York's architects. Mr. Withers was best known for his work during the Gothic revival in this country, and perhaps the best monument to his memory is the Jefferson Market Court at 6th Avenue and Eighth Street.

IN GENERAL.

The international competition for the University of California, which marked an architectural epoch in America, has taken a definite step. In order to carry out the execution of such an



PANEL, BY PAUL E. DUBOV, ARCHITECT.
New York Architectural Terra-Cotta Company, makers.

extensive and important work, covering so long a period of time, a perpetual board of advisers has been appointed, composed of the following well-known architects: D. Despradelle, of Boston, and Charles F. McKim, John M. Carrere, and John Galen Howard, of New York.

Frank Lloyd Wright and Webster Tomlinson, architects, Chicago, have formed a copartnership, with offices at Oak Park, Ill., and 17 Van Buren Street, Chicago.

Vivian & Gibb, architects, Ithaca, N. Y., have dissolved partnership. Arthur W. Gibb will retain the firm's offices in the Trust Company Building, while Clinton L. Vivian opens an office in the Hawkins Building, Ithaca.

On the evening of January 12, Mr. Sid H. Nealy read a paper before the Washington Architectural Club on the "Architectural Lessons of the Galveston Disaster."

At the regular monthly meeting of the Cincinnati Chapter, A. I. A., the drawings of the first competition of the year were exhibited. The problem was a school-house in a thrifty suburban town. Although there were



THE ODEON AND MASONIC TEMPLE, ST. LOUIS, MO.
W. Albert Swasey, Architect.

Built of gray and white impervious brick. Made by the Hydraulic-Press Brick Company.

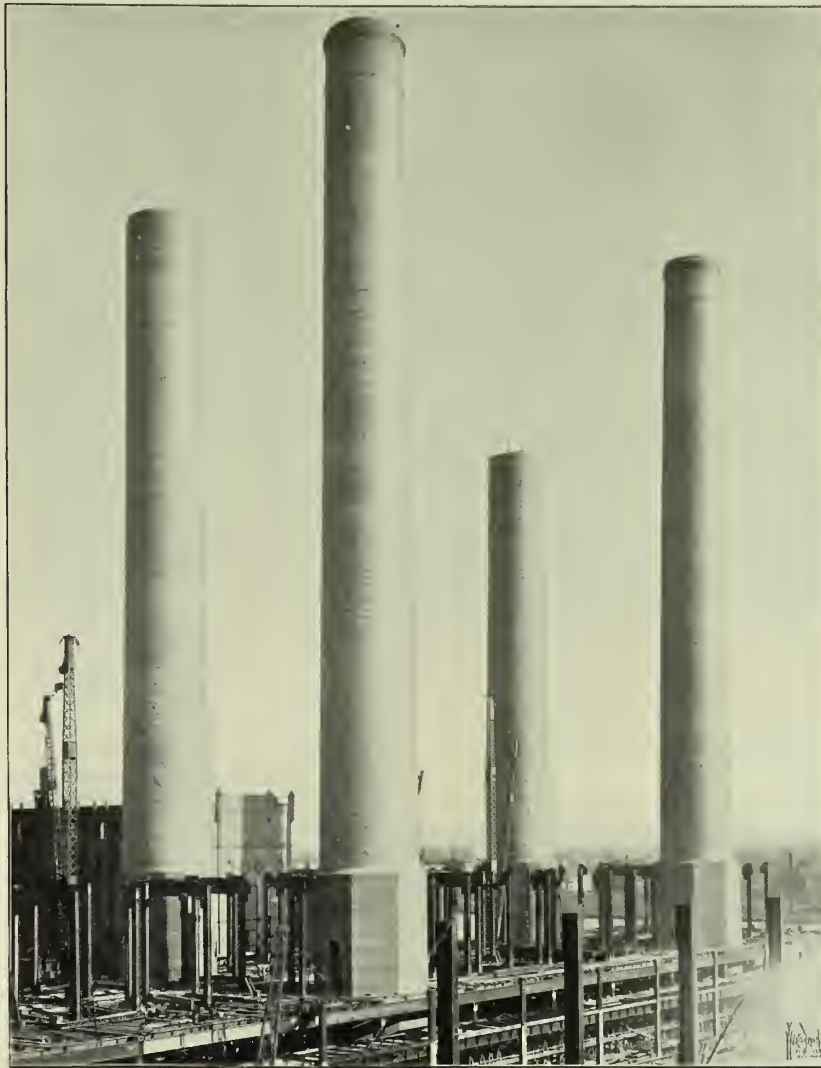


CAPITAL, EXECUTED IN TERRA-COTTA BY THE
NEW JERSEY TERRA COTTA COMPANY.

but four entries, the work was of the most satisfactory character, and the comments of the jury led to an interesting discussion. On the same evening Mr. Ludwig Eid gave a talk on building materials employed in the construction of buildings on the continent.

COST OF USING ENAMELED BRICK.

THERE is a very prevalent idea that enameled bricks are too expensive to be commonly used where such material would be desirable. Aside from the broad question that nothing is too good to meet the necessities of a particular case in the best manner, the fact is that a facing of enameled brick can now be applied to a masonry wall at so comparatively slight an expense as to



GROUP OF CHIMNEYS FOR THE NEW POWER HOUSE OF THE MANHATTAN ELEVATED RAILROAD, NEW YORK CITY.
Brick furnished by Sayre & Fisher Company.

make it undesirable to economize in first cost by using anything else. The Tiffany Enameled Brick Company manufacture bricks of varying thickness, running from $1\frac{1}{2}$ to $4\frac{1}{2}$ ins., all presenting, when laid up in the wall, the appearance of bricks of the ordinary size. These bricks range in price from twenty-seven cents per square foot for the thinner varieties to forty-three cents for the thickest. The thinner bricks are made with a slot, so that they can be firmly anchored to the wall, and except in preserving the brick form on the exterior, are practically enameled tiles, but are made on the same body and with the same care in applying the enamel which characterizes the more commonly used sizes. There is no



TERRA-COTTA FIRE-PROOF CONSTRUCTION, CITY POST OFFICE, WASHINGTON, D. C.
Work done by the Central Fire-proofing Company.



DETAIL, BY BRIGHAM & ADDEN, ARCHITECTS.
Conkling-Armstrong Terra-Cotta Company, makers.

MISCELLANEOUS ITEMS.



LINDALL AVENUE CHURCH, ST. LOUIS, MO.
Link & Rosenheim, Architects.
Roofed with Ludowici roofing tile.



DETAIL, EXECUTED IN TERRA COTTA
BY THE NORTHWESTERN TERRA
COTTA COMPANY.

out in enameled brick. For elevator wells in the interior of a building, for lavatories, sub-basements, and interior courts, the use is already very prevalent. There are also an increasing number of buildings which have been faced throughout with enameled brick. A good enameled brick is the best known resistant of fire and water, and will stand for inside or outside work in any climate; while with the new dead finish enameled brick, handsome effects can readily be obtained, and the unpleasant effect of the glaze avoided, while all the advantages of the impervious and easily washed surface is retained.

reason why these thin facings should not be applied in a perfectly satisfactory manner, and there certainly is no question about the excellent appearance of a wall which is faced through-

R. Guastavino Company are now operating a factory of their own, exclusively for the making of the glazed and finished material with which, as contractors, their name has been so long identified.

The National Fire-proofing Company, Pittsburgh, is sending out a very attractive "Cake Walk" calendar, in which "burnt clay" is shown in a novel and pleasing way.

The Penn Buff Brick and Tile Company, manufacturers of "Blue Ridge" enameled brick, have recently added to their plant considerable new machinery of the most modern type, which will increase their capacity about threefold. This company sold every brick it could make during the year 1900.



BAPTISTRY, TREMONT TEMPLE, BOSTON, MASS.

Blackall & Newton, Architects.

The Faience has a glazed surface with subdued colors, pale yellow and green predominating. The pilasters at side are a pale gray blue. Grueby Faience Company, makers.

THE BRICKBUILDER,
FEBRUARY,
1901.



CHATEAU D'OYDONCK, BACHTE, MARIA-LEERNE.



THE BRICKBUILDER.

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„ Terra-Cotta	II and III	Fire-proofing	IV
Brick	III	Machinery	IV
„ Enameled	III and IV	Roofing Tile	IV

Advertisements will be printed on cover pages only.

THE LICENSING OF ARCHITECTS.

WE have so repeatedly in these columns placed ourselves on record as unreservedly favoring laws looking to the proper licensing and control of the practice of architecture that we are especially glad in this number to present to our readers the very interesting article upon the subject, contributed by Dr. N. Clifford Ricker, Dean of the College of Engineering, and Professor of Architecture in the University of Illinois. While such strong efforts are being made in New York to arouse professional interest in this subject, the article comes with especial timeliness, and based, as it is, upon the observance of the operation of the law during a period of several years, its conclusions possess a value which entitle them to the highest consideration. The standing of the architect in a professional sense has changed immensely during the past few years. Indeed, it might almost be said that as a profession, architecture was not practised at all in this country before the Centennial of 1876. There was little concerted efforts and almost no appreciation on the part of the public of what an architect was expected to know and to do wisely and correctly. It would have been impossible to have enacted any laws such as that which has graced the statute books of Illinois without the growth in public

appreciation on the part, not merely of the architects, but also of the casual citizen who is interested in the welfare of this country. It must be borne in mind, however, that the Illinois law, admirable as it is and efficacious as it has proved, in practice does not make the slightest attempt to discriminate between what we would professionally call a “good” or a “bad” architect. Such a discrimination, as far as it relates to artistic interests, would certainly be desirable in many ways, and if it could be applied with any sort of fairness, would do a great deal to enhance the worthiness of our profession. The examinations which are held in Europe, looking to the licensing of the architects, do include a careful inquiry into the applicant's artistic ability; but the spirit of our constitutional laws, as Dr. Ricker very aptly puts it, gives Americans the inalienable right to spend their money in erecting buildings that are masterpieces of ugliness. And so the most we can hope from laws to be enacted in this country looking towards the control of the practice of architecture is that such laws shall make it impossible for a man to practise unless he at least knows how to make his building strong and sanitary. Such restrictions are fairly within the constitutional powers of every State, and it is only a question of time when they are bound to be exercised in some form or other.

The Illinois law, in fact, might almost be termed not so much an act to license architects, as a law to regulate building construction; for it makes it impossible for either engineer, contractor, or self-styled architect to undertake the erection of any building which has walls and a roof unless he has satisfied the authorities that he has the requisite knowledge. This is a purely practical and utilitarian limitation, and yet it has been remarked repeatedly that some of the most enthusiastic supporters of laws of this description have been architects who have won their chief title to favor through their artistic rather than their practical attainments.

Dr. Ricker calls attention to one result of the law which possibly was not anticipated by those who presented it, namely, the suppression of the infliction of immature architecture on the unsuspecting community by draughtsmen not yet out of their artistic swaddling bands. We fancy that very few architects in ordinary practice are at all alarmed by the kind of competition which their draughtsmen can set up against them, for it is a sort of work which generally brings its own reward, though not always in the shape in which the ambitious draughtsmen anticipate; but it is so thoroughly a mistake for a young man to start in business until he is fully equipped that any hindrances which would keep him in training until he has attained his

majority is a blessing to him, no less the real because he may not appreciate it.

Dr. Ricker calls attention to the excellent work which was done in the interpretation and application of the law by the late Mr. Dankmar Adler and Mr. P. B. White, but he very modestly fails to rightly emphasize the value of his own high reputation and his strong artistic common sense which were so effectual in making a law of this kind acceptable to the many interests which were at stake. If a similar law should be passed in New York, we cannot wish it a better fate than that its interpretation and application should be entrusted to a board selected as wisely as the board which has had the Illinois law in charge.

BUILDING TRADES' EXHIBITION.

FROM time to time there have been in this country spasmodic and generally abortive attempts to establish regular exhibitions of building material and appliances. They do those things better, however, in London, where the Building Trades' Exhibition has come to be a regularly recognized necessity of the constructive arts. This year the executive of the British Fire Prevention Committee, whose members have learned an important lesson from the trade aspect which fire-proofing has assumed since the Cripplegate fire, have organized a special feature of the exhibition, which promises to be productive of considerable good. A separate hall has been set aside for the fire-proofing exhibits, and a sub-committee headed by Mr. Edwin O. Sachs, the well-known architect, is apparently endeavoring to interest all the leading authorities on fire protection, etc., throughout England to participate in the exhibition in question. There will be a great deal of this exhibition which will be of value to the architectural and engineering professions as well as to the municipal authorities and the insurance companies, and the Fire Prevention Committee will show a model of their testing station, with reports, photographs, etc. Something of this kind is badly needed in America. We have only the most fragmentary, sporadic attempts at anything of this description now, and this, notwithstanding that fire-proofing as a science is far in advance of what is practised abroad. There can nothing but good come from an interchange of ideas on such subjects, and to be most efficacious such ideas should be presented conjointly, where comparisons can be made and the different points of view studied together. It is hoped that something of this kind may shortly take practical form in Boston, if not in New York.

THE question of housing the poor is just now occupying the attention of many cities, both in the United States and England. The League for Social Service, 105 East 22d Street, New York, of which Dr. Josiah Strong is president and Dr. William H. Tolman is secretary, is taking a deep and active interest in this work.

A petition signed by prominent men in New York City, men who are taxpayers, is about to be presented to the State legislature of New York, urging that body to enact legislation which will result in acquiring one block of ground on the East Side of New York City to demon-

strate the feasibility of building on said ground model houses for the people. The block of buildings, it is proposed, shall be owned by the city, and rented at prices which will pay the legal rate of interest on the investment, and the cost of keeping the homes in first-class condition.

The petition from the city of New York, asking the legislature of New York to pass a bill authorizing the city to acquire property and erect model houses for the people, embodies plans as follows:

The plans for such homes to include the block as a whole.

The buildings to be fire-proof, with every modern improvement that can be advantageously used, the whole to be owned by the city, and rented at such rates as will pay the legal rate of interest on the investment and the cost of keeping such homes in first-class condition.

The city to be forever debarred from renting any such property for the purpose of selling intoxicating liquors therein.

These recommendations are made in the belief that the best interests of the city demand some such plan be put in operation, because it will

First. Furnish homes for the people who otherwise would never have them.

Second. Furnish employment for its own mechanics, laborers, and tradesmen, and thereby benefit the whole community.

Third. Do away with the present unsanitary tenements, which are a menace to life and health; it being an undisputed fact that over six thousand deaths a year occur from consumption alone, contracted under conditions the average wage-earner is powerless to protect himself against.

Fourth. By refusing to allow any intoxicating liquors to be sold on such premises, the municipality is committed to a line of policy which must in time commend itself to the citizens of the city by checking the causes which lead to demoralization and vice, and as an object-lesson show that the municipality stands for the ideals it must strive after if the nation is to survive and prosper, as its ultimate fate must depend to a great extent upon the training the children of the great cities receive, and the environment that surrounds them.

Fifth. Gradually put in operation a system that will restore to the people the right to live on the earth without paying, at least, one fourth of all they earn, to landlords for what nature intended should be the common heritage of all the people.

The Third Annual Convention of the Architectural League of America will be held at Philadelphia, May 23-25.

The proceedings of the Second Annual Convention of the Architectural League of America, held at Chicago, June, 1900, have just been issued in pamphlet form. All the papers read before the convention are included,

Brickwork in Paris.

BY WILLIAM T. PARTRIDGE.

THE predominant characteristic of nearly all the brickbuilding in Paris is picturesqueness. Whether that quality be altogether a desirable element in city buildings is at least open to question. Brick, of course, lends itself readily to the picturesque; and the small size of the buildings in which brick is employed in this city offers further temptation for the use, perhaps the exaggeration, of that quality. It is certainly much easier to make a picturesque design when the problem is a small one, or the site irregular.

To this picturesqueness of outline, color is the natural accompaniment; and the domestic structures in Paris, being, as we have said, small, are freed from the strict regulations governing larger buildings, and open a limitless field for the use of brick in obtaining the desired color.

In the smaller domestic work, then, and wherever individuality and color are sought for, brick is much employed, although stone is a cheaper material, and is



STUDIO, PLACE DES ÉTATS-UNIS.

more easily obtained. Therefore, in looking for examples of brickwork, we naturally turn to those residence centers where small private houses mark individual ownership.

Many of the buildings we find there might fittingly be called architectural misfortunes. They are almost grotesque. In many cases, to be sure, there occur happy combinations of color; but they are usually wasted upon buildings unspeakably poor in architectural form. Examples of the reverse instance — good outline and atrocious color — are no less common. In most of this smaller work, indeed, the so-called "emancipation" of the French architect from the influences of the past is a matter for sincere regret. Many an attempt to reproduce a Louis XII. motive is marred by molding, or rather expanding, its graceful detail into conformance with the school traditions. The consequent changes in scale are ruinous.

It is in the new quarter of Paris that the most inter-



RESIDENCE, RUE EUGÈNE FLACHAT.

esting examples of brickwork are to be found. Brick is employed there occasionally in apartment houses as well as in private dwellings; but the larger structures are so hampered by building laws that there is little or no attempt at actual recognition of that material. Several schools and colleges, by the way, are built entirely of brick; and some attempts at a commercial or factory type, employing a combination of brick and iron, have been made from time to time.

The quarter of Hausmannized Paris that we mean to designate lies around the Place des États-Unis, the Parc Nouveau, and the little street of Eugène Flachat.



THREE RESIDENCES, RUE EUGÈNE FLACHAT.



STUDIOS, RUE EUGÈNE FLACHAT.

On the south side of the Place des États-Unis stands the house of Julian Story, the American artist. It is of a light-colored brick, — originally yellow, — with red-brick quoins. The entrance, bay, an addition, and windows above are of stone, following an Italian rather than a French Renaissance precedent. A further touch of Italy is given by the wide projecting eaves. The studio is recessed, and breaks the roof-line pleasantly. But the large window lighting the studio proper is bare and meager in comparison with the charming stone motive directly above it. The brick decoration contributes an air of gaiety that is not displeasing; but greater refinement and dignity might have been obtained by using, below the attic at least, brick of only one color, with no attempt to enliven the surface by the weak cornice decoration of imitation quoins.

Another innovation that is, on the whole, rather unfortunate is the addition of the entrance, which, although it makes an interesting composition, mars the mass of the main building.



RESIDENCE, PLACE MALESHERBES.

Another dwelling which, by its overhanging roof and arcaded upper story, is stamped with Italian influence is found in the street of Eugène Flachat. It is a logical expression of the plan, and satisfactory in spite of what may seem to be a lack of symmetry. A few simple, broad lines of stone frame the lower three stories, while the arcade and overhanging roof lend dignity to an irregular though frank fenestration. Colored mosaic decoration is used in the cornice and under the arch of the principal window. A unique iron balcony binds the double window, and all of the stone carving is refined in detail.

Further along the same street is another and simpler Italian motive, — a house of glazed brick, with no attempt at architectural treatment except in the strong basement and crowning eaves. Much of the decoration in brick-work is coarse, and much is meager, — as, for example, where the voussoirs of the arches are ornamented.

On each side of this building is a smaller house, one



RESIDENCE, NEAR PLACE DES ÉTATS-UNIS.

Gothic, the other in a late Renaissance style. The former, to the left in our picture, is made entirely of brick except the base and entrances. Considerable effect is obtained by brick corbels. Colored tile-work appears in what serves as a frieze, and a diaper pattern of dark brick covers the body of the building. The small building to the right in the picture is of a common type of the French Renaissance, brick with architectural members of stone, varying only in proportion and in refinement of detail.

The example of brickbuilding next pictured is also on the Rue Flachat, where its picturesque broken skyline looks somewhat out of place among more conventional neighbors. But the broad treatment in the use of colored brick, and the spotting of the wall-surface by headers, makes it worthy of study.

The more formal specimens surrounding those we have selected follow two conventional styles, — the French Gothic and the style of Henry IV, or Louis XIII. The

Gothic examples in brick are for the most part modeled after the Louis XII. wing at Blois.

The house on the Place Malesherbes rivals in size Blois itself, from which it has drawn nearly every motive and detail. The view in front is more interesting than that on the sides, where the plan demanded a certain monotony of fenestration. The building is a clever, free adaptation of a precedent to meet modern requirements. Situated on a corner and occupying all the frontage of a small block, it preserves its carefully studied sky-line uninterrupted by adjoining constructions.

A small, though none the less interesting, mass is near the Place des États-Unis. In contrast to the freedom of its large rival, its sky-line is marred on account of a bald, utilitarian background, — the walls of a neighboring apartment house. The re-enforcement of the soft stone party-walls of the latter by brick ties is interesting.



RESIDENCE, RUE LEO DÉLIBES.

There are illustrated two more examples of Gothic work in brick between party-walls, examples differing widely in situation as well as design.

The florid house on the street of Leo Délibes, with its great studio window, suffers in comparison with the charming little composition near the Sorbonne, which has an individuality as distinct as the work of Burgess or Wilson Eyre.

There are several attempts at the use of brick and iron in domestic work in the Style Nouveau, but the result is one to avoid. In the suburban streets are many especially attractive brick compositions. Here the background of foliage gives contrast and makes welcome that picturesqueness of which one is timid in the city.

Thus far, it will be observed, the notes of this architectural pilgrimage have omitted accrediting work to the several designers. But in the domestic architecture of Paris there is an utter lack of that individuality of conception that stamps the London dwellings, for example.

An architect visiting in Paris finds himself compelled



RESIDENCE, NEAR THE SORBONNE.

to refer to the architectural periodicals for the identification of the smaller buildings. In England, on the other hand, the first glance at a building enables him to name the designer, — Shaw, Belcher, or Ernest George, as the case may be.

Does the École training destroy individuality?



FACADE, RUE ME. CHANIN.

Results of License Law for Architects in Illinois.

BY N. CLIFFORD RICKER.

President, Board of Examiners of Architects, State of Illinois.

IN continental Europe, the profession of architecture can only be entered after a full course of technical studies in a school of architecture, a term of practical experience, and by passing a severe examination by State authority. This insures the possession of an amount of professional knowledge and experience at least equaling the requirements for admission to the professions of law and medicine. It results that the duties, powers, and remuneration of an architect are more clearly defined, and his responsibility for his work is greater than is the case in the United States, where the profession is practically open to any person possessing the moderate capital necessary to equip an office, and who can secure some confiding clients.

This condition of affairs was long since considered objectionable by thoughtful architects, who agreed that at least a minimum professional knowledge should be possessed by every architect, and that, like law and medicine, this profession should be protected from ignorant and dishonest pretenders, dangerous to life and health, and promoting large expenditures of money, producing neither good architecture nor any adequate financial return.

The average citizen is frequently unable to distinguish between scientific physicians and quacks; he is still less likely to appreciate the great difference between a competent architect and one ignorant of sanitation, of the principles of construction, relying entirely on Divine providence to sustain his buildings until after the collection of his commission.

The most feasible and effective method of regulating the architectural profession is the enactment of a license law, requiring some examination of the professional qualifications of architects, and exercising some control over practice, with the punishment of dishonest acts. Such a law is quite similar to the laws regulating the practice of law, medicine, and pharmacy, now existing in nearly all civilized communities. It can only be based on the police powers of a State to protect the lives, health, and property of its citizens, because a law authorizing inquiry into matters of taste and style would probably be adjudged to be unconstitutional. Americans have an inalienable right to spend their money in erecting buildings that are masterpieces of ugliness, so long as these do not endanger the health and lives of their occupants or of their neighbors; and this right cannot be abridged, any more than their right to employ physicians of any "pathy," or lawyers belonging to any party.

New York was probably the first State to pass such a license law for architects; but this act was summarily vetoed by Governor Flower, who regarded it as merely a means for organizing a professional trade union, thus being purely class legislation.

Similar laws have been proposed in other States, especially in Ohio, Missouri, and Texas, but no such law has been enacted except in Illinois.

As early as 1895, at least, a license law was drafted

by a committee of the Chapter of the American Institute of Architects in Chicago, being chiefly the work of the late Dankmar Adler of Chicago, who devoted much very valuable time and thought to this subject. The same committee appears to have endeavored to induce the legislature to favorably consider and pass this law, but it never passed the initial stage.

Some changes were made, and a bill embodying them was introduced in 1897 by Hon. C. W. Nothnagel, — an architect practising in Chicago, then a member of the Legislature, — and seconded by a committee of Chicago architects. To the general surprise of the profession, these efforts were successful, and the law was enacted and approved by the governor. A few amendments to remedy defects were further made in 1899.

The chief points of the present law are as follows: Each practising architect must procure a license, obtain a personal seal bearing his name and address, and impress this on all working drawings and specifications issued from his office. This locates the personal responsibility for defective construction, and for injuries to life or health. This license may be revoked for non-payment of annual fee, and restored on payment thereof. Or it may be revoked for incompetency, recklessness, or dishonest practices after due trial before the Board. Penalty of from fifty to five hundred dollars per week is provided for practising architecture without a license, and the Board is required to prosecute all violations, and is authorized to expend funds for this purpose. These penalties are not received by the Board, but are paid into the local school fund, I believe.

In order to avoid any strong opposition to the enactment of this law, it was considered necessary to make two concessions, whose effect is temporarily injurious; but this condition is rapidly improving.

1. License without examination. Any person practising architecture as a profession on July 1, 1897, the time at which the law went into effect, was entitled to a license without examination of his qualifications, provided he made application before Jan. 1, 1898, and furnished satisfactory proofs of the fact. Although a careful investigation of the evidence was made in each case, the competency of the applicant could not be considered, and it is probable that a considerable number of incompetent men were necessarily licensed, to the disgust of some fully qualified practitioners.

But it is certain that without this provision, strenuous opposition to the law would have been made by prominent architects, who regarded any examination into their competency as humiliating and as a possible means of injury that might be utilized by professional rivals. But a single architect, entitled to license on account of practice, has ever voluntarily taken the examinations prescribed by the law.

However, this mode of obtaining license became impossible after Jan. 1, 1898, and the holders of this class of licenses are being rapidly replaced by those licensed after careful examination of their professional qualifications and experience, as provided in the law. Nearly one sixth of the entire number have been thus replaced by younger and competent men within the past three years, so that at the end of fifteen years from this time very few will be left, and the architects in Illinois will

form a professional body unequaled in professional equipment in any other State.

2. Contractors may make their working plans without obtaining license or using a seal. It is common for large contractors to furnish their own plans and specifications, accompanying these with a bid for the work, just like builders of steel bridges. When such plans are offered for bids from others, and the work is let to another contractor, the author of the plans becomes an architect practising without license, and is liable to the penalties of the law.

This provision was inserted to avoid opposition of large contractors, but its operation is practically prevented in Chicago, where an ordinance authorizes the issue of building permits only for plans stamped with the seal of a licensed architect. This ordinance has practically compelled railways, builders of steel structures, and manufacturing companies erecting their own buildings to place their work in charge of an employee possessing a license.

This provision of the law should be canceled, since no reason exists why any distinction should be made in the responsibility for buildings, whether the designer and superintendent be a professional architect or an experienced contractor.

The law defines an architect as being professionally engaged in preparing plans and specifications for buildings, which are further defined as structures possessing foundations, walls, and roof, which includes some classes of engineering structures, and, therefore, engineers engaged in designing such structures are required to obtain licenses. This is simply just, because it would be improper to permit an engineer to practise architecture without a license, just as he would not be permitted to plead in a court of law without having been admitted to the bar.

The statement has sometimes been made that the law practically prevents non-resident architects from practising in Illinois. But this is entirely untrue, for such architects may obtain licenses on exactly the same terms as those resident within the State. A considerable number of such licenses have been issued to architects residing in Boston, Cincinnati, St. Louis, and in various cities in Indiana.

In accordance with the provisions of the act, the governor appointed a Board of Examiners to execute the license law, consisting of Hon. Dankmar Adler, president of the Board for the first two years, Peter B. Wight, its secretary, W. H. Reeves, W. C. Zimmerman, and N. C. Ricker.

This Board first met and organized on Sept. 3, 1897, and since no forms nor precedents for conducting its business existed, it first became necessary to prepare a series of blank forms, and to arrange a system for handling the work that should insure justice to all applicants, and speedy decisions in all cases. A blank application was sent to all applicants, to be properly filled out and accompanied by an affidavit.

As a check on the statements made in the application, the names of two buildings were required, for which the applicant had been employed as architect, together with the names and addresses of their owners. Letters to these owners soon elicited the facts, whether the appli-

cant had actually been the architect of the building or merely a contractor for its construction. If satisfactory replies were received, and personal knowledge or inquiries made by the Board corroborated this information, the license was issued. It was manifestly impossible for any member of the Board to have personal knowledge of each of the eight hundred applicants for license on account of practice. But if it appeared that the applicant was merely a contractor, superintendent, or mechanic employed on the building, or if by a singular mental error he had named a building with which he had no connection whatever, the case was laid aside, and the applicant was requested to furnish more evidence.

It was quite common for a doubtful candidate to obtain remarkable certificates of professional competency from his townsmen, believing that such papers would paralyze the Board. It was often interesting to learn that in the opinion of his friends, Mr. Blank, of Podunk, was the professional equal of any Chicago architect, thus giving to fame the name of a practitioner hitherto unknown to the profession. It was generally found that these certificates formed the chief qualification of the applicant, although the citizens sometimes expressed themselves entirely satisfied with his work, and saw no reason why the State should interfere.

The dire vengeance of local political bosses and of legislators was occasionally threatened if a license were refused, but this vengeance always failed to materialize, possibly because architects seldom have much time to devote to practical politics and to acquire such influence.

About eight hundred applications for license on account of practice were filed, and of these about seven hundred were granted, after a very careful and patient consideration of each case, with a disposition to interpret and administer the law as leniently as possible. More than five hundred of these were issued to architects practising in Chicago or its suburbs, which, indeed, seemed to be a large number for a city, where building had been almost prevented since 1892 by hard times, and by disputes between contractors and trade-unions. About one hundred and fifty architects were licensed in the remainder of the State, and a score or more of non-residents obtained license. The number of applicants was indeed surprising, since no member of the Board would have expected to find more than four hundred architects practising within the State.

Besides the great number of architects in Chicago, other evidence demonstrated its vastness and its un-Americanized foreign population, for a Bohemian architect was found there, practising entirely among his compatriots, who actually used specifications printed and written in the Bohemian language. It was even necessary to employ an interpreter at his appearance before the Board.

After January 1, a new form of application blank was used, together with a different form of license, stating that its possessor had passed a satisfactory examination of his professional qualifications as prescribed by the law. This application for examination and license specifies the education and professional training of the candidate, the nature of his employment for the five years previous, and names any buildings designed by him. Working drawings and specifications of these buildings may be sent in, and

resident architects are required to personally appear before the Board for oral examination. If this evidence and the qualifications of the applicant appear inferior to those required in the class examination, he is directed to appear at the next class examination, which is entirely written, continues for two and a half or three days, and is conducted by a committee of three members of the Board, which marks the papers, identified by numbers only.

Two or three class examinations have been held annually, alternately in Chicago and at the University of Illinois. These relate only to the five points specified in the license law:

"The examination shall have special reference to the construction of buildings, and a test of the knowledge of the candidate of the strength of materials, and of his or her ability to make practical application of such knowledge in the ordinary professional work of an architect, and in the duties of a supervisor of mechanical work on buildings, and should also seek to determine his or her knowledge of the laws of sanitation as applied to buildings."

As before stated, no inquiry on any other subjects is authorized. Those specified are within the police powers of the State, upon which the law is based.

These examinations have been carefully arranged so as to place on equal footing the graduate from a school of architecture, the man trained in the office of an architect, or the competent mechanic or superintendent, educated by experience and private study. Possession of the required knowledge is essential, no matter where obtained. All kinds of candidates have been examined, from the simple mechanic or draughtsman to the graduate of the best French school with a diploma entitling him to practise architecture in France.

Up to this time 186 applications for examination and license have been received, and 120 of these candidates, or nearly two-thirds, have successfully passed the examinations, and licenses have been issued. This makes a total of about 820 licenses issued, about 670 of these being now in force, showing a loss of about 150 architects.

This loss is caused by deaths, by removal from the State, by abandoning the profession, etc., but chiefly by revocation of licenses for failure to pay the annual renewal fee. It has doubtless chiefly occurred among architects licensed on account of practice, affording a basis for my previous statement, that about one sixth of this class has been replaced by men that have passed the examinations.

One license has been revoked for dishonest practices.

The license law is enforced by the attorney of the Board, Hon. Charles N. Goodnow, of Chicago, who keeps a close watch on buildings and architects, and conducts all prosecutions in the courts for violation of the law.

The system of administration is largely due to the wise foresight and the careful thought of the late Dankmar Adler, a gentleman imbued with the noblest civic spirit; the very complete forms required were chiefly devised by Peter B. Wight, the secretary of the Board; other members have devoted especial care to the examinations and the general work of the Board.

The general results of the law have been decidedly advantageous to the public as well as to the profession.

Numerous shysters and incompetents have been driven out of practice, especially in Chicago and its vicinity, where a considerable number of men have been prosecuted and fined. There is plenty of room for this class outside of Illinois.

The professional status of the architect has been very materially elevated, and the general public is learning that there is a great difference between the architect and the contractor, and to beware of a person attempting to perform both services at the same time. No man should have an interest in the profits of the erection of a building built under his direction and subject to his approval, acting as the expert adviser and agent of the owner.

Draughtsmen in the larger offices have been restrained from practising on their own account, unless they pass examinations and obtain a license, when they usually commence for themselves. This kind of practice has been quite common in Chicago, to the detriment of regular practitioners, who have to pay rent and other expenses, from which the draughtsman is free. It has usually been forbidden in the best offices. Cases have even occurred where draughtsmen have been employed to work on competition drawings, and have made and presented other designs made by themselves on their own account, certainly a matter of bad faith.

The professional education and training necessary to the successful practice of architecture has very materially increased during the existence of the law. Nearly one sixth of the number of architects licensed without examination have been replaced by men who have passed the examinations now required. Since this change has occurred within three and one half years, it may reasonably be expected that all incompetent men will have left the profession at the end of the next ten years, when all practising architects will have either passed the examinations or possess equal preparation for their work. The professional standing of the architect should then, in Illinois, equal that of the lawyer or the physician.

Two very important changes are very clearly apparent at this time, and they are certainly in part due to the license law.

The country practice, excepting court-houses and large school buildings that are still designed by specialists, is rapidly passing into the hands of local architects instead of Chicago architects. This gives the country architects plenty of work, and produces a congestion of practitioners in Chicago, where architects do not yet appreciate this great change.

With the exception of great office and mercantile buildings, still monopolized by a few Chicago firms, the work of the profession is rapidly passing into the hands of younger men, whose education, training, opportunities for travel, etc., are far superior to those of their predecessors. It may be confidently expected that if a truly American style of architecture ever appears, it will be the work of these enthusiastic and energetic young men, and it is more likely to appear in Chicago than elsewhere, the place of origin of these three great advances in modern architecture, — the steel foundation and skeleton, the office building, and the rational mercantile building now just developing into its permanent form.

The "Village Bank" Series. IV.

BY DWIGHT H. PERKINS.

IN a prosperous inland village, in the center of an agricultural community, the local bank has outgrown the limitations of the small store building which it had formerly occupied, and has determined to build for itself.

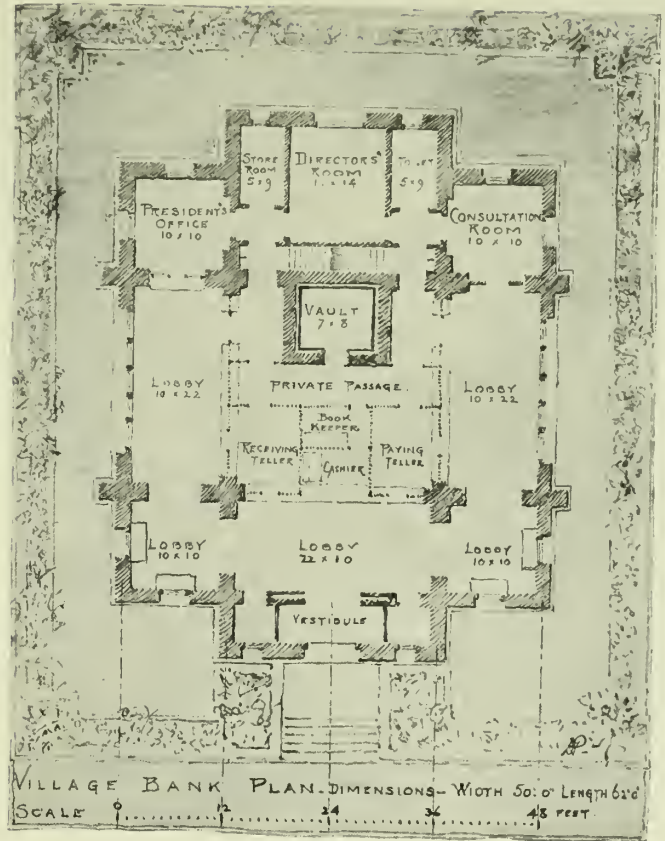
A country college is also located in this village, and the intelligence and taste of the community is higher than the average. This is evidenced by the public library, the church, schoolhouse, and town hall, which have been built around the public square, and which by rare good fortune happen to be well designed.

The bank is to occupy the only remaining vacant space fronting the square. It is, therefore, the desire of the directors to make their building beautiful as well as convenient. They believe that it is commercially wise and prudent to do so; they do not consider good design as a luxury, but as an evidence of good character on their own part, and as something which would be required by their customers and fellow-citizens.

The practical requirements are as follows: A central working space with room for two tellers, a cashier who assists in the correspondence and clerical work, and a bookkeeper; this working space to be directly connected with the vault by means of a private passage, and to be connected with the official department through a semi-private passage.

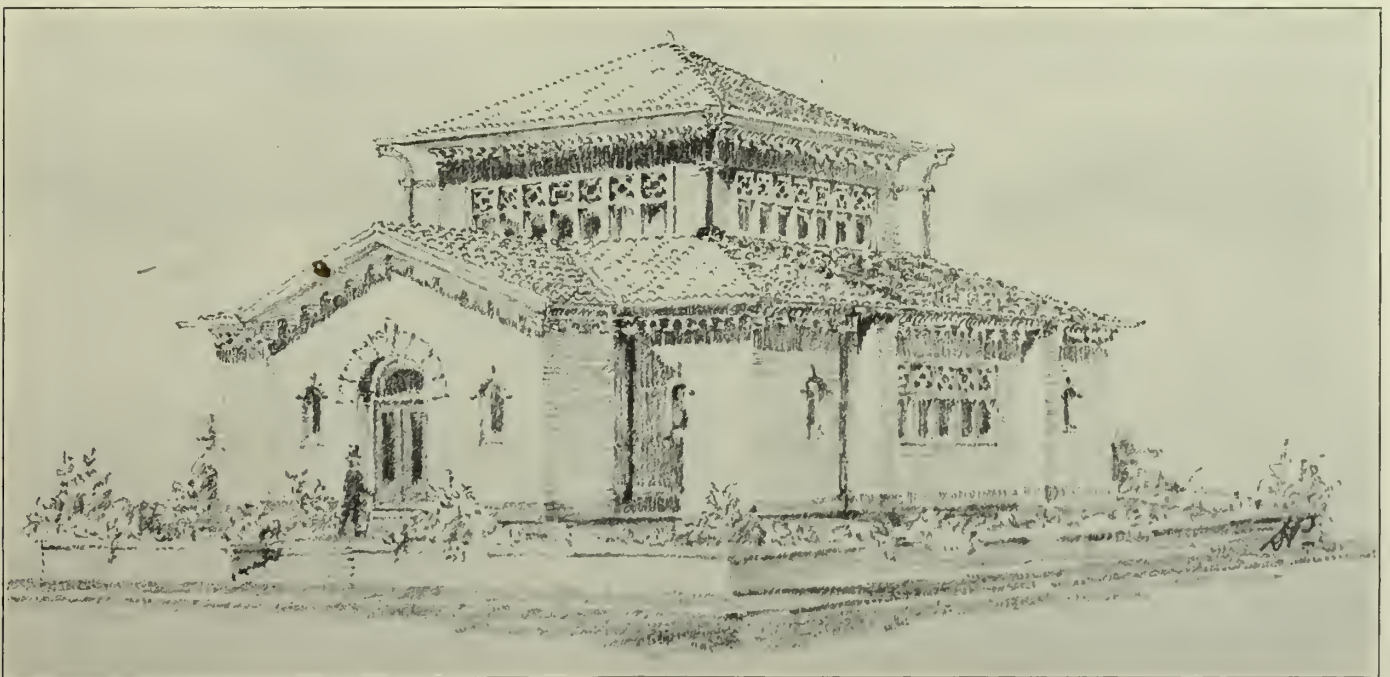
The official department must contain a directors' room, which will be the president's private office when the board is not in session, an outer office for the president, a consultation room where customers may confer with the officers, and the usual store and toilet rooms.

Around the working parts and connecting with the official parts must be commodious, well-lighted lobbies for the public. An examination of the plan will show one of the many possible solutions of the problem. The only entrance is through the vestibule in front. The



PLAN.

lobby is in front and at the right and left. It is well lighted by windows in the two side walls. The clerks are in the center, and their space is lighted from the lantern above. The vault is so placed that it is near the tellers, and is visible from all points; it is especially arranged with reference to the outside windows so that a passing patrolman may see it at any hour of the night by means of the light kept burning constantly. The vault is a "triple-decker," having capacity for old books and records above and below the money division. Storage



A VILLAGE BANK.



SIDE ELEVATION.

for plate and valuables of all kinds is given in the basement, as shown by the section, the plan being similar in extent to the main story.

The section shows the method of lighting the interior. Access is given to the lantern windows by means of the vault staircase and the balcony, so that the windows may be easily regulated and cleaned. It also shows the arched construction of the interior cross walls and the method of abutment.

There is also near the group of central public buildings a power-house which supplies heat and light

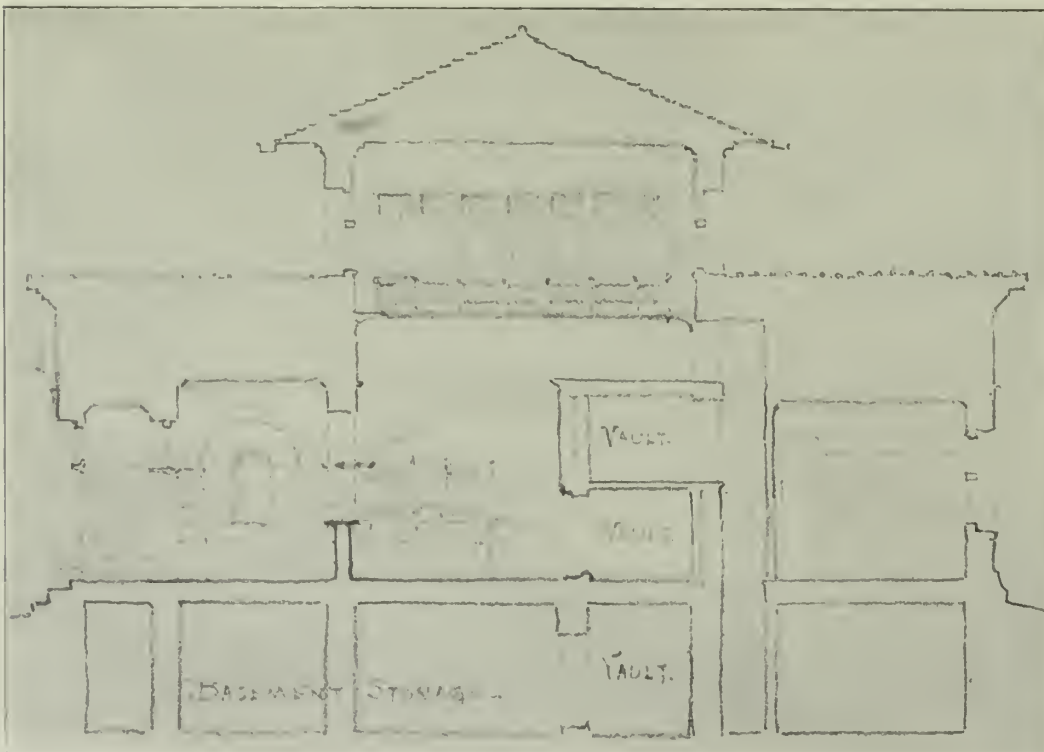
to the neighboring buildings, and it is, therefore, unnecessary in this building to put in a heating plant. The smoke nuisance, so far as this building is concerned, is therefore overcome.

The interior is all of brick and tile, brick being used in color combination for the walls and counters, and tile for the floors and ceilings. The color tones are to be light and warm, the whole being permanent and very easily cleaned, and the annual calciminer will not be needed.

The exterior walls are built of light-colored Roman brick with terra-cotta trimmings, and the roof is of green tile.

The design is the organic outgrowth of the plan, and, like it, is based upon a 12-ft. unit, thus making the composition metrical throughout. Where light is especially needed, the window openings are grouped, and, being wide, no arch construction is attempted above them, arches being used for the main entrance and window openings solely. Above the main windows the space is enriched by terra-cotta tracery.

The entire building is raised 4 ft. above the street walks, and grass and shrubbery is used in addition to the low wall on the lot line to make a proper setting for it.



SECTION.

"The Brickbuilder" Competition. V.

A VILLAGE BANK.

CRITICISM AND AWARD.

BY C. H. BLACKALL.

THE problem of a village bank is one which certainly has enough in itself of interest to attract any one. In simplicity of requirements and unity of purpose, with opportunity for quiet dignity and pure design, it strongly recalls the conditions of the old Greek temple, being in some respects the nearest approximation to the classic type which our modern life can offer; and while there is not the slightest necessity of reverting to the typical Grecian structure, one cannot but be reminded of it in judging such a competition as this. The problem as laid down is perfectly clear and comprehensive: "A building

preference is given to a picturesque, village-like treatment. Elegance, refinement of detail, and, in this particular case, the character of detail and design as adapted to burnt-clay products are all conditions which must be considered, and taking these into account, as well as the balance between the civic nature of the problem and the village character of its location, I place first the design marked "Turk." This has all the appearance of a bank, is of a design such as could well be treated in burnt clay, and, with the possible exception of the somewhat unfashionable female in the foreground, the presentation is excellent. One would wish that the sense of proportion between the columns and the base-course were a little better felt, and, indeed, the whole building would have gained immensely by being set up more from the level of the street. It would also have been quite within the bounds of the conditions if more had been made of the

BRICK-BUILDER COMPETITION -
FOR A VILLAGE BANK -
BY "TURK"

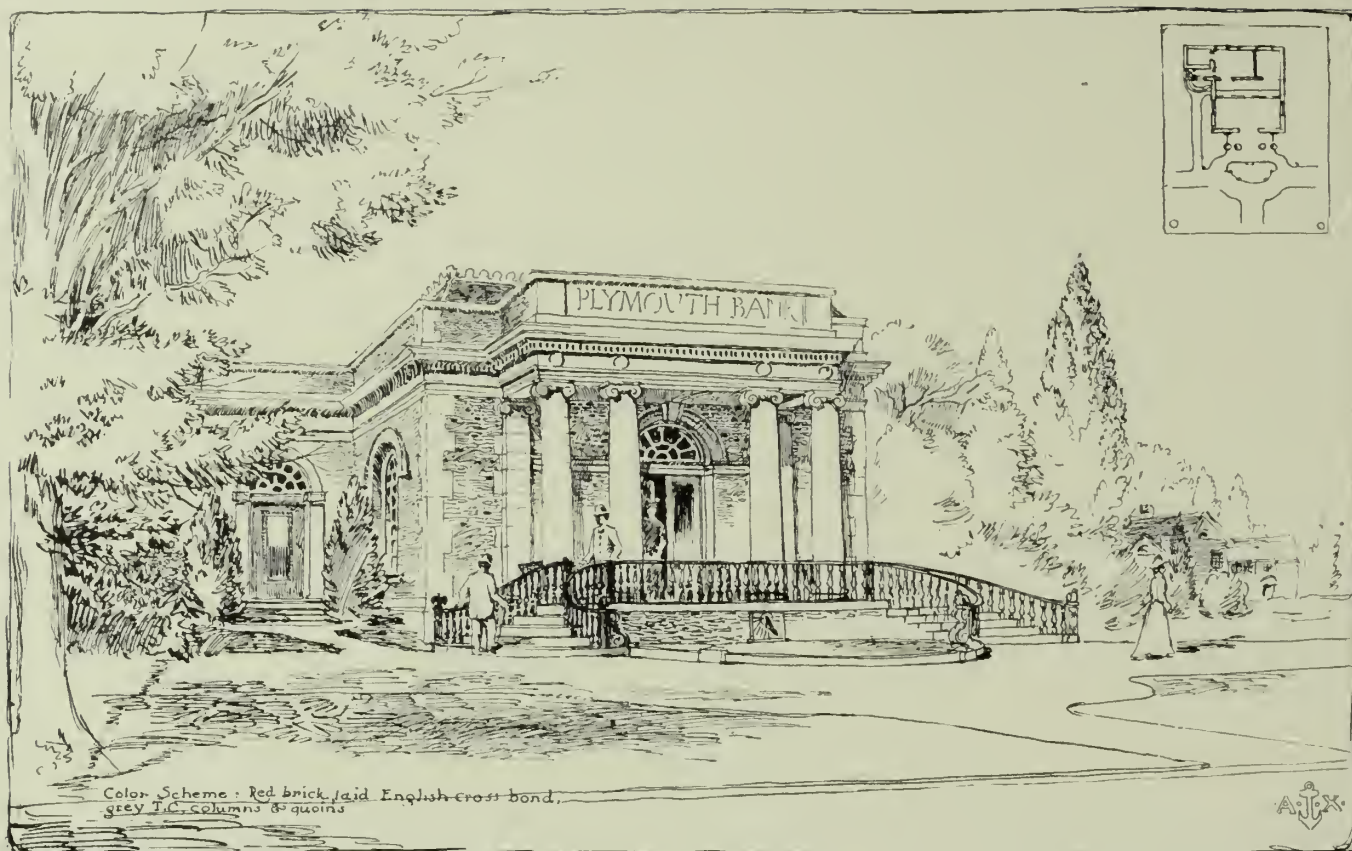


FIRST PRIZE DESIGN.

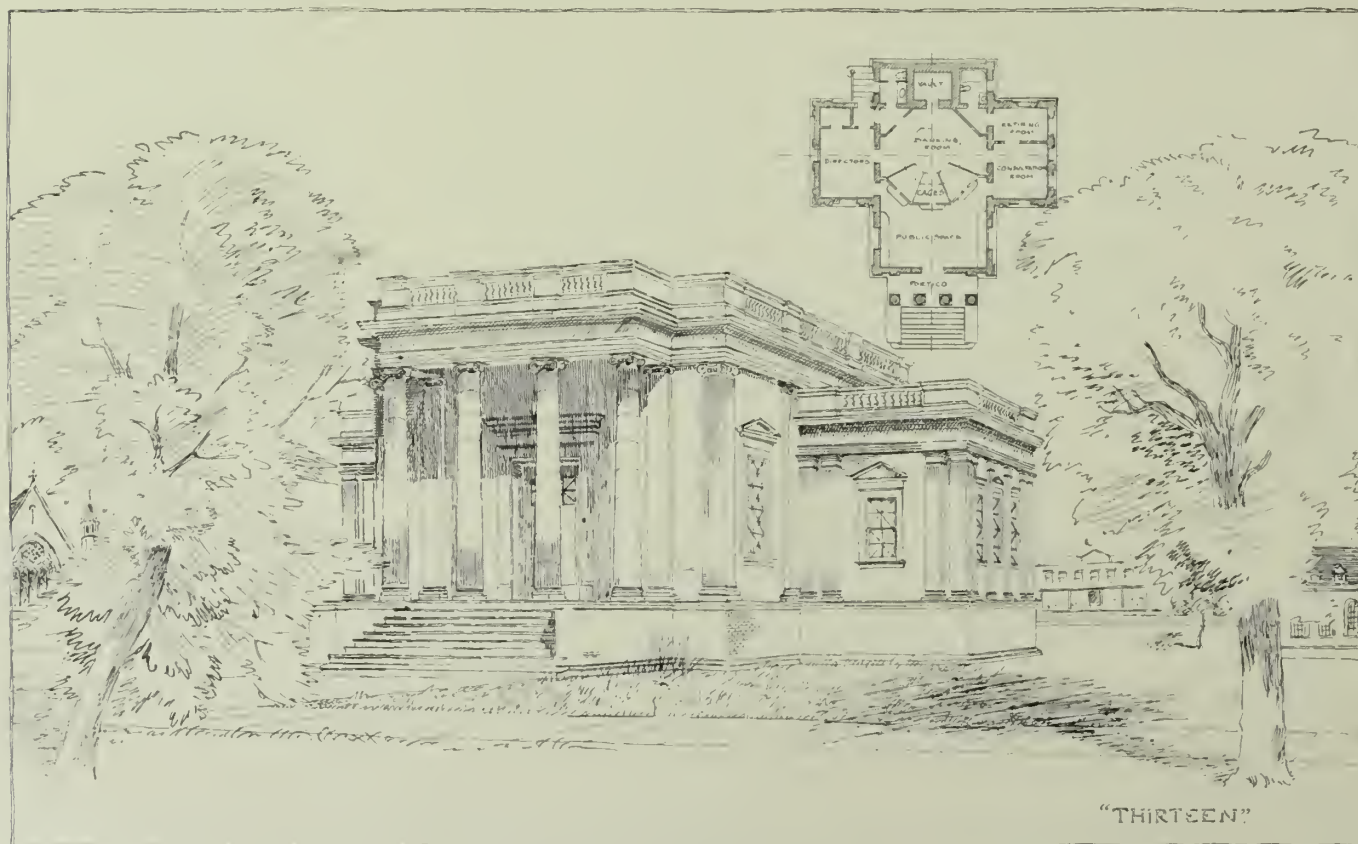
W. PELL PULIS, NEW YORK, N. Y.

to cost in the vicinity of twenty-five or thirty thousand dollars is to be built facing a village green. The building is to be one story in height, and is to be used for a small bank. The design is to be of such nature as is suitable for being carried out in burnt-clay products." That sounds very simple, but its very guilelessness might easily prove a snare to the thoughtless. A bank is essentially a civic function. It suggests aggregations of people and accumulations of wealth, so that while the fact of the proposed building being a part of a village implies a certain freedom and even license in design, these qualities must somehow be combined with reminders of the strength, financial resources, and cultivation which should give a design the peculiar qualities of a bank in the abstract, so that in deciding between the competitors a distinction has in a way to be made between a judgment based on purely architectural grounds and one in which a

approach to the building by means of a terrace or platform raised four or five steps above the sidewalk level, leading thence directly to the steps at the door of the bank. The entrance itself is admirable. The treatment with antes is always pleasing, and the doorway, though a trifle crowded, suggests excellent detail. It is not clear, however, how the side pediment window is treated, this feature being discreetly masked by the perspective; but it is more than likely that study would show the impracticability of using the same ante and column motif here as about the door, and would suggest rather a simple window, with more wall space, and with the antes carried more frankly around the corner. But, as a whole, the design is very pleasing, the details are such as would permit of refinement and elegance in treatment, and in my judgment it fairly deserves the first prize. The village character is made manifest chiefly by the smallness of its



SECOND PRIZE DESIGN.
FRANCIS S. SWALES, DETROIT, MICH.



THIRD PRIZE DESIGN.
JAMES D. BURT, NEW YORK, N. Y.

actual size, and it is perhaps more truly a bit of civic architecture on a small scale.

On the other hand, the design submitted by "A-N About An Anchor" is essentially village like in character. It escapes entirely the civic look of "Turk's" design, and as a bit of picturesque architecture is most charming in every respect, and in execution the building would undoubtedly look even better than does this drawing. The small annex at the left is over emphasized in the sketch, and the railing in the foreground is unduly pronounced; but as a composition it certainly is admirable, and has such freedom from severe academic lines as we would naturally look for in a village bank. Its architecture is not in as refined a key as the design submitted by "Turk," but it is a very close second. The idea of the treatment of the entrance is fortunate in many ways. The terrace and

but in nearly every instance the plan has been broken so as to show eels on each side in addition to projection at the rear, and the entrance portico adds another note of confusion. I should like to have seen this problem treated as a single building without break or projection except the portico, and it is not difficult to imagine such a structure as simple as the Greek temples, to which reference has been made, and no less pure and straightforward in detail. The Volta Bureau, built by Peabody & Stearns in Washington a few years since, is just such a design as I have in mind, and is of interest as a comparison. The four designs which are so nearly equal are marked "Thirteen," "Black Cat," "Oak Brook," and "K. E. M." The design marked "Oak Brook" is simple and straightforward, regretfully large in the windows, and unnecessarily pronounced in its roof, but it is a design which might be



DESIGN SUBMITTED BY J. J. CRANE, NEW YORK, N. Y.

balustrade make one forget any criticism of the proportions between the height of the order and its base, and, at the same time, while giving abundant access to the premises, afford just the slight degree of fencing-in which adds to its character as a conservative financial institution. It is manifestly a brick building, with either stone or terra-cotta trimmings. This design I place second.

It is harder to judge which competitor is entitled to the third place. There are five designs, all of which are so nearly equal in merit, or at any rate in possibilities of development, that it hardly seems fair to place one above the other. They all have a common failing of trying to get too much into the problem, of putting too many motifs on a very simple façade. Indeed, it would seem a matter of surprise that among all the designs submitted hardly any have treated the building as a whole,

refined into a very presentable village bank. "K. E. M." and "Black Cat" are earnest attempts, and are to be commended in many ways, even though one might wish for a little less architecture in each. "Thirteen" has a pleasing composition, and looks like a thoroughly interesting design, but the scale is unfortunate, and the design suggests a building several times larger than this could possibly be. The only way to pick out the third man among all these is to choose the one I personally like the best, and accordingly I shall vote for "Thirteen," notwithstanding its large scale and its rather hard outline. The proportions of themselves are excellent. The building could be set and surrounded so as to present a very stately appearance, and if it is not, strictly speaking, village architecture, it could certainly be made into an exceedingly attractive suburban bank.



DESIGN SUBMITTED BY H. S. HEAD, READING, PA.

BRICKBUILDER COMPETITION - V -
 A VILLAGE BANK
 Submitted by K. E. M.



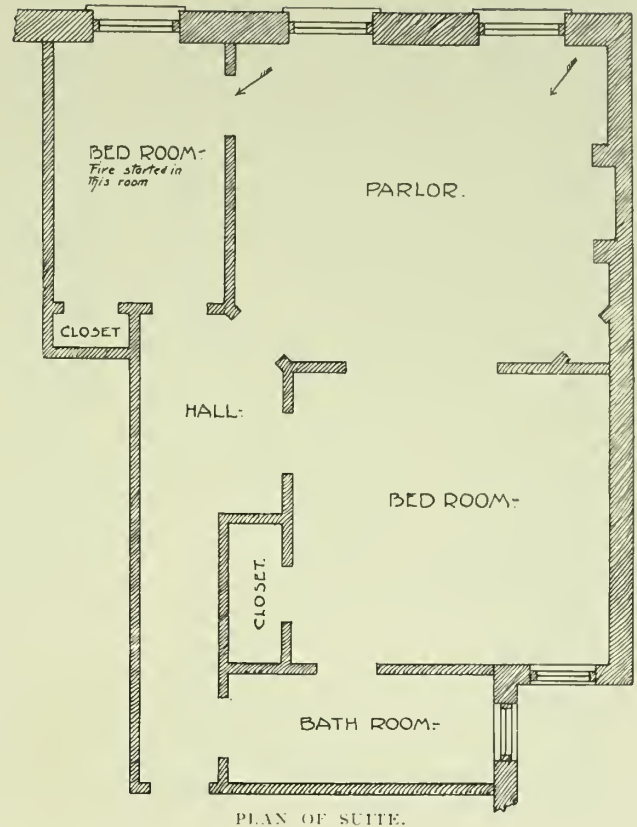
DESIGN SUBMITTED BY J. J. MCMAHON, NEW YORK, N. Y.

Fire-proofing.

REPORT ON FIRE IN THE PIERREPONT APARTMENT HOUSE, NEW YORK.

ON the 1st of February there occurred a fire in a real fire-proof building, which is one more practical demonstration of the great strides which have been made of late in this most important branch of building, and which should be impressed not only upon professional men, but upon the general public, who should be glad to know that tall apartments, which are a necessity in large cities where ground is scarce and worth a fortune, are safer and more secure against damage by fire than the suburban cottage. With such demonstrations constantly occurring, it seems strange that people should be timid about living in these lofty homes. The fire in question occurred on the ninth floor of the Pierrepont, 43 West 32d Street, at 11 A. M., and was caused by the upsetting of an alcohol lamp. The accompanying plan shows the arrangement of the apartment at the point where the fire started, and the arrows show the position of the camera when the pictures were taken. The occupant immediately gave the alarm, but owing to the presence of many inflammable articles of furniture, curtains, etc., the fire gained great headway at once, and the smoke was intense. The fire burned for about twenty minutes, during which time it was gradually being subdued by the employees of the building by means of the fire hose, which is available on each floor of the building. It was well under control by the time the fire department took hold, and was soon extinguished.

The fire was confined entirely to this apartment, in which, of course, the contents were absolutely destroyed. The door leading to the main corridor was not destroyed, but the leaded glass panel was burned out, and the ceiling in the corridor smoked a little. The front windows were



all burned out, but no damage was done to the front of the building itself. The interior doors were destroyed, but the floors are, on the whole, still in good condition. In the small bedroom where the fire started, the plaster has for the most part fallen off, but the terra-cotta partitions are in no way injured. They are straight and true, and the work of replastering and finishing was begun at once.

Showing that the fire burned fiercely and that the heat was intense, a brass bedstead was destroyed, the frame being badly warped and twisted, and parts of it melted, and a brass chandelier was similarly affected. Without a doubt the damage done would have been much less had the doors and trim been fire-proofed by one of the several good methods now in vogue, provided that they had been closed. The greatest monetary loss was in the valuable paintings which hung upon the walls of the parlor. The actual refitting of the apartment will probably cost not over \$800.

The Pierrepont is only one of a large number of hotels and apartments which are constructed absolutely fire-proof and in the most modern and up-to-date manner, making life in the center of the metropolis not only convenient and comfortable, but reasonably safe. The material used in the construction of this building was furnished by the National Fire-proofing Company, to whom great credit is due for the production of a result upon which it seems almost impossible to improve. It will not be necessary here to go into details concerning the development of fire-proofing methods, which subject has been given special attention by THE BRICKBUILDER for years, but it probably will prove interesting to examine the unique features of fire-proof construction which were adopted in the Pierrepont. The spans between the beams averaged 5 ft. 6 ins., the largest being 6 ft. 8 ins.



ROOM WHERE FIRE STARTED.

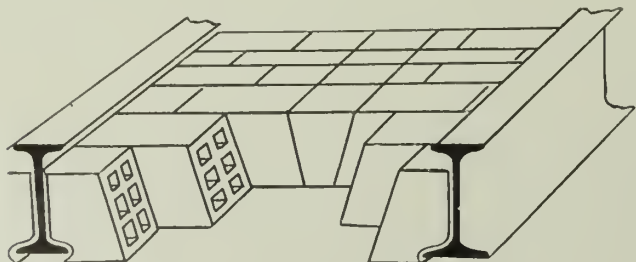


SUITE, DESTROYED BY FIRE, PIERREPOINT APARTMENT, NEW YORK CITY.

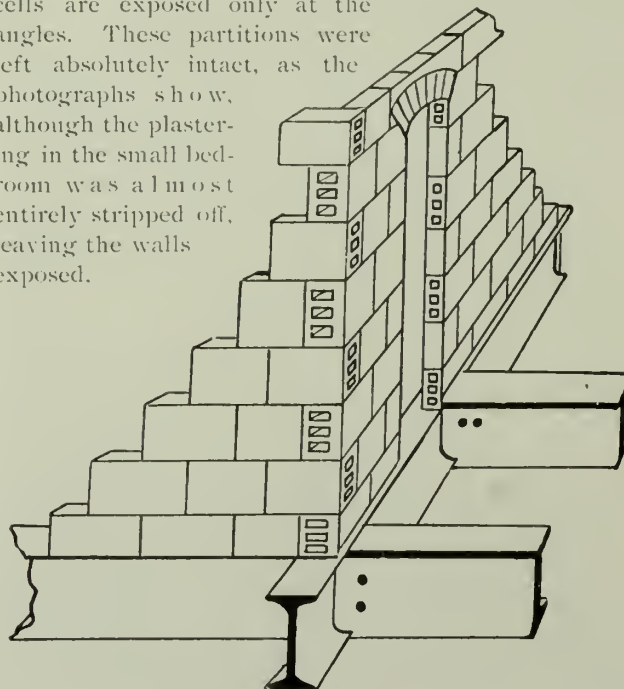
The arches were 10 ins. flat and put together in end construction. This company made an interesting test recently, by which it was clearly demonstrated that their system of end construction could be safely applied to spans of 7 ft., and with arches 10 ins. in thickness. It is only within a few years that the end-construction system, as shown in the accompanying cut, has proved really successful, because in the earlier methods the joints were not broken. Then the use of porous tile is a great advantage in this system over hard tile, because a much better joint can be had, as the material is thicker. End construction is practically a porous terra-cotta product, although some makers use hard stock. It is made with the cell running across the arch, or when set, from beam to beam, and the soft plastic state to which the clay is tempered, in order to properly mingle the proportion of sawdust, destroys all "fiber" to the material, and makes a granular product which has no tendency to "check" in drying; the body of the clay is uniform and the evaporating surface greater; the sawdust and clay, being thoroughly disintegrated in tempering as well as properly mixed, provides for the equal shrinkage of all portions of the block, and insures a perfect article unless deformed in handling. When set in the arch it provides one con-

tinuous wall of material instead of separate portions of an arch, mechanically connected. By this method there is no continuous air-duct for the accumulation of heat, the conveyance of draughts, the housing of dirt and vermin, or the weakening of the ceilings. It prevents vibration which will ultimately break the key's clinch or adhesive qualities of the mortar, and surely and finally destroy the ceiling.

The partitions in the apartment were 4 ins. thick of porous terra-cotta blocks, as illustrated in cut, and the cells are exposed only at the angles. These partitions were left absolutely intact, as the photographs show, although the plastering in the small bedroom was almost entirely stripped off, leaving the walls exposed.



END CONSTRUCTION ARCH USED.



PARTITION BLOCKS USED.

Selected Miscellany.

NOTES FROM NEW YORK.

The condition prevailing among architects and builders in New York at present is "healthy," which is perhaps the most satisfactory thing which could be said of it. Business has settled down to a common-sense basis; and while there has been a dearth of important competitive work to keep up a lively interest, there has been a great deal of activity among investors of moderate means, and those architects and builders who have attended strictly to business have their hands full.

There is so much opposition to the proposed bill for licensing architects, among the members of the profession themselves, that it is doubtful whether such a bill can be passed in this State, and there is also a question as to whether anything would be gained by the passage of such a bill. The matter of good and artistic work will adjust itself in the natural course of evolution, and

pure and durable marble instead of the sandstone originally intended. This will increase the cost of the building \$700,000, and will make the total cost, including the removal of the old reservoir, \$3,390,000.

Plans for the new East River Bridge at Blackwell's Island have been approved, and work can be started without further delay. One million dollars has been appropriated for the work. It is estimated that the entire structure will cost \$8,000,000, and will take about three years to complete. It will be wide enough for two railroad tracks in the center, with ample driveways and walks for pedestrians on either side of the railroad.

The southeast corner of Maiden Lane and Broadway has been bought by a syndicate, who are to erect a sky-scraper on the site. Clinton & Russell are at work on the plans, and the cost will be \$900,000. The property cost \$1,300,000.

The United States Senate has reported favorably upon the bill appropriating \$2,500,000 for an up-town post-office in this city. This news will be hailed with



HOUSE AT BUFFALO, N. Y. GREEN & WICKS, ARCHITECTS.

the education of the public to a proper appreciation of good work will do more than anything else to bring it about. An architect's ability to construct might be licensed, but you can never check his flights of imagination or measure them by precise standards. There will always be 3 per cent. architects among us, license or no license, and there will always be clients who will not pay 5 per cent., and whose demand for cheap labor must be satisfied.

There is a growing desire on the part of the public to become reasonably intelligent as architectural critics, and there is consequently a growing public interest taken in the Architectural League exhibitions, the sixteenth of which is now open and is free to the public every day in the week except Tuesdays and Thursdays.

We are glad to state that the city authorities have been generous in regard to the new public library. They have decided that the building should be built of

general satisfaction as a timely step for a much-needed improvement. It is twenty-four years since the Post-office Building in City Hall Park was completed. A quarter of a century is not a long space in the life of a city, or a public building; but in that short period, New York has risen as if by magic, and the post-office, deemed amply capacious when built for at least fifty years, has already become entirely inadequate to the postal needs of the city and country.

NOTES FROM PHILADELPHIA.

Rankin & Kellogg are fast making a national name for themselves, and assisting to bring the profession in Philadelphia more prominently before the country. It has just been announced that they were the successful competitors in the competition for the new Indianapolis post-office, this being the second government building they have won in competition.

The old Maritime Exchange at Third and Dock Streets, one of the few buildings in Philadelphia occupying a commanding position, and one of the best classical structures in the country, is to be converted into a permanent home for the Philadelphia Stock Exchange. Louis C. Hickman recently won the competition for the proposed alterations, and we are assured that his design will add to, rather than detract from, the dignified character of the old building.

NOTES FROM ST. LOUIS.

There are signs which encourage the belief that a revival in building has come with the new century. There is no longer any uncertainty in regard to the World's Fair, and it only remains for the site to be selected before architects can be selected for the buildings.

Architect Isaac S. Taylor has commenced the Bank of Commerce Building, on the corner of Broadway and Olive Street, and has prepared plans for the new Kennard Building (seven story and basement), of



FIREPLACE MANTEL. ELMER GREY, ARCHITECT.

Church at Vandalia, Ill., and are preparing plans for St. Paul's Southern Methodist Church on St. Louis Avenue.

The Turner estate is erecting a six-story building on the northeast corner of Locust and 4th Streets, for which Barnett, Haynes & Barnett are the architects. The building is to be of steel construction, with terra-cotta façades.

J. B. Legg is the architect of the new courthouse at St. Charles, which will cost \$85,000.

The St. Louis Chapter of the American Institute of Architects has tendered its services to the World's Fair committee to assist in selecting a site.

NOTES FROM PITTSBURGH.

With the new year there has been a great boom in building operations, and this promises to be



PUMPING-STATION, SPOT POND, MASS.
Shepley, Rutan & Coolidge, Architects.
Roofed with Celadon Roofing Tile.

slow combustion, red brick, and terra-cotta. He is also preparing plans for an eight-story fire-proof building, to be built on the south side of Washington Avenue, between 11th and 12th Streets; and a little farther east, in the same block, an eight-story, slow combustion building. The first-named building is to be faced with white enameled brick and terra-cotta, and the latter with red brick and terra-cotta.

Mr. Taylor has also plans for a banking building on the northeast corner of Locust and 8th Streets for the Mercantile Trust Company, and a six-story factory building on 22d and O'Fallon Streets for the Tennet Shoe Company.

F. C. Bonsack has prepared plans for a residence in Westminster Place for Mrs. Charlotte Rogers, and for the club-house of the Glen Echo Club.

Mathews & Clark have just finished a Methodist



ADMINISTRATION BUILDING, WATERTOWN ARSENAL, WATERTOWN, MASS.
Charles H. Alden, Jr., Architect.



DETAIL. C. L. BERG, ARCHITECT.
New York Architectural Terra-Cotta
Company, makers.

The famous competition for the new Pennsylvania State Capitol Building of several years ago has been recalled by several bills introduced in the legislature during the winter. By building of common brick, fire-proofing with a coat of "fire-proof paint," and leaving the walls finished in rough plaster, the building was completed for \$500,000, the amount of the first appropriation. Now it is proposed to appropriate \$6,000,000 to carry on the work, and one bill recommends that the present building be torn down and the work begun all over; at any rate, it has cost the State \$500,000 to learn a few things about competitions, legislative committees, etc.

The Farmers Deposit National Bank will soon com-

the best year that architects here have known in some time; good draughtsmen are in demand.

The People's Savings Bank will build a fifteen-story office building at the corner of Fourth Avenue and Wood Street. Alden & Harlow are the architects.

Work has been begun on an addition to the Hotel Henry, which will double the size of this hotel, and it is said that the Hotel Shenley will also build a large annex.

Alden & Harlow have let the contract for a new building for the Western Pennsylvania Institute for the Deaf and Dumb. Cost, about \$130,000.



COAT OF ARMS, STATE OF NEW YORK.
G. L. Heins, Architect.
Excelsior Terra-Cotta Company, makers.

mence work on a large bank building. Alden & Harlow are the architects.

McClure & Spahr, a firm new to Pittsburgh and who have recently come from the office of Peabody & Stearns, are preparing plans for a large riding academy.

Baltimore capitalists are interested in building a large apartment house on Fifth Avenue, to cost \$300,000.

The Pennsylvania Railroad Company has purchased ground in the East End, and will build a new station there.

PERSONAL AND CLUB NEWS.

W. L. B. Jenney, architect, of Chicago, is in receipt of notice that he has been elected "Corresponding member of the Société des Architectes Français," a society of the highest standing in Europe.

Mr. H. King Conklin, architect, of Newark, N. J., has associated himself with Messrs. Boring & Tilton, New York City.

Messrs. Howard, Cauldwell & Morgan, architects, announce the termination of their partnership on the completion of work in hand. Future work will be undertaken by individual members of the firm, who will retain their present offices in common at 10 and 12 East 23d Street, New York City.

Messrs. Davis & Brooks, architects, announce their association with Mr. Francis W. Crosby, and their removal to offices in the Phoenix Mutual Life Building, 49 Pearl Street, Hartford, Conn.,



SPANDREL. MCCOLLUM & ELA, ARCHITECTS.
Conkling-Armstrong Terra-Cotta Company, makers.



DETAIL, BY COPE & STEWARDSON, ARCHITECTS.
Perth-Amboy Terra-Cotta Company, makers.



PANEL. PEABODY &
STEARNS, ARCHI-
TECTS.
Northwestern Terra-
Cotta Company,
makers.

where they will continue their architectural practice under the firm name of Davis, Brooks & Crosby. The old firm's office at New Britain will be continued.

On the evening of January 26, Mr. James P. Jamieson, of Cope & Stewardson, addressed the members of the St. Louis Architectural Club on "The Design and Construction of the New Buildings for Washington University."

At the 548th regular meeting of the Society of Arts, Boston, held at the Institute, Rogers Building, on Thursday, February 14, Mr. Robert S. Peabody, president of the American Institute of Architects, lectured on "The Designing of the Buffalo Exposition." Illustrated by stereopticon.

On the evening of February 3, a party of Philadelphia's "smart set" made merry in the limited yet hospitable quarters of the T Square Club. Mr. James Russell Harris, a member of the club, furnished a program, which though a departure from the conventional was greatly enjoyed by many of the younger members of Philadelphia's elite.

The first architectural exhibition of any pretensions ever held in Canada occurred at Toronto, January 26 to February 9, under the auspices of the Toronto Architectural Eighteen Club, and from all points of view it was voted a success, and heralded as a permanent entry on the part of the architects of Canada into the progressive movement for the advancement of architecture and municipal arts. Besides a goodly display of Canadian work, there were exhibited about fifty drawings of the Pan-American Exposition, and also the Circuit Collection of the Architectural League.

The most successful features of the entertainment program were a smoker to the Ontario Association of Architects, the Ontario Society of Artists, and the Engineers' Club of Toronto, and a lecture on "Modern City Making" by Mr. Albert Kelsey, of Philadelphia.

WE give below extracts from a paper recently read before a clayworkers' association by Mr. J. Van Inwagen, Jr., general manager of the Tiffany Enameled Brick Company. It seems to us that Mr. Van Inwagen presents the manufacturer's side in a fair and reasonable manner, and that his suggestions by way of remedy of some of the existing evils are worthy of consideration. He says:

"In the first place, the average architect or contractor is too busy about his own affairs to know how much time is required to make the various clay products which

go into his buildings, and the result is that the order is often not placed, either until the material is actually wanted, or too late for the manufacturer to get it out on time, causing the substitution of some other material, or perhaps a vexatious delay. In the latter event, the manufacturer is urged to rush out the material, and you know that the results of a rush order are likely to be less satisfactory in the way of quality. . . .

"Our customers are often surprised that we have not in stock the particular size and color or shape they want; but if they would think it over, they would realize what it would mean to the manufacturer to do this. For instance, say that we only manufacture twenty-five colors and ten sizes; to carry in stock 5,000 bricks in each of the twenty-five shades and in one size alone would mean 125,000 bricks in stock. Multiply this by ten (the number of sizes manufactured), and you have 1,250,000.

Now we make both a bright and a semi-bright finish, either of which may be required, this brings our total up to 2,500,000, and we still only have 5,000 of any one shade, size, and finish in stock, and we have not even considered returns, round corners, octagon, radius, and molded or ornamental bricks.

"Of course, we are all working to sell as much of our material as possible, but I do not believe any of us would object to occasionally running against an order where it was impossible to get in on the deal, owing to the architects having specified some other make than our own, as much as we do to having a specification made which means practically nothing.

"What is the result of not specifying? Contracts are often not given to the general or sub-contractor until shortly before the material is wanted; consequently, no order has been placed. You do not know, nor do your rivals, who will be fortunate enough to land the order, and you must either take a chance and put in stock the required material, or run the chance of losing the job through inability to deliver the goods on time. If we do the former, several of us have a lot of finished material on our hands to carry an indefinite length of time, some of which will very likely eventually reach the scrap pile, on account of its being suited perhaps only to the special work on which you have been figuring and 'got left.'

"Another difficulty — you are often asked for prices on your material, and at the same time, how soon can you furnish it. You quote your price and name the time in which you can deliver the goods. That is perhaps the last you hear of the matter for six months, when all of a sudden in comes the contractor to give you the order, and wants to know how soon he can have it on the ground. You state



PILASTER.
PEABODY &
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TECTS.
Atlantic Terra-
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pany, makers.



COLUMN.
CHARLES
STEGMAVER,
ARCHITECT.
New Jersey
Terra-Cotta
Company, makers.

that it will take such and such time, which is perhaps two weeks or a month longer than you told the architect you could do it in—and your troubles have begun. The contractor, calls up the architect, and the architect



DETAIL, BY GARSTANG & REA, ARCHITECTS.
Winkle Terra-Cotta Company, makers.

sails into you. Are you to blame under the circumstances? At the time when you first called upon him, did he say he would use your material? Did he state when he would need it, or what size, color or quantity would be required? As a rule, no. Since you were first called in, which perhaps was a slack time at your factory, orders have come from other sources which will alone keep you busy for months to come. What is the result? The architect, contractor, and owner are all disappointed, and unless they appreciate fully where the blame really lies, are inclined to lay it all onto you, and you have thus, through no fault of yours, lost not only that order, but perhaps what is worse, the chance to figure on subsequent ones. You might be asked: 'Why did you not keep in touch and know when the work was going ahead?' Any one who has had much experience as a salesman can answer this question as well as I. It is because you are likely to get yourself disliked if you are constantly running after and bothering them; and yet how are you to otherwise get the information if you are so many times put off with indefinite answers?

'I can remember several cases where our material has been specified, without any notification to us, several contractors been invited by the architect to figure the work, and not one of those contractors asked us a price on which to base their estimate until the lucky one secured the contract. . . .

'At another time you are told that a certain size and color will be wanted, your material will be used, and when it will be required. You go ahead and make it. The contractors figuring the job, perhaps a few days before the contract will be let, and a little longer before the material is wanted, ask a quotation on an entirely different size or shade, the architect in the meanwhile having changed his plans without notifying you.

'What are some of the possible advantages to the architect, contractor, and manufacturer of specifying:

'*First.* As far as possible, specified material only would be figured on and used. In this way the architect would not be bothered by the salesman, as the

latter would know that the order must eventually reach his office.

'*Second.* Responsible contractors would know that irresponsible rivals, who had perhaps figured too low, would not be allowed to substitute inferior and, consequently, cheaper material.

'*Third.* The manufacturer would be ready at the right time to deliver the goods, and would know in plenty of time to get them out in good quality.

'*Fourth.* Valuable time would not be lost by contractor and manufacturer, where contractor is allowed to choose between two or more goods of like character, which is very likely to be the case, on account of the former's desire to save something.

'*Fifth.* Reliable trade papers, at proper times (to be determined by the architect), could either publish in their columns such specifications, or notify parties whose materials were specified. Less trouble to architect's offices, to allow, say once a week or oftener, if necessary, a few representatives of reliable papers to get this information than to be constantly bothered by a raft of salesmen.

'Some of the objections to these are:

'*First.* The fear of the architects of a raise in prices, induced by specifying; but need that follow? I think not. A good many of us, perhaps all, would be only too



SEAL, BOARD OF EDUCATION, NEW YORK CITY.
C. B. J. Snyder, Architect.
Standard Terra-Cotta Works, makers.

willing to place in their offices a price-list, which would not change except on account of a higher freight rate, or wages, or some manufacturing item affecting the cost of production, of which we could and would give them reasonable notice.

"*Second.* Unfortunately some manufacturers offer what amounts to a bribe, in the way of a discount to architects, who specify their material, and the result is that your upright architect cannot specify that material without having the suspicion of his fraternity and his clients thrown upon him that he is getting a 'rake off.' The remedy for this is in the manufacturer's or dealer's own hands.



DETAIL, BY E. O. FALLIS,
ARCHITECT,
St. Louis Terra-Cotta Company,
makers.

"*Third.* You may object that this specifying of material does not give a fair chance to the one who has something new and good to place upon the market. We are all practically in the same boat as regards that, and experience teaches that it takes time to introduce and prove anything new, and the after benefit of having yours specified will more than make up for your missing the first order."

MISCELLANEOUS ITEMS.

Some very handsome faience work is being done in two of the principal stations of the Boston Elevated Railway Company by the Grueby Faience Company.

Fred H. Hersey, 16 State Street, Boston, Mass., has been appointed New England agent for the Standard Terra-Cotta Works.

Owen Finch, architect, has opened an office at 184 Main Street, Oneonta, N. Y. Manufacturers' catalogues and samples desired.

F. Neil Brodie, architect, has opened an office at 42 Princess Street, St. John, N. B. Manufacturers' catalogues and samples desired.

Among the orders recently taken by the Atlantic Terra-Cotta Company are the following: Commercial Trust Company Building, Jersey City, N. J., Geo. B. Post, architect; residence, Cedarhurst, L. I., Barney & Chapman, architects; Empire Building, Atlanta, Ga., Bruce & Morgan, architects; Chickering Hall, Boston, Mass., Peabody & Stearns, architects; Young Men's Christian Association Building, New Haven, Conn., Brown & Von Beren, architects; Young Men's Christian Association Building, Brooklyn, N. Y., Parish & Schroeder, architects; public schools Nos. 178 and 182, New York City; State Hospital for the Insane, Howard, R. I., Martin & Hall, architects; New England Building, Vassar College, New York, York & Sawyer, architects;

Huntington Chambers, Boston, Mass., Arthur H. Bowditch, architect; Central Fire Station, Providence, R. I., Martin & Hall, architects; House for Primates, Bronx Park, N. Y., Heins & La Farge, architects.

NEW PUBLICATIONS.

HISTORY OF THE PORTLAND CEMENT INDUSTRY IN THE UNITED STATES by Robert W. Lesley.

This book, although issued by the American Cement Company, of Philadelphia, is not in any sense a trade publication. It seems to cover the entire history of the manufacture of Portland cement in this country, and reviews many of the larger operations in which this product has been employed. Tests by eminent chemists and engineers are recorded, and many valuable suggestions are given for the proper use of cements. Mr. Lesley is a well-known authority upon the subject, and his new work will have a special interest to all users of American Portland cement.

BRICKLAYING. — Edited by Owen B. Maginnis. Owen B. Maginnis, Publisher, 310 West 128th Street, New York City. Cloth, \$2.00.

This book contains extensive detailed explanations of the most approved modern methods of "Bricklaying," as applied at the beginning of the twentieth century.

The information has been obtained directly from the work during construction, and is the current practice



DETAIL, BY J. F. W. JENNINGS, ARCHITECT,
American Terra-Cotta and Ceramic Company, makers.

and experience of the best authorities, supplemented by chapters on "shoring," "needling," and "underpinning," the whole making an invaluable book of reference for architects, engineers, contractors, builders, and mechanics.

Illustrated by over two hundred engravings with full descriptive text.

THE BRICKBUILDER,
MARCH,
1901.



PALACE OF MARGARET OF AUSTRIA, AT MALINES, BELGIUM.



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ADVERTISING.

Advertisers are classified and arranged in the following order:—

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Advertisements will be printed on cover pages only.

ANDREW CARNEGIE AS AN ARCHITECTURAL EDUCATOR.

WE read in the daily papers that Andrew Carnegie has offered to build for the city of New York some sixty odd branch libraries, the total cost of his proposed gift amounting to over \$5,000,000. There is an ancient proverb which relates that he who causes two blades of grass to grow where one grew before is a public benefactor. We might apply a similar statement to Mr. Carnegie's numerous public gifts, and say that he who causes many good buildings to grow upon the face of this earth, where without his fostering help none would have appeared at all, is truly one of the greatest benefactors of his race. It is doubtful if Mr. Carnegie has ever considered himself as having a special mission to educate the public along the lines of good architecture, but, consciously or otherwise, his gifts have had precisely this effect; and it is a somewhat remarkable fact, that a man who was literally the maker of his own fortunes, who worked himself up from the humblest position to that of one controlling far more influence than any political ruler, should show such judicious discernment in the working out of his gifts. He has made a specialty of the smaller public libraries, and it can almost be said that through his efforts there has been

created a distinct type of library, admirably fitted to practical conditions, and at the same time designed in a thoroughly artistic manner. The average millionaire is a person who surely cannot be congratulated upon the possession of a great deal of taste, and many memorial buildings, which have been donated to the natal village by some wealthy citizen who has gone West and struck it rich, have been entrusted to architects whose sole recommendation was that they had some pull with either the donor or the town authorities. Mr. Carnegie seems to have proceeded in an entirely different manner. The architects who have been selected to design his various buildings have been almost without exception of the highest rank. He has aimed apparently not merely to give the money and the building, but at the same time to present to the community which he endows as good a specimen of architecture as the circumstances will permit. In this respect he has been emphatically a public educator, while in his larger buildings, such as the Carnegie Library at Pittsburgh, or the Music Hall in New York, he has succeeded through his architects in creating buildings which are veritably monuments, and has evinced an appreciation of the fine arts which is none the less to be commended because of its extreme rarity as an attribute of the average man of his class.

THE greater part of Mr. Carnegie's donations for libraries have been to the smaller towns, to locations in which it is probable that without his help there would have been not only no library for the town, but no example of good architecture. He has at once educated the community in art and in literature, with results which may not at first be readily apparent, but which as the time goes on and the intrinsic value of his gifts is made more manifest will show for what they are worth. The average rural community in this country seems to be about as barren of artistic possibilities as could well be imagined. Indeed, outside of New England the smaller towns and villages are mere clusters of abiding places, without the slightest suspicion of esthetic surroundings or good taste. It is not to be expected that Mr. Carnegie's benefactions will extend to every one of these benighted localities, but it is beyond question that his example will inspire other wealthy men to similarly endow our smaller towns, and he surely has made a beginning which in time ought to give to our country or village life at least a measure of the charm which is so distinctly a feature of the smaller English cities.

A single, well-designed, carefully studied building offers an object-lesson that can neither be forgotten nor ignored, and however deeply a community may be steeped in an atmosphere of artistic poverty, it is sure to

be aroused by even one bit of pure art, with results which will reflect far beyond the range of a circulating library. We believe that architecture in some respects is the greatest educational force within the reach of ordinary mortals; that the elevating tendencies of a good building, while they work very slowly, are sure to bring forth tangible results. In fact, good architecture is the exponent of the highest civilization, and in choosing libraries as the special form of his benefactions, Mr. Carnegie has selected the type of building which offers the greatest possibilities to the architect, and which is in many respects closely in touch with the tendencies of thought and life which are to mold the early years of the twentieth century.

IN one of his recent essays Mr. Carnegie has very clearly stated his principles regarding the distribution of wealth before death, and he makes the statement that while it is extremely difficult to make donations to individuals which shall neither pauperize nor demoralize them, there are plenty of opportunities to give in a public way to a community as a whole, and that these opportunities far exceed the combined possibilities of all the millionaires in the country. It is surely a fact that if any one would wish to spread his money in such manner that it would reach the furthest and come nearest to helping the greatest number of people, he could select no better means than to build a large building, for so much enters into the construction of a building nowadays, and modern work embraces such a variety of labor, from the commonest kind of manual work to the highest intellectual study, that when the bills are all paid it can safely be said that the money has gone directly to the producers, to those who work with their heads or their hands, and that instead of being distributed to a favored few, it has spread through all ranks of society. So that if our millionaires desire to benefit the greatest number in the best way, so as to help them to be self-respecting, to earn what they receive, and to learn something while they are earning it, there can surely be no better way offered than to follow exactly the example Mr. Carnegie has set, not necessarily, however, building libraries all the time, for there are plenty of other things to be done, and many of which are even more beyond the reach of individuals. It is our belief that the good which Mr. Carnegie will accomplish by giving money as he has will in the long run be far greater, will reach more people, will elevate the community as a whole to a higher degree of intelligence and appreciation, and will leave a more lasting memorial in the hearts of his countrymen than if he had taken the same amount of money and with it endowed either schools, hospitals, or churches.

WHAT A STUDENT SHOULD KNOW.

THE Architectural League of America neither slumbers nor sleeps, and if there is anything which is of vital interest to the younger generation of architects, the League evidently intends to find it out and put it in the best light for its members. The executive board of the League has formulated a number of questions for

discussion, and has portioned them out among the various affiliated societies for consideration and report. All of these questions relate to what should be expected of a graduate from an architectural school when he begins office work. It is not likely that the League will be able to call out exact answers to these questions, for the reason that the proper solution of what is best for an architectural student is materially modified by temperament, disposition, environment, and local usage. Some of the questions might seem to the elders in the profession as unnecessary, or even frivolous, but that the League should spend its time in seriously considering and discussing just such topics is a good sign. It is a wise provision of our intellectual nature that we are unable to see more than a short distance ahead of us. The beginner in any art or profession can never fully realize all that he has to meet, and is seldom able to appreciate how little he knows. In fact, the average student, fresh from a technical college, can generally consider himself fortunate if his four years' schooling has given him even a beginning of a sense of appreciation of what constitutes good taste. If he gets no more out of college, that of itself is a good deal. At the same time, however, it is a most excellent mental discipline for every architect, young and old, to take account of stock, to see what he thinks he is good for, and what he hopes to be. The mere question of whether one student should accentuate the mathematic side of the profession, or whether another should devote himself to fine art, whether the school problems should be of a monumental nature, or whether the study of the style should be based upon a knowledge of pure design,—all these have an undeniable value, no matter how they are solved, provided the solution seems a fair one to the one who is studying them. The real advantage of questions of the sort proposed by the League is, we repeat, in stimulating thought, in helping its members and their friends to focus their vision, to formulate their artistic creeds and keep on thinking. These same questions were asked years ago, and will be asked when we are dead and forgotten. The gain to the individual will come in the solving rather than in the process of solution, and the League is fulfilling its mission by just such queries as it has propounded.

THE ROTCH TRAVELLING SCHOLARSHIP.

WE wish to call the attention of our younger Massachusetts readers to the approaching examinations for the Rotch Travelling Scholarship, which are to be held on Monday and Tuesday, April 1 and 2. This scholarship enters upon its eighteenth year with these examinations, and during this period it has won for itself through the achievements of its past holders a name which is so familiar as to require no explanation. Its opportunities ought to be the goal of every active, alive, young architect, and it is to be hoped that this year's competition will be a good strong fight that will bring out the best kind of fellow. Particulars and details of the approaching examinations can be had upon application to the secretary, C. H. Blackall, No. 1 Somerset Street, Boston.

“Terra-Cotta in the Small Cities of Italy.”

BY ALFREDO MELANI.

WHEN one speaks of small cities in Italy, it is well to make at once a distinction between those which are actually small in the matter of their size and their influence, and those which, while being large enough and having played in their time an important rôle on the political and social stage of Italy, are at present only secondary and entirely forgotten towns. With the exception of Rome, Florence, Venice, Milan, Naples, and Genoa, which remain even now capital cities, the other towns which formerly shared with these centers the Italian activity, which was the glory of the peninsula, are depopulated places without commerce and without any intellectual aspiration. Such are Ferrara, Mantua, Rimini, and Urbino. The possession of an extraordinary cultivation is not necessary to appreciate the place these cities occupied in the Italy of the Renaissance. The princes of Este, the families of Gonzaga, of Malatesta, and of Montefeltro, who held their courts respectively in the above-mentioned cities at the time of the Renaissance, were possessed of unbounded wealth and authority. It was precisely on account of these reigning families, who divided among themselves the territory of the peninsula, that the art of Italy was concentrated in several centers.

These families looked to find the pleasures of life in strength and in amiability, now in war, and now in peace; and especially in war with enemies who spoke the same language, these families kept in their service two armies, one of soldiers, and one of artists, and courtiers and wealthy citizens naturally possessed the same tastes as the reigning families. Thus, in these strange times, full of miseries and amours, the cause of art received a formidable and unexampled impulse. Go at the present time to these cities which formerly stood at the head of all Italian progress, go to Ferrara, for example, and you will receive the most desolating and disagreeable impression. Ferrara is situated in the midst of a vast, richly cultivated but monotonous plain, whose limit at the horizon offers nothing fine or attractive; for the Veronese Alps are only indicated in the far distance, while the nearer Apennines lack grandeur of outline. Placed not far from Bologna, the city of the Estensi would still rejoice if it had one half of the life which circulates in the loins of the capital of the Emilia. But it has it not. Ferrara is a dead city; in the wide streets, flanked by ruined palaces, the grass grows as luxuriantly as if these streets had never been trodden by men. Solitude is the mark of the city, which at the epoch of the Renaissance received the homage of the most illustrious princes of the time, thanks to its reigning family, which, after that of the dukes of Savoy, was the most ancient and most famous of Italy.

In approaching Ferrara the traveler perceives with admiration four enormous brick towers rising at the angles of a grandiose and fortress-like edifice. These are the towers of the Castello, or Castel Vecchio, that is, the palace of the princes of Este. The military air of its construction recalls the terrible dramas of its history,

the remembrances of cruelty; but happily, the Castello was not alone a place destined to be the scene of the crimes of the Estensi, for at all times there were gathered there guests of distinction who gave the family of Este occasion to display a truly princely wealth and diplomacy. I do not at this moment wish to speak of the artistic elegancies of the Castello of Ferrara, of the paintings which ornament the halls and the chambers, mostly by Ferrarese masters; but one cannot interest oneself in this city without taking account of the existence of the Castello, which is the personification of the place, just as Florence is personified by Santa Maria del Fiori, Rome by St. Peter, Milan by the Cathedral. Besides, this superb construction, which silhouettes its enormous mass in every panorama of Ferrara, initiates us into the search for monuments in terra-cotta, with which the town is largely ornamented.

The attention of the traveler who walks through the streets of Ferrara is often struck by the palaces and the remains of constructions in terra-cotta, which mingle with those of stone and marble work, existing side by side in the same edifice. I do not care to linger at the monuments of the first class, such as the Palazzo Roverella, whose graceful terra-cotta façade is a piece of architecture known by every one. I desire, on the contrary, to turn to less known works, unpublished if it is possible, for often one finds treasures among the works with which the world has not been acquainted. A fine series of reproductions accompanies my study; but as I cannot give in an article for a review all that I would wish, I must limit myself to reproducing some specimens which continue the series of things that I have already shown in the first article of this series; and casting a glance over these reproductions, one sees that those which concern Ferrara have evidently a Bolognese air. Bologna is *par excellence* the city of terra-cotta, and John II. (Bentivoglio; died 1506), in his pride of being compared to Augustus, said that he had found this city of wood and left it of brick. I am not sure that I have quoted this phrase correctly, but it is nevertheless true that Bologna possessed during the sixteenth century, and even before, a great number of brick kilns, which put into commerce an enormous amount of terra-cotta, and this output served the city and even the surrounding country.

Thus, one is often surprised, in visiting the small towns about Bologna, to see Gothic terra-cotta work on buildings which belong to a more advanced age, and this anomaly is explained by the fact that the provinces received from Bologna the old pieces that in the capital could not well be used. This anomaly, which occurs quite frequently in the smaller cities, sometimes exists even in Bologna, as in the court of the Palazzo Barbazzi, now Pallotti, and in the Palazzo Coltelli, on the Via Porta Castello; signifying that for reasons of economy, the Bolognese architects accepted old pieces that the Bolognese kilns continued to sell at a very moderate price on account of their being out of style; this point of the Bolognese production in that which concerns the terra-cotta of the little towns, especially, is most remarkable, although it does not escape the students who on the apparent aspects of the style would attribute an earlier date to the Italian constructions in brick. Another curious point is that which is concerned

with the reproductions of ancient medals and carvings. It was the mania of the fifteenth and sixteenth centuries to imitate, to counterfeit, and to imply. It is enough to have traveled in the north of Italy to know with what completeness and what preconception the physiognomies of all the personages known, unknown, and imagined of classical antiquity have been evoked by the architects and the sculptors on the walls of the buildings which they



FIG. 1. CASA PAPARELLA, FERRARA, ITALY.

raised. The skill of the fifteenth-century masters in composing in the antique style was startling, and in many cases we are to-day often embarrassed to tell the copy from the original, while often the original has disappeared. The modelers in terra-cotta, and more frequently the sculptors in marble, borrowed their images from antiquity; and these same modelers often finished by reproducing the carvings of the quattrocento. I know a terra-cotta at Bologna on a house No. 123 Borgo S. Pietro, where the author has copied in a very free fashion a celebrated carving of Mantegna, that of a combat between marine deities.

Returning to Ferrara, my specimens all have an ornamental character, and these shown are picturesque bits of a marvelous harmony. For, indeed, these terra-cotta edifices have a remarkable property of composing into decorative ensembles that are often admirable; the bricks receive from their centuries of age a seal of dazzling beauty given by their contrasts and the play of magic lights. For example, see the Casa Paparella (Fig. 1) and the Casa Trentini (Fig. 2). The Paparella façade is very simple, but what charm it has! As in all brick buildings, the effect is obtained by modest projections and light arabesques, which, on the background

against which they are set off, resemble jewels in a great velvet box. Here we are in the presence of one of the most picturesque façades of Ferrara, and any one, even if he does not possess an exquisite perception of beauty, will discern in this fragment the tranquil elegance which is its chief merit, and which again shows that art does not reside in rich plastic ornament, and that pompous decoration can well be successfully replaced by the reserved brightness of simplicity.

I ought to write with the same consideration on the subject of the detail of the Casa Trentini, which would delight the heart of a painter as much as that of an architect or an ornamentist. Here geometrical decorations are used which repeat themselves often in terra-cotta construction; but the Gothic profiles of the archivolts partially corrects what might be called the monotony of geometrical ornament, and the contrast with the bricks does the rest, heightening the original effect with the palette of time. This last piece from the point of view of style appears a little older than the Paparella façade, but the difference is not noticeable, and both belong to the fifteenth century.

A fine detail from Ferrara is the door of the Casa Stramigoni (Fig. 3), one of those pieces of decorative architecture with which northern Italy is plentifully ornamented. Its geometrical style has an aesthetic kin-



FIG. 2. DETAIL OF CASA TRENTINI, FERRARA, ITALY.

ship with the terra-cotta of the Casa Trentini. The ornaments have facets like diamonds. I desired to show an even larger detail by reproducing a part of the archivolt (Fig. 4) where the zigzag (which is well shown this time) harmonizes with the other faceted ornaments in

an energetic and powerful play of light. If the ornamentist had discarded the leaves that are seen at the side of the archivolt, the effect would be that a great part of its beauty would be lost. And while the occasion is at hand, it is well to remark that the terra-cotta of north Italy has a tendency to dazzle by its richness, and a long list might be made of loud and overloaded works in terra-cotta. The use of this material invites the artist to ostentation more than the use of marble



FIG. 3. DOORWAY, STRAMIGONI, FERRARA, ITALY.

or of stone, so one need not be surprised at a circumstance which, after all, is but natural. The ornamentists who used brick, however, had the habit of resorting to color, and polychrome terra-cottas are frequent in Italy. Once color was not admitted in architecture and in ornament, but now all is changed on this question, and the polychromy of the Middle Ages and of the epoch of the Renaissance constitutes the evidence of a fact that for some time has been above discussion. Sincere and vigorous study of the monuments has proved that the principle of color in plastic art has made one of the most imperious rules of the art of the past centuries. However, the existence of this fact is sometimes contested by laggard minds, and perhaps some of them are ignorant of the precise state of the question. So far as terra-cotta is concerned, I propose to collect in *THE BRICKBUILDER* the capital propositions showing that polychromy was an absolute rule of the statuary and the ornament, and was, moreover, a species of corrective for overloaded works.

The color with its tones, deepened especially with azure and gold, served to give the air of repose where

the reliefs followed each other without rest, and to correct as well the disastrous effect of a too lively ensemble.

In contrast to the simplicity of the Stramigoni archivolt, here is a detail of a not badly overloaded archivolt, that of the Casa Zanirati (Fig. 5). Here we are in the full swing of the Renaissance. The frieze with its groups of dolphins and the shells is very well conceived, but the ensemble, in the eyes of an Italian artist, is not graceful in scale. Color might make this bit more sympathetic, but I do not know if the palette of the painter has ever touched up the reliefs of this archivolt. I could give no assurance on this subject, for one can scarcely count the times that in Italy the colors and the gildings of sculptured ornaments have been made to disappear by false notions that polychromy was an aberration of the individual taste of a few artists; and in the study which I present to you I will submit a few proofs.

Before leaving Ferrara, after having called your attention to a fragment of the Renaissance cornice of the church of S. Stefano (Fig. 6), one of the cornices with little niches much used in the terra-cotta of north Italy, whose source is in the Gothic style, I wish to mention a few other buildings where terra-cotta plays an important



FIG. 4. DETAIL OF ARCH, CASA STRAMIGONI, FERRARA, ITALY.

rôle, thinking that the list may be of use to some travelers.

The façade of the church of the Madonnina, constructed towards the end of the sixteenth century by the

Ferrarese architect Alberto Schiatti, is very simple and very elegant; the façade of the Palais de Justice is Gothic in style; the façade of the Palazzo Calcagnini-Beltrame, now in a sadly dilapidated state, is another. This latter grandiose edifice has also been called the Palazzo Serofa, and is a work of the Ferrarese architect Biagio Rossetti, and the sculptor Gabriele Frisoni of Mantua. I will not speak of these, nor of the facade of the Palazzo Roverella which I cited above, a celebrated work of the beginning of the sixteenth century, nor of the facade of the Palace of Lions, now known as Prosperi, where a rich and grandiose portal in reddish marble



FIG. 5. DETAIL OF ARCH, CASA ZANIRATI, FERRARA, ITALY.

contrasts admirably with the rest which is in brick. In place of continuing my enumeration, I wish to have you observe the importance of this facade, one of the most beautiful at Ferrara, a work of the sixteenth century, remarkable as well for the mixture of marble and bricks which compose an ensemble of picturesque antiquity and of perfect beauty. The most interesting portion is easily the portal, the design of which is sometimes attributed to Baldassare Peruzzi, and sometimes to Ercole Grandi; but the background of bricks contributes powerfully to emphasize its magnificence, which is rendered still more admirable by the light arabesques which in point of taste have no companions in Ferrara.

Let us now turn our attention to Mantua. Mantua occupied at the era of the Renaissance a position not less imposing than that of Ferrara; a city in a swamp, whence the industry of man drew the most brilliant rewards, had as early as the end of the fifteenth century united its destinies to those of the Gonzagas, and the protection accorded to artists by the reigning house was almost with-

out parallel at the time. Happily, the proofs of this protection still exist in great measure; and it is sufficient to recall that Leon-Battista Alberti raised at Mantua the church of S. Andrea, one of the masterpieces of Italian architecture, that by his side the great painter Andrea Mantegna worked, and that two buildings, the Ducal Palace and the Palazzo del Tè, contain such a collection of decorative paintings and sculptures that no ornamentist who wishes to get even one idea of the art of Renaissance decoration can possibly afford to ignore them. Having said so much, it is well to speak of the monuments in terra-cotta of Mantua, which, however, are not as numerous as at Ferrara, although the city of Gonzaga possesses some remarkable pieces,—the fragments of the old cathedral, for example.

The church, such as it is now, has the taste of the advanced Renaissance in its interior. The facade is baroque. As a matter of fact, the actual interior is by Giulio Romano, architect and painter, who worked much at Mantua during the sixteenth century, and the facade was built in 1756 by Niccolo Buschiera, an Austrian colonel.

As for the brick, it only colors with its red the fragments of the anterior construction, as I remarked above, and on one side one may admire still the Gothic frontons, which recall the Venetian manner of the fifteenth century,—frontons in brick which show the original design of the Mantuan cathedral, which, by the way, still lives in its full beauty in a picture by Domenico Moroni, an artist of the latter part of the sixteenth century, at the Crespi Gallery, at Milan. Neither could I classify among the less important fragments that you would publish the old Pretura, the details of which, light and delicate as lace, I very much regret not being able to show you. Terra-cotta rarely reaches the point of delicacy that we see here (Fig. 7). The façade of which I am speaking is not in

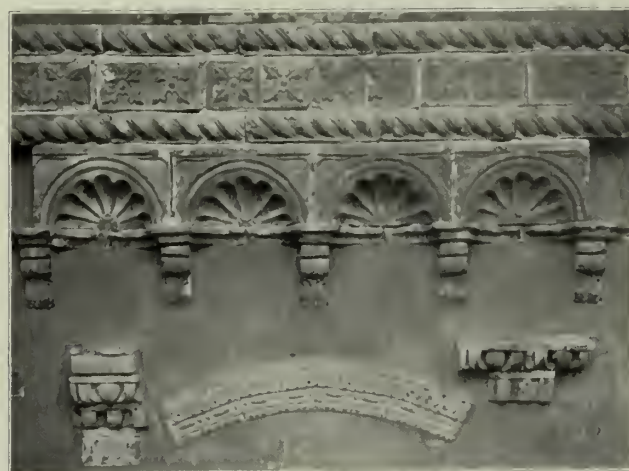


FIG. 6. DETAIL OF CORNICE, S. STEFANO, FERRARA, ITALY.

such absolute disorder that it loses the right of consideration, and all artists and friends of art will protest against seeing the large capitals of the columns serving as fastenings for the cords of the awning, as is clearly indicated in the photograph. In a city as artistic as Mantua, there will probably be no lack of persons, whose tastes are

formed by the Ducal Palace and Palazzo del Tè, who will have the audacity to pronounce the Latin phrase *De minimis non curat prætor* with regard to our little facade; but every sensible man will feel a great respect for it. Nevertheless, some one has attempted to improve upon it, as may be seen above the first window of the second story, but apparently good counsels prevailed, and at present we can ask only the rigorous application of the



FIG. 7. ANTICA PRETURA, MANTUA, ITALY.

original design. While we are speaking of things which damage the old work, I would add that in northern Italy, especially in the smaller cities where advanced intelligence arrives later than at the capitals, much terra-cotta decoration has been covered with whitewash, that is, when a red more delicate than that of the natural brick has not been used. This is explained, as I remarked before on the subject of architectural polychromy, by the disdain which almost until yesterday the Italian artists and public have felt for color. If the writer were not an Italian, and if he did not write from the very places where this happens, perhaps, among my readers, who are not acquainted with the country *ou fleurit l'oranger*, some one would make the reservation, or would say that this was a case of exaggeration. But the facts themselves bear witness to the truth of my statement; and if I should add that the terra-cotta work of Italy has no longer the flourishing life of the past, because public opinion is not yet reaccustomed to the pleasures of color, I would add willingly, for I wish to acquaint you with a new truth, and to show you "the state" of the Italian question concerning brick-work from the point of view of actual application. This may appear inopportune in an article on the employment of terra-cotta in the past centuries, but it is useful to know it in order not to have to repeat it on future occasions.

I add, as a curious complement of my photographs,

and even as a speaking witness of my statements, a little facade from Rimini (Fig. 8), the facade of the church of S. Andrea dell' AUSA. You may see for yourself in what fashion this has been treated by the enemies of color, and the false beauty of this little facade, which would be pretty enough in its original state; but our enemies, those who think that beauty dwells only in the strident whiteness of chalk, wanted to cover its nudity, but in a different way from that which the "Brachettone" follows in the Judith of Michelangelo. Understand, I am not making an unlikely comparison; every amateur will be glad to see that the mason has saved for us above the facade of S. Andrea dell' AUSA a rectangular surface, which, by reason of its novelty, strongly attracts the attention. It is an arrangement of little pieces, faceted and put together with diligence on a surface which forms a wall, where the light dances almost as in a cave of stalactites. This example is not common in Italy, and excellent ideas may be drawn from it.

I must confine myself to this single example from Rimini, but I do not wish to pass it without saying that even this city, now fallen into decay, led formerly, at the time when Ferrara and Mantua flourished, a splendid existence under the Malatesta family, a famous house which during the fifteenth century drew around itself



FIG. 8. CHURCH OF S. ANDREA DELL' AUSA, RIMINI, ITALY.

the most celebrated representatives of the literary and artistic culture of the age. Every one will recall the touching episode of Francesca da Rimini, in Dante's "Divine Comedy," and Francesca was in fact an ancestor of these Malatestas, of whom the history of the Renaissance leaves us so many good and bad souvenirs.

The "Village Inn" Series. III.

BY JOHN GALEN HOWARD.

THE site for the Inn is charming. What makes it doubly interesting is the fact that while it fronts on the public square and is thus in the thick of the village, the land behind, toward the full south, is free and open, down to the river nine hundred feet, and away beyond over the whole country-side.

Three hundred feet broadside on the square, and 900 ft. and more from the square, down the slope to the winding river, — room and to spare for an inn with all its accessories; especially as the property widens to the south of the flanking shops, by a hundred feet, easterly in a right jog, and, on the opposite side, by the western slue of the boundary. The square itself seems cramped by comparison. We can well afford then to set off a little of our land to public uses, and widen the square by so much in a liberal sweep, — we shall gain in the effect of our new buildings by so doing, profiting as well by the

placing our main nucleus of the hostelry farthest toward the south.

The stables will fit in admirably in the east jog, behind the shops; and there is just room enough on the other side for the kitchen offices and servants' quarters. Tucked thus into the corners the service departments are out of the way, and leave room and air in the best part of the site for the center building. The Inn we will call the King, and the stables and kitchen his humble retainers, bowing low before him. We can imagine them taking hands with the outsiders, the village folk, (the village shops, etc., that is), in a general merry-go-round.

"We're all of a kind," crying; "the Retainers, — they're a little finer folk than we," (this from the villagers), "but they are the same kind; they are village folk, too, only they are rigged up somewhat to do honor to the King. Ah! The King! that's different. He likes us and we like him, — only, — only, — he's for Philadelphia people, you know!"

That is the point, — the Inn proper must have aspirations; it must be of a little higher caste than the vil-



A VILLAGE INN.

increased importance and beauty of the village, which will have its effects on our receipts later. At the same time we will suggest to the village fathers a modest and inexpensive improvement of the square, by the introduction of refuges, or slightly raised pavements in parts, and the planting of trees, to give a definite arrangement to the otherwise disorderly place. A fountain on the west side where the river-road comes in, — a bit of a monument to the forefathers in the axis of all, — and we have everything ship-shape and orderly, already an ensemble in which the heterogeneous elements of country shops, Parisian town hall, Gothic church, and Colonial mansion, all take their places, without sacrificing their own peculiar characters. The task of harmonizing our new works with their neighbors is by so doing much the more readily solved.

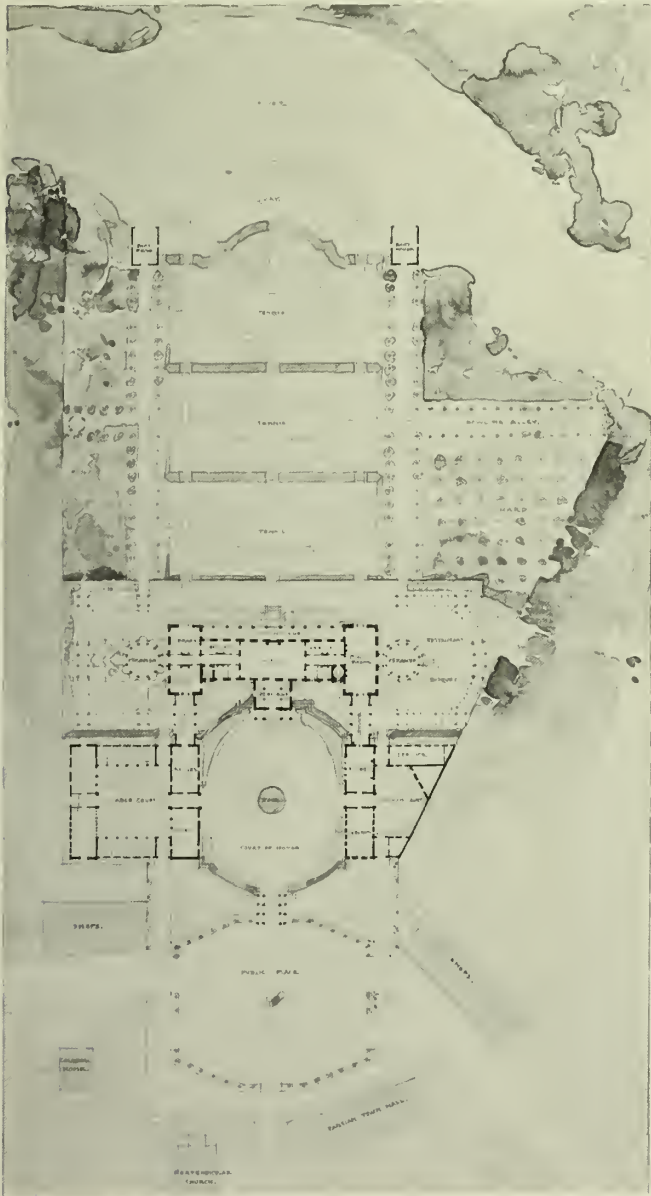
Nothing gives a building the quality of distinction so much as setting it well back from the street, and introducing between it and the entrance minor features which serve to give the key and the scale. Here then is an added reason, in the beautiful view toward the river, for

lage, of which it is, or is no doubt to be, the leading lion. *Noblesse oblige!* The steep slope of the land toward the river is a rather ticklish problem, — only if we attack it in the right way it is sure to yield us a special beauty. We will try terracing all the way down. Let the square itself be the first terrace looking over the wall down into the court of honor, which is the second terrace. All this still more enlarges the apparent amplitude of the Public Place. The court of honor, of course, is flanked to right and left by the stables and kitchen offices, which are on its own terrace; the third side, the bottom of the court, is built across by the main body of the Inn. The fourth side of the court, behind us, is, as I have said, open to the square, except in the center, where the entrance is marked by the drive-porch.

The Inn is on the third terrace, its main floor being level with the court of honor, and entered from it through the vestibule which juts forward from the main building to the swing of the retaining wall which defines the south side of terrace number two. So the basement of the inn is entirely above the ground of its own terrace.

Beyond the buildings we descend by successive terraces, a tennis-court on each, to the water, where the boat-houses are placed at either end of the quay. Bowling-alleys, avenues of trees, summer houses, the orchard, trellises, arbors, shrubberies, and river walks, — all the delights of country life are at hand.

But I have not said a word about the material or the color. Good rich rough red brick, with overburnt bats,



A VILLAGE INN, GROUND PLAN.

laid up in warm gray mortar, — and, where you must have it, a quoin, or a key, or a springer, — or a little careful detail about a dormer, a chimney, or a porch, — of lusterless tawny terra-cotta, — that will be best, and cheapest at the same time. Overhanging eaves with the rough rafter ends showing their deep bronze-brown elbows underneath; and for the roof, yellowish gray-green, deep-toned tile, with plenty of play of dark and light to keep it from being dead or heavy, — just a water-color executed. Here and there an earthen pot of flowers in a window, a trailing vine, a few homely plants and shrubs, and the place is redolent of comfort and of good times.

The Exhibition of the Architectural League of New York.

THE sixteenth annual exhibition of the Architectural League of New York opened on February 17, and closed March 9.

A great deal of space was occupied this year by the drawings and models of the buildings and accessories of the Pan-American Exposition at Buffalo. These buildings being of a temporary character and in perishable material are not of the first moment to those who are interested principally in the development of permanent style, or of the use of durable materials. Nevertheless, since such expositions have usually had a widespread influence on the art of their times, — an influence which is often observed and felt by those not directly interested, — it is perhaps justifiable to give a large amount of space to work of this character.

It is not at all probable that the buildings at Buffalo will have any such effect on the contemporary work of the country as did those at Chicago, and it may be hoped that they will not, since it is apparent that the designers have had in mind something of the French idea of an exposition, — that it is a temporary thing, a gala affair, and fit subject for experiment and for the production of gay and somewhat fantastic effects.

It is not to be understood from this that the designers of the Buffalo buildings have in any way taken their inspiration from those in Paris last year. The contrary is the case, there being remarkably little evidence of direct French influence. The prevailing style is Southern, chiefly Renaissance with leaning toward Spanish. The most striking thing about the whole, being the free use of color. The entire color scheme has been under the direction of C. Y. Turner; and while it is too early to try to predict results, it is evident from the drawings on exhibition that the matter has been gone into with the utmost thoroughness, and from the hands of such an artist as Mr. Turner we may be sure we shall get satisfactory effects.

The prevailing note in the color scheme is furnished by the roofs which are all of red tile. This is indicated in the general plan of the grounds by Carrere & Hastings, who have general charge of all landscape work, and of the laying out of the grounds.

In general, the scheme is intended to lead from light tones at the entrance up to more brilliant effects at the end of the court, which is terminated by the Electric Tower by John Galen Howard.

Two of the galleries were almost entirely given up to paintings by Mr. Turner of color schemes and details of the various buildings. In the Vanderbilt gallery there were a number of drawings by the architects, and the sculpture part of the exhibition is given over entirely to work in connection with the Exposition.

Among the more prominent work in this connection may be mentioned the following: Ethnology Building by George Cary; Manufactures and Liberal Arts by Shepley, Rutan & Coolidge; Temple of Music by Essenwein & Johnson; Machinery and Transportation, Electric, and Art buildings by Green & Wicks; Forestry, Horticulture, and Graphic Arts by Peabody & Stearns; Stadium and

Propylæa by Babb, Cook & Willard. We should also mention the bridge by Carrere & Hastings, which is almost the only piece of French work in the Exposition. It is presented in a beautiful water-color by Hopkinson Smith, and is very decorative, though somewhat more monumental than the other work.

Mr. Howard's Electric Tower closes the view from the bridge, and is well worthy of a place of honor. It is shown by a characteristic water-color elevation and a very fine model, also colored. The treatment of the shaft of this tower with perforated panels in geometrical patterns, picked out by color, is original and very effective. We expect good work from Mr. Howard, and his work does not suffer from being less Parisian than usual.

Apart from the Exposition work the most notable thing about the exhibition is the evidence it furnishes of the spread of the French style. Apparently if you are doing work in the vicinity of New York, and if you are not one of those privileged mortals who years ago made a reputation for peculiar merit in some other style, you must now work in French whether you know how or not. The style is as prevalent at this year's exhibition as was the Richardson Romanesque ten or twelve years ago, and the result promises to be quite as disastrous. The question arises, "Will it be as disastrous to the style itself?" Even now there are those who think they see the reaction setting in. There is noticeable about the work of some of the older and abler men of the French school a purity of style and a restraint in detail, the lack of which marred much of their earlier work. This is noticeable in the very fine model of the New York Public Library, by Carrere & Hastings, which stands in the entrance hall, and which shows a scholarly and dignified structure, having the French influence it is true, but showing it in a way with which none need quarrel. The same may be said of Mr. Howard's tower, of which mention has been made, and of the Soldiers' Monument by the Messrs. Stoughton.

Drawings by Boring & Tilton show the same tendency in a very marked manner. A design for a government hospital by this firm is almost colonial, though it avoids the weaknesses of the style which threatened at one time to bring it into contempt. This hospital building is largely of red brick in connection apparently with stone.

There is hardly a design in the classic styles in the whole exhibition which does not show some sign of the French influence, and in many cases it can only be characterized as a mania. No one need quarrel with the work of the Beaux Arts men as a whole, nor with their influence properly considered, but it does seem regrettable that architects who formerly did quiet and inoffensive, if not brilliant, work should feel impelled to work

in a style which they do not understand, and toward which they have no natural predisposition.

There are some notable exceptions, however, to the general rule of being French at any cost. George B. Post's design for the New York Stock Exchange is one of them. His drawings, among which is an excellent water-color by Hughson Hawley, show a dignified classic façade with a basement, above which is a Corinthian colonnade surmounted by a heavily sculptured pediment. An interesting point is that the wall re-



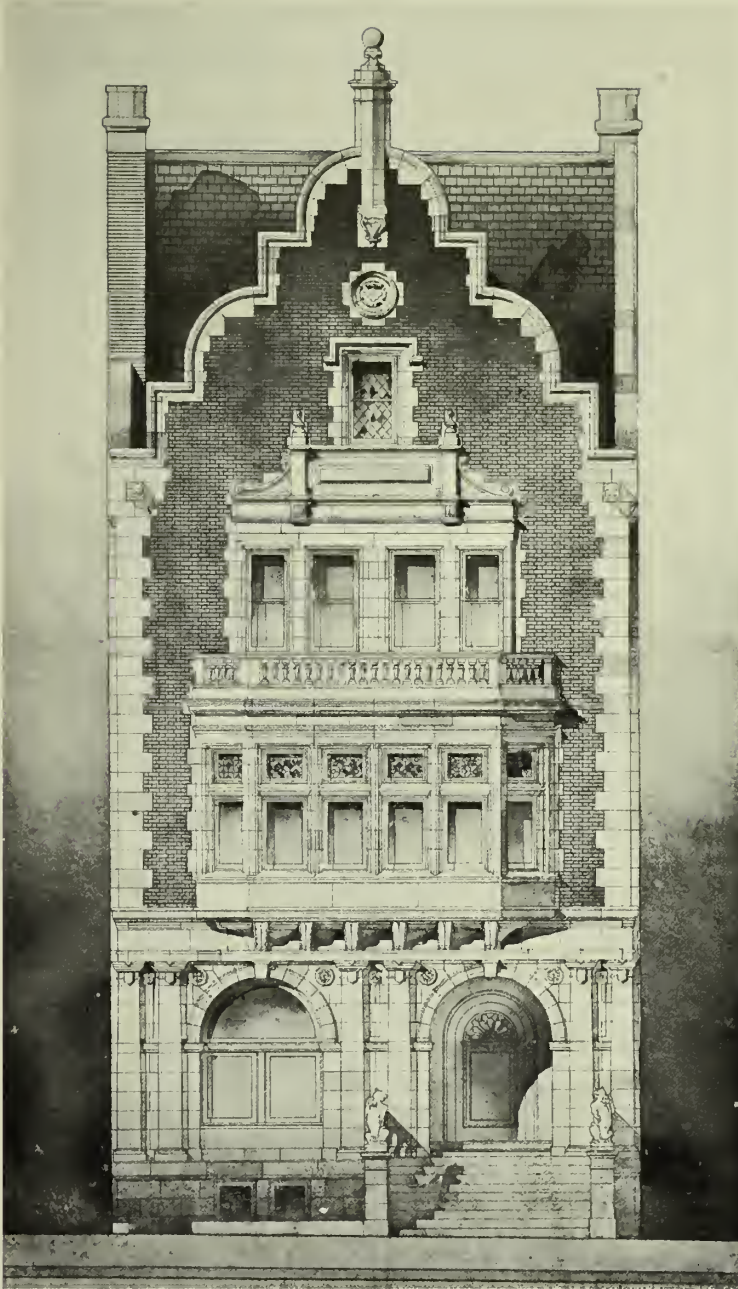
DESIGN FOR A STORAGE WAREHOUSE.
Bruce Price, Architect.

cessed behind the large colonnade is almost entirely glass. Another notable exception is the accepted design for the Union Club by Cass Gilbert & John Du Fais. This design is purely Italian, and will be a monument well worthy of the prominent site it will occupy. Other architects who do not seem to be afflicted by the desire to pass as belonging to the French school are Bruce Price and Clinton & Russell.

The competitions of the year have not been very notable, the most important being those for the Yale Memorial Building and for the Union Club.

Carrere & Hastings's accepted design for the Yale Building is a worthy effort, showing the same characteristics of dignity and restraint as their New York Library.

Besides that of Gilbert & Du Fais, two other competi-



RESIDENCE, BROOKLYN, N. Y.
W. B. Tubby & Bro., Architects.

tive designs for the Union Club are exhibited, those by Wood, Palmer & Hornbostel and Donn Barber. Both are well planned, and no doubt in the hands of their designers, who are men of ability, would have developed into buildings of high merit. The design by Wood, Palmer & Hornbostel is the only one which proposed the use of brick.

Another competition in which brick was more generally used was that for the Carnegie Library at East Orange. Jardine, Kent & Jardine were the successful competitors. Competitive designs for this library were exhibited also by Ludlow & Valentine, and Ackerman & Ross. These were published in *THE BRICKBUILDER* last month.

Ackerman & Ross also show a very charming design for a public library at San Diego. It is not necessary to say that the draughtsmanship is excellent.

Ferry & Clas show a photograph of a historical society

library at Madison, Wis., which is a dignified and pleasing structure in good classic. Not being near New York, its architects did not feel impelled to make it French.

Probably the most notable design in the exhibition in materials of clay is that for a storage warehouse, a very large building by Bruce Price. In this the piers are treated with bands of terra-cotta, and the large arches are filled in with brick in a diaper pattern of red and buff. The cornice is heavily bracketed, the brackets or corbels being in colored terra-cotta. The building above the basement gives the impression of being entirely of brick, and yet it is extremely varied in color, which shows that the terra-cotta is used in its best form as a material



YALE CLUB BUILDING, NEW YORK CITY.
Tracy & Swartwout, Architects.

of clay capable of any amount of ornamentation and variety of color. The design is the work of a man who thinks out his designs and withal makes few mistakes.



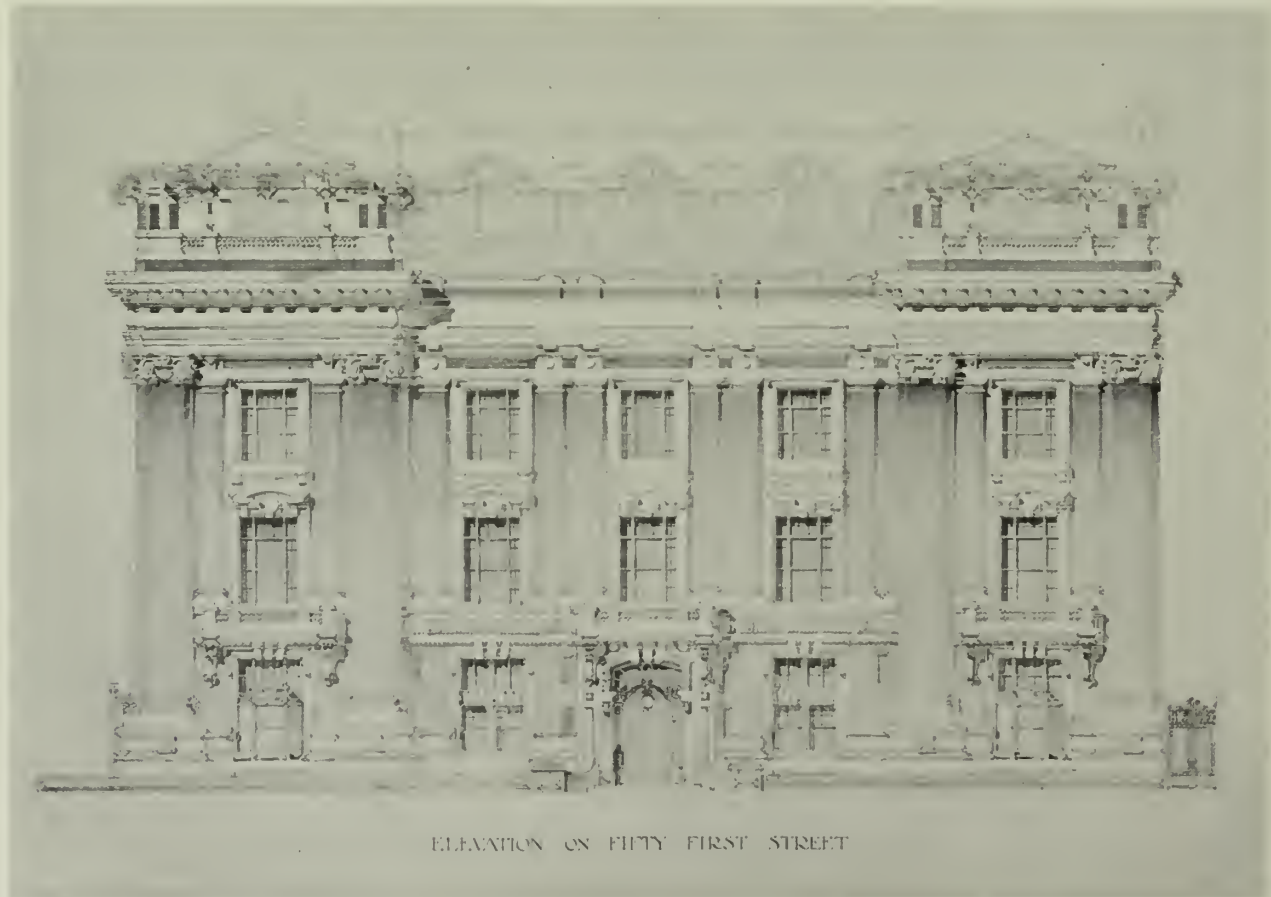
WINDSOR ARCADE, NEW YORK CITY.
Charles I. Berg, Architect.

Two very large office buildings by Clinton & Russell, the Broad Exchange Building and the Atlantic Building, are largely in brick and terra-cotta. Little variety has been attempted in the color, but the terra-cotta matches and blends in with the brick and seems part of it, which is another way of using terra-cotta right. J. H. Friedlander, who is a Beaux Arts man, has a design for a detention hospital, which is largely of brick above the

basement, and in which he has introduced some variety of color in the arches of the top story.

York & Sawyer show a building for Vassar College, of brick and stone which is a strong and able piece of work. They also have a country house design of brick and stone which should work out well.

T. Henry Randall has two designs. One for St. John's College, Annapolis, is a scholarly structure in



COMPETITIVE DESIGN FOR UNION CLUB, NEW YORK CITY.
Wood, Palmer & Hornbostel, Architects.

classic of brick and stone. The other, the residence of Mr. Poor at Tuxedo, is a very interesting Elizabethan building in brick and stone.

Snelling & Potter have a plan and a very well-rendered elevation of a large apartment house which is quite French and very interesting and clever.

The Messrs. Stoughton also show a church in New York of buff brick and stone in Romanesque, with apparently more or less classic feeling in the detail; it is restrained and agreeable. Their soldiers' monument, mentioned before, is presented by several drawings and an excellent model. It is a pleasing, dignified, and well-studied design and should be an ornament to its location.

Hugh Lamb shows a design for an office building, twenty-eight or thirty stories high, in brick and terra-cotta.

by the best pen and ink rendering in the exhibition, and is in itself a very good thing and strictly in keeping with the main building.

R. H. Robertson is represented by only one drawing, but he is at his best in a country house at Lenox in brick and half-timbered stucco work.

Cope & Stewardson exhibit a very good water-color by Hughson Hawley, a bird's-eye view of Washington University, St. Louis.

Van Vleck & Goldsmith show several designs, among them one for a house for a Mr. Williams, in the modern French, well-studied, restrained, and pleasing.

Katherine C. Budd has a number of very vigorous and pleasing sketches; they almost persuade us that it may be possible for a woman to do vigorous architecture.



WOODWARD HALL, ST. JOHN'S COLLEGE, ANNAPOLIS, MD.
T. Henry Randall, Architect.

C. B. J. Snyder exhibits a drawing and model of the Peter Cooper High School. It is designed in English collegiate Gothic, to be executed in brick and terra-cotta. It is a pleasing design, and the designer has obtained the large window space necessary without ruining his building artistically.

Charles I. Berg exhibits several drawings of the Windsor Arcade, now familiar to New Yorkers, and a design for the Hotel Touraine in brick and stone.

W. Albert Swasey has a large water-color of an office building in Memphis, Tenn., which is nearly all brick and terra-cotta.

Charles A. Rich shows a studio building in brick and stone.

Price & Darrach have a dormitory for the Morning-side Realty Company in a free Elizabethan style, which is largely of brick.

N. Le Brun & Sons exhibit a competitive design for a lady chapel at St. Patrick's Cathedral. It is presented

Ernest Flagg's exhibit is entirely composed of drawings for the United States Naval Academy at Annapolis. He shows nine drawings in all, some of them very large, and all well rendered. They show a group of well-designed and rather monumental buildings, which are decidedly French in character, but show a restraint which is seldom absent from Mr. Flagg's work.

H. J. Hardenbergh is represented by the new Willard Hotel at Washington and an office building.

Some familiar names are lacking. McKim, Mead & White are entirely unrepresented. Peabody & Stearns show only their Exposition work. Charles C. Haight sends nothing, Israels & Harder do the same, and many others. Our Boston friends are particularly conspicuous by their absence. Are they afraid there is no room for them unless they "do" French. Let them take heart and send along their best work next year, and be sure it will find plenty of admirers even though we can't find a cartouche in the lot with a microscope.

Portland Cement.

PORTLAND cement is the product of the burning to the point of sintering, and subsequent grinding to a fine powder, of an intimate mixture, in certain definite proportions, of materials consisting essentially of carbonate of lime and clay. Ordinarily about 75 per cent. of carbonate of lime and 25 per cent. of clay, or their equivalents, would be mixed together, the materials containing, besides the lime, silica, and alumina which are necessary for the production of a cement, a certain amount of iron oxide, magnesia, alkalis, sulphuric acid, and other minor elements which, although quite unnecessary as essential constituents, influence the character of the cement to a certain degree, depending on their amount.

According to the Union of German Portland Cement Manufacturers, anything produced in any other way than that above described, or containing an addition of more than 2 per cent. of other substances, cannot be called Portland cement.

Portland cement is a sharp slate-gray powder with a greenish or bluish-green tinge. It is distinguished from natural cement by the fact that it is burned at a much higher temperature, sintering of the product being necessary for the complete combination of its constituents. It is also marked by containing a much larger proportion of lime to silica and alumina, or greater hydraulic index, as it is called, than natural cement; by the fact that its composition can be varied within only very narrow limits, and by its very much higher specific gravity, about 3.15, and consequently greater volume weight or density. It sets usually much more slowly than natural cement, hardens more rapidly, and has a much greater strength.

Comparison of the analyses of a good Portland cement with those of two natural cements of the lime and magnesian class shows the very decided differences which exist in their composition:

	Portland.	Natural.		Portland.	Natural.
	Lime.	Magnesian.		Lime.	Magnesian.
Silica	21.6	16.9	Alkalies	1.5	1.8
Alumina	7.4	11.0	Sulphuric acid	1.3	1.0
Iron oxide	2.3	4.7	Ignition	2.4	4.5
Lime	62.8	34.6	Silicates unde-		
Magnesia	1.5	14.8	composed	1.0	12.4

Portland cement must be free from magnesia, or nearly so, so that it cannot be produced from the rock from which most of our American natural cements are made. The temperature of burning is such that little or no silica or silicates are left uncombined with lime, and with the increase in the proportion of the latter there is a relative decrease in the percentage of some of the other constituents.

Although there may be wider variations found in the composition of all available cements which pass under the name of Portland, the best brands will fall far within the following extremes:—

Silica	20.0—24.0	Magnesia5—3.0
Alumina	5.0—9.0	Alkalies5—3.0
Iron oxide	2.0—5.0	Sulphuric acid5—2.0
Lime	60.0—64.0	Ignition5—4.0

Should a cement fall outside these limits, it is desirable that it should be carefully examined, especially if the magnesia or sulphuric acid are excessive, or the lime amounts to more than 64 per cent.

Fire-proofing.

LESSONS FROM THE MONTREAL FIRE.

ON the night of January 25 last, there occurred one of the most destructive fires ever recorded in the history of the city of Montreal, the total loss approximating \$3,500,000. Commencing in the Saxe Building, on the southeast corner of St. Paul Street, it quickly communicated to the Nelson Building adjoining; from thence it swept across St. Peter Street, and in a few hours reduced the Board of Trade Building and the whole of the warehouses, contained in the block bounded by Lemoine, St. Nicholas, St. Paul, and Commissioner Streets, to ashes.

Of the buildings destroyed, the most important was that of the Board of Trade, erected in 1889 at a cost of nearly \$500,000 and at the time said to be of slow combustion construction. That it was of the combustible order is shown by the rapid manner in which the fire seized upon it and in a comparatively short time reduced the structure to ruins.

Amidst this mass of destruction is to be found many valuable lessons as to the behavior of the many differ-



FIG. 1. SHOWING PROTECTION TO SOFFIT OF GIRDERS AND HOW IT RESISTED ONE OF THE HOTTEST FIRES ON RECORD.

ent materials which enter into modern construction, under the action of fire and water.

For some reason (presumably in case of fire to prevent its spreading) the floors over the restaurant and boiler rooms were constructed of "porous terra-cotta" side arch construction, and strange to say, two forms were used: the one having skew-backs designed to protect the beam flanges; the other, depending on metal lathing and plaster for the same purpose. Possibly no better illustration could be found of the behavior of these two forms of construction under precisely similar conditions.

By referring to Fig. 1 it will be seen that a porous terra-cotta skew-back, properly designed and placed, will sufficiently protect the lower flanges of steel beams.

The skew-backs and arches are intact, except where a large safe falling from above has broken a portion of one panel, and it is to be noted that the arch did not collapse, but the safe remains where it fell on the top of the arch. The arches and skew-backs have sustained no practical damage, remaining true and level as when they were built, despite the fact that tons of débris in the shape of broken cast-iron columns, twisted and broken



FIG. 2. SHOWING LOAD ON TERRA-COTTA FLOOR.
AT RIGHT, REMAINS OF A TIN-COVERED DOOR
X SAFE, FALLEN FROM ABOVE.

girders, bricks, mortar, sheet-iron, etc., fell and is now deposited on them, the depth in some places exceeding six feet (see Fig. 2).

The metal lath and plaster covering failed to afford any efficient protection to the lower flanges of the steel beams, the lathing having been stripped by the action of heat and water from the hangers, and in every case where this form of construction was used, the lower flanges of the beams were apparently left unprotected at an early stage of the fire. The beams are twisted, the arches have sagged, and this portion of the work is practically a total loss. When one views these two forms of arches side by side, there can be no question of the superiority of porous terra-cotta over metal lathing and plaster, as a protection from fire.

The cinder concrete used to level up the top of the arches disintegrated under the action of fire and water, and little, if any, traces of a continuous piece can be found. There is no doubt that this material is not fire-proof, and should be carefully avoided where positive results are desired.

The sandstone with which the three fronts of this building were faced has suffered severely. Everywhere is to be seen splintered stone, broken lintels, string-courses, and cornices, even some of the carved shields on the upper stories being entirely obliterated by flaking, and one can but come to the conclusion that sandstone is not a safe material to use in the construction of fire-proof buildings.

The Board of Underwriters have in the past demanded that all communicating doors in the openings of interior division or separating walls of a building shall be of wood

covered with tin. These were placed in the Board of Trade Building, but not a vestige of them is to be found other than a few scraps of tin in the basement and a small piece hanging on one door, although the brick openings are standing intact.

The brickwork, on the whole, has stood the test well. In no case has the hard brick been damaged to any extent, but in many places the soft has sealed under the action of fire and water. This apparently shows that the use of soft brick should be avoided where stable results are desired.

Much has been said and written of the failure of the vaults to protect papers and documents placed in them for safe-keeping, but not one word has been written of the cause, or even an attempt made to locate the fault. In all cases examined, the papers were most charred *near* the iron doors, and this would tend to prove that these were faulty in construction. Both the outer and inner doors evidently became overheated, and the vaults being shallow (the papers almost touching the doors), nothing inflammable could remain near them without being damaged or destroyed.

One cannot but be struck by the difference in behavior between the l joist forming the lintels over large openings in the brick division walls of cellar and brick segmental arches which were used for others. The former have buckled in the center badly; the latter have not moved, and are as perfect as the day they were built.

That cast iron will undergo a severe fire test with less damage than steel construction has once again been demonstrated by this fire. The former used as columns



SHOWING COMPARATIVE EFFECT OF A FIERCE FIRE ON A
STONE AND A BRICK WALL.

invariably broke rather than buckled; the latter twisted and buckled. Neither can be safely used without the protection of some fire-proof material.

Although no attempt was made to erect a fire-proof building other than the portions herein before described, it is a satisfaction to those who have advocated terra-cotta fire-proof construction that it has in this conflagration withstood such a severe test perfectly, and that it can without a question of doubt be relied upon in the hour of trial.

Selected Miscellany.

NOTES FROM CHICAGO.

All signs point to a great local revival of building activity this spring. The practical ending of the long and bitter strife between capital and the building trades at last opens a clear field to real estate investors. The past four years of increasing commercial prosperity has brought sufficient growth and new business to Chicago to out-strip the over-building, incident to the World's Fair, and the years of building stagnation which have followed. Rents for all classes of buildings have a strong upward tendency, and many flats and apartment houses are being planned to meet the demand. Office space down-town is already so well taken up that in many of the best buildings there is scarcely a vacancy. The growing demand for office space will be partly met by the new fourteen-story office building soon to be begun by the National Life Insurance Company on La Salle Street between Madison and Monroe. Jenny and Mundie are the architects, and the cost of the structure will be nearly \$1,000,000.

Three of Chicago's daily papers will soon be in modern buildings exclusively their own. The *Inter-Ocean's* new building on Monroe Street near Dearborn, designed by William Carbys Zimmerman, is rapidly approaching completion. The *Tribune's* new building, designed by Holabird & Roche, will soon replace the old structure at the corner of Dearborn and Madison Streets.

All leases in the old Central Music Hall Building will

terminate on May 1, and the building will be demolished to make room for the first section of Marshall Field's mammoth new store, which will, when completed, cover the entire block on State Street between Washington and Randolph.

Mandel Brother's new retail store on the site of the old McClurg bookstore at Wabash and Madison Streets is now finished and counts for one more in the group of new steel buildings covered with cream-white enameled terra-cotta.

Adamo Boari, the architect who distinguished himself by taking first place in the Mexican Capitol competition, has been commissioned by the government to prepare plans for a new building to replace the old National Theater in the

city of Mexico. Mr. Boari will do the work here at his office in Steinway Hall.

Seven large country houses, by as many different architects, are to be erected this year on the newly opened "Hubbard's Woods" tract on the North Shore between Winnetka and Lakeside.

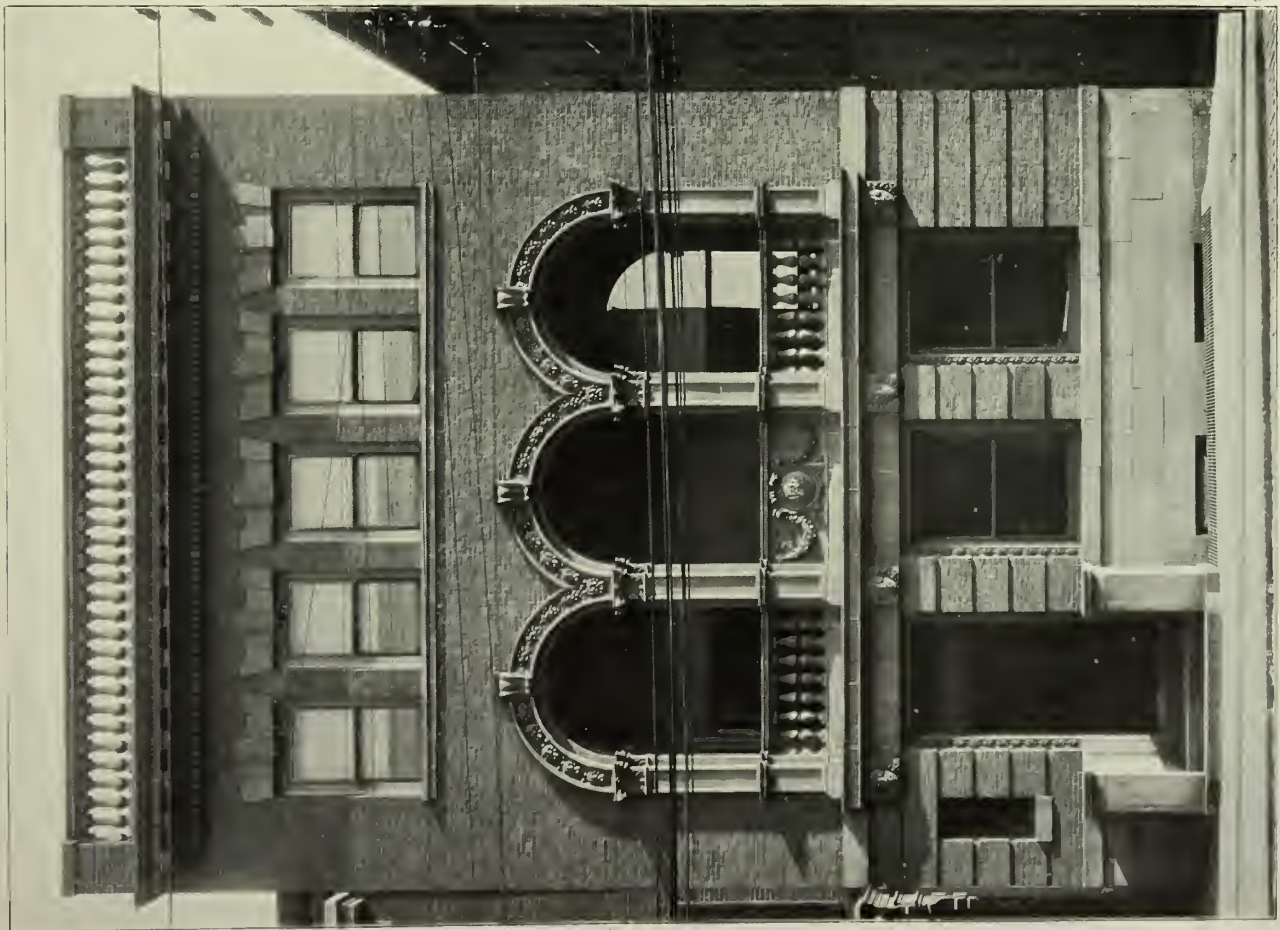
Trustees of the John Crerar Library are formulating plans whereby they hope to secure the privilege of erecting their new building on the lake front at the foot of Washington Street. The fact that the library is distinctly a public institution and will be an ornament to the city are among the reasons offered for desiring this particular site. Provision for the building was made in the will which created the library. Further, the testator, Mr. Crerar, set forth that it should "be tasteful, substantial, and fire-proof." The building, planned by



RESIDENCE, MINNEAPOLIS, MINN.
Built of "Ironclay" brick, Columbus Face Brick Company, makers.
F. B. & L. L. Long, Architects.



RIVERSIDE WAREHOUSE, DETROIT, MICH.
Stratton & Baldwin, Architects.



OFFICE BUILDING FOR THE GLOBE BREWING COMPANY, BALTIMORE, MD.

Joseph Evans Sperry, Architect.



STATION FOR CHESAPEAKE & POTOMAC TELEPHONE COMPANY, BALTIMORE, MD.

Joseph Evans Sperry, Architect.



HOUSE, AT WEIRS, N. H.
Roofed with Ludowici roofing tile.
Herbert Dumerasq, Architect.

Shepley, Rutan & Coolidge, is to be two stories high and classic in style. As originally intended, the institution has become of practical value to "the great army of artisans of the city. It is preeminently a library to which the mechanic, the artisan, the electrician, the engineer, the architect, and all others interested in applied sciences may go to obtain the results of the latest and best research in their particular field of work." Cooperation with the public library which has developed is also mentioned as one of the reasons why the public should favor the lake front location. By this means the public library is enabled to save the great cost of scientific books. Scientific societies are provided with meeting rooms in the library free of charge. If located far out in either division of the city, the trustees argue, the benefits of the institution could not be enjoyed by the down-town workers, nor would it be convenient to the societies, to say nothing of the extra car-fares required to those who would be compelled to consult its volumes. No other location is found available in the loop district, and it was this fact which first turned the trustee's attention to the old post-office site. The library now contains sixty-five thousand volumes, has an endowment of \$3,400,000, and a constantly

increasing building fund which already amounts to \$320,000.

At the last meeting of the Architects' Guild, Mr. Charles A. Coolidge was present as the guest of the evening, and the dinner was followed by a very interesting discussion of the best methods of teaching architecture in the Art Institute, Mr. Coolidge being one of the directors of the Architectural School. This school, with its steadily growing patronage from the Middle West, promises to become a strong factor in the training of the future draughtsmen and architects of Chicago, and demands the intelligent guidance of the best men in the profession, that it may advance in accordance with modern ideas of architectural education. At the next meeting of the Guild, the same subject will probably come up for further discussion.



GLENDALE SCHOOLHOUSE, GLENDALE, OHIO.
Roofed with American S. Tile.

NOTES FROM SAN FRANCISCO.

The New Century opened propitiously for San Francisco, and everything in the building line looks rosy for the year. The amount of building done during 1900 was \$6,150,000 against \$4,711,000 for 1899, and this year it is hoped to far out distance last.



SEMI-DETACHED HOUSES, LOUISVILLE, KY.
Brick furnished by the Ohio Mining and Manufacturing Company.
Mason Maury, Architect.



INTERIOR OF STABLE, NEW YORK CITY.
Lined with "Blue Ridge" enameled brick, Penn Buff Brick and Tile Company, makers.
S. Gifford Slocum, Architect.

There are many large projects in the offices of our leading architects, but none that is exciting such general interest as the building to be erected on the Baldwin Hotel site, which has been vacant since the hotel was burned down over two years ago. The property was bought from E. J. Baldwin by James L. Flood for \$1,425,000. It is the owner's intention to erect a nine-story, fire-proof office building with stores. The building will cover 31,816 sq. ft., the size of the lot, and front on three main streets. Albert Pissis is the architect.

Another large improvement that will be started immediately is the Pacific States Telephone & Telegraph Company's Building on New Montgomery Street, four stories in height and fire-proof throughout. The style will be French Renaissance, in sandstone and chocolate colored brick. The cost of this improvement will be \$250,000.

George W. Percy, one of our prominent architects, died suddenly of heart disease, last December, at the age of 53. Mr. Percy's early death is much regretted by the profession and, indeed, by all who knew him; he was

a genial man and a general favorite. His head draughtsman, H. H. Meyers, has taken up his work, which includes several large structures in this city and one in Honolulu, H. I.

Death has also removed James E. Wolfe, one of our pioneer architects: he died in harness at the age of 80.

The revised plans of M. Benard, of Paris, for the University of California were accepted by the Board of Regents last December. As they now stand they are materially reduced in size and cost of buildings from those that won him the prize of \$10,000. The arrangement is also somewhat modified, and it is estimated that

it can be executed for about \$12,000,000, none of the buildings shown in the prize scheme being omitted however. A permanent advisory committee was appointed consisting of the five original judges: Paul Wallot of Germany, Jean Louis Pascal of France, Norman Shaw of London, Walter Cook of New York, and J. B. Reinstein (lawyer) of San Francisco; together with these will be associated C. P. McKim, J. M. Carrere, and J. G. Howard of New York and D. Despradelles of the Boston Institute of Technology; to this committee will be submitted any changes or additions that may be deemed necessary in the plans.

PERSONAL AND CLUB NEWS.

Rankin & Kellogg, architects, announce their removal to 1012 Walnut Street, Philadelphia.

Among the recent events at the Boston Architectural Club was a paper by C. H. Blackall on "The Construc-



COMPTON WYNYATES, WARWICK, ENGLAND.



INTERIOR OF LOGGIA, HOUSE AT CAMBRIDGE, MASS.

The perforated tiles forming the screen are copied from Chinese tiles. The color is pale blue. Grueby Faience Company, makers.
H. Langford Warren, Architect.

tion and Design of the New Colonial Theater"; a paper by John E. Cheney, assistant engineer, city of Boston, on "American Bridges"; a paper by H. C. Holt describing some observations on the Caryatids

an appeal will be made for subscriptions for carrying out the work.

A bill has been introduced in the Wisconsin Legislature providing for the licensing of architects. It is almost identical with the law in force in Illinois. The bill sets forth that licenses shall be issued to all architects now practising, and that others shall pass an examination before being granted a license before a board of five examiners, created for that purpose. An original license fee of twenty-five dollars will be charged and five dollars a year thereafter. The measure does not prohibit builders from making plans for their own use, nor does it prohibit owners from making plans.

The Illinois Chapter of the American Institute of Architects held its regular monthly meeting in the Art Institute on Monday evening, February 25. Three papers on French, Italian, and Japanese architecture, respectively, were read. All the papers were illustrated by lantern slides, and were of unusual interest. The



PRUDENTIAL BUILDING, NEWARK, N. J.
Showing wall built of hollow tile fire-proof blocks. Raritan Hollow and Porous Brick Company, makers.
George B. Post, Architect.

Porch of the Erechtheon, and a "Steak and Stein" dinner at the Hotel Thorndike.

John H. & Wilson C. Ely, architects, announce their removal to the Globe Building, 800 Broad Street, Newark, N. J.

The John Stewardson Scholarship in Architecture of the University of Pennsylvania for 1901 has been awarded to Mr. Ira Wilson Hoover, of New York, a graduate of the architectural department of the University of Pennsylvania. The holder of the scholarship, the income of which is one thousand dollars, is required to spend a year abroad in the study of architecture. The jury of award this year was composed of Messrs. John M. Carrere and Walter Cook, of New York, and C. Howard Walker of Boston.

Ernest Flagg, who is the architect of the new buildings for the Naval Academy at Annapolis, has been selected as the architect of a naval arch, which the promoters hope to erect, at the cost of about a million dollars, near the Battery in New York. The arch is to be higher than the Arc de l'Étoile, in Paris, but it is to be treated in a different and quite original manner. The affair is in the hands of the Alumni Association of the Naval Academy; and, as soon as the site is secured and the design approved by the Municipal Art Commission,



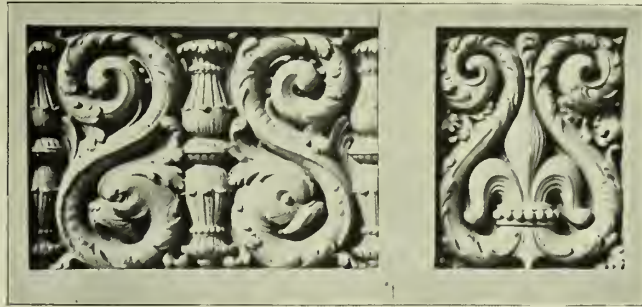
NICHE IN SCHOOLHOUSE, NEW YORK CITY.
New York Architectural Terra-Cotta Company, makers.
C. B. J. Snyder, Architect.

first paper was written by John Galen Howard of New York City; the second paper was written by Prof. A. D. F. Hamlin of Columbia University; while the paper on Japanese architecture was written by Mr. Hunda of Tokio, Japan.

The Chicago Architectural Club gave a smoker at the rooms of the club in the Art Institute on Monday evening, March 4, at which an informal discussion was held on the questions: "Should Architectural Design and the Study of Historic Styles follow and be based upon a Knowledge of Pure Design?" and "How can Pure Design be best Studied?"

MISCELLANEOUS ITEMS.

Edward R. Diggs & Co., of Washington, D. C., in addition to their Baltimore and New York branches, will



DETAIL, BY A. W. DILKS, ARCHITECT.
Excelsior Terra-Cotta Company, makers.

shortly open offices in Philadelphia and Boston, for the sale of their front brick.

The Jewettville Pressed Brick and Paving Company, of Buffalo, N. Y., has purchased the good will and plant of Brush & Schmidt. Among the stockholders of the corporation are: William C. Brush, William H. Brush, Warren H. Brush, and Stephen C. Brush, who will control and manage the company. Their experience in the brick business, covering a period of fifty years, is a guarantee that patrons will be well served. The Jewettville company will make specialties of the manufacture of high-grade front and paving brick. The facilities of the plant are being greatly increased in order that all contracts may be filled promptly and satisfactorily.

The increased use of roofing tile in this country is made manifest by the statement of the Cincinnati Roof-



PANEL, FISHER & LAWRIE, ARCHITECTS.
Winkle Terra-Cotta Company, makers.

ing Tile and Terra-cotta Company, that they booked orders during February for five hundred squares of American S. tile, in addition to an order for three hundred squares, for work being done in New York City for John D. Rockefeller, Esq.

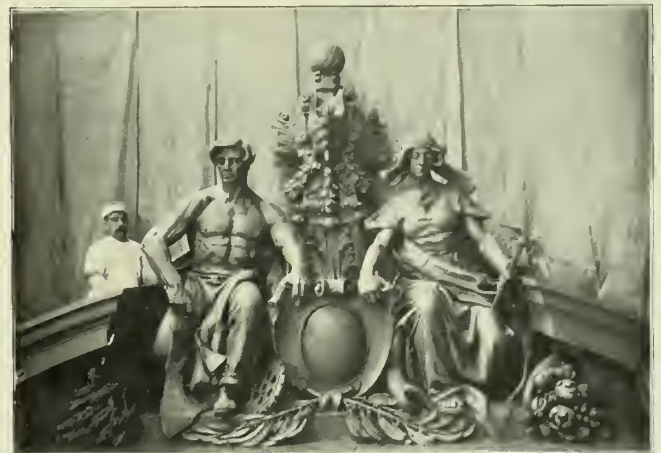
V. Emile Thebaud & Co., architects, have opened an office at 54 Gluck Building, Niagara Falls, N. Y. Catalogues and samples desired.

George Trust, architect, has opened an office at Tacoma, Wash. (P. O. Box 813). Catalogues and samples desired.

Sayre & Fisher Company have been awarded the contract to furnish all the front and enameled brick which will be used in the new Mount Sinai Hospital, New York City, of which Adolph Brunner is the architect, William Schickel, consulting architect, and Norcross Brothers, builders. The hospital will cost about \$1,600,000.

SOUTH AFRICAN BRICKS.

A REPORT has been going the rounds of some of the English technical papers which has excited a good deal of amused interest. "What sort of bricks have you in your country?" said the lecturer to a student from South Africa the other day. "Oh, they are well enough," replied the student; "they break if you let them fall onto the ground, or hit them too hard, but when they are



PEDIMENT TO AN ENTRANCE.
Atlantic Terra-Cotta Company, makers.
George B. Post, Architect.

covered with stucco at the front and wall-paper at the back they do well enough." It wouldn't be wise to say that such an experience could not be duplicated in this country. Some years since we had occasion to investigate some bricks in a far western State where good clay was scarce and fire-proof brickmakers even more so. We found a product whose color matched the pale tint of the indigenous salmon. The bricks were so brittle that out of a lot of one thousand selected at random from a pile, less than half were perfect and none would stand



CLOCK FRAME OVER ENTRANCE TO OFFICE BUILDING.
Perth Amboy Terra-Cotta Company, makers.
Sproatt & Rolph, Architects.

a drop of three feet onto an ordinary firm soil, while they were all so porous and thirsty, that after we had immersed one in water and it had bubbled and sizzled for full fifteen minutes, we gave up trying to determine what percentage of water it would absorb. Those were in the early days, but even these days are early for South Africa; and because bricks are now poor is no reason for supposing that an intelligent demand in that part of the world will not be met by a higher grade of supply.

NATIONAL BRICK MANUFACTURERS' CONVENTION.

THE fifteenth annual convention of the National Brick Manufacturers' Association of the United States of America was held at Old Point Comfort, Va., February 13 to 16, and was attended by between three and four hundred delegates, representing all branches of brick and burnt clay manufacture, coming from

nearly all sections of the country. The various papers which were presented to the convention were of a thoughtful, serious nature, and were listened to in a spirit which shows that our brick manufacturers are not disposed to be contented with any conditions which can be bettered; while an appreciation of educated, scientific thought applied to the manufacture of brick and terra-cotta was manifested by the convention to an extent which is exceedingly encouraging to those who realize how much hard work has been expended in developing the modern brickmaking plant. This convention represented the fundamental materials of which all our architecture is built, the special mediums to the use of which THE BRICKBUILDER is committed; and while the papers read were very largely of a technical nature, there was much in them which would appeal with force to our architectural readers. The processes of the manufacture of brick and burnt clay have been thor-

oughly modernized and equipped with labor-saving devices, which represent most careful study and thought; but in many respects the brick industry is in much the same condition as relates to the essential manner of production as it was in the days of Pharaoh. The mechanical processes are still very largely manual, and there is apparently a great field for some one to apply to the manufacture of common brick the same kind of engineering intelligence which has made possible our enormous national development in the manufacture of steel and iron. Just what shape this development will take in brick manufacture is entirely an uncertain element. But that it will come seemed to be one of the lessons which could be read between the lines of the official report of the brickmakers' convention.

The following-named officers were elected for the ensuing year: W. H. Hunt, of Cleveland, Ohio, president; Charles A. Bloomfield, of Brooklyn, first vice-president; J. H. Davis, of New Haven, Conn., second vice-president; and C. H. Yohe, of Alexandria, Va., third vice-president; T. A. Randall, of Indianapolis, secretary, and J. W. Sibley, of Birmingham, Ala., treasurer.

IN connection with the housing of the poor, the building of public bath-houses by municipalities to give free baths to the poor is also being agitated. Buffalo is in advance of many cities in the United States in this field. The second of the public bath-houses maintained by the city of Buffalo was opened to the public January 2. This bath-house, including the site, building, and equipment, cost \$18,900. It provides twenty-nine baths and has two apartments, — one for men and one for women. The baths are absolutely free, including soap, towel, and attendance, and have been patronized by a very large number of people.



DETAIL BY PEABODY & STEARNS, ARCHITECTS.
Conkling-Armstrong
Terra-Cotta Company,
makers.



PORCH COLUMN.
Northwestern Terra-Cotta
Company, makers.
Varian & Sterner, Architects.



PILASTER, GUSTAVE
W. DRACH,
ARCHITECT.
Indianapolis Terra-
Cotta Company,
makers.



TERRA-COTTA KEY.
New Jersey Terra-Cotta Company,
makers.

THE BRICKBUILDER,

APRIL,

1901.



TOWN WEIGHING HOUSE, AT ENKHUYZEN, HOLLAND.



THE BRICKBUILDER.

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ADVERTISING.

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	PAGE		PAGE
Agencies.—Clay Products	II	Cements	IV
Architectural Faience	II	Clay Chemicals	IV
„ Terra-Cotta	II and III	Fire-proofing	IV
Brick	III	Machinery	IV
„ Enameled	III and IV	Roofing Tile	IV

Advertisements will be printed on cover pages only.

THE PROTECTION OF STRUCTURAL STEEL.

WITHIN the last ten years steel has come to be a most important factor in the construction of our commercial buildings. In fact, it is the material upon which nearly all of our reliance is based for the provision of scientific support. The preservation of the steel from corrosion, no less than from fire, has received most careful consideration; but if we are to judge by an article which has recently appeared in *Insurance Engineering*, we have by no means arrived at the final conclusion. The writer, Mr. Frank B. Abbott, offers a statement that structural steel to be imbedded in a wall which is laid up in cement mortar should receive no paint of any description, no surface coating, but should be simply thoroughly cleaned, and every trace of rust removed by cleaning with wire brushes before the metal receives its masonry coating. He claims that the only proper protection for the steel is what is offered by the cement in the masonry; that this cement forms an impervious protection against rust, provided it can attach itself directly to the steel, but that if paint of any description is applied to the steel, it is only a question of time when the paint will entirely disappear, leaving an opportunity for moisture to work in between the cement and the metal. We cannot see, however, that Mr. Abbott has at all proved his point.

On the contrary, we have seen abundance of evidence that the right kind of paint is of very great value in protecting the steel, and that the cement on the outside of the paint is certainly in some cases an apparently perfect protection for both the paint and the metal. Some years ago a large building was torn down in New York, from which were taken some wrought-iron beams which were among the first which had been used for structural purposes in this country, having been in position for at least thirty years. It was found that the cement mortar had formed a solid cake about the metal work, and this coating had protected the paint, which in its turn apparently protected the iron. We have seen numerous other instances showing that it is far safer to trust to the protection of properly applied paint than to expect that the careless methods of laying up brick or terra-cotta about a steel frame will insure the deposition of a protective cement coating on the metal.

There is one statement which is constantly encountered which we are always inclined to question, and that is, that unless steel or iron is thoroughly cleaned from scale and rust, the protective coating of paint, or whatever it may be, cannot be depended upon. Our observation leads us to directly contrary results. We have experimented by selecting a wrought-iron water pipe which was entirely covered with thick rust, so that it could be brushed off with the finger. Over that coating of rust we have applied a heavy coat of paint, and have left the pipe exposed to the weather for two winters, at the end of which time we were unable to detect any difference in the amount of rust. While we would by no means argue from this that it is safe to neglect the proper cleaning of structural steel, we cannot help feeling that the real danger from careless painting is not from the presence of scale, or slight amount of rust under the paint, so much as from imperfect application of the paint, or poor composition of the material itself. About all that we really know in regard to the durability of steel in a frame structure is that in some cases it rusts and in some it does not. Experiments and investigations are not conclusive as showing cause or prevention in one case or the other, but in default of any more positive information we certainly shall be very loath to accept Mr. Abbott's conclusions and omit painting entirely.

THE QUALITY OF MODERN BRICKWORK.

COMPARISONS are apt to be invidious, and it is seldom safe to draw conclusions based upon a comparison of the past with the present day. It is a question, however, whether the advent of the steel frame has not, on the whole, resulted in a lowering of the

standard of what is considered good brick masonry. Where the whole structure is supported by a steel skeleton, where the worst that could happen from defective masonry would be the falling out of a few panels, and where the results most apparently desired are good looks and fire protection, it would not be strange if builders no less than workmen, should minimize the value of what we sometimes designate as an honest masonry construction, and should be content with a character of bonding and bricklaying which is by no means up to the ideal standard. Human nature is so constituted that it will acquire bad habits far easier than good ones; and though steel construction has not yet crystallized into a thoroughly coherent system, it has been used long enough to make our workmen careless, and we regret to see every day more instances of it in our modern work. Furthermore, not content with assigning to it the static loads, the engineers have called upon the steel skeleton to resist variable wind pressures, and the tendency of structural designers is to ignore entirely the stiffening effect of a well-built curtain wall between the supports of a steel frame, with a result that the contractor would very naturally feel that it mattered very little how his bricks are laid up, provided the metal is thoroughly protected and the external appearance is preserved. This is surely a mistake; fortunately, it is one which will rectify itself in time. The ideal steel frame building to our mind is one in which the brickwork is laid up in the most thorough manner, so as to not merely inclose, but to thoroughly brace the framework, and to form a most efficient protection against any probable infiltration of water. The building laws in many cities allow the curtain walls of a steel building to be only 12 ins. thick. We are inclined to think that 16 ins. would be far safer, and in the lower stories this ought to be 20 ins.; and the high quality of laying which characterizes some of the older work ought to be insisted upon in every case in connection with a steel frame, not merely as an additional safeguard, but because it is an integral part of the stability of the structure.

PROSPECTS.

SOME interesting figures were published in one of the magazines last month, showing the immense strides this country has made during the past ten years, not merely reversing its position from that of a debtor to that of a creditor nation, but, in addition, building up an enormous balance of trade, and adding to its wealth at a rate which borders upon the marvelous. Such financial combinations as now exist in this country are beyond the fables of the past generation, and we have grown accustomed to capitalizations running up into hundreds of millions and backed by solid tangible values. The personal thought suggested by all these figures is what share of all this wealth is coming to the architects, and why haven't we seen more of it. As a matter of fact, the volume of new building is increasing all the time, but it is our conviction that we are only just beginning to realize on our balance of trade, and that it will be at least another year before the accumulations will be distributed in the shape of large building operations. Real estate is the last to feel the good times, as also it is the

last to feel the approach of hard times. The twelve months just elapsed have been marked by a large increase in building and a constant raising of the quality of the work, so that architects have had opportunities that were beyond their reach a few years since. But there is every evidence that good times have only just begun. The increase in building operations for February over the corresponding month of a year ago amounts, considering only the principal, large cities, to something over 122 per cent. Some cities, it is true, show a loss. Philadelphia, Washington, Denver, Minneapolis, and Atlanta have all fallen behind, but the gain in Kansas City amounts to 281 per cent., Chicago goes ahead 231 per cent., and from that, the advance drops down by degrees to Indianapolis, which is advanced only .49 of 1 per cent. We find in nearly all the offices a good deal of activity in the preparation of sketches and schemes for large public work, and where there is so much of this evidenced it can be taken as a fair sign that the investing public is looking around for opportunities to place the money reserves which have piled up during our prosperous export years.

"The Brickbuilder" Competition. VIII.

GIVEN BY THE GRUEBY FAIENCE COMPANY, BOSTON.

PROGRAM.

THE design is to be of the ticket windows in the vestibule of a theater, and the immediate treatment about these windows.

There are to be three windows, at a height of about 4 ft. above the floor, and they need not be of equal size. The intention is to obtain a design which, while a decorative motive in character with the surroundings, is complete in itself. All glass used shall be plain, undecorated glass — no stained glass. Grilles to be simple in character, if used. The treatment of the adjacent wall and its relation to the windows is to be indicated. The design is to be such as is adapted to the working out in faience.

DRAWINGS REQUIRED: An elevation drawn to the scale of $\frac{1}{2}$ in. to the foot, with plan at left and section at right side, near the bottom of the sheet. The drawings to be in black ink with no wash work, on one sheet measuring 22 ins. wide by 15 ins. high. Shadows, if indicated, to be done in free hand, parallel perpendicular lines. Drawing is to be signed by a *nom de plume*, or device, and accompanying the same is to be a sealed envelope with the *nom de plume* on the exterior, and containing the true name and address of the contestant.

Drawings are to be delivered, flat, at the office of THE BRICKBUILDER, 85 Water Street, Boston, on or before July 1, 1901.

For the four designs placed first, the Grueby Faience Company offers prizes of fifty, twenty-five, fifteen, and ten dollars, respectively. All premiated drawings are to become the property of the Grueby Company, and the right is reserved to publish any and all drawings submitted.

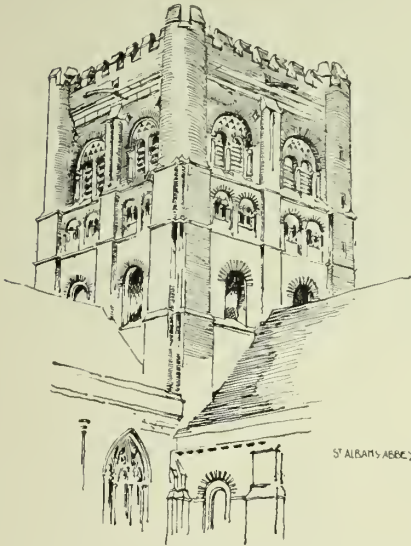
The competition will be judged by Mr. C. Howard Walker.

Old English Brickwork. I.

BY W. G. HORSEMAN AND HENRY TANNER.

IN writing on the subject of "Brickwork in England," it is necessary to make mention of the very early periods of its use, although these may possibly have an

interest more for the antiquary than the architect. So far as can now be ascertained, the Romans were the first to introduce the art of manufacturing and using bricks in this country, and during the period of time which elapsed between their conquest of Britain, A. D. 43, and their final departure about A. D. 418, bricks were very generally used in the construction of the fortified towns and camps, which they founded in various parts of the country.

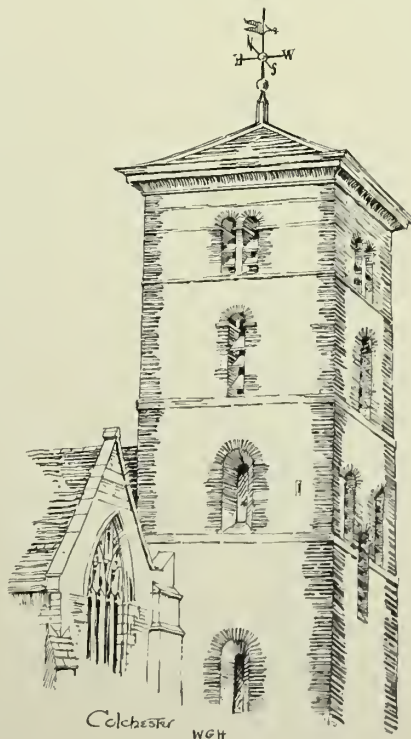


ST. ALBANS ABBEY TOWER, HERTFORDSHIRE.

There is little doubt but that these towns possessed temples, baths, theaters, houses, etc., upon a scale not far short of those founded in other colonies of the Roman Empire; for instance, the remains of villas at Begnor in Sussex, Great Witcomb in Gloucestershire and Woodchester, exhibit in their plan and arrangement most of the characteristics of those in Italy.

The bricks, or rather wall tiles used in these buildings, vary very considerably in dimensions. Those found at York, Colchester, Verulam, Porchester, and other places measure from between 1 and 2 ft. in length, 8 to 12 ins. in width, and about 1 1/4 to 2 ins. in depth; and in all cases these bricks are very hard and well burnt.

At Richborough, in Kent, the walls are from 20 to 30 ft. high and about 11 ft. thick, formed of courses of bricks and stones regularly laid. The ancient wall of London is similar in construction; two courses of bricks and then a layer of stones, about 2 ft. in



CHURCH TOWER AT COLCHESTER, ESSEX.

thickness, alternate throughout the height. The art of building must have reached a high stage of perfection, as it is recorded that when the Emperor Constantine rebuilt the city of Autun in Gaul in the third century he brought the workmen chiefly from Britain, which abounded with the best artificers. After the departure of the Romans, it is more than probable that the practice of brickmaking was discontinued for a long time.

The Saxons and Normans certainly did use bricks in their buildings, but these are generally believed to be the old Roman wall tiles, or bricks, taken from ruined or existing buildings and reused. That this was done in



HURSTMONCEAUX CASTLE, SUSSEX.

some places has been satisfactorily proved by finding in Norman buildings some of these old bricks still having the traces of Roman mortar adhering to them.

In Brixworth Church, Northamptonshire, some arches formed with Roman bricks can still be seen in the walls of the nave, and at Darcul Church, in Kent, similar remains exist.

The Abbey Church of St. Albans, in Hertfordshire, is perhaps the most important building of the Norman period. Begun by Abbot Paul, A. D. 1077, and consecrated in A. D. 1115, it is very largely constructed of Roman bricks, all of which were probably obtained from the adjacent Roman city of Verulam, which was then ruined and deserted for the new city clustering round the church, founded in honor of the martyr Saint Alban. These bricks here used are from 1 1/2 to 2 ins. deep, and the mortar joints are very thick, about 1 1/8 to 1 1/4 ins.

The extremely fine central tower is entirely built of brick, and being fortunately in much the same condition as when completed by its Norman builders, gives a very



GREAT CRESSINGHAM PRIORY.

good idea of what must have been the general external appearance of the Norman church, most of the other portions of which have been refaced at various periods, although the core of the walls is still of brickwork. The whole building was planned upon a vast scale, with nave arcade, triforium, and clearstory. The interior was plastered completely and decorated throughout with mural painting, some remains of which still exist.

Two other churches, also at St. Albans, present examples of Roman brick used anew. St. Michaels, where some very early windows, of Saxon or Norman date, having brick jambs and arches, exist above the present Norman arcade. St. Stephens, founded A. D. 980, where these bricks are used instead of stone quoins to form the angles of west end of nave, the walls of which are constructed of flint rubble.

There is also much early work at Colchester, which during the Roman occupation was an important fortified town. The church tower illustrated, of which the quoins, windows, arches, doorways, and dressings are formed with thin Roman bricks, presents a good example of the old material at hand being reused by the Saxon and Norman architects.

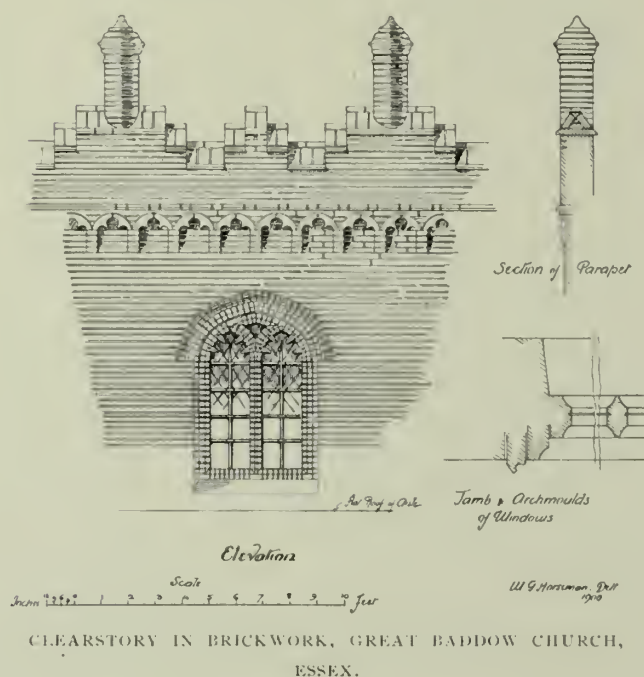
The examples mentioned above rather tend to show that the art of brickmaking was not practised by the Saxons and Normans, who found scattered throughout the country many remaining Roman brick buildings, from which they could, and probably did, draw their supplies. On the other hand, the art of brickmaking

may have only been lost for some time after the departure of the Romans from Britain, as the process was simple and easily learned.

However this may be, we probably owe the introduction of brickmaking in more or less its present character to the Flemings, who came over from the low countries (Holland and Flanders) and settled in the eastern counties, that part of England where there was the greatest scarcity of building stone; in fact, the conditions here were very much akin to those the new colonists were used to in their own countries, where brick was certainly the principal, if not almost the only, building material.

The earliest examples of brickwork, of which the bricks have very much the form and dimensions of those used at the present day, are to be found in these eastern counties, and it is more than probable that these bricks were imported by ship from the Netherlands.

Flemish wool manufacturers are first recorded to have settled in Norfolk in the second half of the thirteenth

Great Baddow Church: Essex.
Nave Clearstory.

century, and in the course of another century had become very numerous throughout the eastern and southern counties, their influence on the brickwork in these places being distinctly perceptible.

The earliest known instance of brickwork in the modern manner is at Little Wenham Hall, in Suffolk, which was built A. D. 1260, which date coincides very nearly with that of the first Flemish settlement here.

The building is a rectangle about 45 ft. long and 24 ft., wide, with a tower about 17 ft., 6 ins. square attached to the northeast angle. The ground story is vaulted in three bays. The hall, or living apartment, is on the first floor, and opening from this, on the east side, is the very interesting domestic chapel.

On the second floor is a long apartment, and over this is a flat, leaden roof. The exterior walls are finished with battlements, under which are loopholes, or oilets, widely splayed internally, through which arrows and



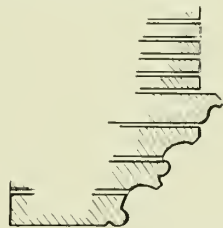
REDBOURNE CHURCH, HERTFORDSHIRE.



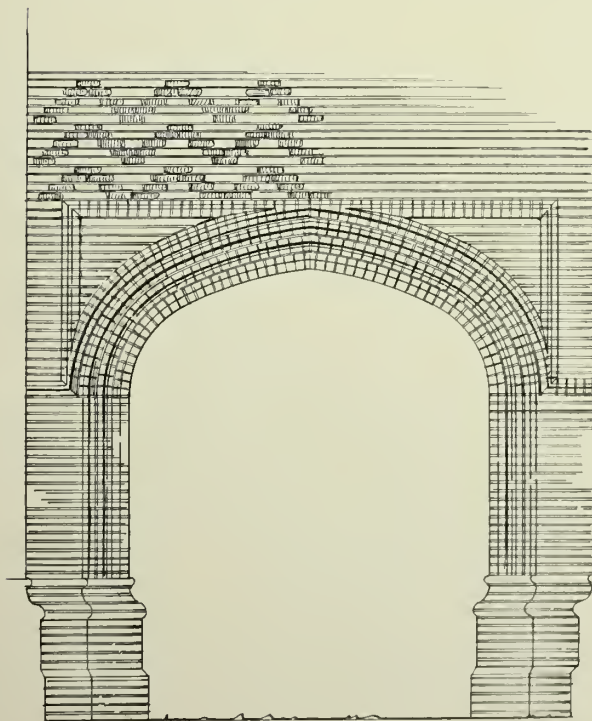
LAYER MARNEY TOWERS, ESSEX.

other missiles could be discharged. The bricks used in this building measure $9\frac{1}{4}$ by $4\frac{3}{4}$ by $2\frac{1}{4}$ ins., and are of a pale red color.

The Grammar School at Eweline, in Oxfordshire, is an excellent example of fifteenth-century brickwork,

LAYER MARNEY TOWERS.
ENTRANCE GATEWAY.

ARCHMOULD.



ENTRANCE GATEWAY, LAYER MARNEY TOWERS, ESSEX.

and the quadrangle of the adjoining hospital, or almshouse, which dates from about A. D. 1448, has its walls formed with oak uprights, and the spaces between these filled in with bricks laid in the herring-bone manner.

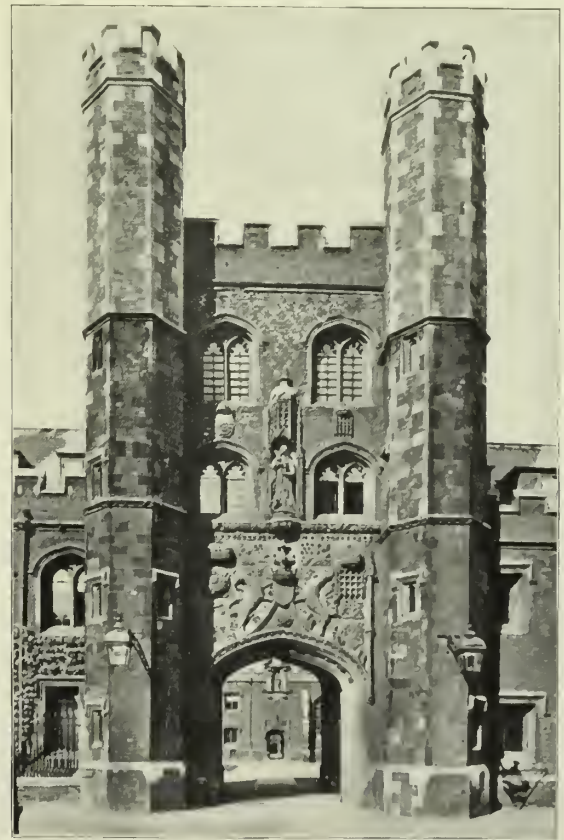
Eton College, a royal foundation of Henry VI., was begun about A. D. 1440, and to obtain a regular supply of bricks, a piece of ground was hired at Slough for an annual rent of twenty shillings, a brick kiln built upon it in 1442, and 66,000 bricks were brought to the College in May of the same year.

Many of the college buildings at Cambridge present excellent examples of early brickwork.

The earliest parts of Queen's College, founded by Queen Margaret of Anjou, A. D. 1448, are of but little later date than the foundation of Eton. The very fine gateway tower on the eastern side of the main quadrangle was commenced in 1448. It is built of

red bricks, which are small and laid with very coarse mortar joints.

The western building upon the riverside is later, and the walling is of red brick with stone dressings. There is a small cloister walk under part of this building,



ENTRANCE GATEWAY, ST. JOHN'S COLLEGE, CAMBRIDGE.

built entirely of brick with four centered arches in three orders, with splayed bricks and plain piers.

The magnificent gateway towers of Trinity, St. John's, and Jesus colleges are entirely built of brick walling with stone dressings.

The first two are on a large scale, the tower in each case being flanked at the four angles by large staircase turrets rising well above the roof.



ROOS HALL, NEAR BECTLES, SUFFOLK.

In all these towers the bricks are rather irregular in form, and vary very much in color, and laid in the walls, with coarse wide joints, little trouble apparently was expended upon keeping the courses truly level, or the bricks exactly over those below, and the effect is now very fine and quite different to the snug and smooth look of most modern work, which is so dear to the bricklayer of to-day.

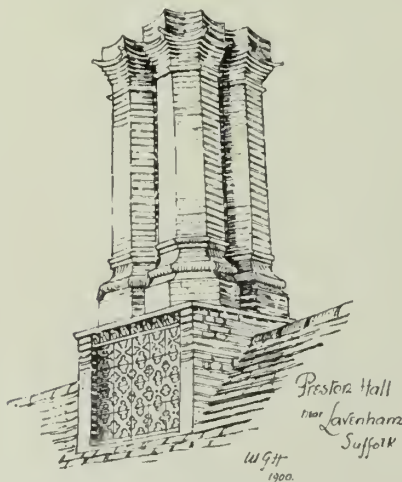
Caistor Castle in Norfolk, built by Sir John Falstaff some time prior to the year 1460, was a moated building of great size, originally covering six acres of grounds.

Oxburgh Hall, Norfolk, was erected at the end of the fifteenth century by Sir Edmund Bedingfield, who obtained a grant from Edward IV. in the year 1482 to build the manor house with towers, battlements, machicolations, etc. It is entirely built of brick, in square form, round a courtyard approached by a bridge spanning the moat, and through an arched gateway flanked by two octagonal turrets 80 ft. high, one of which contains a spiral stair of brick excellently worked. The floor of the great hall is paved with small fine bricks.

In the first year of Henry VII., A. D. 1485, a license was granted to Roger Fiennes to embattle and fortify his manor house of Hnrstmonceaux in Sussex, and there is no doubt that the whole of the present building was erected at that date. It is of much interest as, though retaining all the general form of a castle with drawbridges and moat, it was rather intended for a residence, and

though strong enough to stand the attack of marauders, would have been incapable of enduring a regular siege.

The building consists of three courts, one large and two small ones. The main gateway here illustrated is in the center of the south front, and at each angle stands an octagonal tower 84 ft. high. The whole plan measures about 200 ft. north to south and 214 ft. east to west. The art of brickmaking was now



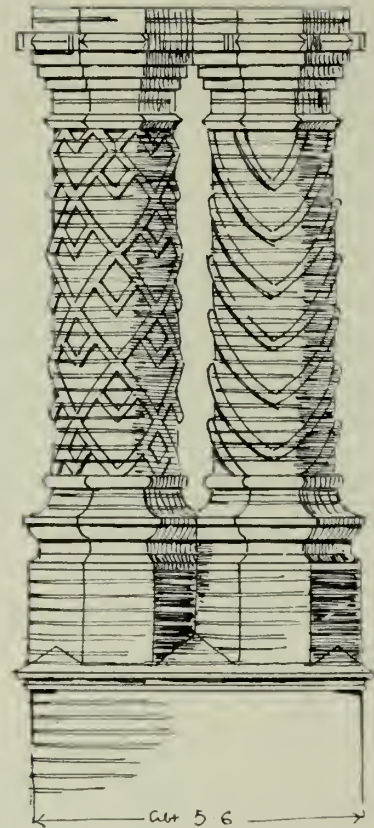
CHIMNEYS, PRESTON HALL, NEAR LAVENHAM, SUFFOLK.

carried to some perfection, as Dr. Lyttleton, writing some one hundred and fifty years ago, states that the fabric had stood three centuries' wear and tear, although in a very exposed position near the sea, without suffering the least injury in any part of its walls.

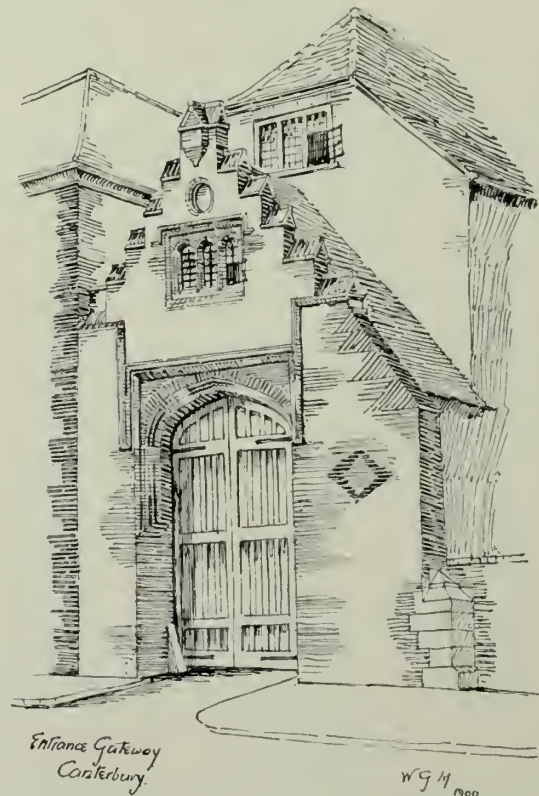
The church at Great Baddow, near Chelmsford in Essex, has a fine clearstory over the nave arcade entirely built of brickwork. Even the mullions, tracery, and cusplings of the windows are made in this material. The manner in which the window cusping is done is instructive.

The church at Feering, in the same county, has much good brickwork, notably, the porch, the buttresses, window tracery, mullions, trefoil arch, caves course, and battlements are built with bricks.

The aisle parapets of St. Mary's Church, Redbourne,



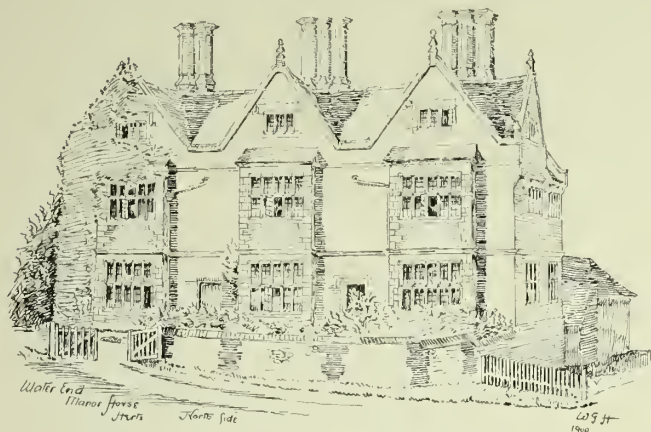
CHIMNEY STACKS, PENSHURST PLACE, KENT.



ENTRANCE GATEWAY, CANTERBURY, KENT.

near St. Albans, have brick battlements, under which is a corbel table supporting cusped trefoil arches, also in brick.

Very late in the fifteenth or early in the sixteenth century, molded brick and terra-cotta began to be used



WATER END MANOR HOUSE, HERTFORDSHIRE.

in building, and with this variation came unmistakable signs of the Renaissance appearing here and there amid Gothic details and moldings, although the main features retained their mediæval character long after.

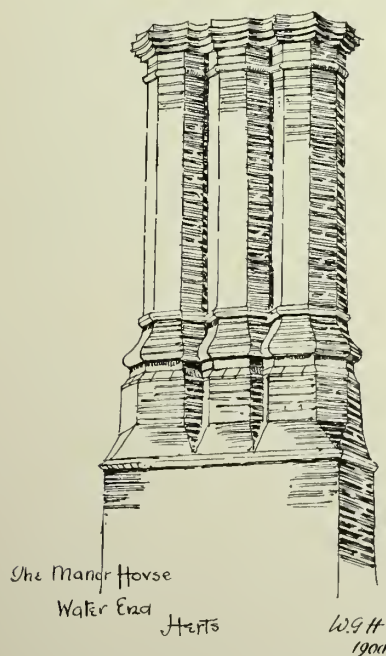
The introduction of terra-cotta was chiefly due to the influence of Italian workmen brought to England by Wolsey and Henry VIII., although it had been manufactured here in a very crude form before their arrival.

East Barsham Manor House and Great Snoring Rectory are very early examples of brick and terra-cotta work of this period; and the character of the work and the mastery over the material clearly show the influence, if not the execution, of Italian workmen.

The buildings date from quite the end of the fifteenth century, and are generally English in design; but the perpendicular tracery and moldings at East Barsham are combined with shields and plaques arranged as a frieze and cast from molds, and are distinctly Italian; while at Great Snoring the frieze is ornamented with terra-cotta heads, separated from each other by balusters enriched with the classic acanthus leaf.

The sedilia in Wyndham Church, Norfolk, is an extremely rich piece of work, built early in the sixteenth century.

The earlier portions



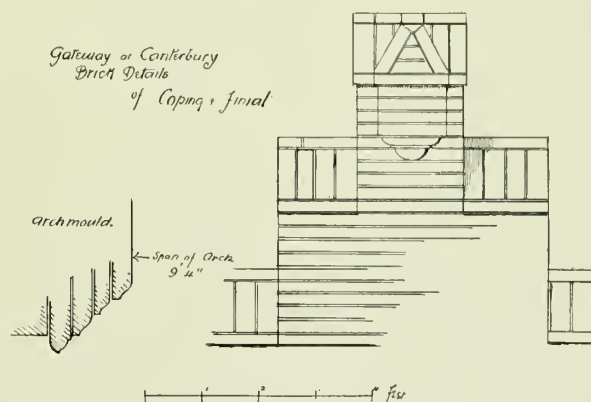
CHIMNEY STACK, WATER END MANOR HOUSE, HERTFORDSHIRE.

of Hampton Court Palace, commenced by Wolsey in A. D. 1515, though mainly built of brick with stone dressings, in the picturesque if debased style of the Tudor period, contains some interesting examples of early terra-cotta work, notably, the circular panels containing busts and Wolsey's coat-of-arms, all of which were probably executed by Magano.

Torrigiano, another Italian workman brought from Italy by Wolsey, executed a tomb with numerous large figures in terra-cotta, in the Rolls Chapel, Chancery Lane, London.

Great Cressingham Priory, built early in the sixteenth century, is a curious and interesting example of brick domestic work. The whole of the upper story and also the angle turrets on the south side being covered with richly molded brick panel work.

Other good examples of the use of brick and terra-cotta are to be found in the late Tudor domestic chapel attached to "The Vyne," a large house near Basingstoke



Brickbuilding in Modern France. I.

BY JEAN SCHOPFER, PARIS.

BRICK has always been employed in French architecture. There are Romanesque brick edifices in France, and, in the south, Gothic ones. We know how successful brick was during the Renaissance, and numerous castles and palaces in which it was employed were illustrated in *THE BRICKBUILDER* last year. It might have been expected that the unfortunate revolution brought about in French architecture by the neo-classic would prove fatal to the use of brick. In fact, since the middle of the seventeenth century the development of so-called classical principles has had the effect of banishing from all architecture the colored element. Gray

weighty vaults. Iron sufficed unto itself; the trusses leaned upon steel piers; the wall became useless, at least, as a support, and was only necessary in order to isolate the interior from the exterior, as a space to be filled in. Henceforth, thin, light materials sufficed. None presented more advantages than brick, and brick was thereupon allied to iron. Both still have a glorious future.

Brick is not, however, necessarily employed with iron. It is, in itself, capable of every function; it has been employed in modern French palaces, castles, town halls, private houses, lycées, schools, and barracks, for villas and for business houses. In fact, there are no services that have not been demanded of it.

I should like, in a series of articles, to pass in review the most interesting buildings which have been erected during the last twenty years in France, to criticize them,



THE TROCADÉRO, PARIS.

was deemed, then, the only really noble tone for buildings, and stone the only material worthy of being employed by architects. This opinion existed for some time.

It was only during the nineteenth century that people's eyes were opened anew to the charming possibilities of brick in architecture. Again it occupied a place of honor; the elegant structures of the Renaissance were studied, and it became evident that original might, by a good architect, be produced with brick. On the other hand, new materials affected the very life of architecture. Iron made a triumphant appearance, and brought with it absolutely new principles. With iron, in fact, there was no more necessity for heavy stone walls bearing

and draw from them a few, never-failing rules — alas, too often forgotten! — of the architectural employment of brick.

There are a few axioms relating to this subject that can be briefly stated. In spite of their simplicity, they are not always applied.

In the first place, brick is not stone. This seems to be a foregone conclusion, but it is often forgotten. How many architects reproduce, in brick, forms proper to stone! This is contrary to all good sense, but happens frequently, as we shall see. Brick is a material of small dimensions. We must remember that in classical architecture the orders were not created for brick. It is true that they were imitated in brick during the Renaissance.

This is, perhaps, not a sufficient reason for our doing so.

Brick, made as it is in different colors, should, if we would develop the merits it possesses, inspire us to create a polychrome system of architecture, that is, a system where color not only plays a decorative part, but, moreover, accentuates the very structure of the building. This is not always the case. Do we possess a very reliable sense of color?

Finally, I beg the reader not to examine the monuments assembled here as he would models. There are, I believe, but few works in contemporaneous architecture which might serve as such. The fault does not lie with brick, and I should have as much trouble, perhaps more,

to dissimulate its object. The exterior tells of the interior, and the two great arcaded galleries which encircle the concert hall form convenient outlets. The brick here is absolutely polychrome; the great matched brick arch stones alternate, in the arches, as do the layers of light and dark brick in the main building. Enameled bricks are introduced in the frieze in order to produce a decorative effect, completed by the roseworks of enameled terra-cotta in the tympanums. Finally, almost throughout the edifice, the architectural forms are exactly suited to brick. The arcades on the small and large towers are well becoming to brick buildings, and were inspired by the Romanesque style, which itself borrowed them from the Lombardian school, but whose first appearance



THE CAPITOL, TOULOUSE.

in finding good models of stone architecture. I give here a glimpse of what has been done during the last twenty years. Some buildings are good, some mediocre, and some bad. The critic is not responsible. He can, and should say, this or that is good in such a monument, or this is bad. This conforms to reason and taste, and this does not.

Here, first, is the Trocadéro, which was built in 1878 and considered worthy to survive the Exposition for which it was erected. The two great wings added to the central building now shelter the Museum of Compared Sculpture. The central building encloses a vast concert hall, and we cannot accuse the architect of attempting

really dates from the Byzantine monuments of Ravenna. The little edicules terminating them are of less happy effect.

Before examining the more modern applications of brick, we must point out one or two restorations as modern copies wherein brick plays an important part. We give here the facade of the Capitol of Toulouse, which in the majesty of its development might rank among the monuments of the seventeenth century. It was, however, built during our time, and I thought it of sufficient interest to be reproduced here, even if it is absolutely Louis XIV. in style. As we know, Toulouse has always excelled in the use of bricks. St. Sernin is

one of the most beautiful Romanesque brick monuments. Here we see the Ionic order, but I believe no architect can remain indifferent to the fine qualities of this building.

The Luxembourg Museum of Paris is modern, also, but built in the Renaissance style. The only color effect sought for here, as in many other well-known monuments, is the contrast between the white stone and the red brick. Brick can rightly aspire to newer combinations than this.

In the north, brick has always been successfully employed. Here is a big school at Armentières where brick

this facade is of brilliant aspect. It is an example where brick, with very slight expense, can enliven a façade which economy obliges to be of great simplicity.

We have come to the most interesting work of this series, the lyceum of Lakanal, which M. de Baudot built twelve years ago. M. de Baudot is a man possessing a thorough knowledge of the history of his art; he teaches it at the Trocadéro Museum. But he has studied the history of architecture, not as many architects do, in order to find motives to copy or imitate, but, on the contrary, to discover the principles which were applied during the best periods, and to see if the same principles



THE LUXEMBOURG MUSEUM, PARIS.

only is used, and in an intelligent manner by Mr. Chipiez. I mean by this that decorative effects are drawn from its architectural employment, as, for instance, in the arches of the windows. On the other hand, decorative motives belong also to brick decoration. We find, in the form of the roof, the general shape dear to the northern regions, and of which Belgium gives us so many examples.

At Vieryon, in central France, another great school of the arts and crafts shows us a facade not entirely composed of brick, and where it is used only to play a decorative rôle in the filling in under the windows, in the voussoirs, and finally in chains across the facade. A white and a yellow stone complete the polychrome effect;

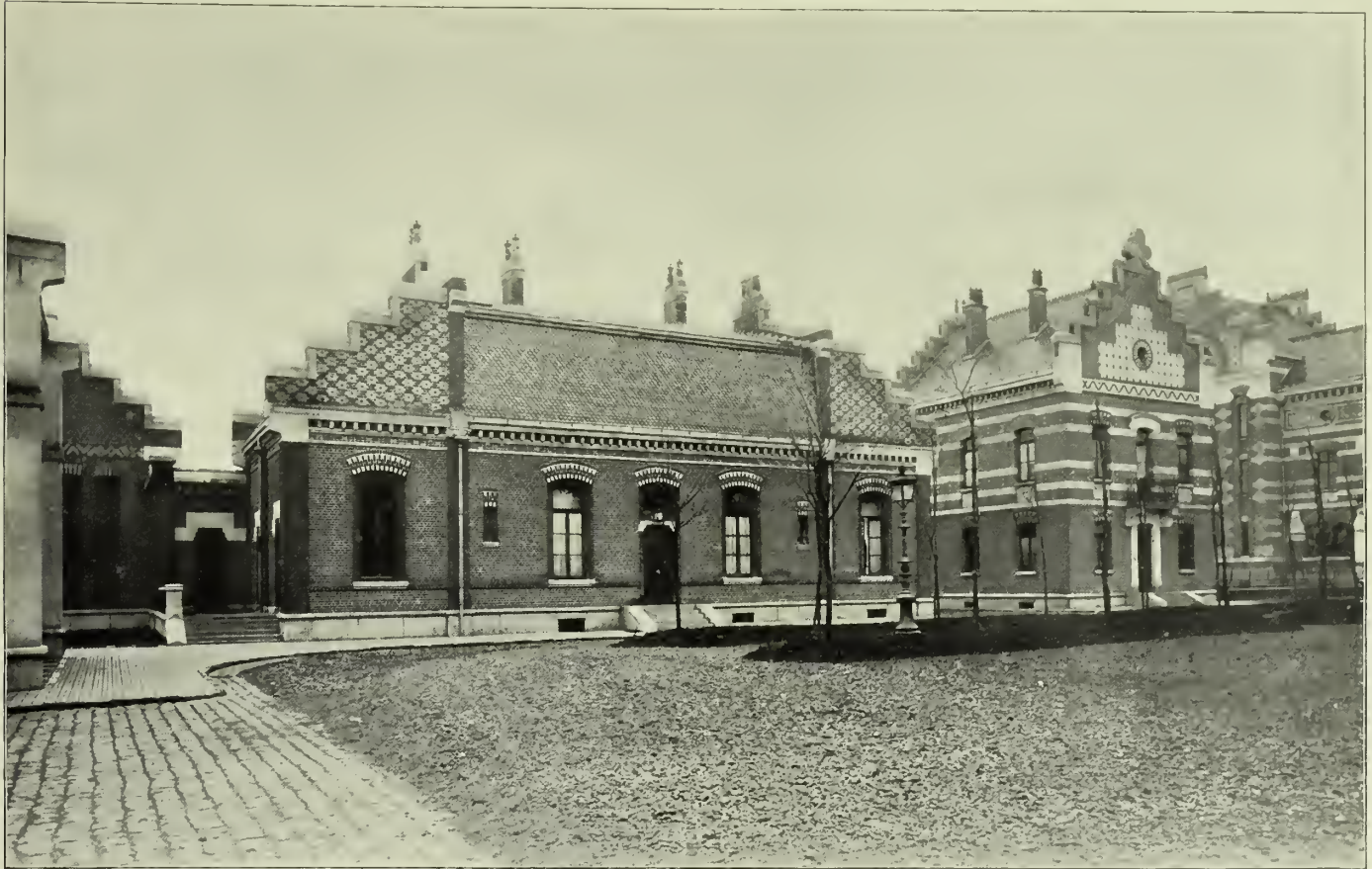
would not be of use to us if we knew how to employ them according to our new materials and the different needs which are ours.

But M. de Baudot is a clever man. He has carefully refrained from trying to revive the Romanesque or Gothic, which are as ridiculous for our civilization as is the Greek style. He is truly modern. Consequently, we can always be sure that his works, whatever they may be, will be interesting. Here, then, is Lakanal, built of brick. And we see at once that the architect has treated it as such, that he has understood not only the structural forms of brick, but also its decorative possibilities.

Study these two photographs in their smallest details;

it is quite worth while. See how the walls are built, the piers between the windows, the window arches and their supports. Then see how happy is the decorative effect of

harmony of the whole, and the hardy manner in which the lines of construction are accentuated. This is not stone indifferently converted into brick. The building is

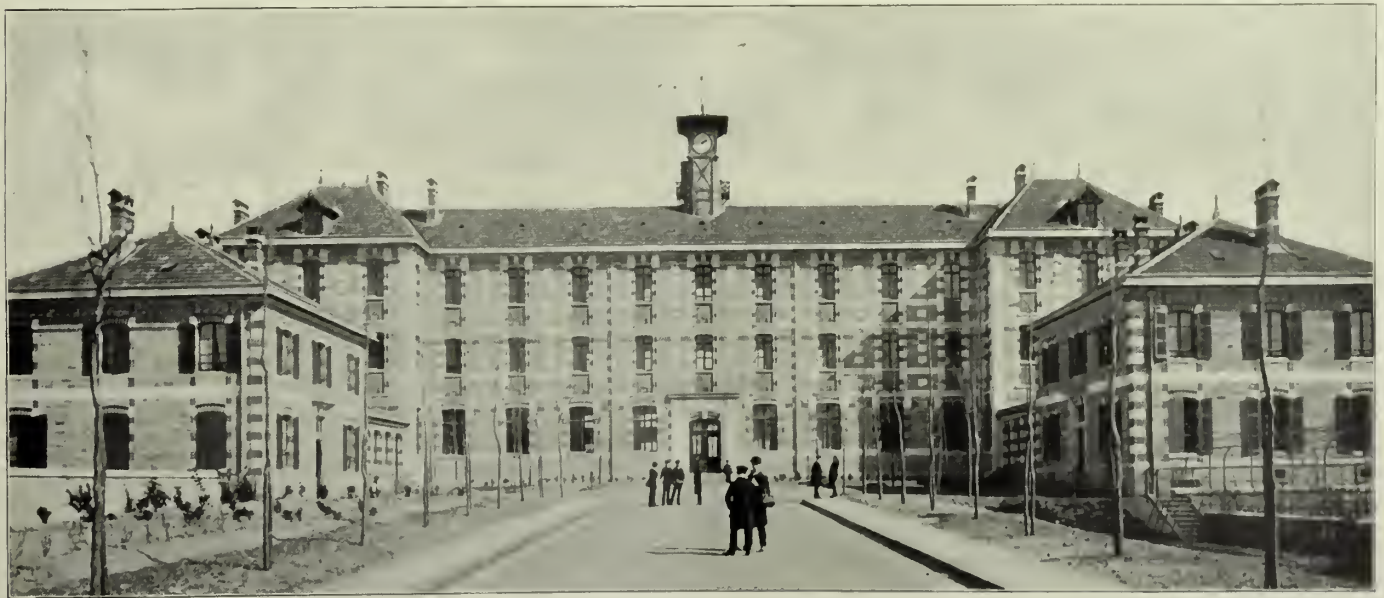


PROFESSIONAL SCHOOL, ARMENTIÈRES.

the line of brick, and how the most complicated ornaments assume the shapes proper to brick.

Notice, also, the original cornice in high relief, the

one which all architects will find profit in studying, and which, if it is understood, will have an excellent influence on the rational development of good brick architecture.



PROFESSIONAL SCHOOL, VIERVON.



LYCEUM OF LAKANAL, PARIS.



LYCEUM OF LAKANAL, PARIS.

The Works of Rafael Guastavino.

PART I. AS ARCHITECT

BY PETER B. WIGHT.

THE extensive works performed by Rafael Guastavino and those associated with him, in many localities throughout the United States, displaying such originality of conception and care in execution, seem to merit more than a passing mention among the many new constructive expedients for which the last few years have been memorable. Coming among us from Spain in 1881 a comparative stranger, he has, through extraordinary perseverance, not only merited the confidence which many of the leaders of architectural thought have placed in him, but made possible the development of architectural design in directions heretofore considered impracticable. While he has made possible many projects in design which were heretofore thought to be difficult and almost prohibitively expensive in execution, and carried



FIG. 1.

them out with a simplicity of construction by many considered daring if not impossible, it may be said that we have as yet but reached the beginning of the possibilities of original designs, for the execution of which we may intend to employ "Cohesive Construction." This is the name which Mr. Guastavino has applied to the system of which he is the father and main exemplar. After these nineteen years of untiring effort, the architects of America owe him a debt of gratitude for not only having been a faithful and conscientious contractor, but for having made possible a larger field for architectural design.

It is pleasant to know that all this has come to us from a trained architect, and that it is not the work of a self-seeking contractor only. It is also interesting to know that the subject of our story was brought up as a musician, and came from a family of musicians, and has given another demonstration that the transition is easy from a musician to an architect, as has been seen in the lives of the late Jacob Wray Mould and John Wellborn Root. He was born in Valencia, Spain, in 1842, but at seventeen forsook music for an architect's office, and



FIG. 2.

became a student of D. José Nadal, who was Royal Inspector of Public Works. On his death, which came from an accident in pursuit of his official duties, Mr. Guastavino went to Barcelona, took a University course, and afterwards entered the School of Architecture. He was connected with the office of the architects Granell & Robert until 1862.

His first important order as an architect was gained in competition in 1866, and I am able to present to the readers of THE BRICKBUILDER a photograph of it, for illustration, which will well bear examination (Fig. 1). This and some of the succeeding illustrations will serve to show that Barcelona is a modern and progressive city. It shows also that her architects were not without refinement and moderation in their designs, and that even in old Spain a young professional of twenty-four years had opportunities which were rarely exemplified at that time



FIG. 3.



FIG. 4.

even in our own country. Mr. Guastavino was an enthusiast in cohesive construction from the very beginning of his career, first pinning his faith to cement and concrete. But in so doing he encountered difficulties; for then no reliable cement was made in Spain, and the ultimate improvement in its manufacture was due to his exertion. The cement that he first used was made at Gerona. It was a semi-quick-setting cement. But when he erected his own house at Barcelona in 1872, of which he was both architect and builder, of which a photograph is here shown (Fig. 2), he used an English Portland cement. After that he used a cement made by Dr. R. Montestru at Tardienta (Aragon), a few miles from his own country



FIG. 6.

seat at St. Gines. During his dealings with Dr. Montestru he gave the doctor Vicat's book on cement manufacture, with the help of which he succeeded in making a free silicate, or Portland cement of fair quality.

Having embraced the profession of a builder as well as architect, as was then customary in Spain, he was largely engaged for many years in the erection of mills and factories, in which the necessity of fire-proof construction was evident. and while erecting these he had every opportunity to experiment with concrete and tile for floor and roof constructions. He was guided by the study of the architecture of the Byzantines and Persians, whose influence had been felt in Spain from the third to the fourteenth century. These conditions can best be described in his own words. Buried in the uncut publications of the American Institute of Architects, without table of contents or even headlines, can be found a paper read by Mr. Guastavino before the International Congress of Architects at Chicago, in 1893, from which I may

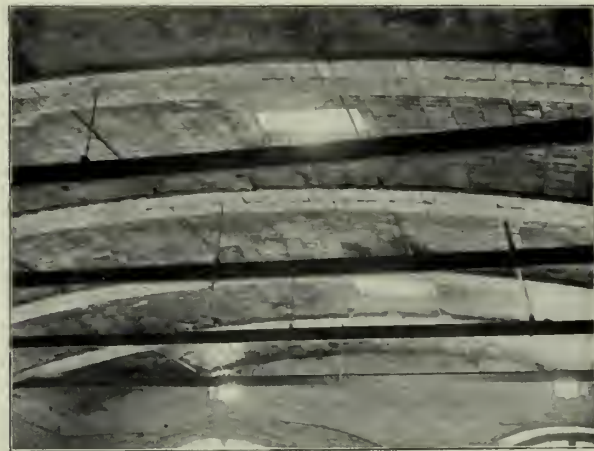


FIG. 5.

make frequent quotations. On this condition of the development of the primitive cohesive system of building in Spain, he said: "The imperial edict of Constantine, declaring Christianity to be the State religion, transferring at the same time the capital of the Roman Empire to Byzantium, drove the eastern European and western Asiatic Jewish race and other sects, for the first time after Christ, into emigration, giving occasion, perhaps, for the later invasions of the Arabs and Mussulmans. Spain was the principal attraction for emigrants, not only on account of climate, richness, and the already relatively large commercial relations with the Greek Empire, but also on account of the freedom and religious tolerance, as is always the case in new countries. Byzantine churches and cathedrals were built in Spain at the same time that synagogues were tolerated. These edifices were of remarkable constructive character. . . . The character of the most ancient Byzantine and Romanesque types in Spain was of monolithic construction, made of conglomerated material. The walls and floors (like other specimens relatively modern) were, some of them, of stone and concrete, others concrete alone. For the second, it seems that molds or heavy centering were used, giving to the material an appearance outside like a cast mass, as can be seen by specimens of walls with large portions of floors and vaulted ceilings, which are yet in existence,



FIG. 7.

showing perfectly their construction. Some domes were built with stone and packed with the same casting-packing material referred to, probably without centers, because there is small ashlar; and it is yet customary there to build domes of that kind, using only a stick-pole as a radius, and closing each time the ring of stone, so that no centering is used in such case. The construction was the same in the period of the Arabs and the Moors. It was like that of the rest of Spain, Byzantine in style."

It was the study of these that led him at first to revive the ancient concrete constructions. In 1868-69 he built the great factory of Batllo Brothers, covering four blocks, which was gained in competition. The buildings contained 64,000 spindles, 1200 looms, a bleachery, warehouse, etc. These buildings were, some of them, five stories high and all of cohesive construction, that is to say, some of the floors were of concrete, and others, and the roofs, were arched with tile, while the circular stairways were built monolithic with tile. The general style of the exterior was similar to Fig. 3., which, however, is from a photograph of a factory built later for Muntadas, Aparicio & Co., in 1875. The erection of the Batllo building, the first in which cohesive tile construction was used, attracted a great deal of attention from architects and the instructors of the School of Architecture, who visited it with the students while it was in progress. It was during the erection of the Muntadas factory that the government engineers made an inspection of the floor and roof construction, a combination of tile arches and iron tension members for which a patent was granted to Mr. Guastavino. The illustration (Fig. 3) shows the ingenious way in which he combined rubble masonry and brick in the exterior walls. Other mills and factories, built or designed by him after this time, in which the cohesive construction was used, comprised the woolen mills of D. Carreras (of which an illustration is given in Fig. 4), erected in 1876, of Vidal & Sons, Rosic, and the porcelain works of Florens & Co. In the latter he first used tie-rods of iron concealed in the arch, on account of the great heat of the kilns, which has led to the use of this system so extensively in our own country.

Fig. 5 is an illustration of the interior of the roof of a warehouse built for Mr. Gran at Barcelona, in 1877. This was the first building in which the cohesive construction was used of dome form with tie beams. The span of the roof is 28 ft. Fig. 6 is an interior view of a circular con-

cert theater erected at Villasar. The roof over the boxes is supported by segment arches, from wall to columns, between which are the ceiling arches, and the dome roof is 46 ft. in diameter, with lantern in the center, — all of cohesive tile construction.

Two more examples only of street architecture will be given. Fig. 7 is another example of a corner house designed and built by Mr. Guastavino, in Barcelona, in 1868-69, as the result of a competition. A large part of the exterior details are executed in cement, including the frieze, with bas-relief figures on the "pan-coupé" and the main cornice. This house has a spiral stairway entirely built of concrete, with marble treads.

Fig. 8 is the city warehouse, office, and residence of D. M. Cossademunt, the glass manufacturer, for whom also he designed a factory. The roof of the latter was a trussed tile arch of about 40 ft. span. The location of Mr. Guastavino, in the important manufacturing city of Barcelona, was of great advantage to the development of his ideas. His clients were manufacturers to whom fire-proof methods of building were before unknown. They were prosperous, and hence there was also opportunity for the refined taste of an architect in designing their residences. The illustrations here reproduced give evidence of the existence of a modern and progressive city in Spain, which will surprise many readers. The building shown in Fig. 8 will be seen to be a very excellent and rational one, built of two shades of brick with stone,



FIG. 8.

while adjoining it on the right is a six-story building, which was in progress when the photograph was taken.

The cohesive construction, making it possible to make these buildings fire-proof, supplied a want that was then beginning to be felt at Barcelona, and Mr. Guastavino might have continued to fill it but for an accident which brought him to this country, where he found a still larger field of operation, as will be seen in the article to follow,

be used for ventilation or for any purpose that would prevent its being hermetically sealed against the admission of fire draughts.

For further description, reference will be made to the illustrations which show in detail the steel work, fire-proof material, and concrete ballast. Fig. 1 is a section of a floor, constructed with 20-in. steel girders placed 12 ft. from centers, with bearings on columns at 13 ft., 4 ins. from centers, to carry a movable load of 150 lbs. per superficial foot. The columns are tied together transversely with 12-in. I-beams, which are covered independently. The 20-in. girders are also tied at their centers of span with tie-rods set high enough to be built into the segment arches. The sections of the girder and skew-back tiles are self-explanatory. All walls of tiles are 1 in. thick, and all exposed parts of girders are covered with at least 3 ins. of tile, with a hollow air-space. The soffit tiles are secured with tapped screws

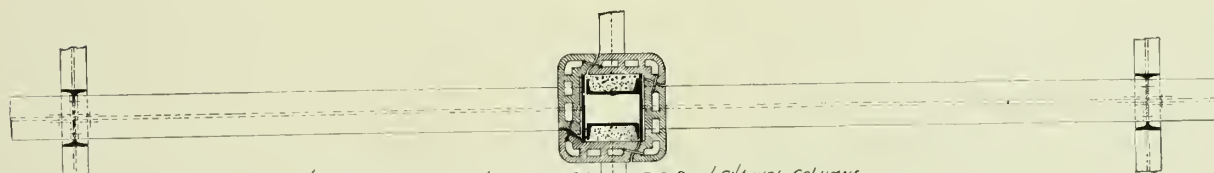
shown in Fig. 1, of the same steel construction of columns, girders, and ceiling, but varied by the insertion of 12-in. I-beams between the girders, and segment arches between the 12-in. beams — a less economical construction by reason of using the 12-in. I-beams. These are 6 ft., 8 ins. from centers. The soffit tiles give a protection of 1 in. of tile and $\frac{1}{2}$ -in. air-space to the beams. The hollow skew-backs are longitudinal with the beams, and the end pressure arch tiles are 6 by 10 ins. with six holes in each. The plan of the column is here shown in Fig. 4. It is covered with four L-shaped tiles 3 ins. thick, with walls 1 in. thick, and a 1-in. air-space in each. In addition the space between the column and the tiles is filled with concrete. The edges of the tiles are o.g. shaped, and they are cramped with steel cramps. In every other course the tiles are reversed, thus breaking joints.

Fig. 5 shows the section, and Fig. 6 the plan of construction for a light attic or ceiling floor to carry 50 lbs.



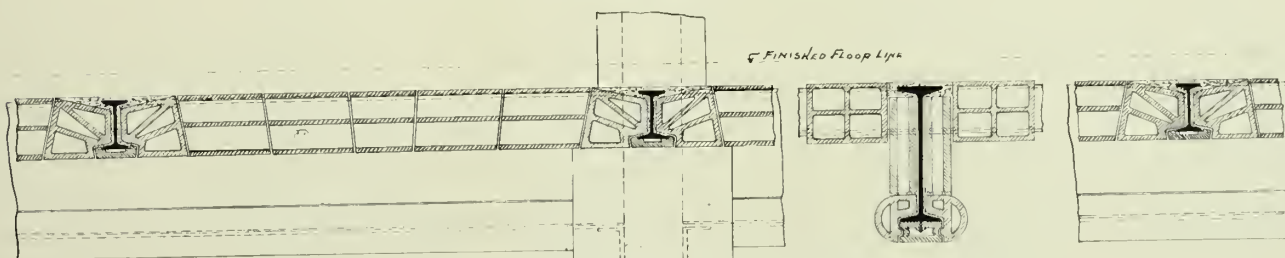
SECTION OF GIRDERS AND ARCH FOR ROOF

FIGURE 7.



HORIZONTAL SECTION OF ALL COLUMN COVERING FOR BRICK CHANNEL COLUMNS
TO FINISH 16" 16" OUTSIDE IF 3" TILES ARE USED (AS SHOWN)

FIGURE 6.



SECTION OF GIRDERS AND FLAT END PRESSURE (9 INCH) ARCH FOR
ATTIC FLOOR CONSTRUCTION WITH I BEAMS

FIGURE 5.

to the girders. The segment arches are end pressure, built with 8 by 12 in. tiles having six holes in each. For the flat ceiling, shown in Fig. 2, 3-in. 5.5-lb. I-beams are built between the girders at 3-ft. centers; and between the 3-in. I-beams are set loosely 1.33-lb. T's at 18½-in. centers and 0.9-lb. angles at the ends against the girder covering. Each T or angle carries three hollow ceiling tiles, which are 12¼ by 18 ins. with rebated ends, where they rest on the T's and angles. The tiles have coves at both sides to hold the mortar joints. The small T's and angles are set by the tile layers. The small T's and angles are thus covered by the tiles and mortar joints, as well as the 3-in. I's.

Fig. 3 is a sectional drawing at right angles to that

per superficial foot. The girders are light 20 in., and the floor beams 7 ins., and all spaced as in Fig. 3. Here the girders are covered in the same manner as in Fig. 3, the soffit tiles and skew-backs of the flat arches are of semi-porous terra-cotta, and the 9 by 12 in. arch tiles are of hard terra-cotta. The column shown in Fig. 6 is similar to that in Fig. 4, but smaller.

Fig. 7 is a section of roof construction with 20-in. light girders, 12 ft. from centers, and light segment end pressure arch. The same care in here protecting the girders is taken. The segment arch is of 6 by 10 in. semi-porous tiles with six holes, and the haunches filled with concrete only to the tops of the girders. The tie-rods are buried in the arches.

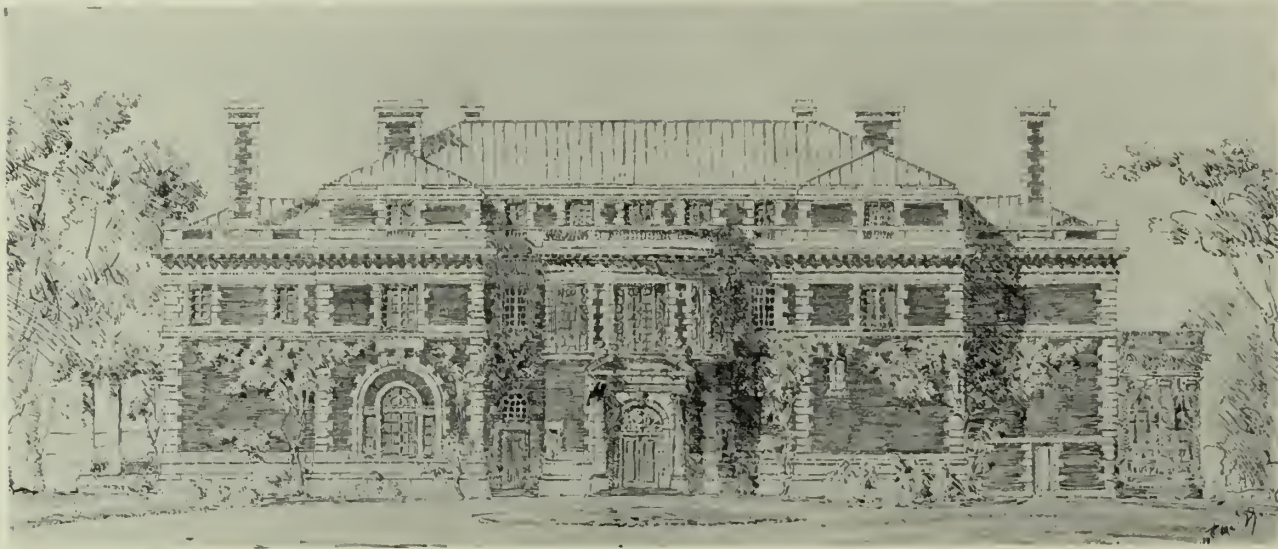
Selected Miscellany.

NOTES FROM NEW YORK.

The progress made in New York in any single year is really wonderful, speaking from the architect's standpoint. The last ten years have seen a revolution. The

New York in magnificence, if not in size. It will cost \$2,000,000, and will be erected on the southeast corner of Fifth Avenue and 52d Street, which property is valued at \$1,000,000. Several architects have prepared competitive plans, but at this writing no decision has been reached.

The number of plans filed recently, and the amount



HOUSE AT HYDE PARK, N. Y. YORK & SAWYER, ARCHITECTS.

building of the Columbia University Library, of the Cathedral of St. John, the great arches of which are conspicuous on Morningside Heights, the new buildings beyond the river, of the University of New York, the improvement of Riverside Drive, giving one of the noblest views in the world, the completion of the enlarged Museum of Natural History, the great Public Library that is to be erected on 42d Street, the new building of the Brooklyn Institute near Prospect Park, the new bridge across the East River, the subway in course of construction, and most of all the intellectual and æsthetic progress that all these imply, — denote that the metropolis is taking its place among the greatest cities of the world as a desirable place of residence as well as a profitable place to work.

And still there are rumors of more big hotels. Mr. Gates of the great Steel Trust and his friends intend to erect a hotel which will rival anything of the kind in

of expenditure represented, is simply marvelous. Good times have certainly come to the architects of this city, and we are praying for "many happy returns of the day." By the way, it may interest readers of THE

BRICKBUILDER to know that there is a great scarcity of good unemployed draughtsmen in the city, and if there are any embryo Rugelos, or Wrens, or Garniers hidden away in obscure places, they might do well to take a "run down to the city." There are several architects who have spent lots of valuable time trying to find good men. Of course, most of us politely bow out the average "journeyman draughtsman." Some sort of an employment

agency would fill a long-felt want, and would be a legitimate business for a good man.

Another hotel to be built by a wealthy syndicate will be erected on Park Avenue, between 41st and 42d Streets, being very convenient to the Grand Central Depot. The building will be commenced very soon, but great secrecy



HOUSE AT NEWTON, MASS.
Roofed with "Ludowici" roofing tile.
Willard T. Sears, Architect.



HOUSE AT CINCINNATI, OHIO.
Roofed with "American S." roofing tile.
S. S. Godley, Architect.

has been preserved as to the identity of the architect and as to particulars in regard to the building.

The carrying into effect of the plan for the Interstate Palisades Park now depends upon the action of the New York Legislature. The Legislature of New Jersey has approved the Park act, which authorizes the joint commissioners of New York and New Jersey to "select and locate such lands, lying between the top or steep edge of the Palisades and the high water line of the Hudson River, as may, in their opinion, be proper and necessary for the purpose of establishing a State Park, and thereby preserving the scenic beauty of the Palisades." There



FRIENDSHIP SCHOOL, PITTSBURGH, PA.
Terra-cotta made by the Northwestern Terra-Cotta Company.
C. M. Bartberger, Architect.

will probably be no opposition to this act, and a result will be reached which has been striven for for many years, and for which result we will be eternally thankful.

NOTES FROM CHICAGO.

As a result of the prolonged period of building inactivity, through which Chicago has passed since 1893, the present revival finds her short of architectural draughtsmen. As a result, the demand so exceeds the supply that a good T square and pencil pusher is at a premium, although there is really no "boom" in building nor is there likely to be one.

The first annual traveling scholarship of the Chicago Architectural Club has been awarded to N. Max Dunning. The interest in the five competitions, involving the various stages in the design of a "United States Embassy in a European Capital," has been very keen, and the competitors, varying in number from fourteen in the second to four in the final competition, have done themselves and the club great credit by their industry, and by the ability they have shown in attacking a very difficult problem.

The Architectural Club has appointed as delegates to the approaching second annual convention of the Archi-



HOUSE AT BEVERLY FARMS, MASS.
Roofed with Celadon roofing tile.
William G. Rantoul, Architect.

tectural League of America, at Philadelphia, Joseph C. Llewellyn, president of the League, and Robert C. Spencer, Jr., of the executive committee.

Herman Van Holst is preparing to make an extended European tour, and has resigned his position with Shepley, Rutan & Coolidge.

The fourteenth annual exhibition of the Architectural Club, which opened on the twenty-eighth of March, is now in progress, and while the number of exhibits is less than in recent years, the standard of quality is high and presents unusual interest and variety. There are comparatively few *projéts* from the schools which usually take up much space and do not greatly interest the average visitor. Chicago has a room of selected drawings, the well-known contributors being Mr. Sullivan, with photographs of the



PANEL, PAUL E. DUBOV, ARCHITECT.
New York Architectural Terra-Cotta Company, makers.

Guaranty and Condict Buildings, his cottage at Ocean Springs, Miss., and a very fiercely polychromatic Russian Church in blue, purple, scarlet, and gold; Birch Long's imaginary garden, embassy gates, and Jackson Park sketches show a charming originality and artistic feeling; Hugh Garden's little theater and country house are particularly nice, both in design and drawing; Richard Schmidt's hospital, drawn by Mr. Garden, is a very dignified and restrained piece of design, somewhat suggestive of "the new movement"; and Mr. Spencer and Pond & Pond have some characteristic country houses.

The feature of the exhibition is undoubtedly the collection of drawings from San Francisco, chiefly contributed by Willis K. Polk. There are also a number of interesting things from Bliss & Faville and Coxhead & Coxhead. The star drawing is Mr. Polk's line rendering, a very large bird's-eye of the proposed peristyle at



CAPITAL, BY THE NEW JERSEY TERRA-COTTA COMPANY.

the foot of Market Street, San Francisco, from behind the tower. The city and hills beyond are managed with unusual artistic skill and a remarkably clever technique. Altogether the club is very grateful to Mr. Polk.

To conclude a hasty survey, there is a case of the always beautiful Grueby ware and a case of equally interesting pottery from Mr. Gates, of the American Terra-cotta and Ceramic Company, who is producing some new and beautiful effects in soft, dull glazes in greens, yellows, reds, and metallic lusters.

NOTES FROM ST. LOUIS.

The site for the World's Fair has become the absorbing topic in building and realty circles. Now that all

uncertainty regarding the fair is removed, the impression prevails that the coming years will witness unprecedented activity in building; in fact, many important projects are assuming definite shape, and architects are busily engaged on prospective work.

The scheme to condemn the property in the block immediately north of Union Station, and make a park of it, has been revived and is receiving such universal support that it is thought the municipal assembly will act favorably upon it. One or two large hotels and a number of other substantial improvements are now being considered for adjacent blocks should this be done.

Architect Isaac Taylor has prepared plans for a building for the Delmar Jockey Club, to be located on Taylor

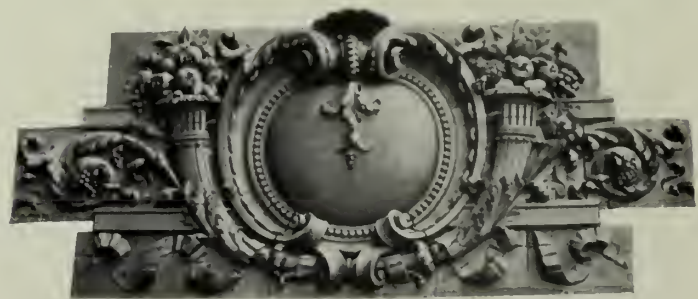


SPANDRELS, C. B. J. SNYDER, ARCHITECT.
Standard Terra-Cotta Works, makers.

Avenue, and has drawings on the boards for a large commercial building on the site of the old Belvedere Hotel Building on Washington Avenue, Thirteenth, and St. Charles Streets.

Mr. William B. Ittner, commissioner of school buildings, is to be congratulated upon the design of the Horace Mann School, on the corner of Oak Hill and Juniatta Streets, it being the most interesting of the number of successful schools he has built.

The munificent gift to the public library of \$1,000,000, by Mr. Andrew Carnegie, will doubtless enable the erection of the long-desired building, and also several branch libraries, it being one of the conditions that one half the sum should be used for that purpose. The board several years ago purchased the block between Olive, Locust, Seventeenth, and Eighteenth Streets, but this is not generally considered the most desirable place, it being the almost universal opinion that the Exposition Building,



CARTOUCHE PANEL, CLINTON & RUSSELL, ARCHITECTS.
Perth Amboy Terra-Cotta Company, makers.

having outlived its usefulness, especially in view of the more important event in prospect, should be removed and the library built there. The ground belongs to the city, having originally been a park, and must eventually become a park again, and it would be an ideal location.

The St. Louis Architectural Club is considering the feasibility of establishing a traveling scholarship, and hopes to be able to send one of its members abroad this summer. At a recent meeting, William B. Ittner gave an illustrated lecture entitled the "History of World's Fairs," and at a meeting held March 23, he read a paper on "Japanese Gardens."

Mr. John B. Hughes has presented the club with the library of the late Architect Furber.

NOTES FROM PITTSBURGH.

It is difficult to realize that, with the first of April, the greatest business concern of Pittsburgh, one so intimately associated with the building business, the Carnegie Steel Company, has ceased to have a separate corporate existence, and is now but one of the many divisions of the United States Steel Corporation. Many of us who have been accustomed to "call up" the Carnegie Company to find out this and that about our framing plans will still be asking for the Carnegie Company, I fear. What effect this new concern will have on Pittsburgh industries is the subject of some discussion here.

With the announcement of Mr. Carnegie's retirement has come a letter to Pittsburgh outlining some of the many things he is to do here, not only for the Carnegie Institute and the new technical institute, but for the libraries in surrounding towns, and for his old employees. He has already given \$4,000,000, the income of which is to be used to pension old employees, aid those who may be injured, and help the families of any of the workmen who may be killed. This is, we believe, the first attempt of this kind where the men themselves do not contribute.

This year the examinations for the John Stewardson Memorial Scholarship were held here simultaneously with those in Philadelphia. The announcement was not made sufficiently long before to enable many of our draughtsmen to



PILASTER PANEL.
Conkling-Armstrong Terra-Cotta Company, makers.
Willis G. Hale, Architect.



ENTRANCE, BROAD STREET NATIONAL BANK, TRENTON, N. J.
Whole first story of mottled gray terra-cotta. Excelsior Terra-Cotta Company, makers.
William A. Poland, Architect.

enter, and we hope they will be given here again next year.

IN GENERAL.

The committee on Vacation Traveler of the Boston Architectural Club announce the election of Gordon Allen as the recipient of this year's fund.

There was an exhibition of Beaux Arts drawings by Herbert D. Hale, J. Harleston Parker, and Guy Lowell in the rooms of the Boston Architectural Club and the Boston Society of Architects, from Saturday, April 6, to Saturday, April 13, inclusive.

Woodman, Newman & Harris, Philadelphia, have won the competition for the new Rittenhouse Club Building, this being the third local competition of prominence they have gained. The others were the new City Troop Armory, and the Corn Exchange Building at 3d and Chestnut Streets.

The Penn Buff Brick and Tile Company of Newark, N. J., manufacturers of the "Blue Ridge" enameled brick, has changed its corporate name to that of Blue Ridge Enameled Brick Company. In all other respects the company remains unchanged.

On April 1, the general offices of the Tiffany Enameled Brick Company were removed from the Marquette Building, Chicago, to the company's works at Momence, Ill., about fifty miles out of Chicago. The Thomas Molding Company, Chamber of Commerce, will act as



CAPITAL, KEES & COLBURN, ARCHITECTS.
American Terra-Cotta and Ceramic Company, makers.

general sales agents for the Tiffany Company at Chicago, although the company's business will be under the direction of the president of the Tiffany Company, Mr. J. Van Inwagen, while J. Van Inwagen, Jr., takes full charge at the works. This change is necessitated by a largely increased business.

In the fall of 1872, the Union Akron Cement Company, through its Chicago house, furnished twenty-one hundred barrels of the Akron (Star brand) cement to the United States Government, for putting in the lower part of the concrete foundation for the Chicago Post-office. Nearly twenty-five years afterwards, during the spring of 1897, the Chicago Post-office was taken down, to make room for a new and larger building.

In the May, 1897, issue of the *Cement and Engineering News*, page 74, the following in reference to the con-



CARTOUCHE OVER ENTRANCE.
Atlantic Terra-Cotta Company, makers.
A. H. Bowditch, Architect.

crete foundation is found: "In the wrecking of the Chicago Post-office, the contractor encounters a mass of 14,000 cu. yds. of concrete, underlying all foundations, walls, and vaults, while a continuous mass or slab of con-



Height 15 ft.

GROUP ON ROOF OF NEW ORPHEUM THEATER, BROOKLYN.
Made in white terra-cotta, by B. Kreischer & Sons, New York.
Frank Freeman, Architect.

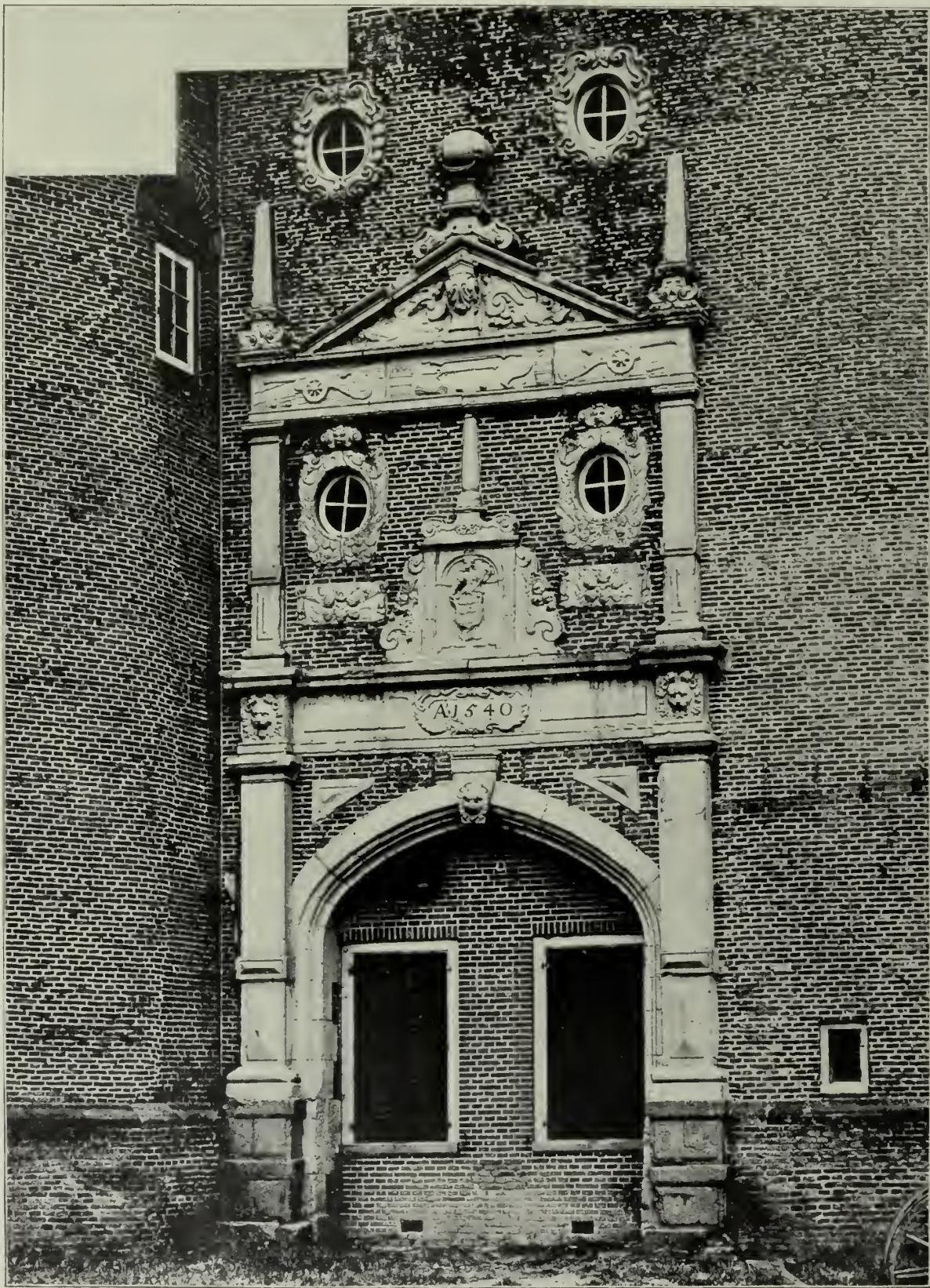
crete covers the entire area of the building from 3 ft., 6 ins. to 4 ft., 6 ins. thick. The space between the under side of the basement floor and the top of the concrete slab is filled in with Louisville cement; this yields easily to only slight efforts. The concrete slab, composed of a higher grade of cement, is tough and refractory, and is giving the contractors much trouble, and is the cause of the delay in clearing the site, and involves a penalty of one hundred dollars per day to the contractors, running since April 1. The work of removal of this large body of concrete is being vigorously prosecuted by the aid of numerous steam drills and dynamite. Even this proves a



PANEL, GEORGE H. MILLER, ARCHITECT.
St. Louis Terra-Cotta Company, makers.

slow and tedious process, and is an object lesson as to the respective qualities of a good and a sometimes indifferent cement." The concrete slab mentioned, that was so tough and refractory, was made with the Akron (Star brand) cement, manufactured by the Union Akron Cement Company, Buffalo, N. Y.

THE BRICKBUILDER,
MAY,
1901.



TOWN GATE AT ENKHUYZEN, HOLLAND.



THE BRICKBUILDER.

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„ Enameled	III and IV	Roofing Tile	IV

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IT has come to be the rule nowadays that if any one is injured around a building, no matter from what cause, some one else is expected to pay the bills. This view has not only gained wide currency among the workmen, but has been supported by many decisions of the lower courts. Fortunately for the principles of fair dealing, however, such decisions have frequently been reversed by superior courts, and while a belief is still held by the average workman that anything which happens to him of an adverse nature about a modern building will give him just cause for collecting damages from some one who is more blessed in this world's goods than himself, such belief does not obtain the final sanction of the law. Some years ago a building in New York collapsed under most distressing circumstances. The resulting investigation showed that one of the column foundations was altogether inadequate to the load placed upon it, affording ample cause for the failure. Further investigation showed that the foundation was properly planned and contracted for, but that the foreman of the work seemed to have deliberately made his footings smaller than the drawings called for. The heirs of one of the workmen who was killed in the accident brought

suit against the owner, but the highest court of appeal has just decided that the owner, after having employed a competent architect and made contracts with a reputable builder, was not liable for the results of carelessness, ignorance, or maliciousness on the part of a foreman. The question naturally arises, Who is responsible in a case of this kind? And following out the very current theory that some one must pay for all our woes, the workmen would naturally seek to fasten the blame upon the most guilty party, which in this particular case was the foreman. But as this particular foreman was not blessed with attachable worldly goods, it is extremely probable that damages will never be collected. It is, however, a pity that at least a certain measure of the rigid accountability for bad workmanship which is insisted upon in France should not find its counterpart with us. We do not sympathize with the communistic feeling that we can make our neighbors pay for our mishaps, but, aside from any question of pecuniary damages, one of the conditions which constantly encourages poor workmanship is the fact that the responsibility therefor is so seldom pressed home in the right direction.

And this brings us back to a theme which we have repeatedly advocated in these columns; namely, the public necessity for limiting the practice of building, of architecture, or the direction of engineering operations strictly and solely to those who are qualified by education and experience to properly attend to the same. The attitude frequently taken by the parties in interest at an inquiry into the cause of a bad building accident reminds one of Thomas Nast's celebrated cartoon, showing the members of the Tammany ring standing in a circle, each man pointing to his neighbor, and saying, "He is to blame," and so passing the responsibility entirely around the circle indefinitely. Rigid legal liability may sometimes work hardship, but if it served no other good than to keep out of building operations the ignorant or the unqualified, it would be worth doing.

A striking incident directly in point occurred a short time since in one of our suburbs. A hotel was being built on speculation. The nominal owners bought the land, heavily mortgaged it twice or three times over, obtained some plans, and contracted with a builder to put up a certain structure. The whole scheme was rotten to the core from the start, and every one connected with it knew it, if we may judge by the results. The first to draw back was the sub-contractor for the piling. He found that when the piles were driven to the depth required by the contract, they seemed no nearer hard pan than if they had not been driven at all, and, very wisely, he immediately threw up his contract and abandoned it to another pile driver, who, less scru-

pulous than his predecessor, simply stuck his piles into the mud and left them for the masons to erect a hastily thrown together building thereon. Of course, the building went to pieces, and there has been no end of trouble ever since. The original promoters did not get out quick enough, so they failed to make the profit they expected to make by a quick turn before the building should go to pieces, and the principal loss fell on the mortgagees, who found their security rather worse than valueless. This is not an isolated example. We find such in every large city, and Budensicks do not all come from New York. We cannot hope to entirely prevent rascality, but we can, and we ought to minimize the possibilities for deliberate and dangerous swindling, by a proper system of restricting the practice of architecture and building to those who are qualified therefor.

WITHIN the past month work has commenced upon the demolition of the old Horticultural Hall of Boston. This has been one of the prominent structures of this city, and its passing means the disappearance of one of the landmarks. At the time it was erected, some fifty years ago, it ranked as one of the best buildings in the city. The front was what was, for those days, considered a very ornate one, constructed entirely in granite, with heavy orders in three tiers—Doric, Ionic, and Corinthian, and a considerable degree of embellishment with heroic-size statues in full relief. It is disappearing to make way for a modern office building. In the meanwhile the new Horticultural Hall, in another part of the city, is rapidly approaching completion, the society expecting to occupy it this summer. It would be difficult to find a more fitting comparison between the past and the present methods of architectural design than is afforded by these two buildings—the old and the new Horticultural Hall. The one represents the kind of blind adherence to tradition which, notwithstanding the limitations of the period in which it was created, managed to produce some buildings which were large, imposing in effect, with a big, generous scale which has only of late years been rightly appreciated. The best that can be said of the details is that they are correct. It is not a building of which, in an architectural way, we should to-day feel proud; and yet it is what we should have once been glad to call our best. On the other hand, the newer building eschews granite entirely, and presents a structure which is essentially brick in its character, and which is studied in a way which we like to think characterizes the best of our recent work. The details are proportioned to the general scheme, and the design is a comprehensive entity rather than an aggregation of independently correct units. In other words, the new building is a distinct idea, while the old one is a compilation; and right there is the emphatic difference between the best this country produced during the first three quarters of the last century and the work which we are turning out now. There is a monumental character about the new Horticultural Hall which is extremely successful, together with a satisfactory feeling of completeness which is quite independent of material. Nor can one have any thought that the ponderous, monumental sounding granite which was

made to serve the older building would by its use have enhanced the artistic value of the modern structure.

SPEAKING of color, no one can ignore the Pan-American Exposition buildings. It is fair to say that never before in the world's history have buildings been created on such a scale and with such a lavish attempt at exterior polychromatic decoration. They are still too new for final judgment. A brand-new building always needs weathering and mellowing; but however they may change under the touch of the summer breezes, they are sure to present a most impressive object-lesson to our architects of what can be done with color. The buildings of the Columbian Exposition of 1893 were white throughout, the dazzling purity of the tone being only enhanced and accented by the restrained decorative spots of color at isolated points. Indeed, the only building at Chicago which attempted any marked polychromatic treatment was the Transportation Building, by Adler & Sullivan. The Buffalo buildings leave practically no white whatever, but every foot of wall service, every molding and ornament, every statue, is clothed in its mantle of light.

These buildings are all huge experiments. They are built of the shoddiest of materials, and will scarcely survive a single winter. They are mere full-size models, but they will undoubtedly have their effect upon the architecture of our country, and especially on the use of burnt clay, for in no other material would it be possible to repeat even an echo of the color treatment so successfully carried out at Buffalo. None of these exposition buildings pay in dollars and cents, but each one has been a powerful lever to awaken the art sense of our nation, to show what we can do, and to call out our best. Terra-cotta as an American industry dates practically from the Centennial Exhibition. Its scope was vastly widened by the lessons of the Columbian Exposition, and we feel perfectly safe in predicting that the next few years will show the abundant fruit of the lessons to be learned at Buffalo.

THE final award of the Rotch Traveling Scholarship was this year made by a jury consisting of John Galen Howard, of New York, Edward B. Green, of Buffalo, and W. T. Partridge, of Columbia University. That time passes rapidly is shown by the fact that Mr. Partridge, who was the seventh Rotch scholar, has this year assisted in the selection of the eighteenth. The prize has fallen to William L. Mowll, who was one of the first graduates from the architectural department of Harvard University, and is a student in the office of Peabody & Stearns. There were seven competitors this year. The conditions of this scholarship are too well known to our younger readers to require explanation. The prize ought to be one to call out the best efforts of every live young architect in Massachusetts. For that matter, its influence goes far beyond the borders of the Bay State, and several of the young men who have in past years achieved the scholarship came to Boston expressly to study therefor, and on their return from abroad have resumed their life in other cities, carrying with them, however, the benefits which this Boston institution has conferred.

Terra-Cotta in the Small Cities of Italy.

BY ALFREDO MELANI.

I WILL direct my reader's attention once more to the north of Italy, the region most rich in monuments of terra-cotta, and will stop at Cremona, a city near Milan, which is rarely visited by travelers making the tour of Italy. Cremona, which has had a glorious history and has given birth to so many renowned artists, ought not to be forgotten by those who visit Italy. From the particular point of view of terra-cotta, it ranks among the first cities of the peninsula. Its most important monuments in brick are the Torrazzo, the Cathedral, the Baptistery, the Communal Palace, and that of the Gonfalonieri; and these monuments recall and represent the most splendid period of the Cremonese life. Built in the Lombard or Romanesque style of which the origin is not to be found outside our region, they are the living demonstration of the power and wealth of the city at the time when these monuments were raised amid the enthusiasm which almost always accompanied in Italy these great constructions. Thus, among these, the Torrazzo has ended by representing alone the city of Cremona, almost a monumental symbol, as has happened in several other Italian cities. What this Torrazzo of Cremona which is loved by the Cremonese with a transport closely akin to fetishism is, is shown by the reproduction which accompanies this article, and I am bound to admit that this "campanile" is one of the most famous, lightest,



THE TORRAZZO AT CREMONA.

and most elegant in the peninsula; and although its renown is far spread, its history has been hitherto a mass of inaccuracies and mistakes. The truth about the Torrazzo is, finally, that far from being a monument of the eighth century, as has been stated by writers insensible

to the language of forms (I speak of the foundations), it was only founded at least four centuries later than they pretend, that is, the earliest date of the monument is the thirteenth century. The ogival windows are the best witnesses of my opinion, which is accepted by the most serious writers of the peninsula.

My opinion, to speak truly, is not supported by written documents, but it is the monument itself which tells



WINDOWS IN THE SOUTH FACADE OF THE CATHEDRAL AT CREMONA.

the story of its commencement; besides, those who maintain the great age of the Torrazzo, placing its beginning during the eighth century, found their statements on a false and imaginative inscription, according to which on the 15th of April, 754, Stefano II. being pope and Astolfo, Seigneur of Cremona, king of the Longobards, the first stone of the tower was laid by the Bishop Silvino. If other reasons were not lacking to demonstrate the falsity of this Cremonese inscription, it would suffice to remark that Pope Stefano II. died in 752, two years before the date marked in the inscription (this pope lived only three days after his consecration), and the King Astolfo died in 738, seven years before the date of the same inscription. Whatever this may amount to, we know with absolute accuracy that in 1267 the square sides of the Torrazzo were finished, and as for the upper portion, we have reason to suppose that at about 1300 it was also finished. A document of the secret archives of Cremona informs us that in 1297 the Commune set aside certain revenues for the profit of the Torrazzo, which in this year found its work well advanced. The age of the artist-architect ought to be found here firmly written, but alas! in regard to the author or authors of this work the chronicles and the documents are mute, and no inscription

comes to our aid; so it would be puerile in the present state of our information to advance a theory or pronounce a name. The most exquisite part of the Torrazzo is the polygonal portion of two stories in height, which lifts itself above the square part, and it is only to deplore the fact that I mention here that a rose-colored lime wash covers, vandal fashion, the fine red color of the brickwork which makes the background for the ornamentation of white stone, and causes the finest part of the Torrazzo to resemble something like a superfluity beside the square portion which preserves the natural red color of the bricks. This extravagance should not surprise my reader, who knows that in Italy, at a time, alas! not long ago, brick construction was considered vulgar, and certain monuments received coats of lime wash by order of competent authorities, and this was the case with the Torrazzo.

The tower always accompanies the cathedral, of which it is the campanile, so here I have not wished to separate it, and the reader will find reproduced beside the Torrazzo the detail of two windows of the cathedral of Cremona, an edifice in part more ancient than the campanile. The Cremonese cathedral was commenced in 1107 (as is assured by an inscription which has always existed), but ten years after it was ruined by an earthquake. Immediately recommenced, it was almost entirely finished in 1196, but it was not until 1287 that our monument received from Giacomo Porrata the splendid rose window on the principal façade, which leads us back to the windows shown in the engraving, which are the finest ornaments of the south façade, and take us beyond the time



PALAZZO DEI GIURECONSULTI.

of Giacomo Porrata to 1332, the period at which the south arm of the cathedral was built by the artists Franceschino and Canino de' Taselli. The other part, that is, the north arm of the church, was finished in 1288 by the artists Bertoldino Bragerio and Giacomo de Camperio.

Here is another Cremonese monument of capital importance, the Palazzo dei Giureconsulti, a work in brick built in 1292, at the period when the Torrazzo re-

ceived its finishing touches. This building has not the *finesse* of the ornamentation of the famous building at Piacenza, of which mention will soon be made; but the Cremonese structure should not be passed over by those who are making a study of Italian brickwork.

Among the edifices I have chosen for reproduction the fragment of the court in the Palazzo Stanga, whose lower portion, with its great entablature sustained by



COURT OF PALAZZO STANGA.

little consoles, may be cited as a model of the architectonic style which flourished in Lombardy at the end of the fifteenth or the beginning of the sixteenth century. Especially worthy of notice are the proportions of the portico, the richness of the ornamentation, and the charm of the profiles, which reveal a true master, — a master exquisitely skilful in decorative architecture; and truly brick can only be used successfully by the master ornamentists, by the poets among the decorators; the latter alone can use it tastefully and understand all its resources. The luxury of the ornament in the Stanga court attains such a ravishing effect as to be worthy of being cited as an example; for here the richness of the ornamentation does not distract the eye from the architectural lines, a merit not always found among the architect ornamentists.

Returning a step chronologically, we will notice a very beautiful fragment, a rose window belonging to the Broletto of Brescia, in the Gothic style of the Torrazzo and of the Palazzo dei Giureconsulti of Cremona. Even this Lombard city is forgotten; the traveler casts a glance from the car window as he passes on his way from Milan to Venice, taking no account of the importance of its monuments. Its picturesque church of the Miracoli and its old Broletto or Communal Palace, which presents at present the appearance of the fragment in brickwork, which we reproduce, are important objects for the artist and the traveler who love the beautiful. If I could stop to-day in this city, which has given birth to one of the most celebrated women in the history of humanism, Veronica Gambara, Countess of Correggio, and to a painter of the worth of Vincenzo Toppa, the famous chief of the Lombard school, I would show you that Brescia, among the secondary Italian cities, is one of those where the ornamentists had the best reason to rejoice.

But still other cities and other monuments await us; and if the reader will glance at my illustrations, he will perceive easily that I have culled the finest specimens from the field of our researches.

Lodi, with its façade of the Casa Ghisalberti, is the first city that we encounter. We are not getting far distant from Milan; on the contrary, we are merely taking the route opposite to that to Brescia. We take the great line which unites Milan to Florence, and Florence to Rome and Naples, and our stop is the first stop of the



CIRCULAR WINDOW IN THE BROLETTO, BRESCIA.

express running from Milan to Florence. "One minute's stop" announce the employees of the railway to *messieurs les voyageurs*; and among these last there will be many who are ignorant of the fact that the little town of Lodi contains artistic works of considerable worth. The church of the Incoronata, with its jewels of decorative painting, would suffice to justify a stop-over at Lodi; but the locomotive whistles, and, the minute passed, steams blustering over the Lombard plain. Beside the principal works of Lodi (among these should be placed the Gothic Church of S. Francesco, with its very important decorative paintings) are cited the terra-cottas, which are illustrated. The great frieze which runs below the monumental door has the delicacy of the most remarkable terra-cottas of Milan and of the Certosa di Pavia, of Bologna and of Ferrara; and while the marine deities who hold in their hands the pretty garlands, and the other divinities who gallop over the tranquil waves recall the friezes of Aemilia, the friezes which ornament the windows seem to be the paraphrase of those which are found around the windows of the Grand Hospital of Milan. These *putti* who frolic in a charming decoration of leaves and flowers are *ravissante*, says Burckhardt, in the midst of this architecture, which has in its profiles none of the *finesse* of the portico of the Casa Stanga; but the frieze is a piece of a much more important work than the friezes of the *putti*, and, for my part, I put this frieze among the most beautiful decorations in brickwork of north Italy. In the highest degree pagan, it is a sou-

venir of similar fragments of antiquity, in sculptured and mosaic motifs, and I deeply regret that the name of its author is unknown. How many unknown artists, including those who helped the architects, who are generally the only ones remembered, toiled to make these architectionic monuments! A special study of the decorators in terra-cotta is to be made in Italy; and the writers to whom this difficult task has been given will make a meritorious work, and will enrich it, I am sure, with the history of the art of a precious capital.

I have spoken of the resemblance of the frieze of Lodi to the friezes of Aemilia. This reminds me of the custom which existed at Bologna during the fourteenth, fifteenth, and sixteenth centuries of giving a red tint to the terra-cotta. This solid preparation, the nature of which is not yet well known, was intended especially for the preservation of the bricks, and I am not informed whether the terra-cotta of Lodi presents any traces of it, for in order to decide upon this delicate matter, experiments would be necessary, which I have not undertaken upon the edifice in question.

Let us stop for a moment at a little town near Parma, Borgo S. Donnino, situated on the same Milan-Florence railway where we found Lodi. It is a town of less than five thousand inhabitants, of entirely secondary interest, which, however, occupies a place of some importance in the national art. Provided with a very remarkable cathedral, with sculptures which are among the most interesting of the twelfth century, Borgo S. Donnino possesses



PORTAL OF CASA GHISALBERTI, LODI.

a little chapel with terra-cottas, clinging to the side of the cathedral. The reader, looking at my illustration, will notice the heaviness of the upper entablature, which is evidently a superfluity, and that the beauty of the structure does not extend beyond the second entablature. The type of the ornament of the chapel of Borgo S.

Donnino is adapted leafage, differing from that of the Casa Ghisalberti at Lodi, where figures interlace with the leafage. Although my reproduction can only give a weak idea of the original, my reader will perceive him-



WINDOWS AND FRIEZE, CASA GHISALBERTI, LODI.

self to be in the presence of a work which should be preserved with the greatest care.

The fragment, exposed as it has been during three centuries to all sorts of injuries, reveals to us marvelously the excellent manner in which the workmen of the period executed their terra-cotta work; and the endurance of these delicate decorations arouses a sentiment of surprise and satisfaction. I do not wish to leave this chapel, little known and almost ignored as it has been, without calling attention to the friezes, which achieve an absolute charm by means of an original design divided into small sections, which repeat without fatiguing the eye. The richness of the ornament is well brought out, and the effect is heightened by the quietness of the cornices, the capitals, and other parts of the chapel, which contrast their surfaces to the ornaments in relief. This knowing distribution of ornament always has an excellent effect, and is common to the Italian monuments in terra-cotta, and an overloaded monument is difficult to find. Thus, near Borgo S. Donnino, in a city otherwise quite important, stands one of the finest palaces in Italy, of great richness in that which concerns its details, but of a fine sobriety of ensemble, and this palace gives a fine idea of this *contraposition*, or placing of ornament. Those who know the Italy of the region that we are traversing, have already heard of the Palazzo Comunale of Piacenza, sometimes called the Gotico of Piacenza. It is of this monument that I wish to speak, where the use of brickwork has attained a marvelous result. Below, a portico supported on massive piers of marble in primitive Gothic form, above, bricks everywhere, the imposing semicircles framing windows composed of colonnettes and of a great arch ring, wide but not deep, and of a most striking expression. A remarkable analogy exists between the Gotico of Piacenza and the Palazzo dei Giureconsulti at Cremona, but I have noticed in the building at Piacenza a finer and more distinguished taste; and in the same way an analogy can be traced between the wide windows of our building and those of the Cathedral of Cremona, but the first are superior in

possessing an amplitude and a nobility which in work of this kind has been rarely surpassed. Fortunately, an inscription carved on the façade of the Gotico informs us of the year of its commencement and the names of the architect builders, and at the side of these words, MCCLXXXI, DIE. XVI. APRILIS. FUIT. HOC. OPUS. INCEPTUM, one reads easily the names of the architects Pietro Burgeto, called otherwise Da Borghetto, Gherardo Campanario, Pietro Cagnano, and Negro dei Negri.

The architects who built a palace as important as this must have occupied a remarkable place in their time. What, then, are their works both before and after the Palace of Piacenza? Hippocrates would say the answer is difficult, or entirely impossible. No document or evidence exists bearing on the career of Burgeto, Campanario, Cagnano, and Dei Negri; and at the present time we are reduced to merely affirming as we gaze on the palace that the artistic life of these architects was admirably complete.

Piacenza is ornamented with other edifices of brick, and possesses in its Palazzo dei Tribunali (formerly Palazzo Landi) a magnificent fragment of a façade that I regret not to be able to show in the reproduction. Near Piacenza, Modena and Reggio ought to detain us. At Modena, the brick façade of S. Pietro and the Palazzo Coecapane are specimens of some importance on the



CHAPEL AT BORGO S. DONNINO.

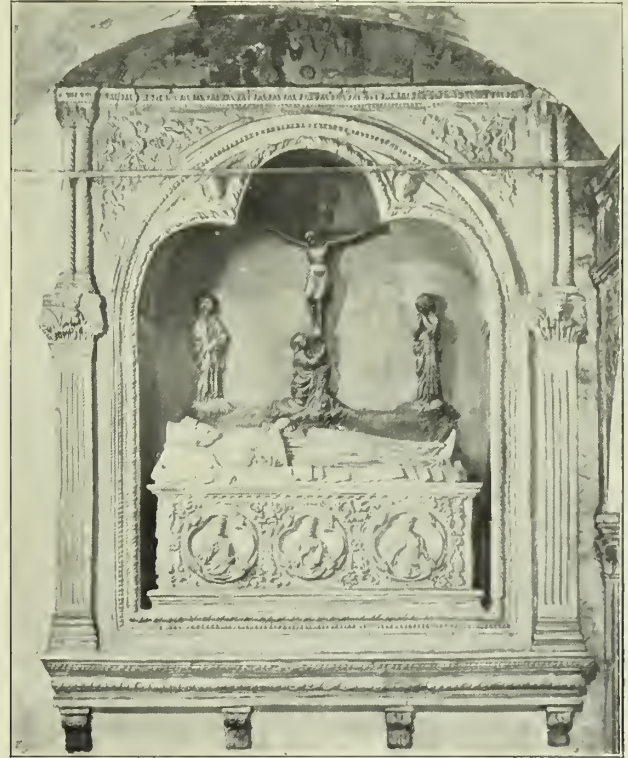
subject of terra-cotta — works of the early Renaissance; and at Reggio, the pretty Palazzo Vizzani Pratoniere should be seen, a work in brick of the same period as the preceding.

In our excursion through a respectable number of small Italian cities, we have not stopped to notice any tombs. Brick has been successfully used, a great many

times in funerary architecture, and Italy possesses a series of these monuments in terra-cotta in churches which, although passed over in silence by most writers, could furnish material for important study. For all the cities, which built largely of brick, constructed tombs and even altars in terra-cotta, and citing at random, I remember that one of the finest funerary monuments of Bologna, that to Alessandro V. (died 1410), lately rebuilt, the work of the artist Sperandio da Mantova, is in terra-cotta. To glean through the field would be an attractive task, for it would perhaps bring unexpected results, knowing, as we do, that many of the decorative works have been covered with a bed of white or of gray to the great profit of their æsthetic quality (!). And as funerary tombs in terra-cotta are in no way a specialty of cities where brick is the ordinary building material, here is an example of a tomb belonging to a small city of Tuscany, Arezzo, — the tomb of Antonio Roselli (died 1467) in the church of S. Francesco.¹

It is, perhaps, well to recall that Arezzo was one of the cities of the valley of the Arno which close around Florence like a great girdle of flowers. Who has not perceived our city in passing on the journey from Florence to Rome? But like Lodi, Arezzo, which is more important than the Lombard city, is not one of the cities to which travelers ordinarily devote even a half

windows, a museum, and the church of S. Francesco, which apart from the tomb of Roselli, the principal object of consideration, contains the celebrated frescoes of Piero della Francesca. The tomb, which in artistic merit cannot rival the frescoes, is of a very curious character in its ensemble and details, belonging to the



MONUMENT TO ANTONIO ROSELLI, AREZZO.



LEFT FRONT OF PALAZZO COMUNALE, PIACENZA.

day. It possesses, however, numerous monuments, the Pieve, the cathedral with its incomparably beautiful

¹ Beside the tombs and the altars might be placed the altar tables, which preceded the tables of enameled clay made by the Della Robbias. The National Museum at Florence has one of these little tables in a mediocre Tuscan Gothic style, but important from the fact of the existence of this kind of productions. I do not mention the numerous lunettes with figures in relief or in bas-relief, in painted terra-cotta on the tombs, altars, etc., which inspired Luca della Robbia to the application of enamel on the sculpture of painted clay.

transitional style, with classic detail placed side by side with the Gothic elements.

The strangeness of the tomb increases if one considers that the monument was practically executed in the Gothic style during the full flowering of the Renaissance. This seems to be justified by the fact, that in a small place one could use up old pieces of terra-cotta without exciting the sleeping critic. Not knowing the author of this tomb, we can only say in general that it belongs to the school of Niccolò d' Arezzo, an eminent artist, less known than he deserves.

He was the supposed author of the tomb of Alessandro V., to which I have just referred, and was certainly superior to the unknown author of the Roselli monument, which has, however, certain qualities worthy of notice—the beauty of the head of the recumbent personage, which is not equaled by the too meager draperies. But this is a fault of the period which was influenced by Masaccio and his school rather than of the artist, who recommends himself to our attention by the elegance of the well-conceived sarcophagus, and the air with which he has modeled the leafage.

The Roselli tomb is only a specimen of a series of monuments of a kind not too much cultivated in Italy, but always worthy of study; and if some day or other I am able to make a study of this kind of art, I shall feel it an honor to acquaint the readers of THE BRICKBUILDER with the results of my investigations.

“The Brickbuilder” Competition. VI.

AN ENTRANCE TO AN ART MUSEUM.

CRITICISM OF COMPETITION.

PROGRAM.

THE design is to provide for the entrance porch of a large metropolitan art museum, of the nature of

nate. Mr. Edward Robinson, who was judge of this competition, has decided that none of the designs presented is worthy of a prize, a decision in which I heartily concur, and I have been asked to say something in regard to this conclusion.

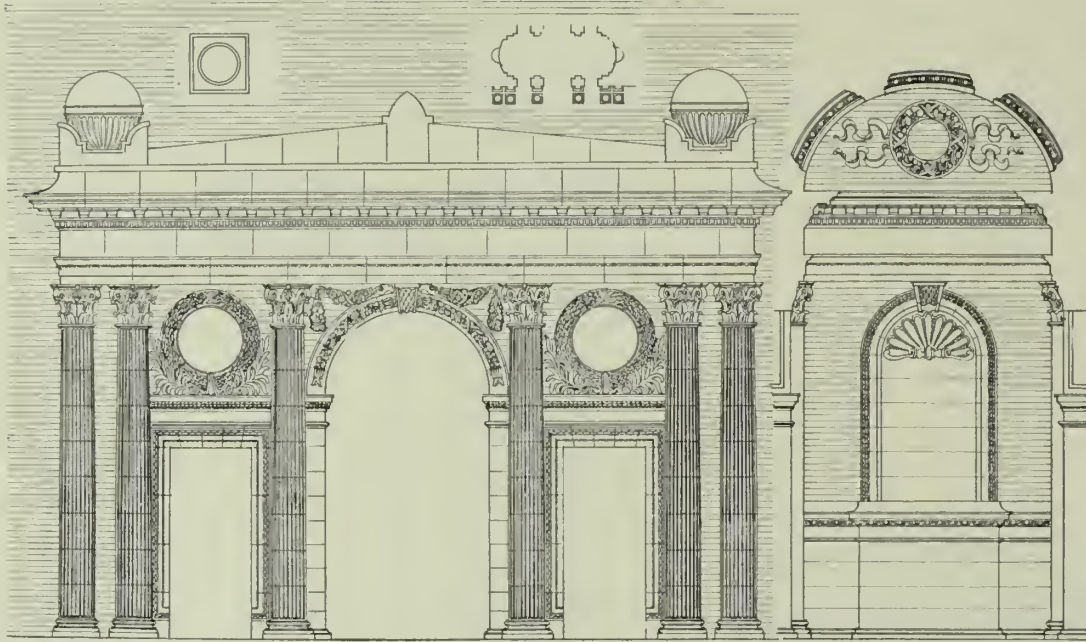
These competitions have been instituted to encourage the study and treatment of burnt-clay products, and to commend and reward ability in architectural design in

those products; and an award in these competitions is assumed to indicate merit. There are abundant precedents in North Italian work of the twelfth, thirteenth, and fourteenth centuries, and in North German and English work of the present time to guide an intelligent student. Such works as those of Street, of Strack, and the book of suggestions by Frank Miles Day are sufficient for some enlightenment on the subject. Burnt clay must, by the limitations of the firing, be a material used in comparatively small pieces—as com-

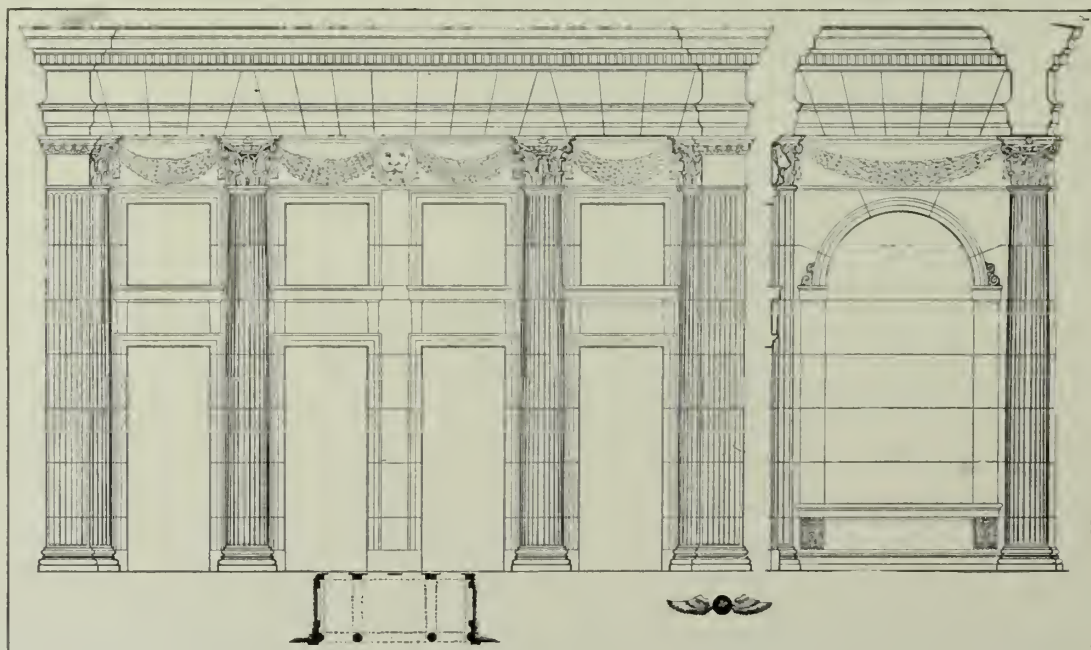
pared with stone—and, therefore, has a smaller scale both in its detail and its motives (excepting in wall surface masses). The competitors in most cases have seen fit to ignore this fact and have merely transposed stone forms into terra-cotta, without the changes in those forms natural to the change in the material. If this were the only objection, such a design as Number I., while ignor-

the South Kensington Museum, London. The entrance will be in the center of a perfectly blank wall, permitting of an individual treatment without reference to the design of the building as a whole. The entrance should be recessed 10 ft., and should allow for four doors, each 3 ft. wide, besides such transoms or side lights as are incidental to the character of the design. The entrance leads to the first floor, which is supposed to be at an elevation of 8 ft. above the street, a flight of steps leading thereto projecting from the line of the building. Any treatment of columns, pilasters, or buttresses is to project from the building line. The height of the first story is to be 20 ft. in the clear. The design is to be such as is adapted to working out in burnt-clay products.

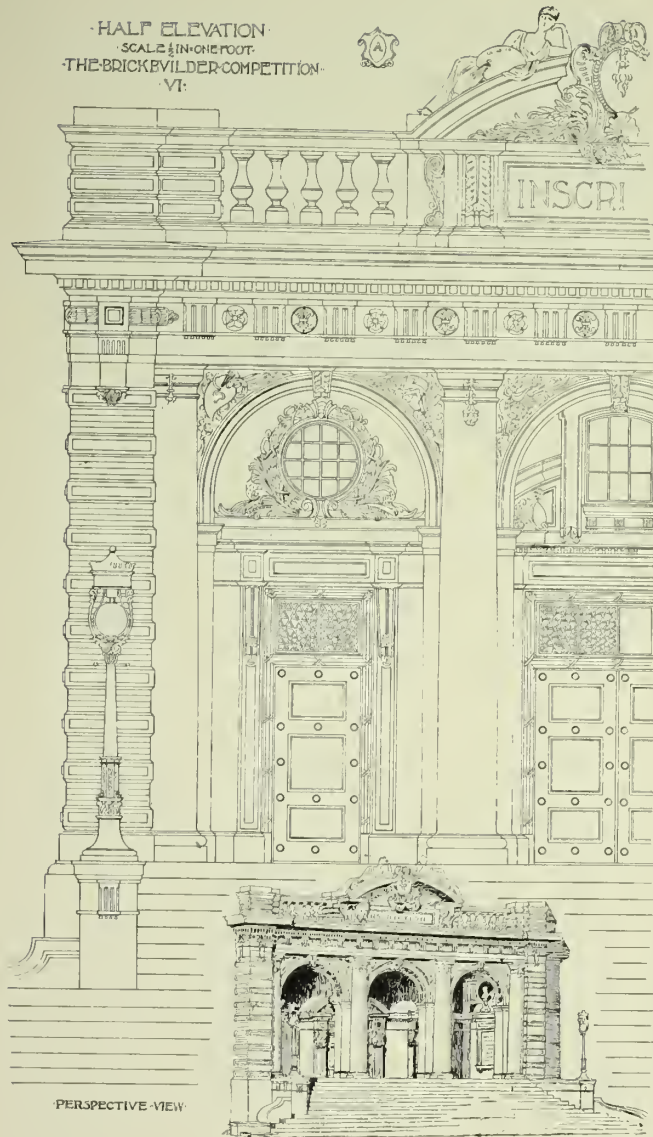
The result of THE BRICKBUILDER Competition Number VI., for an entrance to an Art Museum, is unfortu-



NO. 1.



NO. 2.



NO. 3.

ing the four doors (unless a double door can be counted as two), would be worthy of the award; in fact, the design is the only good one in the entire set, as in most cases orders of architecture are used without the slightest observance of their proportions. With the constant teaching of the orders in the schools, it should be unnecessary to impress upon draughtsmen the fact that their proportions have been determined by the ablest architects in history and by centuries of use, and that it is foolish to experiment with these proportions, excepting, perhaps, in small details under stress

of conditions. The chief fault of the designs is lack of relative proportions of parts.

To rapidly analyze the designs:

Number I. is good in proportions; entablature seems not sufficiently decorated for motives below, and corner globe terminals, while in scale as far as mass is concerned, are much out of scale in detail; treatment of arch surface as considered with arch soffit surface is weak.

Number II. would have effect of thin frame to the opening; poor cornice profile; lion's head out of scale and unnecessary. If openings were poched, it would appear that the transoms were too wide and too low.

Number III. Bad connection with wall of building; bad relation between parapet corner piers and piers below; corner piers below too narrow for length of architrave; balusters unnecessary. Pediment motive requires very careful treatment; brackets are too heavy for fascia above. The whole design has in it too many minor motives too much scattered.

Number IV. Figure frieze too broad and heavy even for the Doric order below.

Number V. General proportions good; relative proportions of details not studied especially in frieze; too many angular block forms in voussoirs, etc., disturbing general proportion.

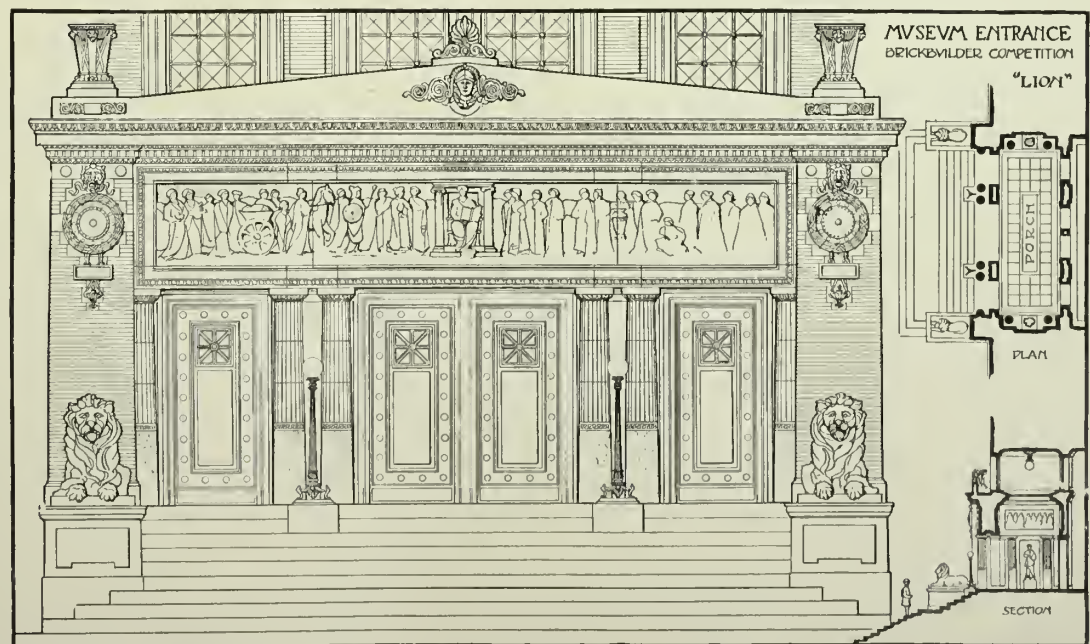
Number VI. Is not apparently certain whether his motive is that of a pierced pylon, a frame, or a loaded arch.

Number VII. Has adopted a terra-cotta treatment, but with uninteresting detail and bad division of tympanum, especially behind the figure.

Number VIII. While adopting a simple and good motive, has placed inadequate divisions between the doors, and for the sake of a title tablet, has overloaded the door heads.

It is unnecessary to mention the remaining drawings.

— C. HOWARD WALKER.



NO. 4.



NO. 5.

CORRESPONDENCE.

EDITOR OF THE BRICKBUILDER:

Dear Sir:—The editorial on the first page of THE BRICKBUILDER, April number, on the protection of structural steel, leads me to add a few words in partial support of Mr. Abbott's article in the *Insurance News*, which you quote. Unfortunately, the subject of rust protection, as well as fire-proofing, has not yet received adequate consideration. But to discuss the question of rust-proofing alone. Mr. Abbott is entirely right when he says that ironwork intended to be enclosed (*in concrete*) should not be painted, and also that it should be absolutely clean and free from rust and mill scale.

The matter of rust-proofing is so simple and so easily understood, when once the causes of rust are known, that there is little excuse for ignorance if one is diligent in seeking causes.

Rust is the hydrated oxide of iron, and is caused by the agency of *three factors working together*, viz., water, oxygen, and an acid. These three factors must be present to produce it. See Ledebur's "Handbook" on the oxidation of iron, etc., pp. 277-281. See also *Proceedings of the Engineers' Club of Philadelphia*, vol. xii.,

p. 225. See also Kent's "Engineers' Pocket Book," p. 386, quoting from the *Chemical News*, which gives the results of the exposure of *perfectly clean* blades of steel to the action of

Dry oxygen and carbonic acid gas mixed, with no corrosion.

Damp oxygen and ammonia, no oxidation.

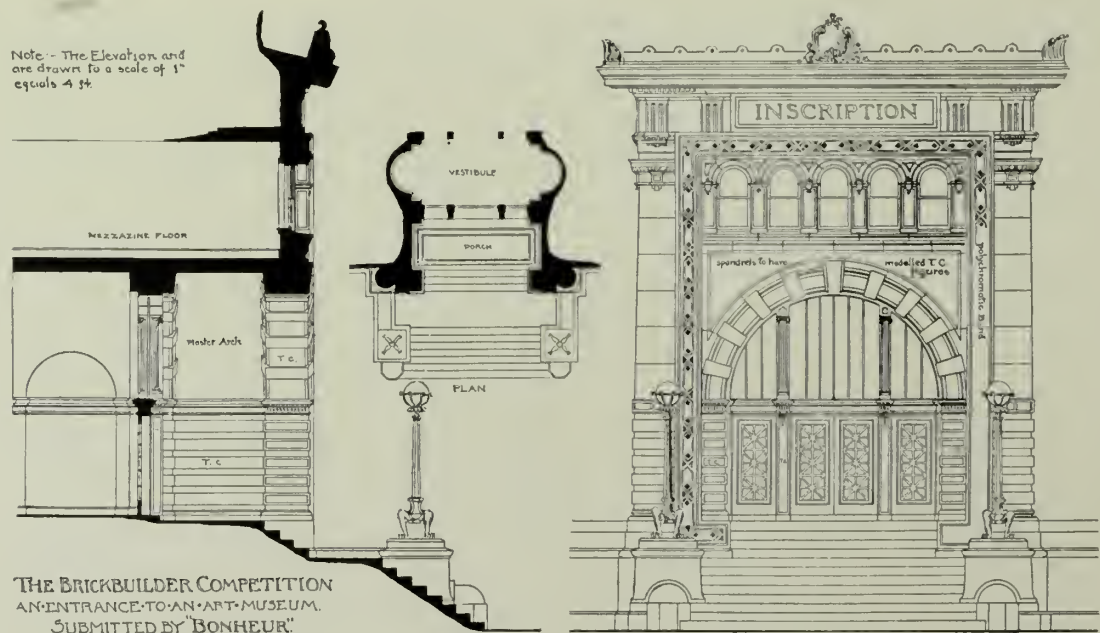
Damp carbonic acid, slight appearance of white precipitate of carbonate of iron.

Damp carbonic acid and oxygen, oxidation very rapid.

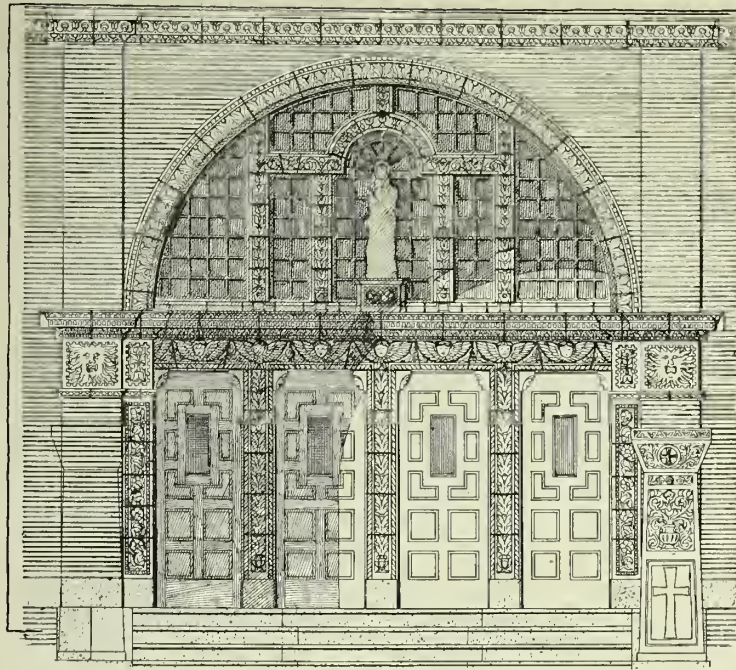
Iron immersed in water distilled, freed from gases by boiling, rust in spots found to be due to impurities.

The chemistry of the matter is very simple; the precaution also very simple; keep these three factors apart, that is, the water, the oxygen, and an acid.

The practical procedure in rust-proofing also is very simple, and should be, first, clean the metal down to the actual surface, then apply the concrete composed of Portland cement and a neutral sand, with or without an aggregate of neutral crushed rock; slag should not be used under any circumstances. This material should be rammed so that it is in actual contact with the surface of the metal, and free from voids or faults. The aggregate should be in small pieces, or it is liable to "bridge"



NO. 6.



NO. 7.

over and cause a void below it. Concrete containing a liberal quantity of cement should be used for this reason. Portland cement is a product of lime and forms a convenient base for the absorption of any acid likely to be found under ordinary circumstances, so that any water finally reaching the metal by infiltration is free from acid and consequently harmless.

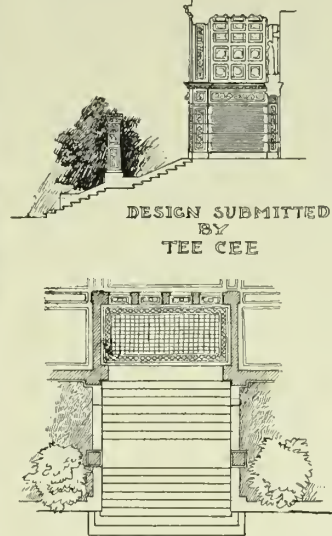
Brickwork covering is, therefore, not suitable, as it cannot perform the chemical function which the cement performs. Therefore, all iron work, which is covered up and cannot be painted at intervals, should be encased in a concrete envelope, both above as well as below the ground line.

Painting iron work which is to be enclosed in concrete is a distinct detriment, because the lime in the cement destroys the oil, and then there remains the loose pigment, which prevents the close contact between the cement and the iron which is essential, and permits the accumulation of water which may filter through the concrete, and may become dangerous if the pigment is an oxide of iron or electro-negative to the metal. Painting is not only worse than useless, but dangerous.

Rust in iron work is augmented by galvanic action. Two substances, one electro-negative to the other, will cause it in the presence of dampness. Mill scale and slag are such active corrosive agents that in the plates used in the hulls of ships it is necessary to get rid of this scale and slag either by pickling, or by the sand blast. If paint is applied to the ship plates without the scale and slag being removed, "rust cones" form around these points under the paint, because paint is not impervious to moisture. The inner sides of the plates are covered with cement or asphaltum compound to prevent the bilge water from corroding them. It is surprising in view of the experience in rust-proofing vessels that go in the water, that so little seems to be known as to how to protect buildings that stay on the land.

The cause of corrosion is known; the means which can be used to prevent are also known; therefore, the

"BRICKBUILDER"
COMPETITION
FOR DECEMBER

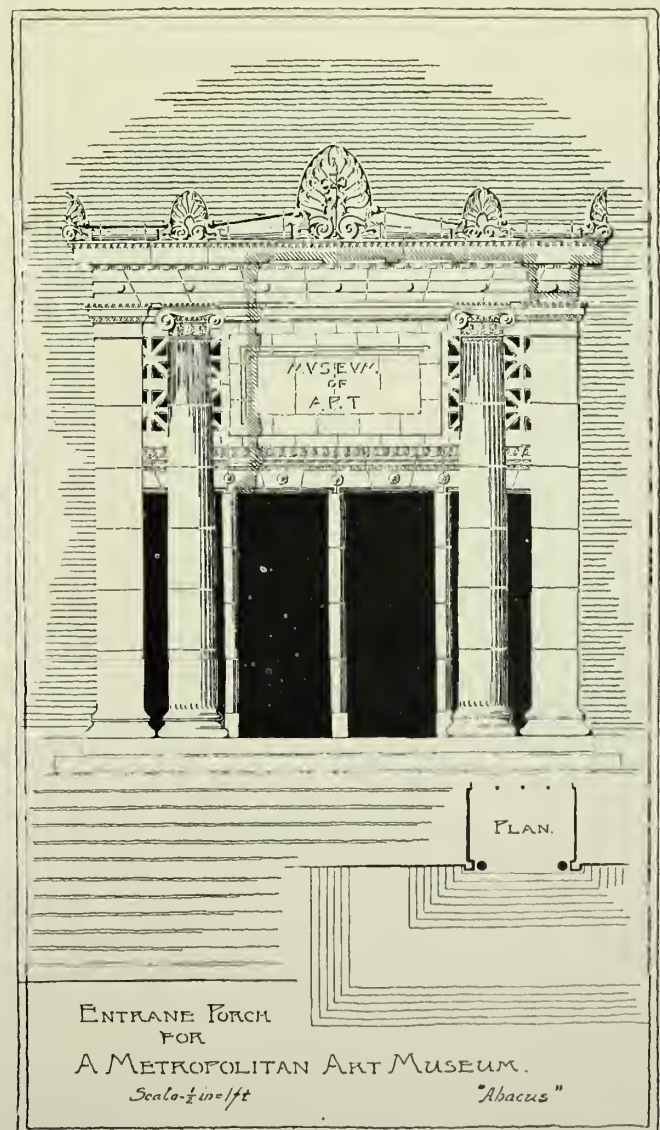


ignorance exhibited, or the carelessness shown by responsible designers in not using the means at their hand in preventing the decay of costly buildings, is criminal.

WM. C. FURBER,
Philadelphia, Pa.

A CORRECTION.

IN the March number of THE BRICKBUILDER there was illustrated a house at Weirs, N. H., and by mistake the name of Mr. Herbert Dumerasq given as architect. Mr. Dumerasq is the owner of the house, and Henry J. Carlson, Boston, architect.



NO. 8.

The Life and Work of Rafael Guastavino.

PART II. WHAT IS COHESIVE CONSTRUCTION?

BY PETER B. WIGHT.

IN reviewing the work of Rafael Guastavino in America, where he is known rather as a constructor and contractor than as architect, an answer must first be given to a question which will naturally be asked, "What is cohesive construction?" This can be most easily answered in his own words taken from the paper before referred to. After dividing construction in general into two generic kinds, "mechanical construction, or by gravity," and "cohesive construction, or by assimilation," and leaving out of consideration wood and iron constructions, he says: "The first is founded on the resistance of any solid to the action of gravity when opposed to another solid, and from these conjunctive forces, more or less opposed to one another, results the equilibrium of the total mass, without taking into consideration the cohesive strength of the material set between the solids. The second has for a base the property of cohesion and assimilation of several materials, which, by transformation more or less rapid, resembles nature's work in making conglomerates." This is a generic definition, and the second includes all structures in which several materials are combined to produce a monolithic material. It may mean a concrete wall or arch made with cement, sand, and other ingredients, or the various combinations of concrete with various stiffening materials, or the addition of steel, to give them greater resistance to tension or compression in certain directions. For illustration, the hollow tile fire-proofing systems are gravity systems, and the Monier system, in which concrete is stiffened with steel, is a cohesive system. All Persian, Roman, Byzantine, Mohammedan, and early Spanish systems of construction, in which concrete formed the main material, and bricks and tiles the subsidiary material, were cohesive or monolithic.

The difference between these and the Guastavino system is that in the latter the hard-burned, flat clay tiles form the principal part of the mass, and the cementing material the smaller part of the mass. To a certain extent good brickwork laid in strong hydraulic cement is cohesive construction after time has hardened it, but it is always laid and used according to the same principles that control all kinds of gravity construction. Bricks are laid, breaking joints, just as tiles are in the Guastavino system, the difference in favor of the latter being its decreased weight and increased strength in proportion to each unit of weight, making it far superior to brickwork for floor, roof, and dome constructions. This is one of the natural results of an evolution that has been going on for a long time. In the paper before referred to, Mr. Guastavino says on this subject: "During the fifteen hundred years that the cohesive construction has been in use, all the improvements and inventions have been, as we have said, toward the idea of obtaining the maximum strength with the minimum weight and ratio of the mass of materials compared with the space covered."

For the information of those who have not used or seen this latest invention of cohesive construction exe-

cuted, it will be well at first to describe the materials used, and how the work is set. Only three materials are used: hard-burned, flat clay tiles, Portland cement mortar, and plaster. The tiles are generally 6 by 10 ins. or 8 by 12 ins. in size and $\frac{3}{4}$ in. in thickness. They are made in this country on clay presses, which run them out through mandrel dies in gangs of six each, cut off to the proper length with a wire. These square blocks are so scored that after burning a smart blow will cause them to fall apart into six, flat, rectangular tiles, having rather a rough surface well adapted to the adhesion of cement or plaster. The process in this country is very much cheaper than that followed in Spain, where the tiles are made by hand in molds, though labor there is



THE PROGRESS CLUB, NEW YORK.
R. Guastavino, Architect.

much cheaper than here. The tiles are also more uniform and true. They were thus made before Mr. Guastavino came to the United States, in 1881, for covering flat roofs, being laid in Portland cement over coated felt. Hence he found material better adapted to his purpose than that which he had previously used, and with such change as was necessary in size and thickness, they were all that he wanted. The simplicity of the system can be illustrated by the fact that one size of tile would be sufficient to perform all the examples of cohesive construction that have thus far been executed.

In building a simple floor arch, supposing it, for example, to be set between four brick walls properly tied

together, and that the arch is 8 ft. wide and 20 ft. span, the first course of tile is set as a skew-back on a ledge or in a groove in one of the short walls, which is slightly elevated in the center. These are set, using only a light frame center slightly curved, and as wide as one tile, and the joints between edges of the tiles are of pure plaster of Paris, used only on account of its quick-setting properties. A second course of half tiles is set on top of



CITY HALL, BINGHAMTON, N. Y.

these and breaking joints with them next to the wall, with rich Portland cement, the joint being not more than one-quarter of an inch. As soon as this second course of tiles is set, the whole will be self-supporting, and the curved board is moved out to serve as a center for the second row of the first course of tiles. This is set the same as the first row with plaster at the edge joints, and the second row of the second course is set on top of them with Portland cement mortar, breaking joints and covering only half of the second row of first course tiles. Then the first row of the third course of tiles is set next to the wall, covering the first row of half tiles set in the second course and half of the second row of the same course. This brings the thickness at the skew-back to 3 ins., which is the thickness of the completed arch. The next row of first course tiles is then set as before, then a row of the second course and a row of the third course, and so on until the arch is built across the twenty feet. The curved centering is set for each row of the first course to a guide traced on the side walls of the space to be covered and indicating the rise of the whole arch, which is presumably about 2 ft. in 20. Only the simplest conditions for building a cohesive or timbrel arch are here given for the purpose of illustration. It will be seen that the plaster used plays a very small part in the construction. It is used for convenience only on account of its quick-setting properties to keep one isolated row of tiles in place until the next course can be set above it. When completed with three courses of tiles, the arch has two bed joints of Portland cement through its whole area, and only the edge joints of one course of tiles are of plaster. The breaking of the joints in both directions practically makes the arch homogeneous if the cement becomes as hard as the tiles.

It will thus be seen that the Guastavino cohesive construction depends as much upon the quality of the cement used as of the tiles, and is only reliable when the best Portland cement is used in the most careful manner. It was only because Mr. Guastavino found when

he first visited the United States that it was a market for the best grades of Portland cement that he decided to change his residence and make this the field of his future operations. Here at last were the ideal materials he had always longed to have. While he saw that the opportunities were great, he had no other encouragement at first. At the time of the Centennial Exhibition at Philadelphia in 1876, a number of photographs of his work as an architect and inventor was exhibited in the Spanish government section; and having received a medal for these, he felt encouraged by that alone to visit this country as soon as he could find it convenient to do so. This did not occur until 1881. He gives an account of some of his early experiences in his book on "Cohesive Construction," published in 1893. Of these he said: "I had not been here long before I recognized the necessity of studying American methods, materials, and facilities. To this work I devoted five years." He had determined to introduce his system because he had found the best materials here for it, but he was full of anxiety lest a failure with new and untried workmen might endanger their lives, and that the arches, being for floors and requiring speedy work, to meet our requirements, might not become sufficiently firm before they were used. He says: "Explanations were given to interest prominent architects and builders; but some seemed to take the matter as a dream, or as though I were a visionary; while others, more benevolent, said it



CITY HALL, PATERSON, N. J.

might be beneficial in Spain or Italy, but never in this country, so different in climate, processes, and necessities." His anxiety at first about getting tiles was not well founded, for, as above stated, such tile were then being made for other purposes, though he did not know it.

His first work was done in 1886 in a four-story private house on 78th Street, New York, and later in the Arion Club, 59th Street, whose building committee accepted

his proposition, when they ascertained that with his arches they could make a saving of over \$5,000 in two floors alone, largely on account of the amount of iron that was omitted.

With this experience and a series of experiments that he undertook in New York, he commenced the study of his art along scientific lines, and endeavored to adduce formulas based on constants, which for the first time in his experience he was able to obtain. Part III. of "Cohesive Construction" is devoted to an explanation of these investigations. He found that the cohesive strength or resistance to shearing of two hard tiles cemented together with good Portland cement was equal to 124 lbs. per square inch, so that this could represent the cohesive strength of an entire arch whenever the tiles are as hard as the cement. Then as the butt joints are not depended upon to sustain the arch, there could be no shrinkage of joints to cause it to contract, as is the case with all brick arches, and curved boards used for centering could be replaced after the work had been fully set, showing that there had been no settlement. Another test for tension in a section of three courses of tile laid with two courses of cement gave a tensile strength of 287 lbs. per square inch on work ten days old, as the average of two tests, while the average of four compression tests was 2,060 lbs. per square inch. With these constants he was enabled to find a bending moment on which to base his calculations for future work. He also tested tiles cemented together with plaster of Paris for shearing, which showed only 34 lbs. per square inch as against 124 lbs. for Portland cement. From this will be found another evidence of the unreliability of plaster mixtures for carrying loads, no less than for fire-proof qualities. In 1887 he worked out formulas for all the constructions he is likely to undertake under his system, which will well repay examination by those who are in any way skeptical as to its utility. Some of these deductions may not meet the approval of scientific engineers, but in most cases it may be said that they are within the results that

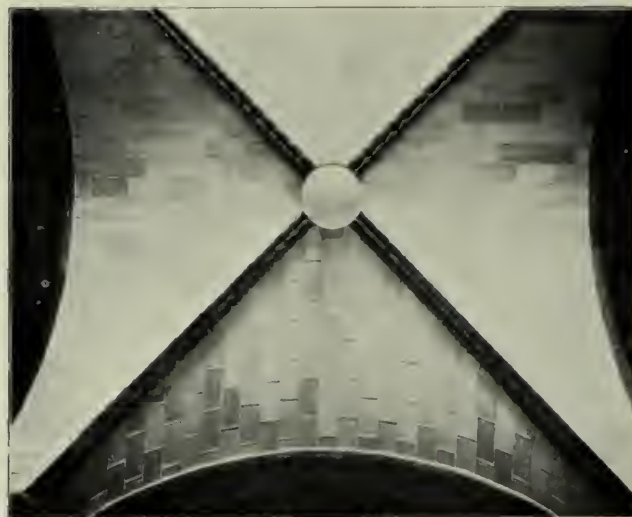


TUFTS BUILDING, BOSTON.

his practical experience has demonstrated in many instances. He has thus accumulated a mass of information for future use, which makes it easy for him to accomplish with safety constructive feats which appear to the uninitiated as simply marvelous. Quite different from an engineer who holds that all good construction is in a state of repose, he calls his product a *live* material, but not in the sense usually applied to the word. It is used rather to remind us that it has many other properties,

such as stiffness and a disposition to transfer stresses in directions not experienced in gravity constructions, than those which are demonstrated by the authorities on building construction in general.

Before closing this part, it may be well to see how the Guastavino cohesive construction is regarded by other acknowledged experts, and for that reason I will quote



VESTIBULE CEILING.

from L. De Coppet Berg's "Safe Building": "The arches have some very great advantages. The principal one, of course, is their lightness of construction and saving of weight on the floors, walls, and foundations. Then, too, in most cases iron beams can be entirely dispensed with, the arches resting directly on the brick walls; of course, there must be weight enough on the wall to resist the horizontal thrust, or else iron tie-rods must be resorted to." He gives an example of a 3-in. cohesive tile arch of 20 ft. clear span, with a rise of 20 ins., and a floor load of 150 lbs. per superficial foot, uniformly distributed, computed graphically. His computation, however, is for a barrel arch, as if built in voussoirs; while Guastavino seldom builds, and does not recommend, barrel arches, but gives them a slightly curved section, longitudinally. It is, therefore, a very conservative calculation, but demonstrates that the greatest pressure per square inch in the arch section would be 130 lbs. As he gives 300 lbs. as a safe stress on a sample that he tested when only twelve days old, which is better than that obtained in the Guastavino tests of 1887, this computation is greatly in favor of the arch. He also calls attention to the danger of sliding in the horizontal joints, *only* in case strong cements are not used. But referring to his tests again, he says: "The shearing stress of the mortar joints is evidently greater than the tension, as samples tested tore across the tile and could not be sheared off." In this connection the following advice applicable to all arches applies equally to this kind: "In arches with heavy concentrated loads at single points there might, in rare cases, be danger of the load shearing right through the arch. The resistance to shearing would, of course, be directly as the vertical area of cross-section of the arch, and in such cases this area must be large enough to resist any tendency to shear."

(To be continued.)

Fire-proofing.

THE CENTRAL TRADING COMPANY'S NEW BUILDING, AT CHICAGO.

ANOTHER ILLUSTRATION OF THE EVOLUTION OF CONSTRUCTIVE ARCHITECTURE.

BY PETER B. WIGHT.

THE firm of Holabird & Roche has just completed another of a series of buildings at Chicago, which serves to give additional evidence of the evolution of Constructive Architecture in steel and clay in that city. The Central Trading Company's Building, occupied as part of the department store of Mandel Brothers, has been erected during the past six months at the north-west corner of Wabash Avenue and Madison Street. It fronts 64 ft. on the avenue, an equal amount on a wide alley in the rear, and 150 ft. on Madison Street. As will be seen, it is divided into three bays on the avenue front and seven on the street. Each bay is 21 ft., $1\frac{3}{4}$ ins. from center to center of steel exterior columns, and constitutes a constructional unit. The width over all is 64 ft. and the length 150 ft. The total height is nine stories and basement, but this height is not shown on any of the illustrations. Fig. 1, showing the method and order of construction, is from a photograph taken from the upper story of a building on Wabash Avenue, looking over the Elevated Railroad Station, and Fig. 2 shows only five bays and the four upper stories of the Madison Street front, from a photograph taken from the window of a building on Madison Street. Figs. 3 and 4 (see line



FIG. 1.

plates, Nos. 33 and 40) show the details of the whole construction to scale. It may be added for explanation that the buildings to the right and left, as shown on Fig. 1, are the older parts of the Mandel establishment, the latter being connected with the new building by enclosed bridges across the alley.

The spacing of the steel columns of the interior corresponds with those on the exterior, and the columns that carry the north side are built against the old party wall of the adjoining building, which belongs to the same owners. The fire-proofing and floor construction throughout is with porous terra-cotta. The floors are 15 ins. hollow tile, end-pressure construction, and were set before the enclosing walls. Outside and inside columns and girders were fire-proofed alike. The north wall above the roof of the adjoining building was enclosed with 12 ins. of brickwork, which was carried, 4 ins. in thickness, around both sides of the fire-proofing of

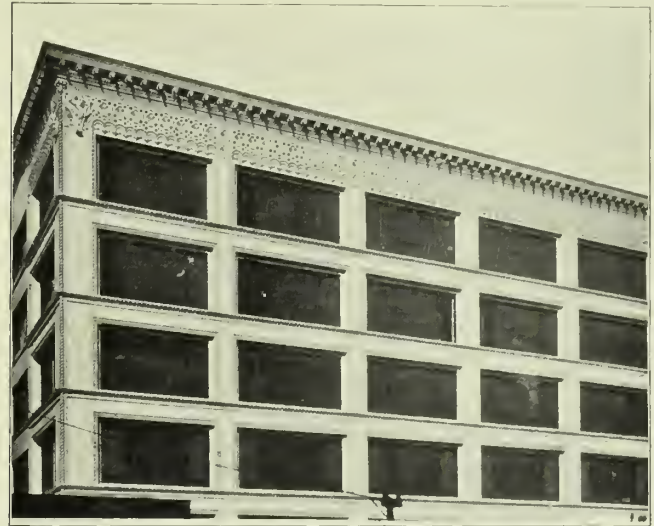


FIG. 2.

the columns, and enclosed the fire-proofed wall girders also.

The entire exterior is built with cream-colored enameled terra-cotta by the Northwestern Terra-cotta Company. Fig. 2 shows what this is so perfectly that no additional description is necessary. To show how this was attained, in one respect, I will say — though I hope that in so doing I am not betraying any secret — that all the bed joints of this terra-cotta were ground on a rubbing bed. No attempt has been made to "flatten" the surface of the enamel; it is as perfect as can be made. This perfection of workmanship has made it look as if made in a single piece, which is not satisfying to the critical eye. But time, and more especially smoke, will soon make the joints more evident.

The speaking illustration (Fig. 2) and the scale details (Figs. 3 and 4) show better than words can tell how the problem has been considered from the point of view of artistic design. Here, again, is seen the use of broad windows in a high building so successfully used elsewhere by the same architects. But in this, also, the constructive lines are emphasized and harmonize with the commercial demand for the greatest amount of daylight. The idea of a wall is only suggested, the piers and transoms being only sufficient to cover the steel structure and sustain the window frames. The detail does not show its derivation from any of the historical styles of architecture; hence it must look to the future historian for a name. Some may say, "This is not art," but better let the future decide that.

Selected Miscellany.

ARCHITECTURAL AND BUILDING PRACTICE IN GREAT BRITAIN.

(By Our Special Representative.)

IN the retrospect of 1900, published in *THE BRICK-BUILDER* for January, 1 gave some particulars of the efforts made to solve the great problem of housing



NEW ART GALLERY, WHITECHAPEL, LONDON.
C. Harrison Townsend, F. R. I. B. A., Architect.

the working classes, with special reference to the work of the London County Council. This is a subject which naturally concerns architects and builders particularly, for not only is there the planning of houses suitable for accommodating large numbers of persons in separate families, but special methods of construction are involved to a considerable extent, the great difficulty being to erect satisfactory houses which can be let at a low rental. The council have undertaken a new task. Hitherto their attention has been almost exclusively devoted to large blocks of tenements within the metropolitan area; now they have decided to erect a number of cottages on the outskirts of the city. At Norbury, in Surrey, an estate of thirty-one acres has been purchased, on which 551 single cottages and 211 double cottages will be erected; while at Tottenham (on the north of the city) cottages are to be built to house nearly 40,000 persons. This latter scheme is by far the largest of its kind yet undertaken by the council. Opinions differ as to the success of the projects. Some are optimistic, while others, reflecting on past experience, believe that the council will never be able to erect houses at such a price as will

enable the rents to be within the reach of those workmen who are earning from one pound to thirty shillings a week. It is certainly true that the jerry-builder with limited capital is able to build houses cheaper than the authorities, but if one believes at all in the influence of environment on character, the appearance of these houses is a deterrent against this view of the case. It was hoped that the housing question, which is one of the most pressing of the day, would come before Parliament during the present session, but other matters have so far prevented this. When the subject is discussed, however, there will be such zeal displayed that some effective measure for solving the problem will most probably be passed. It is, perhaps, opportune to mention that the daily influx of inhabitants from the outskirts of London to the central parts is to a great extent the creation of the last thirty or forty years; it is estimated that nearly a million people enter and leave London daily by railways alone, and that the number of road vehicles has trebled during the last twenty-seven years. At the present time we have thousands of men, women, and children living amid the most distressing conditions, and our main thoroughfares, at certain times of the day, are so choked with vehicles and pedestrians that locomotion is impeded to a most inconvenient extent.

Cookham Buildings, here illustrated, cost \$70,000. The block provides accommodation for 306 persons in 21 tenements of two rooms, 22 tenements of three rooms, 10 tenements of four rooms, and 1 tenement of five rooms. The rents vary from \$1.75 to \$3 a week, according to the tenement.

In my previous article I pointed out that there was a growing dissatisfaction with the manner in which some architectural competitions are conducted. It is not desirable now to refer at any length to this somewhat hackneyed subject, but here is a case in point which shows how very unsatisfactory these competitions may become. Some time ago it was decided to reconstruct the Royal Infirmary at Glasgow as a permanent memorial of the Diamond Jubilee of our late revered Queen. A competition was held, and Dr. Rowand Anderson, a



COOKHAM BUILDINGS, LONDON.



HOUSE AT BUFFALO, N. Y.
Green & Wicks, Architects.

very capable architect, was appointed assessor. Out of the designs submitted he placed first those by Mr. H. E. Clifford, of Glasgow, which was estimated to cost \$1,190,000 to carry out, but the executive committee (who themselves appointed Dr. Anderson) thought fit to choose another of the designs submitted, a design costing more to execute than that selected by the assessor, and not even among the first four chosen by him. Now the question may very fairly be asked, What is the use of appointing a skilled assessor and paying him a large fee if you totally disregard his decision? The suggestion has been made that sometimes he may act as a

decoy, but this is unworthy of any self-respecting authority. The Glasgow Institute of Architects very properly resented the committee's action, and issued a strong protest against such practices. Certain it is that if competitions are conducted in this manner, no reputable architects will enter for them. Another fact to be recorded in connection with this Glasgow competition is that with the printed conditions were issued two sets of sketch plans indicative of alternative arrangements, which the sub-committee recommended. These were not in accord with present-day principles of hospital design, as their authors possessed no architectural experience: the plans were out of date, and this fault is displayed in the accepted design, which is an elaboration of one of them. Six of the ten competing architects found it necessary, in spite of risk, to entirely throw over these plans.

For years past attention has been directed to the existing law in regard to what are termed "ancient lights," a



HOUSE, MISS M. T. HARRISON, CINCINNATI, OHIO.
Elzner & Anderson, Architects.



HALL.
HOUSE FOR MISS M. T. HARRISON, CINCINNATI, OHIO.
Elzner & Anderson, Architects.

constant and most aggravating source of annoyance to architects. Under the Prescription Act, when a window has enjoyed unobstructed light for twenty years, the right to light is deemed absolute, and any encroachments by new buildings result in compensation—or worse. It has come to be considered that the rights are satisfied if the owner of the privileged windows get an uninterrupted view of 45 degs. of sky from the zenith, but the whole system is a most objectionable one. A joint committee of the Royal Institute and the Surveyors' Institution considered the matter and recently made certain proposals for reform, and it is hoped that these proposals will receive legal sanction, thus ridding architects of a constant source of trouble. Scotland has no "ancient lights."

The Architectural Association, which may be called the teaching body of the Royal Institute, has matured an important scheme for day courses of instruction. Architectural education is very inadequate in this country at the present time, and this scheme, by which pupils may learn the drawing of the Orders, elementary problems of construction, and a certain amount of practical office work and tracing, is worthy of every support. The

tuition is intended to be preparatory and supplementary for those who are about to enter, or who have entered, architects' offices as pupils. The first course of studies will last one year. Referring to the Architectural Association reminds one of the "New Century Greetings" from past-presidents which were published in the association's journal. Mr. Blashill, the late superintending architect to the London County Council, gives, perhaps, the most amusing advice. He says:

"Your work is to design, estimate, and superintend buildings. Stick well to that. Eschew gardening, pastoral staves, and hammering of pots, but know about flowers. Be easy with archaeology. Study old work sufficiently, modern work incessantly. Study, also, work-

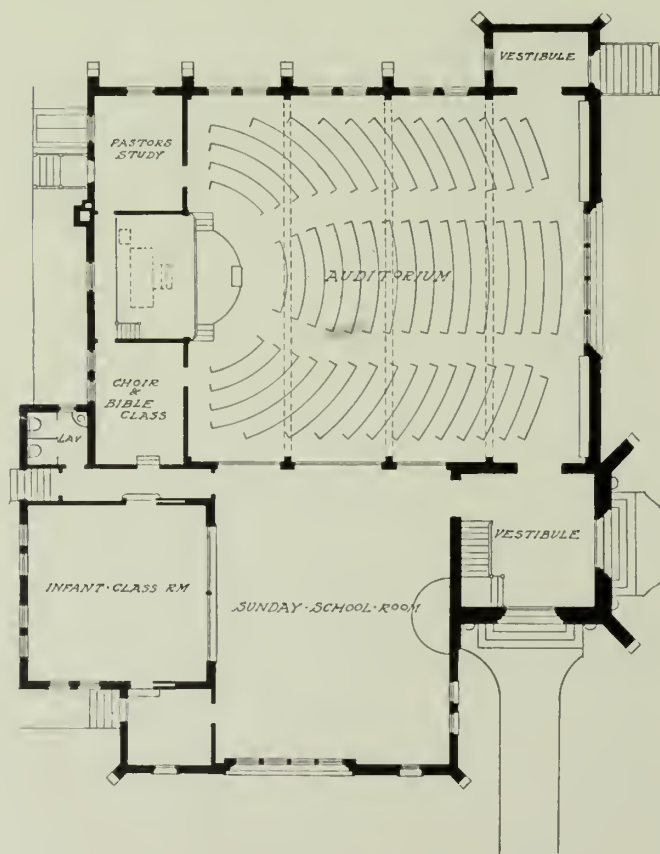


CHURCH AT ST. LOUIS, MO.
Weber & Groves, Architects.

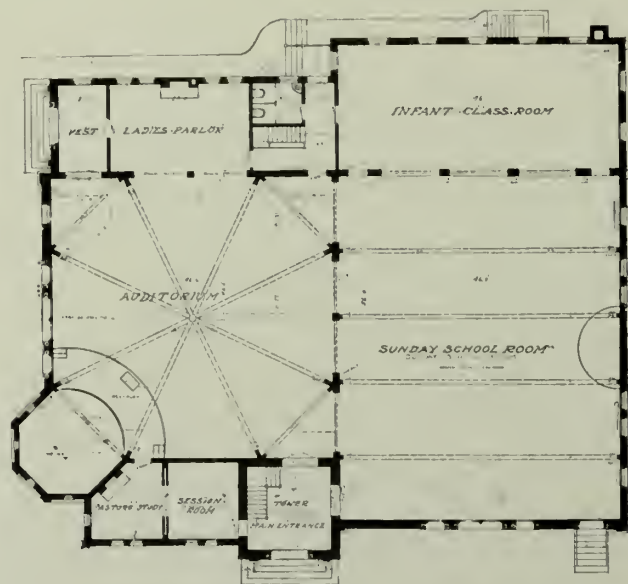
men and tools. Form an opinion of every building new to you; ponder wonderingly over the rest. Listen with discrimination. Pray against twaddlers, and stop your ears. (Have I not suffered fifty years under their droning!) Be always trying your hand at design, of which plan is the root, elevation the flower. You will do better than you expect; might found a School. How the critic would enjoy the scent of your heels!"

I may now refer to the accompanying illustration of the

new art gallery erected at Whitechapel from designs by Mr. C. Harrison Townsend, F. R. I. B. A. The building was formally opened by Lord Rosebery on March 12 last, and is a most distinctive piece of work. The facade is carried out in terra-cotta, of a pleasing buff color, supplied by Messrs. Gibbs & Canning of Tamworth, and of the same kind as that used in the Bishopsgate Institute, which was described by the late Sir Edward Burne-Jones as "most beautiful." The architect, as an advocate of the wider use of color in London street frontages, has, as at the Horniman Museum, made a prominent feature of the introduction of a large mosaic panel, suggestive of the objects of the building. It will be 25 ft. long by 13 ft. high, and will be recessed between the two



PLAN, COTE BRILLANTE PRESBYTERIAN CHURCH,
ST. LOUIS, MO.
Grable & Weber, Architects.
(See Half-Tone Plate Form.)



PLAN, WESTMINSTER PRESBYTERIAN CHURCH,
ST. LOUIS, MO.
Weber & Groves, Architects.
(See Half-Tone Plate Form.)



TERRA-COTTA FIRE-PROOF CONSTRUCTION, FREE PUBLIC LIBRARY BUILDING, NEWARK, N. J.
Work executed by the Raritan Hollow and Porous Brick Company.
Rankin & Kellogg, Architects.

turrets so as to allow a pent roof to protect it from the beating weather. This panel has not yet been executed, but a beautiful design for it has been prepared by Mr. Walter Crane. The subject is, "The Sphere and Message of Art."

NOTES FROM NEW YORK.

"Moving day" has come and gone, and has brought many changes in the downtown district. The historic old Stock Exchange is being demolished to make way for the new and larger building which is to be erected on the site, from plans by George B. Post. The Exchange



MURLAND BUILDING, PITTSBURGH, PA.
Built of brick made by the Ohio Mining and Manufacturing Company.
Alden & Harlow, Architects.

meets temporarily in the Produce Exchange Building. In this connection I cannot refrain from a brief pause for a eulogium on the Produce Exchange Building, one of the first really large buildings in the city, and still one of the very best architecturally. There is a massive dignity about it, with its heavy walls and deep recessed openings, that in this age of skeleton construction will never be duplicated, and which effect is lost to architecture as far as office buildings are concerned, unless the architect boldly disregards current methods, as in the case of the Singer Building, and makes his outside walls of solid masonry. The Produce Exchange Building is beautifully proportioned, beautifully detailed, and has a rich warm color which makes it a landmark of lower New York, and which adds greatly to the *ensemble* as



FIREPLACE, EXECUTED IN FAIENCE, BY THE GRUEBY FAIENCE COMPANY.
J. A. Schweinfurth, Architect.

seen from the bay. It is, moreover, according to my notion, the best work ever done by Mr. Post.

Other noticeable changes are taking place on Liberty Street, where two old office buildings are being removed to make room for the new Chamber of Commerce, and on the corner of Broadway and Maiden Lane, where two buildings are being removed to make way for a sky-scraper.

McKim, Mead & White have filed plans for a handsome residence to be built on 73d Street for Mr. Joseph Pulitzer. Brick and limestone will be used for the front of the house, which will be five stories high. The architects estimate that the dwelling will cost \$200,000.

Mr. Ulrich J. Huberty, a Brooklyn architect, has won



SHELDON LIBRARY, CONCORD, N. H.
Showing roof covered with "American S." roofing tile.
Ernest Flagg, Architect.

the competition for the large brick crematory to be built at Ravenswood, L. I. The building will cost \$70,000.

NOTES FROM MINNEAPOLIS AND ST. PAUL.

The outlook for 1901 has been unusually promising, there being a large demand for business quarters, as well as for flats and modern residences. There will be a considerable number of heavy warehouse buildings erected this year, several of which are already under way.

Our new Chamber of Commerce will be six stories, of pressed brick and terra-cotta; cost, \$400,000. Kees & Colburn, architects.

The Minneapolis *Times* has broken ground for a business building for its own use, to cost about \$75,000.

The superstructure of the new Asbury M. E. Hospital will be completed during 1901. It will be thoroughly modern and fire-proof, the floors and roof to be of hollow tile. The exterior will be of cream or buff



FOUNTAIN IN DEPOT WAITING ROOM.
Perth Amboy Terra-Cotta Company, makers.
T. P. Chandler, Architect.

brick, and a large amount of ornamental terra-cotta will be used. There will be practically no structural iron or steel in this building. Cost complete, \$200,000. E. P. Overmire, architect.

At St. Paul the items of greatest interest are the appropriation of another \$1,000,000 for completion of new State Capitol. Cass Gilbert, architect.

S. F. Heath, who formerly practised in Minneapolis with the late W. H. Hayes, has given up his plan to return here, having formed connections at Seattle, Wash.

L. S. Buffington, formerly the leading architect of the "Twin Cities," is here, having made a fortune out of his acetylene patents.

Since the dissolution of the Minnesota Chapter, A. I. A.,



WALBRIDGE BUILDING, BUFFALO, N. Y.
Union Akron cement used in foundation and construction.
Green & Wicks, Architects.

the architects of St. Paul and Minneapolis have had little in common. It is to be hoped that returning prosperity will lead to reorganization and the interchange of courtesies and ideas that characterized the old chapter.

PERSONAL, CLUB, AND SUNDRY ITEMS.

George A. Freeman, architect, New York City, announces his removal from 27 East 20th Street to 566 Fifth Avenue.

Howland Russel and William H. Schuchardt announce



CARTOUCHE BY HORACE TRUMBAUER,
ARCHITECT.
Conkling-Armstrong Terra-Cotta Company,
makers.

Manufacturers' catalogues and samples desired.

Reynolds Fisher has given up the practice of architecture and has settled in business in Seattle. The architectural firm of Patton, Fisher & Miller, Chicago, from which Mr. Fisher has retired, will be continued by the remaining partners, Normand S. Patton and Grant C. Miller, under the title of Patton & Miller.

The Committee of Experts of the Art Federation of Philadelphia, composed of the following architects and engineers—John Burkenbine, president of the Franklin Institute, Theo. N. Ely, superintendent of motive of the Pennsylvania Railroad, Wilson Eyre, Jr., Charles E. Dana, and Albert Kelsey, chairman—have completed plans for a new parkway to connect the City Hall with Fairmount Park, and an ordinance prepared by ex-Mayor Warwick will be immediately presented to councils.



PANEL BY WIDMANN, WALSH & BOISSELIER, ARCHITECTS.
Winkle Terra-Cotta Company, makers.

The residence at Minneapolis, Minn., F. B. and L. L. Long, architects, which is illustrated in the half-tone plate form of this number, was built of brick manufactured by the Columbus Brick and Terra-cotta Company.

The house at Wilkesbarre, Pa., Wilson Eyre, Jr., architect, illustrated in the half-tone plate form of this number, was built by George T. Dickover, to whom we are indebted for the photographs.

The Chicago Architectural Club at its last meeting elected the following officers under the newly revised

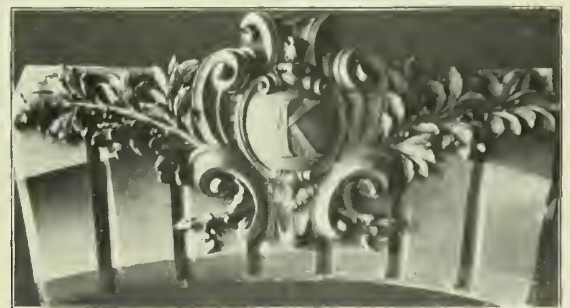
constitution: President, Robert C. Spencer, Jr.; vice president, Emil Loreh; second vice-president, E. C. Hemmings; secretary, John H. Phillips; treasurer, Adolph Bernhard. The other members of the executive committee are Robert E. Bourke and T. E. Talmadge.

Edward R. Swain, architect, of San Francisco, has opened a branch office in the Stanginwald Building, Honolulu, H. I.

constitution: President, Robert C. Spencer, Jr.; vice president, Emil Loreh; second vice-president, E. C. Hemmings; secretary, John H. Phillips; treasurer, Adolph Bernhard. The other members of the executive committee are Robert E. Bourke and T. E. Talmadge.

At the annual meeting of the St. Louis Architectural Club the following list of officers was elected to serve for one year: President, G. F. A. Brueggeman; first vice-president, James P. Jamieson; second vice-president, Charles O. Pfeil; secretary, Ernest Helfensteller, Jr.; treasurer, Charles H. Deitering; advisory committee, Edward G. Garden, Frank A. P. Burford; auditors, S. L. Sherer, Charles H. Deitering.

The preliminary draft of program, showing the general allotment of time at the third



DETAIL BY CHARLES L. BERG, ARCHITECT.
New York Architectural Terra-Cotta Company, makers.

annual convention of the Architectural League of America, to be held at Philadelphia, May 23, 24, 25, 1901, is as follows: First day, May 23.—In the galleries of the Art Club. 9 A. M., registration of delegates, etc.; 11 A. M. first session of convention; 3 P. M., take special steamer to Newcastle, Del., where the old Colonial architecture of the place will be inspected, and the whipping-post and pillory, still in occasional use, will be viewed. Supper will be served on board in the evening, while returning to the city. Possibly other stops

PANEL.
New Jersey Terra-Cotta Company, makers.



OFFICE BUILDING FOR THE SATTLEY MANUFACTURING
COMPANY, SPRINGFIELD, ILL.
George H. Helmle, Architect.

may be made. Second day, May 24.—At the University of Pennsylvania. 10 A. M. to 1 P. M., business session in Houston Hall; 1 to 3.30 P. M., luncheon and reception by the provost, trustees, and faculty in the Museum of Archaeology; 3.30 P. M., business session in Houston Hall; 8.30 P. M., an entertainment will be given at the rooms of the T Square Club. Third day, May 25.—In the galleries of the Art Club. 10 A. M. to 1 P. M., morning session; 2.30 P. M., afternoon session for unfinished busi-



CAPITAL FOR SCHOFIELD BUILDING, CLEVELAND, OHIO.
Atlantic Terra-Cotta Company, makers.
Levi T. Schofield, Architect.

ness, etc.; 7.30 P. M., banquet at Horticultural Hall. The T Square Club will be most happy to welcome its friends in Philadelphia during the third convention of the Architectural League of America, to be held May 23 to 25, inclusive. The Hotel Walton, Broad and Locust Streets, has been selected as visitors' headquarters, special accommodations, at reduced rates, being held in reserve.

ANNOUNCEMENT.

HENRY MAURER & SON beg to extend to all architects and engineers visiting the Pan-American Exposition a cordial invitation to inspect their exhibit of clay products for building and other purposes, assuring them of a hearty welcome.

To those engaged in fire-proof construction, as well as to those branches of manufacturing requiring a high grade of fire-brick, much will be found of interest.

NEW BOOKS.

TABLES AND DIAGRAMS FOR CALCULATING THE STRENGTH OF WOOD, STEEL, AND CAST IRON BEAMS AND COLUMNS. By Benjamin E. Winslow, graduate of the School of the Technical Society, Copenhagen, Denmark; Architectural Engineer for the Chicago Board of Education.

This book furnishes to engineers, architects, and others interested in the construction of small or large structures of wood or metal a rapid and easy means of computing the sizes of beams and columns by the use of graphical tables. The tables have been in use for several years in making calculations for the erection of school and other important buildings in Chicago.

Cloth, oblong, 12 by 9 in.; 53 pp., including 19 full-page plates. Price, \$2.00. The Engineering News Publishing Company, 220 Broadway, New York.

We are frequently asked for information regarding clay-working machinery, by those who are considering the enlargement of their plants, or others who are contemplating starting in business anew. As if to aid us and those of whom we speak, there has just come to hand a publication, issued by the American Clay-working Machinery Company, of Bucyrus, Ohio, which is in itself an encyclopedia upon the subject. In this work the company describes in detail its whole line of manufacture in a most comprehensive way. The reputation of this company, which is the largest in the country, gives to this new work the value of a text-book upon the whole subject of clay-working machinery.

IN GENERAL.

The Union Akron Cement Company, of Buffalo, are furnishing 1,000 barrels of their Akron Star brand for the new buildings of the Iroquois Portland Cement Company, at Caledonia, N. Y. Also a large quantity for the new elevator being built at Nelsonville, Ohio.

Sayre & Fisher Company's brick have been specified on the following new work about Boston: Institute for Savings, Roxbury, Peabody & Stearns, architects; addition to Converse Building, Boston, Winslow & Bigelow, architects; library, Plymouth, Everett & Mead, architects; bank building, Malden, Shepley, Rutan & Coolidge, architects.

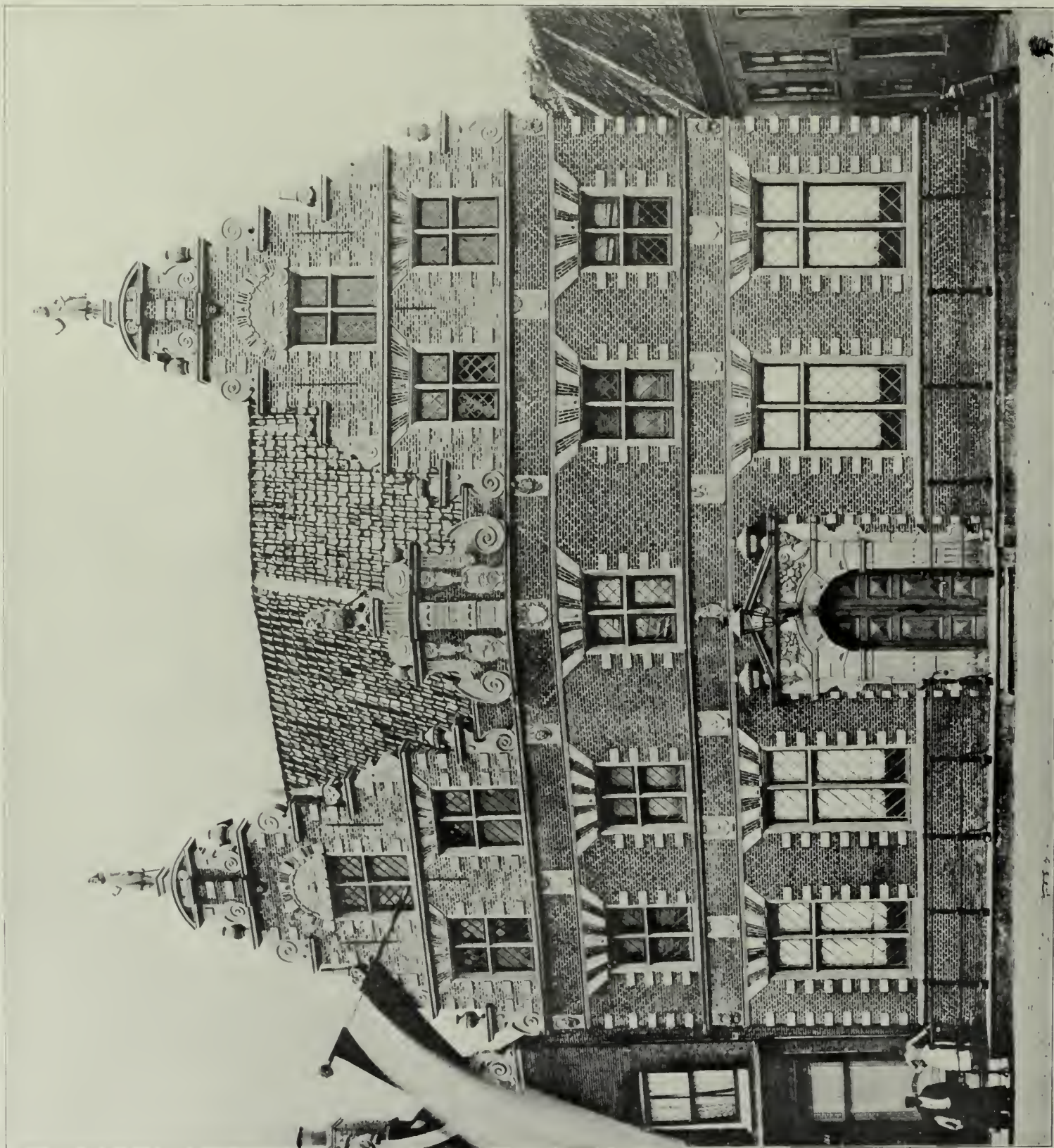
The Hartford Faience Company announce that they will at all times carry a full line of wall, base, and capping



PANEL, HOLABIRD & ROCHE, ARCHITECTS.
Northwestern Terra-Cotta Company, makers.

tile in various colors, but that mantel work will be made only on order. Estimates will be furnished on application.

THE BRICKBUILDER,
JUNE,
1901.



TOWN HALL AT HOORN, HOLLAND.



THE BRICKBUILDER.

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ADVERTISING.

Advertisers are classified and arranged in the following order:—

	PAGE		PAGE
Agencies.—Clay Products	II	Cements	IV
Architectural Faience	II	Clay Chemicals	IV
„ Terra-Cotta	II and III	Fire-proofing	IV
Brick	III	Machinery	IV
„ Enmeled	III and IV	Roofing Tile	IV

Advertisements will be printed on cover pages only.

THE Architectural League of America held its third annual convention at Philadelphia, May 23, 24, and 25. The proceedings were marked by a degree of earnestness and enthusiastic interest which promises well for the possibilities of this the youngest of the architectural organizations. Enthusiasm is always contagious, and when it is coupled with such willingness to work and readiness to tackle the vital problems of the day as was manifested in Philadelphia, there can be no doubt about the League being ready to work out its mission. Ten years ago such an organization as this would have been impossible. To-day it is rapidly becoming a necessity, and the third convention has seemed to be characterized by a soberness and a serious consideration of the duties before the organization to an extent which was perhaps less in evidence in the earlier meetings. The League is in no sense a mere association of architectural draughtsmen, but is a union of earnest, determined young architects, whose manifest aim is to raise the standard of intelligent architectural and professional practice throughout the country, and we feel that our readers will be interested in the papers which were presented at the convention, some of which are found elsewhere in our columns.

However opinions may differ as to the art products of the Germans, there is no denying their theoretical excellence. There has never been a time when the best of the German work could compare favorably with the average production of Italy or France; but, on the other hand, when it comes to matters of abstract discussion, of statement of principles, of ultimate analysis of the vague and oftentimes illusory principles which lie at the bottom of all creative art, there is no race which seems so well fitted to grapple with these questions and put them in usable, helpful shape as the Germans. As archaeologists they have stood unrivaled. Much of our best knowledge of Greek and Roman architecture and a large proportion of our best architectural publications are of German origin. Of recent years, however, there have been signs of a change in the point of view of the German school of architecture, and the modernizing influences, which have been so potent in England, in America, and in France, have found an echo across the Rhine. One of the foremost representatives of what might be termed the modern movement in architectural design in Germany has been Otto Wagner, who is an architect, and a professor in the Vienna Academy of Formative Arts. We begin in this number of THE BRICKBUILDER a translation of Professor Wagner's recent work on Modern Architecture. The translation is by Dr. N. Clifford Ricker, of the University of Illinois, who is certainly most thoroughly qualified to translate such a work and present it in a shape which shall have in its English guise the force and value of the original German. The architect in the busy turmoil of professional practice sometimes but dimly realizes the fierce academic battle which is waging between what is, perhaps, improperly styled the old and the new, between those whose point of view is backwards to the monuments of Greece, Rome, and the Renaissance, and those who would make all our architecture a spontaneous creation of to-day. The discussion, truly, is an academic one, for at heart the differences are far less vital than they sometimes seem, and the essentials of good architecture, whether retrospective or most thoroughly modern, are in reality quite in accord. There is little in Professor Wagner's paper which would awaken hostile criticism from a true artist, from whatever school, and there is a great deal which is put in such manner as to be of much value to every student. We doubt if all our young friends would agree with his statement, however, that the successful activity of the architect comes after his fortieth year. We believe our readers will agree with us that this translation constitutes a most valuable accession to our stock of formulated architectural ideas.

THE THIRD ANNUAL CONVENTION OF THE ARCHITECTURAL LEAGUE OF AMERICA.

DID the Philadelphia Convention sustain the enthusiasm created at Chicago? No; for it had gotten beyond merely clamoring for American ideals, and attempted to grapple with the problem itself. Enthusiasm, however, was not wanting, and many of the speakers were constantly applauded. The program was a full one, covering three days, and, in order to get through with it, a session was held on board the steamer which had been chartered for a trip to Newcastle, Del.

THURSDAY, MAY 23.

The first session began in the galleries of the Art Club, on Thursday, and was given up to routine business.

Mr. George Bispham Page welcomed the delegates on behalf of the T Square Club, and, as its president, did the honors gracefully. Mr. J. C. Llewellyn, president of the Architectural League of America, responded, and in a brief address reviewed the work of the year, and in no uncertain words stated the independent attitude of the League. He congratulated the Institute upon the improved working of the Tarsney Act, and especially in regard to the efforts of that organization in having an expert commission appointed to plan the future extension and embellishment of the city of Washington.

The formality of electing a speaker and secretary of the convention was gone through with, and Messrs. Llewellyn and Lorch, of Chicago, were elected. The reading of communications followed. Over one hundred and sixty letters and a score of telegrams were received, and only those showing a genuine interest in the work of the League were read.

The annual report of the Executive Board showed that the affairs of the League had been more easily carried on under the new constitution and by-laws than in the past. It recommended that the Exhibition Circuit Committee be in future appointed from the same club as the officers of the League.

Several architectural clubs corresponded in regard to joining the League. The Toledo Club was admitted.

The continuance of the Exhibition Circuit as a helpful means of cooperation was recommended, and special stress was put upon education and the promise of success in that field.

With the reading of the report of the Committee on Code of Ethics and Competition — Walter F. Owen, chairman (New York) — a difference of opinion enlivened the session. Mr. Harder presented a strong minority report. The committee advocated and reported the result of a joint meeting with a committee from the Institute. Mr. Harder objected to accepting part of the Institute's code, on account of its conciliatory tone, claiming that nine years ago that body came out boldly and demanded that competitions should be judged by a committee made up of a *majority* of practising architects, while now it proposes to "try to control" competitions, and recommends "that *at least one* architect" be placed on every jury. A heated discussion followed, and Mr. Lacey (Philadelphia) gave a practical illustration of the utter disregard of many business men for professional conduct. The matter was finally referred back to the committee.

Other reports followed during the adjourned meeting on board the *Sylvan Dell*. E. J. Russell (St. Louis) reported for the Committee on Current Work, and recommended clubs to affiliate themselves with kindred societies, in order to broaden their scope. A scheme whereby the individual members of one club, upon removing to another city, may become members — if properly recommended — of the club in the city to which they go, without the payment of an initiation fee, was advocated.

FRIDAY, OR UNIVERSITY DAY.

Prof. Warren P. Laird opened the second day's proceedings by welcoming the delegates to the University of Pennsylvania, and delivered an address in which he said the schools were in sympathy with the Ideals of the League, and all live problems looking to the regeneration of architecture.

The report of the Committee upon Education was then read by Prof. James M. White of the University of Illinois. Its discussion and the reading of analogous papers marked the first systematic efforts to study the opportunities and extraordinary source of architectural inspiration offered by contemporaneous life in the United States. That the results were somewhat obscure is not to be wondered at, though they demonstrated that a good deal of thinking had been done since the last convention.

The following telegram was read: —

"Greeting to the convention. I regret not to be with you. I hope that your deliberations will result in a firmer stand than ever for a rational conception and working ideal of the architectural art. Push on in the good work; I am with you in spirit.

[Signed.]

"LOUIS H. SULLIVAN."

Professor White, of the University of Illinois, outlined the methods adopted by the Committee on Education, to endeavor to procure a consensus of opinion in regard to pure design. Replies to questions were read from many clubs and individuals. All were theoretical. The best came from the Chicago, Toronto, and Philadelphia clubs, and a letter from Howard Walker (Boston) was somewhat to the point.

If, in the future, an entire year were given up to this study alone, and if half as many questions were taken up, something more tangible and capable of immediate application might be obtained. The thin edge of the wedge has begun to penetrate; to drive it home concentration is necessary.

The subject was nevertheless ably debated, question by question, and when — "Should instruction in design be restricted to monumental problems?" came up, a lively tilt occurred. One speaker made the mistake of referring to small buildings as "hack-work," and Mr. Spencer (Chicago) championed Art for Art's Sake whether it was large or small, and carried his point, being supported by half a dozen eager speakers.

Mr. Harder then rose and brought the morning's discussion to a focus. His pregnant remarks commanded close attention.

He reviewed the results of the work of the Centralized Art School of France, and its influence at home and abroad. In foreign countries he claimed its results were

not as successful as in France, where it had grown upon local traditions and expanded to meet local needs. The pith of it all was the need of the establishment of a National School of Fine Arts in the United States.

Mr. Kelsey (Philadelphia) pursued this line of thought, but contended that first a deep-rooted purpose must be made to underlie our art, and that, until this is felt more keenly than at present, such an institution would be futile. Mr. Lorch (Chicago) thought the United States was as yet too young for such a movement, but Mr. Page (Philadelphia) pointed out that it was very seldom that a country had a chance to be caught young and in a susceptible and receptive state. He thought the movement might well begin at once. Mr. Elwell (New York) feared that a national academy would mean politics, and as there are already "art bosses," he feared that politics would be a fatal barrier to the creation of a National School of Fine Arts in which to foster the best talent.

"Mysticism and Architecture," by Claude Fayette Bragdon (Rochester), proved to be the best paper of the morning. Mr. Bragdon's easy confidence and rapid illustrations on the blackboard, as he spoke, made his remarks carry conviction. He began at the beginning, and ended nowhere. Yet his theories upon the arithmetic of beauty were unanswerable, and only had to be heard to quicken and strengthen the analytical power of every designer.

At the afternoon session Prof. Newton A. Wells (Urbana) delivered a paper upon "The Relation of Color to Form in Architectural Design," which accidentally happened to supplement Mr. Bragdon's paper, and was equally sound and instructive. In fact, it carried his theories to every-day application, and was full of useful suggestions, and pointed out many of the laws that govern all successful creative effort.

The paper was well studied and carefully balanced, in proof of which I quote his concluding paragraph:—

"While form through the logic of its structure may convince the head, color shall, through the magic of its sensuous charm, captivate the heart."

The educational debate, however, practically occupied the entire day. Francis S. Swales (Detroit) read the reply of his club to the question, "Should the study of architectural design and historic styles be based on a knowledge of pure design?" and Mr. Emil Lorch (Chicago) read a paper entitled "Some Considerations upon the Study of Pure Design." Likewise, Frederick W. Streibinger (Cleveland) took a hand in the reading of opinions on these subjects.

As has been said before, all this is in the right direction, though somewhat scattered. If some one will boil it all down and present the meat in tangible form, the third annual convention will have contributed notably to the progress of architectural thought.

In the evening an amusing little play, written for the occasion by Herbert C. Wise, was given in the rooms of the T Square Club, entitled "De Bumps and Buonarrotti."

SATURDAY, MAY 25.

The last day opened with the reading of the report of the National Committee upon Municipal Improvements. H. K. Bush-Brown (New York) had brought with him

several large maps of American cities and their suburbs, and quite a library, consisting of reports from various municipal art societies, park boards, etc.

Communications were read from Boston, from the secretary of the American Park and Outdoor Art Associations; another from Springfield, Ohio, from the president of the National League of Improvement Associations. The latter expressed a hope that the League would send a delegate to the Buffalo Convention in August. Favorable action was taken upon this suggestion later in the day.

Mr. Bush-Brown then read a letter from Hon. Tom Johnson, mayor of Cleveland, in which he promised his cooperation in furthering the work proposed by the Cleveland Architectural Club, namely, the grouping of the new public buildings to be erected in that city, which was endorsed three years ago by the Architectural League of America.

Mr. Bush-Brown's report dealt largely with the commercial value of the City Beautiful in attracting strangers. It appeared that several appeals had been made for information in regard to town improvement; among others, letters were received from officials in two cities. It was pointed out that literature upon this subject has been lacking, and speakers with collections of lantern-slides are often in demand. The League endeavors to supply both.

With this end in view, Chas. Mulford Robinson (Rochester), a member of the Committee, has written a book, entitled "The Improvement of Towns and Cities" (Putnam's Sons). Its purpose is to supply laymen and city officials with a description of what has been done in the broad field of modern city making, and what is required of all communities where any civic pride exists.

Sylvester Baxter (Boston) explained the impulse back of the metropolitan system, whereby Boston and forty neighboring communities have acquired for all time adequate public recreation grounds, bathing beaches, and a good water supply.

Chas. F. Caffin (New York) made some telling criticisms in regard to the inappropriate architectural treatment of several small parks, and justly scored architects for striving after monumental effects rather than attempting to ameliorate the condition of a neighborhood. The practical art of sizing up such requirements, from a sociological standpoint, he contended was frequently missed.

Mr. Day (Philadelphia) contributed some information in regard to local endeavor along these lines, and Mr. Elwell, reinforced Mr. Caffin by describing the condition existing in Mulberry Alley, New York, and advocated public wash-houses, athletic grounds, sand-courts for children to play in; and Mr. Hynes (Toronto) explained that his club had started an agitation for improving the condition of several of the streets in his city.

Mr. Caffin spoke earnestly and showed an acute knowledge of his subject. "Art with a big A," he said, "was often a menace to many of the projects and schemes which otherwise business men would be apt to foster."

Sylvester Baxter concluded the morning session with an instructive talk, entitled "The Spanish Renaissance

in the New World." A score of large photographs, many beautifully colored, hung on the walls while he described the monastic architecture of Mexico, its brilliantly glazed domes, and gold enorned interiors. This was the only theme of an archaeological nature, and he might well have brought it up to date by calling attention to the modern architectural requirements of our Spanish colonies.

James Knox Taylor (Washington) was not present at the opening of the afternoon session, when he was scheduled to speak. He, however, arrived in time to conduct the members of the convention through the new Mint Building, and while passing from room to room informally explained the present aims of the office of the Supervising Architect.

Under unfinished business, several more letters upon the study of pure design were read. One by Denman W. Ross (Brooklyn) was particularly lucid; he defined the subject by saying, —

"It means doing what the public knows, understands, wants. Design is the plane of fashion, the handmaid of commerce."

Toronto was selected as the place for the next convention. St. Louis asked for that privilege for 1903.

Several nominations were made for president, but J. C. Llewellyn (Chicago) was reelected.

The League thus enters upon another year of activity, with Chicago once more the seat of government.

The dinner given at Horticultural Hall in honor of the visitors by the T Square Club was a success.

Mr. Day made a good toastmaster.

The reelected president affirmed his strong belief in the usefulness of architectural clubs, and showed how work in a small way had led to larger responsibilities. He frowned down "brass-band" methods, and reminded his hearers that "in union there is strength."

Communications were read from Randolph Coolidge, Jr., D. H. Burnham, and the editors of the *New England Magazine* and the *Review of Reviews* — the latter, Dr. Albert Shaw, congratulated the League upon the good work it is doing by studying the larger relation of architecture to the whole life of the community.

The most stirring speech of the convention was "Intellectual Honesty in Architectural Design," by Chas. F. Caffin. He began by saying that we live in an age of universal knowledge, when it is weak not to be intellectually honest, and that, notwithstanding the absorbing interest the true architect takes in his work, there is no excuse for his being narrow. He said many good things, and had a fling at "Progress before Precedent," asking, "Will a man deny his mother and refuse all responsibility for his mother-in-law?" — which, by the way, was ably answered later in the evening, when it was admitted that that provoking maxim had been used merely for campaign purposes. He confessed that intellectual dishonesty was often the prevailing condition of our times, and regretted that we were not better masters of ourselves. He pointed out that the Greeks never knew that they were doing classic work, and asked why that word "classic" should exercise such a great influence over the profession, when we have such great opportunities all our own.

He paid a tribute to American ingenuity and the lofty building, but lost his popularity by announcing that the engineer would soon eclipse the architect.

Cass Gilbert was equal to the occasion, and his address was most impressive.

Inspired by the word "Progress," he dwelt upon the rapid changes of the day, and finally declared that the engineer was doing much to help progress, but that he would always be the servant of the architect, concluding, amid great applause: —

"Above and beyond all this is the intellect and ever-guiding hand of the architect."

Mr. Hynes offered a toast to the Cleveland Club, in whose quarters the League found its being, and promised a warm welcome to all who might attend the next reunion in Toronto.

Clarence H. Blackall (Boston) captured every one by his flattering allusion to the spirit of the work of the League. He told of a fiery youth who had written some years ago from Paris, saying that he was coming home, and did not know whether he could make a living or not, but that he heard there was room on top in Boston; "and so God help the fellows on top when he got there!" He said the young man did make his mark, and that that was what he expected of the members of the League.

Mr. Kelsey made a few remarks upon the undiminished enthusiasm of the convention, and the growing fraternal feeling among architects and draughtsmen, and, above all, their increasing loyalty to their art.

Dr. Talcott Williams (Philadelphia) gathered up the ideas of the evening and blended them into an eloquent speech, in which he urged a more perfect union of the past and present, which would insure "that ripe coming of beauty which is the dower of the future."

QUESTIONS BY COMMITTEE ON EDUCATION FOR DISCUSSION, AS CONDENSED AND AMENDED BY THE EXECUTIVE BOARD. REPLIES TO SAME.

1. (a) What should be expected of a graduate from an architectural school when he begins office work?
- (b) What should the schools leave for the offices to teach?
2. Is it advisable that the architectural student devote the time necessary to obtain a so-called classical education as a foundation for refined culture and taste, or can the same refinement be gained by studies more closely allied to architecture?
3. (a) How much mathematical and engineering training should an architect have?
- (b) Should design and construction be separated so as to train specialists in each of these lines?
4. Should schools' study of architectural design be limited to monumental problems?
5. (a) Should architectural design and study of historic styles follow and be based upon a knowledge of pure design?
- (b) How can pure design be best studied?
6. To what extent and by what methods should an architect acquire a knowledge of the art industries allied to architecture?

REPLY BY C. HOWARD WALKER.

There are two old Oriental proverbs of which I am rather fond: One is, "The strength of the pot begins in the clay." The other: "To the man with shoes all the world is covered with leather."

My answers are based somewhat on those proverbs.

1. (a) The object of a school is to produce architects or to train them. The training they receive as draughtsmen in a school is only an incidental part; therefore, much the most important part of a graduate's attainments is not called upon for a very considerable time after he has entered an office, and may not be called upon until he starts for himself in his profession. The expectations for attainment from the office when he enters is slight, and can be roughly stated as follows: Good draughtsmanship, *i. e.*, neatness, speed, and knowledge of how to lay out $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{3}{4}$ scale drawings. Knowledge of combinations of material and construction and how to represent them, especially how materials should be assembled, and their points of junction. Ability to use constructive formulæ from books. Knowledge of the orders of architecture, and especially a realizing sense that these orders are so organized that fundamental changes in them produce architectural disease.

(b) Tradition of the office. The adaptation of ways and means. Eternal vigilance with both the contractor and the client. A high standard of integrity. This last might be begun in the schools.

2. Note my first proverb. It depends upon the individual, since some men can never obtain refinement, and others cannot be prevented from obtaining it. The classical education is so closely interwoven with many of the studies allied to architecture that either leads to the other. They cannot be divorced. It is merely a question of the relation of time to be devoted to each, and that depends upon the man himself. In a general way I should say that an architectural student in the schools needs more direct teaching from instructors on the studies allied to architecture, and would depend for his classics on his knowledge of how to use books. If the question implies a knowledge of Latin and Greek, they are not necessary.

3. (a) Enough to prevent him from originating absurd combinations of materials, and to enable him to comprehend where strains and stresses will occur, at what points to anticipate weakness, and when to economize strength under present conditions. No matter how thoroughly trained as a civil engineer an architect may be, few, if any, have enough constant calculations to make to trust their conclusions as anything more than approximate, and it is almost a duty to have their work gone over by a specialist.

(b) That comes naturally. The man falls into either class by predilection. Both classes should be trained.

4. No. But the principal stress should be laid on monumental problems. Monumental design gives much that tends to restrain and better ordinary hack work, while hack work gives absolutely nothing valuable to monumental work, unless it be an accommodation of ways and means. First-rate monumental work is as

heedful of conditions as is any other, but is devoid of the exaggeration of pettinesses. Teaching in hack work is merely the enconragement of common sense, which should, on general principles, be taken for granted, however lacking a large proportion of the students may be in it. I suppose this question is aimed at the teaching of small house designing, etc., and should say that very little of it was necessary in the schools. The office supplies it.

5. (a) I see no reason why "pure" design, by which I understand the study of proportioning construction, solids, and voids, devoid of ornament and dependent upon construction requirements and materials, should not be carried on together. Every style was naked before it was clothed, and the transitions are instructive. The student who is brought up on a knowledge of disposition of masses needs as much training in beautifying those masses as the student who has a knowledge of styles needs in adapting the styles. It is somewhat as if Sandow tried to make his own clothes, or a fop tried to make himself look like Sandow. Certainly the constructive organism is the more important, but with students, analytical, subtle study of proportions is a late achievement, not an early one, and while the first year in school may have teaching in simple construction proportions, little of value can be expected in the results, and if a knowledge of the styles and appreciation of the delights of cultured, *soigné*, accomplished work by the best men of all times is held back from the student, he is lacking stimulus, encouragement, and much of the joy of architecture. I see no reason why the two things cannot be taught together to the benefit of both.

(b) By comparison of problems, the determining qualities of pure design affect both the reason and the eye. The reason, inasmuch as they must appear stable and must not violate the laws of gravity, and consequently must have symmetry. The eye, as they must be agreeable to it. Each person can judge as to how far the reason is satisfied, but there will be a vast difference of opinion in regard to the usual merit. A discrimination in this respect can only be cultivated by constant comparisons which can be obtained through problems. As architecture deals with solids, I am not at all sure that models would not be of great value, for while accomplished architects comprehend, or think they do, what the effect of masses will be as indicated on plans and elevations, the student is completely at sea on the subject. It is the most difficult thing to get him to think in the third dimension.

6. This hits at the old idea that crops up now and then that an architectural student should be a competent bricklayer, should wipe plumbing joints, lay matched floors, forge joint bolts, etc., in order to know how they should be done. If he wants to, let him. The kind of a man who wants to either has a deal of time on his hands, or will never get beyond those details. Business is carried on (no matter how many lapses there may be) on the fundamental principle that good work and honesty are necessary for success — if it was not, there would be no good work — and the architect who spends a large part of his energies in making himself a searching committee for minor defects is bound to be in hot water all the time and get no better result, nor as good, as the one

who insists upon the employment of men of reputation and insists that his specifications be followed. The harping critic immediately asks, "How does he know his specifications are followed?" He knows by the training he gets in a good office, by his constant connection with good work, and by his knowledge that any firm of reputation cannot afford to do bad work. No amount of time devoted to craftsmanship of his own hands will give him any more than an occasional advantage over the student who has devoted himself to the greater things in his profession, and this last student will whip him hands down in many other things. I notice the question says "art industries." Perhaps I have misconstrued it. It mentions decoration in all materials, and if wood and stone carving, etc., are implied, the more he can learn about these the better; the schools should teach something in regard to them, and if he is an artist, he cannot keep his hands away from them, schools or no schools.

QUESTIONS 1 A AND B.

REPLY BY C. W. BRUEGGEMAN, FOR THE ST. LOUIS
ARCHITECTURAL CLUB.

The two questions to which an answer is attempted in the following paper seem to hinge so much the one on the other as to make it impossible to answer the one without the other.

It is obvious that when we have outlined, as we shall try to do presently, what we expect a young graduate to be capable of on beginning office work, at the same time we must indicate what we do not expect him to be capable of until we have taught him.

It is evident that we cannot expect from a graduate any more than from any other person what he has not been taught, or more strictly what he has not learned; therefore, we are in a manner compelled to bring into the subject what the teaching of a graduate should have been during his college course. We assume as being conceded on all sides, and, therefore, as being outside the range of this discussion, that every architect should have as a foundation a liberal general education, whether he be a graduate of an architectural school or no. So we shall proceed to technical matters.

We believe it to be impossible to make courses in architectural schools, in the time that is generally devoted and may reasonably be expected to be devoted to them, comprehensive enough to turn out graduates proficient at draughting in all its branches, mechanical and artistic; at the same time proficient in the knowledge of architecture, its history; its design and the arts indissolubly connected with it; and at the same time proficient in architectural engineering, and all the practical constructional detail that is but imperfectly mastered, and is being constantly revised during years of active professional work. It is to be deducted from this that if we intend the student to know something of all these things we do not and cannot reasonably expect him to have such familiarity with them on entering an office as to go on in the practice of them with all the smoothness that is desirable in actual work.

We may assume it possible to have an architectural school with three courses embracing the three heads just previously outlined. Graduates from any one of these

departments who had wisely chosen that most suited to his temperament and to his abilities might reasonably be expected to come into an architect's office able to give points all round in his special line of knowledge, to have gone beyond grounding and theory, in short, to have all the working smoothness of a practitioner, and to be a valuable man capable of earning a considerable salary, but he would not have as yet the education necessary for the making of an architect.

At the present date the graduate from an architectural school looks forward to being what is known as an "all-round" architect; therefore, we expect him not to have had a specialized course, but to have been grounded in all branches of architectural training. In this grounding it is possible to give more weight to one department than another, and this seems to be the kernel of the question before us. The question, then, is what branches may be given less time to in order that more attention may be paid to others? It seems to us that too much attention cannot be given to such departments as are not likely to be thoroughly and correctly looked after in the experience that comes to the graduate after he enters on office work.

Of architectural history the student is likely to get nothing in the office; of architectural design he will get some, and in time a great deal, but it will be given in the most unsystematic manner; we believe, therefore, that in those two branches the student should be thoroughly grounded in the school. In office designing he sees the thing done, but most usually without a reason being offered; in the school he should be taught how to discover the reason, how to apply the principles governing design so as to be able to work out for himself the general scheme, for in the office his mind is only too likely to be contracted to that small portion of the work that falls to his share.

Mechanical draughting is likely to form a large part of his immediate experience in the office, and that he will and must become proficient in, in a very short time, so that in the school no special effort need be made in that direction. Free-hand drawing, on the other hand, must be largely developed outside of office work. We expect a student from a school to be so grounded in this as to have all his natural ability well developed. Modeling, of course, should be part of his training to that end. The student who has not spent considerable time in thus educating the hand has at the same time not had his eye educated for the appreciation of form and proportion. He sees without accuracy, and too often fails to see at all. In the office there is but little time for this training, so the graduate should be expected to be proficient here on beginning office work.

In considering what should be expected of the graduate in the way of construction and constructional detail, it is necessary to be rather nice in making a statement. There are certain lines of architectural construction which have gone quite over to the specialist — the architectural engineer. The steel skeleton for the high building, the steel truss, and some of the more complicated forms of built columns and girders lie properly with him.

We still have a grip on wood trusses, girders, posts, etc., and on all forms of construction in stone and brick, and we should expect the graduate to have explored the

theory of construction and to have knowledge of the strength and possibilities of these materials as well as steel and iron in their simple constructional shapes. When it comes to the detail of construction, a very general knowledge only should be expected. The student has been trained to understand general principles, which will enable him quickly to follow the office practice in detail-making. It would be idle for an architect to expect a graduate to be educated up to his special idea of the correct form of window-box or wood gutter. So he expects him to come with his mind open in that respect.

It is impossible to give answers to the questions under consideration that cover the ground from all points of view. In the large office one thing is looked for, and in the small office something quite different. The graduate who enters an office should be expected to know something about the class of work likely to be done there. In the large office a more general knowledge should suffice; in the small office he should have given more thought to work, such as frame houses, but right here comes up a point we wish strongly to insist upon. To a great degree architects and draughtsmen are of one of two classes: the first, designers with a general knowledge of construction; the second, constructionists and practical men with a general knowledge of design.

The architectural student, early in his college course, must discover to which class he leans, and take up with most care the studies in that class. Having done so to the time of graduation, he must then look up a position where one of his class is desired. Then we believe that what should be expected of him is something very likely to be fully realized.

QUESTIONS 3 A AND B.

REPLY BY WILLIAM RAE, FOR THE TORONTO ARCHITECTURAL EIGHTEEN CLUB.

3. (a) An architect should have as much mathematical and engineering training as will enable him to solve, by means of formulæ derived from the experimental research of scientific experts, every problem the erection of a modern building may involve in the safe and economical use of the materials of its construction, including steel construction, heating, lighting, ventilation, and sanitation.

In considering this question we have borne in mind the difference between education and merely a knowledge of the expedients of modern practice, for these expedients vary so much in different localities, and change from time to time, so many men devising their own and ever learning fresh ones, that we think no rule may be laid down concerning them.

The use of formulæ and tables thus derived we think one of the most justifiable expedients of modern practice.

The architect's work is the harmonious association of all the crafts, which harmony can only be considered complete when the possibilities of each craft in relation to the whole is perfectly developed, and to do this a knowledge of the nature and functions of every material used is necessary.

(b) Design and construction should not be separated so as to train specialists in each of these lines, because a specialist is one who, in addition to the ordinary knowl-

edge of his craft, acquires a special knowledge of one line, not one who has acquired a knowledge of one line only of the general knowledge of his craft.

Design in architecture is surely, as seen in the study of the highest design, the human figure, constructing beautifully. Certainly, the most intellectual part of the esthetic satisfaction derived from the contemplation of the human figure comes from the perception of the harmonious grace of its constructional requirements.

Could we imagine a figure built up of compression members covered with tension members and concealed beneath a coat of ornament?

What we understand by architectural design has to be based upon the use of some material. To what material shall we limit it? Stone and wood only? We do not know what the material of the future may be; there may be no stone or wood. Times change, and we must change with them.

If to build with steel construction is engineering only, then to cover this construction with an architecturally ornamental plaster is decoration only.

Though the expedients of modern practice may involve the use of specialists, we must consider it as an expedient only. The architect is the opposite of a specialist.

QUESTIONS 4, 5 A AND B.

REPLY BY JULIUS F. HARDER, FOR THE ARCHITECTURAL LEAGUE OF NEW YORK.

4. No reason can exist why general study of any art or science should be restricted to any branch or division of it, and more particularly, not to an unusual and ideal one. Nor is this the case so far as we know, anywhere, in any school. The remedy, if there be any necessary, would be, that instead of architectural design being limited to monumental problems, it is advisable to limit the school of architectural design in monumental problems in so far as it causes a sacrifice of time and attention necessary to the acquirement of information, not so pleasantly monumental, but absolutely imperative to professional practice.

5. (a) The "historic styles" should be studied as solutions of the problems which were presented by them in their time. It is a fact that too much stress is laid upon this matter. It is of very secondary importance. It is the most serious blunder of the schools that the "historic styles" are impressed as of primary importance. The schools are the only influence in the architectural life of to-day which seek to keep these ghosts imbued with artificial life.

Were America free from influence of foreign schools, the conviction is forced home to us, that by this time its people would have made more progress in substantial architecture. All in all, the results might not have been better, but, upon the other hand, they could not have been worse, or more enslaving and retarding in effect.

This is proven by the universal progress which is recorded in all departments in which "schools" have not existed, and consequently have not interfered. The shortcomings, however, are not those of architecture nor of archaeology, nor is this an argument against schools, but the art of education itself is only in a formative state,

and but recently has itself become progressive and self-reformatory.

We would much prefer to go to the root of the whole matter and discuss the queries: Of what does architectural education consist? How can it best be imparted to the student? The root answer to both would be: Hereditary disposition on the part of the student; his physical and mental fitness; sympathetic environment. Here we have the school, the system of imparting knowledge, the methods of acquisition, the subject, the materials, and the object all combined. The school, the student, and the course are but details growing out of this general proposition. The profession of education, reaching out to inform itself as to its own functions, looking for light that it may behold the fruition of its own ends, asks itself first of all: Of what does any kind of education consist? How can the various kinds be imparted to the various individualities of students?

The problem of architectural school education applies equally, although with less force, perhaps, to other educational departments. In the sciences and in law, for instance, definite and absolute quantities and propositions are dealt with, whereas in architectural art we may only say of what it has consisted in the past, and admit with more or less reluctance that the materials, the methods, and the forms and organization of modern life make the imitation of the real art of the past but the mockery of the present. We testify to lack of knowledge and inspiration, to wrong analysis, to an education which is worse than none at all, by dogmatic insistence that the art triumphs of the past must contain the solution of the new problems of to-day. It is all very well to make demands upon the schools. The school itself must have opportunity for healthful life, its own disposition, its own environment. The hereditary disposition of the American school must be the spirit of American institutions and American inventiveness and progressiveness. Its environment must be one free from influences beyond its own, of specters, and of shadows. Its equipment must consist of an understanding that there are real, modern problems of architectural necessity to be met with real modern materials, as evolved by modern knowledge.

Finally. In order that an art school may create its own atmosphere, fulfil its purpose, contain in itself an inspiration and an incentive to work and study, all the various art branches of the colleges and universities of the country should be detached from other branches of study, and be amalgamated in one American art school, thus gaining in scale, volume, influence, and effect through concentration and through singleness of purpose.

Answering the final question, then under these conditions only "can pure design be best studied." Given now a buoyant and vigorous American student-body, under the tutelage of independent and progressive men, and who shall say what are the restrictions set upon the American architectural art of the future.

QUESTION 4.

REPLY BY MR. WATTERSON, FOR THE CLEVELAND ARCHITECTURAL CLUB.

If this question means that the student's time should

be divided between constructive work and monumental problems, it is one thing, and if it means that his time should be divided between "the theory of design" and monumental problems, it is quite another. The prime object of all education is to fit the student to cope with the problems of his profession in a masterful way. The prime object of an architectural training is to fit the student to be a successful architect in all that the word implies, but it is not at all to the point that he shall become an expert engineer. At the same time it should be remembered that it is the intent of architecture to beautify structural forms. Consequently, a knowledge of structural forms cannot be ignored.

Modern construction calls for an unusual condition in design, and makes it possible for the untrained mind to do seemingly impossible things, — things which the trained mind would utilize to develop proper legitimate design. Mr. Marshall says in an article on the "Education of an Architect," which appeared in the *Record*: —

"It is evident, then, that we must teach our architectural student most emphatically to work in structural forms, but it seems to me equally true that in the education of the architect we should follow the developments of the past, *i. e.*, that we should endeavor to teach the youth the principles of beauty and how to apply them to structural forms which are already settled and commonplace to the race as a race of builders. It were well, as I have said before, to make the education of the architect as wide as possible in every direction, for the broader the man, the more effective will be his work so long as his dominant artistic impulse is left full play; but there seems no reason to insist upon the attainment of knowledge of highly technical engineering methods which are useful only in the solution of new structural problems, although it would, of course, be desirable, if possible, for the architect to gain the acquaintance of such methods. Of course, he should know thoroughly the underlying principles of engineering method, the way in which the strength of materials and foundation values are developed, and the most practical forms of construction in stone and brick, wood and iron, especial attention being given to the nature of arch thrusts, and he should be able to work out the less complicated problems in each case, but beyond this all that he needs to know are the general forms within which he may work economically."

Now, on the other hand, it is a choice between monumental problems or the study of the "theory of design," and it would seem that, inferentially, the training in monumental work would so familiarize the mind of the student with the principles of good design that he could easily meet the requirements of any other composition.

It has been said that "the student is fortunate if his school training gives him even a beginning of a sense of appreciation of what constitutes good taste." It is essential that the architect, to do good work, must be thoroughly grounded in the rudiments of design, and the student should be taught his design as the child is taught his alphabet. He should learn to use his moldings, his surfaces, and his openings as a child is taught to use his letters in the formation of words, and words in the construction of sentences. If monumental problems embrace a greater number of the principles of design than

other problems which are given to the student, then instruction should be limited to the monumental, but it would seem that the mind which had been taught to skilfully handle a composition which embodied the heavier principles might easily express itself in any style, the principles being the same, the difference being in the manner of expression.

It is the duty of instruction to place high value upon the spirit of design, and it is for those who have in hand the education of the younger generation of architects to determine what method is best. The student should be taught to think inductively, that his individuality may be expressed in his work. Just the best method to accomplish this end depends largely upon the aptitude of the student, but it would seem that the mind trained upon monumental work and filled with the traditions of the best historic work would put into his problems an interpretation which generally would be correct.

Naturally, from the diversity of human ability, all students trained under the latter system may not become successful practitioners or draughtsmen, but with proper administration in the hands of capable instructors, this system should produce many successes and few failures.

QUESTIONS 2, 5 A AND B.

REPLY BY GEORGE BISPHAM PAGE, FOR THE T SQUARE CLUB.

2. Assuming that it is meant by a "classical education" the regular Arts Course of the universities, it is advisable, because a classical education forms a good foundation to build upon in after life; advisable, however, only if a post-graduate course in some recognized school of architecture is to follow. The refined culture and taste so gained can hardly be obtained by other means.

5. (a) Pure design being the logical solution of a given problem, it must follow that the architectural styles of the past are of their day and generation only. They may be studied as stepping-stones to the development of modern architecture, though no contemporaneous problem can be solved without meeting modern requirements in a modern way.

(b) Pure design can best be studied by an unbiased consideration of all the diverse conditions entering into a problem; thus, the dominant conditions will then govern the character and expression of the design.

QUESTIONS 1 A AND B.

REPLY BY J. W. CASE, FOR DETROIT ARCHITECTURAL CLUB.

On entering an office after pursuing a course of study in an architectural school, the student should be prepared to execute simple office work under the direction of an older man, so that he will be of immediate use and value in an architect's office. Besides this, he should understand all the general principles of all branches of an architect's practice, so that he may quickly learn the office methods of applying this fundamental knowledge.

The school should teach general principles; the office should teach the technical application of these general principles.

In a four years' course of architecture there can be

no time for specialties. The time is all too short to cover the general knowledge required in all the different branches of an architect's practice.

The student should not find that an excessive amount of his school time has been taken up in studying monumental problems, whereas in his entire future practice he may never have a monumental problem to solve.

He should not find that an excessive amount of his time has been occupied by historical research, taking in consideration those principles which would enable him to design architectural forms suited to his own surroundings, and making of him an archaeologist, capable of reproducing historical forms, but unable to design new forms suited to his own atmosphere, material, and indigenous conditions.

He should not find that an excessive amount of his time has been occupied in perfecting methods of making pictures, which his defective knowledge of constructional forms renders him incapable of constructing.

He should not find that he has given so much time to the study of applied mechanics and its application to architectural engineering that he is deficient in artistic qualities.

When a student enters an office he very often finds that his study has been biased by one or another of the above points of view, and also that he has not made an adequate study of the arts and crafts, or, in other words, that he does not know anything about the artistic uses of building materials.

The superior knowledge of the artistic possibilities of building materials marks the greatest epochs in architectural history. It is the basic principle, the vital and essential quality of Grecian and Gothic architecture.

The artistic chisel, feeling the firm and homogeneous Pentelic marble, brought forth those subtle curving forms and refinement of proportions which constitute the greatness of Grecian architecture.

The character of building material forced the architect to invent the arch, the vault, and buttress, and atmospheric conditions produced Gothic masses silhouetted against the sky.

The Japanese carver studies the grain of his wood, and from its twistings evolves the creatures of his imagination.

What does the American architect know of the artistic possibilities of building material, or wish to know?

The student who is expected to understand all the fundamental principles of an architect's future practice will study the subject from three general points of view. As an artist, he will study drawing in charcoal, pencil, pen, brush with color, modeling in clay, terracotta, cement, metal castings, carving in stone and wood. Designing, both applied color and form, and imbued colored material, stained glass, wrought iron, etc. Ornament, historical and creative, based on native flora and fauna.

Architectural design, not only monumental problems, but artistic solutions of practical problems.

History of art, architecture, sculpture, and painting as the development of principles.

Building materials, development of their artistic possibilities.

As a construction, the student will understand the

general principles of building materials; of wood, masonry, and steel constructions and their superintendence.

Laboratory work should supplement the abstract consideration of building materials. The student should pursue courses of shop-work in carpentry, masonry, metal, and spend considerable time in watching building operations.

It might be advised, before allowing an architect to practise, to require him to pass a certain amount of time as clerk of works; the gain to himself, to his client, and to the future of American architecture would be enormous.

As a business man, the student should study specifications, contracts, and civil law relating to building contracts and operation.

The school should teach all the fundamental principles which will control the architect in his practice.

The office should teach the practical methods of applying these fundamental principles.

The time of the student should not be taken up in perfecting the practical application of any of these studies of rendering; too much time is taken up in learning to make perfectly graded washes.

Beautifully rendered drawings are an important factor in competitions, but are properly the work of a specialist.

The study of mental instructions should embody principles and methods, and leave abstruse mathematical calculation to the specialist. The application of applied mechanics is the work of a specialist. Post-graduate courses should be arranged to meet the requirements of specialists. The school must form and direct the artistic tendencies of the student, and to that end the study of classical problems in architectural design is advisable, but the study of design should not be restricted to ideal, classic, or monumental subjects.

A majority, or more, of the students of architectural schools will devote their entire efforts in their practice to solving the requirements of ordinary commercial and domestic problems, and will never have an opportunity to design a monumental structure; students, therefore, should be instructed in the fundamental principles of the problems on which their entire future life will be passed.

They should understand the desirable arrangements and the conditions to be avoided in designing houses, commercial structures, churches, municipal buildings, schools, theaters, libraries, etc.

Their instruction should show them how to satisfy the practical conditions of ordinary problems in an esthetic manner.

How can the solution of these practical problems be left for the office to teach, for it is generally conceded that the office solution of those problems is unsatisfactory.

For this end, the student must know building materials, how to use them practically, and especially how to develop their esthetic possibilities. He should understand and sympathize with the arts and crafts, and receive instruction in modeling, carving, stained glass, wrought iron, etc., not to the extent of manual dexterity, but to gain a knowledge of esthetic possibilities in using materials.

The most essential requirement of an architectural education is cultivation of the artistic creative faculty.

The creative faculty, the art instinct, the artistic imagination, is the most valuable and most essential quality that the architect can have or acquire: it is the essential element in all great art. To awaken and develop this faculty is the greatest opportunity of the architectural school.

"SHOULD THE STUDY OF ARCHITECTURAL
DESIGN AND THE HISTORIC STYLES
FOLLOW AND BE BASED UPON
A KNOWLEDGE OF PURE
DESIGN?"

BY ROBERT C. SPENCER, JR.

THE question before us is one which vitally concerns architect, student, and teacher alike. Not altogether clear or exact, perhaps, in its wording, but clear enough, I think, to us for all the purposes of discussion. Of "pure design" or abstract design we cannot readily conceive apart from some medium of expression as a means, or apart from beauty as end to be attained.

But with certain universal principles of design we are all more or less familiar, and we can readily conceive of the existence of others, yet unknown, but vaguely felt by us apart from any concrete application through any specific medium.

Many of us are also familiar with these abstract exercises in design based on these principles which may be practised in various media, and which are employed chiefly as yet by certain teachers and masters in the field of decorative art to whom design inspired by these principles and ideas without reference to any special use is, for lack of a better name, known as "pure design."

It is, therefore, to these principles and their study in relation, first, to beautiful design in general, then to the design of beautiful buildings in particular, that our discussion to-day must be confined if we would be of some direct helpful service to the cause of architectural education. I am not attempting here to show, and I do not believe, that a general knowledge of principles, such as one man can impart to another, or which can be learned by cold-blooded routine study, will enable an architect to employ them in the reasoning department of his mental laboratory with any certainty of creating beautiful buildings.

In the case of an individual without that inborn creative instinct which seeks expression in line, form, color, and material, the best education, the most thorough intellectual knowledge of abstract principles, coupled with the highest reasoning powers, will not alone enable him to do what the untaught savage, imbued with the beauty-creating spirit, does apparently by intuition through the unconscious and intuitive guidance of imagination by their eternal laws. There is a certain intuitive power in some minds which might be called the electro-motive force of the inventive and creative faculties. Whether this force can be intensified and developed we scarcely know. But we have faith and hope that while youth lasts it can be fanned into a divine flame. We do know, however, that in many minds this force is there, though not manifest, simply waiting to

flash forth, as the arc of dazzling light leaps between the carbon points when the switch is thrown and the subtle but powerful current is liberated. How best to free this force, how to guide it, and how to supply its deficiency by certain knowledge of broad principles and established truths is the real problem which confronts the parents and teachers of our future architects.

The parents first. The schools alone cannot make architects, nor can the kindergartens, which so beautifully lead into the schools, more than begin the work. The parent must realize fully his responsibility to the child for its right guidance, physically, mentally, and spiritually, from the cradle. Example and precept at home are more than schools and formulae. And since one of man's highest and purest delights is in the expression of the spirit through creative effort, the education of every child should look from the beginning to the evolution of an individual, intelligent, and creative personality, gifted with a reasonable mastery of at least one medium of expression.

Whether that one medium of expression is to be music, literature, painting, sculpture, or architecture will be best determined by the free choice and natural bent of the individual. Our architectural schools will then no longer be hampered by sons who have been *sent*. Their places will be more than filled by those who *come*. Among the many who now crowd these schools but few are led thither by a genuine enthusiasm for art. The heads of the schools, therefore, protest that their function, in large measure, is to so drill the average student by means of the "Orders," the literal following of historical examples, and by the suppression of any undue evidences of individuality, that he may become a sane (?) and safe (?) member of an eminently respectable profession.

But, in spite of this protest, I know that the schools are not satisfied with a sane, safe, and eminently respectable product. They would fain be the nurseries of great masters, and each would, if it could, be the Alma Mater of the men whose works are to be landmarks in the unwritten history of architecture in America. There is a *feeling* of disquiet and unrest abroad, as well as a *spirit* of disquiet and unrest. We are looking and groping for a knowledge of principles and methods which, when intelligently and earnestly applied by talent to the solution of practical problems in terms of beauty, shall be found as universally sound and vital as are the special applications of these principles and methods to planning as taught by the world's best schools to-day. The basic principles of design apply to *all* art and to *all* of architecture. They can be taught to a child or to an unlettered savage, for they are elemental—they are beautifully simple. It is only in their applications that they appear diverse and assume an apparent and almost paradoxical complexity that bewilders and misleads and makes us doubt in our ignorance or blindness. The artists of all ages have been guided by them, consciously or unconsciously, in their broader aspects. The children of the public schools almost unerringly choose from the crude efforts of their fellows penned upon the walls, the *best*, in unconscious, inevitable, natural obedience to Nature's laws. For these laws are, after all, natural laws, since they spring from the same infinite Intelligence which created the lily and the mountain crag, and made to mul-

tiple upon this little earth millions of marvelous human eyes to see in them simplicity, unity, strength, repose, harmony, order, rhythm, purpose, and, through the more wonderful eye of the awakened spirit, to see the living and tangible expression of infinite Power and infinite Intelligence and infinite Spirit.

Working through the inspired intelligence of man, as through a marvelous instrument, this same infinite Spirit manifests itself through toil and struggle in the works of men which they and their fellows have deemed beautiful. How are we as instruments to become responsive to the touch of the Master, producing sweet tones and harmonies, not jarring noise and hopeless discord?

Are we to do this by denying these laws and their existence? By applying them here and casting them stubbornly aside there? By declaring them to be so contradictory as to annul each other? Putting aside any question of faith in or reverence for an infinite Intelligence, disregarding even the beautiful and unerring working of natural law throughout the universe, can we close our eyes and ears to nature and to the precepts and discoveries of the students of beauty in nature in this scientific age, which is preeminently an "Age of Reason"?

Do we fear that the temple dedicated to Art is about to be profaned by the steel-shod foot of Science? Why, then, this doubting—this looking askance—this timid shrinking at the thought of Beauty, understood and approached, not through Science, but in the light of the knowledge which Science by her sane and searching methods has already given, and of which she stands ready to give more to those who earnestly seek?

These are generalities—but generalities must precede particulars. The cloud must precede the infinitude if rain drops.

I have already mentioned some of the most universal principles underlying the arts. With just a little sound knowledge of these principles, and just a little appreciation of the possibilities of pure design, the student under right guidance is prepared to study architectural design and the history of architecture, as well as the specialized study of material and structure, bringing to bear upon each of these the test of universal laws in so far as he has already been able to grasp them, and, guided by wise and stimulating instruction, learning of the application of these principles as exemplified in the great historic monuments and of their misuse as exemplified in the decadent periods of our art. In short, the study of architectural history may be made simply one phase of the study of those principles upon which all good architecture is based, be it the architecture of Egypt or the architecture of America in the twentieth century. As for "the Orders," instead of making them a fetish to be bowed down to and blindly worshiped as having some mysterious intrinsic qualities of proportion which make them to a degree applicable and bodily transferable to any building, they should be honestly given their due place in the study of architectural history and art, and no more. If they are beautiful and universally applicable to anything from a circular Roman temple to the base of a twenty-story modern office building, depend upon it, the young man trained in pure design will appreciate these facts, regardless of time-honored tradition and

without further teaching; to him "the Orders" will speak for themselves. But he will consider them first but as details of *buildings*, which are themselves of far more significance than their structural and decorative parts. He will understand that an order cannot be studied intelligently apart from the structure or type of structure to which it originally belonged. To him, column, entablature, and pediment will be primarily nothing more than simple structural elements, to be cast aside as useless where the structural requirements can better be met by other means.

He will build naturally, be it on paper, in the solid clay, or in materials. He will build simply, honestly, and reasonably. Obedient to the laws of Unity and Harmony, his decorative details will be as natural an outgrowth of Structure and of Use as the flower springing lightly from the stem is an outgrowth of the plant, and so in sympathy with the whole that the melody of simple, beautiful structure is made rich harmony. He will not be content to remain in practical ignorance of the modern materials, tools, and processes which should be his media of expression. On the contrary, once acquainted with the possibilities opened up to him by the study of pure design, he will not rest until he knows thoroughly, by intimate and long study and use, the material side of his art. The failures and successes which others have made in the past in the use of materials and tools will be studied by him in the light of the great fundamental laws.

He will not abuse materials nor unduly force them. He will appreciate the natural charm of simple, beautiful surfaces, colors, and textures, and let them alone. He will know how to seize and put to his own use the inimitable effects of nature which we call "accidentals."

All this, and more, if he be taught *Principles* first, last, and all the time. And, once a beginning has been made, he may in large measure be his own teacher, seeking for evidence of The Law everywhere in Nature, in Art, and in Life, and making The Law always the final test of his work. I believe that we are fast coming to a parting of the ways. There is a vast army of children in the schools, who, as the men and women of to-morrow, will demand something more than the dry husks of an imitative or interpretative architecture. They will see the radical difference between the *artisan*-architect, who skilfully reproduces the works of other periods, and the *artist*, who creates for his own time, for his own people — for himself. The common-school education of our cities, with kindergarten training, drawing and nature-study in the lower grades, and manual training and more drawing in the higher, is developing in our children an appreciation of beauty and developing their powers of independent thought and analysis. Let us hope that the artists who spring from their ranks may be trained as to meet the real needs of their times. The study of pure design, as a means of strengthening creative power, of developing an appreciation and understanding of the principles of line, form, and color, of light and shade, rhythm, balance, and organization, should be made an important and primary feature of every school of architecture. Of its value to the individual I have the most direct personal knowledge.

In closing, and before we enter together upon a discussion of this vital question, I urge you all from the bottom of my heart to seek with us, in a broad, optimistic, hopeful, and scientific spirit — the spirit of the true artist — for a better knowledge and appreciation of these laws which govern all successful creative effort. You cannot deny their existence or their power.

"PROGRESS."

BY CASS GILBERT.

I AM very much gratified to be called before the Architectural League of America to address you upon any topic, but I am particularly flattered that I am called upon to address you upon the topic of "Progress." It is a topic that appeals to every man of intellectual integrity or intellectual honesty, and especially so to the American of to-day. I cannot hope to express to you in eloquent terms the thoughts that rise, perhaps, in the minds of every man present here to-night — the thoughts that may be inspired by the word "progress." It seems to me that if there is one word more than any other to-day that inspires American intellectual life, American energy, and American achievements in every direction, it is the word, or the thought expressed by the word, "progress." Progress in our political institutions, progress in our mechanical inventions, progress in our intellectual life, progress in our spiritual movement forward in the world, and progress in the arts — which is simply the expression of all the others combined and the record of events from day to day as they go forward.

I contend that the architects, the artists, the painters, and sculptors in all the various departments of art-life have borne their share well in the field that is represented by the word "progress." I want to express my appreciation of the very admirable and instructive statements that have been made by Mr. Caffin. It seems to me that his point of view is excellent. He speaks, however, from the standpoint of the layman — the layman who is especially interested in art. There is no class of men from whom the professional architect can gain more instructive and valuable knowledge than he can from just that sort of man, — one who thinks about the subject in which the architect, as a professional, is interested, who thinks so clearly and puts his thoughts so clearly in writing as does Mr. Caffin. Nevertheless, I think that Mr. Caffin made some statement to the effect that we are "up against" the problem as to whether we were going to be decorators of interiors or exteriors of buildings, and assumed apparently that we were about to step aside and admit the engineer to be the master builder and we to be the decorators of his work. I want to controvert that statement! Are you, gentlemen, ready to admit such a proposition? I think not. Mr. Caffin contradicts himself when he says that the office buildings in Chicago are demonstrations of intellectual honesty. By whom were they built? By the engineers? They have condemned them as very faulty in their construction. They might let him pass by the architects, and say that they did not create the conditions that made such structures necessary. We will then have to go to the real

estate men and capitalists who did. We architects want our share of credit and believe that we deserve it.

I look back into the history of architecture, and it seems to me that I see that the great engineering achievements in the direction of buildings have been by the architects. My engineer told me the other day that scientifically the dome of St. Peter's in Rome was impossible; yet I know it has stood several hundred years, to the admiration of the world. The engineers of Florence told Brunelleschi that he could not build. He was a modeler in clay, a sculptor, a man who competed for the bronze doors and gates of the Baptistery of Florence; then went to Rome and measured the old buildings and studied the same as I did, as we all have gone around the world and tried to learn the works of the masters. He started with the instinct of taste, with the desire to develop the things he saw around him to things more beautiful. He found the necessity, and he met that necessity. We do the same thing.

Twenty years ago there were no sky-scrapers; the problem did not exist. We have found the problem, and, to a certain extent, at least, have met it. I claim it is the highest evidence of progress of American architecture, and the highest title we have to claim for ourselves the right of existence as a profession, that we have met a thoroughly modern problem in a thoroughly modern way, and practically in ten years, as you see it. Will you tell us that we are not engineers? I say we are something better than engineers, and they shall act but as the servants of the architect who tells and directs them what to do, and they do it; intelligently, but only under his bidding and his control, and it must be so. It must be so, and why? The architect and the engineer may work together. The architect deals with two elements of human life,—the material and the spiritual; the engineer deals with but one,—the material. Which is the greater of the two? You know and I: it is the spiritual element of life and the spiritual element of art. Those of us who have been in practice a few years refer back to the subject of progress and remember the time when our drawings were made in a very simple way and reproduced in a very simple way; the needs were simple and the requirements few. Things have developed since then. We have grown all along the line. The requirements upon the architect now are multifarious. He must meet them, and meet them perhaps in a new way. He calls to his aid the various arts and the various sciences; they all contribute. Far be it from me to detract or take one single jot or tittle of the value of the credit that belongs to the noble allied professions that so admirably aid in forwarding our own work. But, gentlemen, I tell you I am glad to stand as the champion, perhaps for the moment, of the idea that architecture, more than any other profession, has been in the very forefront in the line of progress,—progress in the sciences and in the arts of to-day. It is a very interesting study, this thought of progress in the arts. It is a trite thought, perhaps, to go back to the time when the first man lay a few boughs across from one stick to another and formed a shelter for himself, and enclosed it, little by little—finally he built a house; or he who took the log and hollowed it out, dug the log out, and got inside and paddled, and so on until we come to the steamship—all that is progress. Any

man who has been about the United States very much has seen something of progress. A few years ago I saw men who had been more or less in the West and seen the time when the broad prairies had scarcely a house upon them, when there was scarcely a tree, when there was scarcely a road, when there was practically nothing; and yet within our short lifetime those prairies have been developed. To-day one finds beautiful groves of trees, well-made roads, well-built houses, and electric communications of all kinds,—developments of the arts and sciences; a contribution of the young men coming out of those homes and entering into the walks of life in all departments, very largely into art. The prairie has been made to blossom like the rose, and the earth has covered herself in the presence of man with a mantle of green and gold. We have seen progress enough in our country, and it seems to me that we can reflect upon it, not in a boastful spirit, but in a spirit of thankfulness for the power that has given it to us, the power that has condescended to give us an opportunity. We have seen the development of our country in its sciences and its arts, in its national life, and it is peculiarly gratifying to us that it is so.

I feel that the plea of the previous speaker made for intellectual honesty is one of the fundamental things we should bear in mind in relation to progress. It seems to me that the most progress is made by exactly the thing for which he pleads. For if a man simply takes a problem given him and solves it in the way that comes easiest, the way in which he is most accustomed to work, he makes but little progress. If he is an observant man, he finds new conditions in each new thing. He follows those new conditions. He looks them plainly and squarely in the face, and the result is something new. That is progress. And yet progress is not a novelty; it is a development. Progress does not mean, from my standpoint, gentlemen, the throwing away of that which was before, but the development of that which was before. There are two kinds of progress,—a progress forward and a progress backward. There is only one animal that I know of that goes equally well one way or the other, and that is the crawfish, and we do not admire him. We must go forward or backward. We are happy in living in a day when things go forward, and the Architectural League of America is one of the things of the country which is trending in that forward direction. Speaking of the Architectural League, I see gentlemen here to-night who were members of the first Architectural League in this country. In 1881 half a dozen fellows got together, and with them we made an Architectural League. We didn't call it by that name, but the result was the Architectural League of New York. From that has grown up this whole system of clubs and leagues, and, finally, this organization and society. It seems to me that is progress. In those days we were just starting in; we thought we were. We knew we were, in a sense, as the poet says:—

" . . . dreamers, dreaming greatly
In the man-stifled town,—
And we yearned beyond the sky line where strange roads go
down:
Came the whisper, came the vision, came the power with the
need,
Till the soul that was not man's soul was lent to us to lead."

Modern Architecture.

BY PROF. OTTO WAGNER.

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THE ARCHITECT.

THE architect from his happy combination of the ideal and the real should be esteemed as the best of modern mankind. But, unfortunately, he himself alone feels the truth of this expression, while his contemporaries stand aside with reserve. I must join in his praise at the risk of being accused of delusions.

The training of the architect, extending throughout his life, the responsibility connected with his creations, the great difficulties opposing the erection of his works, the indolence and the preposterous views of the multitude concerning architecture, an unfortunately too common envy, and the diversity of opinions among men of his profession almost invariably cover with thorns the path of his life, so that he too frequently looks longingly on the younger of the sister arts, which usually offers a life strewn with roses offered by mankind. Praise and criticism make the career of the artist fruitful, just as sun and rain do the earth, but they seldom appear in the architectural sky, where only the eternal gray of practice and the dismal darkness of public indifference veil every clear and cheerful prospect.

The architect can never count upon immediate success, or on the ideal rewards. Recognition sometimes comes to him after perhaps years of work, if under numerous difficulties he has completed a building; but the acme of his artistic ecstasy and the joy of creation occurs in the moment when he sketches out one of his ideas according to correct ground principles, which are neither evident nor understood by every one. Therefore, the architect must seek in his own satisfaction the chief part of his reward. But he must with constant love and persistence keep his work ever in hand, and neither wander nor tire, even if, as is the rule, his pecuniary recompense is but moderate, and if the world is pleased to give as much to a vocalist for an hour of song, as Gottfried Semper, with all his economy, saved during his entire life.

Among all formative arts, architecture alone creates and produces, it is alone prepared to originate forms that appear beautiful to mankind, but whose models are not found in nature. Even if these forms have their germs in natural objects, and their origin in building materials, the result lies so distant from the origin that they must be accepted as entirely novel objects.

Therefore, it cannot be surprising to learn *that in architecture is to be seen the highest expression of human power, striving after the divine*. There is proof of this in the incomprehensible and overpowering influence exerted on mankind by works of architecture, which plainly demands consideration. Hence, architecture must be esteemed to be the mightiest of all arts.

All artistic ability is composed of two qualities of the man: Of the innate power (creative ability) and the acquired knowledge (science). The more clearly these two possessions appear and balance each other, the greater will be the value of the art work produced. It

is scarcely necessary to give an example, yet to make it clearer, it may be stated that Hans Makart possessed more innate power than acquired knowledge, while for Gottfried Semper, the reverse is plainly true. On account of the vast quantity of material to be studied, the condition of Semper will be most common among architects. Among painters and sculptors, results appear without any apparent scientific knowledge, but this is manifestly impossible for architects.

This creative power chiefly consists of imagination, taste, and manual skill, just those qualities so essential in the profession of the architect, and so neglected by one deciding on a future vocation. The youth may love the work and take pleasure in it, but if imagination, taste, and manual skill are wanting, or even if one of these qualities is absent, the toil of his training is mispent. For this reason, there occur among architects change of profession, misery, and dreary examples of wasted lives. Therefore, the system of attempting to educate a man as an architect, because he might possibly become one, must forever be dropped, unless some authority decides that he is born for it, or has a decided inclination for it.

It is unnecessary to emphasize that peace of soul, freedom from care, inspiration and experience, must be combined, so that the qualities mentioned may all exist in their fulness in the individual. On this will it depend, whether the creative power of the architect will retain its strength or fail during the course of his life. But it must be stated that the wealth of knowledge to be acquired, the experience, the successive production and perfection of fresh and youthful ideas until their embodiment, all postpone the date of the full maturity of the architect far beyond the time when other artists have already attained the climax of their powers. It is not extreme to place the successful practice of the architect after his fortieth year.

To the difficulties resulting from the vocation itself are added others, which make his life still less rosy. The worst and most injurious one is the numerous sham architects and practising vampires. Hence, the architect must utilize every means to reach and maintain that position which justly belongs to him and accords with his powers and knowledge.

The protection of architecture by the State should be discussed here. It is certain that the State enjoys the greatest advantages from the culture of art. Italy is a country where the chief nerves of its life are certainly the art works of past ages, and France likewise owes its prosperity chiefly to art. This protection may occur in various ways. For example, all public buildings should be executed only by real architects. The purchase and use of old or rented buildings for public offices should cease, mere utility should yield to the artistic and practical, and every opportunity for free architectural competitions should be utilized.

Mention should here be made of the City Improvement Fund of Vienna, an institution especially favorable to art and art industries in Austria, in its noble results. This alone made it possible to adorn Vienna by many monumental buildings, which certainly could not otherwise have been built. The means at its disposal for such purposes are exceedingly small, compared to those as-

signed to monumental art in foreign countries. There can be no comparison with Paris, but it is even far inferior to conditions in Berlin, where during nineteen years, from 1871 to 1890, monumental structures costing about \$62,500,000 were erected by the government alone.

The architect cannot evade the reproach of having done much to lower his position and profession. The attempt to attain success by dishonest competitions, by neglect of strict requirements, or by a sanguine excess in promises made to his clients has greatly injured the architect. Another cause is the usually inartistic and tasteless manner of executing the drawings for his works. A simple and insipid drawing without any artistic attraction inspires professionals and laymen with anything but interest. Opportunity will occur later for treating this more fully.

Yet the heart of the evil lies more deeply. *The chief reason why the importance of the architect is not fully appreciated lies in the world of forms heretofore employed by him in his expressions addressed to the multitude, and which in most cases remain entirely unintelligible to it.* To explain this point thoroughly is the chief purpose of this work. It is not sufficient to condemn the architecture of the present time, to lose courage in the artistic contest forced on mankind, or to simply yield to the indifference of the masses for architecture, and to throw away our weapons.

Unwearied contributions to the exhibitions, an iron industry, and untiring activity will certainly produce a gradual improvement. Participation in competitions cannot be too strongly urged, since they are exceedingly instructive, in spite of all their defects. Although professional colleagues are usually silent concerning exhibited works, yet every one is aware that artists can only be improved by their works, in whose presence all baseless claims vanish. By his works the artist shows his power, thought, and feeling, his soul and truth, and they are always interesting, if beautiful. All artists are susceptible to such truths; the opportunity for showing them is at exhibitions and competitions.

The title of architect clearly belongs to the artist in architecture alone, and it is improper to create architects of different kinds, such as architect-contractor, architect-constructor, etc. The titles conferred by the State, like State-examined-architect, diplomaed-architect, civil-architect, etc., frequently show as great misuse of the title, as when it is appropriated by persons without shadow of justification therefor.

It is unfortunately everywhere the custom for parents or guardians to decide on the future occupations of children without investigating their individual tendencies. Yet this should never be done, especially in choosing the vocation of architect. The motives influencing the adviser of the youth all concentrate in the short-sighted view that this or the other calling will be most profitable. It is then impossible to judge of the capacity of the young man, since the required qualities of imagination, taste, and clear thinking only appear later, when the choice of occupation has already been made and his fate decided. Early facility in drawing does not of itself stamp the youth as a future architect. In order to act correctly, the best method would be to refer the already scientifically educated candidate at the age of twenty-two

to twenty-six years to the K. K. Academy of Formative Arts, whose instructors should have the power to decide whether he might successfully pursue the architectural course. This is easily done by the instructors. There lie before them certificates, drawings, sketch-books. They may permit candidates to take a novitiate year of academic studies, and in case the expected tendency does not appear, they can ascertain the facts without error, or even correct a previous decision. Were this consistently done, it would produce healthier conditions, and would introduce a more natural relation between the number of architectural problems and the number of architects. That an improvement in architecture and in art would result, together with many advantages to the State, the people, and the city, does not require emphasis.

The fact that every architect must also be a constructor has led to a confusion in ideas, yet it is clear that one may be a skilful builder without being able to lay claim to the title of architect. Examinations established by the State are at best only designed to determine whether the candidate appears competent to make the necessary statical calculations, and whether he is able to construct buildings suitable for residence and other purposes; but whether these structures may also be works of art can only be determined by artist architects.

There is now a certain tendency for great architects to attain to authoritative positions as officials, and it must be admitted that so long as these are the best men, just decisions will be made by them. But if such architects no longer exist, the laws remain, and opportunities are opened to men who are not architects. There is something unhealthy in all these conditions, and we must then rejoice that the architects have themselves taken up the work of improvement. The Architects' Club is selected from the Society of Formative Artists in Vienna, and exactly corresponds to an architectural court of judgment. It can only be warmly recommended that officials may recognize its worth and may utilize its assistance in the solution of all important questions. It is desirable that the question of title should be settled in this natural manner.

The earlier life of the architect and the development of his powers have been discussed. But on leaving the school the maturing architect must possess some intellectual qualities, which alone completely fit him for the practice of his profession. As one of the most important, I may mention the ability to clearly perceive the requirements. It is evident that our contemporaries propose the problem and compel the architect to solve it and to invent its form. Numberless things influence this form, all of which must be known to the artistic architect if the form created by him is to be the proper one. Modes of living, customs, fashion, etiquette, climate, location, materials, tools, as well as the means at command, all strongly influence the production of the artwork. To these are daily added numerous novelties and inventions, of which the architect cannot be ignorant, but must quickly and fully inform himself of their value. It is evident that the study of books and journals, practice, traveling, etc., play a principal part in this matter.

A few words are necessary in relation to traveling. After the youthful apprentice to architecture has com-

pleted his studies and leaves the academy as mature, before he commences to practise, a journey of one or two years in Italy usually occurs. I believe this is a mistake. It is certain that much in this step is traditional, and that our modern conditions have essentially changed the point of view. Aside from the fact that the duration of such a journey is now much shorter, modern publications have fully prepared one for everything worth seeing there. This is opposed to the two years' residence in Italy, formerly customary, and which too frequently leads the youthful architect into dissipation. Entirely aside from this, I believe that after three or four years of study at the academy the future architect is not sufficiently mature for a successful tour in Italy, the nursery of ancient art, and therefore that such a journey is always taken to teach shade, well-balanced proportions, arrangement for show, sharply fixed distances of vision, correct perspective contours, the genesis of forms and their motives, characteristic effects in painting and sculpture, etc., can only be appreciated by a skilful and experienced eye. This maturity does not exist at the age of departure from the academy. A tour in Italy for making the commonly quite incorrect drawings of selected buildings can only be regarded as practice in drawing, but to use it in collecting architectural motives that are afterwards to be used on every occasion and at any cost is to be esteemed almost a crime, and certainly a mistake. A very important motive for a journey after completing studies and after the manual labor therein is a certain longing for freedom and for observation, which always arises at that time of life. For this reason I most warmly recommend a brief study tour, which must evidently first be in Italy. But the purpose here indicated is entirely fulfilled in three to five months; after a rest of a month the larger cities may be visited as well as places where luxury is at home, and where one may thoroughly observe and appreciate the requirements of modern mankind. Three months will suffice to fully carry out this plan, and the student will return with impressions received, when he can commence his further work in an office with undiminished love of labor. Years are to be spent there in patiently and industriously learning the practice of the art, so as to pass into independent architectural work at about the end of his thirtieth year. He then has about ten years before his perfect maturity, during which he may produce art works at the cost of others or of himself, which he can scarcely regard with complacency in his later days.

One fact requires mention, and which every architect finds out. This is the constant lagging of ability behind the desire to accomplish. Even ability does not protect the newly fledged architect from this. Thus the architect learns from each new building and is aware of his progress. This perception and the impossibility of improving anything after execution naturally produce a certain artistic depression. A reason for greater confidence in the creating architect is that his experience never diminishes, nor does his love of creating lessen, if it remains healthy, until very late in life. Striking proofs are afforded by the ages of many great architects, which far exceed the usual limit, — Bramante, 70; Sansovino, 93; Michael Angelo, 89; Maderna, 83; Bernini, 91; Jones, 80; Von Klenze, 80; Semper, 76; Garneier, 73, etc.

Before passing to the next topic, a very pertinent question must be answered. Why is not the modern architect likewise a painter and a sculptor like most architects in past ages? The chief reason for this is to be sought in the fact that the knowledge required from the modern architect, and to be acquired by him, has attained such dimensions that it already far exceeds the normal powers of acquisition in man; while the period of study and practice by the apprentice to the art is diminished in accordance with our social conditions. This fact must necessarily produce specialists. But other things are added, and which entirely explain the type of modern architect. Most are mentioned in this work, and reference may here be made to the more prominent. Modern social conditions have permitted the typical art worker to entirely disappear, and have indeed changed each workman into a machine. The natural result must be that this great domain of art is left to the architect. Thus more than ever claimed on all sides, the modern architect is compelled to devote all his time and powers to his limited profession. We might, with equal justice, propose the query, Why are not our modern painters and sculptors also architects? Doubtless for the same reasons that prevent architects from being likewise artists, though with the limitation that the architect is more fully justified by the reasons stated.

So much for the person, period of study, and the existence of the architect. What he is to create will now be discussed. The topics to be examined are style, composition, construction, and practice of the art, although their absolute separation is evidently impossible.

STYLE.

The opinion is unfortunately very common in professional circles, indeed is accepted as an axiom, that the architect must create a basis for each one of his compositions by selecting a so-called style, it even being demanded that he should always show an especial preference for that style tendency whose owner he appears to be.

However repugnant to me to speak on my own account, yet I cannot hesitate to spurn the reproach that I employ the so-called "Empire" style, or utilize it as a basis for further development. The reason for this imputation is to be sought in the frequent use of some characteristic motives of the Empire period in my buildings and designs, such as the projecting horizontal band and the straight line. It is only necessary to refer to the importance of the straight line in our modern buildings. Our perfected construction, machines, tools, and structural methods all require it, while externally plastered construction, long since elevated to be a fully justified art form, directly requires the band and band-like forms. It would be a great error to overlook these facts; opportunities will occur later for clearly presenting my views and freeing myself from this reproach.

The style basis mentioned above is adopted by the opponents of this theory, even in the smallest detail; it becomes a hobby, and is finally made a standard of value in deciding on created art forms. The thoughtful architect is now much perplexed to place the lever for overthrowing such a crazy theory.

It is first to be noted that the word "style" in the sense employed here always denotes the climax of the

period, the apex of its highest elevation. But it is more correct to speak of an art period as not being distinctly limited. Thus it is certain that during the development of their own style, the Greeks were not conscious of its contrast with the Egyptian style, just as little as the Romans were conscious concerning the Grecian. The Roman style was slowly developed from the Grecian, as the latter was from the Egyptian. Hence, from the climax of one style to that of the next there lie before us an unbroken series of transitional forms. The different forms are shaped and evolved by the nations according to their powers, their modes of expression and thought, until they correspond to the ideal of beauty for the period.

Each new style is generally produced from an earlier one by combining new methods of construction, new materials, new human problems and opinions, with the older one, thereby creating new forms.

When events convulse the world and rage through a state, art stops, and when nations have by their might won power, importance, and finally peace, then art has blossomed anew. Great social transformations have always produced new styles. Art and its so-called style are always the fully developed expression of the ideal of beauty for a definite period of time. The artists in all ages had the clearly stated problem of composing new forms from those coming or transmitted to them, which then represented the art forms of their era.

It is indeed to be assumed as demonstrated, that art and artists always represent their period.

It is self-evident that the strongly agitated latter half of the nineteenth century also seeks an expression corresponding to a view of art original with itself. But events progress more rapidly than any development of art. Therefore, what is more natural than to seek art in haste, to atone for neglect, to look for happiness everywhere, and to believe that it may be found; hence, so many artists have cried "Eureka," and have sought and found men inspired by their views. The impetuosity of all style tendencies in recent decades was the result of this tendency. Who does not recall the electric effect produced by the words "Old German" style after the great political events in Germany?

If in a quiet and unprejudiced way we now consider the clamor about styles and the philippics of the last fifty years, by which the art views of the world were to be guided into true paths, we can only regard the mistakes of those apostles of style with compassionate smiles. After the earlier art mists had blown away, the result was found to be without motive and unsuitable; it became clear that all so-called styles were once fully justified, but that a different expression must be sought for our modern period. Even if such styles caused temporary satisfaction, because the results usually recalled good old models, this artistic debauch cannot continue, since such art works appear to be merely the fruits of archaeological studies, and all creative value is almost entirely wanting in them.

But the problem of art, even of modern art, has always remained the same in all periods. Modern art must yield for us modern ideas, forms created by us, which represent our abilities, our acts, and our preferences.

Whether Durer, Michael Angelo, Rubens, or Fischer

von Erlach created a building, an allegory, a statue, or a portrait, such an art work always bore the original stamp of the master and the period, and it never occurred to such artists to base their works on a definite style, nor to copy the modes of expression current in previous centuries. But we too frequently find, in opposition to what is here said, an endeavor by modern artists to reproduce old ideas with the greatest accuracy, and even to imitate the changes produced by weather upon ancient monuments still remaining. This cannot possibly be the problem of modern art, and it certainly shows an absence of all artistic feeling, that nothing disturbing is found in the use of such "art forms" in the modern world.

A few style pictures will serve to further illustrate what has been said. A Grecian temple, painted in bright colors, with a grove adorned by vari-colored statues, a handsome, high-girt Greek with brown skin, the sacred olive tree in its harmonious coloring, the deep blue sky, the atmosphere tremulous with the heat, the sharply outlined shadows, — this is indeed a picture, a symphony. A Gothic church, the solemn gleam of candles softly shining through colored windows, the multitude gently flowing toward the church in their dully, party-colored, slashed doublets and smock frocks, the incense, the pealing of bells, the organ tones, beneath a frequently very gloomy sky, — this is again a picture. The French kings, from Louis XIII. to Louis XVI., the court ladies and courtiers in their rich and heavy clothing and perukes, their etiquette, their richly serolled halls, at last becoming more simple, the shepherd plays in their artificial gardens, far removed from the depressed people, — again a series of pictures. If the attempt were made to take from these pictures only the smallest portion, and to replace this with another bit in another style, this would become a discord in the harmony. If the picture is to become harmonious for us, then must art and its unchanging forms keep in close touch with man, his appearance, and his endeavors.

The style pictures just mentioned lead us logically to perceive the intricate and heretofore ignored connection of taste, fashion, and style. Even a slight gift for observation must produce the conviction that the external appearance, the clothing of men in its form, color, and appointments, entirely expresses contemporary art views and art creations, and indeed nothing else could be conceived. No period and no style is an exception to this. These facts become clearly evident by comparing pictures of costumes with contemporary works of architecture, or still more so by an examination of paintings representing both together. (Carpaccio, Callot, Bosse, Lepautre, Chodowiecki, Canaletto.) This subject may be pursued so far, that the conviction is finally forced on us, that the great masters in past ages failed when they attempted to represent figures in the costumes of their ancestors. Their views and their perceptions always corresponded to the forms of their own epoch alone. The creations of pencil and brush were always the original style of their own time. Why entirely otherwise to-day? A collected medley of styles, everything copied and even applied superficially, and this is expected to harmonize with our surroundings! It is not necessary to be an artist to reject this result. Where is the error? Why this discord between fashion and art? Modern mankind has certainly not lost taste, but now more than ever

before notices the least error in fashion, which is increasingly more critical than formerly. Our clothing and our fashions are dictated by general consent, are properly determined, and thus exclude all errors. Discord is not to be sought therein, but must consequently exist in the works of current art, and this is indeed the case.

Objects resulting from modern views (it is evident that this can only apply to such as have become art forms) *harmonize perfectly with our surroundings, but copied and imitated objects never do.*

For example, a man in modern traveling costume accords very well with railway waiting rooms, with sleeping cars and carriages, but how would it appear to see persons in the costumes of the era of Louis XV. making use of them? The very delicate feeling of the public concerning fashion and this indifference or even stupidity in reference to artistic works are based on the following principle. Fashion is nearest, most popular, most easily influenced, and is the precursor of the style, while the developed style itself represents a crystallized, less easily affected and more refined taste, whose criticism demands depth. But the most potent reason why people usually are so thoroughly indifferent to works of art is that the language of art is unintelligible to them, and the objects produced are not works of our period.

Our era has wandered far in seeking and groping for truth, in expressing our views, and has sought safety in monkey-like imitations rather than in new creations and in a natural development. It has pleased artists to dissect the dead with microscope and knife rather than to lay hand on the pulse of the living and to alleviate their pains.

The assumption that many architectural problems, such as churches, appear to be the same now that they were centuries since, while other problems are of the most recent origin, has produced great errors. Hence laymen, and unfortunately many architects, are of the opinion, for example, that a parliament house may be Greek, but a telegraph or telephone building may not be Gothic, while they directly require a church to be in that style. They all forget a single fact, that men entering these buildings are all modern, and that it is not the custom to ride with naked legs to parliament in an antique triumphal chariot, nor to go in a slashed doublet to church or to the city hall. All such errors are eventually charged to the architect. In extenuation there may only be pleaded the haste required and a search for the true method.

A striving after "picturesque effect" and for harmony with existing structures have produced similar peculiar results. In a very recent competition for a city hall, the architects, the professional and non-professional judges, all honestly tried to bring the proposed structure into harmony with the ancient "picturesque" surroundings, proceeding as in the decoration of theaters, never understanding that the erection of the new city hall would cause the rebuilding of all adjoining edifices, so that finally an "ancient" city hall would be surrounded by modern buildings. In another competition for a city hall, some fifty-two out of fifty-three designs were executed in Gothic or Old German. Yet the author has found that the controlling factors in such cases are anything but Gothic or Old German men, being rather plump, self-conscious,

modern Germans, and he aimed to express these peculiarities in his treatment of the city hall.

Artistic attempts to join imitations to existing edifices without taking account of other conditions, with a certain poverty of spirit and lack of independence, must always produce an effect like that of a man in the costume of a past century, hired from a dealer in costumes, who attends a modern ball. Hence, this cannot possibly be the true path for modern architecture to follow, even were all creative power denied to it.

All modern creations must correspond to the new materials, to the requirements of the present time, if they are to suit modern mankind; they must manifest our own better, democratic, self-conscious, ideal nature, and must take into account the colossal technical and scientific acquisitions, as well as the thoroughly practical tendency of mankind; this is even self-evident!

What colossal labor there remains to modern art, and how zealously must we lay hold of it, to show the world that we have become equal to the problem set before us! If we enter the true path, the innate perception of mankind's ideal of beauty will naturally be more strongly evident, architectural expression will become intelligible, and a style representing our epoch will be created. Nay more! We find ourselves in the midst of this movement. This general departure from the broad road of imitation and habit, this ideal striving for truth in art, press forward with gigantic force, overthrowing everything opposing their definite and victorious course. As always heretofore, art will have the power to hold up their own ideal before the eyes of mankind.

But the revolution will be so powerful, that we may scarce speak of a revival of the Renaissance. A completely new birth, a creation, will result from this movement, and unlike earlier masters with few traditional motives and intercourse with some neighboring nations at command, but in consequence of our social conditions and by the power of modern acquisitions, we shall have all the abilities and all the knowledge of mankind at our free disposal. This new style will be the "modern," representing us and our epoch, plainly derived from new conceptions in art, which must clearly express the almost total disappearance of romanticism and the generally dominating prominence of reason in all our acts.

This future style, representing us and our era, and built up on the basis here indicated, requires time for its development, like all preceding styles. But our rapidly living century likewise here endeavors to reach this end more quickly than was the case earlier; therefore will the world attain success more quickly and to its own surprise.

Such views require that one should never speak of the choice of a style as the basis of modern architectural creation, but the architect must strive to produce new forms, or those forms that most readily harmonize with our modern construction and requirements, thus best expressing truth. The architect may search in the full treasury of traditional forms, but he may not copy those selected, but rather adapt them to his purpose in new forms. If this process can be but gradual, it is indeed evident that it requires for this end the suggestions and aid of our contemporaries.

(To be continued.)

Selected Miscellany.

NOTES FROM ST. LOUIS.

The reports of the Building Commissioner show for the past four months an increase in value of building permits of more than one and one half million dollars over that for a corresponding time last year, and both architects and builders are busy.

A recent decision of the Supreme Court, sustaining the city in its power to issue special tax bills against property for street improvements, has opened the way for the making of streets, and the Board of Public Improvements is losing no time in availing itself of it.

The corner-stone of the building for the Mary Institute of the Washington University group was recently laid. The building will cost \$200,000. Work on the other buildings is progressing rapidly, some of them being now under roof.

Baker & Kneill have been selected, through competition, as the architects for the hospital and dormitories of the State Federal Soldier's Home at St. James, Mo.

The contract has been awarded for a thirteen-story fire-proof office building for the northeast corner of Seventh and Market Streets, which will replace the historic Masonic Temple built during the early '60's. The building will cost \$600,000. W. Albert Swasey is the architect. Mr. Swasey has also a fine residence for Dr. J. J. Lawrence on the corner of 89th Street and Fifth Avenue, New York City.

The new Centenary Hospital, adjoining the Barnes Medical College on the north side of Chestnut Street, will be six stories, and cost \$85,000. J. B. Legg is the architect.

Architects Mauran, Russell & Garden have been



DETAIL BY C. I. BERG, ARCHITECT.
New York Architectural Terra-Cotta Company, makers.

selected as the architects of the Garth Memorial Library at Hannibal, Mo. They have also designed an interest-



CARTOUCHE, HORACE TRUMBAUER, ARCHITECT.
Conkling-Armstrong Terra-Cotta Company, makers.

ing half-timbered house for Westminster Place, and an English Gothic residence for Forest Park Terrace.



WAVLAND LIBRARY, WAVLAND, MASS.
Roofed with Celadon Tile.
Cabot, Everett & Mead, Architects.

Architect Will Levy is building the Jewish Hospital on Delmar Avenue, west of Union Avenue. The pavilion plan has been adopted, and the buildings will be fire-proof.

The Metropolitan Life Insurance Company is building new offices on the corner of Grand Avenue and Palm Street. Messrs. Le Brun & Son of New York, the architects, have employed the Dutch

Renaissance, using red brick with red tile roof.

Frank A. P. Burford has resigned as chief assistant to Commissioner of School Buildings Wm. B. Ittner, to accept the secretaryship of the Jean Johnston Construction Company, and George F. A. Breuggeman, formerly with Mauran, Russell & Garden, succeeds to the position.

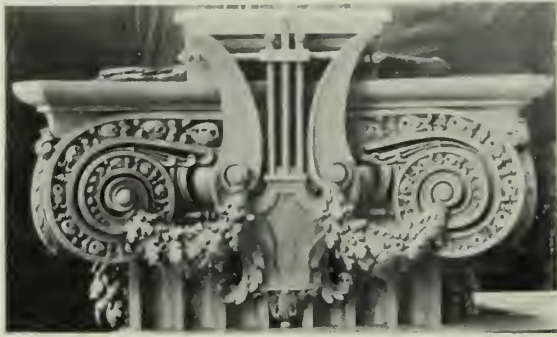
NOTES FROM PITTSBURGH.

The reports so far this year from the building inspector's office show that this is the best year that Pittsburgh has ever known, both in number and importance of new



DETAIL OF PEDIMENT.
Executed in gray terra-cotta by the New Jersey Terra-Cotta Company.

buildings, and if the reports of only a few of the many new buildings announced in the papers during the month are true, the remainder is likely to prove even better.



CAPITAL, A. H. BOWDITCH, ARCHITECT.
Atlantic Terra-Cotta Company, makers.

H. C. Frick, who is building the twenty-story office building at Fifth Avenue and Grant Street, is reported to be negotiating for the purchase of the property on the opposite corner of Fifth Avenue, now occupied by St. Paul's Roman Catholic Cathedral. The congregation has voted to sell and to build a new building in the East End. If this goes through, one of our most interesting brick buildings will be torn down, but it will likely be the ending of all opposition to the removal of "the hump" on Fifth Avenue.

Alden & Harlow are preparing plans for a fifteen-story building at the corner of Fourth Avenue and Wood Street, and for an eight-story building to be built in the East End. They have also prepared plans for a large residence to be built on Forbes Street, cost about \$100,000.



DETAIL BY NIMMINS & FELLOWS, ARCHITECTS.
Northwestern Terra-Cotta Company, makers.

McClure & Spahr are the architects of a fifteen-story building for the Keystone Bank.

D. H. Burnham, of Chicago, is reported to be preparing plans for a \$1,000,000 office building to be built here.

NEW PUBLICATION.

House and Garden, the first number of which we have received, is a magazine devoted to architecture, gardens, and decoration. It comes to us from Philadelphia in a very attractive and presentable form, and shows through all its numerous illustrations the recognizable evidences

of the appreciative, refined taste of the trio of Philadelphia architects in whose hands it has been placed, Messrs. Wilson Eyre, Jr., Frank Miles Day, and Herbert



DETAIL EXECUTED BY THE ST. LOUIS TERRA COTTA
COMPANY.

C. Wise. There is a large possibility for publications of this kind, and we are glad to welcome it, and commend it to all our architectural readers.

SUNDRY ITEMS.

John A. Davidson, architect, whose office for the past five years has been at 828 Flatbush Avenue, Brooklyn,



BALUSTADING FOR COLLEGE OF MUSIC, CINCINNATI, OHIO.
Indianapolis Terra-Cotta Company, makers.
Gustave W. Drach, Architect.

has removed to the Continental Building, 46 Cedar Street, New York.

The Roxbury Courthouse, illustrated in our May number, was designed by J. Laurence Berry and Francis R. Allen, associate architects, and not Allen & Vance as stated.

The Inter Ocean Building, Chicago, illustrated in the



DETAIL BY F. S. NEWMAN, ARCHITECT.
Standard Terra-Cotta Works, makers.

half-tone plate form of this number, is of white enameled terra-cotta, some touches of gold being burned in on the ornamental work. The fluted columns, 24 ft. high, are made in three pieces, which is quite a problem in a shrinking, warping material, when it is considered that these same fluted columns are in reality nothing but bundles of straight lines. The two large groups of statuary above the double columns are finished in dull white enamel, and the central figure of "Progress," at the entrance, is in dull green enamel, as also is the semi-circle of columns at the entrance and the domed framework above, holding the glass panels. The work was executed by the American Terra-Cotta and Ceramic Company.



"PROGRESS," FIGURE AT
ENTRANCE OF INTER
OCEAN BUILDING,
CHICAGO.

American Terra-Cotta and Ceramic Company, makers.

Akron Star Brand Cement is being used in the erection of a new church at Avon, Ohio, and for a large beet sugar factory at West Bay City, Mich.

The Perth Amboy Terra-Cotta Company have secured contracts to furnish the terra-cotta for the following buildings: Arrott Building, Pittsburgh, Pa., F. J. Osterling, architect; building for the People's Land Company, Pittsburgh, Pa., Alden & Harlow, architects; residence for R. W.

Patterson, Dupont Circle, Washington, D. C., McKim, Mead & White, architects; hotel for the Toronto Hotel Company, Toronto, Can., Henry Ives Cobb, architect.

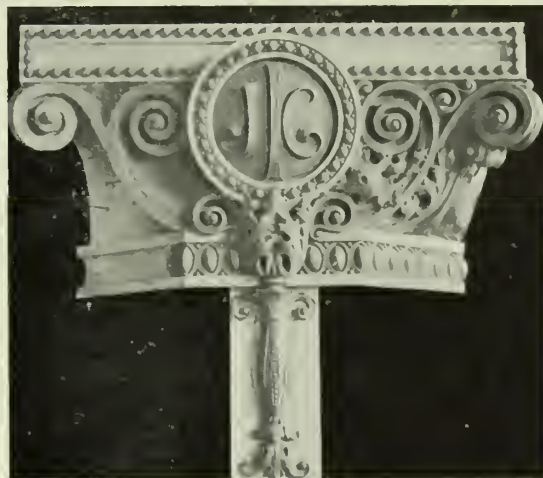
Shawnee brick, made by the Ohio Mining and Manu-



DETAIL BY CHARLES B. MEYERS, ARCHITECT.
White Brick and Terra-Cotta Company, makers.

facturing Company, have been used in the following new buildings: Apartment, 21st Street, New York City, Thorne & Wilson, architects; offices and warehouse,

Broad Street, New York City, R. S. Townsend, architect; apartments, 85th Street, New York City, Hill & Turner, architects; residence, Fifth Avenue, New York City, Renwick, Aspinwall & Owen, architects; ware-



CAPITAL EXECUTED BY THE WINKLE TERRA-COTTA
COMPANY.

rooms, Mercer Street, New York City, Robert Mynicke, architect.

Fiske & Co., Boston, will furnish brick for the following new buildings: National Food Conservatory, Niagara Falls, N. Y., Earle & Fisher, architects. (This building takes upwards of 800,000 face brick.) Parish House, Park Congregational Church, Norwich, Conn., Earle & Fisher, architects; Y. M. C. A. Building, New Haven, Conn., Brown & Van Beren, architects; Y. M. C. A. Building, Hyde Park, Mass., Thos. Rowe, architect; Masonic Building, Lewiston, Me., Coombs & Gibbs, archi-



TERRA-COTTA FIGURE FOR ORPHEUM THEATRE, BROOKLYN.
B. Krejscher & Sons, makers.
Frank Freeman, Architect.



"TEMPLE BAR" BUILDING, BROOKLYN, N. Y.
Architectural terra-cotta furnished by the Excelsior Terra-Cotta Company. Brick furnished by Sayre & Fisher Company.
George L. Morse, Architect.

teets; Town Hall, Warren, Mass., Dwight & Chandler, architects; Y. M. C. A. Building, Fall River, Mass., Nat. C. Smith, architect; Franklin Bank Building, Pawtucket, R.I., Wright & Isham, architects; Lowell Textile School, Lowell, Mass., Lockwood & Greene, architects; Bowdoin College Library, Brunswick, Me., Henry Vaughn, architect; Knights of Pythias Building, Somerville, Mass., J. W. Cobb, architect.

ANNOUNCEMENT.

HENRY MAURER & SON beg to extend to all architects and engineers visiting the Pan-American Exposition a cordial invitation to inspect their exhibit of clay products for building and other purposes, assuring them of a hearty welcome.

To those engaged in fire-proof construction as well as to those branches of manufacturing requiring a high grade of fire-brick, much will be found of interest.

THE Year Book of the Department of Architecture of the Massachusetts Institute of Technology is in a suggestive way a good epitome of the work which is done at this most excellent school. The distinction

between practical problems and school projects is becoming less every year, and though we fancy that Mr. Myers' Study for a Department Store, which appears in the Year Book, would hardly suit all the requirements of Jordan-Marsh, or Wanamaker, it is quite probable that these commercial houses may grow up to something of that sort some of these days, and in the meantime, the training the students obtain from the study of these purely academic problems is beyond question.

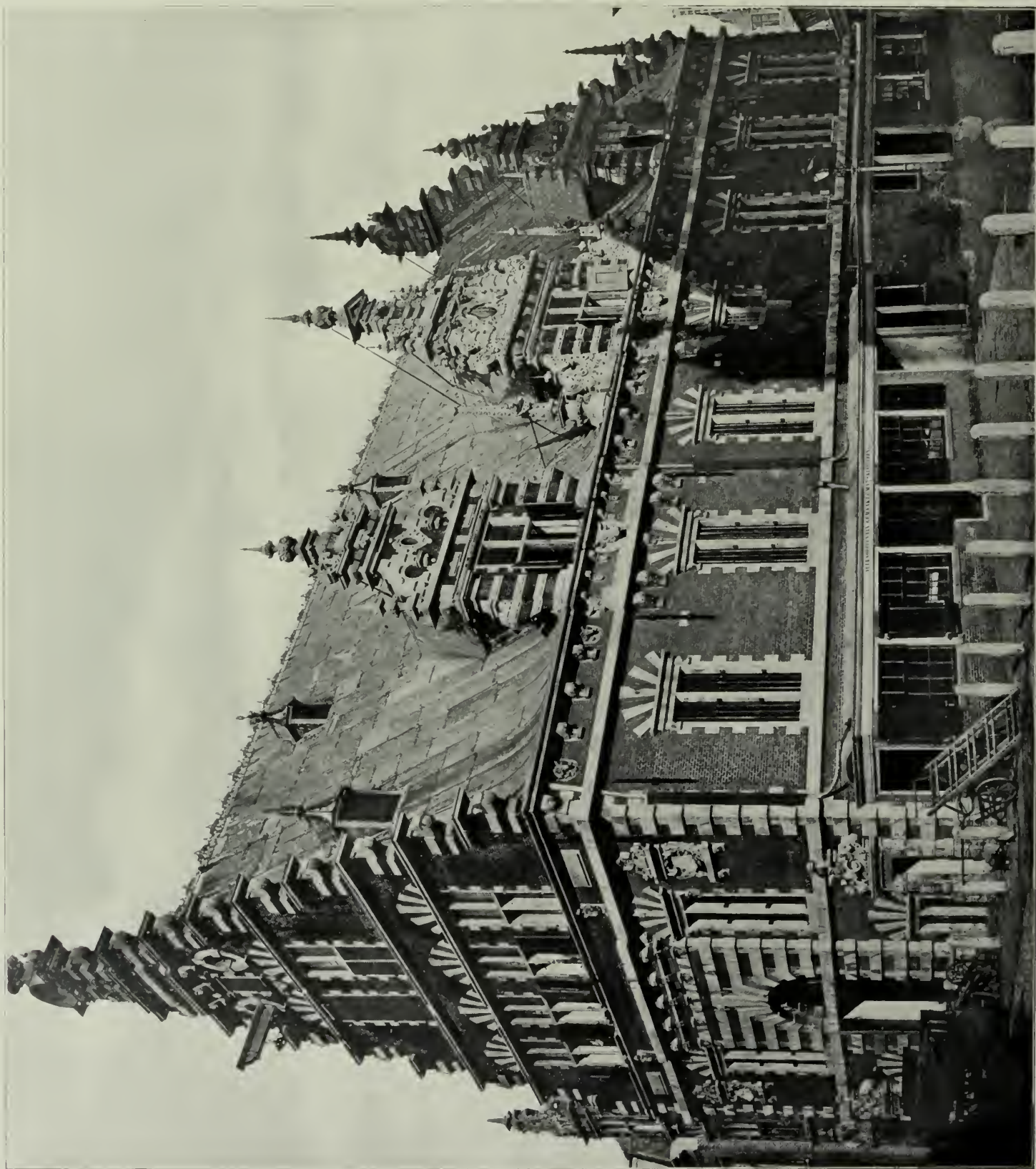
The Hand-book of the Department of Architecture of Cornell University is in a similar way a very excellent presentation of the students' work. We notice particularly a design for a reception room in a State Capitol, by Mr. Tissington, as a most careful study of a very elaborate problem.

SOME striking facts concerning the question of housing the poor in Liverpool have recently been collected by the League for Social Service. At various times the Municipal Corporation of Liverpool has obtained powers from Parliament to borrow sums amounting to \$2,000,000 for the demolition and improvement of property found to be unsanitary. This large amount has already been expended with the exception of about \$35,000. The Medical Board of Liverpool now reports that many houses are in an unsanitary condition, unfit for habitation, and they recommend an immediate appropriation to carry on the work of destroying this property, and then improving it with new homes. The number of houses which have already been demolished by the Municipal Council of Liverpool as unfit for habitation is 6,500. The City of Liverpool has now in the course of erection 182 houses, with recreation grounds for the poor, and since January 1, the city has appropriated \$150,000 to be used in erecting 95 additional houses for the poor.



HOUSE FOR W. H. ANDERSON, CINCINNATI, OHIO.
Elzner & Anderson, Architects.

THE BRICKBUILDER,
JULY,
1901.



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1901

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ADVERTISING.

Advertisers are classified and arranged in the following order:—

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Brick	III	Machinery	IV
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Advertisements will be printed on cover pages only.

THERE is a lot of outdoor work which is directly in the line of architectural study; and when the temperature in the office is too high for serious book study or work with drawing board and T square, it well repays the earnest student to go out in the country and study form and composition as he can find it in plant life. We had occasion a few days since to examine some of the summer work of students in a neighboring school, which was devoted primarily to the arts. The work of one student was remarkable in that he managed to get so much real, positive, helpful study from the simpler plant forms. This is something which is easier to illustrate by example than by precept, but every architect knows how much of the vegetable kingdom can be directly assimilated in the architectural world in detail, and how important it is to freshen one's perceptions by going back as it were to the fountain head of decorative work and study nature. The only trouble is in our vacation days we easily confound simple loitering and admiring of a pretty plant with the careful reasoning examination and analysis which can be productive of so much architectural good. Most of us loiter our vacations away, and regret it when the fall and its new problems come in on us unawares. But looked at aright, a hot season and the

country life afford a valuable opportunity for a kind of serious study which we are only too prone to ignore.

THE question is sometimes asked by our too impatient friends, Why is it this country does not produce more and better brick buildings? That we will ever know the full answer to such a query is hardly likely. We certainly admit the limitations of our brick architecture as well as those of buildings erected in a less pliable and permanent material, and it is to be hoped that the time may never come when we cannot see possibilities of improvement even in the best of our work. But granting for the moment that the difficulty lies not wholly with the mere ability of our designers, there are, it seems to us, some explanations, or, perhaps, more truly, some possibilities of improvement in the design and increase in the quantity of our terra-cotta and brick architecture. When an architect is entrusted with a commission for a large, prominent building, the temptation to select at once the material which is popularly associated with the architectural triumphs of so much of the old world is sometimes too strong to be resisted. He feels that this may be his only chance, and that if he can only persuade his client to be sufficiently complacent, he, the architect, may be more sure of his ground and of his results by using stone than by attempting brick and terra-cotta. Then sometimes we are a bit lazy, and it is easier to copy, or at least we think so, than to bend ourselves to the really difficult task of properly designing a burnt-clay structure. An architect will often lack the courage of his own convictions, and though he may know that brick is the proper material to use, will run off into free stone or granite because his client tells him to do so. Indeed, the architect who, becoming thoroughly convinced that brick or terra-cotta should be used under certain conditions, will resolutely impose his convictions upon his client, is rare. There is no lack of abundant demonstration, however, that the difficulty lies almost wholly with the intent of the architect, and not with the material. Four of the most successful recent buildings in this country are the Horticultural Hall, Philadelphia, by Frank Miles Day; the Natural History Museum in the same city by the same architect in conjunction with Wilson Eyre and Cope & Stewardson; the Broadway Chambers, New York City, by Cass Gilbert; and the Horticultural Hall, Boston, by E. M. Wheelwright. All of these structures are built of brick. Nor does this by any means exhaust the list. Monumental, impressive buildings in brick have come to stay, and if we are asked why we do not have more of them, we would reply, give us time and the courage of our convictions, and they will come.

Old English Brickwork. II.

BY W. G. HORSEMAN AND HENRY TANNER, JR.

THE second period in the history of brickwork in this country was, broadly speaking, from and including the time of Queen Elizabeth to that of Inigo Jones, through that time of chaos in architecture when the mason or carpenter probably undertook the work of designing as well as the erection of the buildings upon which they were employed, under frequently the direct supervision of the employer; when men like Abel of Herefordshire, Thomas Holt of Oxford, both of them carpenters, and Simons and Wigge of Cambridge were the nearest approach to the present-day architect. John Thorpe and the Smithsons, being almost the only men whose names have come down to us as acting in the true position of architect as we know it.

Brickwork had ceased to be much employed ornamentally after the time of Henry VIII., through whose long reign it and terra-cotta had been very freely used for the execution of moldings, window tracery, copings, etc., but from the middle of the sixteenth to the latter half of the seventeenth century it was

building activity, the material used being chiefly the red bricks, which have weathered by time to a beautiful color, and, as we know them, add so much charm to our English landscapes, and are so characteristic of them.

A friendly spirit of rivalry was abroad as to the possession of the most magnificent house, the largest rooms, or the longest gallery (this latter feature so character-



HATFIELD HOUSE, HERTFORDSHIRE.



HATFIELD HOUSE, HERTFORDSHIRE.

very rarely used except for plain walling, stone being very generally used for dressings in every position, as in the case of large houses such as Blickling Hall in Norfolk, Moyns Park in Essex, Kentwell Hall and Long Melford Hall in Suffolk, Hatfield House in Hertfordshire, Aston Hall in Warwickshire, and Bramshill House in Hampshire, which are a few examples out of very many of its use in this manner.

Many, however, of the smaller and less important country houses built during this period are constructed entirely of brickwork, and furnish good examples of its use ornamentally in their door and window dressings, string-courses, gables, parapets, copings, and chimney-stacks.

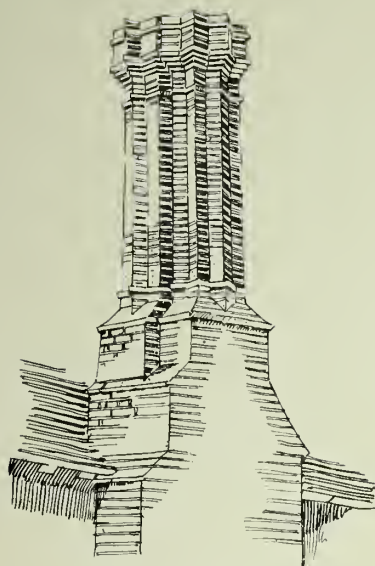
The reign of Queen Elizabeth was a time of great

istic of these houses), a spirit which was bound to give an immense impetus to building, and which fortunately for us was productive of better results than that which occurred later, in the history of our Renaissance, when good, honest brickwork was thought to be too mean a material for use in the great showy houses — such as were built in vast numbers in the eighteenth century — except as a core to be plastered over in imitation of stone in those cases where the use of stone dressings was found to be too costly, and the effect of stone had to be obtained somehow.

This, too, was a period of fanciful houses, both as regards plan and elevation, such as some of those designed by John Thorpe and Sir Thomas Tresham. The triangular lodge at Rushton, in Northamptonshire, and the house designed by Thorpe on the lines of his



GREAT TANGLEY MANOR HOUSE, SURREY.



CHIMNEY-STACK, WHEAT-
HAMPSTEAD, HERT-
FORDSHIRE.

The consequence was that half-timber building was discontinued, a method of building which was almost universal throughout the wooded tracts of country, and even largely used in London, until in A. D. 1605 James I. issued a proclamation forbidding buildings to be erected in London, except of brick or stone, the great advantages and increased safety of the houses built of these materials being then understood.

Brick was much used as a filling in between the studs in half-timber work; the Deans Cloister, at Windsor, though now rebuilt, and exactly on the old lines, a very good example of this method, the brick filling being put in herring-bone fashion.

Shrewsbury and Worcester furnish us with many examples of this kind of work, the one illustrated here being a typical example, the brick corbelling over the doorway being interesting and picturesque even if not very architectural. It is also very prevalent in the smaller domestic houses and cottages in the counties of Kent, Sussex, and Surrey, and to a lesser extent in Norfolk, Suffolk, and Essex.

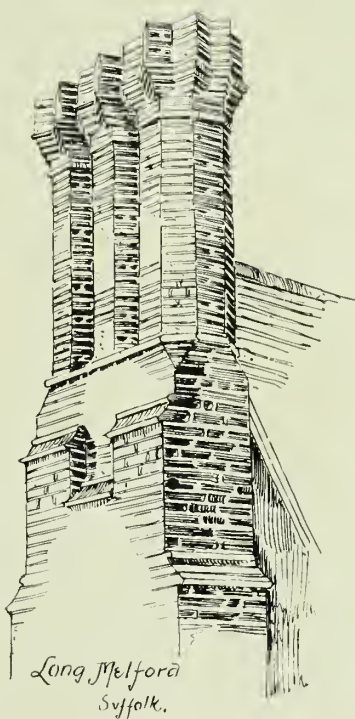
At Great Tangle Manor House, in Surrey, though



THE SICK HOUSE, WINCHESTER COLLEGE.

own initials are good examples of the eccentricities prevalent at this period.

Great impetus was given to the use of brick as a building material by the growing scarcity of wood in English forests, a fact which caused much uneasiness, and into which inquiry was made at the time: the iron works in Kent and Sussex being responsible, in a large measure, for much of the destruction of wood by using great quantities as fuel for their furnaces.



Long Melford
Suffolk.

most of the house is timber and plaster, there are parts, as our illustration here shows, where brick is used in conjunction with the timber; the great square brick chimney-stacks also add greatly to the picturesque effect of the charming spot.

Brick chimneys, again, are a history in themselves, showing in their varying forms, from the large square single flue to the highly ornamental groups of chimneys, such as we see at Hampton Court Palace, the progress made, both in design and scientific construction.

The earliest-known example of a chimney in England is most probably the circular chimney-stack of the king's house, at Christchurch, in Hampshire, a ruined building of Norman date; but at this early period chimney-shafts were doubtless the exception and not the rule, and at Rochester Castle, in Kent, also a building of Norman date, the flues from the fireplaces are continued vertically up in the thickness of the external walls for a short distance, and then turned horizontally through the wall, showing on the outside face merely a square aperture, a method probably productive of much smoke and discomfort in the rooms.

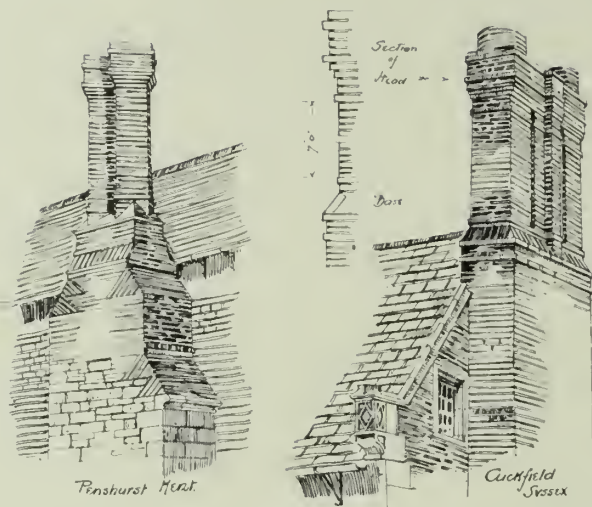
The plans of the smaller domestic buildings were simple in the extreme: a large apartment formed the hall, which was generally used for living and even sleeping in. There also was a kitchen and usually an apartment off the hall, called the "solar," perhaps, devoted to the use of the female inhabitants of the house. These apartments generally had fireplaces and chimneys, but in many cases a lantern upon the roof carried off the smoke from the hall fire, which often was on a raised hearth in the center of the floor.

At a later date when the need of greater privacy and



THE DEANERY, WINCHESTER.

comfort was recognized, more rooms were added, and the necessity for a large hall no longer existed; it became the usual expedient to insert a floor at a convenient height,



dividing the hall into two stories, thus increasing the accommodation.

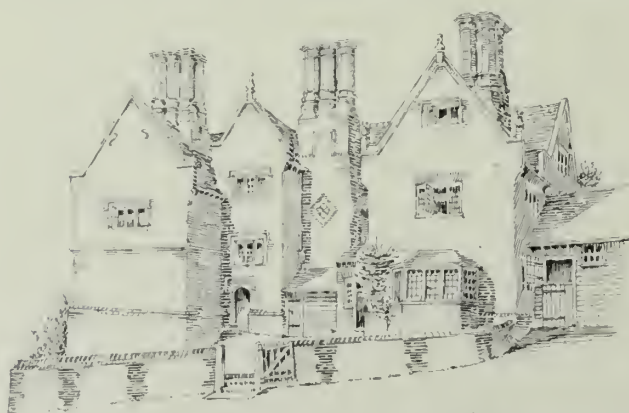
The same feeling which prompted this extension of plan also required the comfort to be obtained by the



CHARLTON HOUSE, KENT.

more general construction of fireplaces, and, consequently, chimney-stacks.

Brick chimney-stacks seem to have come into very general use about A. D. 1500. Many extremely beautiful



Wake End
to Wheatthampstead
Herts.
1890

examples still exist in buildings of much earlier date, but in most cases these are of stone.

Chimney-stacks may be broadly divided into two types — internal and external stacks — and from the usual plan of having a huge recessed fireplace or ingle nook upon the ground floor, were frequently of large dimensions, the effect of which, when seen, as in the case of an external stack, is very fine.

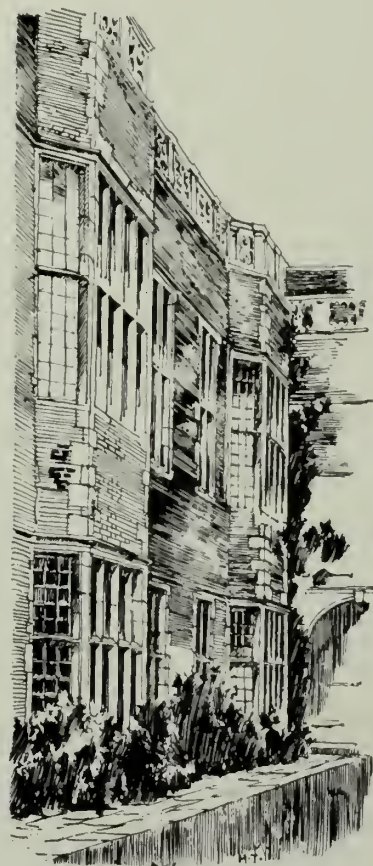
Early brick chimneys were generally grouped in rows upon square bases, which rise well above the roofs.



MOVNES PARK, ESSEX.

The plans of the shafts enclosing the flues are of very varied form — circles, octagons, and hexagons, — and these again were varied by having their sides curved, on plan, or again the moldings of an octagon or hexagon chimney-shaft were worked spirally from base to cap. The walls or shafts containing the flues were at first invariably separate, only being united by the projection of the cap and base molds, as the chimneys of Eton College, Hampton Court Palace, Eastbury House, near Barking, and Penshurst Castle, in Kent, which very well illustrate the mastery the brickbuilder had attained over his materials.

By degrees the flues were diminished in size, and their enclosing walls in the chimney-shaft proper were connected at first so slightly as still to give the appearance of detached shafts, as the chimney-stack illustrated from Wheatthampstead in Hertfordshire, which has three flues grouped together, the chimney-stack from Long Melford, or the very fine early example at East Barsham in Norfolk, a prototype of the many rubbed brick



BRAMSHILL, HAMPSHIRE.



ENTRANCE GATE, PEMBERTON'S
ALMSHOUSES, ST. ALBANS,
HERTFORDSHIRE.

sex country houses for the construction of the chimney-shafts proper. Even when the lower part of the stack consisted of masonry, the upper part was often built with bricks. This method of building is probably due to the fact that the stone employed in building these houses was hardly suitable for the construction of chimneys, but whatever the cause, the present effect of these brick chimneys upon stone bases or walling is very charming.

The chimney-stack from Penshurst, Kent, here illustrated, is a good example of this.

The villages in the counties of Kent, Surrey, and Sussex abound in many varied examples of the plainer forms of chimney-stacks, many of which are worthy of illustration, and would amply repay careful study.

The caps of these simpler types are generally formed of the ordinary walling bricks, rubbed or molded brick being of very rare occurrence in these cottage buildings. The two simple forms, here illustrated, are from Udimore in Sussex, and Kilndown in Kent. It was a very

chimneys which were afterwards built in this country. Towards the middle of the seventeenth century the flues in many houses were often carried up together in one large square stack, and this was simply paneled on each face. The chimneys of the Deanery, at Winchester, and the old Sick House or Infirmary of the college at the same place are good examples of this variety of finish.

It is also interesting to note that brick was very generally used, on account of its adaptability and ease of manipulation, in some of the very beautiful Kent and Sus-

sex country houses for the construction of the chimney-shafts proper. Even when the lower part of the stack consisted of masonry, the upper part was often built with bricks. This method of building is probably due to the fact that the stone employed in building these houses was hardly suitable for the construction of chimneys, but whatever the cause, the present effect of these brick chimneys upon stone bases or walling is very charming.

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LAVER MARNEY, ESSEX.

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MANOR HOUSE, EXAMPLE OF STEPPED
GABLE.

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ALMSHOUSE, KING'S LYNN.



RESTORATION HOUSE, ROCHESTER.

bays, here illustrated, are those of the front overlooking the terrace walk and bowling green.

Hatfield House, in Hertfordshire, is another remarkably fine house of this period, and, like Bramshill, is built upon the H plan. The south front has angle towers much after the design of those at Blickling. Hatfield was erected by Sir Robert Cecil, between the years A. D. 1605 and A. D. 1611.

Another characteristic building is that of Ham House, near Richmond (Surrey), built in A. D. 1610.

Eastbury House, near Barking, in Essex, is a smaller type of house, built entirely of red brick, the mullions, window jambs, and gable copings being of that material.

The window jambs in this case have been plastered over in imitation of stone quoins. Possibly, at a later date, this has also been done in other cases; for instance, the windows of Seckford Hall, in Suffolk, where there is some cut and molded brickwork of this date in the jambs and mullions of the windows.

Some almshouses at Audley End, near Saffron Walden, in Essex, have much good brickwork of the same period.

At St. Albans, in Hertfordshire, the entrance gateway of Pemberton's almshouses is worth notice, and in the village of Flamstead, six miles away, the almshouses are built entirely of red brick, the copings and finials being particularly good.



RESTORATION HOUSE, ROCHESTER.

Water End Manor House, a small country house near Wheathampstead, in the same county, is also a good example of this date, and likewise has copings, strings, and finials executed in molded brick, as are the caps and bases of the very perfect and beautiful chimney-stacks.

The almshouses at Harefield, near Uxbridge, present another good example. They are built around three sides of a small quadrangle, and have the characteristic chimneys of the period. The springers to the gables in cut brickwork are especially instructive.

At King's Lynn, in Norfolk, the almshouses, here illustrated, are built entirely in brickwork. The gables are



ST. JOHN'S COLLEGE, CAMBRIDGE.

very simply treated with plain hollow curves, finishing with a flat pediment.

The gables of this period were treated in many and various ways, and were perhaps the most thoroughly typical feature, as they afterwards fell into disuse, owing to the increasing influence of the classic school whose chief if not sole idea of the way to finish a building was to run a parapet round the summit of its walls, keeping the roof and chimneys as much out of sight as possible.

The earliest form was the stepped gable, doubtless of Flemish origin, which afterwards gave way to those formed of segments of circles and curves.

The stepped gable was common throughout the eastern counties, and is also to be found in some places in Kent and Sussex. The gateway from Canterbury, previously illustrated, has this form of gable.

St. John's College, Cambridge, has some extremely good examples of the later segmental gables.

Restoration House, Rochester, also has gables of this type.

The gables on the south front of Mackeraye



MACKERAYE END HOUSE, HERTFORDSHIRE.

End Manor House, near Wheathampstead, in Hertfordshire, present another variety of this form. In this instance, a flattish pediment forms the crowning member of the gable.

Perfectly straight gables were also often built in brick. Those at Water End Manor House and the almshouses at Flamstead, both places in Hertfordshire, are formed with molded bricks, as also are the springers and the finials which sit upon these and the apex. The gables of Moynes Park, Essex, are another instance of this form.



MOYNES PARK.

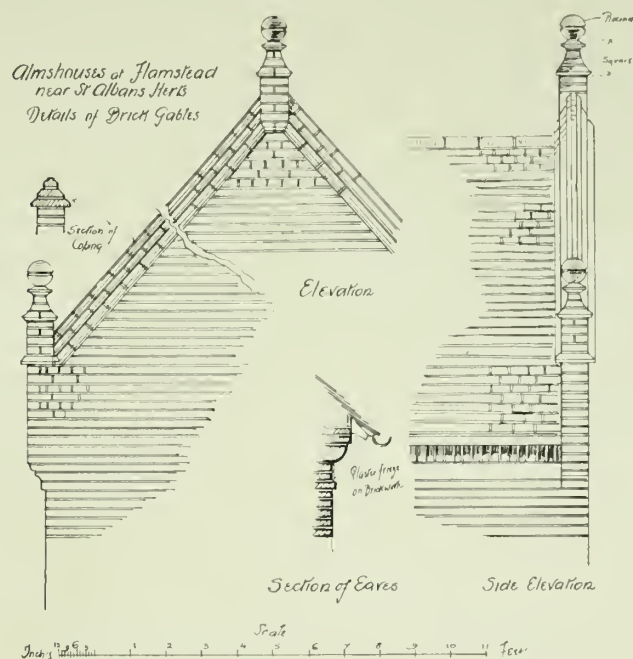
The large houses of this date were generally surrounded by extensive and elaborately laid out formal gardens, the protecting walls of which were frequently built in brick. At Byfleet Manor House, in Surrey, the forecourt walls, here illustrated, still remain; the walls here are 14 ins. thick, but from the treatment of the broad, sloped coping

have a fine and massive appearance, giving a feeling of strength and security to the enclosed space.

The almshouses at St. Albans, already referred to, are set back from the main road within a forecourt enclosed by brick walls, the entrance gateway in which is a good example of work of this period.

Brickwork is not very often to be found in ecclesiastical structures of this period, indeed very few churches were founded, or even added to, at this time, and in most towns and parishes the existing churches probably amply sufficed for the needs of the population.

The illustration of Feering Church, Essex, shows part of the aisle and porch which are entirely built of brick, and though possibly rather earlier in date than the period we have been considering, it is too excellent an



example to be passed over. The moldings of arches of porch, jambs, and mullions are executed in molded bricks, as are the battlements and cusped corbel table under. The gable of the porch is of the stepped variety already referred to.



SHREWSBURY.

Examples of brickwork with half timber construction.

"The Brickbuilder" Competition. VII.

AN ENTRANCE TO A CITY PARK. CRITICISM AND AWARD.

BY HENRY BACON.

PROGRAM.

THE municipal authorities of a large city, in the residential portion of which is a park, have condemned adjacent property for the purpose of enlarging the park.

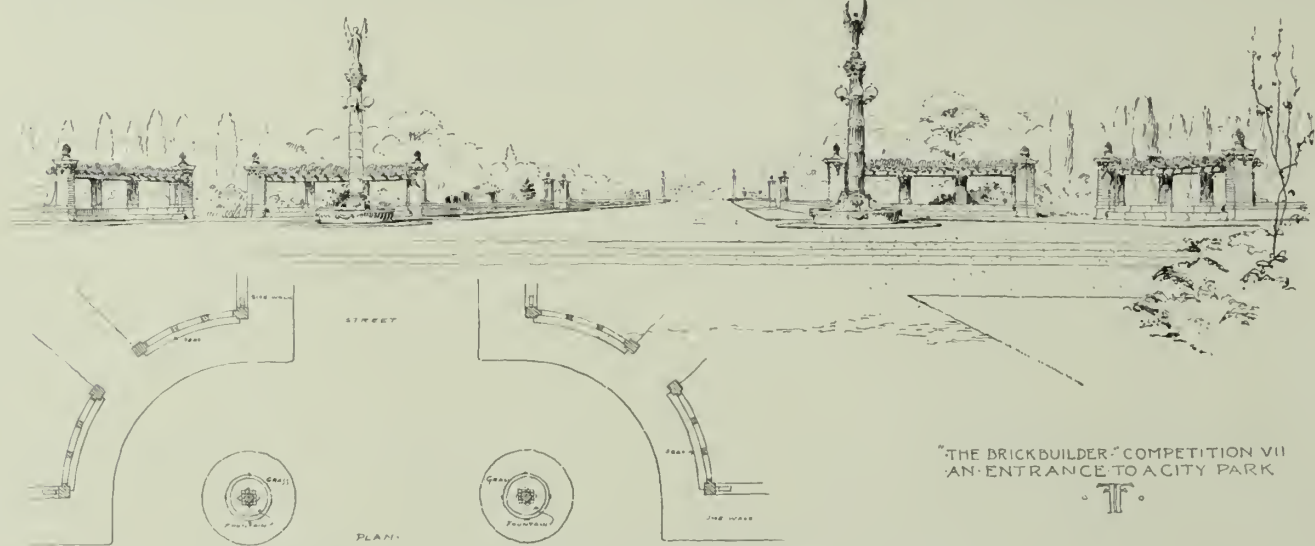
The present park is bordered by wide streets, devoted to traffic and car lines, none of which can be closed.

The addition to the park will be rectangular, of the same width as the present park, and separated from it by one of the streets which runs from east to west.

The purpose of this competition is to provide an entrance to each of the portions of the enlarged park, at the west end of the intersecting street, and to so treat

between the sidewalks and fountains is well adapted for the avoidance of congestion, and the fountains and pergolas shading the seats at each side of the entrances to the two sections of the park are useful and agreeable features. On the other hand, the two columns surmounted by figures are not of a character which would be best perpetuated in the material called for in the program. The design would be better if the fountains were enlarged and the columns either omitted entirely or replaced by piers treated in a manner more suited to the materials prescribed.

The design placed second, designated by a capital, shows a knowledge of detail superior to that evidenced by any of the other competitors. This design is excellent from all points of view except one, which is that it is too small in scope for the large site. The materials, brick and terra-cotta, are employed with a good understanding of the principles which underlie their proper use, and none of the other designs, including the first, approach the scheme of the designer in this particular.



FIRST PRIZE DESIGN.

W. PELL PULIS, NEW YORK, N. Y.

the street that its commercial character will disappear as much as possible.

The park ground is undulating, and the general character of the roads and planting is rural.

The design for the entrance is to be such as is adapted to working out in burnt clay products.

Most of the designs submitted are far below the standard that might be reasonably expected, considering the requirements of the competition, and, though some show a certain excellence of conception of the general scheme and others a good expression of detail, none of them present a satisfactory solution from all points of view.

Of the designs submitted in this competition five have been selected for criticism.

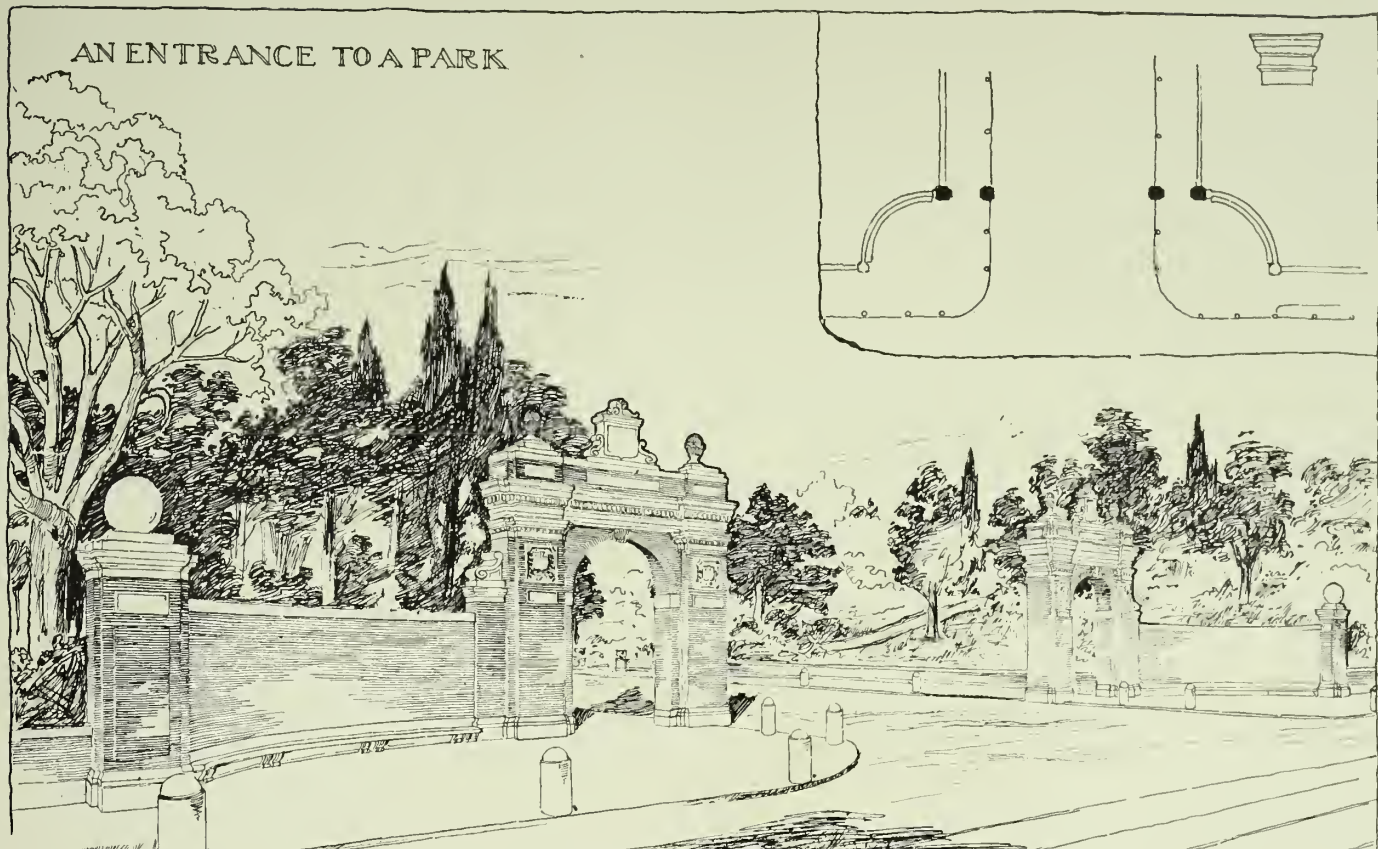
The design placed first is marked by the symbol "FF." In general plan this design is broad and simple, giving ample space for the uses noted in the program for the competition. The general view of this design is pleasing, and shows a generous space given up by the park to the street, an excellent feature which is too often overlooked in the design of park entrances. The space

The entrance to the two sections of the park are not as distinctly placed as in the design submitted by "FF," nor is the space devoted to the intersecting street so planned as to give the right expression to its voluminous use. The plan of entrance in this design and the other designs criticized, with the exception of the one placed first, does not give the freedom for traffic provided in the latter.

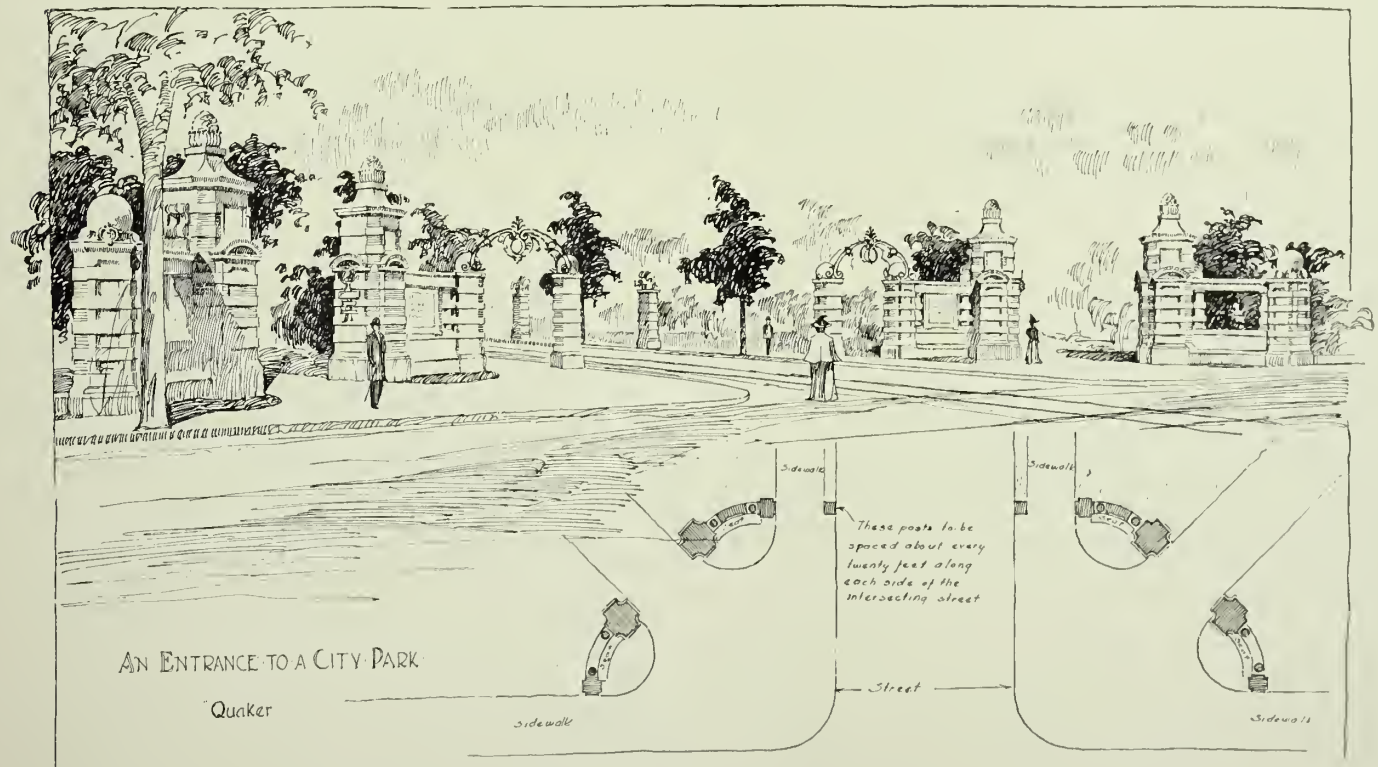
The design by "Quaker," placed third, is simple and orderly, but falls short of the first two designs in conception and detail. The entrance to the two sections of the park are as well placed as those in the design placed first, but there is no climax in the composition, and the proportion of terra-cotta to brick is too great for a successful result.

The design by "Old Virginia," placed fourth, is of a character that would be more appropriate for an entrance to a private institution. The minor entrances are too small, the curved ramps between the large and small posts are in poor taste, and the vases and lamps on these posts are of a severely contrasting variety.

The design by "Pipe Dreams" is placed fifth, and,



SECOND PRIZE DESIGN.
H. K. JONES, PITTSBURGH, PA.



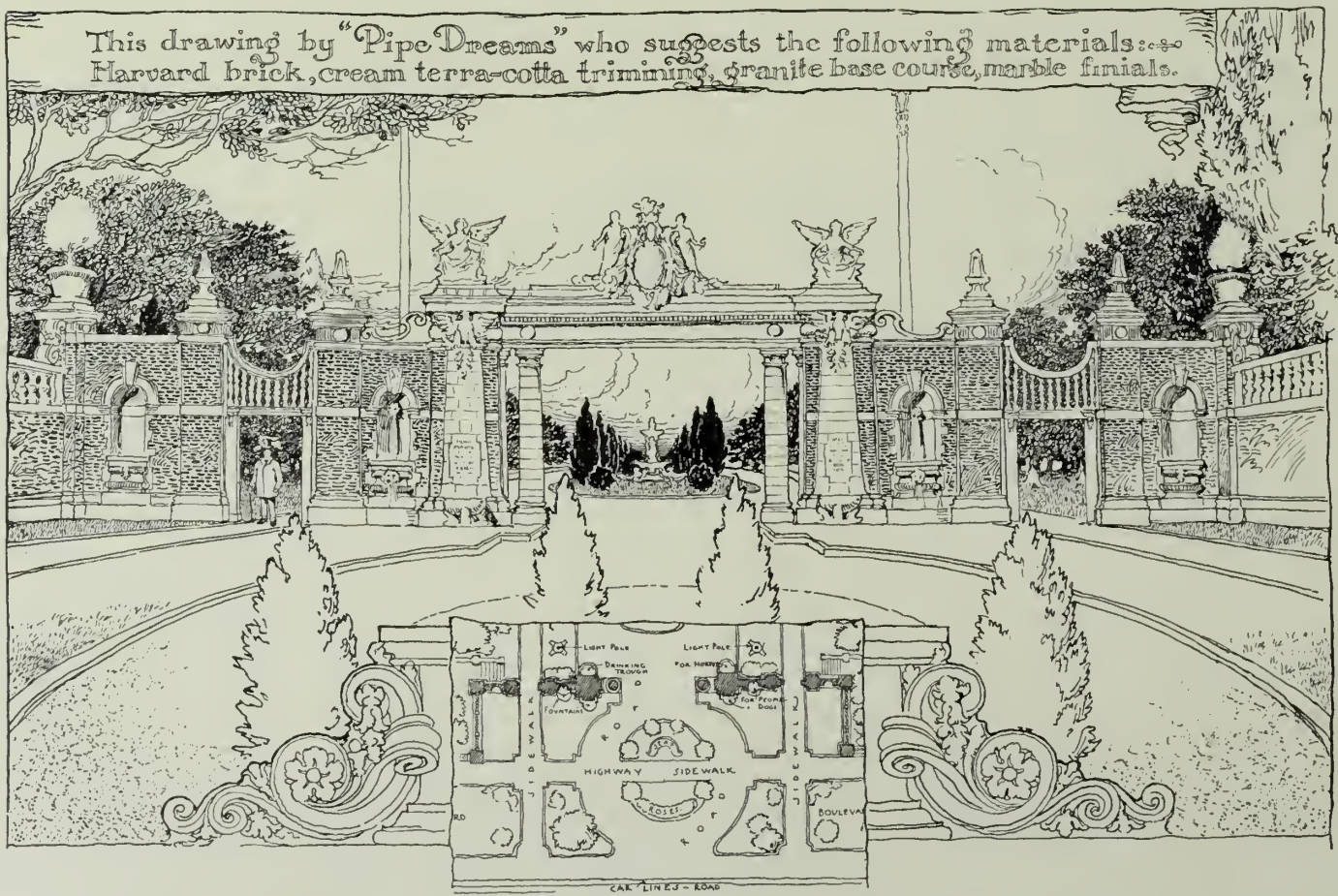
THIRD PRIZE DESIGN.
ROBERT C. HEATH, GERMANTOWN, PA.

like that placed fourth, is too small for the purpose. The character of the central opening is not in keeping with that of the rest of the design, and the large beam surmounted by a cartouche over the two columns indicates too clearly the use in its interior of the iron necessary for its support. The bad proportions of this open-

ing are a good illustration of the error into which it is easy to fall by too intent a consideration of the practical use of iron in designing masonry. The plan of the intersecting street is tortuous, and the whole scheme is more restricted in spacing than any of the other designs submitted.



FOURTH PRIZE DESIGN.
FRANCIS S. SWALES, DETROIT, MICH.



MENTION.
FRANCIS S. SWALES, DETROIT, MICH.

Modern Architecture.

(Continued from June number.)

If we look around with unprejudiced eyes, and see how art moves everywhere, how artists toil in forming new ideals of beauty, and we consider what has been already accomplished, then must we be convinced *that between the modern and the Renaissance there now extends a wider gulf than that between the Renaissance and the antique.*

COMPOSITION.

As already indicated by the word, art is ability or power, elevated to perfection by a few of the elect, and furnishing beauty with a perceptible expression. If this expression be received by the eye, this power corresponds to the conception of formative arts. Of the formative arts, painting and sculpture always have their models in nature, while architecture has man's creative power as a direct basis, and it is able to present its product as an entirely new creation. The primitive germ of this new creation has its fruitful soil in human life; to this is related the problem, which art must solve by means of the architect. This problem is to correctly recognize the requirements of mankind, and it is the first basal condition of successful creation by the architect.

The beginning of all architectural creation is composition. It is well known that a recipe for an architectural composition cannot be given; yet in considering what has been said, the following may serve as the commencing point of composition. Before taking up the pencil, a good and great conception is to be studied and thoroughly considered. Whether it appears as a lightning flash or slowly reveals itself, whether it be worthy of deep thought and refining, whether on first being worked out it appears a prize or a blank, or whether it must repeatedly be commenced anew, all these are of no importance. But this is certain, that a happy idea as a basis and its perfect mental evolution are of far greater importance to-day and contribute more to the appreciation of a work than the most lavish ornamentation produced by the natural and unconscious powers of the artist.

A certain practical element, with which mankind is now saturated, cannot be created without reference to the world, and every artist must eventually conform to the law: *Anything that is unpractical can never be beautiful!*

After grasping the basal idea, it is further important to note the requirements according to the program for the building, and to arrange these clearly together, thus producing the skeleton of the edifice. This arranging must follow the development of the ground plan, which concerns the building in the most important way, and we must proceed with the aim to produce the clearest and simplest solution by making prominent rooms and masses in an empirical way, until a so-called academic ground plan or type of building results. The simple arrangement of the plan will always aid orientation in the building and the required economical construction of the edifice. It is evident that the external form of the building must keep equal pace with this planning. Such a mode of procedure is advisable in every architectural

design and is indispensable in competitions, if any result is expected.

It must always be deemed a great error to adapt the required internal structure to a favorite external motive, or to sacrifice it thereto. Falsity is then unavoidable, and the resulting form has a repugnant effect. An apartment house for renting, which parades projections without apparent motive, towers, and domes, or prides itself on having the appearance of a palace, as well as the so-called stylish furniture, on which one sits with discomfort, both alike have the same foolish effect, and are merely artistic lies.

Every composition will essentially be influenced by the material in which it is executed and by the technical skill applied to it. This will be discussed later, and is merely mentioned here, because composition must always adapt itself to materials and workmanship, and not conversely. The composition must also very plainly show the materials for its execution, and the mode of working them. This is true, whether for a monumental edifice, or for the design of the smallest ornamental object.

But composition is plainly connected with many other things. The most important are the pecuniary means at command, the geographical location, the special attention to be paid to that locality, the probable duration of use, esthetic suitability to its surroundings, and an external appearance entirely corresponding to its internal construction. In the cases mentioned, an endeavor to express truth must be the guiding star of the architect; then characteristic treatment and a symbolism of the work arise naturally; in the church will appear sanctity, purpose and dignity in the building for government purposes, and cheerfulness in the edifice for amusement.

But too frequently must the composition comprise the entire object produced, and the desired opportunity is then offered to the architect for influencing and deciding by his abilities those points, such as heightening the effect, preparation for the view, creation of resting points for the eye, etc. Our modern era is very susceptible to grand effects, which are caused by the previously unknown congregating of men in large cities, and this supplies the motive for a certain noble impulse, which frequently permeates modern creations. It may then be stated with great satisfaction, that in the arrangement of the general design, of the squares and streets, in the location of monuments, and in the consideration of avenues, entirely aside from great structural creations, the vast advance in engineering science has made results possible, and our modern art has created works, beside which neither the Renaissance nor the antique can place their equals.

Here should we loudly cry "Forward" to the modern creating architect, and warn him against too great and too devout adoration of the Ancient, so that although modest, his self-consciousness may again appear, without which a great work cannot usually be produced.

To composition likewise belongs the higher treatment of architecture. By this is meant a proper cooperation with the sister arts of sculpture and painting. The architect should never lay down the supreme command. Whether it concerns the external or internal ornamenta-

tion of his work, or art monuments are to adorn more extensive designs, streets, and squares, the architect must alone and always be the leader, since everything must be subordinated to the basal conception made by the architect. Errors of this kind in art monuments become very apparent and constantly occur. Every art monument is an integral portion of the square on which it is intended to stand, since the square must exist before the monument is designed for it; thus the square is not created for the monument, but conversely.

All such mistakes are always charged to the executing artist, and they usually occur because the monument was designed before its location was fixed, or the artist adopted the too common opinion that the work must be considered by itself alone, instead of adapting it to the dimensions of the square, the height of the enclosed space, or the outline of the background. It must be said that the architect will generally decide on such points more correctly than will the sculptor or painter. Similar importance must be placed by the architect on the magnitude of statues in relation to the building and to each other; it is immaterial whether they adorn a square, a building, or a room, are executed in relief, or in the round.

To composition further belongs artistic economy. By this is meant moderation in the application and treatment of forms transmitted to us, which corresponds to modern ideas and extends to extreme limits. This is especially true of forms, which are accepted as lofty expressions of artistic conception and elevated feeling, such as domes, towers, quadrigas, columns, etc. Such forms are generally only clearly sketched out and are sparingly employed, since their too frequent use would always produce an inverse effect. A simple and practical basis must be our point of view, if the work is to be a faithful reflection of our era, fully and completely expressed.

Not to weaken these principles, but to come nearer truth in design, it must be emphasized that architects in different countries have to employ forms of more or less richness to express local characteristics. It is only logical that the South Germans, the French, or the Italians must have different ideals of beauty, and composition should go so far in the endeavor after true modes of expression that even the period and fashion may be properly emphasized; all enduring art-works are thus adapted with tolerable accuracy to their time and location.

This is the place for a careful consideration of the points mentioned in this work as plainly influencing composition, so that in different places are found differences in the artistic expression of the object. It is further certain that the national element has only entered into art in this natural way. From the similarity of the modes of life of peoples in civilized countries, these diversities will never be great. For these reasons, an obstinate adherence to ancient styles for certain monuments, or the selection of an antique style for a certain people, may be termed a fad, even although Germans are very well suited by a portion of what is known as the "Old German" style.

It cannot be the object of this essay to illustrate everything relating to composition, nor is it possible to restrict it within a domain in which any subject is classed. Hence, much that has been said must be ex-

tended by the reader. Limited to the most important ideas, space may be found for the following.

A simple and clear arrangement of the plan generally requires symmetry of the building. There is something decided, completed, well weighed, incapable of extension, indeed, self-conscious, in a symmetrical design, which is required by earnestness and dignity, the constant attendants of architecture. Only where the form of the site, the purpose of the building, the means at command, or the style to be used make symmetry impossible, is an unsymmetrical solution justifiable. The aping of an unsymmetrical building, or a designedly unsymmetrical composition, to produce a picturesque effect is entirely to be condemned; yet all ancient models of this character originated only because later generations introduced successive alterations into the symmetrical design of the building, causing thus its unsymmetrical form, which was never originally intended.

The designing architect must place great stress on perspective effect, or must so arrange the outlines, the subdivision of the masses, the cornices, the projections and recessions of the masses, the relief of moldings and ornaments, so that they may appear with correct emphasis from a *single point of view*. This point will naturally and most commonly be that from which the work will be most frequently, most easily, and most naturally viewed. Nearly all art monuments show the great weight their creators laid on this principle, since examples occur where the architects limited the distance of vision so as to compel the observer to view the building in this way and not otherwise. Hence, edifices in narrow streets must be quite differently outlined and have ornaments and projections in lower relief than those on wide streets and squares, or such as are to produce an effect at a distance. These forms are so much influenced that an increase of one or two yards in the width of the street must be taken into account.

There are also architectural works in which it is plainly evident that they were designed for two different distances of vision. Many buildings with domes and towers, some triumphal arches, etc., make this apparent. The aim for external effect in such edifices is then two-fold; the façade and its details must satisfy the observer on the square or the street, while the lofty superstructure, with its rich outlines, either forms an integral part of a perspective view, or must harmonize with the view of a city, in order to become a characteristic monument, visible from afar. Especially well designed in this respect are some edifices in the Barocco style, and their study in relation to perspective effect and to well-considered distance of view is therefore warmly commended to the future architect.

Less refined, although always sufficiently finished, are some examples of buildings in the Gothic period. The bringing of Gothic cathedrals into greater prominence by removing adjacent structures is, therefore, very objectionable, although this has been favored of late, because it was certainly not so intended originally, and all such changes have ended in failure. The changed distances of view for the cathedrals of Paris, Cologne, and Milan are eloquent in this matter.

It is a property peculiar to human designs that the eye of the observer of every art work seeks a point of

rest or concentration, because otherwise a painful insecurity or esthetic dislike results. This always causes the architect to arrange such a focal point on which the visual lines of observations may be concentrated. Failure to accent the center of axis of a square, that of a large building or apartment, the perspective view of a street ending in nothing, or any unjustifiable lack of symmetry are all to be classed as faults, since they do not fulfil the preceding requirement.

A more important human peculiarity even more strongly influences architectural composition, and consists in the need and desire for heightening the intellectual effect, and only after this is accomplished does there occur greater satisfaction. The mental reception of the impression made by great monumental designs may be explained, as that the general image is at first indistinctly received, and only after a few moments does the glance and the impression slowly concentrate on a point, in which the outlines, the surroundings, and the general arrangement participate. Then occurs the fixation of the eye. The necessity then first appears for observing the effect of the different parts and of the details by continually changing the point of view. To satisfy such human requirements by artistic creation belongs to the most difficult problems of architecture.

The object created only receives at a late period an unprejudiced judgment, since this results from the long duration of its construction, and the slowly maturing appreciation by the public. The laws by which such problems are to be solved form an integral part of the main ideas of the composition and frequently are a revelation of the creator of such works. They may be said to form the "counterpoint" (theory of harmony) of architecture. A few hints may make this clear. They will show where, among other things, the architect must fix his aim to obtain artistic solutions of such problems.

Constant consideration of horizontal and vertical angles of vision by the observer under every mode of arrangement.

Grouping of separate buildings for general effect.

Utilization of the site and of the landscape background.

Adoption of new, and a correct estimation of existing, perspective views and vistas, both outside and inside the edifice.

In designing a street, continual regard must be paid to the varying views at its ends, which will be presented to the observer.

A properly emphasized and well-placed point for the eye to rest upon.

Correct location and marking of axial breaks, both externally and internally.

Dignified accenting of the ends of important streets.

Well-considered magnitude and importance of buildings and monuments in relation to the forms of cities, squares, and streets.

Clear and easily understood characteristics of the building.

Consideration of the effects of dimensions, of sequence, and of coloring of rooms.

And many other things as well.

If the solutions of such questions are to satisfy the previously stated requirements of mankind, such as

desire for enhanced effect, for a carefully arranged point of view, for a point of rest for the eye, for proper limitations of form, and for entire satisfaction, they then demand from the architect high abilities and strenuous thought. The Renaissance and Barocco masters supply excellent examples. Our modern period particularly esteems large dimensions, has often successfully employed such suggestions and traditions, and it has created works which we may regard with justifiable pride. Thus the view from the future central building of the imperial Pacale in Vienna towards the Maria Theresa Square, after the completion of the rear portion according to Semper's immortal design, and the removal of the ancient gateway, will excel all others in effect, in visual arrangement, in well-conceived surroundings, in outlines, and in a resting point for the eye. That these remarks can only influence the future architect, and that they would be entirely useless without artistic treatment, scarcely requires emphasis.

But all qualities indispensable to the architect retire behind imagination and taste, these alone being able to produce those magical results which are required to free and elevate mankind.

CONSTRUCTION.

The necessity for protection against injury by weather, by men and animals, was certainly the earliest occasion and purpose of the building. In the edifice itself is the germ of all construction, whose development progresses with its purpose. Such creation is based on the idea of mere utility, which cannot suffice, for the feeling for beauty is innate in mankind, calls for the aid of art, and makes it the constant companion of construction. Thus arose architecture! The decoration of huts and caves by flowers, boughs, trophies, arms, and memorials certainly aroused the earliest tendency to imitation, and thus originated the earliest art of architecture, which awakened its sister arts of sculpture and painting. Their works are the independent creations of the beautiful.

Requirements, purpose, construction, and idealization are then the primitive germs of artistic life. United in a single conception, they form a necessity for the origin and existence of every art work, and this is the meaning of the words: "*Necessity is the sole mistress of art.*"

Gottfried Semper first directed our attention to this truth (even if he later deviated from it), thus clearly showing the path to be pursued. Requirements and construction keep equal pace with the aspirations of mankind, which majestically progressing art can only follow distantly. A fear lest the principle of mere utility may suppress art is then apparent. This has even led to a contest, unjustly commenced, where persons were of the opinion that the opposition between realism and idealism is insurmountable. The incorrectness of this view is in the assumption that utility may completely supplant ideality, and in the deduction that mankind could live without art; while it is true that utility and realism precede in order to prepare for the works to be executed by art and idealism. From the origin of art to this time, this precedence and this progress have remained the same, as will clearly appear by a glance into the past.

Man's earliest architectural form was the roof, the protecting ceiling, certainly used as a substitute for non-existent caves. It preceded pillars, walls, and even the hearth, being succeeded by supports artificially built of trees or stones, later followed by wattled work forming the wall or partition. These elements received a further development in permanent settlements by tools and by natural accidents. Traditions, a continual addition of new purposes and new materials, together with the art innate in man, after an infinite period of development, all these have generally raised to artistic forms the primitive shapes of pillars, walls, rafters, etc. Only in this manner can prehistoric art have arisen. No doubt can exist concerning the accuracy of this statement. Besides, if we examine all art forms of historical periods an almost unbroken course of general progress from the era of their *structural* origin until the present may easily be proved to exist. Logical reflection must, therefore, lead us to the conviction that this law is *unavoidable*: "*Every architectural form was produced by construction, and it has gradually become an art form.*" This primary law bears all analyses and explains to us every art form.

Already in the essay on "Style" and in the Introduction, it was emphasized that art forms experience changes. Aside from the fact that the form must correspond to the ideal of beauty during the period considered, these changes occurred because the mode of execution, the materials, the tools, the means at command, and the requirements all have varied, and, further, because in different countries was added thereto the fulfilment of different purposes.

Hence, a structural basis influences forms, and it may therefore be deduced with certainty that new constructions must likewise yield new forms. More than in any earlier period our latest era has produced the largest number of such constructions (merely consider the results of the use of steel). What can be more logical than to maintain: *That if art is by construction supplied with so much that is entirely novel, there must arise from it new forms, and usually a new style.* If all these forms have not yet become perfected art forms, this can be explained by the reasons previously given, since mere utility first prepares them for art. The fact may also be emphasized that every development of form always proceeds slowly and imperceptibly.

Semper has the merit of having proved this axiom in his book "On Style," although in a somewhat indirect way. Like Darwin, he did not have the courage to fully complete his theories, and stopped at a symbolism of construction, instead of designating construction itself as the germ-cell of architecture. Construction always comes first, for no art form can originate without it, and the problem of art, which is to idealize existing objects, becomes impossible without the existence of the object.

The development of original art forms corresponding to modern construction thus depends on ourselves, and the possibility of creating such forms is afforded and made easier for us by the rich inheritance that we have received. The useful result of this discussion is a very simple one: "*The architect must always develop the art form from the construction.*" Modern mankind accordingly understands the immense importance of construction, and has assigned the most distinguished experts to

its greater perfection. This domain has thus become so vast that it naturally leads to subdivision of the work; hence, the technical specialties of bridge construction, of railway construction, of girder construction, etc., which are now developed very rapidly.

Yet construction enters the domain of art, for the architect will select, specify, perfect, or invent the construction most naturally applicable to the edifice to be created by him and best suited to the art form to be produced. The means at command and the purpose of the building will always produce variation between the limits of mere utility and of artistic execution, but correct judgment will guide the influence of the architect or engineer.

Therefore, the engineer, who takes into account not the future art form, but only the statical calculation and the matter of cost, speaks a language unsympathetic to mankind, while the mode of expression of the architect remains unintelligible if he does not proceed from the construction. Both of these are great errors.

Since the engineer is seldom a born artist, and the architect is generally made an engineer, it is safe to assume that if art is in time to improve, the architect must extend his influence over the domain now occupied by the engineer, so that the correct esthetic requirements may be satisfied. The succession of preliminary utility and of art development will always occur, and in time will increase the unsatisfactory effect of the work of the engineer. There is no thought of lowering the status of the engineer, but great abilities in both lines are seldom combined in the same individual.

If the proposed art form is derived from the construction, the latter is further influenced by many other things, to be mentioned later. One of the most important elements may be taken as a strictly expressed requirement of our modern period, and may be discussed here. This is the time allowed for erection and the durability usually dependent thereon. It is a very general opinion, though in part entirely false, that modern methods of construction are greatly lacking in solidity, because they are very rapid. This is the result of speculation, which naturally has nothing in common with art, but is its greatest enemy. Yet if our modern construction be closely examined, we are easily convinced that the reverse is true, and that modern construction is suited to a definite problem, as well as to produce both economy of time in erection and durability, two opponents. Modern construction exhibits great results in this way.

In the methods of construction employed during all periods, there is an evident desire to assure to buildings the greatest possible stability and permanence in order to obtain eternal duration, one of the most important ground principles of architecture. After modern construction produced a complete change in the time of erection required, though the principle of durability remained the same in art, construction was required to solve this problem, and it was compelled to adopt new means to satisfy this requirement. These methods were chiefly the use of new materials and the introduction of machines. Their influence on art forms must certainly become apparent.

A further problem therefore falls to the architect, and

he not only has to plainly indicate the construction in the art form created by him, but he must also produce the conviction in the observer, that the material employed and the time of erection have both been properly expressed therein. Faults in this respect are only too numerous. Art forms, where the time of erection neither corresponds to the effect nor to the material employed, always have something untruthful or irritating. To this category belong consoles and corbels that support nothing, steel structures that bear the impress of stone forms or exhibit a latticed appearance, plastered exteriors that appear to be of stone construction, and most external details that seem to be other than they are.

But where the aim of the construction is to combine reduced time of erection with equal or greater solidity, and with artistic forms of equal worth, this must be accepted as correct and as required by the problem. An example will show the correctness of this view. For a prominent monumental edifice, a colonnade with an entablature is executed as the chief motive of the architectural treatment of the upper story. The building is constructed of horizontal courses of stone, which material is procured with great expenditure of time and money. Immense stone blocks, that recall the system of construction used by the ancient Romans, are employed for the lower members of the main cornice, being structurally necessary because the modillions of the entablature are wrought in them. The procuring and dressing of these blocks cause great sacrifices of time and money. This mode of execution should be termed the "Renaissance mode of construction," and a "Modern method of construction" with it, for the same problem. Stone slabs are employed for the external covering (plane surfaces) of the building. The volumes of these slabs being materially less, they may be of nobler materials, as in marble. The anchoring of these slabs would produce bronze knobs or rosettes. Anchored steel supports would be used to bear the strongly projecting cornice, divided in thin courses, and these supports would be covered with gilded bronze coverings in form of consoles. The result of this comparison would be, that the volume of stone-work would be from one fifth to one sixth that of first method, the number of ashlar would be less, the monumental effect would be enhanced by the nobler material, the amount of money required would be largely reduced, and the time of erection would not exceed the desired limit.

Here are certainly sufficient advantages to cause the preference of the modern method of construction in such a case. But the list of advantages is not exhausted, a greater one being that a number of novel artistic motives are produced, whose development is not only very desirable for the architect, but he must seize upon them with haste and zeal to truly make progress in the art. Results of this kind are not isolated, for every object without exception will yield them to the creative architect, if considered from similar points of view.

It must be natural for modern men, who prize the value of time, to promote those systems of construction that can satisfy their wishes in this respect. This again occurs by the use of materials quickly obtained and of good quality, by subdivision of the work, or by commencing

different portions of the structure at the same time, so that a quicker method of erecting the edifice results. If the structure be substantial, it will supplant earlier methods in spite of an increased cost. It is evident that new forms must result from this procedure.

Ease in obtaining any material must vary in different countries, and, therefore, its use and the perfection of its treatment also vary. Thus, in certain countries some materials predominate, a fact that the architect can never neglect, since the aspiring ideal of beauty also requires "local character" (exteriors in brick, plaster, half-timber work, etc.).

One matter is in close relation to the time of erection of a building and requires mention, since most clients, and even the architect himself, are incorrectly informed in regard to it. This is the time required for the graphical, artistic, and structural working out of the project entrusted to the architect. The production of artistic works is partly empirical creation, and is but too frequently dependent on caprice and inspiration, but such work will never be so free from faults that the artist executing it could not indicate desirable changes (although usually too late).

For apartment houses, which owe their existence solely to a tendency to "investment of capital," the time during which the architect must complete his work is always so small, or is even limited to a few days, because the owner usually permits the building to be commenced immediately after employing the architect. For monumental buildings, a sufficient time is usually allowed to the architect for studying and completing his project so far as to make great changes unnecessary, and he even frequently enjoys the privilege, not sufficiently prized, of being able to properly take everything into consideration by means of a model of the edifice, before its erection is commenced. It is, therefore, proper to consider this fact in judging artistic works.

Among materials that particularly influence the modern fashion of architecture, steel naturally plays the chief part. Its structural forms accommodate themselves least to the multitude of forms transmitted to us. In the rich inheritance of art now available, we find almost nothing that would aid us in a beautiful treatment of the forms of steel. If there be a further adherence to the unsympathetic principle of mere utility connected with steel, it is not sufficiently considered that where art shapes this material, entirely novel forms are produced, and that one of the greatest impulses is thereby given toward the existence of the new style. The properties of steel are indeed so extraordinary that it is able to satisfy almost any requirement, and, therefore, in regard to the use of this material, only pecuniary limits need be considered. Its universality has led to its predominance, so inartistic and offensive a few years since. Other new materials, together with its incomplete and somewhat doubtful resistance to tests, as well as pecuniary reasons, have had a sobering influence, and have limited its use to correspond with the artistic views of modern mankind. There still remain many edifices structurally and esthetically affected by the use of steel, so that its existence and its influence on our present architectural system may be said to set a fashion.

(To be continued.)

Fire-proofing.

RATIONAL METHODS OF FIRE PROOFING.

BY WILLIAM COPELAND FURBER,* M. AM. SOC. C. E.

THE experiments by James E. Howard (*Iron Age*, April 10, 1890, Kent's "Engineers Pocket Book," p. 382) indicate that steel has its maximum strength at about 400 degs. Fahr. These experiments are also confirmed by other experiments of a similar character (see *Journal of Franklin Institute*, CXII., p. 241).

Howard's experiments show that the strength is affected also by hardness of the steel, the hard steel having a higher resistance than the soft steel; thus he found that .10 per cent. carbon steel had a strength of 20,000 lbs. per square inch at 1000 degs. Fahr., and .60 to 1.00 per cent. carbon steel had the same strength at 1,600 degs. Fahr. These facts teach us that in order to preserve the integrity of the structure, the temperature of the framework should not be allowed to greatly exceed 400 degs. Fahr.

Fire-clay is a native combination of the hydrated silicates of alumina, mechanically mixed with silica and alumina in various subdivisions, and sufficiently free from the silicates of the alkalis and from iron and lime to resist vitrification at high temperatures. According to the authorities, fire-clay contains from 47 to 80 per cent. silica and from 17 to 48 per cent. alumina. Fire-clay is probably the most durable substance that can be applied to the protection of ironwork from heat. The knowledge, however, of its virtues has frequently led the architects and manufacturers to decrease the thickness of the covering of the ironwork to a point where it no longer answers its purpose in a satisfactory manner.

Since the substitution of ironwork for brickwork in the structural parts of a building, the tendency has been to restrict the space occupied to the minimum, and this has resulted in begrudging every inch required for fire-proof covering, and, as a consequence, in such cases the fire-proofing is no longer of sufficient thickness to fully insure that the ironwork will be properly protected in event of great heat.

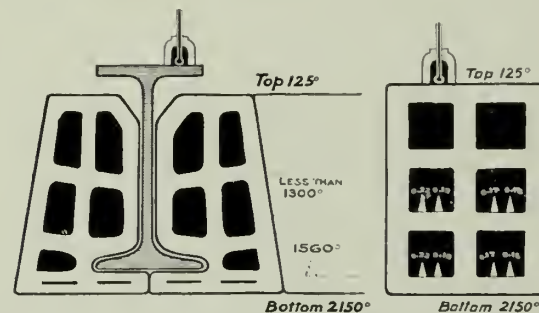
The skeleton building has reduced the area of piers and columns to such a small part of the area formerly required that the other extreme has been reached in making the sections of the minimum dimensions, with the least possible allowance for thickness of fire-proof covering, and, as a result of this, at least some of the so-called fire-proofing is a mere pretense; for while it is true that the covering is fire-proof in the sense that it is non-combustible and almost indestructible itself under trying conditions, yet it is not thick enough to afford insulation to the metal within it, to preserve it, and the term "fire-proof" has become, therefore, a misnomer. In those instances where buildings have been subjected to severe tests and failure has resulted, the unthinking critic has condemned the *system* of fire-proofing, whereas the *method* only, was at fault.

The necessity for dead air space cells makes it more difficult to insulate the structural work by preventing

any considerable conduction of heat from the point of application. A glass lamp chimney is kept below the melting point of glass because the heat of the flame is rapidly carried away by the upward current of air and by radiation, while if the heat were stored in it it would soon reach its melting point. The column and beam, not being able to give up their heat by conduction and radiation, store it up, and are, therefore, placed in an unfavorable position compared with the lamp chimney. The dead air space cells, however, play a very important part in fire-proofing, and are highly effective in the nonconduction of heat. Some authorities give the thermal conductivity of air as $\frac{1}{3300}$ part of that of iron; the data relating to these matters, however, is not complete, nor is that which is in existence in a very satisfactory shape. The value of dead air spaces, however, is very great, and the use of air-cells in terra-cotta fire-proofing is essential. Fire-clay with air-cells has many times the value of the solid material; it is evident, therefore, why they should be used in fire-proof coverings.

The value of air-cells as a nonconductor of heat is shown very clearly in the illustrations, taken from the catalogue of a prominent manufacturer, and will bear study by designers and manufacturers. Volumes might be written as to the behavior of fire-proofing under tests, but these illustrations contain more practical information than pages of general description of how a particular accident occurred, and why one place failed when another did not.

These experiments show that after a test of twenty-



EXPERIMENTS TO DERIVE THE TRANSMITTING POWER OF HEAT THROUGH HOLLOW TILES. CONDUCTED BY HENRY MAURER & SON.

five hours, with a final temperature of 2,150 degs. on the outside of the floor tile, a temperature of 1,560 degs. was found in the first cell adjoining the outside 1 in. of terra-cotta wall, and while twenty-five hours is a very severe test (for if time enough be given the whole mass would attain the same temperature), yet the reduction of heat is not sufficient to have maintained the full strength of the beam, even for a short time.

The temperature in the first air-cell is 1,560 degs. Fahr. If this temperature is obtained here, it is evident that the lower flange of the I-beam, which has not as much protection, is considerably hotter, and, as the temperature of the iron should not be allowed to greatly exceed 400 degs., it is apparent that this beam has lost a great part of its strength temporarily. The second cell shows a very much greater reduction in the temperature, and the top of the block shows a comparatively low temperature. The great capacity of the iron to absorb and transmit heat is shown in the temperature of the top flange of the beam,

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which is much higher than that of the terra-cotta. While this experiment was evidently made without scientific precision, yet it answers the purpose in an admirable way as illustrating the progress heat makes in going through the floor.

The cellular construction used in the body of the ordinary floor tile is wholly omitted about the flanges, and this is shown to be a mistake. The reason it is omitted is because it would make the floor thicker than usual, and this means that the building must be made higher, because the floor thickness would be increased.

The protection the beam should have is, of course, determined by the maximum temperature to which it is likely to be exposed, but in conflagrations temperatures of 2,500 degs. Fahr. are easily obtained.

S. Albert Reed (*Franklin Institute Journal*, November, 1896) estimated that the temperature of a fire at a lard refinery at 59th Street and Eleventh Avenue, New York, was 5,000 degs.

In the tests made by the committee of Fire Insurance Underwriters, the Architectural League, and the American Society of Mechanical Engineers in 1896, the committee decided to make tests on the following basis: 2,500 degs. for six hours, representing a conflagration; 1,200 degs. for one hour, representing a mild external fire; 700 degs. for one half-hour, representing a mild condition such as might occur in an office building or dwelling.

The building, to be effectually fire-proof, should be capable of resisting the probable maximum temperature, and, assuming that to be 2,500 degs., the ordinary covering is not sufficient.

It is quite possible to cover metal work in buildings so that the application of great heat for a short time shall not injure it, but in order to insure this, the covering must be thick enough.

The fire-brick lining of steel-melting furnaces is about 12½ ins. in thickness; the temperature of melting steel is about 2,900 degs., or 12½ ins. of fire-brick is required to insulate 2,900 degs. of heat. This thickness of lining insures that the hot steel shall not be chilled from the outer air, and also that the iron covering of a Bessemer converter shall not be reduced enough in strength to prevent it answering as a constructional envelope. This practical example gives us some basis for arriving at the thickness of covering necessary to protect the structural parts of a building.

The conditions of exposure, however, are greatly in favor of the steel converter, or the open hearth furnace, in this respect that, in these instances, the heat is conducted or radiated away from the outer walls into large volumes of air of ordinary temperature, which keeps their surfaces at a temperature corresponding to the capacity of the surrounding air to absorb it; while with a beam or column in a building, little or no opportunity can be afforded to conduct the heat away, because the air spaces must be "dead," that is, they *must not* be continuous, in order that, under no conditions, they could act as flues to conduct heat and fire along their length, and thereby defeat their purpose as a protective covering.

In buildings a covering of 1 in. of porous terra-cotta is all that protects the lower flanges of the I-beam; the girders usually have a trifle more, or a total thickness of 1½ to 2 ins. covering.

The experiments of Howard and others show that steelwork, to preserve its integrity, should not be allowed to attain a temperature exceeding 400 degs.; 1 to 2 ins. of terra-cotta cannot prevent this. It is probably true that manufacturers are not wholly responsible for the thinness of their covering, but are compelled to follow the footsteps of the original designers, because architects have been accustomed to the previous shapes and forms, and will not make any changes in the direction of increased thickness, and, if this is true, the responsibility for the present insufficient methods must rest upon the architect's shoulders. Manufacturers cannot be expected to make things they cannot sell, and if the thin coverings are the only kind they can dispose of, then they are in a commercial sense blameless; nevertheless, a moral responsibility rests upon them to prove to their patrons the necessity for a greater thickness of covering to insure the result striven for.

IS A FIRE-PROOF STRUCTURE POSSIBLE?

THIS is a question which was asked of an architect in connection with buildings of the State institutions of Indiana. "A fire-proof structure is possible," was the answer. "Fire-proof buildings have been destroyed," was the reply, "and how do you prove your assertion?" The architect said, "Why not consider a cupola furnace? Here is a structure of steel and clay. Where is there a building which may be submitted to such heat, and yet we find the furnace a relatively permanent structure. Of course, this is not an architectural structure, yet it shows possibilities. It indicates that with steel structural supports and a proper use of burnt clay such a structure is indestructible."

Now, it is true that many buildings with a minimum of steel and a minimum of clay protection are quickly and easily destroyed by the burning of a large amount of combustible material on the interior, but who will say that it is not possible to protect a steel structure by the use of burnt clay when he considers the intense heat to which the cupola furnace is subjected? The protection is not relatively heavy, but the work is thoroughly done and well applied. No architectural structure, with the material which it contains in the state of combustion, is ever subjected to the heat which is applied in a cupola furnace. The coke furnaces of Pennsylvania and machinery of steel manufacturing indicate clearly enough that fire-proof construction is merely a question of adequate thought and adequate workmanship. Steel or iron in itself is a material more readily destroyed by fire than wood, yet steel adequately protected presents an absolutely fire-proof building.

Many of our buildings are adequately protected in the places where they need it the least; for instance, there is 8-inch fire-proofing between beams, and only one inch under them. The surface between beams needs the protection the least, and the surface under them or over them needs it the most, and yet it is there where they get it the least. If any one ever questions the possibility of absolute fire protection or fire-proof qualities of a structure, why not think of the cupola furnace or the coke oven? — *The Clay Worker*.

Selected Miscellany.

NOTES FROM NEW YORK.

Hot! Well, I should say so! Although allusions to the weather may seem inappropriate in these columns,

stone office building to be built at 72 and 74 Broadway, to take the place of two small buildings which burned down about two years ago. The cost of the new building will be about \$900,000.

Janes & Leo have prepared plans for three five-story stone and brick dwellings to be erected on 83d Street, at a total cost of \$225,000.



ENTRANCE, HORTICULTURAL HALL, BOSTON, MASS.

Wheelwright & Haven, Architects.

Showing tile ceiling executed by R. Guastavino Company.

(Another illustration of the Guastavino work in this building is shown in the half-tone plate form of this number.)

they will have to be excused this time, for no influence is affecting business so much at present as the awful heat, and perhaps no business will suffer so much by the delay necessitated as the building trade and its branches.

Down-town there are a great many old buildings being torn down to make way for new ones, and this work of demolition is always trying in hot weather, but during the past week it has been impossible for the men to work, to say nothing of the horses, whose sufferings are even worse. A prosperous state of affairs still holds good with our architects, and the merry pencil pushers are all happy, for although the chance for liberal vacations is slim, there is a pecuniary compensation for those who deserve it that is eminently satisfactory.

A few items of new work follow:—

Bruce Price has filed plans for a twenty-story brick and

A twelve-story fire-proof building is to be erected at 140 West 42d Street, the site of the old St. Cloud Hotel. Bruce Price will be the architect for the building.

Clinton & Russell are preparing plans for a six-story factory building to be erected at Seventh Avenue and 16th Street, for the Oxley & Enos Manufacturing Company.

H. J. Hardenbergh has filed plans for an eleven-story brick and stone office building to be erected at Bridge and Pearl Streets, for the Maritime Building. Geo. A. Fuller Company will build it, and it will cost about \$400,000.

James B. Baker has filed plans for the new Chamber of Commerce Building to be built on Liberty Street near Broadway; cost \$500,000.

Renwick, Aspinwall & Owen have planned a twelve-story brick and stone hotel to be built on 44th Street; cost \$200,000.



WINDOW CORBEL, JAMES BROWN LORD, ARCHITECT.
Atlantic Terra-Cotta Company, makers.



TABLET, EXECUTED IN FAIENCE, BY THE GRUEBY FAIENCE COMPANY.

The following New York architects have been invited by the supervising architect of the Treasury to submit competitive plans for the new building for the Department of Agriculture, the cost of which will be \$2,000,000: Babb, Cook & Willard, Howells & Stokes, Carrere & Hastings, Brite & Bacon, and John Russell Pope.

NOTES FROM CHICAGO.

Robert Watson Bruce was this week appointed county architect by the Board of Commissioners of Cook County. As is well known, Mr. Watson is also State architect.

Governor Yates has appointed Fridolin Oswald, of



DETAIL BY THOM & WILSON, ARCHITECTS.
White Brick and Terra-Cotta Company, makers.

Alhambra, Madison County, a member of the Board of Examiners of Architects in place of William Carby's Zimmerman, of Chicago, resigned.

The old buildings at 225-227 Michigan Avenue are

being removed preparatory to beginning the construction of the addition to the Auditorium Annex. The building will be twelve stories, and will cost \$800,000. Holabird & Roche are the architects.

John Devereux York, architect and illustrator, has just returned to Chicago from a year's visit to Japan, and is considering two plans for the future. It is possible he will return to the practice of architecture in the



DETAIL BY GEORGE F. PELHAM, ARCHITECT.
New Jersey Terra-Cotta Company, makers.

office of Henry Ives Cobb, with whom he was formerly associated, or he may go to South Africa as an illustrator for Scribner's, with whom he was also associated, and in whose interest he has visited many parts of the world.

Nimmons & Fellows have made preliminary plans for the eight-story hotel and sanitarium which it is proposed to build at the northwest corner of Michigan Boulevard and Eldridge Court. A number of well-known surgeons and physicians are interested in the project.



OFFICE BUILDING FOR THE NEW YORK AND NEW JERSEY
TELEPHONE COMPANY, BROOKLYN, N. Y.

Front brick made by Sayre & Fisher Company; Architectural terra-cotta by Perth Amboy Terra-Cotta Company.
R. L. Daus, Architect.

The Chicago & Western Indiana Railroad will next year begin the construction of a new depot on the site of its present one, Dearborn Station, at Dearborn and Polk Streets, the cost of which will be between \$2,000,000 and \$3,000,000. It is possible that land will be acquired on both sides of the present station for additional space on which to build. Official announcement of the intentions of the company was made at the meeting of the board of directors recently held.

The eighty odd concrete piers, resting on hard-pan, over 80 ft. below datum, which are to support the new Field Retail Building, are completed, and the caisson work for similar foundations for the new Tribune Building is well advanced. It is doubtless safe to say that this absolutely permanent and unyielding type of underpinning will largely supersede piling or "floating" foundations for first-class high buildings in Chicago.

The following paragraph appeared in a recent number of the *Construction News*: "Architects whose specialty is designing and constructing beautiful homes should find cause for congratulation in the status of affairs in Chicago at the present time. From a financial standpoint, professional practice of this sort, unless one receives more than the ordinary commission, is unremunerative; but from an artistic standpoint and from a social aspect, it presents opportunities rarely to be found in architectural practice. This dissatisfaction from a pecuniary view is due to the whims of the opulent, who are sensitive about their homes as they are about nothing else and demand that the architect earn his salary twice over. It is believed that they could be shown how essential it is that the practice of one's profession involving so much learning, combined with rare good taste, should be more profitable than the ordinary class of construction, and for this reason it should be possible to obtain much better

commissions. It is said that there are some architects who are constantly in receipt of 7 per cent. for this class of work, and even then they consider that they are none too amply compensated."

The Architectural League of America having elected as president for the ensuing year Joseph C. Llewellyn, of Chicago, the choice of the remaining members of the executive board devolved upon the executive committee of that club of which he is a member.

Said executive committee now desires to announce that they have filled the executive board by the reappointment of the members who served last year.

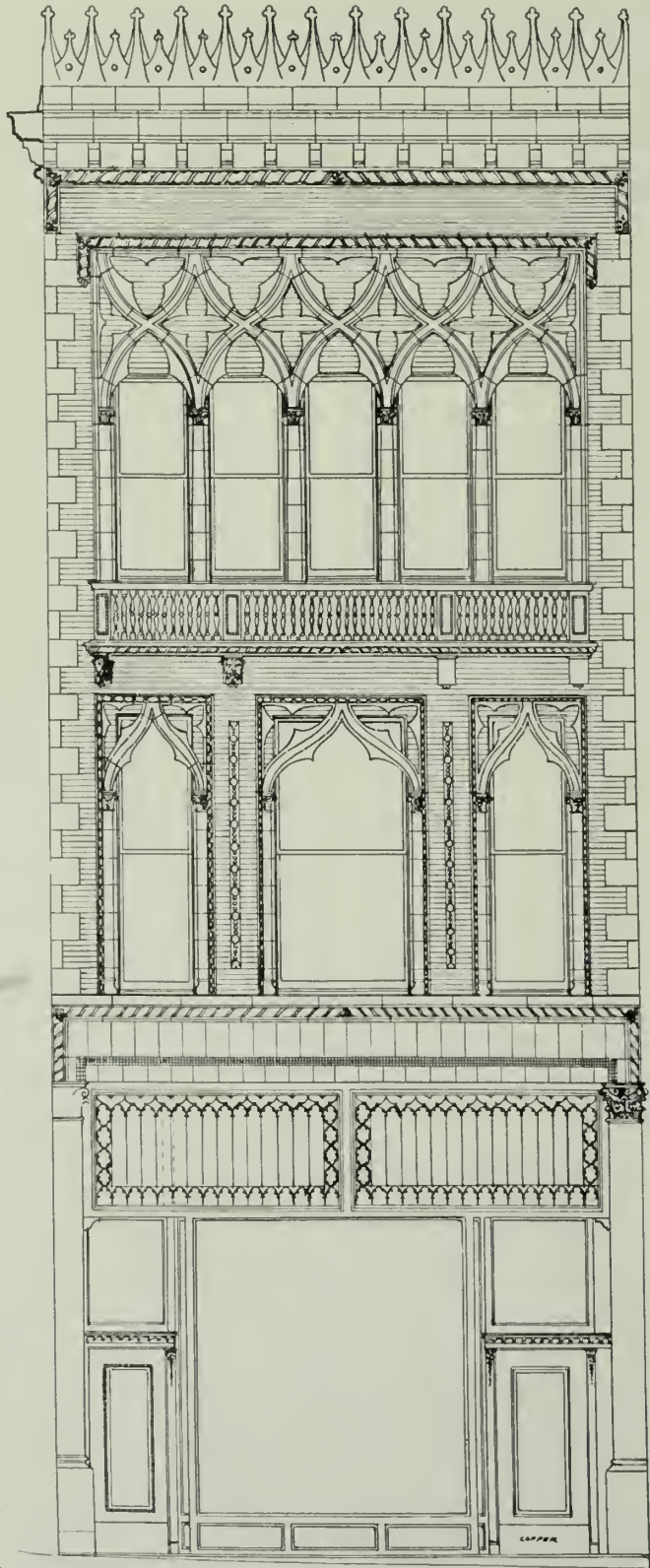
The board is as follows: President, Joseph C. Llewellyn, Chicago; vice-president, Richard E. Schmidt, Chicago; corresponding secretary, Emil Loreh, Chicago; recording secretary, Hugh M. G. Garden, Chicago; treasurer, August C. Wilmanns, Chicago; members of executive board, Prof. Newton A. Wells, Urbana, Ill., and Robert C. Spencer, Jr., Chicago.

NOTES FROM SAN FRANCISCO.

The rush of work, such as now prevails in our architects' offices has not been experienced for the past ten years.

Bliss & Faville are the architects for a new hotel to be constructed by the Crocker estate. It will be ten stories high and fire-proof. The first story is to be of a light-colored stone, and the upper stories of brick and terra-cotta in the French Renaissance style. Its cost will exceed \$1,000,000.

A bill was passed by the last legislature making it necessary for all architects to take out licenses to practise in California, and for those entering the profession after March, 1901, to pass an examination in design, construction, and the determination of the investment value of buildings. A very capable board of examiners for the northern district, consisting of Seth Bab-



COMMERCIAL BUILDING, 620 LOCUST STREET, ST. LOUIS, MO.
C. S. Holloway, Architect.

son, Henry A. Schulze, William Curlett, and Lionel Deane, has been appointed by the governor.

Willis Polk, one of our best local designers, is now associated with D. H. Burnham & Co., Chicago. He was associated here with the late George W. Percy.

John G. Howard, of New York, has been appointed the architect for the Mining Building at the University of California. He was the winner of the fourth prize in the Phoebe Hearst Competition.

Theodore F. Laist, one of the designers in the government architect's office, has lately been on a trip here on business connected with the new San Francisco post-office. Mr. Laist is well known in San Francisco where he made a name as a designer of great versatility.

Mayor Phelan has donated a public library building



DETAIL BY BROWN & VON BEREN, ARCHITECTS.
New York Architectural Terra-Cotta Company, makers.

to the city. It will cost about \$20,000, and be of Roman brick and terra-cotta. William Curlett is the architect.

Newton J. Tharp has been appointed architect for a monument to commemorate Dewey's victory. It will be located in Union Square, and will cost \$45,000.

NEW TRADE CATALOGUE.

ANOTHER valuable work for the architects' and builders' "Trade Library" is the new catalogue issued by the American Enamelled Brick and Tile Company, 1 Madison Avenue, New York.

The valuable catalogue (all catalogues are not valuable) is one that contains essential facts regarding the business it represents, put into concise and intelligible form. It is the result of observation and study by those who are most interested, and, as has been stated before, is a text-book on the particular line of manufacture it



ATHERTON BUILDING, LOUISVILLE, KY.
Faced with Hydraulic-Press Brick Company's buff enameled brick.
Dodd & Cobb, Architects.

represents. As such it is of immense value to the busy architect or builder who needs it for ready reference.

We need say little more than that the new catalogue issued by the above-named company meets all these essentials. It presents their manufacture of enameled brick in an interesting and instructive manner, and should be possessed by all who are in any way interested in the rapidly growing demand for this material.

SUNDRY ITEMS.

D. A. Crone, 1133 Fayette Street, Allegheny, Pa., desires architects' samples and catalogues.

The Atlantic Terra-Cotta Company has been awarded the contract by the George A. Fuller Company for the Flatiron Building, Fifth Avenue and Broadway and 22d and 23d Streets, New York City, D. H. Burnham & Co., of Chicago, architects. The company is making an extensive increase in its plant.

The new power station for the Edison Company, at Brooklyn, N. Y., will be roofed with Ludowici Tile, Meeker, Carter & Booraem, New York agents.

Meeker, Carter & Booraem are supplying the enamel brick which are being used in St. Joseph's School, 87th Street, New York City, Schickel & Ditmars, architects.

The brick used in the construction of the new St. Michael's Church, Brooklyn, R. F. Almirall, architect,



SWISS COTTAGE, CINCINNATI, OHIO.
Roofed with "American S." Tile.
William W. Franklin, Architect.

LOCAL COLOR.



SPANDREL, CARNEGIE LIBRARY, LINCOLN, NEB.
Northwestern Terra-Cotta Company, makers.
Fisher & Laurie, Architects.

and the new building for the American Express Company, Madison Avenue, New York, S. Huckel, architect, are being supplied by Meeker, Carter & Booraem.

Akron Star Brand Cement is being used in the following new work: Y. M. C. A. Building, Medina, N. Y.; for street paving at Gloversville, N. Y.; also on extensive work for the B. & O. R. R., in the States of Ohio and Indiana.

Henry Maurer & Son have put up at the Buffalo Exposition a building which is of burnt clay throughout and



DETAIL BY HARDE & SHORT, ARCHITECTS
Excelsior Terra-Cotta Company, makers.

absolutely fire-proof. The fact that it is visited by thousands of people every day indicates the interest that the public takes in matters of this kind. It was an expensive undertaking, and Messrs. Maurer & Son are to be commended for their liberality and enterprise in presenting to the public so practical a demonstration of fire-proof construction.

COMPARISONS, though invidious, often help us to appreciate our blessings. An architect, recently returned from abroad, has expressed himself as being particularly struck with what he chooses to term the absence of local color in the street architecture of Paris as compared with the civic aspect of Boston, and for that matter of many of the American cities. The prevailing building medium in Paris is the Caen stone, which is one of the most beautiful of building materials when fresh and clean-cut, but which, like nearly every stone known to the building trades, becomes speedily very dirty, and catches all the impurities which are so rife even in a city as clean as Paris. The extensive use of brick in our public work has infused a note of color whose value we often do not fully appreciate. There is much to be desired, and everything to be hoped for, as regards pure design; but when it comes to any question of local color,



SPANDREL, GARRICK THEATRE, PHILADELPHIA, PA.
Conkling-Armstrong Terra-Cotta Company, makers.
Willis G. Hale, Architect.

it is hard to gainsay the position our architecture occupies. A brick building will keep clean indefinitely, supposing, of course, that the proper kinds of bricks are used in the beginning; and it is not only easy to impart a strong local color to our architecture, but it is inevitable that that local color should be both abundant and of constantly increasing value. Bricks and terra-cotta offer a range in tones such as can be found in no other material; and when the time arrives that the average of excellence of our public buildings is, on the whole, as high as the average abroad, it is fair to predict that the appearance of our future cities will be extremely interesting, full of local color, and at once beautiful and enduring.

THE BRICKBUILDER,
AUGUST,
1901.



MARKET AT YPRES, BELGIUM.



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Architectural Faience	11	Clay Chemicals	IV
„ Terra-Cotta	11 and 111	Fire proofing	IV
Brick	111	Machinery	IV
„ Enameled	111 and IV	Roofing Tile	IV

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FIRE-PROOF CONSTRUCTION.

ANY one who has attentively studied the history and development of fire-proof construction in this country cannot have failed to appreciate the motive forces which have not merely evolved the special forms in general use, but have really created the science. Reasoning without reference to the facts one might readily assume that the two most potent factors in developing a fire-proof construction would be on the one hand, the interests of the great fire insurance companies who are so vitally affected by loss and damage from fire; and, on the other hand, the municipalities who make laws prescribing what construction shall be used in certain cases. As a matter of fact, the insurance companies have borne a very slight part in the development, their function being practically confined to the very important one of placing a premium upon good construction. We would wish that the premium were higher, and that the insurance companies might see fit to more earnestly encourage the best construction, by making more difference between the rates upon the fire-trap and the fire-proof building. But even the little difference that they have made in the rates of

the two kinds of buildings has certainly helped a great deal to encourage the right sort of construction. It surely is not due to any very great extent to the building laws that we, to-day, are able to construct a building which will resist almost any kind of conflagration.

BUILDING laws cannot at most do more than formulate what is considered good practice, and practice must come first. It is safe to say that nearly every advance of a radical nature which has been made in building construction during the past fifteen or twenty years, if not originally designed in conflict with existing laws, were certainly not regulated by them; and those cities have indeed been fortunate which possessed building regulations upon the subject which were even fairly intelligent and in line with the scientific understanding of the educated constructor. We mean by this that fire-proof construction as a specialized science has developed as a direct result of tangible appreciated need, and its growth has been regulated and retained with only a very slight stimulus from either insurance or legal inspection. It is a matter of common business sense.

IN a large city a fire-proof building is, in the long run, the best investment as compared with any structure which is exposed to damage by fire. Even in the smaller towns it has come to be recognized that a structure of any more than moderate height or extent is a safer investment if constructed in accordance with the fire-proof principles. There has been a very good illustration of this fact afforded by an office building at Atlantic City, the permits for which were issued by the city granting the right, in accordance with existing ordinances, to put up a ten-story structure of what is called the second class, namely, with brick external walls, wooden floors, and wooden internal construction. After this permit was granted a new ordinance was introduced and passed, requiring buildings of that height to be fire-proof. The holders of the permit had a perfect right to carry out the original plan, but careful consideration of the whole matter apparently convinced them that the extra expense of twenty-five thousand dollars needed to make the building thoroughly fire-proof was money well invested, and that their building so constructed would be safer, would rent better, and the insurance rates not only for the building, but for those near-by, would be less, than if only the first cost was considered, and second-class construction adapted. This is only one of many instances which show the economic value of fire-proof construction, and which illustrates the manner in which fire-proofing has been developed from commercial necessities rather than as a result of academic theories.

Brickbuilding in Modern France. II.

BY JEAN SCHOPFER, PARIS.

ONE of the most pleasing buildings of brick of these recent years is the Boucicaut Hospital (Fig. 1), interesting for so many reasons. The architect is Mr. Legros, and the several buildings, which cover a very considerable amount of land, show a superior knowledge on his part of the requirements of a large hospital and the exigencies of modern science.

In this structure brick alone has been employed, and intelligently so. We give two views of it. The one facing the private garden shows the little pavilion where wealthy people, who prefer going to a hospital, are treated. The façades are gay with their simple brick designs and a few notes of white stone. The roofs are uniformly covered with red tiles of excellent effect.

The second view (Fig. 2) shows the minor buildings of the same hospital. Most of them have, as can be seen in the one at the right, an elevated ground floor and one vaulted floor above it. The form of the great discharging

roof reminds one of the buildings of the time of Louis XIII., and the houses of the old Place Royale, now the Place des Vases. This monument shows us no new formula, but is a good example of the style to which it



FIG. 1. BOUCICAUT HOSPITAL, PARIS.



FIG. 2. BOUCICAUT HOSPITAL, PARIS.

arch makes visible from the exterior the ingenious form of these hospital wards.

Brick also was chosen for a well-known building, the Pasteur Institute (Fig. 3). Here all the qualities of brick are by no means developed. The architect was satisfied with an unoriginal style, with the angles and frames of white stone in a background of brick. It is of sombre elegance, but of little interest for our special study.

Brick and stone are again the elements of the Agronomical Institute (Fig. 4). Here are the window frames and the angles of white stone, which we shall often have occasion to see. However, a certain distinction of the whole, a certain elegance of proportion, cannot escape our observation. The form of the

is circumscribed, and is one of the most serious works of the time, giving proof of long study and reflection on the part of its designer.

The Chaptal College (Fig. 5) is much more characteristic. It is by one of the most notorious architects of our time, who has always shown a fondness for the use of brick, of which, in fact, he has made a specialty. Mr. Train, when he designed Chaptal twenty years ago, did not intend his façade to be entirely of brick. He made but a discreet use of it, although an interesting one, as we may see by the view reproduced here. Brick is only introduced in the base of the first floor, between the bays of the windows which are pierced throughout the length of the two stories, for the window arches, and, finally, between the corbels of the cornice. It plays here a clearly polychrome part, which is



FIG. 3. PASTEUR INSTITUTE, PARIS.



FIG. 4. AGRONOMICAL INSTITUTE, PARIS.

moreover accentuated by enameled terra-cotta. It is shown, too, under a new aspect, and I would point out, before we pass on, the really original way in which it appears under the cornice. It is placed in the wall so as to be seen at an angle, and the architect draws from this new and characteristic arrangement an excellent and unexpected decorative effect.

We shall have other works of Mr. Train to examine.

The building which demands our attention now is by Mr. Magne, professor at the Ecole des Beaux-Arts, one of the architects who has made the best employment of brick. It is the Greek pavilion (Fig. 12) of the Exhibition of 1900, but is destined to survive it, for the pavilion will be pulled down in Paris to be erected again in Greece, where it will serve as a little museum. The system of construction is simple. The supports of the iron cupola

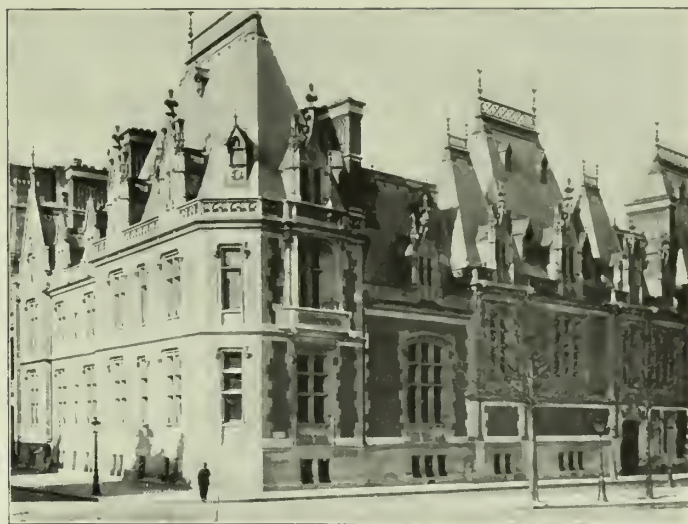


FIG. 6. PRIVATE HOTEL, PARIS.

are visible from the interior and rest on iron columns which rise from the ground. On the exterior we see big squares of brick of a delicate rose tint, separated by layers of horizontal brick of a very dim blue-green. The frames of the doors and windows are of the same combination of colors. A frieze of enameled terra-cotta decorates the upper portions of the walls. In the illustration (Fig. 12) we can see in what manner the bricks are laid. At one side is a piazza, and the whole is covered with big red tiles. The ensemble of the pavilion is satisfactory in line, the choice of materials excellent, and the polychromy in charming taste. We were not spoiled by the Exhibition of 1900, and the little Greek pavilion had but few rivals.

Now we must enter the vast field of private constructions. Beautiful works do not abound here, although



FIG. 5. CHAPTAL COLLEGE, PARIS.



FIG. 7. PRIVATE HOTEL, PARIS.

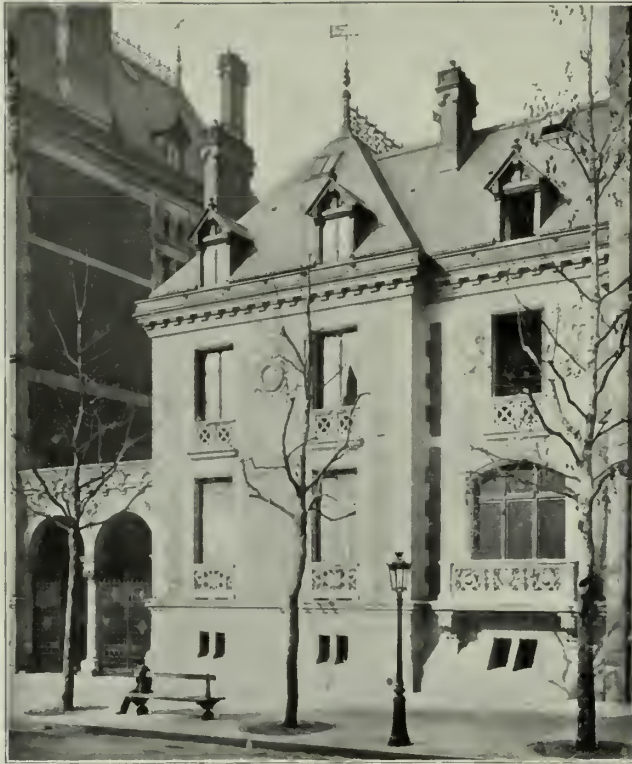


FIG. 8. PRIVATE HOTEL, PARIS.

there is a large number of brick houses in Paris and the provinces. We have a right to hope for an improvement in these brick residences in the future. More satisfactory buildings of this material are erected now than twenty years ago. We begin by the oldest ones, and will examine, in another article, the most interesting modern houses. We will be sober of commentaries on the works



FIG. 10. PRIVATE HOTEL, PARIS.

that deserve but few. First, comes quite a common type of private house (Fig. 13), such as we see often in Paris, — frames of white stone and reminiscences of Louis XII. architecture. Such is the formula dear to many a contemporaneous architect.

The next example (Fig. 7) shows another and more classical style, white stone and brick combined. This



FIG. 9. PRIVATE HOTEL, PARIS.



FIG. 11. PRIVATE HOTEL, PARIS.

sadly lacks individuality. Among the cheaper houses there have been many very small ones built in the style of the one in the next illustration (Fig. 9), of brick in two shades of red, and somewhat awkward applications of enameled terra-cotta. Houses resembling this one in general effect are, alas, too often to be found.

The residence shown in Fig. 8 is of more elegant appearance, but built after the same idea,—white stone at the angles, the body of the building of plain brick, and the great windows, with balconies, in the Renaissance style.

I prefer the house pictured in Fig. 10. Here we have a real brick building. The architect has sought the decorative effect in the material alone; he has ignored the half Renaissance, half Louis XIII. formula which has been so painfully abused. The window frames only are of stone, but we cannot see the advantage of it. The rest with the little motive of dark brick is of good construction, frank and logical.

We must bring our first examination of private buildings to a close with a glimpse of a big private house on the Place Malesherbes (Fig. 6), the most important one of its kind to be seen in Paris. Here is no modern style, but a quasi-restitution. This is historical architecture, and we are in the midst of the Renaissance; the different parts of the house are clearly accentuated, the dormer windows monumental, and the roof high. The color effect lies still in the contrast between white stone and red brick, which is here, as in many Renaissance monuments,—the Louis XII. wing of the Castle of Blois, for instance,—of two shades. We see this in the view of the detail (Fig. 11).



FIG. 13. PRIVATE HOTEL, PARIS.



FIG. 12. GREEK PAVILION, PARIS EXPOSITION.

This is a house of lordly dimensions, but it is a pity that the architect was content to make a copy. Brick was thus employed four centuries ago. We can, in our time, create works which are more personal to us.

This is what I shall prove in my next article.

CLAY GOODS FOR HOSPITALS.

AN eminent German doctor has recently been discussing English methods of hospital construction, from a doctor's point of view. He says that our architects are too fond of erecting barrack-like buildings of enormous size, and that the walls of these latter tend to absorb to such an extent that they soon become contaminated, and are powerful agents in the propagation of certain forms of disease. Instead of these enormous permanent buildings for hospitals, he advocates the more extended employment of smaller isolated buildings, which can be rapidly destroyed on the appearance of anything like unfavorable symptoms, and new buildings erected in their place. There is much in the German critic's observations, but they fail to appreciate the enormous advances made in recent years in the employment of sanitary clay goods for hospital purposes. In such hospitals as have been properly equipped, where the walls and floors are entirely covered with glazed sanitary ware, the outer walls of the building of glazed brick, and where practically every part of the working portion of the hospital is armored in the same way, there is no necessity for the erection of trumpery temporary buildings. We do not know of a single case of "hospital fever" in properly constructed and defended hospitals, where sanitary clay goods have been adopted. But we must say that now and again there is some room for improvement. The fixing of glazed tiles as a dado is at best a poor expedient, and no architect worthy of being called a hospital specialist would dream of adopting it, unless, indeed, it were a question of finance, which, unfortunately, is too often the case. *The British Brickbuilder.*

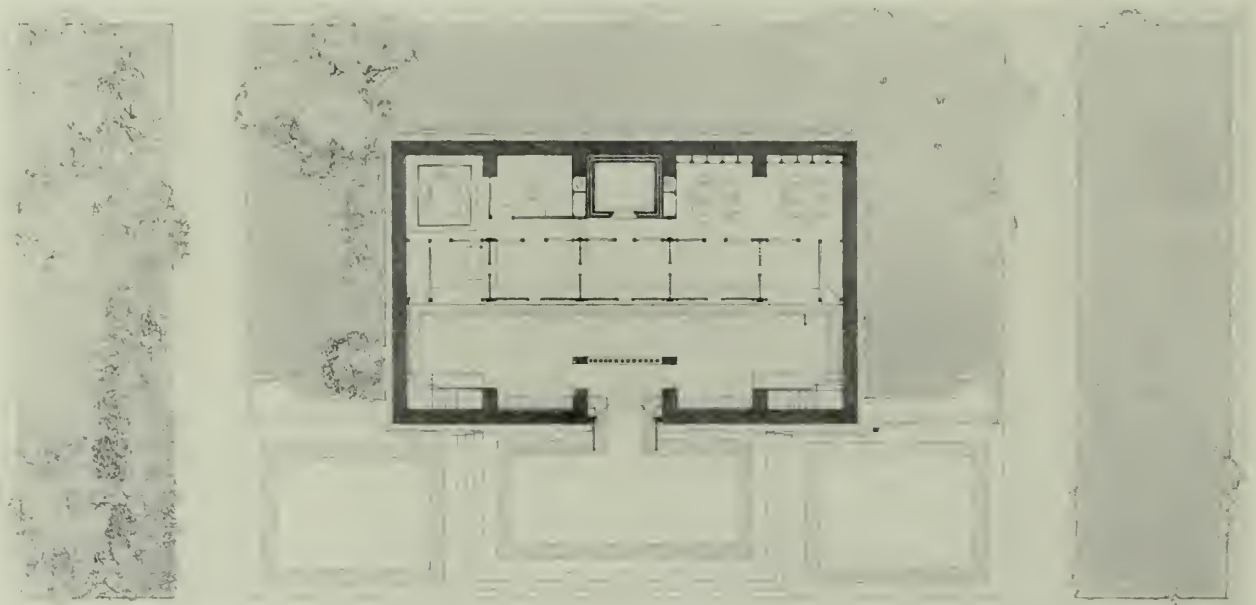
The "Village Bank" Series.¹ V.

BY FRANK LLOYD WRIGHT.

WHILE there is probably little romance about a bank,—less poetry in the bray of Sancho Panza's substantial, positive gray donkey than in the sound of Rosinante's spirited neighing,—yet the community likes to feel that this same bank is there to stay. It is, in fact, the town strong box, and it is a temple to the God of Money, as modern temples go. In its temples, though they perform the function of modern mercantile machines, the community would find the lack of some attempt at ideal enrichment intolerably offensive. Just what this ingrained human love of ornament is, is not clear—not yet. Though this love is more indiscriminate than ever, more easily satisfied with meretricious gewgaws and meaningless signs and symbols, we may be thankful that

some concession to the time-honored love of ornament, with a monumental and significant simplicity arbitrarily associated in the popular mind, perhaps, with a tomb, or a mausoleum. Most mausoleums are neither monumental nor significant, unless they are monuments to the well-meaning ignorance of their builders, and significant of a cold, stupid horror of death. The whole genus "monument," as we build it in our cemeteries, rests upon a false basis,—a memorial is better.

The plan is intended to satisfy the necessities of the average banking business in a direct way, without waste space or waste motion. The entrance (and it is the only entrance) is barred with bronze gates closing over bronze doors, one of which would remain open during banking hours; as both bear the legend of the bank, one would always be in place to advertise its function. This matter of advertising, as usually practised, seems better adapted



A VILLAGE BANK. GROUND PLAN.

we still possess it, for back of it are probably the only instincts that make life bearable or desirable.

This design has taken shape with some conception of the dignified character of the mercantile machine, and

¹ PROGRAM.

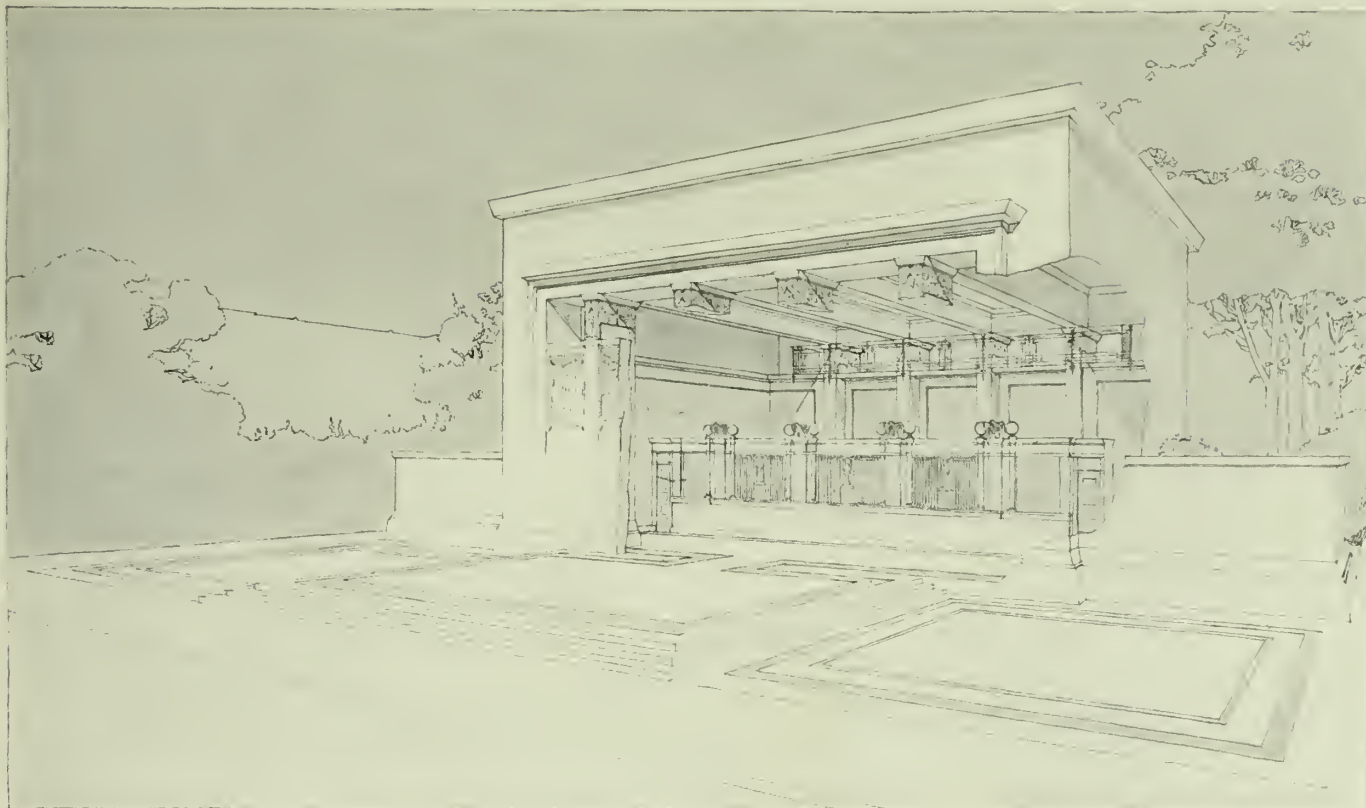
The problem is to be treated primarily from a picturesque standpoint. The building is assumed to cost in the vicinity of twenty-five to thirty thousand dollars, and be only one story in height, the interior arranged for a main banking room, a small consulting room, a directors' room about 12 by 14 ft., a vault measuring outside of the brick walls 8 by 10 ft., and any other interior arrangements which may seem suitable. The main entrance is to be preceded by a small vestibule, and the building itself should be set back not less than 10 ft. from the street line and be isolated on all sides. The site is supposed to be a level one, and the bank will be in close proximity to the public library, the village church, the schoolhouse, and the court-house, which together will form the center of a town of a few thousand inhabitants. The design is to be of such nature as is suitable for being carried out in burnt-clay products.

to the handling of a three-ring circus than the handling of a dignified institution.

Within these doors there is a vestibule of glass and bronze, and the customer is compelled, by the swinging of the doors, to enter at one side and leave at the other. The public is thus thrown directly to the tellers and clerks. The cashier is located to the left, although the plan might better be reversed to keep the custom of moving to the right. The cashier uses the director's room, which is ceiled with glass, as a consulting room. The stenographers' room also is conveniently connected.

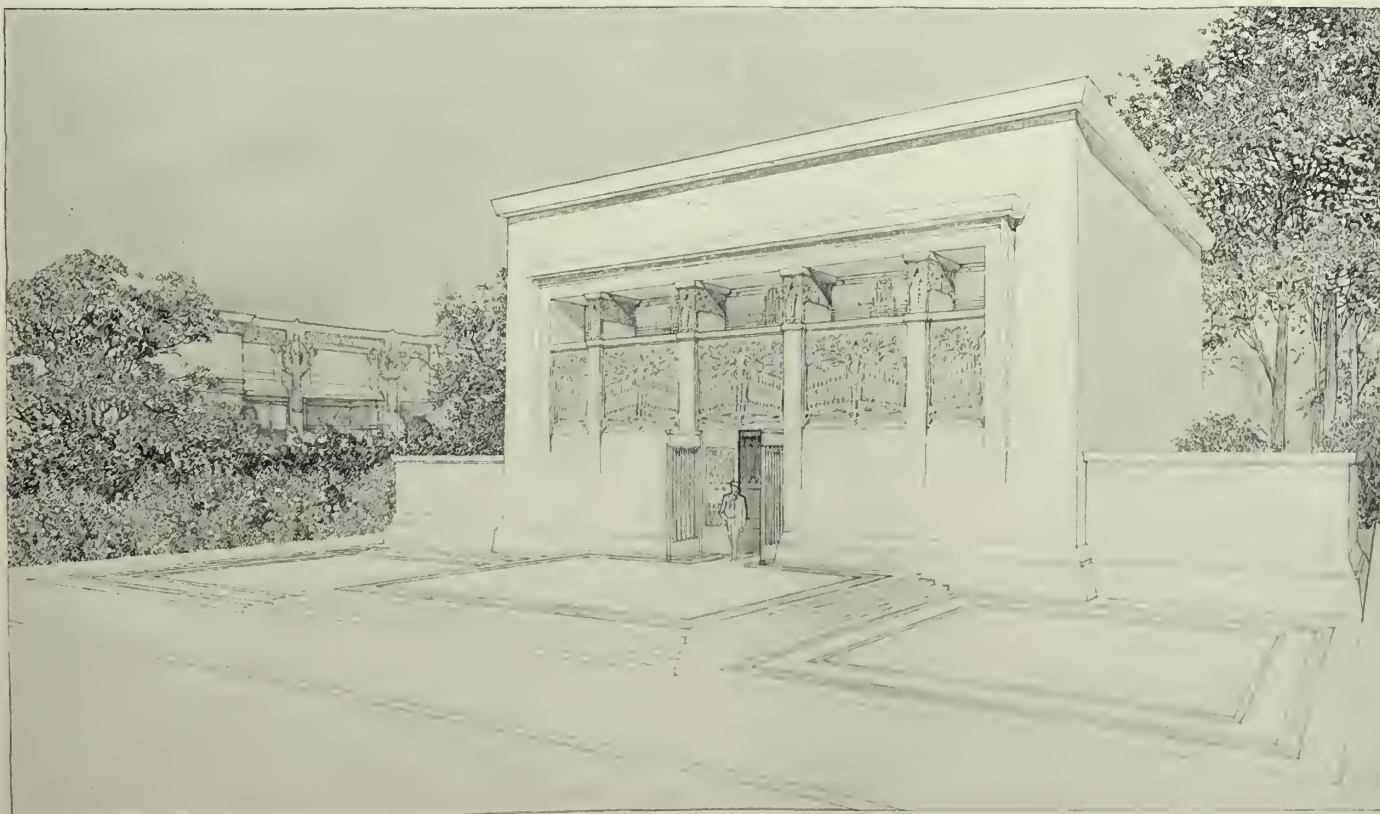
All this machinery, including the vault, is kept down to the height of the top of the screen, and the screen presents a solid front to the public. A door is left at either end,—one for customers, cashier, and directors, and the other for clerks, all coming and going through the one doorway to the street.

Stairs are provided on either side of the entrance to supposed safety deposit vaults below, artificially lighted and ventilated. This provision for the deposit vaults presupposes a clerk below; in a village bank probably a luxury. The stairs could be moved within the control of the machinery behind the screen if necessary.



This machinery is lighted overhead and ventilated from above, as shown in the section; the windows at the sides passing free behind the caps, as a screen of bronze frames, sash, and glass. The interior walls are lined with a mosaic of enameled ceramic work laid in broad panels marked by simple lines of gold mosaic, and the screen is to be constructed of terra-cotta and antique bronze, the terra-cotta being worked out in a soft Pompeiian red, and the bronze finished in verdegris. The building is con-

structed entirely of brick. The ornamental members throughout are of terra-cotta, except the window sills and the caps, which are cast in bronze, finished in antique verdegris. The floors in the public space are laid with a mosaic of unglazed ceramic. The design makes use of the structural feature of the piers carrying ceiling beams of the long span as the decorative element providing the enrichment of the façades, and this feature is merged with the gently sloping walls in eminently plastic fashion.



A VILLAGE BANK.

The Planning of Small Libraries.

BY CHARLES KNOWLES BOLTON,
(Librarian Boston Athenæum.)

BEAUTIFUL as many library buildings are, it is significant that few librarians or State library commissioners, when approached for information, will name one that is wholly satisfactory in arrangement for the work for which it was constructed. This is to be explained in several ways. The library as an educational and social factor is still in course of development, and the plan must change as the purpose broadens or changes. The librarian, too, is not always competent to guide the architect, and the latter is frequently unwilling or unable to believe that a good design for this particular kind of building can and ought to be developed from the inside rather than from without. The usefulness and convenience of the building should be considered first and foremost, for on that depends its success; its architectural beauty is capable of as lasting and real value to the community, but it must be subordinated to the floor plans.

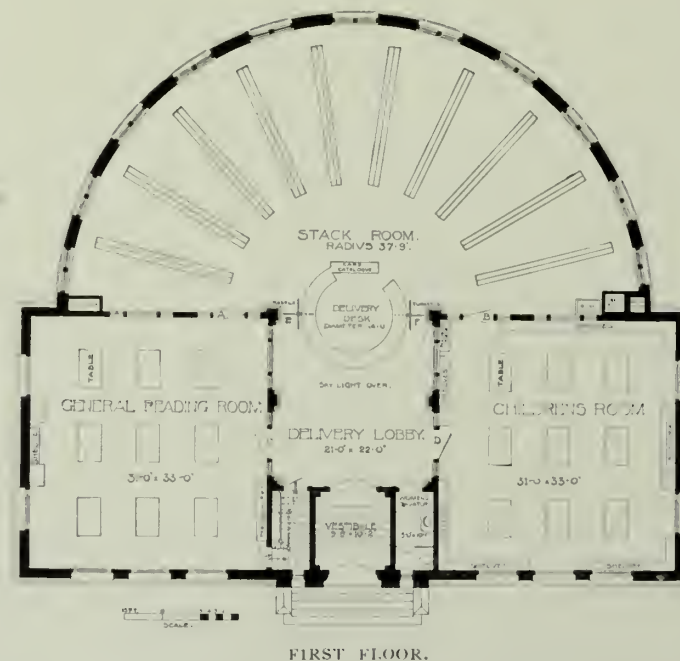
It is certainly true that many librarians do not know what they want. They had for some years a disposition to condemn the alcove system of arrangement as wasteful and inconvenient for modern needs, however beautiful and appropriate it may have been when employed in the stately libraries of Europe, and in the earlier institutions here. Architectural effects, and even the "bookish atmosphere" which is so valued in the old-world ecclesiastical and collegiate libraries, seemed for a time somewhat out of place in the smaller libraries devoted to the public. Town libraries are the meccas not so much of scholars as of laborers, of children unnumbered, and the countless readers of light literature. Of what use is a "bookish atmosphere" and an alcove system to them? the librarian began to ask. Moreover, the sleepless energy of the printing-press and the book-bindery soon

led to the annihilation of available shelf space, and there was little or no land in most town centers over which alcove could be added to alcove. Did the alcove waste the space? Was it appropriate? Here was a real problem. As an answer came the stack, with its immovable steel cases, placed so close together that the aisles, with their glass or gridiron floors, look like tunnels. Now that the movement to admit to the shelves has grown popular, the objections to alcoves have been in a measure withdrawn. They give an air of quiet comfort that charms the student. The books that interest him are almost within his reach, and the partial enclosure made by the cases affords a restful seclusion. When the alcoves are a part of the plan, and the outer ends of the cases form columns which reach to the ceiling, there is a unity, dignity, and seeming fitness to the whole.

At present the two systems — alcove and stack — are being combined. From two to three fifths of the books, including works of reference, belles-lettres, history, travel, and biography, are arranged in alcoves accessible to readers, with few, if any, restrictions, but under careful supervision. When the number of volumes makes it necessary, an upper tier of alcoves is added. Care should be taken to have the room high enough to permit a future gallery, and also for adequate gallery windows, reaching so near to the ceiling that light will be thrown upon the top shelf of each bookcase. A high light is of much more value than a light entering close to the floor.

In village libraries, to cost from \$5,000 to \$15,000, the books of general interest may be placed about the walls of the reading room without need of alcoves, until the collection grows large enough to compel an arrangement of

movable bookcases to form alcoves. A wise foresight suggests double windows or narrow windows close together, so that there may be one for each alcove when crowding makes alcoves imperative. It happens not infrequently that an extra bookcase must be set in a



FIRST FLOOR.
CARNEGIE BRANCH LIBRARY, LAWRENCEVILLE, PA.
Alden & Harlow, Architects.

particular place because the number of books upon a certain subject (the Philippines, for example) has increased at that point with unexpected rapidity. To be able to provide shelving in this way, with proper windows for light, may put off for some years an entire readjustment of books in all the cases. In a library, to cost from \$15,000 to \$50,000, fixed alcoves add to the quiet, and may well be a part of the plan.

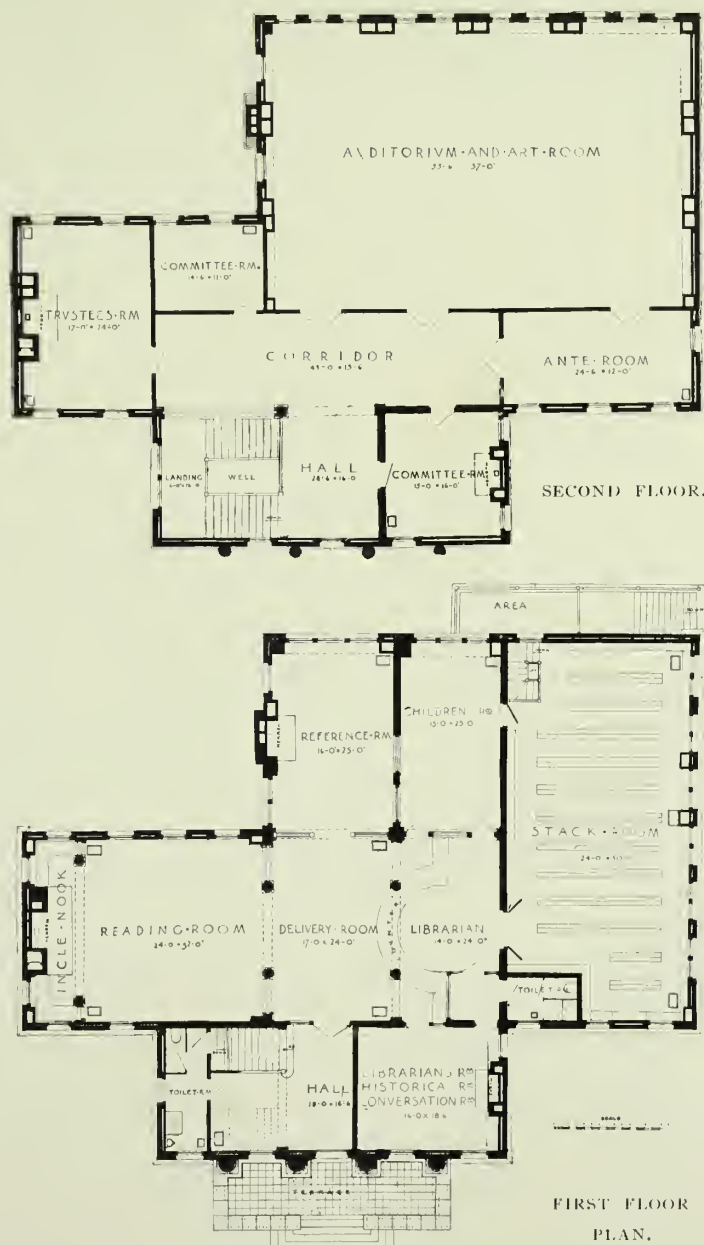
In the ordinary arrangement of space, the reading room is on one side of the entrance. There is a children's room on the other side, and the delivery desk is opposite the front door. Back of the desk is a stack, which forms an ell or projection. All persons passing to and from the stack must go by the attendant at the desk. The projection may be suggested architecturally, but not at the time constructed, if the building is small. In branch libraries, or in libraries having collections which grow very slowly, a semi-circular wing is attractive. The cases radiate from the delivery desk, and the windows throw light between them. The spread of the cases may allow space between their outer ends for small study tables and chairs. The stack itself (for the storage of books relating to science, etc.) should have aisles at least 30 ins. wide; the top shelf of each case, on which the books rest, should be not over 6½ ft. above the floor, although in the alcoves one or two higher shelves may be used to advantage, because a step or ladder will be at hand. Shelves are frequently made so broad that ninety-nine out of every hundred books do not reach the back board. A space is then left where dust gathers, and an occasional book, crowded out of sight by a careless boy, lies forgotten and is after a time reported as lost. A shelf 8 ins. wide is all that is necessary. The length of the shelf should not exceed 30 ins., to avoid sagging, and the material may be of steel or of wood. Shelves of iron or steel are much in use, but they are said by many to injure the books. As a building settles, the slightest variation in the uprights throws the steel shelves out of adjustment, and an expert must be employed to refit the metal, while

a janitor can alter shelves of wood whenever they become too short or too long to serve their purpose. Most librarians allow about 10 ins. between the shelves, and any book which is over 10 ins. in height must lie on its front edge until out of shape, or must be taken from its proper place to sleep in oblivion in the corner set apart for large books. A librarian will sometime be found bold enough to advocate a greater space for all works except fiction.

On every floor of the stack there should be space for a small table and a chair, with a shelf to hold books reserved for special students. In this way, the stack becomes more than a mere storehouse, and serves to provide a series of quiet study rooms. When the stack consists of three or five floors, the middle one should be on a level with the delivery desk floor, with a stairway going down and another leading up, in order to minimize the amount of climbing forced upon an attendant.

Provision for a stack should be insisted upon in every library plan, as a means of escape from the pressure which inevitably comes upon a growing collection of books. It may be unimportant in extent, but it must be capable of enlargement. Architects often plan buildings so perfect in proportion and in ornament that they cannot afterwards provide a stack without ruining their exterior designs. In a few years the disgusted trustees are forced to ask the people for more money to mutilate the most attractive edifice in town. In consequence, architects should endeavor to plan a building, which is either capable of enlargement without disfigurement, or has extra space already provided, though it may not be used for years.

The delivery desk, which is also an information desk and a vigilance station in a small library, is closely associated with every function of administration, and should be a distinct feature of the plan. It must be near the stack, so that books may be brought quickly for those who do not care to visit the shelves. This operation, and the cancellation of the charging record when books are returned, require the best of light — overhead or at the side — and steady. Finally, the person in charge should



LIBRARY AT CHAMPAIGN, ILL.
J. A. Schweinfurth, Architect.

be able, if the library cannot afford to have two assistants constantly on duty, to see the greater part of every room which is open to the public—the reading room, the children's room, the reference room, and also the card catalogue, which must be well lighted and near a table. If the library is too small to boast of all these, the subdivision of one large room by glass screens may serve the same purpose; in any case there will be need of ease in supervision. Much may be said in favor of an unbroken roof, and a plan which has as its chief feature one large room. This is economical in repairs and simple in administrative problems.

It will be seen that much is required of an architect in placing the delivery desk. One is amazed to see in some fine buildings a desk dependent upon artificial light, and so placed that secluded corners (even in small buildings) permit children to romp and commit acts of vandalism beyond the eye of the attendant.

A word in general. Among the requisites for a library of any pretension to good work are a reading room and a children's room. A larger library may be expected to have a reference room, although the reading room will answer the purpose, a library work room, and a conversation room, which may also be the historical and exhibition room as well as a meeting place for the trustees.

Equally important in the large library are the bicycle room, the librarian's room, a room for unpacking cases of books, lockers for employees and habitués, and a lift for heavy books. The conversation room may profitably be provided with shelves for a collection of standard authors to catch the eye. It is coming to be recognized as the duty of every town library to preserve every book, newspaper, and pamphlet of local interest, and to exhibit antiquities, social as well as geological and historical. A room, or even a bookcase with glass doors, can soon be filled with attractive gifts from old mansions and farmhouses. A series of portraits of pioneers is a delightful addition to the historical room, and a map with names of roads, lanes, brooks, hills, meadows, swamps, and the sites of

old houses is a valuable acquisition. Owners of colonial and revolutionary, and even later military commissions, signed by famous statesmen, will gladly give these family papers to be framed and hung forever in the library.

There should be wall space in every library for exhibitions of pictures. A library art league has been formed in an eastern state to pool subscriptions for a fund; several groups of pictures are purchased each year, and are forwarded from member to member.

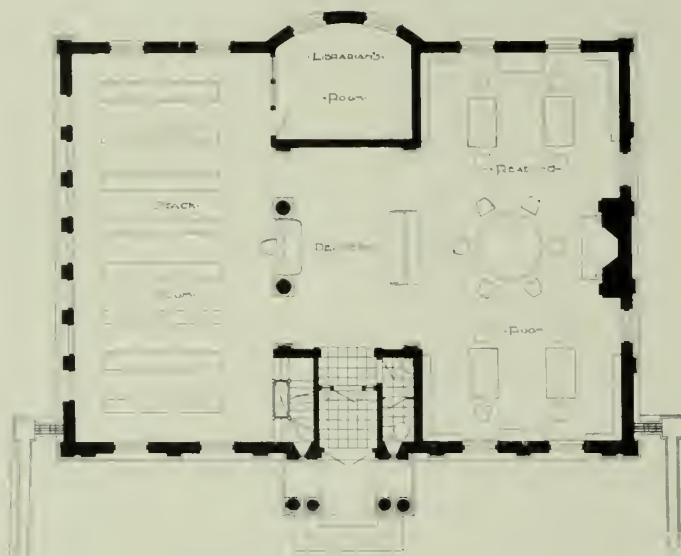
Still another feature of the more enterprising library must be mentioned, the school-reference collection. The assistant in charge of work with the schools needs, as provided at Brookline, a large sunny room, to contain children's reference books and many copies of works useful as collateral reading. A room of this character may be situated in the basement.

The building should in any case be set high enough out of the ground to make a light, airy room in the basement possible.

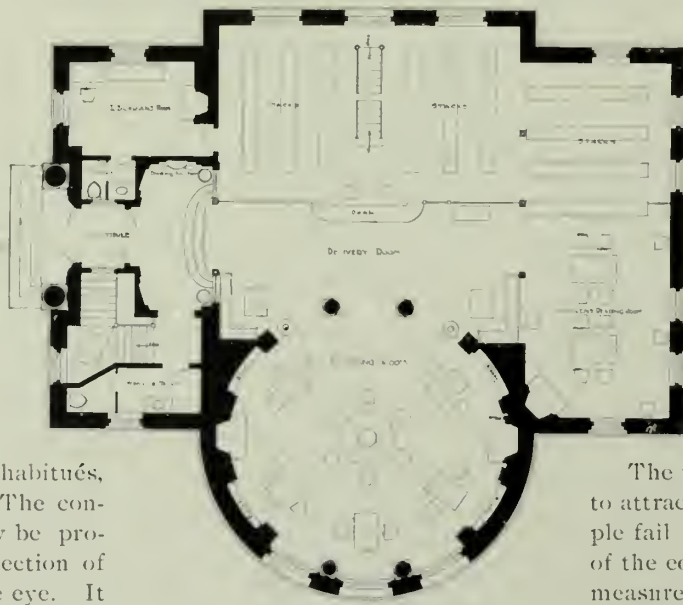
It is hardly necessary to say that thought should be given to the position which the library is to occupy on the land. It seems inconceivable that one of the best firms of architects in New York could be guilty of placing a building on a lot in such a way that enlargement is possible on one side only, and then to block that side by an enormous old-fashioned chimney and fireplace. The trustees of that library are now facing a problem that these architects have done their best to make impossible of solution.

The usual conveniences and devices to attract, instruct, and amuse the people fail to interest a considerable part of the community. This is due, in a measure, to the fact that libraries, and particularly those given as memorials, are furnished after the taste and station of the donors or trustees. It never occurs to a man who is able to

make and give away a fortune that the leather-seated chair which he enjoys is to the laborer less comfortable than a pine stool. Women of the laboring classes are quicker to adapt themselves to more luxurious surroundings, and they soon feel somewhat at home in a beautiful room with its mahogany furniture and oil paintings; but



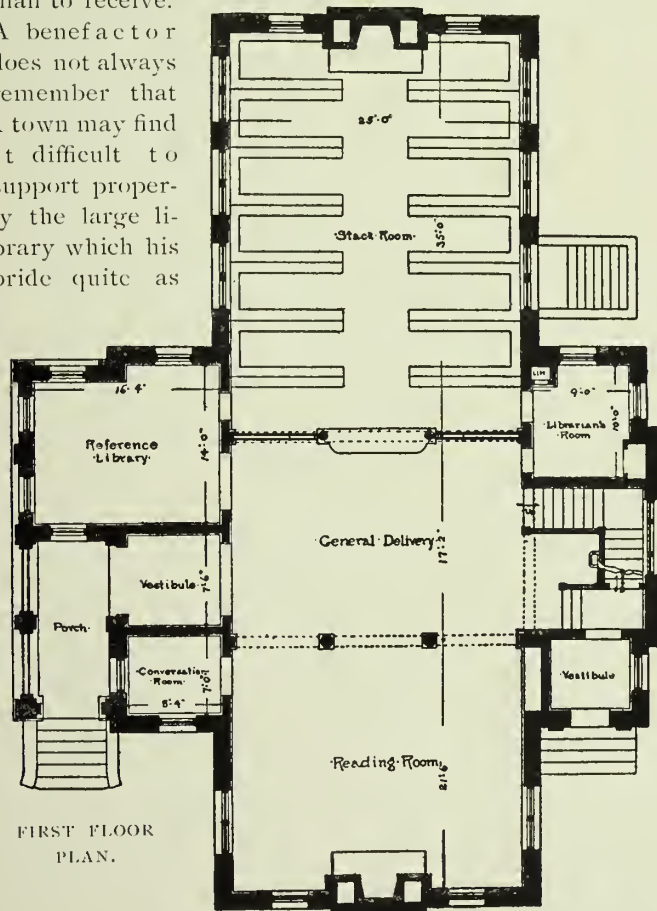
RUSSELL LIBRARY, PLYMOUTH, MASS.
Everett & Mead, Architects.



FIRST FLOOR PLAN.
LIBRARY AT WEYLAND, MASS.
Everett & Mead, Architects.

their husbands are in many cases far less appreciative of these things. These men need the influence of the library, and it certainly should seek their friendship and support. Radical measures are necessary, and a lounging room with daily papers may bring the desired result. It can best be placed in the basement, with a separate entrance from the street, so that with its toilet room it may be used after the rest of the building is closed. Smoking will perhaps be interdicted, but there should at least be a place where men may feel at home. The conclusion can hardly be avoided, that, whether you will or no, the public library is slowly but very certainly drifting toward the position of the poor man's club-house.

A final suggestion seems appropriate in an age when it has been proved by example to be more blessed to give than to receive. A benefactor does not always remember that a town may find it difficult to support properly the large library which his pride quite as



FOGG LIBRARY, SOUTH WEYMOUTH, MASS.
Cutting, Carleton & Cutting, Architects.

much as his generosity prompts him to build or bequeath. Several New England towns have massive granite buildings which stand as monuments of folly. Had the same sum in each case been divided, half for a modest building, and half as a fund to provide income for administration, leaving to the town the task of purchasing books, how much greater results might have been achieved! Money for administration means a wide-awake trained librarian, who can convince the people that every dollar spent for books is well spent. But building and books alone can never persuade a sleepy town of the need of an up-to-date administrator. Architects have an opportunity in this matter to advise wisely and unselfishly those would-be benefactors who have the interests of others near to their hearts.

Modern Architecture.

(Continued from July number.)

The making possible and the facilitation of so many constructions, the unlimited choice of dimensions of rooms, the execution of any prescribed pier construction, the free selection of and form of ceiling, with artificial lighting of the interior at pleasure, the great reduction in the thickness of walls, security against fire, and the great reduction in time required for erection, and many other things, are entirely due to the use of this material.

The immense importance of construction and its energetic influence upon modern architecture have been sufficiently emphasized, but it will save time for the future architect to study this with the most thorough attention.

Well-conceived construction is not only the vital requirement of every artistic architectural work, but it cannot be sufficiently repeated that it places in the hands of the modern creative architect an infinite number of suggestions for the creation of new forms in the fullest meaning of the word.

Most structures must be arranged throughout by the architect himself. But this not only demands constant progress and the acceptance of every novelty in the domain of construction and materials, but also rightfully requires in the architect a strongly cultivated and natural ingenuity.

PRACTICE OF THE ART.

There have been frequent mentions of the "Practice of the Art." By this is meant skilful practice in the production of form. It will become manifest in every one who devotes himself to the artistic profession for a long series of years. I therefore consider it appropriate to arrange its most important principles in this essay. Before entering on the subject proper, the question should be considered: "How are architectural works to be represented by drawings?"

It is not to be denied that so long as architectural creations remain on paper, very little interest in them is manifested. This is caused not only by the fact that almost every observer fails to bestow on them the intellectual labor required for understanding a project, but this is also likewise the reason why so many architects prefer to represent the design in a spiritless manner, not in accordance with the demands of modern taste. Since constant improvement in the mode of representation occurs by new artifices and inventions, and the taste of the designer varies, the method cannot be precisely fixed, so that mere suggestions can only be made here.

Commencing at the alpha of architectural drawing, it must first be emphasized that all jaunty mannerism is entirely objectionable, and that it must always be the problem of the architectural artist to place his ideas on paper in the clearest, most accurate, neat, direct, and convincing way. Every architectural drawing exhibits the taste of the artist, and it should not be forgotten that *proposed* and not *existing* objects are to be represented. The mania for presenting the most deceptive view of the proposed object is therefore an error, since it must contain an untruth. All charming accessories and har-

monies taken from nature, embodied in a good water-color drawing and transferred to a non-existent object, are intentional deceptions, and are therefore to be rejected for that reason.

We may say that it is more direct, correct, and, therefore, more natural to place the work before the eyes of the observer by a representation adorned by symbols, arousing interest and filled with ideas. The artist thus has opportunity, while always remaining within the truth, for exhibiting imagination, taste, and his preferences, for moving and captivating the observer. There is now a not sufficiently esteemed youthful freshness in modern art tendencies and publications. It is only necessary to refer to the large number of excellent English, German, and French art journals, where almost everything is presented in a modern, artistic, allegorical, or symbolical manner. Such publications offer an abundance of suggestions to the architect. One must nevertheless be warned against too much of this "doctoring." A refined taste will further be a guide to the architect, and in spite of rich suggestions it will cause him to adopt in his drawings only things that properly accompany the chief object and enhance the interest of the observer.

He will naturally employ only those modes of representation from which the greatest effect may be expected with the least expenditure of time, and which do not prevent easy and beautiful reproductions. By the use of drawn borders, titles, separate details, etc., the most harmless orthographic drawing may be transformed into an art work worth seeing. Architectural representations intended for exhibitions require the exclusion of everything inharmonious with their surroundings. Plans, elevations, and sections that show broad surfaces of white paper can never be arranged between pictures and sculptures, since they certainly disturb the general effect. This is also the reason why architectural works are so frequently treated in a more than neglectful way in exhibitions.

However important the manner of the representation, this is evidently of far less importance than its subject, to which we will return after this brief digression. As elsewhere in this essay, only certain important principles can be made prominent here. The most modern of all in architecture are our existing great cities. Their earlier and smaller dimensions originated an infinite number of novel questions, whose solution is expected through architecture. In the most recent period, the problem of improving the plans of cities has become especially prominent, there being in many cases an imperative necessity to strive for a rational solution of this question, caused by the enlargement of cities.

A combination of art and purpose is always, according to modern views, the first requirement of a good solution. Cases may indeed frequently occur in which the artistic idea overshadows the purpose, but it must naturally be assumed that the converse relation occurs in municipal architecture and engineering, since the opinion is certainly becoming general that no sum of money for business purposes is too great, while for art, "nothing" is just right. It is sure that the practical question in city improvement must be most prominent, and that really art has only to see that all vandalism is

avoided. It will only become more definite and demand its rights where its own work naturally occurs. This causes the requirements of traffic, business, and sanitation to be accurately stated and fixed, and the architect who designs the plan of the improvements must endeavor to fulfil these demands in an artistic manner.

Every improvement in a city naturally divides into two parts, one in which technical science and art act without restriction, especially in what is built around the exterior of the city, and another, in which the desire for a new form must adapt itself to the multitude of existing houses, to the art monuments, to existing arrangements and plans, as in the interior of the city. Both naturally depend upon each other, and there are many problems that can only be solved by a consideration of the entire domain of the city. Unfortunately, greater emphasis is always laid on the apparently more pressing inner portion, and the suburbs are sparingly treated. This is entirely wrong, since new difficulties must speedily arise and problems appear that just as urgently demand solution.

It is certain that some future requirements (tracks, parks, food supply, removal of sweepings and snow, transport of building materials, funeral processions, stations, precinct buildings, etc.) will be more conveniently fulfilled, be better in appearance and cheaper if a broad railway extends throughout a plan for improvements. From the neglect of the suburbs, especially in Vienna, there has resulted great inconveniences, successfully avoided in nearly all German cities, where the improvements have made the suburbs more habitable, healthier, cleaner, and more beautiful. The reverse is the case in Vienna, where the suburbs of the city are no better than the Hungarian villages that have become proverbial. It may be stated that the constantly pressing enlargement of a city is certainly in direct relation to the traffic conditions, and that bad traffic facilities must produce high cost of ground, an increased number of stories, and a contracted style of architecture, and badly planned suburbs materially contribute to make this evil worse.

Streets and squares demand the greatest care and attention in the plan of a city, and first require consideration. It is unnecessary to prove that the magnitude of a square must be in proportion to the height of the buildings around it. The dimensions of a square appear to be taken at pleasure, yet their natural limit is that the maximum height of the surroundings is pretty clearly fixed. Whether these are edifices or trees, this height can scarcely exceed 97.6 ft., except for higher portions of buildings. If a square with the given height is to produce a sufficiently powerful impression on the eye, with other proper conditions, about 29.64 acres may be assumed as the esthetic limit of area. The Place de la Concorde in Paris has an area of 24.7 acres (including the Seine).

But the surface of so large a square requires for artistic reasons certain points of rest for the eye and very bold subdivision. These rest-points are produced by locating statues, architectural monuments, fountains, etc., while rows of lamp-posts, balustrades, walks bordered by trees, broad flights of steps, or sidewalks, furnish the guild lines for the eye and subdivide the

surface. For the esthetic limit of width of a street, with buildings 65.6 to 98.4 ft. high, about 262.4 ft. may usually be taken, but this likewise requires strongly emphasized subdivisions, so that this may be intelligible to the eye with ease and pleasure. From experience, the length of a street should not be less than five times its width, nor exceed fifteen times without a strongly marked interruption. The least dimensions of a square evidently depend upon its form and on the height of the buildings enclosing it, while to the width of streets must be applied the principle generally accepted everywhere, that the height of buildings on them must never exceed the width of the street.

It is here necessary to oppose the preposterous view, that a great portion of the public cherishes and decorates every open space by a formal garden. The advocates of this opinion invariably use numerous catch-words in a bombastic way, such as visual width, aerial center, absorber-of-nitrogen, etc. These catch-words are embodied in patriotic phrases and given to the public, everything being asserted to be extremely sanitary, but not stating whether such designs are likewise beautiful. Such sanitary arrangements are more than questionable in their effect, these miserable caricatures of gardens are always in every one's way, and then render impossible one of the most beautiful of architectural motives, the effect of surfaces and their leading lines. The enchanting effect of the Place de la Concorde in Paris, or of the Place of St. Peter in Rome, will permanently remain in the memory of a visitor. Formal gardens on those places (fortunately, no one has had the temerity to desire this) would have entirely destroyed their effect. But in Vienna, one of the largest squares in the city (City Hall Park, containing nearly 20 acres), has been robbed of all artistic effect by an absurd formal garden, and also disfigured by awkward arrangement scorning all practical requirements. Formal gardens in cities must fully satisfy both esthetic and practical requirements (two ideas that generally coincide), both providing for the pedestrian in haste, by a shaded path, but also preserving the imposing effect of the area of the square.

In addition to what has been said, the park question presses into prominence, and therefore demands brief consideration. In a proper and original sense, parks are extensive domains, including beautiful landscapes, causing their wealthy owners to make them family seats. Drives and footpaths are laid out to connect in an easily accessible manner, and to bring into picturesque alternation, hills, woodland scenes, groups of trees, lakes, ponds, rivers, brooks, clusters of rocks, lookout points, etc. At the most beautiful and most suitable places are built castles or kiosks. These motives are produced by the contrast of nature and art, but are changed into caricatures or imitations of the English park (City Park in Vienna, and so many others) by a reduction in scale and by the introduction of objects, neither appropriate to the ground nor to the location. Further reduction evidently makes them ridiculous, as shown by many examples. This is the more to be lamented, because Renaissance masters, and particularly those of the Barocco period, have left us unsurpassable models of formal gardens near buildings as examples worthy of imitation. They

have clearly pointed out the true path to be pursued, so that the edifice and the formal garden may reciprocally support and supplement each other in effect. It is not sufficient to recommend the architect to energetically lay hold of this idea, and to elevate as rapidly as possible the art of landscape gardening, now, indeed, at its lowest.

Thus he must not only beautifully treat the principal arrangement of such designs, but must also so far inform himself in regard to the flora that in designing such a project it will be an easy matter to undertake the proper arrangement of groups of trees, borders, shrubbery, and hedges; he must know the hardiness of plants under local conditions; he must be fully acquainted with the color and appearance of the proposed plants; he must have a clear knowledge of the ground and of its artificial grading, of the location and arrangement of avenues, vistas, points of rest for the eye on lawns, of artificial waterworks, of the use and placing of statues, of hot-house and decorative plants, of the construction of conservatories, of carpet gardening, and of the apparatus for maintenance. He must further be accurately instructed in regard to the kinds of trees suitable for avenues in different cases and what additions of hedges, shrubs, etc., may be required, and finally, he must know how to successfully provide against the dying of vegetation along streets from the escape of gas, leaking of sewage, vibration produced by wagons, and from lack of sufficient depth of ground beneath it (on account of canals, sewers, etc.).

Attention should be devoted to the monumental effect of the surface of the ground. Squares may be treated in mosaic patterns by paving with stones of different colors, and by the arrangement of lawns with isolated plants, then obtaining the grandest effects by the addition of principal lines, well-located objects of display, etc. These are in such intimate relation to the artistic and monumental appearance of the square and of the street that their most careful consideration cannot be sufficiently recommended.

Returning from this digression to the forms of squares and streets, it is evident that these must be strongly influenced in another way by the architect to fulfil artistic requirements. But on many questions the architect exercises no influence, since other reasons generally predominate over the esthetic one. The most important of the remaining requirements for producing an artistic and richly varied result are, that the proper location be fixed for public buildings, and that the always omitted esthetic, but absolutely necessary, terminal object be provided on the visual axis.

The neglect of artistic requirements, the principle of utility so prominent everywhere, an antipathy to great monumental works of architecture, an invariable lack of money for art effects, gives the architect many a hard problem, and these and similar difficulties have produced a kind of sham architecture that attempts to conceal faults by deception. The obsolete apartment house façades and the pattern type of façade most recently affected (arcades and buildings on Francis Joseph Quay, in Vienna), an artistic and not a practical suggestion, belong here. The swindling ideas, teeming with deceptions and recalling Potemkin's villages that occur in such arrangements, cannot be sufficiently censured. No other

art period has such things to show; they give a very melancholy representation of the art conditions of our era. A partial excuse for them may be that taste takes wrong paths toward the desired artistic expression, and that modern mankind must generally deny to it the means of attaining this, since the continually increasing multitude of buildings for rental increases in a ratio very different from that of the necessary number of public edifices.

Modes of living daily become more similar and have almost suppressed the separate house. The building regulations have done more, and these cause the present uniformity of our houses for rental. In no other city does the modern rented dwelling play so great a part as in this (Vienna). Conditions of ownership of land in London have produced an architectural type for this purpose, which disclaims almost entirely the assistance of art, and in Paris a solution has been reached, starting with the requirement of placing the servants in the mansard story. The area covered by buildings in Berlin is greater than in Vienna, and hence the prices of land there have never reached that height which has injured our long-restricted city. Such a great increase in the number of stories in buildings for rental would not be possible, like that so common in Vienna. Buildings for rental (or investment buildings) are not rare here that have six or seven stories above the street level. Similar types of edifices in many stories, with the larger residence of the owner in the principal story and accented on the exterior, are becoming more rare. Warehouses and detached dwellings are not included here.

Under the compulsion of economic conditions, our present buildings for rental fulfil no other purpose than to accumulate small and easily rented flats in a single structure so as to produce the greatest revenue from the capital invested. After the rental value of the different stories was approximately equalized by passenger elevators, it naturally resulted that an architectural treatment by accenting the different stories was no longer possible, so that architectural exteriors are entirely mistaken when their motive is sought in palace architecture, since this contradicts the internal construction of the building. Therefore, in the treatment of the façades of modern buildings for rental, architecture has been reduced to a plane surface broken by numerous similar windows, to which are added the projecting main cornice, with perhaps a crowning frieze and a portal. The ground principles maintained in this work show that the problem of the art cannot be to contest these economical tendencies, or to conceal them by deceptions, but must consist in the proper fulfilment of even such requirements. The modern eye has lost the usual small scale, and has become accustomed to forms less rich in variety, to longer straight lines, to more extensive surfaces, and to larger masses, so that a stronger handling of the masses and a plainer outlining of such edifices certainly appear to be indicated. Hence, art must chiefly express itself where its dominion remains uncontested and its interference is natural.

Therefore, in case of apartment houses for rental, which will always continue to be the chief factor in the appearance of streets, the architect must seek effects by ornamenting the surfaces, by contrasting forms, by

simple and properly chosen details, and by clearly emphasizing the construction, but without permitting these to degenerate into a mutual strife to excel, as unfortunately too commonly preferred. Designed artistically as indicated above, our apartment houses would very soon combine in an esthetically pleasing view, and they would certainly be suited for all purposes for which the street is provided.

It must always be remembered that a modern great city neither can nor should have the appearance of ancient Rome or that of old Nuremberg.

The importance of the straight line in modern architecture has frequently been mentioned. A number of reasons clearly and strongly indicate its use to the greatest extent. It is a justifiable requirement for the direction of streets, since man always walks in a straight line, and a person in haste would certainly be irritated by the least deviation, causing loss of time. The last decades bear the motto: "Time is Money." Projectors of curved avenues may inform themselves on this point by observing men crossing the surfaces and angles of lawns. Still worse befalls those who introduce inconvenient streets, and many unflattering changes will be made by those led into this difficulty. It is evident that straight streets are not always possible. The curve or broken line must frequently be chosen for lines of streets, to preserve existing buildings, or to produce better forms of building sites. Such are then existing conditions that contribute to make the appearance of the city richer in contrasts and also more interesting.

One matter requires special mention, that breaks in the direction of the street must never be located at the middle of a block. If the straight line, or the shortest line, is admitted to be best for pedestrians, then for carriage traffic it is certainly permissible to arrange slight turns and curves, but only where they would result from existing natural or artistic causes. The greatest protection for the public, demands for carriage use a sufficient width of the streets, and a considerable increase in width at the intersections of streets.

The lack of public buildings which by grand forms or by richer outlines are suitable for interposition between façades of apartment houses to powerfully break the view of the street by strong contrasts, must allow the architect to produce such effects by other means. The most suitable of these are: the insertion of squares, a moderate projection and recession of façades of buildings, the arrangement of parkings, placing subdivisions in the streets, a division of the street by inserted monuments and fountains, and, finally, by objects placed in the street, such as trees, shrubbery, hedges, kiosks, etc.

It scarcely requires discussion that a pious preservation of inherited works of art, a strict acquiescence in the preservation of their surroundings with reference to well-weighed visual distance of view, and many other things afford other valuable means for enriching the artistic treatment of the perspectives of streets.

But the problem of the architect does not end with the artistic treatment of the streets and squares of a city. The most recent period has produced many institutions and many improvements awaiting artistic development. Railways are first mentioned, whose influence on the view of the street is but too frequently fatal. Aside

from all other disturbances produced, railways on the street level nearly always disfigure its appearance, whether they are horse, steam, or electric. This opinion has become a conviction in the great cities. Thus the Parisians would never permit them on the Place de la Concorde, or on the Champs-Élysées, nor the Berliners on the Unter den Linden. Main railways, to which every large city must adapt itself, may be either elevated or subterranean. The choice of either system depends entirely on local conditions and practical reasons. The results for and against them may be collected in a few main points. Subterranean railways, when covered, scarcely affect the appearance of the street, are more convenient for traffic, but are usually more costly in construction, and are disagreeable to the traveling public. Elevated railways sometimes strikingly disfigure streets, are somewhat cheaper than subterranean, and afford the passengers much enjoyment by unobstructed and changing views. But the inhabitants will always decide to preserve the most beautiful appearance of the city, and, therefore, the elevated railway will not receive their approval, which is invariably the opinion of the architect as well.

Law or custom, practical or financial reasons, produce in every city some quarters occupied by villas, manufactories, or dwellings that depend on a suitable location of the city, and frequently develop very rapidly during a period of prosperity. In more recent times there is a certain tendency to restore the importance of the separate house, with the ideals therewith connected, in order to recover what has been neglected. This tendency has taken possession of building speculation, so that a new type of city and street has arisen, the cottage and villa arrangement. Although the streets in such villa quarters are to be approved for esthetic reasons, where so frequently laid out with alternating, contrasting, detached buildings, or those in solid blocks with gardens before them, interposed squares, etc., they have so far only shown defective results, chiefly because speculation has killed this mode of building by the unrestricted duplication of a *single* architectural type. Popular estimation has pronounced its justified and destructive judgment by designating such quarters as villa churchyards. Whether separate dwellings or apartment houses, a large number of similar buildings, placed beside each other, must destroy all effect and produce esthetic weariness, only to be removed by strong contrasts. Therefore, such villa quarters at least require to be intersected by streets needed for business traffic, executed in a very different architectural arrangement.

The important influence exerted on the appearance of streets by monuments was fully treated under Composition, except for fountains, the step-children of modern art. Squares and streets of modern dimensions imperatively demand prominent and strongly marked points. This cannot be done by monuments, since their necessary number and dimensions would far exceed their purpose and meaning. Recourse must be had to other objects for display, and monumental fountains come first in consideration. To refreshing and animating effects offered to the citizens is added, as an important artistic motive, the fact that they are very readily adapted in form and dimensions to the shape of the square. This is

then a standard motive, especially in our own city (Vienna), whose general use is not sufficiently considered.

The influence of modern bridges on the appearance of the street has almost vanished. Steel has supplanted stone, and the means at command tell the rest of the story in a way not to be misunderstood, so that bridges have almost entirely sunk to become structures of mere utility, mere elevated extensions of streets. The earliest brutal appearance of the new material led the citizens to protest energetically, and this has now at last resulted that even where only partially possible, the deck bridge is used to retain the always beautiful perspective unobstructed. It is likewise imperatively necessary for art and artists to contribute weighty suggestions for such undertakings, that the heretofore neglected view of the bridge lengthwise may receive a certain development, thereby in part affording the esthetically required view for the person approaching it. The artistic treatment of bridges must in most cases exhibit strongly emphasized bridge ends, with a richly designed railing for the bridge.

Our great advances in sanitation, the undisputed results of sanitary precautions, the vast and increasing population in great cities, and also the fact that cleanliness is inseparable from works of art,—all indicate the necessity for a scrupulously clean condition of our business streets, and a spotless appearance of public buildings and monuments. This requirement is more than justified, and the architect must even in his first sketch take corresponding precautions. It cannot be our object to mention everything pertaining to sanitation, but weight must be laid on this, that the architect must be perfectly acquainted with current information in this field, especially since modern requirements demand novel artistic forms.

Not belonging to sanitation, but allied thereto, is the problem of the disposal of gases of combustion and soot, continually becoming more prominent in our great cities. Sanitary regulations, such as compulsory use of coke, location of manufactories on the outskirts of the city, apparatus for consuming smoke, etc., evidently afford but slight relief, since these do not affect the vast number of heating apparatuses in our dwellings and public buildings. The appearance of the city is affected only in esthetic respects by manufactories and their great chimneys, while smaller smoke flues remain almost invisible. Even if more beautiful forms were perhaps devised for the former, yet, according to the present condition of science, no hope exists for the elimination of smoke and soot from our cities within any conceivable time. But smoke and soot are most injurious to modern art works. A mixture of dust, soot, and sediment quickly covers every work of art in the open air, giving it an entirely changed appearance, certainly not intended.

Attempts have not lacked for taking into consideration the innate sense of color in man by the aid of the sister arts. All such are thwarted by the esthetically and chemically injurious result of the evil just mentioned. Combined with this are also unfavorable climatic conditions, from which result blackened façades, with their sculptured ornamentation made unrecognizable by soot. The unpleasant color of bronze monuments, the lack of durability in all paintings on the exteriors of public buildings, the necessary boxing of all marble decorations

of squares and buildings during winter, etc., are the sad result of this evil. A remedy is only to be provided by the use of the simplest possible forms, of smooth surfaces, the use of porcelain and majolica, stoneware, mosaic pictures, etc., and modern architecture is able to show important results in this field.

Sufficient light, pleasant temperature, and pure air in rooms are very justifiable requirements by mankind. While these were esteemed unattainable a few decades since, a number of improvements and inventions have given us the possibility of their complete fulfilment. Thus the electric light makes possible the ideal lighting of rooms with avoidance of danger from fire.

Political and social conditions influence in a high degree architecture in cities, and these must even be taken as the primary causes of our so greatly changed type of buildings. Democracy has placed before the art a large number of new problems, but it must be stated that though art has gained by the power of the new impulse and by the possibilities created by modern construction, it has certainly lost the will of the sovereign, energy, and love of fame in individuals. Our colossal structures (exhibitions, railway stations, parliament houses, etc.) are eloquent witnesses, when compared with castles, palaces, etc.

Finally, we should consider the influence of economy upon art. It seems as if the influence of art first begins only where abundance and wealth exist. This is certainly wrong. Simplicity, indeed, best suits our present views, which in the appearance of the city at least require the artistic and the practical. Mere utility and overloaded tastelessness must therefore disappear. Even the simplest object may be treated artistically without increase in cost. More than ever in such cases there comes to the architect the earnest warning to demonstrate his artistic powers by exact and conscientious fulfilment of requirements by using the simplest and most appropriate forms. *Doubtless it can and must go so far, that nothing visible to the eye may be produced without receiving the consecration of art.* It should never be forgotten that the art of a country is not only the measure of the value of its wellbeing, but, above all, of its intelligence as well.

A general and inflexible adherence to such ground principles by architects would soon give an entirely different appearance to every city, and cause the disappearance of the offensive and overloaded ornamental chaos of suburban buildings. At every such opportunity the influence of the modern endeavors of mankind upon the future treatment of architectural works would be considered. But while there still frequently prevails in the external appearance of our buildings some uncertainty, a groping and seeking after the true generally appears in internal architecture, in the treatment of objects for use, an energetic and well-aimed application to industries, as well as very advanced powers, that take a fuller account of modern tendencies.

The word "comfort" has been naturalized in all languages, and everything would now be designated as mistaken that is opposed to its strict laws. Two conditions serve as criterions, and are prescribed by modern mankind: *The greatest possible convenience, and the utmost cleanliness.* All attempts to ignore these axioms produce

only worthless results, and all products of art not in accordance with these rules bear within themselves the germ of death. Examples are innumerable. Inconvenient stairways, everything ugly, unpractical, hard to clean, all inconvenient sanitary arrangements, furniture with sharp angles, seats unsuited to the form and not adapted for occasional use while reading, eating, or smoking, or for receptions, all unpractical works of art industry, even if the greatest minds are responsible for them, and many other things belong in this class. It is here immaterial whether these articles were intended for the palace, or for the simple dwelling of the citizen. If our modern creations of this kind, corresponding to the idea of comfort, be compared with the productions of even the most luxuriant French periods, the vast difference is very clear, and it must be confessed that good and entirely novel things may now be created, and have indeed been produced. The English first fulfilled these requirements, and they have for decades borne allegiance to this modern tendency; they have so far succeeded in the most recent times by a happy choice of forms taken directly from nature as to tolerably make amends for the lack of taste so long prevailing among them.

It was stated in the essay on the Architect that the modern architect has become the supporter of art handiwork. Strenuous endeavors made by the State to again unite art and industry have so far been without result worthy of mention. This is because art industry, art handiwork, and the ideas therewith connected are merely phrases, and that any elevation of this conception under present conditions is entirely inconceivable. Industry and handiwork naturally tend toward production by a manufactory, and money or wages alone attracts in this direction; but production in a manufactory is incompatible with art. This fact will also briefly and clearly show the defective, one might almost say the obsolete, point of view of our schools for art industries. It may, therefore, without further discussion, be maintained that everything really good and novel in industry and handiwork at this time is created by architects alone. In designing such works, the architect must have the technics of the material and of the workmanship before his eyes, and must know them thoroughly.

If we now turn aside from these endeavors in handiwork, an extensive knowledge of which the architect must possess for ordinary architectural works, and merely glance over the different tendencies, like stonework, textiles, ceramics, metal-work with its hundreds of processes, it will become clear that the architect must accumulate a treasure of knowledge if his creations are to be successful. There are vast numbers of things that modern civilization produces, for which modern art has already invented forms, and even given to many perfected shapes, that scarcely recall forms in past times, and are, indeed, entirely novel, since even their basis or structural principal has come from our original requirements and observation. A refreshing breeze passes over the sterile field of art, and luxuriant shoots put forth everywhere. Not everything that germinates and grows there ripens into fruit, or becomes an art form, but as the natural development of art requires, novelties do arise, and finally the dirty sewer of copying will be left behind, a circumstance fortunate for us. Art strides

forward slowly and seriously, produces creatively and constantly, until it attains the ideal of beauty that fully corresponds to the period. The noisy talk of mankind may again cause it to descend, but it will arise again and again if its new and inspiring impulse is supplied. Thus it was and so will it ever be. It is the sacred problem of the architect to accompany and not depart from it, even if the path be thorny, so that mankind may rejoice in the objects created by art through his means.

As these words suggest, earnest advice is given to those who are to become architects, to exercise themselves in observation, in perception, in the recognition of human needs, and to take the results of their observation as a basis of creation, but not to copy existing objects, unsuitable for modern men, or with slight changes to dish them up as novel and good. If architecture be not rooted in the life, in the needs of existing mankind, then will it lose the direct, animating, vivifying quality, and it will sink down to the depth of a wretched level, even ceasing to be an art.

The architect must always keep before his eyes, *that art is called to work for mankind, and that mankind is not here for the sake of art. Creative power must ever show itself anew in every work of art, and they are right who declare beautiful novel creations to be the supreme measure of value of art qualities.*

CONCLUSION.

This essay has extended far beyond the original intention, and yet it appears to me only to give expression to my convictions in the briefest form. Its contents can merely be the foundation; the method and means of producing other ashlar for the structure, how they are to be laid, and what forms they are to receive, — all these must be left to the pencil in the school. I have yet much to say, but illustrations would then be necessary. I would then avoid this, since my previous publications form in a certain sense illustrations of what is said. They clearly show how my expressed views have ripened. I believe that in this essay I have pointed out the path that must be followed in order to approximate to the proposed aim, — a modern architecture.

A direct question, "How should we build?" cannot indeed be answered. *But our feeling must indeed say to us to-day that the antique horizontal line, the arrangement of surfaces in broad areas, the greatest simplicity, and an energetic prominence of construction and material will thoroughly dominate future developed and novel art forms; this is demanded by modern technical science and by the means at our command. It is self-evident that the beautiful expression, which architecture will give to the needs of our time, must harmonize with the views and with the appearance of modern mankind, and it must show the individuality of the architect.*

There can now be no suggestion of smothering the ideal, or of lowering the level of art, and those convinced by this essay or strengthened in their convictions must admit that the great and new impulse for which mankind constantly longs, when rightly understood, will assuredly contribute more powerfully to clear up the now very erroneous views on art than all well-meant and obstinately defended theories on the use of the forms of past centuries, pure in style and well copied, but which no

longer have any connection whatever with modern mankind.

But architects who strive for the aims indicated in these essays are, then, *what the architects of all periods were, the children of their era; their works will bear their own stamp, they will themselves solve their problems by contributing to development, and they will truly create; their language will be intelligible to mankind, the world will behold its own reflection in their works, and self-consciousness, individuality, and convictions that belonged to the artists of all periods will fill their hearts.*

The errors of our ancestors in permitting impiously the works of their own ancestors to be neglected or destroyed will be avoided by us, and we shall place in a suitable setting like jewels, works transmitted to us, so that they may be preserved for us as modeled illustrations of the history of the art. The vast progress of civilization will plainly show us what should be learned from the ancients, and what should be omitted, and the indicated true path will certainly guide us to the aim of creating the novel and the beautiful.

May what has been said in these essays fall on fertile soil for the welfare of art and artists; may the thoughts expressed contribute to arouse a freshly pulsating life, a rich development of architecture with a definite aim, so that in a not too distant period we may see embodied our ideal of beauty, the predicted and hoped for!

THE END.

STEEL construction is the most characteristic architectural development of the nineteenth century. It came as an inspiration to a few of our best architects, and its possibilities, extreme adaptability, and scientific accuracy at once commended itself to every constructor. It has undoubtedly influenced our national architecture far more than we can now appreciate, and its effects will continue for many years to come. But, like all good things which come in this world, it has its inconvenient side. All of our architecture is fortunately not limited to fifteen and twenty-story office buildings. In fact, our best architectural successes have been in buildings of a very moderate height, and worth in design is by no means measured by either expanse or altitude. The steel cage construction is so new, and gives the architects such boundless control over the material forces of the building, that we have undoubtedly at times put too high a value upon it, and, in a way, it has tinctured our whole idea of construction. When it is no longer necessary to carry piers on anything more substantial than an I beam, and when the external effect of the building is obtained by the use of a thin veneer of architecture over a minimized web of steel, and while the whole problem is, in reality, still in its infancy, we must expect, and we do find, more failures than successes from an esthetic standpoint. The very fact that the problem is so interesting can easily blind us as to what is its essential nature. We do not mean by this that the steel skeleton is to be deprecated, but rather that in our designing we should not forget that the principles of constructive design are older than I beams, and that artistic composition, balance, and unity are not factors of Z-bar columns or built girders. The fact that terra-cotta and brick lend themselves so thoroughly to steel construction should not make us forget the limitations of either material.

Selected Miscellany.

NOTES FROM ST. LOUIS.

The universal topic at present is the coming World's Fair, and now that the site has been determined upon and the Commission of Architects selected, the work will soon be under way.

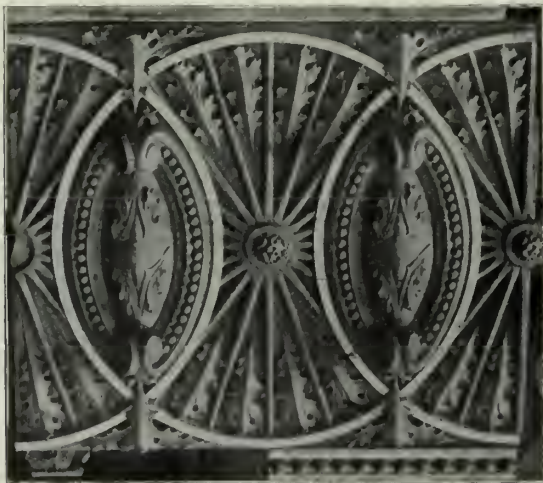
The selection of the site has been very fortunate, the municipal assembly having granted the privilege of



DETAIL BY CLINTON & RUSSELL, ARCHITECTS.
Perth Amboy Terra-Cotta Company, makers.

using the western or undeveloped part of Forest Park, and the available land contiguous to the park will fix no limit upon the space that may be used.

The plan pursued in selecting the architects has followed closely that which prevailed at Chicago, a commission of ten architects having been chosen, five from St. Louis, and five from the country at large. Mr. Isaac S. Taylor has been chosen the chairman of the com-



DETAIL FOR A VEHICLE MANUFACTURING BUILDING.
Winkle Terra-Cotta Company, makers.

mission and the director of the works. The other St. Louis members are: Eames and Young, T. C. Link, Barnett, Haynes and Barnett, Widman, Walsh and Boissellier; and the members from a distance are Cass Gilbert and Carrere and Hastings of New York, Van Brunt and Howe of Kansas City, Walker and Kimball of Boston, and D. H. Burnham & Co. of Chicago.

A desire is manifest to have some of the improve-

ments of such a nature as to remain permanent as well as that some of the buildings shall remain a permanent



DETAIL FOR NEW THEATRE, BOSTON.
J. M. Wood & J. G. Howard, Associated Architects.
Atlantic Terra-Cotta Company, makers.

and enduring monument of the occasion commemorating the hundredth anniversary of the "Louisiana Purchase."

The building permits since the first of the year show a total value of buildings of six and one-half million dollars for that period, being a gain of 121 per cent. over



DETAIL BY J. E. R. CARPENTER, ARCHITECT.
Standard Terra-Cotta Works, makers.

that for the same period last year, and for May and June the gain was 272 per cent. over a similar period for 1900.

In designing the new Ralph Waldo Emerson School, Commissioner of Schools Wm. B. Ittner has followed the lines of English schools in plan as well as in exterior treatment. The building will contain 18 rooms besides the kindergarten department, and will be 200 ft. long,



DETAIL BY HARDE & SHORT, ARCHITECTS.
Excelsior Terra-Cotta Company, makers.



ST. LEO'S CHURCH, LEOMINSTER, MASS.
Maginnis, Walsh & Sullivan, Architects.



COLUMN BY E. L.
ENGEL, ARCHITECT.
B. Kreiseher & Sons,
makers.

catholics are building a church on Grand Avenue at a cost of \$50,000, and St. Mark's congregation are building a church and parochial residence on Page and Academy Avenues, to cost the same amount. The former is a classical design by C. S. Holloway, and the latter is Gothic by G. W. Helmuth.

IN GENERAL.

Edward P. Casey, architect, has removed from 171 Broadway to 1 Nassau Street, New York City.

Walter H. Kilham and James C. Hopkins, Boston, have formed a copartnership under the firm name of Kilham & Hopkins; office at 9 Park Street.

The School of Architecture of the University of Pennsylvania, like the Architectural School at Harvard, is soon to have a building of its own.

One of the largest office buildings in Philadelphia will soon be erected on the northwest corner of 12th and

but only two stories and basement high. It will cost \$125,000.

A number of large churches are being built, a permit having been issued for St. John's M. E. Church at the corner of Kingshighway and Washington Avenue. Barnett, Haynes and Barnett have prepared drawings for the new Roman Catholic cathedral, to be built on the northwest corner of Lindell Boulevard and Newstead Avenue. The building will be of marble, in the Renaissance style. The Italian

Chestnut Streets. James Windrim has been appointed architect.

Guy Lowell, of Boston, has prepared plans for a palatial country house, to cost \$300,000, at Jenkintown, Pa.; and an equally large if not so costly a suburban residence has been started at Bryn Mawr, Kennedy & Kelsey, architects.

SUNDRY ITEMS.

St. Augustines Church, Pittsburgh, Pa., Rutan & Russell architects, illustrated in the plate forms of this number, was built of "Ironclay" brick, made by the Columbus Face Brick Company.

The architectural terra-cotta used in St. Peter's Church, Harding & Gooch, architects (illustrated in the plate form of this number) was made by the Excelsior Terra-Cotta Company.

B. Kreiseher & Sons, New York City, manufacturers of architectural terra-cotta and brick, report the following new contracts: Residence, Washington, D. C., McKim, Mead & White,



ADVANCE THRESHER COMPANY BUILDING, MINNEAPOLIS, MINN.
Kees & Coburn, Architects.
Built of "Ironclay" brick, made by the Columbus Face Brick Company.

architects; white brick. Press Club, 9-11 and 13 Spruce Street, New York City, A. W. Brunner, architect; buff-gray brick. Residence, Tuxedo Park, New York, Clinton & Russell, architects; gray terra-cotta. American Express Building, Madison Ave., New York City, Samuel Huckel, architect; dark gray speckled brick.



DETAIL BY GEORGE
KEISTER, ARCHITECT.
New Jersey Terra-Cotta
Company, makers.

Celadon Roofing Tile (Charles Bacon, Boston agent) will be used on the new addition to the Hotel Somerset, Boston, A. H. Bowditch, architect.

Charles Bacon, Boston agent for Sayre & Fisher



DETAIL BY JOSEPH EVANS SPERRY, ARCHITECT.
Conkling-Armstrong Terra-Cotta Company, makers.

Company, reports the following new contracts for furnishing brick: Clinker brick for stable, Brookline, Mass., Coolidge & Carlson, architects; house, Brookline, Mass., W. G. Preston, architect; Massachusetts General Hospital, new building, Wheelwright & Haven, architects; South Terminal Trust Company Building, Boston, Winslow & Bigelow, architects; Walker Building, Boston, Winslow & Bigelow, architects; Sears House, Weston, Mass., J. E. Chandler, architect; block of houses, Bay State Road, Boston, L. M. Merrill, owner. Total of nearly a million brick.

Adjoining the Canadian Government Exhibit, at the Pan-American Exposition, Buffalo, 1901, Messrs. Henry Maurer & Son, of 420 East 23d Street, New York City, have erected a structure, a view of which we reproduce, to exemplify the various uses to which clay is adaptable.

They have here erected a flat arch of the "Herculean" method of fire-proof construction, spanning 25 ft. in the clear, from wall to wall, without the use of iron beams or girders; all the metal necessary being Tee irons $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. by $\frac{3}{16}$ in., which are thoroughly imbedded in Portland cement to render the metal rust-proof, and again en-

cased in terra-cotta grooves, being everywhere covered by such fire-proof material never less than 2 ins. in thickness; presenting the acme of fire-proof construction.

The strength and rigidity of such an arch is phe-



SCHOOLHOUSE AT ST. BERNARD, OHIO.

Werner & Adkins, Architects.
Roofed with "American S" tile.

nomenal; one of 18 ft. span having been tested to meet the requirements of the Philadelphia Building Department, to cover buildings of any and every class, at 600 pounds to the square foot, showing, during a prolonged test of several days, no perceptible deflection whatever.

Another arch of 13 ft. span, 8 ins. deep, was erected at the New York Glucose Company's Factory, now building at Shady Side, N. J., and stood without any visible structural strain a load far exceeding even that.

This construction presents many radical features of interest to architects and engineers

They also show terra-cotta partitions of different thicknesses, the so-called "Phoenix" 2-in. partition being especially worthy of examination; column covering,



ASTOR APARTMENT HOUSE, NEW YORK CITY.

Clinton & Russell, Architects.

Terra-cotta furnished by the New York Architectural Terra-Cotta Company; front brick furnished by the Hydraulic-Press Brick Company, Fredenburg & Louns-bury, New York Agents.

gas retorts, front brick of different colorings; red clay roofing tiles which, if more extensively utilized for ware-

entire exhibit is an instructive lesson to all interested in fire-proof building.



DETAIL BY FISHER & LAWRIE, ARCHITECTS.
Northwestern Terra-Cotta Company, makers.

houses, depots, sheds, etc., would materially reduce the fire losses so frequent when shingles are used; in fact, the



THE FIRE-PROOF BUILDING, ERECTED AT THE PAN-AMERICAN EXPOSITION BY HENRY MAURER & SON.

NEW BOOK.

SCHOOL ARCHITECTURE. By Edmund M. Wheelwright, Boston. Rogers & Manson. Size, $7\frac{1}{2}$ by $10\frac{1}{2}$ ins. 350 pp. 250 illus. Price, \$5, delivered.

In 1898-1900 there appeared in *THE BRICKBUILDER* a series of papers on "The American Schoolhouse," by Edmund M. Wheelwright. The success of these papers suggested the publication of this book, in which the original material has been recast and the scope of the subject has been greatly widened.

Many American schools not considered in the original papers are illustrated and described, but the work is especially enriched from foreign sources. Examples are presented of the most typical and practically suggestive schools of Germany, Austria, Switzerland, the Scandinavian countries, England, and France, the subject being more comprehensively treated than in any book heretofore published. All details of school construction are considered, yet the information is studiously condensed within the limits of a convenient handbook, which is made readily accessible by an unusually full index.

It is hardly necessary to refer to Mr. Wheelwright's wide experience in the designing and construction of schools, or to his general recognition as an authority on school architecture.



DETAIL BY A. VAN BRUNT, ARCHITECT.
St. Louis Terra-Cotta Company, makers.

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A General Treatise on Designing and Planning of Schoolhouses.

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THE BRICKBUILDER,

SEPTEMBER,

1901.



HOSPICE SAINT JEAN (1563) AT HOORN, HOLLAND.



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THE REWARDS OF ARCHITECTURE.

IN a recent number of *Munsey's Magazine* there was published an article on the profession of architecture, this being one of a series dealing with the great enterprises of the business world. Particular stress seemed to be placed upon the pecuniary rewards which the profession of architecture holds out, and these rewards, which, though they come to few architects in the copious abundance which the *Munsey* writer imagines, are yet very tangible realities, and are so large and enticing in nature that a layman reading the article might very naturally draw the conclusion that architecture is a profession in which the rewards are sure as well as large, and would very naturally wonder therefrom why the profession is not vastly overcrowded and why all bright young men should not devote themselves at once to preparing to reap the magnificent incomes which the magazine writer depicted so alluringly. In one sense the profession of architecture is decidedly overcrowded. We doubt if there is any calling in which the subordinate

ranks are any more crowded than in architecture. Our universities are grinding out graduates by the score year after year, but somehow the number of practising architects who win large financial returns increases but very little from decade to decade. The reason is not hard to discover. It is very easy to get into the lower ranks of architecture, but he who would aspire to the great prizes must spend so many long years in arduous preparation that unless he has a special aptitude for that particular kind of work he is pretty sure to be tired out and thrown off the track before he arrives. It requires very little talent to be a third-rate architect. It requires a great deal to be first-rate. And though there are exceptions, and some architects who are mere business managers are able to reap large pecuniary rewards, it is nevertheless true that the large rewards are every year being more and more turned into the hands of the best fitted. Architecture is a profession which, as we understand it, will never be overcrowded in the upper ranks. There will always be room for the thoroughly well equipped architect, and though we occasionally hear pitiable stories of pluck and courage in the face of long years of small business and no prospects, such as was told in the columns of a contemporary a few weeks since, it is extremely rare to find a thoroughly well equipped architect with a natural bent for architecture who fails of an opportunity to exercise his talents. We think the *Munsey* article, which by the by seems like the work of a layman, exaggerates the financial rewards. The average income of a good architect we imagine rarely exceeds six or eight thousand dollars a year. At the same time the rewards are pretty certain for the right kind of men, and the profession has advanced amazingly during the last quarter of a century in its financial possibilities no less than in its artistic intrinsic capabilities.

ONE by one the states of this country are falling into line on the matter of supervision of the practice of architecture. We have just received from a subscriber at San Diego an abstract of “an act to regulate the practice of architecture as a profession in the state of California,” with a copy of the laws and rules of the board. The carrying out of the act is committed to a dual board consisting of ten members, five of whom have jurisdiction over the northern part of the state and five over the southern. It is provided in the act that half of the board shall be members in good standing of the San Francisco Chapter of the American Institute of Architects, or some similar institution or association of architects. This board is empowered to formulate and

adopt its code of rules and regulations so long as they shall not be inconsistent with the general intent of the act. Any person shall be entitled to examination for certificate for the practice of architecture upon payment to the district board of fifteen dollars. Should he be successful in his examination, he is required to pay a further fee of five dollars. It is provided, however, as in nearly all of the other states in which such legislation has been made, that any architect in good standing engaged in the practice of his profession on the date of the passage of the act shall be granted a certificate without examination upon payment of a fee of five dollars, but such application must be made before September twenty-third of this year. The act further stipulates that no person shall practise architecture without a certificate under penalty of a fine of not less than fifty dollars nor more than five hundred dollars. The law as a matter of fact is rendered of rather doubtful efficiency for the reason that it is expressly stipulated that "nothing in the act shall prevent any person from making plans for his own building nor furnishing plans or other data for buildings for other persons, providing the person so furnishing such plans or data shall fully inform the person for whom such plans or data are furnished that he, the person furnishing such plans, is not a certified architect." It would seem to us that under that clause of the law there is no real necessity of a certificate of any sort except as a matter of personal pride or business advertisement. It has been found that in Illinois the last named motives really count for a great deal, and it is quite probable that although the California law practically leaves it optional with an architect whether he shall or shall not have a license, the natural workings of human nature will probably result in a very general application for licenses. In regard to architects residing outside of the state, they are not required to pass an examination provided they can present satisfactory evidence of competency upon which they can obtain a temporary certificate upon payment of the fee of five dollars. The act is weak, furthermore, in that it does not distinctly define what an architect is, and the provisions apparently do not apply to engineers or constructors of any sort.

Among the by-laws we note that a diploma of graduation from the full course of architecture or architectural engineering of any university or technical school approved by the board may be accepted in lieu of an examination. We notice also a curious provision in regard to the seal which a licensed architect is required to possess, that as this seal is for the purpose of making an impression a rubber stamp is not permitted. The subjects for examination sound very comprehensive. They include the demonstration of ability to make practical application of knowledge in the ordinary professional work of an architect as follows: 1. Merit as investment. 2. Planning. 3. Construction. 4. Design. 5. Rendering. Beyond this there are the ordinary requirements which are found in all technical schools and in all similar laws.

The law is good as far as it goes and is on the whole a very fair beginning. It is a pity that it could not go a great deal further and be really mandatory instead of simply permissive.

THE development of the typical American public schoolhouse plan has called for a great deal of study and thought, and to the solution of the problems involved probably no one has contributed more than Mr. Edmund M. Wheelwright, whose book on *School Architecture* has just been put on the market. The architectural profession in this country can feel a great deal of pride in the schoolhouses which have been evolved as a result of so much study and which have met the public demand so completely. There is even now, however, hardly a single large city in this country wherein the school accommodations are entirely adequate to the demands. There is a constantly increasing necessity for larger and better schoolhouses, and at the same time the architectural necessity that schoolhouses shall be artistic is growing in every community. Mr. Wheelwright's book is therefore specially timely, and it is one which appeals not merely to the trained architect, but with quite equal force to every one who is interested in schoolhouse construction. This book should be in the hands of every school committee. It is not likely that any publication of this sort would make good architects out of good school committee men, — that is neither necessary nor desirable, — but it would show to the intelligent reader how schoolhouse architecture has developed and how a schoolhouse may be not only thoroughly well planned, but also well designed. It is fair, we think, to claim that this book marks an epoch in schoolhouse construction. The time was not very long since when almost anything would answer for a schoolhouse, and the structures in which our ancestors learned the rudiments of education were cheerless, barren and often unsanitary. The modern school can and should be a thing of beauty in which the most exacting considerations of hygiene, lighting and arrangement are most scrupulously considered. Mr. Wheelwright has rendered a great service in reducing the requirements of a modern schoolhouse to least terms, expressing them in a concise, comprehensive manner and formulating the results of the best practice both here and abroad. The work is by no means exhaustive. Within the last few years thousands of well-built, well-equipped schoolhouses have made their appearance in various parts of the country, and the writer could only select from the best of material which was offered; but he has gathered together the typical examples of all sorts and has brought to the subject an analytical mind and a trained intellect, which makes his deductions of great value.

A. I. A. CONVENTION, BUFFALO, N. Y., OCTOBER 4 AND 5.

The thirty-fifth Annual Convention of the American Institute of Architects will be held at Buffalo, Oct. 4 and 5. Quarters have been secured for members near the Exposition grounds. Members who have not already signified their intention of being present should send their names at once to Mr. William H. Broughton, Secretary, Buffalo Chapter, Prudential Building, Buffalo.

A very interesting program has been arranged for the Convention, and the indications are that a large number of members will be in attendance.

Brickbuilding in Modern France. III.

BY JEAN SCHOPFER.

WE will examine in this article more interesting brick residences. The examples will be varied so as to demonstrate the diversity of forms to which brick has been applied.

In Fig. 1 we see it employed in the wisest and most sober manner, in a rich private house on the Parc Monceau, frames of stone appearing at the windows only.

There is something restful in the simplicity of this house, and we find pleasure in contemplating it after



FIG. 1. PRIVATE HOTEL, PARIS.

having visited some of the fantastic structures which we are obliged to accept under the head of modern art.

Fig. 2 is of an apartment house in the west of Paris. It is by one of the most interesting of the young architects, Mr. Plumet, and is of light-colored brick. The window arches are interesting, and the whole of great sobriety. There is, however, a slight heaviness in the central balcony of the fourth floor.

The villa reproduced in Fig. 3 is at Asinères. The bricks are of two shades, and the whole framed in



FIG. 3. VILLA AT ASINÈRES.

ponderous chains of white stone. The general effect is bad.

I prefer, however, original as it is, the next little house (Fig. 4). The architect was instructed to build a home for a bachelor. He was told that the house must be of limited dimensions, but that there should be a large drawing room where the master of the house could receive his friends. And so all the high ground floor is occupied by one vast room, and the private apartments are on the upper floor. From this comes the tower-like aspect of the little house. When the photograph was taken it stood quite alone in a street of vacant lots. The growth of the city towards the west has changed the appearance of its surroundings, and now the Romanesque tower is flanked by small Renaissance houses.

Fig. 5 is a house which I do not give as a model, but which is of interest because it shows that something may be done with brick alone, and that we can find color



FIG. 2. APARTMENT HOUSE, PARIS.

effects without eternally turning for them to white stone and red brick.

The stable and coachman's house (Fig. 6) in the courtyard of a big private house in the Rue Ampère are built of the same material. Here the brick of the ground floor is varnished, and on the first floor it fills the intervals between a timber work which is a real timber work, bearing weight, and not an application of a lattice on an ordinary wall which we have so often seen in England. The effect is gay, and the owners can dispense with the usual dining-room stained-glass windows destined to hide the court from view.

The house illustrated in Fig. 7 and situated on the Avenue Henri Martin is by the same architect who built the Greek Pavilion, which we examined in the preceding article, Mr. Magne.

It also is of brick, well designed and of good color effect. White stone appears here in the window frames,



FIG. 4. PRIVATE HOTEL, PARIS.

but its arrangement is by no means traditional and has evidently been independently thought out, according to its rôle in the building. The arches of the windows introduce a red note in the light-colored façade. In the right fore part of the house where the three windows are joined in one a discharging arch of red brick strengthens the wall above the vast opening.

The tiles in the frieze, of enameled terra-cotta, placed under the cornice, complete the decoration of the façade.



FIG. 5. PRIVATE HOTEL, PARIS.



FIG. 6. RUE AMPÈRE, PARIS.

The last work to be seen is by the excellent brick specialist, Mr. Train (Fig. 8). It is a house on the Place St. Sulpice. It is entirely of brick and treated in the most agreeable and simple way. The iron lintels of the windows are visible. The varnished brick in the walls are in relief. The upper arches are ingeniously drawn. In fact the façade is a model from the point of view of decoration and brick construction.

The façade faces a court, not the street. The building to which it belongs is a shop of religious works of art. Hence the design of the windows.

Before examining brickbuilding in the north of France, where it has always been held in great favor, we give an illustration (Fig. 9) which will serve to illustrate one way of employing brick as an accessory, to show its intervention as a purely decorative element.



FIG. 7. PRIVATE HOTEL, PARIS.



FIG. 8. BACK OF STOREHOUSE, PLACE ST. SULPICE.

It is a large villa designed by Mr. Grandpierre.

The walls are in *pierre meulière*; brick and white stone intervene to enliven the angles, the window frames and the walls beneath the cornice. The whole is picturesque and highly colored, as a country residence should be.

AN UNUSUAL CASE.

COMPETITIONS of the old and more familiar sort have usually meant a selfish scramble on the part of some unfortunate architects to secure the approval of a few well-meaning but misguided committee men. It is not always thus, however. A subscriber writes us from Omaha calling attention to the proceedings of the county commissioners of Hall County, Nebraska, who were authorized to employ an architect for a proposed eighty-five thousand dollar courthouse. Several architects were invited to meet the commissioners. After a conference with the six architects present and before the meeting adjourned, the commissioners selected an architect, J. R. Kimball of Omaha, agreeing to pay five per cent commission on the cost of the building and in addition all traveling and other expenses, plus eighty-five dollars per month for superintendence. Such practice is not as rare as it was a few years ago, but it is none the less deserving of commendation, and it shows that the architect's position is not in the forlorn condition which some of us remember so well. It is our conviction that competitions for any except the large monumental public buildings do far more harm than good, are an expense to every one concerned, and simply delay the final selection of an architect without any compensating advantages. We have yet to know of a single competition for

buildings of the larger type in connection with which the desired results would not have been accomplished quicker, with less expense and with pleasanter feelings on the part of every one concerned, had the procedure been adopted which appears to have worked so successfully at Omaha. The architecturally uneducated public has an idea that a competition among architects is instituted for the purpose of selecting or obtaining or in some mysterious manner evolving plans. As a matter of fact this is not true; a competition means simply the selection of an architect, and in nearly every instance



FIG. 9. VILLA BY GRANDPIERRE.

after the architect is selected the whole problem has to be restudied, and valuable time, money and nerve tissue are wasted. We certainly congratulate the commissioners of Hall County both on their method of procedure and on the result of their selection.



GARDEN VIEW OF HOUSE, PLACE DES UNIS, PARIS.

Architectural and Building Practice in Great Britain.

BY OUR SPECIAL REPRESENTATIVE.

THE most important event in the architectural world since the publication of my last letter in *THE BRICKBUILDER* has been the action taken in regard to the national memorial to our late revered Queen Victoria. When the executive committee discussed the matter,



GARDEN FRONT, HOUSE AT FOUR OAKS, SUTTON COLDFIELD,
W. H. BIDLAKE, ARCHITECT.

three points came before them: the first, as to whether one architect of eminence should be selected for the work; the second, as to whether there should be an open competition; and the third, as to whether a few men should be selected to prepare designs and be remunerated for their trouble. Unfortunately, the last course was adopted. A great outcry against the decision was raised in the public and technical press, when many leading architects and artists expressed themselves strongly in favor of an open competition. The five architects chosen by the committee were Mr. T. G. Jackson, Mr. Aston Webb, Mr. Ernest George, Sir Thomas Drew and Dr. Rowand Anderson; Mr. Brock being the selected sculptor, around whose statue the architect will be asked to arrange an architectural envelope. In making such a choice the committee, after selecting the first three architects, seem to have been influenced by a patriotic spirit, which caused them to throw in a representative of Ireland and of Scotland.

Mr. Norman Shaw's opinion on architectural matters is probably the most influential in this country at the present time, and he had no reticence in expressing his dissatisfaction with the restriction of the competition to a few men. He pertinently remarked: "English architects of to-day know nothing of monumental work. This is perhaps because they have done so little of it. That little has been done badly. In this respect there is a vast difference between ourselves and the French and the Germans. Our best work is domestic architecture, theirs monumental. In the hands of people who could design the Arc de Triomphe and the magnificent votive church at Montmartre, such a work as the

Victoria Memorial would be perfectly safe." And not only did the committee make a great mistake in selecting only a few men to submit designs, but it was worse to choose only one sculptor, especially at a time when the great art was witnessing revivals both in this country and in France. It would be waste of time to repeat what other prominent men have said about this memorial; suffice it to say that from the very first there has been an emphatic demand for an open competition. The site chosen by the committee is that of Buckingham Palace, and it is generally understood that the memorial will occupy a position directly facing the building, with an avenue of columns or sculpture leading up to it. There are two objections to this site. The one is that Nash's palace is not worthy to form the architectural background to a great memorial, and the second that the line of the building and that of the mall are not in accord, the mall leading slantwise to the palace.

The Royal Academy exhibition this year is not exceptional, the architectural room especially preserving its wonted appearance. There are 166 drawings exhibited, — which is fewer than usual, — and of these the domestic work is, on the whole, good, several delightful country houses being shown; such as "Glebelands," a red brick building in Mr. Ernest Newton's most characteristic manner, the round-topped gables being very familiar. Mr. Aston Webb's "Sick Quarters for the Britannia Royal Naval College at Dartmouth" (of which an illustration is here given) is skillfully planned and worthy of this architect. The buildings are now in course of erection, the walls being faced with red brick, with Portland stone dressings. Mr. Caröe shows several churches (the one here illustrated is about to be erected of local bricks and tiles. The chief characteristics of the plan are the single-span nave and the arrangement of the sanctuary and east window).

In April last the Building Trades' Exhibition was held at the Agricultural Hall, London. It was the most com-

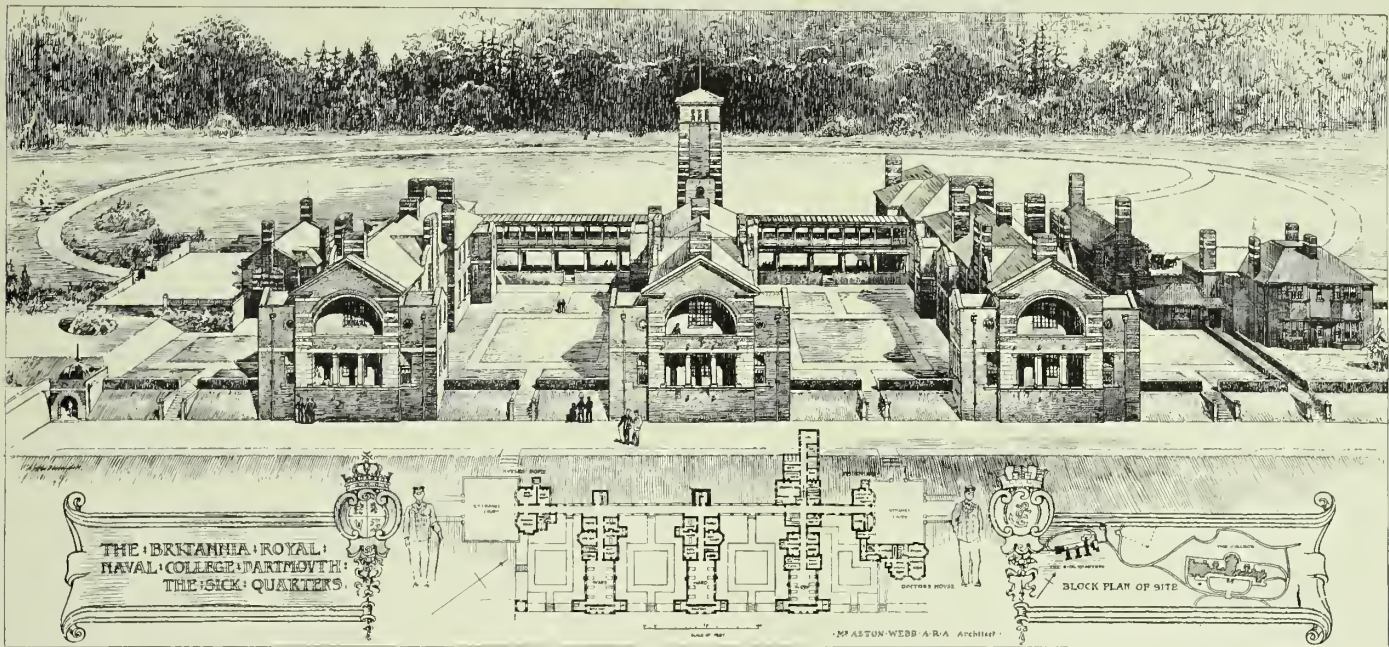


HOUSE BY PENTY & PENTY.

plete of its kind up to the present and was well attended by architects, builders, engineers and others. In connection with it an important conference between representatives of the Royal Institute of British Architects, the Institute of Civil Engineers and brickmakers was held relative to the proposed standardization of bricks. As was pointed out by Mr. Thomas Blashill (late superintendent architect to the London County Council), who

presided, a great difficulty arises by reason of the varying sizes of bricks needed to be used in the same wall, and it is very desirable that a standard should be determined. The following resolutions, drawn up by a joint committee of the two institutions named above, were submitted to the meeting:

sider the propriety of standardizing the size of bricks." Despite the diversity of opinion on this matter, however, of three things there is no doubt: First, that it is extremely difficult to determine what the shrinkage in a particular brick will be; secondly, good bricks conforming to the standard will cost more than those which



The length of the brick to be double the width plus the thickness of one vertical joint.

Brickwork to measure four courses of bricks and four joints to a foot.

Joints to be $\frac{1}{4}$ inch thick and an extra 1-16, making 5-16 inch for the bed joints, to cover irregularities in the bricks; thus giving a standard length of $9\frac{1}{4}$ inches center to center of joints.

The bricks to be measured in the following manner:



HITCHIN TOWN HALL.

Eight stretchers laid square end and splay end in contact in a straight line to measure 72 inches.

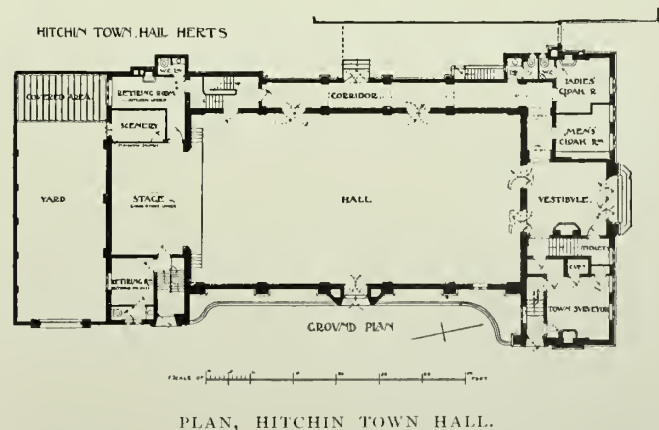
Eight headers laid side by side frog upwards in a straight line to measure 35 inches.

Eight bricks laid, the first brick frog downwards and then alternately frog to frog and back to back, to measure $21\frac{1}{2}$ inches.

The foregoing to apply to all classes of walling bricks, both machine and hand made, and facing bricks.

A variety of opinions were expressed at the meeting, and nothing more definite was arrived at than a resolution "that it is desirable to form a committee to con-

do not; thirdly, brickmakers at present experience no difficulty in selling their bricks irrespective of any standard, and therefore, if any change is made, it is for the convenience of architects, engineers and contractors. Perhaps the most the committee can do is to decide on a standard and leave it to the brickmakers to do their best to conform to it; but brickmaking is not an exact science, and those bricks which will need to be "thrown away" because they are above or below the standard size will doubtless offer considerable hindrance to the proposal being adopted throughout the country. It is interesting at this juncture to note that the further south one goes the smaller are the bricks. They are



PLAN, HITCHIN TOWN HALL.

smallest in Italy, then in Holland they are 2 inches thick, in London $2\frac{1}{2}$ inches, while in Edinburgh the thickness increases to 3 inches and $3\frac{1}{2}$ inches.

Two men of note in the architectural world have recently died—Mr. J. M. Brydon and Mr. Arthur Cates. The former was the architect of the great new building for the Local Government Board and Education Department now about to be erected in Whitehall, and it is a melancholy fact that, like Mr. William Young (the architect of the new War Office), Mr. Brydon should not have lived to see the completion of his greatest



CHURCH BY W. D. CAROE.

work. Mr. Cates devoted himself to architectural education and was largely responsible for the examinations now held by the Royal Institute of British Architects.

In concluding, I may refer to those of the accompanying illustrations which have not already been mentioned.

In the house by Messrs. Penty & Penty, sandstock facing bricks ($2\frac{1}{4}$ inches thick), with rubber arches and quoins, are being mostly used, finely tooled stone being employed for the dressings. It is intended to cover the roofs with sea-green Westmoreland slates, laid in courses which diminish from eaves to ridge, the coverings to ridge and hips being of lead.

The new Town Hall at Hitchin (in Hertfordshire) has a frontage of 78 feet, and its architectural style may be described as a simple treatment of the late English Renaissance. The joint architects of the building were Mr. E. W. Mountford and Mr. Geoffrey Lucas.

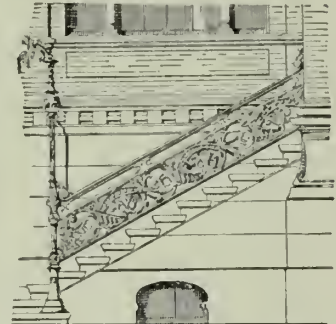
The house at Four Oaks, Sutton Coldfield, was designed by Mr. Bidlake for himself, and is an excellent type of the new domestic design. It is more especially successful in its grace and modeling (if the latter term may be borrowed from another branch of art), suggesting comparison with the domestic buildings of Gloucestershire, which are unsurpassed in this respect.

The Life and Works of Rafael Guastavino. Part III.

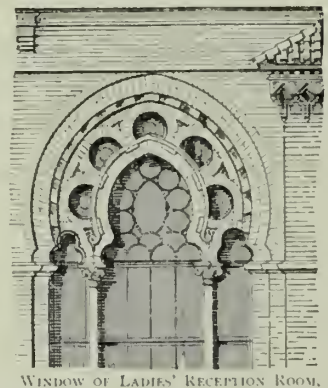
THE PRACTICE OF ARCHITECTURE AND COHESIVE CONSTRUCTION IN AMERICA.

BY PETER B. WIGHT.

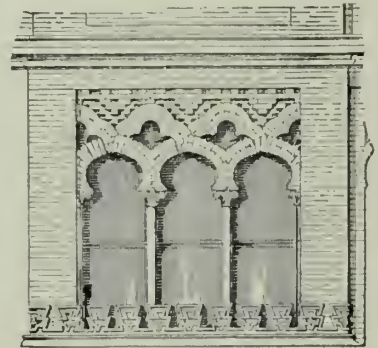
IT has been told in a previous paper how Mr. Guastavino's first work in America was architectural practice. Some reminiscences of this may be interesting. As stated, he came to this country in 1881, attracted by what he considered to be an appreciation of his work in Spain, as shown by the award of a medal at the Philadelphia Exposition, 1876, not knowing that nearly every exhibitor received a bronze "medal of merit" and no graded awards were made. He saw at once that here was a greater field for his talents than in the old country; but how to get the chance to cultivate it was not so clear to him. He had introductions to several architects in New York, but they did not enthuse over his ideas of construction. He therefore sought to bring himself before the public as an architect, and got an opportunity in the only journal then open to him, *The Decorator and Furnisher*, to publish some of his original drawings and perspectives on the Spanish Renaissance, with descriptive essays. He then got an opportunity to submit designs in competition for the new building of the Progress Club on 59th Street near 4th Avenue. In this he was successful and was chosen as architect for the building. Afterwards the late Henry Fernbach, who was the expert adviser of the committee and had recommended Mr. Guastavino's design for adoption, was appointed as consulting architect, and together they carried out the work. The front of this building (of which we present some details) was then the only brick front in this country



STAIR BANNISTER IN BRONZE.



WINDOW OF LADIES' RECEPTION ROOM.



CENTRAL WINDOW OF BILLIARD ROOM.



FIG. 1. DETAILS FROM THE FRONT OF THE PROGRESS CLUB, NEW YORK.

treated according to real Moorish principles. It is in the "Mudejar" style of the primary epoch, one of the phases of the beginning of the Spanish Renaissance before the Italian influence came in as the result of the Hispano-Italian wars. It is also illustrated and described in *The Decorator and Furnisher* of June, 1883.

Before the clubhouse was finished he again succeeded in a competition for the synagogue at Madison Avenue and 65th Street, New York. In carrying out this building he selected as his associate architect Mr. Schwartzman. He made all the drawings and details for both of these buildings, as well as designs for the interior decorations. He was next employed by Mr. Bernard Levy to design a residence. Mr. Levy had enough confidence in him to allow him to introduce his system of cohesive construction, and in this house, the first in America, he used his timbrel arches from basement to roof, and built the stairway with tiles and cement.

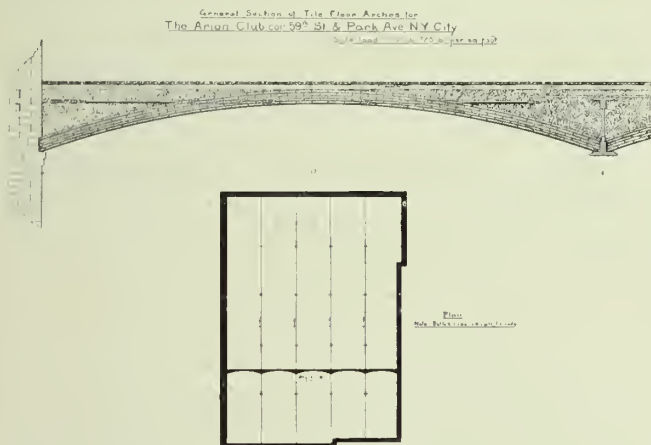


FIG. 2.

The same year he competed for the Arion Club, but was unsuccessful, and this was his last attempt to practise architecture as a profession. He however succeeded in getting the contract for the floor construction, which was shown on his plans. The illustration here given (Fig. 2) shows a plan of one of the floors and a section of the construction. It will be seen that these arches of seventeen

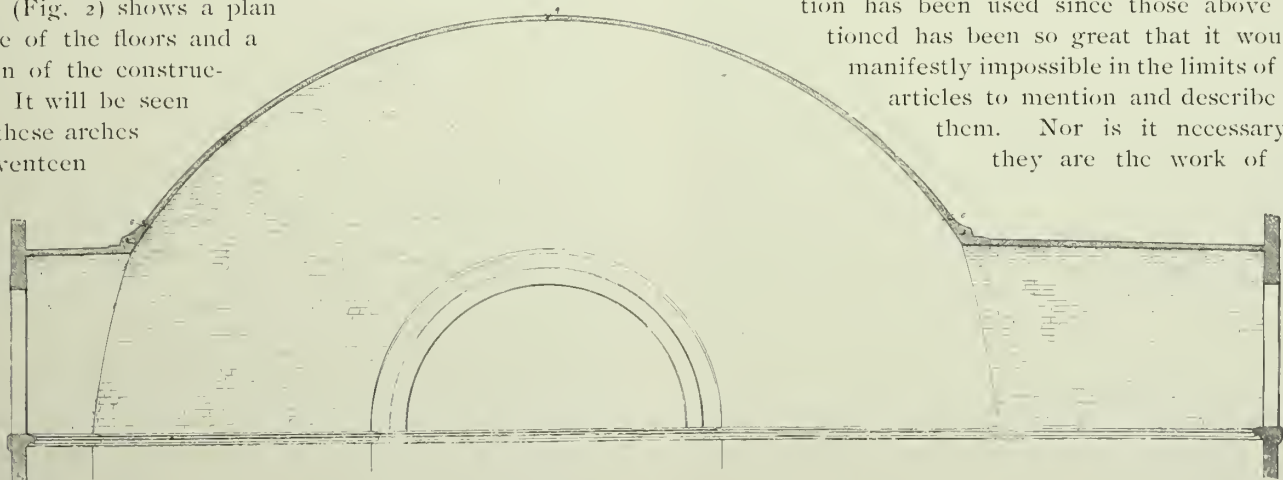


FIG. 4. SECTION THROUGH DOME, SEVENTY FEET IN DIAMETER, GRACE UNIVERSALIST CHURCH, LOWELL, MASS.

feet span are not domical, but plain segment arches made of five thicknesses of tiles, and computed to carry the extraordinary safe load of 725 pounds per superficial foot. They are such as he would not now recommend for such a building, but it was necessary to make them five inches thick to insure confidence in what was

regarded by all but himself as an experiment. Another reason that actuated him in so doing was that, as he had as yet not been able to put entire confidence in the Portland cement he was using, he set the first two courses of tile with plaster of Paris. His main object

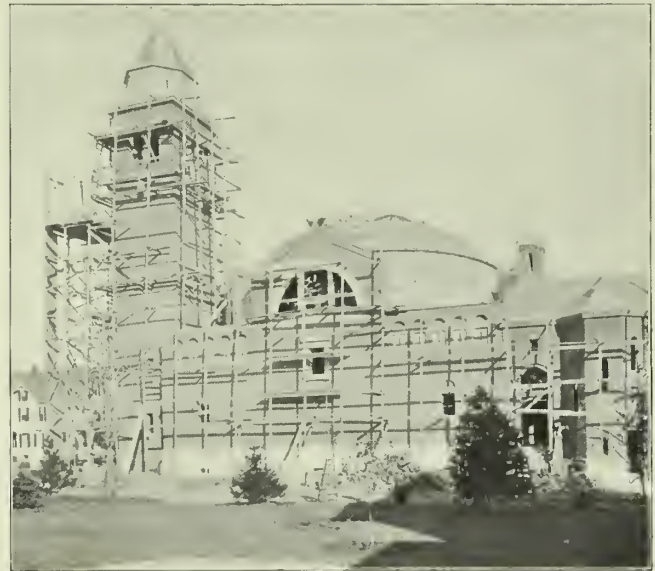


FIG. 3. GRACE UNIVERSALIST CHURCH, LOWELL, MASS.

in coming to America was thus accomplished, and he was now successfully launched as a contractor and expert. He had designed several private houses also, not above mentioned, and as soon as they were completed had no more desire to combine the profession of architecture with the business of a contractor, as he had done in his own country, especially as it was not considered good practice to unite them in our own.

He called his construction "timbrel arches" or "Spanish arches," but was surprised to find that architects would not call them by these names, but preferably as "Guastavino construction," by which they are now known.

The number of buildings in which cohesive construction has been used since those above mentioned has been so great that it would be manifestly impossible in the limits of these articles to mention and describe all of them. Nor is it necessary, for they are the work of some

of our most eminent architects as well as of Mr. Guastavino, and many of them are well known to the architectural profession through observation and publications. If some of the most important are not herein mentioned, it will be because they have already been illustrated in *THE BRICKBUILDER* and other journals. No attempt will



FIG. 5. DOME, EAST BOSTON HIGH SCHOOL, 70 FEET DIAMETER.

be made to arrange them in chronological order, and it will not be necessary for the purpose of these articles to give the names of the architects. In most cases they gave only the outlines of the constructions and Mr. Guastavino did the rest; such is the confidence that his work has inspired. In some, where the constructive steel used has been reduced to the minimum consistent with the performance of its office in connection with the cohesive tile work, both steel and tile work has been planned and executed by him alone.



FIG. 7. ELLIPTICAL STAIRCASE, BUFFALO GENERAL HOSPITAL.

His most remarkable and, to all appearance, daring constructions have been domes built over large areas. That which will be first selected for illustration is on Grace Universalist Church at Lowell, Mass., the exterior of which is seen in Fig. 3. The sectional drawing of this dome (Fig. 4) makes the construction clear. This dome has a span of seventy feet. Its thickness at the bearing edge is six inches, or six courses of tiles; and at the top four inches, or only four thicknesses of tile. So far it was a simple problem, but the penetrations of twenty feet each on the four sides required

extraordinary precautions, accurate calculations and great care in execution. It was thought wise, as will be seen in the drawings, to insert steel angles in the intersections. The work was executed six years ago under the immediate direction of R. Guastavino, Jr., and required seven weeks to build it. The result has been entirely satisfactory.

The dome of the East Boston High School, the exterior of which is seen in Fig. 5, is sixty-eight feet



FIG. 6. BUFFALO GENERAL HOSPITAL.

in diameter, and only fifteen feet rise, while near the center it is reduced to three inches in thickness. It also was personally directed by R. Guastavino, Jr. The method of using the skeleton centering is shown, permanent radial ribs being used. Between these a curved board was set for each course of tiles, and removed as soon as the second overlapping course had been set. As a test of the quality of the work during the construction, the upper end of the ribs was lowered from time to time, to see if there was any settlement, leaving the dome self-supporting at various stages of its progress. The eight-inch dwarf walls at the angles of the octagon and the intermediate four-inch walls are shown built on the haunches of the dome to support the weather roofing, a part of which is in place.



FIG. 8. CLINIC, BUFFALO GENERAL HOSPITAL.



FIG. 9. LIBRARY, ST. JOSEPH'S SEMINARY.

The work in the Buffalo General Hospital is shown in three illustrations. Fig. 6 is a room with ceiling in the form of three flat domes, photographed before the plastering was done. Only two pairs of steel beams are used, which carry angle beams, forming octagons, from which the domes are built. They are so flat that the tiles are not laid concentric, but all breaking joints in the same direction. The beams are all covered with grooved tiles. Fig. 7 shows an elliptical staircase in the same building, the balustrade and risers of which are built with enameled tiles, and the walls are lined with



FIG. 10. CHAPEL, ST. JOSEPH'S SEMINARY.

the same. Fig. 8 is a view of the clinic room, which has a dome ceiling on pendentives. The gradients are all covered and the walls lined with enameled tiles. The elliptical stairway last shown terminates at the floor above the gradients. For thoroughly antiseptic treatment this probably surpasses any clinic room heretofore built. All the enameled tiles used are made at the factory of the R. Guastavino Company at Woburn, Mass., and are the result of much expensive experimentation in burning enameled tiles without saggings, by which process it has been possible to make large quantities in less time than formerly.

St. Joseph's Seminary is the largest and most complete example of cohesive construction ever executed. Problems of masonry engineering were encountered and solved at every turn. Our illustrations show the library (Fig. 9), the chapel (Fig. 10) and the grand staircase (Fig. 11), all as they came from the hands of the R.



FIG. 11. GRAND STAIRWAY, ST. JOSEPH'S SEMINARY.

Guastavino Company, and before being turned over to the finishers. The library, even without any interior work or the fire-proofing of the steel columns, at first suggests the remains of some newly discovered Moresque building, as indeed it really is the modern evolution of the constructive arts of the Moresque builders. After what has been heretofore said it hardly needs further description. The chapel (Fig. 10) is a revival of the true Romanesque construction, in which, however, what



FIG. 12. MORTUARY CHAPEL, PAWTUCKET, R. I.



FIG. 5. DOME, EAST BOSTON HIGH SCHOOL, 70 FEET DIAMETER.

be made to arrange them in chronological order, and it will not be necessary for the purpose of these articles to give the names of the architects. In most cases they gave only the outlines of the constructions and Mr. Guastavino did the rest; such is the confidence that his work has inspired. In some, where the constructive steel used has been reduced to the minimum consistent with the performance of its office in connection with the cohesive tile work, both steel and tile work has been planned and executed by him alone.



FIG. 7. ELLIPTICAL STAIRCASE, BUFFALO GENERAL HOSPITAL.

His most remarkable and, to all appearance, daring constructions have been domes built over large areas. That which will be first selected for illustration is on Grace Universalist Church at Lowell, Mass., the exterior of which is seen in Fig. 3. The sectional drawing of this dome (Fig. 4) makes the construction clear. This dome has a span of seventy feet. Its thickness at the bearing edge is six inches, or six courses of tiles; and at the top four inches, or only four thicknesses of tile. So far it was a simple problem, but the penetrations of twenty feet each on the four sides required

extraordinary precautions, accurate calculations and great care in execution. It was thought wise, as will be seen in the drawings, to insert steel angles in the intersections. The work was executed six years ago under the immediate direction of R. Guastavino, Jr., and required seven weeks to build it. The result has been entirely satisfactory.

The dome of the East Boston High School, the exterior of which is seen in Fig. 5, is sixty-eight feet



FIG. 6. BUFFALO GENERAL HOSPITAL.

in diameter, and only fifteen feet rise, while near the center it is reduced to three inches in thickness. It also was personally directed by R. Guastavino, Jr. The method of using the skeleton centering is shown, permanent radial ribs being used. Between these a curved board was set for each course of tiles, and removed as soon as the second overlapping course had been set. As a test of the quality of the work during the construction, the upper end of the ribs was lowered from time to time, to see if there was any settlement, leaving the dome self-supporting at various stages of its progress. The eight-inch dwarf walls at the angles of the octagon and the intermediate four-inch walls are shown built on the haunches of the dome to support the weather roofing, a part of which is in place.

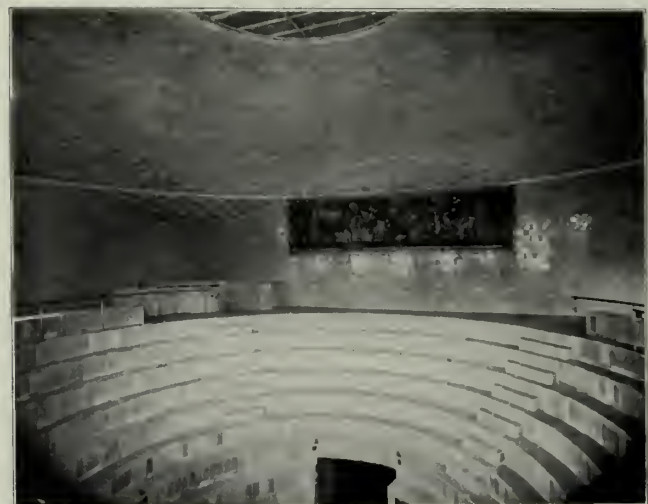


FIG. 8. CLINIC, BUFFALO GENERAL HOSPITAL.



FIG. 9. LIBRARY, ST. JOSEPH'S SEMINARY.

The work in the Buffalo General Hospital is shown in three illustrations. Fig. 6 is a room with ceiling in the form of three flat domes, photographed before the plastering was done. Only two pairs of steel beams are used, which carry angle beams, forming octagons, from which the domes are built. They are so flat that the tiles are not laid concentric, but all breaking joints in the same direction. The beams are all covered with grooved tiles. Fig. 7 shows an elliptical staircase in the same building, the balustrade and risers of which are built with enameled tiles, and the walls are lined with



FIG. 10. CHAPEL, ST. JOSEPH'S SEMINARY.

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FIG. 12. MORTUARY CHAPEL, PAWTUCKET, R. I.



FIG. 13. CHAPEL, CREMATORY, MT. AUBURN CEMETERY, CAMBRIDGE, MASS.

appear at first to be barrel arches are in reality domical. The timbrel or cohesive construction has everywhere been applied to the Romanesque tradition. The whole effect is architectural, though without surface finish. It illustrates the little importance of finish when the construction is rational and logical. The stairway in the same building (Fig. 11) is another example of daring, though safe, construction. But perhaps the use of the word "daring" in this connection is a mistake. We call things "daring" only because at first we do not understand them. If we study awhile we will see that there is nothing daring in this work. He who made it certainly did not think it was, else he would have left it undone. The very life and soul of architecture is seen in the construction before us. It is therefore a "thing



FIG. 14. PUBLIC LIBRARY, PROVIDENCE, R. I.

of beauty" even before the art of decoration has covered it and perhaps will injure rather than improve it, for all that we know. It all depends upon the amount of sympathy of the decorator with the constructor.

We give in Fig. 12 the interior of a mortuary chapel at Pawtucket, R. I. Here we have the old Romanesque construction reproduced almost exactly. It takes us back to reminiscences of Perigueux. Under this chapel is a crypt, all of which is finished in enameled tiles.

In the same vein, but in the style of a later historical period, is the chapel of the crematory at Mount Auburn Cemetery, Cambridge, Mass. (Fig. 13). The entire interior is of cohesive construction, but the ceiling is of groined arches with transverse and wall arches in the manner of the latter part of the twelfth century. This is the first illustration I have given of this system of construction, and it shows how perfectly the Guastavino method is adapted to it. A similar construction was illustrated in *THE BRICKBUILDER* for November, 1900, in the ceiling of St. Paul's (Roman Catholic) Church at Chicago; but there the transverse and wall arches as well as the groins were of molded brick, and the filling only of cohesive tile construction (executed by Paul Mueller of Chicago). Here it will be seen that the groins are dispensed with, which is possible only when the Guastavino method is used. The whole of this is a new construction within the walls of an old building. The whole



FIG. 15. PATERSON CITY HALL, PATERSON, N. J.

interior has architectural expression without a molding or any kind of architectural detail, and again illustrates what has been said about the stairway last referred to.

Again I show a stairway (Fig. 14). This time it is seen in process of construction. The flying arches have been built and the steps finished to the first landing only. The whole thing speaks for itself; and the picture tells us as well that the appreciation of the projectors of this building for reliable fire-proof materials and methods did not extend to the partitions.

In Fig. 15 I give a view of the entrance vestibule of the City Hall at Paterson, N. J., of which a view of the stairway was given in Part II. This shows the Guastavino construction in smooth (but not enameled) tiles, carefully set as finished work in connection with ornamental terra-cotta.

Fire-Proofing.

ANNUAL FIRE WASTE AND ITS RELATION TO FIRE-PROOF CONSTRUCTION.

BY WILLIAM COPELAND FURBER,* M. AM. SOC. C. E.

THE fire waste in the United States in the year 1900 reached the enormous amount of \$130,028,489 (Standard Fire Insurance Tables). The total receipts for 169 fire insurance companies only, in the United States for the year 1900 were \$164,033,656, while the total disbursements were \$163,657,371; or these 169 companies paid out their entire income, less \$376,285, for losses and expenses. The losses paid out in the year 1900 exceeded the losses paid out in the year 1899 by \$3,000,000, although during this time there were no conflagrations; but the ordinary fires were so costly and came in such rapid succession that the receipts from the premiums and the income from investments barely met the expenses of conducting the business. As a consequence of this loss an increase in the rates is recommended as the only remedy (*The Investigator and Insurance Chart*).

A careful study of these figures of over \$130,000,000 waste and an additional \$34,000,000 for administration of the business of the companies will lead to the conclusion that a considerable part of this money paid out for waste and administration could have been saved by the erection of better classes of buildings.

If the actual fire waste of \$130,028,489 be considered as interest paid out for the year, it would have represented an investment of \$2,600,569,800 at five per cent; or in other words the actual waste would have paid interest on the use of \$2,600,569,800 more as capital in business enterprises. This illustration shows clearly how much opportunity there is for the erection of better buildings. The community needs but to be educated up to the facts to realize that good business policy would dictate that the money now paid out in insurance premiums should be capitalized and this capital invested in fire-proofing their buildings.

Few people realize that all fire losses, even though fully insured, actually waste the resources of the country. It is only because the natural wealth of this country is so great that these losses have not attracted more attention.

Destruction of valuable property by fire does no one any good and leaves the country just that much poorer, and the burden of the loss is borne by the community in assessments in the shape of premiums on their insurance, which each owner is compelled to maintain, not only to protect himself against the danger of his own building becoming the origin of a fire, but also against his neighbor for a similar reason.

Moreover, fire insurance up to the full amount of the investment never covers the actual loss to the individual person or company insured, because of the disarrangement of the organization, the loss of time, the sacrifice of convenience and other things which cannot be itemized.

While it is not possible to prevent all this annual waste, because a greater part of the dwellings and small shops could not be made of fire-proof material by reason of the additional cost, yet the most expensive and disastrous fires are not in dwellings or small shops, but in the

business districts of towns and cities; and it is unreasonable to suppose that owners and investors would continue to erect combustible buildings if they were better informed as to the facts and commercial advantage of fire-proof construction.

Legislation on the matter of fire-proof buildings has already been enacted in some of the large cities. The new building code of New York city provides "that any hotel, lodging house, school, theater, jail, police station or institution for the care or treatment of persons, hospital or asylum which exceed thirty-five feet in height shall be of fire-proof construction; and any other building which exceeds seventy-five feet in height shall be similarly constructed." St. Louis has a somewhat similar restriction regarding the height of combustible buildings, and it will be but a matter of time when enlightened public opinion compels the adoption of stringent regulations forbidding the erection of combustible buildings in the important business and manufacturing centers of all cities and towns.

A sharp distinction should be drawn between fire-proof and non-combustible buildings.

A fire-proof building is one that no fire within reasonable limits will affect its strength and stability.

A non-combustible building is one that will not itself furnish fuel to a fire or add to a conflagration, but is not sufficiently protected to withstand great heat without distortion or damage. Each class of building has its place in the community, and this place must be determined by the use to which the building is to be put and its exposure; but the non-combustible building should not masquerade as fire-proof, and it is to be feared that many of the so-called fire-proof buildings are simply non-combustible. The architect should make the distinction between the two very plain to his client and the public, and govern his own work accordingly. No building in which large sums of money are to be invested should be anything else than fire-proof. It is not to be supposed that intelligent bodies of men or capitalists deliberately invest large sums of money in costly buildings and then gamble on the chances of fire rendering these investments valueless or injuring them to such an extent that expensive repairs have to be made to render them habitable again; yet this is not an uncommon thing, and the blame must rest on the architect and manufacturer of fire-proof materials. No architect is justified in designing a costly building unless it is made as near fire-proof as the knowledge and ingenuity of man can make it.

The architect who permits and encourages the sinking of large sums of money in buildings which an accident or the neglect of a careless workman or servant may destroy is not a creditable member of the profession.

If only a limited amount of money is available, it is better by far to restrict the size of the building, or its facilities or ornament, than to spread out an elaborate cover upon perishable groundwork.

The responsibility of subjecting a beautiful and costly building to the possibility of destruction by reason of its inflammable construction is one that should not be lightly assumed by any designer, for it is the most inexcusable folly to lavish great sums of money upon the architectural treatment and artistic embellishment of a building which may dissolve into smoke at

* Architect and consulting engineer, 421 Chestnut Street, Philadelphia.

the least expected moment. If money is available for decoration, it should be available first of all for permanent construction.

If a painter of fame and skill portrayed his best efforts upon canvas which would rot away in a few years, he would receive and well deserve unstinted abuse; yet architects are doing a similar thing all the time, as the fire losses show. The painter's neglect would cost a waste only of his own efforts, but the architect's neglect or ignorance is the means not only of wasting his own efforts, be they great or small, but the substance of his client and part of the wealth of the community.

Much can be said on the question of the amount of the investment being determined by the possible earning power of the enterprise and in some instances prohibiting fire-proof or non-combustible construction, and this is a rational argument and should be considered in all cases, particularly where the conditions are such that the permanency of the building is problematical or maybe undesirable, or possibly when the enterprise is in a transitory stage. Then it would be folly to argue for permanent construction. But these conditions are not likely to obtain in the valuable business section of a town, and therefore these cases need not be considered in this discussion.

It may be argued in defence of the architects that the owner of the building would have it *thus and so*, and that the question of whether the building was to be combustible or fire-proof was not left to the discretion of the architect; and if this be true it argues ill for the prestige of the architect and indicates how little weight his knowledge and judgment have with his clients. The client who decides such questions without consulting his architect on the business side of the proposition shows his lack of confidence in the architect's commercial knowledge; and it must be confessed that a greater knowledge of the commercial side of the matters relating to building on the part of the architect would result in better architecture and the rational treatment of many questions which are now determined by the whim or fancy, prejudice or ignorance of the architect or his client.

If all buildings were constructed in a better manner, and if all the designers of buildings were intelligent and conscientious and actuated by true public policy, and if farsighted owners of real estate were educated up to the facts, then those people who now for their own temporary gain erect dangerous and inflammable buildings would be compelled by laws passed in obedience to an enlightened public opinion to erect non-combustible buildings, and the money which is now annually spent in repairing preventable losses could be applied to better uses.

Upon the question of fire-proof buildings of the best class much remains to be said. When the amount of the investment in a modern high building is considered and the little or inadequate study given to the question of fire-proofing is borne in mind it is surprising that capitalists and investors have been contented so long with the perfunctory way in which this matter has been treated by the architects.

The stability of the structure is wholly dependent upon the integrity of the ironwork, and ordinary prudence dictates that nothing which can be done within reason to insure this integrity should be left undone. The wealth of marbles, mosaics, wrought metals, rigid

and plastic ornament and the elaborate cabinet work are often squandered if any precaution has been neglected to keep the structure safe from the distorting and destroying effects of fire and the insidious work of corrosion.

The investment of large sums of money in monumental buildings cannot be considered wise or in line with true public policy unless the buildings are permanent, and they cannot be considered permanent unless they are fire-proof and rust-proof.

FIRE LOSSES.

IN the last bulletin of the American Statistical Association Dr. Samuel W. Abbott, the secretary of the state board of health, gave certain interesting facts concerning the fires in European cities, statistical data which should have a bearing upon our American methods of meeting and lessening our annual fire losses. The tendency in the Old World, as in the New, is toward the annual occurrence of a larger number of fires. We are all the time increasing the number of commodities used that are either susceptible of spontaneous combustion or of easy ignition. The use that we make of chemical compounds of various kinds which may be productive of fire is far greater than the use thus made by our forefathers, while gas, electricity and a number of other heating and lighting devices are the causes in all parts of the world of a large number of fires. The difference between our experience and that of cities and towns of continental Europe is that while in the United States the amount of loss by fire remains tolerably uniform, so that as more fires occur in a year there is a much larger annual loss by fire, in Europe, while the number of fires occurring, when the size of a city is taken into account, are frequently as great as the number experienced in American municipalities, the loss ratio per fire tends steadily downward, and even the aggregate loss by fires in a municipality has a downward tendency in spite of their growth in numbers. Dr. Abbott has said, as a matter of personal experience, that when a few years since he visited the fire department at Venice he found that it consisted of an ordinary hand engine which was placed in a small room under the Ducal Palace, and that while the city had a population of nearly 200,000 the annual reports showed that the fire losses were not over \$20,000 a year. The statistics which he has gathered indicate that in Milan, with a population of nearly half a million, the total fire losses for the last ten years have averaged less than \$150,000 a year. In this instance the city is one about the size of Boston, is a large industrial center, and yet its fire losses, as compared with those of Boston, are about as ten cents is when compared to one dollar. Budapest has a population considerably larger than Boston. It is, perhaps, the most important manufacturing center in eastern Europe, and yet the average fire losses for a number of years past at this Hungarian capital have been not much larger than the fire losses of Milan. The city of Paris, with a population of over two and one half million, has had a fire loss for a number of years past approximating somewhat near to that of Boston. In 1895 the fire loss was about \$2,500,000, but in 1898 it was less than a million dollars, these representing the extremes for a number of years. — *Boston Herald*.

Selected Miscellany.

NOTES FROM NEW YORK.

The real-estate journals are predicting a record-breaking fall and winter in realty transactions, and we are all confidently looking forward to such a condition



WARREN AVENUE ENGINE HOUSE, BOSTON, MASS.
John A. Fox, Architect.

of affairs. The past two months, although usually very quiet, and this year unusually hot and disagreeable, have been marked by a steady increase of business among architects and builders.

So long as the country continues in a state of prosperity and prices in the iron trades are held firm, so long as millionaires from all sections of America insist on residing and building in our midst and scattering the



DETAILS BY WILLIAMSON & CROW, ARCHITECTS.
Indianapolis Terra Cotta Company, Makers.



HOUSE BY J. W. DOW, ARCHITECT, WYOMING, N. J.

accumulations of recent years, so long will the architects and builders share in the good things of the day.

Work on the new Custom House has progressed so that the foundations now nearly reach the street. Special provision is to be made for water-proofing of

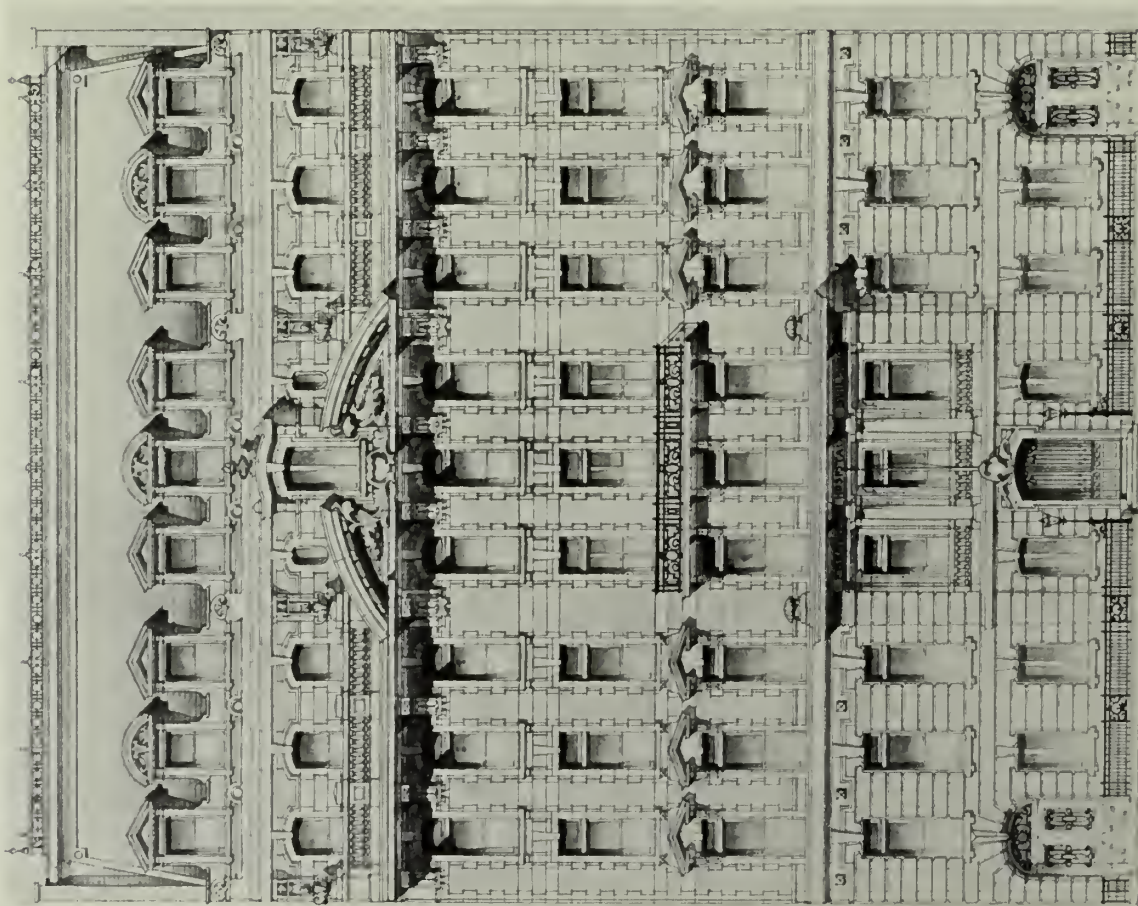


ARMORY, MEDFORD, MASS.
Shepley, Rutan & Coolidge, Architects.
Roof covered with Celadon Roofing Tile.

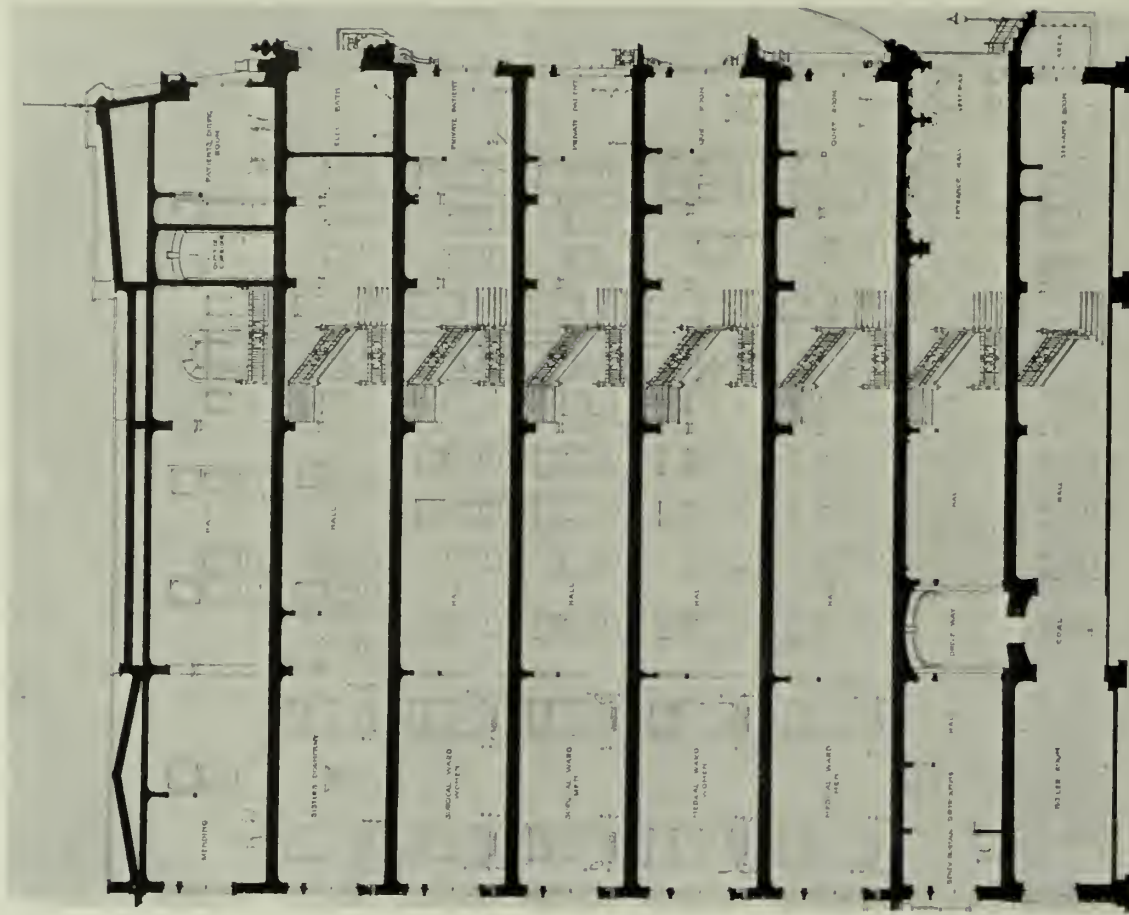
the sub-basement, owing to its situation at tide water. Granite composes the stonework of the basement. The material for the superstructure has not yet been decided



RESIDENCE, ST. LOUIS, MO.
George W. Hellmuth, Architect.
Built of Hydraulic-Press Brick.



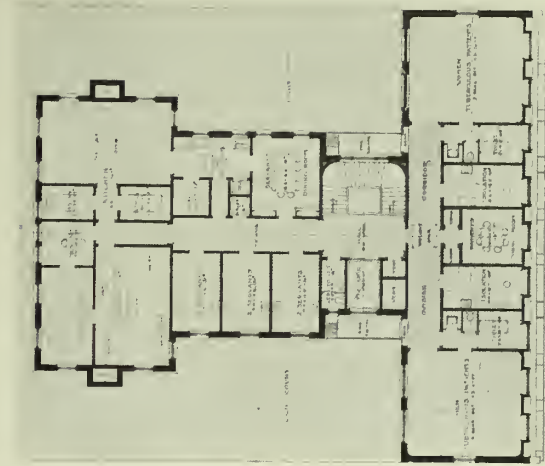
FRONT ELEVATION.



LONGITUDINAL SECTION.

ACCEPTED DESIGN FOR NEW FRENCH HOSPITAL, NEW YORK CITY.

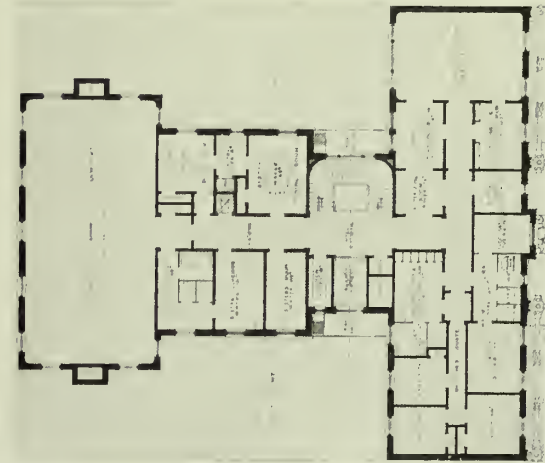
Weich, Smith & Provot, Architects.



SEVENTH FLOOR.



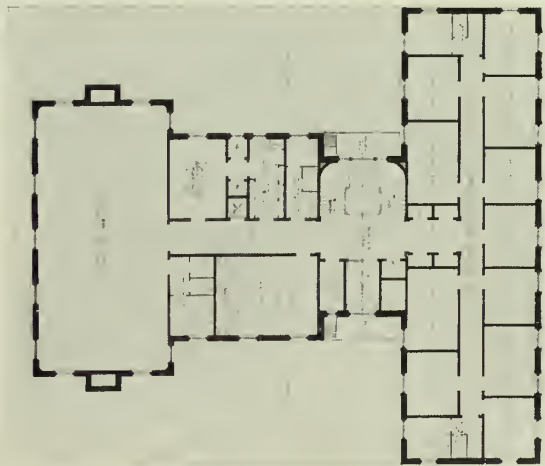
THIRD FLOOR. WOMEN PATIENTS.



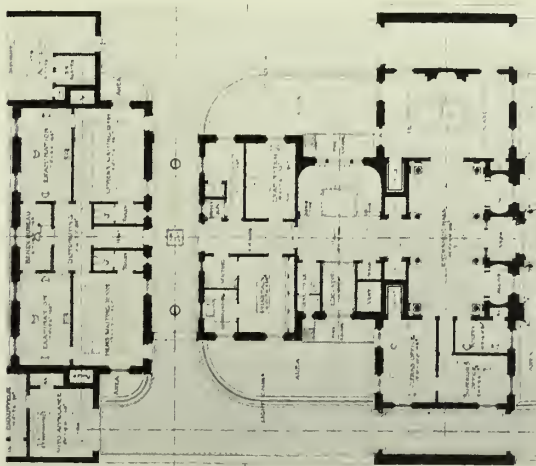
SIXTH FLOOR.



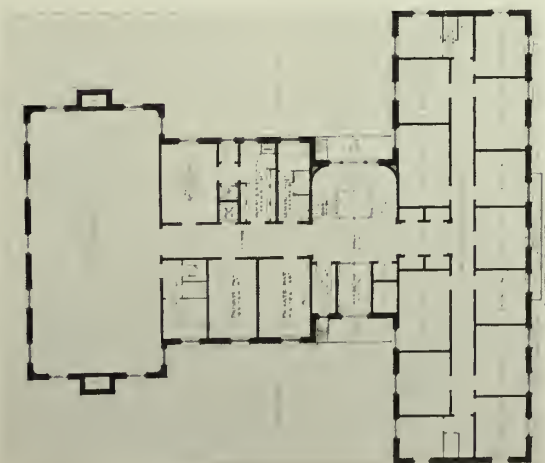
SECOND FLOOR. MEN PATIENTS.



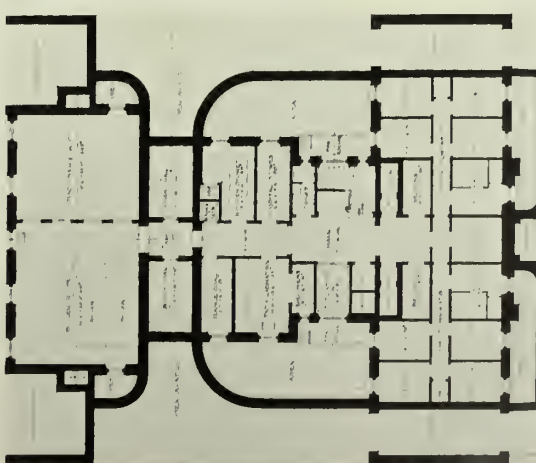
FIFTH FLOOR. WOMEN PATIENTS.



GROUND FLOOR.



FOURTH FLOOR. MEN PATIENTS.



BASEMENT.

NEW FRENCH HOSPITAL, NEW YORK CITY.
Welch, Smith & Provot, Architects.

upon, and will not be until bids for the same, which will be advertised for this month, are received. The entire building will cost about \$3,000,000.

Mr. Cass Gilbert is also the architect for the new building of the Union Club at Fifth Avenue and 51st Street. The work has progressed nearly through the second story.

Caissons are being sunk for the foundations of the new Stock Exchange.

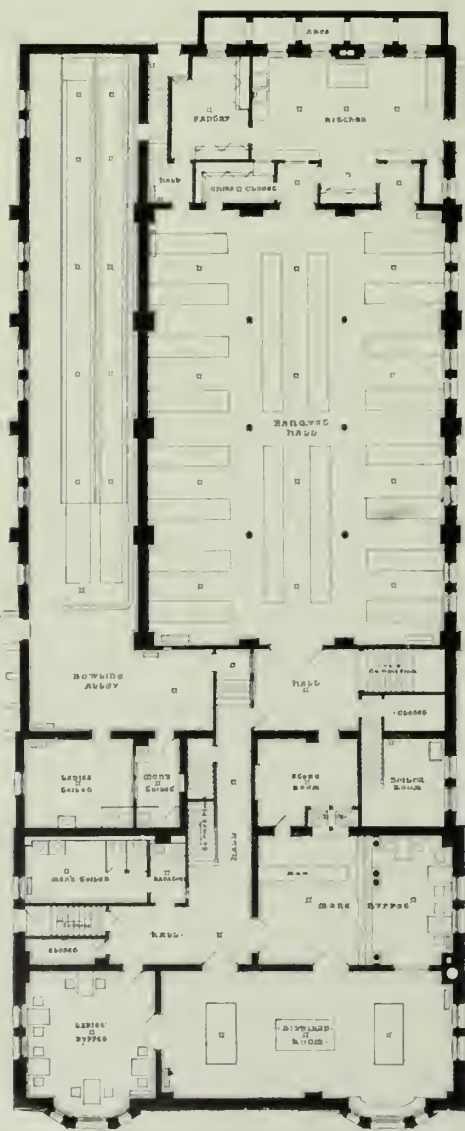
Mr. Bruce Price is completing a residence for Mr. Samuel Thorne on Fifth Ave. It will be one of the most beautiful buildings in the city. Just at present the people of New York are being



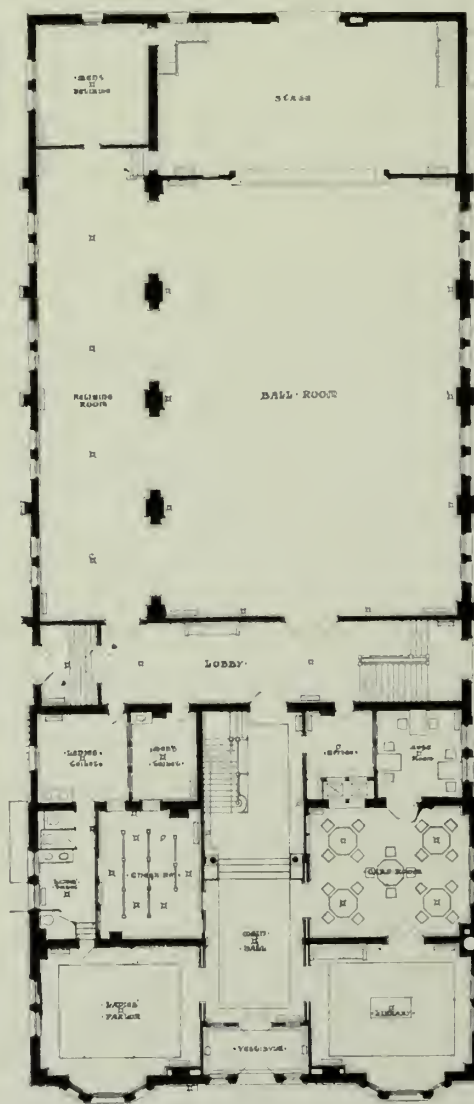
CLUBHOUSE FOR THE CLEVELAND GESANG VEREIN, CLEVELAND, O.
Frederic W. Streibinger, Architect.

treated to a surfeit of real-estate news. The *Herald* a few weeks ago began the publication of a real-estate supplement every Wednesday, which immediately proved successful and interesting, so much so that one of the "yellow" journals inaugurated the same institution, which appears upon the same day and closely copies the *Herald* supplement. They are both fully illustrated and very complete.

At present the outlook for the completion of the underground rapid-transit road within contract time is bright, and work on the new steel East River bridge is being rapidly pushed.



BASEMENT.



FIRST FLOOR.



SECOND FLOOR.

PLANS, CLEVELAND GESANG VEREIN, FREDERIC W. STREIBINGER, ARCHITECT.

The Brooklyn Rapid Transit Company are about to begin the erection of a \$100,000 ear barn. It will be built of brick and fire-proof materials.

Another handsome apartment is the Dorilton now being erected at Broadway and 71st Street, from plans by Janes & Leo, architects. It is a twelve-story building in modern French Renaissance style, and is finished most elaborately. There are forty-eight apartments, trimmed in mahogany, oak, white enamel and bird's-eye maple. On top of the building there are two sun parlors and a roof garden. No expense has been spared to make it one of the finest



DETAIL FOR MANTEL. GEORGE B. POST, JR., ARCHITECT.
Perth Amboy Terra Cotta Company, Makers.

SUNDRY ITEMS.

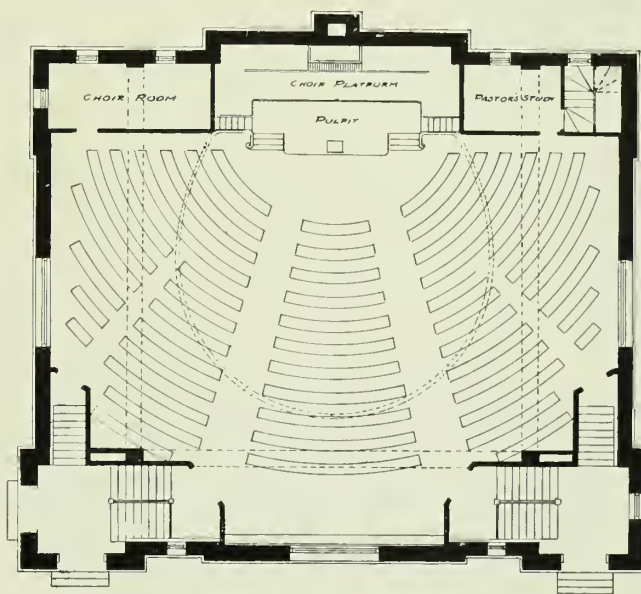
While the drawings of St. Leo's Church, Maginnis, Walsh & Sullivan, architects, published in last month's number, indicate that limestone was used in connection with the brick in construction, it is nevertheless a fact that terra-cotta was finally chosen in place of the stone, the Excelsior Terra Cotta Com-

pany having furnished same.

A wall about forty-five feet long and twelve feet high, of white enameled brick glazed on the flat, is laid up as a facing for the partition wall required by the



MISSION TABERNACLE, MOLINE, ILL.
O. Z. Cervin, Architect.



apartments in the city, and apartments will rent for \$1,500 to \$3,500 a year.

The profession has suffered a decided loss in the recent death of Mr. John R. Thomas, a successful and well-known architect, whose latest work, which was well under way at the time of his death, promised to be a fitting memorial, but as it seems likely that an incompetent firm of political architects will be called upon to complete the work, we fear greatly for the final effect. I refer to the magnificent new Hall of Records on Chambers Street.

board of underwriters between the rear of the switch-board of the General Electric Company and the rear wall of the Electrical Building at the Pan-American Exposition. This wall was made necessary on account of the high voltage (10,000 volts) at which the current is received by the transformers of the General Electric Company to be converted into lower voltage for use in the exhibition grounds. The brick used in this wall was manufactured by the American Enameled Brick and Tile Company of New York City. Within the enclosure of the General Electric Company there are exhib-



GATE LODGE FOR JOHN D. ROCKEFELLER, CLEVELAND, OHIO.
Charles W. Hopkinson, Architect. Roof covered with American S. Tile.



SPANDREL BY WILLIS G. HALE, ARCHITECT.
Conkling, Armstrong Terra Cotta Company, Makers.

ited samples of the brick used in the wall, and architects, engineers and builders desiring same will be supplied from the home office if they will enter their names in the register kept on hand for that purpose.

The American Enameled Brick and Tile Company have made extensive additions to their plant at South



DETAIL BY HARDE & SHORT, ARCHITECTS.
Excelsior Terra Cotta Company, Makers.

River, N. J., and now have special facilities for the manufacture of arches and special-shaped brick.

The New Jersey Terra Cotta Company report a very prosperous year, having furnished architectural terra-



"THE AUGUSTA," WASHINGTON, D. C.
A. B. Heaton, Architect.

cotta for many prominent buildings around New York, of which a number are mentioned here: Addition to bank building, Red Bank, N. J., Joseph Swannel, architect. Residence, Spruce Street, Newark, N. J., J. H. & W. C. Ely, architects. Mercantile building, West 8th Street, New York City, Clinton & Russell, architects. Brewery buildings, West Hoboken, N. J., C. F. Terney, architect. Hospital building, Jefferson Street, New York



HOUSES, RIVERSIDE DRIVE, NEW YORK CITY.
Janes & Leo, Architects. Terra-cotta made by the New York Architectural Terra Cotta Company.

City, Flemer & Koehler, architects. Seventeen apartment houses, West 140th Street, New York City, John Hauser, architect. Four apartment houses, West 141st Street, New York City, John Hauser, architect. Mercantile building, Academy and Halsey Streets, Newark, N. J., Herman Kreidler, architect. Four apartments, West 112th Street, New York City, Charles Stegmayer, architect.

The plant of the Atlantic Terra Cotta Company of New York has been very largely increased, and it now ranks as one of the largest companies in the United



DETAIL BY THOM & WILSON, ARCHITECTS.
White Brick and Terra Cotta Company, Makers.



STAR LAUNDRY BUILDING, MINNEAPOLIS, MINN.

F. B. & L. L. Long, Architects.

Architectural terra-cotta made by American Terra Cotta and Ceramic Company. "Ironclay" brick made by Columbus Face Brick Company.

States. The dull enamel, of which it is making a specialty, has been very highly commended by architects and contractors.

The Flatiron Building at 22d and 23d Streets, Fifth Avenue and Broadway, New York City, calls for a larger tonnage than any building heretofore erected in New York City.

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and Broadway, New York City, D. H. Burnham & Co., architects. Building for Mrs. Ellen P. Stevens, Detroit, Mich., Donaldson and Meier, architects. Building for Virginia-Carolina Chemical Company, Richmond, Va., M. J. Dinmock, architect. Charlotte Williams Hospital, Richmond, Va., Fuller & Pitcher, architects. Flannery apartments, Pittsburg, Pa., F. J. Osterling, architect. Keystone Bank Building, Pittsburg, Pa., MacClure & Spahr, architects.

The formation of an architectural club among the draughtsmen of San Francisco is about to be consummated. Mr. August G. Headman is an enthusiastic supporter of the movement, and says that the idea is heartily approved by all the draughtsmen who have been approached, and the club will receive the sanction and support of the architects of the city. The Builders' Exchange have voted their meeting hall for the use of the club, and the first meeting will be held about the middle of the present month at that place.



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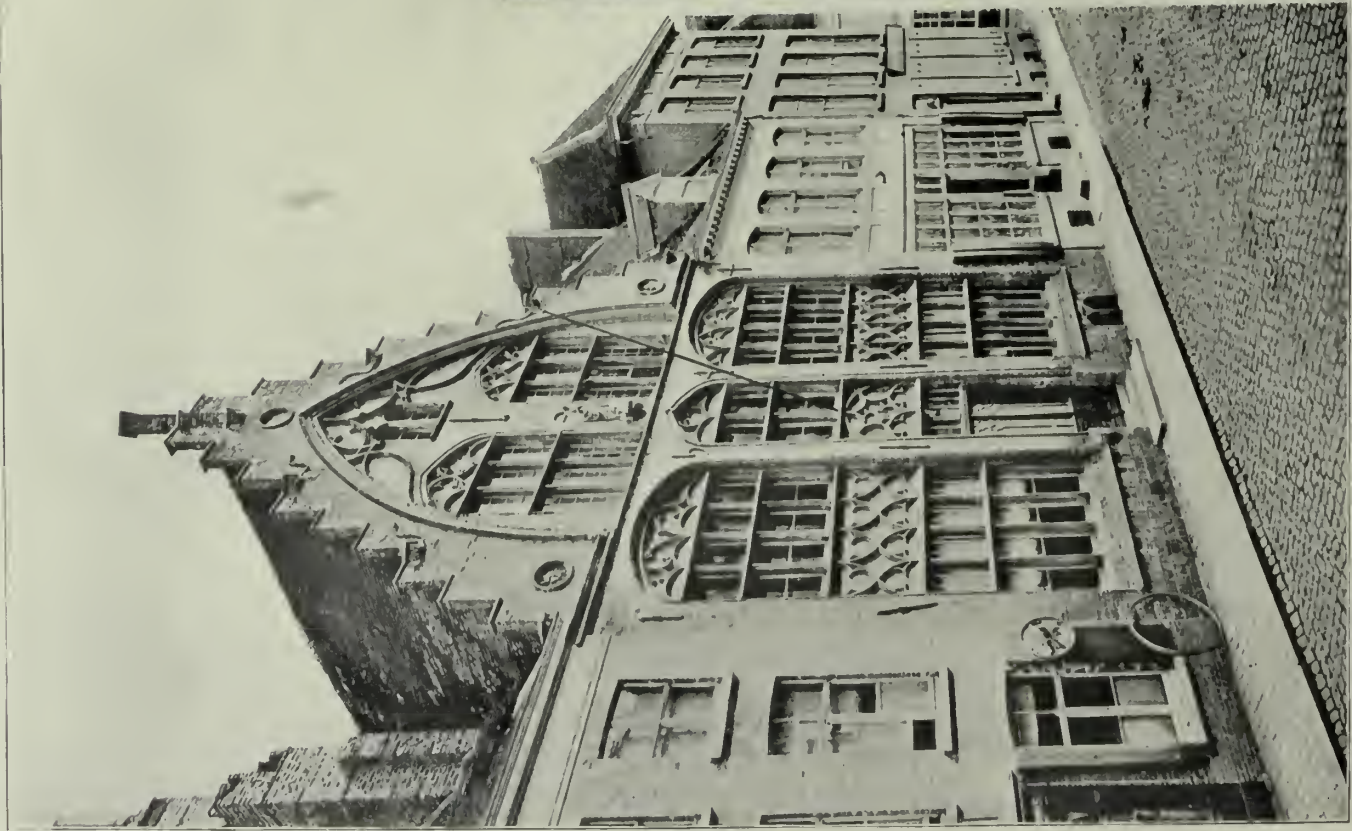
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OCTOBER,

1901.



(16TH CENTURY.)



(17TH CENTURY.)

HOUSES AT YPRES, BELGIUM.



THE BRICKBUILDER.

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ADVERTISING.

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Advertisements will be printed on cover pages only.

AMERICAN INSTITUTE OF ARCHITECTS.

THE American Institute of Architects held its thirty-fifth annual convention at Buffalo, October 3, 4 and 5. The attendance was large and enthusiastic and the address of the president, Robert S. Peabody, was certainly in line with the feelings of the members, and found a ready response. When we recall the slow growth of the first twenty-five years of the life of the American Institute and compare the disheartening apathy of those days with the strong, confident tone of the present, it is easy to appreciate how much the profession in this country has advanced. The Institute occupies a recognized and a high position in the community, and the service which architects can render to a community in meeting an opportunity such as was afforded by the Pan-American Exposition was very gracefully acknowledged by President John S. Milburn in his address of welcome.

This convention is of interest to the younger members of the profession in that it has so cordially acknowledged the position of the enthusiastic young architects and draughtsmen who are working so hard to make the junior clubs as well as the Architectural League a factor

in their development. Mr. Peabody called especial attention to this and expressed the hope that the Architectural League of America might take the same relation to the Institute that the Architectural Association in London has borne so well with the Royal Institute of British Architects. He would have the Architectural League the center for class and club life, from which its older members, as they recognize that their turn is past, would naturally graduate to the Institute, and to their hands when the proper time comes he would gladly bequeath the American Institute, trusting that they would do far better than their predecessors, who have had no architectural leagues in which to prepare themselves for their work. And Mr. Peabody puts in a well-timed word for the relation between the head of a large office and his draughtsmen: “And when the head of it says ‘I,’ let us hope for his sake that he intends it as Admiral Dewey might, and let us not forget the men behind the guns, without whom the guns are powerless. And when the young aspirant for fame in a large office talks as if he were the nameless ghost whose spirit pervades all the successful work in the office, let us remember how long the Army of the Potomac vainly struggled and fought before Grant’s master mind turned that same armed machine to victory.”

The Institute has taken a very wise step at this convention in voting to invite the American Society of Civil Engineers to send to future Institute conventions a delegate who shall have all the privileges of the convention except the right to vote. This is entirely as it should be. Engineers are not architects, but architects have to be engineers occasionally, and certainly the paths of the two professions cross so frequently that there could be nothing but good result from coöperation between the two in the convention meetings.

The officers elected for the ensuing year are: President, Charles F. McKim of New York City; first vice-president, Frank Miles Day of Philadelphia; second vice-president, Alfred Stone of Providence; secretary and treasurer, Glenn Brown, Washington.

A CARNEGIE SCHOOL OF ARCHITECTURE.

AMAN with so many millions to dispose of annually as Mr. Carnegie might very easily develop a preference for founding new institutions rather than helping or amplifying the scope of existing ones. The libraries which his wise generosity has scattered so plentifully over this country have surely been productive of nothing but good in every sense, but we cannot fully sympathize with one of the latest announcements of his proposed endowment for a school of technology for the city of

Pittsburg. We are heartily in favor of technical schools as such, and there is surely nothing to be said against placing opportunities for technical education within the reach of every young man who is able to profit by it, nor will we undertake to set any limits upon the number or extent of such schools in as far as they teach the mechanical or engineering branches, but when it is intended to incorporate in their curriculum the study of architecture as a fine art we feel justified in entering a protest. The Carnegie School proposes to include a College of Architecture. In the commission which was appointed to consider the formation of the school there was apparently no one who can claim any special knowledge of the requirements of the profession, and we cannot believe that any one who is familiar with the present status of architectural education in this country would seriously advise such a department in the proposed school. Architecture is preëminently an art which is best studied by association with good architecture and with those who are most capable of creating it. We believe it would be absolutely impossible to create a successful school of architecture without an architectural setting and without the influences which can be acquired at their best only in the most favorable localities. That is precisely why our young men every year and in increased numbers go to Europe to study. And that is why in our judgment Mr. Carnegie's money could be employed to far better advantage in helping to build up the existing centers of architectural studies rather than in attempting to create one out of hand.

It would be years under the most favorable circumstances before a school of architecture in Pittsburg could for a moment compare with any one of the four or five leading schools of architecture in this country at present existing. It is not necessary nor desirable that there should be a multitude of scantily educated, partially equipped architects, but it is most highly desirable that there should be a high standard and that the best should be cultivated to the greatest possible extent. The standard is surely set by the highest and not by the average. London in the seventeenth century profited far more by one Sir Christopher Wren or one Inigo Jones than it would have by ten thousand architects of mediocre ability. A general diffusion of architectural training is by no means a matter of prime necessity. We must educate the type rather than increase the area of the planting bed, and for these very reasons we believe that the attempt which Mr. Carnegie is fostering at Pittsburg with undoubtedly the best motives in the world is a mistake and is likely to do more harm than good. It is not a kindness to a young architect to encourage him to be content with anything but the best or to lead him to think that anything but the best will answer his need. There surely is abundant opportunity for increasing the effectiveness of our present schools without diverting that help into new and untried channels.

STRIKES.

THE iron trade has just emerged from the struggles of a strike. We are threatened with similar complications in other departments of the building industries. In New York the condition of struggle between the me-

chanic and the contractor is almost chronic. All these conspire to produce an increased cost of production and at the same time a diminution in the quality. But our condition, though deplorable from an economic standpoint, is immeasurably more satisfactory than that which prevails in England, if we may judge by a very thoughtful article on the subject in a recent number of the *North American*. Trade unionism in Great Britain has killed the glass industry, is strangling the cement industry, has driven shipbuilding out of several locations, and has made it in many localities impossible for English producers to compete with foreign trade. The mechanic has by far the upper hand in England and he uses his power unsparingly. Here the relations between the mechanic and builder though sometimes strained are on the whole very amicable, and in Boston there has for years prevailed the utmost harmony between the masons and the master builders. All disputes have been settled without strikes, and in the rare cases when appeal has been taken from the arbitration boards the decisions have been accepted by both sides in a spirit which speaks well for our American mechanics. We have strikes in plenty, but notwithstanding it all we believe conditions here are improving, notwithstanding the retrograde motion which seems to characterize conditions abroad. It is our intention in a subsequent issue to present a statement of the manner in which disputes are settled in this country between the masons and the master builders, believing that such statement will be of interest to all our readers.

PERMANENCE IN BUILDING.

ONE of the daily papers a short time since with its usual weak logic published an editorial against building for all time, reasoning that because condemned and half worn out locomotives or machinery should be promptly discarded and substituted by the latest approved inventions, the same rule would hold good as to buildings, and that therefore to put up a great hotel, office or business building with the idea of so constructing it that it will last for centuries is in all probability to make a serious mistake from an investment point of view. The argument is entirely a specious one. We are not troubled in this country with building too well; our trouble is rather that we build too poorly and take too little account of both practical and artistic necessities. We will venture the broad statement that very few of the buildings which have been torn down in the last quarter century and replaced by what we are pleased to term modern up-to-date structures would not have been removed if they had been constructed in what would have been termed at the time of their erection really first-class manner. The trouble is that only of recent years has architecture risen to the dignity of an educated profession, and the buildings which have been torn down have been almost without exception structures which were erected without intelligent architectural planning or supervision. There are of course instances where a small building had to make way for a large consolidation of interests, but that is not due to the building being necessarily out of date either in plan or construction, and our contemporary need have no fear that we will build too well.

Old English Brickwork. III.

BY W. G. HORSEMAN AND HENRY TANNER, JR.

ENGLISH brickwork underwent a complete change in treatment about the middle of the seventeenth century, chiefly owing to the introduction of soft bricks commonly called "rubbers," that is to say, a brick capable of being easily cut or rubbed to any desired shape or size after being burned in the kiln.

In most buildings anterior to this date the moldings and other details were of necessity executed with the ordinary molded brick, which was shaped or molded before burning in the kiln, a method which produced a durable brick, but also one which entailed much expense in cutting to any desired shape and thus greatly limited their use.

The manufacture of a brick which could be cut or carved *in situ* was a great factor in promoting the use of brickwork, even in buildings of the most ornamental character, and once again we find it used in the place of stone for the dressings and other architectural adornments, as well as in its original position, the plain wall.

Amongst the earliest example of its use in this manner may be cited the old house in Great Queen Street, near Drury Lane in London, and the charming old Pocock School building at Rye in Sussex. Both these buildings are designed with orders, and the limitations of brickwork are frankly acknowledged, particularly in the latter where all the moldings are of rubbed brick adapted to suit the material. The order is Tuscan, the frontage being divided into five parts in two stories, the pilasters and their pedestals running through these with the entablature breaking round, and an attic story above treated as three dormers with pediments over.

The work is coarsely jointed and perhaps somewhat rudely executed, but the different members of an ordinary Tuscan order are all suggested.

The arches over the windows are straight brick ones channeled to form *voussoirs*. The building was erected about the middle of the seventeenth century.

The house in Great Queen

Street was probably built about the same time, and was designed by Inigo Jones and either executed by him or his pupil and successor, John Webb.

It is much more orthodox in character, though not so complete a specimen of brickwork, the moldings and entablature being formed with plaster and wood. The order is Corinthian, comprising the first and second floors, the ground floor being treated as a basement. The frontage is divided

by brick pilasters into five bays; the ornaments of cut brickwork above the first floor windows are curious features, taking the place of the usual apron.

The tiled roof springs directly off the cornice without either balustrade or blocking course, and is well broken up by the five very simply designed dormer windows which have hipped tile roofs.

An extremely fine brick house dated A. D. 1646 and the design of which is also ascribed to Inigo Jones existed until recently, facing the old church of St. Helens Bishopsgate in the city of London.

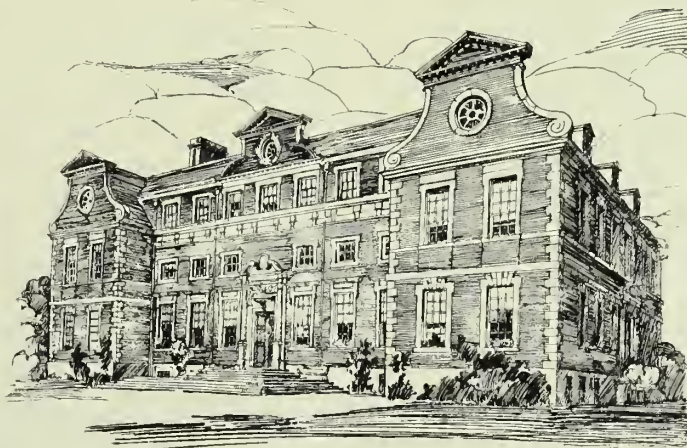
The general design of the front is much the same as the Great Queen Street example, but in this instance the whole of the brick walling between pilasters and windows was worked with channeling, as well as the arches over the ground, first and second floor windows which were channeled into *voussoirs*; the central *voussoirs* were extended up to the underside of the brick cornices and those of the first floor windows to the underside of the second floor window sills which were well and elaborately worked in molded brick. A third floor of much later date had been added to this house.

Raynham Hall in Norfolk was one of the later works of Inigo Jones and is built of brick with stone dressings, with the exception of the center of the garden front, which is entirely of stone.

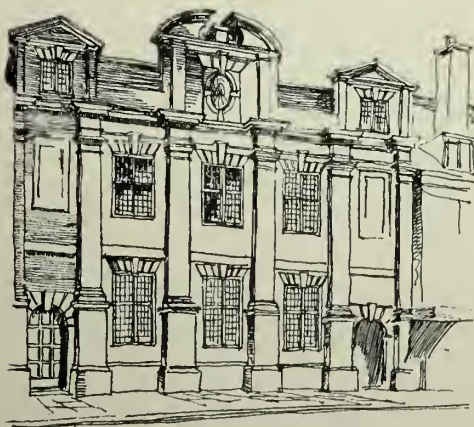
This illustration shows the entrance or west front with the two wings which project about ten feet from the main frontage. The whole building is a little



NO. 9 ST. HELENS, BISHOPSGATE.



RAYNHAM HALL, NORFOLK.



POCOCK SCHOOL, RYE.

unusual in character, the frieze with its flat baluster-like ornaments, the broken curved pediment in the center feature with the pediment growing out of it and the curved gables on the wings with the pediment over, which remind one forcibly of the west front of one of the early Italian Renaissance churches with the scrolls at the sides to hide the flanking aisles.

The grand flight of steps up to the entrance doors adds greatly to the effect and the dignity of the whole composition, which, viewed from the front looking up the hill with the combination of red brick and stone and the background of green trees, is as pretty a picture of English domestic architecture as one may wish to see.

The house is very solidly built, some of the walls being over four feet thick. The plan of the house is a simple one, the entrance leading to a large hall with reception room surrounding and opening off it, the salon being at the back, opening on to the east front, the curious feature of the planning being that although there are staterooms on the first floor there is no grand staircase.

The school of architects immediately following Jones, his kinsman Webb, Marsh and Gerbier, all did work directly inspired and very similar in style.

The Vyne, a house near Basingstoke, already referred to, was enlarged by additions designed by Webb, who used brick for the wall, with stone dressings.

The brickwork in this house is relieved by diamond patterns formed by using vitrified headers, a very effective method, and which is to be found all through the eastern counties. In many old houses in Hertfordshire, when the brick walling is in Flemish bond, all the headers are in vitrified bricks.

Perhaps the effect when first erected was rather spotty, but now that time has toned down the material the result is charming.

Though in London and the districts where Inigo Jones's immediate influence made itself felt, architecture was assuming a more scholarly and grammatical form, still in other places only a faint glimmer of the coming Renaissance was in evidence and the classic feeling was long in penetrating to the more remote districts.

In such buildings as Sustead Old Hall near Cromer in Norfolk these indications of the coming revival made themselves evident, for although the character of the gables is distinctly earlier, yet in the brick quoins, the chimney and the pediments over the second floor windows, and the rude frieze over those of the first floor, the influence of the classic revival is evident. The windows of ground and first floors are insertions of a later date than that of the main building, which was erected A. D. 1663, shown by the iron lettering in the gables.

The original openings were larger, and probably brick mullioned, as in one at the back of the house which still exists. This very interesting example of a transition stage is now unfortunately quite a ruin, and soon will have to be numbered among the buildings of the past, buildings that exist only in name and in archaeological records.

To study rubbed brickwork in its perfection it is necessary to examine closely the work of Sir Christopher Wren, who introduced the use of fine jointed work in the reign of Charles the Second, and used it to a very

large extent, both for wall surfaces and moldings, frequently in combination with Portland stone, the two materials forming a beautiful and harmonious contrast, the one of a rich and varied red and the other of a silver gray.

The entrances to the Middle Temple Lane, London, and the one from Newgate Street to Christ's Hospital, London, recently taken down and rebuilt at the New School buildings near Horsham in Sussex, are good and typical examples.

Further examples here illustrated are the entrance to Kensington Palace and the very charming church of St. Benet in Thames Street, both in London and both the work of Wren. St. Benet's Church is particularly good. The angles of the main building and tower are emphasized by slightly projecting pilasters formed with alternate bands of courses of stone and brick. The carved swags over the windows are executed in brickwork.

The old house formerly at Enfield in Middlesex was also a notable example of this kind of brickwork. The portion here illustrated gave access to a flat near the first floor level between the projecting wings, and as will be seen from the details, the work was well and carefully carried out. When the house was demolished some years ago the central portion was carefully preserved and is now to be seen in the South Kensington Museum, London.

The gate piers of Lindsay House, Lincoln's Inn Fields, London, probably the work of Inigo Jones, and those of Hampstead-Marshall are good instances of rubbed brickwork.

The use of rubbed brick was continued throughout the whole of the eighteenth century for the construction of window jambs and arches, doorways, etc. The doorway here illustrated is taken from a large house, the front of which is entirely in this method of building, in the King's Bench Walk, a part of the Temple, London.

Side by side with the use of rubbed brickwork in such profusion we find in the humbler buildings molded bricks being again used in forming the dressings and other architectural embellishments.

The old house here illustrated at Basingstoke in Hampshire is a good example. The brickwork of walling is rather rough; the bond and vertical joints are not very carefully kept. The brick architraves to the windows, the cornices and eaves are formed with molded bricks roughly cut and with rather wide joints to the required sizes; yet the effect of the whole gable end is very charming.

The bricks used in the walling measure $8\frac{3}{4}$ long by $4\frac{5}{8}$ wide by $2\frac{1}{4}$ deep. The side of the house abutting upon the street has been rebuilt at a later date.

Chelsea Hospital, London, is a well-known building and deservedly so, designed by Wren. It was founded by Charles the Second as an asylum for aged and disabled soldiers, and is so used at the present time. The main building is planned on a large scale, with a central block and two boldly projecting wings ranging in height with this. A central hall gives access to the chapel and dining-hall on either side. These two apartments have tall circular-headed windows of great size, the jambs of which are executed in carefully rubbed brick. The wings are three stories in height, with square-headed windows, rubbed brick being again used here for the arches

and dressings. The whole is crowned by a large and well-designed wooden cornice, from which springs the high-pitched slate roof, which is pierced by dormer win-



WISHFORD.

dows. The chimney stacks form a very important part of the general design, rising high above the ridges everywhere. They are square in outline with strongly paneled facings. The lodge's outbuildings and old garden walls surrounding this fine block of buildings are worth more than passing notice.

The center turret, being of stone, does not come under the heading under immediate discussion. It is particularly well designed and adds greatly to the appearance of the building.

Wren also prepared designs on a large scale for additions to Hampton Court Palace, of which, however, only



SUSTEAD OLD HALL.

a small part, the court at the southeast corner, was carried out. The work was begun A. D. 1689, and the materials employed are Portland stone and red brick of a most beautiful color. The design is simple and dignified. The ground-floor story forms a basement, and is lighted by segmental-headed windows. The state apartments are

placed upon the first floor, have large square-headed windows over which are the circular windows of the next floor, and above these are the square windows of the uppermost rooms. The whole is crowned by a stone cornice surmounted by a blocking course and balustrade which conceals the roof from view. Here again as at St. Benet's Church the angles of the building are marked by slightly projecting pilasters which are constructed of equally deep alternating bands of stone and brick.

The banquetting house attached to Kensington Palace, London, is an extremely fine example of cut and rubbed brickwork, although of course of much later date than the above mentioned examples, as it was probably designed by Sir John Vanbrugh early in the eighteenth century. The cut and rubbed brickwork of the square



THE ENTRANCE, KENSINGTON PALACE.

and circular columns of the center bay and the tall window reveals or curved splays on the south side are worth notice.

Tytenhanger House, near St. Albans in Hertfordshire, built A. D. 1654 by Sir Henry Blount, is a good and complete example of a country house completely executed in brickwork. It is planned with a central block and two wings and is three stories in height.

A flat brick band is carried round the building at the first floor level. The molded underside of this band breaks round the head of architraves of windows of the ground floor. The first-floor windows have brick aprons under their sills springing off this brick band, and these windows also have pediments as well as architraves in molded bricks. In the case of the wings these pediments are pointed, but in the center portion they are alternately circular and pointed. Above these windows are those of the second floor, which also have molded brick architraves. The angles of the walls have brick quoins projecting beyond the face of brick walling.



ST. BENET'S CHURCH,
THAMES STREET, LONDON.

this moat, the piers and gates on the house side being very fine specimens of their class.

The house itself is an almost perfect example of the medium-sized country houses of this period, which are to be met with throughout the whole of the southern and midland counties.

The entrance front here illustrated is very simple and broadly treated, but the mellow tone given by time to the old brick walling, the boldly hipped tile roofs, combined with the tall and characteristic chimney shafts and the beautiful setting of the whole house with its ancient gardens, make an impression upon the mind which is not easily forgotten.

Of the same type of house, and about the same age, is the old mansion of Moyles Court near Ellingham, upon the western borders of the New Forest in Hampshire. A flat brick band marks the level of the first floor, and the angles of the wings are emphasized by the same alternate long and short brick quoins as noted at Tyttenhanger and Groombridge. The house is additionally interesting to some as being the home of Lady Alice Lisle, the widow of one of Cromwell's officers, who gave food and shelter to two of the Duke of Monmouth's adherents after the battle of Sedgemoor. For this Lady Lisle was arrested and tried at the Winchester Assizes and condemned by Judge Jeffreys to be burned alive. James the Second, however, altered the sentence to that of beheading, and she was accordingly thus executed at Winchester in A. D. 1687.

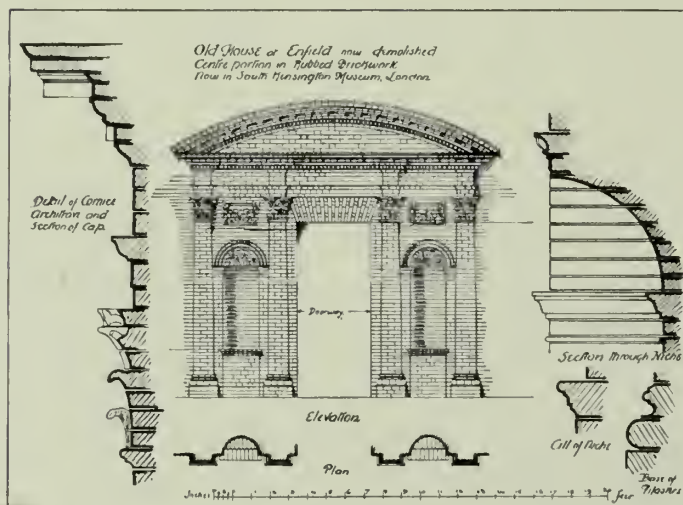
The whole is crowned by a boldly projecting coved cornice, and the tiled roof springs directly off this.

The chimney stacks are massive and well designed; they present a variety of the paneled stack before referred to.

Groombridge Place, near Tunbridge Wells in Kent, is somewhat later in date than Tyttenhanger House. It is built upon the site of a mediæval house, of which the walls enclosing the large and ancient moat still exist. The present house is approached by a bridge over

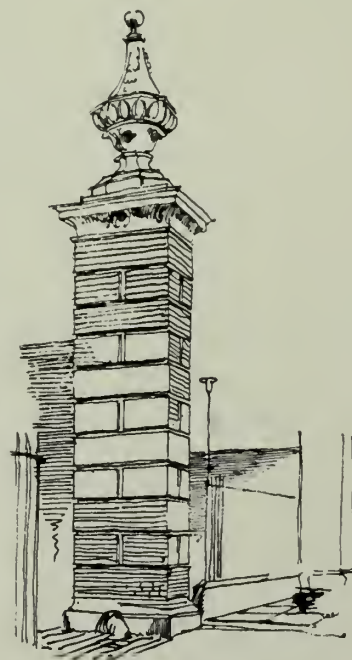
Up to nearly the end of the seventeenth century, except in some isolated cases, the small country houses generally present the same appearance as the three houses (Tyttenhanger, Groombridge and Moyles Court) above mentioned. The roofs of the projecting wings were either gabled or hipped back, and the walls finished under the eaves with a large coved cornice as at Tyttenhanger House, or by the tilting rafters showing, and these being shaped on their undersides formed a modified kind of modillion cornice as at Groombridge, or a cornice of molded bricks off which the roof sprang, as at the almshouses, Flamstead, and Mackeraye End House in Hertfordshire. But as time went on the boldly projecting wings, which were a survival from the early type of quadrangular house, became less pronounced in projection, until at last a mere break forward in the walling was the last surviving mark of these once important features, and in the smaller country house even this was omitted and the house became very square in form.

The brick quoins at the angles, which are such striking features, gave way to stone quoins, generally much smaller in size, and the walls were often finished with an elaborate modillion cornice constructed in wood, off which the roof directly sprang. The flatness of the front was relieved by a slight bringing forward of the wall in the center, in which the entrance door was usually placed, and this projection was carried up to the roof, the cornice breaking round it, the upper cornice members

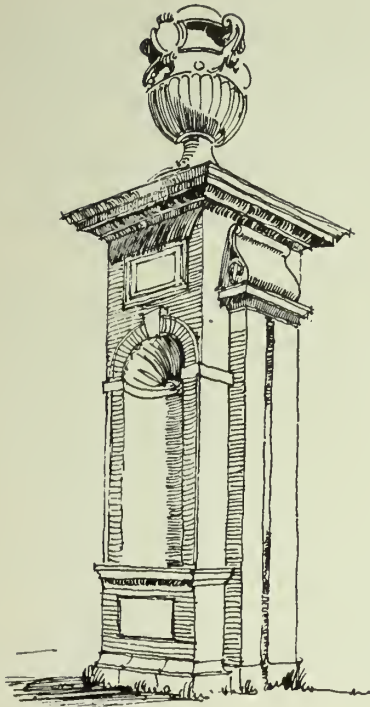


being sloped upwards to form a small, flattish pediment.

The Moot House at Downton near Salisbury is a good example of this treatment, and may be taken as the type of design adopted for country houses during the first half of the eighteenth century, after which the craze for erecting houses as much like a Greek or Roman temple as possible, adorned with enormous porticoes and orders of great scale, fairly set in and rendered the further employment of brick an impossibility in country



GATE PIER, LINDSAY HOUSE.



GATE PIER, HAMPESTEAD-MARSHALL.

houses, as these structures had either to be built in stone or of brick plastered over the plaster face, being marked out with sham joints to imitate stone if the expense of masonry were too much.

Fortunately, however, this craze was not generally adopted in the building of small rural houses or those in the towns until quite the end of the eighteenth century, when in nearly every case in which brickwork was used for the construction of the walls it was entirely hidden from view under a thick coating of plaster, and

this method of building was carried on until under the influence of the Gothic revival brickwork once again was used honestly and well. The consideration of this, however, does not come within the scope of the present article.

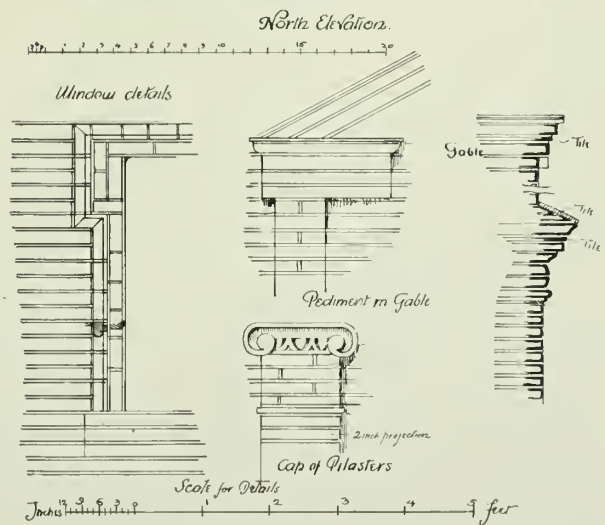
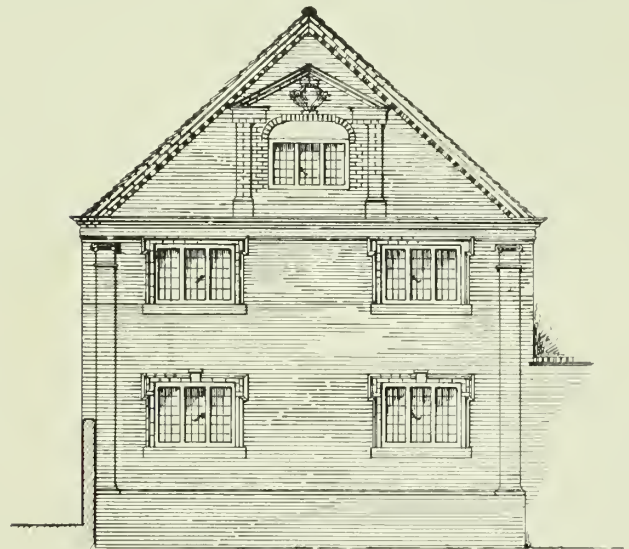
Another innovation which materially altered the character of English brickwork toward the end of the seventeenth century was the introduction of the sash window.

Up to this period the windows had been constructed with solid oak mullions and transoms, which in themselves were amply strong enough to carry the weight of the walling over without the assistance of an arch, which was very often omitted, especially in the eastern counties, as illustrated in the example given in the last article from an old house at Trowse near Norwich, in which the splayed or molded bricks of the jambs are

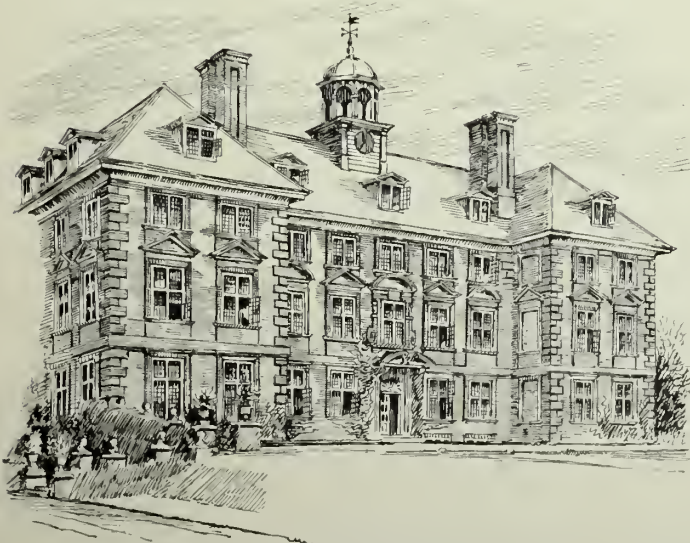
merely carried across and supported upon the head of the window frame, the great strength of which effectually prevented the possibility of fracture or settlement of the walling over.

Brick relieving arches were sometimes employed, as shown in the illustration of a part of the Deanery at Winchester, where they are elliptical in form; but the effect generally when arches are used is not so good as the simpler way of finishing the window openings as described above.

With the advent of the sash window the hollow frames of which were incapable of sustaining any great weight



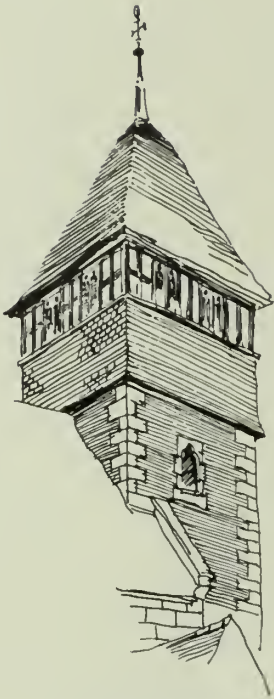
OLD HOUSE AT BASINGSTOKE. DETAILS OF NORTH GABLE.



TOTTENHANGER HOUSE, HERTS.

the employment of brick relieving arches to carry the walling over the head became an absolute necessity. These arches were often executed in cut and rubbed bricks; a slight camber or rise was often given to the soffit in order to deviate the appearance of dropping in the center which an absolutely flat soffit of large span sometimes had.

In buildings of large scale the use of sash windows did not at present materially detract from the appearance, as, for example, the window openings of Hampton Court Palace and Chelsea Hospital, where the openings



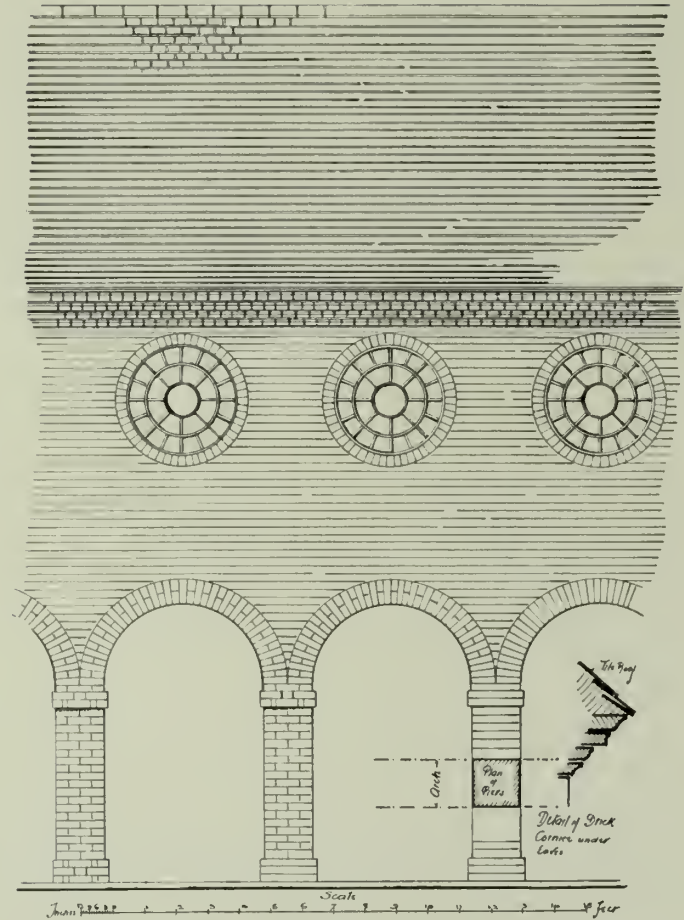
NETHERHAMPTON.

are tall in comparison to their width, a very necessary essential in the design of windows constructed in this manner; but in the smaller domestic buildings, when the necessary height could not be obtained, the effect is very poor when compared with the mullioned and transomed windows they displaced. For instance, the mullioned and transomed fenestration of Tyttenhanger House, Hertfordshire, is very charming, but it would be difficult, if not impossible, to have obtained as good an effect with the later type of window on account of the low proportions of the openings upon the second floor. For these reasons probably we find that the mullioned windows were still much used in the smaller buildings until quite the end of the eighteenth century,

and in some instances side by side with the sash window as shown in the illustration of Moyles Court in Hampshire, where, however, the sash windows in the projecting wings appear to have been inserted in the old openings early in the eighteenth century.

There is much good brickwork of late seventeenth and the eighteenth century date to be found in Cambridge.

St. John's College has already been referred to, and of other instances St. Catherine's College may be mentioned here. The buildings are grouped around three sides of a square and are three stories in height. The materials employed are brick for the wallings, and stone dressings for doorways and windows.



FROWDE ALMSHOUSES, SALISBURY. DETAIL OF GARDEN FRONT.

The Frowde Almshouses at Salisbury present much of interest to the student of brickwork. The garden front here illustrated is a very effective, if rather plain, piece of design.

The long range of piers and arches, seventeen in all, forming a kind of cloister walk, giving access to the ground-floor rooms, is very charming in its effect of light and shade.

The circular windows over these arches light a long corridor on the first floor, into which all the upper rooms open.

Many houses around the Cathedral Close in the same city, particularly the choir school, are worthy of study.

At Guildford in Surrey are many fine brick houses of eighteenth-century date.

The old town of Blandford in Dorsetshire was entirely rebuilt early in the eighteenth century, after being destroyed by fire, and most of the existing houses are built of brick of this date.

In London and the district round, brick from the first date of the introduction had always been a favorite building material, and after the great fire which occurred A. D. 1666 most of the houses and shops were rebuilt in this material, and in spite of the changes



DOWNTON MANOR HOUSE.

necessitated by modern ideas there are to this day numerous examples of late seventeenth and eighteenth century still standing in much the same state as when newly finished.

many doorways in this material, one of which is here illustrated.

The increase in trade and the consequent converting of houses into offices and shops in the city drove the wealthy



HAMPTON COURT PALACE.

The block of buildings called the Temple, London, afford many instances for study. New Court, a quadrangular block, was built in A. D. 1677, — the buildings

trades and merchants into the suburbs where they built their houses, and it is perhaps here can still be found the best specimens of eighteenth-century brickwork.



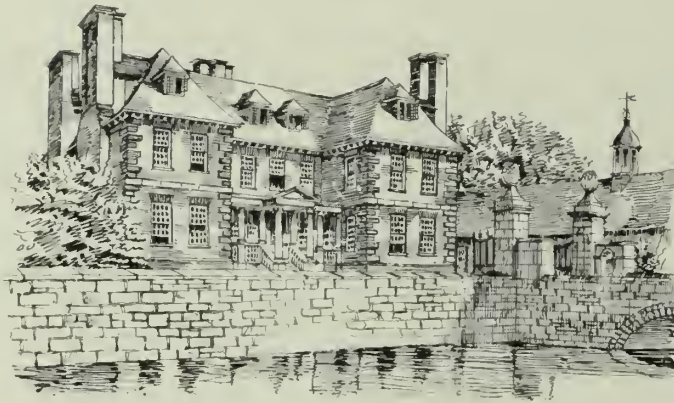
MOYLES COURT, RINGWOOD, HANTS.

are four stories high, with brick bands of slight projection marking the levels of the floors between the windows, which have flat arches and jambs in cut and rubbed brickwork,—and in King's Bench Walk are

Highgate and Hampstead, then villages on the north side, abound in brickwork of this period, and Fulham and Putney on the west at one time closely rivaled them as residential resorts. At Richmond in Surrey and in

the neighboring parish of Kew many fine old eighteenth-century brick houses are still remaining.

Maid of Honor Row at Richmond is a good example of a Georgian terrace, while at Kew many old houses of this date are grouped round the green.



GROOMBRIDGE PLACE, KENT.

In such a short review of a very extensive subject it is impossible to do full justice to the later periods which abound in beautiful examples of typical English brickwork which deserve to be treated more *in extenso*, but



the foregoing articles give a general idea of the gradual development of brickwork in England from the time of the introduction by the Romans, with examples of all the types of importance.

External Color at the Pan-American.

BY CHARLES H. CAFFIN.

THE buildings at the Pan-American are constructed of staff and have been treated with external color. The analogy of this with the use of colored terra-cotta was so complete that it suggested itself as a subject that might interest the readers of THE BRICKBUILDER. I propose to treat it under the three heads of what we looked for, what we found, and what we missed.

I am writing this in New York with special reference to its clear skies and freedom from smoke. Yet, if the introduction of color into architecture is desirable under such conditions, it must be even more so in cities where the atmosphere is less clear, provided the color is such as not to be unfavorably affected by the smoke and damp; and for this purpose colored terra-cotta from its impermeability seems to be eminently suitable. It has other qualities that recommend it,—lightness, toughness and non-combustibility,—so that how far it may be made to contribute to color also is a practical consideration.

The problem is surely one of construction rather than of decoration. At least that is the aspect of the matter uppermost in my mind,—the building in color rather than the enlivening of the structure afterwards with spots of embellishment. No modern city presents more charming features of color than Paris, and the foundation of it is the Caen stone so generally used in building, which can be cut almost like cheese and then hardens by exposure and takes on a delicate gray tint that composes, as if an artist had arranged it so, with the normal color of the sky; forming, also, a background of subtle neutrality to the accidental notes of color in awnings, shutters, flowers, and to the prevailing green of the innumerable trees. This gives a general local color to the city that one readily recognizes and carries away in one's memory as altogether characteristic. Such a uniformity of impression is not to be looked for in American cities. In them the prevailing note is individualism; it is the pith of enterprise and will inevitably make itself felt in the architecture, so that any consideration of colored exterior must look not to uniformity of effect but to separate action.

It was this that raised one's anticipation when it was announced that color was to form an important integral part of the *ensemble* at Buffalo. For it was felt, not unreasonably, that both the occasion and the circumstances would warrant and make possible some very notable contributions to the solution of the problem. The occasion was one of festivity which would permit a generous application of color, while the temporary life of the buildings would justify an adventurous spirit of experiment. Even if enthusiasm should overstep the limits of discretion, the structures would not remain to plague their inventors as in general practice, where an architect may well hesitate to go far in experiments the value of which he cannot truly estimate until it is too late to alter the results. But at Buffalo the designer's imagination might have been allowed to swing freely. Let us see how far the opportunity has been grasped.

As one approaches from the south, the eye is first arrested by the blue dome of the United States Govern-



HORTICULTURAL BUILDING.
Peabody & Stearns, Architects.

ment Building and by the pyramid of red roofs and pinnacles that surmount the Horticultural Building. These are emphatic notes of color against the sky and whet one's anticipation of a pronounced scheme of color to follow. We hasten towards the Triumphal Bridge, eager to view the color *ensemble* of the "Rainbow City," concerning which so much had been written in advance. But where is it? There are two more blue domes, other red roofs, there is a good deal of color also on the Temple of Music immediately on our left which we shall examine later, but where is the architectonic scheme of color? Where indeed is there any definite suggestion of color except in the details before mentioned? The *ensemble* is certainly not white, neither is it colored in any sort of significant manner. It has, in fact, a suggestion of innocuous neutrality, except for the Electric Tower which is ivory white with details of green-blue and gold.

Gradually it dawns upon us that our expectation must be modified; that instead of an *ensemble* we must look for detail; that instead of a scheme of color we must fall back on separate features of decoration. The realization of this makes one a little

more critical regarding the objects that first attracted attention and were for the time accepted provisionally—the blue domes and red roofs. It is recalled that the architectural style adopted is free Renaissance, particularly the Spanish-Colonial brand, and that a feature of Mexico, the country of splendid domes, is the use of majolica in some of them. And with that thought in one's mind, how dry, lusterless, unvibrative is the blue of these domes! without any beautiful quality of hue or suggestion of structural material—in one word, painty. Equally the red roofs fail to supply illusion of burnt clay; the color being uniform and heavy, with none of the subtle variations and vivacity of color that red tiles yield. To be

frank, these features indicate the work of a painter rather than of an architect; of one who thinks in surfaces rather than in materials of construction.

Let us turn, however, to the massing of decoration over certain parts of the buildings. Here we shall find a much more architectural feeling. A very successful example is the main portal of the Horticultural Building, designed by R. S. Peabody of Peabody & Stearns.



ETHNOLOGICAL BUILDING.
George Cary, Architect.

This entrance, surmounted by a flat gable, is round topped, with a series of ornamental bands supported upon little columns, decorated with raised ornament on a blue ground. Over the arch is a cartouche with supporting figures and scroll work in relief, colored blue, green and yellow. On each side is a panel, blue ground and white raised figures, quite Robbia-like in feeling, and below them are two groups of sculpture, naturalistically colored. With the exception of these last the ornament is Renaissance. In the side pavilions loggias are introduced, the vaulted ceilings of which are decorated with signal success after the *Villa Madama*. Indeed the whole of the colored decoration of this building is exceedingly pleasant, rich even to profusion and yet controlled by excellent taste. And the same is true of almost all the principal entrances, notably those of the Machinery and Electricity Buildings. Both of these are by Green & Wicks and, were we discussing the architecture, it would be pleasant to dwell upon the combined sprightliness and dignity of these two very charming structures. But it is with the decoration that we are concerned, and that is massed around the different portals and colored with a bold use of primary tints that merge in a very agreeable harmony. The eaves also are very effectively treated with an imitation of timbers and carved woodwork, that really suggests the material, the dark brown being picked out with bright color.

There is an instructive lesson in the color deco-



SOUTH ENTRANCE, MACHINERY BUILDING.
Green & Wicks, Architects.



WEST ENTRANCE, LIBERAL ARTS BUILDING.
Shepley, Rutan & Coolidge, Architects.

ration of the Temple of Music. An attempt has been made to secure vivid emphasis by the introduction of red, but its interrupted use in patches deprives it of any constructive value. With the exception, however, of this building, two very crudely colored band stands close by and sundry groups of sculpture, intended to simulate bronze but more suggestive of chocolate, the colored decoration is very agreeable and in some cases extremely good in detail. But it is detail.

What we miss is any definitely intelligible scheme of color. Only to a very limited extent has the color been used structurally as an intrinsic part of the design; instead, it has been applied almost entirely as extrinsic ornament. Herein is the disappointment, for ornament is not architecture, more particularly in the case of the huge buildings which have become a feature of American cities. In these the problem is, or ought to be, essentially one of structural design, to which the embellishment bears but a very insignificant relation. Without any, the building may still be very attractive, while no amount of embellishment will disguise or atone for a poverty of construction. We had hoped, therefore, to see at Buffalo an attempt to build in color. Perhaps the architects will assert that they have made it, for certainly the buildings are not white. But just as certainly they give no definite impression of color. In their pale buffs and drabs they are, as I said before, innocuously neutral; whereas we were justified

in expecting some more or less adventurous essay in constructional color.

The treatment of the Electric Tower will illustrate my contention. The structure itself is very majestic and it rises among the other buildings with a certain exclusiveness, for it does not follow the Renaissance type. Indeed, one of its best features is that it embodies the character of type that is gradually being formed to meet the conditions of the modern office building. It smacks of what is going to be distinctively an American contribution to architecture. Here surely was incentive for some distinct style of color treatment. What has been used is an arrangement of ivory, green-blue and gold, the combination that the decorator of a theater falls back upon as safe. The green-blue is a very charming tint suggested by the water at Niagara Falls, and is used as an accessory to remind us of the source from which the electric power is derived. Then why not have made it the dominant motive? Evidently this was too adventurous, beyond the depth in which the architect cared to venture. He preferred paddling in shallow water to the daring freedom of the swimmer. It is characteristic of the whole *ensemble*—a timid holding on to conventionalities rather than a bold leap of the imagination—in a word, an opportunity lost.

The director of color was Mr. C. Y. Turner of the National Society of Mural Painters, but I do not think he must be held responsible for the partial failure of the scheme. The story current in Buffalo is that the architects approved of his plans in the gross, but that each one demurred to its application to his particular building. If this was the case, it may be explained by the fact that the Renaissance style had been adopted as a type, and that its accepted conventions restrained them. As an endorsement of this, it is a fact that those buildings in which the embellishment has been carried farthest are the ones in which the architects have handled the type with the greatest freedom.

Towards a solution, therefore, of this problem of structural color the Pan-American Exposition contributes nothing, unless it be by suggestion. The idea of green-blue in connection with the Electric Tower kindles one's imagination. Suppose that the shaft of the tower had been of this green-blue, and that the superstructure, which sits upon it like a crown, had still preserved some of the color but been freely decorated with gold, and that the near-by buildings had been constructed in violet and those more remote in orange, we should have had a scheme distinctive, yet certainly not bizarre, and combining local tints which might be introduced into city architecture without offense. As it is, orange-red shows very effectively on the walls of the colonnade of the Ethnological Building, a structure distinguished by harmony of mass and excellent adjustment of its parts and decorative details; but the definite note of orange is not carried through the structure, which is of a kind of pink buff, agreeable but quite unadventurous.

For it was not a tentative and obviously safe thing that we looked for, but the resolute tackling of some really imaginative scheme or even a bold recourse to examples of constructional color already used abroad.

As it is, the result accomplished does not advance experience a single peg and has not adequately represented what experience might have suggested.

The Life and Works of Rafael Guastavino. Part IV.

THE PRACTICE OF ARCHITECTURE AND COHESIVE CONSTRUCTION IN AMERICA.

(Concluded.)

BY PETER B. WIGHT.

THUS far the illustrations have shown what cohesive construction has accomplished as a factor in the evolution of architectural design, and I think the

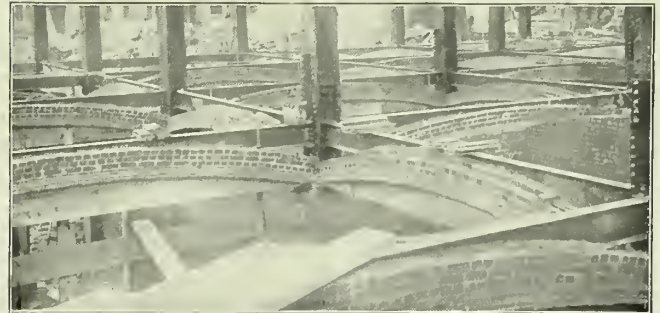


FIG. 16. MUNSEY BUILDING, NEW HAVEN, CONN.

promise made in a previous part to demonstrate it has been fulfilled. As Mr. Guastavino is no longer practicing his profession, but conscientiously carrying out



FIG. 17. MUNSEY BUILDING, NEW HAVEN, CONN.

the conceptions of his brother professionals, he is unable longer, except by way of suggestion, to express the longings of his own inspiration in the materials whose



FIG. 18. MUNSEY BUILDING, NEW HAVEN, CONN.

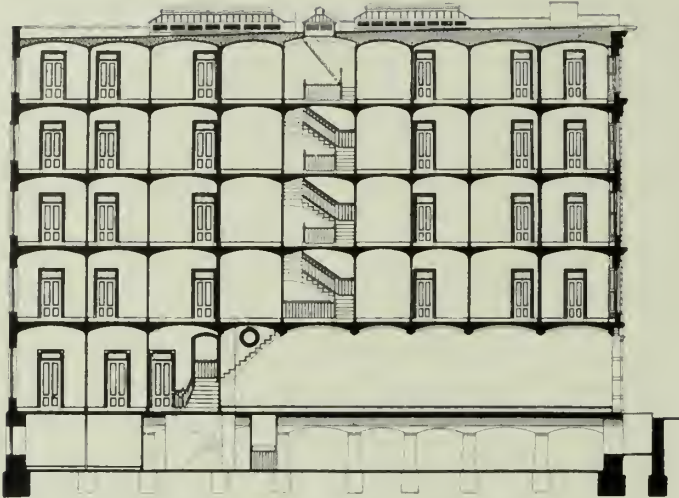


FIG. 19. FIRE-PROOF TENEMENT HOUSE, NEW YORK CITY.
LONGITUDINAL SECTION SHOWING TILE ARCH CEILINGS
FROM CELLAR TO ROOF.

use he has brought to such great perfection. But what he has done has been given as a legacy to the profession which it cannot too highly prize and by the use of which it can go on developing new constructions and new forms forever.

It has seemed needless heretofore to remind the

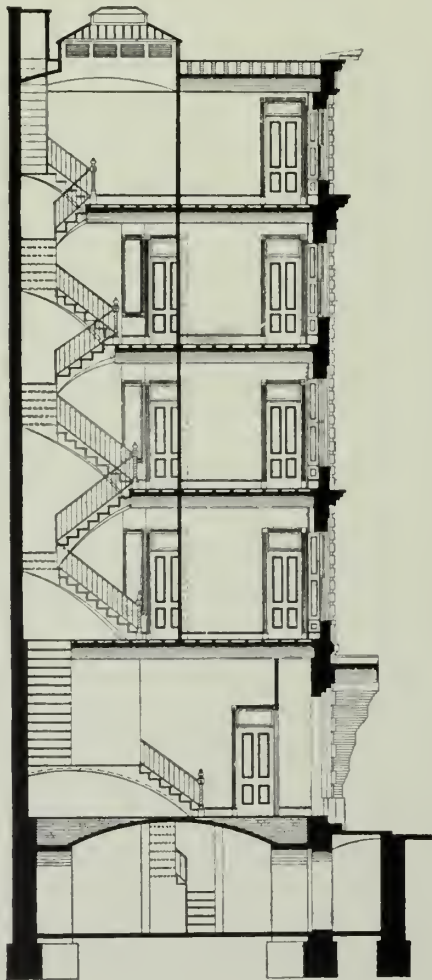


FIG. 20. CROSS SECTION, FIRE-PROOF
TENEMENT HOUSE, NEW YORK CITY.



FIG. 21. ELLIPTICAL STAIRWAY, FIRST NATIONAL BANK,
PATERSON, N. J.

reader that all the work in cohesive construction herein described is as thoroughly fire-proof as any of the other constructions in burned clay. It is this quality that has been the main inducement for its use. But it differs from others in that it makes many constructive forms possible that were before unknown, and has been, therefore, a potent element in architectural design. Its largest use, however, as may be readily supposed, is where its fire-proof qualities only are sought for. It

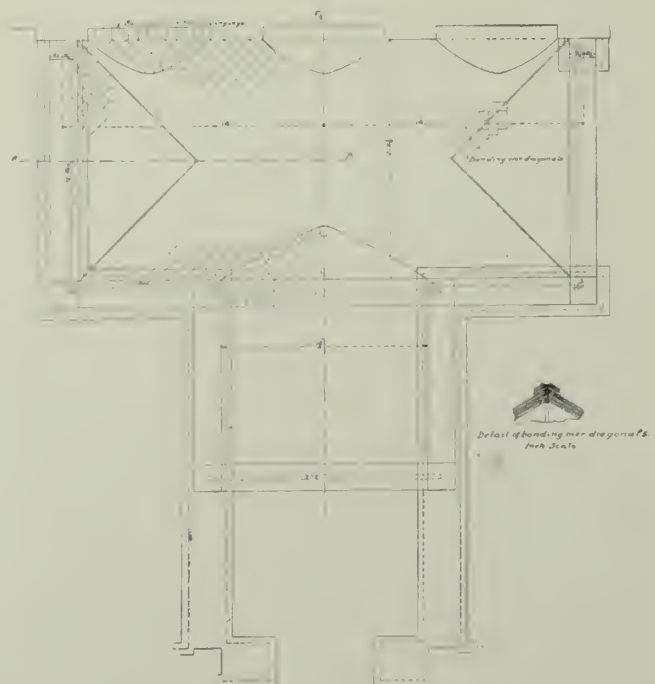


FIG. 24. PLAN OF AMBULATORY, NEW YORK UNIVERSITY.

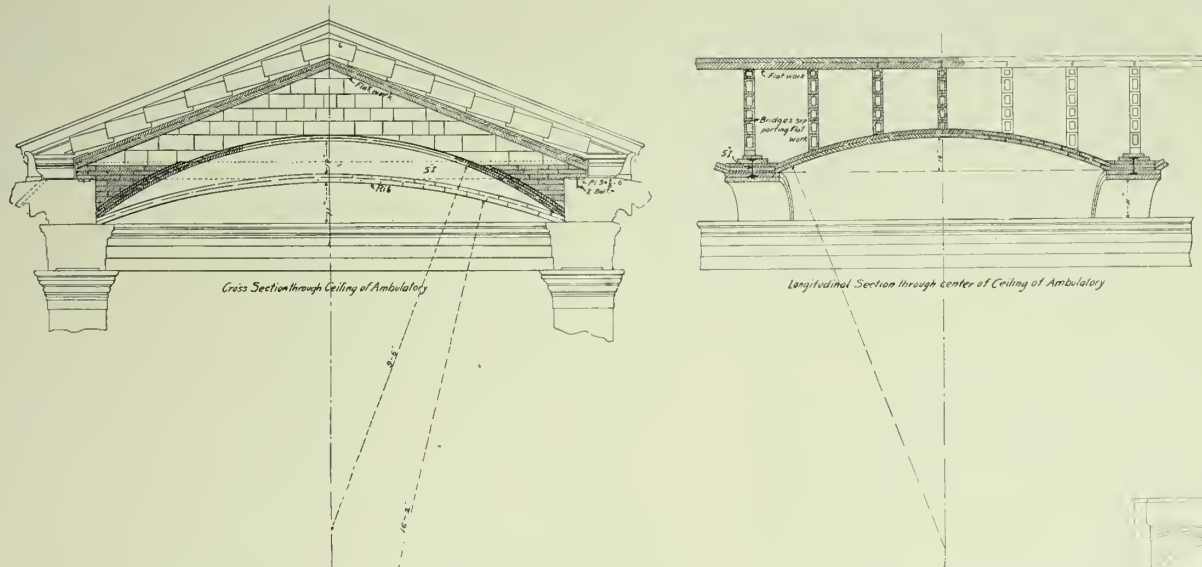


FIG. 26. AMBULATORY, NEW YORK UNIVERSITY.

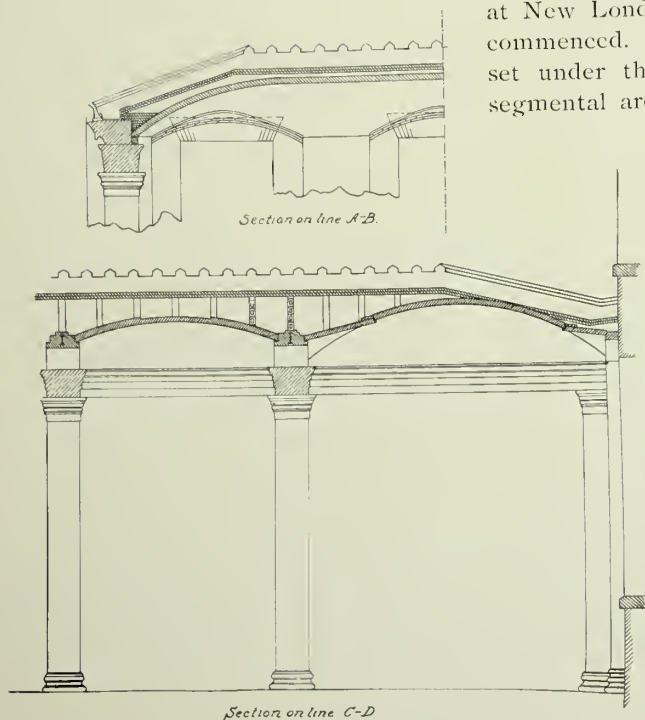


FIG. 25. AMBULATORY, NEW YORK UNIVERSITY.

therefore is important to select one illustration of the system of fire-proof floor construction most urgently recommended by Mr. Guastavino. Supposing a large area of fire-proof floor to be required, the best application of the Guastavino system is where columns and girders only are used—that is, where the floors are divided into squares or rectangles with steel columns

at the corners of the rectangles connected by girders in both directions. The steel girders are only used to carry a small part of the loads of the floors, and act mainly as braces and tie rods as the circumstances require. The loads of the floors are almost entirely concentrated on the columns by the tile construction. This will be illustrated by three photographs of the work in process of construction in the Munsey Building at New London, Conn. Fig. 16 shows the work commenced. Segmental centerings of wood are set under the girders, and on these are built segmental arches of three courses of flat tiles,

much wider than the girders, on which are set three courses of brick covering the sides of the girders. The lower course of tiles is the widest, and each course above sets back enough to receive the bearing of the edges of the courses of tiles forming the domes. The square sections of domes intersecting the girder arches, and are built in three or four courses as may be necessary and filled on top with concrete or ballast. As compared with the traditional systems of construction this is a form of masonry in which the pendentives and the dome are united in one. The principle is old, dating from the Greco-Byzantine period, but the application is new and original. Fig. 17 shows the top of the domes ready for the concrete. Fig.

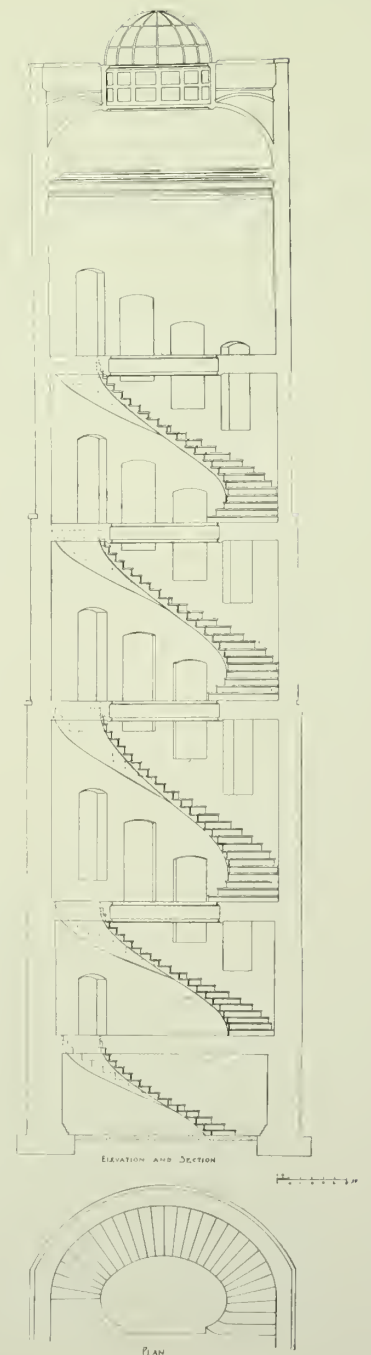


FIG. 22. PLAN AND ELEVATION OF ELLIPTICAL STAIRWAY IN FIRST NATIONAL BANK, PATERSON, N. J.

18 shows the underside when completed. This being in the basement, it will be seen that the arches start from the top of the brick piers which carry the columns. The section of floor carried by each column is 19 by 25 feet, which is also the exact size of each dome. The domes contain no steel whatever. These are guaranteed to carry a safe load (distributed) of three hundred pounds per superficial foot.

The next illustration will show two sections (Figs. 19 and 20) of one of the earliest works of Mr. Guastavino in this country, designed as well as built by him. This is one of two fire-proof tenement houses built in the city of New York in 1883. The first floor was entirely vaulted

Fig. 22 shows the plan and vertical section of this stairway, and Fig. 23 will give some idea of the amount of careful study necessary to the successful construction of such work as this.

In conclusion I present part of the working drawings of the ambulatory of the New York University, connected with what is called "The Hall of Fame" (Figs. 24, 25 and 26). The whole of the ceiling and roof are constructed of tiles and cement. The ceiling has very flat vaulting carrying dwarf walls and flat tiles, covered with roof tiles. The ceilings are of enameled tiles throughout. This is one of the latest of the Guastavino constructions.

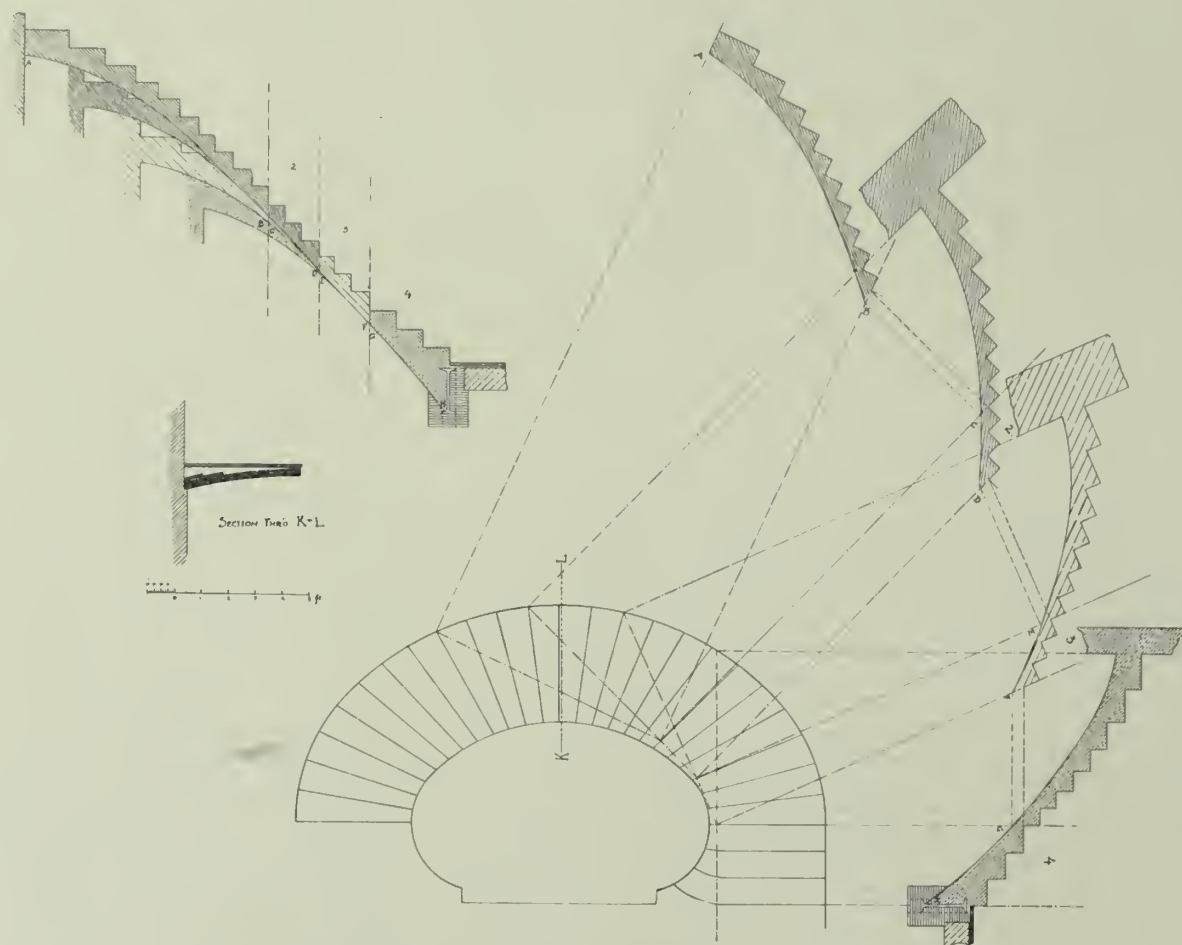


FIG. 23. LAY-OUT OF STAIRWAY IN FIRST NATIONAL BANK, PATERSON, N. J.

from the masonry. The upper floors and the roof were built with segment arches between beams spaced so that each arch covered a room. As in the Arion Club, the arches were five inches thick, and the first two courses were laid in plaster of Paris because he had not yet been able to put entire confidence in the Portland cement then obtainable. The stairways of this building were also built of tiles. A good beginning was here made which was well worthy of imitation.

Fig. 21 is a view of part of the elliptical stairway built in the First National Bank at Paterson, N. J. It is shown as left by the tile layers and ready for the decorators. The floors of this building were not of cohesive but of flat hollow tile arch construction.

These articles would not be complete without allusion to the conscientious work that has been done since 1890 by Mr. R. Guastavino, Jr., who has been such a valuable assistant to his father. I saw him on the first work that was entrusted to his sole charge, the Telephone Building at Denver, and then learned to admire the conscientious way in which the work was done. It is one of those buildings in which he used the minimum of steel, but it would be useless to describe it without diagrams. Since then he has had special charge of nearly all the domes of large span which the Guastavino Company has erected.

[THE END.]

Selected Miscellany.

NOTES FROM NEW YORK.

The prospects of new work are very satisfactory and all the architects are busy.

Before long some of the immense new structures for which foundations have been laid during the summer will begin to rear themselves high into the air and



HOUSE AT NEW BRITAIN, CONN.
Francis W. Crosby, Architect.

assume their place among the massive and beautiful buildings of which New York may be justly proud.

The new Custom House and the Union Club, both by Mr. Cass Gilbert, bid fair to equal anything of their kind in the city and to add greatly to the reputation of this



FIDELITY CLUB BUILDING, MOBILE, ALA.
Charles Pearson, Architect.
Built of brick furnished by the Hydraulic Press
Brick Company, St. Louis.

eminent American architect, whose scholarly and beautiful work shows the influence of McKim, Mead & White, being a free and intelligent use of Italian motives, combined with an indefinable feeling of whole-souled truth and liberality which it seems to me approaches very

near to our true ideal of an American style. It is not a case of "Progress before Precedent." They should go hand in hand.

Mr. Post's new Stock Exchange is making satisfactory progress, and will be a dignified addition to the Wall Street section.

Mr. R. W. Gibson will soon begin work on the Woman's Hotel on 29th Street near Madison Avenue. It will be eleven stories high and will cost, exclusive of the plant and fixtures, \$350,000. The general plan is to have a large number of moderate-sized rooms for the use of business women of limited means, as well as



HOUSE AT HARTFORD, CONN.
Davis & Brooks, Architects.

expensive rooms for those who desire them. It will be a skeleton-frame structure, with the two lower stories devoted to millinery stores, etc., generally controlled by women.

NOTES FROM ST. LOUIS.

Activity in building circles continues, and especially is it noticeable on account of the many substantial residences being built.



THE WINSTON-HARPER-FISHER BUILDING,
MINNEAPOLIS, MINN.
F. B. & L. L. Long, Architects.
Built of "Ironclay" brick made by Columbus Face Brick Company.

Architects J. B. Legg and C. N. Frig are building a Methodist church at Mexico, Mo.

Eames & Young have awarded the contract for constructing the Dolph building on Locust Street. The building will be of dark brick with terra-cotta trimmings, fire-proof, six stories, and will cost \$100,000.

The same architects, associated with Will Levy, are preparing plans for an eight-story wholesale building, to face 213 feet on Washington Avenue and 150 feet on Twelfth Street. The building will be one of the largest of the kind in the city, having 275,000 square feet of floor space, and will be occupied by a dry goods company. The cost will be \$400,000.

An interesting five-story building in the Italian Renaissance style is being put up on the corner of Fourth and Locust streets by Barnett, Haynes & Barnett.

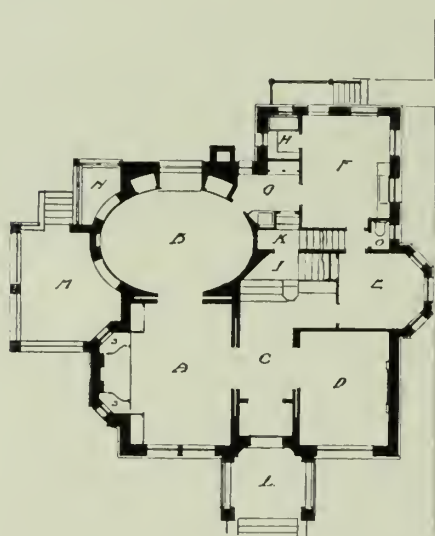
Architects Mauran, Russell & Garden are having considerable success in designing library buildings, they having been chosen as the architects for the new library at Decatur, Ill.



HOUSE AT CINCINNATI, OHIO.

E. M. Spinning, Architect. Roofed with American S. Tile.

building was one of the pioneer fire-proof office buildings in the city. It is eight stories high and has one of the most interesting façades, being Gothic, after designs by Peabody & Stearns. Notwithstanding its being a



FIRST

- | | |
|--------------|----------------|
| A LIBRARY | H ENTRY |
| B DINING RM. | I MAIN STAIRS |
| C REC. HALL | K REAR STAIRS |
| D PARLOR | L PORCH |
| E DEN | M PORCH |
| F KITCHEN | N CONSERVATORY |
| G BUTLERY | O TOILET |

SECOND

- | | |
|-----------------|-------------------|
| A SITTING RM. | G SERVANTS' BATH. |
| B BEDDING RM. | H HALL |
| C CHAMBER | I LANDING |
| D BATH RM. | K REAR STAIRS |
| E WEST CHAMBER | L LINEN CLO. |
| F SERVANTS' RM. | M DRESSING |



FLOOR PLANS, TRUE HOUSE, CHICAGO.

A notable event in building circles has been the transfer, by ninety-nine-year lease, of the Turner building to the Chemical building owners. The Turner

comparatively modern building, it is to be sacrificed to modern progress and will be replaced by a sixteen-story addition to the Chemical building at a cost of \$175,000. Henry Ives Cobb, who is a stockholder in the Chemical building company and who designed the original building, will very likely be chosen as the architect.

Considerable progress has been made in World's Fair matters, the general scope of the work having been decided upon and the more important buildings assigned as follows:

Agricultural Building, Isaac S. Taylor, St. Louis; Liberal Arts Building, Carrère & Hastings, New York; Mines and Metallurgy, Van Brunt & Howe, Kansas City, Mo.; Transportation Building, Widman, Walsh & Boisselier, St. Louis; Art Building, Cass Gilbert, New York; Social Economy Building, Barnett, Haynes & Barnett, St. Louis; Educational Building, Theodore C. Link, St. Louis; Manufacturers' Building, Eames & Young, St. Louis; Electricity Building, Walker & Kimball, Omaha; Service Building, Isaac S. Taylor; and the Government Building, James K. Taylor, supervising architect. Since the above allotment the commission has



ORPHEUM THEATRE, BROOKLYN, N. Y.

Frank Freeman, Architect.

Architectural terra-cotta made by B. Kreischer & Sons.



DINING-ROOM.



LIVING-ROOM.

HOUSE AT CHICAGO, ILL., FOR JOHN R. TRUE, ESQ.
Huehl & Schmid, Architects.



CAPITAL BY PEABODY & STEARNS,
ARCHITECTS.
Conkling-Armstrong Terra Cotta Company,
Makers.

The different buildings are all larger than those of the Columbian Exposition. The Italian Renaissance has been selected as the style of architecture, and the main cornice line is to be uniformly 65 feet high.

Mr. E. L. Masqueray of New York has been selected by director of works Taylor as the chief designer.

The St. Louis Chapter of the A. I. A. held its annual meeting and dinner at the Mercantile Club, Monday

decided to put up two additional buildings for Manufacturers and Liberal Arts.

It is expected that the contracts for the above buildings will be awarded before the first of January.

one of the new office buildings struck for sixty cents an hour, their demand was granted at once, though union rates, fixed this spring, were but fifty cents.

The board of trustees of the Carnegie Institute have at last been notified that the city is ready to turn over to them the ground required for the extension of the present building, and work will probably soon commence on this. The trustees are also at work on the preliminary arrangements for the technical institute which Mr. Car-



DETAIL "FLATIRON" BUILDING, NEW YORK CITY.
D. H. Burnham & Co., Architects.
Atlantic Terra Cotta Company, Makers.



DETAIL FOR BANK OF COMMERCE, TORONTO, ONT.
Darling & Pearson, Architects.
Perth Amboy Terra Cotta Company, Makers.

evening, September 22, and elected Mr. W. S. Eames president, W. B. Ittner vice-president, J. L. Mauran secretary, and F. C. Bonsack treasurer; these officers, in connection with Mr. James P. Jameson, forming the board of directors.

NOTES FROM PITTSBURG.

The report of the Department of Public Works so far this year indicates that this will be the best year that Pittsburg has known in building operations. It is practically impossible to get men enough to carry new work along properly, and recently when the bricklayers on

negie is to build here. Experts from many schools and colleges throughout the country have been here aiding them in this work.

In the public waiting-room of the new Union Station glazed colored terra-cotta has been used very successfully.

Mr. Carnegie is to present to the city of Allegheny a statue of a former prominent citizen, Colonel Anderson. Colonel Anderson befriended Mr. Carnegie when a boy, lending him books and aiding him in many ways. Daniel Chester French is the



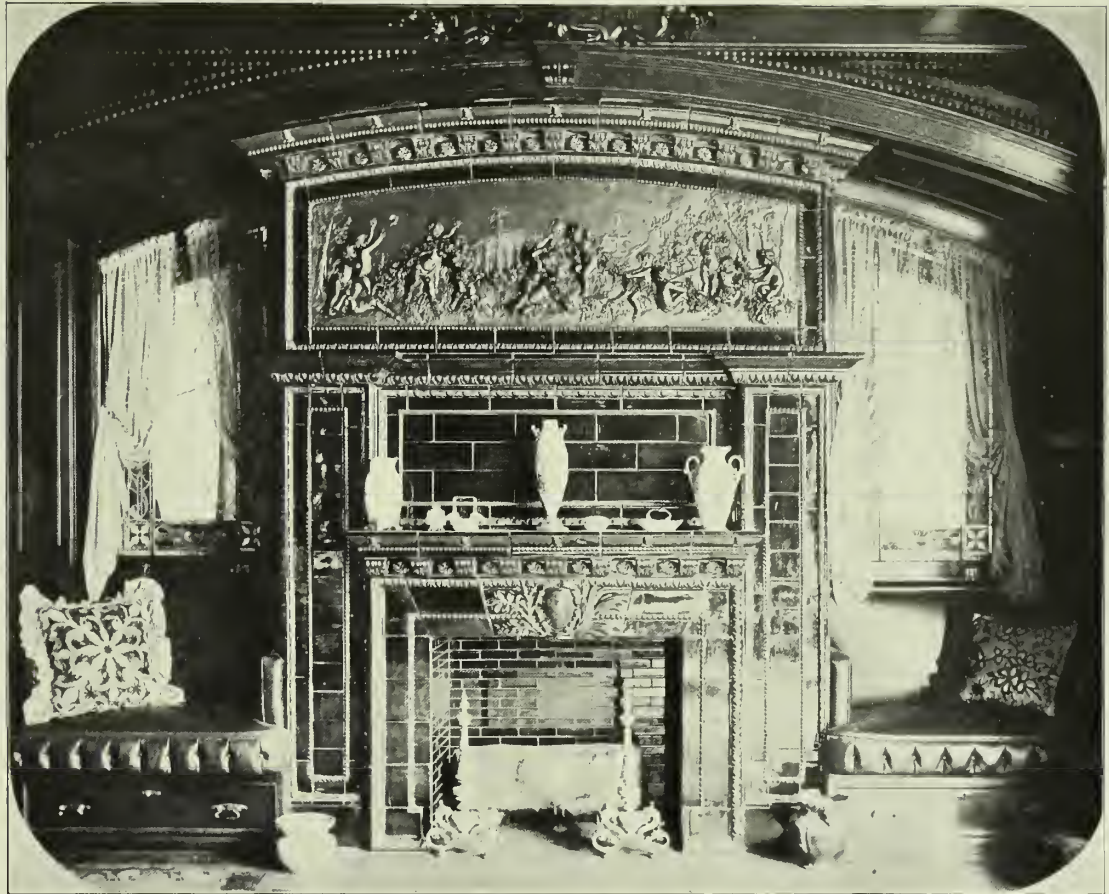
TERRA-COTTA PANEL MADE BY THE
NEW JERSEY TERRA COTTA COMPANY.

sculptor, Brite & Bacon of New York the architects.

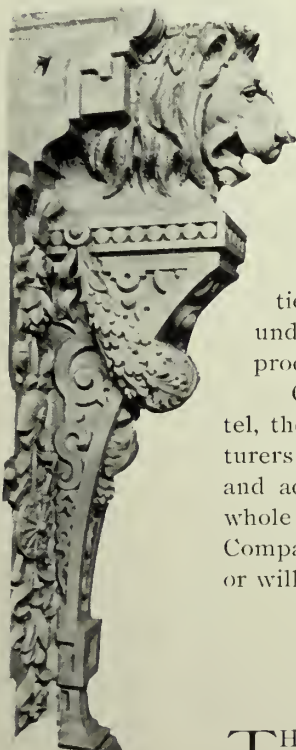
Alden & Harlow are preparing plans for a twenty-three-story office building for the Farmers' Deposit National Bank, to be built on the corner of Fifth Avenue and Wood Street.

A MANTEL IN FAIENCE.

THE unusually handsome mantel which is illustrated on this page is the work of the Hartford Faience Company, Hartford, Conn. The illustration does not adequately convey the variety of rich colors employed in the design, but enough is shown perhaps to indicate the rich effects which may be obtained by the use of a



FAIENCE MANTEL IN RESIDENCE AT MILWAUKEE, WIS.
E. R. Liebert, Architect.
Made by the Hartford Faience Company.



DETAIL BY
HENRY SCHUYLER,
ARCHITECT.
Excelsior Terra Cotta
Company, Makers.

material which lends itself so readily to graceful ornamentation and beautiful color decoration.

Faience, which has always been used extensively in Europe, is rapidly finding recognition in this country, and we look to see a greater use of it when the possibilities of the material are more fully understood and the quality of our product better appreciated.

Concerning this particular mantel, the architect writing the manufacturers says it is thoroughly well done and adds much to the charm of the whole work. The Hartford Faience Company carry a fine line of mantels or will execute from special designs.

HOUSE FOR JOHN R. TRUE, ESQ.

THIS beautiful house illustrated in our plate form is built of a semi-glazed, cream-white terra-cotta from foundation up. As an architectural creation it has additional interest from the fact that Mr. True is president of

the Northwestern Terra Cotta Company, which furnishes the material, by the use of which he has demonstrated his absolute confidence in this form of burnt clay to withstand successfully not only the ordinary ravages of time, but the defacement of accumulated soot, which is so common in many of our larger manufacturing cities.

The roof is covered with a light green semi-glazed tile, made by the Ludowici Roofing Tile Company.



BLOCK OF RESIDENCES, RIVERSIDE DRIVE, NEW YORK.
Janes & Leo, Architects.
Terra-cotta by the New York Architectural Terra Cotta Company.

SCHOOL AND UNIVERSITY PUBLICATIONS.

We have received from the following institutions publications which contain interesting descriptive matter relating to the different branches of art and scientific study which they severally maintain:

Laurence Scientific School, Cambridge, Mass.

The Art Institute of Chicago.

Architectural Department, University of Pennsylvania.

Copies will be furnished upon application to those who are interested.

NEW TRADE PUBLICATIONS.

A new chapter regarding the Herculean Fireproof Floor Arch is contained in a pamphlet just issued by Henry Maurer & Son. This new pamphlet is made



CAPITAL BY CHARLES A. RICH, ARCHITECT.
White Brick and Terra Cotta Company, Makers.

especially interesting because of the illustrations it contains of work which has been executed. Henry Maurer & Son, 420 East 23rd Street, New York City.

From the new catalogue issued by Gladding, McBean & Co., San Francisco, Cal., we are led to believe that the burnt clay interests are well looked after on the Pacific slope. In this book are illustrated many of the best type and most prominent buildings which have been erected in the far western states, in which the company's product — brick and terra-cotta — has been used.

SUNDRY ITEMS.

Architects Dennison and Miller of Warren, Ohio, have removed their offices to Youngstown, Ohio.

The opening smoker of the Washington Architectural

Club was held in the club room on Saturday evening, October 12. Competition sketches and photographs made during the past summer were exhibited.



TERRA-COTTA PANEL, FIRE STATION, YONKERS, N. Y.
Standard Terra Cotta Works, Makers.
E. A. Quick & Sons, Architects.

Mr. Walter M. Evatt has been appointed New England manager for the National Fire-proofing Company, with offices in the Tremont Building, Boston.

Charles Bacon, Boston agent for the Celadon Roofing Tile Company, reports the following new contracts: Library, Derby, Conn., Hartly Dennett, architect; residence, Newton Centre, Mass., Coolidge & Carson, architects; residence, Weston, Mass., J. E. Chandler, architect.

B. Kreischer & Sons, New York City, report the following new contracts in Greater New York: Office building, Liberty and Cedar streets, John T. Williams, Jr., architect; light gray speckled front brick and buff light court brick. Telephone stations, 220 to 224 West 124th Street and 123 to 127 East 124th Street, C. W. L. Eidlitz,



CAPITAL BY MESSER & SMITH, ARCHITECTS.
St. Louis Terra Cotta Company, Makers.

architect; light court buff brick. Tontine building, Wall and Water streets, George A. Fuller Company, contractors; light gray front brick. Twenty apartment houses, Kent & Willoughby avenues, Brooklyn; buff and gray brick and gray rock-faced brick.

“School Architecture.”

A General Treatise on Designing and Planning of Schoolhouses.

BY EDMUND M. WHEELWRIGHT.

More than 250 Illustrations of Schoolhouses and Plans; many of the best types of all grades having been chosen.

An indispensable Text-book for Schoolhouse Designers.

Price, \$5.00, delivered.

ROGERS & MANSON, *Publishers*,
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THE BRICKBUILDER.

NOVEMBER,

1901.



HOUSES AT YPRES, BELGIUM.



THE BRICKBUILDER.

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ADVERTISING.

Advertisers are classified and arranged in the following order:—

	PAGE		PAGE
Agencies, — Clay Products	II	Cements	IV
Architectural Faience	II	Clay Chemicals	IV
“ Terra-Cotta	II and III	Fire-proofing	IV
Brick	III	Machinery	IV
“ Enameled	III and IV	Roofing Tile	IV

Advertisements will be printed on cover pages only.

AN INSURANCE TRUST.

THE *American Architect* in a recent editorial makes a very sensible suggestion that the fire insurance companies might imitate the example of the steel companies and combine into a trust. Such a proposition it seems to us has everything to commend it, and undoubtedly one of the first results of the union would be the raising of the standard of first-class buildings from an insurance standpoint. When the Manufacturers' Mutual Fire Insurance Company undertook to put a premium upon good mill construction it began a work which has accomplished perhaps more than any one agency towards the elimination of fire risks in that particular class of buildings. This company had the field to itself, and we can readily understand how a trust which could control all the insurance interests, which would be free from the temptations of competition for business, could bring about a much needed reform in some constructive features of our modern buildings. The terrible annual waste which this country has to stand is in large part worse than needless, and if conditions should be such that the *American Architect's* suggestions could not be carried out, it is to

be hoped that there might be at least a more intelligent concerted action on the part of the underwriters towards reducing fire risks. That such risks can be reduced is abundantly demonstrated by the success which has attended the use of terra-cotta and burnt clay in what we term fire-proof construction, and the danger now is not from the few buildings which have been intelligently planned by competent constructors and architects, but rather from the great majority of buildings which are allowed to exist without any fire-proofing whatever. It is these which constitute the real menace not merely to themselves but to the better class of buildings, as was shown in the Rogers-Peet fire in New York. The rates on inflammable construction in our cities ought to be prohibitory. We cannot look to the building departments to discriminate against such structures, but it is a matter of business prudence for the insurance companies to grapple with the careless condition of the ordinary construction in our large cities, and by concerted action there is not the slightest doubt that in a very short time the fire risks in our large cities could be reduced by a very considerable extent.

THE QUESTION OF STYLE.

A VERY earnest discussion has been going on recently in England regarding the architectural style in which it was expedient to build the proposed Liverpool Cathedral. This is a construction which was started on paper many years ago, but after a long period of inaction has taken a new lease of life and bids fair to assume definite shape. It is extremely interesting to follow the discussions which take place on this subject, and it is also worth while to consider what such discussion implies. England is a country in which architecture has never been *sui generis*. Its art has been imported, in essence at least, and though greatly modified by local conditions and admirably adapted to the wants of the British public it has never had the spontaneous inherent life which has characterized Italy, France and Spain. In neither of these last named countries would there be any serious discussion as to what style should be used for any building; and indeed we even fancy that in the United States, while there might be differences of opinion, there would probably be very little discussion upon such a subject. We would feel a natural gravitation toward a particular style, or at least we would not consider it in any sense a national calamity if one style rather than another were adopted. There will always be room for honest difference of opinion between the classicist and the romanticist. There will always be those who will follow the lead of the Renaissance

as well as those who feel that no church edifice can be truly religious unless it is a bit barbaric or Gothic. But the acrimony of the discussion which seems to be disturbing the English architects is not easy for us to comprehend, and shows that the question of style, after all, is quite as much one of fashion as of conviction in England. The idea that the committee can decide whether the building shall be Gothic or Renaissance seems to us indicative of a condition several degrees worse than we have to contend with here. There is probably not an architect in the world who could do equally well in any two styles; and, judging by the discussion, there is at present in England no recognized tendency towards a particular style; her architects are working individually rather than collectively, and the passing period is one which will leave no distinctive creation of English architecture. Under these circumstances it would seem by far the wiser way for the Liverpool committeemen to ignore the question of style and make the selection one of men, trusting that the best architect they can select will be most likely to give them the best building, rather than that a predetermination of style will be any guarantee of architectural success.

THE INFLUENCE OF ENVIRONMENT.

WE quote from a contemporary: "The — School of Architecture which opened its new year is doing a valuable work in an unassuming manner. The course embraces the same studies as in the great schools. It is perfectly well recognized that a young man may get as good an education for all practical purposes at a small college as at a great one and that more depends upon the student himself and his immediate instructors than upon his environment." For all practical purposes we agree fully with the foregoing. Fortunately, however, architecture is far more than a matter of practical purposes. It is an art, and as all creative arts are essentially imitative in their processes of development, architecture is the art which must be studied by example. So that while having every good wish for the school of architecture to which the quotation refers, and without doubting its good work in practical lines, it is evidently unqualified to teach architecture as a fine art, and the students therein who rely upon themselves and their instructors to make up the deficiencies in environment will surely appreciate what they miss when they are able to compare themselves with graduates even less richly endowed by nature, but who have profited by the artistic environment which counts for so much in the three or four leading architectural schools of this country.

THE SAFETY OF SAINT PAUL'S.

AFTER all, there are some conditions which if not more successfully met in this country than anywhere else are certainly here overcome in an easier and more assured manner. We have seen many statements in both the daily and the technical papers in regard to the structural safety of Saint Paul's in London. The cathedral rests upon a relatively thin layer of clayey soil superimposed upon a deep bed of alluvial deposit which

extends to so great a depth below the pavement that at the time Sir Christopher Wren built the structure he did not deem it necessary to carry his foundations down to the firm subsoil, which we believe is some sixty or seventy feet below the sidewalk. The numerous tunnels which have been carried under London in all directions have raised fears that their construction would sap the strata of soft earth and so undermine the cathedral foundations, and the English constructors seem to be much exercised as to what to do. There are probably a score of architects and engineers in this country who would not have the slightest hesitation in grappling with a problem of this sort and solving it successfully, and aside from a question of cost there is not the slightest reason why tunnels should not be carried anywhere under Saint Paul's and the foundations extended down to a proper bearing; but the difficult problems of foundation work which were so new to the profession in this country a generation ago are almost a closed chapter to our English confrères, and while the imputed American invasion of London need not be carried to the extent of an American architect being employed to properly construct foundations for the city's great cathedral, we believe that those having the building in charge would be relieved of many of their fears as to ways, if not means, by a visit to this country and a study of the heavy foundation work which has been put under so many of the huge buildings in New York and Chicago.

CLUB NEWS.

The annual exhibition of the T-Square Club will be held in the galleries of the Art Club of Philadelphia, from January 4 to 18. Entries must be received not later than November 23. Exhibits must be received not later than December 7. Exhibits will be discharged January 20, 1902, when they will be returned to the owners, or will be forwarded to New York (subject to selection by a committee representing the Architectural League of New York), as may be directed on the entry slip.

The T-Square Club has just issued a syllabus announcing the subjects for competition among its members for the coming season. In accordance with a recently established custom of the club the subjects for study are limited to one department of design. Certain phases of city street embellishment are to be taken up at each meeting. Far from encouraging attention to purely imaginary studies for beautifying thoroughfares without regard to public needs the programme invites a solution of practical problems. Architectural treatment is to be suggested for an elevated railway station, a city square, facilities for bill posting, a public wash-house, street accessories and public conveniences. That the question of these improvements is a pressing one in the rapid growth and development of our cities is shown by a number of instances of actual legislation. It is this desire for civic beauty and convenience that the T-Square Club recognizes and to which it turns its attention with characteristic zeal. The competitor whose designs receive the highest number of approving votes is awarded the T-Square Club Traveling Scholarship.

Brickbuilding in Modern France. IV.

BY JEAN SCHOPFER.

WE pass on to the north of France. We must choose with discrimination, for here stone is the exception and brick the rule. The warm tones of the brick seem to have been created to brighten this rather dull climate. They add a spot of color to the hazy horizons of the North. The brick is almost always red. Sometimes it is relieved by notes of lighter brick.



FIG. 1. HOUSE AT ROUBAIX.

The series of houses given here call for few commentaries. They were all built at Lille or at Roubaix, large manufacturing towns, or in their immediate neighborhood, to serve as habitations for wealthy manufacturers. In their general form we can see that they belong to a septentrional country. They have conserved a certain



FIG. 2. HOUSE AT LILLE.



FIG. 3. HOUSE AT ROUBAIX.

reminiscence of the Flemish Renaissance in general taste and sumptuosity, even heaviness sometimes. The desire for comfort is evident, as is the love of the picturesque which is, perhaps, not always refined, but which, such as it is, has a certain originality. Towers are popular. Belfries and pinnacles, high dormer windows and the clear accentuation of the different parts of the house, divided and asymmetrical façades, great steep roofs and monumental chimneys, — all these elements, even if they have donned Renaissance garments, come from the middle ages.

Such are the different characteristics developed according to the different tastes of the architects, with more or less happy results. Sometimes the whole is decidedly too heavy, as in Fig. 1, and the forms of baroque septentrional architecture are evident. Sometimes, on the contrary, as in Figs. 2 and 3, the construction and decoration are remarkable in their sobriety. Some architects use only red brick, with angles and window frames of white



FIG. 4. HOUSE AT ROUBAIX.



FIG. 5. HOUSE AT LILLE.



FIG. 7. HOUSE AT LILLE.

stone. Others alternate stone and brick, and this system is pushed to its utmost in the house represented in Fig. 4. Enormous stones in bossages heighten the effect. Some houses are very broken up as for construction, and the love of the picturesque greatly exaggerated. Others, on the contrary, retain a certain amount of good taste in

the picturesque, and from this point of view the house in Fig. 5 is certainly one of the best in comfort and harmony. There are town houses rich and correct but of little interest (Fig. 6). There is also a collection of most picturesque country houses where white stone plays an important part at the angles, frames and in the bossages,

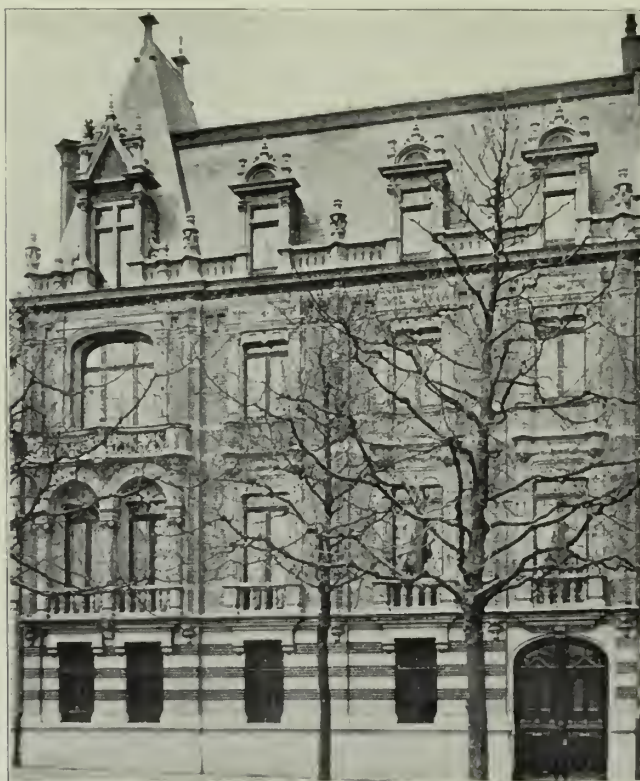


FIG. 6. HOUSE AT ROUBAIX.



FIG. 8. HOUSE AT LILLE.



FIG. 9. HOUSE AT LILLE.

and which are characteristic because of the presence of little towers (Figs. 7, 8, 9 and 10), some mere ornaments (Figs. 7 and 10) and others, on the contrary, more



FIG. 10. HOUSE AT LILLE.

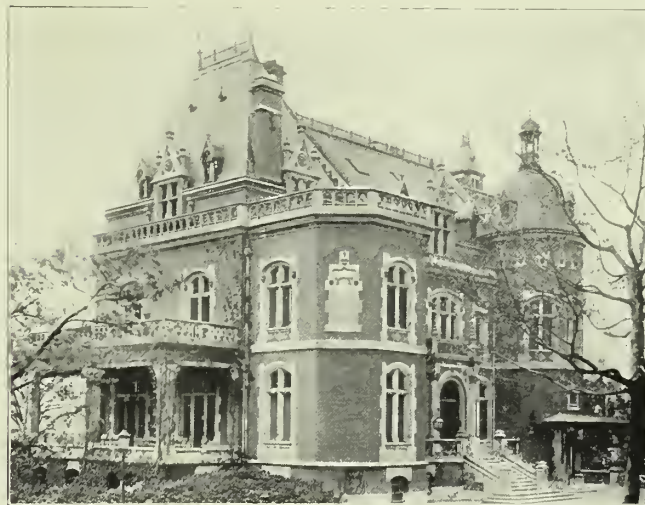
important, and permitting the construction of a *loggia* (Figs. 8 and 9).

Such is the richness and diversity of brickbuilding in the north of France.

If a conclusion were necessary to these brief notes, we might say that, on the whole, brick, which was considerably employed in France during the Renaissance, is also very popular nowadays.

If all the buildings that have been made of it have not been successful, we must remember that the architects are to blame and not the material. We have been overrun with a quantity of little houses, copies of the Renaissance and the Louis XII styles, cheap, vulgar and unintelligent imitations.

On the other hand, a few architects have shown that they appreciated the immense resources of gay and polychrome brick. They treated brick as it should be treated; they made themselves not only brick decorators but brick constructors. These few will form an independent school. They are in the right, and the right, in spite of all, triumphs in the end.



HOUSE AT MOUREAUX.

The Greek pavilion of Mr. Magne, Train's Chaptal College, the house on the place St. Sulpice, the Boucicaut Hospital by Legros and, above all, the Lakanal Lyceum of Mr. De Baudot will offer fruitful study to all those who have the development of rational brick architecture at heart.

We should write of enameled bricks, but that is beyond the limits of our subject. A word has been said about a façade of Mr. Train. A new career opens before polychrome brick since the recent experiments made in Paris with bricks baked at a very high temperature.

These bricks offer qualities of remarkable solidity and impermeability, and whose colors, forming part of the material, penetrate it and cannot crack or fall off. They promise a new domain of unlimited richness to terra-cotta building.

But these experiments are of too great importance to be treated in a few lines. We shall return to them more at leisure for the benefit of the readers of THE BRICKBUILDER.

[END OF SERIES.]

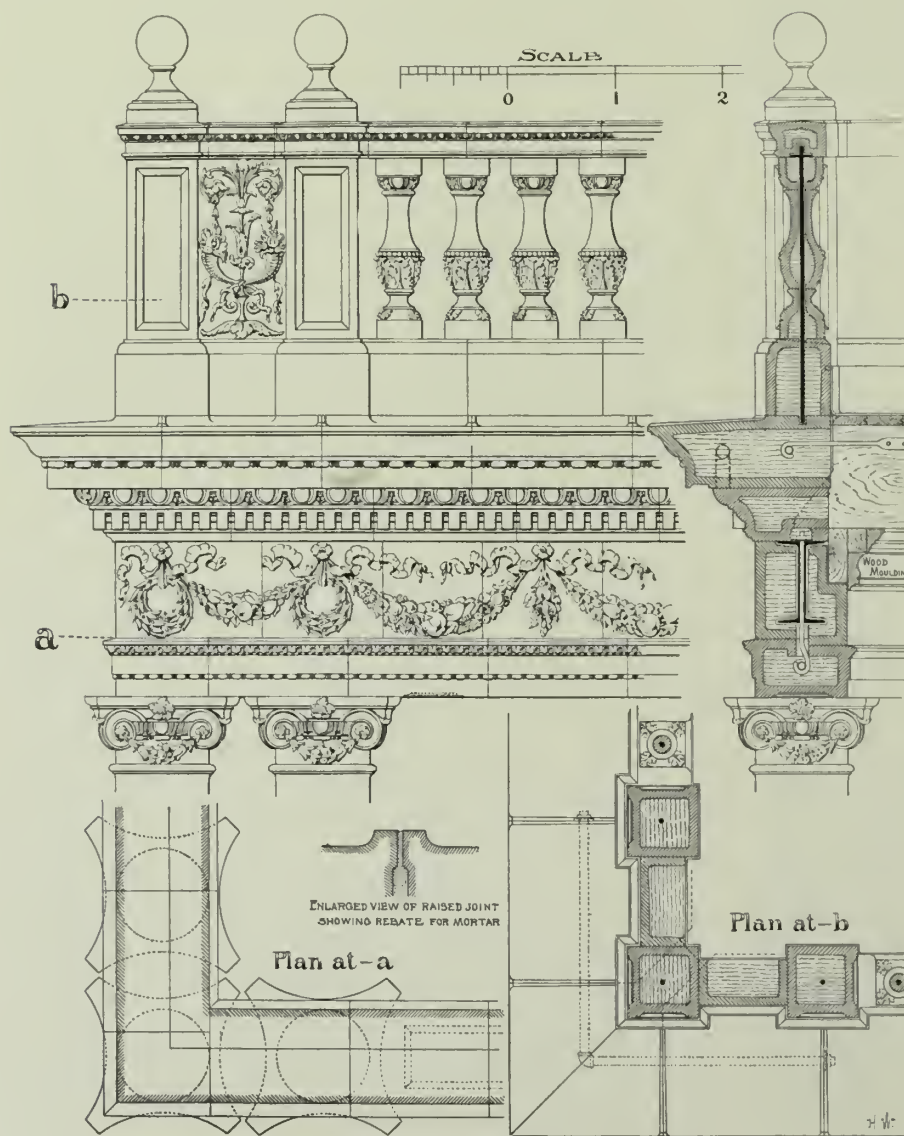
Terra-Cotta and Steel.

BY THOMAS CUSACK.

EXAMPLES of terra-cotta and steel construction have appeared in past issues of *THE BRICKBUILDER*, through which medium they came within reach of a much wider circle than that wherein they had originated. The extent to which the data thus formulated have been used in the execution of later work of like character shows that these suggestions were found serviceable by those to whom they were primarily addressed. It proves, if it proves anything, that better methods had not been discovered—in itself an adequate if not wholly conclusive indorsement. We are therefore inclined to the opinion that further and more recent examples of composite construction will receive equally favorable attention from architects, engineers and others directly interested. Terra-cotta manufacturers who desire to keep themselves posted on what is being done by their competitors will find much advantage in a free interchange of ideas at every forward step in current practice. They, no less than the pro-



PORTICO, VETERINARY COLLEGE, CORNELL UNIVERSITY.
C. F. Osborne, Architect.



DETAILS OF PORTICO, CORNELL.

gressive, liberal-minded men in other walks of life, are beginning to see a "community of interest" in contributions that, once made, become common property.

Answering the inquiries of a well-known architect a few days ago as to the advisability of a terra-cotta portico, we were able to offer him the accompanying scheme of construction, with some advice based on experience gained in connection with many similar problems. This proposal has since been adopted substantially as presented, and the result will, we believe, amply justify all that has been promised, if it does not satisfy the more sanguine expectations entertained concerning it.

The proposed portico has some points of resemblance to a porticochère erected a few years ago at the Veterinary College, Cornell University, which we likewise deem worthy of illustration, if only by way of comparison. In the latter case the clear span of widest opening is 12 feet, the weight over which is carried by two 9-inch channels bolted together on 1-inch separators. In the blocks forming soffit provision is made for a $\frac{3}{4}$ -inch rod, from which they are suspended by $\frac{3}{4}$ -inch hangers. Said hangers, passing up through slot between channels, are adjusted to required tension by nut and washer. The frieze is molded to fit snugly between flanges of channels, to which principal support the blocks are attached in such way

that the weight is transmitted to the channels rather than allowed to rest on the soffit suspended from them. The other members of cornice and balustrade, therefore, rest directly on the girder, as do the deck-beams to which the whole entablature is anchored.

A $\frac{1}{2}$ -inch rod goes through each of the balusters, and through a $2\frac{3}{4} \times \frac{3}{8}$ plate, for which a rebate is made in bottom bed of capping to balustrade. As the lower surface of this plate is exposed between the balusters, it should always be galvanized to prevent rust and then painted to match the terra-cotta before setting. A balustrade so constructed, when properly set in cement mortar, becomes quite rigid, and its permanent security can be relied upon irrespective of climatic conditions.

The corner blocks of cornice, having a projection on two sides with corresponding reduction of bond, call for some additional support. This is furnished in the manner indicated by dotted lines at *b*. Two pieces of 1-inch pipe are screwed into an ordinary elbow, after which a nut with washer is tightened on the outer ends. In this way the angle is securely bolted to the two adjoining blocks before any of the other members of that course are set in position. The cement entering the rebated ends of these blocks and held there under pressure of the bolt cannot escape. When it sets, the three blocks become for all practical purposes a monolith. To make a block of such size in the first instance, while not impossible, would be inadvisable, if for no other reason because of the difficulty in handling and the liability to injury in transit.

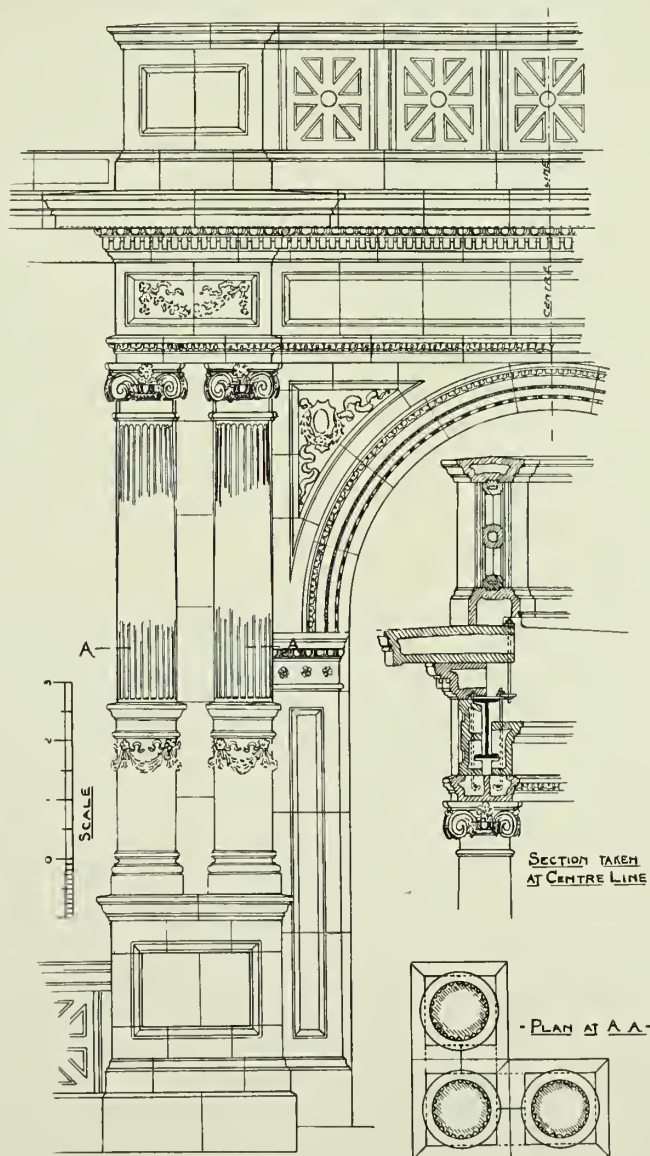
A photograph of this work taken a few years after its erection shows that the most noticeable defects are due to a want of care or skill in the setting. The horizontal lines are not as true as they might have been, an irregularity not inherent in the individual pieces, but due to a want of accurate adjustment. The vertical joints are unnecessarily large, the mortar has not been made to match the terra-cotta in point of color, which latter oversight accounts for the streaks and mortar stains that give cause for adverse criticism on an otherwise passable piece of work. The disadvantage under which eastern manufacturers suffer in the matter

of setting is not shared by our friends in Chicago. The latter prefer setting their own work, and architects who favor the use of terra-cotta do much to encourage the practice. Some indeed insist upon it as a condition of the contract. There is doubtless much to be said on both sides; but we incline, in this as in some other things, to the western example. We have seen work handled with as much care and set with as much skill by a general contractor as could have been bestowed upon it by the most conscientious manufacturer; but we are obliged to

admit that such instances are the more conspicuous because of their comparative rarity. Of course in New York and other cities where terra-cotta architecture is now the general rule an increasing number of bricklayers are gaining experience, and contractors who give themselves the trouble to think have a wider circle from which to select the best men. The men themselves who have acquired an aptitude in that line of work are beginning to attract favorable notice, and will in time gravitate towards the point for which nature or accident has prepared them. Some of the "front men" are now developing into sub-contractors, with terra-cotta setting as a special and presumably lucrative employment. Whether as a coincident or a case of water finding its level, this evolution is on parallel lines with a similar one in England, where terra-cotta setting became a specialized branch of bricklaying some years ago. When history so repeats itself it is usually owing to the force of similar circumstances.

So simple a matter as the constituents and method of mixing mortar for pointing gray (limestone) terra-cotta has been known to exercise the minds of certain builders to an unreasonable degree.

We could speak of several, professional and otherwise, who have come to grief in an unsuccessful attempt to master its apparently insoluble mysteries. One such, with wit enough to grow rich in Wall Street, abandoned all hope and employed a painter to "touch up the joints." The painter was probably an expansionist, for by the time he got through, joints that did not exceed $\frac{1}{4}$ inch when he started appeared at least $\frac{5}{8}$ from the sidewalk. The climax was reached in a vain effort to remove the paint



DETAILS OF PORTICO, BAPTIST HOUSE, BROOKLYN,
W. E. Parfitt, Architect.



RENSSELAER HOUSES, ALBANY, N. Y.
Marcus T. Reynolds, Architect.

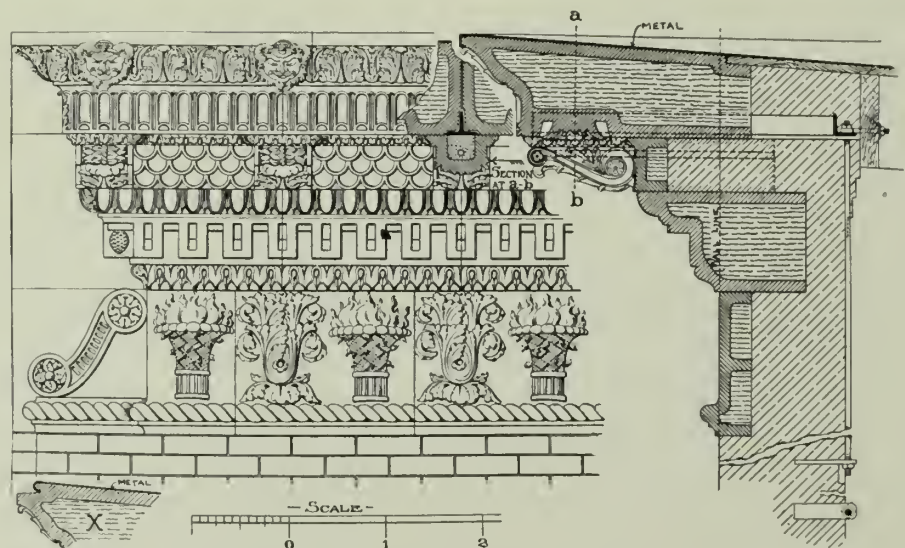
that had been smeared on the ends of the terra-cotta, and so an elaborate block of buildings carries these discreditable scars as a permanent eyesore.

Two inquiries from widely different quarters reached the writer a short time ago on the same day, touching this question of mortar. One asked how to prepare mortar to match the terra-cotta; the other, not less frankly, though with a shade less modesty, requested that mortar be sent, also a man to do the pointing. In answer we advised both of them to employ an intelligent bricklayer and tell him that a neat, workmanlike job was expected and desired. He would do the rest. Failing such a man, then an experienced stone-setter and, the color being gray, preferably one accustomed to limestone. The inquiries were not repeated, from which it may be inferred that the advice proved salutary. With so many brands of cement of different shades, sand from silver to dark brown, and lime putty for those who prefer using it, there should be no difficulty in preparing mortar to any desired color, toughness and plasticity. In the case of red and black, metallic stains of undoubted permanency can be obtained from reputable dealers.

The propriety of using wood for either deck or ceiling is open to question; and on that item at least we think

our later example, given in a portico for the Baptist Home, Brooklyn, is an improvement. Constructed in the manner shown, the roof is fire-proof and can be made permanently water-tight by cement or asphalt graded so as to shed water to leader or other outlet. The ceiling, too, can be finished in cement, plain or paneled as choice of circumstances may dictate. Tin roofs are liable to leak, and when they do, ceilings, whether wood or plaster, call for the immediate attention of a painter after the leaks have been disposed of. In less than five years the more durable method of construction will likewise be found the less expensive and in other respects greatly preferable.

The proposed portico is in its way an example of terra-cotta construction *per se*. Granting the use of steel as an auxiliary support, there is no compromise or qualification in the preference given to burned clay. The base, dies, columns and capitals are in this case terra-cotta. There is but one joint in each column, and it, being at the band, is practically invisible. The panels in balustrade are made in solid pieces rebated into the dies and capping in such way that sufficient rigidity is secured without any iron. Instead of two channels we use a 12-inch I beam with a hanger on each side and a 3 x 3/8 inch plate on top. There are four hangers to each block, in consideration of the extra weight of roof, a portion of which is carried by the soffit. Finally, the rain water falling on projection of cornice does not drip down on passers by or those entering the building, but flows back towards the roof through openings in base of balustrade.



CORNICE ON RENSSELAER HOUSES, ALBANY, N. Y.

This last-mentioned precaution is very desirable in the case of an entrance, whatever may be thought of its application to the main cornice of a high building. When the cornice is surmounted by a parapet or balustrade it is rather difficult to make connection between the outer edge of cornice and the metal roof that will remain free from leaks for more than a year or two. When such a task is attempted, as in an important building with which we are acquainted, the metal roofing is usually cemented into a raggle in top bed of cornice. The base of

balustrade, in which sufficient openings have been] provided, is then built directly on the metal. The base around dies can of course be flashed separately and so rendered water-tight. Should leaks occur at these points the necessary repairs can be made without disturbing any of the masonry. Not so, however, in long stretches of balustrade under which the expansion and contraction of metal roofing cannot well be provided for except in the imagination of those who have not tried the experiment.

We doubt whether it is really practicable to construct a roof of this kind that will stand the extremes of temperature and remain water-tight for a great length of time. And if it fails to stand that test in the first instance, what may be expected after cracks have been patched and seams resoldered? One such experience is enough to deter most architects from repeating the same experiment. This will perhaps go far to account for the fact that other methods are almost invariably preferred and the one under notice, though sometimes proposed, rarely adopted. The usual method is to make the wash slope outward from face of parapet, allowing such rain water as actually falls on projection of cornice to flow over the nose. Falling from a height of say four to upwards of twenty stories, it gets dispersed, and the addition so made to the ordinary rainfall is inappreciable by the time it reaches the sidewalk.

Where no parapet wall or balustrade has been contemplated, as in the Rensselaer houses, the cornice should, of course, be made to shed water towards the roof. In that case the metal was turned down over the nose of cornice, as indicated in section *a b*. Sometimes a vertical groove is made a short distance back from the outer edge, into which the metal is fastened. That, however, tends to weaken the member, and renders the projection liable to get broken off. A better plan is shown at X, in which a roll is provided a little back from the nose. This affords a convenient hold for the metal, also a protection to that salient angle while swing scaffolds are being suspended from the roof. In other respects the construction of this cornice is simple, safe and comparatively inexpensive. The design, which bears evidence of much thought and artistic appreciation on the part of the architect, is well in keeping with all the other features of an uncommonly handsome group of residences.

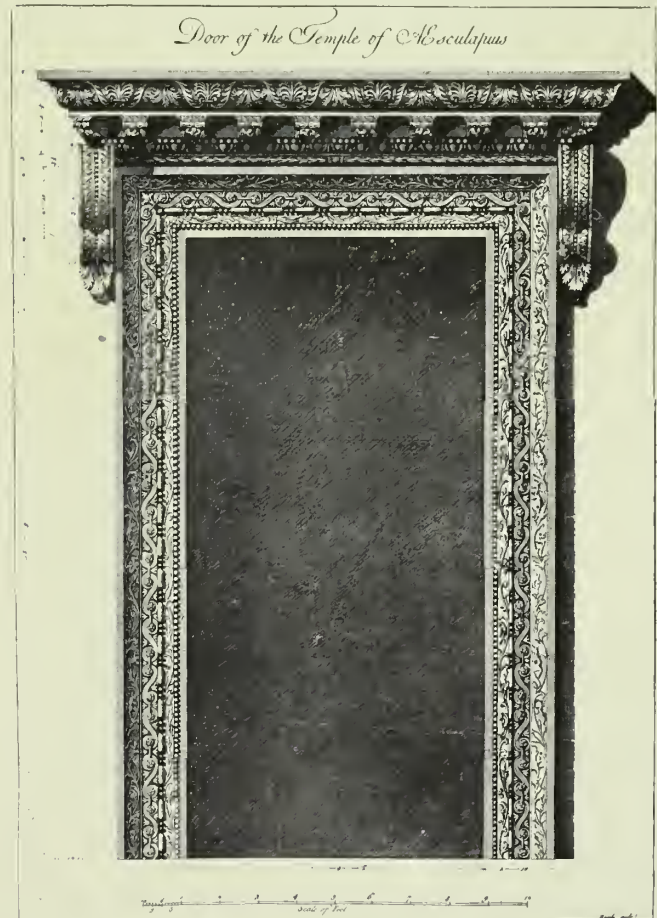
THE use of carbonate of soda to facilitate the laying of masonry in cold weather is now becoming fairly general on the continent, and is also said to be making some headway in the American building world. Experiments were made with this system as long ago as 1890, and mortar treated with soda was employed in laying stone with the temperature as low as fourteen degrees Fahr., and the masonry was found when inspected some time later to be in all respects in a first-class condition. The method employed is very simple, and consists practically in using lukewarm water, in which carbonate of soda has been dissolved, in the making of the mortar. The proportions employed in the solution are two pounds anhydrous carbonate of soda to two and a half gallons of water, but with intense cold the amount of water is generally reduced to one half. — *Exchange*.

"The Brickbuilder" Competition. VIII.*

GIVEN BY THE GRUEBY FAIENCE COMPANY.
CRITICISM AND AWARD.

BY C. HOWARD WALKER.

THE designs presented in the competition for a theater entrance of faience are few in number and are not of a very meritorious character. As a preliminary to a criticism of these designs, the consideration of the



AN EXAMPLE OF THE POSSIBILITIES OF THE ADAPTATION
OF SCULPTURED ORNAMENT, WELL FITTED FOR
TRANSLATION INTO FAIENCE.

*PROGRAMME.

The design is to be of the ticket windows in the vestibule of a theater and the immediate treatment about these windows.

There are to be three windows at a height of about four feet above the floor, and they need not be of equal size. The intention is to obtain a design which, while a decorative motive in character with the surroundings, is complete in itself. All glass used shall be plain, undecorated glass—no stained glass. Grilles to be simple in character, if used. The treatment of the adjacent wall and its relation to the windows is to be indicated. The design is to be such as is adapted to the working out in faience.

DRAWINGS REQUIRED: An elevation drawn to the scale of $\frac{1}{2}$ inch to the foot, with plan at left and section at right side, near the bottom of the sheet. The drawings to be in black ink with no wash work, on one sheet measuring 22 inches wide by 15 inches high. Shadows, if indicated, to be done in free-hand, parallel perpendicular lines.

For the four designs placed first, the Grueby Faience Company offers prizes of fifty, twenty-five, fifteen and ten dollars, respectively. All premiated drawings are to become the property of the Grueby Company, and the right is reserved to publish any and all drawings submitted.

The competition will be judged by Mr. C. Howard Walker.

individual decorative value of faience as a material is suggested. Its effectiveness is as much due to its color as to its modeling. It occupies a position midway between flat color decoration and sculptured ornament and partakes of both, yet is different from either. It is natural then that it should not be made in absolutely flat planes on the one hand, nor should it merely imitate sculptured work on the other. Its best effects are gained by low relief patterns contrasted with plane surfaces of limited superficial area. It is also a wall or floor covering more than it is a major factor of construction, and would therefore be treated somewhat as a mosaic of large scale. It is of oriental origin, developed as a material to clothe

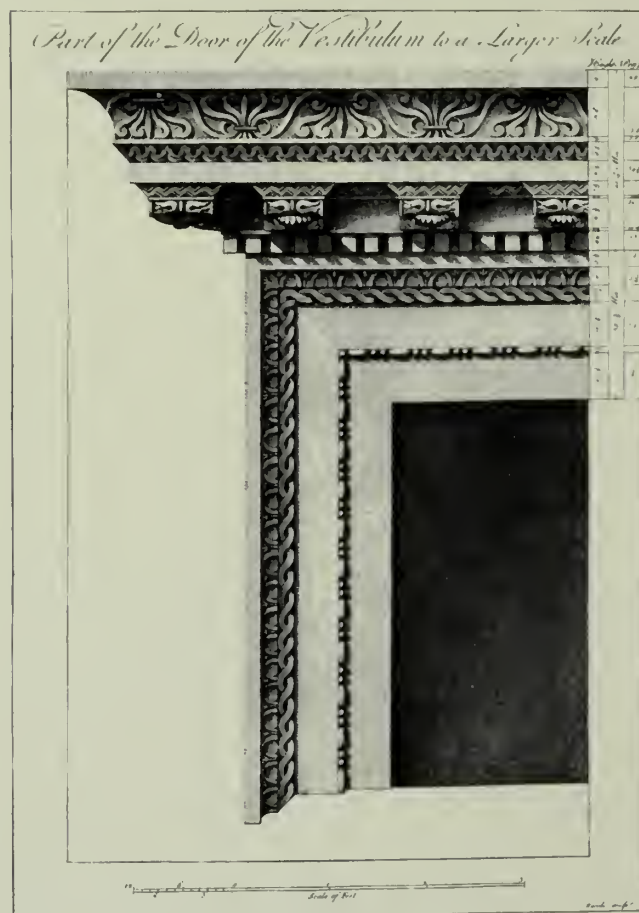
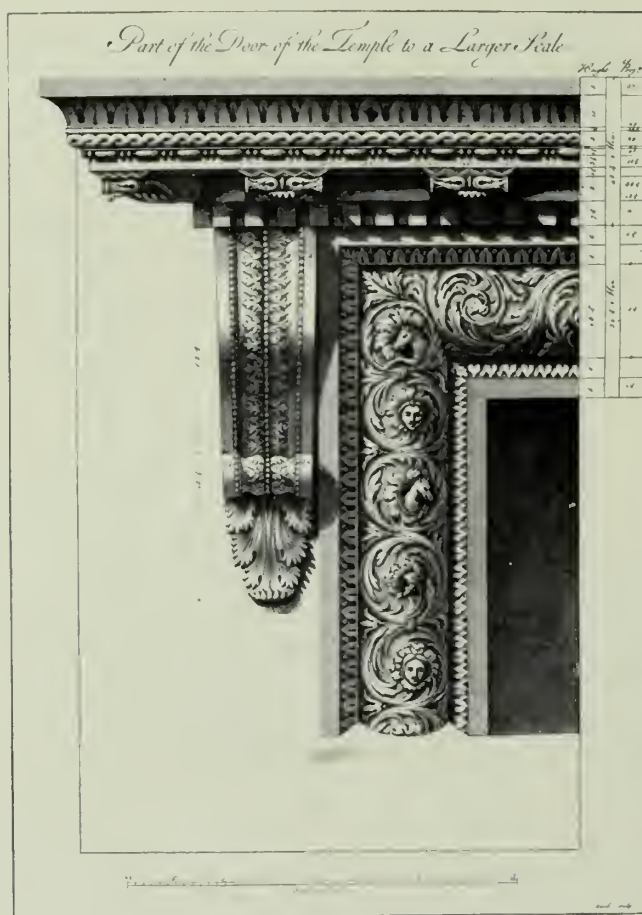
shaped tympanum filled with characterless ornament; design fairly well fitted for faience.

Italiano. Well proportioned from shelf upward; corbeling below shelf complicated and difficult of treatment in faience; design dependent upon modeling picked out with color only.

Rats. According to plan and section, proportions seem heavy for the requirements, especially in the projection of the metal canopy.

REMAINING DESIGNS.

Bow and Arrow. Design has the scale of wood columns and moldings, and would be less effective in terra-



EXAMPLES OF THE POSSIBILITIES OF THE ADAPTATION OF SCULPTURED ORNAMENT.
WELL FITTED FOR TRANSLATION INTO FAIENCE.

surfaces of meaner substances, and by the nature of its manufacture must be made up of pieces not too large to be readily fired. For these reasons the designs have been placed in the following order:

- 1st. Beni Al Hassan.
- 2nd. Eagle.
- 3rd. Italiano.
- 4th. Rats.

Beni Al Hassan. Plan and composition simple; design well fitted for faience; contrast of plain and ornamented surfaces good; parapet pattern at base seems in wrong place; design dependent largely on color.

Eagle. General proportions good; composition of one arch above another unfortunate, leaving awkwardly

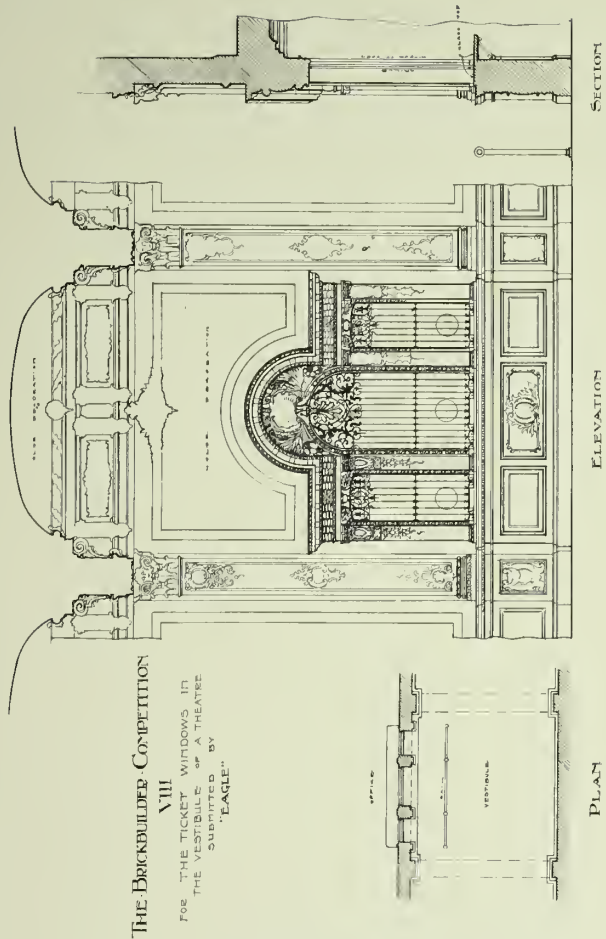
cotta than in wood, because of irregularity of surfaces. It might be made of fine china clay — kaolin.

Western. Badly proportioned; intercolumniation of pilasters too great; entablatures too heavy.

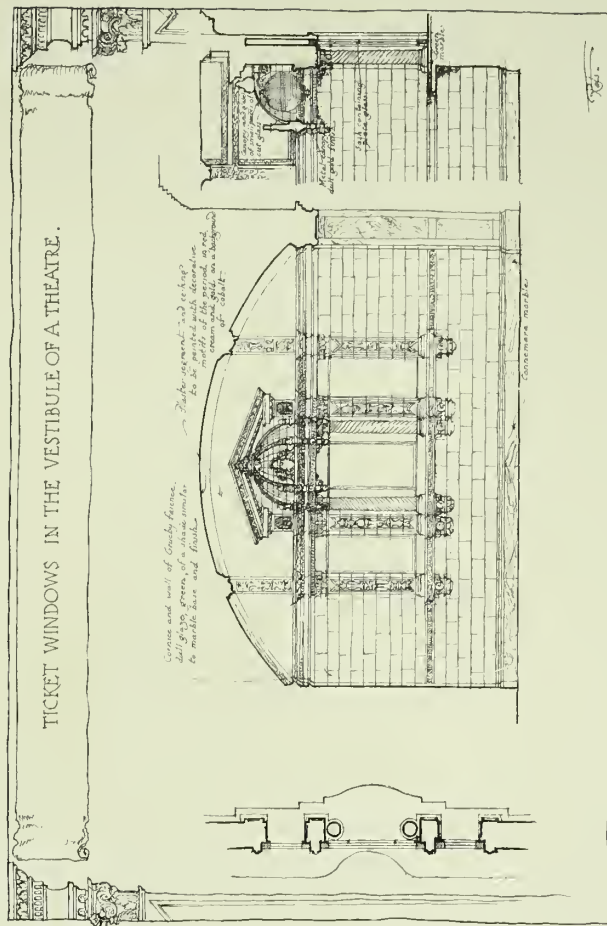
Ticket Seller. Has better proportions; is thin in ornament.

Dot in Circle. Has no distinguishing merit.

In most cases the modeled ornament has been made too fine or too scattered. As an example of the possibilities of the adaptation of sculptured ornament and faience, several plates of the decoration of doorways, etc., in Diocletian's palace at Spalatro are given, which, while in stone, are well fitted for translation into faience.



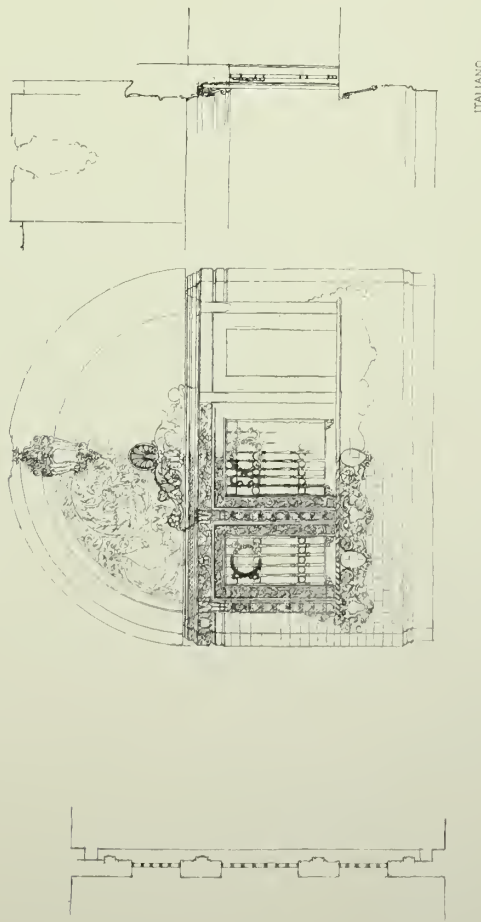
SECOND PRIZE DESIGN.
C. A. Mitchell, Montreal, Can.



FOURTH PRIZE DESIGN.
Francis S. Swales, Detroit, Mich.



FIRST PRIZE DESIGN.
Hugo H. Zimmermann, Chicago, Ill.



THIRD PRIZE DESIGN.
Francis S. Swales, Detroit, Mich.

The Recent Fire in Philadelphia.

BY WILLIAM COPELAND FURBER, M. AM. SOC. C. E.

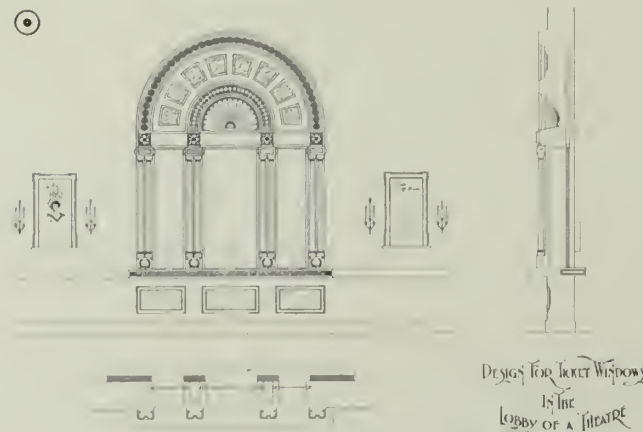
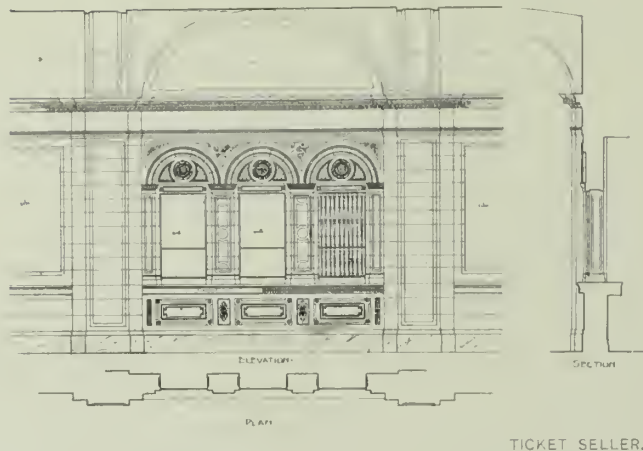
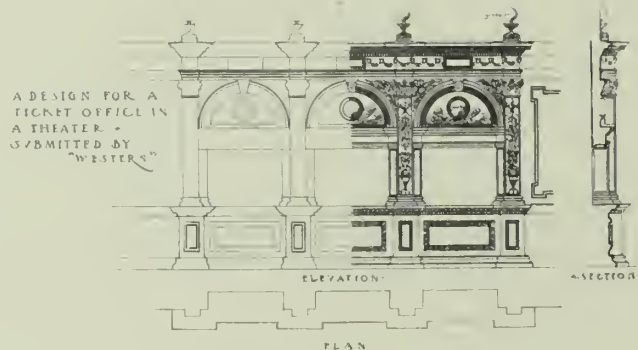
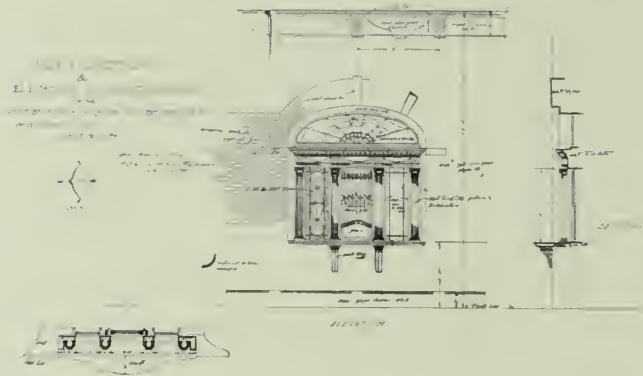
IN years to come, when the knowledge of better ways of doing things makes the old ways seem absurd, our successors will doubtless look back on the loss of life and needless destruction of property by fire, so frequent in this generation, with the same condescension and contempt for our ignorance as we of to-day look back upon the needless loss of life in the past from plagues and "visitations of Providence," assumed then to be entirely beyond the control of man.

"Fire is a good servant but a poor master," and it is a serious reflection on the common sense and ordinary prudence of business men and upon the wisdom of our legislative bodies that such restrictions are not placed upon the destructive possibilities of fires that a catastrophe like that of Friday, October 25, in Philadelphia, would be impossible.

If a house is found in an unsanitary condition and likely to spread infection, it is immediately disinfected or quarantined by the board of health. We have elaborate laws governing the arrangement and disposition of lavatory and plumbing fixtures in buildings, yet there are hundreds of buildings in every city which are more of a menace to life and property than the most unsanitary drainage systems. Imperfect drainage usually makes itself apparent to the senses of sight and smell, and ample warning is given to those who value their health, but the "fire trap" carries on its face no advertisement of its possibilities for destruction, and on the day of reckoning innocent lives are sacrificed and valuable neighboring property destroyed because the owner of a building chose to construct a combustible building in order that he might save a little money on the first cost.

Railroads, steamboats and other public carriers are properly held liable for the safety of life and property intrusted to their care, as well as for the safety of the lives and property of others which may be jeopardized by them in exercising their functions. This is but simple justice, the courts holding that any loss or damage which could have been prevented by the exercise of due diligence or care or better methods should be made good. The laws of this country place few restrictions upon the internal operations of railroads, holding the company liable for the results only. This permits the responsibility to be accurately placed, without the possibility of evasion.

The tendency of this argument is this: The construction and *existence* of "fire traps" is made possible only by our building laws, and by means of these building laws the responsibility of bad construction is placed not on the individuals or corporations who are directly responsible for it, but upon the community. There are two evident remedies for this state of affairs: first, a change in the liability laws so that the owner of a building in which a fire originates could be made liable for any loss of life or damage to property, — Paris, I believe, has such a law, — or, second, a total revision of the building laws which would absolutely prohibit the construction of combustible buildings in the important business centers or in other places where numbers of people were to be employed, and which would also compel the fire-proof reconstruction of old buildings in centers



DESIGNS SUBMITTED IN THE GRUEBY FAIENCE COMPANY
COMPETITION, FOR A TICKET WINDOW IN THE
VESTIBULE OF A THEATER.

which have become important or permit their condemnation. A steam boiler which has become unsafe is condemned without hesitation, and the same principle can be applied to buildings. A pesthouse would soon be condemned and torn down in response to enraged public sentiment, yet dangerous "fire traps" are allowed to menace the safety of whole blocks and possibly hundreds of lives and not a word of protest is made.

The fire departments of the cities of the United States are acknowledged to be the superiors in point of efficiency of those of Europe, and hereby hangs a tale. If this were not so, under our present methods of combustible construction it would not be possible for us to maintain cities. In Europe, where wood is comparatively high priced, substantial design and permanent construction is possible and destruction by fire is uncommon. Consequently the maintenance of expensive fire departments is not necessary, as the fire department is not the alternative between possession and total loss of property as it often is in this country.

Few people seem to realize that they are taxed in order that certain people owning ground in the business centers of cities may erect and maintain combustible buildings; but if this fact was appreciated it would not be long before an imperative demand would be made for laws which would prohibit the construction or existence of this class of buildings. A large part of the great sums now raised by general taxation to keep an army of firemen waiting, and to maintain costly equipment ready for instant use, could be saved if the necessity for the services of the fire department was not so great, and this burden

could then be removed from the shoulders of the people. No one has a moral right to save himself at the expense of the community and his neighbors and entail upon them additional taxation in order that they may insure themselves against the damage which may result to their property from his selfishness or shortsightedness.

If the amount of money wasted every year in the United States (over \$130,000,000) could be used to erect better buildings, it would not be long before a marked

improvement took place in our constructive architecture; and then part of the money now spent on fire department protection could be either saved to the people or devoted to some permanently useful purpose, and then destruction of life and property by fire would become a rarity.

The horrible destruction of life which accompanied the fire at 1219-21 Market Street, Philadelphia, and the destruction of those adjacent buildings to the west of it by the falling of the walls should point a moral to the folly of municipalities permitting combustible buildings to occupy space in parts of the city given over to business pursuits.

This building

was of the ordinary party-wall type, with a front of 35 feet on Market Street and the same width in the rear, and 180 feet in length between the two streets. It was eight stories in height—the last story having been but recently added—and not wholly completed. The whole building was occupied by one firm as a furniture and upholstery salesroom, warehouse and manufactory. The fire is supposed to have originated in the basement, where benzine and varnish were used, and instantly shot up the elevator shaft, spreading the fire and smoke so rapidly that in



RESULTS OF FIRE AT PHILADELPHIA, PA. (OCT. 25, 1901).

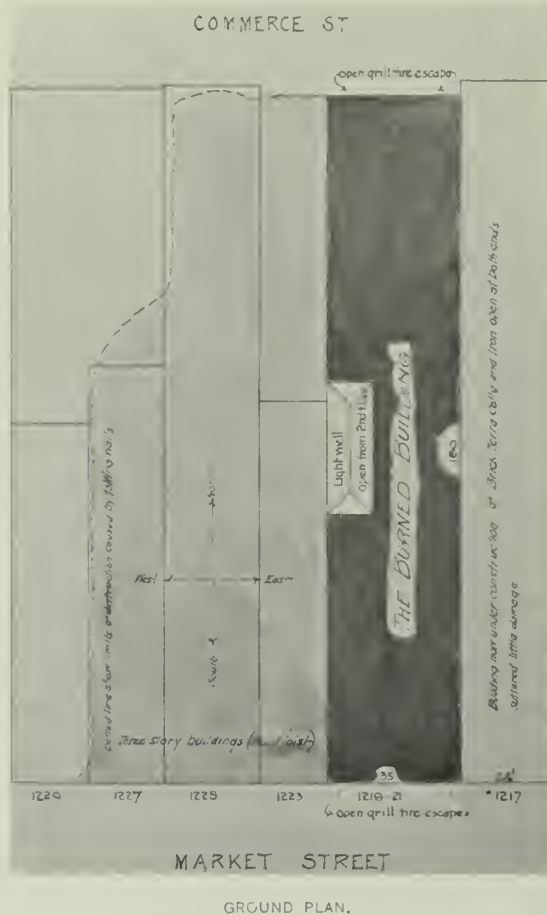
a few minutes the interior of the building where furniture, curtains, bedding, etc., were stored, was a seething mass of flames. The building was provided on the front and rear with ordinary open grille fire escapes, upon which some of the occupants were broiled alive by the flames beneath them. The rapid spreading of the flames and the dense volumes of smoke which accompanied the fire made it impossible for much to be done to aid the victims, notwithstanding the self-sacrifice and bravery of the firemen. Some of the occupants jumped from the upper stories and were dismembered on the awning fixtures or crushed by striking the pavement; others jumped into nets held out by

building No. 1217 on the other side of it. The exposed side of this party wall suffered considerably by the streams of water which were thrown on it while the bricks were hot, which caused the surface to "shell" out. Part of this party wall was originally the 9-inch walls of a dwelling which formerly occupied the ground of No. 1217, and had it failed it would have occasioned no great surprise because of its composite character, but it was undoubtedly steadied through the iron joist by the east walls of No. 1217.

The building No. 1217 Market Street, which prevented the spreading of the fire to the east, was under construction, as shown in the photograph. The floors were of hard-burned hollow terra-cotta, flat arches in the lower stories and segment arches in the upper stories resting on 15-inch I beams at 5 feet 3 inches centers with a span of 22 feet. The front of the building was entirely open between the floors, as shown, and the blackening touch of the flames can be seen on the brickwork and terra-cotta, which was of a light color. In the rear of the building the wooden window frames were reduced to charcoal, but the total damage to the building, exclusive of the damage to the exposed party wall, was estimated not to exceed \$2,000, part of which was caused by the collapse of a tank house on the roof of the adjoining building. Thus the non-combustible building stood the test and saved the day, for had this building been of the ordinary wood joist construction it certainly would have succumbed and added its quota to the fuel, and a great conflagration would have followed. The heat of the fire was so great that buildings on the south side of Market Street took fire, and plate-glass fronts and windows were cracked. The flying embers ignited the roofs of these buildings, and had it not been for the well-trained fire brigades of the large stores on the south side of the street these buildings would have suffered serious damage and possible destruction, and possibly a general conflagration would have ensued.

Another source of weakness in the design of the burned building was a light well opening in the west party wall, shown in the plan. This light well soon became a flue and contributed to the rapid spread of the flames. The light well also, by separating the party wall into two parts, weakened it structurally, and when the windows and woodwork of the light well burned out left both ends adjacent to the light well without any side support. A triangular piece of the party wall south of the light well soon after fell into the burning building, and soon after the remainder of the wall, down to the roofs of the adjoining buildings, fell outward and crushed in the roofs and floors of the low buildings on the west. The fall of this wall, by depriving the flames of the benefit of the great height in aiding combustion, and by destroying the combustible buildings to the west, made it possible for the fire department to gain control of the fire.

The pathetic and horrible death of twenty-two people, the loss of the property in which the fire originated, the destruction of the adjoining property, all give a warning which should not be disregarded. Life and property are not safe in buildings with wood floor construction. The building No. 1217 adjoining the fire, open at both ends, shows that iron and brick and terra-cotta are safe. The moral is obvious.



FIRE AT PHILADELPHIA, PA. (OCT. 25, 1901).

brave firemen; others still, afraid to attempt the flight through the air, remained on the window sills and grilles and were broiled alive and carried down with the walls when they fell and were crushed under tons of brick and mortar. The building was completely wrecked within an hour after the fire began. The falling of the west party wall, which crushed in the three properties on the west, prevented the spread of the fire in that direction, and the brick and iron building on the east stood as a bulwark against the sea of flame surging eastward.

The bricks on the east party wall of the burned building evidently felt as if by some mischance they had gotten back into the kiln again. The wall, however, was kept in its place by the iron joist construction of the

THE CHEMICAL AND PHYSICAL PROPERTIES
OF PORTLAND CEMENT.

BY B. BRETNALL LATHBURY, C. E.

THE important ingredients of Portland cement, lime, silica and alumina, can properly be divided into two classes, basic and acid. The lime, which furnishes about 65 per cent by weight of the finished cement, constitutes the basic part, while the silica and alumina represent the acid part. The combination of these three elements under the influence of heat gives us the basic Portland cement clinker. The source of the basic element is some form of calcium carbonate occurring as limestone, chalk or marl; while that of the acid element is furnished by the clay or shale used in combination with the lime ingredient. In whatever form the calcium carbonate is used, it should be as nearly pure as possible except for the presence of clayey matter, for inasmuch as clay is necessary for the manufacture of Portland cement, a certain proportion is not harmful. Magnesia, although present to some slight extent in both limestone and clay, is not a desirable element, and in excess constitutes a serious objection.

The raw materials from which any Portland cement is manufactured are, generally speaking, reduced separately, and their relative hardness or toughness influences the cost of production rather than the quality. The physical properties of the materials have a direct bearing on the hardness of the clinker and the heat required to bring them to the point of incipient vitrification.

While it is true that a sound cement depends primarily on the correct chemical properties of the raw materials, yet in the finished cement physical tests are of greater importance than chemical in determining the commercial value of the brand. On the other hand the value of physical results depends largely on the methods employed and the skill and personal equation of the operator; while the relative importance of the different physical tests varies with the use to which the cement is to be put.

For general purposes the tensile tests, either neat or a mixture of sand and cement, are the most satisfactory. While the results of neat tensile tests will give fair indications of quality for periods less than seven days, tests with sand mixtures should cover at least seven days. American cement authorities favor a moderately high tensile strength in the seven-day tests with a uniform increase up to twelve or eighteen months for maximum strengths. Against this are the opinions of some manufacturers who advocate lower results at seven days with a uniform increase up to two, three or even four years in order to attain their maximum strength. While there is reason in the facts supporting each theory, the basis of contention is really the process employed in manufacture. With the rotary process, necessitating a high degree of heat, the lime content must be maintained at a higher percentage in the raw mixture in order to insure uniform and perfect burning than is the case with the many types of set kiln processes used in Europe; the results therefore show a greater strength for short periods of time.

The question of high and low results for tensile strength has been discussed for years, and while formerly the more serious objections to the rotary process

were based largely on high tests, they have been gradually removed as the satisfactory results of rotary cements became more apparent each year. From an engineer's standpoint, maximum strength in a short time is greatly to be desired, permitting heavy masonry or steel superstructures to be built on concrete foundations immediately after completion, thus avoiding delays in the progress of the work.

Besides the tensile strength, the next most important tests are those for time of setting, fineness of grinding and constancy of volume when immersed in water either hot or cold. The accelerated tests, while having no direct influence on the tensile strength, furnish sufficient data to render an opinion possible on the quality of any Portland cement in cases where an immediate decision is desirable.

While it is sometimes found necessary under certain conditions to use a moderately quick-setting cement, experience has shown that it is safer to substitute, if possible, one of slower set in case chemical analysis of the cement cannot be made. The rapidity of set in a cement is influenced entirely by chemical conditions, and while many causes of quick setting are harmless, others may have a deleterious influence after the cement has been used. Fine grinding of a cement, by increasing its sand-carrying capacity, is desirable under all conditions of use. Both the cold and hot water pat tests are useful adjuncts in determinations for quality, but while the results of the former are positive, the destructive influence of hot water on some sound cements should not cause their rejection. While immersion in hot water will rapidly detect either an excessive lime content or imperfect burning, both undesirable conditions, some recent experiments tend to show failures in hot water from moderately high but absolutely safe percentages of the alkalis.

The remaining physical tests—strength under compression and specific gravity—can be classed as the least important. Determinations for density, influenced so largely by thermic conditions and manner and method of manipulation, have slight value other than for purposes of scientific research.

Thus it will be seen that while the physical properties of Portland cement are better understood than the chemical action of the ingredients, recourse is had, one to the other, in pursuing investigations along either line and the results established are correlative. Microscopic investigation has also aided in determining both the chemical and physical properties of Portland cement.

Based on the foregoing physical properties, any high-grade Portland cement should conform to the following specified requirements when tested in a properly equipped laboratory under normal conditions.

TIME OF SETTING.		FINENESS.	
Initial set not less than 1 hour.		100 mesh sieve not more than 10 per cent residue.	
Final set not over 8 hours.		200 mesh sieve not more than 25 per cent residue.	
TENSILE STRENGTH IN POUNDS PER SQUARE INCH.			
NEAT.		3 PARTS SAND MORTAR TO 1 PART CEMENT.	
24 hours	250 lbs.	7 days	175 lbs.
7 days	550 "	28 "	250 "
28 "	650 "		

Selected Miscellany.

NOTES FROM NEW YORK.

Taking everything into consideration, there has been no time since the "hard times" of '93 when prospects were brighter or when we had a better right to feel sanguine.

The committee having in charge the preliminary arrangements for the building of the fifty-seven public libraries donated by Mr. Andrew Carnegie have begun



HOUSE AT BROOKLINE, MASS.
Winslow & Bigelow, Architects.

nobly and have made a most satisfactory and sensible arrangement by appointing Messrs. McKim, Mead & White, Babb, Cook & Willard and Carrere & Hastings as an advisory board to supervise the designing and erection of all the buildings.

Although this decision will undoubtedly disappoint many of our young architects who were eagerly looking forward to competitions galore, it is undoubtedly for the best interests of the community, and we feel sure that we will have a series of harmonious and scholarly buildings.

Construction work on the \$2,500,000 annex to the Mutual Life Insurance Company's building, which is in several respects a very remarkable and unusual structure, is now nearing completion. Remarkable engineer-



DETAIL BY FAVROT & LEVANDAIS, ARCHITECTS.
Northwestern Terra-Cotta Company, Makers.



DETAIL EXECUTED BY THE EXCELSIOR TERRA-COTTA COMPANY.

ing work has been done, with the result that the cellar floor is 55 feet below the sidewalk level and 35 feet below the line of standing water. The foundations rest on bed rock 100 feet below the surface of the ground. Above the sidewalk the annex is eight stories in height in Cedar Street, matching the older extension in that street, while it towers sixteen stories high in Liberty Street. The highest part of the building had to be underpinned, and is the highest building which has ever been so treated. The work was complicated also by the fact that the ground floor was filled with the safes and vaults of a safe deposit company, and a settlement of

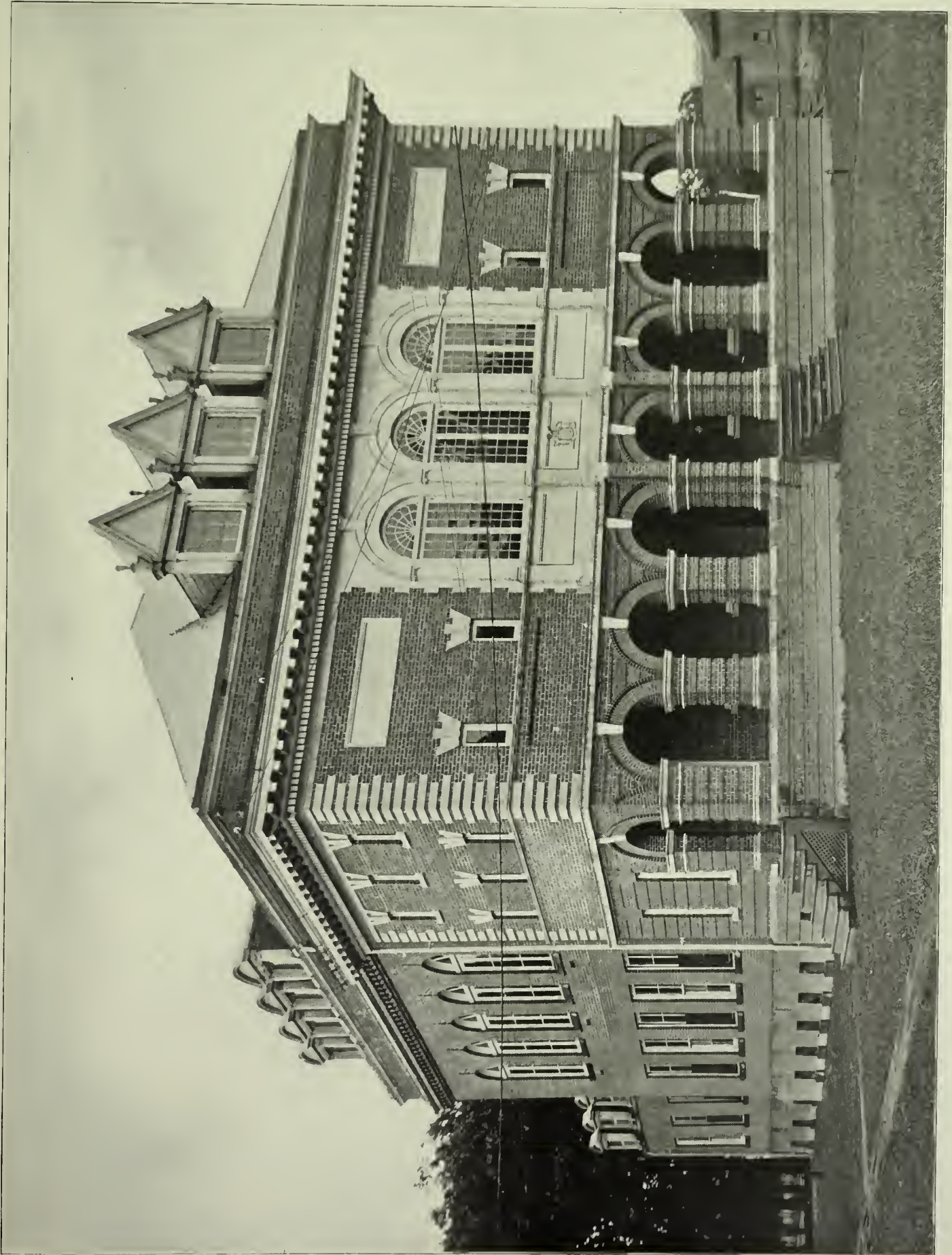


HOUSE AT CHICAGO, ILL.
Handy & Cady, Architects.

the sixteenth of an inch would have stopped the working of the locks.

Caissons formed of steel tubes three feet in diameter were sunk to support the adjoining buildings, and then work was begun on the foundations proper. A discovery that under the hardpan there was a formation of loose sand and crumbling rock in places 32 feet deep, forced the excavators to go to solid rock with all the main caissons, and this was 100 feet below the sidewalk level.

A complete enclosure of the lot was made by sinking



DINING-HALL, THOMAS ORPHAN ASYLUM FOR INDIAN CHILDREN, IROQUOIS, N. Y.
Barney & Chapman. Architects.



FLATS, CINCINNATI, OHIO.
Elzner & Anderson, Architects.

thirty steel caissons, each 8 feet in width and ranging from 15½ feet to 22 feet in length. When these were down to the rock a complete water-tight enclosure was made by ramming the spaces between the caissons full of red clay. The entire operation took many months and was watched with interest by many architects and engineers.

G. Kramer Thomson is drawing plans for a seven-teen-story addition to the building of the Manhattan Life Insurance Company to cost about five hundred thousand dollars. The design will be similar to the present building of the company.

Percy Griffin is drawing plans for two model tenements to be erected for the City and Suburban Homes Company at 78th and 79th streets near Avenue A.



HOUSE AT CHICAGO, ILL.
Hugh M. G. Garden, Architect.



RESIDENCE AT CINCINNATI, OHIO.
Elzner & Anderson, Architects.
Roofed with American S. Tile.

Hobart A. Walker has completed plans for twenty-seven, two and one half story brick houses to be built on Willoughby Avenue, Steuben Street and Emerson Place, Brooklyn, for the Morris Building Company. The fronts will be of red brick and Indiana limestone, and each alternate house will have a half-timbered gable. The total cost will be about one hundred thousand dollars.



DETAIL BY DARLING & PEARSON, ARCHITECTS.
Perth Amboy Terra-Cotta Company, Makers.

C. P. H. Gilbert is drawing plans for a fourteen-story bachelor apartment house to be erected on 52d Street near Fifth Avenue for Edward Holbrook, president of the Gorham Manufacturing Company.

CHAPEL, ROSE HILL CEMETERY.

THE chapel at Rose Hill Cemetery, Chicago, J. L. Silsbee, architect, illustrated in the plate form of this number, is an example of the very successful use of faience for interior finish. The tendency, we are glad to say, is towards a greater use of burnt clay for interior finish of all the better class of buildings, and of this material none lends itself more readily to plain, decorative or color treatment than faience. The work of the Grueby Company, which executed this commission, is done with a thorough understanding of the material, its application, its possibilities and its limitations.



HOUSES AT COVINGTON, KY.
Elsner & Anderson, Architects.

Correspondence.

HOW COMPETITIONS SOMETIMES WORK.

If any of your readers ever have occasion to try to induce possible clients not to hold a competition without a detailed and properly drawn out programme and a professional adviser, the argument may perhaps be impressed by the use of the following illustration:

the best one. After some little inspection they decided that the proper *modus operandi* was that of elimination, and forthwith proceeded to reject six or eight of those drawings which seemed to present the least satisfactory buildings. They then adjourned. Several weeks later they met again and the sifting process was continued until there remained two buildings, either of which was so eminently satisfactory that there seemed to be little choice. One of these was finally unanimously accepted,



ORNAMENTAL DISKS ON MAIN FRIEZE, THIRD CHURCH OF CHRIST, SCIENTIST.
American Terra-Cotta and Ceramic Company, Makers.
Hugh M. G. Garden, Architect.

A large company in the city of New York had decided to erect an office building, and in connection with the enterprise one of the first points to be decided was that of the selection of an architect. Several gentlemen on

when the startling fact was revealed that the winning design was the veritable "stone that the builders rejected," which became "the head of the corner," for it appeared that it had been one of the first "eliminated,"



PANEL BY C. B. J. SNYDER, ARCHITECT.
New York Architectural Terra-Cotta Company, Makers.

the building committee had friends in that profession who must certainly "have a chance"; then there were a number of others who applied; so all were given a few instructions as to what sort of a building was required, and told that they might submit sketches. Some twenty drawings of all kinds was the result. These were placed around the room and the committee proceeded to select



STOCK MANTEL NO. 18.
Made by the Hartford Faience Company.

but in some way had crept back amongst the eligibles without discovery. It has since materialized into one of the successful New York skyscrapers.

WILLIAM O. LUDLOW.

A CHURCH BUILT OF ENAMEL BRICK.

THE New Third Church of Christ, Scientist, Hugh M. G. Garden, architect, illustrated in the plate form of this number, is built of a beautiful velvet-finished enameled brick, made by the Tiffany Enameled Brick Company. Mr. Tiffany, the president of the company, has long contended that the use of enameled brick for exteriors is desirable, especially in many of the western cities, for many reasons, among them, and one of the principal, being that a building so built is better able to withstand the smoke and dirt nuisance and so preserve its original beauty. Another good reason is that



SOMETHING NEW IN ADVERTISING.

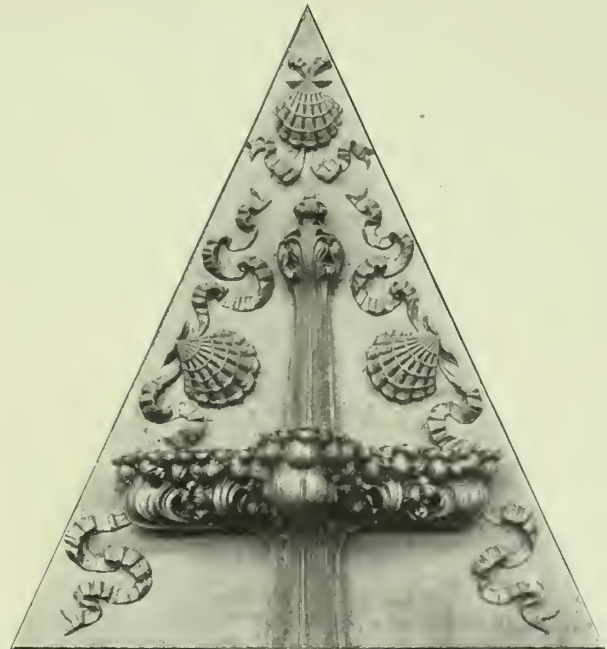
rich effects may be obtained in the body of a building by the use of soft tints under a semi-glaze. Certainly the results obtained in this building have been highly satisfactory to all concerned.

SUNDRY ITEMS.

Meeker, Carter & Booracm, New York agents for the Rogers Terra-Cotta Company, have closed contract for architectural terra-cotta for the new High School at New Brighton, Borough of Richmond, New York. C. B. J. Snyder, architect.

Charles Bacon, New England agent for Sayre & Fisher Company, reports the following new contracts for brick: Carleton Hotel, Boston, A. H. Bowditch, architect; residence, Boston, Peabody & Stearns, architects; Conservatory of Music, Boston, Wheelwright & Haven, architects; Board of Trade Building, Boston, Winslow & Bigelow, architects; Carpenter Building, Boston, A. H. Bowditch, architect.

The successful outcome of the endeavors of the Blue Ridge Enameled Brick Company of Newark, N. J., enameled brick, at the Pan-American Exposition, is doubtless as gratifying to the management as it is to all concerned, even remotely. It cannot be said that the award comes in the nature of a surprise to well-informed per-



DETAIL BY BARNEY & CHAPMAN, ARCHITECTS.
Atlantic Terra-Cotta Company, Makers.

sons, for the reason that it was logical and based upon merit. The company has been recognized as being thoroughly representative of the best element in the trade, and has by its career fully deserved such a distinction. A spirit of enterprise, intelligence in management and



DETAIL BY FRANCIS H. KIMBALL, ARCHITECT.
Conkling-Armstrong Terra-Cotta Company, Makers.

industry have rendered every department as efficient as possible, and made the finest product, a high order of article. The company has enjoyed, however, what is more practical and pleasant, and that is a public indorsement of its products in the shape of patronage. — *Exchange.*

NOW is the winter with its snow slides made as safe as glorious summer, by the use of Folsom Snow Guards. If the prophet stood no show at home, it is not so with this particular make of snow guards, for it is a fact that the leading architects of Boston and those who



PUMPING STATION, CHARLESTOWN, MASS.
Arthur F. Gray, Architect.

follow have used them in abundance on churches, school-houses, libraries, residences, railway stations, pumping stations and the like, until we have come to consider a building not quite complete without them. See what Mr. Gray, the architect of the pumping stations here illustrated, says:

FOLSOM SNOW GUARD COMPANY, Boston, Mass.

Gentlemen,—I have used your snow guards on several buildings, including the following:

Railway stations for Boston & Maine Railroad at Malden and Newburyport, Mass.; pumping stations for Metropolitan Sewer at Deer Island, East Boston and Charlestown, Mass.; also many other buildings, and have found them satisfactory.

Very truly yours,
(Signed) ARTHUR F. GRAY.

The Folsom method of protecting roofs, which differs from the guard-rail by placing guards all over the roof, is scientifically correct; the guards protect the roof at smaller cost, as well as more effectively, by holding the snow where it falls until it melts and gradually disappears, preventing masses of snow and ice, not only from



CLIMAX GUARD.

sliding off on walks, to the danger of passers, or injuring shrubs planted near the building, but from banking at the eaves, with the consequent danger of back water and leaks.

They are so simple and so effective that countless imitations have been put upon the market so formed as to give a brace to the snow-top (or projecting loop), for which feature greater strength is claimed.

It is this feature that is the weakness of all braced guards. The Folsom Guard is strong enough to hold any load of snow the roof will carry, but under *excessive* pressure it will bend *without* raising the upper or puncturing the lower slates. This we consider the most valu-



PUMPING STATION, EAST BOSTON, MASS.
Arthur F. Gray, Architect.

able feature of a snow guard, for it insures a roof against any damage.

The Climax pattern for old roofs is applied by pushing the long end into the joint between the slates until it touches the lower edge of the slate in the course above. This form is securely locked by the sidewise pressure of the snow.

The Standard Guards have spring grips that act when the guards are pushed into the joints between the slates; when the guard touches the lower edge of the slate in the course above, it presses the rear clamps against the two adjoining slates.

All the guards made by this company are provided with a heavy coating of zinc and do not rust out like galvanized wire.



STANDARD GUARD.

“School Architecture.”

A General Treatise on Designing and Planning of Schoolhouses.

BY EDMUND M. WHEELWRIGHT.

More than 250 Illustrations of Schoolhouses and Plans; many of the best types of all grades having been chosen.

An indispensable Text-book for Schoolhouse Designers.

Price, \$5.00, delivered.

ROGERS & MANSON, *Publishers,*
Boston, Mass.

THE BRICKBUILDER.

DECEMBER,

1901.



17TH CENTURY.

HOUSES AT ALKMAAR, HOLLAND.



THE BRICKBUILDER.

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ADVERTISING.

Advertisers are classified and arranged in the following order:—

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Agencies. — Clay Products	II	Cements	IV
Architectural Faience	II	Clay Chemicals	IV
“ Terra-Cotta	II and III	Fire-proofing	IV
Brick	III	Machinery	IV
“ Enameled	III and IV	Roofing Tile	IV

Advertisements will be printed on cover pages only.

NOTICE.

A copy of THE BRICKBUILDER Prospectus for 1902 will be mailed to each subscriber on January 1.

NEW YORK CITY is undoubtedly entering upon a new era as a result of the recent overturn in the elections. Without undertaking to discuss the character or limitations of past officials, the city is certainly the great gainer by the appointments which have just been made in the departments having to do with building operations. Mr. Perez M. Stewart has been appointed superintendent of buildings of the borough of Manhattan, and Mr. William Martin Aiken has likewise been appointed consulting architect. These gentlemen are thoroughly well known both for their personal integrity and for their ability in their respective spheres. Mr. Aiken made a good record for himself while architect of the Treasury in Washington. He is thoroughly competent, a good designer and an honest man, conditions which unfortunately are more conspicuous by their absence than otherwise in the office-holders of our large cities. Mr. Stewart is a builder who has had over fifteen years' experience, and, unless his reputation of the past belies him, there will be no foundation in the future for the disagreeable rumors which have

so persistently been made heretofore regarding speculations in the Department of Buildings. Both of these gentlemen will have large responsibilities and great discretionary powers, and we feel that New York is certainly to be congratulated upon its ability to put such men in office. In fact it seems as if the political atmosphere all over the country is becoming clarified, and with the high standard which marks our President at Washington and the mayor elect in New York, we ought to expect a practical refutation of the criticism that we so often hear expressed of the American political system — that it fails to bring into office the best available elements.

THE capitalization of the United States Steel trust is approximately fourteen hundred million dollars. If we were to capitalize the fire losses of the United States at even so high a rate as eight per cent, it would amount to nearly two billion dollars. The United States Steel corporation is a money earner, which has the effect of bettering social, structural and business conditions. The fire loss is a money waster which represents a perpetual drain on the community without the slightest redeeming feature. And the worst part of it is that the greater portion of this tremendous annual expenditure is needless. By this time the country has had enough object lessons to show beyond question that buildings can be constructed which will not burn down; and if, instead of continuing to pay money for premiums, it were only possible to spend one half the amount in eliminating the danger spots of our large cities by substituting fire-proof for inflammable construction in the cheaper and more crowded thoroughfares, the annual fire loss would in a very few years be reduced more nearly to the relative proportions of the fire loss in such cities as Paris or Berlin. These cities are far from being fire-proof throughout, but they are spared the constant menace of inflammable structures surrounding and hedging in the costly commercial buildings, a condition which exists in every large city in this country.

IT is reported in one of the British journals that an office building on American lines is to be erected in London on the north side of the Strand near its junction with the new thoroughfare from Holborn. The building is to have an area of 125,000 square feet, or four times that of the largest office building in this country, and will have six thousand rooms aggregating 900,000 square feet of rentable area. Part of it will be seven stories and part ten stories high, not very high judged by American standards, but enough for starting such a structural innovation. After all, we cannot expect to hold a monopoly of tall building construction.

Colonial Brickwork of New England. I.

SALEM, MASS.

BY WALTER H. KILHAM.

ONE hundred years ago the commerce of New England was distributed among a score of ancient towns situated at intervals along its irregular and deeply indented coast. Northward from Boston within sixty miles were situated the then busy harbors of Marblehead,



STONE HOUSE, CHESTNUT STREET.

Salem, Beverly, Gloucester, Newburyport and Portsmouth, while southward were New Bedford and a dozen Cape Cod towns of less importance. All of these places have many points of similarity. Placed at the heads of rocky bays or broad tidal rivers, their enterprising captains and shipowners lined their wide, elm-shaded streets with those rows of stately brick mansions which with their quiet old-school refinement have ever excited the admiration of later generations, and in our day, serv-



TYPICAL SALEM HOUSE, SHOWING STABLE AND ENTRANCE.

ing as the models of our revived "colonial" architecture, continue to rebuke the ostentation and trivial display of the decadent academic taste. How it happened that in a newly discovered country, without any of the institutions which tend to refine the taste or train the æsthetic sense, and without a single great work of architecture,

these untaught master builders, laboriously, we may suppose, studying their details from the few architectural books which were at that time available, were able to produce these carefully studied and delicately profiled moldings and capitals, which the modern draughtsman,



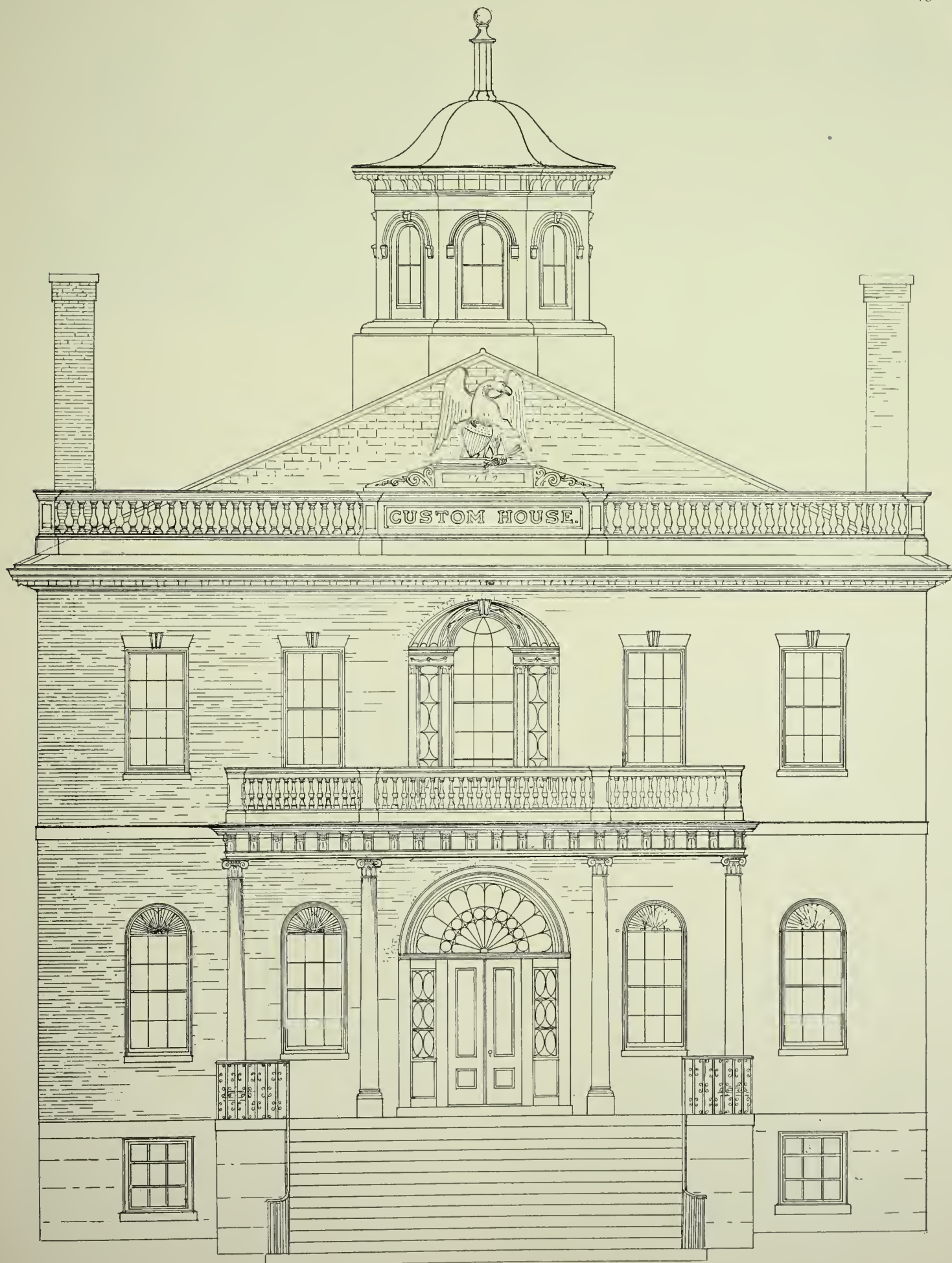
REAR OF STONE HOUSE, CHESTNUT STREET.

surrounded by his piles of plates and photographs, vainly tries to imitate, is one of the mysteries which surround the early life of our republic. We may infer that these early builders depended upon a taste which, guided only by the few good books at their disposal, and free from the injurious influence of any bad or vulgar work, and



CUSTOM HOUSE.

unhampered by distracting notions of sanitation or convenience, led their hands and minds in a straight and narrow but correct and chaste line of thought which, interpreting itself in brick and wood, produced the formal elegance and well-balanced reserve which characterize the buildings of this period. Their materials were few in number. Bricks they had and timber in plenty. Stone was little used. Carefully squared, rather small granite blocks served for the underpinning. Occasionally white marble was sparingly used for lintels and sills. The noble forests of the back country supplied them with magnificent wide boards for dadoes and panels.



FRONT ELEVATION, SALEM CUSTOM HOUSE.
Measured and Drawn by W. R. Greeley and I. R. Adams.



DOORWAY, NO. 10 CHESTNUT STREET.

Owing to the comparative isolation of the towns of that period, marked differences in style, which are frequently characteristic of their inhabitants, are seen in the different places. For example, Salem work varies strongly from Boston, Marblehead work from both, while Portsmouth seems to have gone on an entirely different idea from either. These articles will present typical studies of the architecture of all these cities.

It must be remembered that the details of the brick buildings were generally expressed in wood. Beyond a simple molded brick water table or belt course, and sometimes a lower member of a cornice, very little ornamental brickwork is seen. The bricks are rather small in size and universally laid in Flemish bond.



SHREVE HOUSE, CHESTNUT STREET.

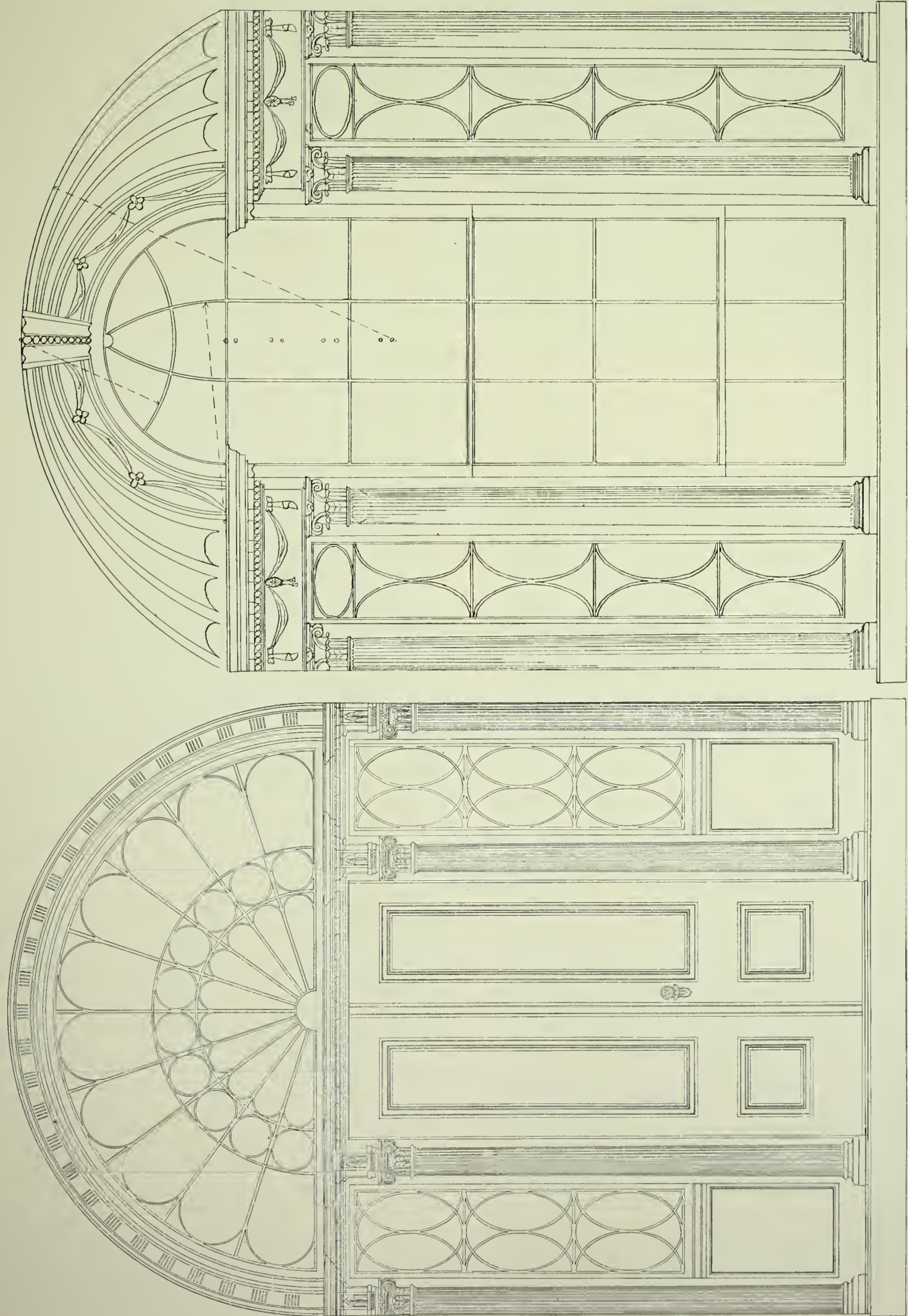


HOUSE ON CHESTNUT STREET.

Chief in interest among the decaying seaports of the eastern coast is the old city of Salem. Her broad and stately streets, where the sea wind, fresh from the harbor islands, blows cool through the great elms, are lined with the finest examples of colonial architecture to be found in this country. The typical Salem house is a square, three-storied, hip-roofed building, with the third story somewhat lower than the others, often only seven or eight feet in height. The house stands but a few feet back from the street and is entered through an elaborately ornamented portico or stoop, which, with sometimes the window above it, forms the principal architectural motif of the composition. These Salem porticoes are almost every one of remarkably correct and graceful design. Many of



DOORWAY, NO. 29 CHESTNUT STREET.



DETAIL OF CENTRAL FRONT WINDOW, CUSTOM HOUSE.

DETAIL OF MAIN ENTRANCE, CUSTOM HOUSE.



REAR OF ANDREW HOUSE, SHOWING GARDEN AND STABLING.

these house and porches are the work of one Samuel Macintyre, who lived in Salem from 1757 to 1811. His father and brother were "honsewrights" in Salem, and a nephew, Joseph, continued in Salem as a carver until his death in 1852. Samuel Macintyre appears to have been a universal genius, for in addition to his skill in architecture he was a skilful musician and organist. As an architect he seems to have been easily a rival of Bulfinch, though his opportunities for doing important work were limited. To him we are indebted for the beautiful spire of the South Church and for old Hamilton Hall opposite, whose walls, with those of the old Assembly House, also his work, have seen the blooming of generations of the youth and beauty of the old town. The Nichols house, on Federal Street, is likewise by Macintyre, and several other houses, as well as many of the ornate fence posts, urns, eagles and other ornaments about the city. He designed the Park Street Church spire in Boston, and many of the tall merchantmen of Salem bore for their figurehead an example of his skill.

The Salem of to-day is fast changing from the picturesque seaport of the early decades of the last century, when the harbor docks were alive with the bustle of fitting out and receiving Indiamen and privateers. Dingy coal barges replace the graceful square-riggers, and the trade in dry goods and prosaic household furnishings has replaced the romantic voyages to far-off Cathay which

fired the juvenile mind in the old days and sent the Salem house flags to every port in the East. But Chestnut Street, upper Essex Street and Washington Square are left almost unchanged, with their noble mansions intact and growing more beautiful under the mellowing hand of time.

Half way along Derby Street, at the head of what was once a bustling pier, stands the Custom House, a dignified brick building dating from 1818. From a literary point of view the genius of Nathaniel Hawthorne, who was once collector of the port, has given the Salem Custom House wide celebrity by the description of it in the opening chapter of "The Scarlet Letter." Architecturally, however, the building is an exceedingly meritorious piece of work, looking its purpose exactly and with much good colonial detail, as the drawings which we publish elsewhere in this issue will indicate. It is interesting to note that in its construction slates were imported from Wales and flagstones for the sidewalks from Potsdam, N. Y., by way of the St. Lawrence. There are pine boards 26 inches wide in the dado. This building cost about \$36,000.



HOUSE ON CHESTNUT STREET.

We have used the word "colonial" in its generic sense. It will of course be understood that much of the work known under that name was executed after the Revolution; in fact, nearly all of the most important work was erected in the prosperous years from 1790 to 1812, and again after the second war with England, when many of the seaport towns were enriched with the ill-gotten gains of privateersmen, and before the commercial activity of the old port had subsided.

Anything written about the old houses of Salem would not be complete without a word about the gardens. Behind the great houses, carefully screened from the street and from the neighboring premises by high lattices and board fences, are the gardens, with their high box hedges, walks of yellow gravel, trellises overgrown with clematis and roses, and geometrical flower beds bursting with the glory of the old-fashioned annuals and perennials, hollyhocks and asters, gay against the whitewashed fences and green foliage. Here more than anywhere else lingers the genius of the old seaport, and here may it linger for years to come, undisturbed by crowding business or modern innovation.



HAMILTON HALL.

The Design and Construction of the Modern Warehouse.

BY AUGUSTUS N. RANTOUL.

THE external structure of a warehouse should be of the most substantial character. It should express immense strength and the greatest security. Thickness of walls, the absence, so far as possible, of openings of any nature, simplicity of design, and a quiet color, assist much in attaining the required effect. Aside from the



MASSACHUSETTS STORAGE WAREHOUSE, BOSTON.
Andrews, Jaques & Rantoul, Architects.

real value of these features, the outside appearance of these buildings has much of a sentimental value in the eyes of the public, and the warehouse should be its own best advertisement.

In some cases trust companies and safe deposit vaults have been combined with the storage of goods, but this seems to be possible only where the conditions



VAN ENTRANCE, MASSACHUSETTS STORAGE WAREHOUSE.

are rather unusual. Trust companies and safe deposit vaults, in order to be successful, should be in a thickly populated district, and the value of land in a location of this kind is generally such as to prohibit its use for storage purposes. Sometimes, however, this high value of land is overcome by increased height in the building, that is, by obtaining a larger floor area for storage space

to a given area of land covered, thus enabling the building, though costly, to yield a proper return on the total investment. The most influential factor in determining the height of these warehouses is generally the value of the land on which they stand. They are required to carry the very heaviest loads, and accordingly the thickness of the walls and the amount of steel used, and also the cost, increase rapidly with the number of stories. The height of the building should stand in direct relation to the value of the land it occupies. It cannot be good policy to build a high and therefore an expensive building on comparatively inexpensive land, for the cost of handling increases with the height to which the goods must be raised.

For protection against fire from the outside, the external walls should be carrying walls. They should be of sufficient thickness to carry the loads without the assistance of steel columns. The steel framing should be confined to the interior supports and floors. Where this composite form of construction is used, the reasonable limit of height is soon reached, for the walls of such a heavily loaded building over nine or ten stories high



MAIN ENTRANCE, MASSACHUSETTS STORAGE WAREHOUSE.

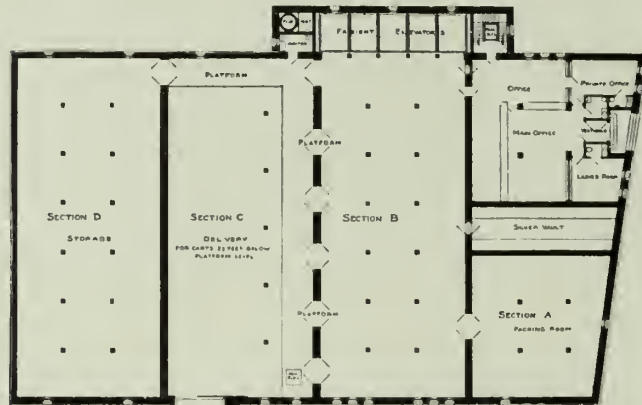
would be so thick as to be extravagant in the amount of material involved and in the area of rentable storage space lost.

In planning, the most careful study must be given to the methods of administration now generally adopted in these modern warehouses. The error frequently made, and which must be carefully guarded against, is an effort to obtain an unreasonable amount of rentable storage space at the expense of economical operation. Liberal space, well lighted, well ventilated and high studded, should be given to the steam plant, in itself one of the most essential features of the building. This involves the heating, the elevator, the electric and the cold-storage service, and frequently the pumping service for the fire standpipes and artesian wells.

Ample space must be given to the receiving and delivery platform. This should be centrally situated between the van entrance and the battery of elevators, and adjacent to the office. If this platform is too contracted it will increase the chance of damage to the goods and the cost of handling them. On the other hand, if this platform is of too liberal dimensions, the tendency is to delay the prompt and proper distribution

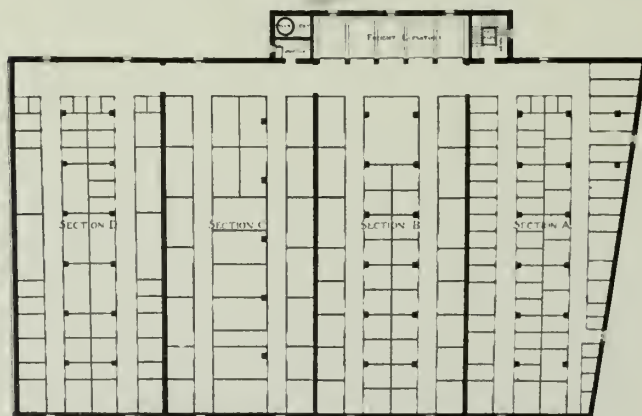
of the goods and thus create confusion. It is generally considered an advantage to have this space, where the principal part of the work is done, under the immediate supervision of the office, and the platform should be located accordingly.

Two thirds or at least one half of the building should be divided into compartments of various sizes. A unit of



FIRST FLOOR PLAN, MASSACHUSETTS STORAGE WAREHOUSE.

size should be established, and all compartments should be the unit or a multiple of it. Opinion varies as to the proper capacity for this unit, but the best results seem to have been obtained by adopting a unit which shall equal as near as possible the capacity of the van. These vans naturally vary somewhat in size, but a unit of 5 feet by 8 feet on the floor by 10 feet high, giving 400 cubic feet, has been found to successfully answer the purpose in several of these modern warehouses, although the height of 10 feet appears to be somewhat excessive. The least valuable storage space is the space farthest from the floor, and my belief is that 9 feet in height is sufficient, and that a building containing ten stories 9 feet high will earn a larger return on the investment than one containing nine stories 10 feet high, notwithstanding the fact



TYPICAL FLOOR PLAN, MASSACHUSETTS STORAGE WAREHOUSE.

that the ten-story building will cost materially more than one of nine stories. Though the walls and columns are no longer, the additional story, with its added load, increases the cost of the building, not only by the cost of the floor and finish, but by the proportionate increase of material required for strength in the columns, walls and

foundations. This limit of 9 feet applies, however, only to the intermediate stories. The basement should have good height in order to accommodate the boiler and engine rooms, and the first floor should have a stud higher than 9 feet in order to accommodate the vans. Experience has shown that it is best to have the vans drive directly into the building. The safety to the goods against robbery and against damage by the elements, as well as the privacy of this method, appeals strongly to the public, and though considerable space must be given up to the maneuvering of the vans the sacrifice seems to be justified. This method of delivering the goods from the van, if adopted, establishes absolutely the level of the first



CORRIDOR OF PRIVATE VAULTS, MASSACHUSETTS STORAGE WAREHOUSE.

floor, which must be thirty inches above the grade of the van entrance, that being the height of the floor of the van above the ground, and this accordingly precludes the possibility of good windows in the basement. On account of this some form of artificial ventilation becomes necessary in the boiler and engine rooms. The greatest care must be taken also in the ventilation of the van space, inasmuch as the introduction of horses into the building will create odors which, unless checked, are bound eventually to permeate the whole warehouse. Such a condition invariably occasions the severest criticism from the tenants. Automobiles, already being so successfully used by some warehouses, are likely to prove the remedy for this evil. The upper stories should also be higher than the intermediate floors, for the careful manager will store, as far as possible, in the top of the building, such articles as have the greatest bulk and least weight, like carriages, sleighs, etc.

Another reason for making the upper floor higher studded is because it must contain the picture gallery,

where wall space is the chief requirement. The picture gallery must be lighted with skylights, thus meeting the demands of artists for the storage of valuable pictures. These must be stored in the securest buildings, and so hung as to have the proper top light to exhibit them to possible purchasers. This section, and one or two others in the building for the storage of pianos, valuable furniture, etc., should be made as dust-proof as possible, and kept at a higher temperature than the rest of the building.



DRIVEWAY AND DELIVERY PLATFORM, MASSACHUSETTS STORAGE WAREHOUSE.

A silver vault for the storage of silver-trunks has been found an advantage in most cases. It is generally built in the basement, the safest place in case the building above should collapse. It is built with heavy walls of brick, lined with steel, and fitted inside with iron racks for trunks. It should have but one entrance with double vault doors. The increased security of such a compartment permits of an extra charge on the storage of very valuable trunks.

The intermediate stories should have the simplest and most symmetrical plan, with one liberal distributing aisle developing on the battery of elevators, with cross aisles serving the numerous compartments and the open storage space. These cross aisles should be about 6 feet wide, in order to accommodate the trucking and also to provide for the swing of the compartment doors, which are at least four feet wide.

Cold storage, which has proved to be such a great source of revenue, demands special attention. Opinion varies as to the best location for the cold-storage compartment, but in many ways it seems advantageous to have it in the basement. In the first place the basement, on account of its tendency to dampness, is bound to be the least valuable storage space, and dampness ceases to be a serious consideration where the temperature is constantly kept below 30 degrees. Again, the temperature of the basement is less susceptible to the outside influences of the atmosphere, and accordingly less insulation is required. By placing the cold section in the basement, it can be arranged to come in close connection with the cold-storage plant, a decided advantage in the transmission of air at a low temperature. The best system, no doubt, is an indirect system with a fan. By this system the air is chilled in a cold chamber and blown through ducts into the cold-storage compartments. This method

prevents the goods from coming in contact with the great amount of ammonia piping required, and reduces the chance of damage to the goods from leaking joints and from the dampness occasioned by the periodical melting of the frost on the pipes.

In planning, too much deference cannot be shown to the requirements of the underwriters. Sometimes the buildings themselves are insured, and frequently tenants insure the goods they store, and, above all, the quotation of a low rate of insurance is one of the strongest arguments in favor of the building. Frequent fire-walls of solid masonry, running from the foundations up through the roof, containing as few openings as the plan will permit, are a great advantage. The elevator shaft should be, as far as possible, surrounded with masonry walls without openings, and the front should be protected by some form of fire-proof shutters. Where the plan permits, the elevators, with liberal platforms, should be placed in battery side by side, for the result is more prompt, more convenient and more economical service. The process of running a van on to the elevator and carrying it up to its destination is a costly method of operation, now practically discarded. Too much time is wasted in unhitching the horses and unshipping the pole, and the corridors throughout the building must be extravagantly wide in order to permit the moving and turning of the vans; moreover, no convenient form of power exists for handling them when heavily loaded. But convenient arrangement should be made at the grade with at least one elevator to receive carriages, sleighs, etc., for storage.

In their construction these buildings are a most interesting problem to the architect. The loads they must be



STORAGE OF PICTURES, MASSACHUSETTS STORAGE WAREHOUSE.

able to carry, besides their own weight, are enormous. Under different conditions and in different localities the loads vary, but the floors must carry a superimposed load of from 200 to 500 pounds per square foot of area. When such weights have to be carried through eight or ten stories, the pressure on the ground becomes tremendous, and the design of the foundations frequently taxes the skill of the most experienced engineers.

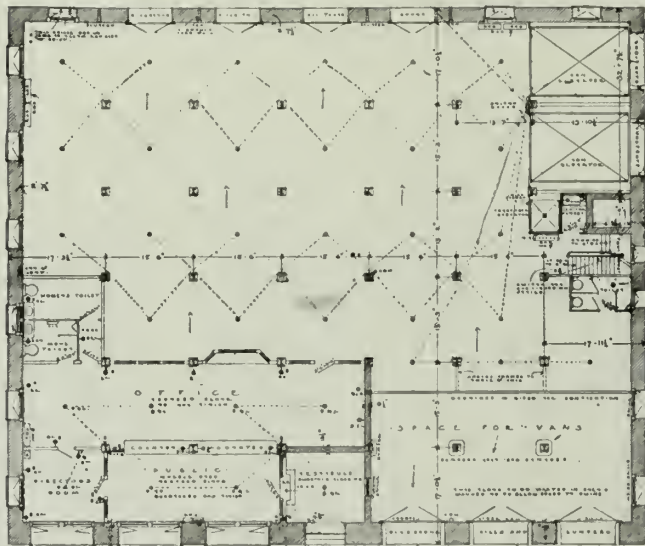
As I have said elsewhere, I believe the solid exterior wall of sufficient thickness to carry the loads, without the assistance of steel, containing only such openings as are absolutely necessary for the ventilation of the building, is the best form of construction. These exterior



UNION TRUST AND STORAGE WAREHOUSE, WASHINGTON, D. C.
Andrews, Jaques & Rantoul, Architects.

walls should be built of brick, an economical material having the greatest power of resistance to fire. Under most circumstances the greatest source of danger from fire is from the outside, and accordingly every opening should be covered with some approved fire-proof shutter, and openings coming near the ground should be heavily grilled as a precaution against robbery.

The whole interior must be framed with steel, very thoroughly protected against fire. Where fire-walls are introduced into the building they become more efficient if they are made carrying walls, that is, of sufficient thickness to carry the floors with their loads. This of

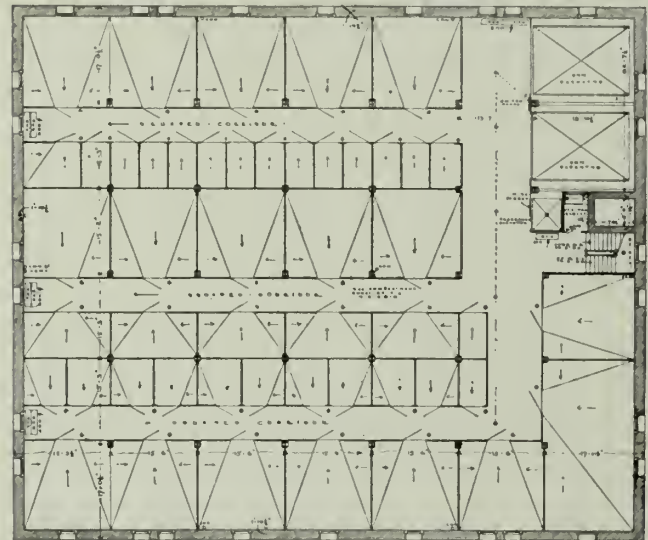


FIRST FLOOR PLAN, UNION TRUST AND STORAGE WAREHOUSE.

course makes them thicker than the ordinary requirements of the underwriters and the building laws, but the increased protection seems to warrant the small sacrifice of space. The increased cost is partially offset by the saving of a row of columns and girders, and the collapse of the building on one side of such a wall is not likely to destroy it, and under these conditions will not involve the destruction of the building on the other side. These fire-walls should have as few openings as possible, and in a newly planned building it can generally be arranged to have but one opening in each story. These openings should be protected with a double set of fire-

proof doors or shutters. The amount of steel involved is a large factor in cost. Unless a judicious design for the steel framing is adopted, making the girders and beams of such spans as to use most economically the standard sizes of steel, the cost of construction will be materially increased.

Owing to danger of fire in the goods stored it is most essential to so arrange the floors as to allow the free flow of water down and out of the building without damage to the goods stored in other portions. To do this, the floors and partitions should be water-proof, and the floors should pitch towards an outside wall, through which scuppers can be arranged of sufficient capacity to carry off easily a large amount of water. Goods raised on skids would be protected from damage by water, but the better method is to raise the floors on which goods stand, including the compartment floors, slightly above the floors of the passageways, and again, the floors of the compartments should pitch towards the doors, so



TYPICAL FLOOR PLAN, UNION TRUST AND STORAGE WAREHOUSE.

that one compartment can be flooded with water, and still be drained into the passageway and out of the building without damage to other goods. In order to prevent a fire in a compartment from getting much headway every precaution should be taken against the admission of air. A good plan is to have the edges of the fire-proof doors slightly beveled to fit tightly into a beveled door frame, and these doors should be clamped with heavy refrigerator locks. When this is properly done the admission of air (the necessary nourishment of a blazing fire) is very much reduced. This tends to smother the fire, but the temperature in the compartment will gradually increase and set off the thermostatic alarm, which will notify the watchman in the office. Fire standpipes of ample capacity, with the necessary hose, should be placed so that no point in the building is more than seventy-five or a hundred feet from any one of them.

One constant source of danger to the finer goods is the vast amount of dust which is bound to exist in buildings involving so much masonry, concrete and cement, and every precaution must be taken to reduce this to the

minimum. The trucks should be rubber tired in order to grind as little as possible into the cement floors. In some cases the imported asphalt has been used for top flooring. This produces much less dust than a cement floor, but is extremely expensive and is not apt to become as hard as is desirable. Good results have been obtained by finishing the floors smoothly with a Portland cement top and covering this with two heavy coats of patent asphaltum paint. This is an economical method which, so long as it stands, keeps down the dust in the floors and can readily be renewed from time to time as the wear of the building makes it necessary.

Nothing has been found, however, better than asphalt for certain parts of the building, like the distributing platform and boiler room, which get almost constant and the very hardest usage.

The best form of elevator for freight purposes is direct steam or electric, as the elevators should stand absolutely flush with the landings to accommodate the trucking. Any form of hydraulic elevator allows a slow sagging, due to the inevitable leakage in the cylinder, so that the platform, after it has stood a few moments at a landing, has a tendency to drop, making a serious inconvenience in the prompt handling of the goods.

The temperature in these warehouses need not be more than fifty degrees, except in the specially heated compartments referred to elsewhere.

The best form of fire-proof shutter and door to be used both inside and outside is the regulation tinned shutter, built up with two thicknesses of sheathing, covered with sheet tin, with locked and soldered joints, no nails being allowed, and on the inside of the building left unpainted, as it has been found that bright tin is better than painted tin in resisting the action of fire.

I have said nothing concerning the cost of construction, a subject of vital importance to the investor and yet one that is difficult to touch upon with any degree of accuracy. The value of labor and materials in different parts of the country and the interior arrangement of the building vary in each individual case. I believe, however, that the absolutely modern warehouse, equal or superior to the most recent buildings of this type, equipped with the necessary plant required for the heating, electric, cold-storage and elevator service, with about one half of its floor area divided into compartments of various sizes, should cost between eighteen and twenty-three cents per cubic foot.

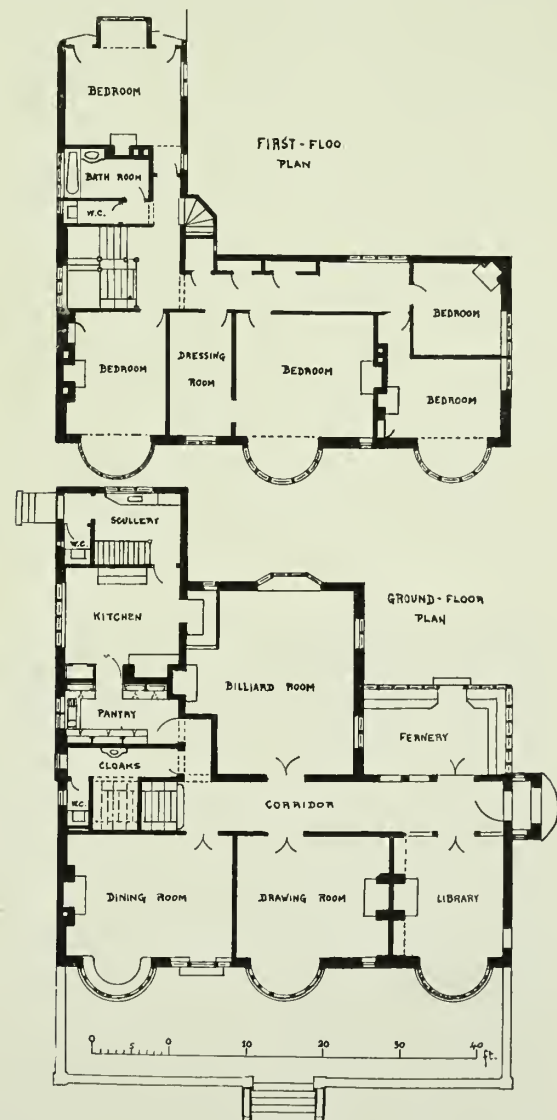
There are not many well-appointed modern warehouses in existence, but they are destined to multiply. Modern habits of changing the residence for summer and winter between continent and continent, and from section to section of our own continent, fostered as these habits are by our rapid and luxurious modes of transportation, will insure, if nothing else does, the steady growth of the modern warehouse system. Capital is already largely involved, and fair dividends are reasonably assured.

In this paper I have endeavored to emphasize throughout the conclusion on which I desire to insist, that the warehouse, however faithfully and intelligently and economically administered, will fail of the best results if it has not been *judiciously planned* and *most economically*, but *most thoroughly*, constructed.

Architectural and Building Practice in Great Britain.

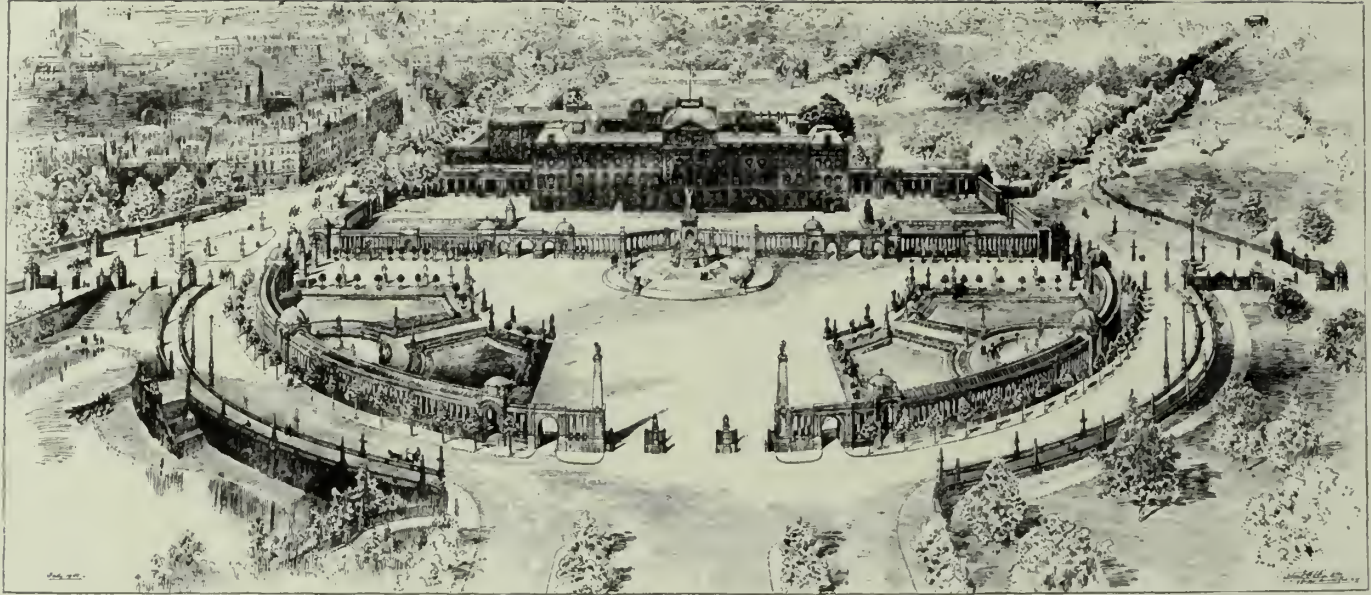
BY OUR SPECIAL REPRESENTATIVE.

AT last the five designs for the National Memorial to Queen Victoria have been exhibited. It will doubtless be remembered that, though the opinion was generally expressed that there should be an open competition, in view of the unique opportunities which such a memorial afforded, the executive committee decided



PLANS, "HILLINGTON."

that five architects only should be invited to submit designs. Mr. Aston Webb's is the selected one. It is evident from the designs themselves that certain main features were indicated beforehand, though at the commencement none of the architects knew anything very definite about Mr. Brock's memorial, for which they were to form an architectural envelope. Mr. Webb's design is, however, undoubtedly the best, though all of them possess features of interest. The railings at present in front of Buckingham Palace, which is situated in St. James's Park, are to be replaced by a stone screen forming the chord, so to speak, of a great semicircular colon-



SELECTED DESIGN FOR THE QUEEN VICTORIA MEMORIAL. Aston Webb, A. R. A., Architect.
VIEW FROM WEST END OF MALL, FACING BUCKINGHAM PALACE.

nade of Ionic columns, the space thus enclosed measuring about 800 feet by 400 feet and being called "The Queen's Garden." The memorial itself, approached by a few steps having an archaic lion at each side, takes the form of a great pedestal surrounded by statuary emblematic of the empire, with a figure of her late majesty at the front; a group of sculpture crowns the whole, while at each side are arranged crescent-shaped fountain

nating in a circus, which is an admirable solution of a difficult problem.

Another burst of criticism has centered around the new cathedral which is proposed to be built at Liverpool. The scheme is an old one, for as long as fifteen years ago a competition was held for the purpose, but after the selection was made the matter died down. Now it has been resuscitated, and the committee have even got so



"HILLINGTON," WALTON ON THAMES. Niven & Wigglesworth, Architects.

basins. The memorial occupies a central position against the screen, and at each side against the colonnade is a fountain surrounded by beds of grass and flowers. From this "garden" a central processional drive and carriage roads (intended to be adorned with sculpture) lead practically into Trafalgar Square, termi-

far as to advertise for portfolios of drawings by June 30 next, the intention being to select a limited number of architects in this manner and to invite them to submit designs, for which they will each be paid three hundred guineas. There was enough dispute over the site, but the question of "style" resulted in greater discussion.



THE LODGE, CAVENHAM HALL, SUFFOLK.



CAVENHAM HALL, SUFFOLK. GARDEN FRONT.
A. N. Prentice, Architect.

Four sites were originally under consideration, but it was soon apparent that two of them were to be relinquished, leaving Monument Place and St. James's Mount for final selection. The former is undoubtedly the better in all respects, but when it became known that the purchase money would be £200,000 the St. James's Mount site was chosen, its cost being only £50,000. This was the committee's first mistake, but matters were made



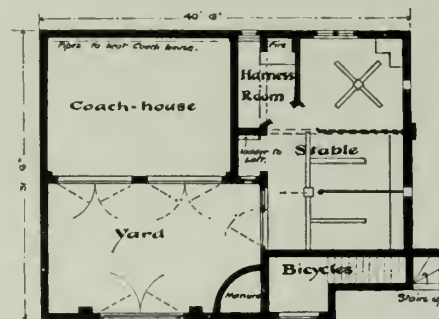
PLANS, CAVENHAM HALL.

much worse by the stipulation that the style should be Gothic. To any one familiar with the position of architecture in this country to-day it is evident that such a restriction could only result in a dead building. There is now no such thing as "Gothic" in the true sense of the word; that is to say, there no longer exists that collaboration among the various workmen which characterized the age when our great cathedrals arose, for the times have changed and the mediæval spirit is long since dead. Had the proposal been made at the time of the Gothic revival, when, with such leaders as Pugin, Street, Burges and others, a school of men was being trained to work in the manner of the old builders, it would not have been surprising; but that it should be put forward on the threshold of the twentieth century, when all around us we hear a clamoring for a new style in place of meaningless copyism, and when the finest opportunity since Wren's time offers for the building of a great cathedral, this is perfectly ridiculous, and more, it is unjust. I am, however, glad to record that the executive committee (apparently) saw the errors of their ways and rescinded their decision, so that the competition is not now restricted to Gothic designs. They deserve every credit for their

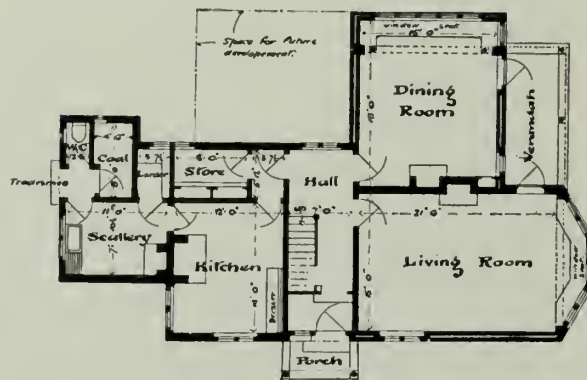
action, though the feeling in informed circles is that only a Gothic design will win the competition.

Whilst speaking of cathedrals it is opportune to note that the huge Roman Catholic cathedral now being completed at Westminster from the designs of Mr. Bentley is progressing satisfactorily, and it is expected that the opening services will take place on the feast of St. Peter and St. Paul next June. But not more than the shell will then have been finished, and the mosaics and marbles will not be completed for many years to come. It is built of red brick, and its nave is higher and wider than any nave in England. Altogether the cathedral is considered to be perhaps the finest erected in modern times.

St. Paul's Cathedral was the subject of much attention a short time ago on account of the subsidences which had taken place. Alarmists were busy as usual and stories were current of the impending collapse of the structure. The actual facts are that owing to underground tunneling the ground has consolidated somewhat, resulting in the dislocation of the arches of the nave, choir and transept, and, more important, the subsidence of the west front with its heavy towers and bells. Moreover, the



Ground Plan of Stables



Ground Plan of House

PLANS, "GALLOPS HOMESTEAD."

whole of the southern transept has moved, so to speak, towards the Thames. In order that no further harm may be done, there must be no more "tubes" in the close vicinity of the cathedral,—the Central London Underground Railway on the north is only 460 feet from the center of the dome, yet the new line from Piccadilly proposes to come 160 feet nearer; but it is improbable that the powers sought will be granted, for the Dean and Chapter intend to oppose all such schemes. It is somewhat ironical that, while money is being wasted inside on Sir William Richmond's foreign decorations, there are no funds available for structural works to assure the stability

of the fabric, — not enough to keep the building in thorough repair; and we even allow Mr. Pierpont Morgan to pay for the cost of installing the electric light.

The building trade in this country at the present time is in a very bad state, due to the war and the continued

The house at Walton-on-Thames, by Messrs. Niven & Wigglesworth, is of brick with red-tiled roofs and modeled plaster work on the bays. A feature has been made of the lead work in the gutters and down-pipes. It is an excellent specimen of modern English domestic architecture.



"GALLOPS HOMESTEAD," SUSSEX.
C. B. N. QUENNEL, ARCHITECT.

high price of materials and labor. In many parts it is practically at a standstill. Wages are proposed to be reduced in order to revive conditions.

In this letter I should not omit reference to the death of Mr. James Brooks, one of the best of our modern church architects. He almost exclusively employed brick in his churches, which were characteristic for the excellent proportion observed in the buttresses and the concentration of what little ornamentation there was. Mr. Brooks was a man of sturdy solid character, and this is reflected throughout his work. His churches, like St. Michael's, Shoreditch, London, or St. Mary's, Haggerston, London, were in poor districts and the money at his disposal was consequently limited; yet the general excellence of their design is a striking testimony to the great ability of this architect.

I may refer, in conclusion, to the several illustrations which accompany this letter.



OUTSIDE STAIRS TO STABLE, "GALLOPS HOMESTEAD."

Cavenham Hall, Suffolk, is Mr. A. N. Prentice's most important work. It is built of red brick, with stone dressings, portions being treated with decorative plaster work; the roofs are covered with red tiles. Particular attention is drawn to the plan, which is considered to be one of the best examples of the planning of a large English country house. The treatment of the conservatory is also worthy of special notice.

"Gallops Homestead," in Sussex, consists of a cottage with detached stables, the cost of the former being about £1,000 and of the latter £600. It was built as a summer residence and is of red brick with rough-cast here and there, and a thatched roof. Thatch, it should be noted, is very rarely employed now, though

it forms a most admirable covering, being warm in winter and cool in summer time; while in outlying districts the risk of fire is so slight that it may be disregarded. Its picturesque appearance is evident.

Fire-proofing.

RATIONAL METHODS OF FIRE-PROOFING. II.

BY WILLIAM COPELAND FURBER, M. AM. SOC. C. E.

IN a previous paper (BRICKBUILDER for July) the maximum strength of iron was shown to be at a temperature of about 400 degrees Fahrenheit, and it was also shown that for each increase of 100 degrees the resistance was decreased 10,000 pounds per square inch of cross section.

When all the experts on fire-proofing, all the engineers and architects and all the manufacturers have reached a common ground in admitting that the present methods of fire-proofing are insufficient, and the fire insurance companies have formulated objections to the present methods and have modified their rates so as to encourage the erection of real fire-proof buildings, then we can properly discuss the details of better methods, but as a suggestion of how easily a great improvement can be made the following discussion is set forth.

COVERING OF FLANGES OF BEAMS.

Beginning with the weakest point admittedly in the present methods, that of the covering of the floor beams, let us see what led to the adoption of the present standard type of hollow tile floor and beam covering, and what reasons, if any, exist for its continuance.

The possibilities of modern skeleton building (and also in a general way the fire-proofing proposition) began when the first iron beam was rolled in 1853. The buildings in which these beams were used followed in floor detail the wood-joist construction, which required flat ceilings. The flat ceiling became then, in the usual process of adapting the new to the old, an essential part of the design of the new system; not by special construction, but by the force of habit which clings to the old form as long as no change is imperative.

In the early structures, when the iron beam and the solid brick arch succeeded the wooden joist, the designers supposed that all demands of fire-proofing had been complied with by the substitution of non-combustible material for wood; and while this was a great advance, it was but the beginning of a new epoch in building construction. Experience soon showed that the lower flange of the beam could be injured by a quantity of heat which was not at all sufficient to seriously affect the floor material itself. When this fact became apparent, the obvious thing to do was to cover this flange; so to-day we see the flange covered with a thin piece of tile that merely covers the beam from view and performs a very slight service as a non-conducting cover. This little piece of tile is there, however, because the ceiling is mistakenly supposed to be required to be flat.

In a building of any pretensions there is but little reason or excuse for a flat ceiling. The possibilities the projecting beams afford for architectural treatment are so great and so promising that it is surprising that they have not been taken advantage of in the past.

The elaborate ceiling enriched with forms of free and geometric relief was a characteristic of the highest archi-

tectural development, and from the record we have of the past we can see there was no effort made to deny the character of the overhead construction, but on the contrary the beam was frankly admitted and treated as worthy of consideration and decoration. It is hardly necessary, however, to point out here the precedents for the architectural treatment of ceilings, but it remains for us to suggest how simply and easily the demands of fire-proofing can be complied with, and also that by complying with these demands we have additional opportunity and incentive for rational decoration at but little increase in cost.

Let us begin by admitting that the floor beam needs protection, and let us cover the lower flanges with an ample thickness of cellular tile; let this projecting tile cover be admitted for what it is, and let moldings and decoration be applied to it. Where low cost is absolutely necessary, the projecting beam covering can be plastered the same as the flat part of the ceiling, with no moldings or elaboration; by returning the one half of the beam projection across the ends of the room, between the beams, a dignified treatment of the ceiling is possible with little additional cost; where a better treatment is possible the ceiling can be subdivided into panels by cross false beam, covers made of "staff" or wire lath fitted in between the beam coverings and finished in plaster to correspond to the beam coverings.

The only special consideration this method requires to permit architectural treatment is that the ceiling beams should be placed so as to permit a symmetrical arrangement of the ceiling panels; this is a simple matter usually, as the beams are frequently placed to suit the partitions, and the other condition then naturally follows.

In putting the beam covering in place it would be advisable to insert a piece of wire-mesh fabric in the outer joints between the two adjoining skew backs, covering their projecting edges and the lower flange tile; this can readily be done while the skew backs are being set. The wire netting, by preventing the possible falling off of the tile in case of mechanical injury, insures the flange from the action of the flames, and also furnishes a good foundation for the plaster, thereby utilizing its additional thickness.

A beam covering of from four to six inches can be made on these lines that will afford a large amount of protection to the beams and insure their strength under any but the most trying conditions and at but a slight additional cost over the present methods. If a ceiling that has been subjected to the action of fire and water alternately is examined, many of the flange tiles will be discovered missing. Yet this manifest and vital defect is usually passed over without comment.

The girders, because they are the main lines of horizontal support, should have a greater thickness of covering than the beams. The detail of the covering should be carefully studied out to fit the conditions of exposure.

THE COVERING OF COLUMNS.

The present standard details of hollow tile coverings for columns, while much better in some respects than the present beam coverings, yet are hardly equal to their

responsibilities. While they are usually thicker than the beam coverings, yet the method of attaching them to the columns and to themselves is far from satisfactory.

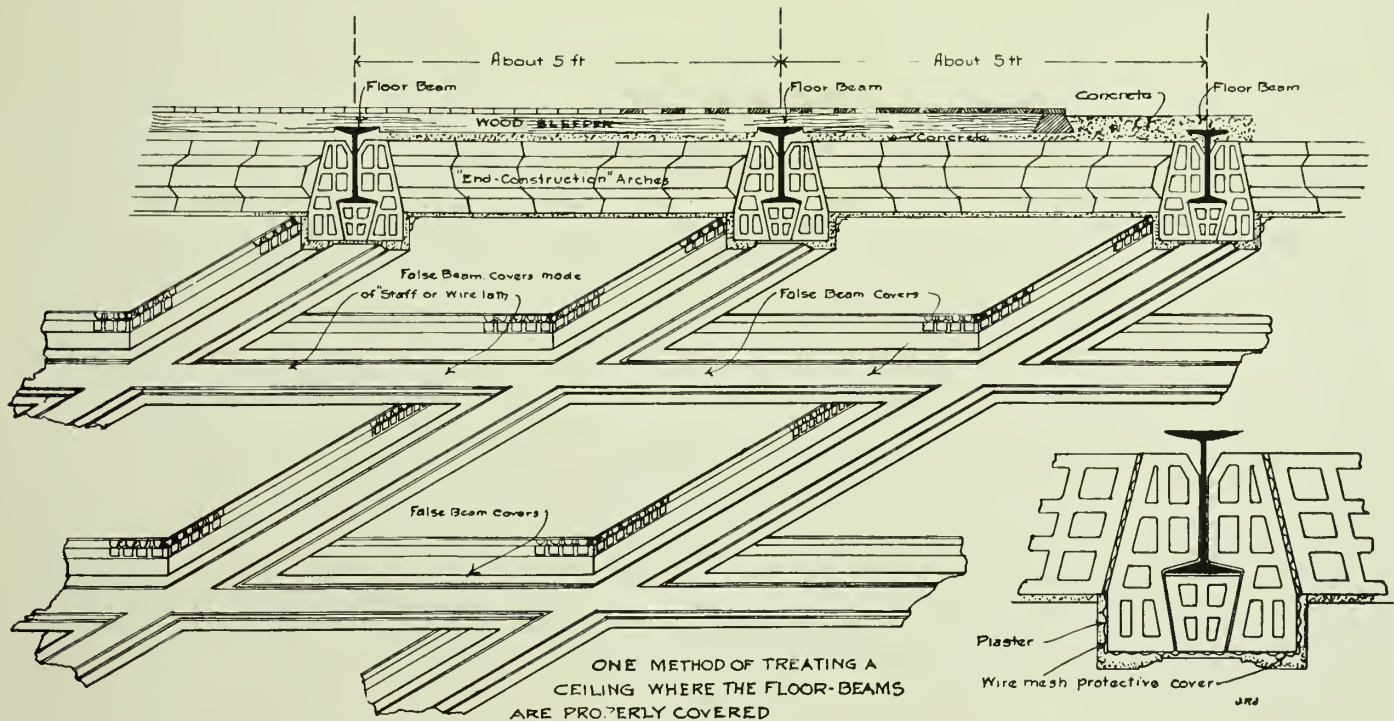
In general it may be said that the beams and girders have the greatest exposure in the ceiling because they are at the top of the room and in the zone of probable maximum temperature, and while this is true, yet the column is more important structurally because its failure would cause the failure of all other members dependent upon it; and moreover the chances of local maximum temperature are very great. For these reasons, therefore, the column covering demands consideration in proportion to its importance.

It should not be overlooked in considering the fire-proofing of structural members, and particularly of columns, that rust-proofing should also be considered at the same time. No structural member should be left unprotected in any position where moisture can possibly pene-

trates, forming an unbroken cover, and allowed to harden, the column or girder will never rust; and if on this basis the fire clay covering of sufficient thickness is put on, the structural member can be relied on always to perform its office in a satisfactory manner. If the concrete envelope is omitted and moisture finds its way to the metal, no matter how carefully it is protected from fire, there will come a time when the column will fail without being subjected to a fire test.

The concrete covering, moreover, because it furnishes such a good backing, permits the attachment of the fire clay covering in a thoroughly satisfactory manner. When the columns are not exposed and the cement envelope is omitted, great care is necessary to give a basis or backing for the hollow tile, and the covering should be so designed as to utilize in the most effective way the shape of the column as a backing for the tile.

In the concrete-covered column a standard-shaped



trate. The very first step, therefore, in fire-proofing exposed columns and girders should be to cover them with an impervious covering, which will prevent rust. The discussion of the rust-proofing question, while germane to this subject, is too long to be inserted here; however, in brief it may be said that the structural work intended to be covered with concrete should not be painted but given a temporary coat of oil. Paint prevents adhesion of the cement to the metal surface. Rust is caused by three factors working together—oxygen, an acid and water. By excluding all three of these factors, or by excluding one or more, rust cannot take place. Portland cement, because it is a product of lime, furnishes a base which will neutralize any acid likely to be present under ordinary conditions. If the metal work is first enclosed in an envelope of Portland cement concrete made with a liberal proportion of mortar, with neutral sand and rock, well rammed into a homogeneous mass, filling all vacant

tile covering can be made which will fit all the columns, but where the tile has to fit the iron work a satisfactory standard shape is hardly possible.

In all column coverings, as the possibility of mechanical injury is very great, the wire fabric or lath protection should never be omitted.

The question of the limit of space to be occupied by the column and the beam and their coverings should not be considered only from the point of how little covering will conceal the metal, but from the standpoint of how much thickness is necessary to fire-proof it. If the object to be attained is only to cover the structural members with tile, then it would be useless to suggest even a minimum of four inches (yet this is hardly sufficient). If the object is to build a fire-proof structure, it should be consistently done, and whatever space is required for proper coverings should be allowed for, and this allowance not cut into for *any* reason.

Selected Miscellany.

NOTES FROM NEW YORK.

In a recent optimistic editorial in the *Tribune* entitled "A City of Great Deeds" attention is called to the truly remarkable activity now prevalent in the building trades and among architects. "Underground, at the surface and far up in the air big armies of wage earners are toiling on railway lines and bridges, on churches and exchanges, on huge structures which will be used for national or municipal purposes, on enormous hotels and apartment houses, on office buildings and department stores of ambitious proportions, on new piers and elevators, on new school-houses and new parks." Naturally these great achievements make us all happy and contented, and we only hope



DETAIL BY WILLIAMSON & SPENCER, ASSOCIATE ARCHITECTS.
Northwestern Terra-Cotta Company, Makers.

rigan, were unable to attend, there were other able speakers among the clergy present who made interesting ad-



BROOKLYN HOME FOR AGED MEN, BROOKLYN, N. Y.

Lord & Hewlett, Architects.

that the new year may bring a continuation of happiness and prosperity.

The last monthly dinner and meeting of the League was particularly interesting and well attended. The subject for discussion was "Church Decoration," and although the principal guests, Bishop Potter and Archbishop Cor-



DETAIL BY BARNETT, HAVNES & BARNETT, ARCHITECTS.
Winkle Terra-Cotta Company, Makers.

dressess. After the enjoyment of the very good dinner, Mr. W. L. Harris, a member of the League, delivered a lecture on "Stained Glass," illustrated with lantern views, which was thoroughly enjoyed. Mr. John La Farge gave an impromptu talk on the tendencies of modern art. The point which he emphasized most strongly was the fact that it is the desires and temperament of the people which will draw from artists and artisans their best work. If there is a demand for good, thorough, honest work, such work will be produced. Committees were appointed by the president, Mr. Hardenberg, to draw up resolutions of sorrow at the decease of two League members, Mr. Thomas and Mr. Morgan.

Our neighbor city, Newark, is soon to have two new buildings which will be refreshing landmarks in a city which is almost entirely devoid of interest architecturally. The Newark City Hall competition, which was a competition open to all, has been decided in favor of Mowbray & Uffinger of New York; and the Newark



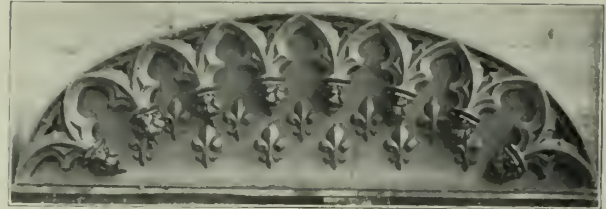
DINING-ROOM.



HALL AND MAIN STAIRWAY.



BRACKET EXECUTED IN TERRA-COTTA BY NEW JERSEY
TERRA-COTTA COMPANY.
C. B. J. Snyder, Architect.



DETAIL BY BARNEY & CHAPMAN, ARCHITECTS.
Atlantic Terra-Cotta Company, Makers.

courthouse competition (limited) has been awarded to Cass Gilbert of New York. The latter building will cost about \$1,000,000.

The committee in charge of the Carnegie libraries to be built in this city and Brooklyn have appointed the following Brooklyn architects to prepare plans for the first five libraries to be built there, viz.: Lord & Hewlett, Walker & Morris, R. L. Daus, William B. Tubby & Bro. and Raymond F. Almirall.

The Sons of the American Revolution will erect a handsome clubhouse on Fifty-fifth Street from plans by York & Sawyer.

NOTES FROM ST. LOUIS.

The closing months of the year have been busy ones in building circles, the report of the

building commissioner indicating an improvement of 100 per cent over last year. The activity is not confined to the offices of architects who were fortunate in being selected as members of the board of architects for the Exposition work, but is general, and

the outlook for the coming year for important work in the business sections of the city is more promising than for many years.

Weber & Groves have prepared plans for a hotel 50 by 100 feet to cost \$65,000.

Mauran, Russell & Garden have been selected as the architects for the Christian Science temple, which will be built on Lindell Boulevard at a cost of \$100,000. They have also the library for the Kansas Normal School at Emporia, Kansas, a \$60,000 building.

The St. Louis Portland Cement Company has employed Isaac S. Taylor as its architect for the large plant to be erected along the Burlington Railway tracks in north St. Louis.

The smoke problem is one that has been a source of an-

noyance in the city for a long while, notwithstanding several efforts to abate it; but a rather unique incident in connection with it occurred recently, when a tenor in one of the leading opera companies instituted proceedings for damages, claiming the smoke had injured his voice.

In Exposition work some progress has been made, the contract having been awarded for enclosing the site. The general scheme



KENNARD BUILDING, ST. LOUIS, MO. Isaac Taylor, Architect.
Built of American-size gray coated impervious brick, manufactured by the
Hydraulic Press Brick Company, St. Louis, Mo.



DETAIL EXECUTED BY WHITE BRICK AND
TERRA-COTTA COMPANY.



DETAIL BY JARDINE, KENT & JARDINE,
ARCHITECTS.
Standard Terra-Cotta Works, Makers.



VAN WICKLE MEMORIAL GATES, BROWN UNIVERSITY, PROVIDENCE, R. I.

Hoppin & Ely and Hoppin & Koen, Associate Architects.

Built of Fiske & Co.'s (Boston) Rough Texture Red Face Brick.

has been determined, and it is expected that the formal dedication of the site will be made on the 20th of December. Besides the 400 acres of forest park, the grounds and new buildings of Washington University will be used.

The plan of the grounds will differ from plans of preceding exposition grounds, inasmuch as the numerous avenues will radiate from the main entrance, the general plan being fanlike in form. At the end of the central avenue the Art Building, by Cass Gilbert, is to be situated on an eminence about 60 feet in height. Cascades in the form of a crescent, issuing from the sides of three hills, will form a basin at the foot, and the other buildings will be situated on either side.

The alumni of the University of Virginia propose to reproduce the rotunda of the university building on the grounds as a permanent monument to Jefferson.

Eames & Young have been employed by the Travelers' Protective Association as the architects for a 2,000-room hotel near the Exposition grounds.

NOTES FROM PITTSBURG.

We think THE BRICKBUILDER a little severe and somewhat mistaken in the editorial on the Carnegie Technical Institute, published in the October number. That the architectural student should make better progress when



HOUSE AT AVONDALE, OHIO.

C. M. Foster, Architect.

Roofed with American S. Tile.



BOND BUILDING, NEW YORK AVE., WASHINGTON, D. C.

George S. Cooper, Architect.

Terra-Cotta furnished by the New York Architectural Terra-Cotta Company. Edward R. Diggs & Co., Washington Agents.



DETAILS EXECUTED BY ST. LOUIS
TERRA-COTTA COMPANY.

that there is a wide field here for a good architectural department, and we believe that the trustees will see that it is the best.

The student at Cornell is probably not surrounded by buildings of the highest merit, but no one will deny the value of the work that its architectural department is doing.

The University of Chicago has, in a few years, by means of its great endowment, risen from nothing to one of our greatest colleges.

Pittsburg architecture is not all bad, and the new school will undoubtedly be well housed, while the large endowment promised by Mr. Carnegie will do much to bring here the best instructors, books, casts, etc.

Mr. E. B. Lee, Harvard, '99, at present in the office of Alden & Harlow, has been awarded the Austin Traveling Fellowship for this year by Harvard University. Mr. Lee expects to sail for Europe in the spring.

The fallacy that borings can be altogether relied upon to determine the nature of soil was recently shown here in the work on the site for the new building for the Farmers' National Bank. Borings showed that the soil was composed of loose, wet sand for at least sixty feet below curb level; excavation, however, showed that at twenty-six feet there was a formation somewhat resembling concrete. Composed of gravel and sand, it was so hard as to require the constant use of the pick to remove it. The drill had loosened it and brought up the loose sand.

surrounded by fine architecture is true, but in these days of inexpensive photography, books and magazines, the best from all countries and places can be readily put before him, imperfectly, it is true, but, accompanied by wise criticism, invaluable. We believe

IN GENERAL.

The entire front of the new building for the Rochester Telephone Company, illustrated in the plate form of this number, is of terra-cotta, quite a good deal of which is in color. The work was executed by the Perth Amboy Terra-Cotta Company.

The Atlantic Brick Manufacturing Company, Philadelphia, whose advertisement appears for the first time in this month's number, is a new concern which is under the management of men who have had a thorough training in the manufacture and sale of brick. They have placed upon the market a high grade, stiff mud front brick in buff, gray, mottled and iron spot colors, in standard and Roman sizes. They are prepared to send to architects and builders, charges prepaid, a full line of samples with prices.

Carl Kusche, architect, 242 10th Street, Oshkosh, Wis., would be glad to receive manufacturers' catalogues and samples.



DETAIL BY FRANCIS H. KIMBALL, ARCHITECT.
Conkling-Armstrong Terra-Cotta Company, Makers.

October last an architectural club was organized in Kansas City, under the title of the Kansas City Architectural Club. It was started with fifteen charter members and the following officers: John van Brunt, president; William H. Cutler, vice-president; Charles H. Payson, secretary; and Fred E. McIlvain, treasurer. It has engaged club rooms in connection with the Kansas City Chapter, A. I. A., and already has one competition under way, the subject being a band stand, to be located in one of the parks of the city.



DETAIL BY WHEELWRIGHT & HAVEN, ARCHITECTS.
Excelsior Terra-Cotta Company, Makers.



HOUSE FOR ROBERT S. PEABODY, ESQ., FENWAY, BOSTON, MASS.
PEABODY & STEARNS, ARCHITECTS.



HOUSE 47 EAST 49TH STREET, NEW YORK, N. Y.

(ENTIRE FACADE OF TERRA-COTTA.)

BARNEY & CHAPMAN, ARCHITECTS.



HOUSE, 6 EAST 79TH STREET, NEW YORK CITY.
BARNEY & CHAPMAN, ARCHITECTS.



RESIDENCE SPRUCE STREET. PHILADELPHIA
WILSON EYRE, JR., ARCHITECT.



HOUSES AT 16. 18 AND 20 EAST 84TH STREET, NEW YORK CITY.
CLINTON & RUSSELL, ARCHITECTS.



HOUSE AT CHICAGO, ILL.
WILLIAM A. OTIS, ARCHITECT.



HOUSE AT MINNEAPOLIS MINN
F. B. & L. L. (N. Y. ARCHT.)



HOUSES AT BUFFALO, N. Y.
GREEN & WICKS, ARCHITECTS.



HOUSE AT CHICAGO, ILL. FOR JOHN R. TRUE, ESQ.
HUEHL & SCHVID, ARCHITECTS



HOUSE AT CHICAGO ILL. FOR JOHN R. TRICE, ESQ.
H. L. & S. W. SCHMIDT, ARCHITECTS.



HOUSE AT SAN FRANCISCO, CAL.
COXHEAD & COXHEAD, ARCHITECTS.



HOUSE AT LOS ANGELES, CAL.
COXHEAD & COXHEAD, ARCHITECTS.



HOUSE AT BUFFALO, N. Y.
GREEN & WICKS, ARCHITECTS.



Green & Wicks
Architects

PORCH, HOUSE AT BUFFALO, N. Y.
GREEN & WICKS, ARCHITECTS.



HOUSE AT NEWPORT. R. I.
(BUILT BY WHITE TERRACOTA.)
MCKIM, MEAD & WHITE, ARCHITECTS.



HOUSE AT NEWPORT, R. I.

(BUILT OF WHITE TERRAZZOTA.)

MCKIM, MEAD & WHITE, ARCHITECTS.



HOUSE AT NEWPORT, R. I.

(BUILT OF WHITE TERRA-COTTA.)

MCKIM, MEAD & WHITE, ARCHITECTS.



HOUSE AT WILKESBARRE PA
WILSON EYRE, JR., ARCHITECT



HOUSE AT WILKESBARRE, PA.
WILSON, LYRE, JR., ARCHITECT.



HOUSE AT ELIZABETH, N. J.
CARRERE & HASTINGS, ARCHITECTS.



FRONT ENTRANCE.
HOUSE AT ELIZABETH, N. J.
CARRERE & HASTINGS, ARCHITECTS.



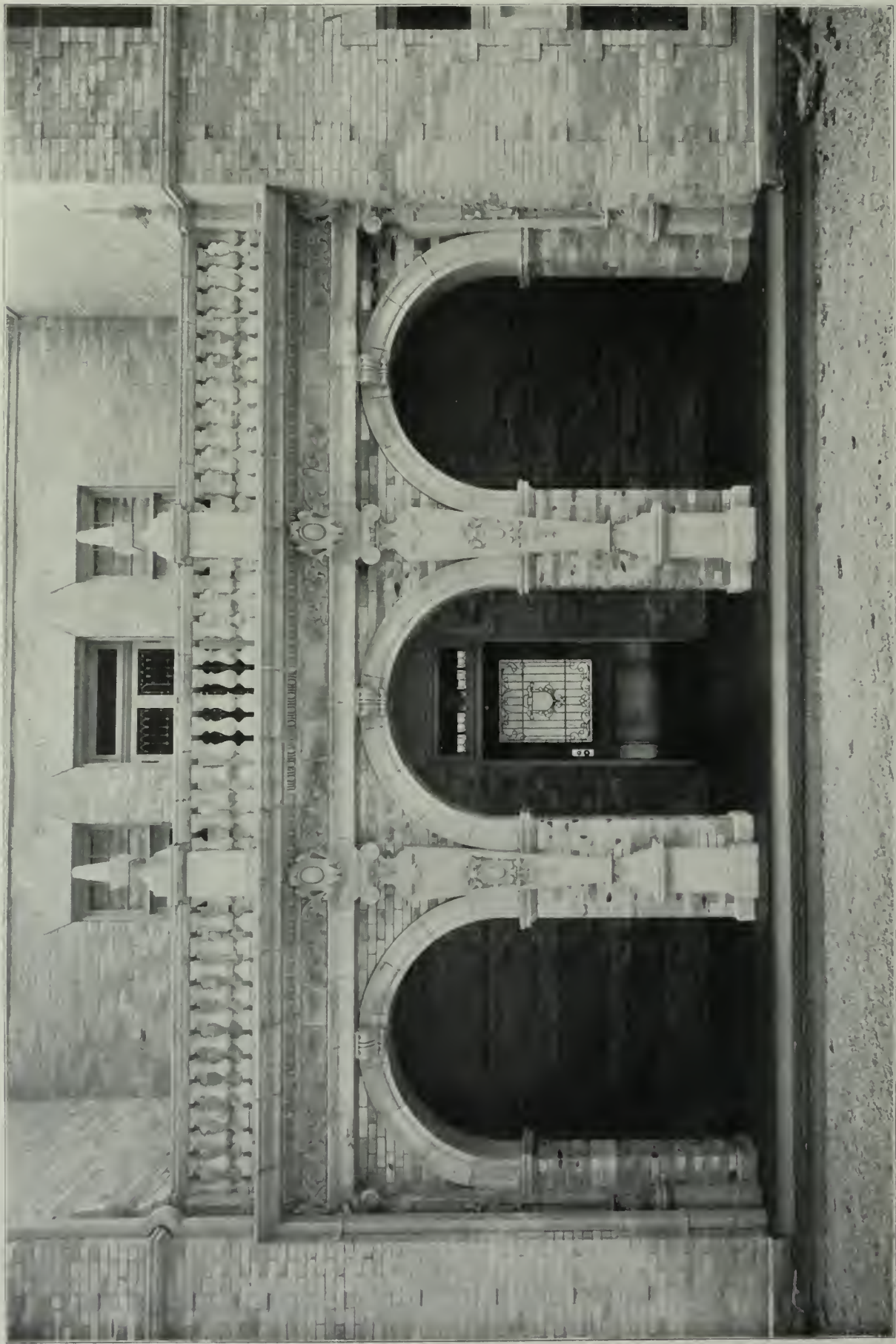
A MASTERS' HOUSE AT GROTON SCHOOL, GROTON, MASS.
R. CLIPSTON STURGIS, ARCHITECT.



HOUSE AT ELIZABETH, N. J.
C. P. H. GILBERT, ARCHITECT.



HOUSE AT TUXEDO PARK, N. Y.
JAMES BROWN LORD, ARCHITECT.



HOUSE AT TUXEDO PARK. N. Y.
JAMES BROWN LORD, ARCHT. ECT.



HOUSE AT TUXEDO PARK, N. Y.
T. HENRY RANDALL, ARCHITECT.



HOUSE AT TUXEDO PARK, N. Y.
T. HENRY RANDALL, ARCHITECT.



HOUSE AT MORRISTOWN. N. J.
HOWELLS & STOKES, ARCHITECTS.



HOUSE AT MORRISTOWN, N. J.
HOWELLS & STOKES, ARCHITECTS.



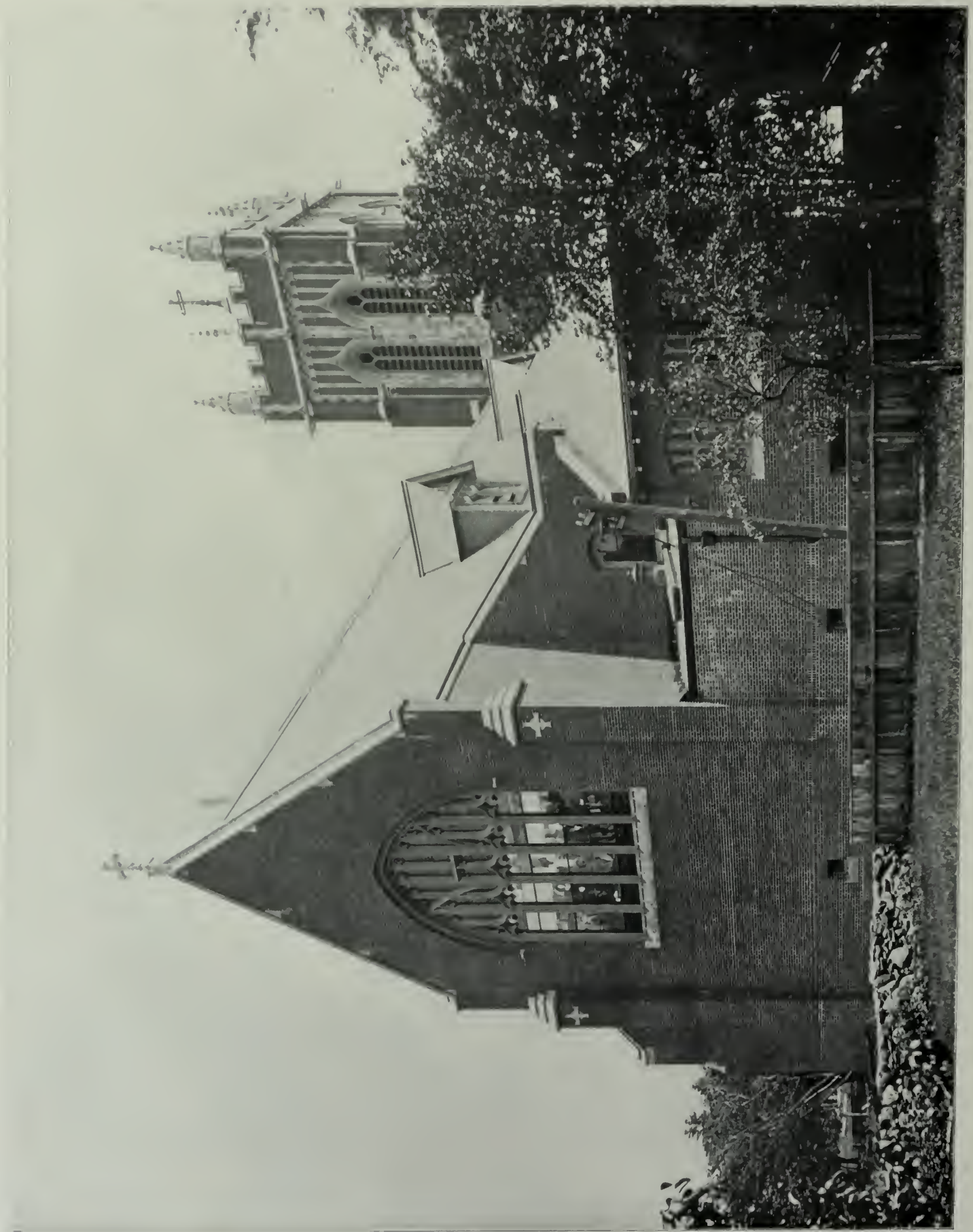
HOUSE AT BROOKLINE, MASS.
WINSLOW & BIGELOW, ARCHITECTS.



ST. LEO'S CHURCH. LEOMINSTER, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS



ST. LEO'S CHURCH. LEOMINSTER, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.



ST. LEO'S CHURCH, LEOMINSTER, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.



COTE BRILLIANTE PRESBYTERIAN CHURCH, ST. LOUIS, MO.
GRABLE & WEBER, ARCHITECTS.



WESTMINISTER PRESBYTERIAN CHURCH, ST. LOUIS, MO.
WEBER & GROVES, ARCHITECTS.



THIRD CHURCH OF CHRIST, SCIENTIST, CHICAGO, ILL.
HUGH M. G. GARDEN, ARCHITECT.



INTERIOR OF CHAPEL, ROSE HILL CEMETERY, CHICAGO, ILL.
J. L. SILSBEE, ARCHITECT.



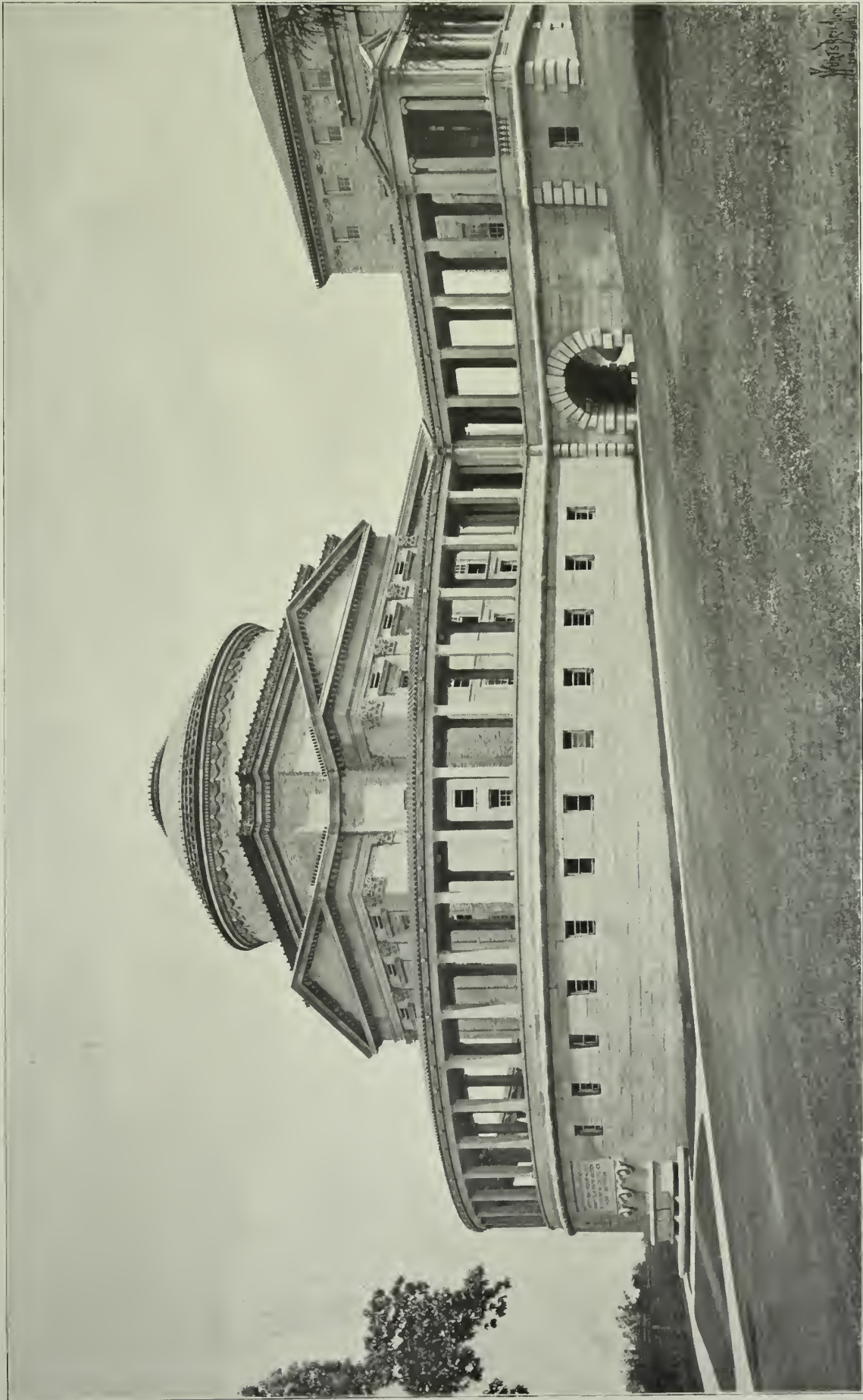
ST. AUGUSTINE'S CHURCH, PITTSBURGH, PA.
RUTAN & RUSSELL, ARCHITECTS.



FRONT, ST. AUGUSTINE'S CHURCH, PITTSBURGH, PA
RUTAN & RUSSELL, ARCHITECTS.



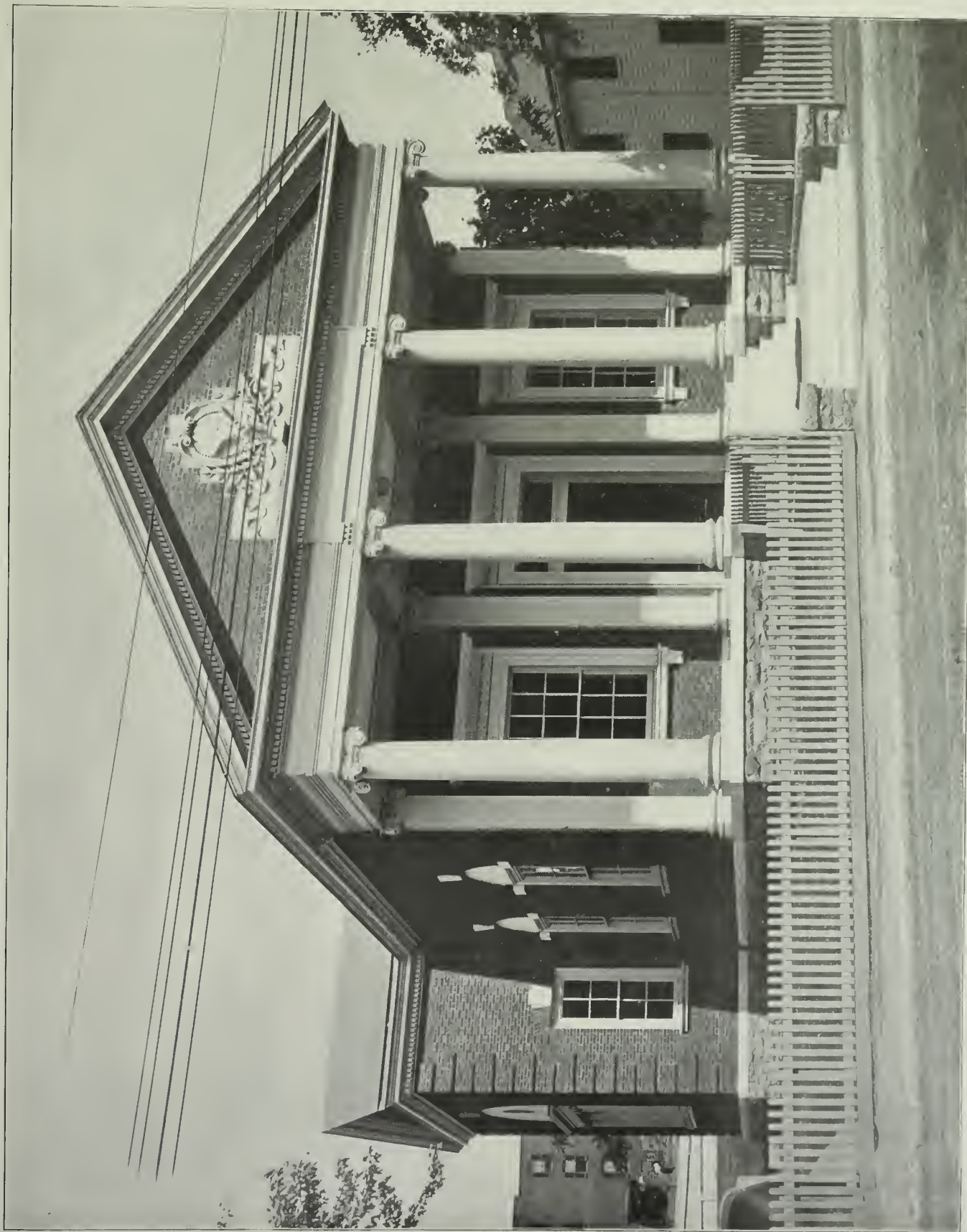
LIBRARY OF THE NEW YORK UNIVERSITY. NEW YORK, N. Y.
MCKIM, MEAD & WHITE, ARCHITECTS.



LIBRARY OF THE NEW YORK UNIVERSITY, NEW YORK N. Y.
MCKIM, MEAD & WHITE, ARCHITECTS.



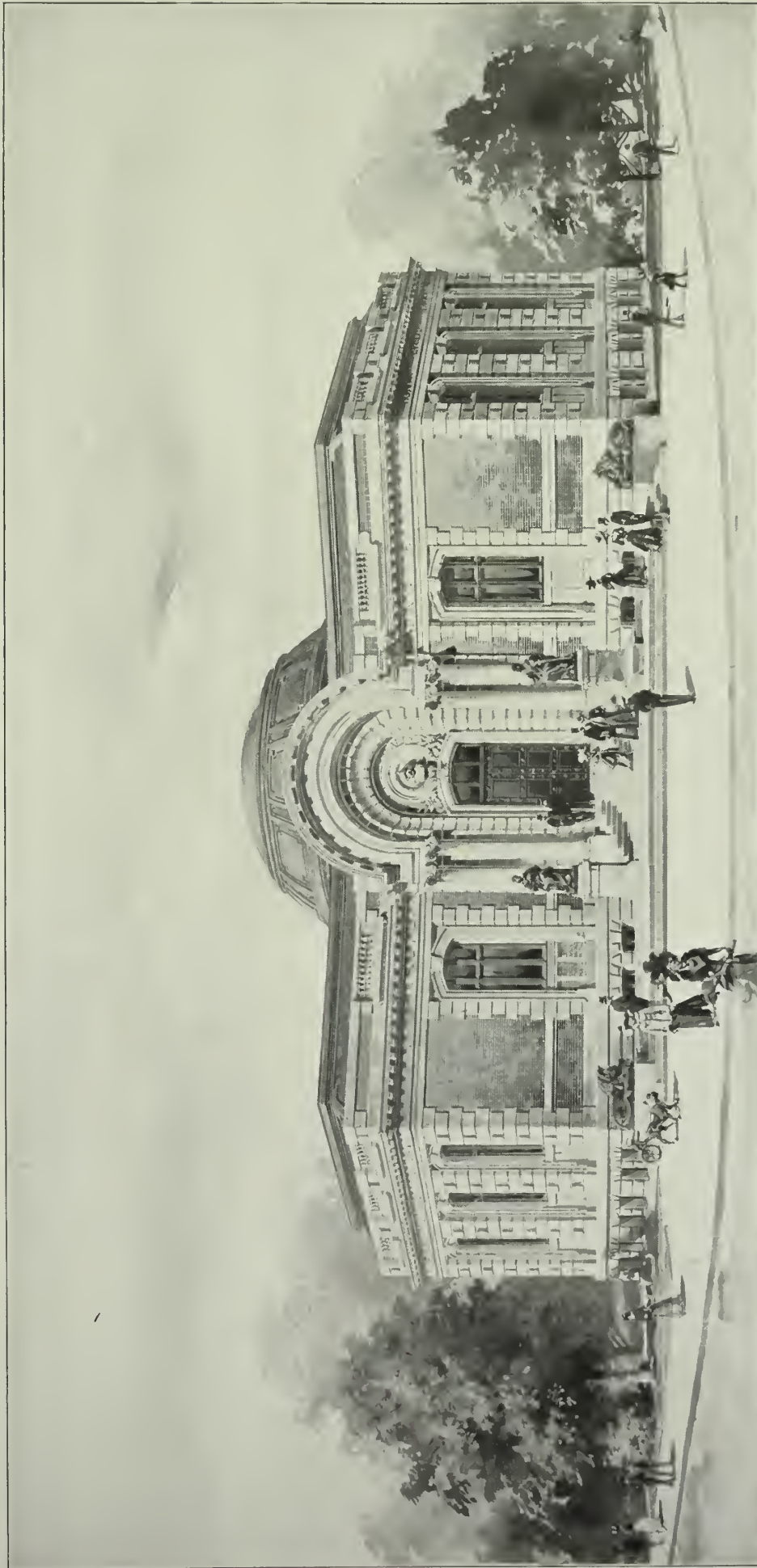
BOSTON MEDICAL LIBRARY, FENWAY, BOSTON, MASS.
SHAW & HUNNEWELL, ARCHITECTS.



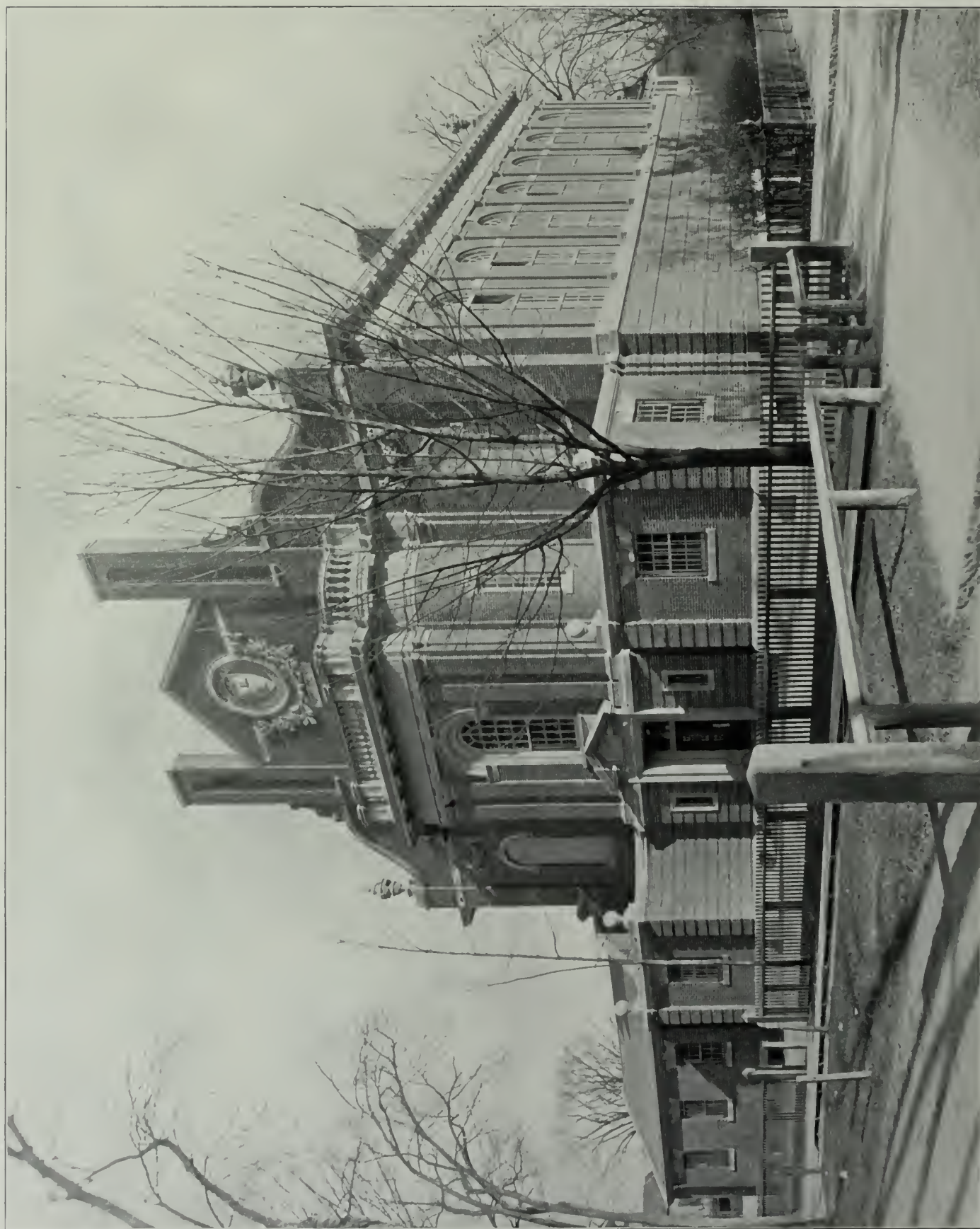
PRATT FREE LIBRARY. WOODBERRY. MD
JOSEPH EVANS SPERRY, ARCHITECT.



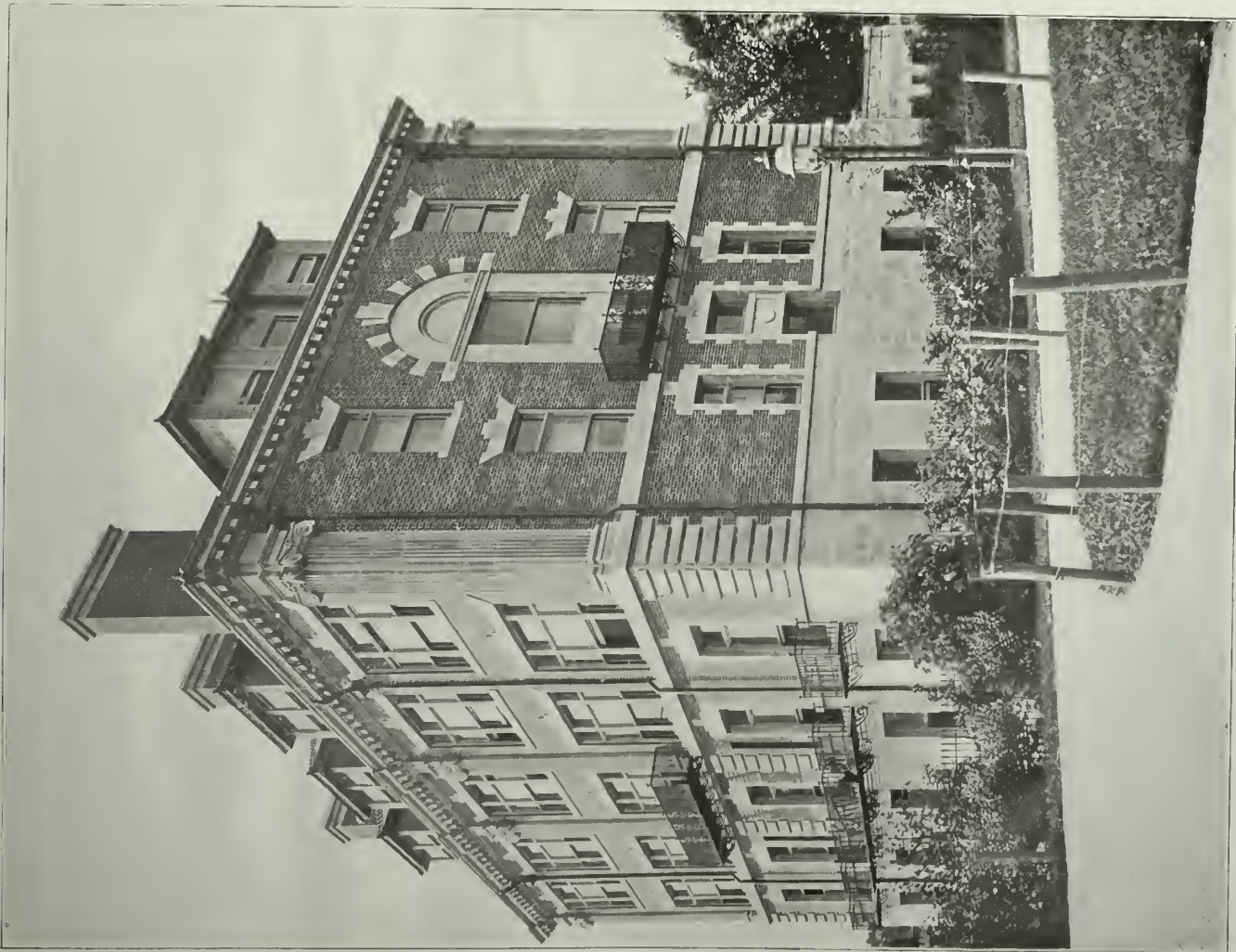
ACCEPTED DESIGN, FREE PUBLIC LIBRARY, EAST ORANGE, N. J.
JARDINE, KENT & JARDINE, ARCHITECTS.



FIRST PRIZE DESIGN. FREE PUBLIC LIBRARY, EAST ORANGE, N. J.
ACKERMAN & ROSS, ARCHITECTS.



RANDALL DINING HALL, HARVARD UNIVERSITY, CAMBRIDGE, MASS.
WHEELWRIGHT & HAVEN, ARCHITECTS.



STILLMAN INFIRMARY, FOR HARVARD UNIVERSITY.
SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS.



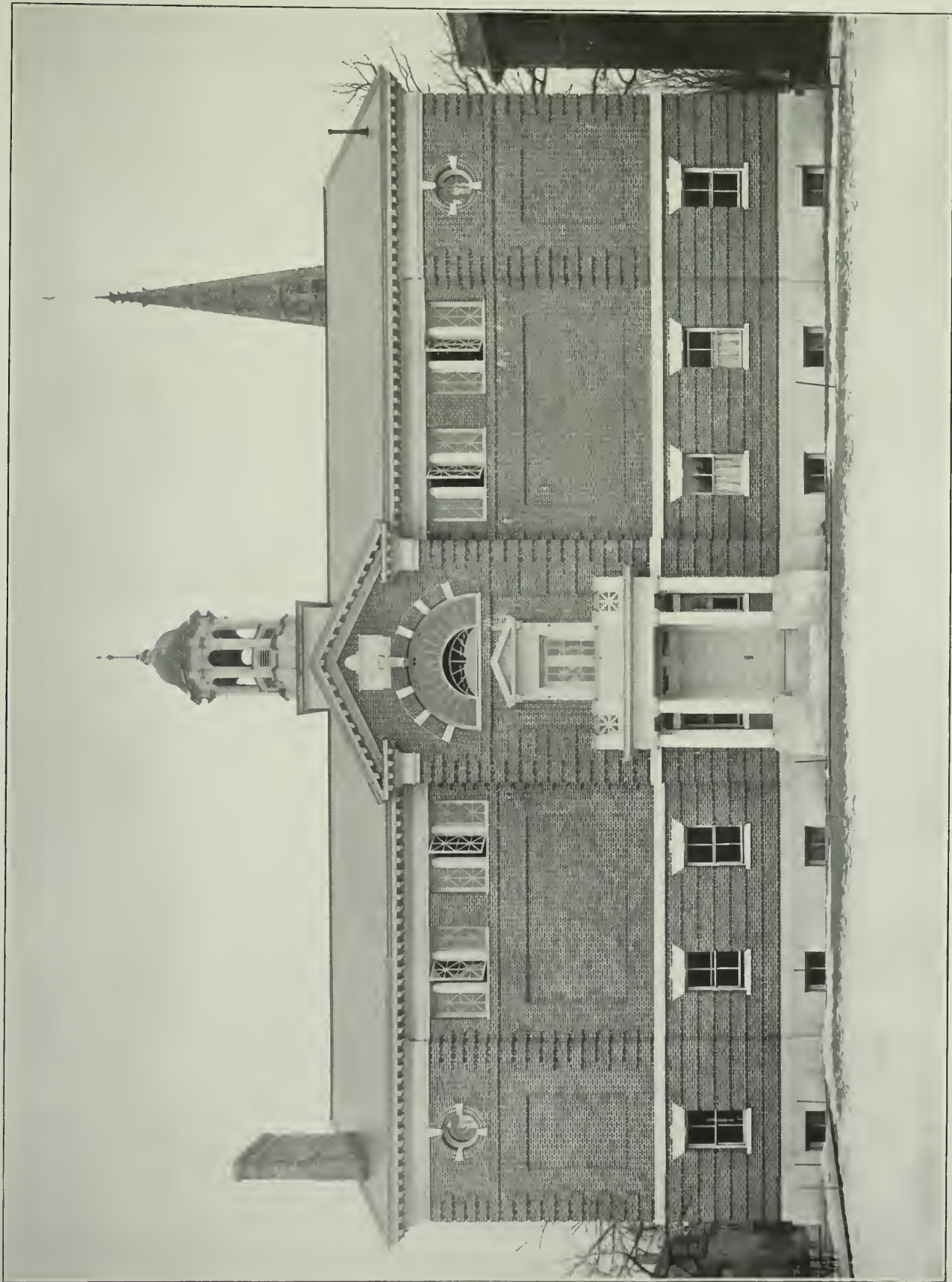
PHILLIPS BROOKS HOUSE. HARVARD UNIVERSITY.
A. W. LONGFELLOW, ARCHITECT.



FRONT ELEVATION.
THE HARVARD UNION, HARVARD UNIVERSITY.
MCKIM, MEAD & WHITE, ARCHITECTS.



ARCHITECTURAL BUILDING. HARVARD UNIVERSITY
MCKIM, MEAD & WHITE, ARCHITECTS



GYMNASIUM, RADCLIFFE COLLEGE, CAMBRIDGE, MASS.
MCKIM, MEAD & WHITE, ARCHITECTS.



THE MCKEAN MEMORIAL GATE. HARVARD UNIVERSITY.



MEMORIAL GATE. CLASS OF 1877. HARVARD UNIVERSITY.
MCKIM, MEAD & WHITE, ARCHITECTS.



MEMORIAL GATE, CLASS OF 1875. HARVARD UNIVERSITY.



MEMORIAL GATE CLASS OF 1857, HARVARD UNIVERSITY.

MCKIM, MEAD & WHITE, ARCHITECTS.



ENTRANCE GATES. HOUSE AT BUFFALO. N. Y.
GREEN & WICKS, ARCHITECTS.



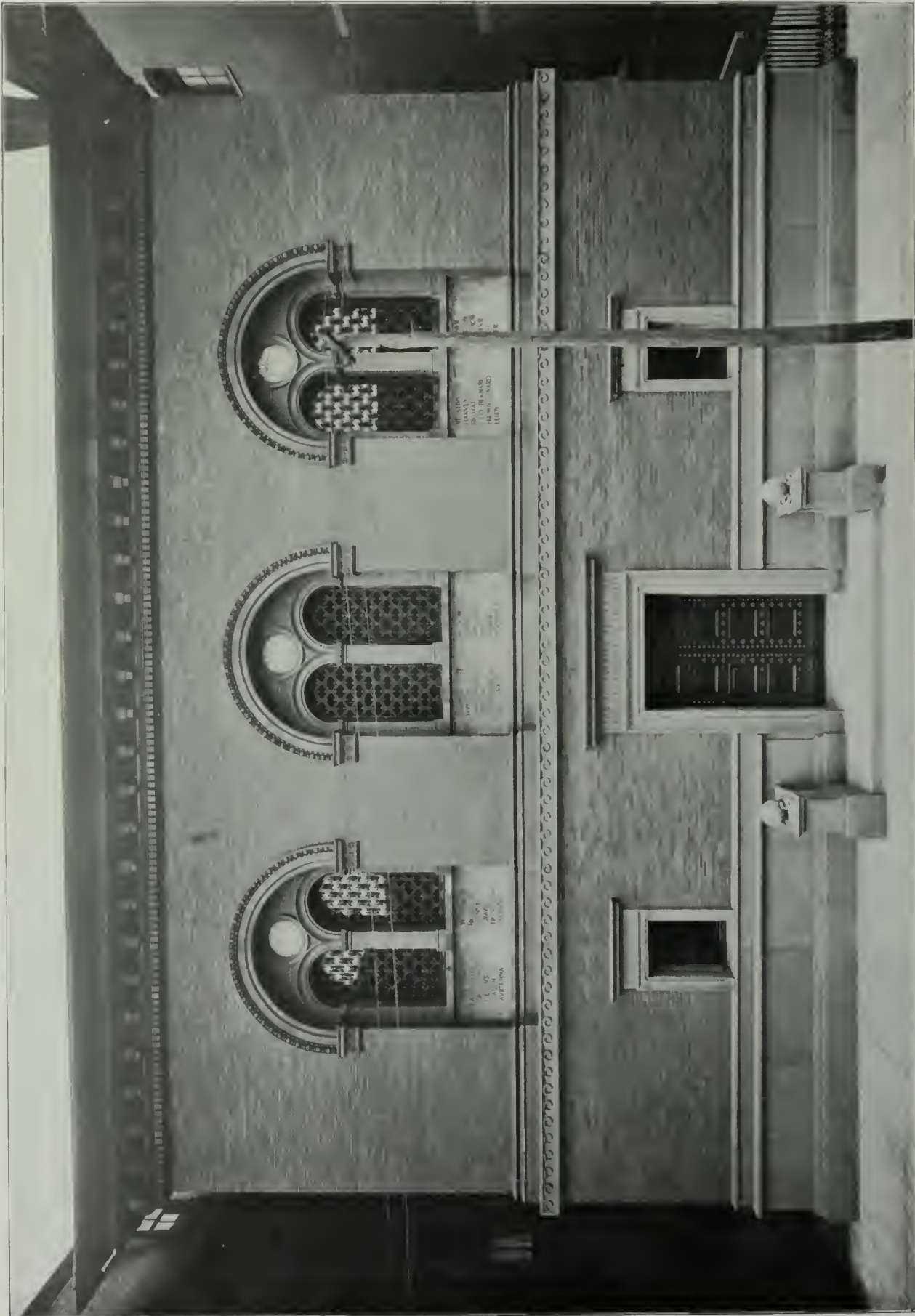
DORMITORY, THOMAS ORPHAN ASYLUM FOR INDIAN CHILDREN. IROQUOIS, N. Y.
BARNEY & CHAPMAN, ARCHITECTS.



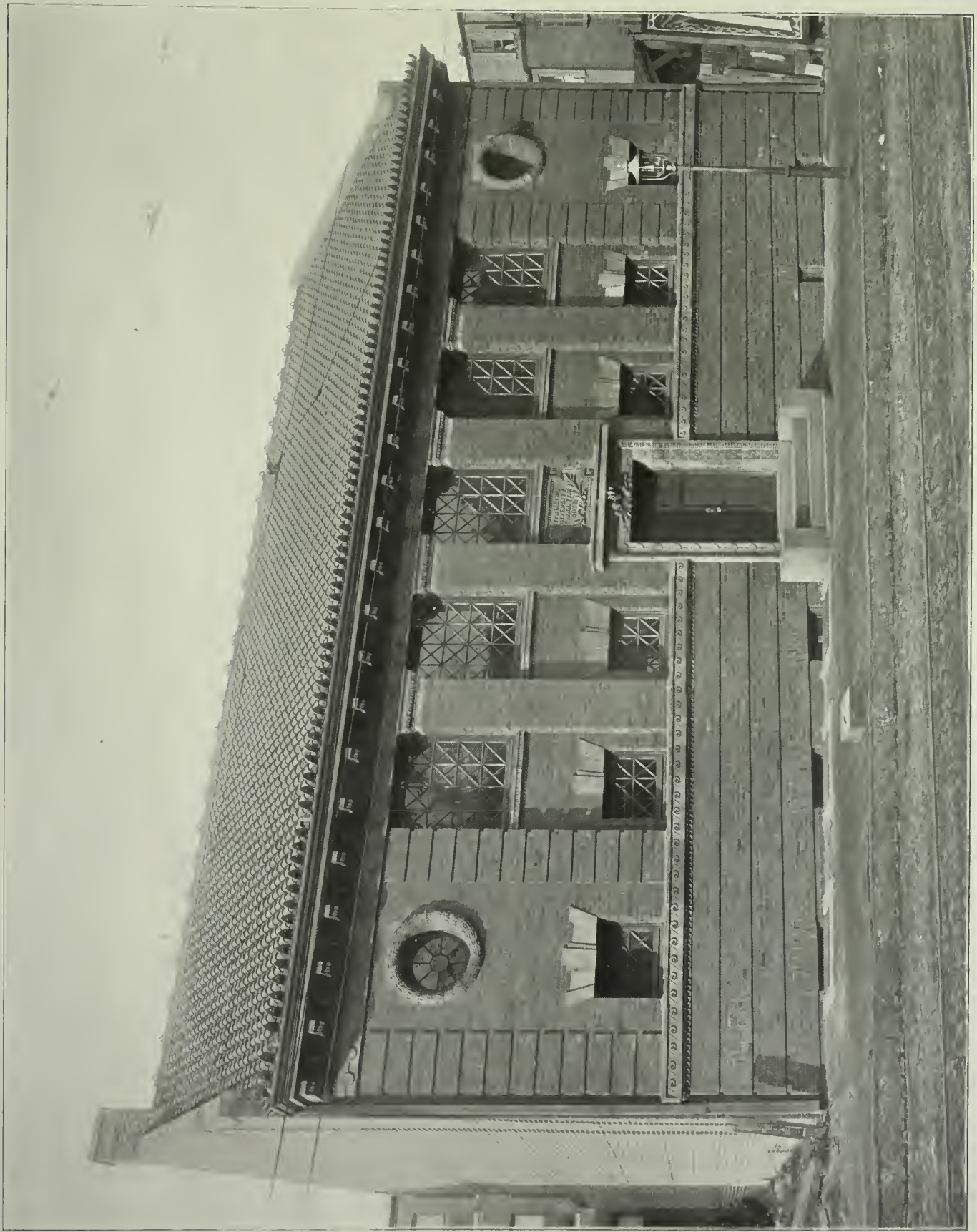
ADMINISTRATION BUILDING, THOMAS ORPHAN ASYLUM FOR INDIAN CHILDREN. IROQUOIS, N. Y.
BARNEY & CHAPMAN, ARCHITECTS.



LIBRARY FOR THE NEW BRITAIN INSTITUTE, NEW BRITAIN CONN
DAVIS & BROOKS, ARCHITECTS.



CLINICAL AMPHITHEATRE OF THE MEDICO CHIRURGICAL HOSPITAL, PHILADELPHIA, PA.
FRANK MILES DAY & BRO., ARCHITECTS.

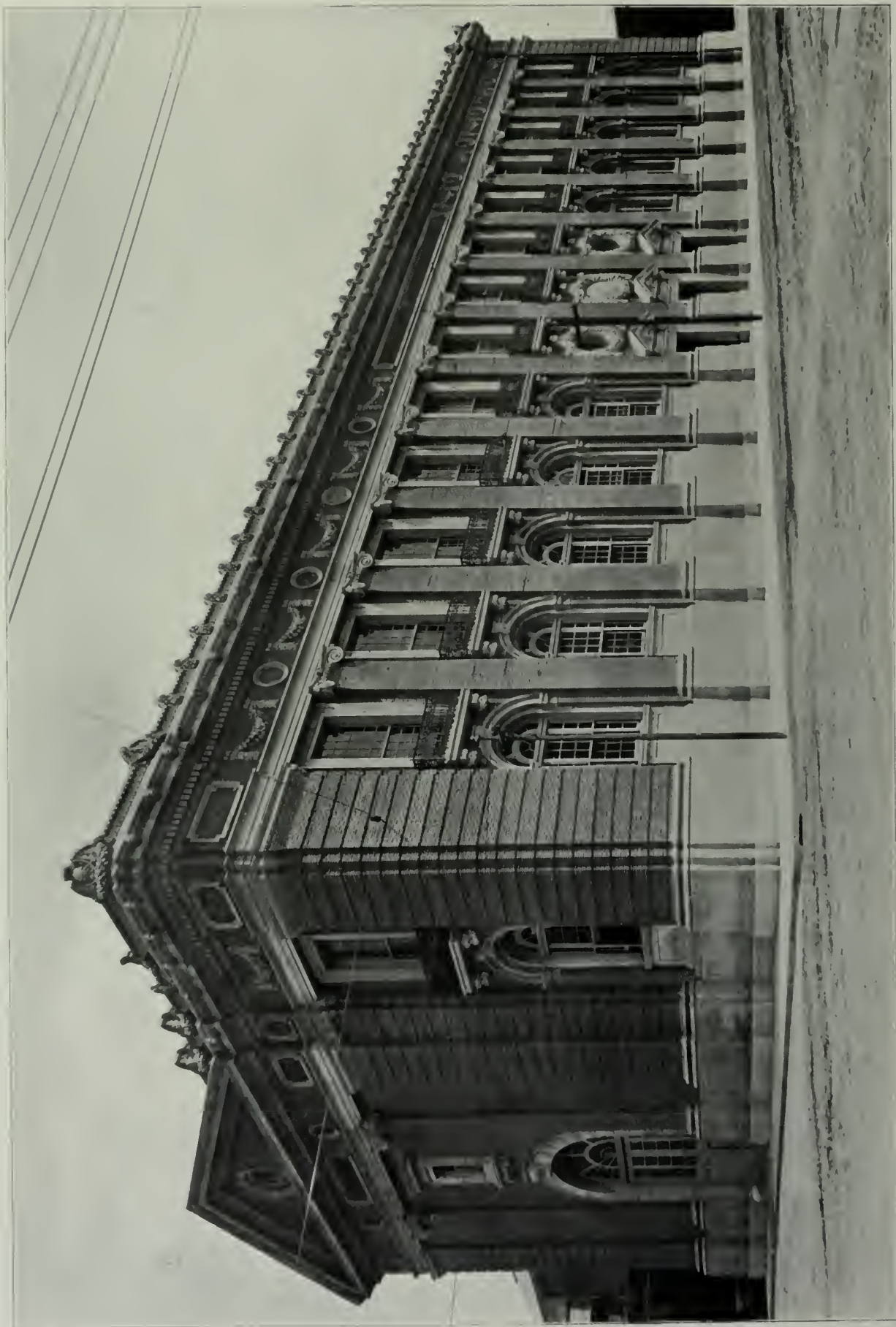


GYMNASIUM, UNIVERSITY SCHOOL FOR BOYS, BALTIMORE, MD.
JOSEPH EVANS SPERRY, ARCHITECT.



MIDDLESEX COUNTY REGISTRY OF DEEDS AND PROBATE COURT. EAST CAMBRIDGE, MASS.
OLIN W. CUTTER, ARCHITECT.





HORTICULTURAL HALL, BOSTON, MASS.
WHEELWRIGHT & HAVEN, ARCHITECTS.



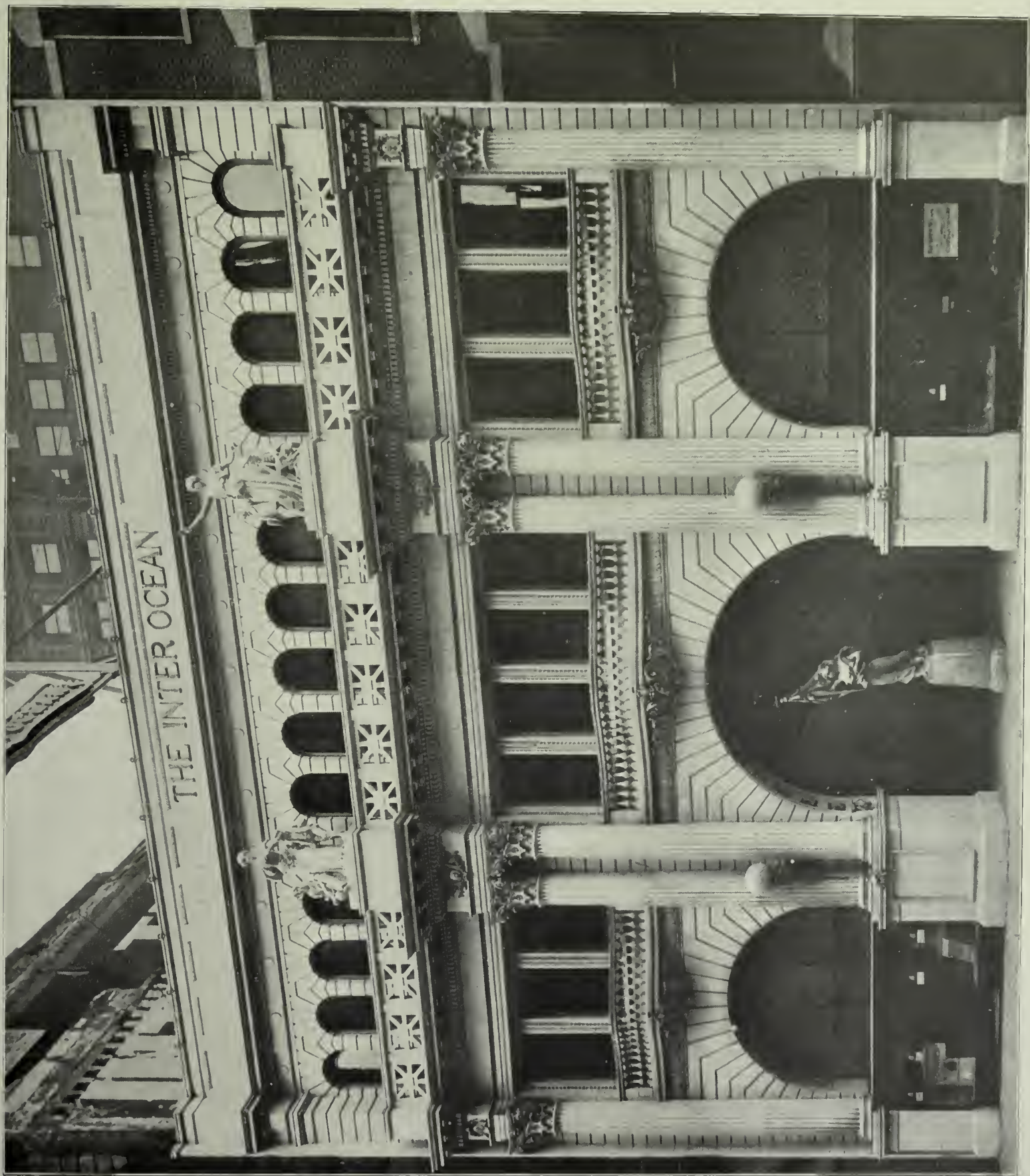
AN INTERIOR VIEW, HORTICULTURAL HALL. BOSTON, MASS.
WHEELWRIGHT & HAVEN, ARCHITECTS.



NEW CHICKERING HALL, BOSTON. MASS.

(ENTIRE FRONT OF TERRA-COTTA.)

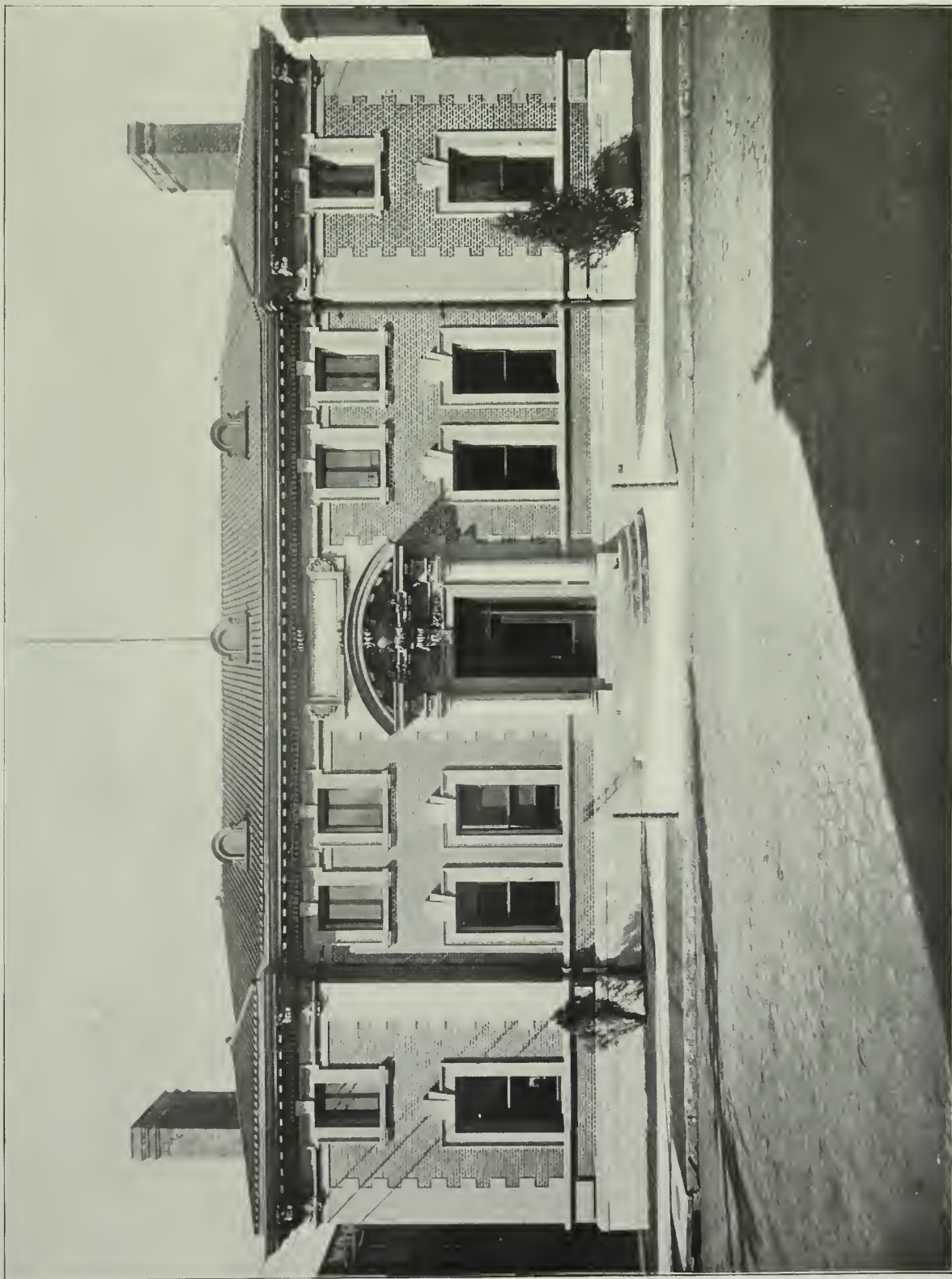
PEABODY & STEARNS, ARCHITECTS.



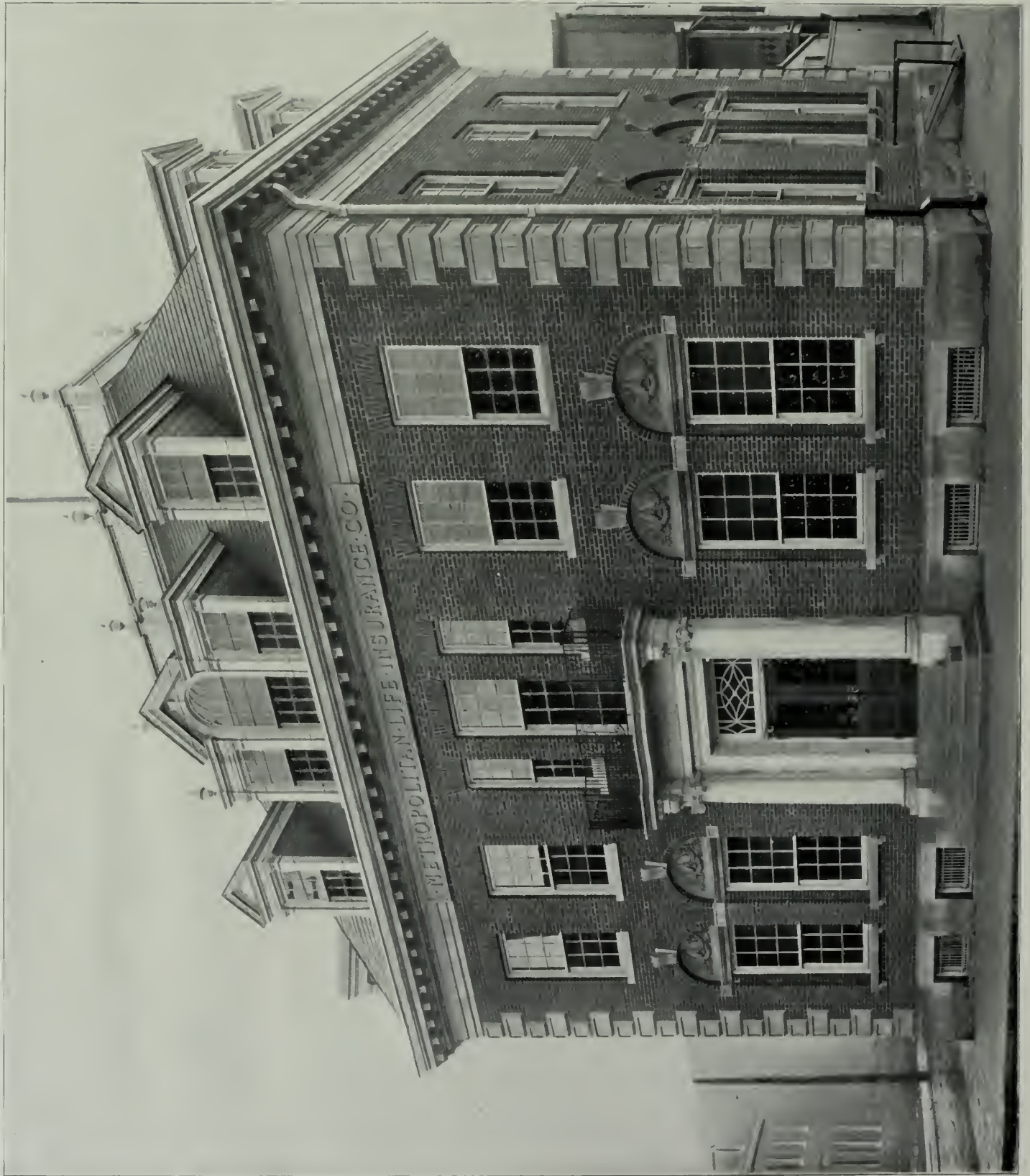
THE INTER OCEAN BUILDING, CHICAGO, ILL.
(ENTIRE FRONT OF WHITE ENAMELED TERRAZZOTA)
W. CARBYS ZIMMERMAN, ARCHITECT.



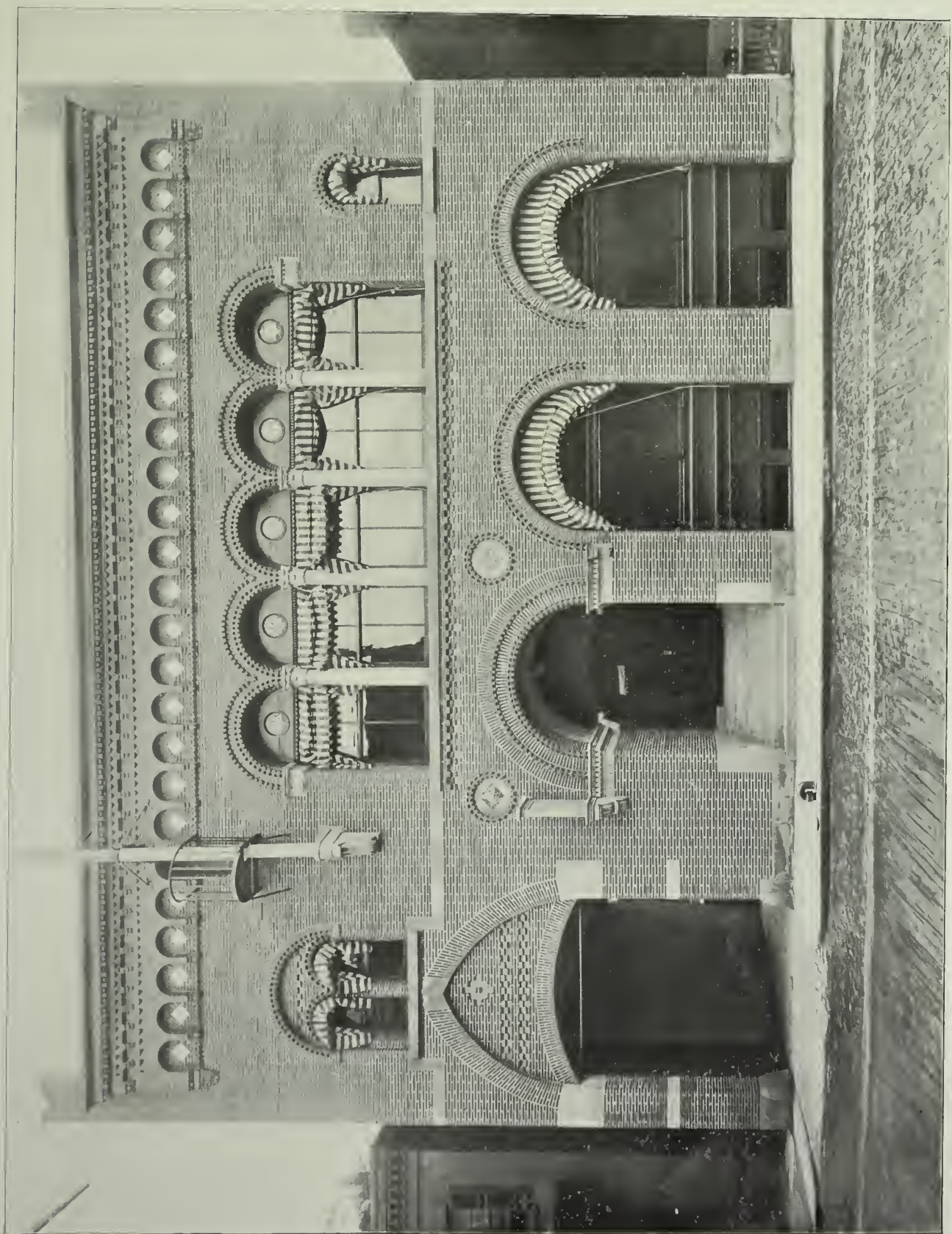
ENTRANCE TO THE INTER OCEAN BUILDING. CHICAGO ILL.
W. CARBYS ZIMMERMAN, ARCHITECT.



OFFICE BUILDING FOR BERRY BROS., DETROIT, MICH.
GEORGE D. MASON, ARCHITECT.



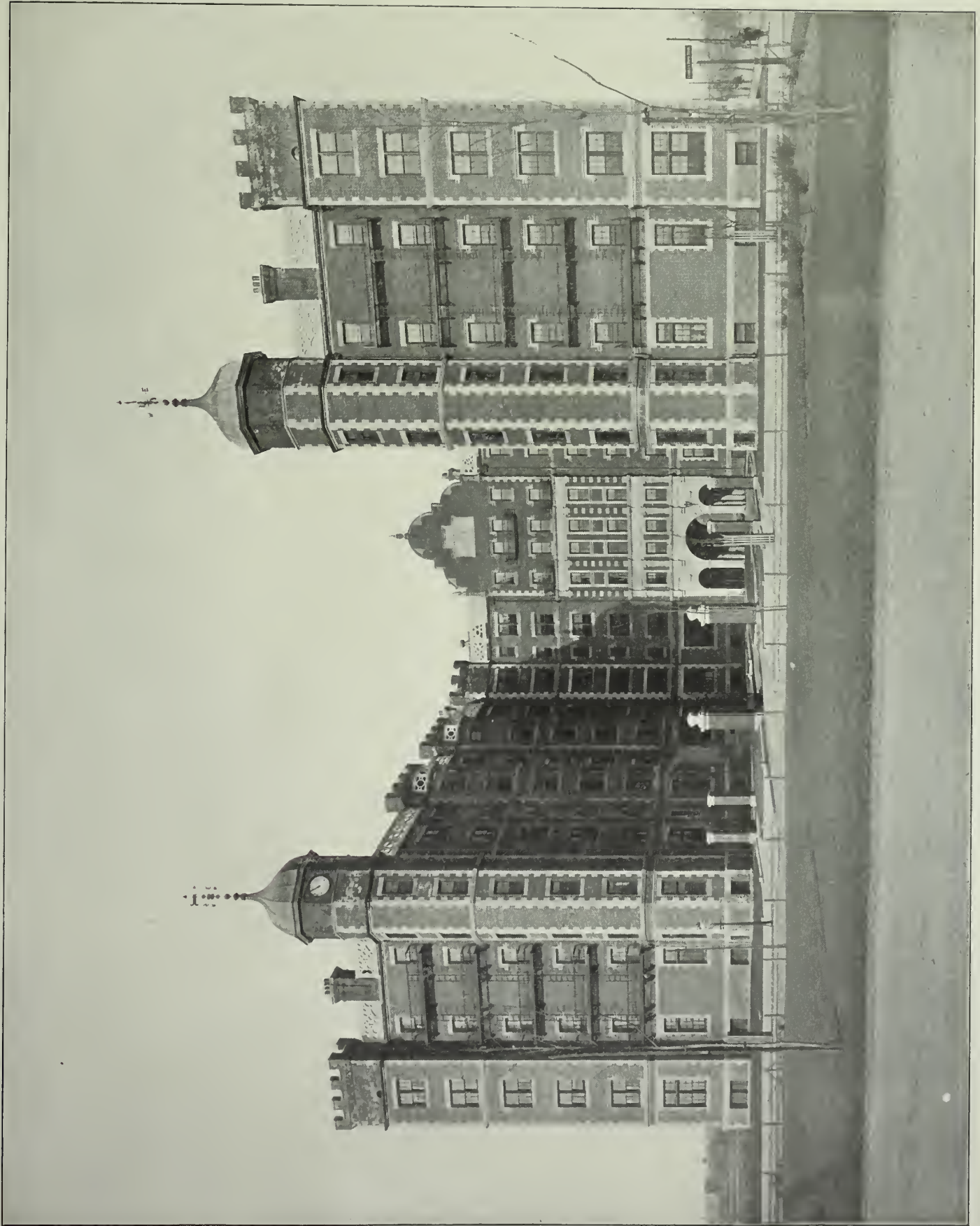
METROPOLITAN LIFE INSURANCE BUILDING BALTIMORE, MD
N. LE BRUN & SONS, ARCHITECTS.



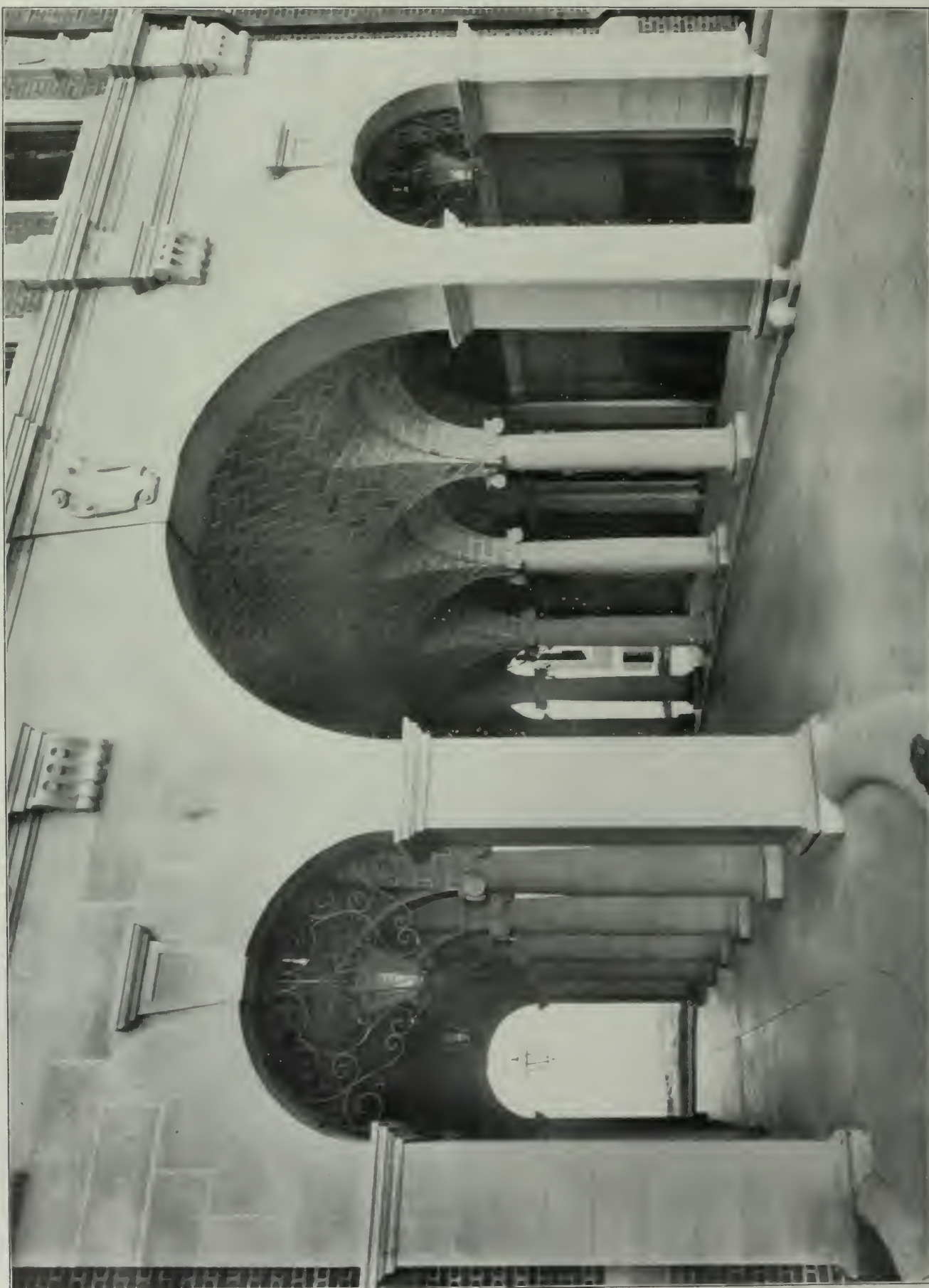
TELEPHONE BUILDING, ROCHESTER, N. Y.
J. FOSTER WARNER, ARCHITECT.



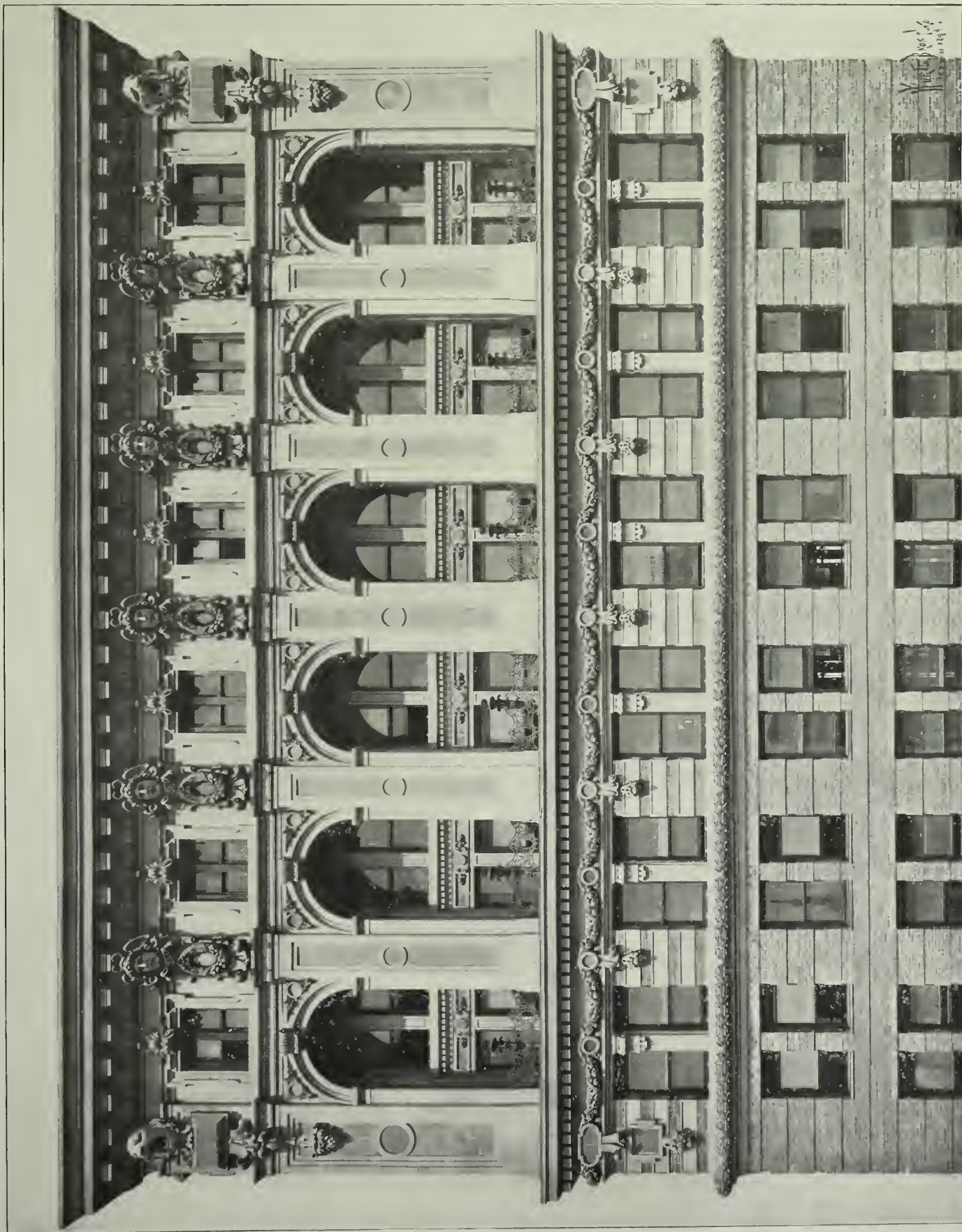
ENTIRE FRONT OF TERRA-COTTA.
TELEPHONE BUILDING, ROCHESTER, N. Y.
FOX & JENNY AND A. J. WARNER & Co., ASSOCIATE ARCHITECTS.



RIVERBANK COURT. CAMBRIDGE. MASS.
HENRY B. BALL, H. E. DAVIDSON, ASSOCIATE ARCHITECTS.



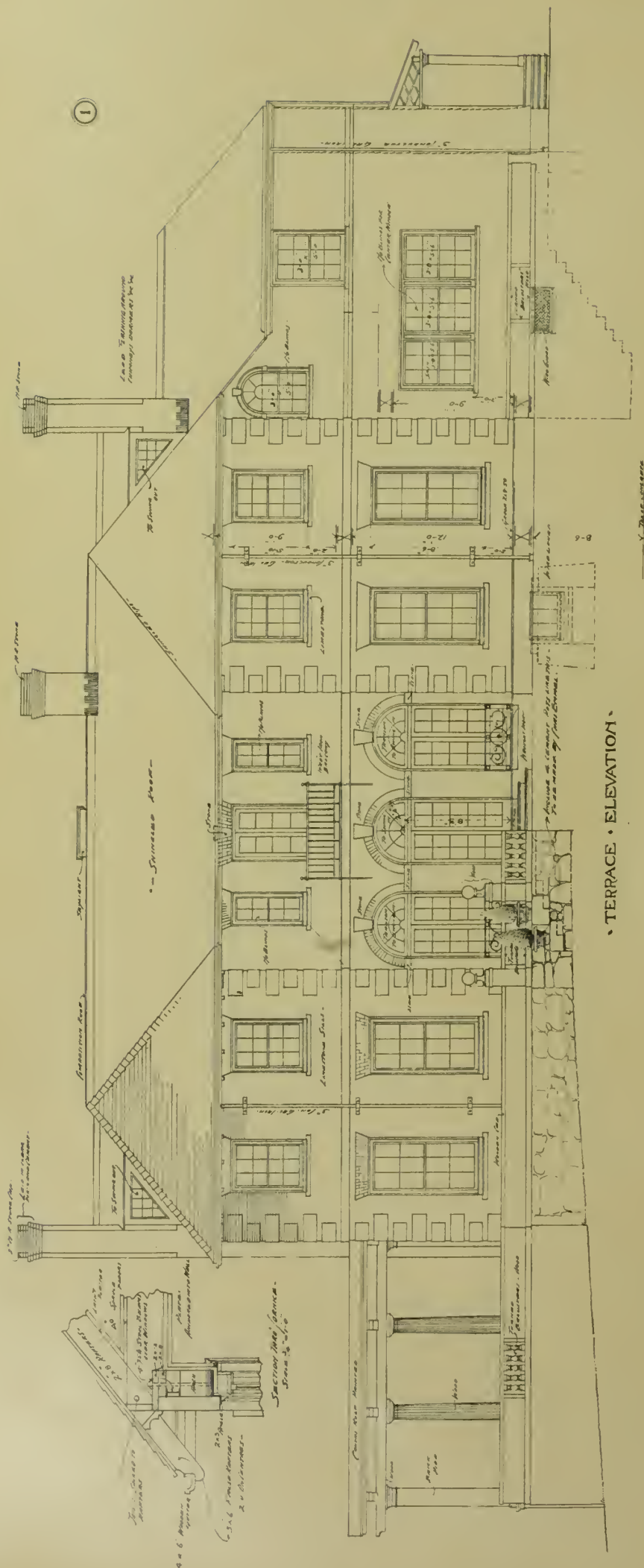
ENTRANCE, RIVERBANK COURT, CAMBRIDGE, MASS.
HENRY B. BAL, H. E. DAVENSON, ASSOCIATE ARCHITECTS.



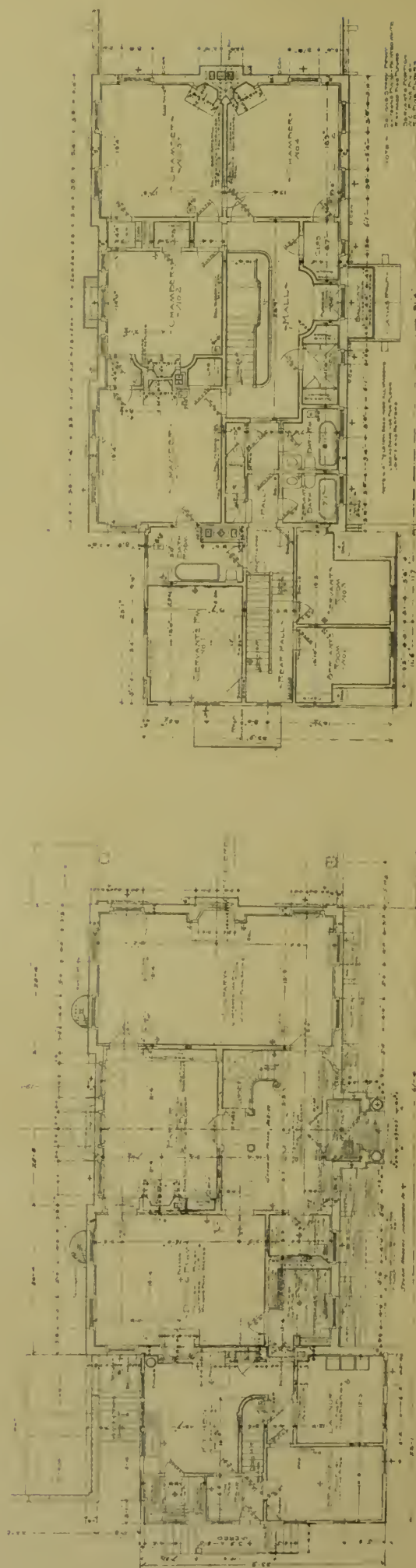
UPPER STORIES. BROADWAY CHAMBERS. NEW YORK. N. Y.
CASS GILBERT, ARCHITECT.



ENTRANCE TO THE ANNAPOLIS, MD., POST OFFICE
JAMES KNOX TAYLOR, SUPERVISING ARCHTCT.



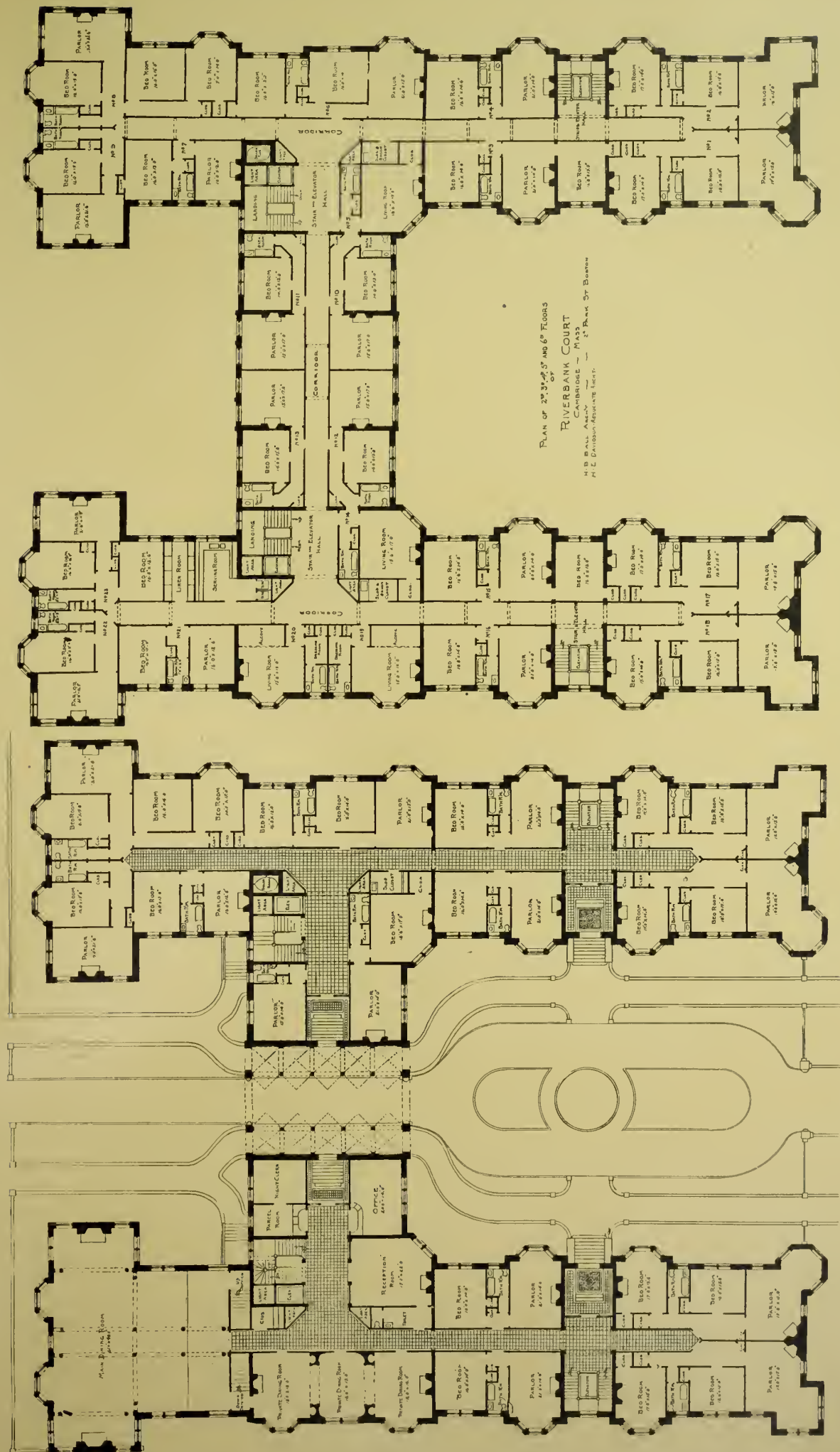
TERRACE • ELEVATION.



FIRST FLOOR.

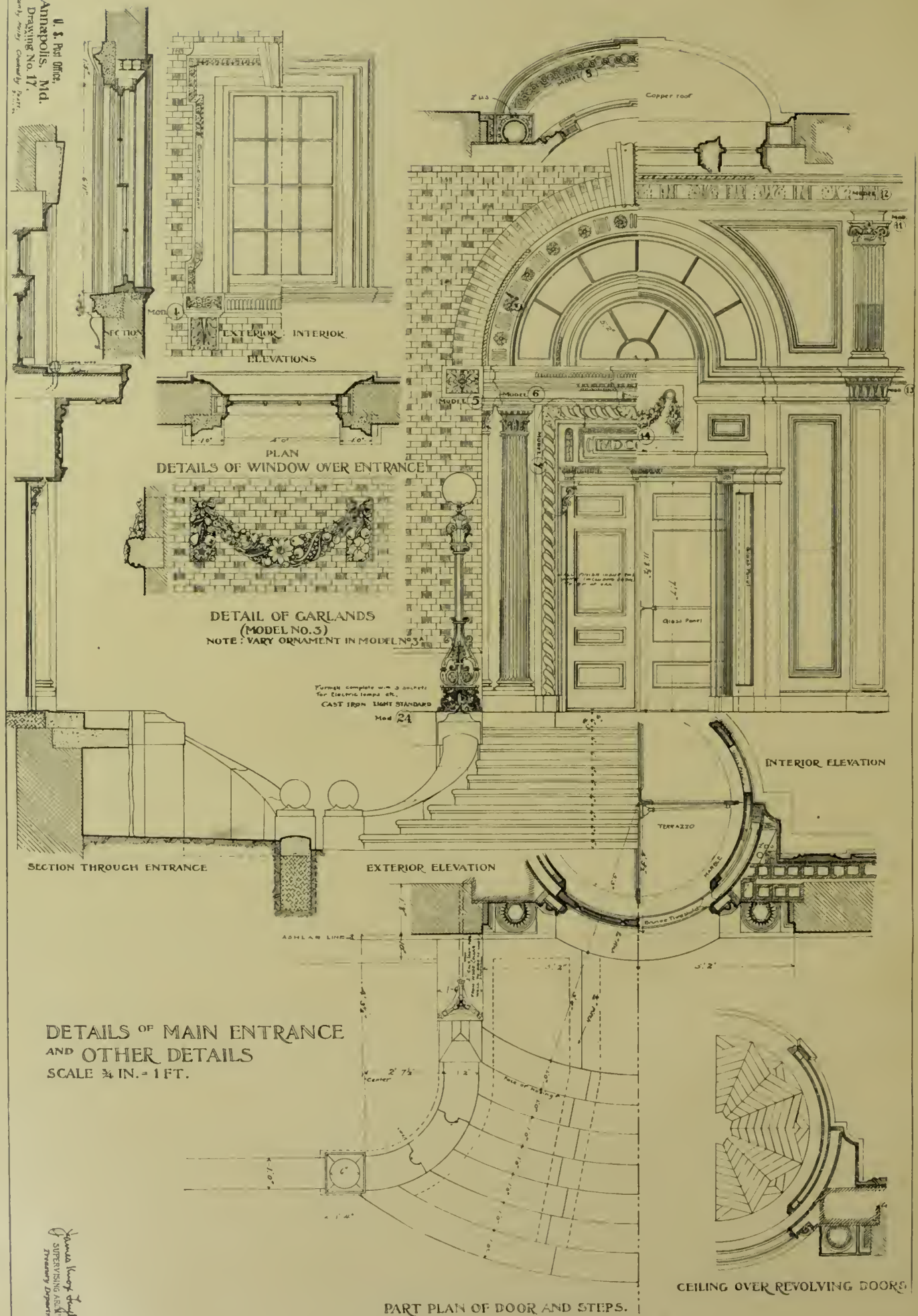
SECOND FLOOR.

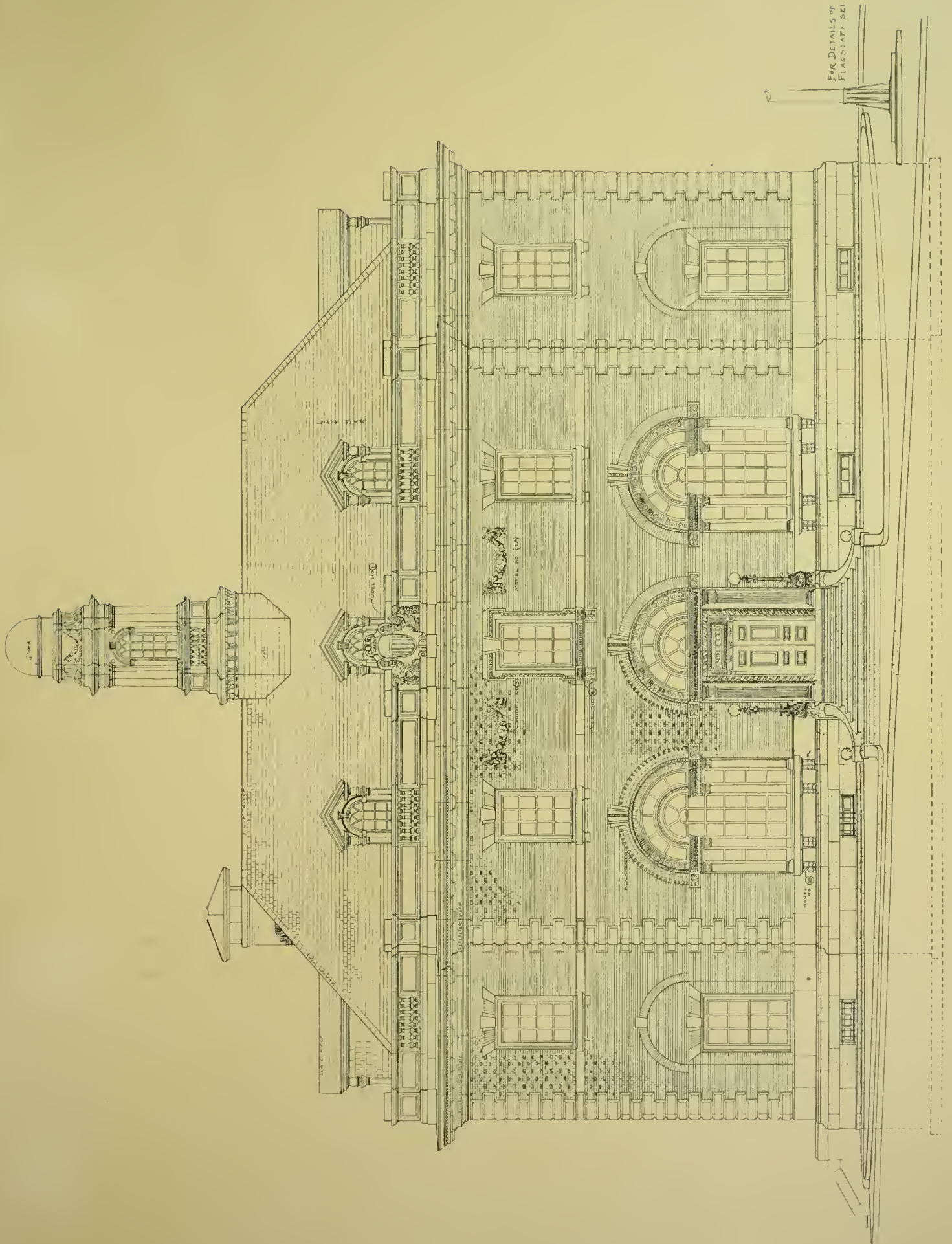
HOUSE AT BROOKLINE. MASS.
WINSLOW & BIGELOW, ARCHITECTS.



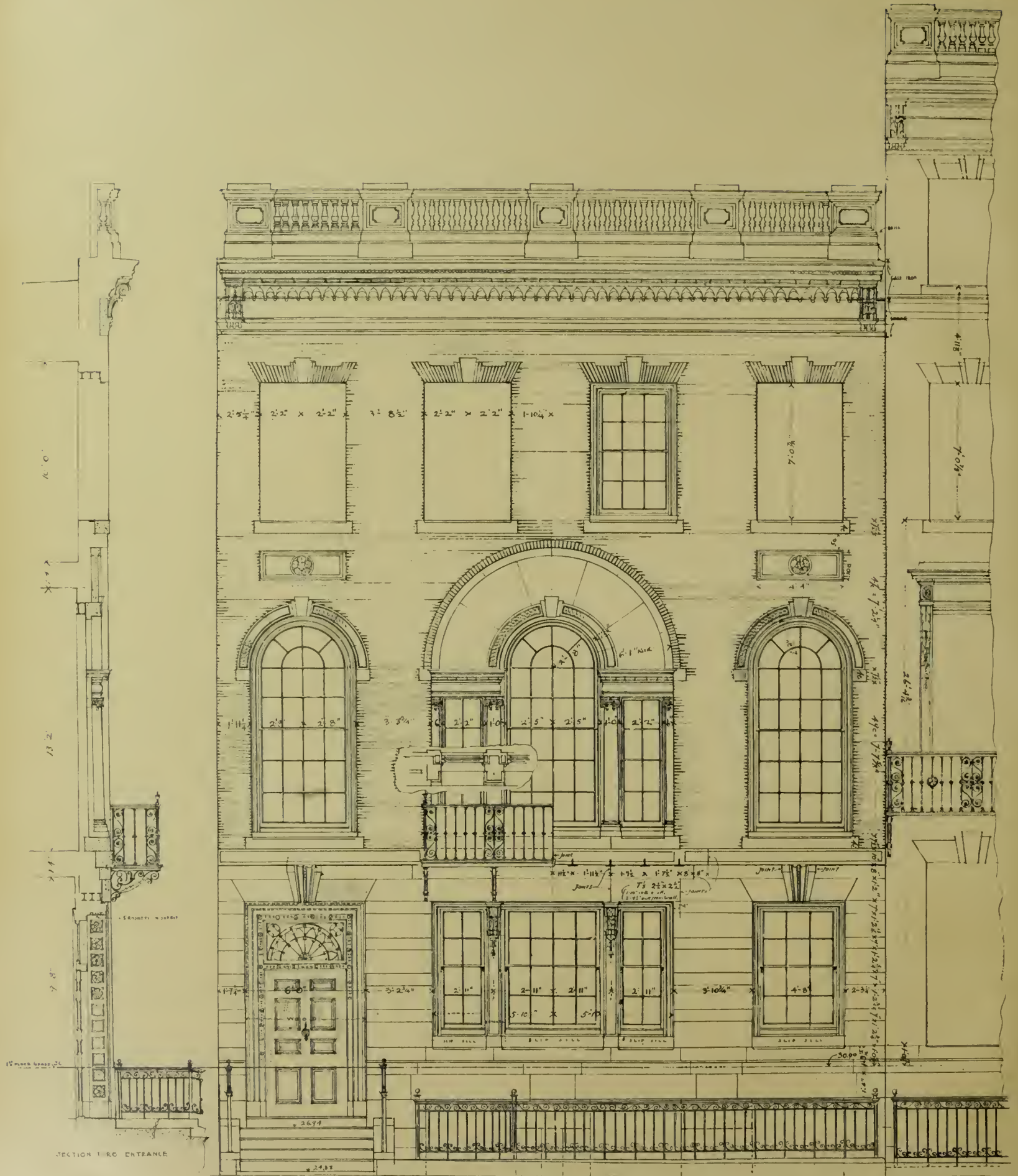
PLANS, RIVERBANK COURT, CAMBRIDGE, MASS.
BALL & DAVIDSON, ARCHITECTS.

U. S. Pat. Off.
Annapolis, Md.
Drawing No. 17.
Copyright, 1901, by James Knox Taylor.





POST-OFFICE BUILDING, ANNAPOLIS, MD.
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.



HOUSE FOR ROBERT S. PEABODY, ESQ. FENWAY, BOSTON, MASS.

PEABODY & STEARNS, ARCHITECTS.

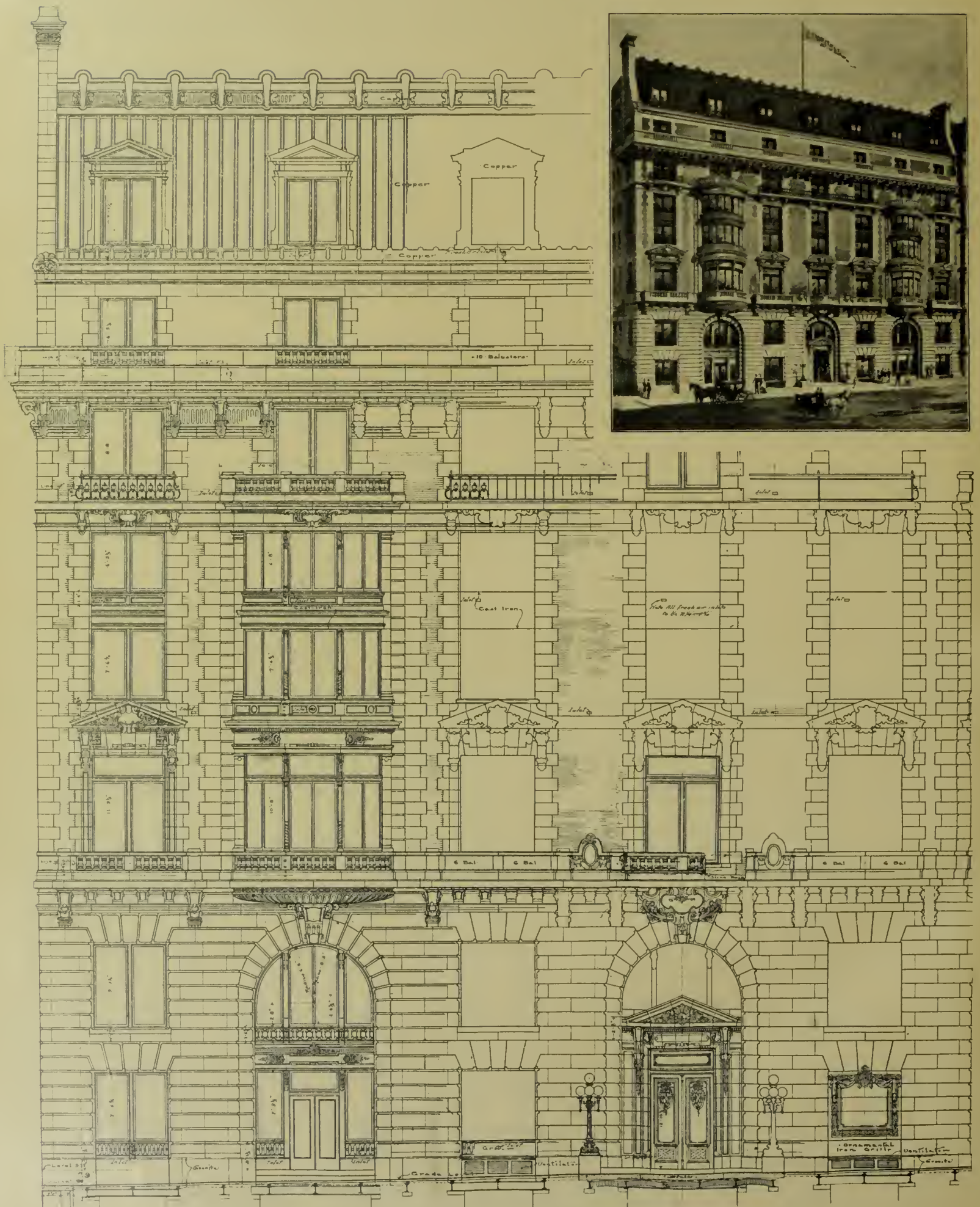
PLATE 6.





MARKET BUILDING
PEABODY & SONS



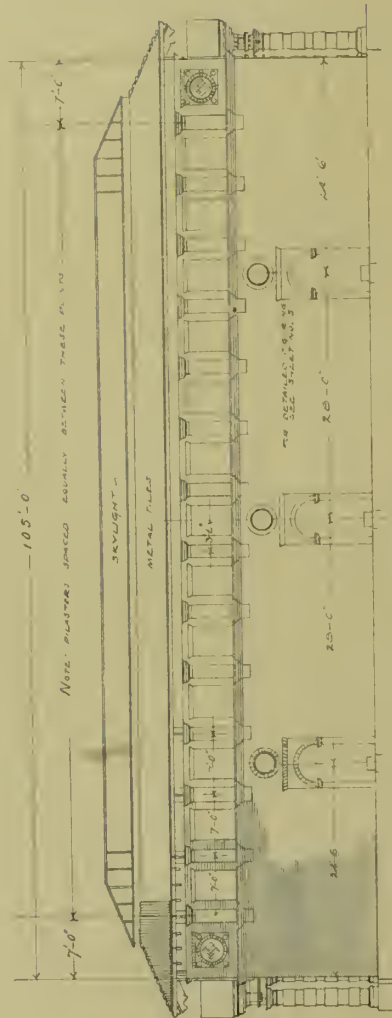


CONNECTICUT MUTUAL LIFE INSURANCE BUILDING. HARTFORD CONN.

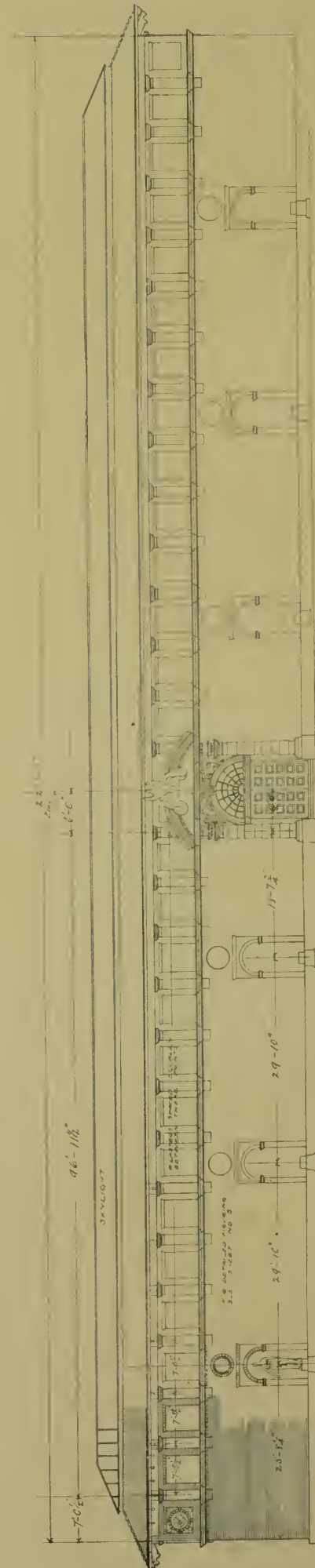
ERNEST FLAGG AND GEORGE M. BARTLETT, ASSOCIATE ARCHITECTS.



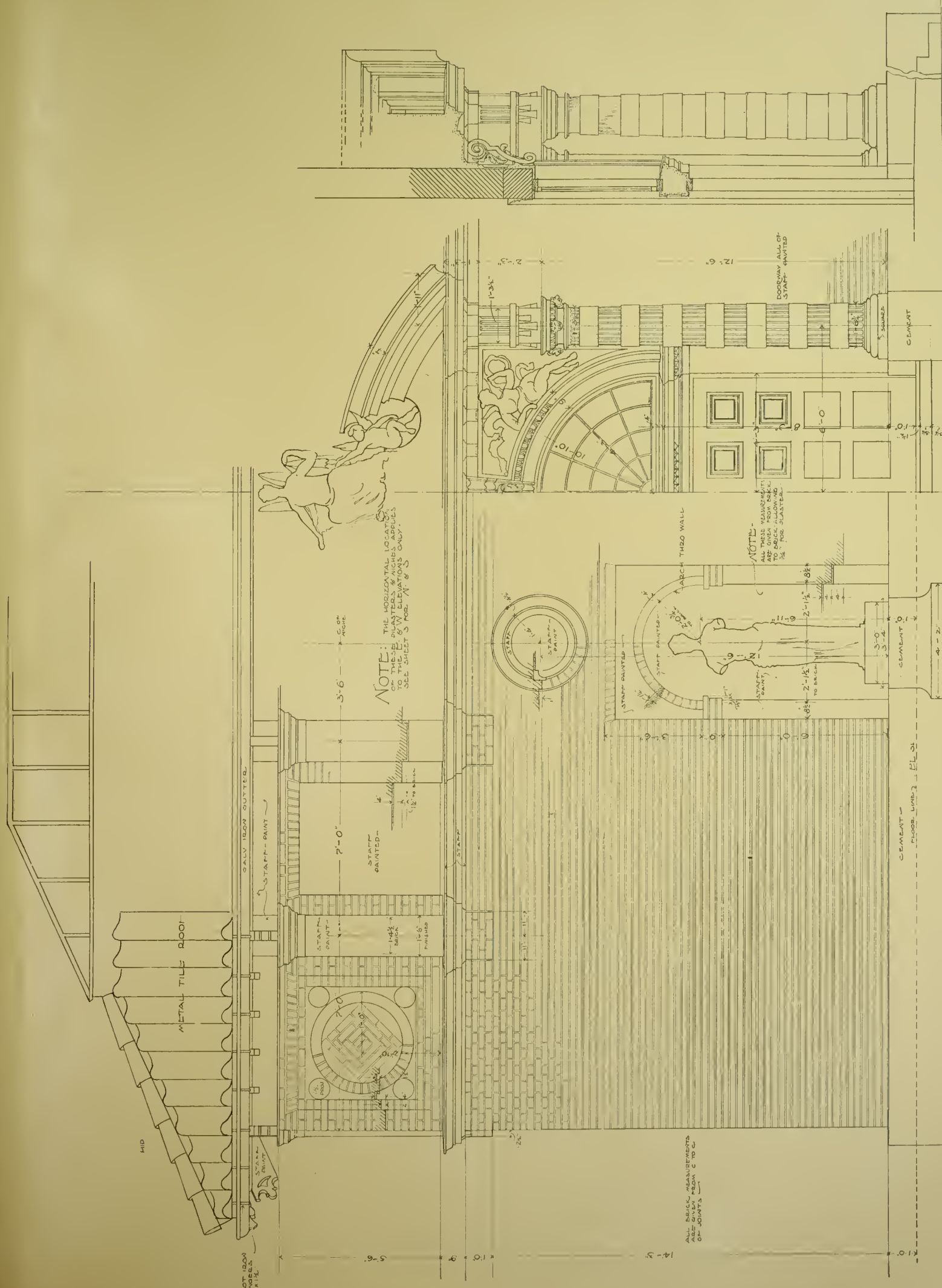




EAST & WEST ELEVATIONS

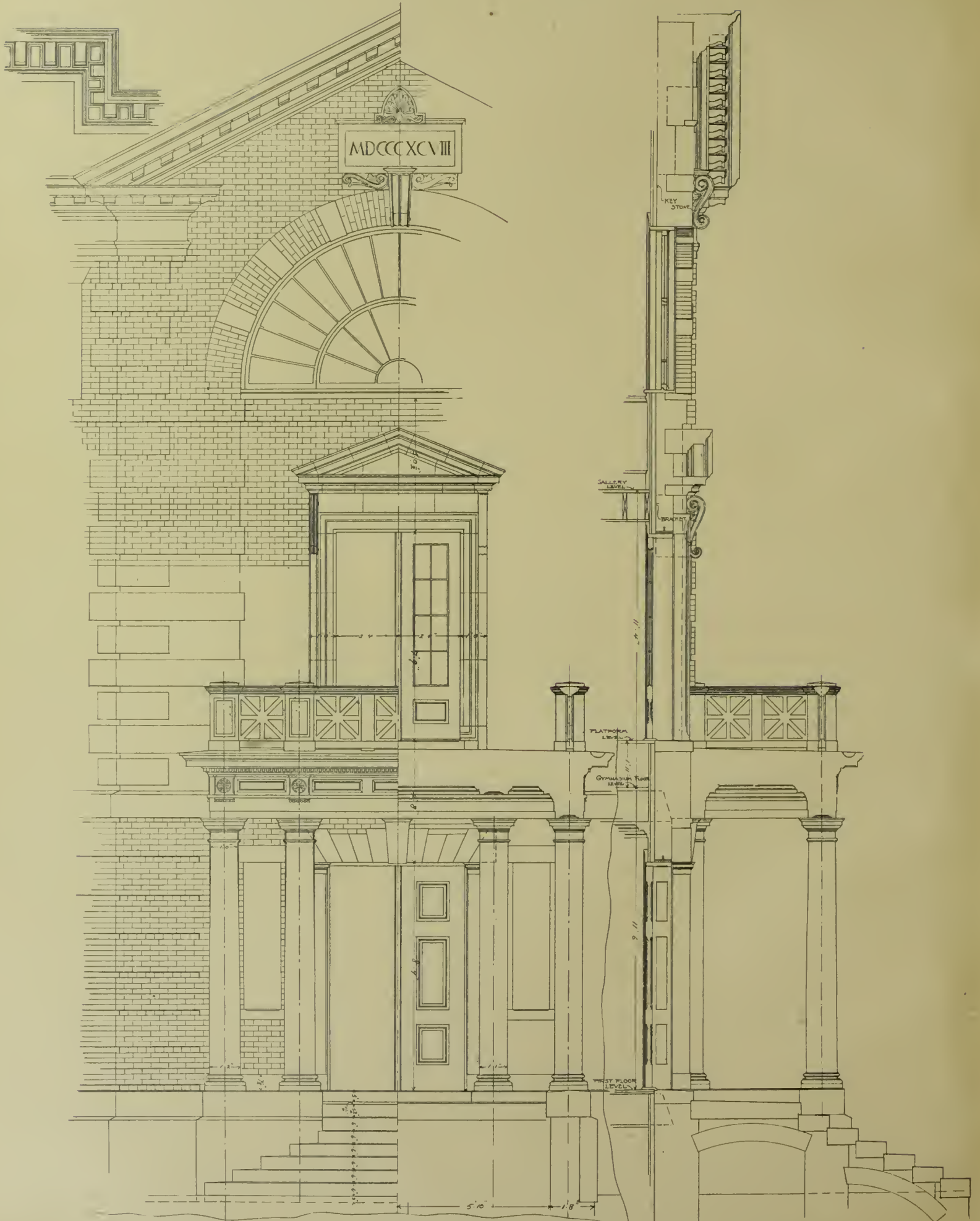


FIRE-PROOF ART GALLERY, PAN-AMERICAN EXPOSITION, BUFFALO, N. Y.
GREEN & WICKS, ARCHITECTS.



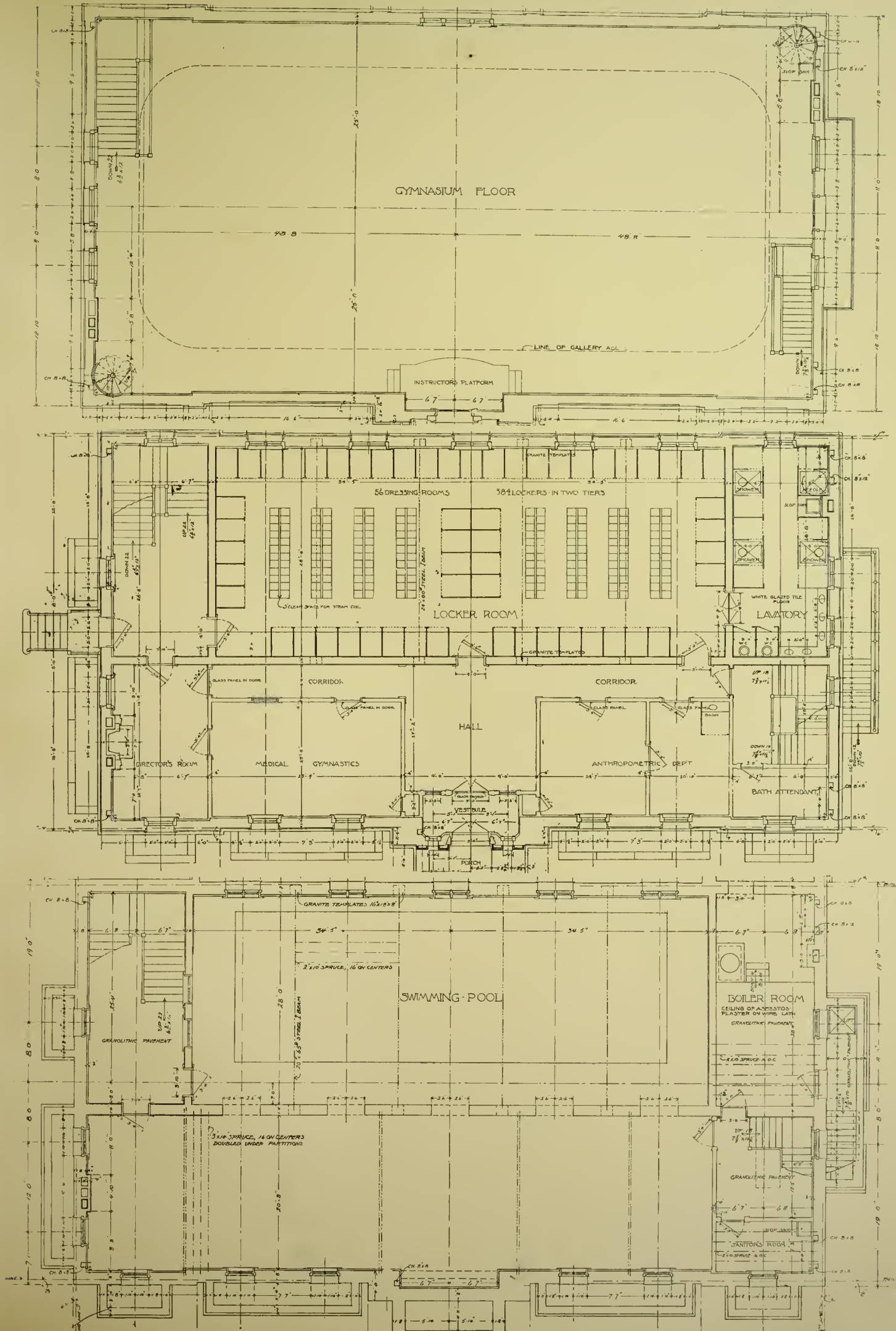
ELEVATION - DOORWAY SOUTH ENTRANCE - SECTION





DETAILS OF CENTRAL PAVILION, GYMNASIUM FOR RADCLIFFE COLLEGE, CAMBRIDGE, MASS.

MCKIM, MEAD & WHITE, ARCHITECTS.

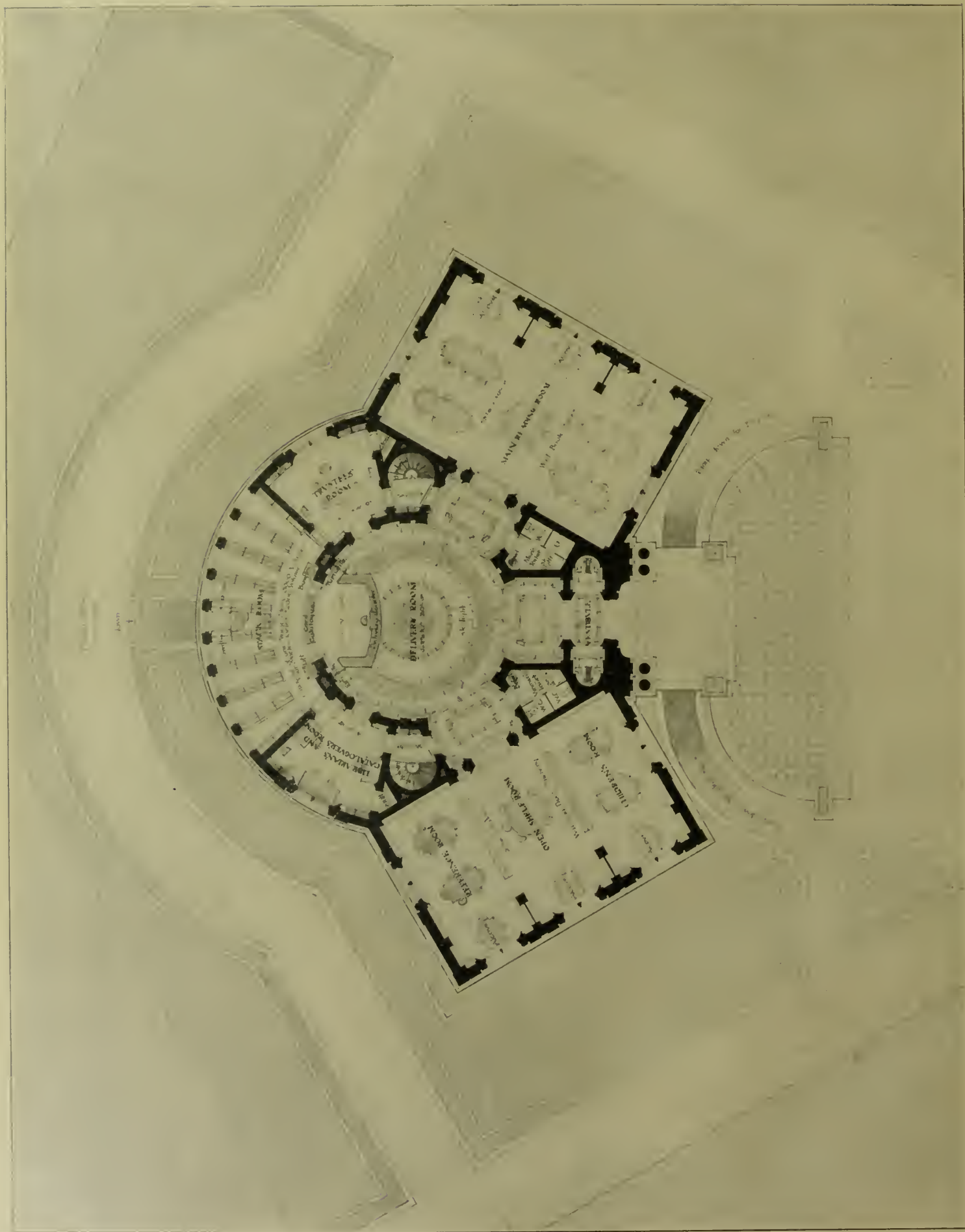


SECOND FLOOR.

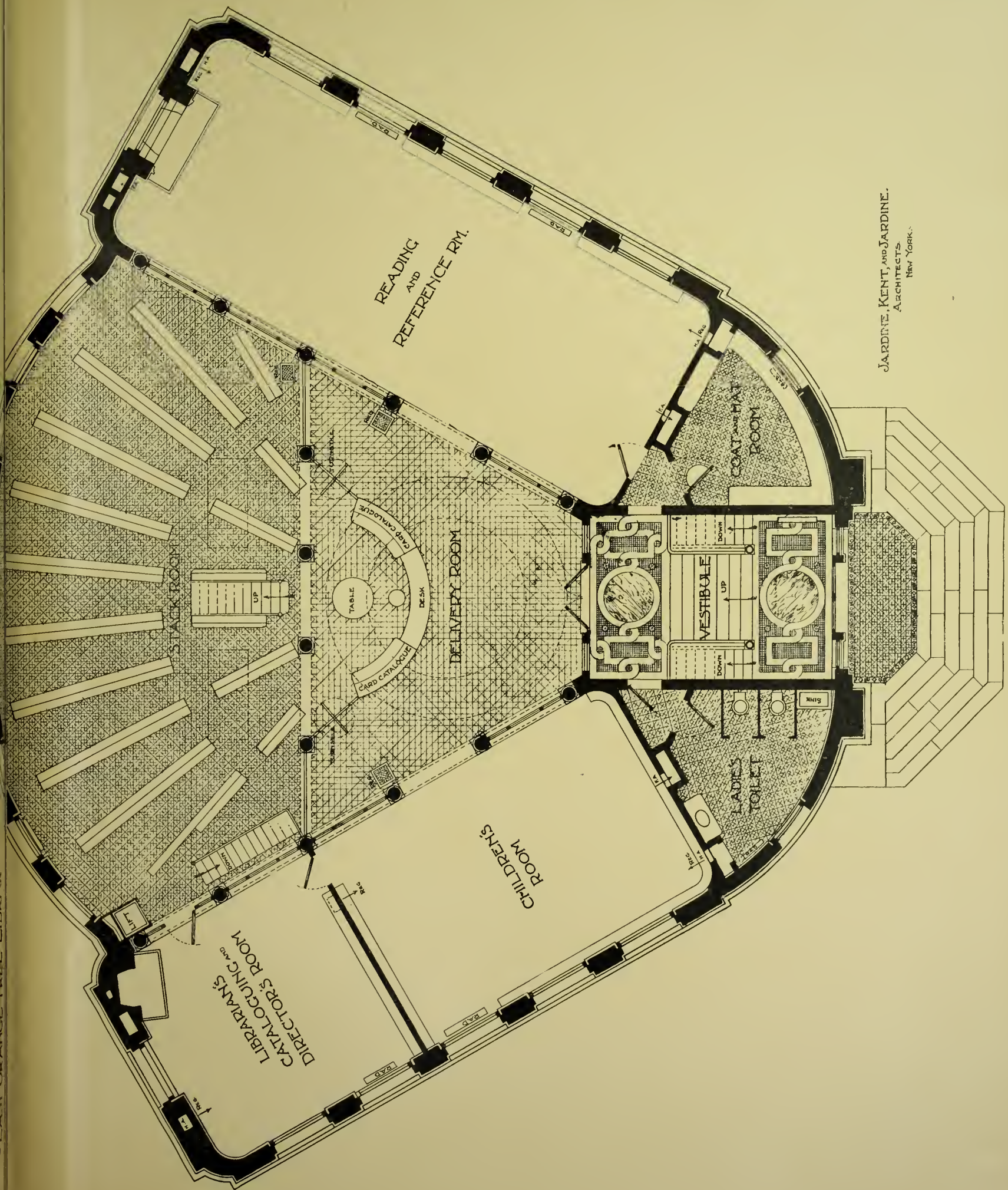
FIRST FLOOR.

BASEMENT.

PLANS, GYMNASIUM FOR RADCLIFFE COLLEGE, CAMBRIDGE, MASS.
MCKIM, MEAD & WHITE, ARCHITECTS.



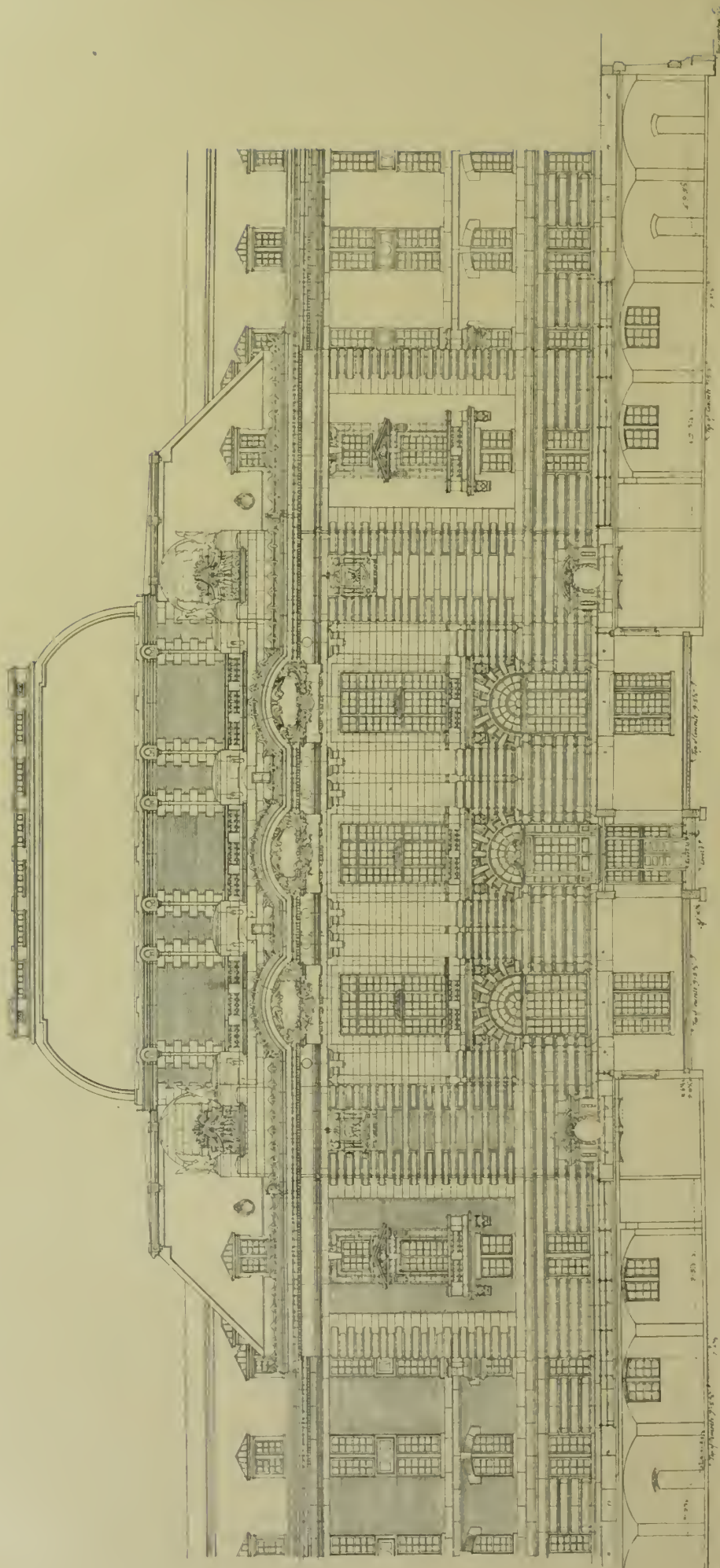
PLAN. FIRST PRIZE DESIGN, FREE PUBLIC LIBRARY, EAST ORANGE, N. J.
ACKERMAN & ROSS, ARCHITECTS.



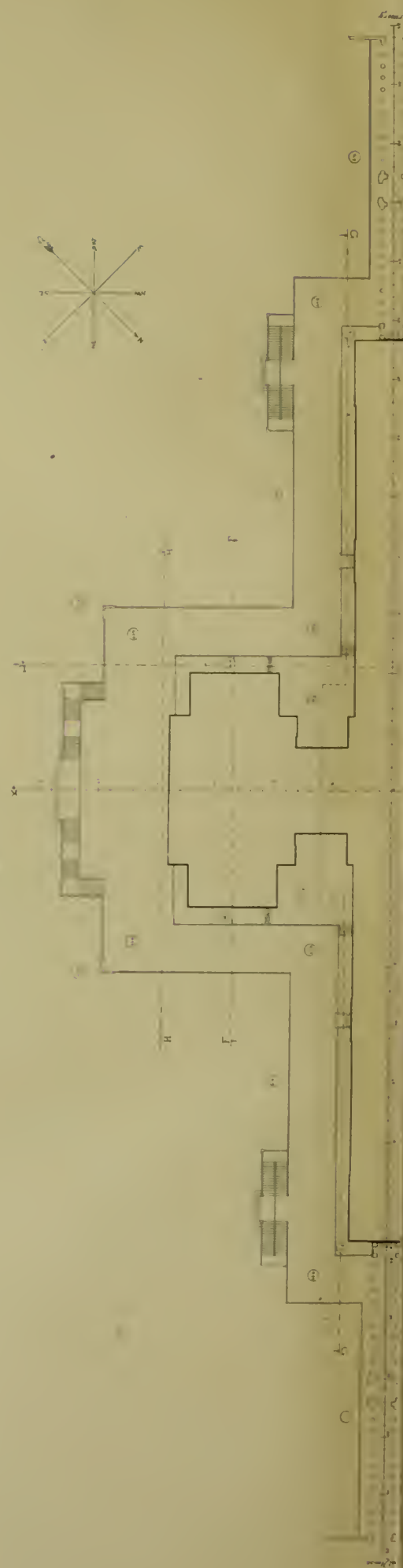
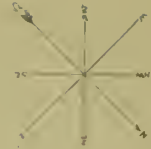
JARDINE, KENT, and JARDINE.
ARCHITECTS.
NEW YORK.

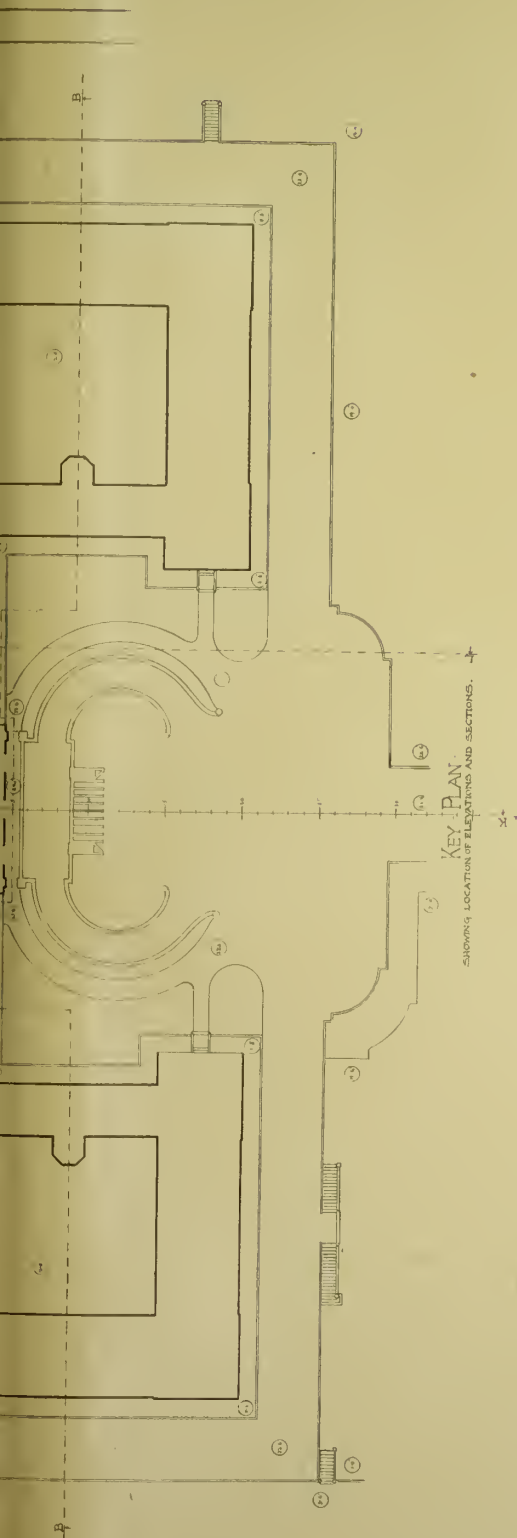




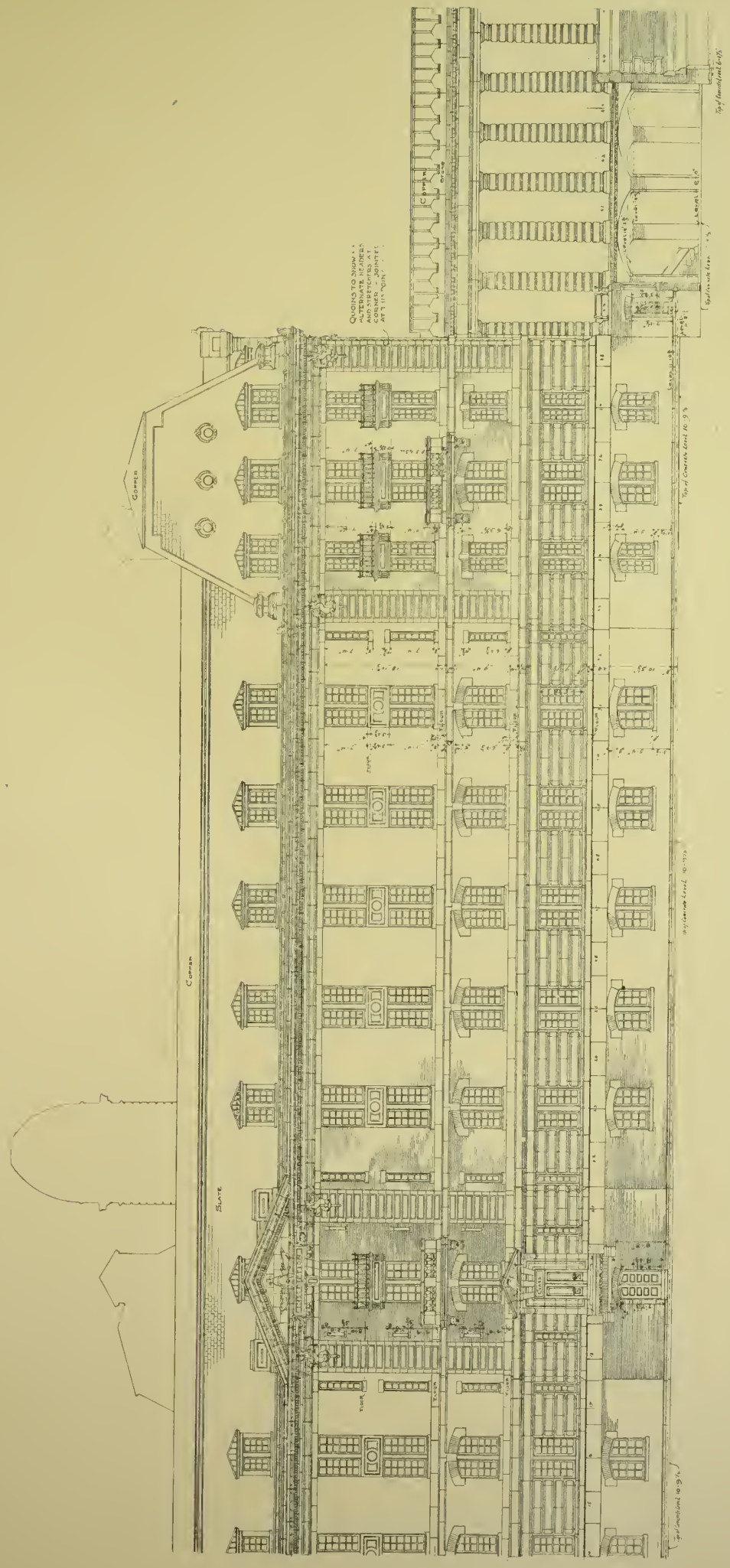


ELEVATION OF CENTRAL PORTION
LOOKING FROM PARADE GROUND
ON LINE H-H'
Summer Plan





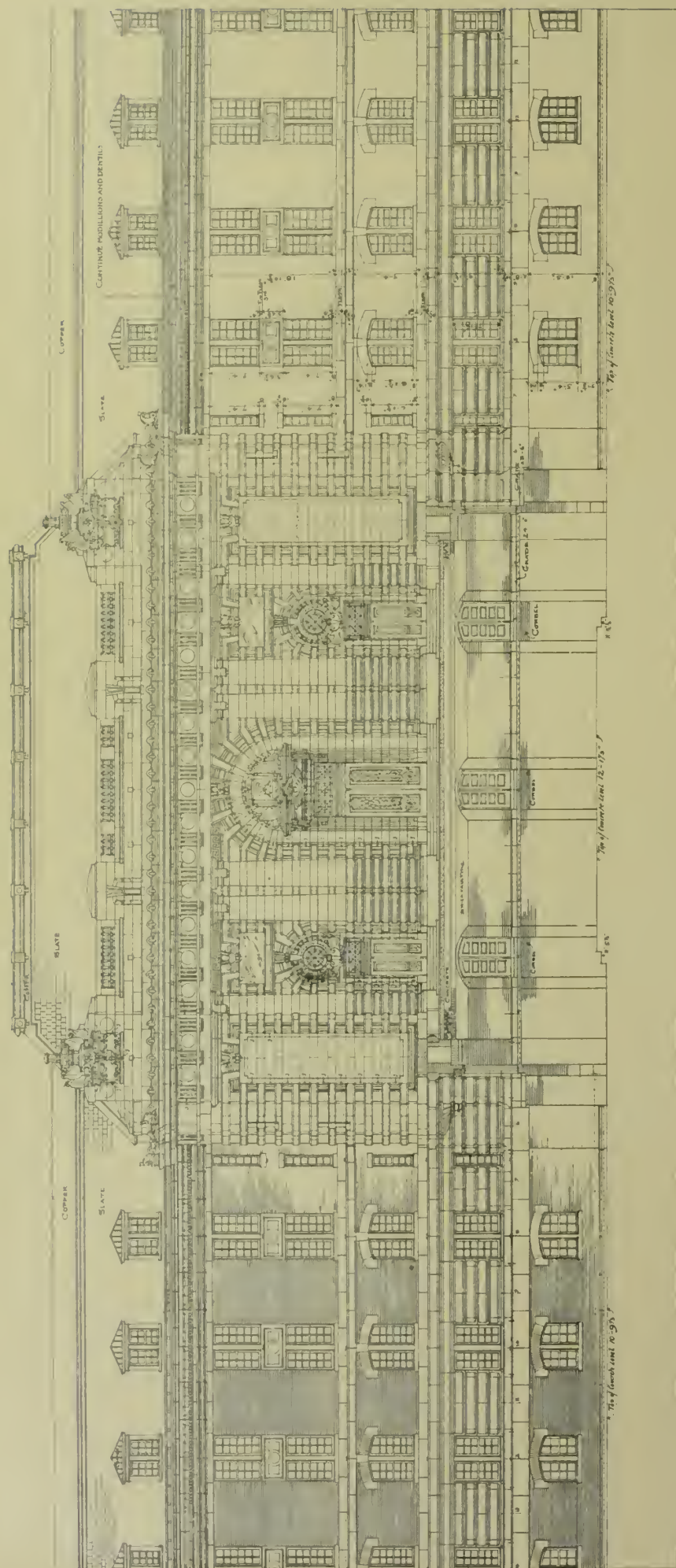
KEY PLAN
SHOWING LOCATION OF ELEVATIONS AND SECTIONS.



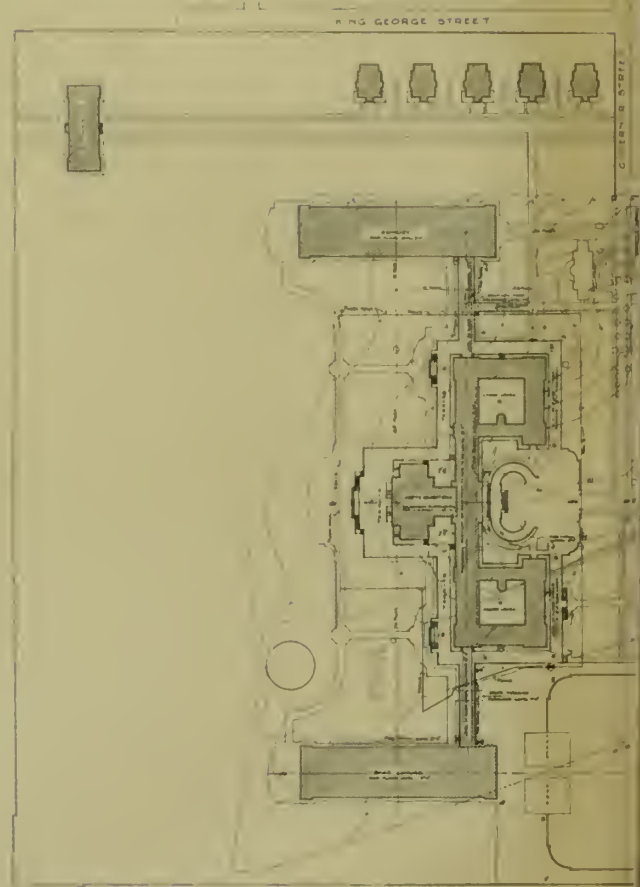
ELEVATION OF WING TOWARDS BOAT HOUSE
ON LINE "G G"

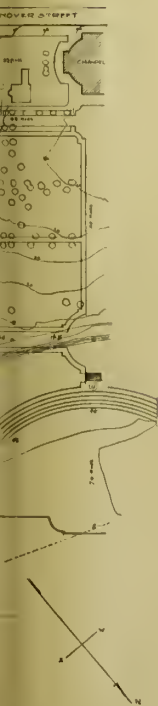
SEE KEY PLAN

CADET QUARTERS BUILDING, U. S. NAVAL ACADEMY, ANNAPOLIS, MD.
ERNEST FLAGG, ARCHITECT.

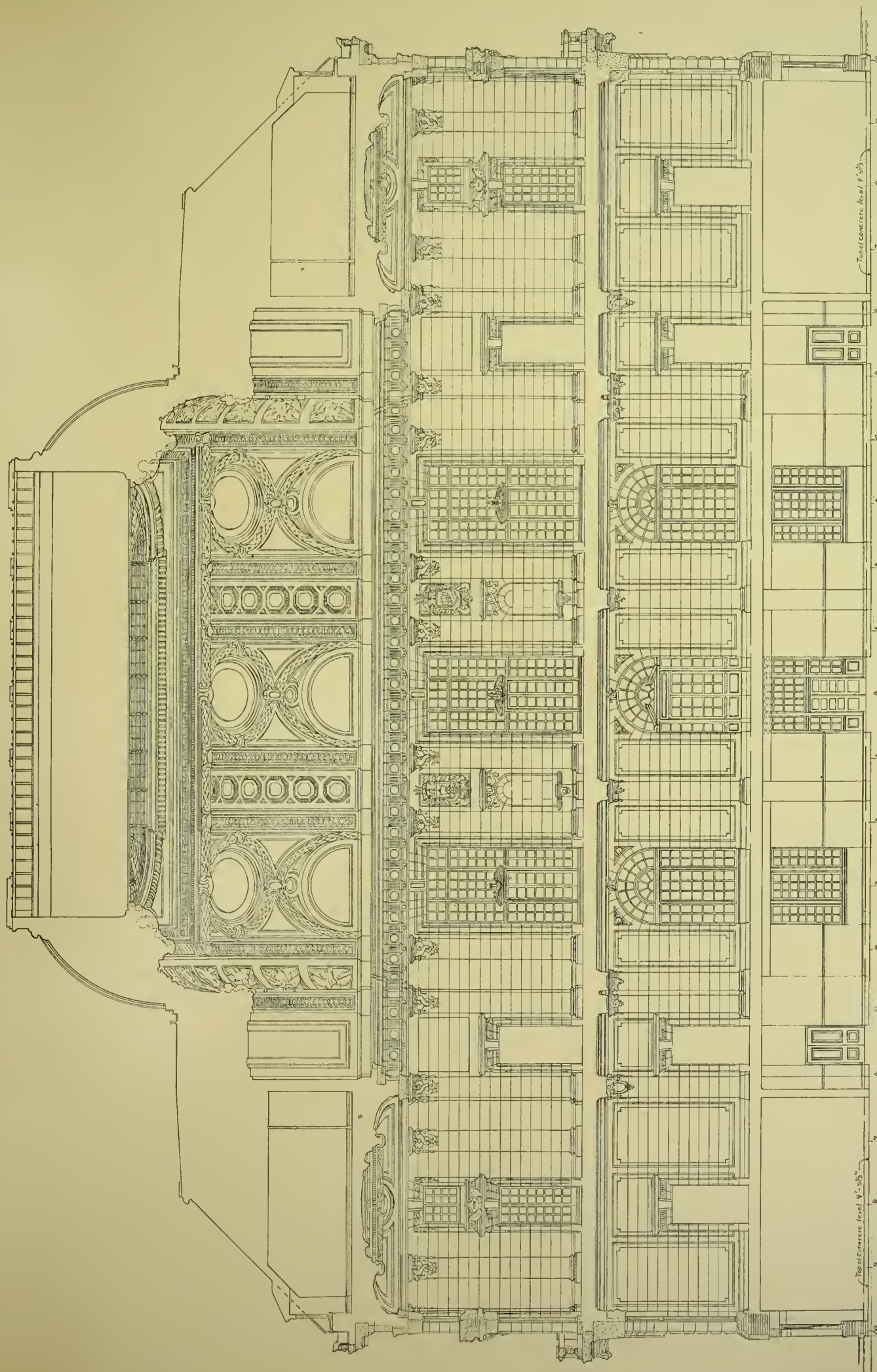


ELEVATION OF CENTRAL PORTION
ON LINE B-B
SEE KEY PLAN





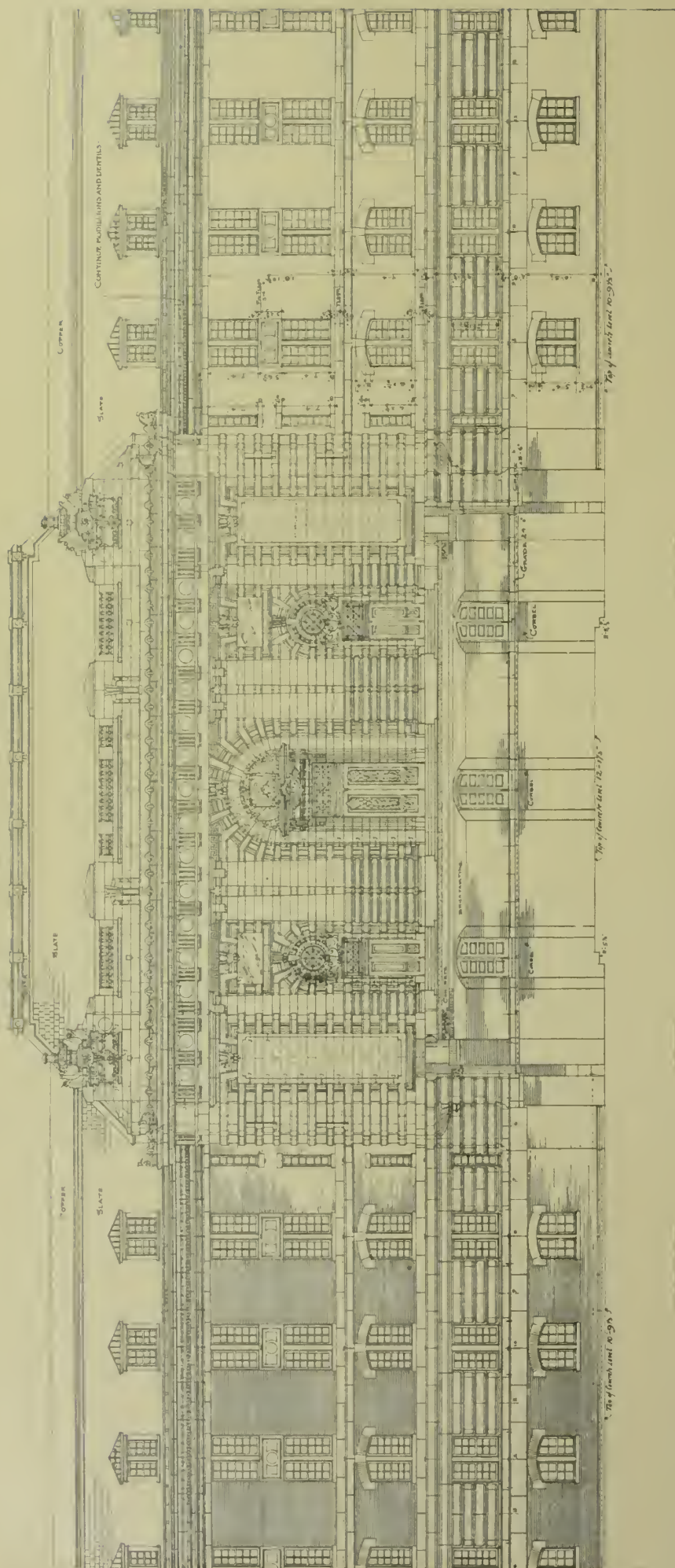
GENERAL PLAN.



SECTION THROUGH MESS HALL PAVILION
ON LINE "F F"

SEE KEY PLAN.

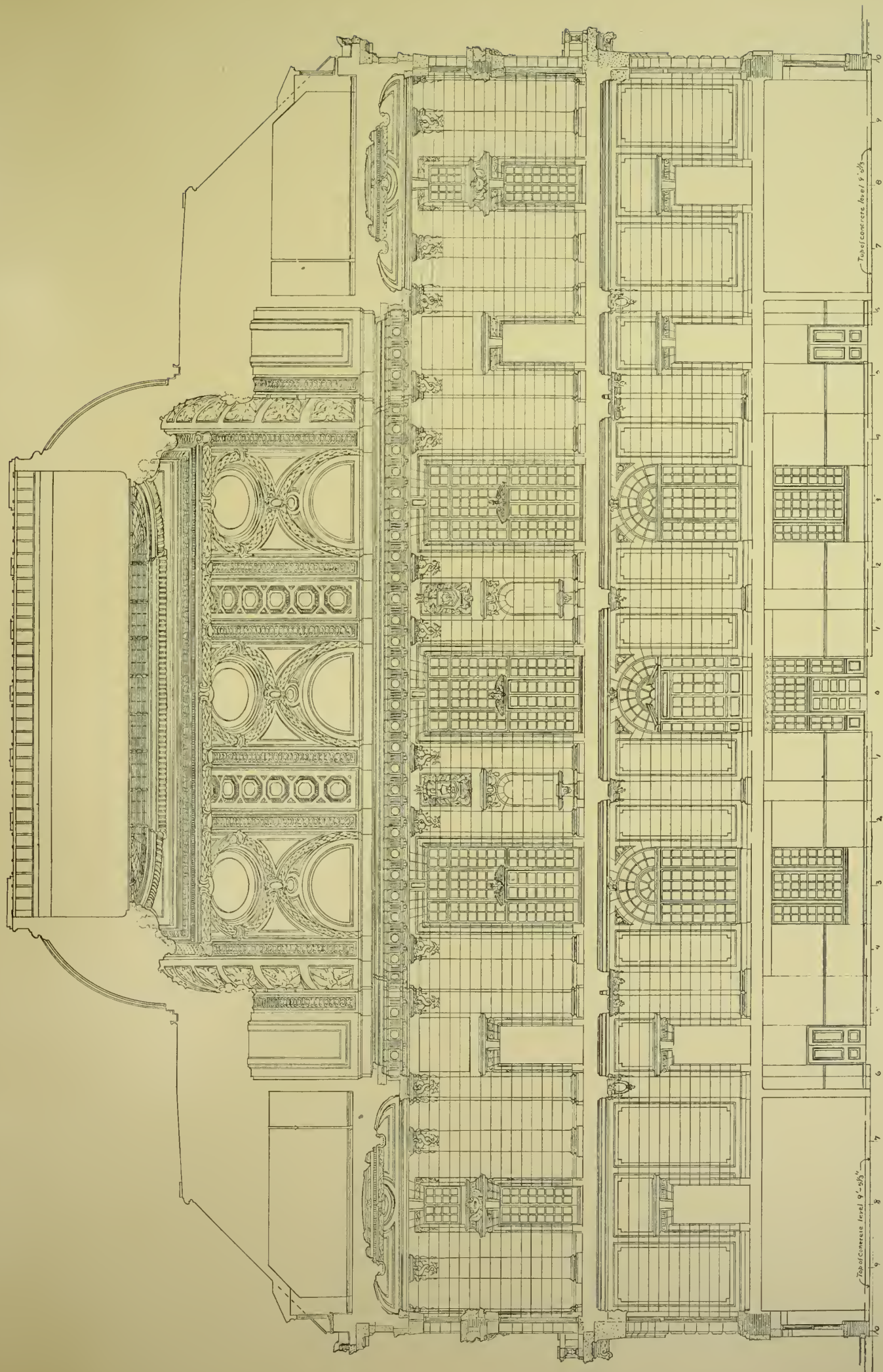
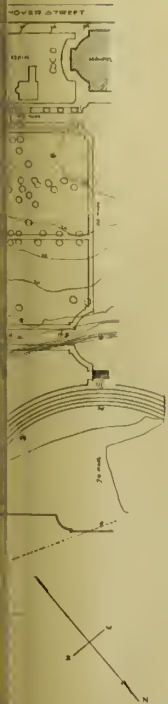
CADET QUARTERS BUILDING, U. S. NAVAL ACADEMY ANNAPOLIS, MD.
ERNEST FLAGG, ARCHITECT.



ELEVATION OF CENTRAL PORTION

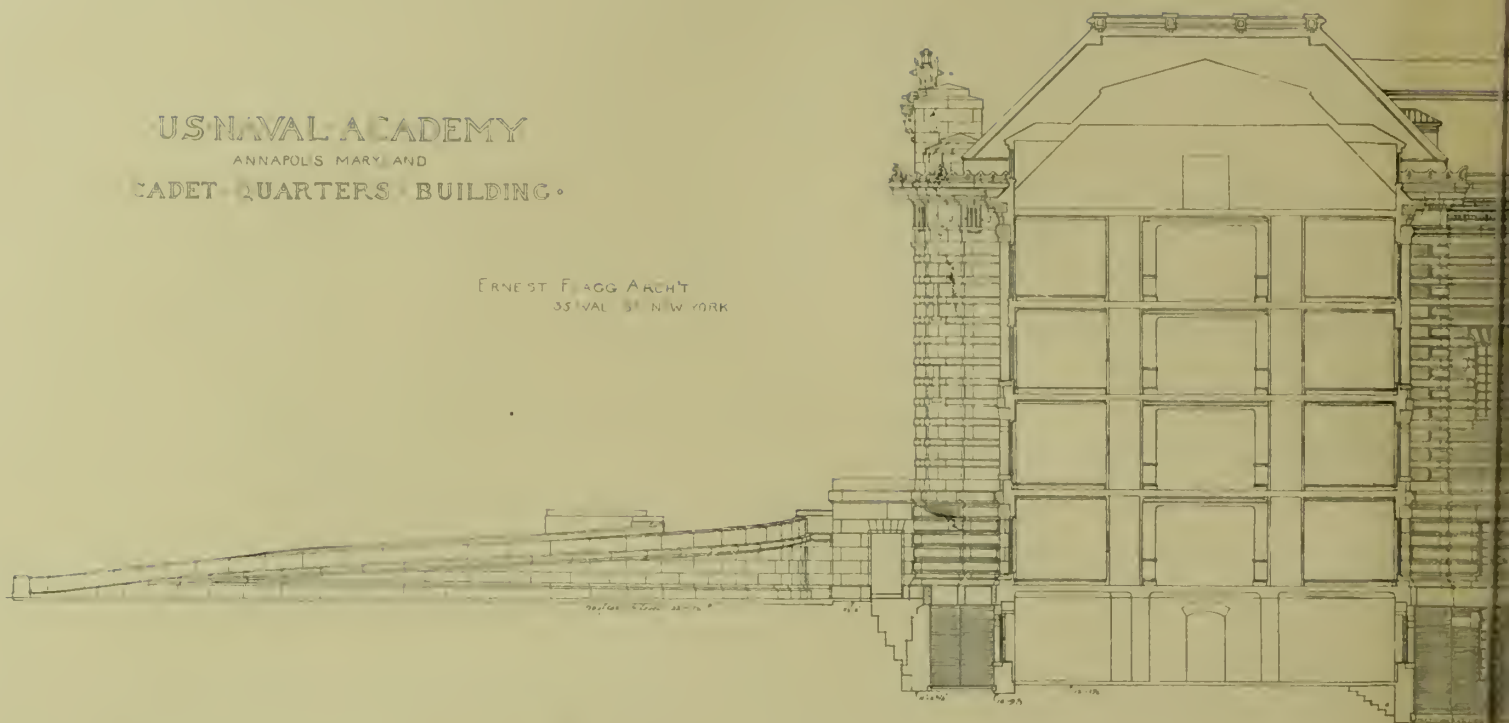
ON LINE B B
SEE KEY PLAN



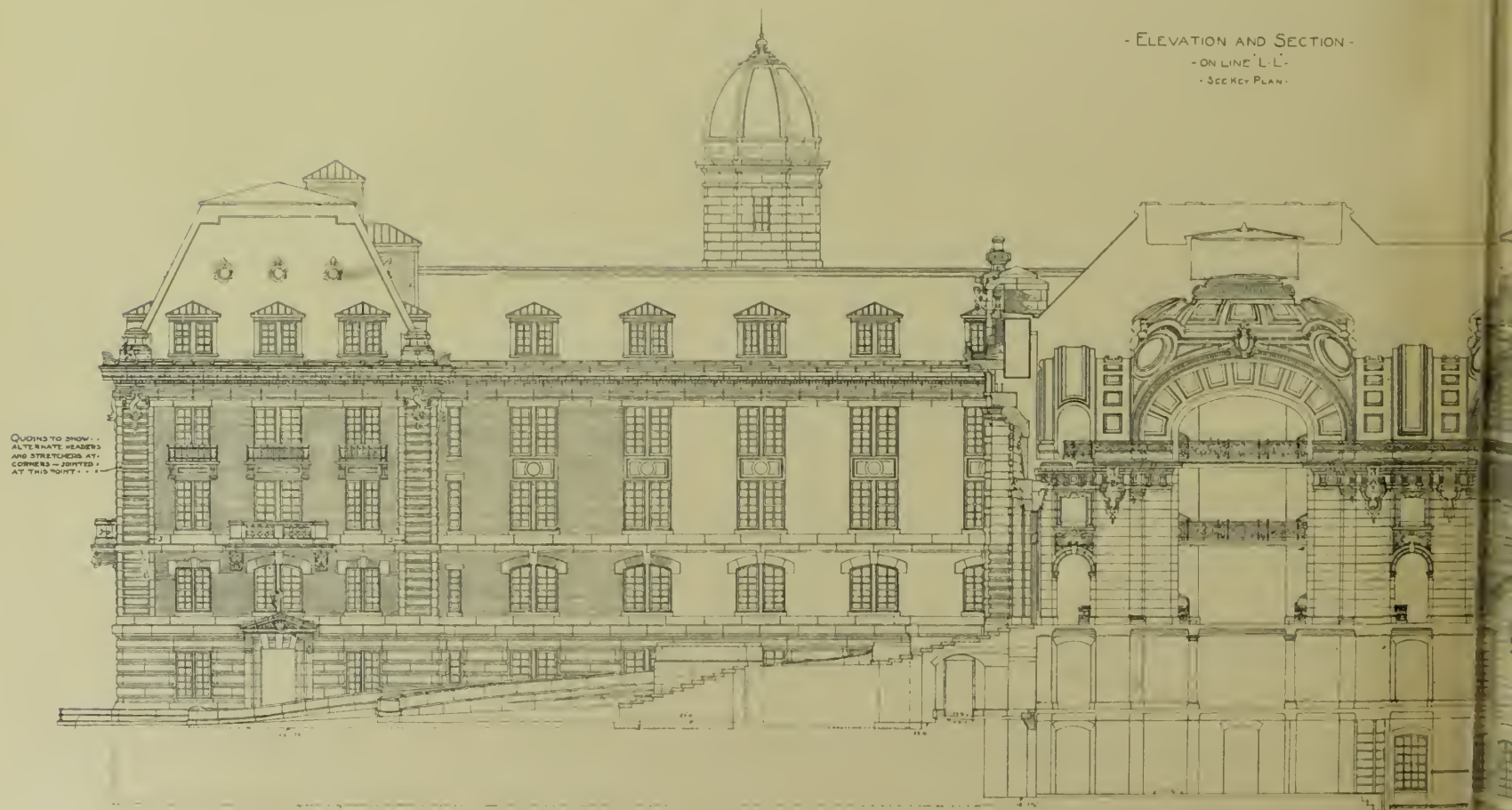


US NAVAL ACADEMY
ANNAPOLIS MARYLAND
CADET QUARTERS BUILDING

ERNEST FLAGG ARCHT
35 WAL ST NEW YORK



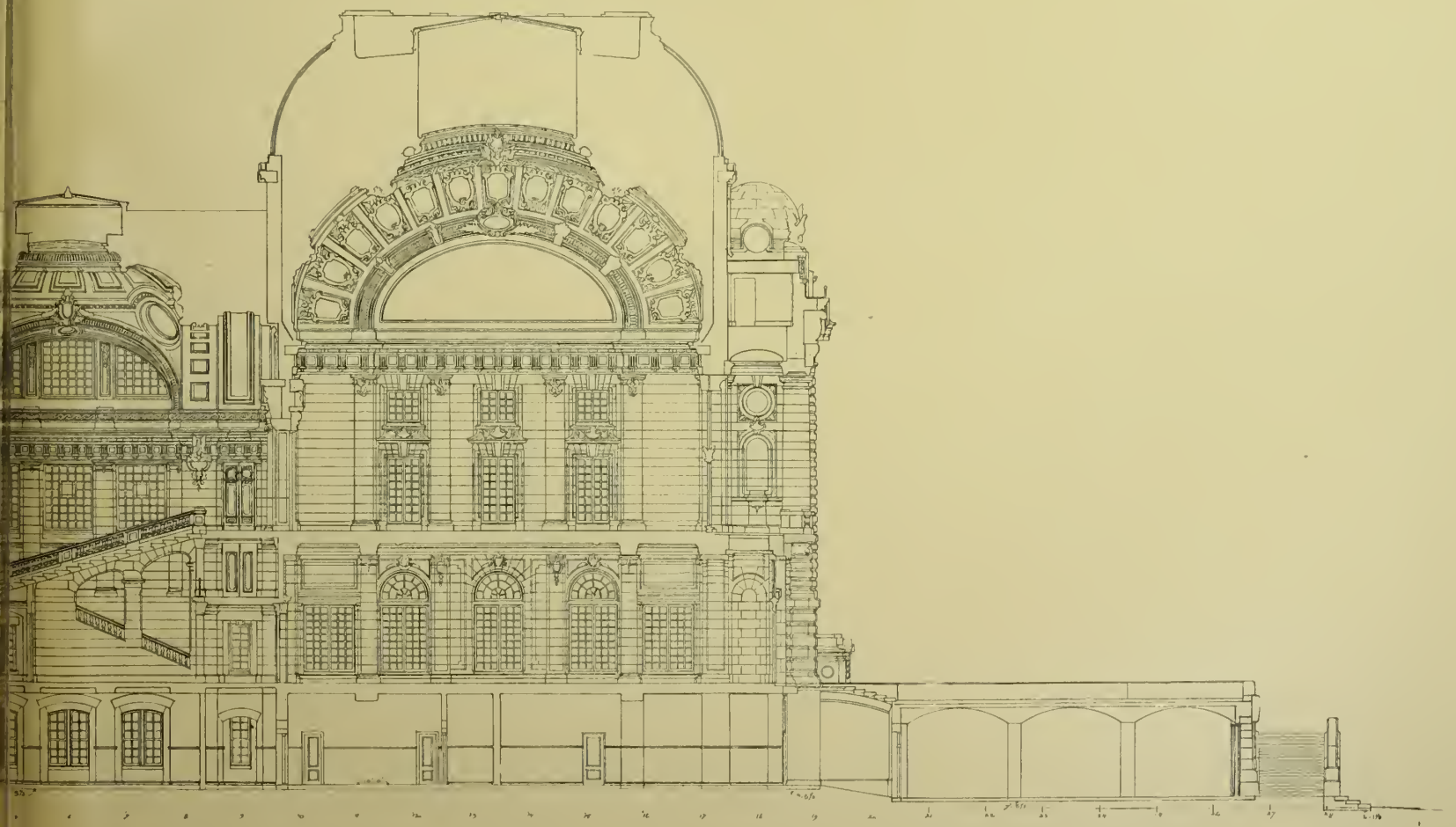
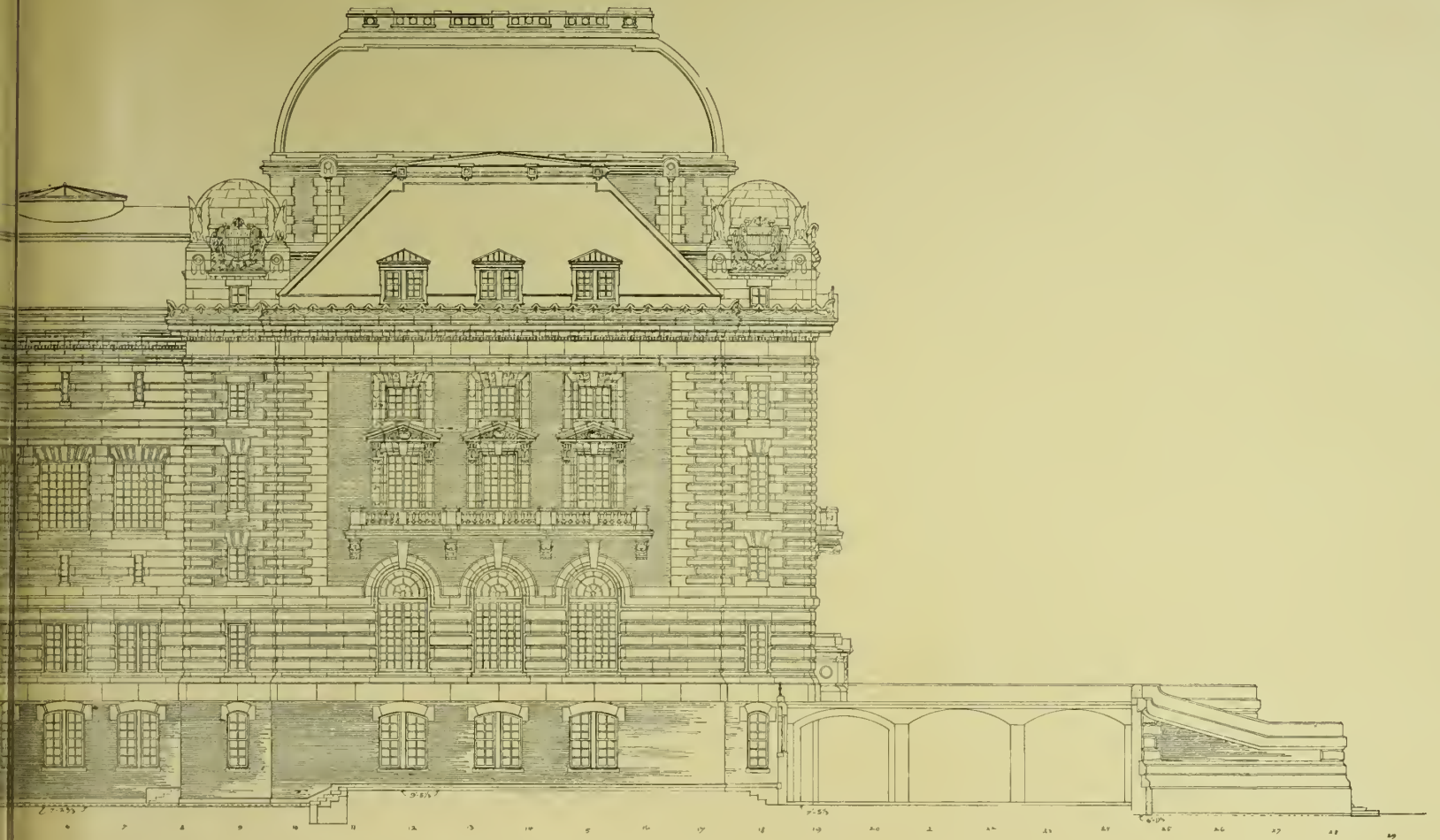
- ELEVATION AND SECTION -
- ON LINE "L-L"
- SEE KEY PLAN -

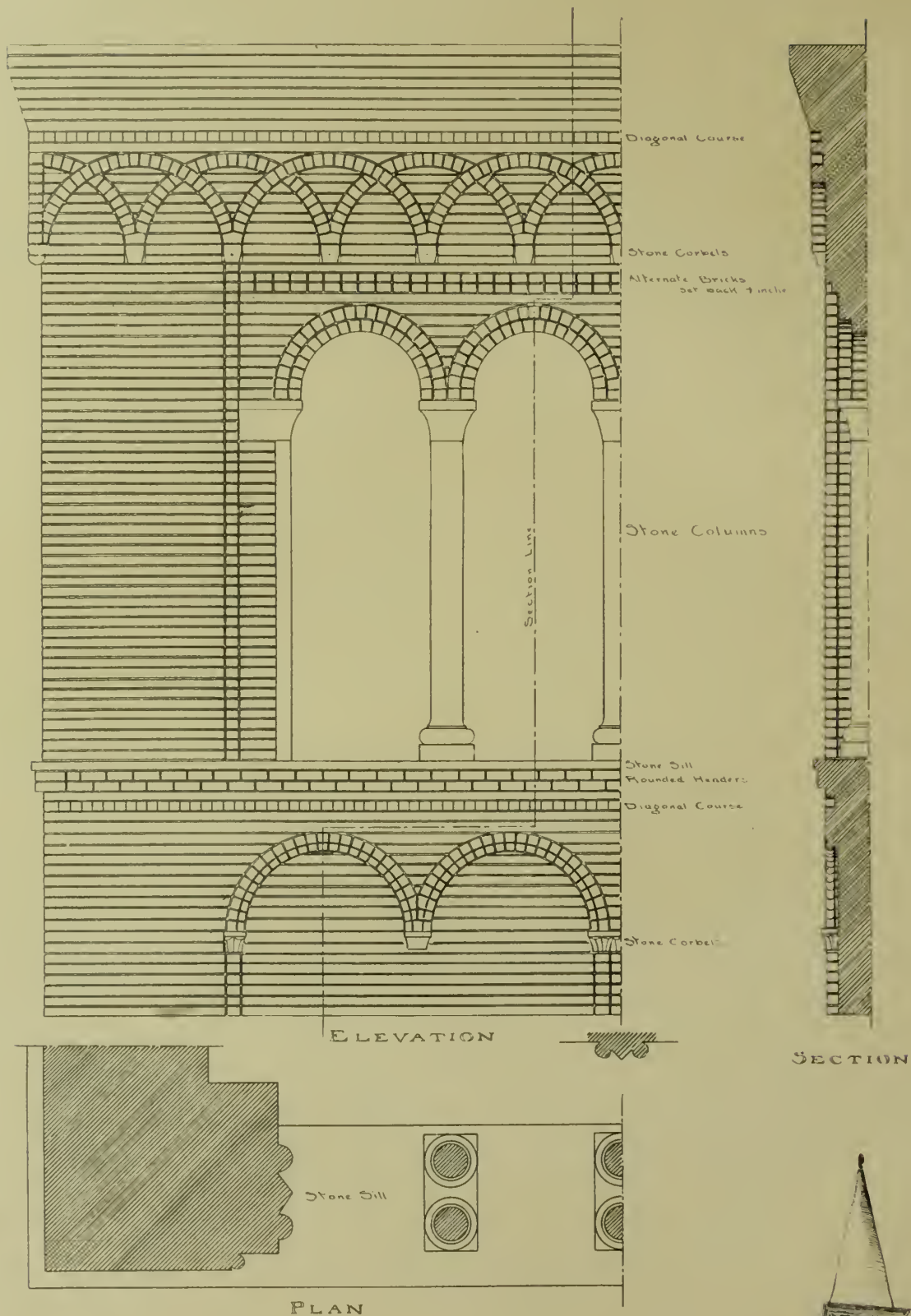


QUERIES TO SHOW
ALTERNATE HEADERS
AND STRETCHERS AT
CORNERS - JOINTED
AT THIS POINT -

TRANSVERSE SECTION -
ON LINE "K-K"
- SEE KEY PLAN -

CADET QUARTERS BUILDING U. S.
ERNEST FLAGG





DETAIL OF CAMPANILE PIACENZA CATHEDRAL

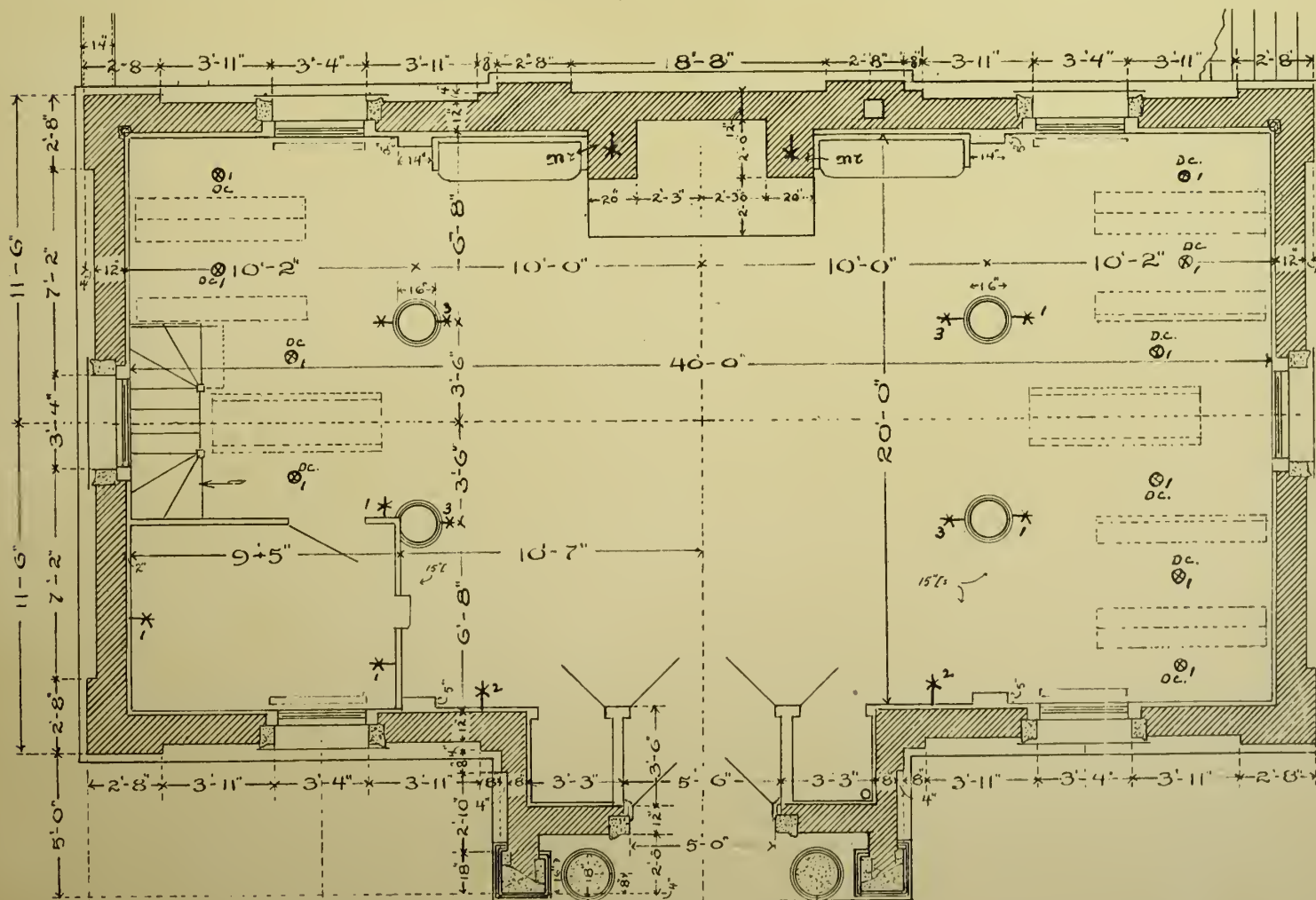
DRAWN FROM MEASUREMENTS BY C. H. ALDEN, JR.

SCALE





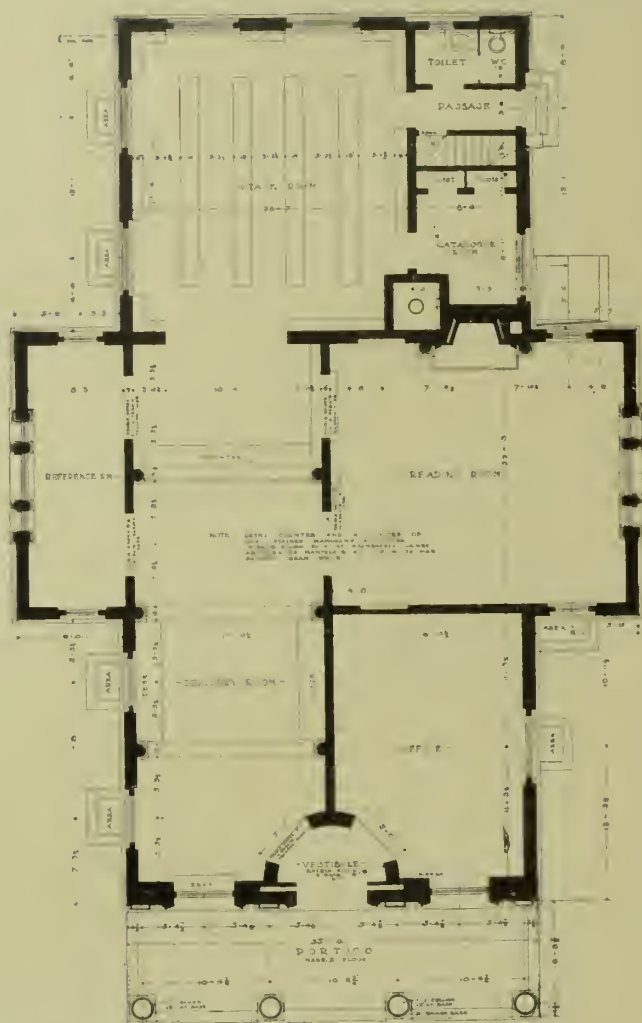
FRONT ELEVATION.



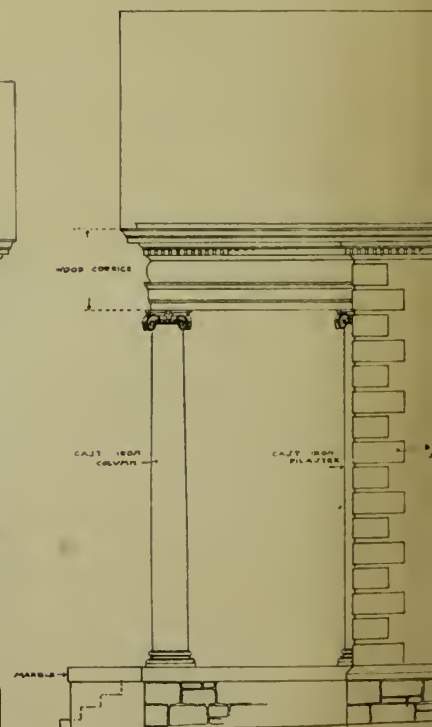
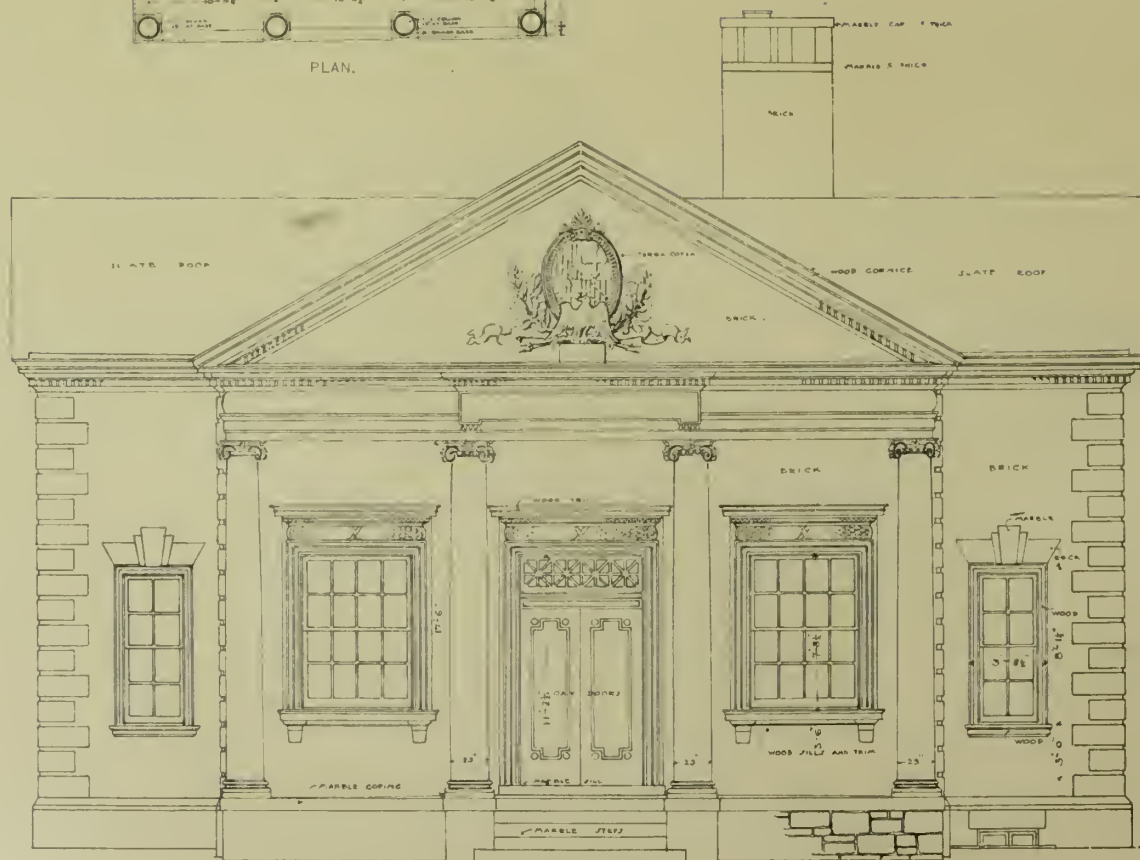
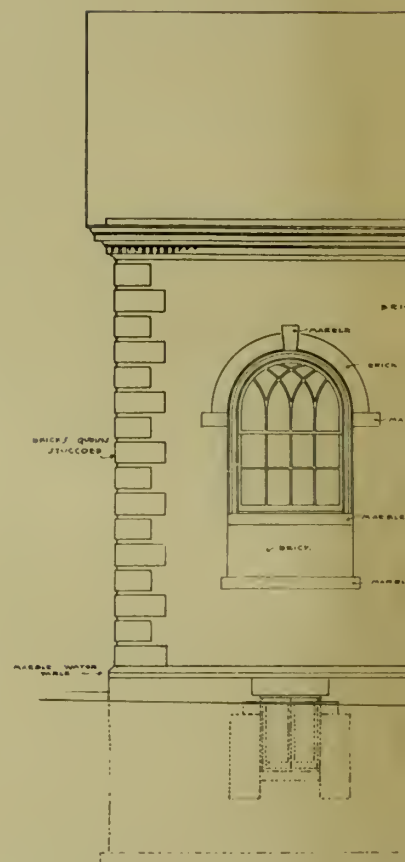
FIRST FLOOR.

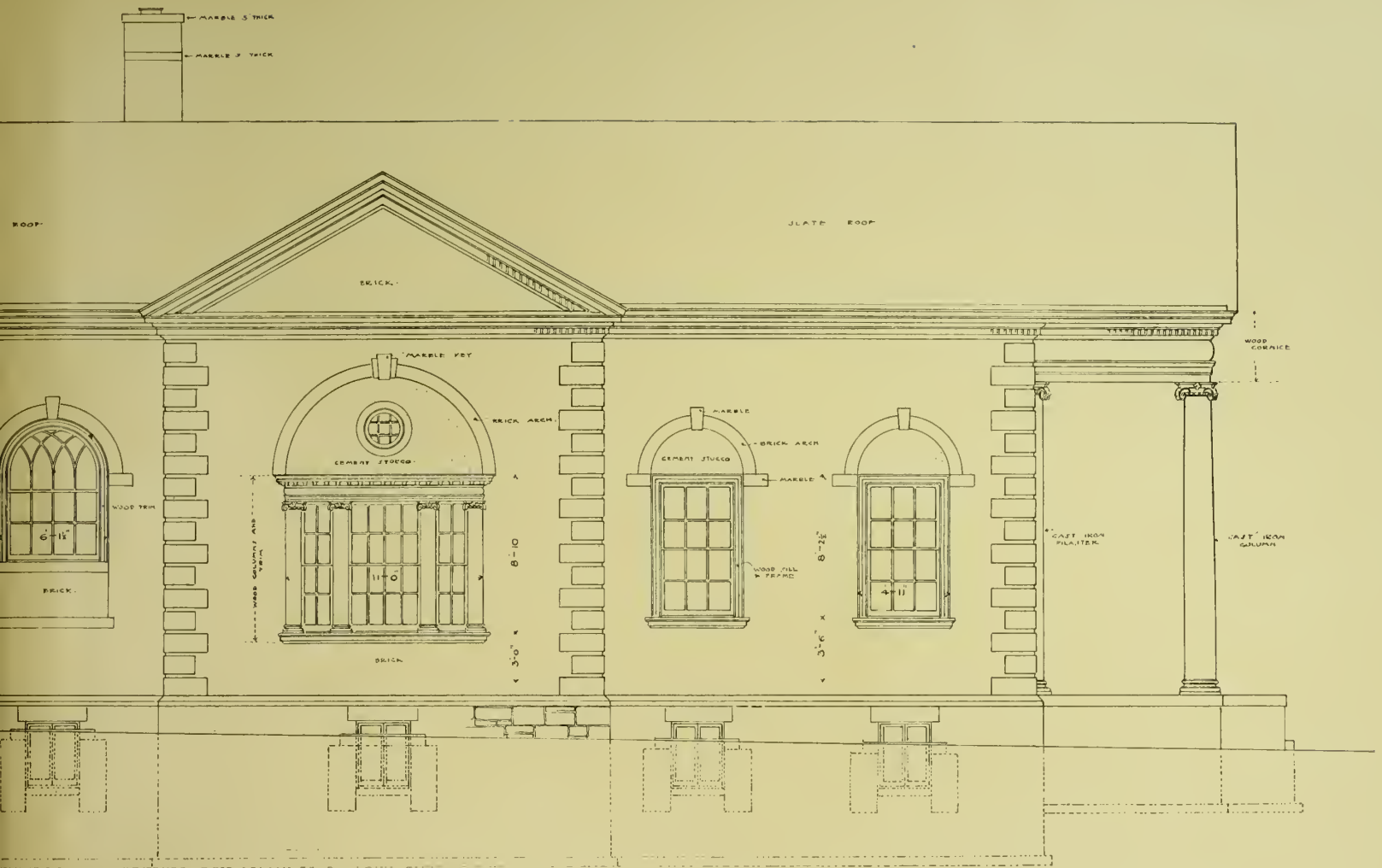
FREE LIBRARY, STONINGTON, CONN

CLINTON & RUSSELL, ARCHITECTS.

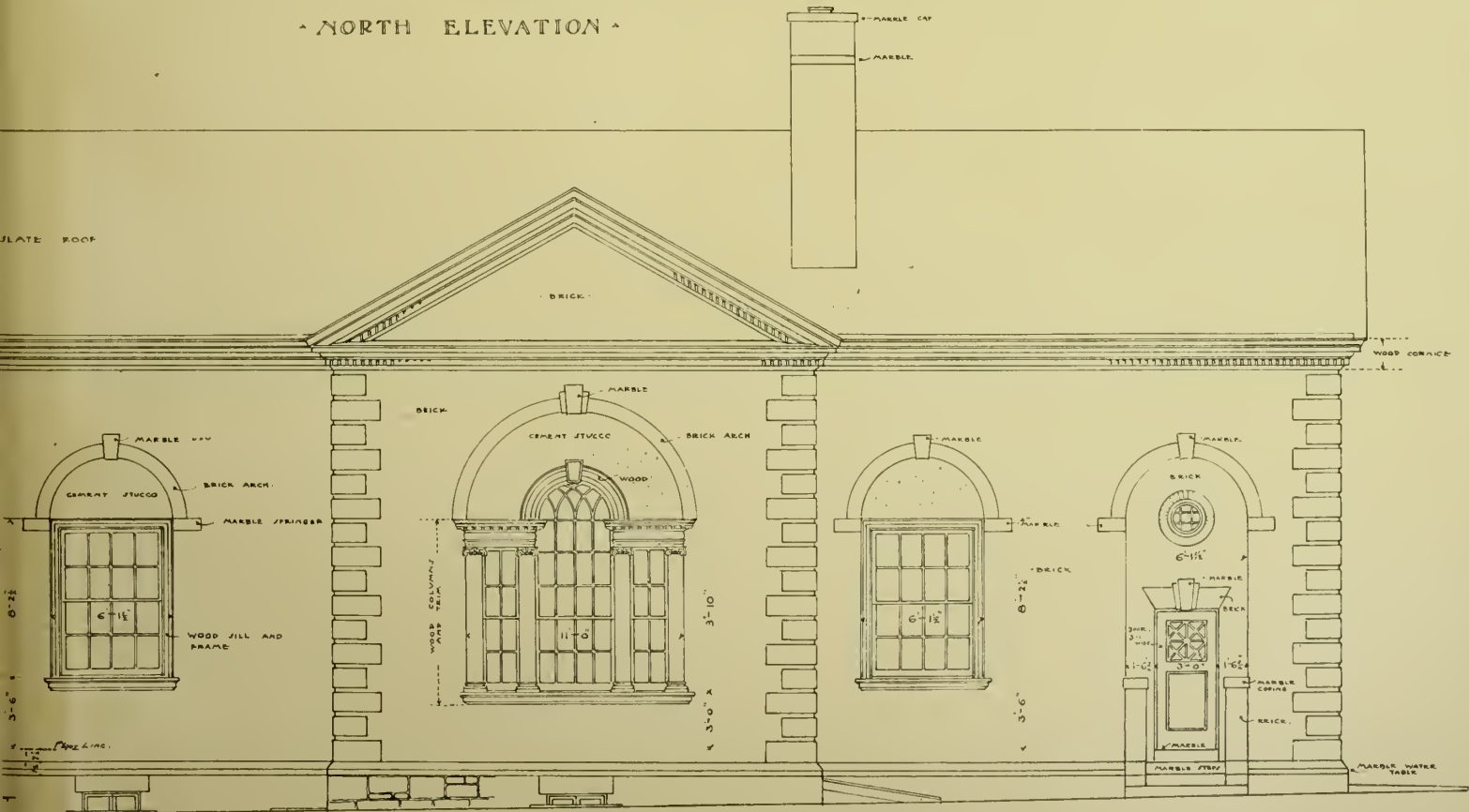


PLAN.



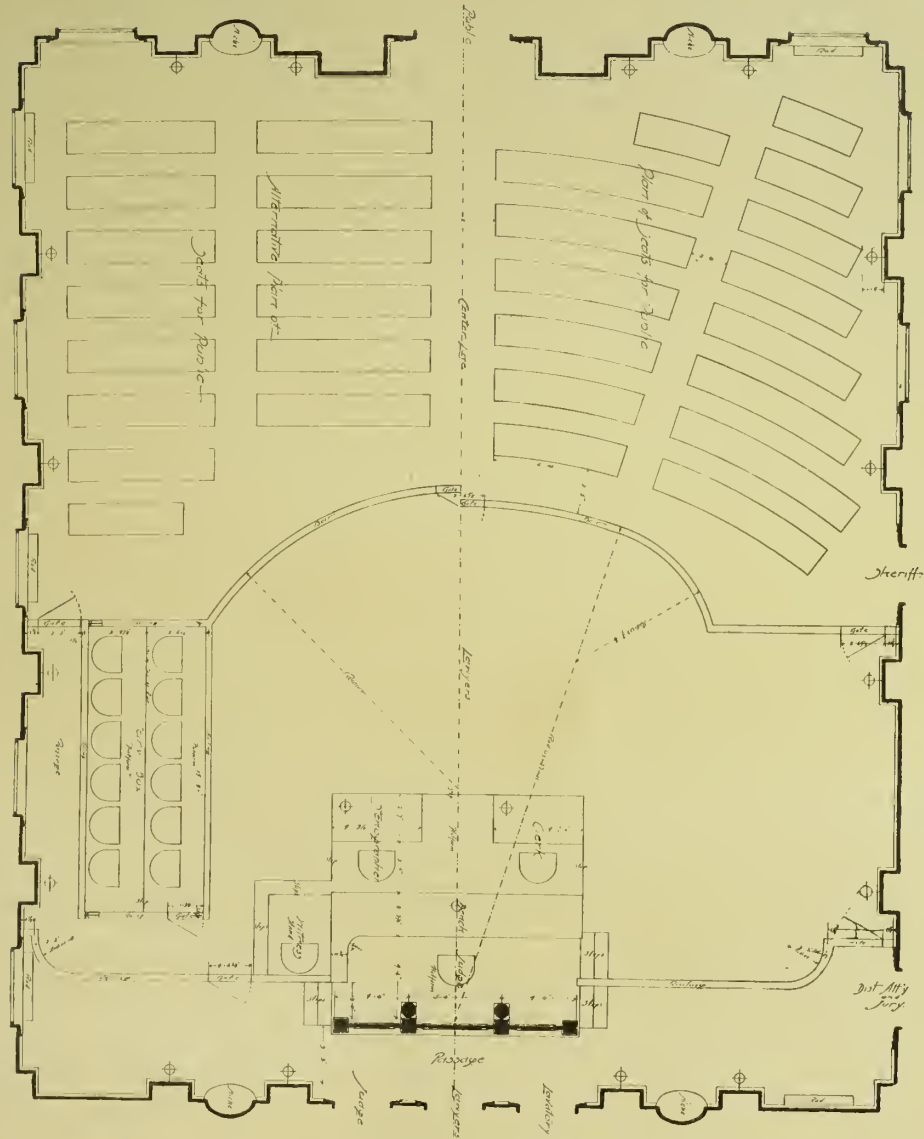


* NORTH ELEVATION *

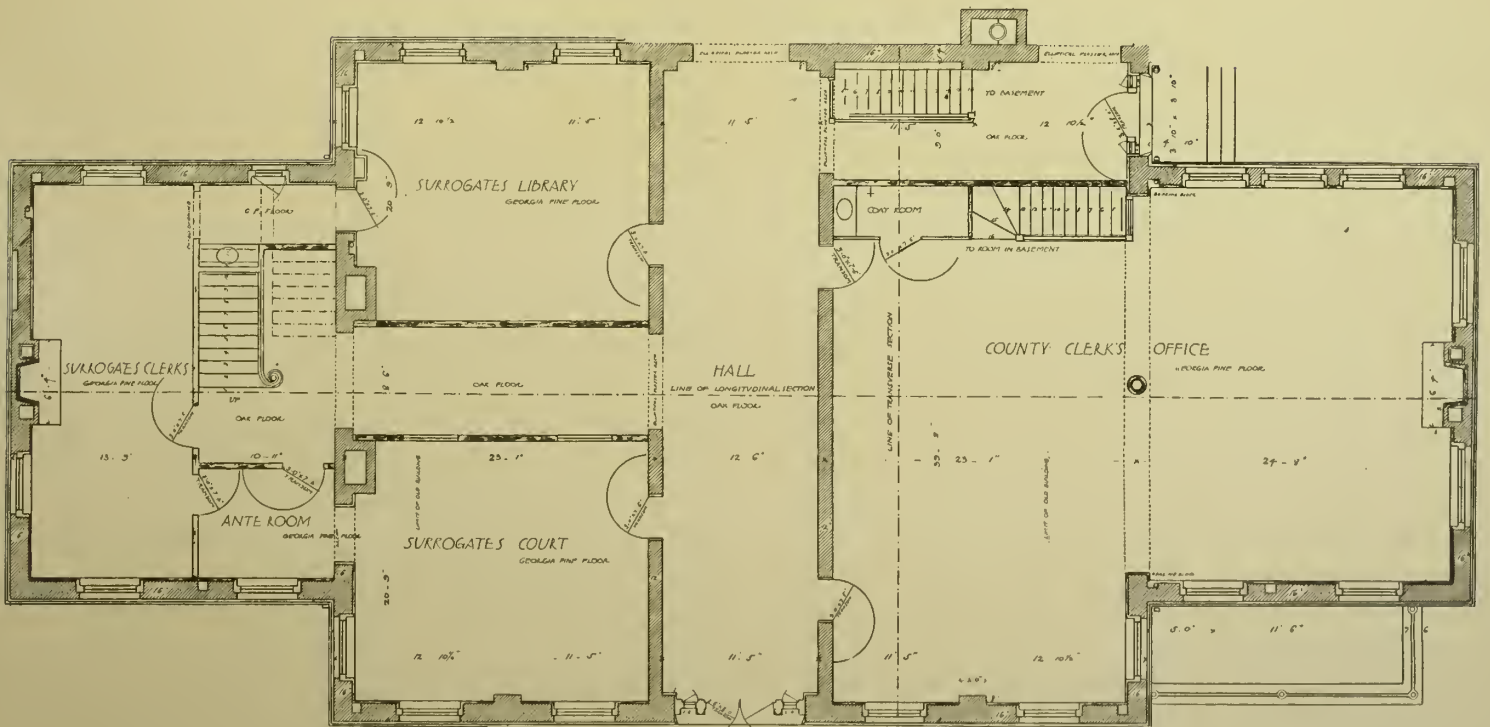




LIVINGSTON COUNTY COURT HOUSE, GENESEO, N. Y.
BRADDOCK & HILLMAN, ARCHITECTS.



PLAN OF COURT ROOM.



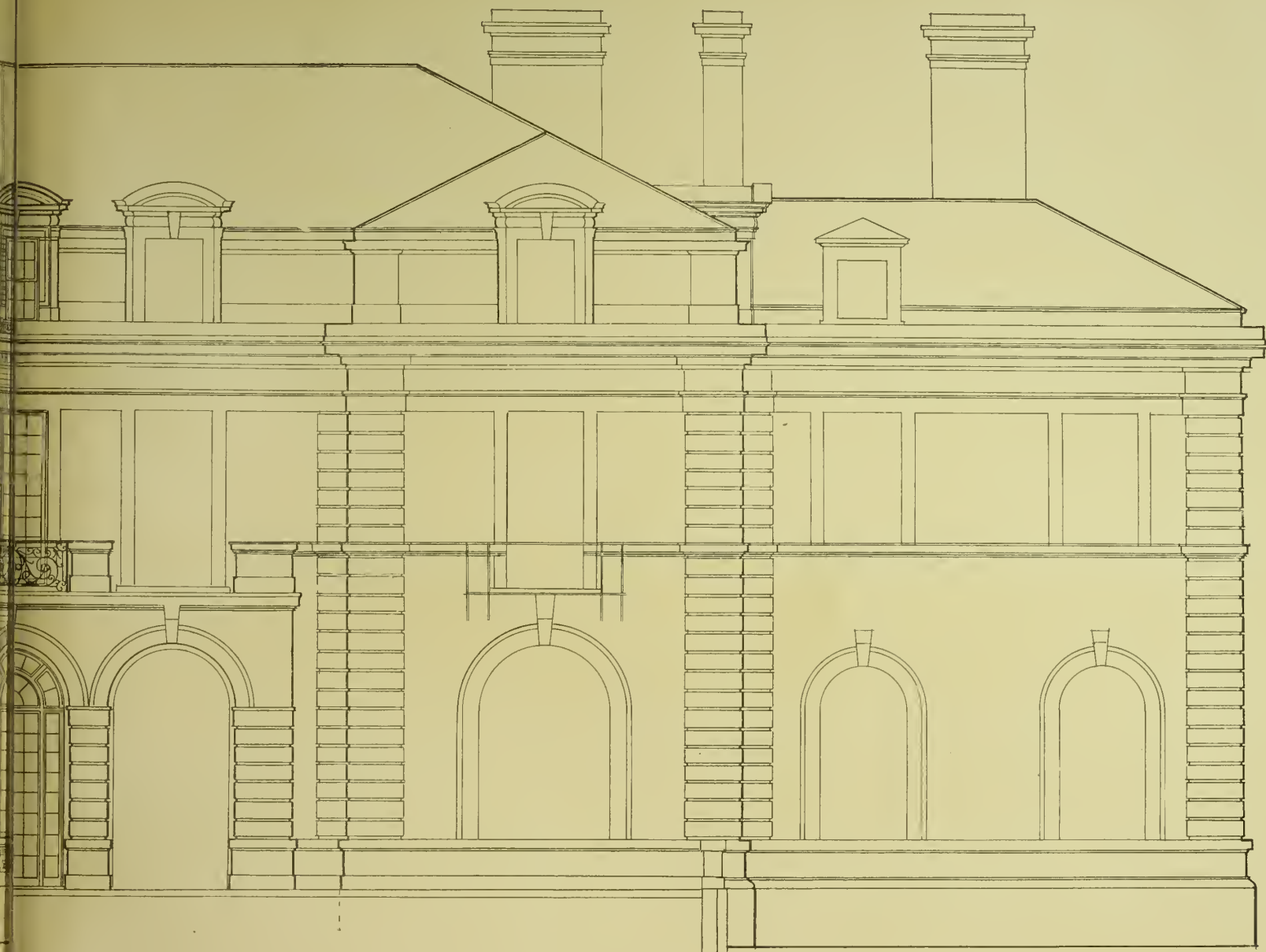
PLAN OF FIRST STORY.

LIVINGSTON COUNTY COURT HOUSE, GENESEO, N. Y.

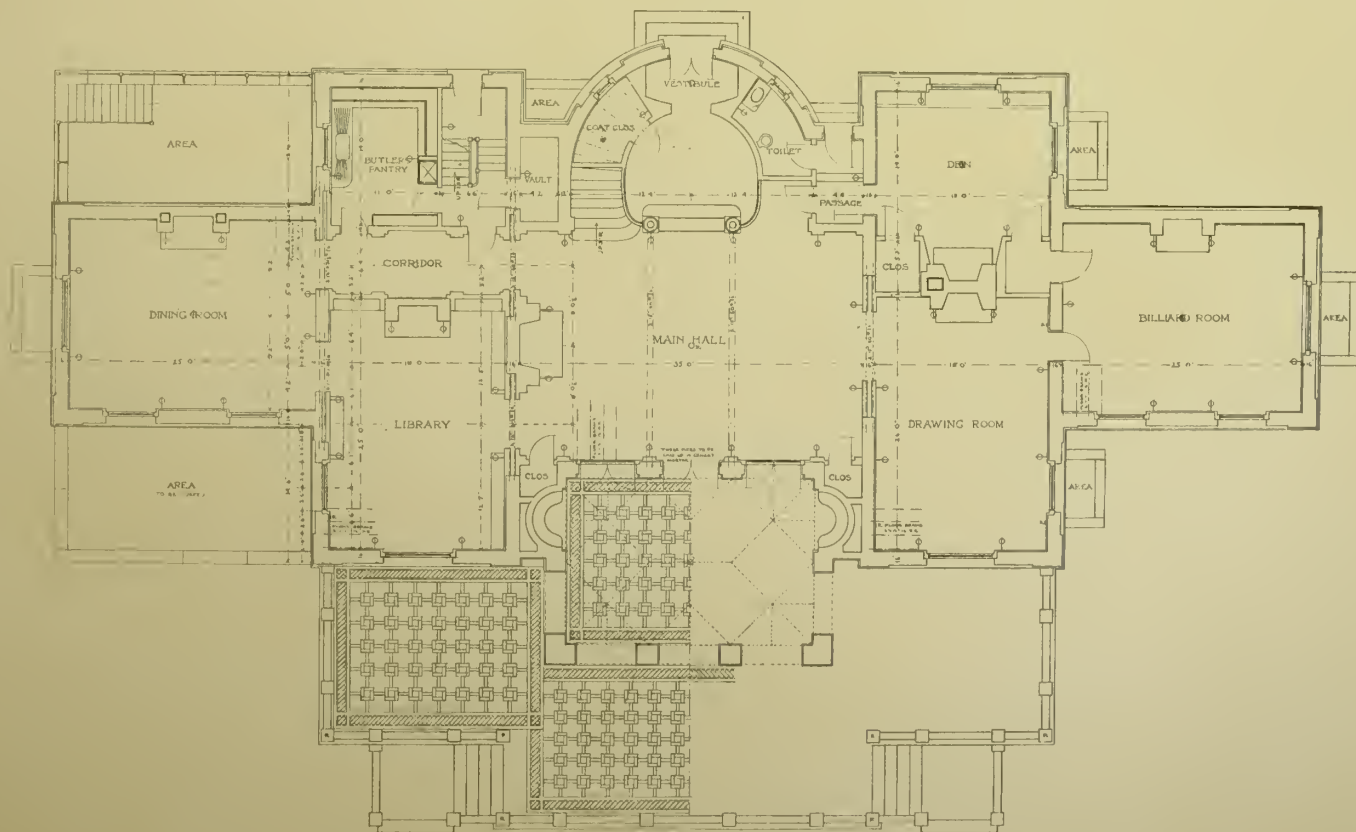
BRAGDON & HILLMAN, ARCHITECTS.



SWINE EYATH

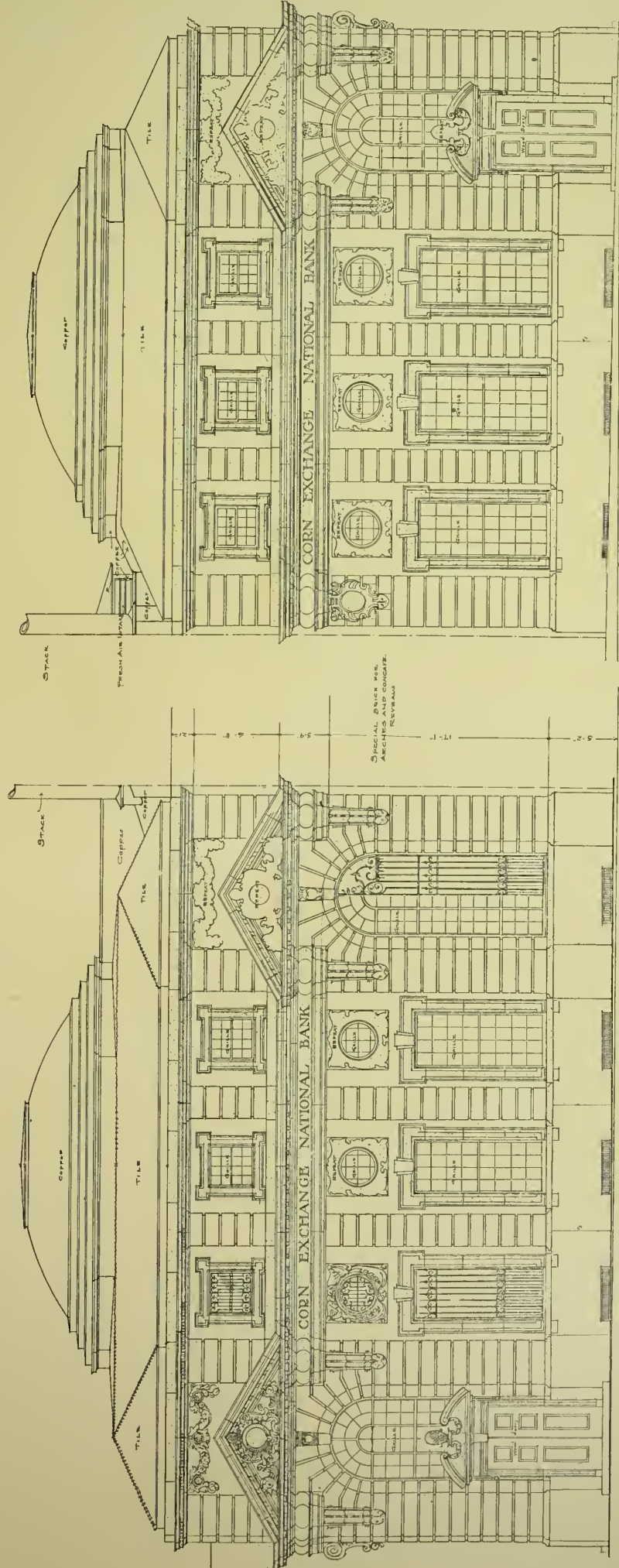
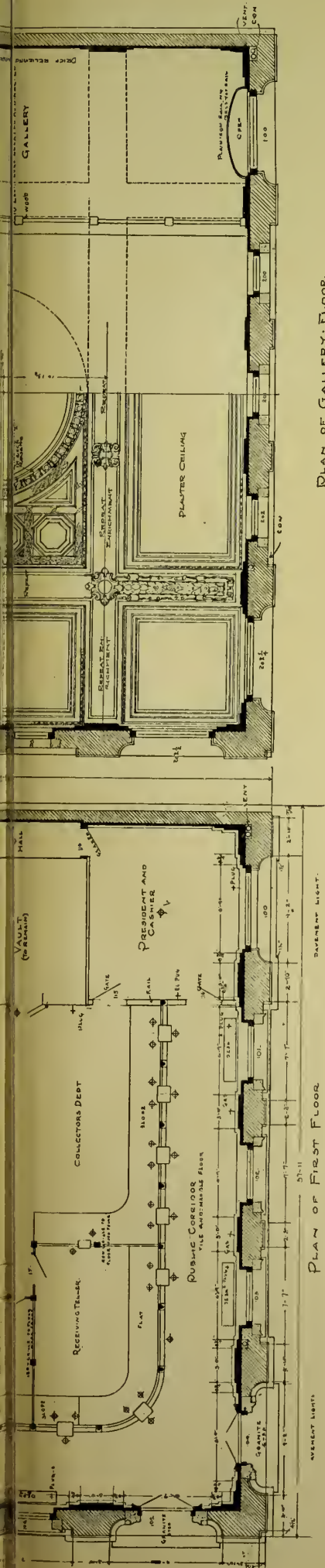


SECTION.

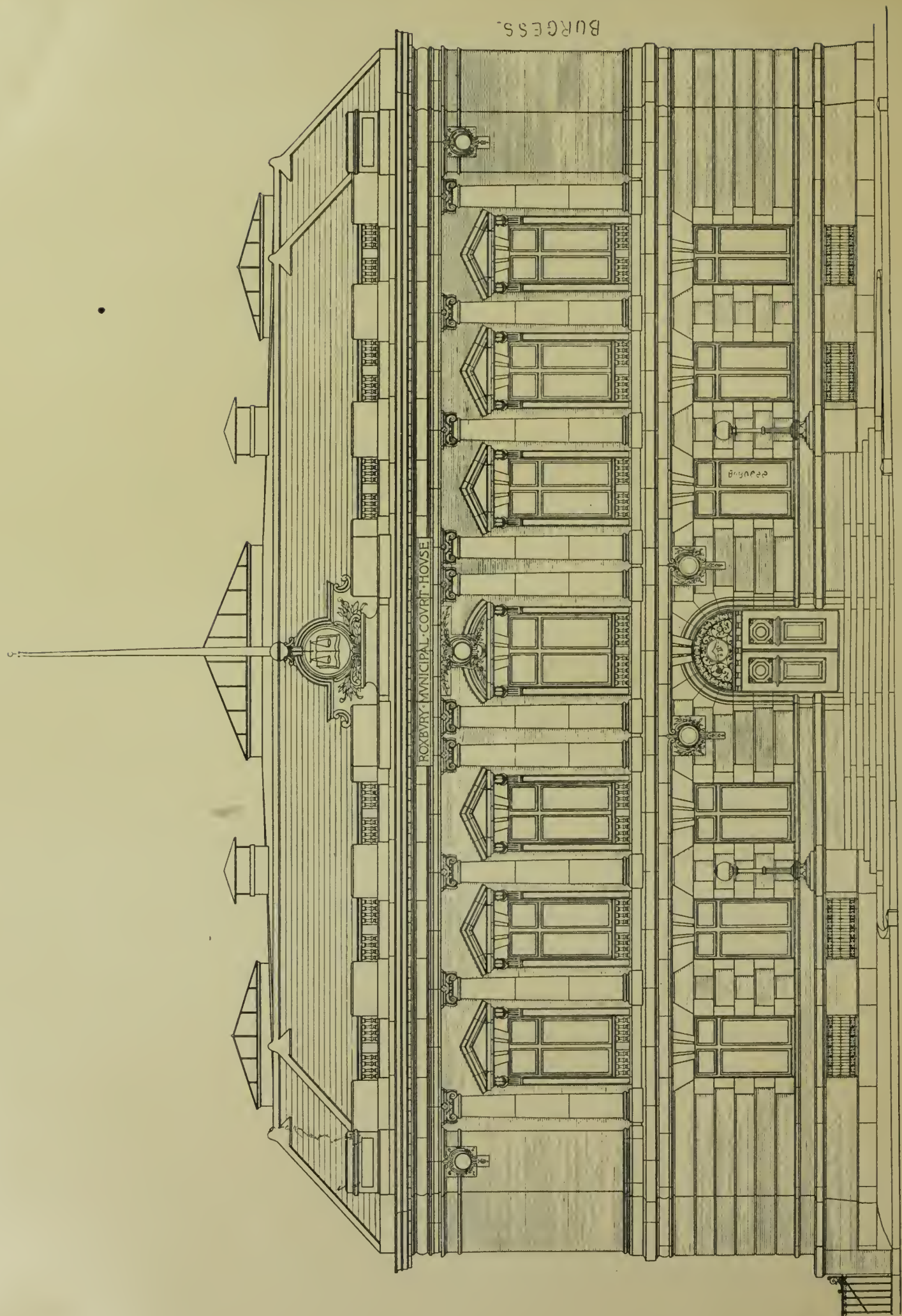


FIRST FLOOR.

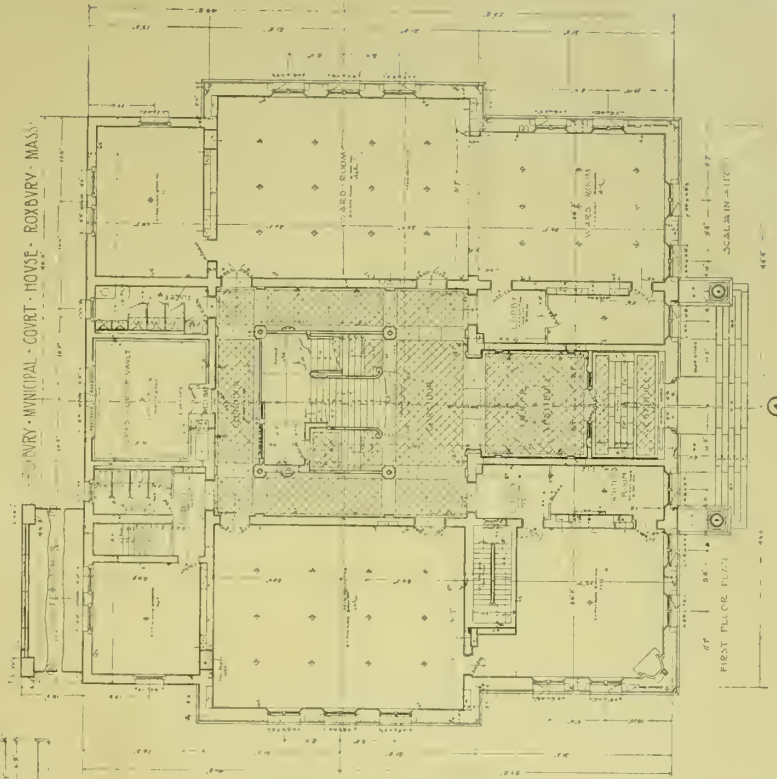
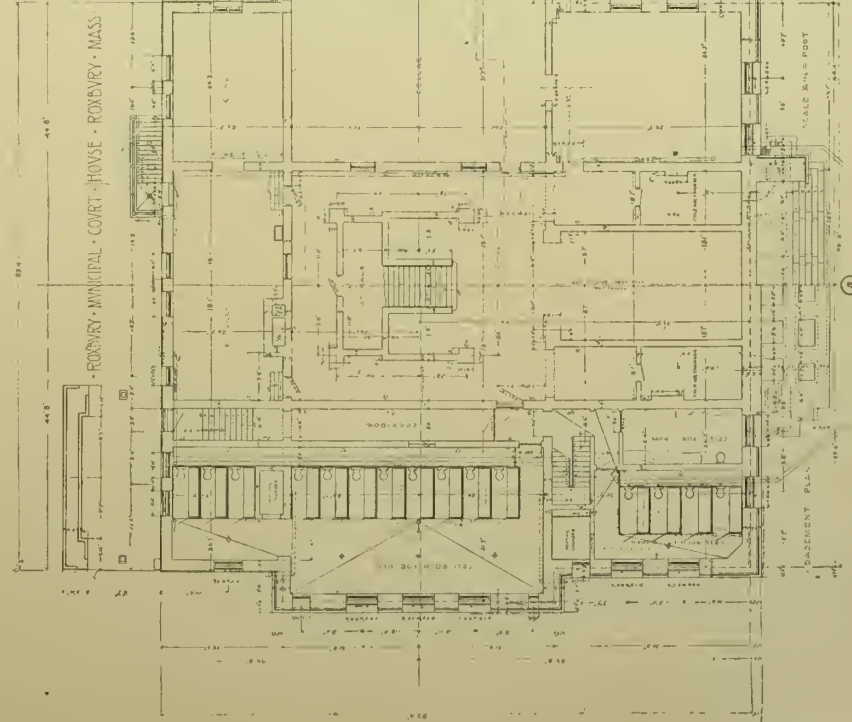
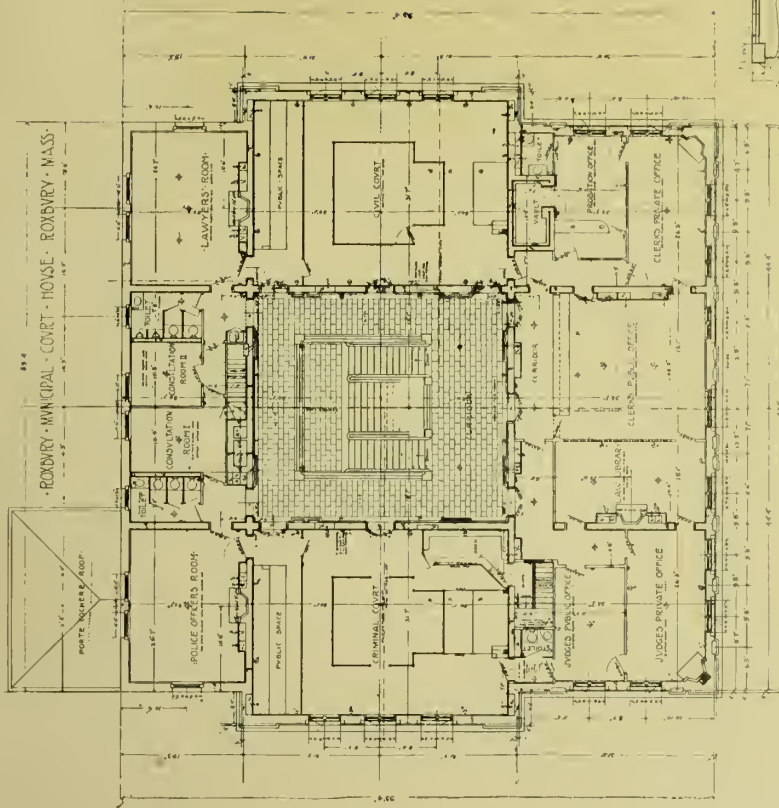


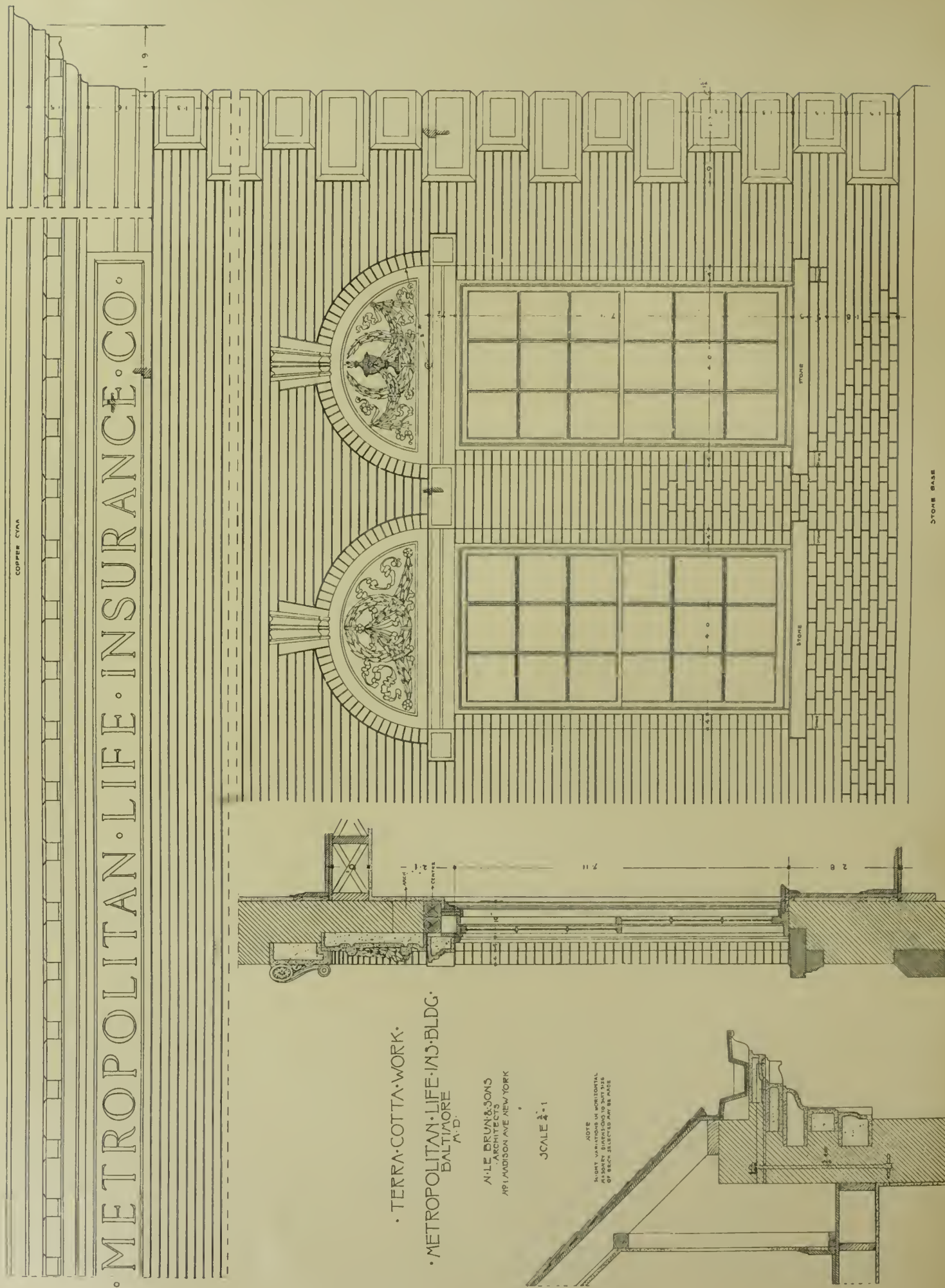


CORN EXCHANGE NATIONAL BANK BUILDING, PHILADELPHIA, PA.
 NEWMAN, WOODMAN & HARRIS, ARCHITECTS.



ROXBURY MUNICIPAL COURT HOUSE, ROXBURY, MASS
ALLEN & VANCE, ARCHITECTS.





METROPOLITAN LIFE INSURANCE CO.

• TERRA-COTTA WORK •
• METROPOLITAN LIFE INS. BLDG. •
BALTIMORE
M.D.

N. LE BRUN & SONS
ARCHITECTS
1817 MADISON AVE. NEW YORK

SCALE 1/4" = 1'

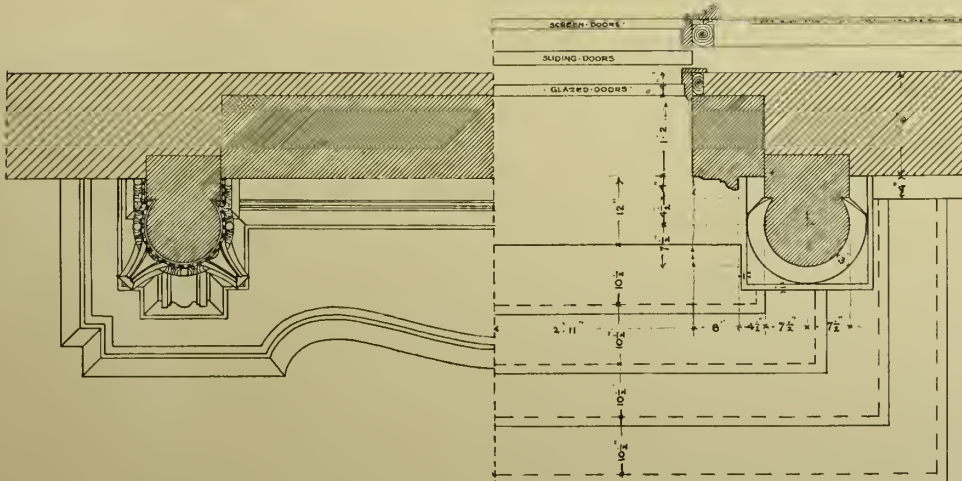
NOTE
MORTAR JOINTS AND MORTAR
PLASTER SHOWN TO SHOW
OF BRICK SELECTED AND BE MADE

STONE BASE

DETAIL. METROPOLITAN LIFE INSURANCE BUILDING, BALTIMORE, MD
N. LE BRUN & SONS, ARCHITECTS.

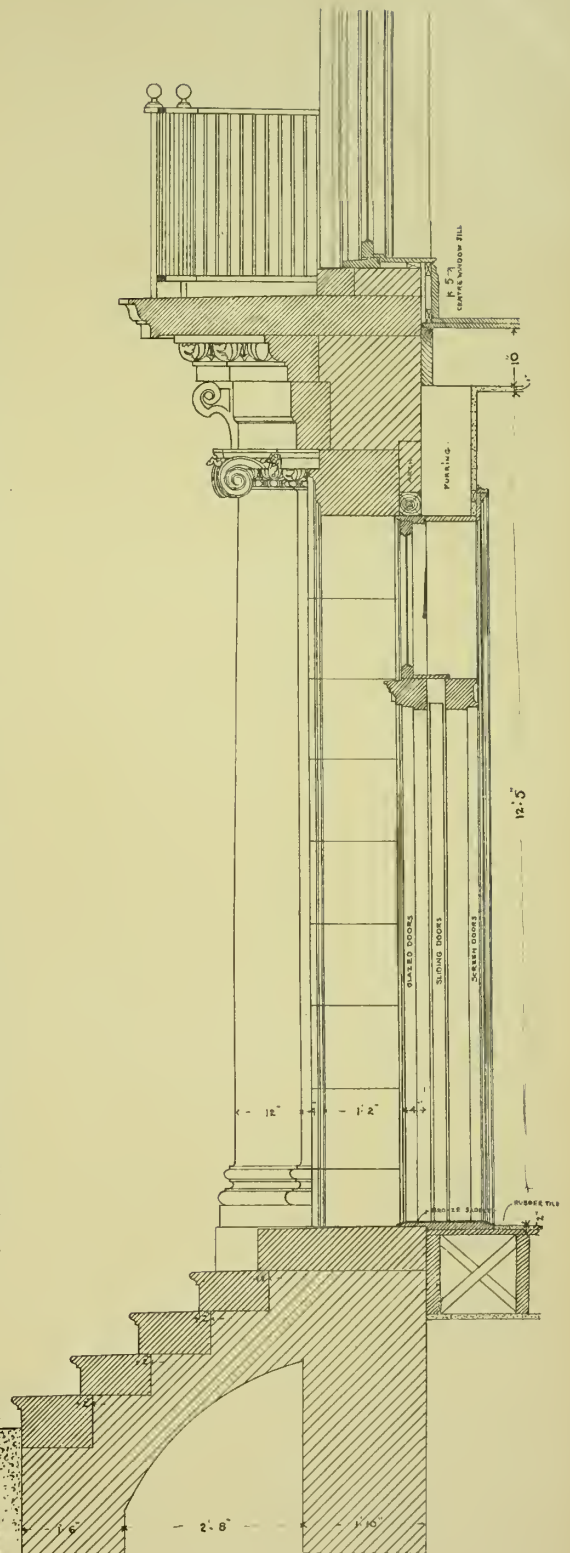


NOTE:-
THE NOSING SHOWN ON STEPS
IS OMITTED, SEE FRONT ELEVATION.



SOFFIT OF ENTRANCE.

PLAN OF ENTRANCE.



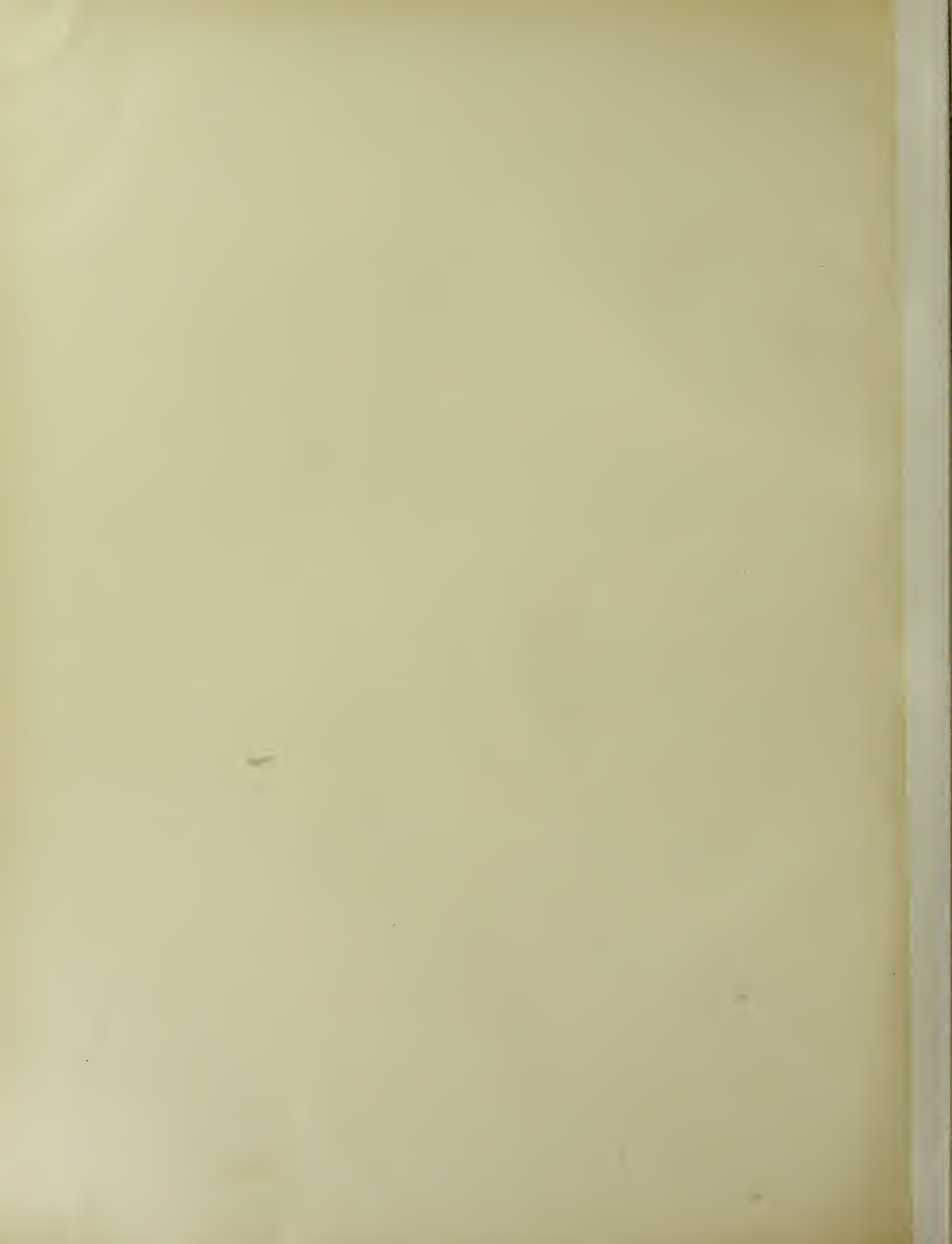
SECTION

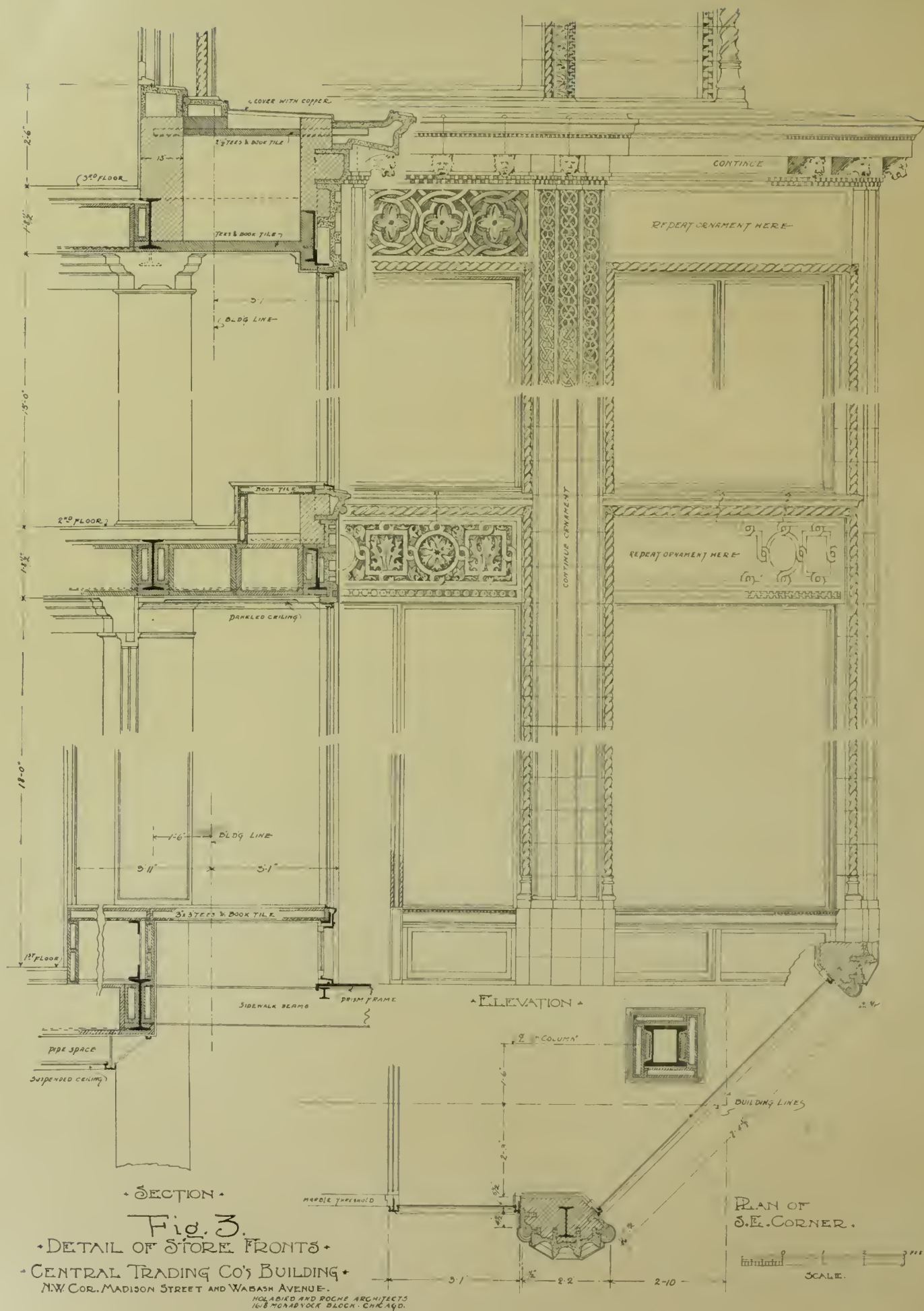
DETAIL OF ENTRANCE.

METROPOLITAN LIFE INS. BLDG.
BALTIMORE
M.D.

N. LE BRUN & SONS
ARCHITECTS.
101 MADISON AVE. NEW YORK.

SCALE $\frac{1}{4}'' = 1'$





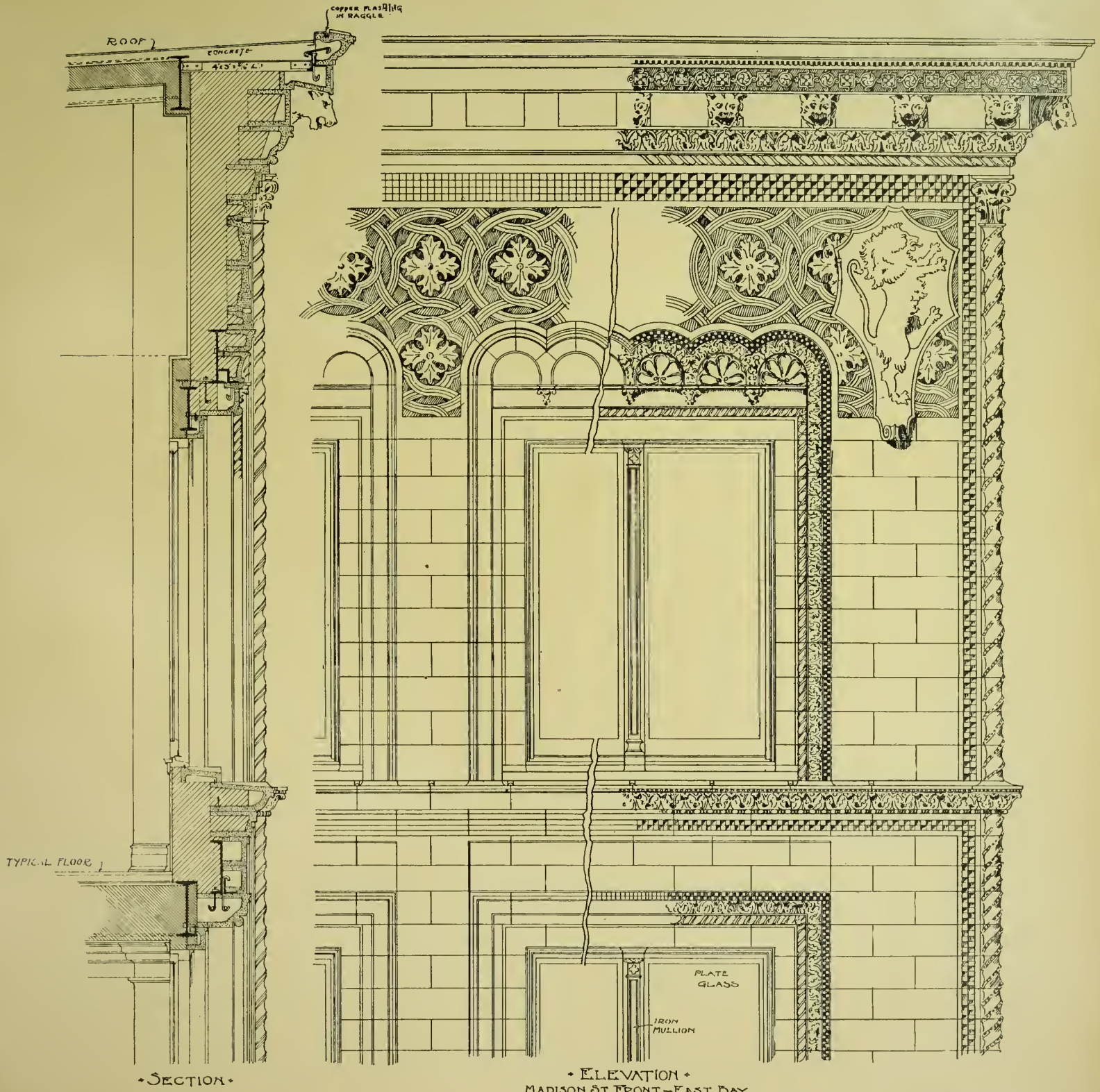
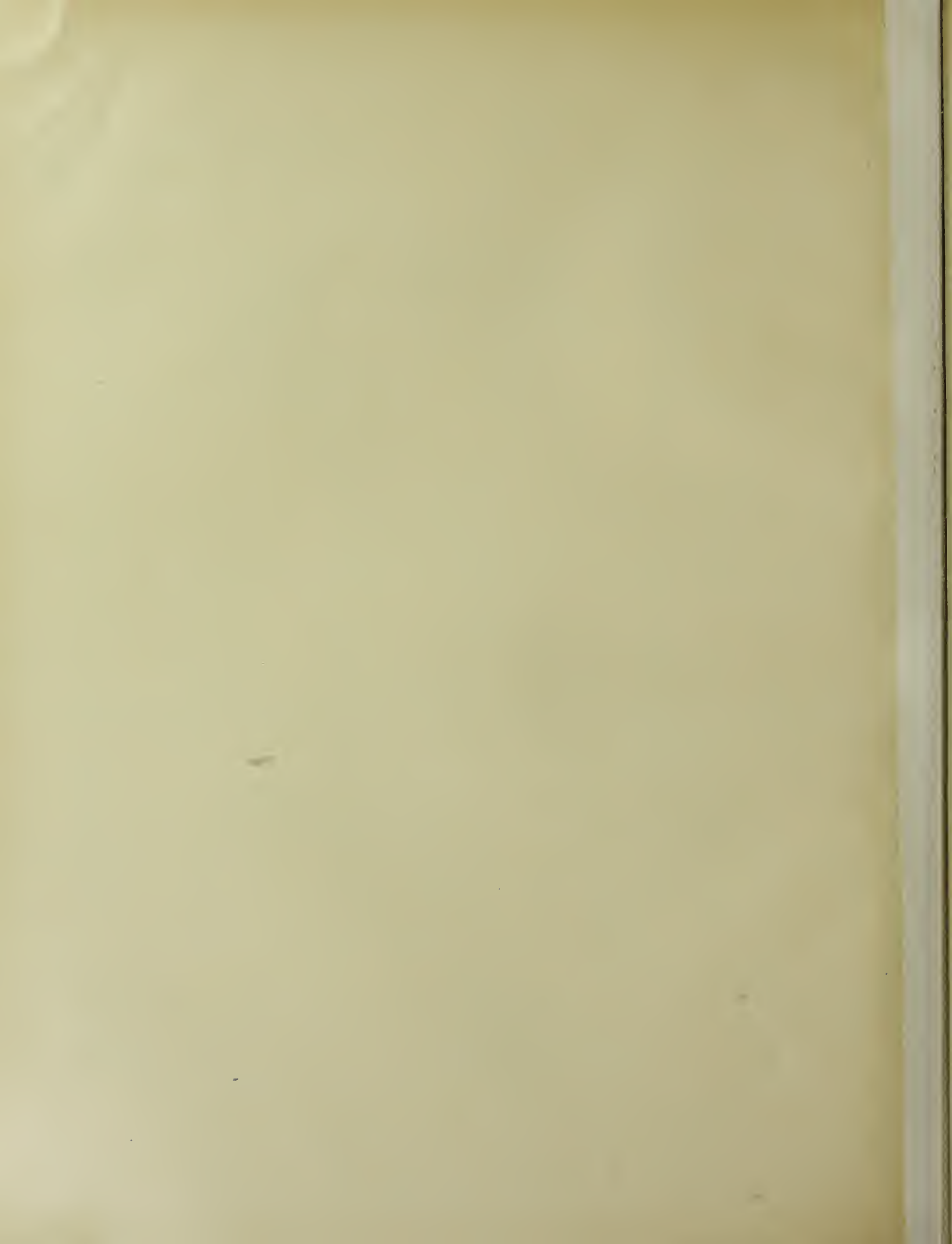


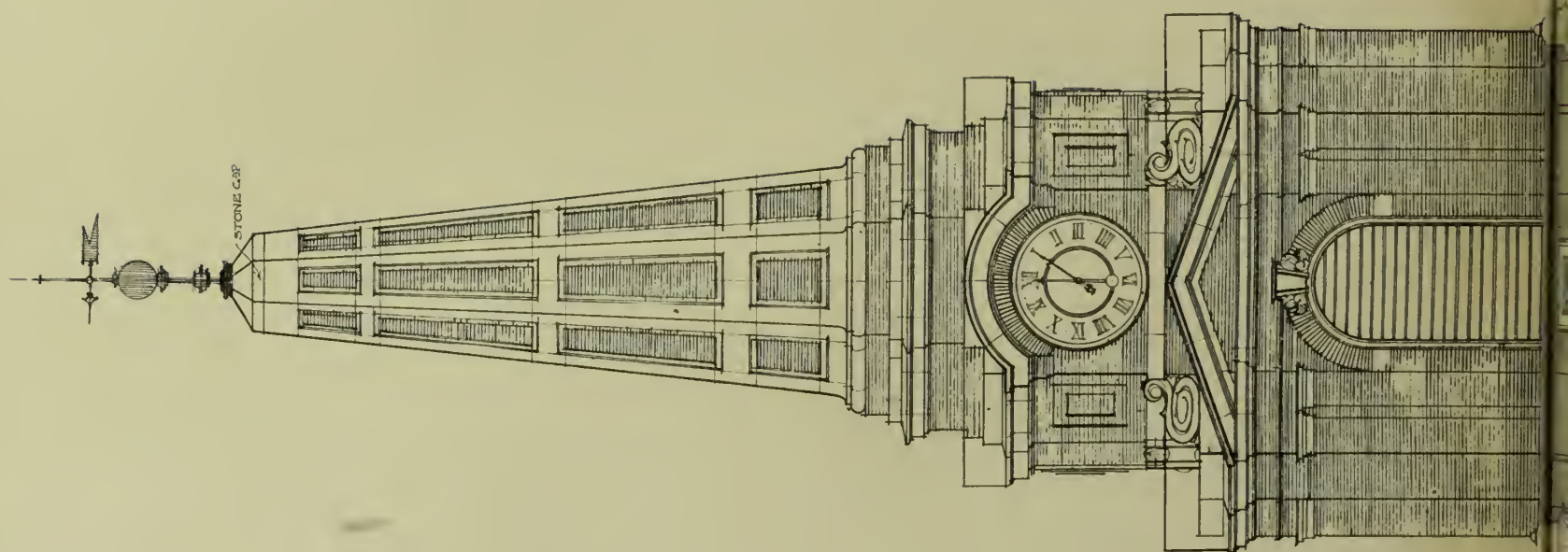
Fig. 4.
DETAIL OF FRONT ELEVATION
CENTRAL TRADING CO'S BUILDING
N.W. COR. MADISON ST. AND WABASH AVE.

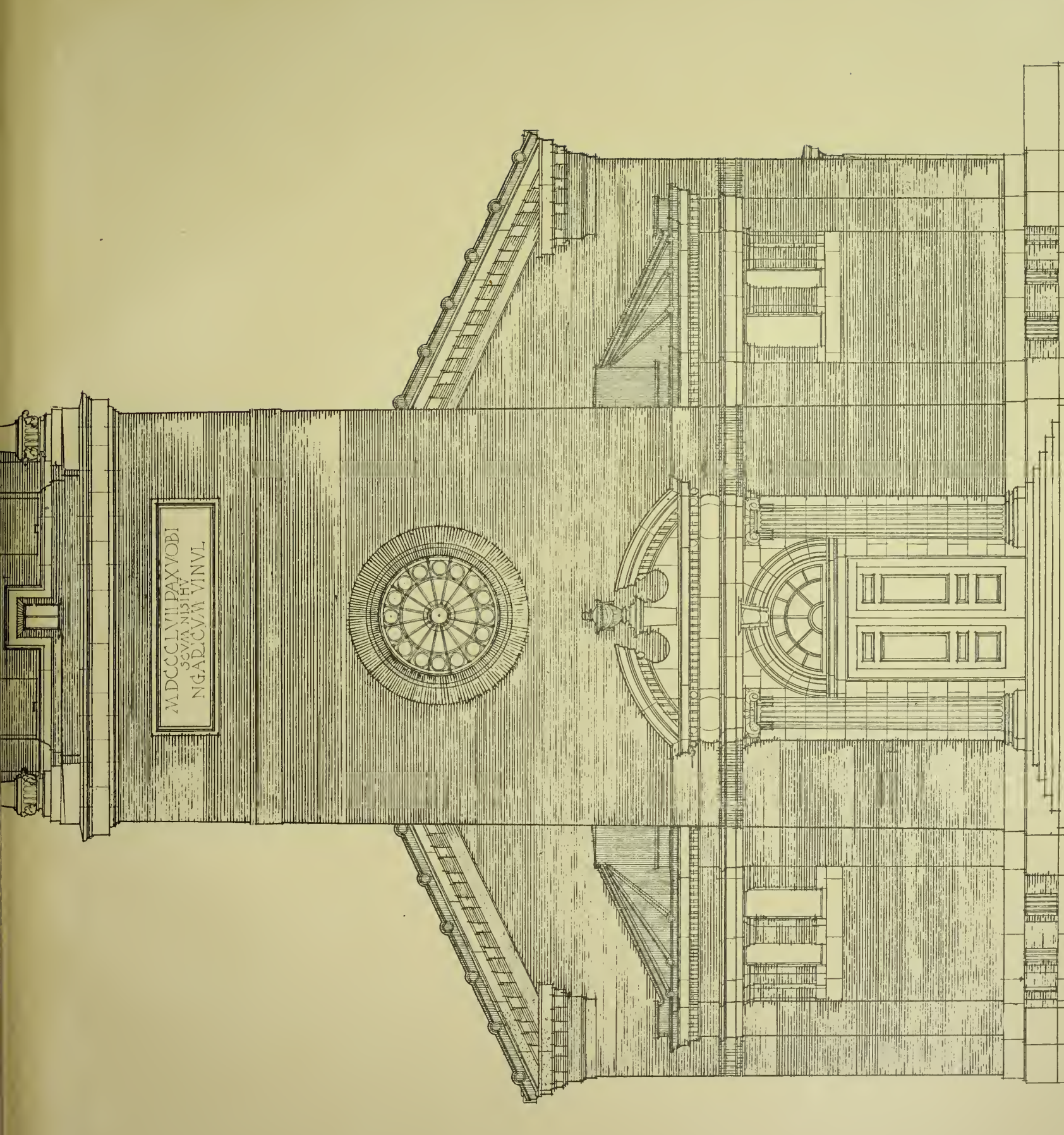
HOLABIRD AND ROCHE ARCHITECTS,
1616 MONADNOCK BLOCK, CHICAGO.

0 1 2 3 FEET
SCALE

PLAN

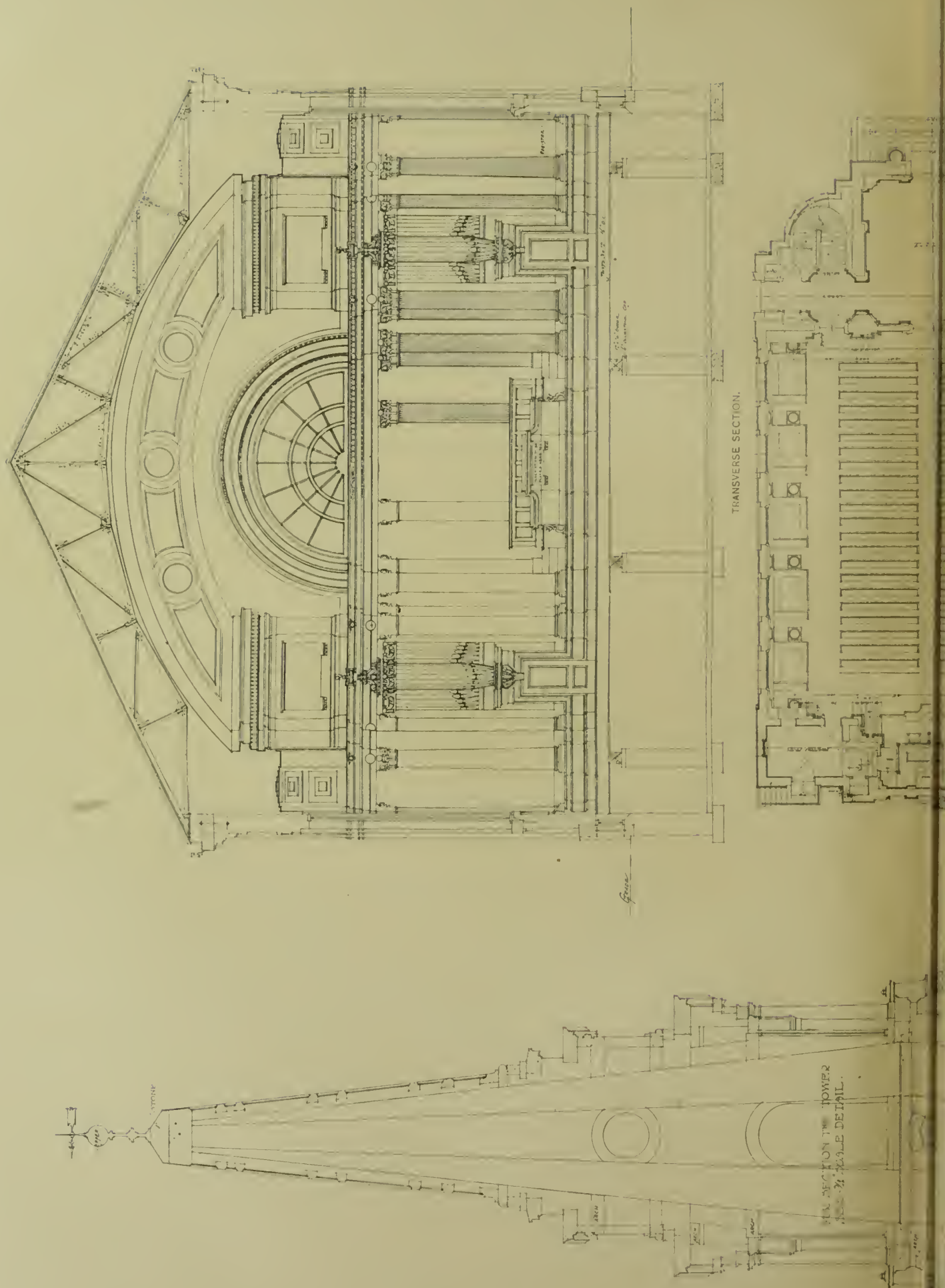


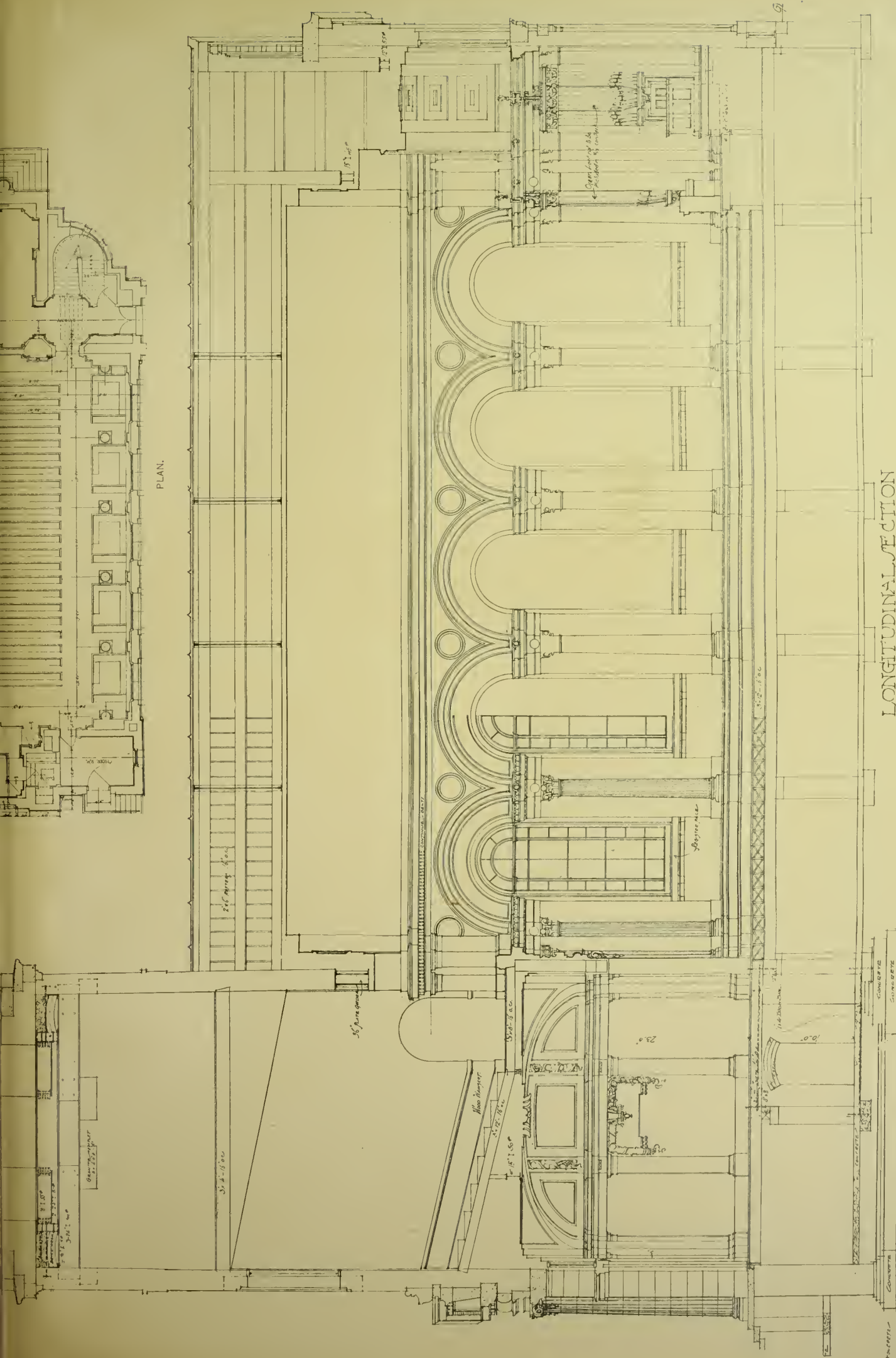




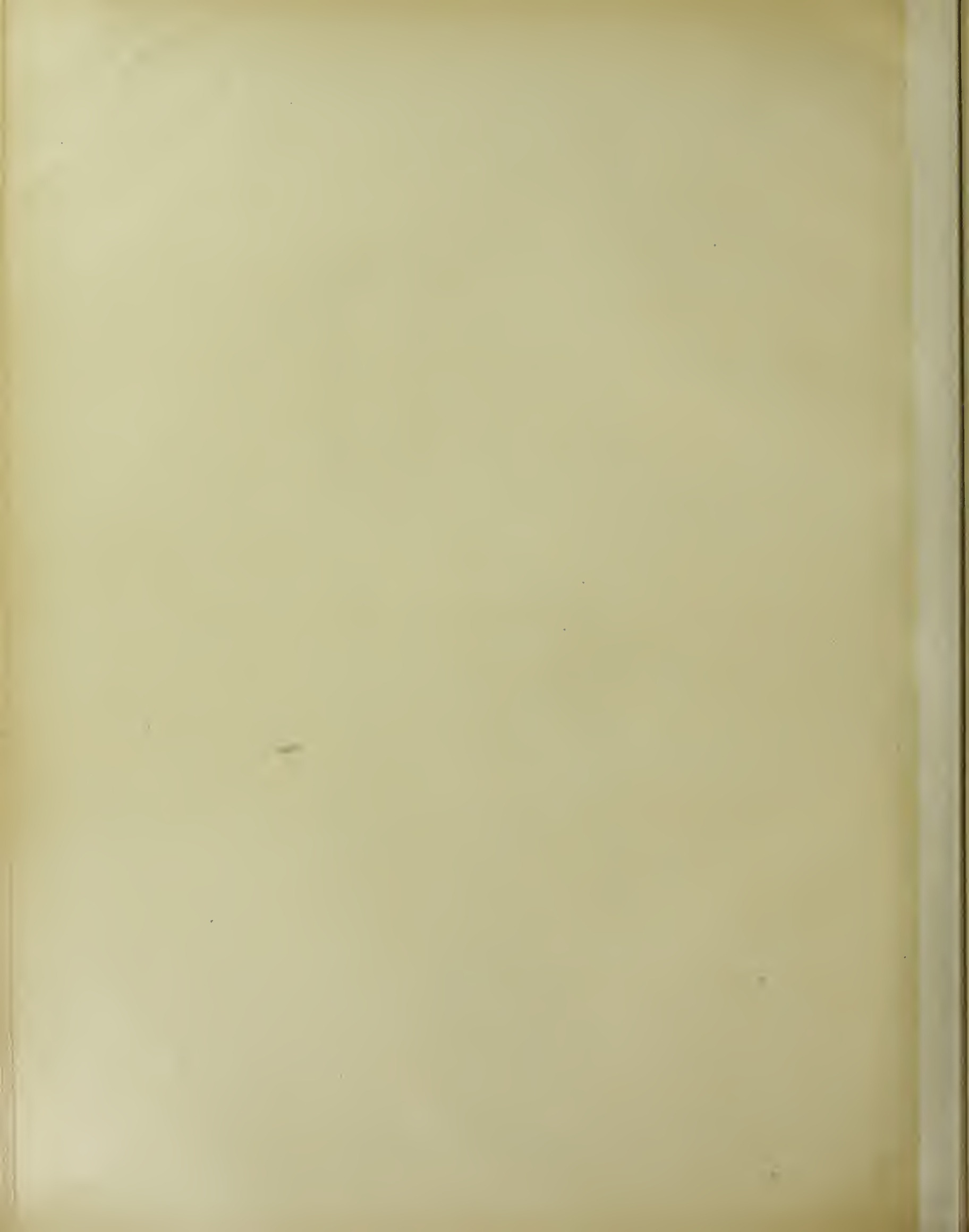
FRONT ELEVATION.
THE CONGREGATIONAL CHURCH, NAUGATUCK, CONN.
McKIM, MEAD & WHITE, ARCHITECTS.



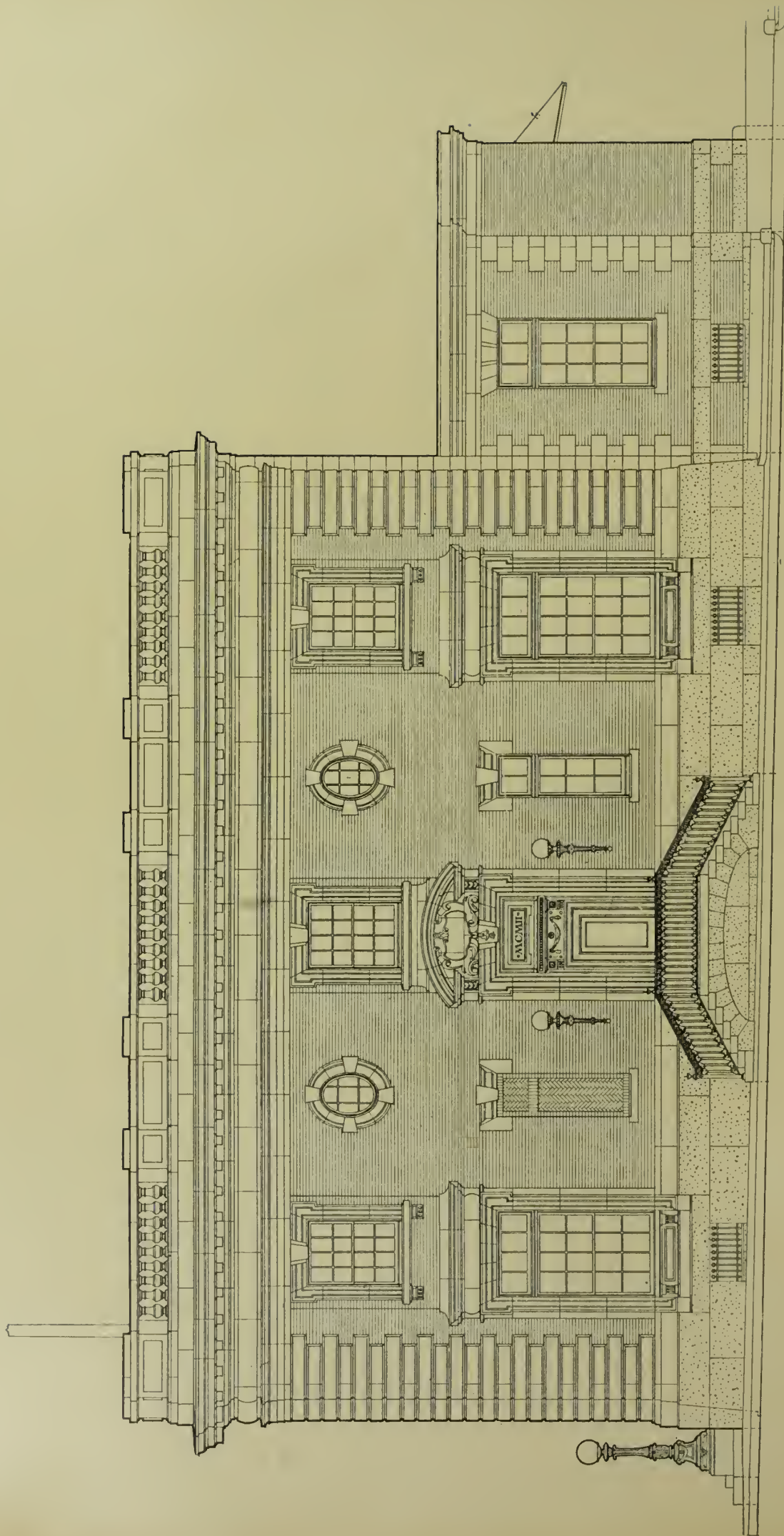




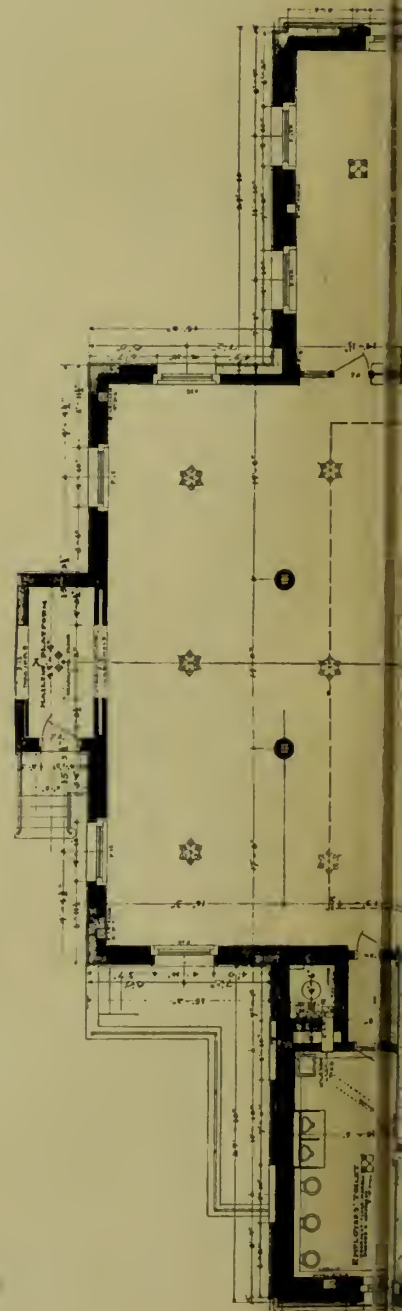
LONGITUDINAL SECTION
THE CONGREGATIONAL CHURCH, NAUGATUCK, CONN.
MCKIM, MEAD & WHITE, ARCHITECTS.

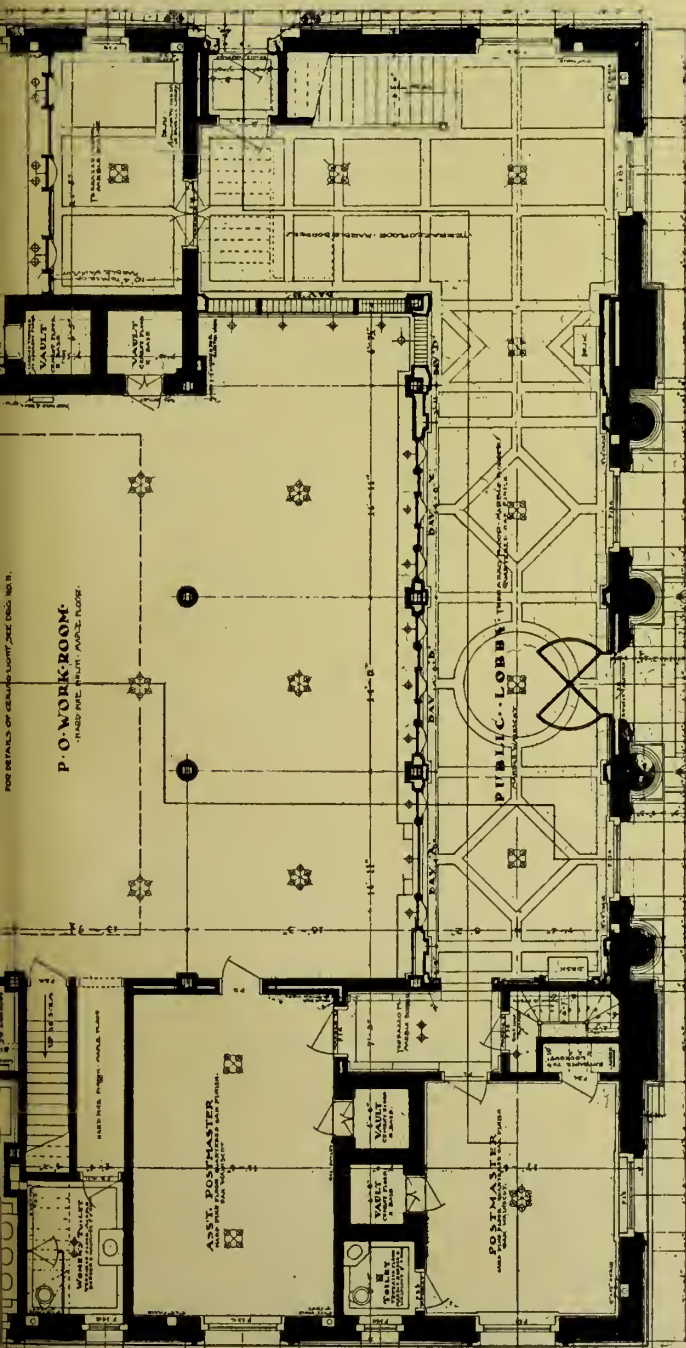




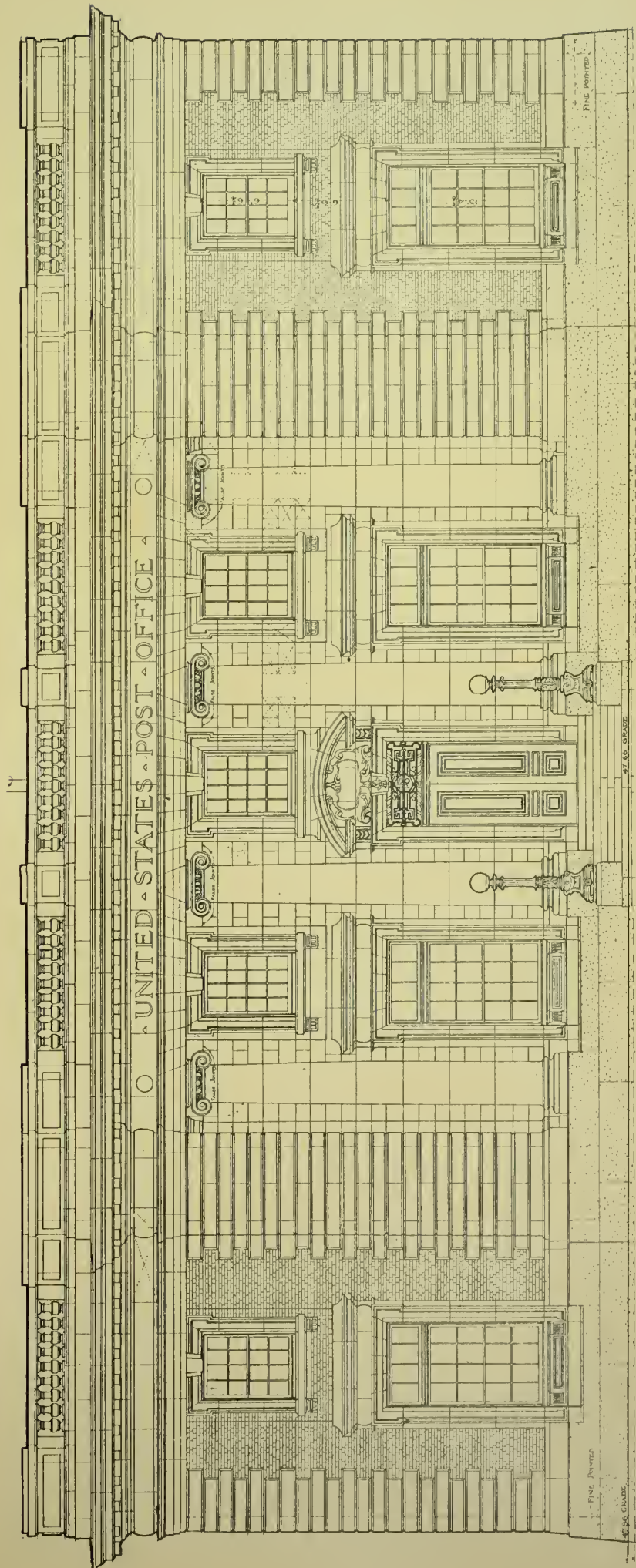


SIDE ELEVATION.



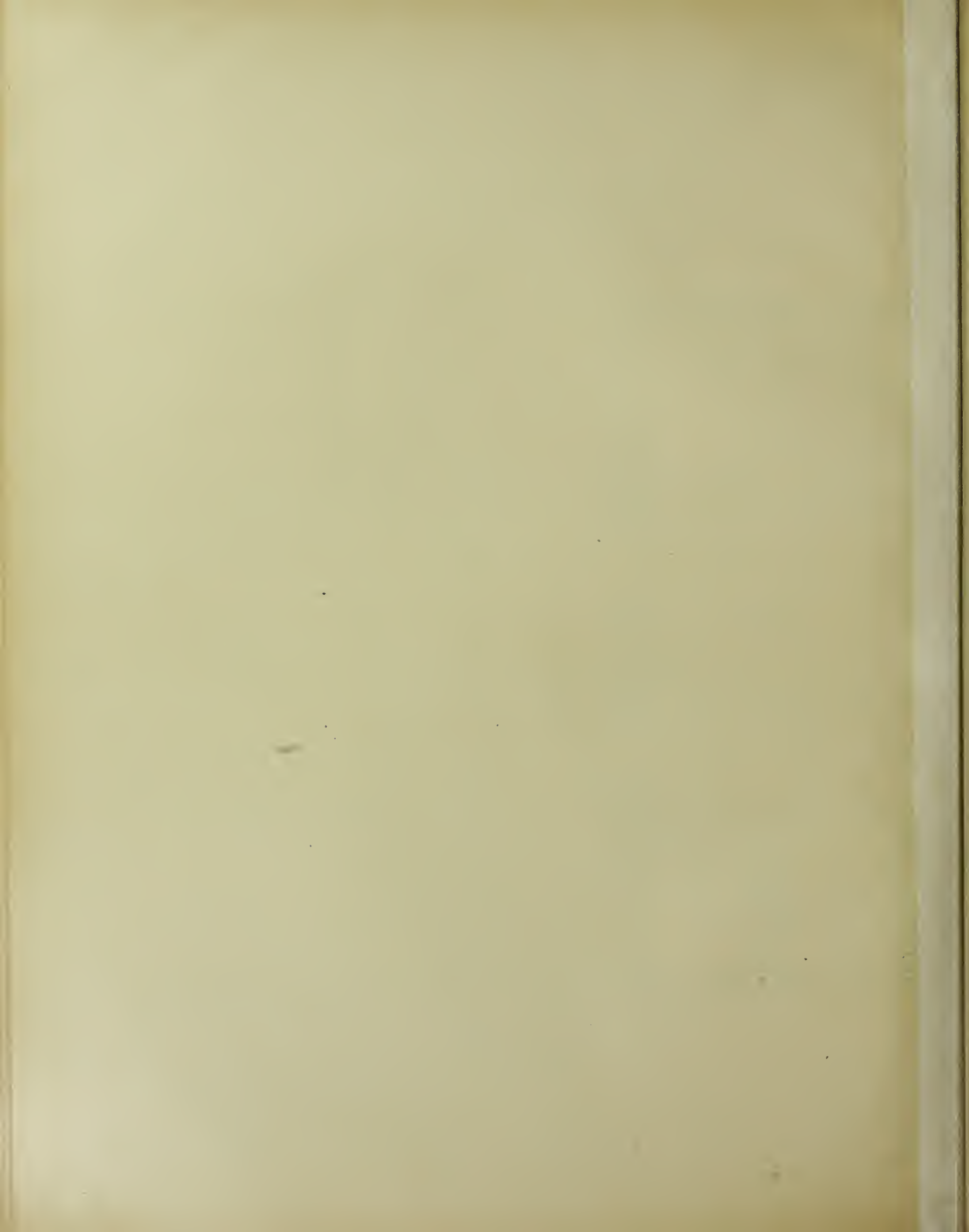


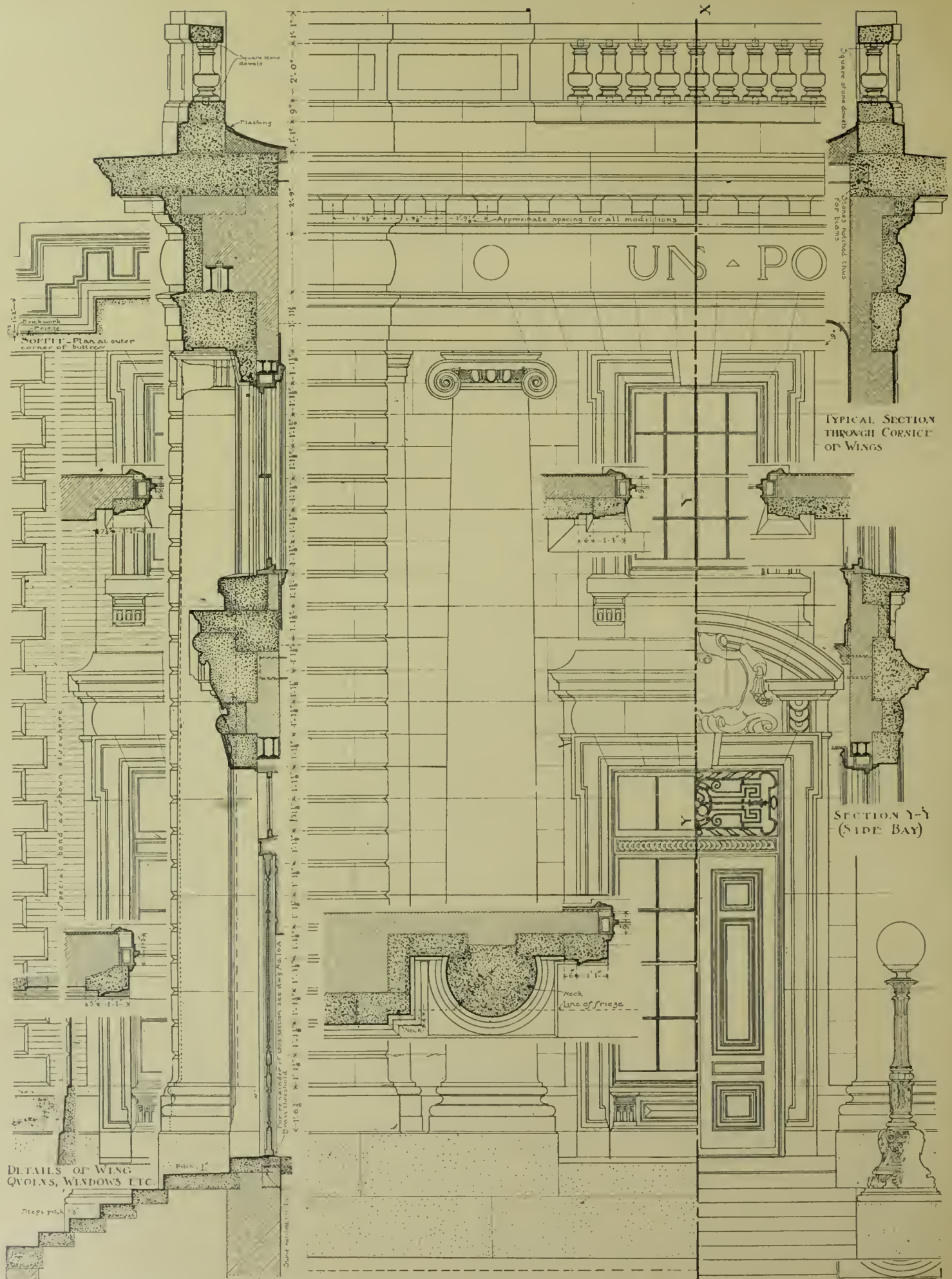
PLAN.



FRONT ELEVATION.

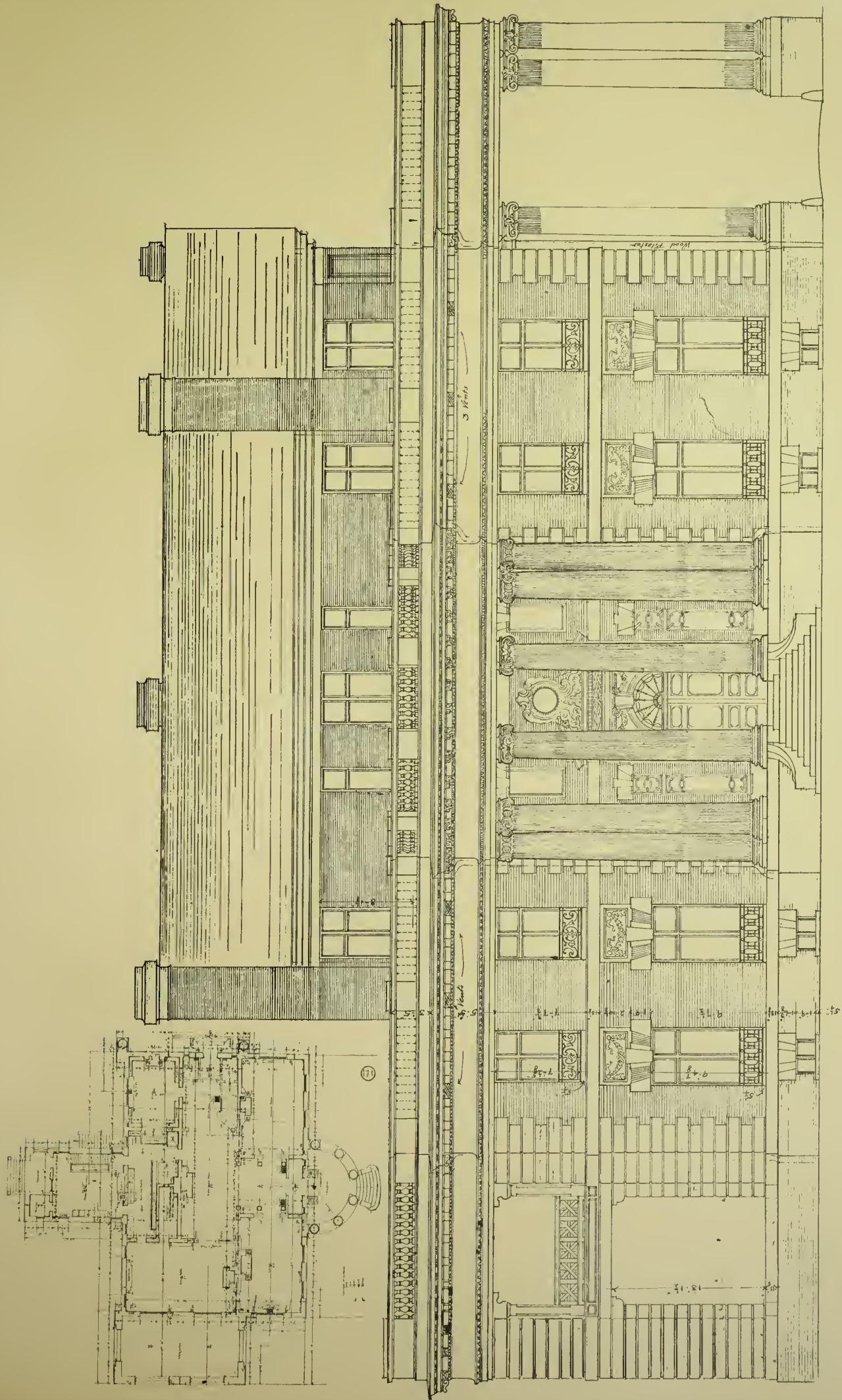
UNITED STATES POST OFFICE, JOLIET, ILL.
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT, TREASURY DEPARTMENT.





EXTERIOR DETAIL.

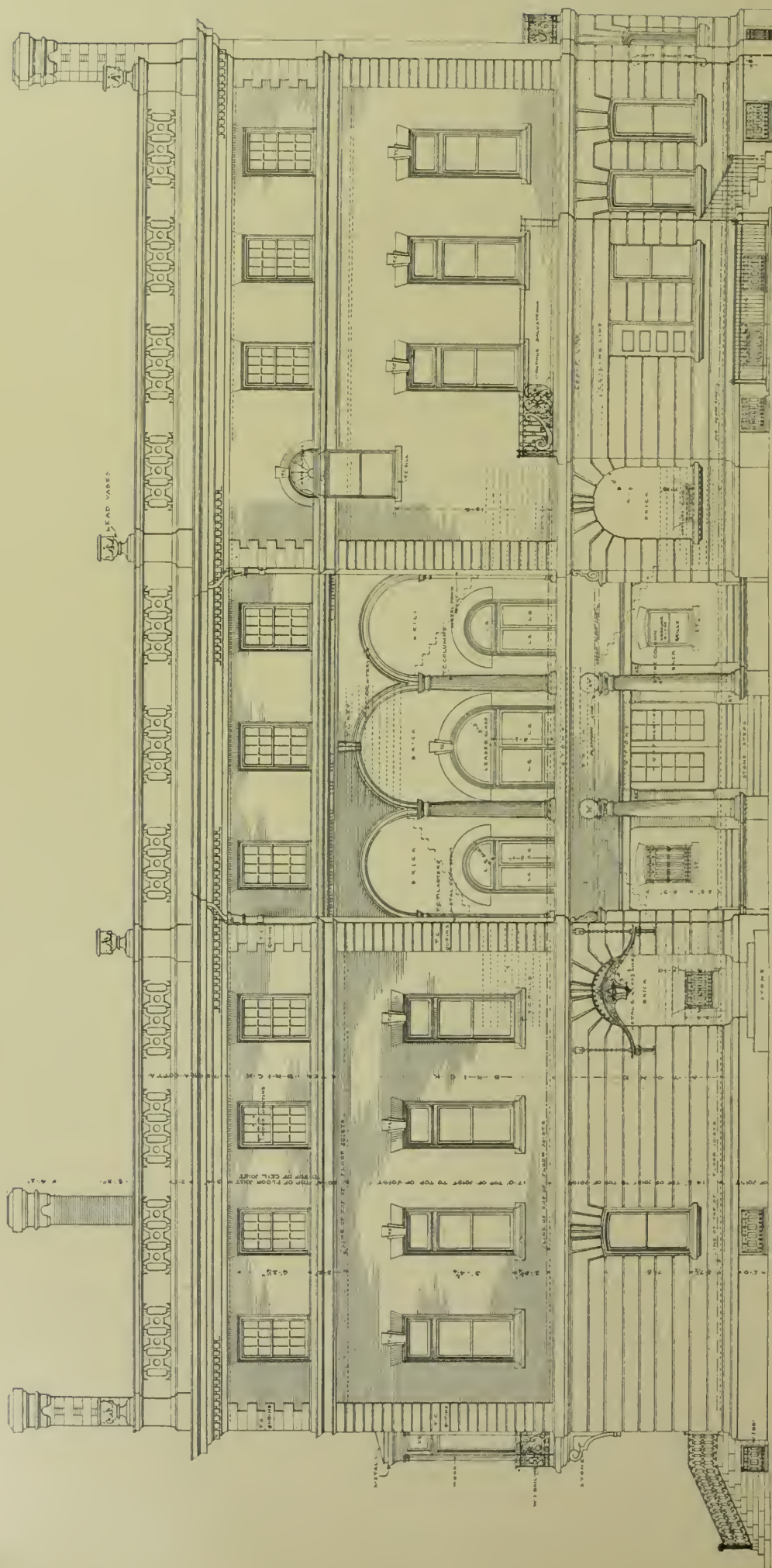
UNITED STATES POST OFFICE, JOLIET, ILL.
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT, TREASURY DEPARTMENT.



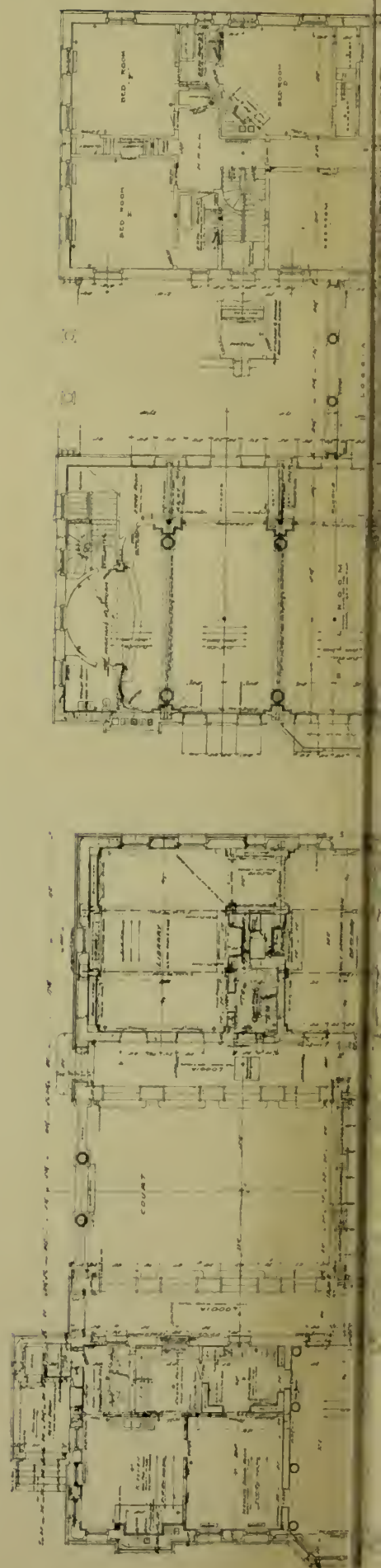
FRONT ELEVATION.
HOUSE AT ELIZABETH, N. J.
CARRERE & HASTINGS, ARCHITECTS.

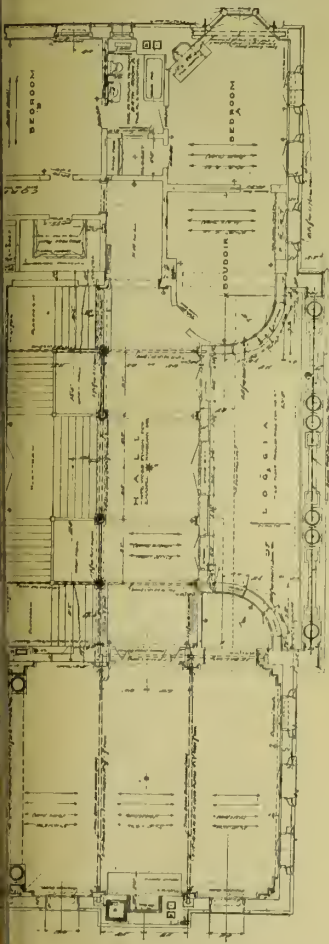




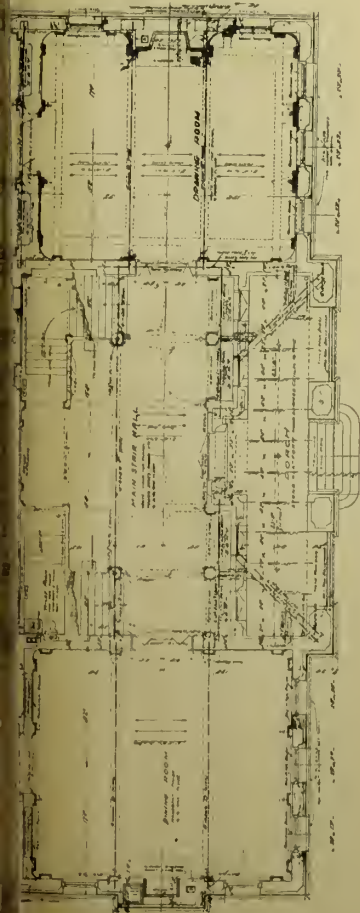


REAR ELEVATION.

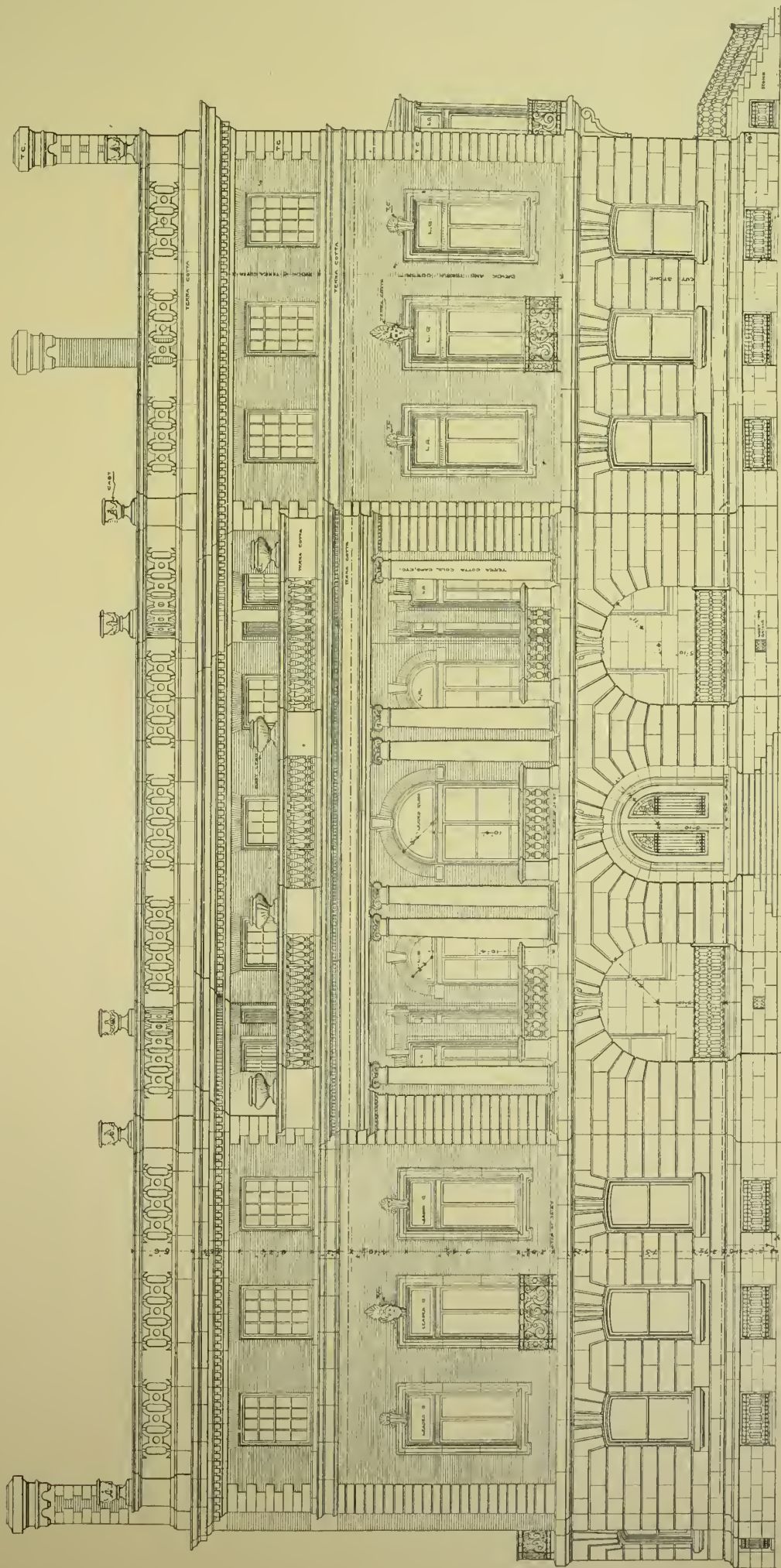




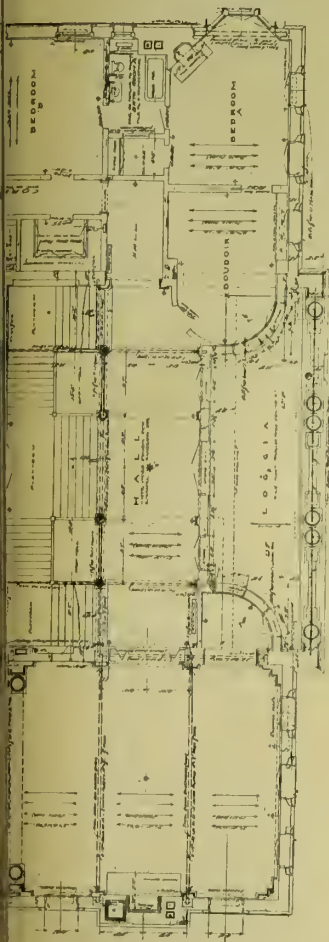
SECOND FLOOR PLAN.



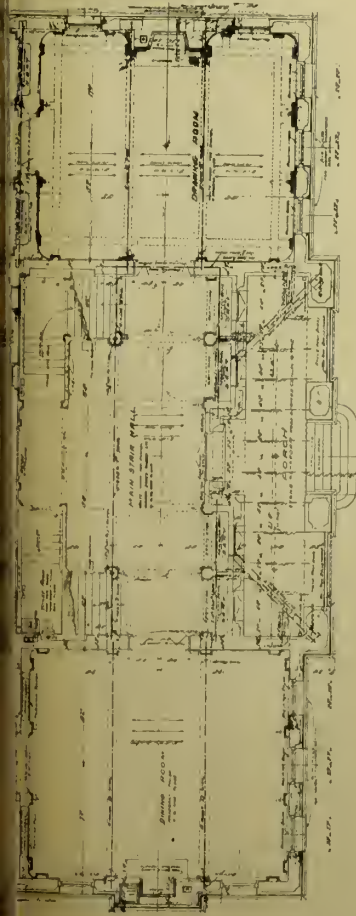
FIRST FLOOR PLAN.



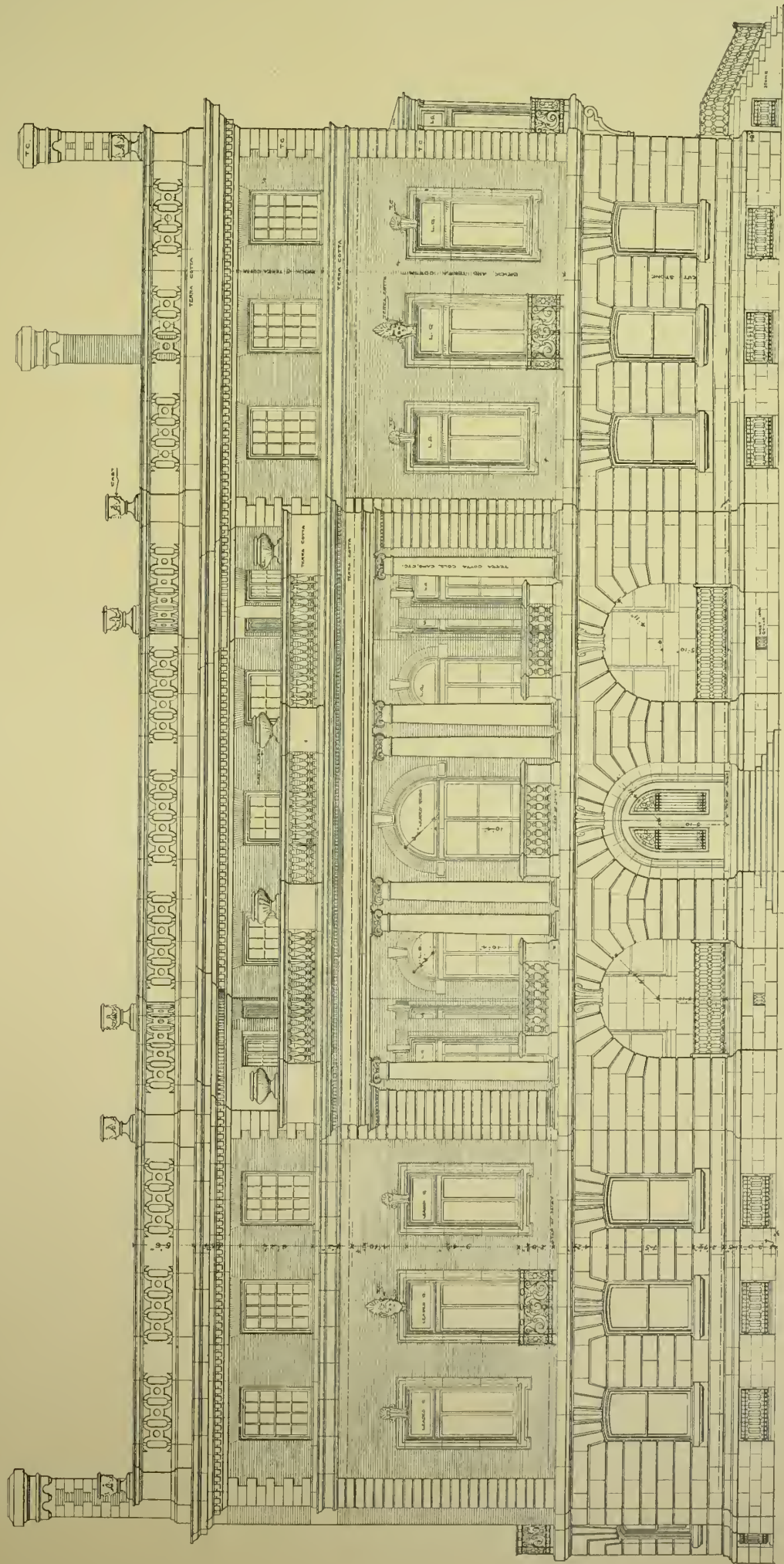
FRONT ELEVATION.
HOUSE AT CLEVELAND, OHIO.
FROST & GRANGER, ARCHITECTS.



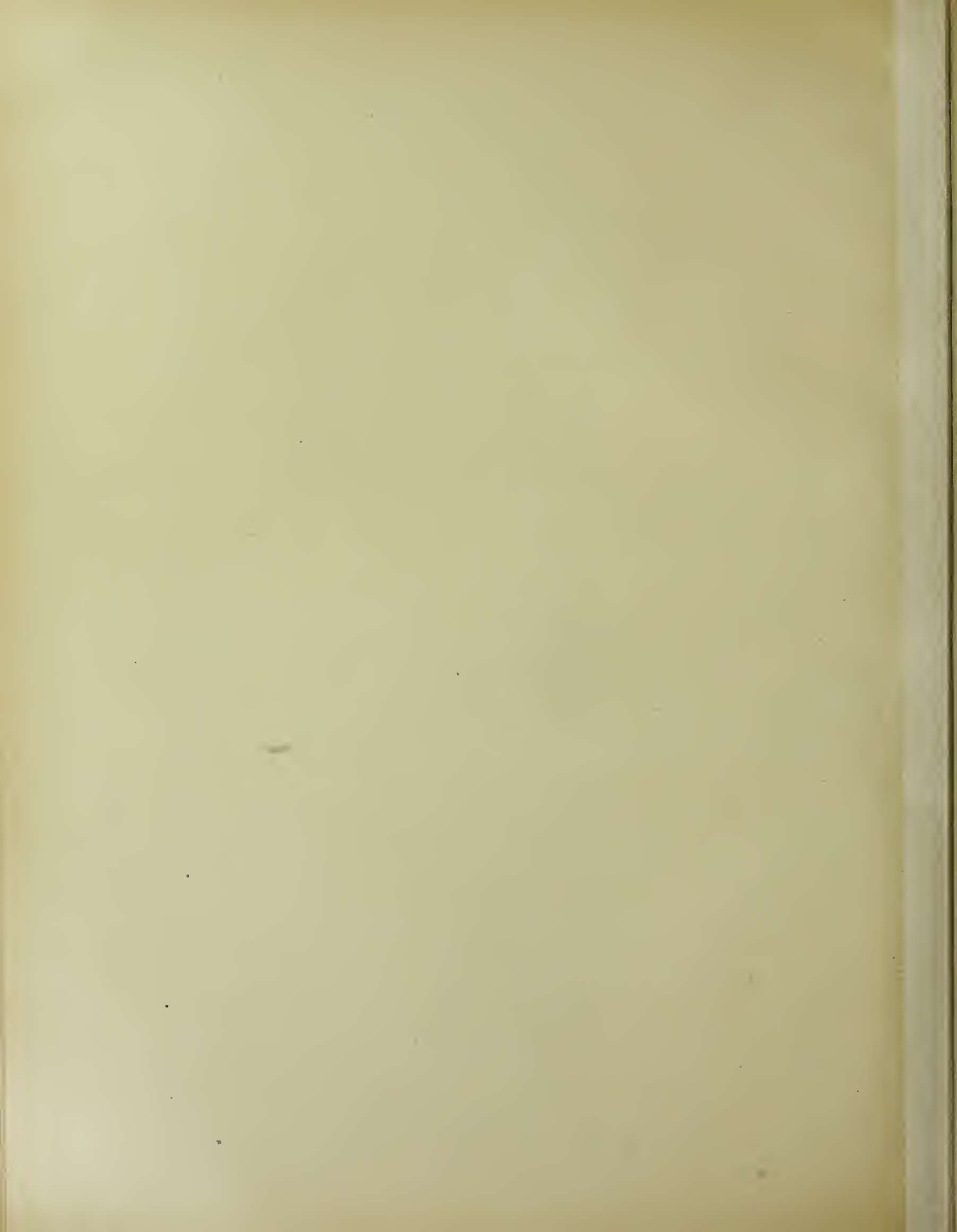
SECOND FLOOR PLAN.

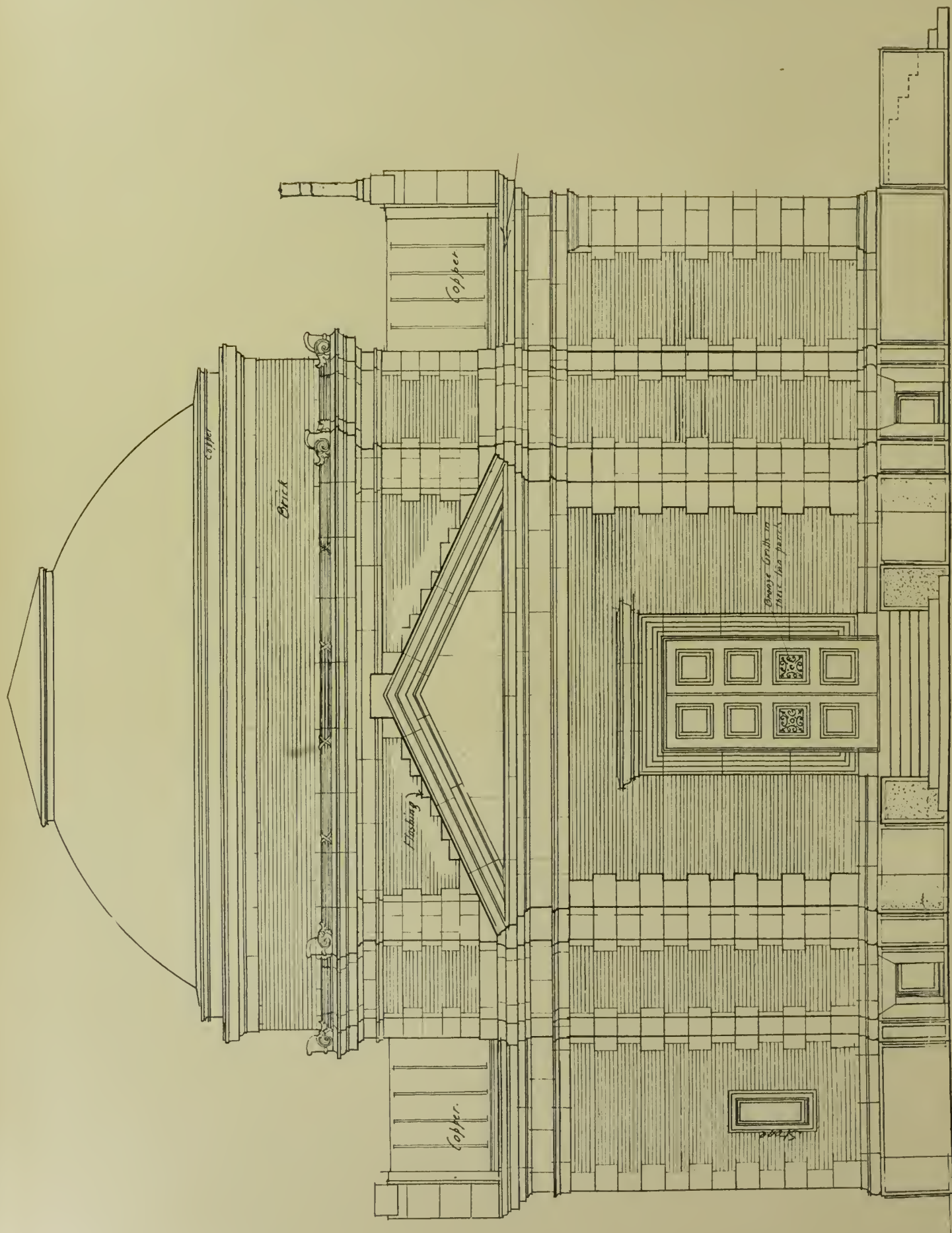


FIRST FLOOR PLAN.

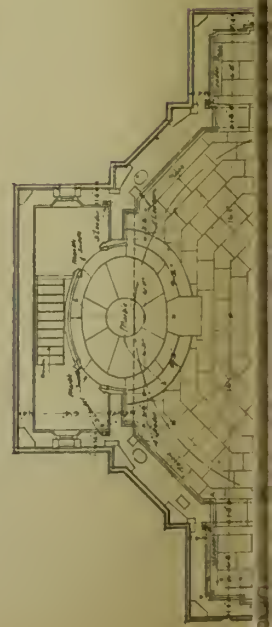


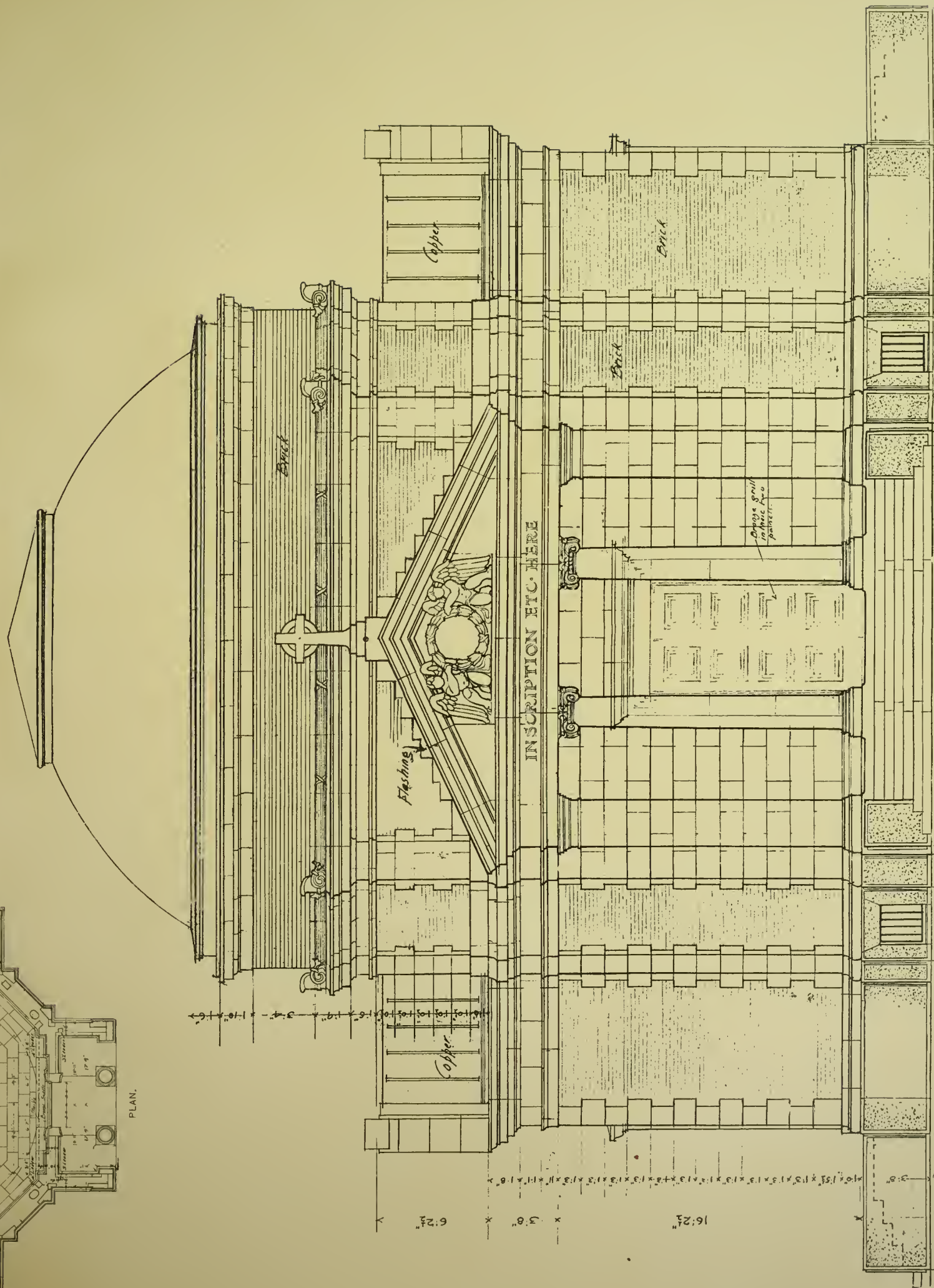
FRONT ELEVATION.
HOUSE AT CLEVELAND, OHIO.
FROST & GRANGER, ARCHITECTS.





SIDE ELEVATION.

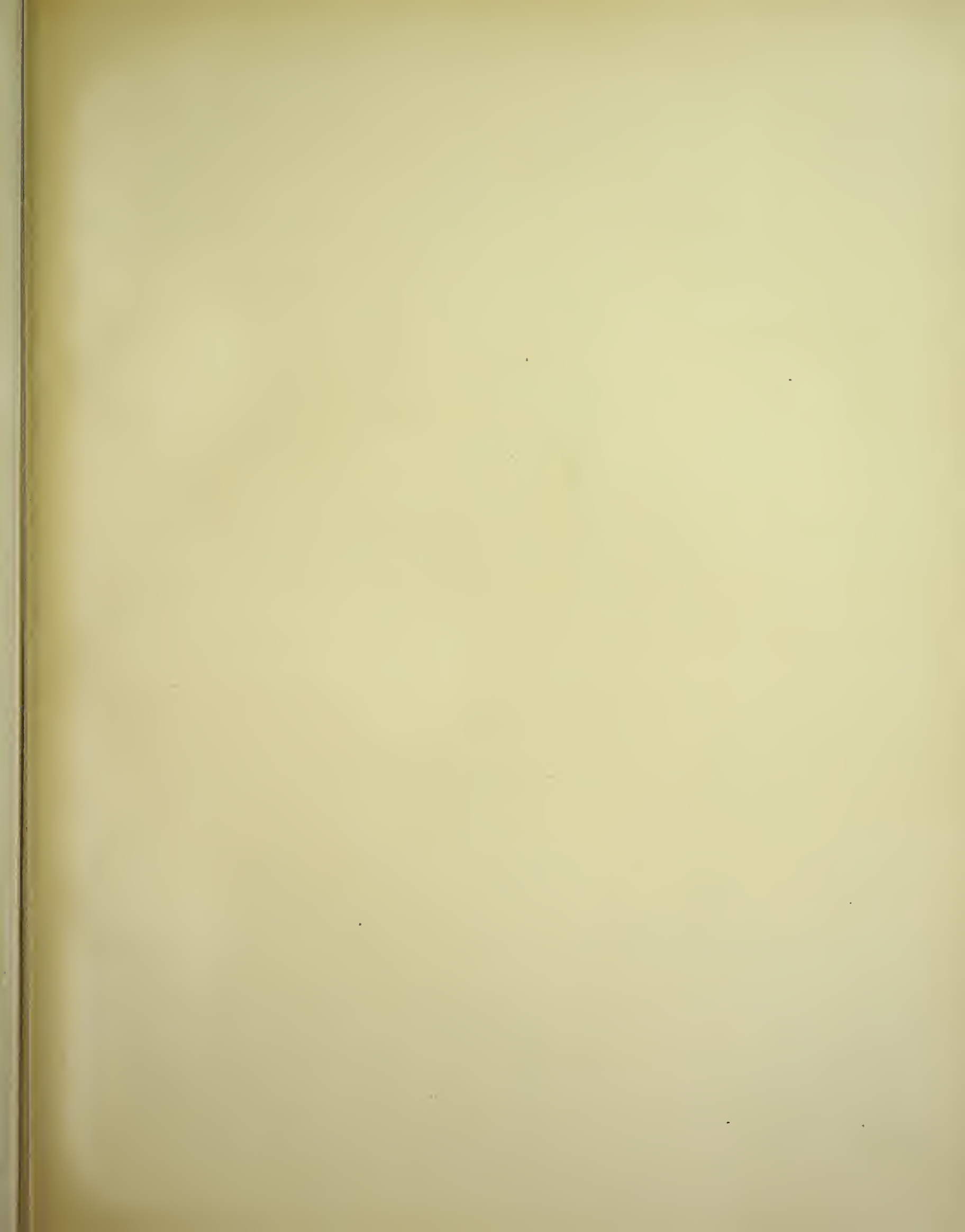


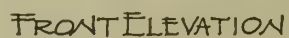
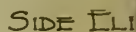


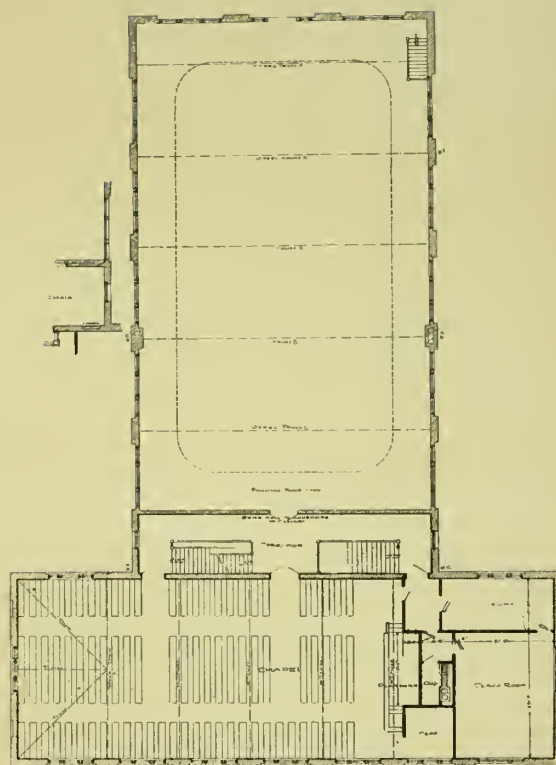
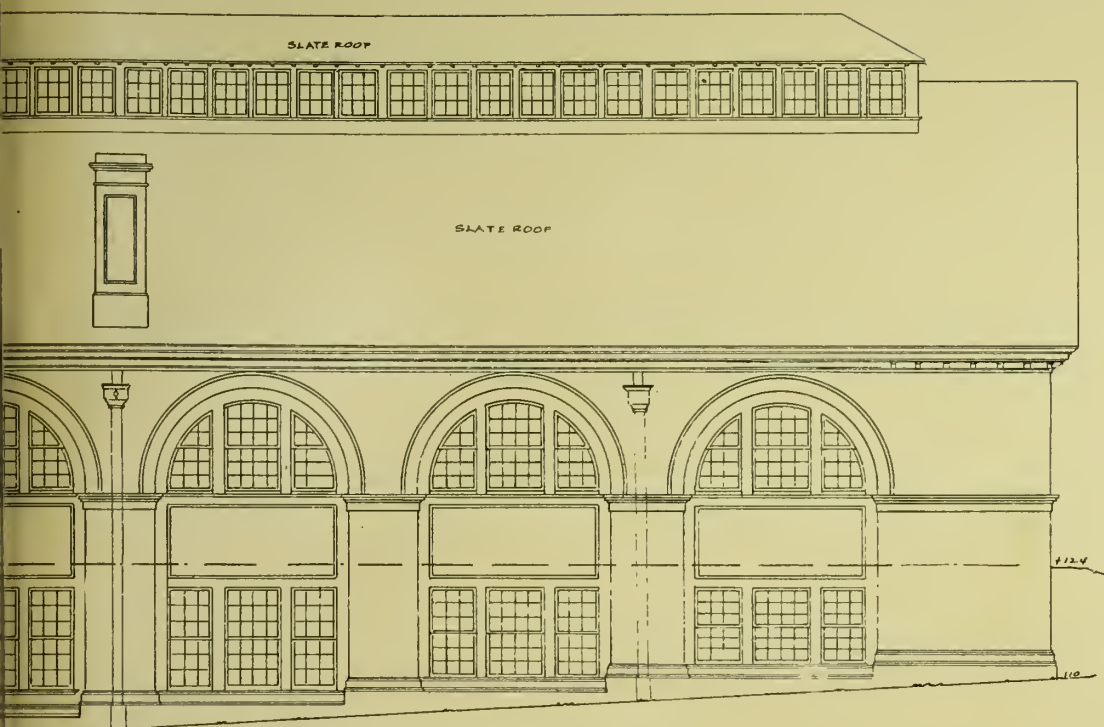
FRONT ELEVATION.

MORTUARY CHAPEL, NEW BRITAIN, CONN.

BRITE & BACON, ARCHITECTS.

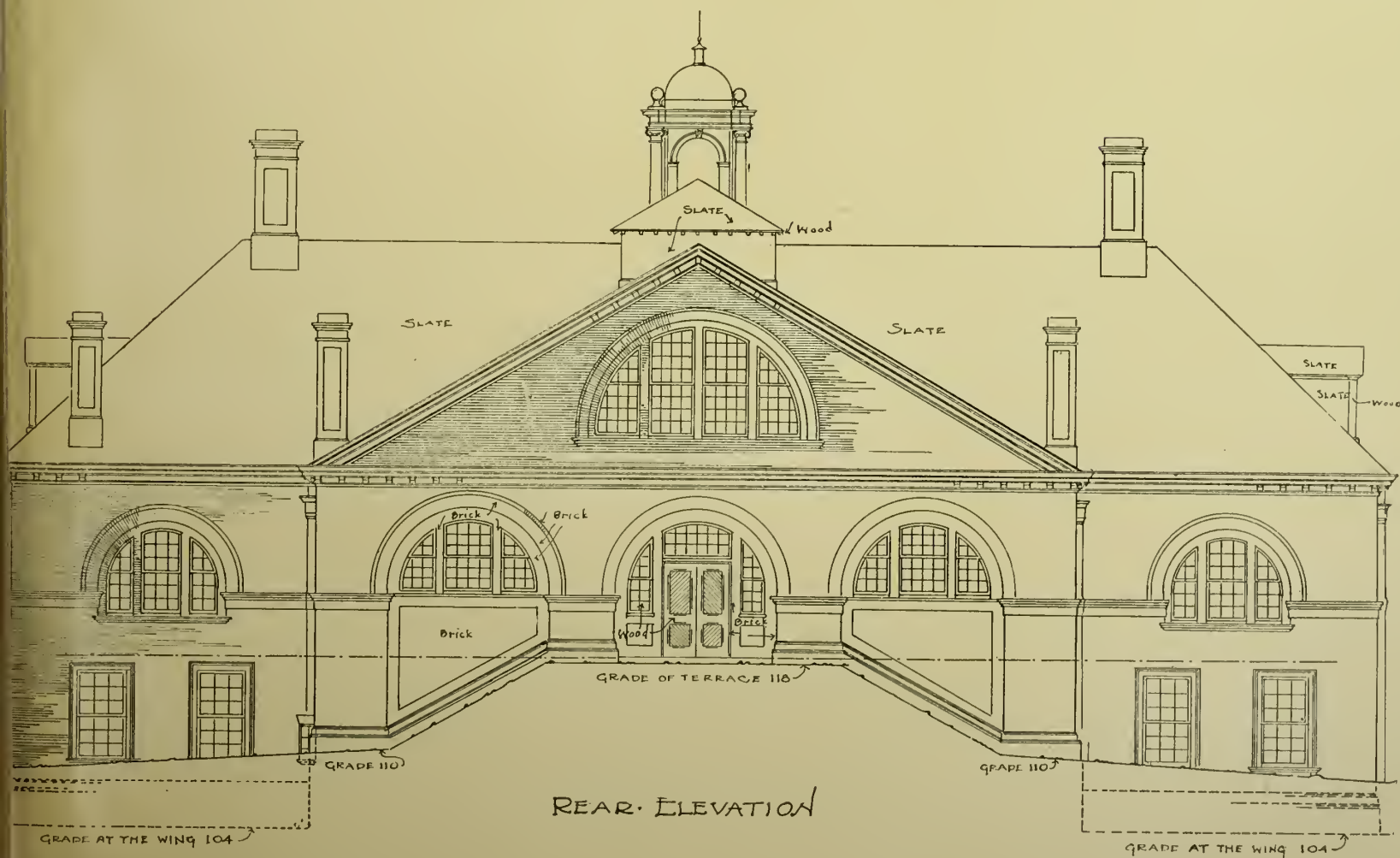






SECOND FLOOR.

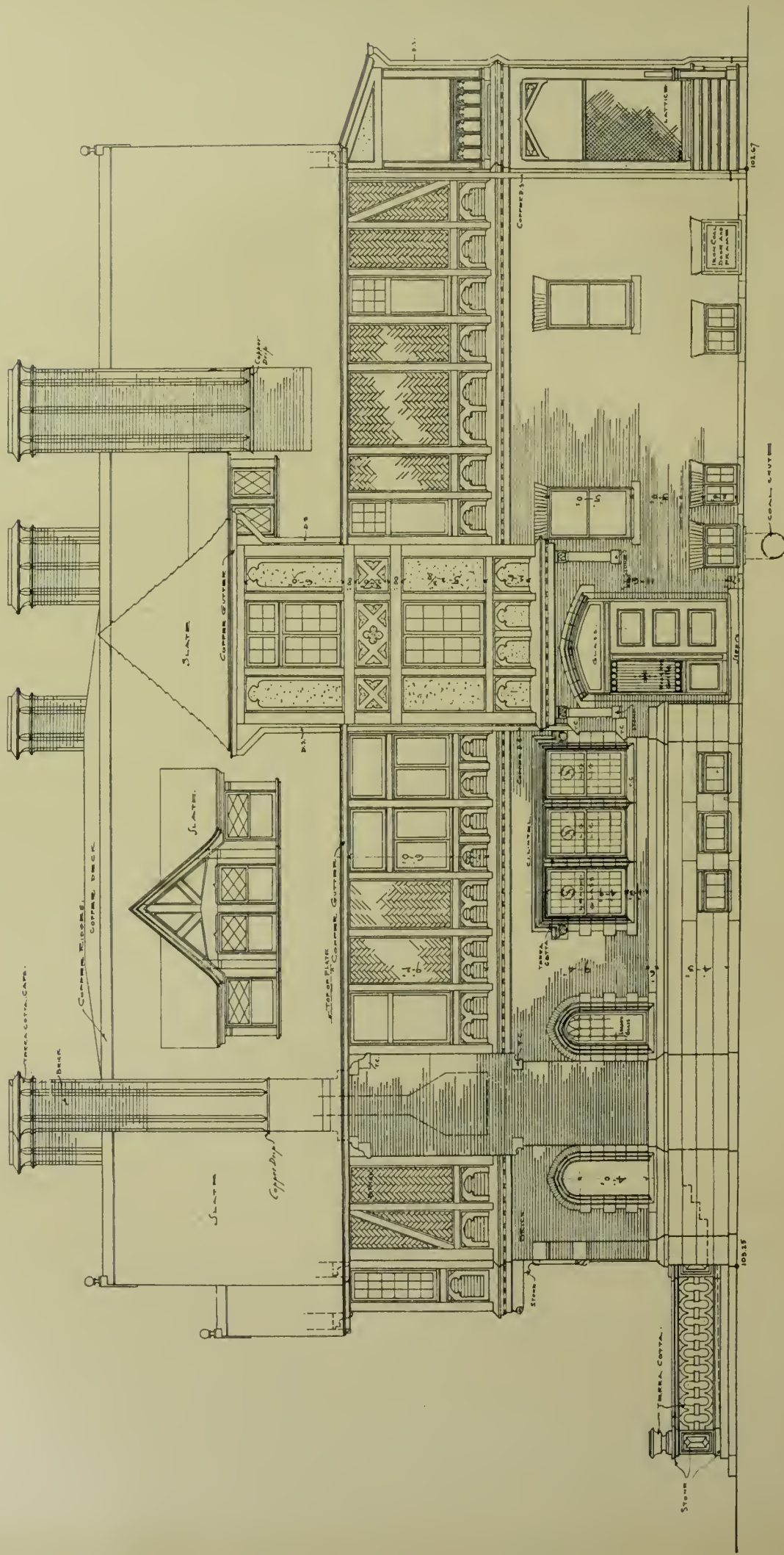
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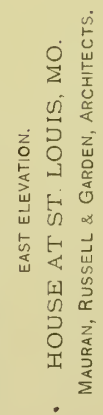
REAR ELEVATION





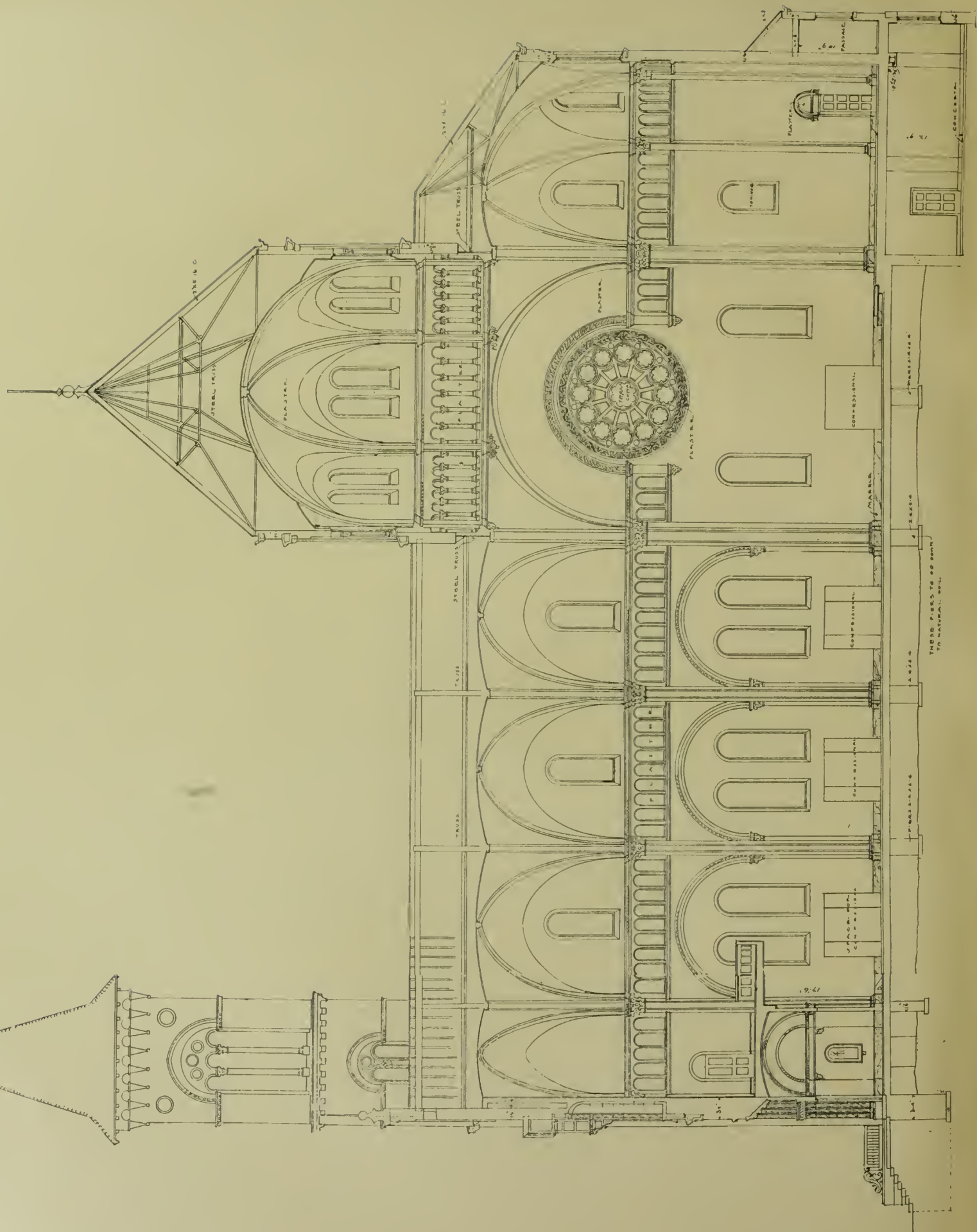


WEST ELEVATION.
HOUSE AT ST. LOUIS, MO.
MAURAN, RUSSELL & GARDEN, ARCHITECTS.



EAST ELEVATION.





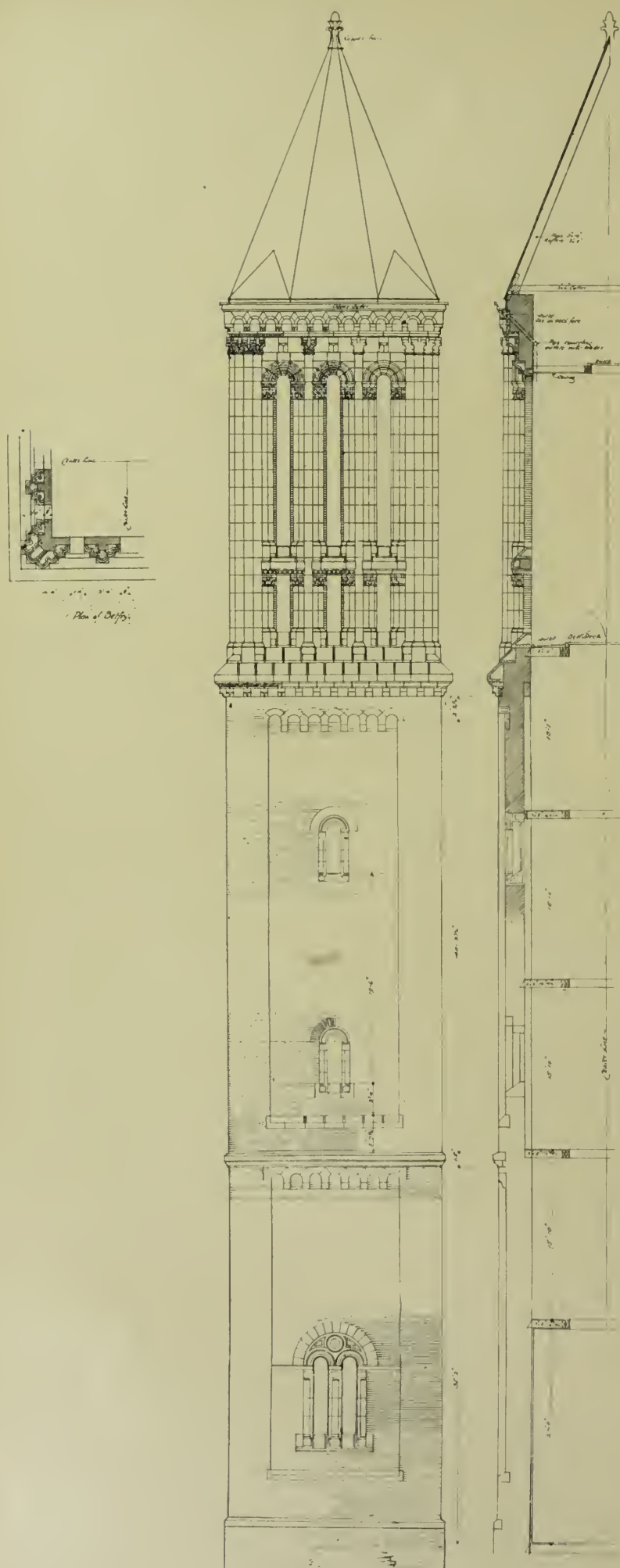
LONGITUDINAL SECTION.



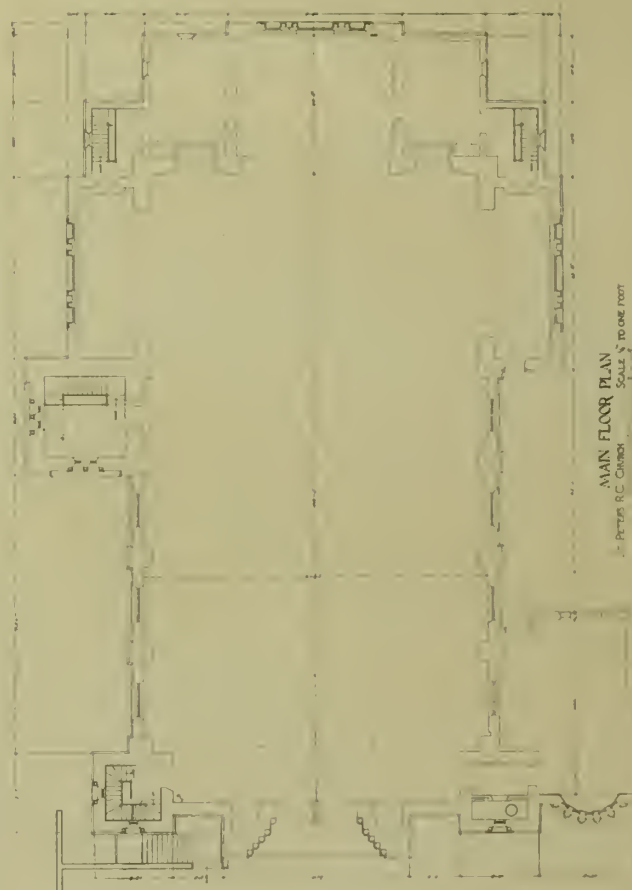
SIDE ELEVATION.

ST. AUGUSTINE'S CHURCH, PITTSBURGH, PA.

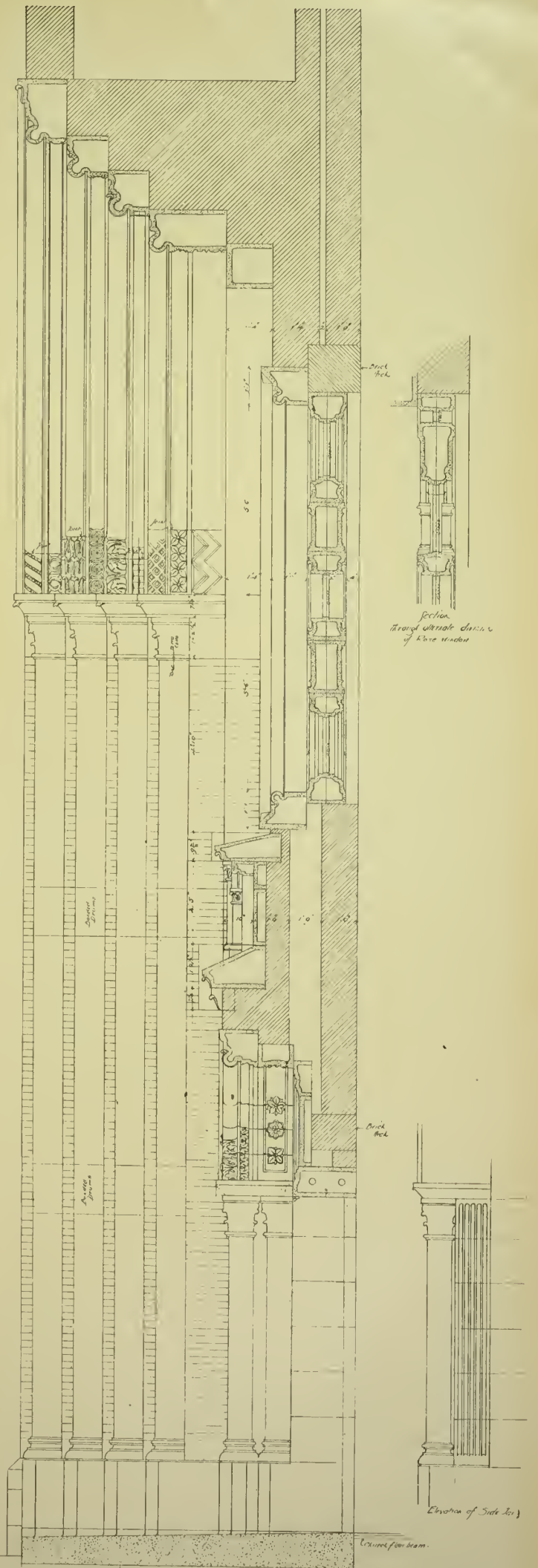
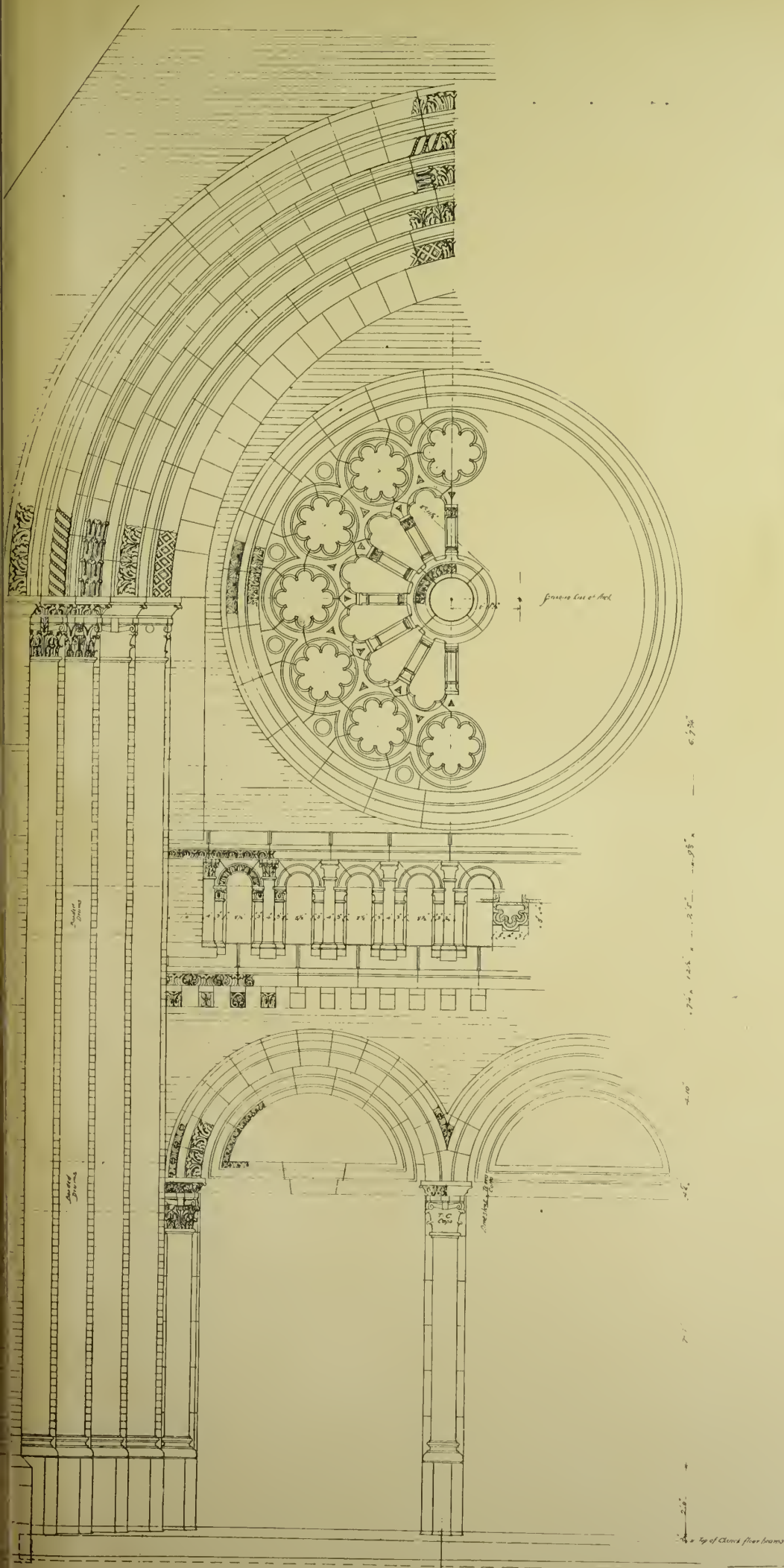
RUTAN & RUSSELL, ARCHITECTS.

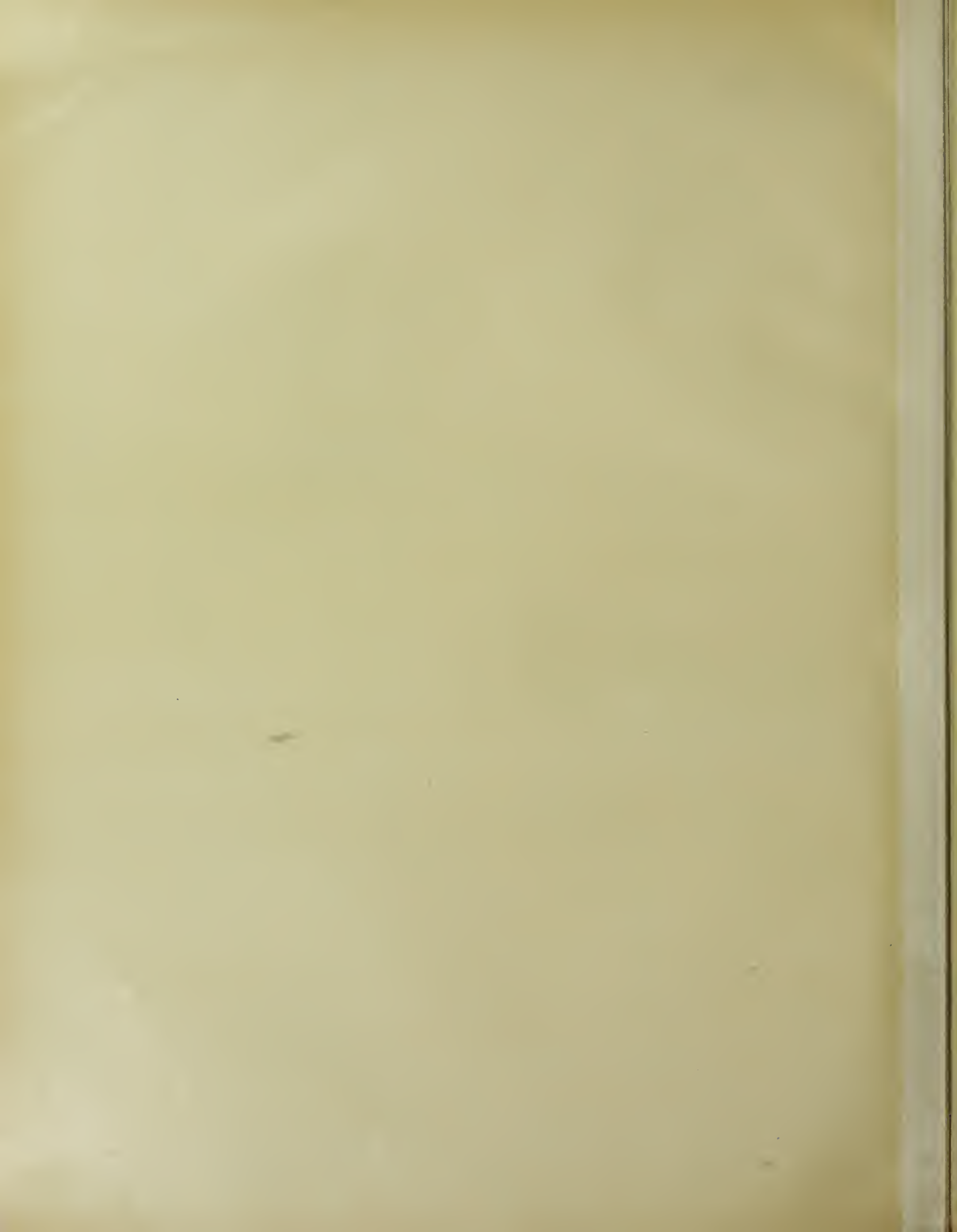


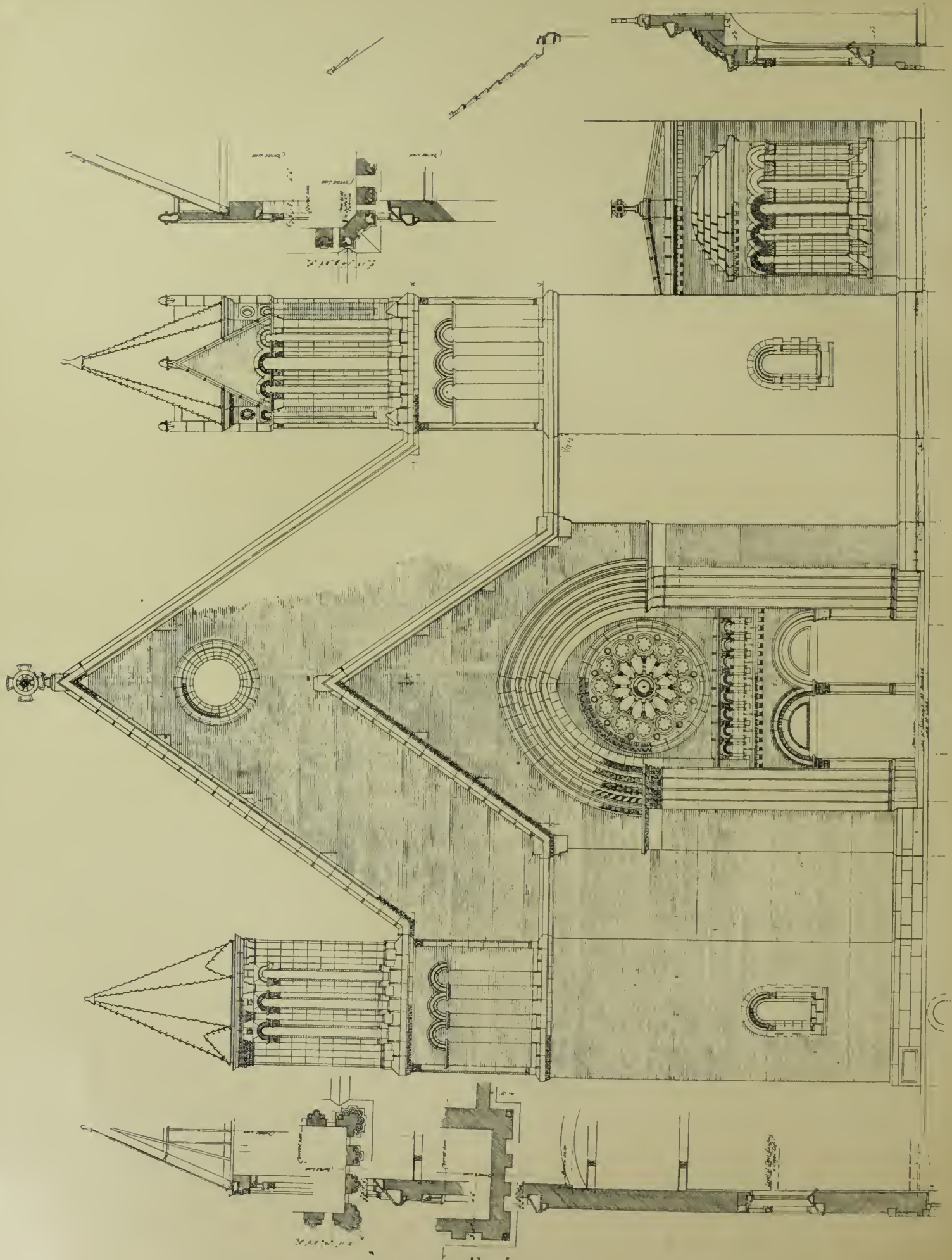
ELEVATION OF MAIN TOWER.



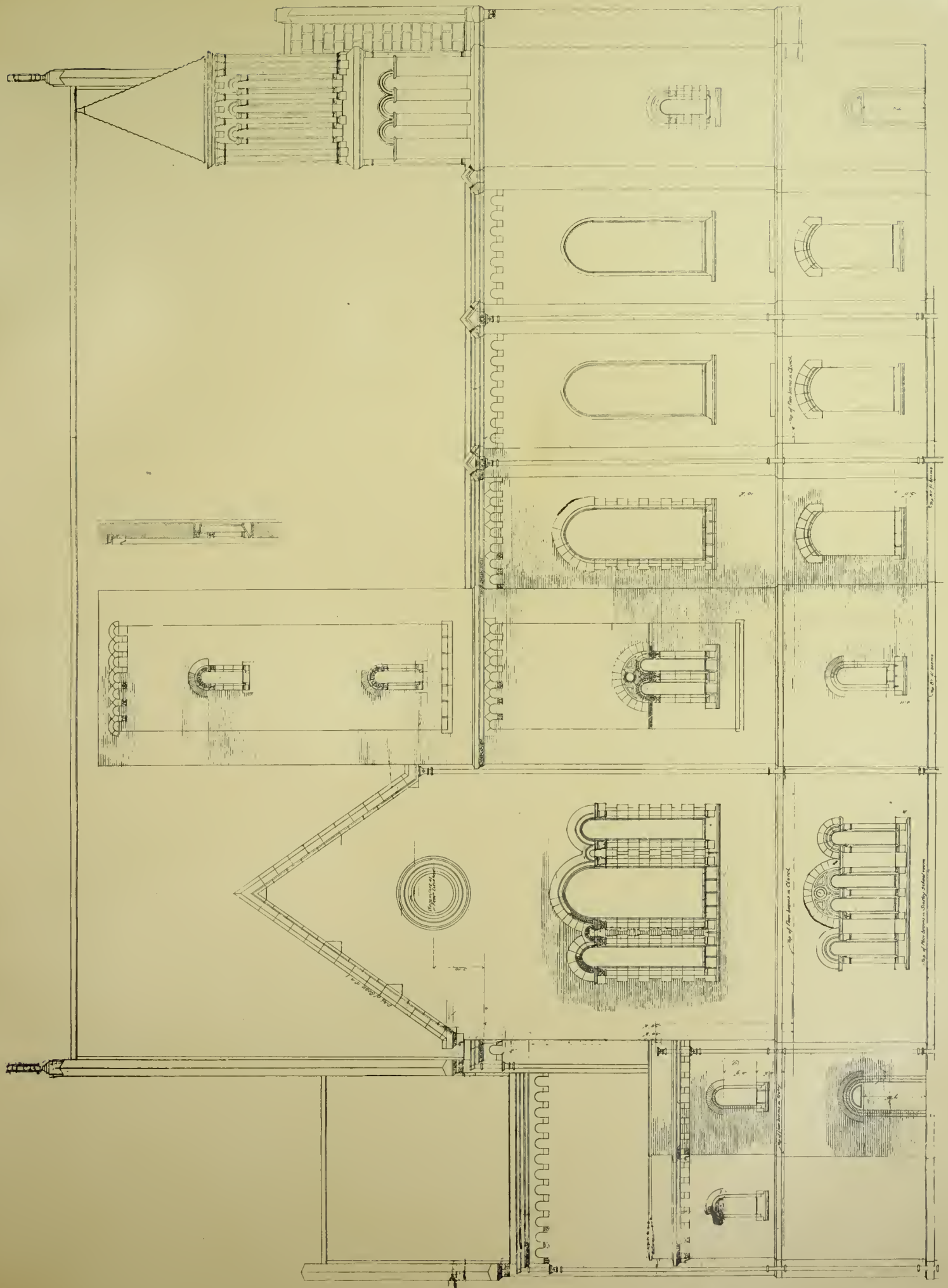
MAIN FLOOR PLAN
SCALE 1/4\"/>







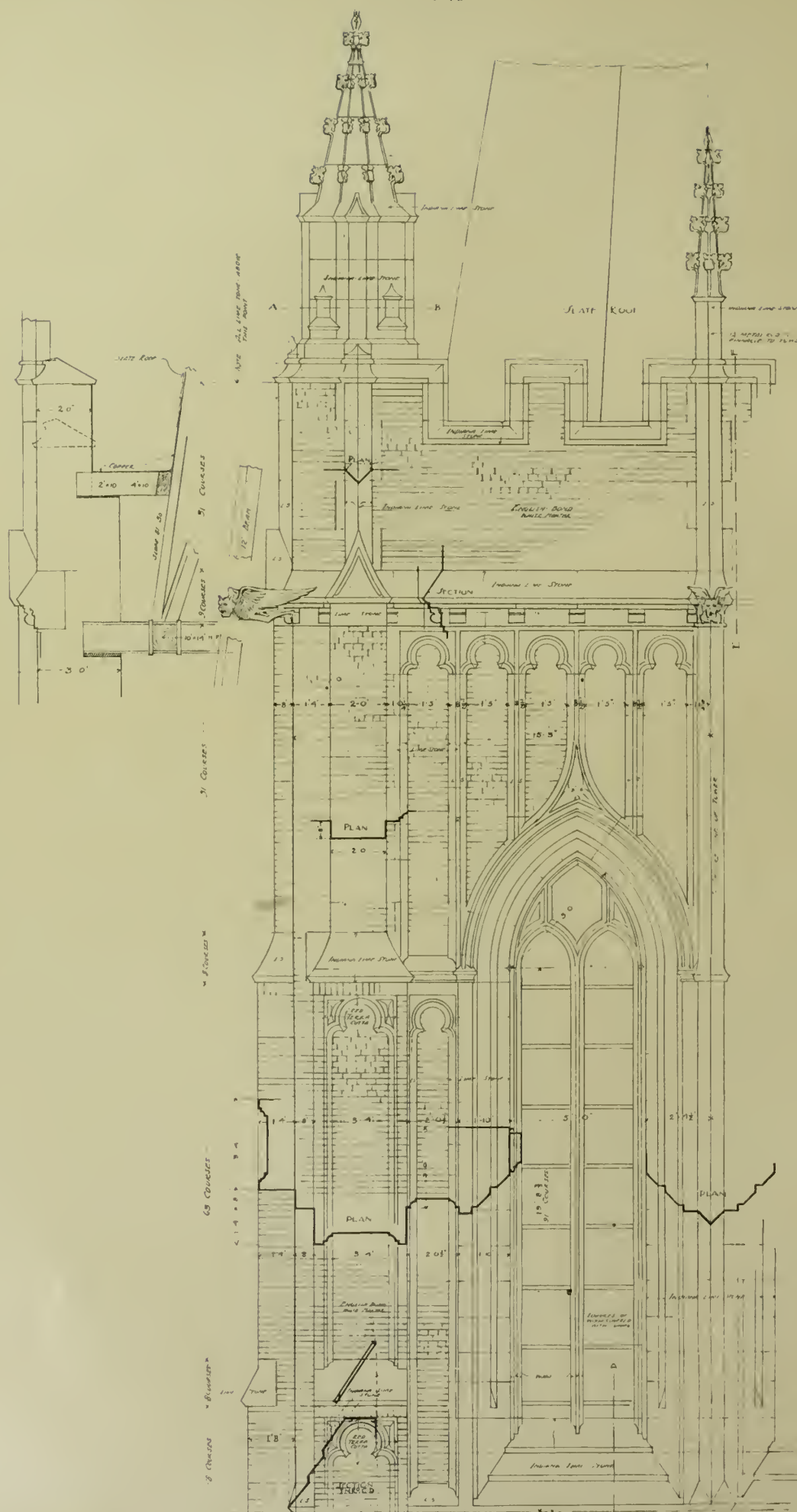
FRONT ELEVATION.



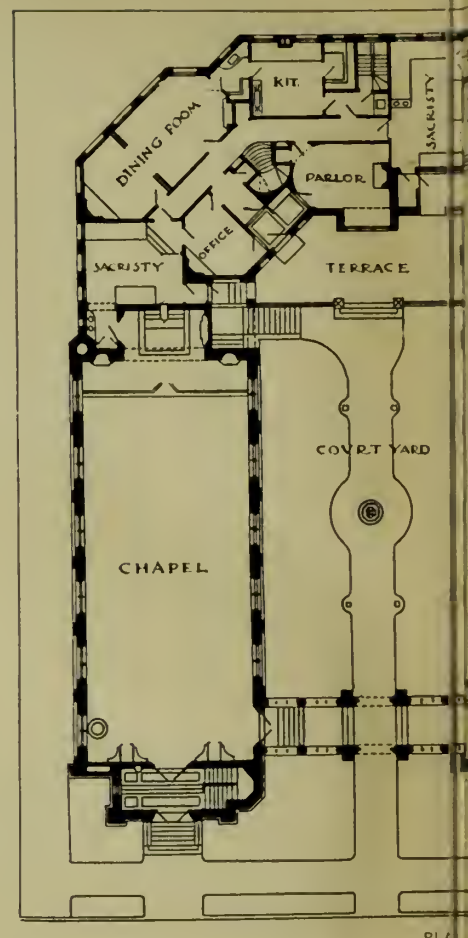
WEST ELEVATION.
MAIN TOWER.
ST. PETER'S CHURCH, NEW BRIGHTON, STATEN ISLAND, N. Y.
GEORGE EDWARD HARDING & GOOCH, ARCHITECTS.

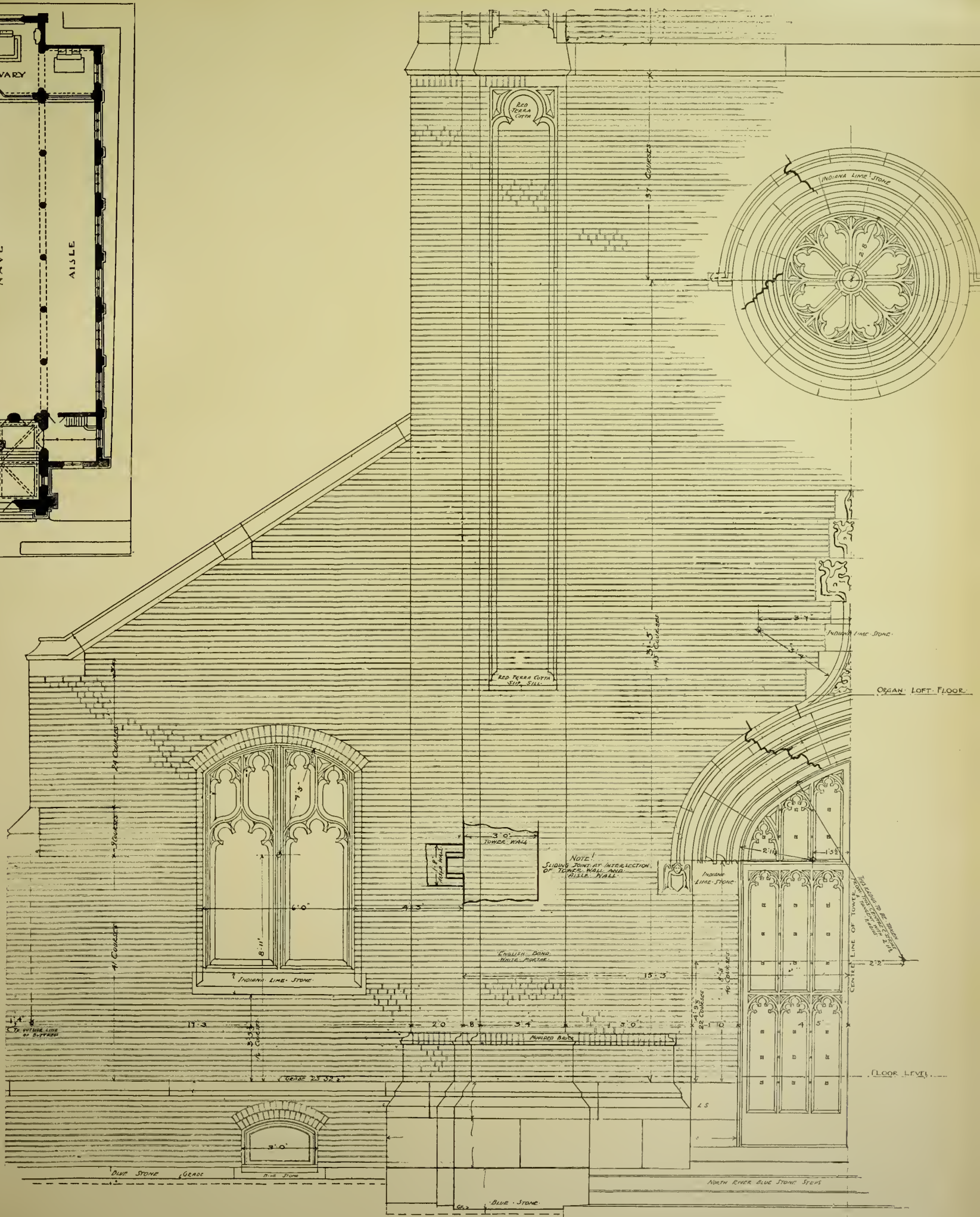


PLAN AT A-B



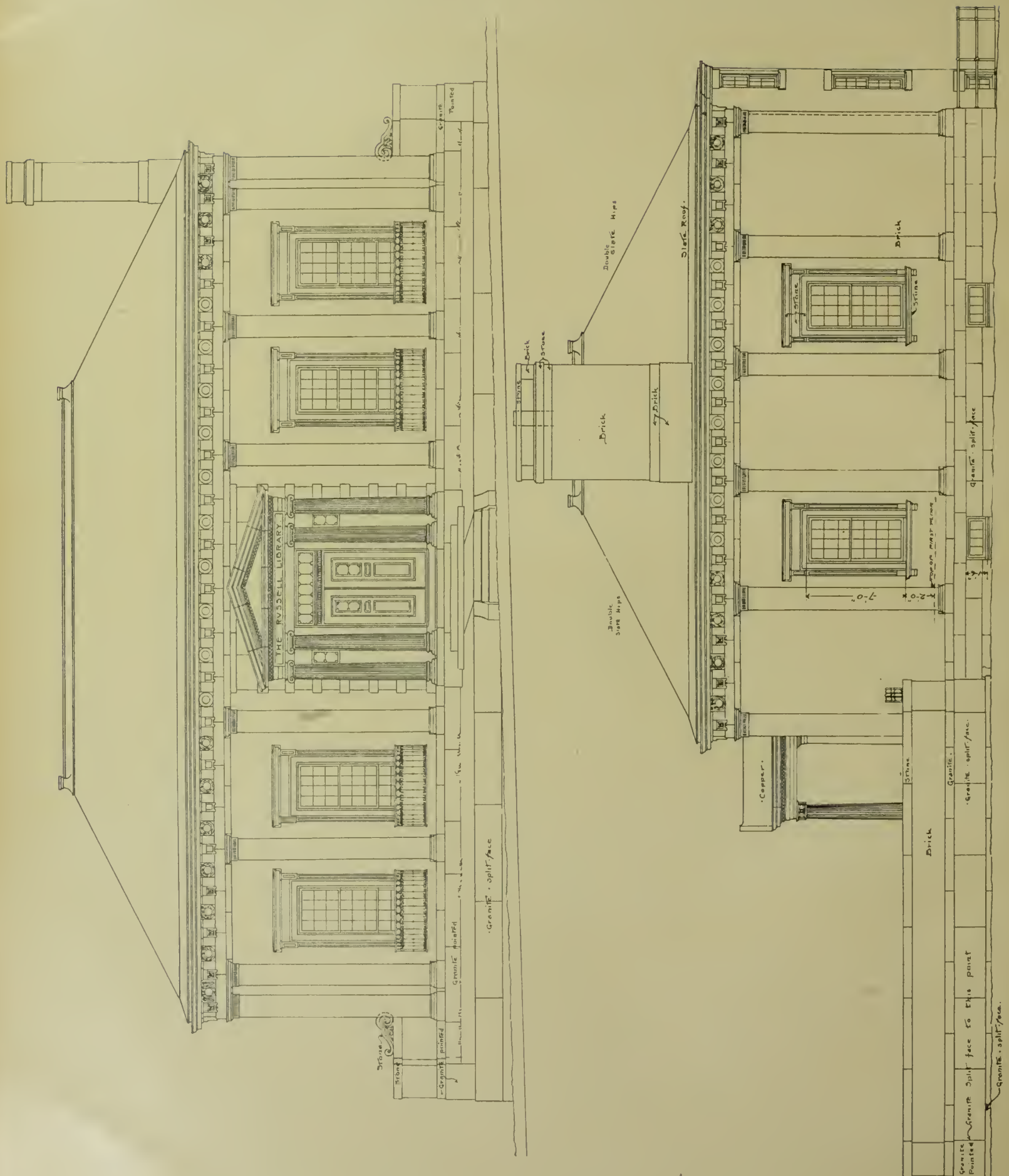
ELEVATION OF UPPER PART OF TOWER.



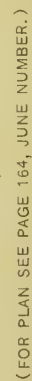


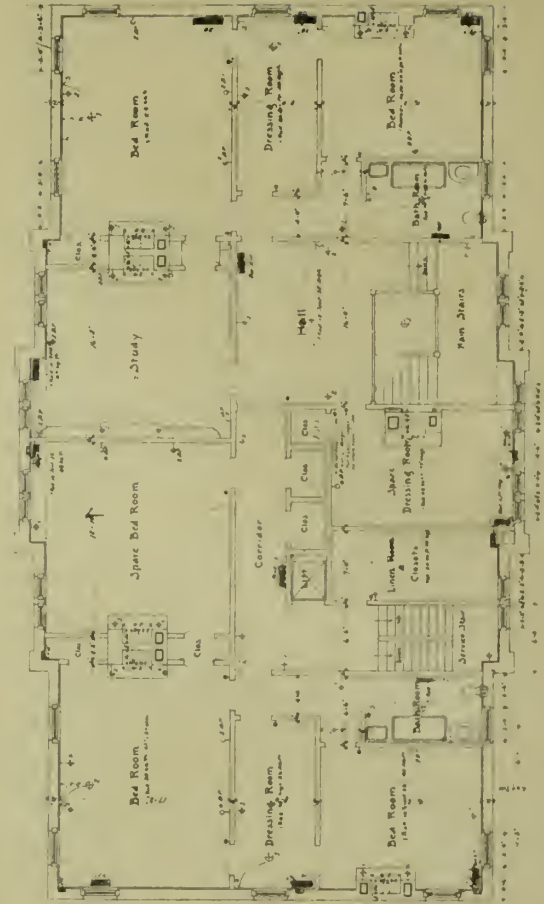
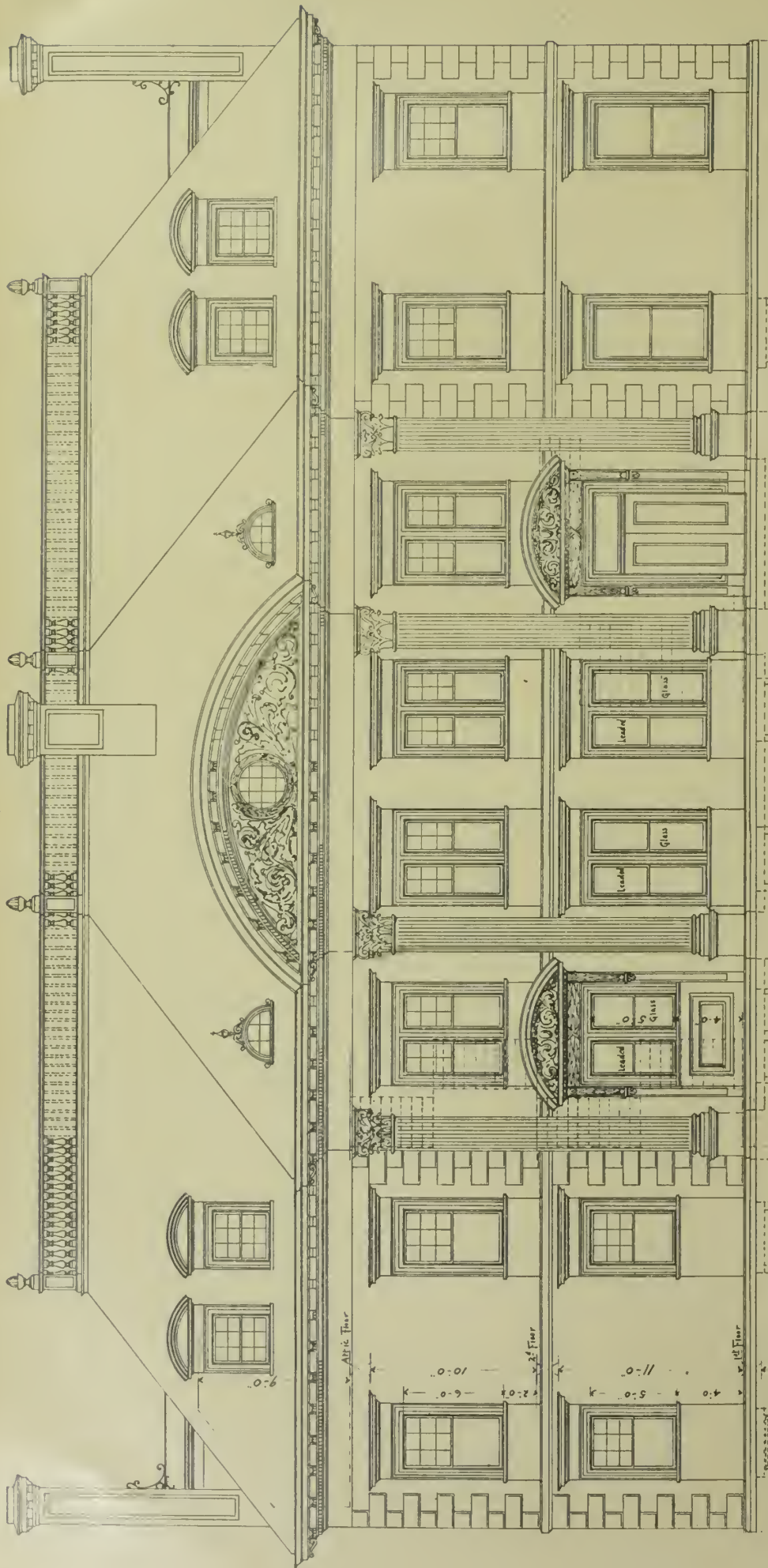
ELEVATION OF LOWER PART
OF TOWER.



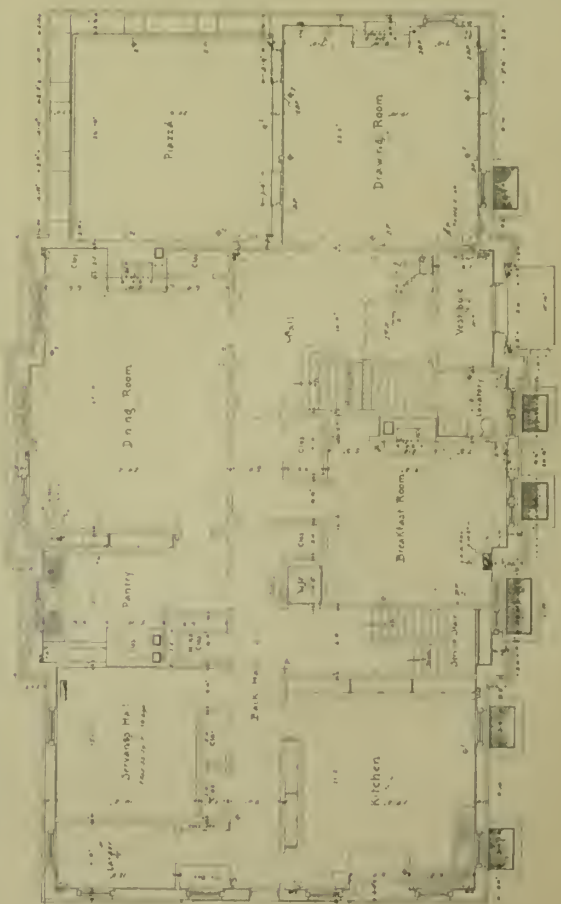


THE RUSSELL LIBRARY, PLYMOUTH, MASS.
EVERETT & MEAD, ARCHITECTS.



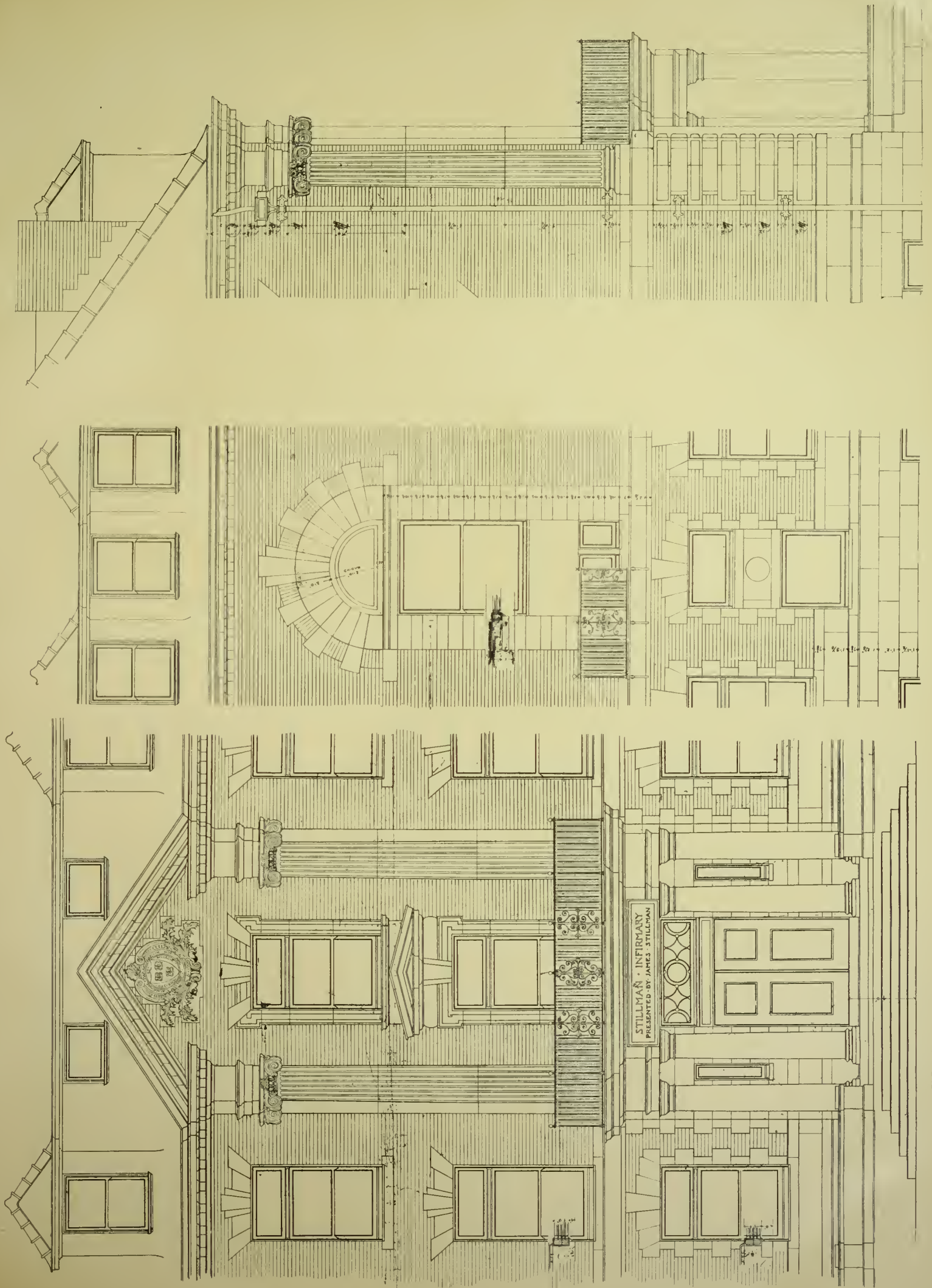


SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

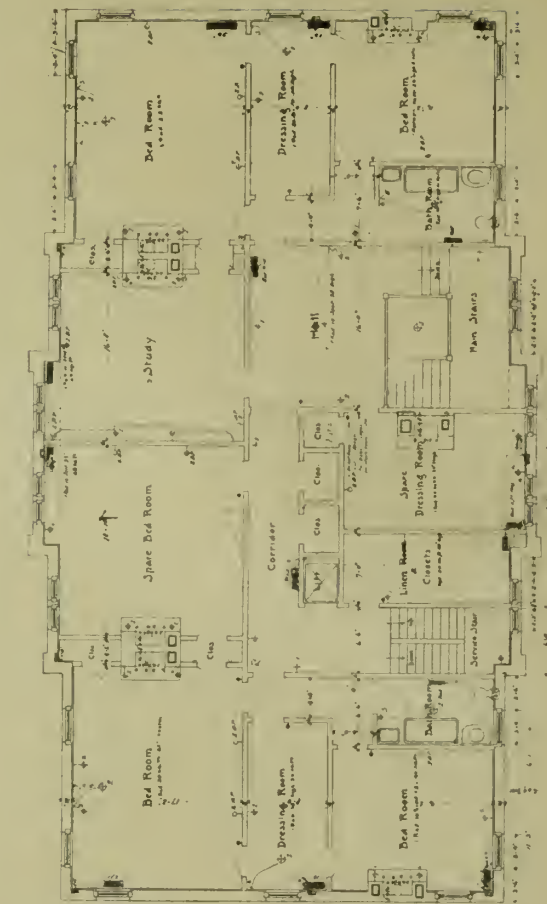
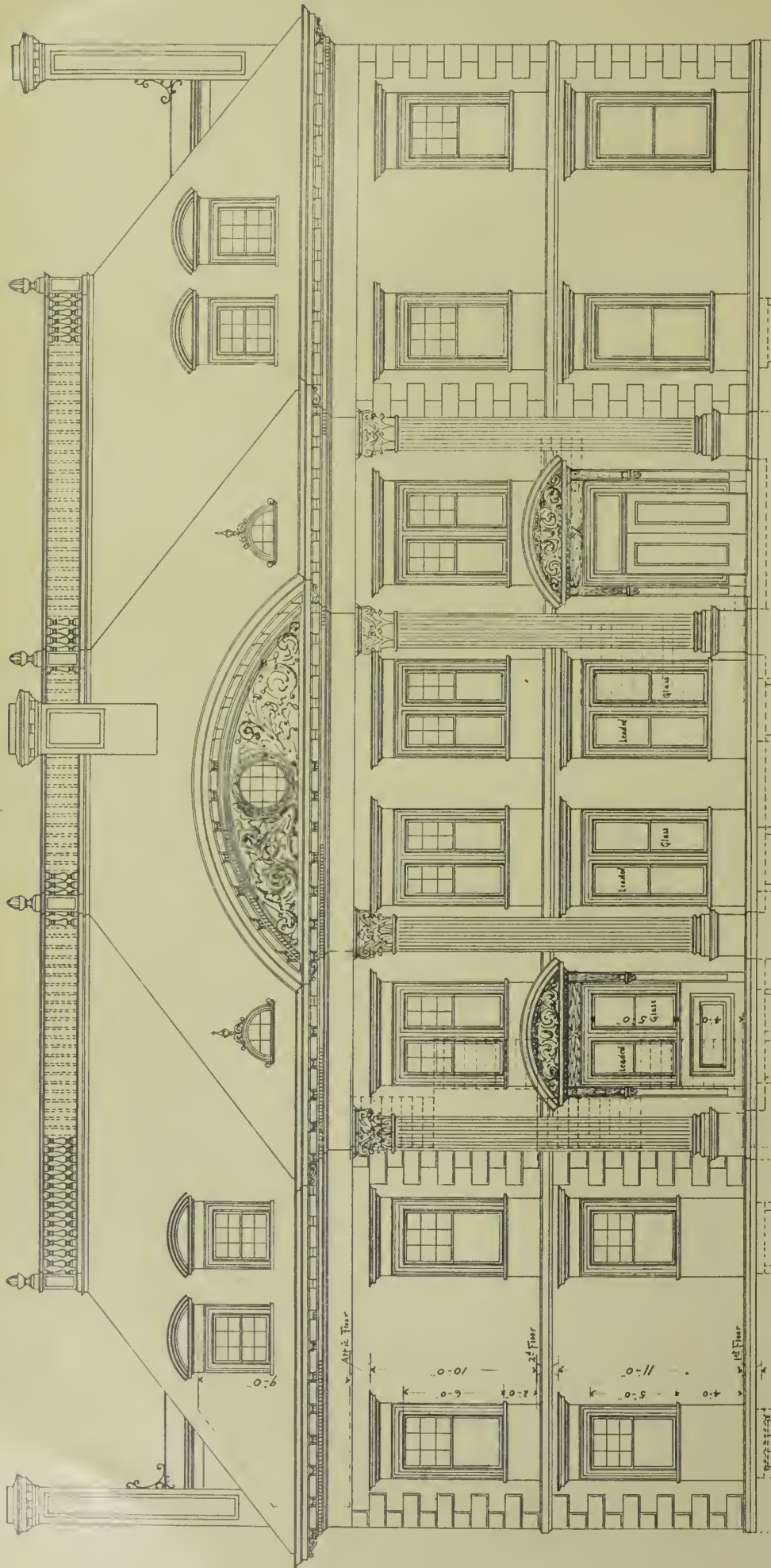
HOUSE AT TUXEDO PARK, N. Y.
JAMES BROWN LORD, ARCHITECT.



DETAILS THROUGH STAIRCASE WINDOWS.

ELEVATION OF CENTRAL MOTIVE.

STILLMAN INFIRMARY FOR HARVARD UNIVERSITY, CAMBRIDGE, MASS.

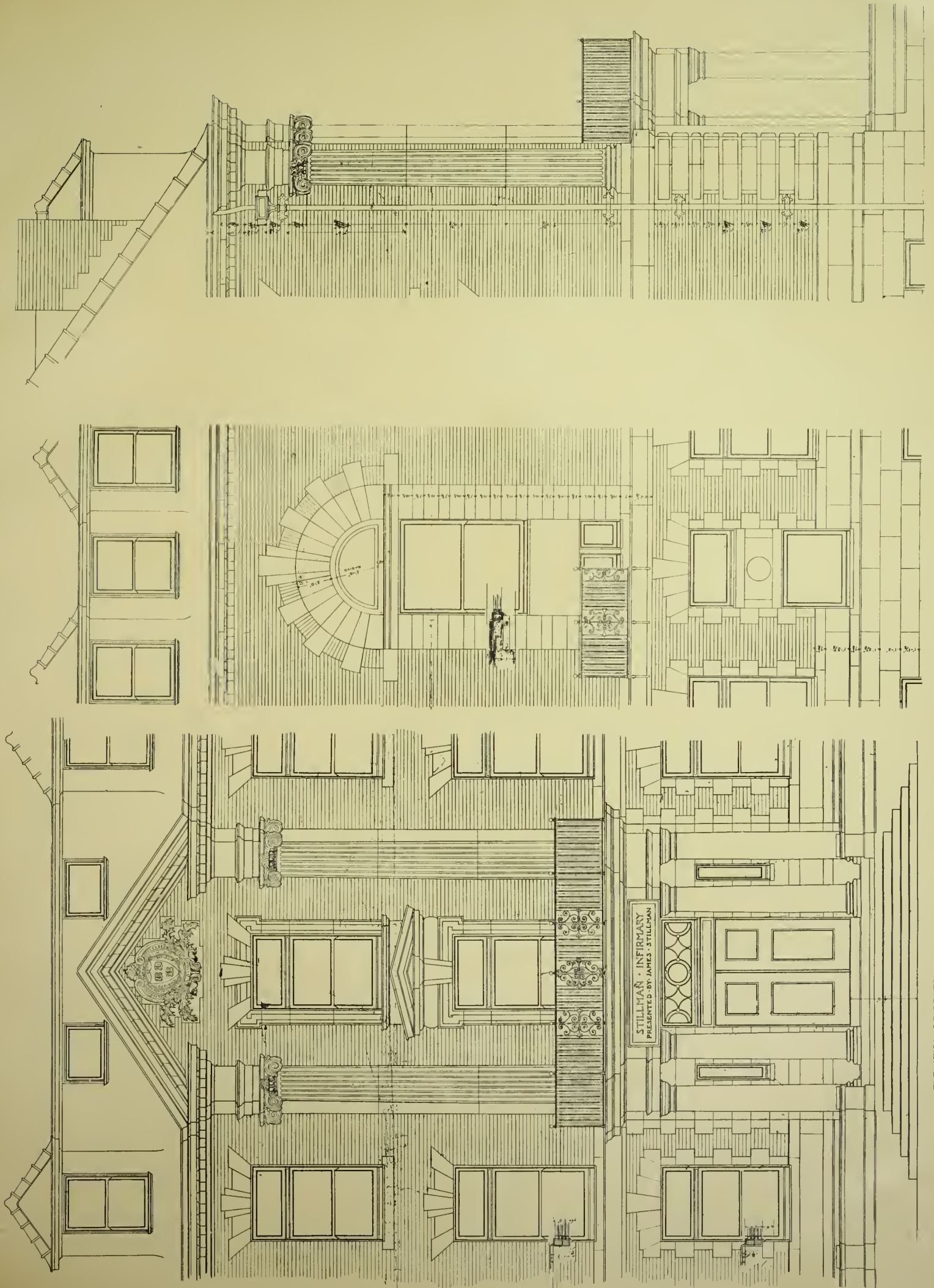


SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

HOUSE AT TUXEDO PARK, N. Y.
JAMES BROWN LORD, ARCHT.

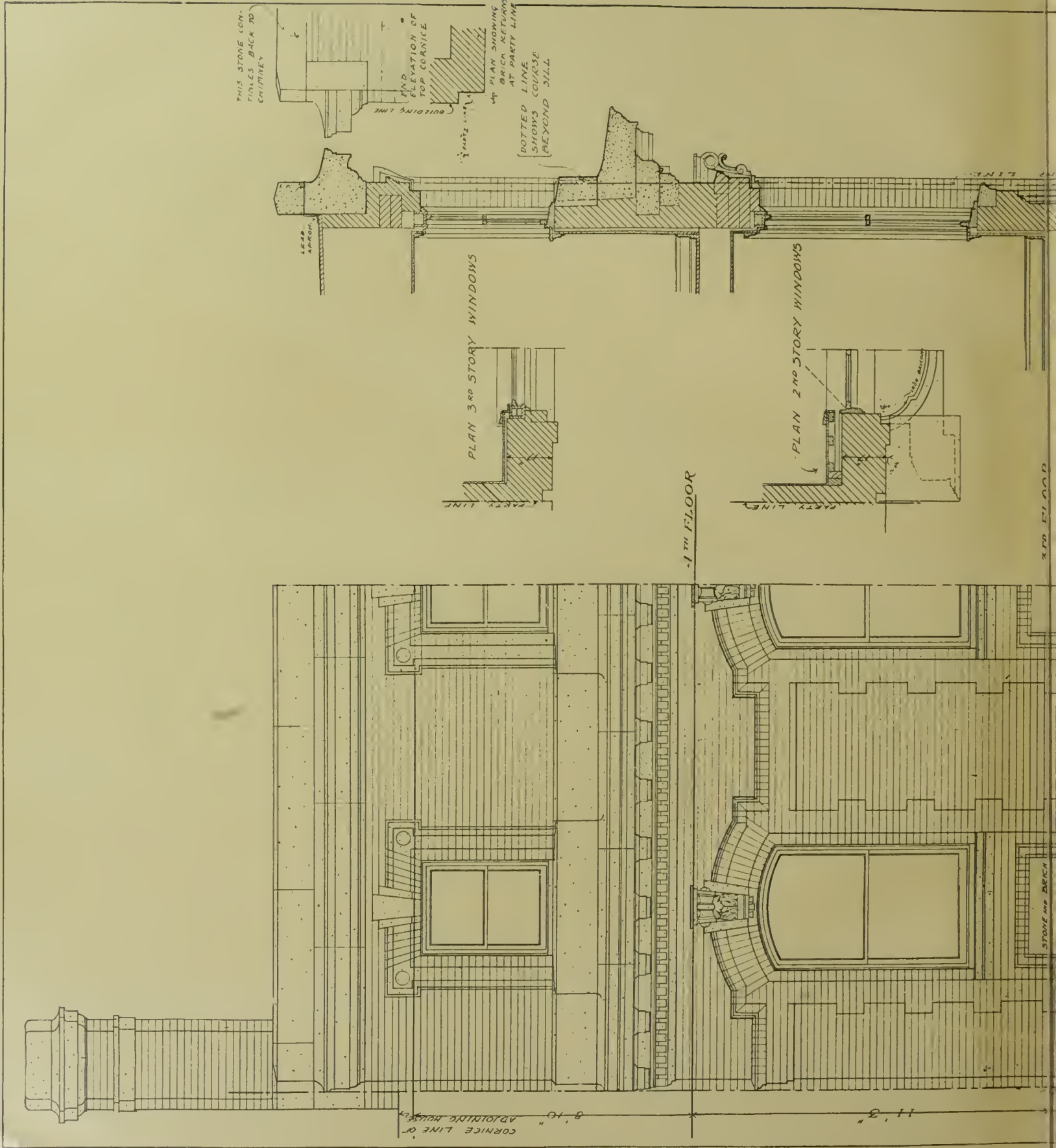


DETAILS THROUGH STAIRCASE WINDOWS.

ELEVATION OF CENTRAL MOTIVE.

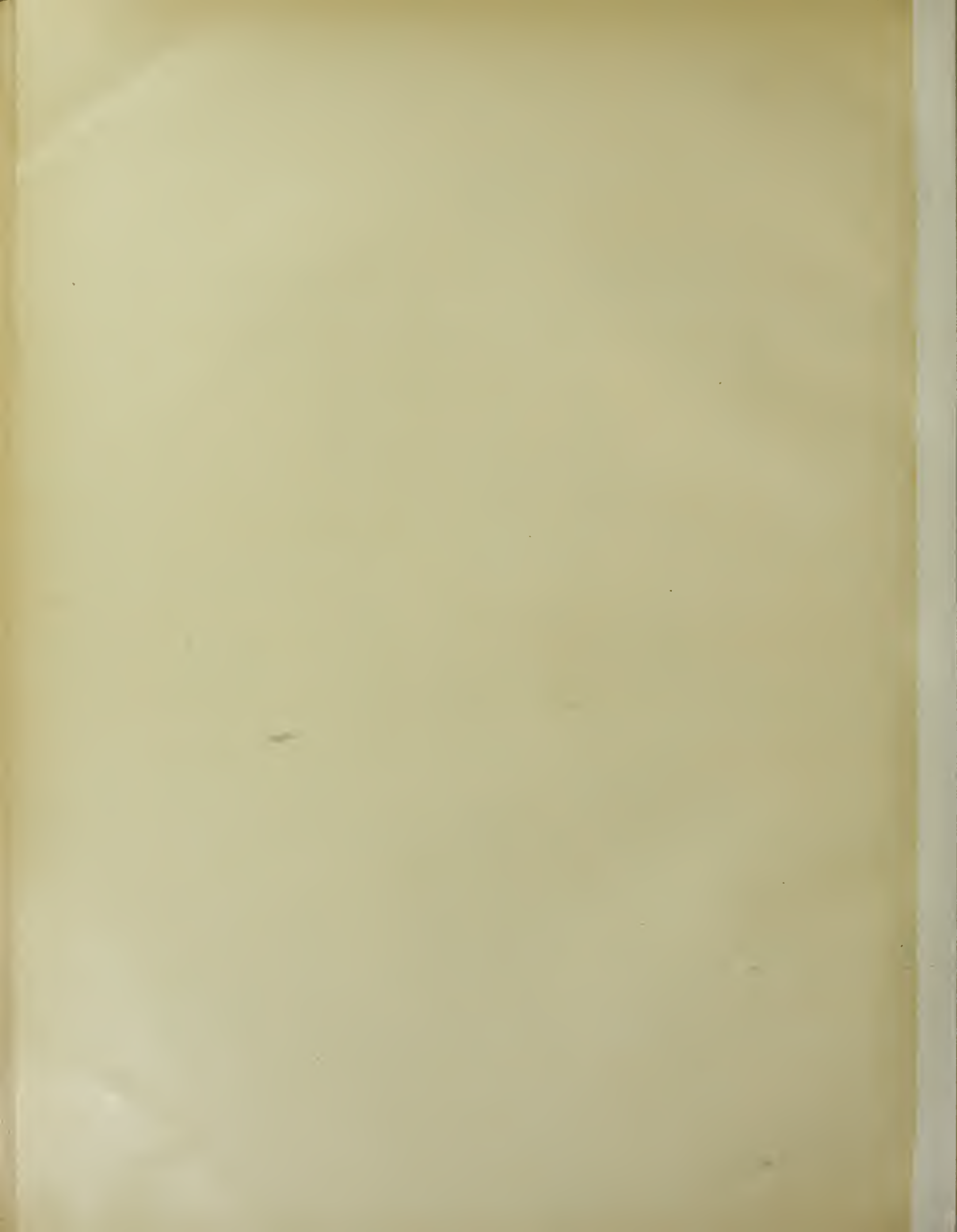
STILLMAN INFIRMARY FOR HARVARD UNIVERSITY, CAMBRIDGE, MASS.

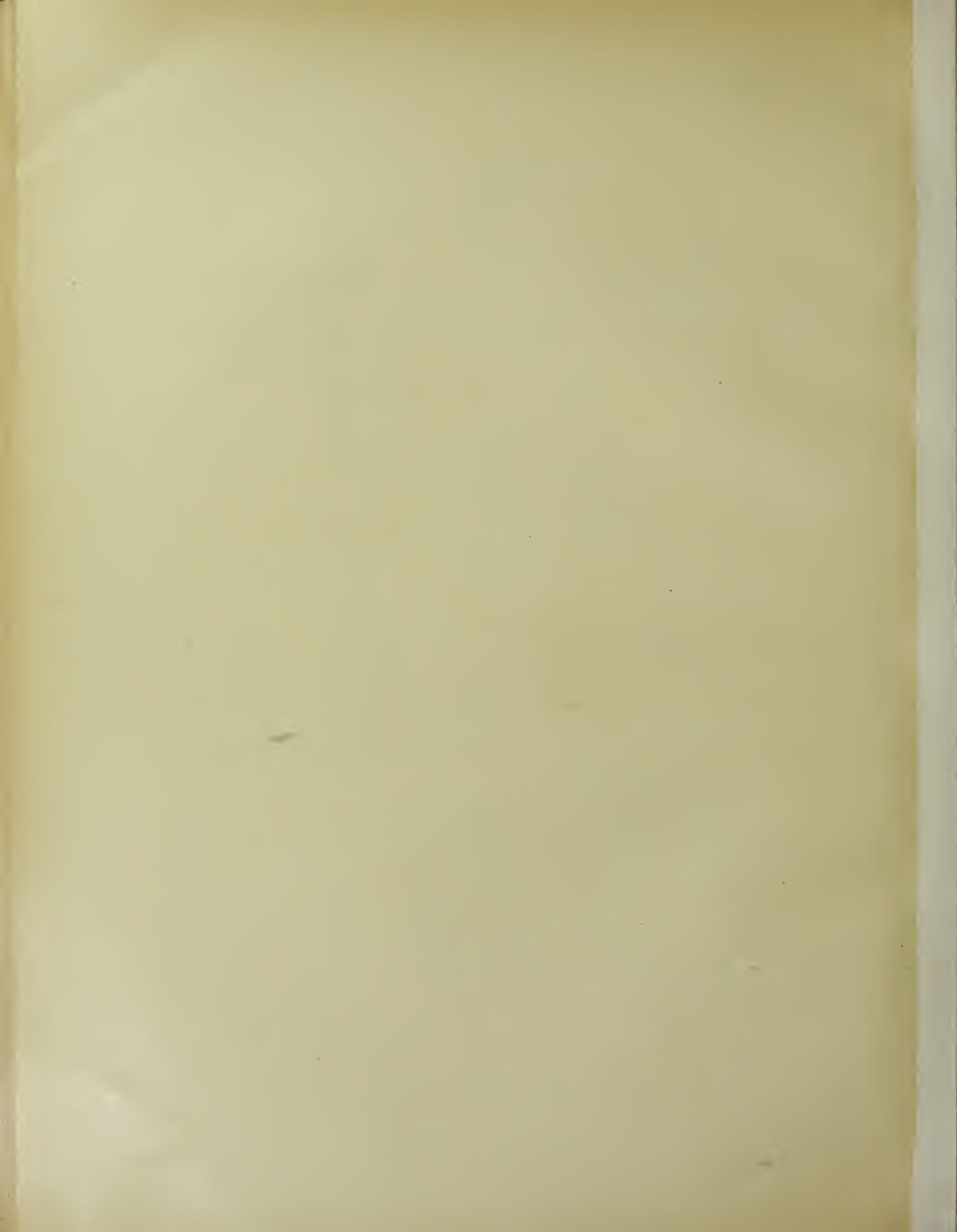
SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS.



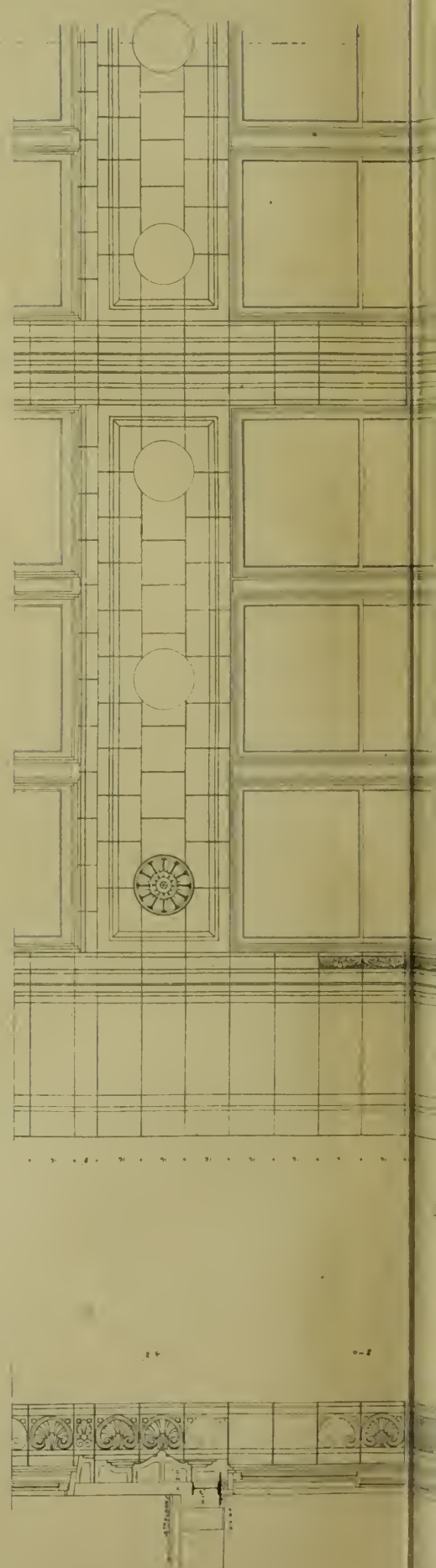
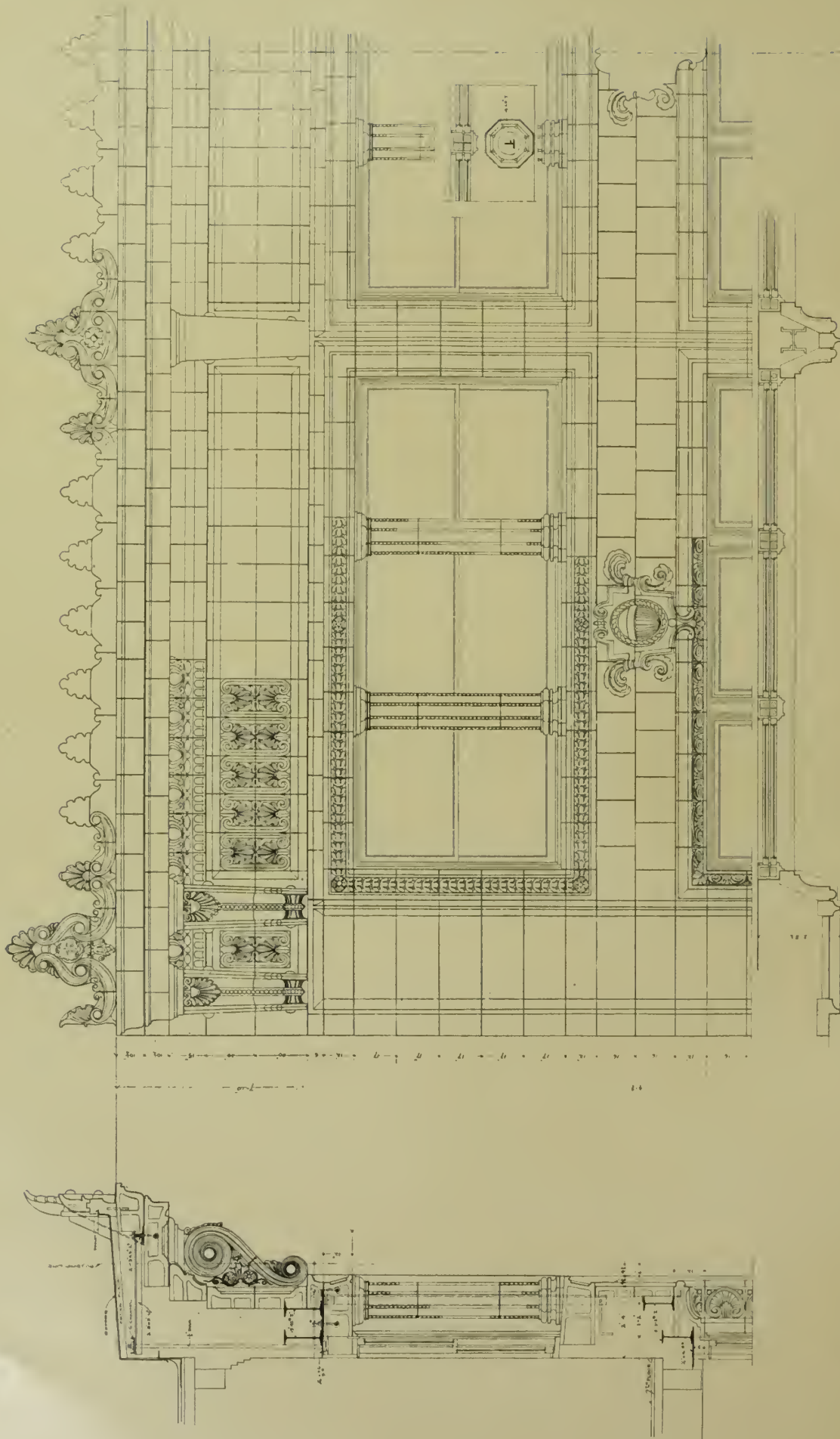


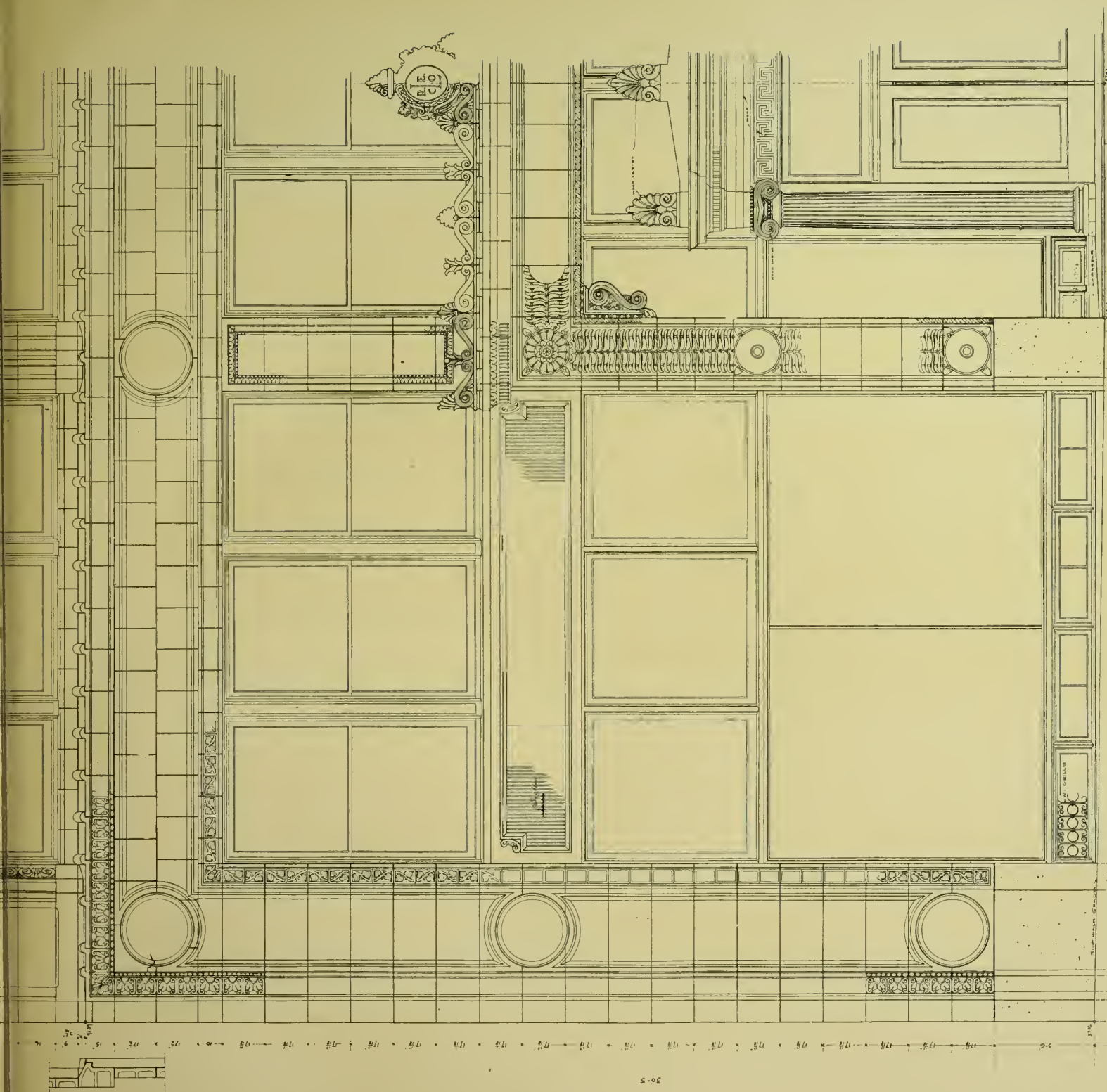
HOUSE, LOCUST STREET, PHILADELPHIA, PA.
KENNEDY & KELSEY ARCHITECTS.



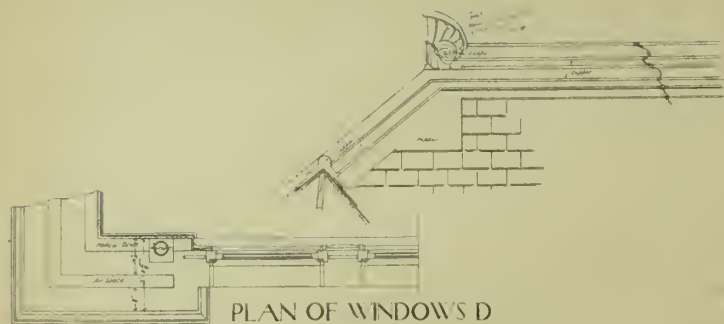






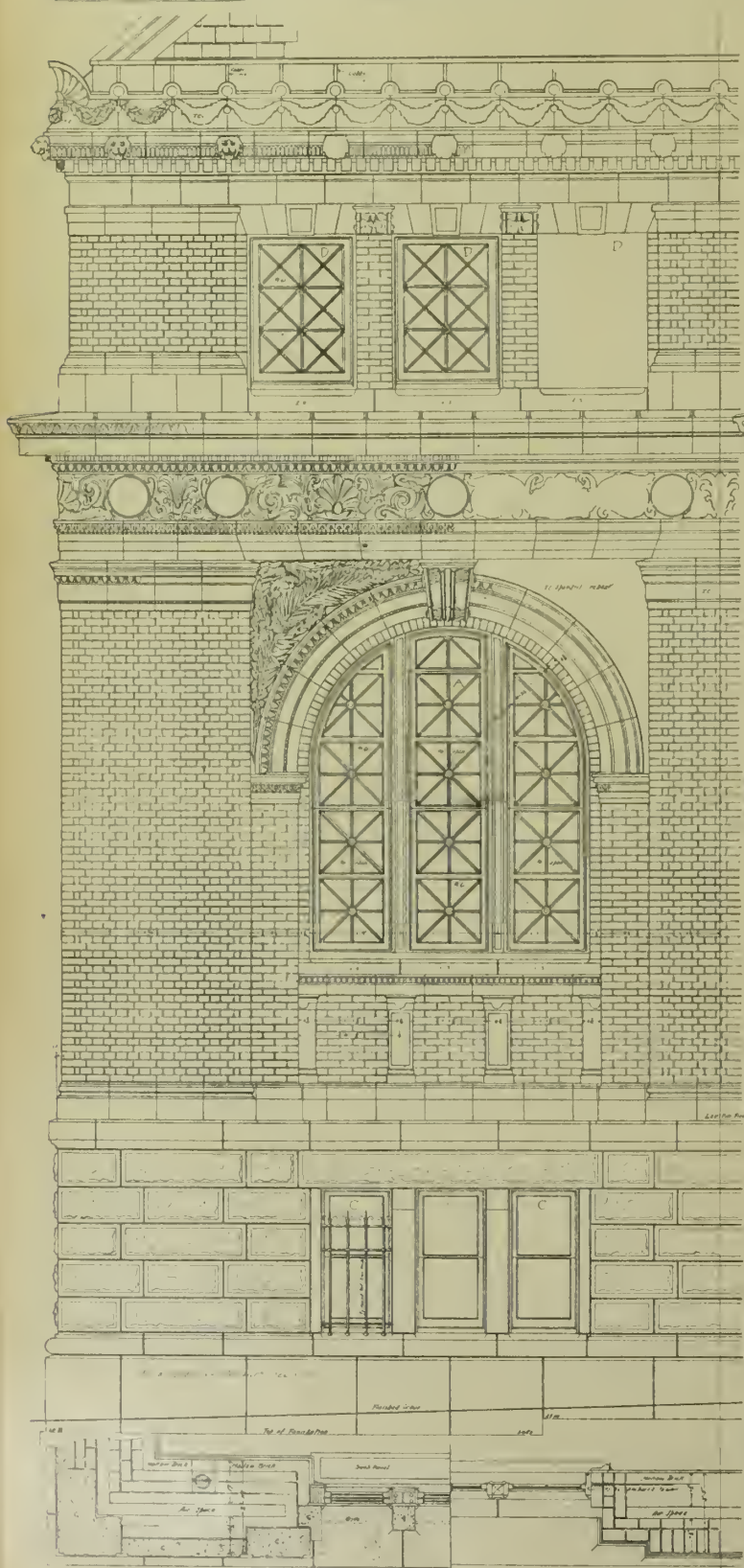


(BUILDING 7 STORIES HIGH. ILLUSTRATION SHOWS 1ST, 2ND AND UPPER STORIES OF ONE HALF OF FRONT.)
BUILDING FOR THE LINDELL REAL ESTATE COMPANY. ST. LOUIS, MO
MAURAN, RUSSELL & GARDEN, ARCHITECTS.

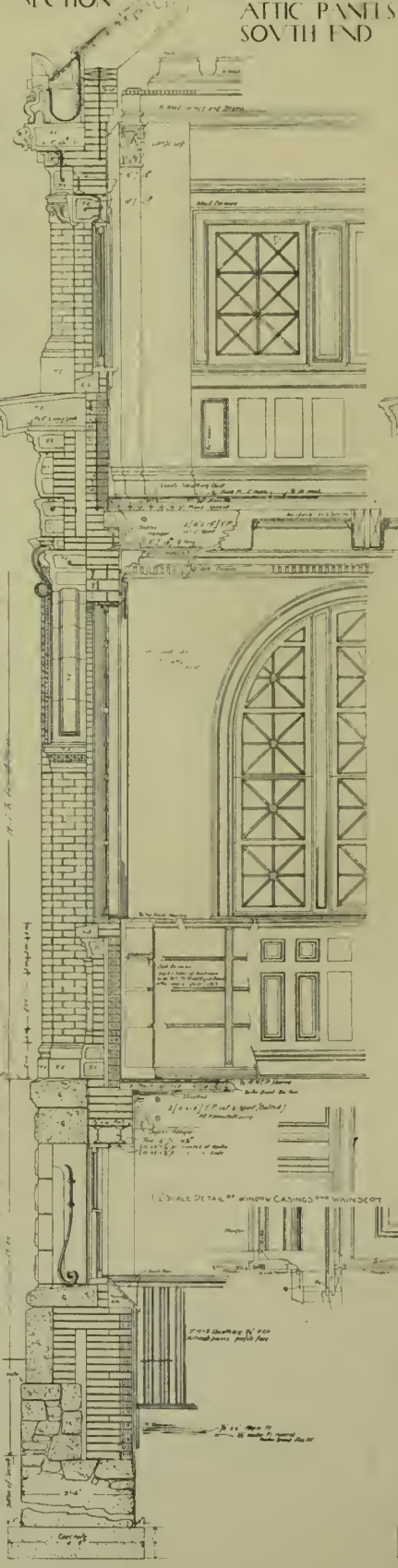
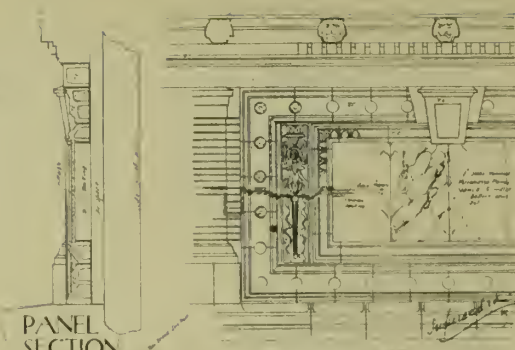


PANEL SECTION

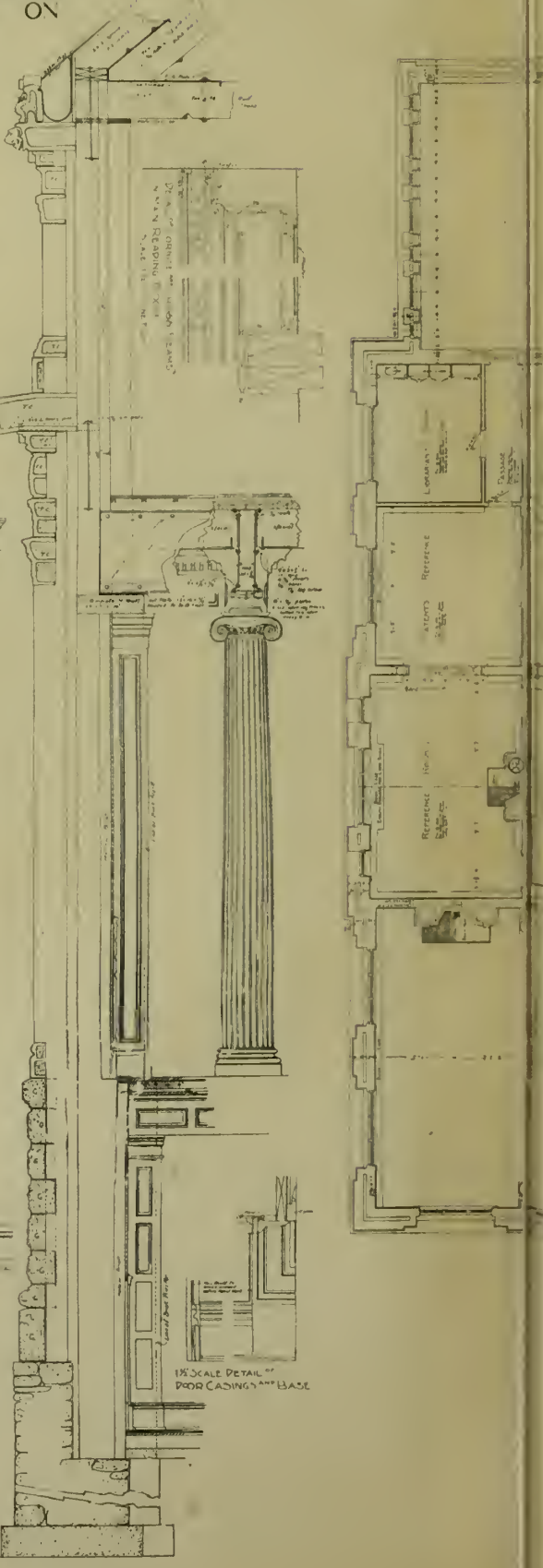
ATTIC PANELS ON SOUTH END

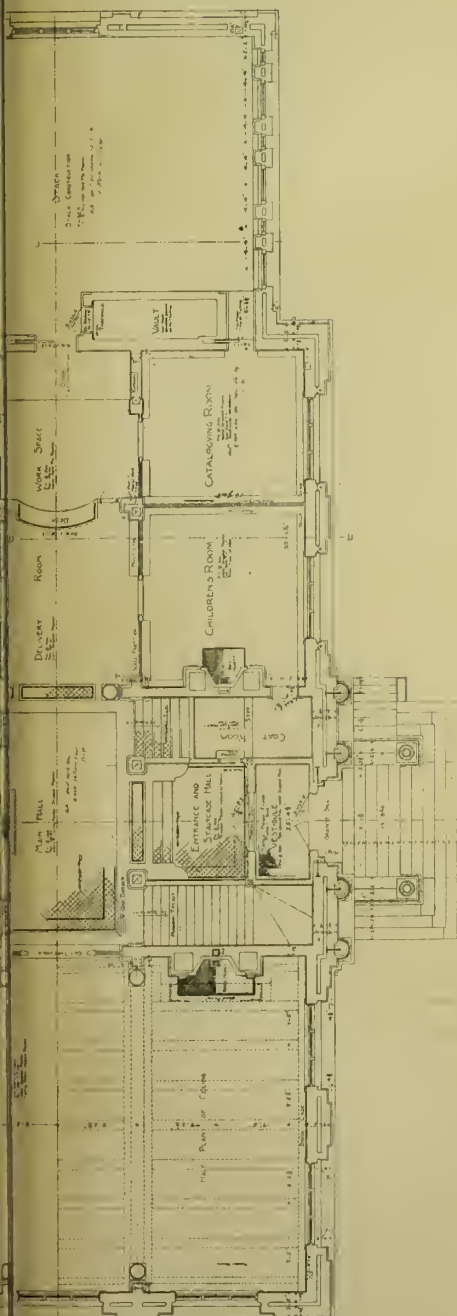


WINDOW SECTION EAST FRONT.

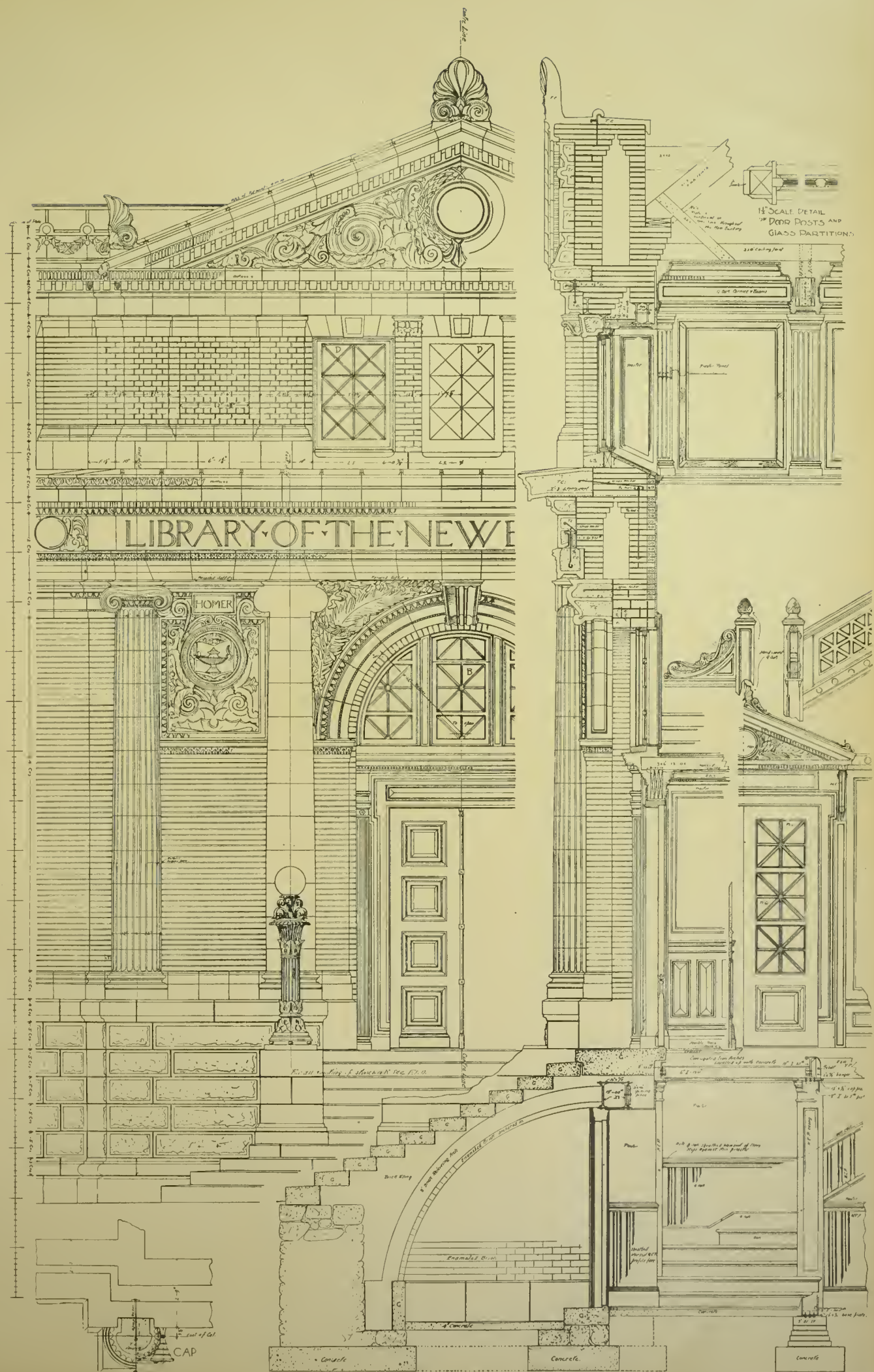


PIER SECTION SOUTH ELEVATION.

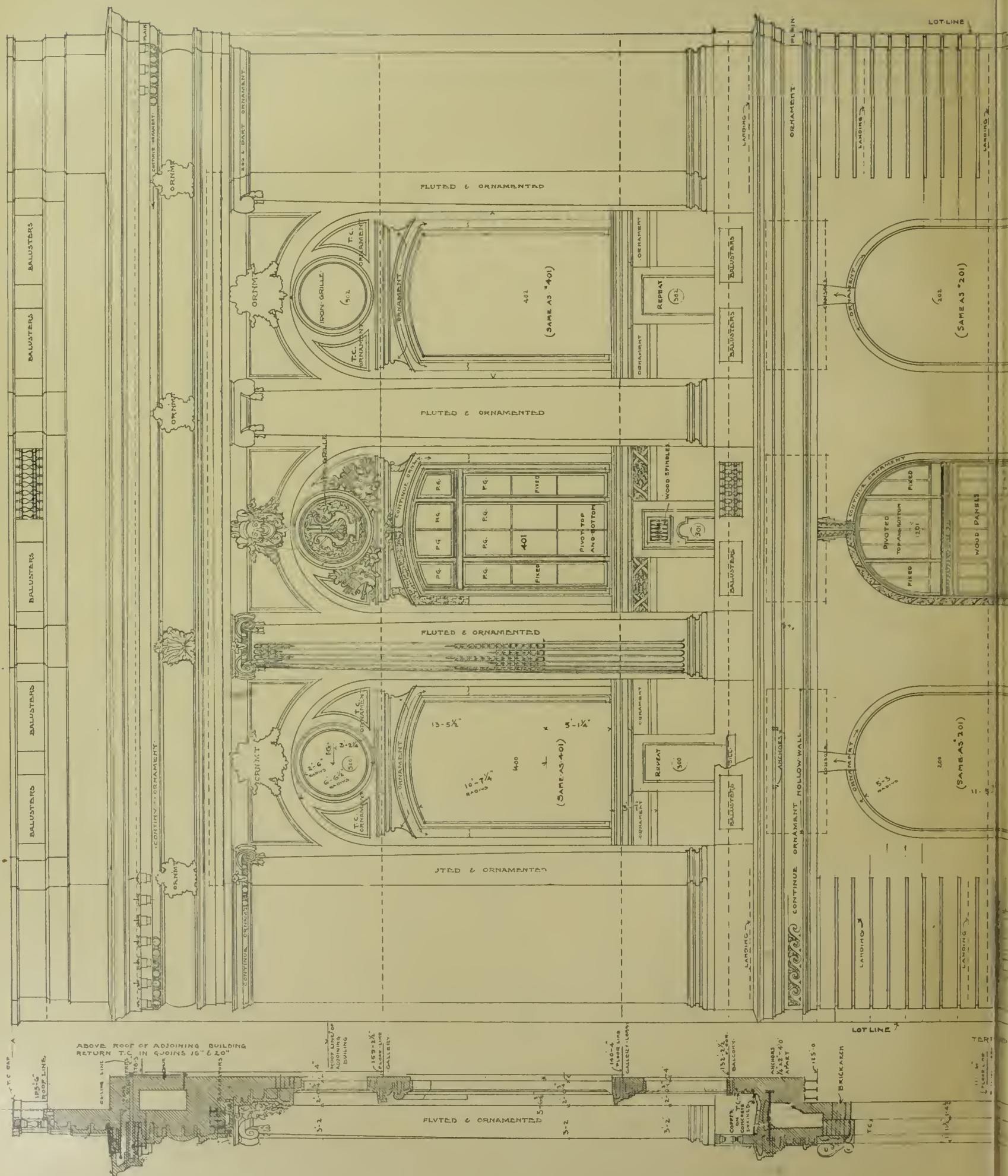


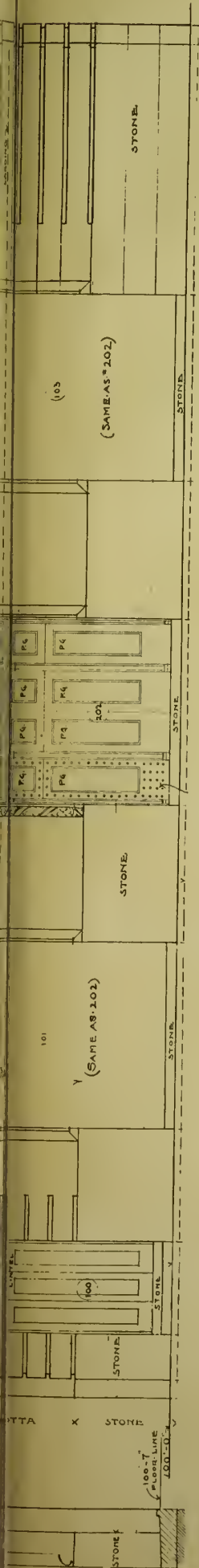


PLAN.

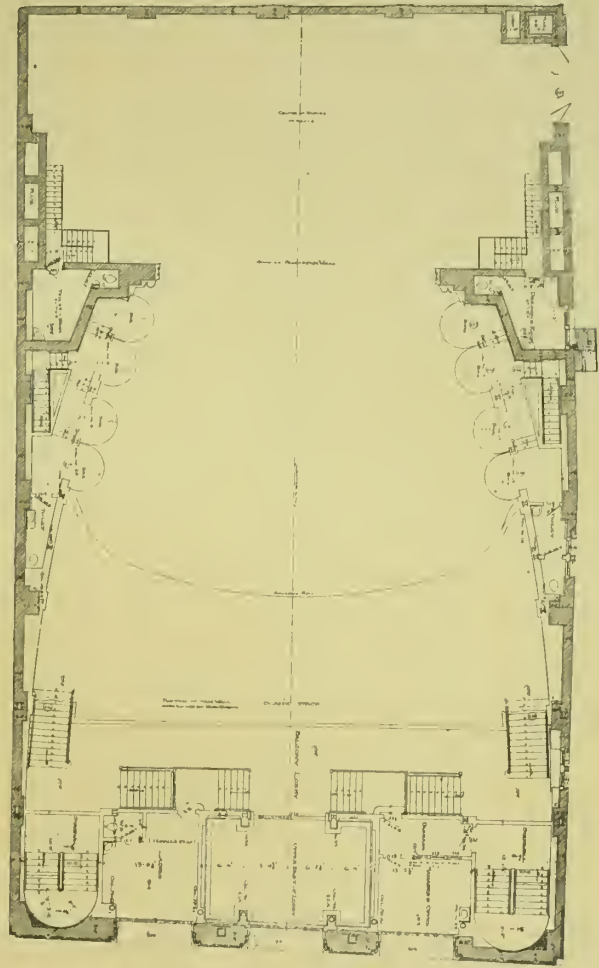
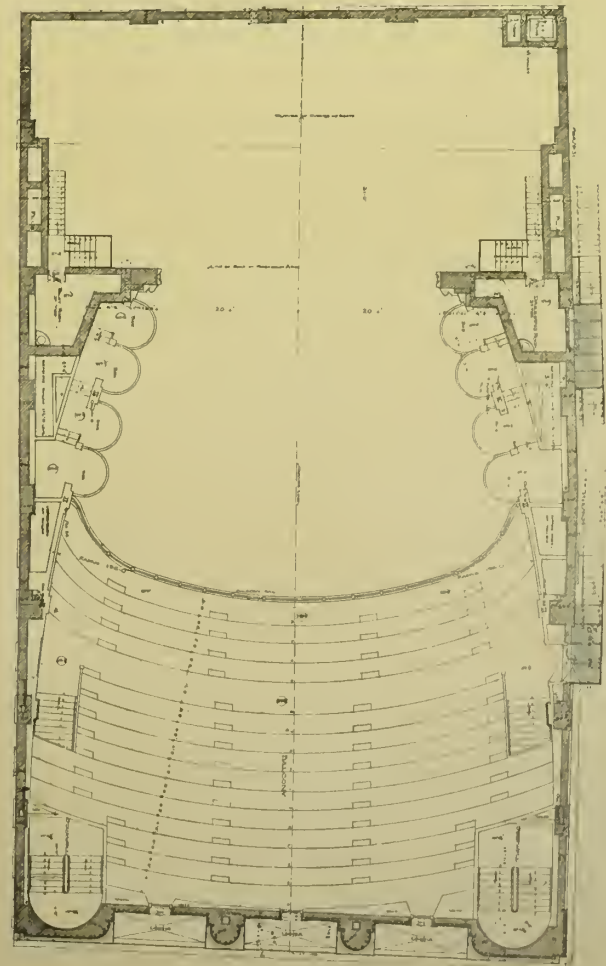
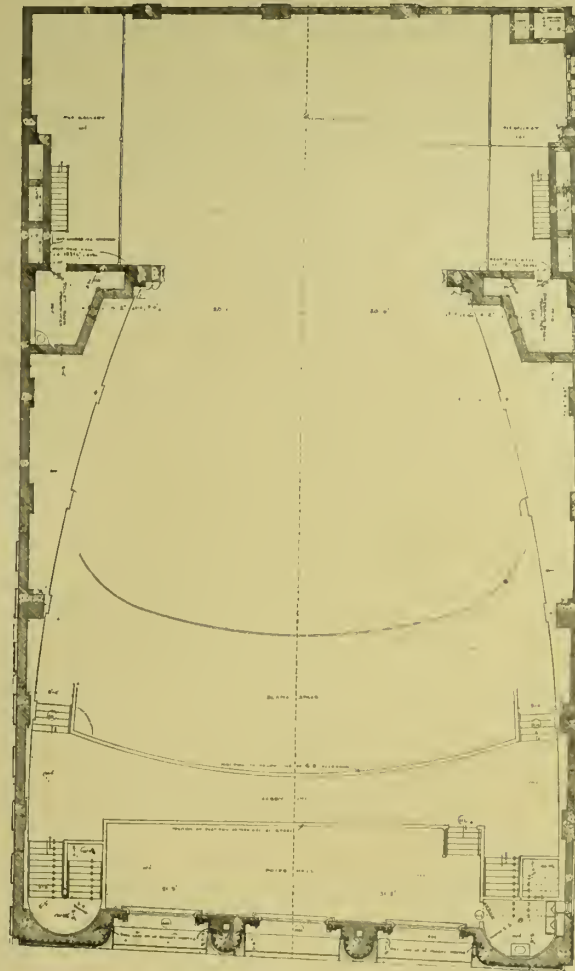
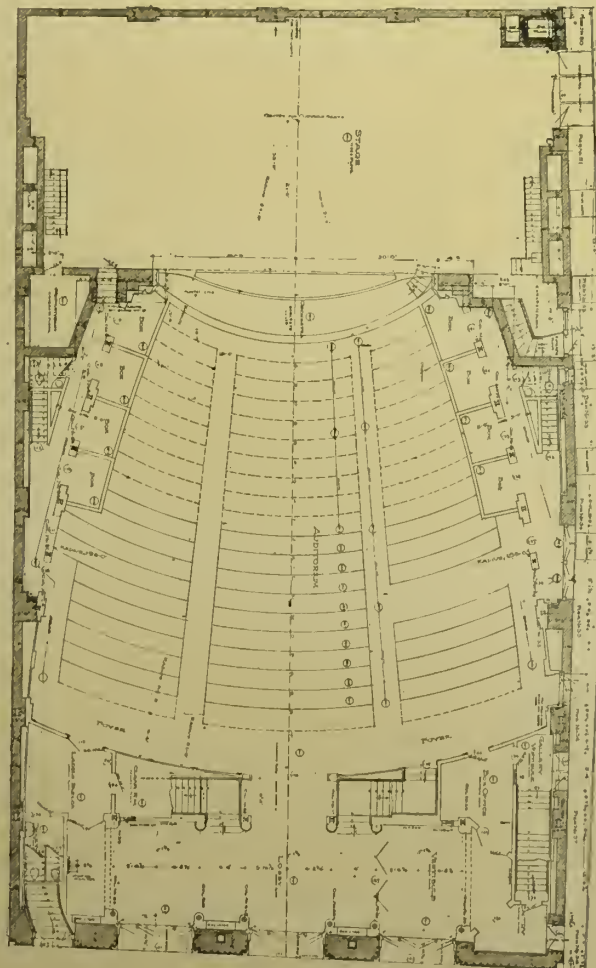


DETAIL OF ELEVATION AND SECTION OF ENTRANCE PAVILION.



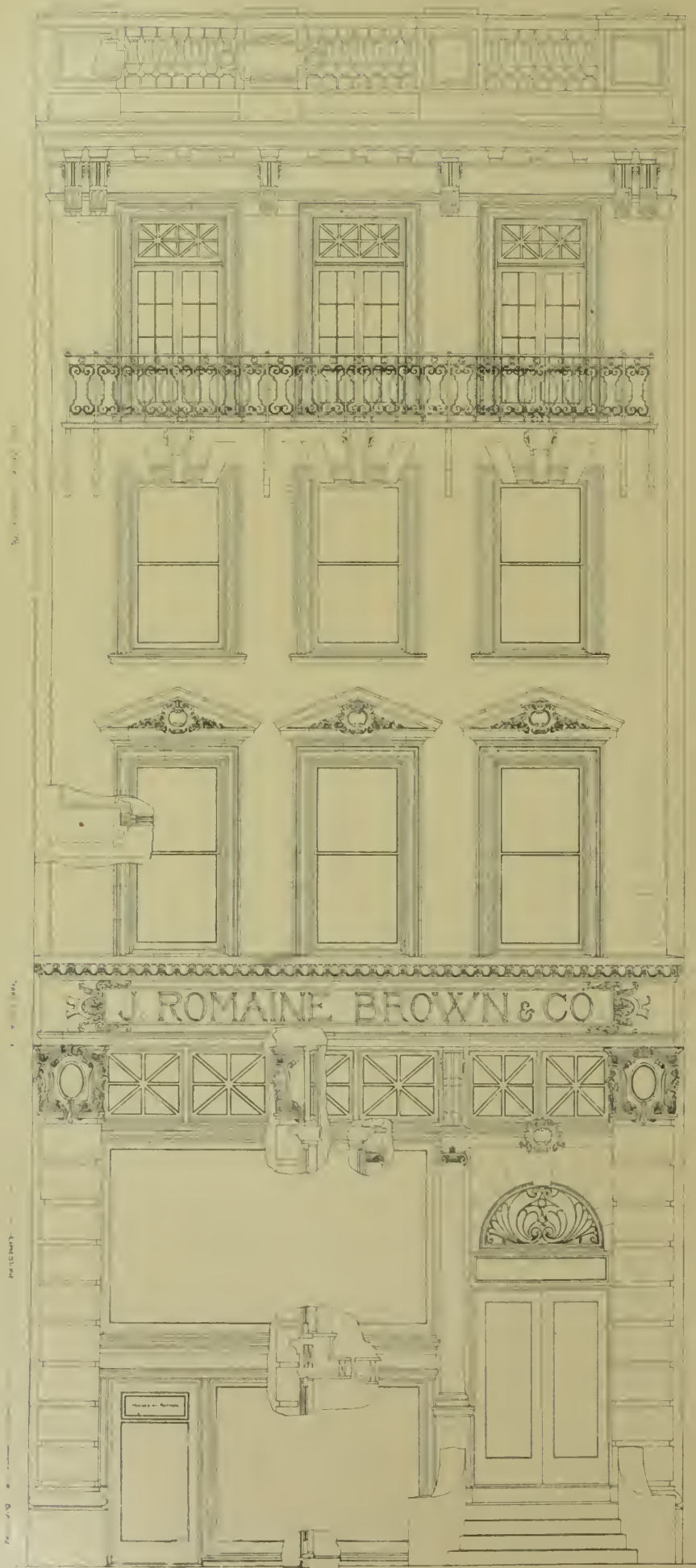


(ENTIRELY OF BUFF TERRA-COTTA, EXCEPT BASE.)
FRONT ELEVATION.



NEW THEATRE AT BOSTON, MASS.
JAMES M. WOOD AND JOHN GALEN HOWARD, ASSOCIATE ARCHITECTS.





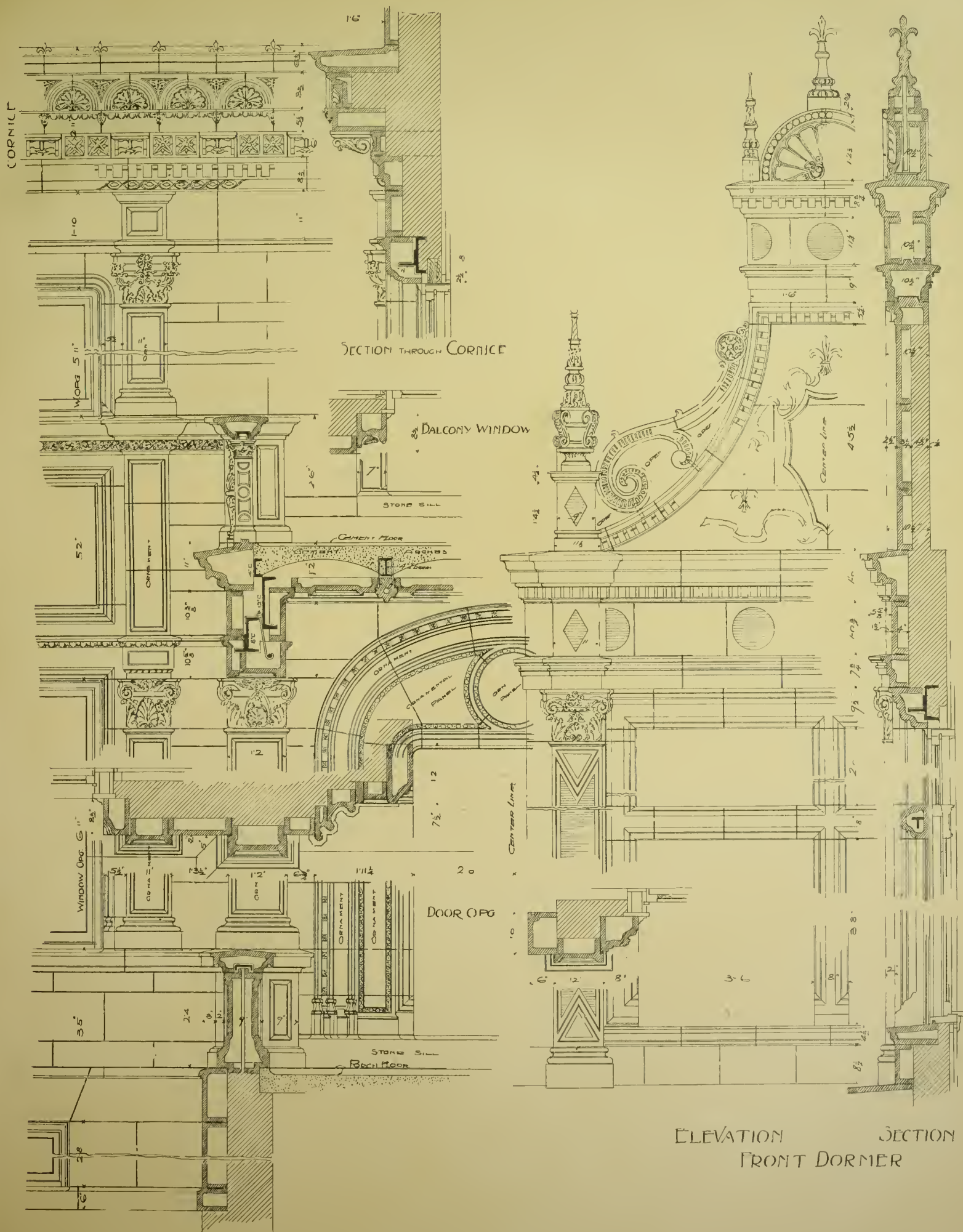
FRONT ELEVATION-



SECTION-

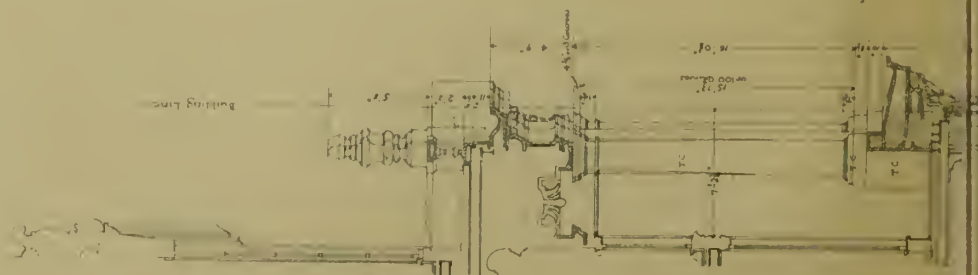
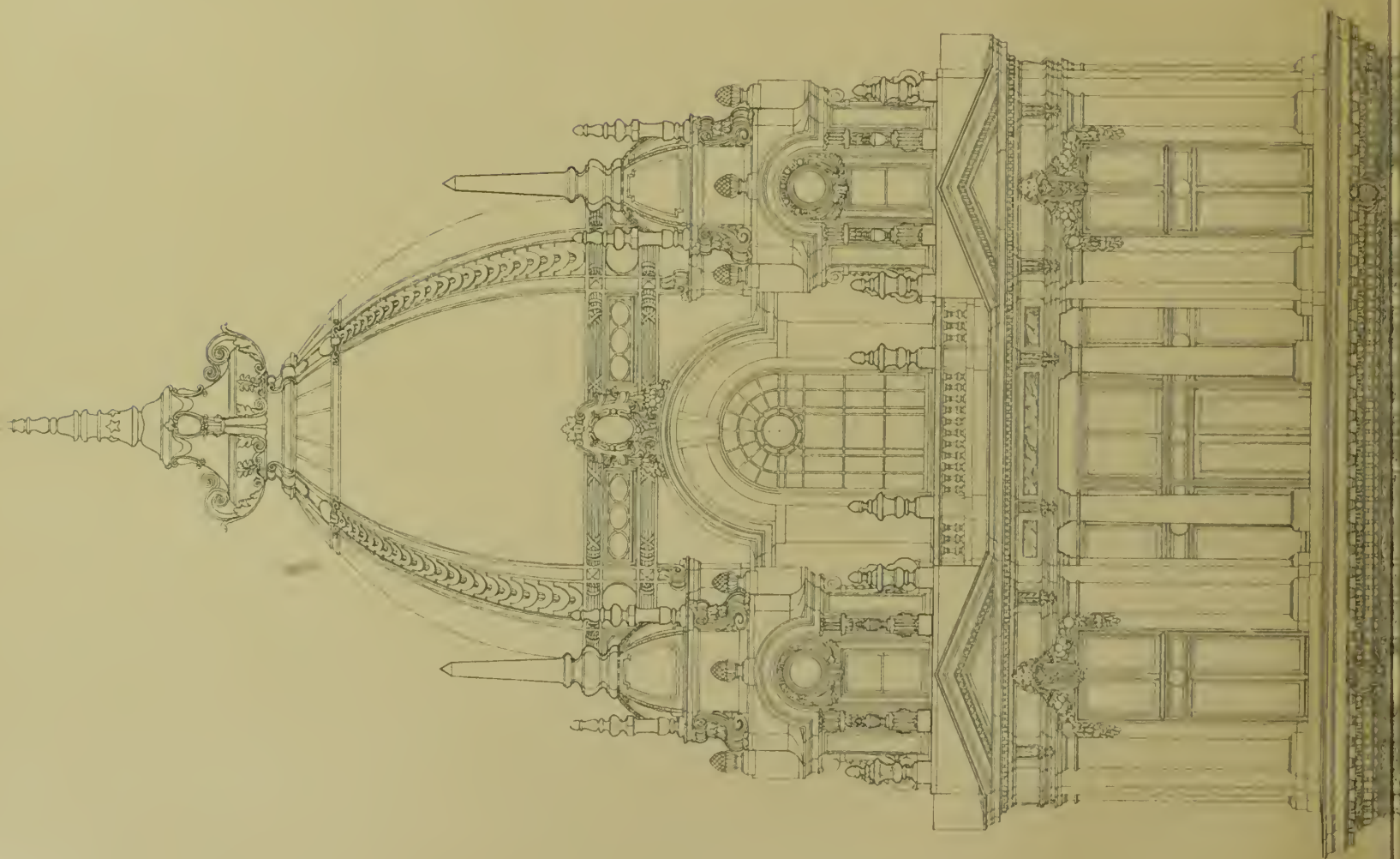
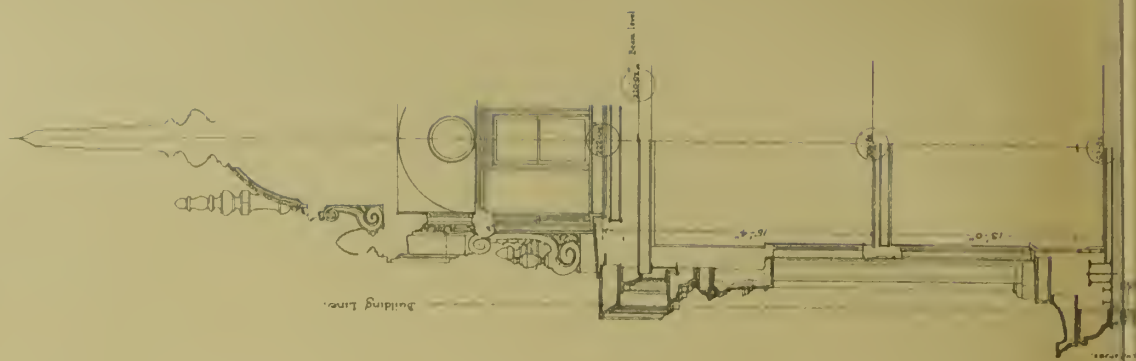
ELEVATION OF PREMISES WEST 33RD STREET, NEW YORK CITY

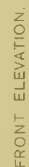
ALFRED H. TAYLOR, ARCHT.



DETAIL OF FRONT & SECTION THROUGH PORCH

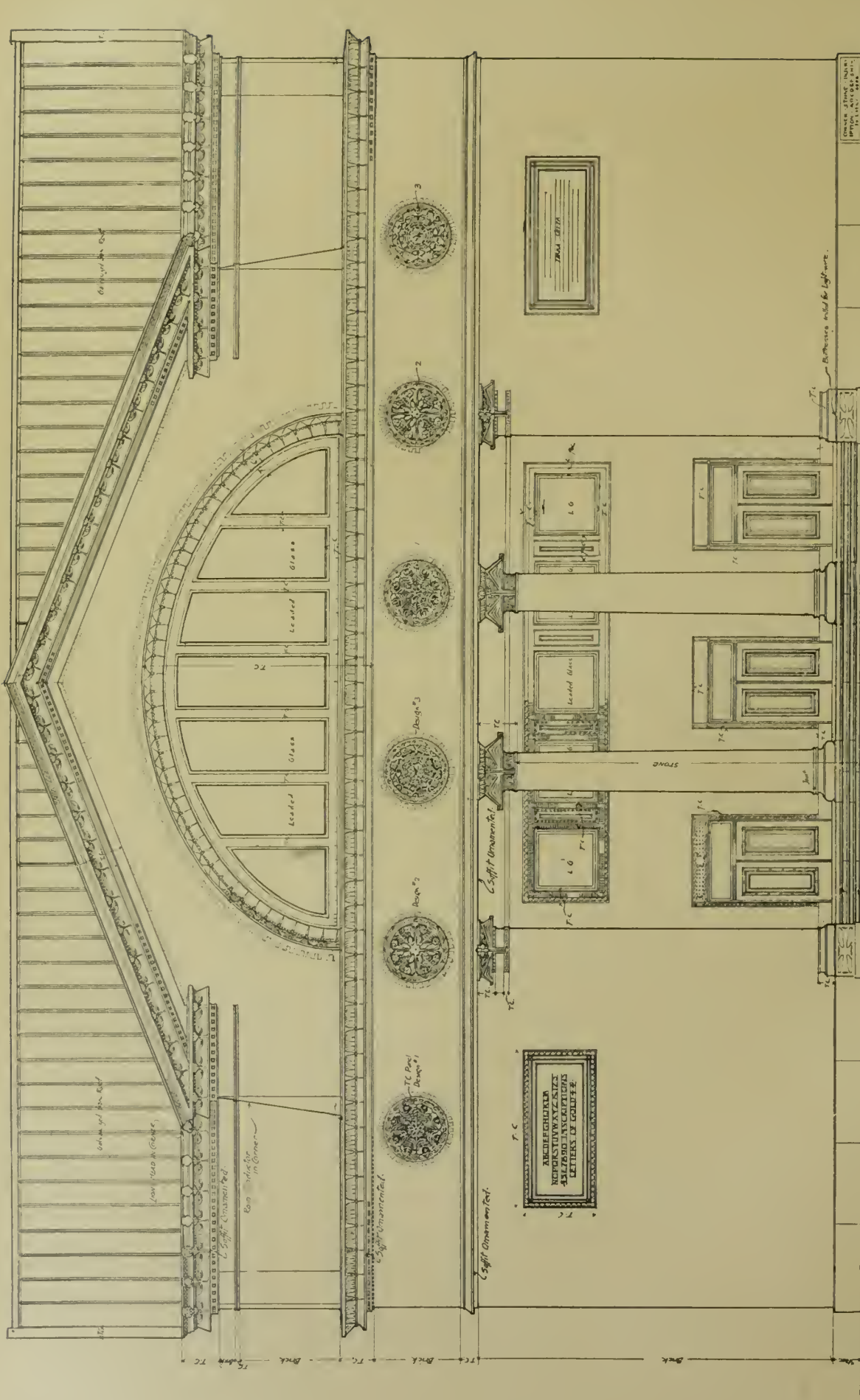






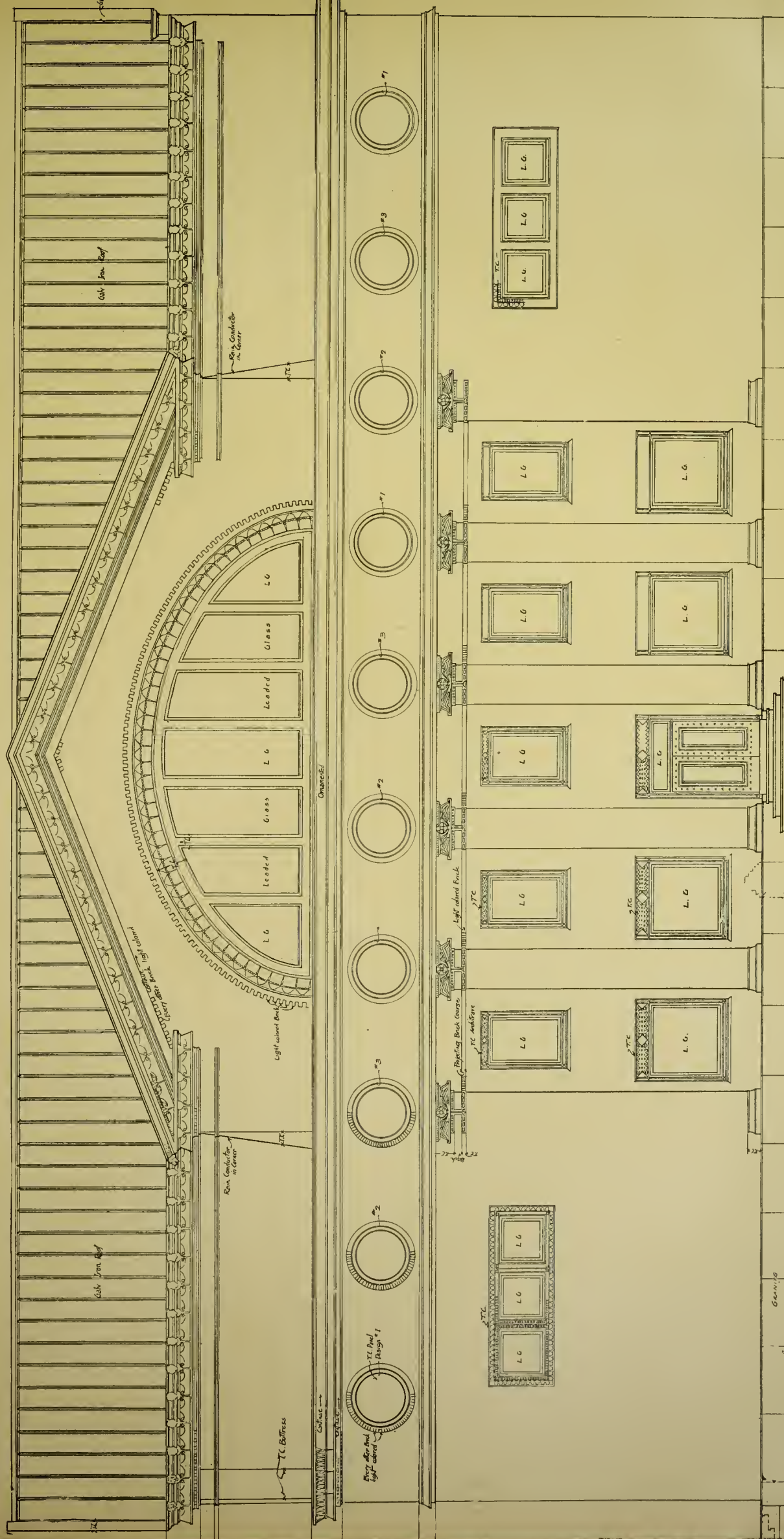
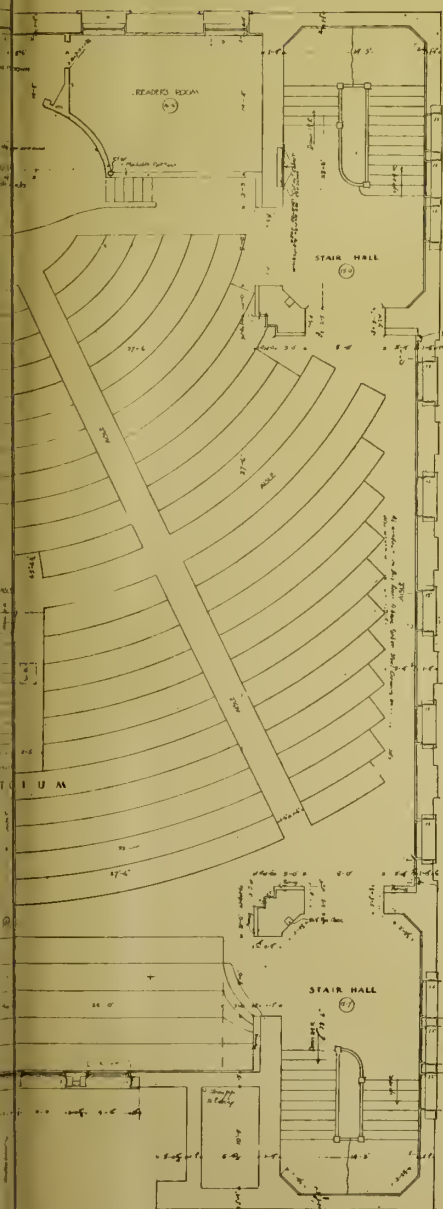
ELKS' BUILDING, DETROIT. MICH.
JAMES M. WOOD, ARCHITECT.





FRONT ELEVATION.

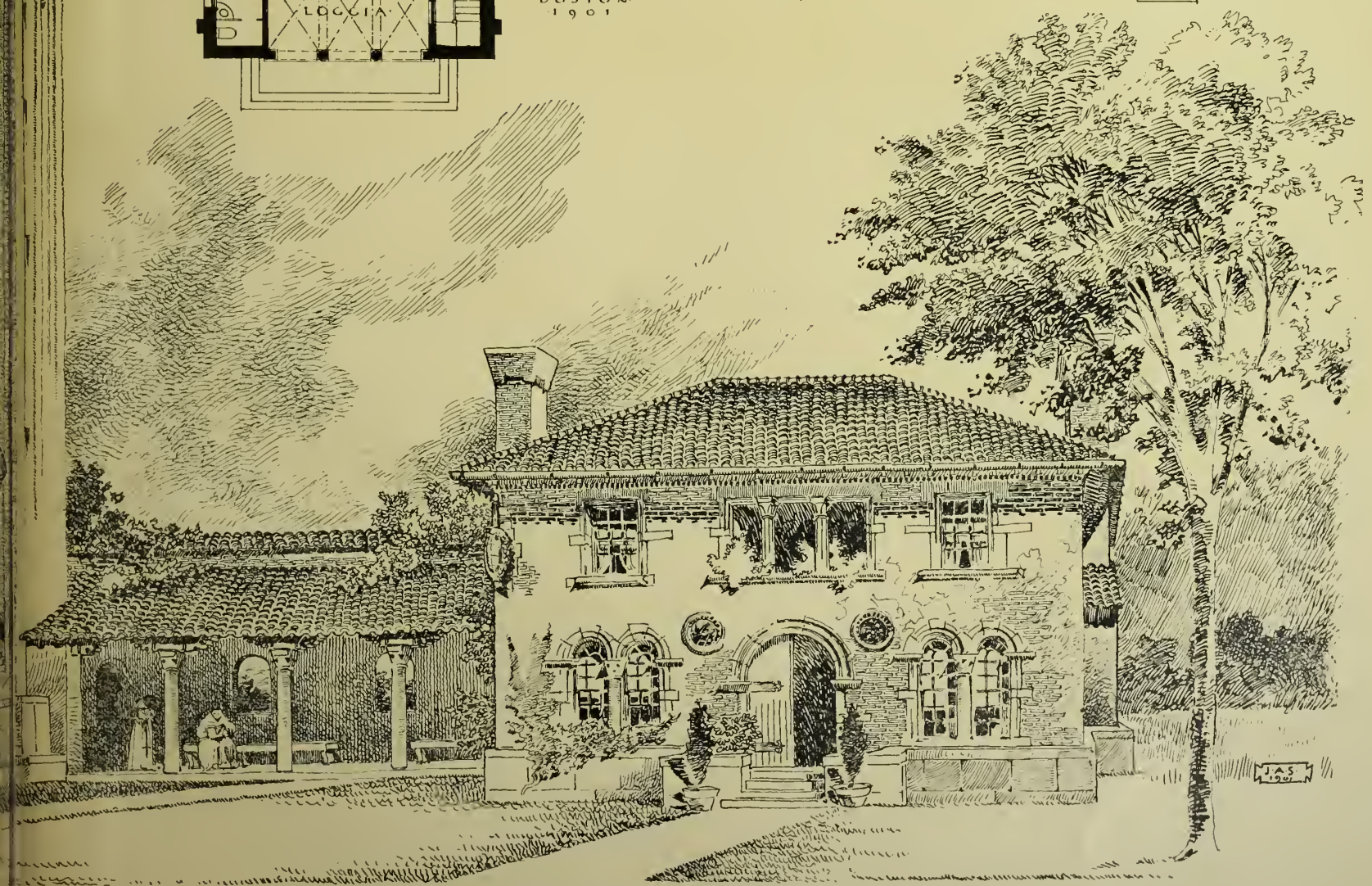
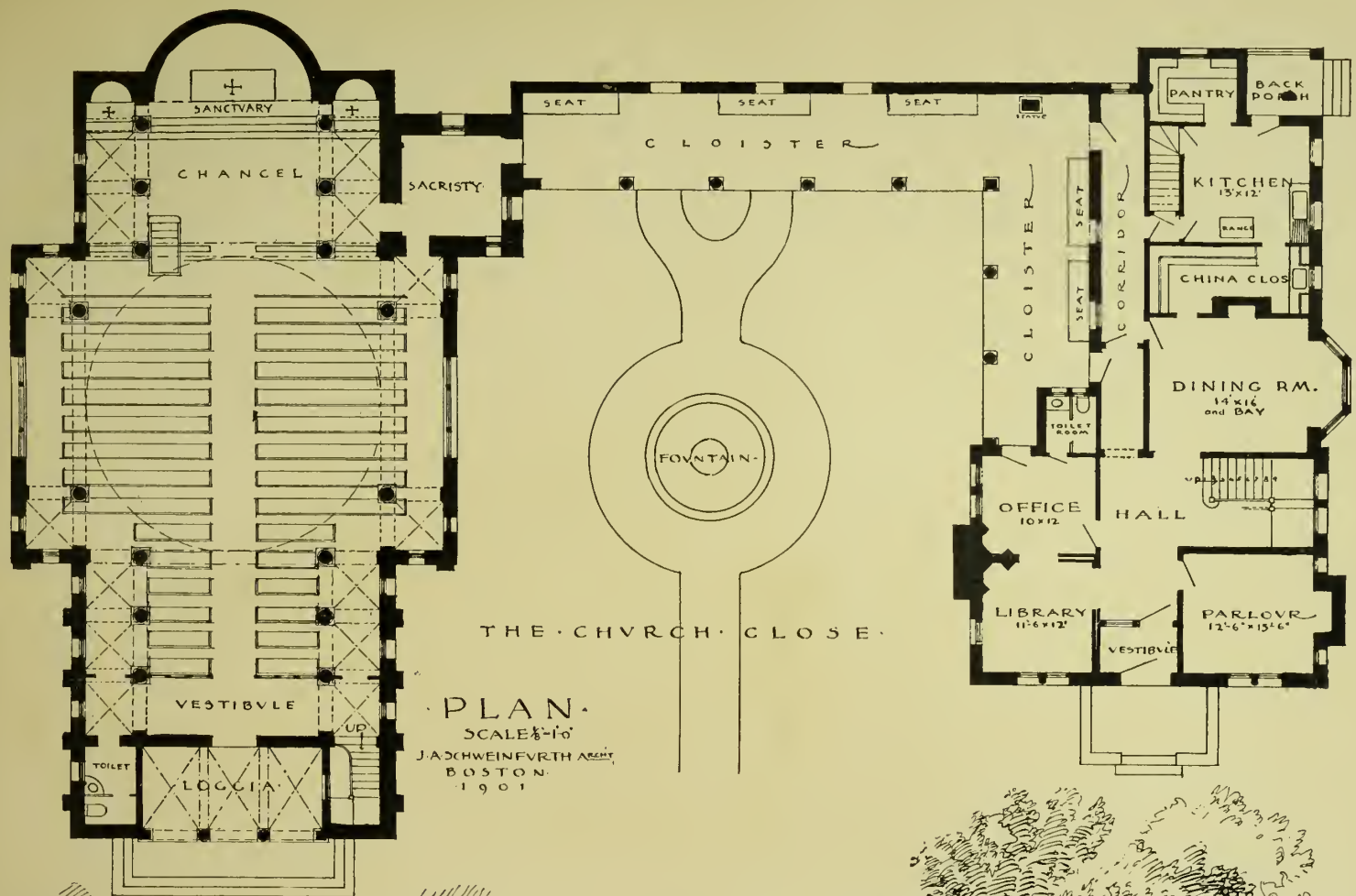




THIRD CHURCH OF CHRIST, SCIENTIST, CHICAGO ILL.
HUGH M. G. GARDEN, ARCHITECT.



SAINT PETER
J. A. SCHWEI

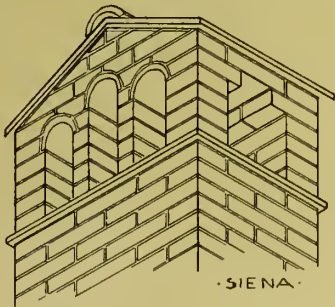




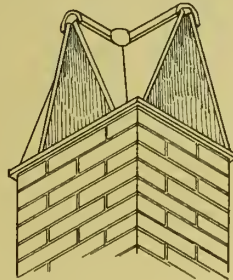
PUBLIC LIBRARY, NASHUA, N. H.
CRAM, GOODHUE & FERGUSON ARCHITECTS.

*Cram, Goodhue & Ferguson, Architects
51 State Street Boston Mass.*

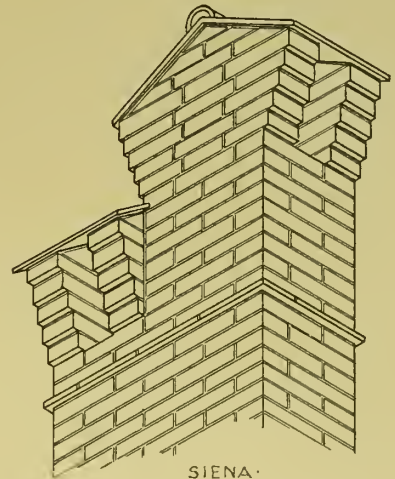
DETAILS OF ITALIAN BRICKWORK
MEASURED AND DRAWN BY WILL S. ALDRICH
CHIMNEYS



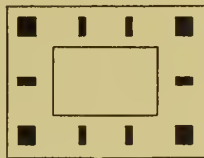
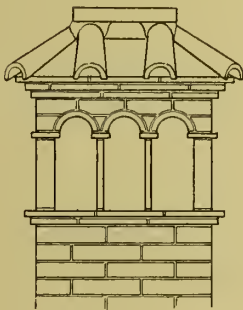
SIENA



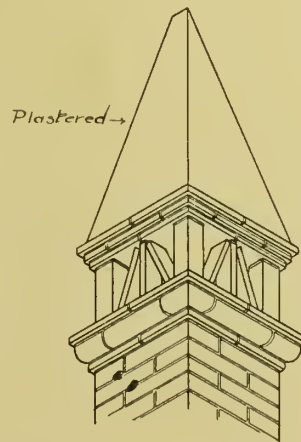
VITERBO



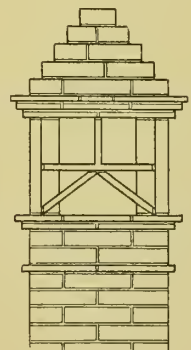
SIENA



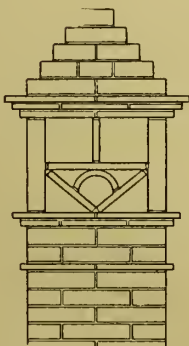
ORVIETTO



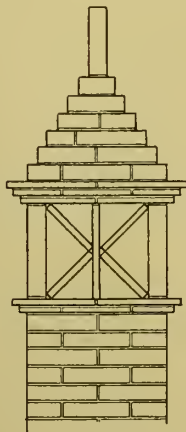
VITERBO



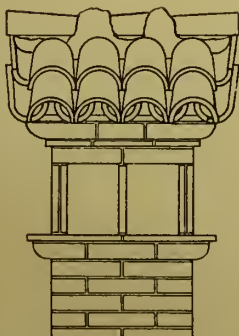
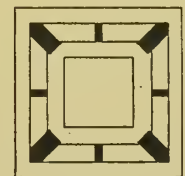
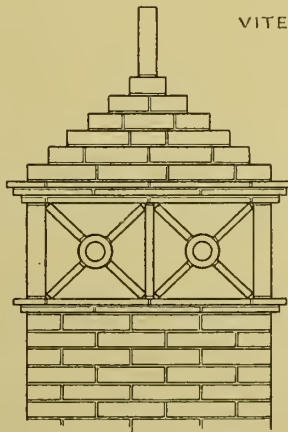
ORVIETTO



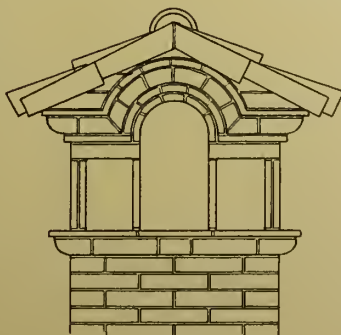
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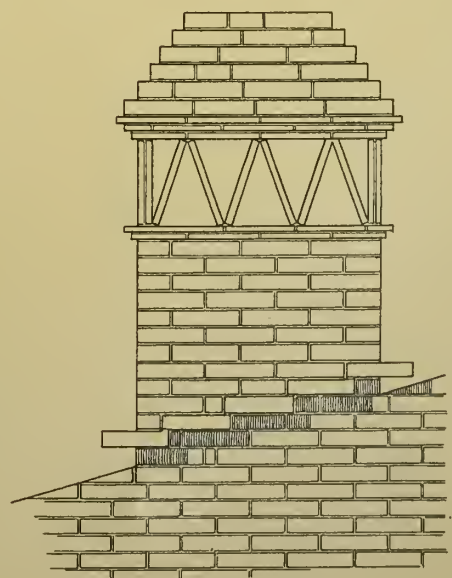
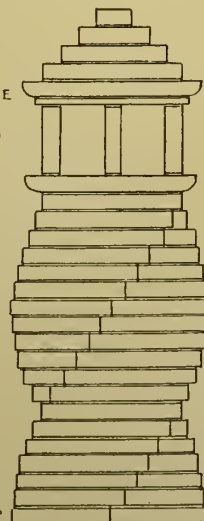
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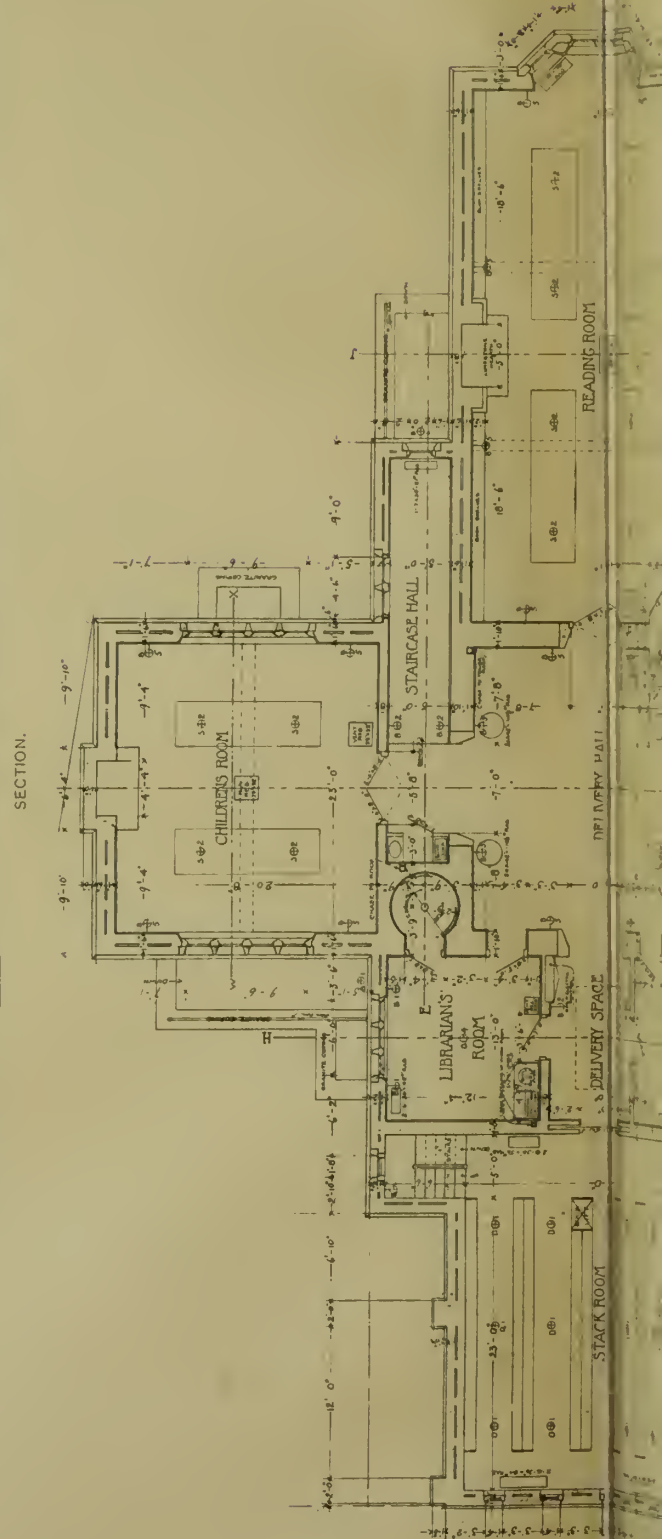
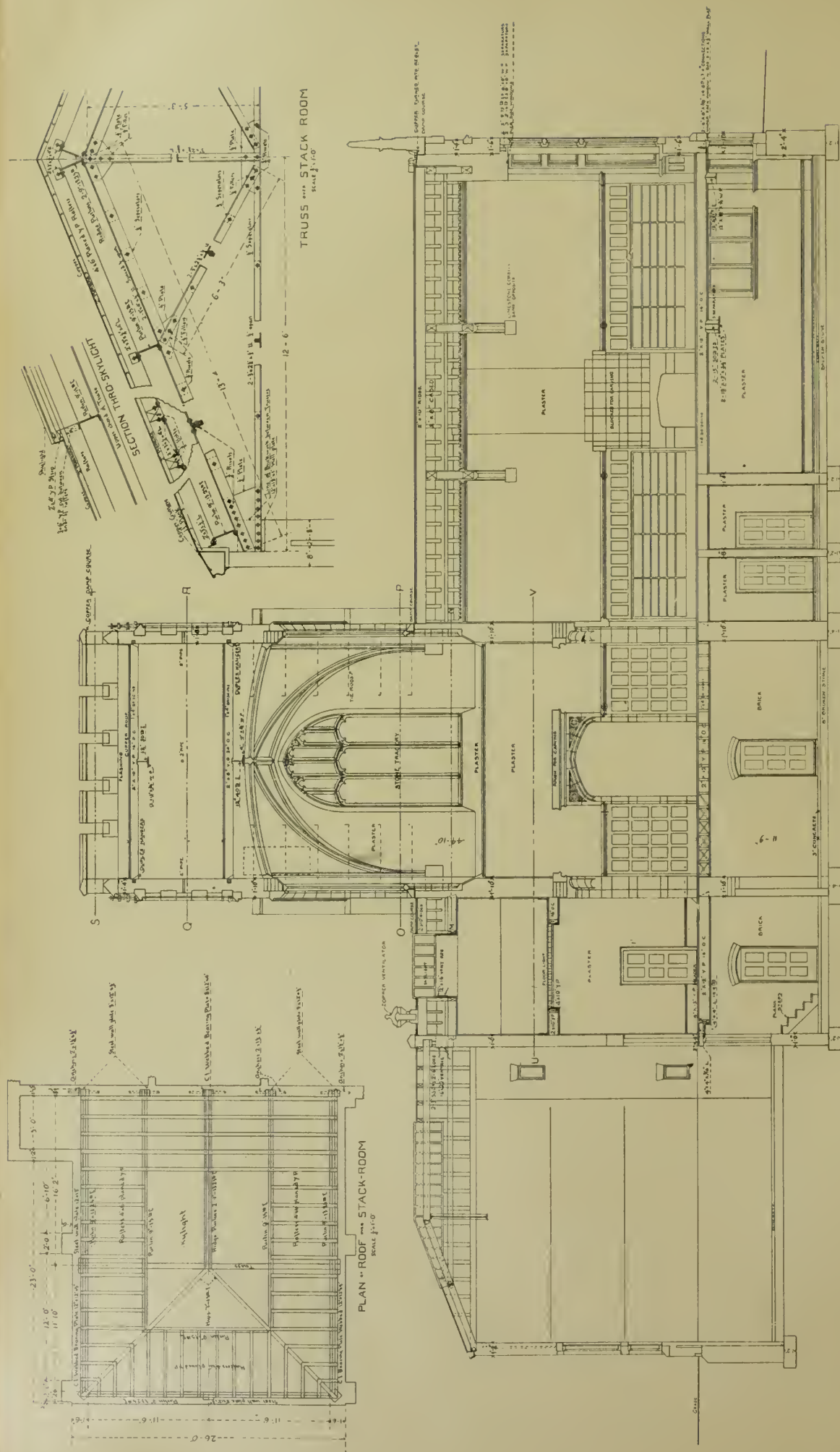
CARAVAGGIO

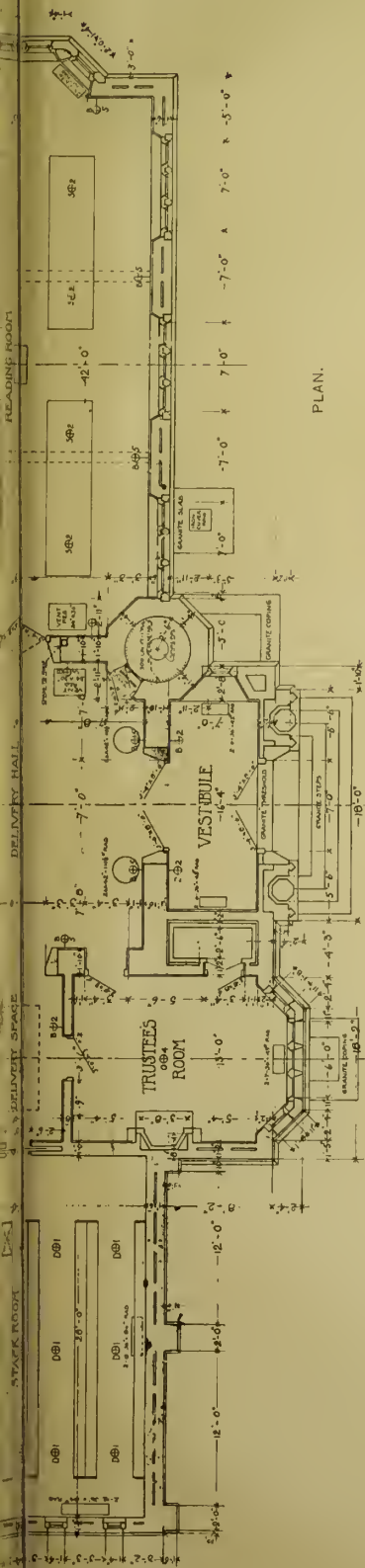


A CRAZY ONE
FROM
CARAVAGGIO

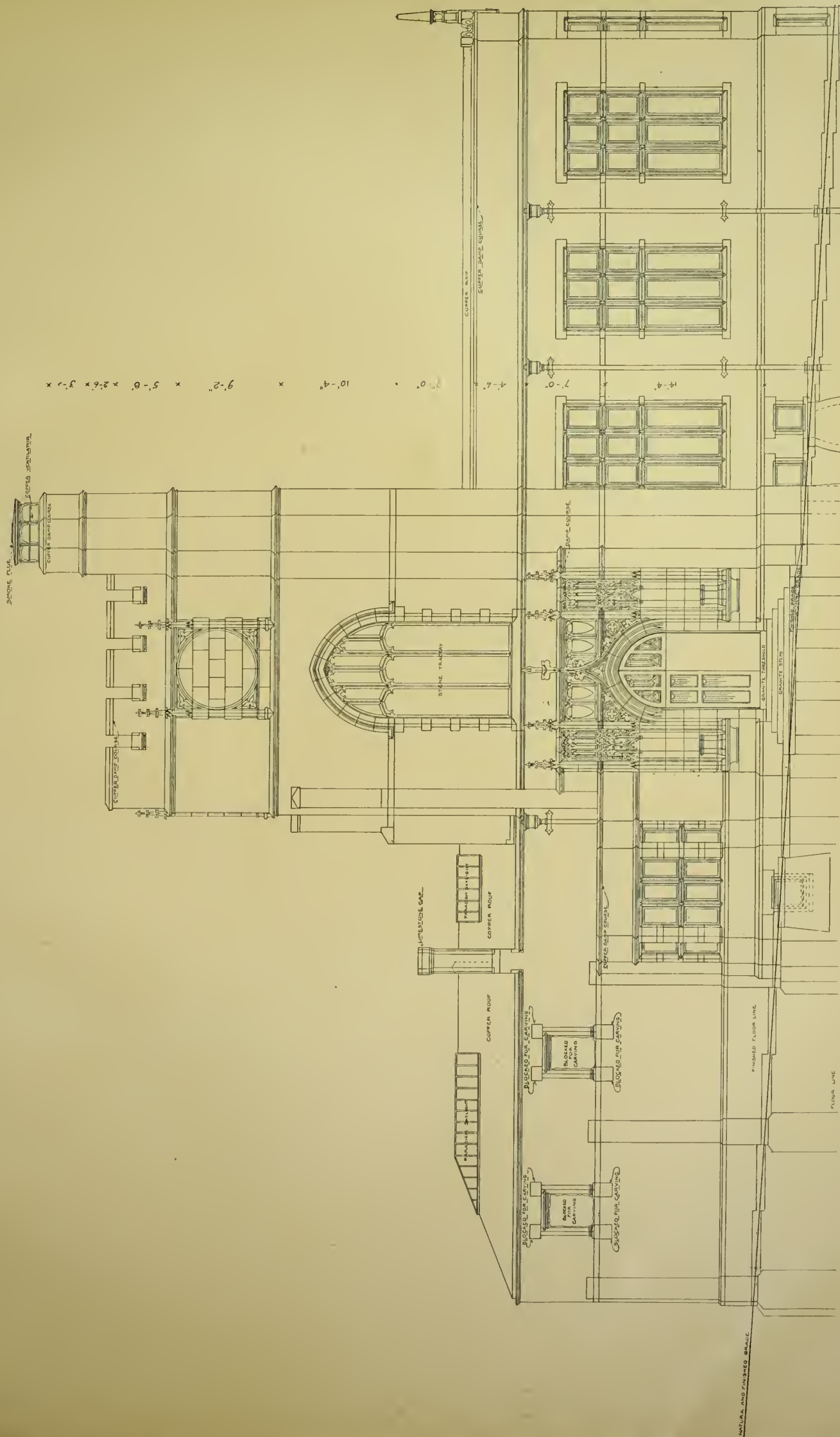


VITERBO

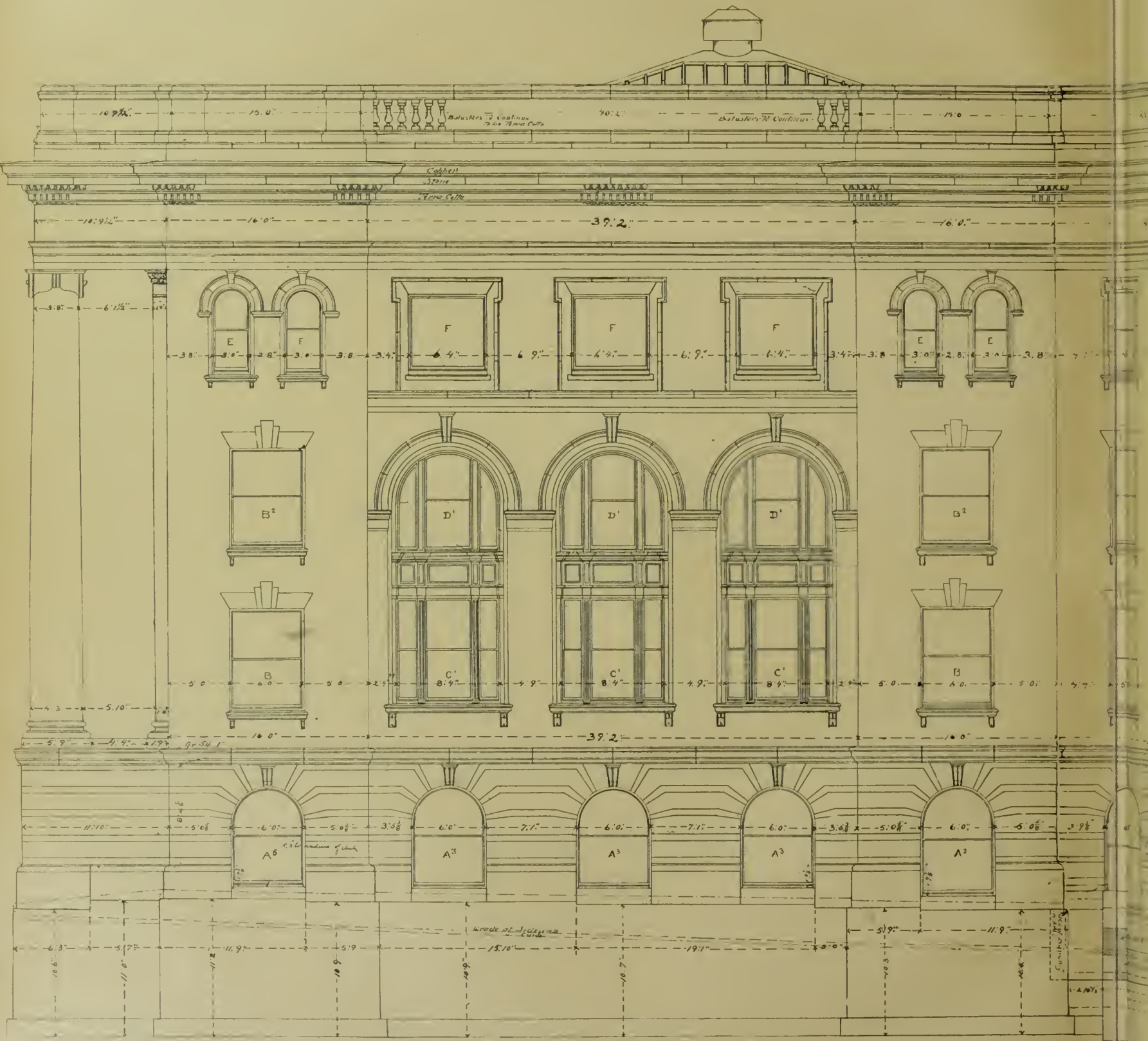




PLAN.



WEST ELEVATION.
PUBLIC LIBRARY, NASHUA, N. H.
GRAM, GOODHUE & FERGUSON, ARCHITECTS.



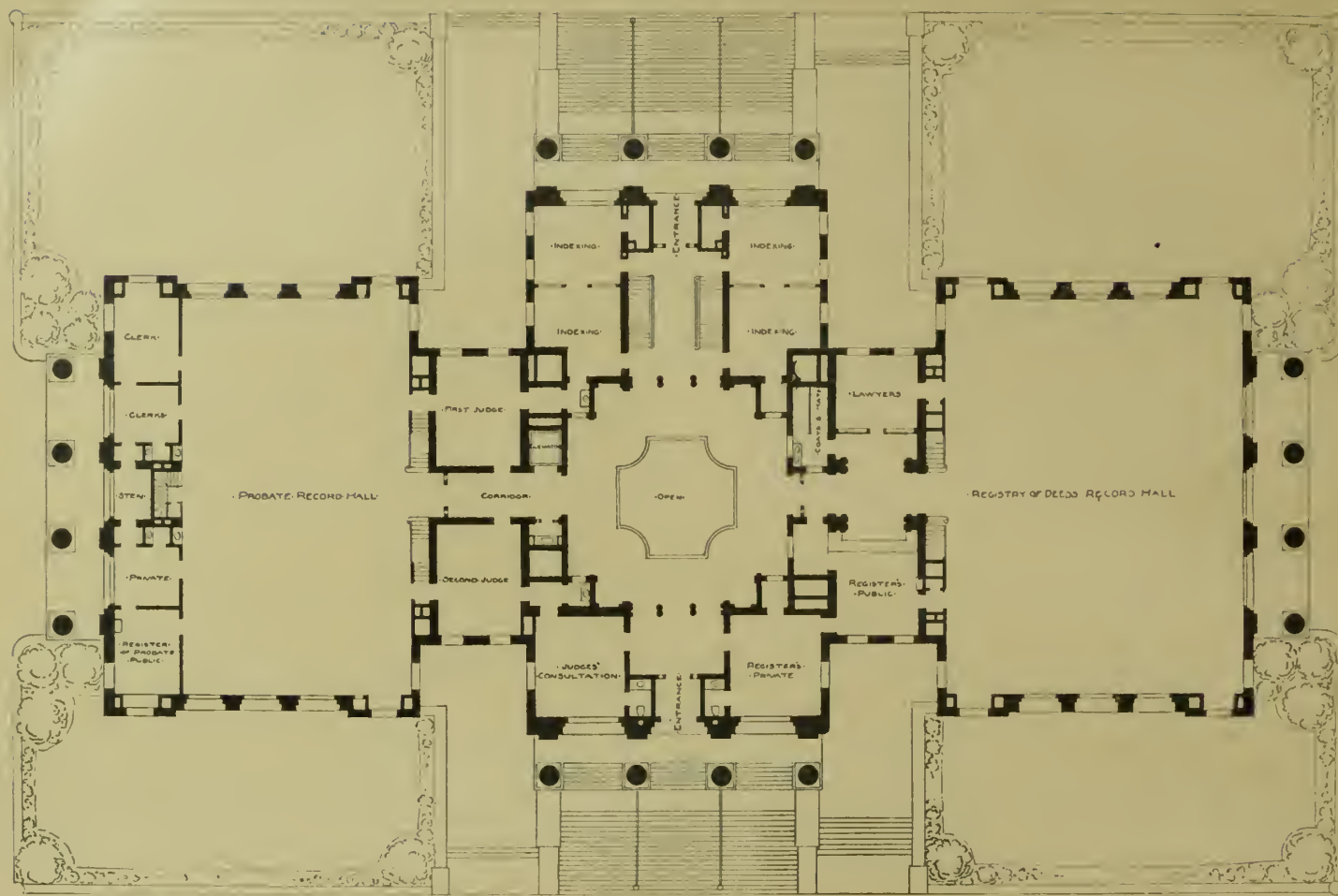


ELEVATION.

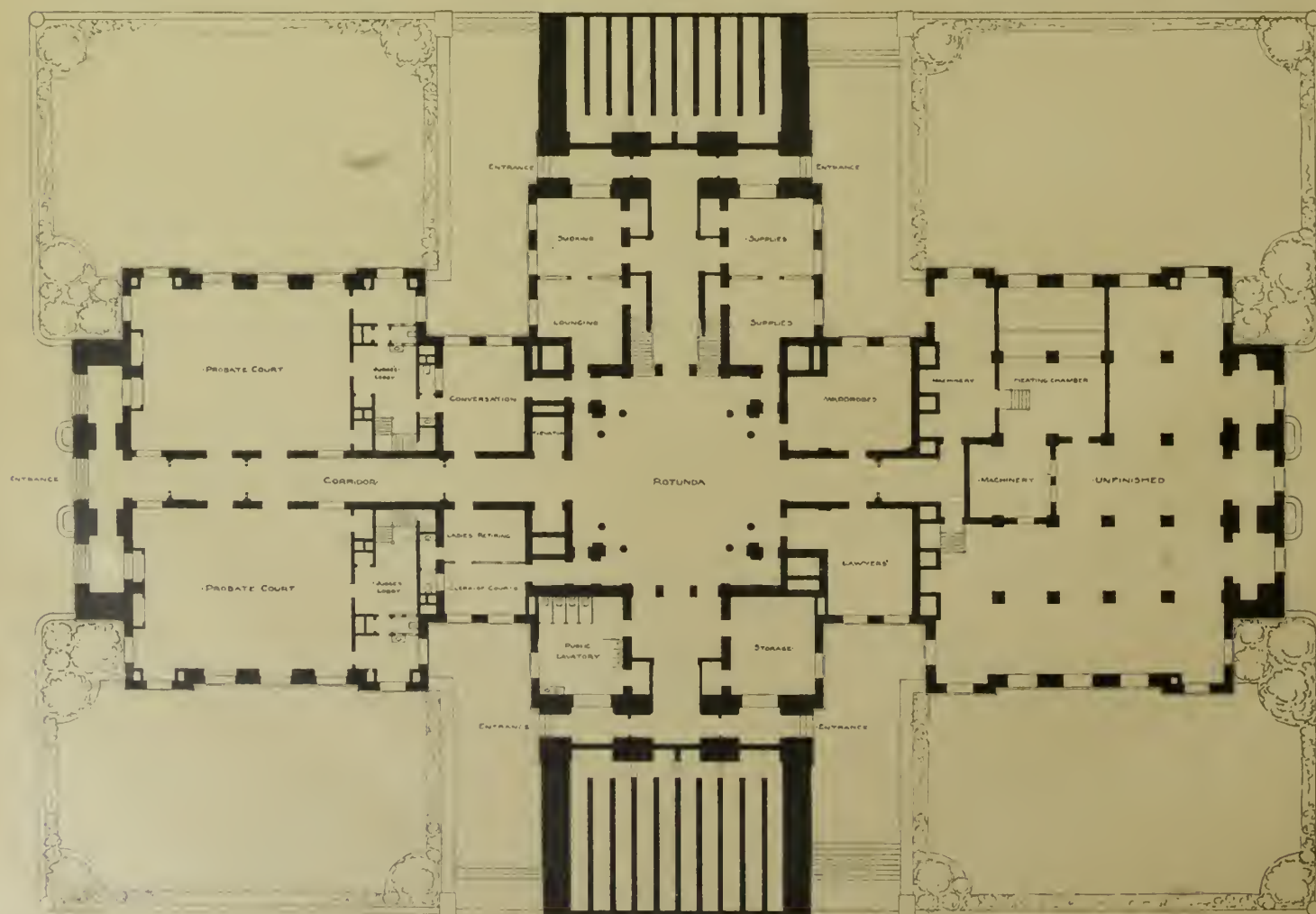
AND PROBATE COURT. EAST CAMBRIDGE, MASS.

QUER, ARCHITECT.



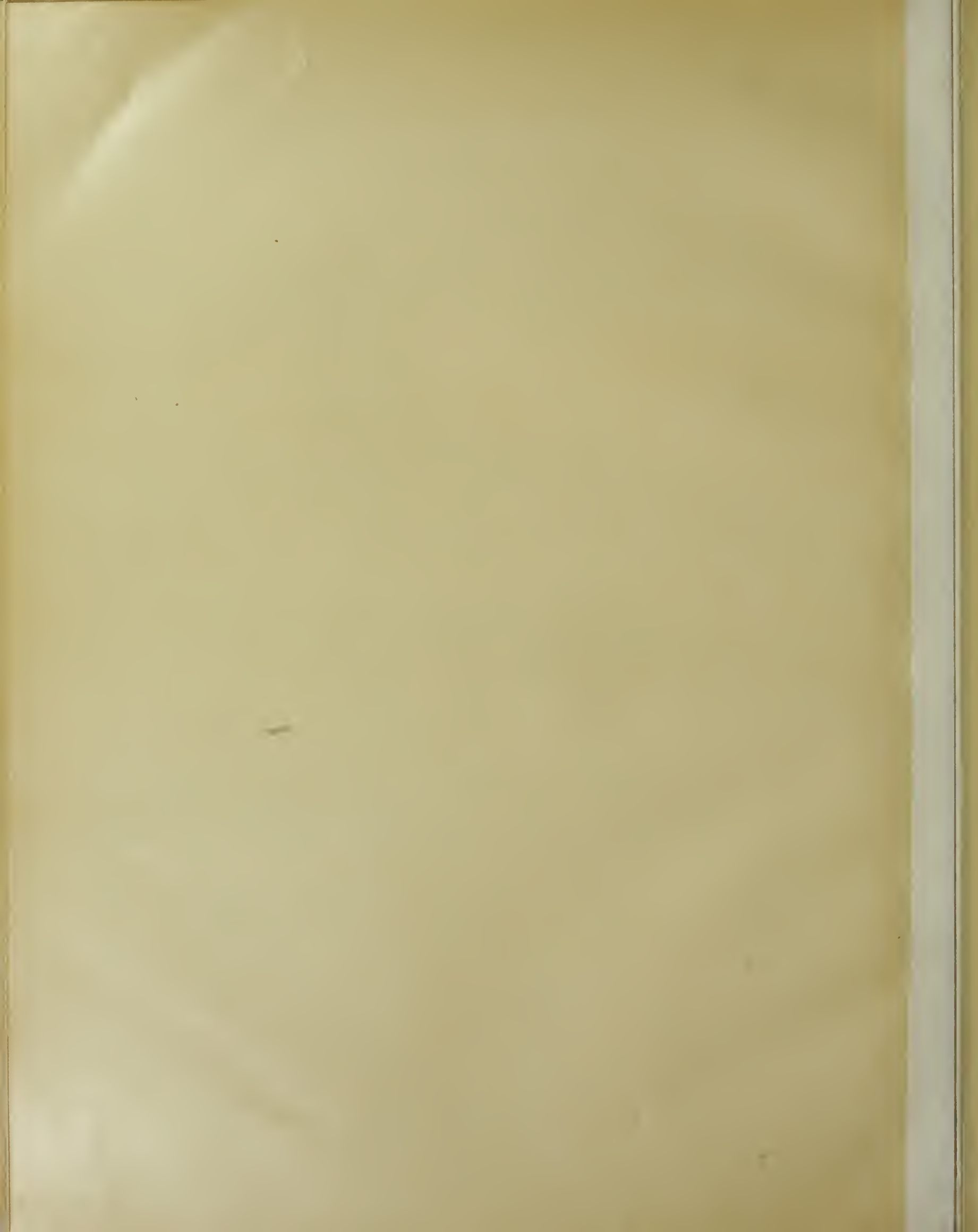


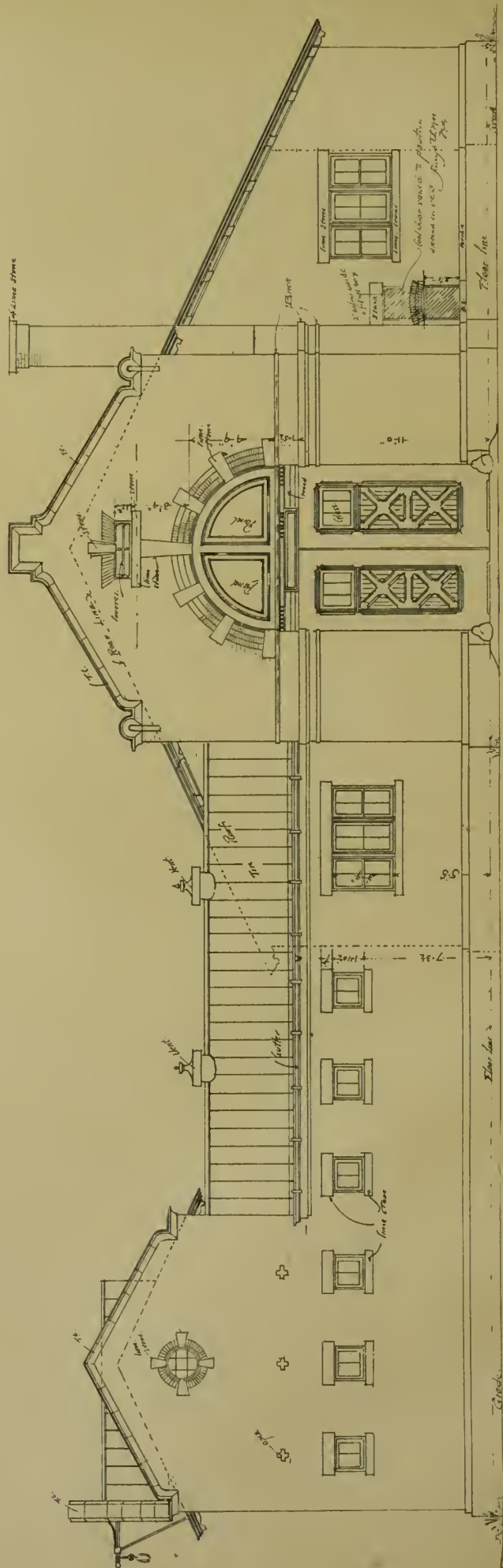
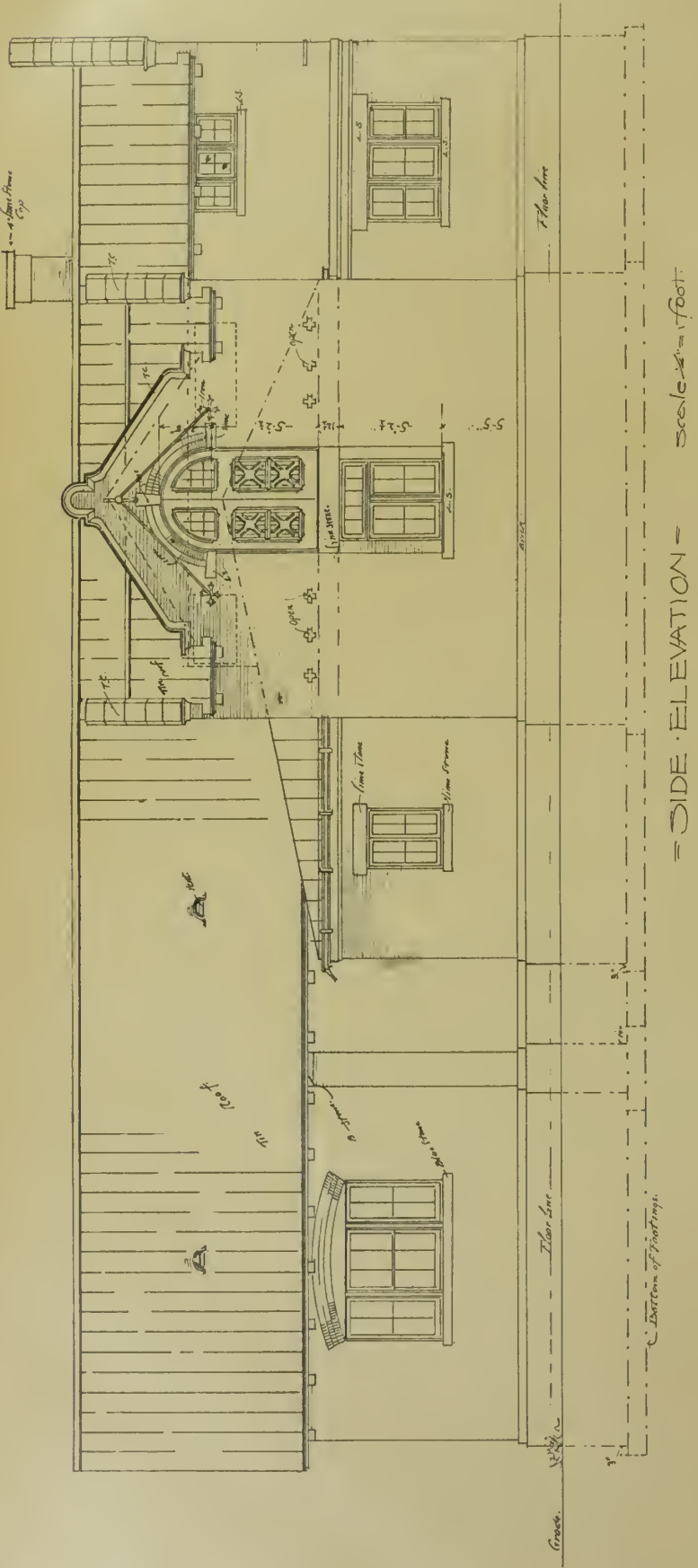
FIRST FLOOR PLAN.



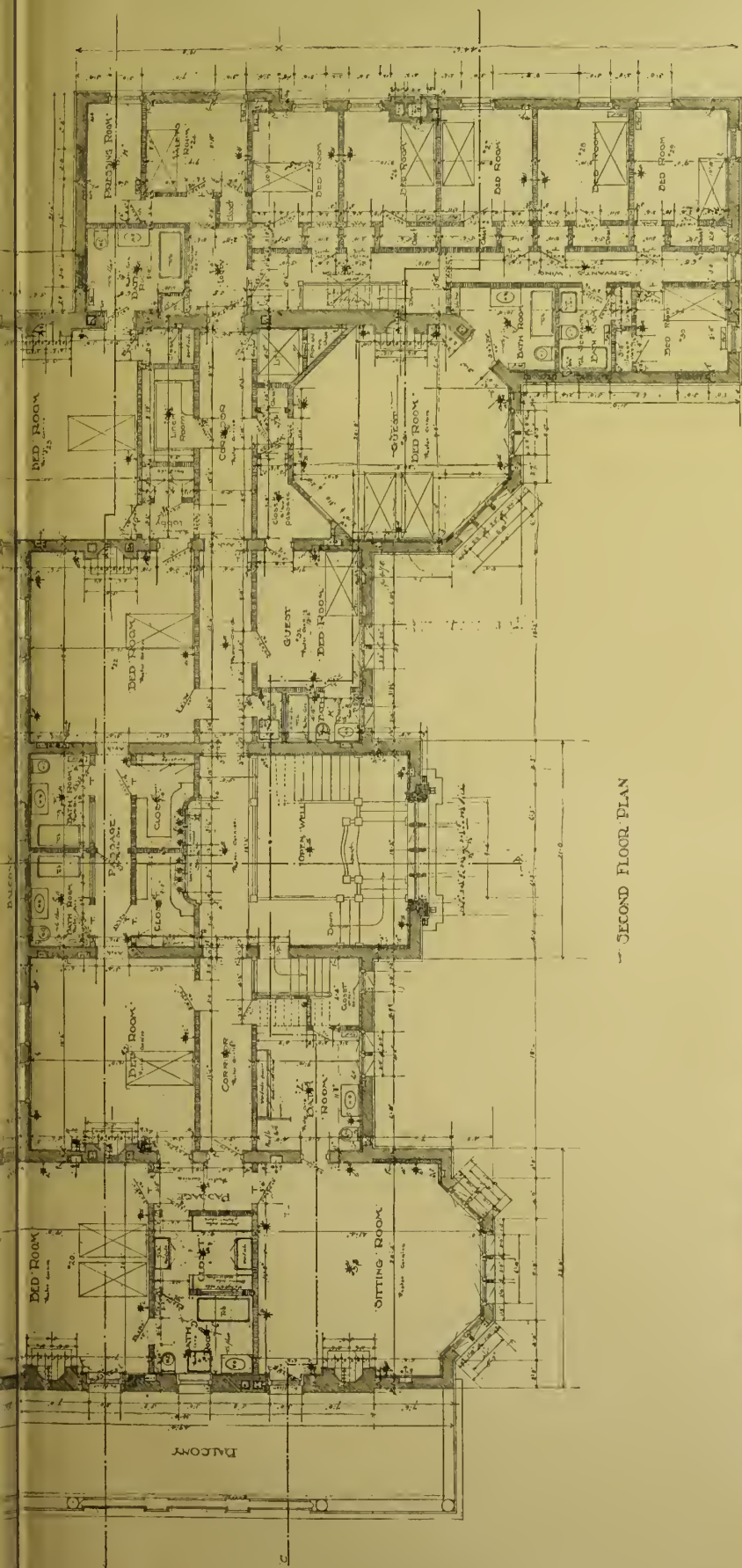
GROUND FLOOR PLAN.



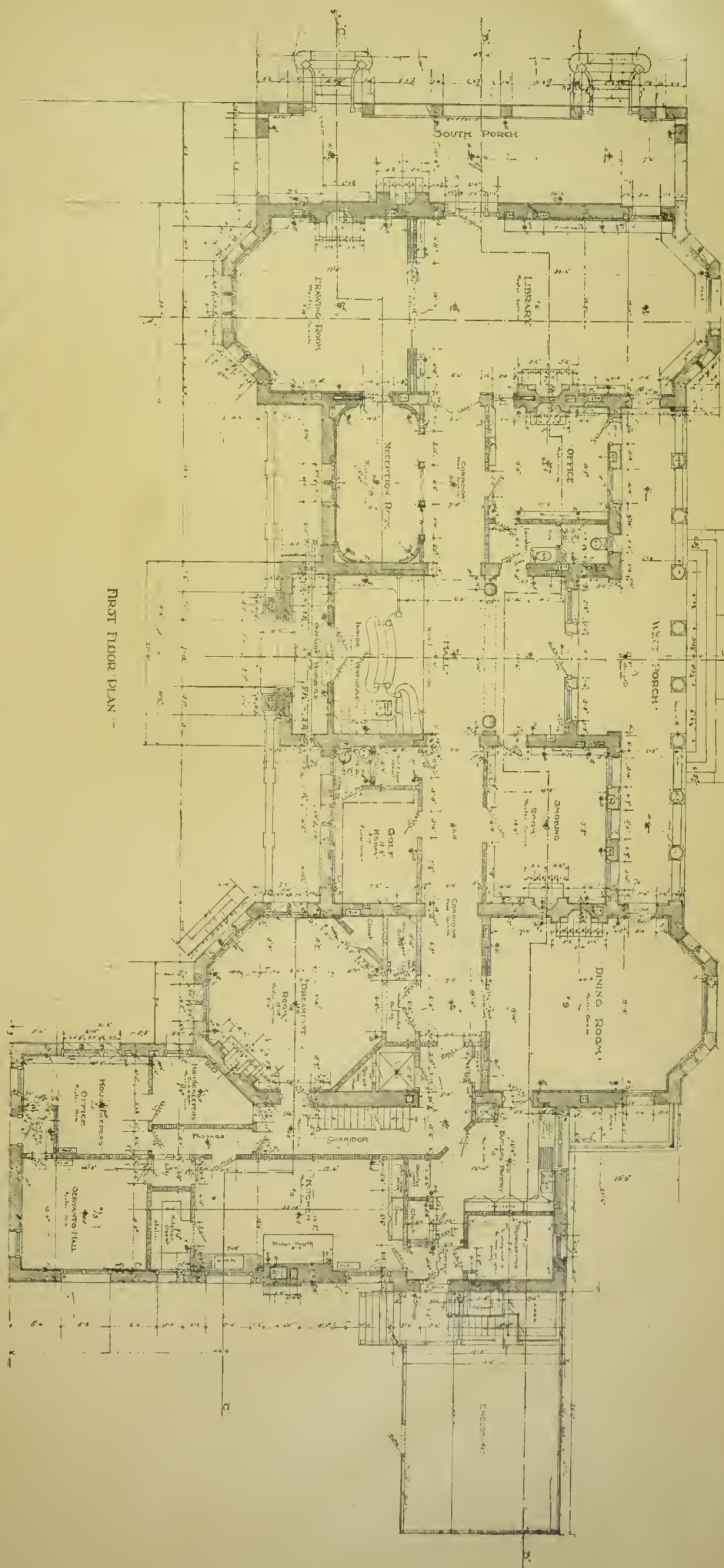




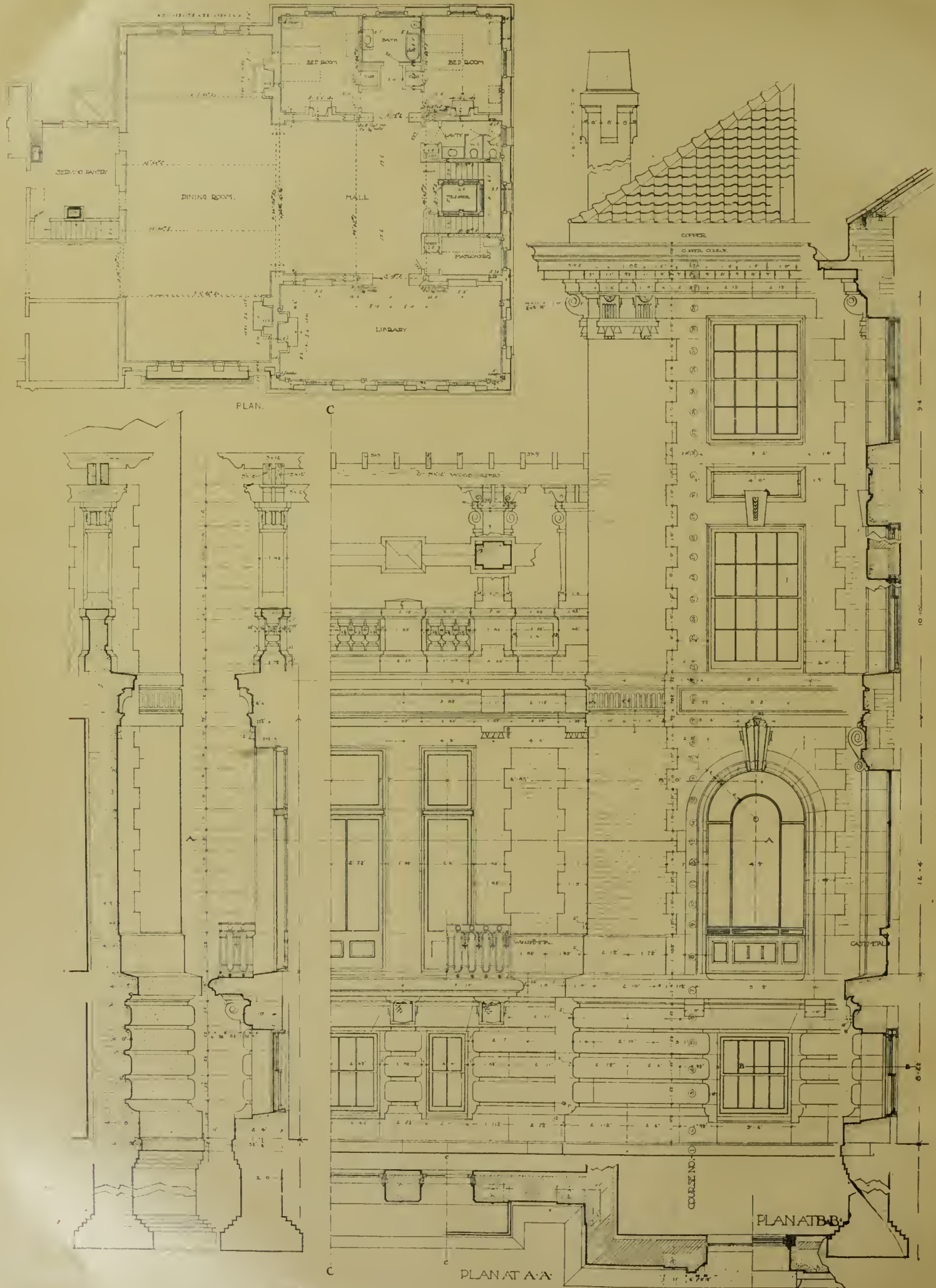
ELEVATIONS OF STABLE.
HOUSE AT MORRISTOWN, N. J.
HOWELLS & STOKES, ARCHITECTS.



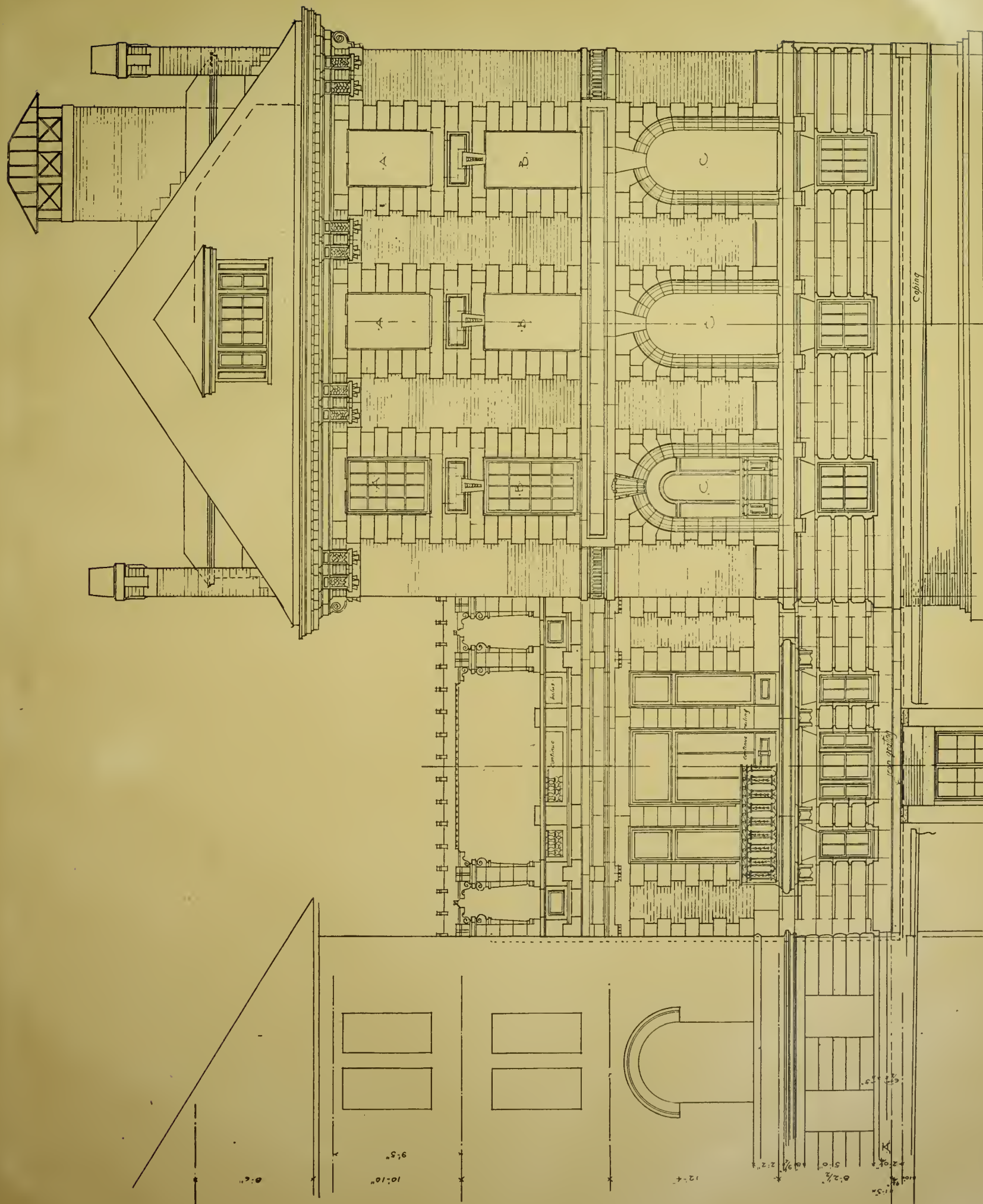
SECOND FLOOR PLAN



FIRST FLOOR PLAN



DETAILS FRONT ELEVATION BROOKLYN HOME FOR AGED MEN, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS.



STILLMAN MEMORIAL WING, BROOKLYN HOME FOR AGED MEN, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS.

