THE BRICKBUILDER

AN ARCHITECTURAL MONTHLY

INDEX
VOLUME
18
JANUARY-DECEMBER
1909

PUBLISHED BY ROGERS & MANSON
EIGHTYFIVE WATER STREET BOSTON MASS

THE BRICKBUILDER — INDEX.

PLATE ILLUSTRATIONS.

PLATE ILLUSTRATIONS—*Continued.*

FRONTISPIECES — FULL-PAGE ILLUSTRATIONS.

GIOVANNI BATTISTA PIRANESI, DEL.

MISCELLANEOUS ILLUSTRATIONS IN LETTER-PRESS.

This list does not include illustrations made in connection with articles nor those of terra cotta details.

MISCELLANEOUS ILLUSTRATIONS IN LETTER-PRESS — *Continued.*

ARTICLES.

EDITORIALS AND MISCELLANY.

THE BRICKBUILDER

VOLUME XVIII — JANUARY 1909 — NUMBER 1

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

DONN BARBER; JAMES ALAN MacLEOD; McKIM, MEAD & WHITE; NEWMAN & HARRIS; PALMER & HORNBOSTEL; CHARLES A. PLATT; SAMUEL L. SHERER

LETTERPRESS

THE TEMPLE OF MUSES, ROME. GIOVANNI BAPTISTA PIRANESI, DEL.

THE BRICKBVILDER

VOL. 18 NO. 1 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· JANUARY 1909

The Denominational Church—II.

BY C. HOWARD WALKER.

IN CONSIDERING the building of a church its material is to be determined upon, and its proportions carefully studied before any accessories are considered. There are of course two methods of attack, first to produce a work of fine monumental character, which requires adequate funds to employ fine material and detail it in a manner worthy of the material, and second, to employ material incapable of receiving fine cutting or surfacing, and by the structural character give to it interest. All wooden churches should have delicate details, as the character and grain of the material justify it. All fine stone should have finely cut details and surfaces. One of the principal errors in American architecture is in having fine stone with a broken surface, which surface could be better obtained in a cheaper, coarser material. The association of fine and coarse material is perfectly possible provided each is treated according to its character. In using rubble stone, random broken ashlar, and seam face stone, etc., wooden forms coarsen to prevent too great a contrast with the rough surface of the stone. This is not the case in using brick and wood together as the brick has a smooth surface which permits delicate detail in the work. Rough stone walls are best associated with porches, etc., which have heavy beams.

MEETING HOUSE HILL CHURCH, BOSTON, MASS.

The treatment of the termination of towers is one in which there is much difference of taste and of opinion, this difference usually occurring in the choice of a tower or of a spire. The spire is merely to gain altitude without excessive cost and also without making the tower of too great mass for the body of the building. For these reasons low, square towers can often be improved by spires, and tall spires give an impression of delicacy and grace.

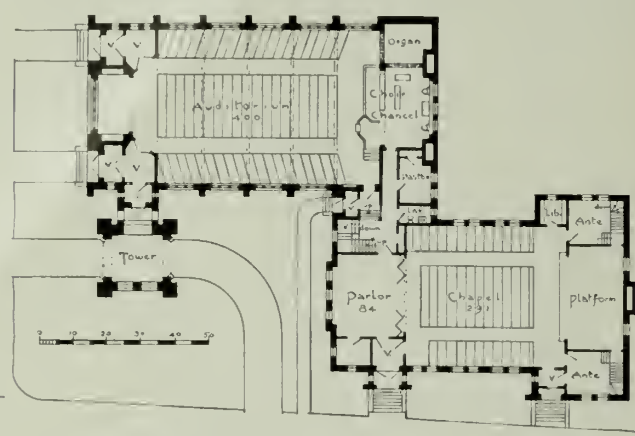
The connection of the base of the spire with the top of the tower often presents difficulties which have been overcome by parapets, by broaching the spire, and by corner pinnacles, each of which is successful if in harmony with the general design. While the top of the tower should appear to be lighter than its lower part, the mistake often appears of making the openings at the top of the tower too large in scale and especially too high. Louver boards obviate this to some extent but not entirely.

On the interior of the church the ceiling or roof is the largest and most conspicuous surface, and as on account of its span it is carried on roof trusses, these can be made to form a decorative feature.

The trusses of early churches were decorated carefully in color and are very effective, as for example in San Miniato in Florence. The denominational church is usually of greater span than are the naves of the great cathedrals and if it has a steeply pitched roof the trusses become disproportionate to the usual height of wall unless the collar beams are kept high. For this reason some variation of a hammer beam truss or of a scissors truss is advisable. For inexpensive work, ordinary Howe trusses with trussed purlines are sometimes effective. Paneled ceilings either of plaster or wood have been seldom adopted, but have very decorative effect. Apparently they have been considered somewhat secular. The ceilings of the Roman basilicas, Santa Maria in Trastevere, San Clemente, San Giovanni Laterano, are very beautiful and suggestive.

The position and importance of the organ is a question for serious consideration. It may be called a unique piece of furniture, and if at all conspicuous should be on the axis either of the church or of a transept. If it is impossible to place it in such a position and it is necessarily put to one side, it should be made comparatively inconspicuous. The decoration of the organ pipes is usually too brilliant and not sufficiently simple, as the scale of the tubes alone is larger than that of any other detail in the church and quite sufficient to make them conspicuous without additional effort. The decoration of the church itself should be in absolutely plain, flat color of pleasing tone. No patterns, stencils, borders, excepting perhaps a few finely ruled lines, should be necessary if the church is well proportioned and designed. The example of the restorations of German churches in Cologne, of Sainte Chapelle in Paris, and of San Francesco in Bologna is sufficient to make decorators cautious.

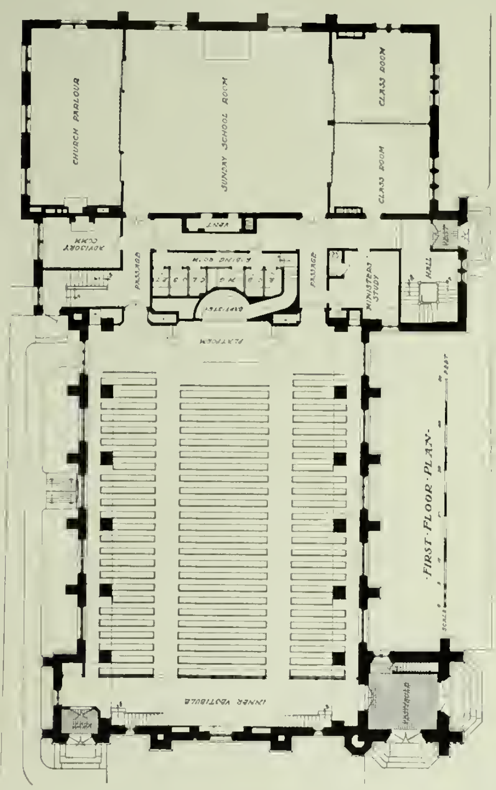
There remains the decoration of the windows, by both tracery and stained glass. If the church is of Gothic type and has mullioned and traceried windows the lines of the tracery alone should be sufficiently interesting to prevent their being seriously disturbed by violent color, and all glass within the tracery should have a large proportion of white or clear glass. Large openings form altogether too frequent opportunities for well intentioned gifts of memorial windows, which in most cases are merely luminous pictures attempting realism in a material incapable of producing it, and which occasionally by a tour de force obtain a decorative effect too brilliant and aggressive for the church. Stained glass is too powerful to be used in its full strength of color excepting where seen at a distance as in the great cathedrals. Near at hand it needs softening, toning, and subdivision into small pieces, otherwise it is brutal. And it can never express realism without theatrical effect. It is a transparent, translucent mosaic and should be treated as such, using delicate tones and tints near at hand with but small introduction of strong color, and increasing the color as the window is placed high or far away from the eye. Plain leaded glass has the effect of delicate tracery, and is often preferable to the colored glass. Fortunately stained glass windows can be and are occasionally removed, for in most cases they serve more to injure than to improve the interior of American churches.



UNITARIAN CHURCH TO BE BUILT NEAR BOSTON, MASS.
Ernest N. Boyden, Architect.

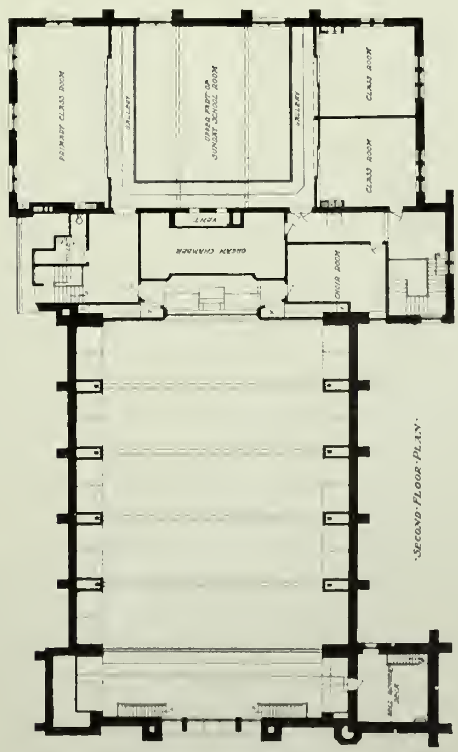
In comparing the designs for denominational churches it is apparent that the chief faults are those which are largely eliminated in ecclesiastical church work by the established traditions of building and the relation of integral parts to each other. In the established church each portion not only has its definite place but its proportionate importance, and we have found that this is by no means the case in other church work. The Sunday school may be so exaggerated that it not only competes with the church in mass but overwhelms it, and the same is equally true of the social portion of the building. In some churches it is extremely difficult to separate one portion from another, and in a vain attempt to impart religious character to an heterogeneous group of units, all sorts of subterfuges are adopted, usually borrowed from some edifice of either great picturesqueness or of unmistakably ecclesiastical character. The elemental study of architecture is based on a thorough knowledge of geometric solids and their correlation with each other when grouped, and a very large proportion of the failures in church architecture are due to an apparent ignorance of this science.

CONGREGATIONAL CHURCH, BOSTON, MASS.

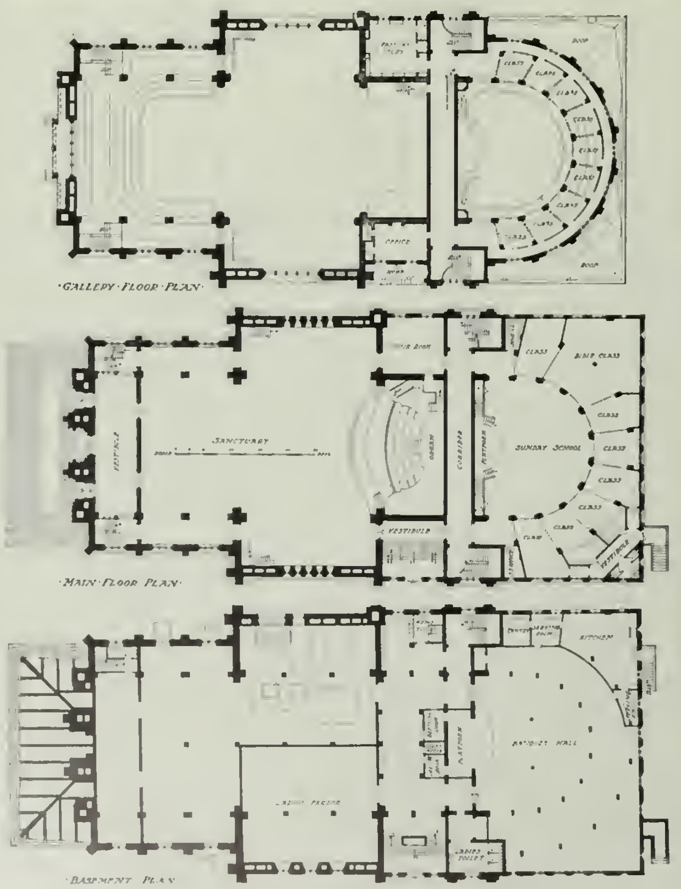


BAPTIST CHURCH, BROOKLINE, MASS.

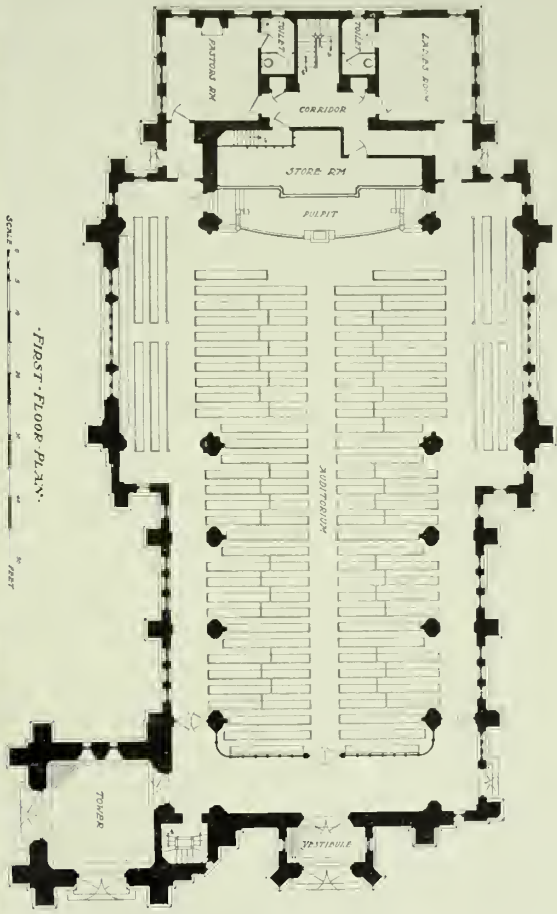
J. A. SCHWEINFURTH, ARCHITECT.



HIGHLAND BAPTIST CHURCH, SPRINGFIELD, MASS.
Kirby, Petit & Green, Architects.

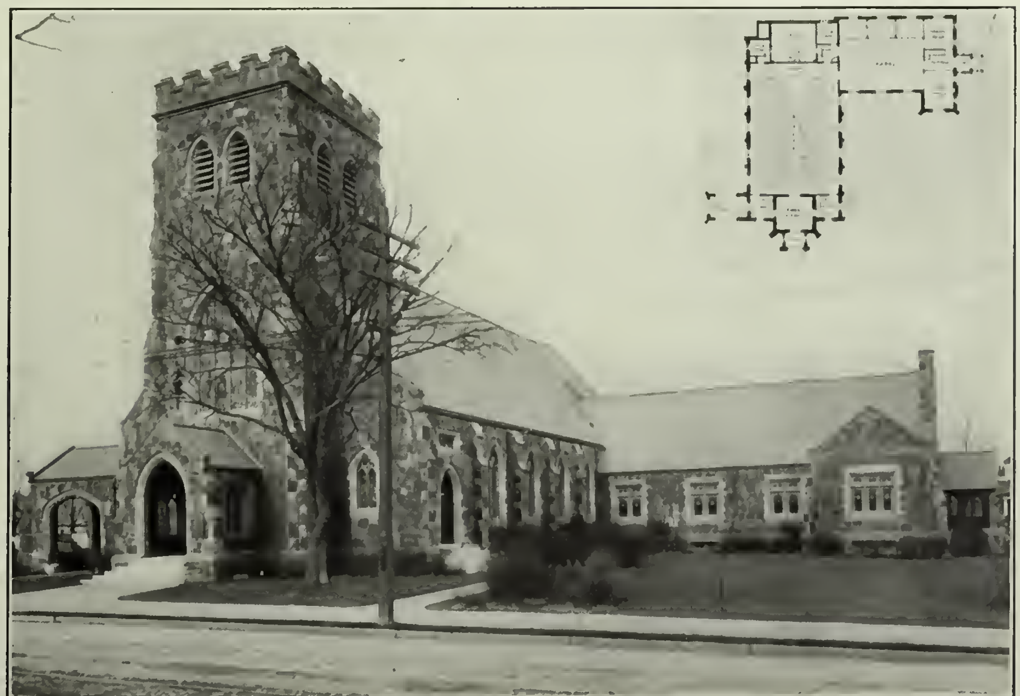


FIRST METHODIST CHURCH, CLEVELAND, OHIO.
J. Milton Dyer, Architect.



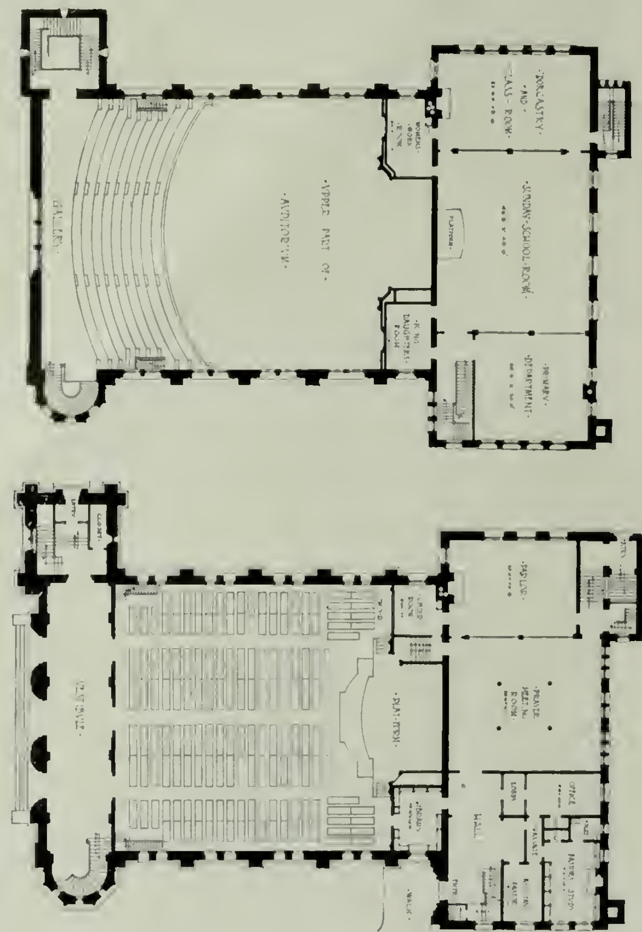
PRESBYTERIAN CHURCH,
SUMMIT, N. J.

DONN BARBER, ARCHITECT.

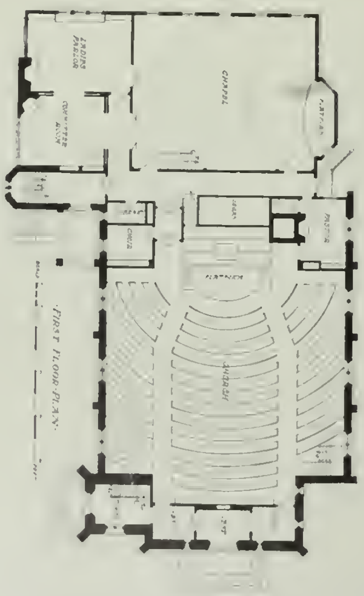


BAPTIST CHURCH,
ARLINGTON, MASS.

CHARLES B. DUNHAM,
ARCHITECT.



PILGRIM CONGREGATIONAL CHURCH, ST. LOUIS, MO.
Mauran, Russell & Garden, Architects.



CONGREGATIONAL CHURCH,
WEST MEDFORD, MASS.
Brainerd, Leeds & Russell, Architects.

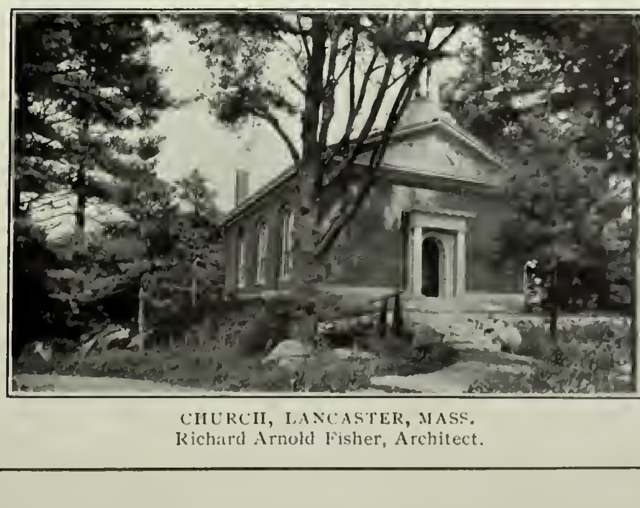
UNITARIAN CHURCH, BUFFALO, N. Y.
E. A. & W. W. Kent, Architects.

PRESBYTERIAN CHURCH, AKRON, OHIO.
Bunts & Bliss, Architects.

METHODIST CHURCH, BEAVER, PA.
Hodgens & Burns, Architects.

CHURCH, BOSTON, MASS.
C. Howard Walker, Architect.

CHURCH, CHICAGO, ILL.
Howard Van D. Shaw, Architect.

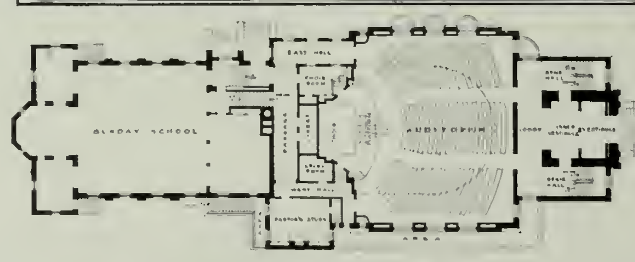


CHURCH, LANCASTER, MASS.
Richard Arnold Fisher, Architect.

It is an excellent method therefore to frankly confess the intention of each portion of a composite building such as the denominational church has become to-day, if it is possible to do so, and if the features that are secondary in character in intention can be made so in fact, a long step has been taken in the right direction.

It is natural to assume that the church itself is to be considered of more importance than are its Sunday schools and ladies' parlors, etc., and therefore it should have the more dignified and larger mass, or if this is impossible it should receive the greater attention and should become the most interesting portion of the design. It readily lends itself to such an intention, as it is capable of receiving finer porch and window treatment than any other portion, and has besides its belfry or tower to dignify it. It should have a more generous scale than the other portions of the building and should distinctly dominate them. When the designs for the other portions are considered the usual fault is the casual planning of windows, which are attacked apparently entirely from a utilitarian point of view and from inside rather than out, which always seems a somewhat selfish procedure on the part of the people who are building. These windows are in nine cases out of ten entirely too large.

There has arisen in America a sort of cult in regard to a blaze of light. Certainly not only has the dim religious light ceased to exist, but in its stead is a glare which is trying to the eyes and has constantly to be tempered with shades. The same mistaken idea in regard to window area occurs in the hard and fast requirements established in regard to schoolhouses. As a matter of fact, the eye adjusts itself readily to light and is refreshed and strengthened by an occasional sojourn in a place where the light is softened and even dim. A very small opening will light adequately a very considerable space provided that the walls and ceilings have power of reflecting and diffusing the light. It is at times interesting to watch the care with which light is theoretically obtained on the plans only to be cut out by stained glass and by shades later. Certainly a church window should be beautiful within as well as without, but in both cases it can only be made so by studying its proportions in relation to the walls in which it is placed, not by assuming arbitrarily that greater or less area is required, when as a matter of fact the light can be both diminished or augmented easily by changing the color on the walls.



FIRST FLOOR PLAN.

BAPTIST CHURCH, CLEVELAND, OHIO.

Hubbell & Benes, Architects.

It has already been mentioned that the spans of the large audience halls of churches exceed very considerably those of the naves of great cathedrals, and yet as a rule these large churches have much less light and shade and detail than the cathedral, and in comparison seem bald and austere. Deep embrasures, grouped piers and columns, vaulted ceilings, seldom occur and in their place are broad expanses of wall and vast areas of flat ceiling. The give and take of moldings, of light and shade, of minor detail, are absent, and it seems often a mistaken idea for churches of this character to borrow a few odds and ends of architecture from the rich treasury of the Gothic merely to enhance the appearance of architectural poverty. Gothic is not preeminently an architecture of large unbroken surfaces, it is a balanced correlation of many parts and details. One must look to classic architecture for the existence of great plain areas framed by delicate lines, and because of this fact alone it is worth considering whether the church with comparatively few traditions should not frankly avoid any pretense of tradition and should build in simple wall and column and lintel and in arch where necessary and should then beautify these architectural factors as best it can, and it will probably be found that when the building is erected in this manner it will partake more of the architecture of the Greek or of the Lombards than it does of the highly cultivated and equally logical developed architecture of the ecclesiastical church.

There is a tendency in denominational churches to gradually introduce architectural motives which are consistent with the traditions of Catholic and Episcopal churches, but seem at least exotic in other work. It is natural that there should be a response to the visual and symbolic appeal to the imagination, to the sentiment, and especially to the love of beauty that exists in the cathedrals. Depth of tone, dim mysterious recesses, columns which lift the great vaulted roofs into the heavens, multiplicity of detail, appropriateness of carving, of stained windows, of mosaics, each and all lend a charm which creates a response either of wonder or of pleasure. Nor is the pleasure entirely sensuous; there is associated with the representation of the great history of the Christain faith in stone and color a reverence and awe that is always unconsciously present. The constant telling of the story in Scripture and painting, whether it be in mere carved detail or in symbols, or in statues and bas-reliefs and in frescos, is in itself a sermon. A capital, a lunette, the bas-reliefs of Donatello on the chancel rail at San Antonio of Padua, or the winged angels over the transept portal at Sebenico all produce a desire to have similar works of art associated with religious worship at other shrines.

The imitation in denominational churches of forms representing a different type of worship is the sincerest acknowledgment of the adequacy of these forms to express religious feeling. But the substance is often mistaken for the spirit, and exactly as we habitually ignorantly use the sacred symbols of another religion as a decoration of objects of the most utilitarian use, for instance the swastica of the Buddhist as a scarfpin, so we adopt from the established symbolism of the established church forms and objects that become incongruous in their new environment. There is a constant desire for instance to get the effect of a chancel without the purpose of a chancel, without the altar and retable, the reredos, and rood-screen, or the choir stalls. The arch above the chancel, ennobled in the great churches, becomes a mere frame about a niche, and it is difficult to overcome the meager appearance of shallowness behind the pulpit. There is of course no ambulatory and consequently no impression of space at this end of the church and the vision is closed by a high blank wall which is fortunate if it possesses windows to break its monotony. The transepts even, if announced in the roof, which does not always occur, are shallow, as pews at right angles to the body of the church are of comparatively small rental value. One of the favorite methods of imitating the effect of the cathedral nave is to build a long and broad central body of which the side walls are supported on arches and which corresponds to an actual nave and then to build a low roofed aisle upon either side, which is only the width of the church aisle, i.e. from 4.0 to 7.0. The church is then lighted principally by clerestory windows. While churches of this type are effective they have by no means the dignity of the cathedral plan, the nave being actually and relatively too broad for the aisles. They possess, however, that perpetual charm which is present in any interior in which one can walk among piers or columns; and the dignity of the uniform measured march of arches, which have always been effective even in the Roman aqueducts.

There is no type of architectural plan which gives as great an opportunity for varied impressions produced by the slightest change of position as that of repeated colonnades and arcades, especially if these are doubled or tripled. The mosque at Cordova, the hall of a thousand columns at Constantinople, the double aisle of San Paolo fuori le mure at Rome, and the cathedrals at Seville and Cologne are all admirable examples of the fact. A high nave with clerestory windows gives a much better opportunity for stained glass than when the windows are near at hand. These churches retain enough of the character of the cathedral to be treated both on the interior and the exterior with long slender shafts and with buttresses, but they rarely require flying buttresses, the interval between the aisle and the nave wall being so slight that the buttress starting from the nave wall is merely perforated by the aisle. There are certain forms of parapets which appear in Europe in countries where the fall of snow is light that cannot be used where there is a heavy snowfall which would pack behind the parapet, and where eaves alone are preferable. Mention should also be made of brick churches, which are of great beauty in Italy and picturesque in north Germany. Brickwork with or without stone and terra cotta is capable of taking most interesting forms, as a study of Street's "Brick and Marble Architecture in Northern Italy" and Strack's book on the same subject give ample evidence. Red brick with marble or with light terra cotta used in small masses and delicately detailed has great charm of contrast, and soft gray bricks are also attractive. The texture of brickwork is very effective, especially where the joints of the mortar show. There are also a number of suggestions in regard to brick mullions and window tracery and types of arches to be found in Spanish brickwork.

It has already been recognized that mission work is appropriate in the states in which were Spanish colonies. The relation of the church to the already existing character of its immediate surroundings, with which it should harmonize, is seldom considered. It can always be of a better material than its neighbors, but it should not be in violent contrast in style or color especially if the architecture near it is probably permanent. The scale and color of adjacent buildings are factors in the satisfactory solution of the problem, unless the church is sufficiently isolated to have its own setting of walls, terraces, grass, and trees. The problem therefore in the city is much more complicated than in a town, and especially is this the case where there is no law limiting the height of buildings. In New York and Chicago churches are pocketed amongst high buildings so that their towers and spires become ridiculous, and the gods of commerce are too evidently in the ascendant. In any such location, the only possible method is to design a noble portico or porch and an end wall and window of great beauty so large and dignified in scale that competition in the utilitarian buildings at hand is impossible. This is not arrogance but an acknowledgment of sovereignty. It is practically impossible for a church tower or spire to be adjacent to a tower building and retain its dignity, and the contingency of such an event should be foreseen in building churches in the midst of cities in America.

In the articles to follow in this series, which are to be published at a later date, churches of the different denominations will be grouped for treatment. — Editors.

The Development and Financing of Apartment Houses in New York—II.

BY ELISHA HARRIS JANES.

THE methods of financing the building of apartment houses may be divided into three classes: the first one, in which the building is erected by the capitalist or some estate, and in which no money need be borrowed during its construction; the second, by what is called the "Cooperative Building"; and the third, the "Building Loan."

There is very little to be said in this article about the first method, as it is practically the same as in the erection of any building or in the execution of any piece of work where the money is always in hand ready to meet obligations.

The second method commonly used is the "Cooperative Building." In a form this was practised in the last century in the so-called "Community Houses," although they resembled more the tenants banding together as a corporation to build and own their residences without the income properties. In this present system, however, it is distinctly novel and characteristic of modern financing in many features, and has only been in operation a few years. It developed because of people with modest amounts who wished to invest in apartment houses without having funds sufficient to meet the equity after the placing of the mortgage, but who did not care to hazard the speculative form of building with the Building Loan, which will be described later.

There were also persons who wished to reduce their rent, but not their conveniences or size of living quarters. The scheme was therefore suggested to save the profit of the investor or owner of the apartment. It was too large an undertaking to get a sufficient number together for each apartment to be occupied by its part owner, so has resulted in being worked out on the following basis:

A number of subscribers band together calling themselves a corporation, although the features are more in the nature of a club, each one subscribes towards an amount to constitute a working capital large enough to equal the equity over the mortgage when the building is completed. The subscriptions are in proportion to the rental of the apartment each takes. This company owns the entire property, subject of course to whatever mortgage may be on it. The subscribers purchasing the stock receive certificates of stock as well as a lease in perpetuity of one or more apartments according to the amount of their stock. This they may occupy themselves, sublet, or even sell at their option, only being restricted by the regulations of the association. These in substance stipulate that the members, individually, or as the company, have the first option to purchase or rent a vacant apartment, and that the company have the approval of the new purchaser. The reasons and the justice of these restrictions are obvious. There are a number of apartments which are not to be sold. The revenue from these is applied to pay the carrying charges and cost of operation, and the balance is divided as dividends to the stockholders. After a shareholder pays his share toward the building, which gives him practically the ownership of the apartment in which he will live, he will not have to pay any rent, interest, taxes, coal bills, or any of the fixed charges on this building, but further receives at the end of the year some profit left over from the renting of the public apartments.

The following figures taken from an apartment house in operation show how they would work out on a cooperative basis:

Cost of land and building,	\$260,000
Mortgage at 5 per cent,	190,000
Equity,	\$70,000

This equity would be taken up by the issue of shares at the par value of \$1,000 each. Supposing three of these apartments are divided among subscribers, each subscriber would have to pay \$23,000. As the building contains fourteen apartments there would be the following income:

11 public apartments at \$2,000,	\$22,000
Running expenses,	21,060
Surplus,	\$940

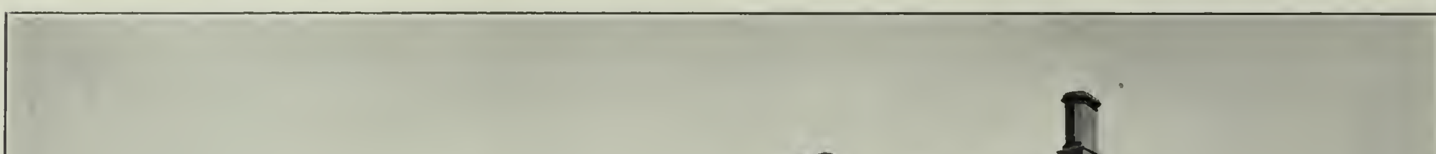
Thus each of the three subscribers would pay \$23,000 for one third of the number of shares, and would occupy his own apartment, get his rent, heat, and water free, and at the end of the year receive \$310, as dividend; in other words, he would receive \$2,310 for \$23,000 invested, or a little over ten per cent income. Should the subscriptions be unequal it would be divided among each of the shareholders according to the number of their shares. Or this surplus of \$940 would be laid aside as a sinking fund to reduce the mortgage, or used for any purpose the stockholders might agree to. Should a greater number subscribe it might show an assessment instead of a surplus at the end of the year, as is shown by the following figures for the same building in which five stockholders each pay \$14,000.

Nine public apartments at \$2,000,	\$18,000
Running expenses,	21,060
Deficit,	\$3,060

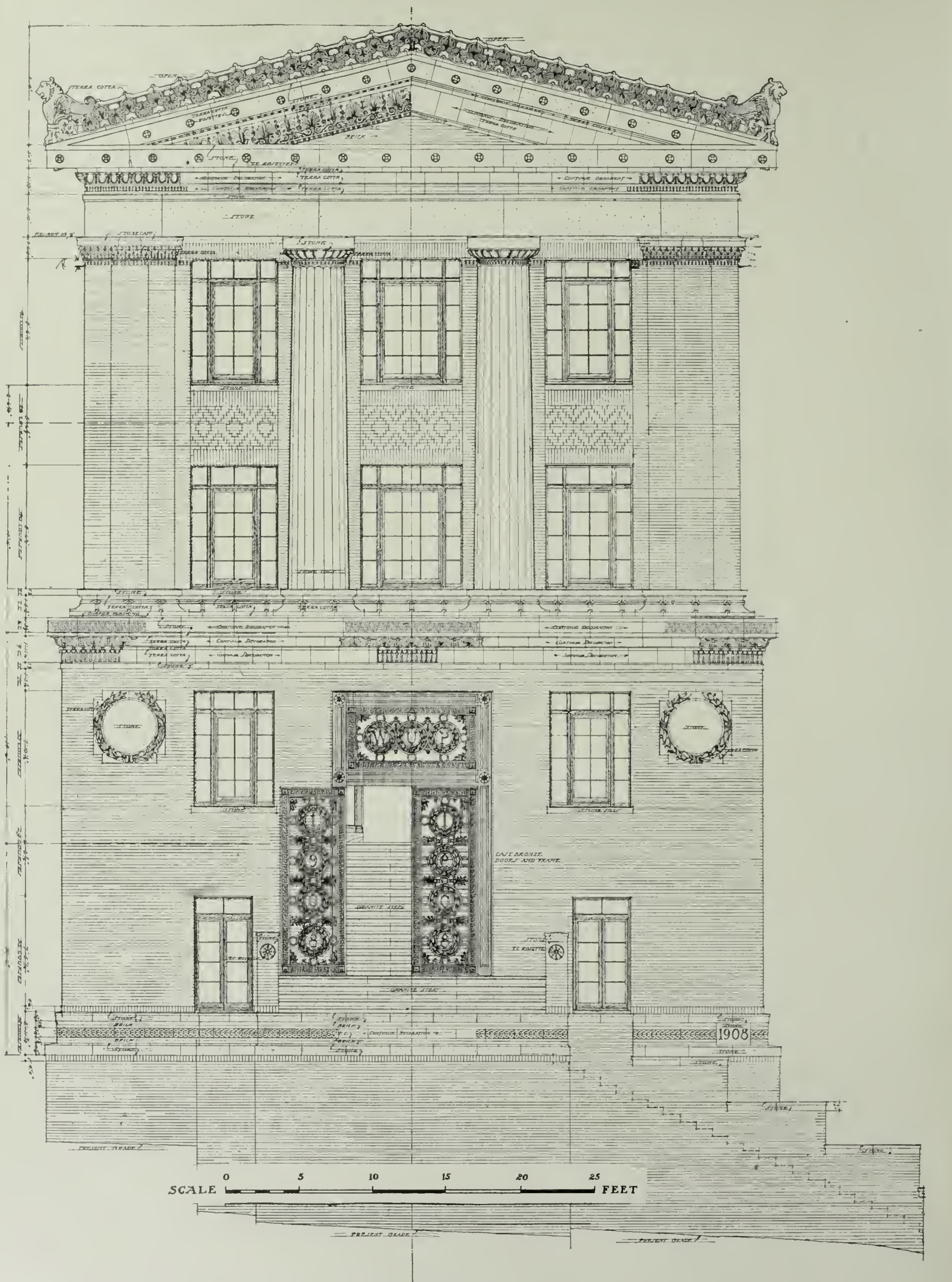
In this case there would be an assessment against each stockholder of \$615, deducting this from their rental of \$2,000, leaves \$1,185, as the income from an investment of \$14,000, or about eight and one half per cent. Thus it will be seen that the fewer the number of shareholders the better the revenue is. There are some instances where shareholders have obtained as high as twenty-five per cent income on their money.

Thus far this principle has only been applied in the rather expensive apartments and studio building. In this latter type it has exceptional advantage, as there is a great variety in size and types of apartments, allowing of small as well as large subscriptions. Besides the suites are of a type easily sublet for a few months at a

FREE CHRISTIAN CHURCH, ANDOVER, MASS.
McKIM, MEAD & WHITE, ARCHITECTS.



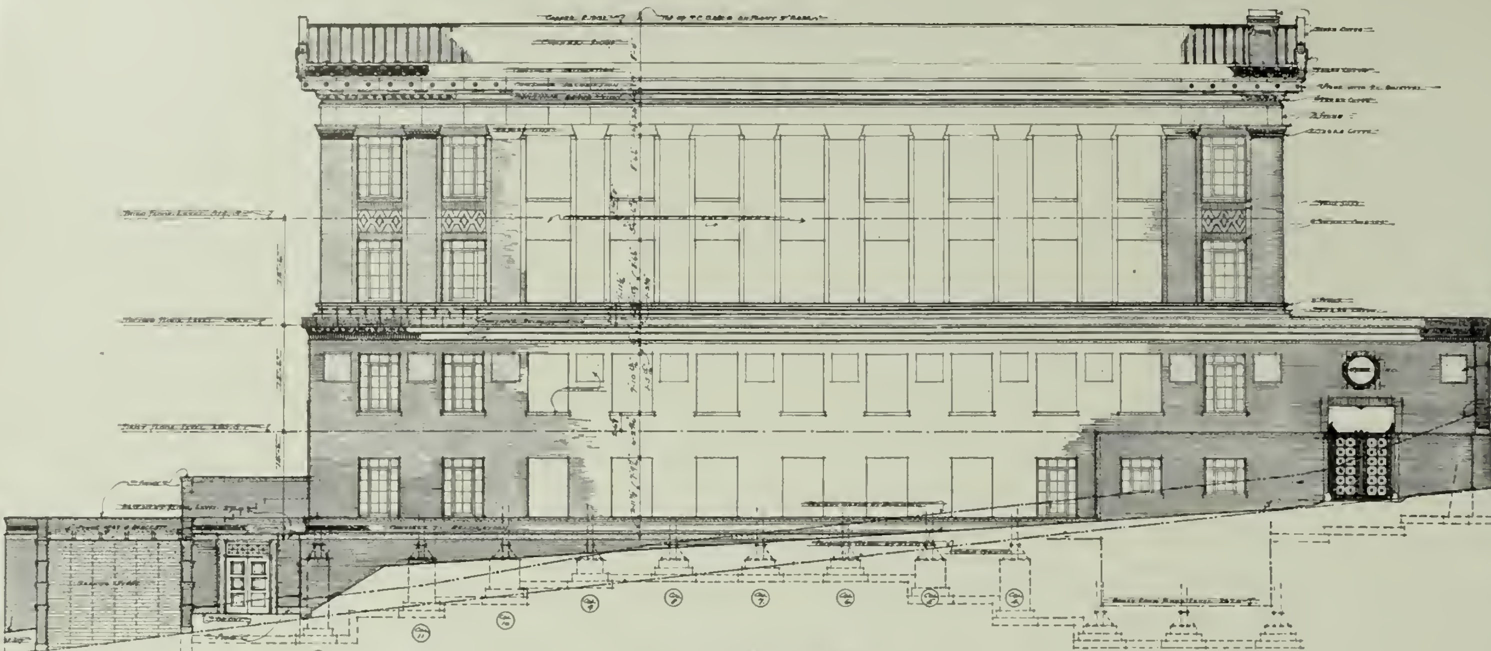
HOUSE, KINGSBURY PLACE, ST. LOUIS, MO.
SAMUEL L. SHERER, ARCHITECT.



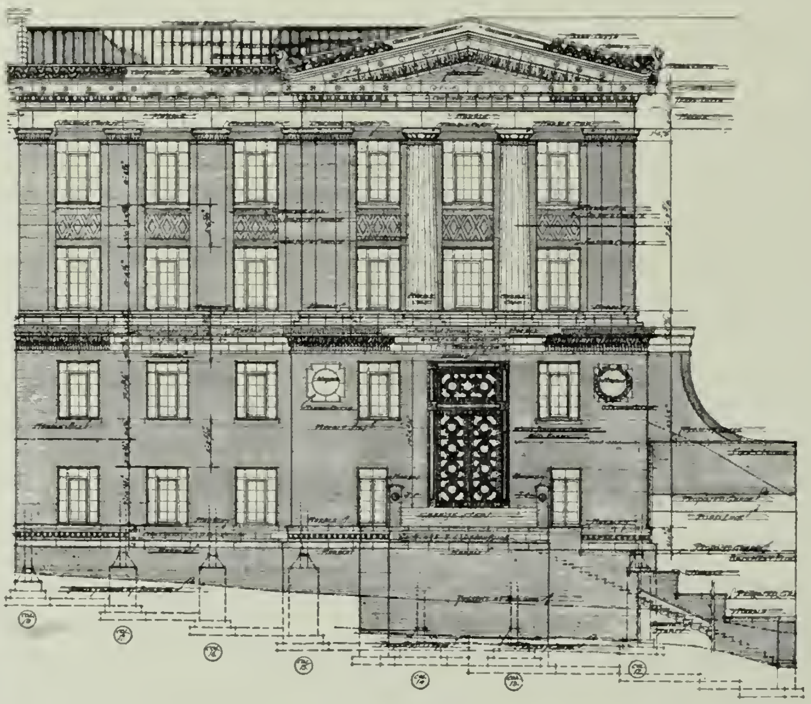
DETAIL OF SOUTH ELEVATION.

SCHOOL OF MINES BUILDING, WESTERN UNIVERSITY OF PENNSYLVANIA, PITTSBURG, PA.

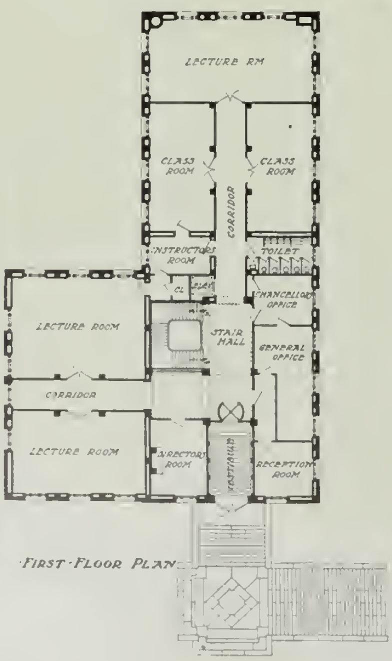
PALMER & HORNBOSTEL, ARCHITECTS.



EAST ELEVATION.

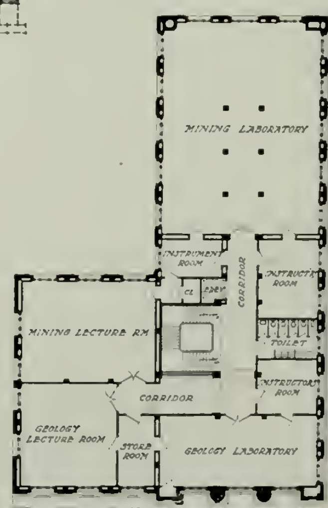


SOUTH ELEVATION.



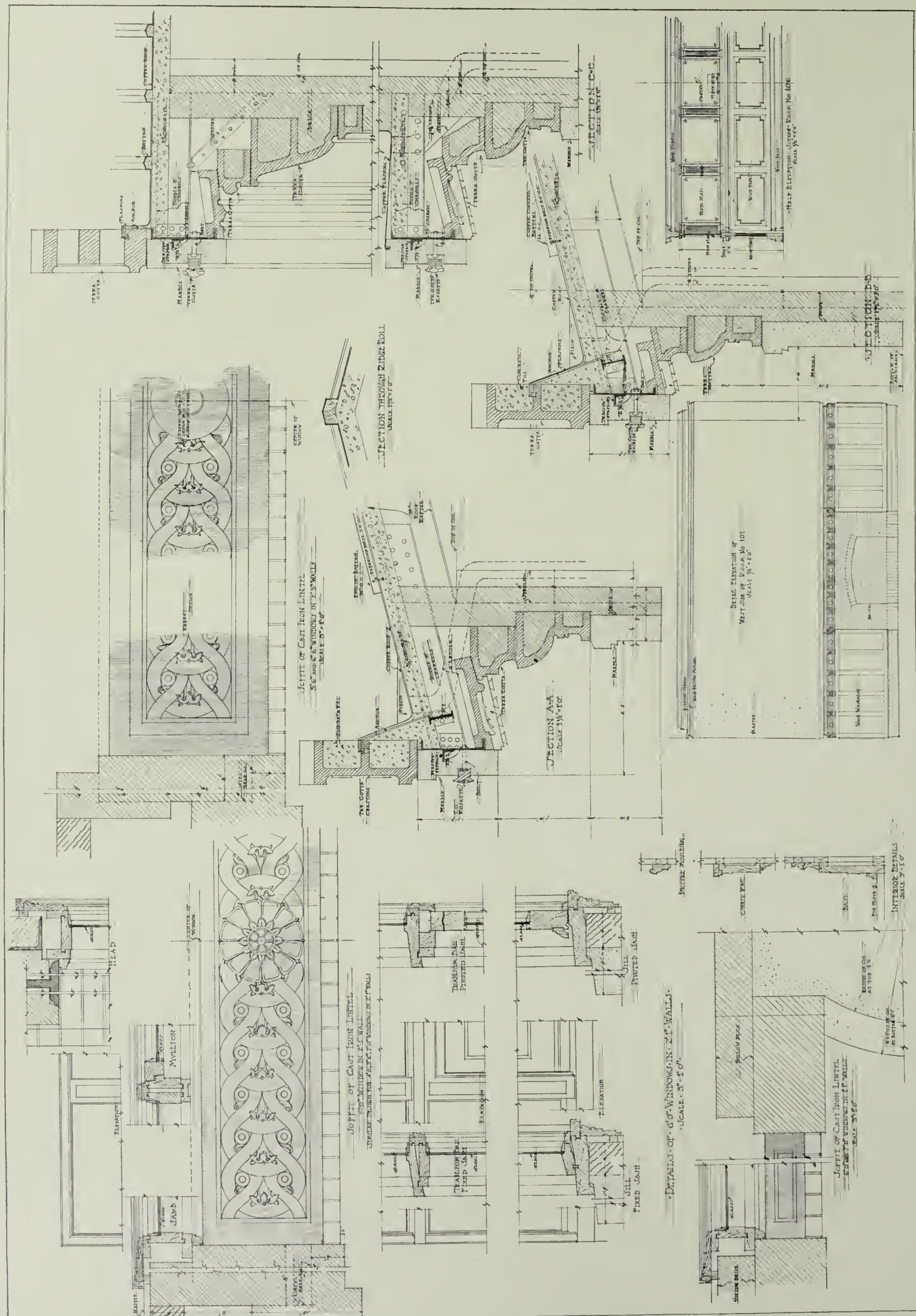
FIRST FLOOR PLAN

EAST AND SOUTH ELEVATIONS
AND
FLOOR PLANS
SCHOOL OF MINES BUILDING,
WESTERN UNIVERSITY OF PENNSYLVANIA,
PITTSBURG, PA.
PALMER & HORNBOSTEL, ARCHITECTS.



SECOND FLOOR PLAN

SCALE FEET



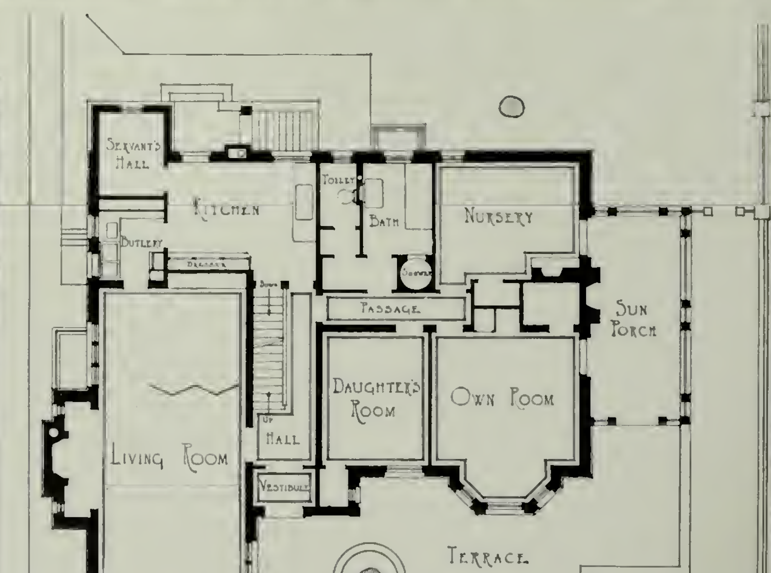
MISCELLANEOUS DETAILS.

SCHOOL OF MINES BUILDING, WESTERN UNIVERSITY OF PENNSYLVANIA, PITTSBURG, PA.

PALMER & HORNBOSTEL, ARCHITECTS.

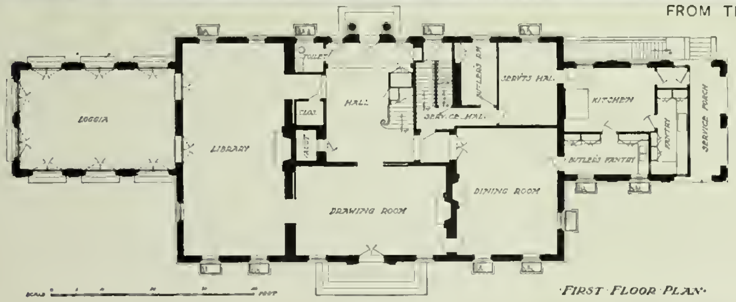
HOUSE AT ST. PAUL, MINN.
JAMES ALAN MACLEOD,
ARCHITECT AND OWNER.

MAIN ENTRANCE.

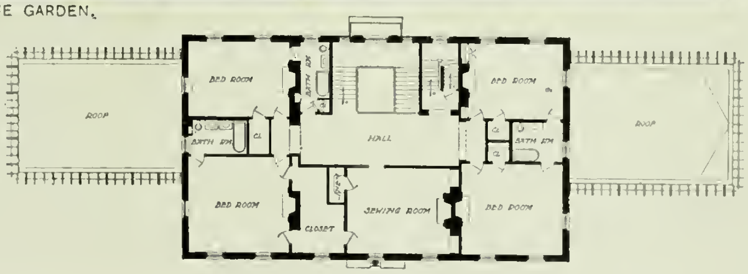


GROUND FLOOR PLAN.

FROM THE GARDEN.



FIRST FLOOR PLAN.

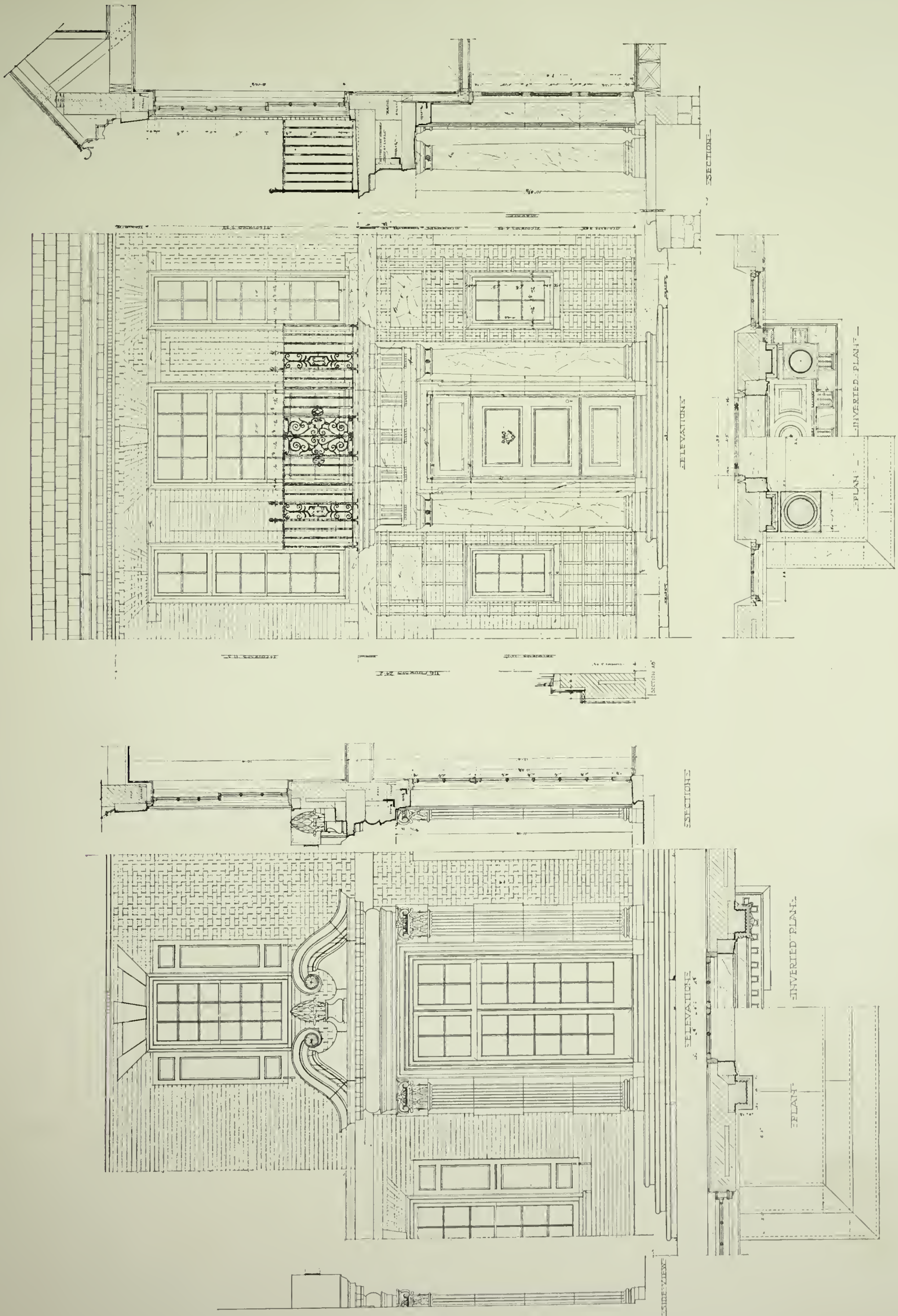


SECOND FLOOR PLAN.

FROM THE ROAD.

HOUSE AT NEW LONDON, CONN.

CHARLES A. PLATT, ARCHITECT.

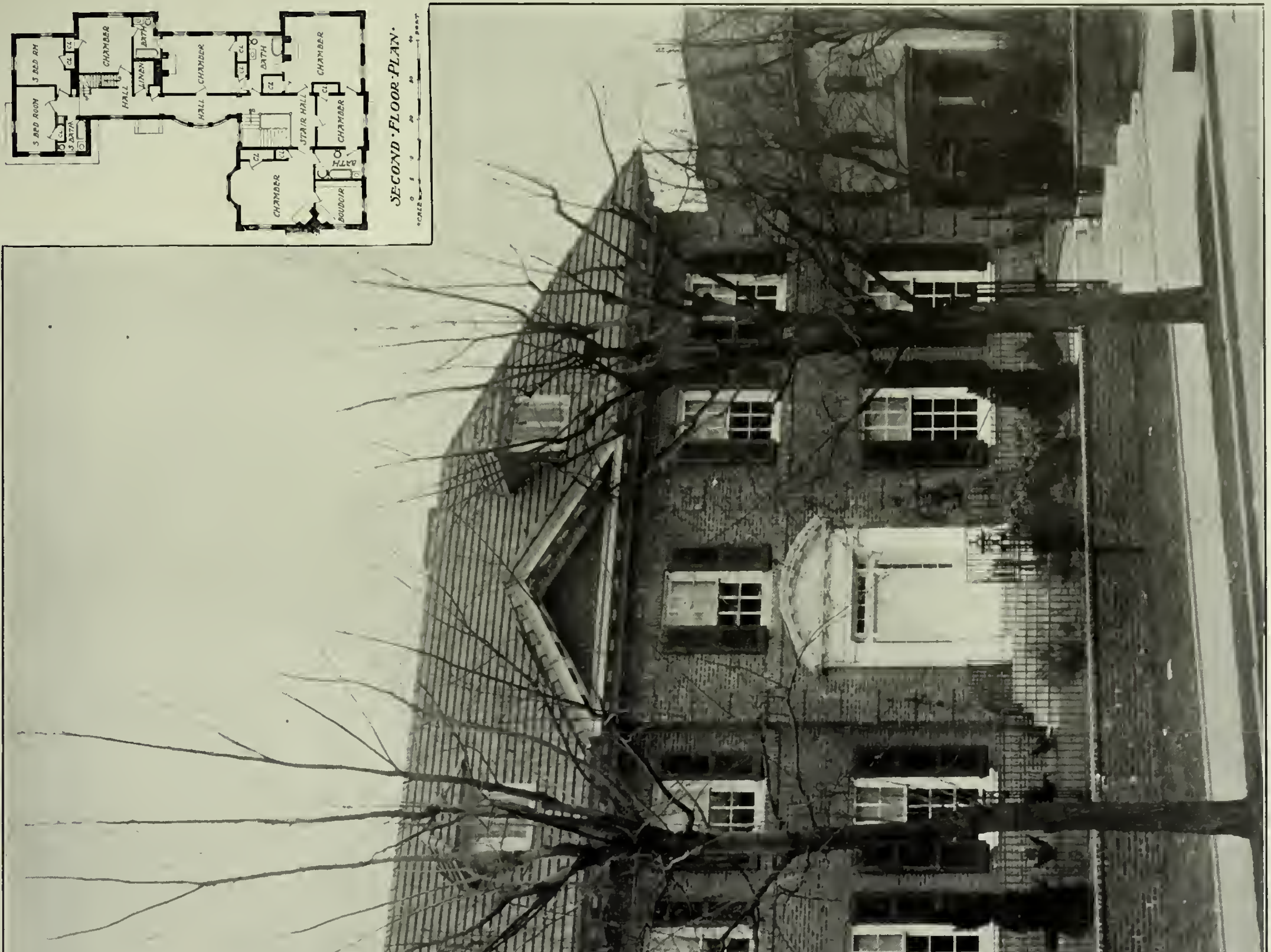


DETAIL OF EAST ENTRANCE.

DETAIL OF WEST ENTRANCE.

HOUSE AT NEW LONDON, CONN.

CHARLES A. PLATT, ARCHITECT.



SECOND·FLOOR·PLAN·

WALNUT STREET FRONT.

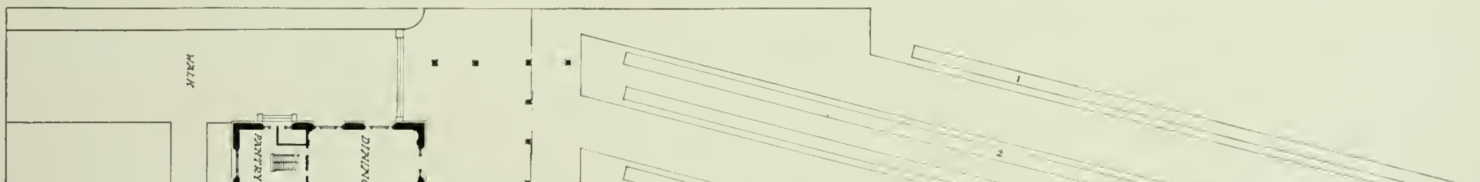
HOUSE. WALNUT AND THIRTY-NINTH STREETS, PHILADELPHIA, PA.

NEWMAN & HARRIS, ARCHITECTS.

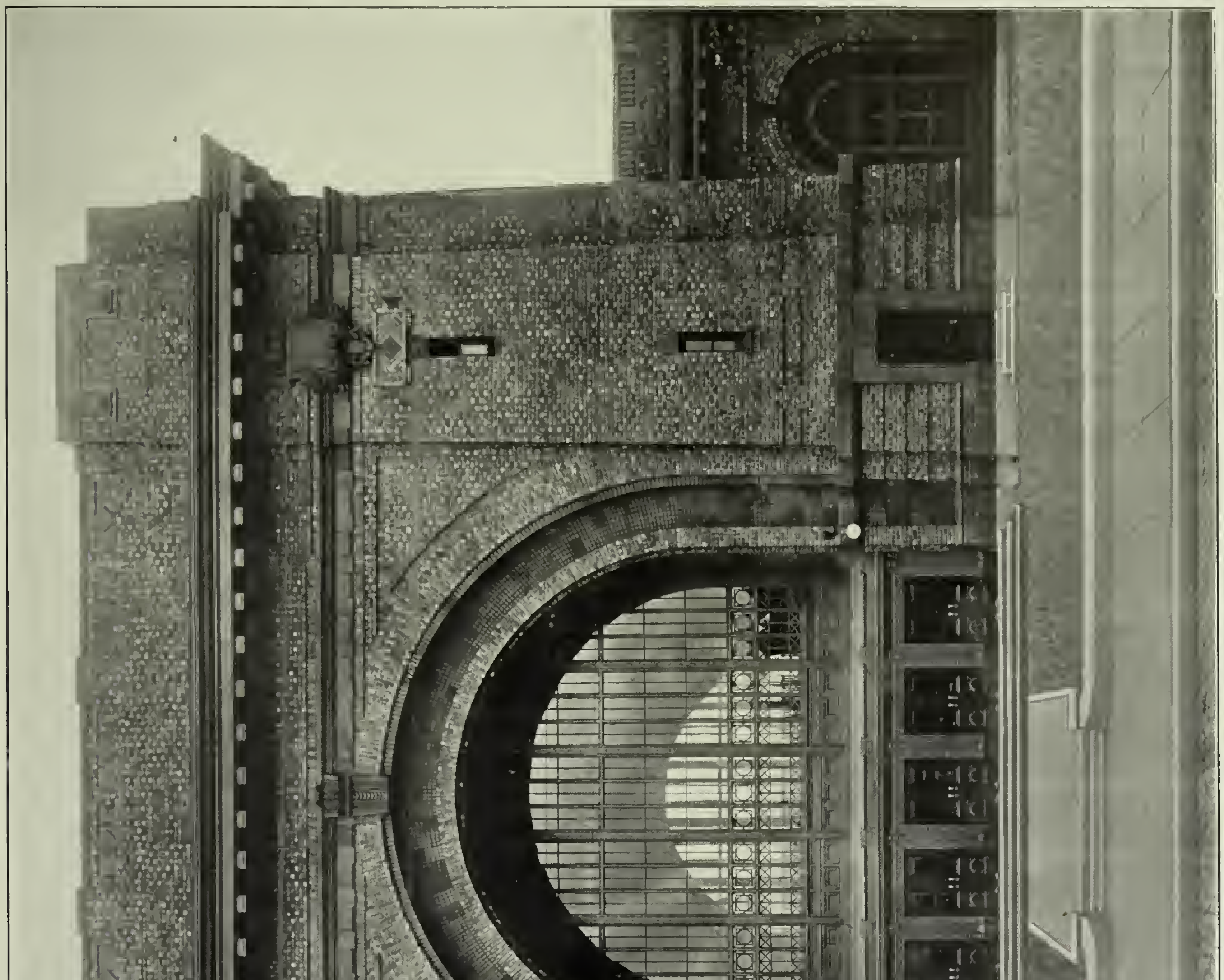
THIRTY-NINTH STREET FRONT.

HOUSE, WALNUT AND THIRTY-NINTH STREETS, PHILADELPHIA, PA.

NEWMAN & HARRIS, ARCHITECTS.



RAILWAY STATION, CHATTANOOGA, TENN.
DONN BARBER, ARCHITECT.



RAILWAY STATION, CHATTANOOGA, TENN.
DONN BARBER, ARCHITECT.

time. In a modified form it is an operation in tenement houses where five or six members of building trades band together, purchase a tenement house, remodel it, and live in it themselves until able to sell it at a profit.

The third method is by far the most common one, and its origin would be difficult to trace. In practically its present form it has been in operation for over thirty years, slight improvements being made to meet the new demands as they have arisen.

In general the principle is as follows: Mr. Operator buys a piece of property, arranges to sell it to Mr. Speculative Builder at an advance, generally very substantial. He agrees to loan Mr. Speculative Builder a mortgage equal to the purchase value of the property, on the condition that the latter erect a certain kind of building. It is also in the contract that Mr. Operator is to advance as a loan to Mr. Speculative Builder certain amounts of money as the building progresses, of the value approximately fifty per cent of the estimated cost of the building. These amounts become a second mortgage on the property and are to run for one year. When the building is completed, Mr. Speculative Builder obtains a permanent loan with which to pay off the purchase money or first mortgage and the building loan or second mortgage. When this is obtained, Mr. Operator has no further interest in the operation, as he has made his profit on the sale of the property, together with a year's interest at six per cent of the amount of the purchase price and the building loan. Mr. Speculative Builder owns an apartment house with a large mortgage and with more or less of his small savings tied up. If he rents successfully and can show Mr. Investor a good investment, he may sell at a profit. This is a synopsis of the transaction.

Now to take up in detail the advantages, risks, and obstacles to be overcome from the standpoint of the operator, speculative builder, and the investor.

The most difficult and important thing for the operator to display is his good judgment and foresight in the purchasing of properties which will have a good market. These he acquires in several different manners: first, by the purchasing of large unimproved plots at a low price, selling a few at first at a very small advance, having them improved, and thus increasing the value of the other lots; second, by securing lots in developed neighborhoods, which he thinks speculative builders will purchase; in this method very often the property will be bought on long time contracts, in the hope of interesting a builder before the title is taken; third, by purchasing the property after the builder has agreed to repurchase and build. This, it is readily seen, is the most advantageous to all, on account of the quick profit and the absence of carrying charges; it can be sold to Mr. Speculative Builder at a small advance, and he in turn has better chance to select his location, instead of having to choose from the few plots Mr. Operator may have.

If Mr. Operator has many pieces of unimproved property and is compelled to hold them for more or less length of time, he loses interest charges and taxes. He must have plenty of money in hand, or at his control, to be ready to buy most economically. When a payment is due on a building it must be made at once. If Mr. Speculative Builder is delayed or slow in obtaining his permanent mortgage, Mr. Operator must be in a position to have his money tied up for a longer period than expected; or, if Mr. Speculative Builder has not been able to obtain as large a mortgage as desired, Mr. Operator must either advance some money on second mortgage or allow the builder to fail. If he feels sure of his builder he will sometimes increase the building loan while waiting for the mortgage to be placed. The operator very often transfers a building loan, or part of it, to one of the large institutions, to enable him to expand more by not having so much money tied up in a few operations. In the latter case, "he goes behind it," that is, makes payments at the same time the institution does, proportioned to the amount each assumes. Mr. Operator's principal troubles come if Mr. Speculative Builder fails to carry out his agreement. He then must foreclose his mortgage and buy the property back with more or less building on it, and try to sell it to someone else or finish it himself. In this case he probably obtains it for the amount of the first mortgage and the money advanced, the latter representing about fifty per cent of the value of the building.

In completing a building that has been foreclosed there are many obstacles due to trade agreements and labor unions. For example, if the plumber has not been paid for his work and his lien has been removed through the foreclosure proceedings, another plumber will not finish the work without being paid a figure large enough to cover the amount owed to the first plumber. Mr. Operator is unable to buy plumbing supplies himself, as the supply houses agree to sell only to plumbers. If through some means he obtains the material, he cannot have it set, as the Union plumber agrees to work for the Master Plumbers' Association only. These same conditions apply in many of the other branches. The boiler and radiators are often sold to the steam fitter with a sort of chattel mortgage. The operator finds he has to pay well for them or they will be taken out. The same difficulties are experienced with the material men as with the plumber.

It is a strange fact, considering how much money the operator advances while these buildings are being erected, with the risk he takes at having to purchase the building with poor material, poor plan, etc., and with the necessary troubles to complete it, that none of the operators and only one or two of the insurance companies doing this sort of business have a "Professional Adviser" to consult with as to the plan, design, construction, and payment, practically everything being left to the judgment of the builder whose methods will be described later in this article. It seems the protection afforded the operator would amply repay him to have all the details of the building passed on by his architect or by an expert familiar with this work. The nearest approach to the above is when Mr. Operator dictates to Mr. Speculative Builder who his architect should be. The companies above mentioned, however, employ an architect to examine the plans and make regular inspections of construction, to pass on the applications for payments, etc., and the cost is charged against the builder. In the last two years the lending companies have become more careful and require that the name of the architect be submitted to them for approval, as so many poorly planned apartments have been erected.

Mr. Speculative Builder, with small capital after buying the property and arranging the building loan payments, must so arrange the contracts as to satisfy the subcontractors either with his small capital or notes, principally the latter, until such time as the building loan payments become due. In some cases he is able to get the subcontractors to wait for their money until his first payment on the building loan is earned. His is more or less a problem of satisfying people with as little cash as possible. His most difficult time comes when he is near completion.

If Mr. Speculative Builder has considerable cash or very good credit, he has no trouble to complete his work; and the only question of his success is whether he has been wise enough in the choice of location, plan, and design to warrant his getting the rentals that show an income large enough to attract the investor. Unfortunately though, few of the speculative builders have been so well provided, many going into operations with less than five per cent in cash of the value of the building, others practically with no cash. Some have successfully carried to completion operations each amounting to $1,000,000, and have had less than $10,000 cash to start with. In these cases, though, they have had exceptionally good credit.

Many are the obstacles for the speculative builder to overcome, and many failures are recorded. A serious fault many fall into, as in all speculation, is that of starting a second or third building before the first is completed, a sort of pyramiding. Mr. Speculative Builder does not always do this from choice. The suggestion often comes from Mr. Operator, when the building is well along, with promises of increased building loan. By this means he is enabled to get rid of plots more difficult to sell, preferring to risk having Mr. Speculative Builder fail than to carry the lots longer. With very few exceptions this leads to a failure sooner or later.

The methods employed are somewhat different from those of the general builder. The character is shown in the beginning with the selection of the architect. With the exception of some of the large apartment houses practically none are designed by prominent architects, but by a class who charge an extremely low commission, a price prohibiting proper study or the employment of capable draftsmen; one set of plans with trifling changes frequently serves for several operations. A true incident occurred which gives an idea of the prices they charge. A young clerk in a real estate office called on one of these so-called architects in the Bronx, who had his name on at least five hundred apartment houses which were filed with the Building Department. The clerk inquired how much it would cost for plans of four twenty-five foot apartment houses of the standard type then being erected. Fifty dollars was the price quoted. As the clerk was leaving he was called back and promised by the architect a suit of clothes for himself if he could bring the job into the office.

The speculative builder seldom maintains an organization employing many mechanics or large force of workmen, so he generally buys the materials and "lumps out" or sublets the labor on account of the uncertainty of prompt payments of cash. In the majority of cases it is a different class of subcontractors doing this work. For the same reason they allow a greater margin of profit. The workmanship, as a rule, is not of the best quality, often being of the poorest, as illustrated by the following incident: A prominent refrigerator company was asked to figure on refrigerators for an apartment house. After being told the size, they asked what quality was wanted and what thickness of partitions and kind of insulation; the answer given by Mr. Speculative Builder was, "I don't care, all I want is a refrigerator that looks well." If that principle is carried out on that which can so easily be examined, what may be expected in that part which is concealed?

As Mr. Speculative Builder's payments to subcontractors necessarily are contingent with his payments from Mr. Operator, he spreads his money a little here and there with notes, or, as a contractor once called them — bearing in mind the picture of the sailing ship generally printed on the face of them — checks which make port once in three months, and then perhaps discharge only part of their cargo.

When an apartment house is almost completed and Mr. Speculative Builder is seeking his permanent mortgage, it is desirable that his building show as large an income as possible, for on this is generally based the valuation. Should this not be high enough he may obtain the required amount by contributing a bonus, or if he is unable to obtain the rentals which he schedules, he resorts to padding the rents; a custom the investor must look out for.

The investor, the one who buys these apartments after their completion, does so for permanent ownership; and here again it is to be commented that seldom does he consult the expert before purchasing, relying entirely upon what the real estate agent will tell him. This too often is simply the following of a well known principle in selling real estate, the house the prospective purchaser admires is the one to be boomed.

Whether the property in the neighborhood of the building is going to maintain the same value or greatly increase, or whether other buildings are apt to be built to the detriment of the apartment house are questions which enter into all real estate transactions, therefore need not be considered especially in this article.

Next in importance is the income. This is the first thing shown to an investor and should stand the most thorough investigation, as there are many ways in which this can be figured and the purchaser deceived.

The speculative builder in renting his apartments endeavors to maintain the prices which have been submitted in obtaining the permanent mortgage. If these cannot be realized, very often leases are made at the price desired to appear in the statements, and the renter compensated by being given several months' free rent. This sometimes amounts to three, four, and even five months. Thus an apartment rented for $1,200 a year is at the rate of $100 a month. If the tenant is given five months' rent free, it then becomes at the rate of $70 a month. In order to still further deceive in the rental rolls, the first month's rent will be paid in advance and a receipt given, as in the above case, for six months' rent. When the building is purchased the leases at the full prices are shown without any mention being made of the free months. The investor does not discover this until he is in possession of the building and is looking for the renewal of leases, then, unless he makes material reductions, the tenants move to other buildings where they can again obtain some months of free rental.

As to the running expenses, the investor must rely upon the books of the agent. It is possible, however, for an expert to figure these quite accurately. Below is given schedules of two different buildings showing the cost, mortgages, rentals, etc., together with the running expenses.

Cost of building to the speculative builder:

Cost of land,		$92,000
Cost of building,		111,300
Commission for first mortgage,		3,200
Interest on building loan and purchase money mortgage,		3,400
Taxes,		800
Insurance, advertising, etc.,		2,300
		$213,000
Mortgage at 5 per cent,	$190,000	
Equity,	23,000	
	$213,000	

This building sold for $260,000, showing to the investor the following income:

Value of building,		$260,000
Loan,	$190,000	
Equity,	70,000	
	$260,000	$260,000

Running expenses:

Interest on loan,	$9,500
Taxes, insurance, and water,	3,000
Electric light and power,	1,900
Coal,	1,800
Help and commission to agent,	2,060
Vacancies, redecoration, and miscellanies,	2,700
Net profit,	7,040
	$28,000
Income, 14 apartments at $2,000,	$28,000

This shows an income of ten per cent on the investment of $70,000.

The second one is on a much larger basis.

Cost of building to the speculative builder:

Cost of land,		$275,000
Cost of building,		549,000
Interest on building loans and purchase money mortgage,		44,800
Taxes,		5,400
Commissions for obtaining first mortgage and selling property,		26,000
Insurance and advertising,		2,500
		$902,700
Mortgage at 5 per cent,	$725,000	
Equity,	177,700	
	$902,700	

This building was sold for about $1,100,000, showing to the investor the following income:

Value of land and building,		$1,100,000
Loan,	$725,000	
Equity,	375,000	
	$1,100,000	

Running expenses:

Interest on loan,	$36,250
Taxes, insurance,	15,200
Electric light, power, and heat,	14,330
Help and commission to agent,	10,500
Vacancies, redecoration, and miscellanies,	10,600
Net profit,	29,620
	$116,500
Income, 47 apartments,	$116,500

This shows an income of almost eight per cent on the investment of $375,000.

It has been found, by taking the average of a number of apartment houses, that the taxes and operating expenses exclusive of the interest on the mortgage cost about four and one half per cent of the value of the building operation, so that allowing an income of five and one half per cent, the gross rental should be about ten per cent, and vice versa; a fair valuation of an apartment house is ten times its gross rental. This ten per cent gross rental may be subdivided as follows:

Taxes, insurance, water,	1¼ per cent
Salaries, coal, light, power, and agent,	2¼ ,, ,,
Vacancies, redecoration, and miscellanies,	1 ,, ,,
Income,	5½ ,, ,,

When the property is mortgaged for sixty per cent of its value, three per cent would apply to interest on the mortgage, and two and one half per cent to income. In other words, taking a building of the value of $200,000, the items would approximate:

Taxes, insurance, etc.,	$2,500
Salaries and operating expenses, about,	4,500
Vacancies, redecoration, and miscellanies,	2,000
Income,	11,000

and if mortgaged for sixty per cent of its value — the interest on the mortgage, $6,000 — the income, $5,000, would equal six and one fourth per cent on the equity of $80,000. No positive rule can be applied, as the conditions differ in each building, but the above is a good average, and shows that a successful income-producing apartment house must return close to ten per cent gross rental.

The success of the building depends greatly upon the condition in which it is kept and the courtesies extended to the tenants. It is well worth the amount of the commission to have it looked after, leases made, and rents collected by a reliable agent, experienced in this line. In the larger apartments they have their separate corps of carpenters and painters engaged by the year who attend to all the wants and keep the place in perfect repair.

These are the main methods followed in the progress of an apartment house from the conception of the idea to its sale and development into an income producer. Some of the instances of the pitfalls may seem exaggerated, but such is not the case. On the other hand, it is not to be thought or interpreted that all these conditions exist in the erection of all of these buildings; to the contrary, there are speculative builders who erect buildings as conscientiously as though they were going to maintain the ownership. These points are explained in order to show any who are interested or connected with this class of work the conditions they may be called upon to meet.

THE FORTY-SECOND ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS, WASHINGTON, D. C., DECEMBER 15, 16 AND 17, 1908 — RESUME.

THE first session was held on the morning of December 15, in the Assembly Hall of the New Willard Hotel, President Cass Gilbert presiding.

President Gilbert in his opening address said among other things :

"If we compare the broad influence of the Institute to-day with even that glimpse of the 'Golden Age' some fifteen years ago, when the Columbian Exposition was built, by the leaders of our Institute ; and we achieved governmental recognition as a profession, through the passage of the Tarsney Act ; we will see the sure advance of a great national organization to a truly national scope — and so seeing we will realize the responsibilities that come with increased authority.

"I forbear to make a comparison in detail or to furnish statistical records, but the evidence is before you in the fact that through the wise councils and unselfish endeavor of the Institute we have come to be the adviser, and as need arises, the respected arbiter in matters of the gravest importance. *Then* it was with difficulty that we obtained a hearing from either the public or the Government. *To-day* we are welcomed in the councils of all those who sincerely desire to do well in matters within the sphere of our profession. Our great and growing cities, our states, and the national Government itself, all call upon us for professional counsel, and approach the subject of architecture and the other fine arts from a standpoint largely influenced thereby.

"The President of the United States, in calling together that notable conference of the governors for consideration of the conservation of the national resources of our country, invited the American Institute of Architects, as one of a few organizations of national scope, to take part therein, and we have now an Institute Committee acting with the Conservation Commission which grew out of that conference. This commission, will, I believe, become one of the greatest powers for national good that has ever been created. . . . .

"We cannot hope to have a schedule of charges that will fit with mathematical precision and equal justice all conditions, but we can have a schedule that will form a starting point — and that shall represent a reasonable minimum. It must be a business paper, simple, direct, and to the point. It must be self-evident, comprehensive, and devoid of argument; inconclusive statements, fugitive suggestions, or elusive phraseology have no place in such a document. It must be a basic minimum statement leaving reasonable variations to local adjustment.

"That the demands upon the architects both in professional service and in the cost thereof have enormously increased is a well known fact. The schedule when adopted some forty years ago represented fair remuneration for that time, but it does not represent fair remuneration now.

"On the subject of competitions there is much to say — and much that had better be left unsaid. Probably ninety per cent of our professional difficulties have grown out of this one fruitful tree of discord. Let me point out, however, the economic side of the question.

"The profession is expending vast energy and an enormous sum each year fruitlessly, foolishly, blindly, in maintaining this wasteful system. It has been impossible to obtain data or to form anything like an adequate estimate of the cost. We do know, however, of specific instances which may be quoted as examples. Let me quote only one as typical. The Government established a competition within the last year wherein some one hundred and thirty competitors took part, expending in addition to their own time and service, about $65,000. The fees paid to the prize winners and to the expert advisers amounted to about $5,000. Loss, $60,000. The total gross fee of the successful competitor estimated on a per centum of the proposed cost of the building is about $12,500 and his net estimated profit from this fee about $4,500. Net loss to the profession about $55,000. And in the end, I am credibly informed, the jury's award was disregarded and even the plan finally selected had to be revised.

"The competition system has become so widespread that now it applies not only to Government buildings but to all other classes of buildings. I think it would not be too much to say that the architects in this country annually expend over $1,000,000 in competitions from which they receive no return. How long can the profession stand this drain ? And this is not all — to foot up the total you must add the profits that should have accrued from time and money expended, the wasted time and effort, the neglect of other duties, the depressing — the disheartening disappointments and the dissensions that ensue. If fault there be, it lies in ourselves. The correction is in our power. . . . .

"The Institute should take a greater part in educational work, not only for students of architecture, but for students and apprentices in the lesser arts and in the trades. We could do most valuable work for the world if we could have under our supervision art guilds and trade schools, if we could direct the work of the young mechanic or artisan who labor in the building trades. Give him a knowledge of his art, inspire him to its finer development and you make him a better artisan and a better citizen. Under the patronage of the Institute, lectures, exhibitions, circulating libraries, scholarships, and the like should be established. The Institute should take an active part in research and archeology, in library and museum work, and in many other forms of development from which all the people as well as ourselves would derive benefit. But all this means the expenditure of a great sum of money annually. It means an endowment, and a large one; an endowment of which we would be only the trustees, not the beneficiaries. We cannot look for such an endowment with a selfish end in view, and its acquisition would increase, not lessen, our labors and responsibilities.

"In maintaining our place in the professional world, we must not forget that it is the student of to-day who is the practitioner of to-morrow. We should therefore act helpfully toward the younger men. Share with them our successes, give them their chance as we have had ours, and foster their reasonable ambitions for professional opportunity and success. So win their confidence by generous and helpful acts that they will naturally seek your counsel and be guided by your experience. They will richly repay you by loyal support of those principles and ideals for which you stand. When you receive a young student into your offices, bear in mind that it is your duty to him and to all concerned to see to it that he is fit for the future work of an architect. If you cannot teach him yourself put him under charge of someone who can.

"Give to all the largest opportunity consistent with their ability, but carefully select those who are best fitted by natural inclination and advise the others to seek another occupation. Encourage those who give promise of fitness, but reject the inefficient, the indolent, or the incompetent."

Bureau of Fine Arts.

The following is quoted from the report of the committee having this matter in charge :

"This subject is presented to the convention, not only as an abstract esthetic question, but as a grave, practical problem, affecting great interests of the public generally and the economic administration of the national Government. The committee, after mature consideration, recommends that immediate action be taken toward the establishment of a Bureau of the Fine Arts, as a part of the governmental machinery, believing that it is necessary to the public welfare.

"This definite and positive recommendation is the result of an investigation and examination of the records of the different departments, through which the following facts have been ascertained.

"Since the foundation of the Government, more than $500,000,000 of public money has been expended for buildings and other works of art, which should have been under the control of a Bureau of Art.

"In addition to this amount, large sums have been spent for parks, bridges, aqueducts, harbor improvements, designs for coins, stamps, bonds, and bills, the value of which would have been greatly increased had they received intelligent artistic consideration.

"About ninety per cent of this total amount has been spent during the last twenty years. In the immediate future there will be spent the sum of $45,000,000, for which appropriations have been made.

"Under existing conditions, there are many kinds of machinery for controlling these expenditures. Usually each act of Congress appropriating money for artistic work specifies the method of procedure, and designates the person or persons in whom the authority is vested. As a result, it is sometimes the President, a member of the Cabinet, a committee of the Senate or House, or a department or bureau; sometimes an army engineer, the superintendent of the Capitol, a committee of the Grand Army of the Republic, a special or private commission or a private individual, who controls and regulates the choice of the artist and the expenditure of the public money, and who acts not infrequently as artistic arbiter. In each case the arbiter regards the enterprise from his own point of view, without respect to its relation to the whole esthetic question, and the result is, generally, waste of public money and always artistic chaos.

"Your committee submits that the expenditure of this vast sum of money, without the supervision of a well-organized and competent authority, is unbusinesslike, improvident, and not economic government. The fact that the present appropriations show that the ratio of expenditures for these purposes is increasing annually, seems to your committee to indicate that the necessity for action is urgent. . . . .

"In further support of its recommendation, your committee quotes the following resolution, which was passed after a thorough discussion at the International Congress of Architects at Vienna in July of this year, 1908, the subject of governmental direction of art having been designated as one of the four subjects for consideration by the Congress.

"'*Resolved*, That every Government be urgently requested to establish a Ministry of Fine Arts, or at least a section which shall deal with subjects relating to the arts. To such a ministry or section shall be attached artists of established reputation. Since architecture can be considered the leading art, architects shall be in a majority. The work of this ministry or of this section shall be the advancement and encouragement of the fine arts in all their branches.'

"This resolution has been endorsed by the principal artistic bodies of eighteen nations in Europe. . . . .

"It is recommended by your committee that the following subjects should be included in the authority of the Bureau of Fine Arts:

"1. Architecture, Painting, Sculpture, Park Work, and Engraving.

"2. Educational matters pertaining to the Fine Arts and the dissemination of useful knowledge among schools, colleges, and universities pertaining thereto.

"3. Administration of the National Gallery of the Fine Arts.

"4. A system of national museums in different cities and that a system of circulating works of art throughout the country be established.

"In conclusion, your committee repeats from its report of last year:

"The intention of establishing a Bureau of the Fine Arts is, not to develop a national style of architecture or definite styles of painting or sculpture, but to invest the whole subject of the fine arts with appropriate dignity, to encourage the establishment of proper schools, to stimulate the universities in this much neglected branch, and to educate the people.

"In other words, the purpose of a Bureau of the Fine Arts would be to propagate the truth that art is not an effeminate luxury, but that it is the manifestation of that great vital force, the imagination, which is the original impulse behind all human progress; and to furthermore teach the people of the United States that if there is one thing above all others which is absolutely and universally democratic, typically and thoroughly American, and essentially in accordance with the whole spirit of the Constitution, it is the inalienable right of all the people by inheritance to possess and preserve the works of genius of the human race, and to participate equally in the inestimable advantages and benefits of the study of the Fine Arts."

Competitions.

In substance the report of the committee having this matter in charge is as follows:

"It is the opinion of your committee that no further action should be taken by the central body than what has already been taken; that conditions which should govern competitions will necessarily vary in different localities and should be made the subject of local legislation; but the resolution suggested at the last convention seemed to your committee one that might be applicable to the whole country and would be as useful a first step in New York as it would be in Los Angeles."

The committee recommends the following resolution:

"*Resolved*, That the A. I. A. does not approve of the adoption of a code for the conduct of competitions that shall be binding upon its members, but that members should consider themselves bound by the resolution passed at the convention of 1907 and should use their efforts, whether as competitors or judges, to see that the seven underlying principles mentioned in the report of your committee are complied with."

Last year's report of the committee, and the resolution accompanying it to which the committee refers in its report for this year, is as follows:

"Your committee recommends that, whenever possible, an architect be employed without competition; that, when competition is unavoidable, the American Institute of Architects recognize three forms of competition:

"*a*. Limited to a certain number of invited architects.

"*b*. Open to all architects.

"*c*. Mixed; certain architects being invited, but other architects being at liberty to take part.

"Your committee recommends that, for the present, no attempt should be made to impose any fixed code of competition upon the members of the Institute, but that the Institute recognize, as conducive to the best results, the following underlying principles for the conduct of all competitions:

"1. The object of a competition is to secure the most skilled architect.

"2. An architectural adviser should draw up the program, advise the employer in regard to it, and the adviser, or, preferably a jury of practising architects, should advise the employer in making the award.

"3. The amount to be expended on the work should be sufficient, within a reasonable margin, to erect a structure of the character and size indicated in the program, or there should be no cost limit stipulated.

"4. The program should be in the form of a contract relating to the award of the work and to other payments.

"5. Whenever practicable, the competitors and the professional adviser should meet with the employer, and agree upon terms which shall be binding upon all.

"6. There should be, in limited competitions, payments sufficient to cover the preparation of the drawings demanded; in open competitions premiums sufficient to cover the expense of at least five schemes; in mixed competitions, payments to the invited competitors as above, and an additional amount, representing the cost of five sets of drawings, distributed among the authors of the best five schemes, such payments not to be confined to the uninvited competitors.

"7. The drawings required should be the minimum necessary to express the design and arrangement.

"Your committee further recommends that the following resolution be adopted by the Institute:

"*Resolved*, It is unprofessional conduct for a member of the American Institute of Architects, even for payment, to submit drawings knowingly in competition with another, unless under such conditions as are explicitly approved by a competent, disinterested professional adviser, either a member of the American Institute of Architects, or of some foreign architectural association of similar standing."

New Schedule of Charges.

A new schedule of charges was adopted by which the minimum rate for an architect's services is advanced from five to six per cent, although the Convention decided that the fee as now established should not be mandatory. It was thought desirable, nevertheless, that the public should be educated to accept this as a just charge to the end that it become generally recognized by clients and the courts as the basis of compensation for the services of the architect.

The Gold Medal of the A.I.A.

The board of directors recommended:

"That the Gold Medal of the Institute be awarded biennially, alternately to a foreigner and to an American; that the recipient be nominated by the board; that, subject to the ratification of the convention and his attendance in person, it be conferred at the following convention.

"This year the board of directors recommends that the Gold Medal of the A.I.A., the first to be conferred upon an American, be awarded to one whom it thinks preeminently worthy to be honored, one who has set a standard for high achievement in architecture, who has generously and wisely advanced the cause of architectural education, and who, as shown in the Washington plan, has grasped and expressed the need of civic beauty, Charles Follen McKim."

Election of Officers.

The following named were elected as officers for the ensuing year: Cass Gilbert, president; Ralph Adams Cram, and Irving K. Pond, vice-presidents; Glenn Brown, secretary and treasurer; F. C. Baldwin, S. B. P. Trowbridge, and John M. Carrere, directors.

NATIONAL FINE ARTS BOARD.

IN response to the plea that the fine arts have been denied that governmental consideration generally shown by other nations, as suggested by the American Institute of Architects, President Roosevelt has taken the first steps looking to their recognition by this government.

The President announces that he has asked the Institute to designate the names of thirty men, representing all parts of the country, to compose a Council of the Fine Arts. The object of the Council, which is to consist of architects, painters, sculptors, landscape architects, and laymen, of which the supervising architect of the treasury department is to be the executive head, is to advise upon the character and design of all public works of architecture, paintings, sculpture, all monuments, park bridges, and other works of which the art of design forms an integral part; and to make suggestions and recommendations for the conservation of all historic monuments.

Hearty approval is given by President Roosevelt of the recommendations of the American Institute of Architects. The President says he will direct members of his cabinet to refer to the proposed Council of Fine Arts for their expert advice on all matters in their charge embracing architecture, selection of sites and landscape work, sculpture, and painting.

"Moreover," declares the President, "I shall request the Council to watch legislation and on its own initiative to make recommendations to the Legislature and Congress in regard to changes in existing monuments or with regard to any new project. I earnestly advise your body to take immediate steps to secure the enactment of a law giving permanent effect to what I am directing to be done. The course you advocate, and which I approve, should not be permissive with the executive, it should be made mandatory upon him by act of Congress."

COUNCIL OF FINE ARTS.

PRESIDENT ROOSEVELT has created a Council of Fine Arts and directed that hereafter the heads of executive departments, bureaus, and commissions, before any plans are formulated for public buildings or grounds or for the location or erection of any statue, must submit the matter to the council and follow their advice unless for good and sufficient reasons the President directs otherwise. The Council is composed of the following:

Architects. — C. Howard Walker, Cass Gilbert, C. Grant LaFarge, Walter Cook, William A. Boring, S. B. P. Trowbridge, John G. Howard, Glenn Brown, Thomas R. Kimball, John L. Mauran, D. H. Burnham, John H. M. Donaldson, George B. Post, Arnold W. Brunner, Robert S. Peabody, Charles F. McKim, William S. Eames, James Rush Marshall, Abram Garfield, Frank Miles Day, and William B. Mundie.

Painters. — John LaFarge, F. D. Millet, E. H. Blashfield, and Kenyon Cox.

Sculptors.—Daniel C. French, Herbert Adams, H. A. MacNeil, and K. T. Bitter.

Landscape Architect. — Frederick Law Olmsted, Jr.

The supervising architect of the treasury department is to act as executive officer in carrying out the recommendations of the Council.

Editorial Comment and Miscellany.

THE CONGRESSIONAL SCHEME FOR A LINCOLN MEMORIAL IN WASHINGTON.

EVER since the promulgation of the great plan for the restoration to the national capital of the original L'Enfant scheme and for further development thereof on sympathetic lines — a plan which represented the mature convictions of McKim, Burnham, St. Gaudens, and Olmsted and received the enthusiastic approval of everyone fitted by nature or education to express an opinion thereon — the national House of Representatives under the able leadership of Mr. Speaker Cannon has seized every opportunity to attack the plan and, by wilful and gratuitous legislation, make its fruition impossible. Time after time the American Institute of Architects, which has more than enough to do in attending to its own internal affairs, has been compelled to array itself against the Speaker and his House, and to fight desperately to save some essential feature of the great plan which had been assailed apparently in sheer wantonness and in jealousy of the interference of architects, sculptors, painters, landscape architects, and public spirited citizens with its own conceptions of the nature, functions, and laws of the fine arts. In every instance the Institute has been victorious, against heavy odds, but there is apparently no end to the eternal vigilance which is forced upon it and is alone the price of safety. Again it is called to do battle, this time for the site originally recommended for the Lincoln Monument, for Mr. Speaker Cannon, with the aid of Congressman McCall of Massachusetts, has produced a bill for a Lincoln Monument, not on the splendid site recommended by the "Burnham Commission," but in the waste lands between the new Union Station and the office building of the Senate.

This action is remarkable in many ways. The site proposed is absurd and inadequate, for it brings the monument into immediate conflict with the station: it means the breaking of what should be a noble vista with the great dome of the Capitol at the end: it isolates the Memorial in a place where it has no proper relation to the other public buildings and monuments: it has not received the approval of any body of men fitted to pass judgment: it lops off an essential part of the general plan for the development of Washington: it authorizes an ill-considered design which is reported to be the work of a draftsman in a Washington office, and gives power to put this into material form without further legislation and without the approval of anyone unless it be some Congressional committee.

These defects are all bad enough, and damn the bill from the start, but what shall we say of the financial aspect of the case? The site proposed by the Park Commission — on the banks of the Potomac and in axis with the Capitol, the Grant Monument, and the Washington obelisk — is Federal property and would not necessitate the raising of a dollar by taxation; the Congressional site, which no one outside Congress wants, is private property, for the purchase of which $3,500,000 is to be appropriated, the further sum of $1,250,000 being allowed for the monument itself.

Where, one is tempted to ask, is the "watch dog of the treasury" of whose economy and thrift we once heard so much? What has happened that he should melt to the tune of $3,500,000 and ask this contribution from the people when a better site may be had for nothing? Does he believe himself justified in levying to this extent on the payers of taxes in order that under the guise of a great motive he should be able again to attack the hated plan, before the defenders of which he already has gone down in defeat several times? Is a possible victory here worth $3,500,000? Or has the bitter cry of the owners of unremunerative real estate come to his sympathetic ear that he should demand the purchase of thirty-six acres of their land at a cost of $3,500,000 to form a futile site for a $1,250,000 monument? Whichever way we look at the question a satisfactory answer is not forthcoming and we are compelled to leave it as one of those mysteries of popular government into which it is not the part of the taxpayer to inquire too curiously.

Bad as the business is it can be considered only as a threat, for it is unimaginable that public opinion will not be aroused by this stupendous blunder, and there are times when even the Houses of Congress must yield to the pressure it brings to bear. As a last resort a presidential veto is possible — sure one may say, if the bill does not become a rider to absolutely necessary legislation, which, judging from the past, will probably be its ultimate condition. Before this drastic action there is yet another possibility, made operative by the action of the President in instituting by executive order a National Council of the Fine Arts. No more significant and wholesome action than this has been taken by a President of the United States for a decade, and its wisdom is amply demonstrated by this same blunder of Congress. How far the power of the Council may extend without legislative enactment remains to be proved, but the question will be put to the test, perhaps by this same Lincoln Monument bill, and in time, as conditions change, we may hope for a Senate and House that will prove sufficiently high minded, farseeing, and truly representative, to fix by legislation the duties and powers of a Council of the Fine Arts that in time may develop into a Bureau or even — who knows — a Department, with its own secretary with a seat in the cabinet.

In the meantime it is not safe to rely on the untried powers of the new Council of the Fine Arts, nor is it fair to force on the President the uncongenial duty of a veto. Public opinion, organized, operative, and instant in its action, can easily check this latest Congressional blunder before it goes too far. The American Institute of Architects has acted promptly, deserving as ever the gratitude of the public; local architectural and artistic organizations are following suit. If every patriotic citizen will make the matter a personal one to himself, such pressure may be brought to bear on members of Congress as will defeat the bill in the House where it originated, and we can rest quietly while gathering strength for the next contest, which, as matters now stand, is reasonably sure to come with the minimum of decent delay.

NEW SERIES OF FRONTISPIECES.

THE WORK OF GIOVANNI BAPTISTA PIRANESI.

GIOVANNI BAPTISTA PIRANESI was a product of a time when the Italian renaissance had passed its zenith and when, though the studies of the artists and architects were directed to the glorious periods that had passed, facility in mere drawing had suspended real creative ability; and so while the architectural works executed during the period of Piranesi's life are scarcely worthy of criticism, his remarkable skill as an etcher and his choice in the subjects which he illustrated make his work of great value to the student.

SCHOOLHOUSE, INDIANAPOLIS, IND.
Brubaker & Stern, Architects.
The entire trim is of terra cotta made by Indianapolis Terra Cotta Company. The brick are sand molds made by Western Brick Company.

We are beginning herewith a series of reproductions of some of the most remarkable of his etchings. He was a scene painter, decorator, architect, portrait painter, all in one, and traveled all over Italy, particularly interesting himself in the remains of Roman architecture. Combined with a most remarkable facility as a draftsman he had a keenness of discernment which is seldom given to one so facile with his lines, and our knowledge of much of the best of the old Roman work is due to his exceedingly well chosen and faithfully presented etchings, while his florid imagination led him to a series of compositions embodying Roman motifs, which, while not capable of standing the most severe academic tests of merit, have great individuality and show a very decided conception of monumental grandeur. He died at the age of fifty-eight years, but his work was carried on to a certain extent by his son, Francesco, and the work of the two is preserved in a collection of some thirty or more volumes which are rarely seen in their entirety outside of the public libraries. We have been at considerable pains to make a selection from his work of the subjects which we believe would be most useful to architects and draftsmen, and in presenting them as frontispieces for the ensuing year we feel that they may serve both as an example of draftsmanship, as essays in composition, and as a presentation under a somewhat unfamiliar guise of some of the noblest works of the past.

PANEL FOR LIBRARY FIREPLACE.
Roswell F. Putnam, Architect.
Executed by Hartford Faience Company.

Baltimore's Architectural Commission is destined to be short-lived. Created by a law passed July 13, 1907, it was to have power to select plans for all public city buildings prepared by various architects in competition. Formerly city buildings were designed by the Building Inspector's office. A committee of the City Council reported favorably, October 5th, an ordinance which is to repeal the law of July 13, 1907. Building Inspector Preston has approved the movement to repeal, giving as his reasons therefor that the city is delayed four months on every building as a result of the competition, and without the competition the city will save the three and one half per cent architect's fee. Thus he invites the public to believe that an official designing bureau may achieve a record for speed and that, in general, fees paid to architects are to be counted as money blown to the winds with little or no value given in return. The two propositions speak for themselves.

HOUSE AT CLEVELAND, OHIO.
Bohnard & Parsons, Architects.
Roofed with French A Tile made by Ludowici-Celadon Company.

Mr. Carl Berger, superintendent of the Queens Bureau of Buildings, is authority for the statement that the filing of plans in that borough of New York exceeds in the number of buildings and the cost thereof any previous December in the history of the bureau. During the last four months of 1908 plans were filed for dwellings involving a total cost of $6,700,000. Not only is there a broadening demand for homes in this section of western Long Island, but the individual

BLOUNT COUNTY COURTHOUSE, MARYSVILLE, TENN.
Bauman Brothers, Architects.
Built of dark buff brick, including columns, made by Columbus Brick and Terra Cotta Company.

value of the homes built has increased one hundred and twenty-one per cent since 1907.

In tenement construction, however, the borough of Manhattan still holds its lead. Here the typical "new law" structure occupies a lot 40 feet wide and is six stories high, accommodating from four to six families on each floor. Each apartment contains as a rule from three to four rooms. In the Bronx the prevailing type of tenement recently planned is a three story building on a lot 20 or 25 feet wide and containing three apartments of four or five rooms each. The typical tenement in Brooklyn, as well as in Queens, is a three story "double flat," occupying a 25 foot lot and containing six apartments of four rooms each.

PANEL BY WINSLOW & BIGELOW, ARCHITECTS.
Conkling-Armstrong Terra Cotta Company, Makers.

Three years' tuition in the American Academy in Rome and $1,000 annually during his stay in Italy have been awarded to Edgar Irving Williams, Massachusetts Institute of Technology, 1908, who has been awarded the Grand Prix de Rome, an annual architectural competition open to the graduates of architectural schools throughout the United States.

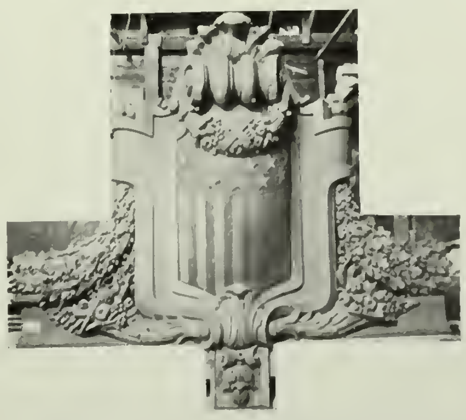
The first year of Mr. Williams' stay in Italy will be confined to a study of the history, topography, and archeology of Rome, to traveling in Pompeii, and to an examination of buildings of the classic period. In the second year the chief subject will be the architecture of the renaissance as seen in Siena, Florence, and other places. During the third year Sicily, Greece, and other countries will be visited.

Mr. Williams, who was president of the Technology Architectural Society last year, has his home in Rutherford, N. J.

Four men were chosen on December 15 by the committee in charge of the competition to make the final plans from which the awards would be made. Three Tech men, E. I. Williams, 1908, F. W. Dolke, 1908, and C. F. Baker, 1907, and R. C. Jones, from the University of Pennsylvania, were chosen. The plans were to consist of "the design of a building, it being assumed that the American Academy in Rome has acquired a plot of land 500 feet square within the walls of the city, on the west slope of a hill, the difference in level assuring to the site a commanding view of the city toward the west."

DETAIL BY NEVILLE & BAGGE, ARCHITECTS.
Executed by New York Architectural Terra Cotta Company.

Two of the most notable examples of apartment house construction recorded in New York last year were the Belmont Apartments and the twelve story cooperative apartment house to be erected in Gramercy Park for Richard Watson Gilder and a group of his friends. The former is de-



DETAIL FOR U. S. NAVAL TRAINING STATION, CHICAGO, ILL.
Jarvis Hunt, Architect.
Executed by American Terra Cotta and Ceramic Company.

HOTEL AT GRAND RAPIDS, MICH.
Williamson & Crow, Architects.
Built of mixed shades of "Ironclay" Brick.

signed to be the largest in the country. It covers the entire Broadway block bounded by Amsterdam avenue and 86th and 87th streets and will house one hundred and seventy-five families.

"It is difficult to argue the obvious proposition that the adornment of a nation's capital, and especially the capital of a union of states, would be a public use. Ancient and modern nations, including our own, have used the public treasury for that purpose." In these words, Asst. Attorney-General Charles W. Russell defends his bill that is to authorize the Commissioners of the District of Columbia to regulate private building in the district so as to preserve the beauty of the city.

FRIEZE, METROPOLITAN LIFE BUILDING, SAN FRANCISCO, CAL.
N. Le Brun & Sons, Architects.
Executed in Faience by Rookwood Pottery Company.

After calling at the White House on the morning of December 7, Representative Driscoll of New York expressed himself as follows: "I would rather see the Government spend $10,000,000 for the beautification of Washington than to spend it for battleships. The Government ought to buy all the lands lying between the Senate office building and the new Union Station, and there are other things that ought to be done to improve the national capital. This is of more importance than more warships."

DETAIL BY G. MUELLER, ARCHITECT.
Brick Terra Cotta and Tile Company, Makers.

BUILDING OPERATIONS FOR DECEMBER.

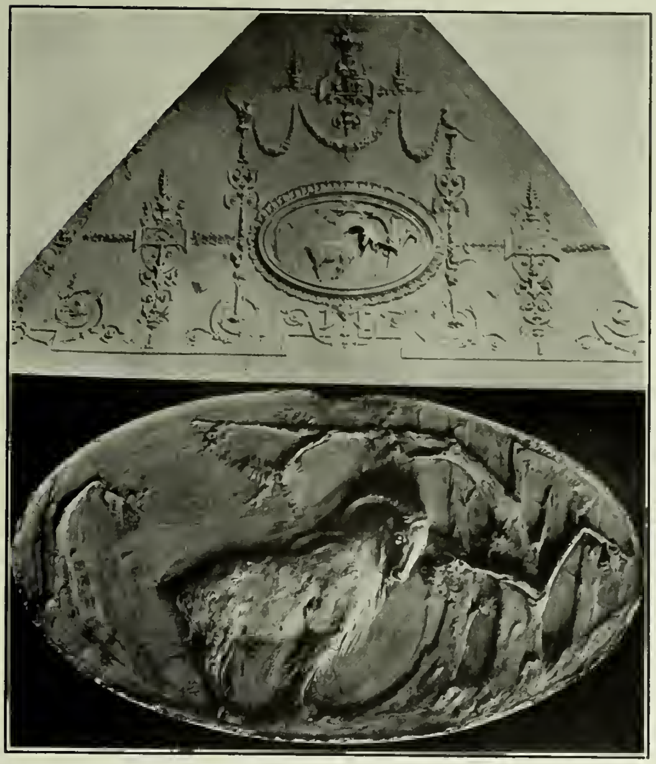
OFFICIAL reports of building operations in more than forty leading cities of the country, received by the *American Contractor*, New York, show a most gratifying increase for December, 1908, as compared with those of the corresponding month in the preceding year. This was to have been expected, since December, 1907, followed hard on the commencement of the money panic, but the increase is larger and more general than was anticipated. Only three cities report a loss and this, in the case of Chicago, is less than one per cent. The loss in Pittsburg was forty-nine per cent and in Syracuse fifty-one per cent. The aggregate value of the permits issued last month is nearly double of that in December, 1907. The showing is remarkable and indicates that 1909 will prove a record-breaker from a building standpoint. The following figures show the percentage of gain in leading cities: Baltimore, 266; Birmingham, 397; Cleveland, 297; Cincinnati, 60; Dallas, 43; Denver, 401; Detroit, 114; Duluth, 440; Grand Rapids, 18; Hartford, 166; Indianapolis, 239; Kansas City, 310; Louisville, 128; Los Angeles, 65; Milwaukee, 206; Minneapolis, 79; Memphis, 11; Nashville, 1,700; New Haven, 567; New Orleans, 17; New York, 144; Omaha, 35; Philadelphia, 127; Portland, Ore., 193; Rochester, 110; St. Paul, 70; St. Louis, 245; Seattle, 25; Spokane, 402; South Bend, 926; Toledo, 94; Tacoma, 47; Washington, 83; Worcester, 200.

DETAIL, ST. BARBARA'S R. C. CHURCH, BROOKLYN, N. Y.
Helmle & Huberty, Architects.
South Amboy Terra Cotta Company, Makers.

IN GENERAL.

A meeting of the graduates of the evening technical courses of Columbia University was held on Dec. 4, 1908, and a perma-

DETAIL BY EDWARD A. QUICK & SON, ARCHITECTS.
New Jersey Terra Cotta Company, Makers.



TERRA COTTA DETAILS EMPLOYED IN SENATOR CLARK'S HOUSE, NEW YORK.
Lord & Hewlett, Architects.
Work executed by Atlantic Terra Cotta Company.

nent Alumni Society was formed, to be known as "The Columbia Evening Architectural Society." The purpose of this organization is to unite the graduates of these courses together for the mutual and professional improvement of members, and aid their advancement in the knowledge of the art of architecture. It is greatly desired that all students not present at the above meeting who have attended this branch of work at the Columbia University will send their names and addresses to the Secretary of Education, Wm. J. Heins, 527 Fifth avenue, New York City.

Extensive public improvements planned by the city of New Orleans are to be made possible of realization by $4,000,000 worth of new bonds now being sold.

The regular monthly meeting of the Washington Architectural Club, held on the evening of December 22, was very largely in the nature of a jollification. Besides the dinner a program of vaudeville acts was furnished.

The fact that the three Mills hotels in New York is an experiment that has long

PANEL FOR SCHOOLHOUSE.
Bausmith & Drainie, Architects.
Executed by Northwestern Terra Cotta Company.

FLEMING BUILDING, DES MOINES, IA.
D. H. Burnham & Co., Architects.
Built of Hydraulic-Press Brick.

since proved se' ,orting is demonstrated in the deeding of these a .w days ago to three trustees, by which Mr. Mills plans to keep the properties consolidated undei one ownership and management. These trustees now consist of Mr. D. O. Mills, his son, Ogden, and his daughter, Mrs. Whitelaw Reid, all of whom give their services to the philanthropy without compensation.

ROYAL INSURANCE COMPANY BUILDING, CORNER WILLIAM STREET AND MAIDEN LANE, NEW YORK.
Howells & Stokes, Architects.
Built of Sayre and Fisher Brick.

COUGHLIN BUILDING, DETROIT, MICH.
B. C. Wetzel, Architect.
Front of enameled brick made by American Enameled Brick and Tile Company.

THE HOSPITAL BUILDING COMPETITION.

AWARD OF PRIZES.

The Jury for the Hospital Building Competition awarded first prize ($500) to George A. Schonewald and LeRoy Barton, associated, New York City; second prize ($200) to Harry K. Culver, New York City; third prize ($100) to Chrystie, Lautenbach and McKinney, associated, New York City; first mention to Frank H. Barry, and George Holland, associated, New York City; second mention to Louis C. Wellman and George F. Frankenberger, associated, Cincinnati; third mention to Frank Howend and Angelo R. Clas, associated, Milwaukee; fourth mention to Norman T. Vorse, Des Moines; fifth mention to A. B. Fitz-Simons and L. P. Wheat, Jr., associated, Washington.

The competition was judged in Boston, January 23, by Messrs. Edmund M. Wheelwright (Wheelwright & Haven), William D. Austin (Stickney & Austin), Charles Collens (Allen & Collens), J. Harleston Parker (Parker, Thomas & Rice), and Edward F. Stevens.

THE BRICKBUILDER

VOLUME XVIII — FEBRUARY 1909 — NUMBER 2

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

DONN BARBER; CLAUDE F. BRAGDON; JOHN T. COMES; RICHARD ARNOLD FISHER; GREEN & WICKS; HOPPIN, KOEN & HUNTINGTON.

LETTERPRESS

VIEW OF THE TEMPLE OF MATER MATUTA—CALLED BY PIRANESI, TEMPLE OF CYBELE—IN THE PIAZZA BOCCA DELLA VERITA, ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

The columns of the Portico were walled up and the building for centuries was used as a Christian Church. The tile roof shown replaced the original roof of the Temple. The building is standing to-day in a very much altered condition.

THE BRICKBVILDER

VOL. 18 NO. 2 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· FEBRUARY 1909

Gymnasiums—Their Plan and Equipment—I.

BY M. B. REACH.*

MY EFFORTS in what follows will be directed toward pointing out certain conditions of building construction and design favorable and unfavorable to the equipment and operation of modern gymnasiums.

As a manufacturer of apparatus I have in the course of twelve or fifteen years' experience seen many kinds of gymnasiums and been brought into contact with many kinds of construction — some good — some otherwise. Considering the various ins and outs of gymnasium equipments, the variety of work called for by different exponents of physical training and the totally different demand in the nature of the buildings therefor, it is small wonder that the "otherwise" predominates.

Shape of Room. — In starting with the shape of the gymnasium room, I perhaps possess some advantage over the architect who has his building plat and general plans to consider first, whereas they come last with me. It will be understood, however, that I am drawing up conditions that are more or less ideal. We can hardly ever hit the ideal aimed at but it is a truism that to keep as close as possible is desirable. This statement involves another. The "ideal" gymnasium, as I have before intimated, varies according to individual views. Having been brought into contact with many units I will take my stand on a basis that would, I believe, be established by a majority, were a vote polled on the questions at issue.

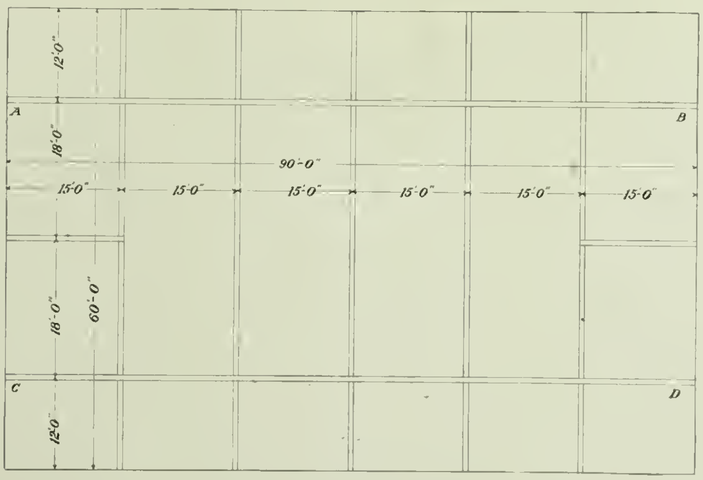


FIG. 1.

The proportion of length to width should approximate three to two. I think this opinion would obtain in all sorts and kinds of gymnasiums. For convenience and arrangement of apparatus, formation of classes, and design of running track this shape serves best.

Height. — The height, which is of much importance, should be not less than eighteen feet, nor more than twenty-two feet. It will be understood that I refer to the attaching point of overhead apparatus. Frequently the actual ceiling height will be found, and advantageously so, much more than this. The trusses in such cases, however, should conform to the minimum and maximum measurements above given. Many times where the gymnasium forms only one room in a building of many rooms, such as in a school for instance, it becomes impossible to even preserve the eighteen foot minimum. In such cases hold as close as conditions permit. Good work is done in many gymnasiums where the ceiling is of less height, but as a rule it will pay to revise plans in order to produce the required height. Besides adding many good and needed cubic feet of oxygen you adapt the room to the purpose for which it is designed, from a practical working standpoint. A low ceiled gymnasium is about as appropriate as an equally low auditorium.

Where ceiling or truss heights are greater than twenty-two feet it involves dropping down a pipe frame to proper distance. This is always expensive. It certainly is inartistic and seemingly an appendix to what presumably stands for a carefully worked out plan.

Trusses. — In designing truss work, and speaking purely for the relation of trusses to apparatus and eschewing any thought in their co-relation to the building proper (which is to be left in the hands of the architect), the plan shown in Fig. 1 is excellent.

The same recommendation would prevail in the location of longitudinal ties or stringers — A-B, C-D — were a gallery or running track installed, providing the gallery was not over six feet. In a gymnasium of this size that width of track should not be exceeded, and under no conditions whatever is a gallery or track less than five feet to be recommended.

These longitudinal ties on either side (which are always needed for the support of certain classes of suspended apparatus best placed at about this distance from wall) could be replaced by three inch wrought iron pipe and a lengthwise support for apparatus obtained in this way.

*Manager, Gymnasium Contract Department of A. G. Spalding & Bros.

Usually such pipe would be installed by the outfitter of the gymnasium at about fifty cents per running foot. I have outfitted gymnasiums, some of them large ones, originally designed without any longitudinal braces whatever. This elimination not only created a deficiency in points for overhead support, but discounted the value of the trusses for similar purposes for the reason that swinging apparatus attached to the trusses minus the lengthwise support will cause a great amount of vibration. I recall one gymnasium where it required three lengths of three inch pipe, from end wall to end wall, before the overhead work was sufficiently stable to accommodate the apparatus demanded for it.

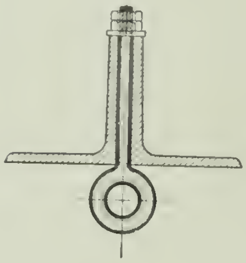


FIG. 2.

In the plan shown the trusses are fifteen feet apart. While not arbitrary, that is a good distance for such overhead apparatus as may require guying from truss to truss, and is a safe spread for extra pipe supports that are sometimes needed in working out schemes for overhead fixtures, hoists to remove apparatus, etc.

FIXTURES. — Following are some sketches suggesting clamps used in suspending apparatus under varying conditions. (See Figs. 2, 3, and 4.)

Fig. 2 is the simplest, neatest, and best. Seldom, however, do we find sufficient space between angles (one half inch required), and sometimes there is the space but it is choked by the conduit carrying the electric light wires. It is always desirable to run such wires above the flange. This seems like making much over a simple matter, but past experiences sustain the position and warrant the expression of it.

Fig. 3 is a common form of clamp used by my company and needs no comment.

Fig. 4 shows a clamp for a truss which is concealed and covered with wire mesh and plaster. In planning a gymnasium calling for this construction it is desirable to have bolts dropped down from the truss and a two inch yellow pine plank bolted to the ceiling before being finished. Details of this sort where worked out beforehand add to the general appearance and economize on the installation, otherwise where clamps need to be attached it becomes necessary to cut away wire and plaster, and when not concealed by the board, replastering is necessary, patchy, and expensive.

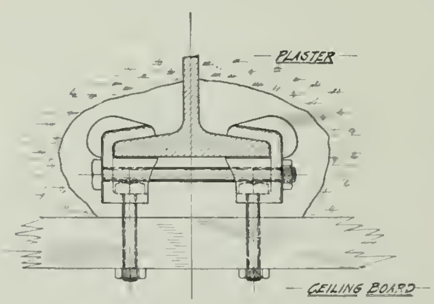


FIG. 4.

Assuming that the maximum height can be observed in providing the overhead point of attachment, the under side of the gallery, where there is one, should be ten feet from the floor. This measurement is given as a desirable minimum.

WINDOWS.—The placing of windows must of necessity depend upon general lighting conditions. It may be pointed out, however, that the majority of wall apparatus is attached at points from five to eight feet from the floor — chest weights at five feet, bar stalls at eight. These two types of wall apparatus are used in quantity for class work and allowance should be made for their proper installation. It is desirable to have one good wall, either free from windows, or windows placed above the height required for apparatus. This is seemingly an easy matter when the room is free from running track or gallery, but I have seen windows intersected by the running track, and a good arrangement it proved. In this case the lower part of the windows only would need to be screened. Ample light is given to the floor, and the running track is equally well cared for. The various games of ball played in modern gymnasiums make it compulsory that the panes be protected.

SKYLIGHTS.— In connection with this feature I do not consider a broad expanse of glass overhead at all desirable. Some of our best gymnasiums so equipped are practically put out of commission in the late spring months on account of intense heat. Skylights set in a monitor roof have always seemed to me the ideal method of distributing light in the upper gymnasium.

The director of a well known gymnasium was obliged to place draw curtains entirely across the upper part of the room in order to make the work on the floor possible as warmer weather approached. In this same gymnasium our men were asked to ring with chalk any spots in the floor that established a leak overhead. With the first hard rain they began to get busy and finally in despair plumbed down from the extreme edges of the glass roof and circled the entire floor. The question of leak is, no doubt, entirely a question of mechanics and workmanship, but the objectionable heat from the sun is condemned by those directors, who labor under these conditions, as impracticable and undesirable.

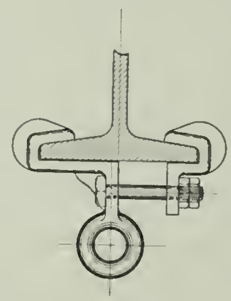
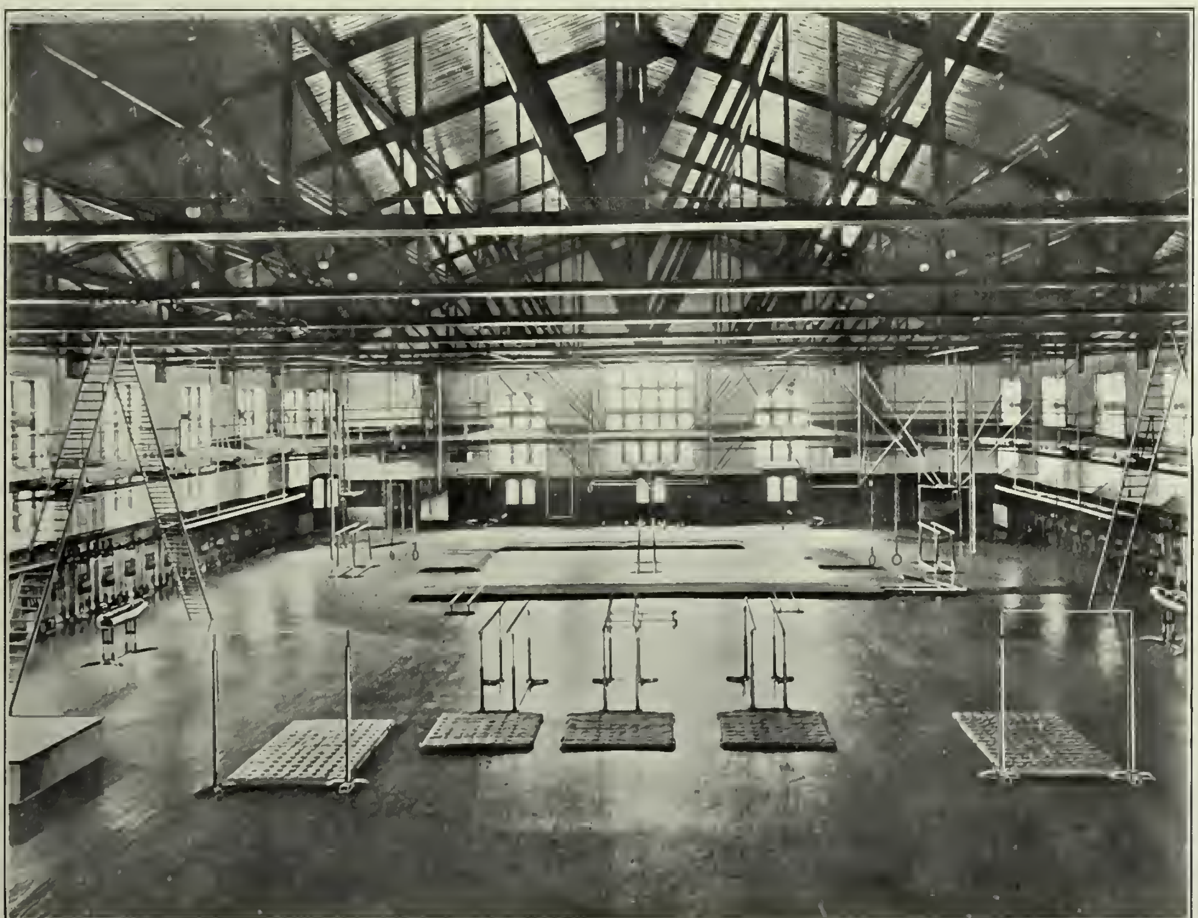


FIG. 3.

LOCATION OF HEATING FIXTURES. — The same thought governing the location of windows should prevail in the placing of heating coils. Let them do their work properly but keep them out of the way. Many equipments have been curtailed and the work in the gymnasium handicapped owing to inappropriate placement of fixtures of this kind. Similar precautions

FIG. 5.

GYMNASIUM,
UNIVERSITY
OF
PENNSYLVANIA.
Approximate
size
145 feet by 70 feet.



GYMNASIUM,
PRINCETON
UNIVERSITY.
Approximate
size
160 feet by 101 feet.

The floors of these Gymnasiums may be easily and quickly cleared of all apparatus.

should be observed in determining the position of hot air ducts along the ceiling. Frequently I have seen overhead space so cut into as to preclude the possible installation of any adequate amount of suspended apparatus. I have recollections of school gymnasiums where congested attendance demanded the maximum amount of work from the allotted space and this work curtailed because plumbers and pipe fitters had been allowed to spoil what otherwise would have proven a good working plant. A good physical director may well feel discouraged where his work is handicapped by conditions of this sort.

FLOORING.—Maple is the preferable wood for the finished floor. All gymnasiums should have a rough, and finished, flooring. This seems like an obvious condition and is mentioned only because I have outfitted one or two prominent gymnasiums where a single maple flooring (one inch) was laid across sleepers embedded in concrete. It is to be borne in mind that more or less apparatus is frequently guyed to the floor, which must therefore be made to withstand this upward pull and strain. Many kinds of apparatus are attached to iron plates which are set in flush. Cut away a one-inch dressed floor to insert a three eighth inch thick plate and little is left for screwhold. I would recommend a rough floor of one and one half inch to two inch thickness; a finished floor of one and one eighth inch to one and one half inch.

The best floors I have seen, and theoretically the correctly laid ones, follow the lines of the walls, forming a design as shown in Fig. 5.

Much of the class drill work in a gymnasium calls for marches and runs around the room, and frequently gymnasiums are used for social events, dancing, etc., in which cases wearing is more evenly distributed over a floor laid as shown in Fig. 5, as it follows the grain of the wood.

TYPES OF GYMNASIUMS. — The foregoing observations, being general in character, may apply to any average gymnasium. There is, however, a differentiation in the treatment of equipments that divides gymnasiums into groups of individual types and makes necessary a corresponding differentiation in the interior design of the building proper. It is with some of these types that I will undertake to deal and endeavor to point out by explanation and plans certain problems that influence the demands on the architect and builder. These will be separated or characterized as follows:

Athletic Recreation Gymnastics	University Preparatory School Y. M. C. A. High School	
Recreation Gymnastics	Armory Club Private Women's Gymnasium	
Co-educational Gymnastics	College School Church Public Municipal	
Playgrounds	Interior Equipment Playground Equipment	Division of sexes and ages
Indoor Running Tracks		

The Housing Problem—I.

BY GEORGE B. FORD.

IN THINKING over the many and various phases of architecture, have you ever chanced to consider the relative quantity of each class or kind of buildings erected? There is one class that predominates all others, and as you consider the question you will see that this class exceeds in number of constructions all the others put together. I refer of course to the human habitation. Consider again: who for the most part inhabit these dwellings; who form the great majority of the world's population? Is it the proprietor with a certain means or is it not rather the "masses,"—those whose small incomes and large family expenses will not permit of their possessing homes of their own? (If anyone doubts this he has but to remember that in New York City only one person in forty-three owns his own home.) Let us carry this idea a little farther and ask, what one class of habitation it is which affects the greater part of the lives of the great majority of human beings?

LOW COST HABITATION. — Can the answer to this be other than "The habitation at low rent"? Consider for a moment what the question of the habitation of the "masses" may embody; its immense importance as a factor either for or against a real home life, especially in the rearing of children; how the character and design of the dwelling itself may make for happiness or unhappiness, for uplifting or debasing, for good, useful, helpful lives, or for useless, immoral lives. It is out of place to dwell on this feature of the question here, for sociological and religious publications are constantly showing the effect of environment on the individual. But what does interest us is how much this problem of the habitation at low rent and cost (or in general the "Low Cost Habitation") affects the architect.

We must admit frankly that it has affected him very little indeed. Why? Because the majority of those who promote such structures either do not know what the word architect means or they believe that they can plan the structure just as well themselves and thereby save the architect's fee. Can the architects blame them? What have architects accomplished so far in America to improve low cost habitations?

THE DATA.—Look through your files of magazine plates and see what you can find on this subject. Of model detached country houses at low cost there are a few, most of which have appeared within a very few years. Of suburban connected houses at low cost there is a much smaller number. Of city or suburban tenements with several apartments on each floor, small suites and low rental, there are almost none, the only notable exception being the publication of the Phipps Houses No. 1 in New York (the writer of these articles has been living in these latter almost since their opening) in THE BRICKBUILDER for September, 1907. And of habitation within the reach of the poor, the really poor, absolutely nothing has been published. Here is a subject which directly affects more people more hours a day than all other phases of architecture put together, and yet we find that there is no phase of architecture so neglected as this, no phase on which the architect can find so little enlightenment, so few records, as on the subject of low cost habitation.

EFFECT ON THE ARCHITECT. — Many architects will say, "what is this question of low cost habitation to me? I have built several cheap houses, but I cannot afford to be bothered with them now." True, so far, but consider what are the tendencies of the times. We all know that enormous fortunes are being accumulated, and that there is a rapidly increasing tendency to expend them in ways which will help one's fellow men to ameliorate the conditions of living, and, that they are being spent more and more in the prevention of the causes of life's struggles and privations.

In what better way can these millions be expended? How can families be better helped than by giving them the brightest, cleanest, airiest, cosiest, cheeriest, most homelike environment that human ingenuity can devise? This is where we enter the province of the architect.

TENDENCIES. — How do we know that philanthropists and others are going to turn their attention in this direction? Observe the importance with which the question is looming up on the other side of the water. In Paris there are many societies for building low cost habitations — the great Rothschild's housing movement — and, greatest of all, the proportion of the new $100,000,000 appropriation to improve the city, which will be expended on better "Habitations à Bon Marché." Look at Germany and note all that is being done in the way of municipal housing in Berlin, Stuttgart, Hanover, Munich, etc.; Belgium, Italy, and Austria the same; and then look at England where in London alone some $125,000,000 have already been spent in improved low cost housing. Have you ever heard of the Brooklyn Model Tenements of Alfred T. White and the Pratt Institute; of the City and Suburban Homes Company with its many acred town of Homewood and its many blocks of model tenements in New York; of the big houses of the New York Fireproof Tenement Association; of the Shepard, Lee, DeForest, Bishop, or Stone model tenements; of the Phipps Houses No. 1, No. 2, or No. 3 (the second for colored people), of the Mills Tenements, or of the Mills Houses No. 1, No. 2, or No. 3 for working men; or of the new municipal lodging houses? Not only these, but have you noticed all the space recently given in the papers to questions of congestion of population in New York City with graphical illustrations of the evils of our present living conditions; and the interest they have aroused in all classes of people? And more particularly the work that is being done in housing research under the direction of the Sage Foundation. Ponder on these and see if you can believe other than in an immense impetus in intelligent building of model low cost dwellings.

WHAT THE QUESTION INCLUDES. — It is now time to see just what this question means and just what it includes. The man who has unlimited money to spend, and even the man who has a moderate amount to spend, can have pretty much what he wants in the way of a dwelling wherever he may be, but the rest of the world must take what they can get, and what they can get depends largely on where they live.

CLASSIFICATION. — In any case people must live in one of two general types, i.e., the house where there is only one family under a given roof, or the tenement where more than one family lives under a given roof. The former type admits of a lawn or garden or both to each family, the latter does not. Each of these types may be divided into three classes, i.e., single, double, or multiple buildings. The single house or single tenement is where for a given building there is only one family on a floor, thus having light on four sides; the double house or double tenement is where there are two families on a floor with a party wall between, thus giving each family light on three sides; and the multiple house or multiple tenement is where there are three or more families on a floor separated from each other by party walls, thus receiving light only from two opposite sides at most.

There are of course other places in which one lives such as boarding houses, lodging houses, and hotels, but in every case they are alike in being non-housekeeping places of abode, and as such may be classed under the generic head of lodgings, distinguished only as they are by party walls or not. Each of these classes has its peculiar problems and with that in view we will treat them in turn.

PHASES OF THE HOUSING QUESTION. — The housing question in general is a broad one. It interests many different kinds of people from many different points of view. There are the various social, ethical, moral, and religious phases, which may interest us individually, but which have no direct bearing on architecture as a profession.

Then there are the purely practical questions of financing and management of dwellings of whatever sort, and there is the question of ownership, whether it be private, cooperative, or municipal; in the former case whether the private ownership be that of an individual, a partnership, a society, or a corporation. There is the question of raising the money to pay for the building, with all the questions as to building loans and their replacing by permanent loans; where to place a loan and through whom; conditions of contract, etc.; or whether the building be built through a cooperative building society or bank. There is the question of the purpose of the building, whether it be built as a speculation with the idea of selling it as soon as possible, or as an investment, or as a philanthropy pure and simple, or as an investment philanthropy. This latter question affects the architect closely, making a large difference in his design for a given lot. Then there is the question of management, whether it be superintended in person and the rents collected in person or whether it be done by some outside agent or agency. In the latter case it is again a question of whether the superintendents be men or women; the experience both in London and in the City and Suburban Homes Company in New York being that the "Octavia Hill" principle of women as collectors is particularly successful. The reason for this is that, thanks to their intuition and tact, women seem to "get on" with the tenants much better than do men.

There is also the question of repairs, by whom they should be made and how often; involving as it does the question of the original construction as to whether the building be constructed with an eye to permanency or not.

PHASES OF ESPECIAL INTEREST FOR THE ARCHITECT. —

With a perusal of the subject many other smaller questions arise but none of more than general interest to the architect. For him the three questions are: materials, construction, and design, whatever type of house it may be. I will take up each of these questions in the above order and see what experience has to teach us to date. Materials and construction are so closely related however that they should be considered together.

Construction and Materials, Fireproof or Not. — The first question naturally is whether the building should be fireproof or not. Let us consider the tenement first. Just here there is considerable difference of opinion. The New York Fireproof Tenement Association Houses and the other more recent smaller tenements by Ernest Flagg are fireproof. The Phipps Houses No. 1 are fireproof, the Mills Hotels are fireproof, also several of the smaller model tenements. On the other hand the City and Suburban Homes tenements which in total area exceed all of the others combined are fireproof only as to stairs and corridors, the rest being constructed with wooden joist floors and wood stud partitions between brick exterior and party walls. The City and Suburban Homes Company, together with ninety-nine one hundredths of the tenement builders in New York, argue that the fire risk is so very small that the extra cost of fireproofing the whole building might much better be used where it would count for more. Mr. Ernest Flagg in an article in the October 6, 1906, issue of "Charities and Commons" argues that the extra cost of fireproofing the whole building beyond the necessary cost of fireproofing the stairways is nearly compensated for by the space gained through the thinning down of all the walls, partitions, and floors; by the decreased depreciation and by the saving in insurance rates. In view of the fires and loss of life that has occurred of late in New York tenements there would seem to be a moral argument at least in favor of the fireproof tenement.

As to materials, the steel frame encased in terra cotta or concrete with terra cotta or reinforced concrete floors sum up the general usage. I know of no instance of a model tenement in America entirely of reinforced concrete. The majority of the European tenements are practically fireproof with fireproof stairs and halls, floors of heavy joists between brick walls and partitions, the joists being filled in between and topped over with concrete; a durable and cheap construction where labor is not high. Other things being equal a fireproof tenement has everything in its favor; the lives of the tenants are safer, the house is cleaner — there being less chance for the wandering about of vermin or the infiltration of dust — the building is more durable, it is much more nearly sound proof thereby giving far more privacy to each family (a great advantage morally, as well as physically), it is warmer in winter and cooler in summer. Are not these considerations of enough weight to compensate for a little extra first cost? With the increasing cost of wood and the decreasing relative cost of fireproofing materials may we not with a little experimenting find a fireproof construction the actual cost of which, as compared with that of wooden construction, will be such as to force the average investor for his own interest to build fireproof buildings? It is an ideal worth striving for.

When we come to the ordinary double or single tenement house we find in America at least that they are rarely of any construction other than wood with occasional exterior walls of brick. Reinforced concrete has been used of late for such buildings but with what results remains to be seen. Abroad the construction is the same as for the multiple tenement. The multiple house is usually of wood encased in brick walls, of which the great majority of houses in Philadelphia are typical examples. The single and double house is of wood except for the recent experiments with terra cotta and reinforced concrete. Except in Switzerland and Sçandinavia, the walls and partitions are always of brick or stone masonry, the floors being like those above described or like our ordinary joist floors except that the joists there are more nearly square in section.

Foundations and Cellars. — As to foundations and cellars there is nothing of importance to note except that the floors are usually of concrete throughout. In Europe outside of the cities the houses rarely have cellars at all, the sod being stripped off, the ground floor raised some two or three feet above the soil, and the underpinning being damp-proofed by a damp course extending through the wall about a foot above the ground.

Walls. — The walls of the houses vary of course with the locality, depending on climate, habit, and natural materials at hand. It is hardly worth while to take this up here. The walls of the tenements, especially the multiple tenements, are practically without exception of brick with trimmings of stone, terra cotta, or other colored brick. For example, the City and Suburban Homes houses are in nearly all cases of a hard, yellow buff brick costing up to $20 per thousand, with sills, lintels, belts, and door jambs of white Vermont marble. Fire escapes, grilles, and railings are of wrought iron painted black. Courts are of a cheaper grade of light colored brick or ordinary brick white-washed. The New York Fireproof Tenement Company's buildings are similar. The Phipps Houses are of a good quality yellow and a good quality red brick with arches and sills of yellow brick, ornament of buff terra cotta, and a base of stone. The window guards, the railings, and the area enclosure grilles are all of heavy wrought iron painted buff. In England the walls are of a gloomy red brick and on the Continent brick or stone masonry covered with cement plaster painted.

Roofs. — The roofs of the houses are of shingle or slate or occasionally flat, covered with tar paper and gravel. Recently roof slabs of concrete have been tried. In the single and double tenements tar and gravel is the rule. In the multiple tenements the same applies to the part reserved for the drying of clothes, wood-slat walks at the proper places preventing undue wear of the roofs. A feature of the Phipps Houses No. 1 and one which deserves being copied is the roof garden across the front of the building. This is covered with tile. Around the edge of it is a high parapet banked with privet and flowers. Around the outside edge of this parapet is a painted tin imitation tile roof sloping down at 45 degrees over the wide projecting cornice. Abroad the roofs are rarely flat. They are usually covered with slates, tin, or flat tile.

When we come to the interiors there is a great diversity of materials.

Floors. — The floors of the houses are usually of soft wood with the expectation of being carpeted. In the tenements they are usually of two or two and one half inch hard pine strips to be stained or painted or carpeted by the tenant as he sees fit. Abroad one often finds floors, except for the living room, of four to six inch tiles painted, the idea being to cover them with linoleum or rugs. This would hardly do, however, in our cold climate. Stair treads in tenements are of slate or Tennessee or Georgia marble, the latter being the more cheerful. The landings and corridors are of cement sometimes painted or of terrazzo or a marble mosaic laid usually with a border motif. The stair railings are of wrought iron; the hand rails are of wood. Abroad the treads are usually of slate though often of wood.

Walls and Partitions. — The interior walls are practically in every case of two or three coat plaster work on 2 by 3 or 2 by 4 studs set flatwise. They should be oil painted, never papered. A mat surface oil painted plaster seems much more durable than any other wall surface and is quite unobjectionable to look at. It should be painted in very light tones — not too cold. In one of the best known model tenements in New York where the walls were painted in olives, Pompeian reds, and chrome yellows, the tenants all complained of the gloominess of the rooms, so that whenever new tenants moved in the rooms were repainted in a much lighter tone to the delight of the tenants but to the detriment of the color scheme. Bath room and toilet room walls are painted with Ripolin or some washable paint. Corridor walls are usually oil painted with the lower half of some dark color that will not show dirt.

Ceilings. — The ceilings are in nearly every case whitewashed so as to give the maximum reflection of light and maximum height effect to the room.

Woodwork. — The woodwork varies, but common practise proves that a hard wood, varnished, wears better and is more economical in the end than a soft wood painted. Ash, chestnut, red oak, and cypress are used, depending on locality and market. In houses, especially single or double, there is a tendency to use soft wood, painted. The latter, too, is the usual practise abroad.

Plumbing. — For closet and bath a simple flush seat without double cover, and with chain flush; a roll rim enameled iron tub painted on the outside; a corresponding wash bowl if such exist, all open and nickel plated or galvanized iron painted is the custom. Floors are cement finished with rounded corners and edges turning up six or eight inches on the walls and painted. In the Phipps Houses the showers in all the two and three room suites are needle spray douches placed just above the shoulder level to give a spray at 45 degrees downward. The sinks are twenty-four inch galvanized iron with a galvanized iron back fifteen inches high in which are the two brass faucets. It is held up in front by two galvanized iron legs. The two tubs adjacent are similarly on galvanized iron legs with galvanized covers. The tubs themselves are of the same material or preferably of white enameled earthenware with a yellow glaze on the outside. There are two brass faucets of two and one half inch projection in each tub. Abroad the sink is usually of enameled earthenware and the tub does not exist.

Heating and Cooking. — Heating is usually by steam with plain silvered radiators in the main rooms and silvered risers in the bedrooms. Just here especial care should be taken to make the openings about all pipes through the floors as tight as possible, consistent with fire laws and pipe expansion, to prevent the passage of vermin, the tenement pest. As to stoves, there is a strong tendency in the later tenements to eliminate them altogether and rely summer and winter on gas ranges with four ring burners on top and oven and hot closet beneath. This rests on a slab of stone or concrete and is ventilated by a flue-opening above. Each apartment should have its own individual flue all the way up to the outer air. Abroad there is usually a built-in range which heats water in the "copper" or boiler. One very rarely sees a gas range there.

Fixtures. — The fixtures are simple and of brass, wired sometimes for future electric light. A quarter meter seems to be the most satisfactory way of supplying gas to the tenant.

Hardware. — As a result of their many experiments the hardware in the City and Suburban Homes tenements is real Bauer-Barff in the most used pieces and imitation in the less used. It wears well. Elsewhere brass is used as sparingly as possible and usually black knobs are used on door handles.

General. — In many of the houses simple, durable roller shade curtains are provided. In some of the tenements small plate glass mirrors are built in.

This gives us a general idea of the details of material and construction. The remaining articles will be devoted exclusively to the design and arrangement of the model tenement and house.

THE Torrens system of land title registration went into effect in New York state on February 1st. A purchaser of land gets his title in the same manner as heretofore, if he so desires, and he may buy or sell during the process of registration without delay or inconvenience. In cases where there is no contest in regard to the title — and in the normal and ordinary case there would be no contest — at the end of twenty days after service is complete judgment of registration can be obtained. The state does not "guarantee" titles under the new law, nor is there any "guarantee" by the state of any of its judgments or decrees. It is clear, however, that an order of court establishing for all time an indefeasible title is a better "guarantee" than a title company's insurance. A registered title is equivalent to a land patent directly from the state. In case of a contest or objection to registration the time to effect registration will, of course, be lengthened. If there is real ground for objection a law suit or bill in equity will be necessary as it has been heretofore.

MEMBERS of the House Committee on Foreign Affairs have agreed to stand behind the Longworth bill which authorizes the appropriation of $1,000,000 annually for the construction of embassies, legations, and consular buildings abroad. The bill was introduced during the last session.

Suggestions for Architectural Study in Western France—II.

BY FREDERICK REED.

THE one redeeming feature to the narrow crooked streets of Brittany is the wonderful picturesqueness of the houses. From a sanitary standpoint we must condemn these relics of medievalism, for in many cities the roof gutters of opposite houses are not over five feet apart while in places they touch each other. Yet their charm to every hamlet is undeniable. At times there will be a row of decayed domestic architecture, the fronts of which will be adorned with excellently carved wooden figures, then again whole streets will have slate façades worked skilfully into geometrical patterns, or perhaps a single house will stand out conspicuously with its granite base supporting the projecting stories and a long sloping roof covered with dabs of golden lichen. Picture the timber houses at Vitré or Vannes, where one's vista is a series of patched roofs either domed or square with fronts that are made of slate supporting semi-circular towers and engaged pillars with curiously carved brackets. Sometimes these façades are carved fantastically, or enriched with paintings, while their sky line is a formation of quaint gables with timber frames. No two cities are richer in this style of architecture than Dinan with her projecting stories upheld by massive beams and Morlaix with her ornateness in slate. Hôtel de Rohan at St. Brieuc is one of the best known buildings of wood and plaster. Other towns that possess many examples of ancient and medieval houses are Dol, Fougères, Guingamp, Le Croisic, Ploërmel, and Auray.

A TOWER OF THE CHATEAU AT NANTES.

ST. LAURENT TOWER AT VITRE.

THE CHURCH S. ARMEL, PLOERMEL, WITH ITS LAVISH SCULPTURE.

There are several worthy old market buildings throughout this region. One of the most fantastic in all France is the fine old timbered house at Auray, while the picturesque market hall at Le Faouet is a marvel in the construction of its wooden beams. St. Renan also has a very large and theatrical market house, while the cities of Evron, Tréguier, and Huelgoat have typical markets similar to many others scattered over the whole of Western France.

A CURIOUS FONT.

Generally it is advisable to visit all museums. From these collections compiled at considerable expense and time we are able to acquaint ourselves with the diverse types of provincial art. These museums are open to the public on Sundays and Thursdays from ten until four o'clock, while at other times the customary fee will secure admission. It would be tedious to enumerate the various exhibits and to mention even the best subjects contained therein, so we will cite only a few of the most important. Vannes possesses one of the richest collections of antiquities in Europe, Vitré has an especially fine outlay of old French faience as well as some thirty Limoges enamels, while the church of St. Pierre at Chartres contains some choice Limoges enamels by Limosin. So at Rennes, Quimper, Le Mans, Angers, and Carnac one may enjoy interesting displays of pottery, Gallo Roman remains, celebrated tombs, and admirable sculpture.

Once you have reached the heart of Brittany and learned to admire the peasants with their mob-caps and blue blouses, take some of their delightful steamer trips. Leave Vannes for Sarzeau and after a most picturesque sail among the fishing smacks you will enjoy the old summer residence of the Dukes of Brittany, the château of Sucinio and the old convent and abbey church near by. Another profitable

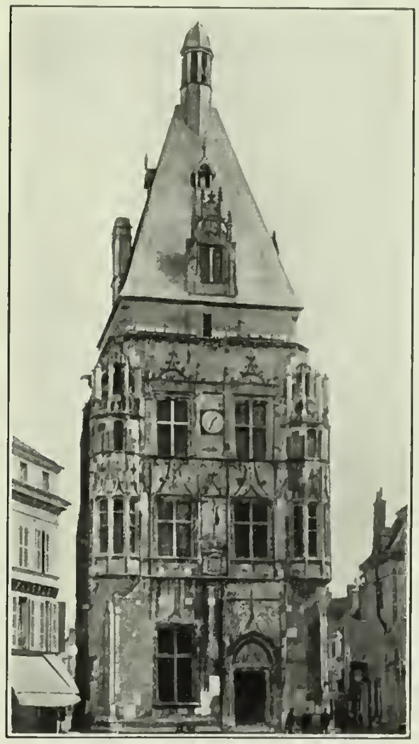
NOTRE DAME CHURCH AT ALENCON.

GALLERY OF CHATEAU AT CHATEAUBRIANT.

CHURCH OF ST. JEAN AT NOGENT-LE-ROTROU.

CATHEDRAL AT ST. POL-DE-LEON.

CLOISTERS OF CATHEDRAL AT TREGUIER.



HOTEL DE VILLE AT DREUX.

AN OLD FEUDAL CASTLE OF THE THIRTEENTH CENTURY AT CLISSON.

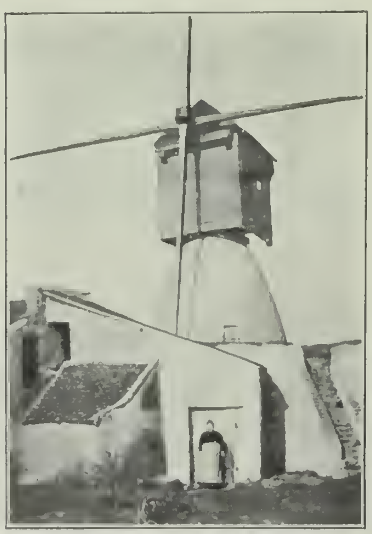
THE MASSIVE TOWERS OF CHATEAU AT NANTES.

trip by boat is from Locmariaquer to Gavr'inis with its well known tumulus and dolmen; the tomb at this place has been excavated recently and measures some three hundred feet in circumference and is thirty feet high. The island of Croix surrounded with cavernous cliffs and containing many interesting megaliths is only a short distance from Lorient. To the Belle-Ile-en-Mer is a charming sail from Quiberon, while the island itself is very attractive in the picturesqueness of the scenery and the old fortifications around the city of Le Palais. The trip from Brest to Landévennec is extremely fascinating for there we find the charming ruins of a sixteenth century abbey. There are countless journeys to enjoy at all points along the coast of Brittany; but if none are taken until reaching the northern shores do not fail to enter that quaint and charming old town, Dinan, by steamer.

ONE OF THE FOUNTAINS FOUND IN MANY CITIES.

CHURCH AT SAINT THEGONNEC.

THE CHURCH STE. CROIX, NANTES.



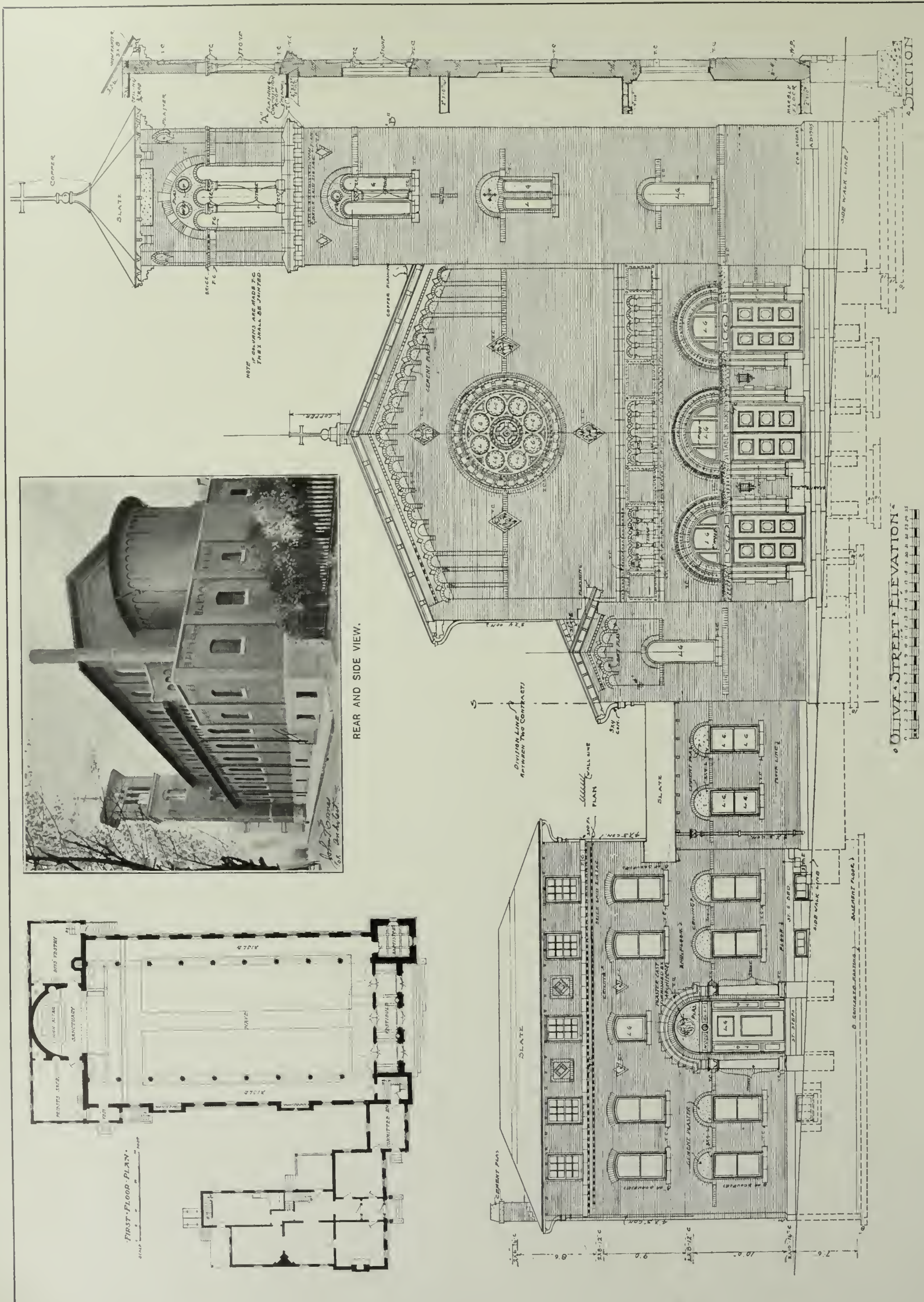
A HOME IN BRITTANY.

A HOUSE TYPICAL OF WESTERN FRANCE.

AN OLD STREET IN BRITTANY.

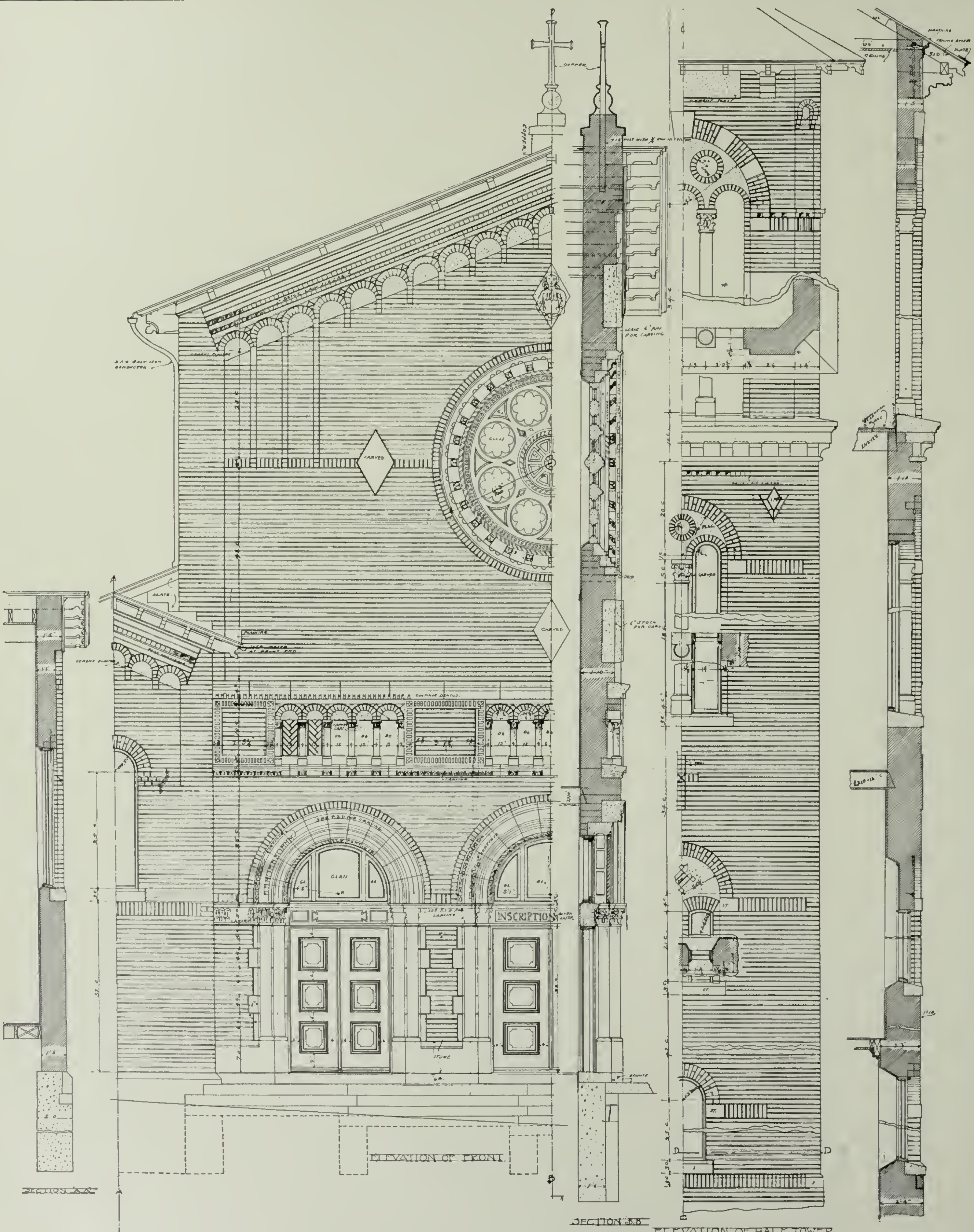
In this country which teems with surprises and delights tramping is the most profitable means of visiting the same. During five weeks the Englishman Jephson covered the most of Brittany in a walking tour — his route is given at the end of the article and would be an ideal trip for the bicycle or automobile. He took with him a waterproof knapsack, writing materials, notebooks, mariner's compass, light rain coat, extra linen shoes, and trousers. In addition to the above we would add a French dictionary, passport, camera, toilet articles, shaving outfit, measuring tape, sketching materials, and a first class guide book. As the majority of people limit their walks to short distances we will suggest a few fascinating journeys among the farmsteads, châteaux, and time honored shrines. At Lannion one could make an early start and enjoy the castles of Coëtfrec, Kergrist, and Tonquédec; the renaissance chapel of Kerfons; and Brevelnez with the noted architectural group of a calvary ossuary, church, and chapels. Another interesting trip, would be from Quimper to Pont l'Abbé

ST. MARY'S R. C. CHURCH AND RECTORY, MC KEESPORT, PA.
JOHN T. COMES, ARCHITECT.



ST. MARY'S R. C. CHURCH AND RECTORY, MC KEESPORT, PA.

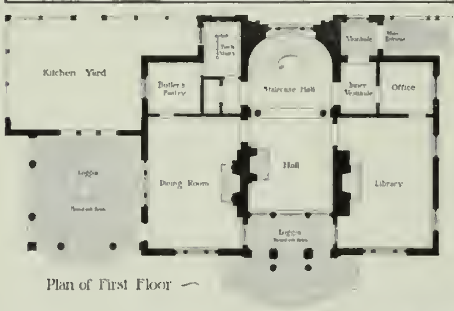
JOHN T. COMES, ARCHITECT.



DETAILS OF FRONT ELEVATION AND TOWER.

ST. MARY'S R. C. CHURCH AND RECTORY, MC KEESPORT, PA.

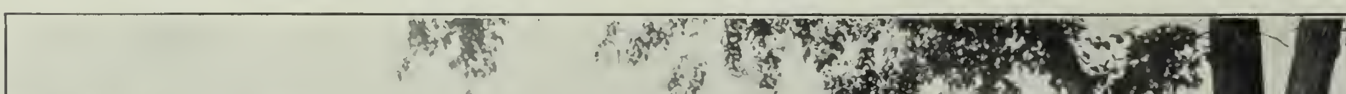
JOHN T. COMES, ARCHITECT.



Plan of First Floor

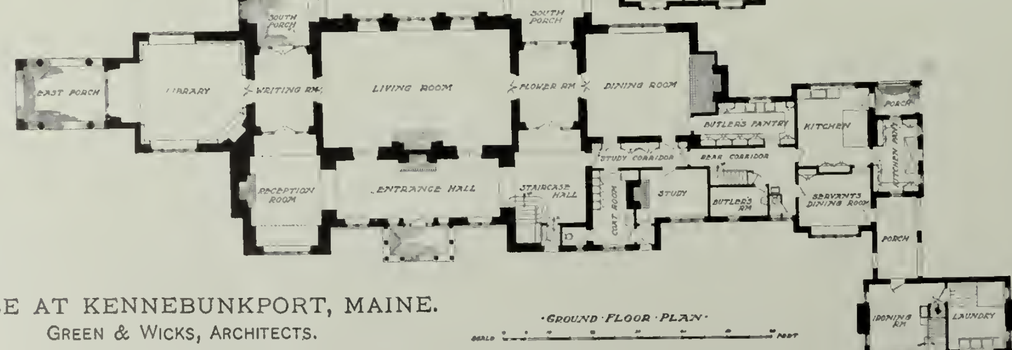
HOUSE
CAMBRIDGE, MASS.
RICHARD ARNOLD FISHER
ARCHITECT.

Plan of Second Floor



DETAIL OF ENTRANCE FRONT.

SECOND FLOOR PLAN



GROUND FLOOR PLAN

HOUSE AT KENNEBUNKPORT, MAINE.
GREEN & WICKS, ARCHITECTS.

DETAIL OF TERRACE FRONT.

GARDENER'S COTTAGE.

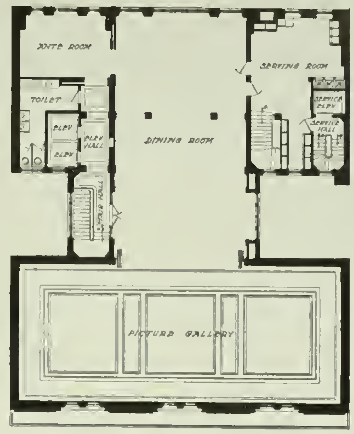
SERVANTS' ENTRANCE.

PLAN OF STABLE AND GARAGE.

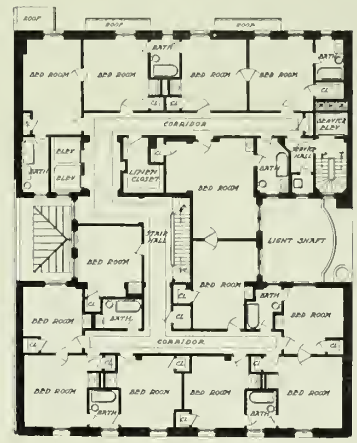
HOUSE AT KENNEBUNKPORT, MAINE.

GREEN & WICKS, ARCHITECTS.

HOUSE AT KENNEBUNKPORT, MAINE.
GREEN & WICKS, ARCHITECTS.

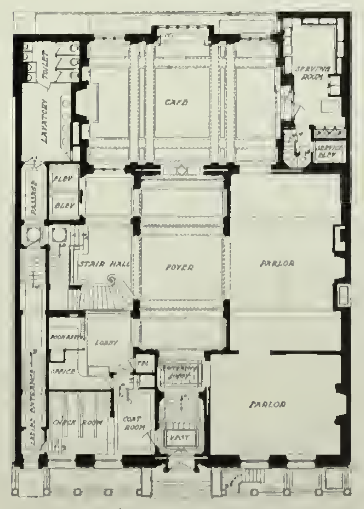


·SIXTH·FLOOR·PLAN·



·THIRD & FOURTH·FLOOR·PLANS·

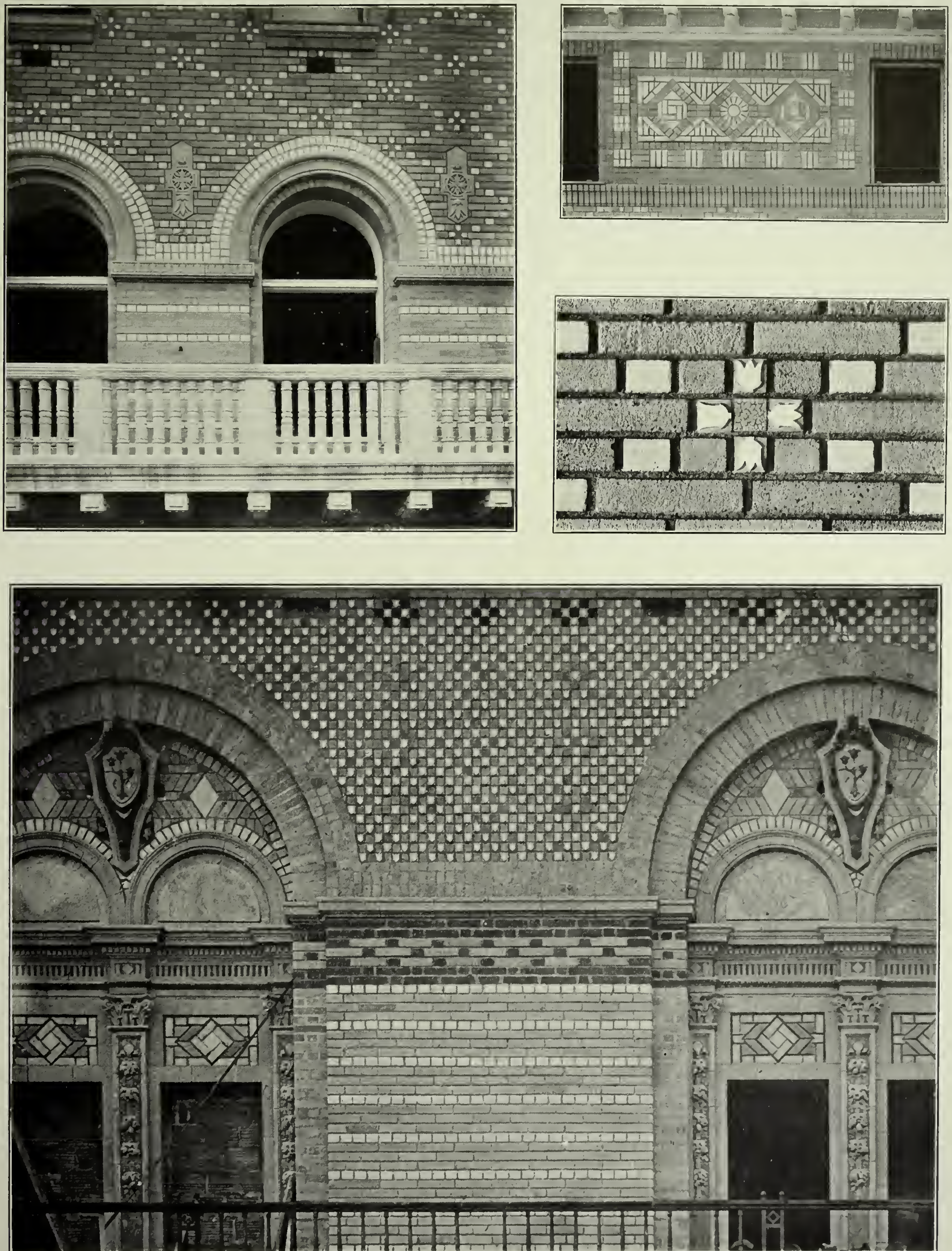
·SECOND·FLOOR·PLAN·



·FIRST·FLOOR·PLAN·

NEW LOTOS CLUB, 110 WEST 57TH STREET, NEW YORK CITY.
DONN BARBER, ARCHITECT.

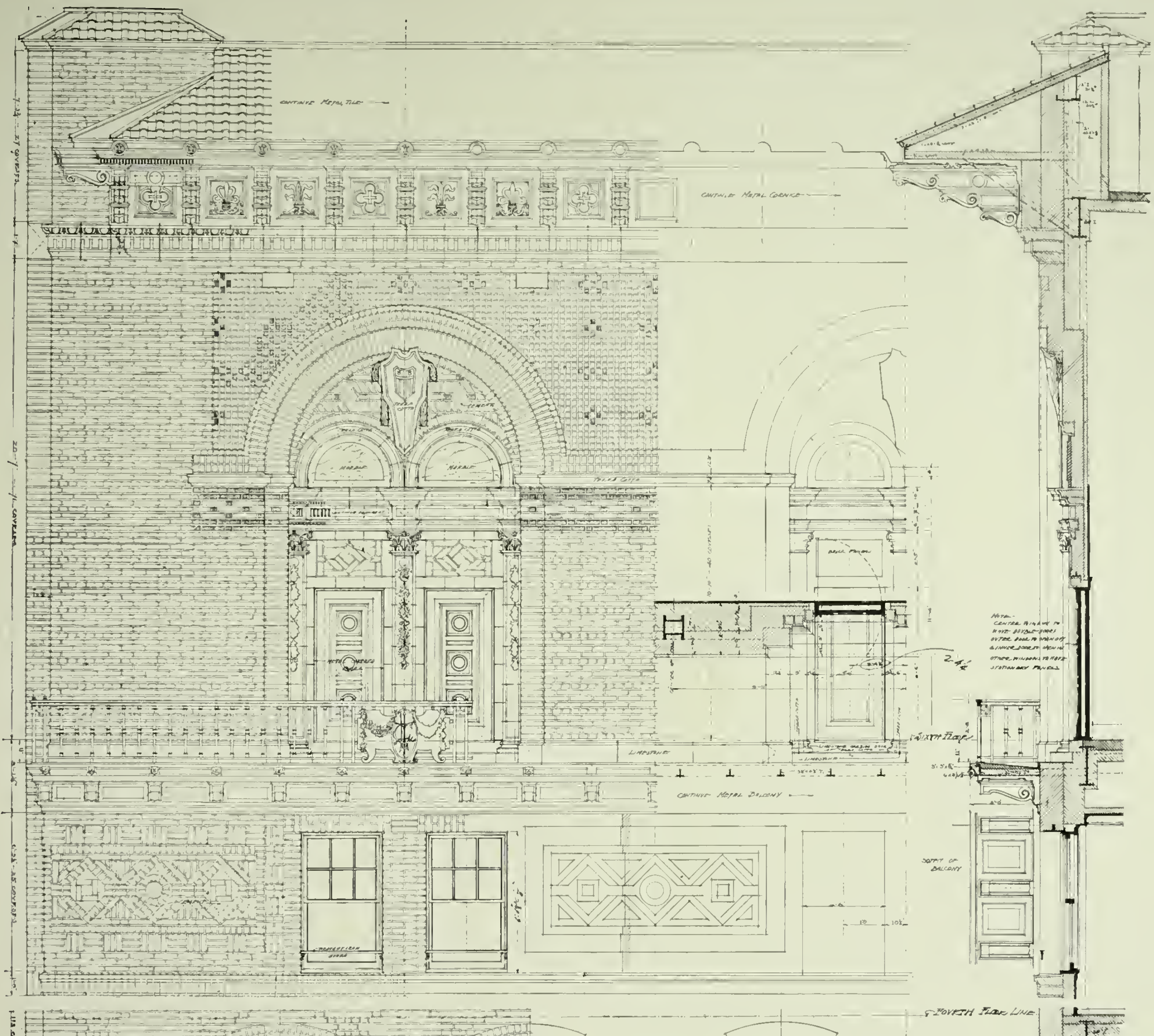
VOL. 18, NO. 2. PLATE 23.



DETAILS OF BRICK WORK.

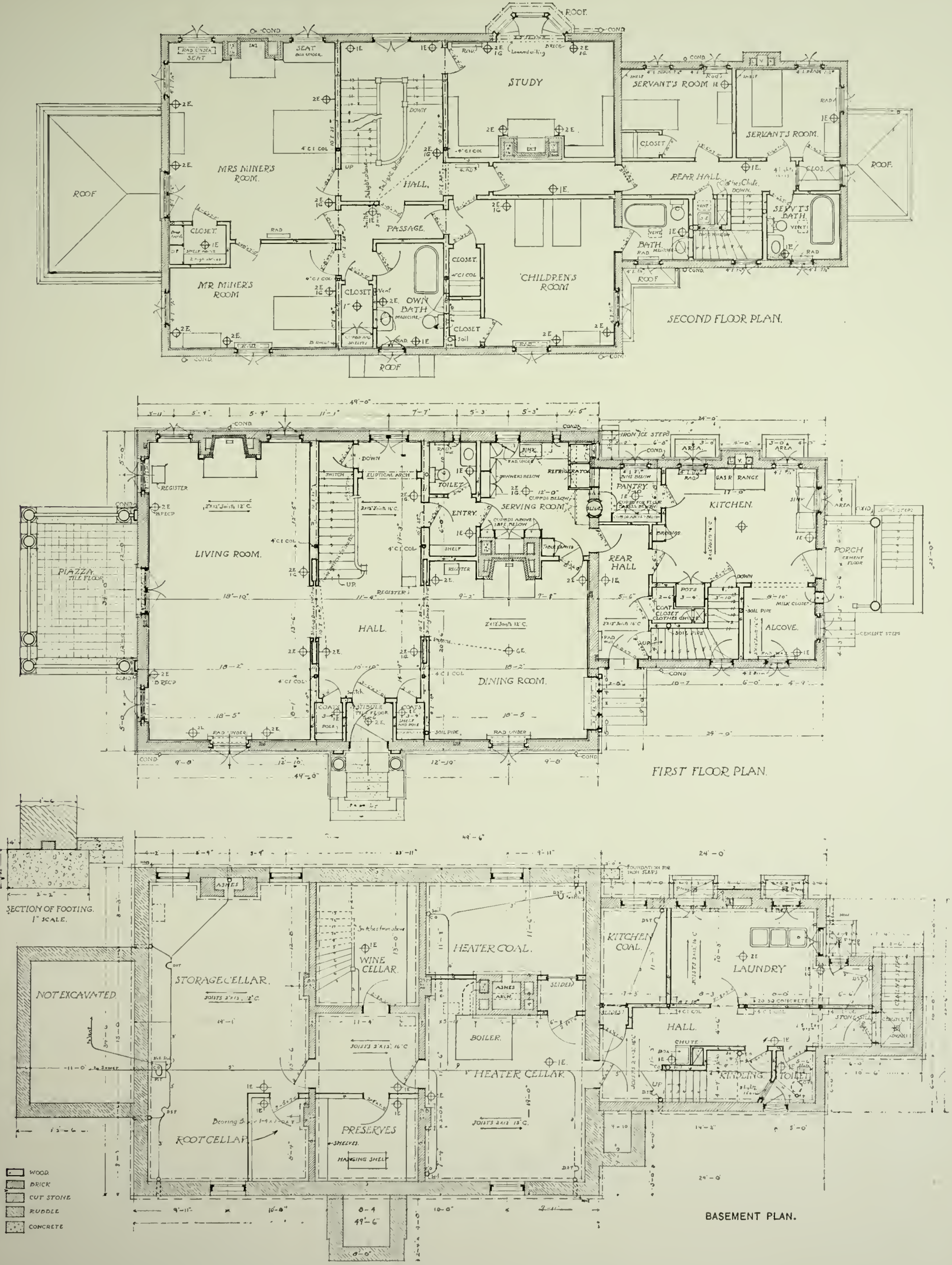
NEW LOTOS CLUB, 110 WEST 57TH STREET, NEW YORK CITY.

DONN BARBER, ARCHITECT.



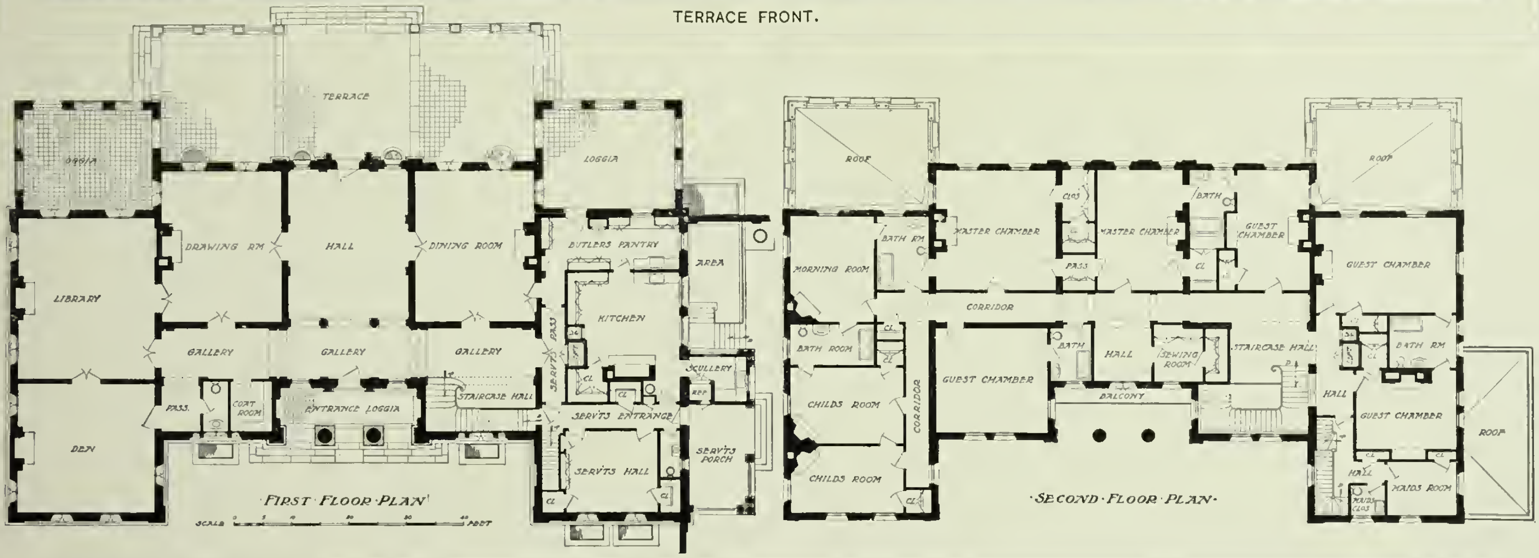
DETAILS, FRONT ELEVATION, NEW LOTOS CLUB, 110 WEST 57TH STREET, NEW YORK CITY.
DONN BARBER, ARCHITECT.

HOUSE AT ROCHESTER, N. Y.
CLAUDE F. BRAGDON, ARCHITECT.



FLOOR PLANS, HOUSE AT ROCHESTER, N. Y.
CLAUDE F. BRAGDON, ARCHITECT.

TERRACE FRONT.



ENTRANCE FRONT.

HOUSE AT LENOX, MASS.

HOPPIN KOEN & HUNTINGTON. ARCHITECTS.

DETAIL OF MAIN ENTRANCE.
HOUSE AT LENOX, MASS.
HOPPIN, KOEN & HUNTINGTON, ARCHITECTS.

A TYPICAL BRETON HOME.

studying on the way the splendid wood carvings at Combrit, the ruins of Le Pérennou and old Roman villa, and the romanesque church at Loctudy. It is hardly necessary to plan other walks, for the country is rich in picturesque castles, churches, and manor houses, and one can revel in excursions from almost any city in this romantic country with its wayside shrines justly commemorating a people of superstition and religion.

AN OLD CHURCH WITH ITS QUAINT CALVARY, PLOERMEL.

A few suggestions are offered for the prospective traveler. In order to save time and avoid missing some of the most desirable places one should lay out his itinerary beforehand, which caution will prevent considerable annoyanee and leave the mind free to enjoy and to work. The time of the year matters little in regard to weather for one of the best tours ever taken throughout this region was during the month of February. But Brittany is a land of pardons and during the summer there are local festivities and one should plan to see as many of these fêtes and festivities as possible. Due allowance should be made at every city for short pilgrimages among the fascinating suburbs. Distances are not great and the roadways for the most part are smooth, connecting all towns of any importance. The automobile, the bicycle, or "à pied" furnishes the best means of seeing the country, for the attractive country homes and the customs of the peasantry form memorable experiences. In traveling by train, third class is preferable unless accompanied by women, as one reaches the heart of a people by coming in contact with them in the humbler pursuits of life, and this close acquaintance is necessary to appreciate the spirit that has developed the art and life that we go to enjoy.

THE CATHEDRAL, NANTES.

The life of the peasantry is very humble and neatness is inbred. Their accommodations are always sanitary and one need have no fear whatever for the appearance of the table or the cleanliness of the lodging. Courteous treatment is received at all hotels, prices are reasonable, and there is not liable to be any exorbitant charge except at some of the fashionable watering places, but in order to prevent any misunderstanding whatever it is better to consider terms beforehand. Care should be taken in regard to drinking water not boiled. Railway restaurants are found at nearly every stop and furnish excellent provision for a moderate price.

The "Indicateur des Chemins de Fer" or railway guide should be carefully studied, as all trains do not carry the three classes. Plenty of time should be allowed to arrive at stations with baggage and occasionally it is advisable to economize in time by taking the express trains. Circular tour tickets from Paris are convenient and make quite a reduction in the regular fare. The best method for handling money is by letters of credit or express checks. In every city or town of any import there are reliable banks of the Credit Lyonnaise. These hints with a slight knowledge of the language will enable one at least to cover the territory with profit and little embarrassment, but to derive the real benefit of such a tour a knowledge of the French is indispensable.

These itineraries are given as an aid in arranging trips through the country west of Paris.

PARIS AND RETURN. SIXTY DAYS.

Paris.					
Chartres	1½	day	Plougastel	½	day
Brou	½	,,	Brest	2½	,,
Nogent	½	,,	St. Renan	½	,,
Le Mans	1	,,	Le Folgoët	½	,,
Solesmes	½	,,	Château de Kerjean	1	,,
Angers	1½	,,	St. Thégonnec	1	,,
Chemillé	½	,,	Morlaix	2½	,,
Clisson	½	,,	St. Pol de-Léon	1	,,
St. Philibert	½	,,	Huelgoat	1	,,
Nantes	2½	,,	Château de Tonquédec	1	,,
Châteaubriant	1	,,	Guingamp	1	,,
Guérande	1	,,	Tréguier	1	,,
Le Croisic	½	,,	St. Brieuc	1	,,
Redon	1	,,	Abbaye de Beauport	1	,,
Rochefort-en-Terre	½	,,	Lamballe	½	,,
Questembert	½	,,	Dinan	2½	,,
Ploërmel	1	,,	Léhon	½	,,
Josselin	½	,,	Dinard	1	,,
Elven	½	,,	St. Malo	1	,,
Vannes	1	,,	Châteauneuf	½	,,
Sarzeau	½	,,	Dol	½	,,
Quiberon	½	,,	Combourg	1	,,
Plouharnel	¼	,,	Rennes	1½	,,
Carnac	¼	,,	Vitré	1	,,
Locmariaquer	½	,,	Fougères	1	,,
Auray	½	,,	Laval	1	,,
Hennebont	½	,,	Evron	1	,,
Lorient	½	,,	Mayenne	1	,,
Quimperlé	1½	,,	Pré-en-Pail	½	,,
Le Faouet	1	,,	Alençon	1	,,
Quimper	2	,,	Sées	½	,,
Châteaulin	1	,,	Dreux	1	,,
Crozon	1	,,	Paris	½	,,

PARIS AND RETURN. THIRTY DAYS.

Paris		Brest	2½ day
Chartres	1½ day	Morlaix	2½ ,,
Le Mans	1 ,,	Guingamp	½ ,,
Angers	2 ,,	St. Brieuc	1 ,,
Nantes	2½ ,,	Dinan	1½ ,,
Guérande	1 ,,	St. Malo	1½ ,,
Ploërmel	1 ,,	Rennes	½ ,,
Josselin	½ ,,	Vitré	½ ,,
Vannes	1½ ,,	Laval	½ ,,
Carnac	1½ ,,	Mayenne	1 ,,
Auray	½ ,,	Alençon	1 ,,
Quimperlé	1 ,,	Dreux	1 ,,
Quimper	1½ ,,	Paris	½ ,,

ST. MALO AND RETURN. THIRTY DAYS.

St. Malo			
Châteauneuf	½ day	Quimper	1½ day
Dol	1 ,,	Châteaulin	1 ,,
Combourg	½ ,,	Brest	2 ,,
Rennes	2 ,,	St. Thégonnec	½ ,,
Ploërmel	1 ,,	St. Pol-de-Léon	½ ,,
Josselin	1 ,,	Morlaix	2½ ,,
Elven	1 ,,	Guingamp	1 ,,
Vannes	2½ ,,	Tréguier	½ ,,
Auray	1 ,,	St. Brieuc	1 ,,
Carnac	2½ ,,	Lamballe	½ ,,
Hennebont	½ ,,	Dinan	2 ,,
Lorient	1 ,,	Dinard	1 ,,
Quimperlé	1 ,,	St. Malo	½ ,,

ST. MALO AND RETURN. FIFTEEN DAYS.

St. Malo		Redon	1 day
Dinard	1 day	Guérande	½ ,,
Dinan	1½ ,,	Nantes	2 ,,
Ploërmel	½ ,,	Laval	½ ,,
Josselin	1 ,,	Vitré	1 ,,
Lorient	1 ,,	Rennes	1 ,,
Auray	1 ,,	Combourg	½ ,,
Vannes	1 ,,	Dol	½ ,,
Elven	½ ,,	St. Malo	½ ,,

JEPHSON'S WALKING TRIP OF FIVE WEEKS.

St. Malo	Sarzeau	Brest	Paimpol
Dinan	Carnac	Landerneau	Guingamp
Montfort	Auray	Le Folgoët	St. Brieuc
Rennes	Hennebont	St. Thégonnec	Lamballe
Ploërmel	Quimperlé	Morlaix	Plancoët
Elven	Rosporden	St. Pol-de-Léon	Dinard
Vannes	Quimper	Lannion	St. Malo
	Châteaulin	Tréguier	

REFERENCE BOOKS.

Baëdeker ....Handbook on Northern France.
Baring-Gould ...." Brittany."
Baudot-Dabot ...." Archives des Monuments Historiques."
Bell..................." Picturesque Brittany."
Bourassé............." Les Plus Belles Cathédrals de France."
Black................." Brittany and Touraine."
Blackburn ...." Breton Folk," and " Artistic Travel in Normandy and Brittany."
Bumpus..............." Holidays among the Glories of France."
Brossard........ ...." Geographie Pittoresque et Monumental de la France."
Cartailhac ...." La France Préhistorique."
Cattois. ...." Architecture Civile et Domestique."
Dunlop. ...." Wanderings in Brittany."
Edwards.............." A Year in Western France."
Gailhabaud .. .." Monuments Anciens et Modernes."
Guizot ... ." History of France."
Hallam ...." The Middle Ages."
Hare....... ....Handbook on Northwestern France.
Headlam............." Chartres "
Hutchinson ...." Summer Holidays in Brittany."
Jephson.............." Walking Tour in Brittany."
Larned ...." Churches and Castles of Medieval France."
Macquoid . ..." Through Brittany."
Massé . ..." Cathedral of Chartres."
Mérimée ...." Études sur les Arts au Moyen Age."
Menpes ...." Brittany."
Miln ...." Excavations at Carnac "
Miltoun . ..." Rambles in Brittany," and " The Cathedrals of Northern France."
Murray ....Handbook for France.
Musgrave .... " Rambles in Brittany."
Rouargue............" La Bretagne Pittoresque."
Sadoux . ..." Les Châteaux Historiques de la France."
Taine ...." Journeys through France."
Sturgis.. ... ." Dictionary of Architecture and Building."
Wendell. ...." The France of To-day."
Viollet le-Duc........" Entretiens sur l'Architecture," " Dessins Inedits," and " Dictionnaire Raisonne de l'Architecture."

AN INCENTIVE TO BEAUTY.

IN BUENOS AYRES there is a municipal commission for the encouragement of architecture. A prize — a gold medal and a diploma — is given each year to the architect of the most attractively designed structure erected, and the owner of the building is excused from payment of taxes which naturally would fall upon the property. For how long this exemption lasts we do not know, but it appeals to property owners who might not be moved by the moral satisfaction of having a prize winning building. The same city has a law providing that all streets opened in the future must be at least 17.32 meters (almost sixty feet) wide. Height of structures is prescribed according to the width of the street, and the law is rigidly enforced. The republic and the city set a high example of taste and generosity in adornment of the national capital, and in consequence the city is singularly beautiful and attractive. Even the markets and slaughter houses are not without distinction as architectural compositions.

THE latest bulletin of the Forestry Division of the Department of Agriculture states that " We are now cutting timber from the forests of the United States at the rate of 500 feet, board measure, a year for every man, woman, and child; in Europe they use only 60 board feet per capita."

Speculation upon how long the forests will supply this inordinate rate of consumption should be abandoned and immediate steps taken to stop the waste of both log and board timber which none will deny exists.

We use wood for construction where other nations would and where we also should use brick or other incombustible material. " The enormous fire losses in this country, by comparison with losses from like cause in Europe, point to this conclusion," says the Philadelphia *Record*, and asks, " Is it a mere coincidence that the per capita of fire losses in this country is nearly ten times that of the countries of central Europe, or greater in almost exactly the same ratio as our use of combustible building material is greater? "

IN EXAMINING many of the buildings at Washington occupied by the various departments, Mr. Marsden Manson, who is chief engineer of San Francisco, says:

" Buildings in which are stored data and documents of almost incalculable value, I find are mainly structures which would not rank higher than San Francisco's third-class buildings. It is astounding that the Government faces such risks. Note the Geological Survey fire. The floors in that building are of wood; so are the doors and file cases and furniture, and in that building are data many times the value of the structure. Note the Interior Department, with its valuable records. You will find wooden shelving, wooden furniture, and wooden window frames. Now, a building of that kind is not safe. I would suggest for economy that the Government buildings be put in better shape to resist possible fire."

Standard Architectural Books — IV.

REGINALD BLOMFIELD, A.R.A., Professor of Architecture to the Royal Academy, author of many works on architecture. A History of Renaissance Architecture in England, 1500–1800. London, George Bell & Sons, 1897; 4to (.285 by .2 by .03), 19 + 431 + 10 p., 109 pl., 68 paged pl., cloth, 50 shillings net. A Short History of Renaissance Architecture in England, 1500–1800. London, George Bell & Sons, 1900; 8vo (2 by .135 by .03), 336 p., 134 ill., cloth, 7s. 6d., net. The influence of the Italian and French Renaissance upon English life is interesting in many ways, but especially as it is expressed in the architecture of the country. Blomfield's book treats the period broadly.

John Alfred Gotch, F.S.A., F.R.I.B.A., and W. Talbot Brown, A.R.I.B.A. Architecture of the Renaissance in England, illustrated by a series of views and details from buildings erected between the years 1560–1635 with historical and critical text. London, Batsford, 1894; fol. (.48 by .365 by .045), 2 vols., ill., 145 pl., 147 shillings net. The monumental works of Nash and Richardson on the Renaissance in England lie quite beyond the limits of our field. An excellent substitute is this book of Gotch and Brown, with good text and explanatory drawings, and an abundance of photographic illustrations.

Andrew Noble Prentice, Associate of the Royal Institute of British Architects. Renaissance Architecture and Ornament in Spain; a series of examples selected from the purest works executed between the years 1500–1560, measured and drawn, together with short descriptive text. London, B. T. Batsford, no date (preface 1893); fol. (.475 by .365 by .03), 10 + 16 p., 60 pl. (in line), 50 shillings. Prentice's book on Spanish architecture has long had the reputation of being one of the best books to be found on an architect's table, not only for the draughtsmanship of its plates but also for the selection of the objects rendered. The author has confined his attention to the Plasteresque, that charming early style which corresponds to the *Cinque-cento* in Italy and the style of Francis First in France. He has chosen for representation little known buildings which especially express the peculiar charm of the Spanish temperament.

Colonial.

William Rotch Ware, Editor. The Georgian Period, a collection of papers dealing with "Colonial" or XVIII century architecture in the United States, together with reference to earlier provincial and true colonial work. New York, American Architect and Building News Company, 1899–1902; small fol. (.36 by .28 by .065), 3 vols., ill., 570 pl. in portfolios, $60 unbound. The Georgian Period, students' edition, consists of the leading articles on old Colonial architecture from the complete edition and one hundred full-paged plates chosen for their value to students, price $15. Colonial architecture, which term includes practically all American architecture based on classic types made before the middle of the nineteenth century, has much interest for us not only on account of its inherent beauty and refinement, but also from the fact that it is the nearest approach to a national style which we have yet produced. There are many excellent bound collections of photographs which, however, have not sufficient explanatory text to warrant their admission to this list as books. Quite the most comprehensive and dignified treatment of the subject is to be found in the three volumes on "Georgian Architecture" published by the American Architect Company. The term "Georgian" is a little misleading, but it is partially justified by the introduction of a chapter on the contemporary work in England from which the American style is mainly derived. Perhaps it is just as well to treat the American work as a phase of a larger matter.

Glenn Brown, F.A.I.A., Secretary of American Institute of Architects. History of the United States Capitol. Washington, The Government Printing Office, 1900–1903; small fol. (.39 by .3 by .065). Two vols., 255 p., 23 portraits, 322 photogravure plates, cloth, $30., for sale by the author. The Capitol at Washington is not strictly colonial but it belongs to the general neo-classic period which goes by that name, and is the most important and the most successful monument which it may show. There are many fine things about it, which are revealed with keen appreciation and excellent judgment by the Secretary of the American Institute of Architects. There is material for a similar work on the New York City Hall.

Oriental.

Ralph Adams Cram, Architect, Fellow of the American Institute of Architects, Member of the Society of Arts, London, Fellow of the Royal Geographical Society. Impressions of Japanese Architecture and the Allied Arts. New York, The Baker Taylor Company, 1905; 8vo (.245 by .165 by .04), 227 p., 52 pl., cloth, $2.00. It may well be true that the most powerful influence felt by the art of Europe in the nineteenth century came from Japanese painting. Japanese architecture has not played and cannot play such an important rôle. It has abundant charm, however, and its delightful presentation in Mr. Cram's little book is a source of constant pleasure and inspiration.

Gastoñ Migeon, Conservateur at the Louvre Museum; Henri Saladin, Architect. Manuel d'Art Musulman; vol. I, L'Architecture par H. Saladin; vol. II, Les Arts plastiques et industriels, par H. Migeon. Paris, Picard et fils, 1907; 8vo (.22 by .17 by .04), 2 vols., ill., pl., cloth, 39 francs. On the architecture and art of Mohammedan peoples there are superb, ponderous books which are quite without the limits of our present effort. All that is most valuable, however, is considered in these two little volumes, which will be most helpful in any architectural library.

HOUSES, CHURCHES, SCHOOLS, ETC.

FOR the study of buildings by classes there is no substitute for a large and well indexed body of periodicals. Information accumulates in the journals, and books are made after this accumulation has become considerable. The preparation of a book also requires time; so that the printed volume is always a little late. Books, moreover, cover only a limited number of classes, whereas periodicals cover all classes of buildings. The manuals, however, of different kinds of buildings have been considered carefully, and it is hoped that the following list contains the most useful material.

Domestic Architecture.

Eugène-Emmanuel Viollet le Duc; Histoire de l'Habitation Humaine: translated by Benjamin Bucknall. The Habitation of Man in All Ages. Sampson Low, Marston, Searle, and Rivington, 1876; 8o (*.225* by .15 by .*03*), 16+*394* p., ill., cloth, 16s. To make our list complete we need a standard work on the history of the development of domestic architecture, and are fortunate in having one by a great master translated into English, and cast in an attractive form.

Andrew Jackson Downing (b. 1815, d. 1852), landscape architect and author of "Cottage Residences" and many other works. The Architecture of Country Houses, Including Designs for Cottages, Farmhouses, and Villas. New York, D. Appleton, 1866; 8o (.*24* by .16 by .055), 10+484 p., *320* ill. In the period before the war there was certainly not the culture or brilliancy which may now be found in all fields of art, but there were many men of serious endeavor. Among them, Downing held a notable place. His book on country houses is quiet and thorough and contains many interesting designs.

Old English Cottages and Farmhouses. A series of volumes designed to illustrate the most typical and beautiful remains of minor domestic architecture in England. W. Galsworthy Davie and E. Guy Dawber, architects. Old Cottages and Farmhouses in Kent and Sussex. London, B. T. Batsford, 1900; 4to (.*25* by .19 by .03), 10+*28* p., 100 plates printed in collotype from a special series of photographs taken by W. Galsworthy Davie; cloth, *21*s. James Parkinson and E. A. Ould, F.R.I.B.A. Old Cottages, Farmhouses, and Other Half-Timber Buildings in Shropshire, Herefordshire, and Cheshire. London, Batsford; New York, John Lane, 1905; 4to (.*25* by .19 by .03), 12+*39* p., 100 plates in collotype by James Parkinson; cloth, *21*s. net. W. Galsworthy Davie and E. Guy Dawber. Old Cottages, Farmhouses, and Other Stone Buildings in the Cotswold District; Examples of Minor Domestic Architecture in Gloucestershire, Oxfordshire, Northants, Worcestershire, etc. London, Batsford; Boston, Bates & Guild Co., 1905; 4to (.*25* by .19 by .03), 10+*39* p., 100 plates, cloth, *21*s. net. The domestic architecture of all countries is interesting; but perhaps that of England has more charm and more valuable suggestion The early types are well presented in this series. For the larger and more important class of residences the collector is referred to the books included under English Renaissance architecture.

J. H. Elder-Duncan, author of "The House Beautiful and Useful." Country Cottages and Week-End Houses. London and New York, John Lane, 1907; 4to (.*295* by .*23* by .025), *224* p., ill., cloth; $3.50. Domestic architecture in England has made great advance in the last decade or so, which has been well illustrated in special works. In our limited list this book by Elder-Duncan will introduce the subject sufficiently.

R. A. Briggs, F.R.I.B.A. Bungalows and Country Residences; a Series of Designs and Examples of Executed Works. London, Batsford, 5th ed., 1907; 4to, cloth; 12s., 6d. The word bungalow, originally applied to light, temporary houses in India, has been found useful to cover a light class of dwellings, which are intended to be picturesque and attractive in design. There is a considerable literature on the subject which is well introduced by this book by Briggs.

Robert W. DeForest and Lawrence Veiller, editors. The Tenement House Problem; Including the Report of the State Tenement House Commission of 1900; by various writers. New York, Macmillan, 1903; 8o (.*29* by .16 by .045), *2* vols., ill., portrait, plates, maps, tables; cloth; $6.00 net. In the literature on this important matter it is easy to determine upon the best book for our purpose. DeForest & Veiller treat the "Tenement House Problem" broadly, without local limitations, although their chief interest is in conditions presented in New York City.

Churches.

Ralph Adams Cram. Church Buildings; a Study of the Principles of Architecture in Their Relation to the Church. Boston, Small, Maynard & Co., 1901; 8o (.*24* by .165 by .*02*), 16+*227* p., frontispiece, ill., pl., plans; cloth, $*2*.50. Architects write so little on matters which they understand best, that it is refreshing to read the work of a master on the specialty which most attracts him. Mr. Cram's little book has much for the architect, but it is more helpful to the churchman.

Ralph Adams Cram. English Country Churches. Boston, Bates & Guild, 1898; small fol. (.*36* by .295 by .03), *3* p., 100 plates in heliotype; $10 unbound. As Mr. Cram's interest in church building centers upon English precedent, his general book on the subject is well supported by this excellent collection of photographs from fine English examples.

John Raphael Brandon (1817–1877), and Joshua Arthur Brandon (1822–1847). Parish Churches; Being Perspective Views of English Ecclesiastical Structures; Accompanied by Plans Drawn to a Uniform Scale and Letterpress Description. London, George Bell, 1848; 4to (.*26* by .13 by .045), 11+126 p., 158pl.; $4.89 in 1891. The two Brandons did so much for the better understanding of English medieval architecture that we may welcome the introduction of one of their best works. The small plates are charmingly done and present a fine series of examples, exteriors, interiors, and plans.

Baths.

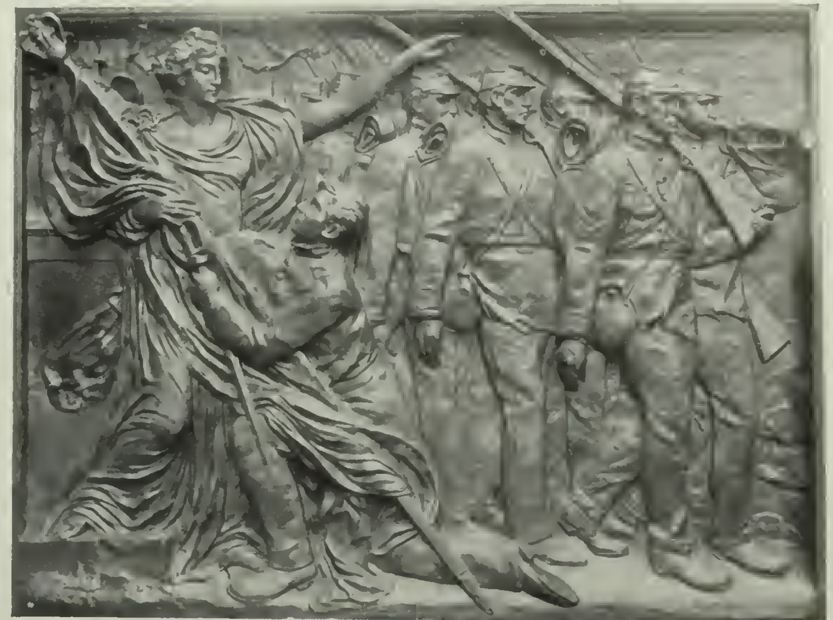
William Paul Gerhard, C.E. Modern Baths and Bathhouses. New York, John Wiley & Sons; London, Chapman & Hall, limited, 1908; 8vo. (.*23* by .15 by .03), 16+311 p., 130 ill., cloth; $*3*.00 net. There is a growing literature on baths, but Gerhard's book is sufficient for our purpose. It gives the history of baths, the practice in all countries, and all forms of modern development. There is an excellent bibliography.

The Mayor's Committee of New York City. Report on Public Baths and Public Comfort-Stations. New York City, 1897; 8o (.*25* by .16 by .*02*), 195+9 p., pl. This is an excellent book on baths. It has also a wider application, being concerned with all forms of public comfort stations.

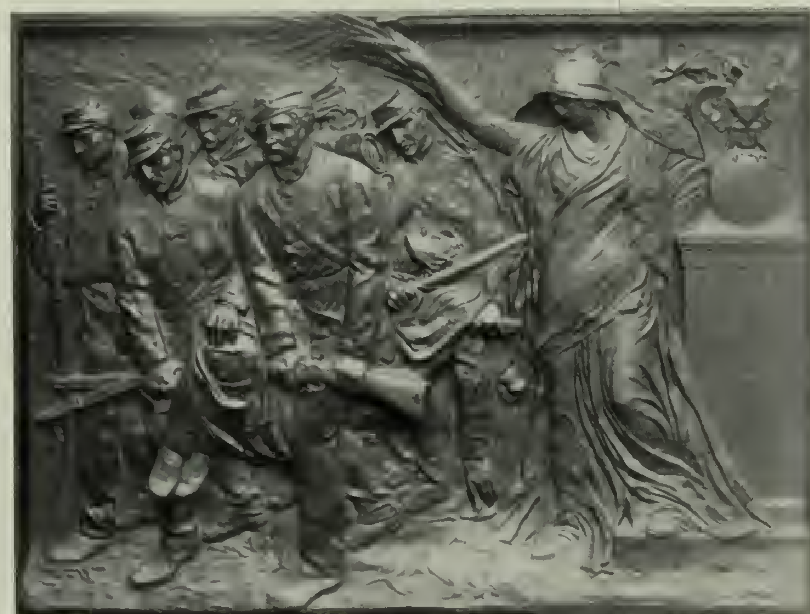
OPEN COURT.
(23 feet square.)

DINING ROOM.

Residence of
F. J. Sterner,
Architect,
New York City.



THE DEPARTURE.



THE RETURN.

DOUGLAS COUNTY SOLDIERS' AND SAILORS' MEMORIAL, TUSCOLA, ILL.

The Arch is of light cream enamel terra cotta, made by Northwestern Terra Cotta Company. The Panels are executed in bronze.
Professors Newton A. Wells and James A. White, University of Illinois, Architects.

Editorial Comment and Miscellany.

THE LOTOS CLUB, NEW YORK.

(See illustrations in Plate Forms.)

ON ACCOUNT of the plan conditions and the requirements of the various floors and consequent spacing and sizes of the window openings, the façade of the Lotos Club presented certain difficulties in composition. It became apparent from the outset that no vertical architectural treatment could be used as the windows were of varying widths and did not come over each other. It seemed to the architect that the exterior should express the three divisions of the floors;—the first and second which were devoted to the usual club requirements, the next three which were used for bedrooms, and the picture gallery floor which required a blank wall treatment. This meant three horizontal bands of almost equal height. Considering these conditions it seemed best to treat the façade as one large rich surface having an interesting texture and in which the windows would happen simply as incidents.

Above the ground floor the façade is built up of "Tapestry" brick. These bricks are twelve and one half inches long, by two and five eighths inches thick, and four inches deep. The surface is very rough and varies from cream white to light brown, the general color effect being a very light brown. The texture being rough absorbs the light, and gives to the building a particularly soft and beautiful tone. The mortar consists of coarse gravel, Portland cement, and a small quantity of lime. The joints are five eighths of an inch wide. The color of the mortar is a brownish gray. The headers forming the diagonal lines measure four inches by two and five eighths inches, and are cream white, standing out in a brownish gray field with considerable distinctness without making an objectionable contrast. At the intersection of the white lines thus formed is a Greek cross made up of a yellow tile and four square bricks, each square brick of a brownish background and having a white lotus flower in low relief. The pattern work panels between the fifth story windows are made up of a combination of the brownish gray brick used in the field, and the white brick used for the diagonal lines. The belt course of the sixth floor consists of a distinctly brown brick with a chain-work pattern in light brownish gray used in the field. The spandrels and belt course over the sixth story windows are made up of small squares in which the lotus figure is alternated with the brownish gray of the field, with single and double crosses in still darker colors, as shown in the illustrations. Altogether there are sixteen different kinds of brick used in the façade.

THE DOME OF THE NEW GIRARD TRUST BUILDING, PHILADELPHIA, PA.
The largest masonry dome in the United States. Over 100 feet in diameter; a free span without intermediate steel work, carrying the heavy 5 inch marble covering for the finished roof. Work executed by R. Guastavino Company.
McKim, Mead & White, Architects.

The windows have been given no architectural treatment, but are enriched by relieving arches of lighter brick, brick and slate sills, ventilation openings, flower balconies, and other accessories, which give an interest to the windows and make them count as part of the wall texture rather than as framed openings. The brick joints of the wall surfaces are treated variously; some portions are raked out and others are flush. The joints of certain patterns are picked out in different colored mortar. The picture gallery wall is enriched with colored terra cotta.

The façade is capped with a widely projecting cornice treated with rich beams and panels, all executed in metal and painted in rich colors on the soffits. The free use of color in the façade has been handled with a certain reserve, yet the impression given is of a rich polychrome surface. The building while reminiscent of the Italian renaissance is distinctly a modern American building.

THE official committee on congestion of population in New York City has vigorously grappled with the problem of practical and just building restrictions. It has found a growing sentiment among real estate experts and others practically interested in building in favor of height restriction. The committee's investigations have established the following facts: The natural ratio between

FAIENCE PANEL, FOR SCHOOLHOUSE, CINCINNATI, OHIO.
Designed by W. P. McDonald and executed by Rookwood Pottery Company.
Gaber & Woodward, Architects.

GEORGE A. SCHONEWALD. LE ROY BARTON.
Awarded First Prize.

H. K. CULVER.
Awarded Second Prize.

the demand for office room and the demand for ground floor space determines that only a small proportion of buildings, even in the congested district, can profitably be built high. (In proof of this the committee adduces abundant figures.) Office buildings planned in 1908 in the office district give room for nearly four times as many people as the average demand during the past six years. It urges that "every great office building erected will absorb the demand for office space which should be distributed over a large area." The limit of 300 feet tentatively proposed by the Building Code Revision Commission means practically no restriction, and the committee tells land owners quite plainly: "You will probably lose money by the erection of high office buildings, if you own small lots covered by low buildings assessed as though they were earning an income from twenty-five story buildings."

ST. MARY'S CHURCH, McKEESPORT, PA.

(See illustrations in Plate Forms.)

THE church is built of a hard burnt red brick with Indiana limestone trimmings. The roof is of wood construction covered with slate. The floors of the vestibule and aisles are of granita — the sanctuary floor being of marble mosaic with ornamental borders. The altar is of marble inlaid with Venetian mosaic and colored marbles. The wall decorations consist of a series of sixteen paintings on heavy canvas which is pasted to the walls. The communion rail and confessionals are of oak with a fair amount of carving, as are the pews which are simple in design. The cellar is only large enough to accommodate the heating plant. The seating capacity of the church is six hundred and fifty. The cost of the church was ten cents per cubic foot, which includes furnishings, fixtures, and wall decorations. The building was cubed from one half of cellar to one half of roof in height. The total cost of the church was $50,000.

THE HOSPITAL BUILDING COMPETITION — THE SUCCESSFUL COMPETITORS.

GEORGE A. SCHONEWALD, who with LeRoy Barton was awarded the first prize of $500, is at present connected with the office of Thomas Tryon, architect, New York City, he

E. P. CHRYSTIE.

JOHN R. LAUTENBACH.
Awarded Third Prize.

E. B. MC KINNEY.

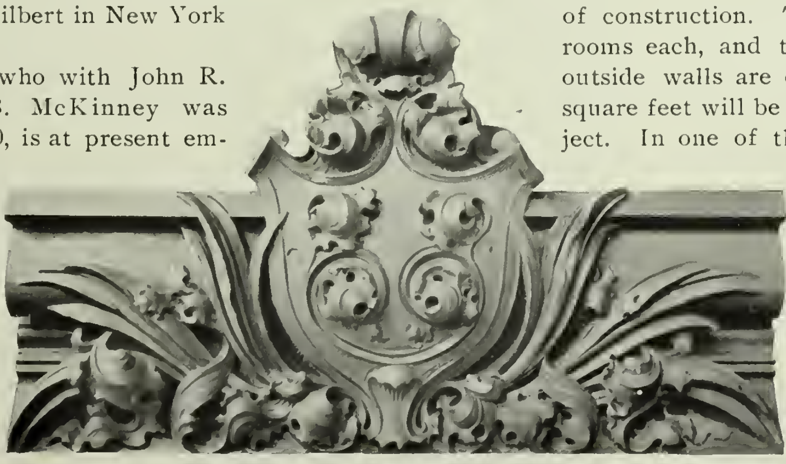
PRIZE WINNERS IN THE HOSPITAL BUILDING COMPETITION.

LIBRARY, HAMLINE UNIVERSITY, ST. PAUL, MINN.
Built of No. 440 Bronze Brown Brick, Made by Twin City Brick Company, St. Paul, Minn.
Clarence H. Johnson, Architect.

having previously been employed in the offices of Rossiter & Wright and Helmle & Huberty. Mr. Schonewald has been for four years a member of the Atelier Prevot of New York City. Mr. Barton is also employed in the office of Mr. Tryon, and obtained part of his architectural education in the office of Helmle & Huberty. He too is a member of Atelier Prevot.

Harry K. Culver, who was awarded the second prize, $200, received his early architectural education in the office of Pratt & Koeppe, Bay City, Mich. For the past seven years he has been connected with the office of Cass Gilbert in New York City.

Edward P. Chrystie, who with John R. Lautenbach and E. B. McKinney was awarded third prize, $100, is at present employed in the office of Hunt & Hunt, architects, New York City. He is a member of the Atelier Hornbostel. Mr. Lautenbach is a graduate of Washington University, and part of his early training was obtained in the office of William B. Ittner, St. Louis. He is now a member of the Atelier Hornbostel. Mr. McKinney received his architectural training in the offices of Warren & Wetmore and Palmer & Hornbostel. He is at present a member of Atelier Hornbostel.



DETAIL BY F. C. BONSACK, ARCHITECT.
Winkle Terra Cotta Company, Makers.

A LARGE estate upon the borders of Orange and South Orange, N. J., and owned by the Page family, is to witness an instructive building operation. One of the heirs of the late Henry A. Page, with a view to the development of the property, retained an engineer to make a special investigation of concrete, hollow tile, and other building materials to determine their comparative fire-resisting qualities. As a result, hollow tile was adopted, and houses of this material have been planned by Architects Squires & Wynkoop and Rossiter & Wright of New York. Six houses are now in course of construction. They have eight or ten rooms each, and the partitions, floors, and outside walls are of tile, of which 40,000 square feet will be used for the whole project. In one of the houses is a floor span of eighteen feet.

THE bad air, lighting, and acoustics of the House of Representatives' chamber at Washington led that body to appoint a commission to devise improvements. Three schemes of reconstruction, each involving an expenditure of about half a million dollars, have now been proposed. Each of them contemplates reducing the size of the house chamber and increasing the seating capacity of the galleries. Each contemplates also bringing the floor of the chamber to the outer wall of the Capitol, thus admitting natural light and air. The bench system such as obtains in the English House of Commons is recommended as being less wasteful of space than the present 391 desks. One plan contemplates a return to the semicircular seating arrangement of Statuary Hall, that part of the Capitol in which the House sat prior to 1859. The other two plans call for a chamber rectangular in form. Any attempt to remove the desks will probably arouse considerable opposition. Elliott Woods, Superintendent of the Capitol, is chairman of this commission.

SCHOOLHOUSE AT SOUTH BEND, IND.
Built of No. 12 Porter Hydraulic-Press Brick.
Freyermuth & Maurer, Architects.

THE Grand Rapids Tuberculosis Sanatorium was held up as a model in the recent tuberculosis congress at Washington. Yet it has been declared after an investigation by local city officials to be inadequately heated, its patients insufficiently and poorly fed and governed by obnoxious rules. The committee reports that the patients sleep on the open verandas, but are rolled into the inner rooms of the shacks to dress. These rooms are said to be uncomfortably cold, as is also the Administration building. Cracks one half an inch wide are to be seen in the walls, and smoke and soot fill the rooms, the pipes having been improperly adjusted. Since experts have praised the building, the question arises: What do experts consider essentials?

PANEL FOR THEATER, J. E. O. PRIDMORE, ARCHITECT.
Northwestern Terra Cotta Company, Makers.

THE secretary of the treasury has secured for the proposed new building for the Bureau of Printing and Engraving the tier of three squares in Washington extending from B Street south to the Potomac River and bounded by 14th and 15th Streets, Southwest. With the acquisition of this land all the property south of Pennsylvania Avenue all the way to the river and west of 14th Street will come into possession of the government and will add a substantial strip to the area of the mall. The new structure, therefore, will have all the advantages of park-like surroundings and none of the restrictions of the rigid building lines, obtaining elsewhere in the city.

DETAIL BY SCHWARTZ & GROSS, ARCHITECTS.
New York Architectural Terra Cotta Company, Makers.

BUSINESS and religion will be well mixed, architecturally, if the First German Evangelical Protestant church of Pittsburg carries out its plans. Its church building is now on a very valuable site, but, according to the original deeds, the land must always be used for church purposes. The solution of the question is certainly thrifty, for a fourteen story office building is to be built above and around the present church, with the church façade showing, of course, in the lower middle of the structure.

THE connecting link between the north and south parkway systems of Chicago is to be either a boulevard built on the surface or, as the Commercial Club has recommended, elevated upon a long series of arches. The former is urged on the grounds of economy and expedition by the Michigan Avenue Improvement Association, representing property owners, who have agreed to share in paying two thirds of the condemnation cost of the additional thirty-four feet needed to widen Michigan Avenue to a boulevard width of one hundred feet. This association recommends that the Commercial Club withdraw its elevated scheme.

IN THE *Alumni Weekly*, published at Princeton, Mr. Ralph Adams Cram gives the essentials of his scheme for improving the architectural plan of the university. The central space around the historic cannon is to be an enclosed and guarded area. An existing roadway, and the vehicles it attracts, is to be removed to the south beyond the two society buildings, "Clio" and "Whig," and eventually a marble terrace is to be built connecting them and supporting the campus above while obscuring the driveway below. To permit the success of this scheme and to obtain a splendid axis enclosed by the distant hills Mr. Cram declares that Dodd Hall will either have to be removed and reduced in height or done away with altogether.

LONDON is to have a New National Theater, established as a memorial to Shakespeare and controlled by a board of trustees chosen from men prominent in the literature, drama, music, and education of the day. Perhaps it was New York that set the example. Howbeit, the prophecy may be ventured that endowed theaters will be established in buildings especially constructed for the purpose in at least six of our leading cities.

MAIN ENTRANCE, PAROCHIAL SCHOOL, BROOKLINE, MASS.
Panel, after Della Robbia, reproduced in colors by Atlantic Terra Cotta Company.
F. Joseph Untersee, Architect.

IN GENERAL.

"Tapestry" bricks made by Fiske & Co. were used in the façade of the Lotos Club, Donn Barber, architect, illustrated in the Plate Forms of this issue.

B. H. Shepard has retired from the firm of Davis, McGrath & Shepard, architects, and a new copartnership has been formed which includes Calvin Kiessling, under the firm name of Davis, McGrath & Kiessling; offices, 1 Madison avenue, New York, and 8 Beacon street, Boston.

Gladding, McBean & Co., manufacturers of architectural terra cotta, have removed their executive offices to the Crocker Building, San Francisco, Cal.

Stebbins & Watkins have opened an office for the practise of architecture at 42 Chauncey street, Boston. Manufacturers' catalogues and samples desired.

Wilder & White have removed their offices from 5 East 42d street to 156 Fifth avenue, New York City.

Janssen & Abbott, architects, announce the removal of their offices from the Machesney Building to the Renshaw Building, Liberty avenue and 9th street, Pittsburg, Pa.

Karl F. J. Seifert, architect, has opened an office for the practise of architecture at 25 West 42d street, New York City. Manufacturers' catalogues and samples desired.

L. Rodman Nichols, architect, announces the removal of his office to 208 South Center street, Schenectady, N. Y.

H. A. Walters has been elected fourth vice-president of the Hydraulic Press Brick Company, with headquarters at Chicago.

One of the most conspicuous sites for a building in this country is that occupied by San Francisco's Cliff House. This ugly building that gave for many years a first impression to those entering by the Golden Gate has recently been destroyed by fire. It is to be replaced by a structure of imposing architectural character and destined to be a fine ornament to the city.

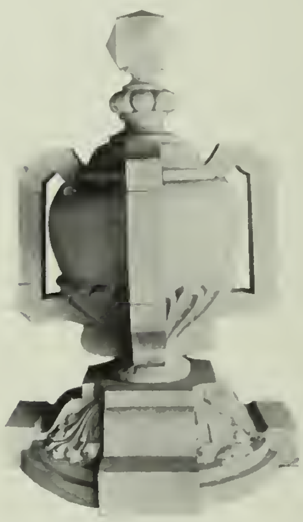
DETAIL, ST. BARBARAS' R. C. CHURCH, BROOKLYN, N. Y.
South Amboy Terra Cotta Company, Makers.
Helmle & Huberty, Architects.

The precarious condition of the Town Planning Bill introduced into the English Parliament by John Burns has led the philanthropist, Mr. W. H. Lever, to donate annually for three years a sum ranging from £500 to £1,000 for instruction and research in the twin subjects of town planning and skyscraper architecture. Opposition to Mr. Burns's bill is centered about the limitation of the number of cottages per acre as the basis of a town planning scheme.

The architects of Indianapolis have organized under the name of "Architects' Association of Indianapolis" with a large charter membership. It has been fully ten years since the architects of that city have had an organization, and the lack of one has been seriously felt on more than one occasion where the interests of the profession have been at stake.

The new association includes practically all the best architects of the city. The officers are: President, Arthur Bohn; vice-president, Clarence Martindale; secretary and treasurer, Henry Dupont; directors, Wilson B. Parker and Anton Scherrer.

At the annual meeting of the Boston Society of Architects these officers were elected: President, Ralph Adams Cram; vice-president, Arthur G. Everett; treasurer, Charles K. Cummings; secretary, Edwin J. Lewis, Jr.; executive committee, Clarence H. Blackall, Louis C. Newhall, Alexander W. Longfellow.



DETAIL BY EDWARD A. QUICK & SON, ARCHITECTS. New Jersey Terra Cotta Company, Makers.

Two blocks on the south side of Washington Square, New York, were chosen by the Courthouse Board as the best site for the new $7,000,000 county courthouse. It was the fourth site chosen, since the Board was authorized by law in 1903, and the selection was endorsed by a committee of four supreme court judges. Nevertheless, opposition straightway set in, led by the New York County Lawyers' Association and joined by the residents of the quiet Washington neighborhood. These influences prevailed at the meeting of a special committee of the Board of Estimate and Apportionment and that committee will recommend the rejection of the Washington Square site as being inconvenient and inaccessible.

The proposed New York State Lunatic Asylum presents another struggle to determine upon a site. About a year ago the Lunacy Commission was authorized by the legislature to have plans prepared for an elaborate group of buildings with a view to utilizing the old Creedmoor Rifle Range on Long Island. State architect Ware has been at work upon these up to the present, when by a bill introduced by Senator Raines authorizing the commission to sell or exchange the Rifle Range and to build nearer Brooklyn, the subject of location is again opened. New York real estate operators are astir and ready to bid for the Rifle Range if thrown upon the market, for it would make a suitable nucleus for a new suburb.

DETAILS BY CLINTON & RUSSELL, ARCHITECTS. Conkling-Armstrong Terra Cotta Company, Makers.

In the case of the new immigration station proposed for the port of Philadelphia a fine site at Gloucester, New Jersey, was recommended by the commercial bodies of Philadelphia and practically determined upon by Secretary Straus; but the slip came in acquiring it. The owners of the property had patiently negotiated with the Government for nearly a year and had offered the land for an immigrant station at a figure less than other parties offered for it. Tardiness of the Department of Commerce and Labor in acting in the matter has caused the site to be disposed of to private parties and much to the disappointment of Philadelphians. If indeed their hopes are to be revived, it is possible that Uncle Sam will be "held up" by someone for a profit.

The Portland Architectural Club, Portland, Ore., will hold its Second Annual Exhibition in the galleries of the Museum of Fine Arts, March 22d to April 10th.

The First Exhibition of the Minneapolis Architectural Club, supported by the Minnesota Chapter of the American Institute of Architects, will be held in the Builders' Exchange, April 17th to May 3d.

THE BRICKBUILDER

VOLUME XVIII — MARCH 1909 — NUMBER 3

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

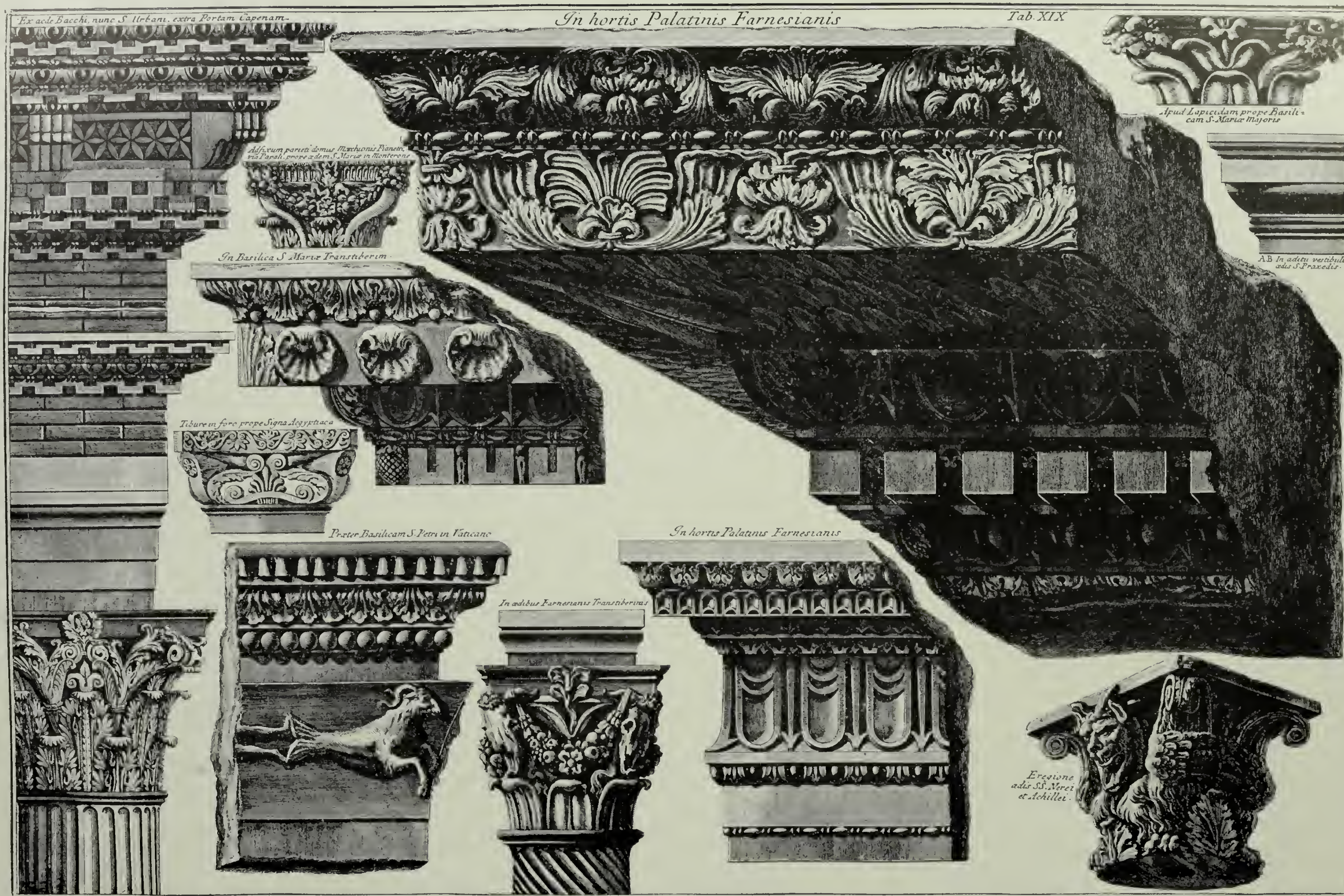
CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

WILLIAM ADAMS; GROSVENOR ATTERBURY; H. VAN BUREN MAGONIGLE; PARISH & SCHROEDER; CHARLES A. PLATT; CHARLES F. SCHWEINFURTH; HOWARD VAN D. SHAW; WELCH, SMITH & PROVOT AND BOWEN BANCROFT SMITH, ASSOCIATED; W. CARBYS ZIMMERMAN.

LETTERPRESS



ARCHITECTURAL DETAILS FROM ANCIENT ROMAN BUILDINGS. GIOVANNI BATTISTA PIRANESI, DEL.

THE BRICKBVILDER

VOL. 18 NO. 3 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· MARCH 1909

Gymnasiums—Their Plan and Equipment—II.

BY M. B. REACH.

THE university, preparatory school, high school, and Y.M.C.A. combine with their scheme of educational gymnastics, free recreative work and athletics. It is with the latter particularly that we are more apt to find confliction with gymnasium work and a certain amount of "give and take" made necessary. In most universities and preparatory schools, as well as high schools, gymnasium work is recognized as a feature of the regular curriculum and is compulsory. Athletics, while voluntary, form an important factor in student life, and as probably no other department of the institution is so effective in promoting that *esprit de corps* that pervades the student body of to-day, athletics must be accepted at their full value and every means offered to properly promote and care for their development. Comparatively few of the student body to any great extent indulge in indoor athletics, however; their physical training comes in the more prosaic gymnasium work, and the welfare of the majority should not be unnecessarily encroached upon. Experience would seem to prove that a majority of gymnasiums planned to-day are entirely insufficient in their accommodation of work demanded. This criticism is made with gymnasium work only in mind. The added feature of athletics emphasizes the need and it is reasonable to suppose that time will increase it. Physical training is becoming more and more a factor in educational life.

I believe that the most practical scheme (and that which is most practical is always best) is a separation of the two features. I hold this as more especially true in college work. One of our newest university gymnasiums now in process of construction has a gymnasium floor approximately 70 by 100 feet and in juxtaposition thereto an indoor "athletic field" 140 feet wide, 190 feet long, with banked track and dirt floor. I recall a state normal school gymnasium where two floors are given over to gymnastic and athletic work. The building was approximately 210 feet long, 70 feet wide; the lower room had a ceiling height of about 17 feet, the upper room having gabled roof with trusses about 20 feet from floor. Various indoor games were played in the lower room, which was otherwise free from apparatus, and regular gymnastics carried on in the upper room. Arrangements such as these create ideal conditions in the matter of equipment and also in the general scheme of work; one department does not interfere with another and the separate work of each is carried on to the best advantage.

Lack of space and the fact that our currency is not always as elastic as our wishes would direct, compel, in a majority of cases that one room serve dual purposes. It is with that type I will deal as applied to colleges and preparatory schools.

The estimated amount of space required per capita in drill or mass work is placed varyingly from 35 to 50 square feet. Obviously an architect should know prior to drafting plans what his maximum working plant must be. There is a certain minimum he should not go below anyway and congestion must be avoided if he is to make his plant adequate to its needs. It would be safe to estimate on the larger number of square feet above given in applying his rule. Class work in gymnasiums is constantly expanding. One college director recently informed the writer that he aimed ultimately to handle 300 on his floor simultaneously. Accepting that figure as a basis we find that his gymnasium should contain 15,000 square feet (which it doesn't). Applying the rule that I outlined in the original pages of this article, the room would measure 100 by 150 feet. I will, however, prove that rule by establishing an exception in the case of an exceptionally large plant. I believe when the width of the room has reached 80 feet and the length exceeds 120 feet the additional space can well be added to the length; that 80 by 190 feet is a better size gymnasium than 100 by 150 feet. Particularly where athletics and gymnastics are combined, different work at opposite ends of room would be the more isolated. Allowing for a running track of from 8 feet to 10 feet wide it establishes a width suitable for the most popular of gymnasium games,— basket ball — and would comfortably provide for three courts; from the athletic standpoint it would offer opportunity for 60 yard dashes and give a longer "straight away" on the track, and allow generally for a better arrangement of events.

Following is a typical equipment for a gymnasium of the above character: Twenty-four chest machines, twenty-four bar stalls, twenty-four bar stall benches, six vaulting horses, six vaulting bucks, six parallel bars, six pairs jumping standards, twelve jump boards, six horizontal and vaulting bars, twelve climbing ropes, six pairs flying rings, ten traveling rings, one incline board, six spring boards, six adjustable ladders, mattresses, three pairs basket ball backstops.

Fig. 6 illustrates a gymnasium of size specified with equipment in place. This equipment is not a complete assortment of required apparatus in any sense of the word. There are numerous individual pieces, regular and special, to be included, and much in the line of small miscellaneous material. The items shown, however, are the groundwork of the gymnasium — apparatus that is used collectively by "squads" or "classes." I show permits of larger squads as several may be engaged at the same time.

Working on a unit basis of six it is desirable to pre-

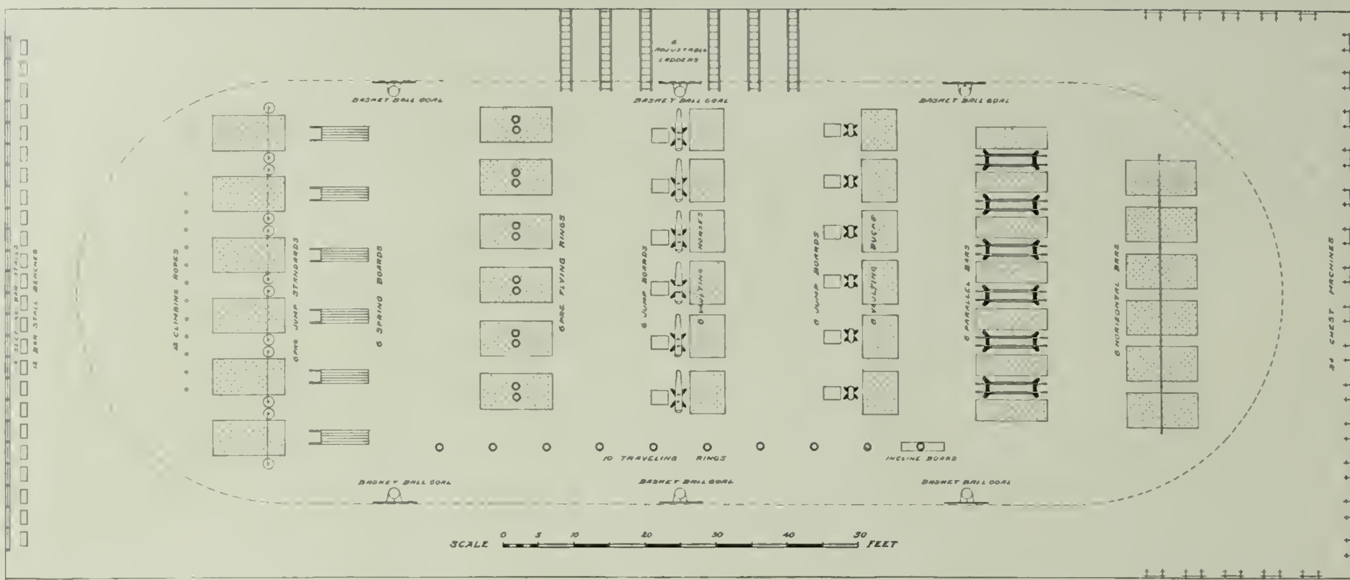


FIG. 6.

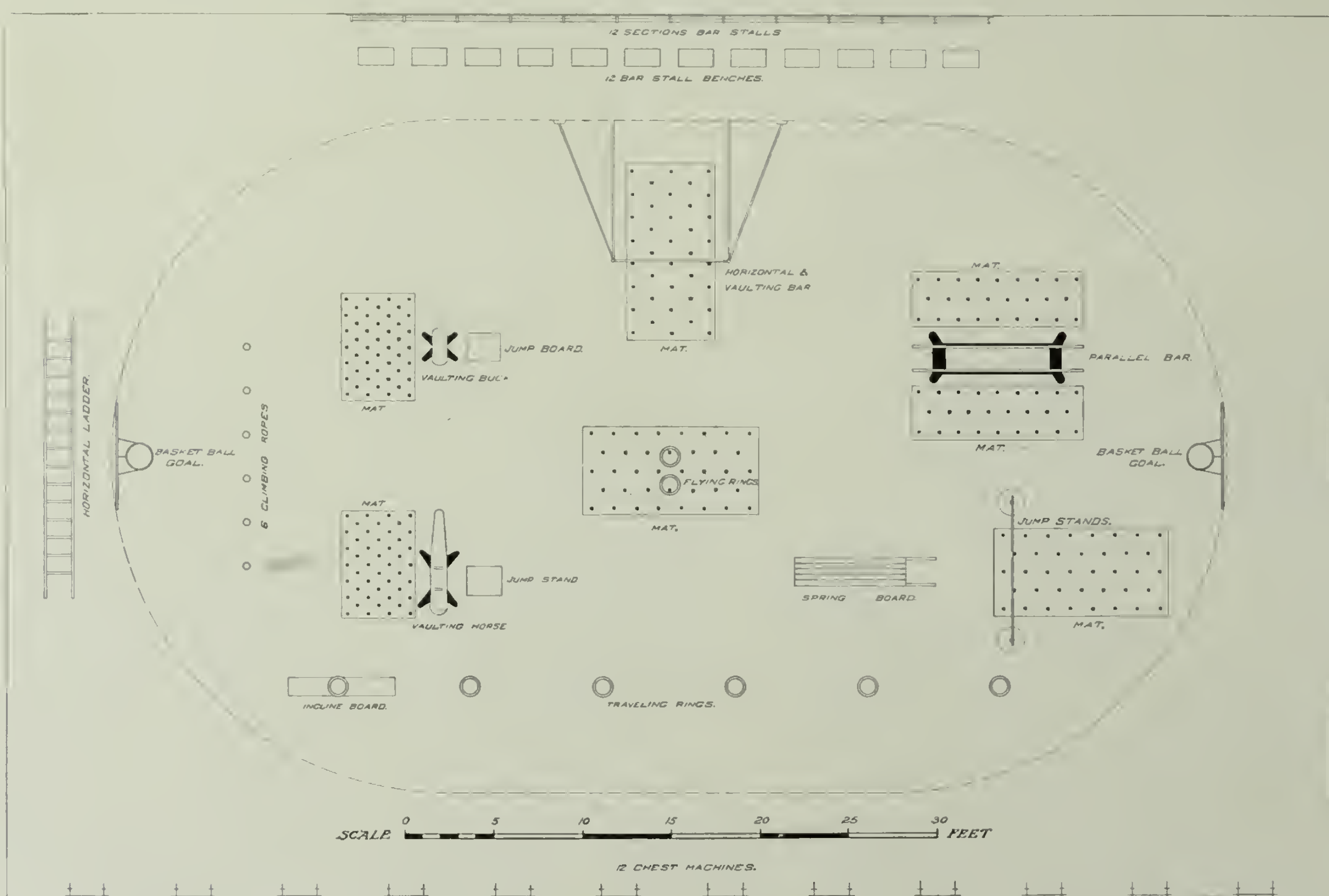


FIG. 7.

this to denote the relative space required in the use of different pieces — (being drawn to scale).

Classes are sub-divided into "units." The average working "unit" on most apparatus is six. It is not desirable to work too many, particularly on slow exercises as it allows the last man to get "cold," and is correspondingly harder to hold his interest. Ladder work serve this multiple in providing individual pieces, such as chest weights and bar stalls, exercises on which take time because they run in series and it would cause confusion in class work if, say two units of six each were taken off horse work and sent to chest machines, of which there were only ten. In providing for apparatus of this class it may be assumed that as a rule twelve would be the

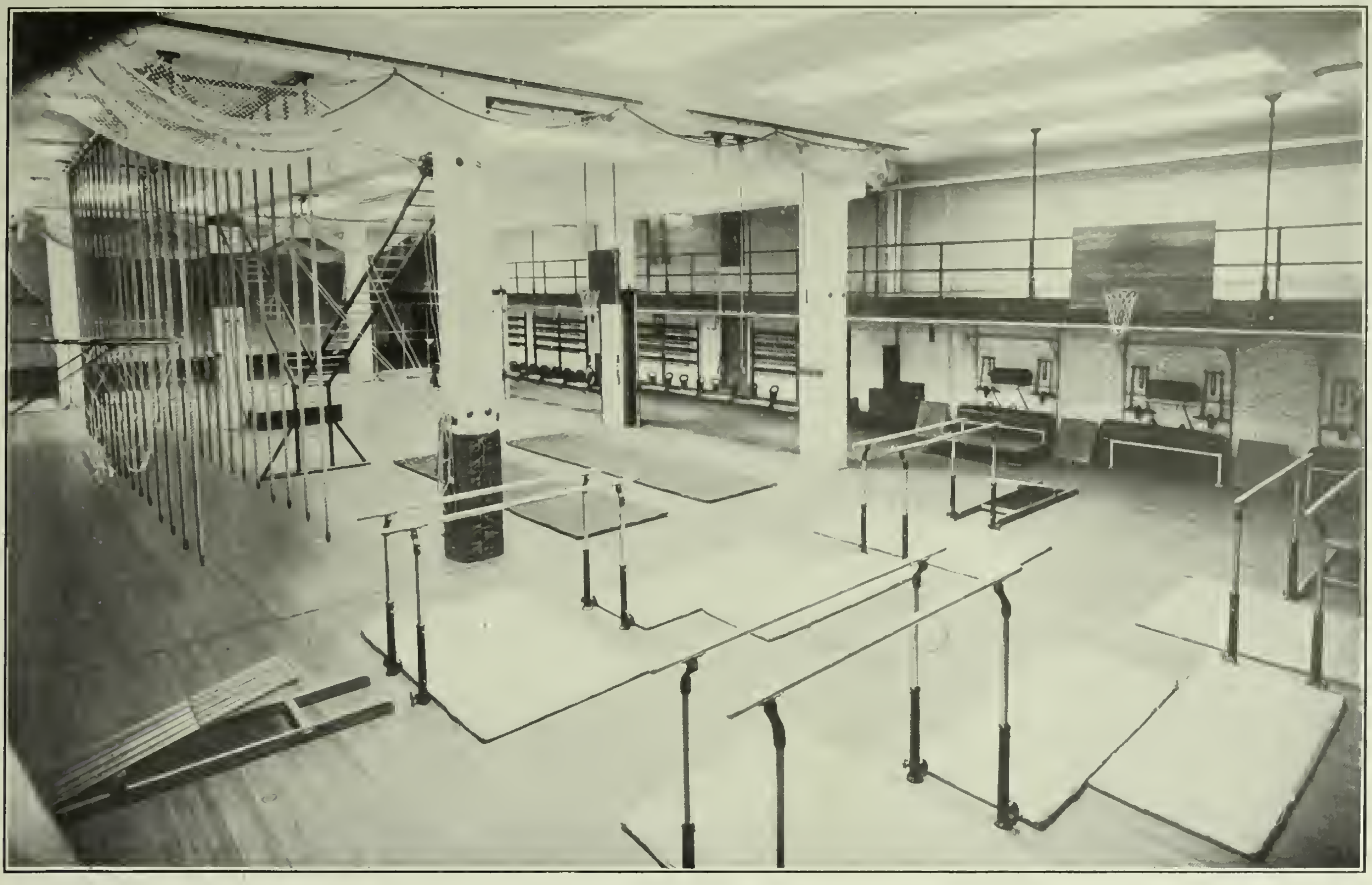


FIG. 8. A HIGH SCHOOL GYMNASIUM.

FIG. 9. A HIGH SCHOOL GYMNASIUM.

minimum number installed, twenty-four the maximum. Chest machines scale five feet on centers; bar stalls three feet. The latter are best installed in one section without interstices between uprights and wall space should be provided accordingly. If provisions are made for these class groups the individual pieces will easily find their places. It would greatly facilitate erection of apparatus, save expense, and produce better results if wall boards were fitted in walls when constructed. They should be four feet ten inches high on center for chest weights, and seven feet nine inches high on center for bar stalls. parallel bar, one pair jumping standards, two jump boards, one horizontal and vaulting bar, six climbing ropes, one pair flying rings, six traveling rings, one spring board, one horizontal ladder, mattresses, one pair basket ball backstops.

Figs. 8 and 9 show interior views of a high school gymnasium that presented problems to the manufacturer of apparatus. It was very necessary to get the maximum amount of work in comparatively limited floor space.

It will be noted that parallel bars, vaulting horses, and vaulting bucks are set into sockets anchored flush in the

FIG. 10. SCHOLARS ADJUSTING GYMNASIUM APPARATUS.

Boards should be six inches wide, one and seven eighths inches thick, and stained to match other interior work.

If the maximum number of three hundred were worked on this floor probably not more than one half that number would use apparatus. Part of the room would have floor cleared and classes carried on in calisthenics, free exercises, tumbling, games, etc.

The average gymnasium will probably seldom run classes of over seventy-five, and from that down to thirty or forty. In planning a room I would base figures on the larger number. Avoid the *small* gymnasium where possible. Floor space and air space are both desirable. Applying the fifty square feet rule, the room should contain 3,750 square feet, and of the proportions generally to be recommended, measure 50 feet by 75 feet.

Fig. 7 illustrates a gymnasium of this size with the following equipment of principal pieces, shown as typical: Twelve chest machines, twelve bar stalls, twelve bar stall benches, one vaulting horse, one vaulting buck, one floor. These sockets are made to fit either piece of apparatus, which when not in use is compactly stored on the wall. It is the storage feature particularly that adds to the working efficiency of the room in its saving of needed floor space when apparatus is out of use. This apparatus was especially designed at considerable expense to make this gymnasium fulfil its purpose.

Fig. 10 shows scholars adjusting apparatus.

Posts in some cases may be necessary in building construction, but they are objectionable from the gymnasium standpoint. Observe how they cut up floor space and that one of them is padded to lessen chances of injury in basket ball games.

Fig. 11 shows a beautifully arranged preparatory school gymnasium.

There is some diversity of opinion expressed among directors on the merits of the running track gallery. However that may be it is certain that this feature must be added in a gymnasium of the classes which I am at present discussing, the running track events being the principal events of athletic contests and those that certainly require much preliminary training. While I am very strongly against the running track in rooms of inadequate size, it is to be assumed that with a knowledge of the work to be carried on, provisions will be made to properly care for that need. I should set the minimum size of a room combining gymnastics and athletics with its running track, at 50 feet by 75 feet. Some directors place this minimum at 40 feet by 60 feet. Association with many directors and contact with many varied problems of gymnasium outfitting lead me to criticise of space exists. The concaved formation of the track is inconvenient for seating purposes, and more or less harm is liable to occur from chairs, stools, or street shoes. I believe careful study would develop a supplementary platform that could easily be placed and withdrawn and which would solve a serious problem in certain types of gymnasiums. One of our larger western universities has collapsible seats as used in circuses, that are set up when occasion demands on the gymnasium floor and stored in a mezzanine passage under the floor, which is centrally located between the locker room and pool below, being above a passageway on this floor, and which is reached through

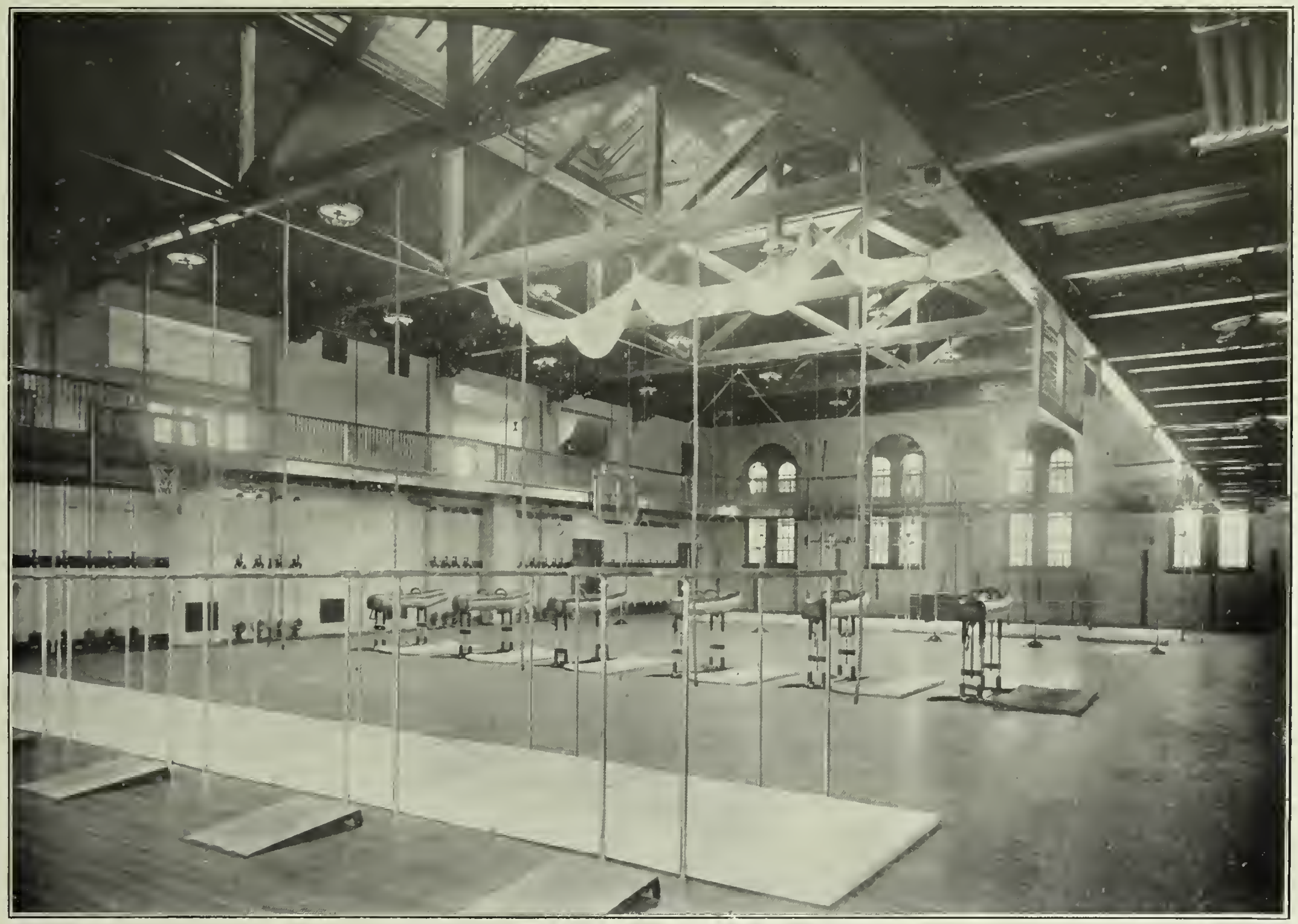


FIG. 11. A PREPARATORY SCHOOL GYMNASIUM.

this opinion. If the track is made wide enough to really serve its purpose to some degree at least, the gymnasium work is curtailed out of all proportion to the benefits derived. It would seem far the better judgment to have a positively good thing than two indifferent if not actually poor ones. Other directors, willing to concede the point as relating to the track proper are balanced by the additional value of its seating capacity. The same rule applies, however. The primary object is the need of a gymnasium, not a grand stand. First, supply that need to the full, then build on the furnishings. I think the point of these remarks will apply more particularly to Y.M.C.A.s and high schools. There is evident a great disposition to curtail space in gymnasiums of this character.

The problem of seating audiences on the running track gallery is still in an unsatisfactory state, even when plenty

trap doors from the gymnasium. Expensive, comparatively, to operate, but effective in its accommodations.

Office, dressing room, and examining room for the physical director should be on the floor with gymnasium. It is desirable to have the director's office placed so that he can view the gymnasium floor. In the larger universities that have a medical director with one or more floor directors, the office for the latter only may be so placed, and the office for medical director together with examining, dressing rooms, etc., may be more isolated.

Where provision can be made for it a small storage room just off the gymnasium, with good wide doors, would be of great value. It enables the director to keep off the floor any apparatus that he may consider undesirable at the time during class periods and also serves when room is used for occasional social functions.

The Specification.

BY J. A. F. CARDIFF.

THE specification is justly considered of equal importance with the working drawings to which it is complementary. The latter express the architect's conception and the former describes in minute detail the mode of executing it. Together they present the architect's *projet* in a technical language readily comprehended by the builder and his artisans.

The ability to write successful specifications requires, among other things, an acquaintance with the principles of architecture, a very general knowledge of and actual experience in building construction and its technical terminology, and the art of expressing ideas in a systematic, lucid, and concise manner. In the more important offices, this branch of the work is executed by a specialist.

The specification should, above all things, be systematic in arrangement, precise in diction, and full and complete in all respects. The descriptive rather than the narrative style should be adopted. The materials and workmanship required should be defined with minute exactness. The phrasing should be as concise as is consistent with clearness. Excess of description, elaboration of verbiage, repetition, and the use of more than one term to express the same thing, should be avoided, thus tending materially to render the language clear and explicit. Ambiguous or general terms should never be used as they are often a fruitful cause of expensive litigation.

This suggests the legal importance of the specification in the event of litigation — a matter that should be kept constantly in mind. The fact that the wording of the specification is generally the basis of over one half of the arguments in a lawsuit, emphasizes the need of exercising the utmost care in the construction of every sentence.

An error in etymology which quite frequently creeps into the specification is the use of the passive verb in the infinitive mood; as, "the work *is to be*," or "the contractor *is to*." Instead of this, the imperative mood, future tense, should be used; as, "the work *shall be*," or "the contractor *shall*."

The question of how fully or briefly the various matters comprised in the specification should be described, is one for the writer's judgment to decide in each case. Naturally, much depends upon the nature of the work, on whether the bidding will be restricted as in private practice or thrown open as in public work, and other considerations; so that no fixed rule can be laid down. But in the majority of cases, the prime requisite is, unquestionably, fullness and exactness in describing the materials, the workmanship, and the results which it is desired to obtain. In dealing with these matters, and in the matter of guarantees required against defects or deficiencies arising or discovered in the work, the specification cannot be too full. But in details, especially those defining the manner by which the results shall be produced, the specification can very easily be too full. And no greater mistake can be made than to restrict the freedom of the contractor in the method of producing certain results, when they can be secured equally well in various ways, and the best results to be obtained from the contractor are dependent, more or less, on his following the way in which his own experience has taught him he can accomplish them most successfully.

Again, restricting the *modus operandi*, when in other ways, equally good if not better, the desired results may be obtained, makes the architect more or less responsible for the consequences resultant upon following the specified directions; and this matter alone often causes vexatious disputes.

When, however, the required results can be more clearly defined by describing a method of procedure, it should be done; but an opportunity should be afforded the contractor to suggest his own course, the architect reserving to himself the right to reject it if his judgment so dictates.

Until the working drawings have been well developed, or at least finished in pencil, it is not advisable to commence the draft of the specification, as unforeseen complications, which affect the specification, continually arise up to and even beyond this point and may be overlooked if the specification is under way too soon. But, from the beginning to the completion of the working drawings, the draftsman should make notes of any unusual conditions which develop, and of such matters of detail as would not be readily apparent to the specification writer.

This memoranda should be supplemented by more copious notes made by the specification writer concurrently with the progress of the drawings. For convenience, it is a good plan to classify the notes under their respective trade sections so that there will be before the writer, at one time, only those notes which relate to the trade whose work is then being described. This permits of a better concentration of the thoughts on the work of the trade being described, in that it does away with the distraction of having to run through a myriad of notes of a very miscellaneous character. Also, as the drafting of the specification progresses, matters will come up which require cross references in other trade sections, and memoranda of them can very conveniently be jotted down in the classified notes for these sections.

The specification writer and the head draftsman should co-operate in determining on a general line of demarkation between what should be described and what shown on the plans. Very frequently a word or two on the drawings covers what is required more clearly than a lengthy description in the specification. Again, there are times when the character of the various portions of a large building is so varied, that it greatly simplifies matters to indicate on the plans some details of the finishes of the most varied portions. This is especially true when a description of the details involves references under several of the trade sections.

All particulars relating to the manner of bidding, receipt of proposal, returning of plans and specification with proposal, examining of site, the right to accept any or to reject any or all proposals, and such other details as relate only to the bidding and not to the actual execution of the work, should be grouped under a heading such as "Instructions to Bidders" rather than under the general conditions or in the body of the specification. This sheet may be either sent to the bidders separately as a supplement to the specification, or better, bound in front of the specification.

A very important adjunct to the specification, and one which it is properly within the province of the specification writer to draft, is the form of proposal. This should accompany every specification when being issued for bids and is required for uniformity and precision of wording. It is particularly necessary when the specification provides for alternative methods of construction. In some offices a regular form of proposal is printed and sent out in duplicate so that the contractor may retain one copy for his files. Also, the printing is frequently, and advisedly, done with copying ink so that the contractor may make an impression of the estimate in his letter copying book if he has adopted that method of keeping his records.

The object of the general conditions, which precede the trade sections of the specification, is to cover such conditions as apply generally to all or most of the different trades comprised in the work to be done, and those details which cannot be properly classified under the different trade descriptions. This should be carefully borne in mind and such matters as are applicable to only one or a very few of the sections, should each be described under its respective trade section, rather than in the general conditions.

When a separate specification is made for each trade, such matters as the removal of rubbish, water supply for building purposes, watchman, temporary office, etc., which are usually comprised in the general conditions, should be distributed among the various trade specifications to the best advantage for securing the required results.

In the general conditions there should also be described some of the matters usually mentioned only in the contract. The matters of fire and liability insurance, bond, arbitration of disputes, liquidated damages, and guarantees are all items which entail expense to the contractor, and his attention should be called to them in the specification so that, in bidding on the work, he can take into account the cost that he would incur in complying with such stipulations. Providing for such matters only in the contract, generally leads to a claim on the part of the contractor for an increase in his quoted price to cover the cost of these items. The claim is just, but coming at a time when a contract is about to be closed at a prearranged price, is rather vexatious.

Again, such matters as will require attention during the progress of the work, should be put in the specification rather than in the contract, for the very obvious reason that they are less likely to be overlooked. The former is constantly referred to while the latter is seldom consulted — certainly it is not as accessible as the specification, and seldom, if ever, is a copy kept at the job.

The contract should contain only such matters as the consideration, manner of payment, provision against liens, and such other stipulations as pertain solely to the articles of agreement between the owner and the contractor. In this respect the form of contract adopted by the Michigan Chapter of the American Institute is better than the uniform contract adopted by the American Institute of Architects and the National Association of Builders.

Following the usual opening clause and index of the specification there should be given a *résumé* of the work intended to be done, under a marginal heading such as "Work Required." Immediately after this, a summary of the work to be done under other contracts should be given under a separate marginal heading such as "Work Omitted." The necessity for knowing just what is not included occurs rather frequently during the prosecution of the work and should be made clearly evident as above suggested.

The specification should be divided into sections proportionate to the number of different trades comprised in the work to be done, and each trade section should be strictly limited to a description of the work which properly comes within its province as determined by the usual or customary practice in the locality in which the work is to be prosecuted.

As to the proper sequence for the trade sections, a very good way is to arrange them, as far as possible, in the order of their subsequent execution. The same sequence should obtain in the arrangement of the various items described in each section.

Each trade section of the specification should be started at the top of a page so that the general contractor, if he so desires (and he usually does), may readily separate the sections to give each of his sub-contractors the portion that relates to his individual branch of the work.

Each trade section should commence with a preamble calling attention to the general conditions and the fact that they apply with equal force to each and every section of the specification. This precaution, although unnecessary from a legal standpoint, is advisable for the purpose of emphasis; and, in the event of the specification being separated into parts, serves to remind the sub-contractor, or persons bidding for the general contractor, that the section is incomplete if not accompanied by the general conditions.

Immediately following the above preamble, and under a marginal heading such as "Work Required," there should be given a summary of the work comprised in the section; and, if there is any work usually done by the trade whose work is being described but which it is not contemplated including, it should be particularly excepted under a separate marginal heading such as "Work Omitted."

The pages of the specification should be numbered consecutively and an alphabetical index to the section headings provided, to facilitate the hasty reference so necessary during the prosecution of the work.

All paragraphs should be numbered, as it will be found to be a great convenience in corresponding, when there is occasion for a reference to items in the specification. Also, in describing a subject which entails a reference to an item in another section of the specification, a parenthetical reference to its paragraph number, placed in the body of the paragraph, is a great convenience to all who have subsequently to refer to the specification. The numbering should be consecutive as a specification rather than serially for each section.

The frequent use of marginal headings, for the items described under each section, makes them easy of reference.

The use of marginal sketches is at times most valuable, as they greatly assist in the clear interpretation of descriptions.

In the more important buildings, when the character of the work in the various portions varies to a considerable degree, a tabulation of the finishes, room by room, will be found most valuable. This tabulation is in the form of a supplementary section to the specification and its chief value lies in its giving a synopsis of the finish of any one room without the necessity of running through a myriad of detailed description to find information of a general character.

Specifications for alterations which are much involved should describe the work generally; that is, item by item without reference to trades. This may then be followed, if desired, with a more detailed description separated into trade sections.

Alternative methods of construction affecting many of the various branches of the work, greatly add to the complexity of a specification and increase the chances of oversights; and should, therefore, be avoided as much as possible.

When necessary, such alternatives are less complex if described in the form of an appendix at the end of the specification, rather than by references distributed throughout the specification. In the section descriptive of the work of each trade affected by the alternative, a note is made calling attention to the appendix. The method of construction most likely to be adopted should, of course, be specified direct; leaving the less likely methods as the alternatives.

Every specification should bear the date of its completion.

Binding the leaves of a specification at the side instead of at the top, similar to book binding, has much to recommend it and of late is being more generally adopted.

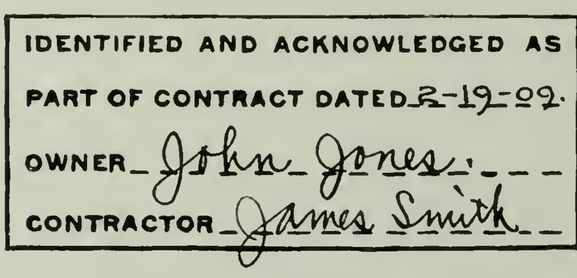
Complete records of the issuance and return of specifications should be kept, and if each copy of the specification is numbered it will be of great assistance in keeping track of them.

Questions brought up by the contractors when bidding, such as omissions, misdescriptions, ambiguous expressions, discrepancies between drawings and specifications, etc., which are at all important in their nature, should be made the subject of an addendum, issued to each and every one of the bidders so that they will all figure on an equal basis.

Any modifications in the work as specified, should be carefully described by means of an addendum bearing the date of the modification; so that at the completion of the work the specification will be an exact description of the manner in which the work has been executed, rather than a description of how it was at one time contemplated executing it. A neglect of this precaution has, in the writer's experience, been a source of endless trouble in cases of subsequent alterations and additions to the buildings, the adjusting of losses by fire and the replacing of burned structures. The addenda are placed at the end of the specification and numbered as additional pages to the specification. Each addendum is also given a serial number.

Previous to the signing of the contract, any modifications in the work as specified may be made by correcting the descriptive matter itself, but modifications made during the prosecution of the work are better provided for by means of addenda. At the description of each item which is modified by the addenda, a note is made such as "See Addendum page . . .". The use of addenda is much to be preferred to letters authorizing the modifications.

Any modifications made in the specification should, if at all possible, be made in every copy, as the existence of incomplete or void copies is bad practice and very likely to lead to troublesome disputes.



For convenience in the matter of signing specifications and contract drawings, the use of a rubber stamp such as is illustrated is suggested.

Student Life at the Ecole des Beaux Arts.

BY WALTER D. BLAIR.

SINCE the Ecole des Beaux Arts is the goal of a large number of American students it may be well to inquire into the requirements of the entrance examinations.

These are divided into two groups, the architectural and the mathematical. The first comprises architectural design, i.e., the *esquisse*, drawing, and modeling, and is open to everyone. One hundred and fifty students receiving the highest marks are allowed to take the second group, comprising written and oral examinations in plain, solid, and descriptive geometry, algebra, arithmetic, and history. Fifty Frenchmen and fifteen foreigners are chosen to enter the Ecole from the combined results of the two groups. The marks received in each subject are multiplied, to give the total mark, by a varying coefficient; for architectural design fifteen, drawing ten, modeling five, mathematics fifteen, history one (the highest mark in any subject being twenty).

The most important examination is the *esquisse*, for which twelve hours are allowed. With a fair knowledge of design on the part of the student it is a matter of drawing or indication, as the French say — that is, presenting an idea in a clear, concise, unequivocal manner. One should give the greatest part of the twelve hours to the conception of his idea and to seeking the proportions and requisite character, leaving to the last few minutes its final expression and rendering.

The French methods of drawing columns, details, and motifs should be acquired as they will be found to be, as it were, a shorthand of architectural notation.

In doing preparatory *esquisses* it is well for the student to allow himself no more time than he will have in the examination. His idea should be expressed clearly, be correct in proportion, and imbued with the spirit and character of the program. To aid this, familiarity with the well known buildings of Paris, the Garde Meuble, the Louvre, the Monnaie, the Archives, the Luxembourg— to mention no others — their motives and elements, is indispensable. They should be compared, analyzed, and studied. Each problem's prototype should be visited. Seeing a building is worth more than an attentive study of its photograph. Since no part of Paris is devoid of architectural monuments the student when he leaves indoor work, can continue his studies during walks to the various parts of the city. A generous allotment of time to this instruction is desirable from every point of view. It increases the student's fund of knowledge, scanty on arrival, upon which he must draw for inspiration. It gives him ideas of character and scale, shows him that building material, be it stone, brick, wood, or iron, can be plastic, capable of expressing emotional qualities; be sad, severe, reverential, gay, as the subject is — tomb, law-court, church, or theater. He will thus begin to understand what the French mean by character — that a building to be good — to speak now only of the exterior, omitting considerations of plan — must reveal its destination and convey an emotional idea in harmony with its function. The great moral law in architecture, in little as well as big things, should be "Thou shalt not lie."

The search for character is the task the French student sets himself, when he has once acquired a sufficient knowledge of architectural elements and an appreciation of, or a feeling for, proportions. The American must do likewise. His chief aid will consist in examining the monuments about him. These the French have seen all their lives, so that much that the American must learn is innate with the French. The French student knows what makes the architectural elements — for example a pendiment — change its emotional note, be grave or gay, public or domestic in feeling. He has at his command an architectural notation in which to express his ideas and a language in which to discuss them.

Drawing in charcoal from the cast is almost as important as design. Most Americans, due to the little attention given to drawing in our schools, are less efficient here than in design. Accuracy and the expression of the character of the object are desired; if there be a flood of light, its portrayal in delicacy of tints and shadows; if the shadows be well defined and clear, a rendering of strong contrasts. To see accurately both form and values is the first requisite — to express what is seen so that another may behold its form and sentiment, the second.

Modeling is closely related to drawing and as it is easier, few students give much attention to it. Indeed it is said in the *Quarter* that the highest marks go to those who do the least before the examinations.

In the three subjects of the first group whatever the student does before reaching Paris is beneficial. The more time he devotes to them, the more able he will be to profit quickly from his new environment.

In mathematics the French go deeply into theory. The American, if he desires, can get French textbooks from Pourchet, rue des Beaux Arts, for plain and solid geometry, algebra, and arithmetic. From them a knowledge of French methods and a vocabulary of mathematical terms, useful for the oral examinations, can be derived. English textbooks, while not so useful, will of course serve to refresh knowledge long forgotten. The reader will doubtless smile at the thought of an examination in arithmetic, for his ideas of arithmetic probably stop at the multiplication table, but neglect of the subject may be followed by disagreeable consequences at the oral examination.

In descriptive geometry the French present their mathematical "piece de resistance," which is, in spite of the boasts for thoroughness of some of our technical and architectural schools, unknown in our country. In this subject the American must learn almost entirely abroad from private coaching, textbooks, and discussion with other students until his knowledge is available without hesitation, for demonstrating before a blackboard difficult and complicated problems.

The written examination, the *epure*, for which twelve hours are allowed, is perhaps the most arduous test in the entire course of the school and consists in solving a series of revolutions, projections, and shades and shadows — operated upon some complicated form. The complete series is seldom finished, despite the twelve hours alloted to the task.

Pending the result of the examinations many leave Paris and visit for rest and recreation the cathedral towns, Coucy le Chateau, Fontainbleau, or any interesting place nearby. As meals and rooms at the average inn of a small town rarely exceed in cost 9 francs per day, such trips are as inexpensive as they are enjoyable.

If the student be admitted to the school, he becomes a member of the second class. If he has studied in a preparatory atelier — feeder for one of the regular ateliers — he becomes after initiation one of the *nouveaux* of his atelier and is compelled to give one day of each week to working for the older men and in addition three days each month just previous to the date when the alternating bimonthly problems of the first and second class are due. The period of service lasts a year, after which the *ex-nouveaux* becomes in his turn beneficiary of the system.

During this period the American gets a working knowledge of French used by the students, a combination of slang and expressions not to be spoken before refined people. He likewise, if he attends lectures, acquires a technical vocabulary which will later on be useful for the oral examinations and courses in which textbooks are not used. The reading of a daily paper such as the *Martin* or *Petit Journal* will supply a current vocabulary better than any book and give an amusing insight into the politics of the country.

In the second class there are courses in stereotomy perspective, mathematics, construction, history of architecture, drawing, modeling, and design, which latter consists of the elements of architecture and problems rather of façade than of plan. The credits given are in design "a mention" and a "premiere mention," counting one and two values respectively, or, as in all subjects, there may be no recompense, a "four" or "veste" as it is called. In the other subjects there are mentions and third medals. Four values in design, two in elements of architecture, and mentions in all the other courses are required to complete the work of the second class.

In the first class the student is occupied only with drawing, modeling, and design, in which serious and interesting programs are given, including the decorative competitions, the Rougevin and Godeboeuf.

The credits are in design — mention, second medal, and first medal, counting one, two, and three values respectively; in drawing and modeling, mention, and second medal. Ten values in design, one in modeling, and one each in drawing from the antique and from life, are required before one is qualified to present a thesis.

An erroneous impression of the length of time necessary to go through the Ecole has been formed. If the quality of one's work is such that medals are received, the time need not much exceed three years, and has often been less.

The hotels of the Latin Quarter are patronized by the newly arrived students until more definite plans are formed — Hotel Jacob, rue Jacob, within a block of the school, and Hotel Foyot, near the Luxembourg gardens, are typical. At the former a furnished room can be had for 55 francs per month, at the latter for 75 francs. Meals are taken at *pensions* or restaurants. The restaurants, such as the Pre'aux Cleres, Tyrion, and most economical of all, one in the rue de Beaune frequented by the neighborhood's bakers, picturesque in their large white caps, are the meeting places of students in which they discuss their work over meals. The *pensions* may be used for a few months by those just arrived, but their cheapness, varying from 150 francs upward for room and meals, is not sufficient compensation to long hold one. The students soon make acquaintances and in groups of two or more hire apartments, which can be had as cheaply as 600 francs per year, the tenant paying in addition certain taxes which the landlord hands on to his tenants when imposed on him by the state or city. In the apartment which I had and which consisted of two bedrooms, kitchen, and studio, the taxes amounted to about 100 francs, and the rent to 600 francs per year. In old buildings where quarters are cheap, it must be understood that there are none of the modern conveniences or necessities, except running water. The cheapest have neither gas nor electricity and are reached by many stairs. Yet the French merchant will send his boy each morning with a four-cent loaf of bread, a small quantity of butter, and a jug of cream up to the loftiest quarter. One hundred and ten steps led to the one I occupied and each morning the loaf of bread stood, end on, the French custom, upon the door mat. Breakfast, i.e., coffee and rolls, may be had on the wide sidewalks, served from a café, at the cost of 35 centimes and a tip of 10 centimes to the waiter.

Lunch and dinner may be had as cheaply as 2 francs 50 centimes or 3 francs 50 centimes at the Pre'aux Cleres, rue Bonaparte, or similiar restaurants, where the regular tip to the waiter is three cents per meal. Some Americans keep house, for which purpose a competent servant who cooks, goes to market, does the housework, and can be hired for $7.00 per month. Of the expensive cafés La Tour d'Argent and Laperousse are well known for the excellency of their special dishes.

Usually the price for a table d'hôte luncheon throughout the smaller towns of France is 2 francs 50 centimes. In the large cities meals can be had at these low prices, but not of the quality and variety afforded in the villages. Culinary skill exists throughout France and the traveler will make, on this score, many comparisons to the detriment of his own land.

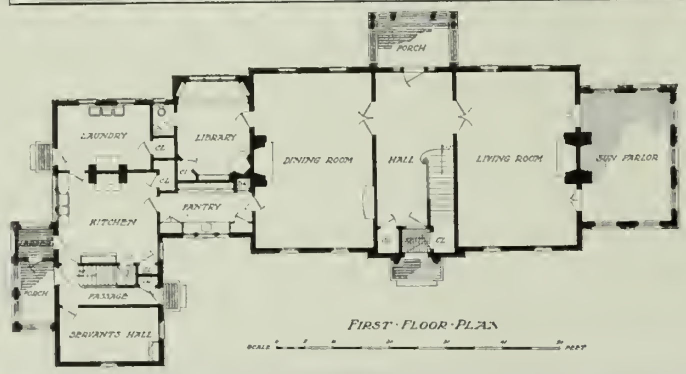
Dining al fresco is very common. The sidewalks, which are wide, are utilized for the purpose, and dotted with tables and people, contribute much to the animated aspect of the streets. Each café has its set of habitués to whom the café is a club where games, especially cards and checkers, are played, and papers read after meals. One is struck by the leisurely atmosphere of these small numberless cafés — no cry of "what next" from waiters, no prodding to order this and that — places where one glass of beer may be consumed the entire evening and not provoke angry or scornful glances from employees or proprietor.

Of the students' celebrations, the Ballade du Rougevin following the rendue of the problem of that name is interesting. Floats from all the ateliers gather in the courtyard of the school to meet the competitors coming from their work. A motley crowd with banners, lanterns, and calcium lights goes singing and cheering through the narrow streets of the *Quarter* to the Pantheon where a bonfire of the floats is the culmination. Viewed from this distance it is very silly, not at all business-like, or practical, but when were manifestations of animal spirits, of exuberance of life, sensible? Their charm is rather in their irrelevancy, their nonsense.

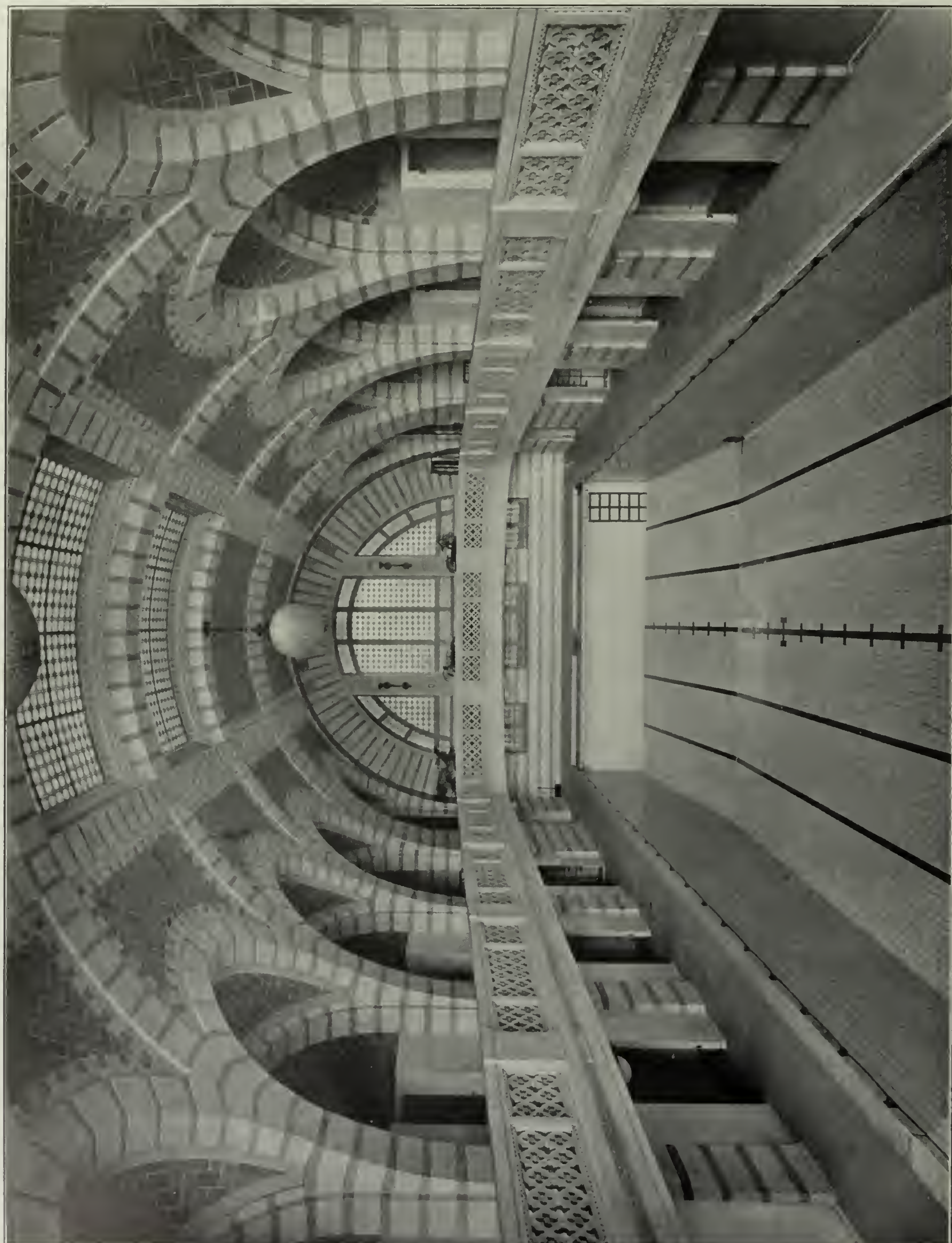
The Quat'z Arts Ball is the artistic tradition and triumph of the *Quarter*. Students and professors only are admitted to it, after their costumes have been approved. Its gorgeousness of color and sumptuousness of effect are a dazzling and successful appeal to the sensuous.

The ateliers, with the exception of the three housed in the Ecole, occupy quarters in old buildings where cheapness and dirt keep company. A crowd of students is not a desirable neighbor: they sing much, often through the night. The walls of the rooms are decorated with caricatures and pictures until a dark somber tone is attained that accords well with the dirt, dishevelment, and confusion of the place. The lighting is by candle, each man furnishing his one or two candles that are stuck to the board on which he is working. The air of the room is close, for there is no ventilation. Silence never prevails. Jokes fly back and forth, snatches of songs, excerpts from operas, at times even a mass may be sung, yet amid the confusion and babble — strange as it may seem — work proceeds.

The fruits of that work should be an architectural point of view from which all problems, however various, are to be seen and studied, an architectural mode of expression and language, and a knowledge of monuments and buildings of many epochs.



HOUSE AT LAWRENCE, L. I., N. Y.
WILLIAM ADAMS, ARCHITECT.



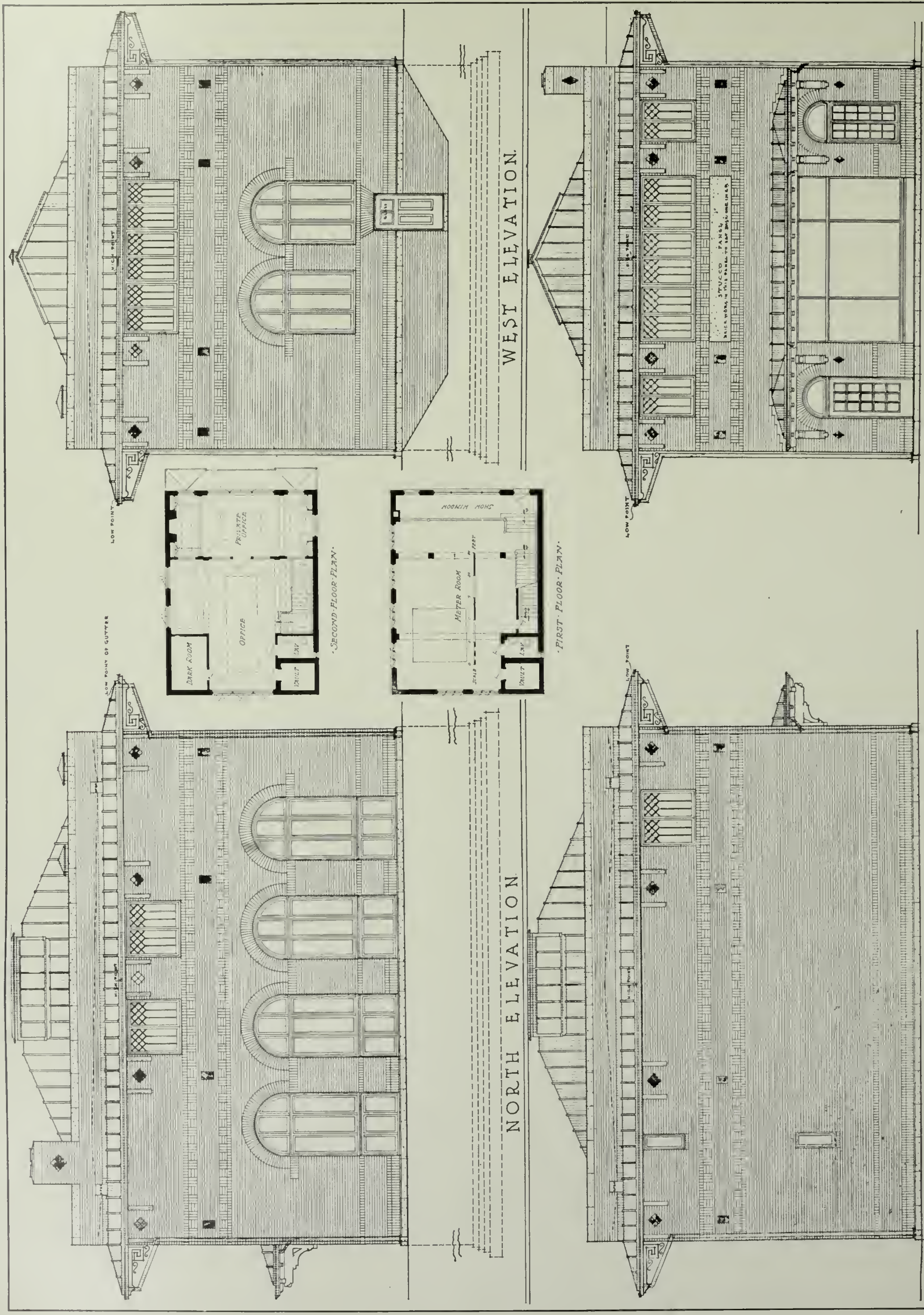
NATATORIUM IN PHIPPS BUILDING, PITTSBURG, PA.
GROSVENOR ATTERBURY, ARCHITECT.

SECOND FLOOR PLAN

FIRST FLOOR PLAN

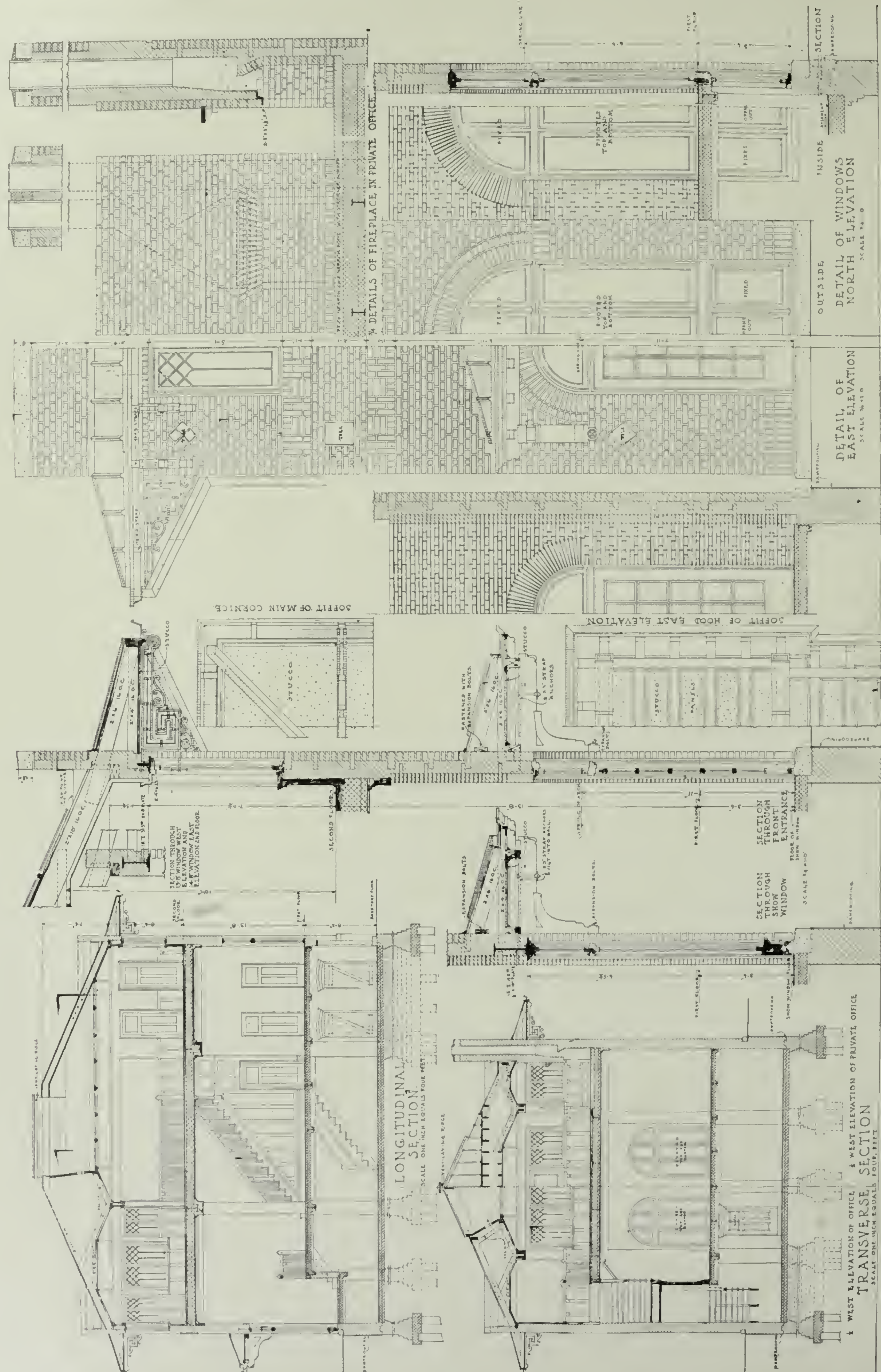
DURAND COMMONS,
DINING HALL,
LAKE FOREST UNIVERSITY,
LAKE FOREST, ILL.

HOWARD VAN D. SHAW, ARCHITECT.

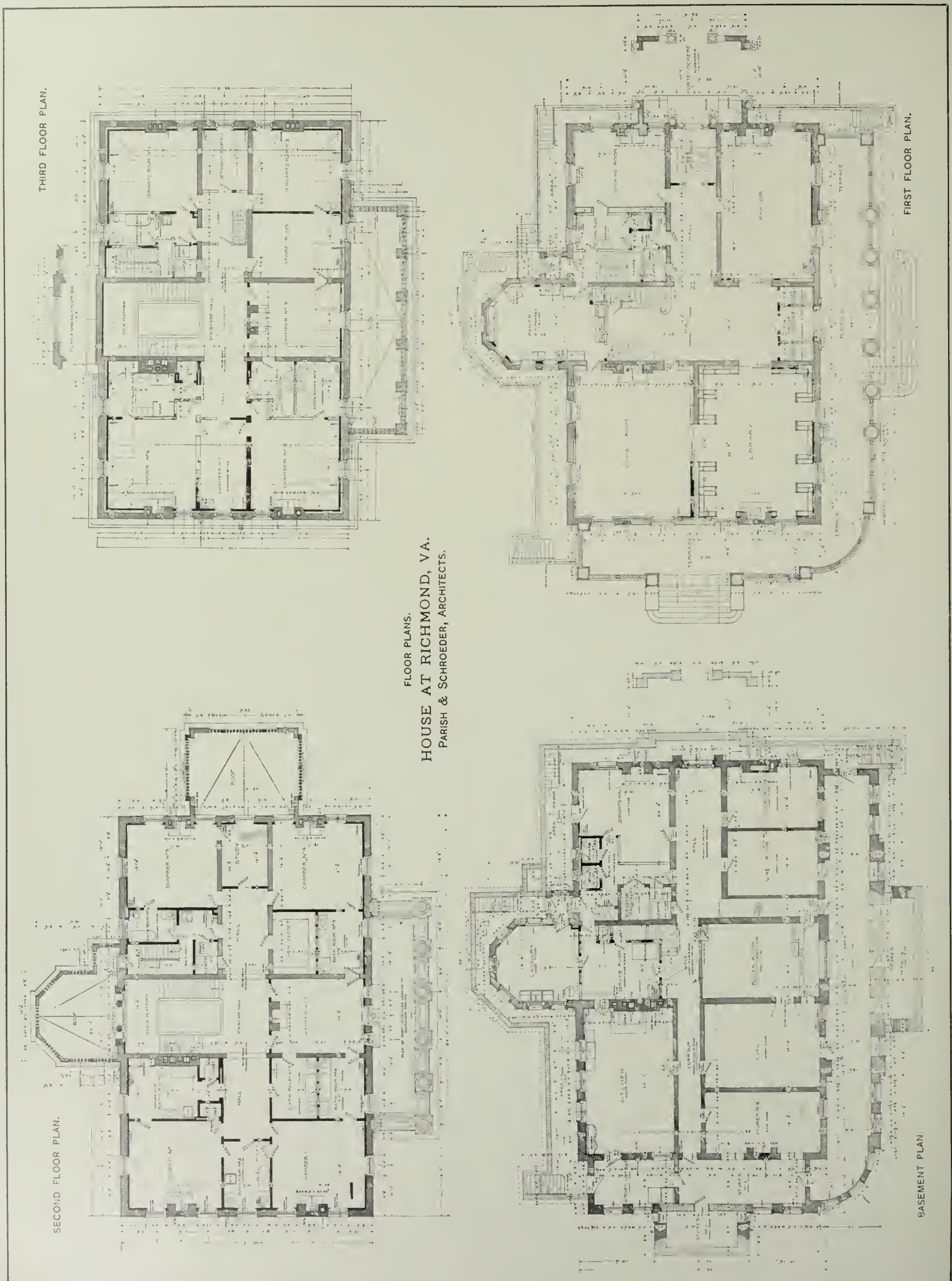


SOUTH ELEVATION. A METER HOUSE AND WORKS OFFICE FOR THE BROOKLYN BOROUGH GAS COMPANY. EAST ELEVATION.

H. VAN BUREN MAGONIGLE, ARCHITECT.



A METER HOUSE AND WORKS OFFICE FOR THE BROOKLYN BOROUGH GAS COMPANY.
H. VAN BUREN MAGONIGLE, ARCHITECT.

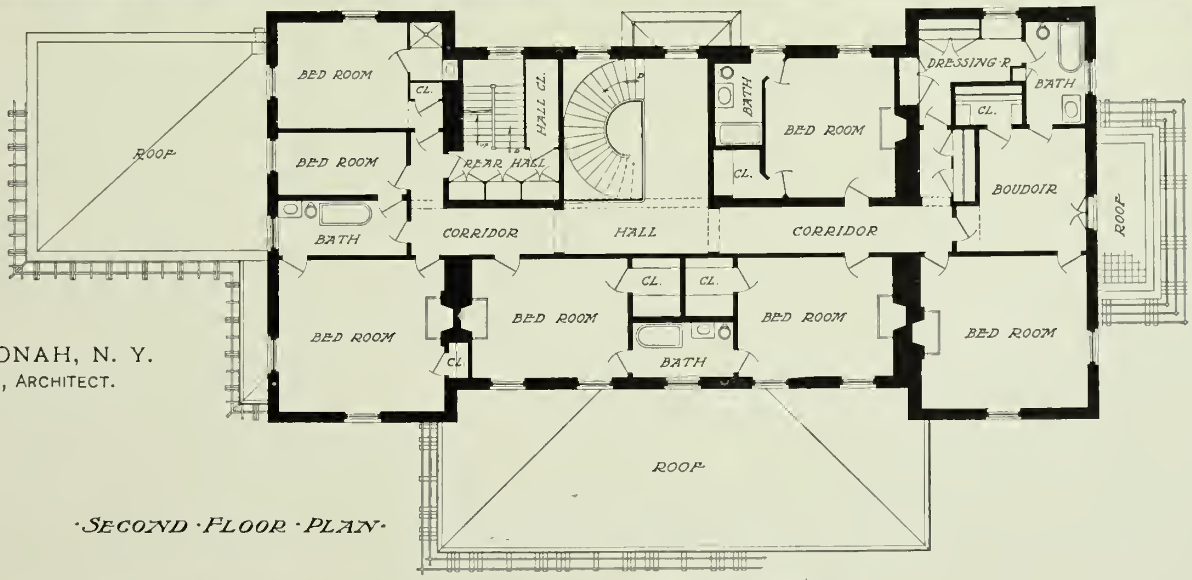


FLOOR PLANS.
HOUSE AT RICHMOND, VA.
PARISH & SCHROEDER, ARCHITECTS.

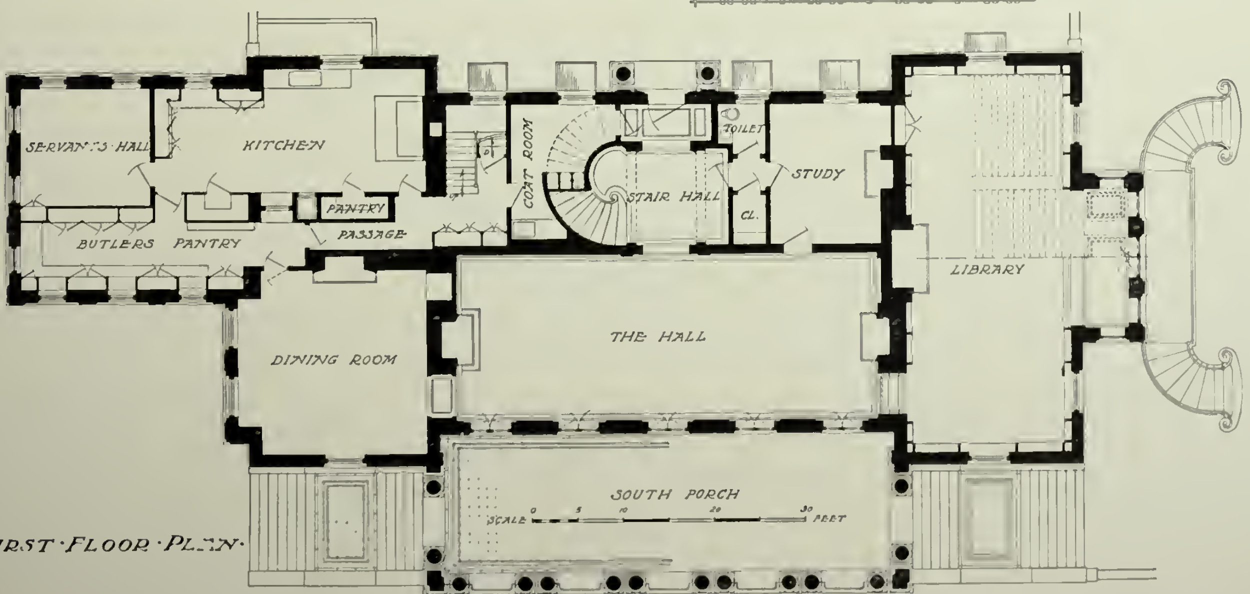
HOUSE AT RICHMOND, VA.
PARISH & SCHROEDER, ARCHITECTS.

HOUSE AT KATONAH, N. Y.
CHARLES A. PLATT, ARCHITECT.

HOUSE AT KATONAH, N. Y.
CHARLES A. PLATT, ARCHITECT.



·SECOND·FLOOR·PLAN·



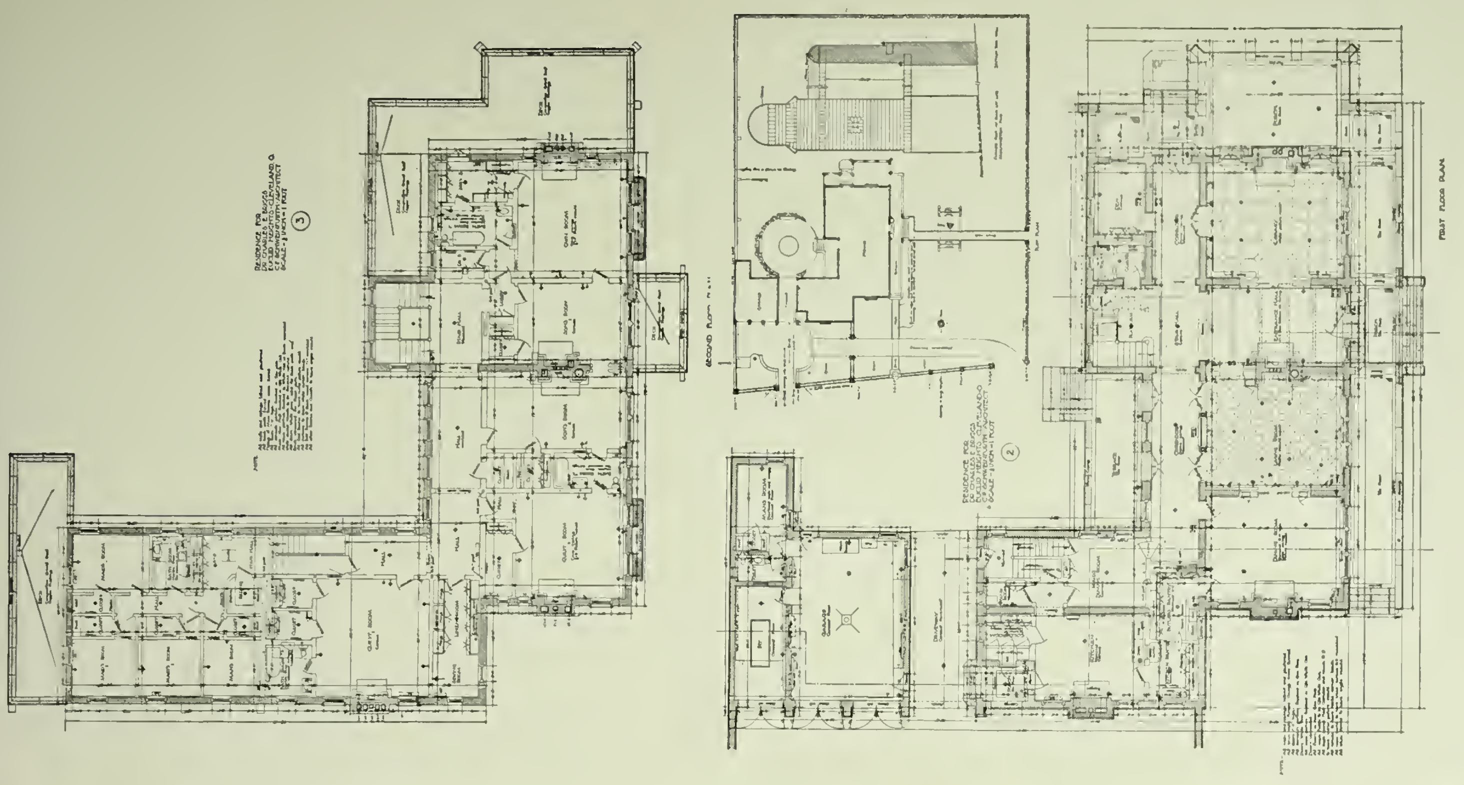
·FIRST·FLOOR·PLAN·

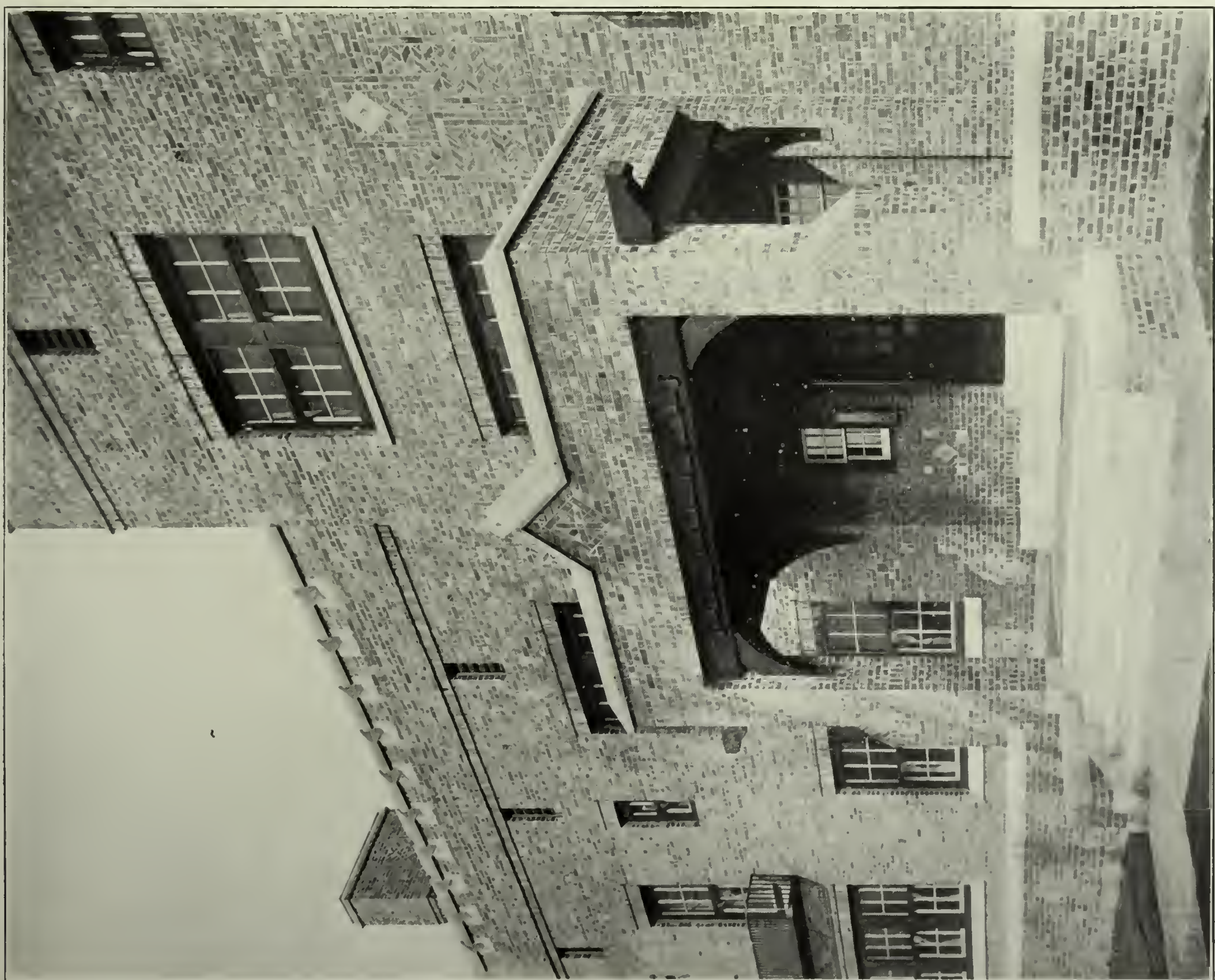
VIEW FROM SOUTHEAST.

VIEW FROM SOUTHWEST.

HOUSE FOR DR. CHARLES E. BRIGGS, EUCLID AVENUE, CLEVELAND, OHIO.

CHARLES F. SCHWEINFURTH, ARCHITECT.

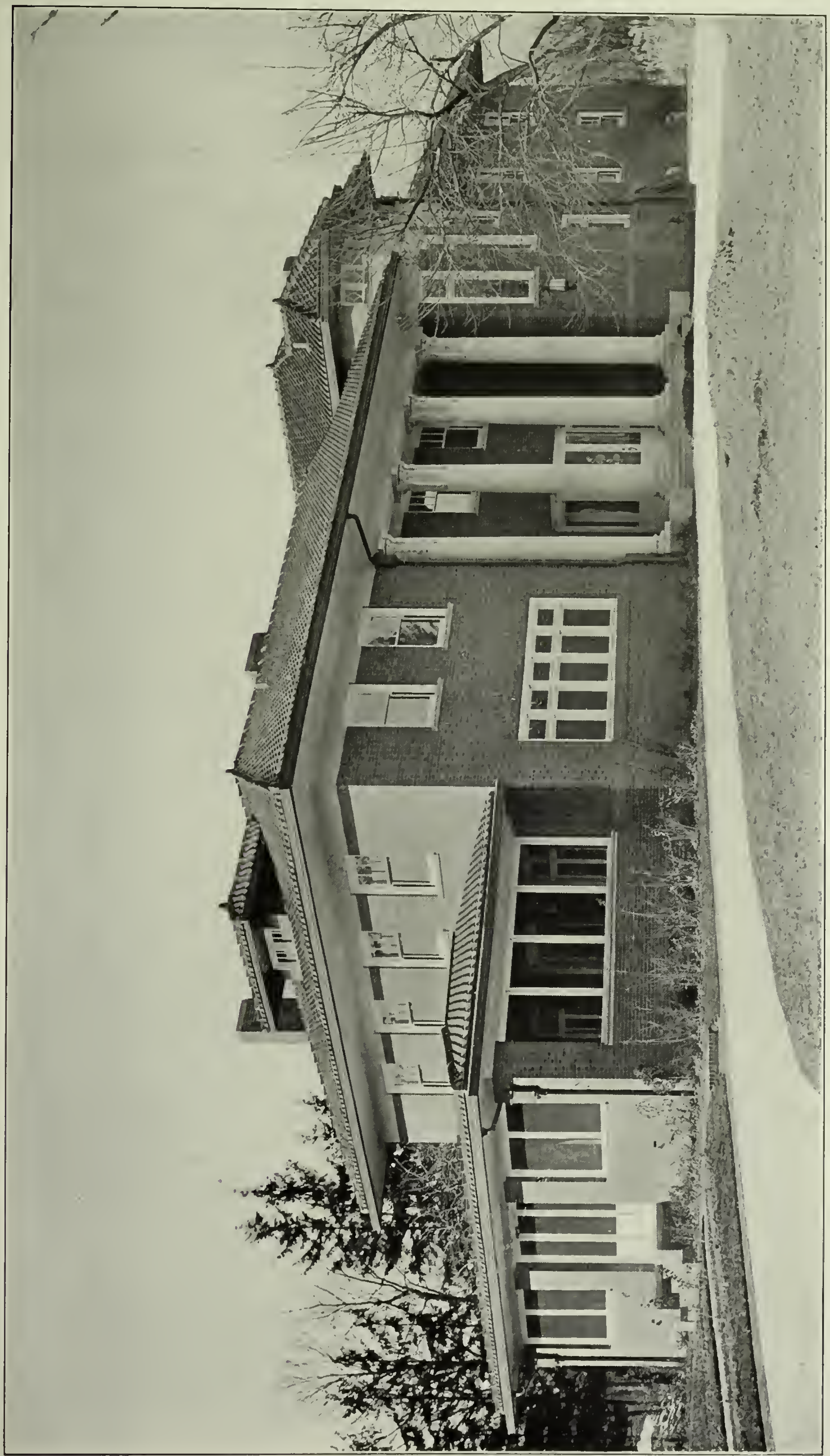




DETAIL OF ENTRANCE.

HOUSE FOR DR. CHARLES E. BRIGGS, EUCLID AVENUE, CLEVELAND, OHIO.

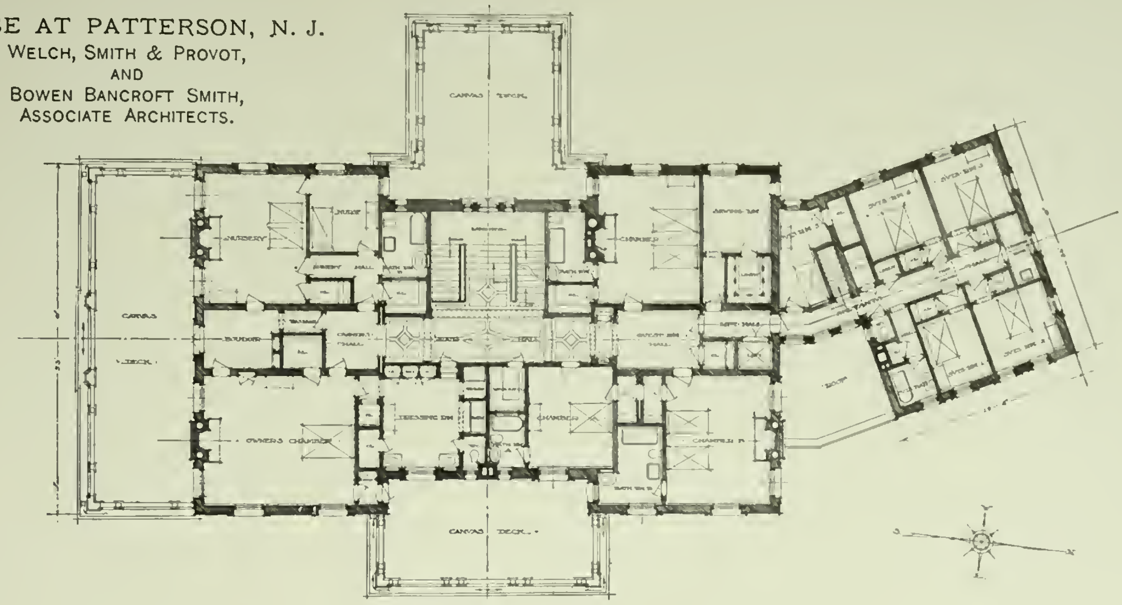
CHARLES F. SCHWEINFURTH, ARCHITECT.



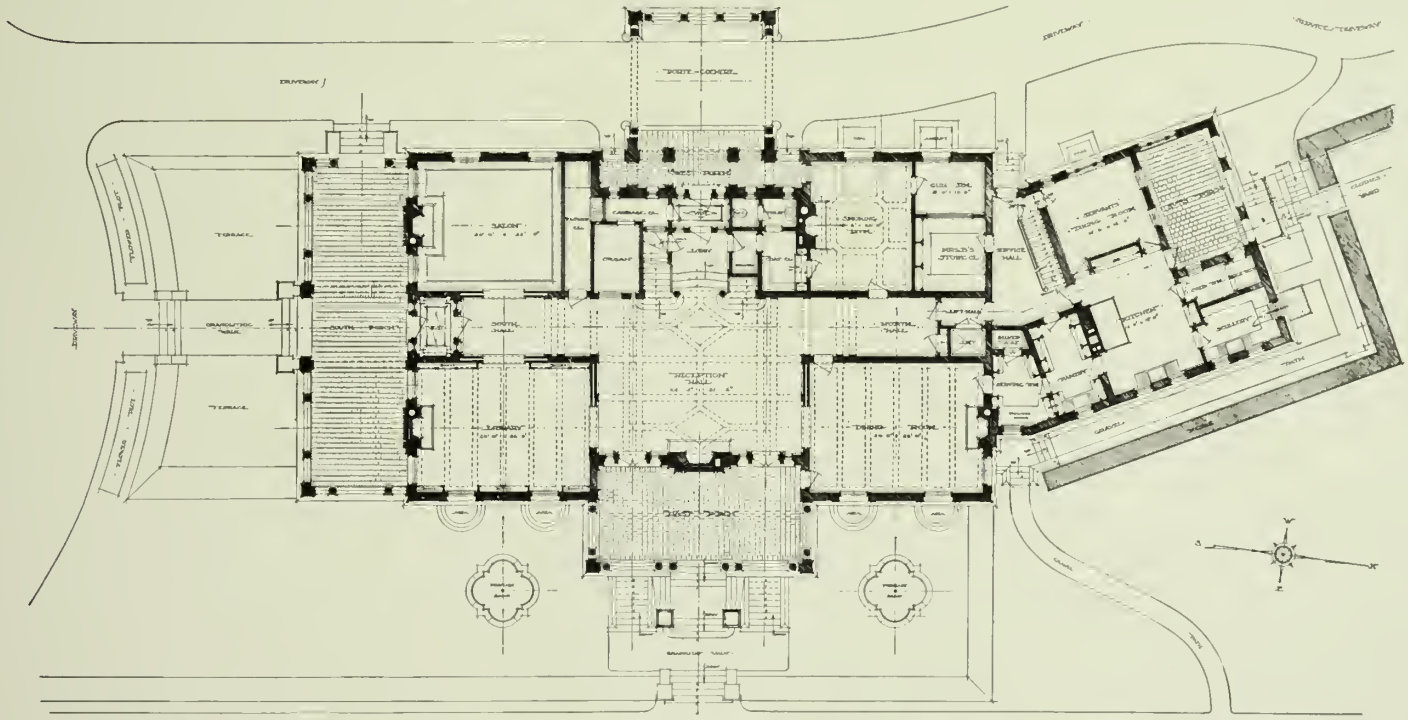
HOUSE AT LAKE FOREST, ILL.
W. CARBYS ZIMMERMAN, ARCHITECT.

HOUSE AT PATTERSON, N. J.

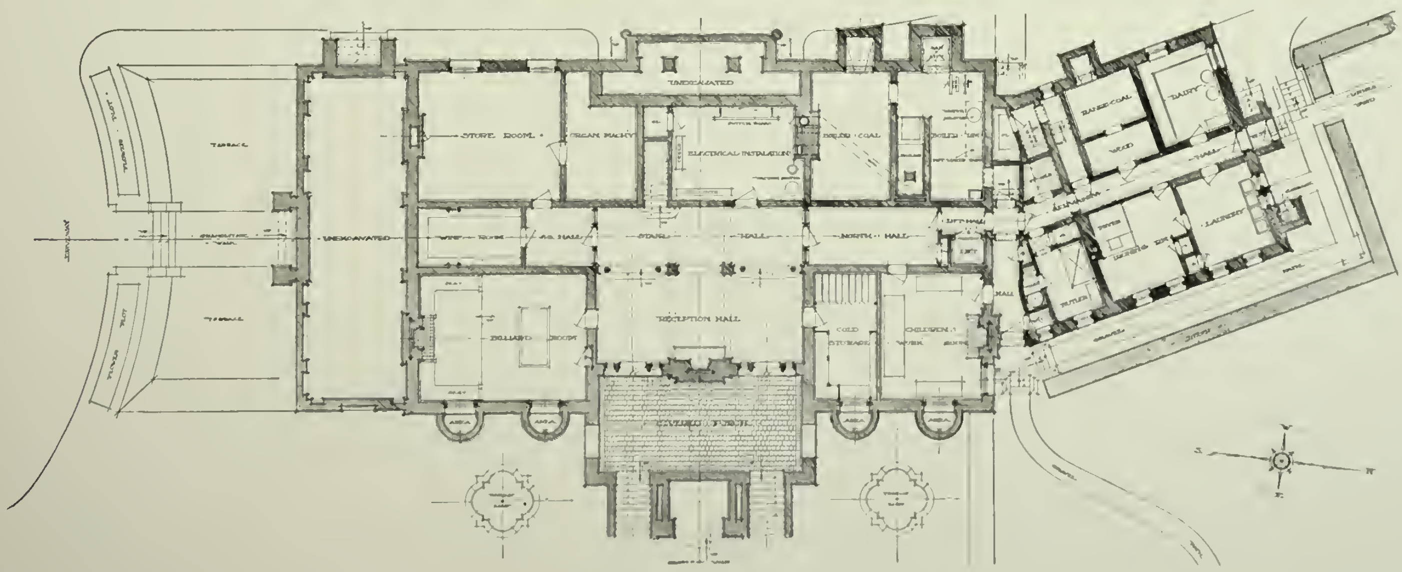
WELCH, SMITH & PROVOT,
AND
BOWEN BANCROFT SMITH,
ASSOCIATE ARCHITECTS.



SECOND FLOOR PLAN.

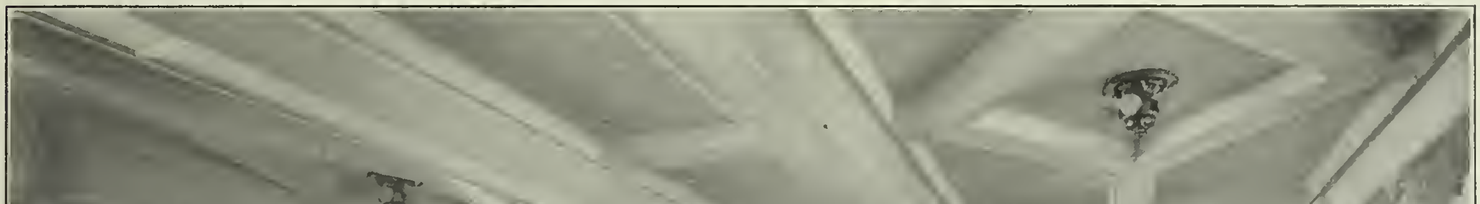


FIRST FLOOR PLAN.



BASEMENT FLOOR PLAN.

HOUSE AT PATTERSON, N. J.
WELCH, SMITH & PROVOT, AND BOWEN BANCROFT SMITH, ASSOCIATE ARCHITECTS.



RECEPTION HALL.

Standard Architectural Books—V.

Schools.

Edmund March Wheelwright, F.A.I.A.: Architect of the city of Boston 1891-1895. School Architecture, a general treatise for the use of architects and others; with descriptive illustrations. Boston, Rogers & Manson, 1901 ; 4to (.27 by .20 by .03), 15+329 p., ill. ; cloth, $5.00. Mr. Wheelwright describes his book well when he says in his preface that he has "sought to keep within the province of the architect, and not to trespass upon that of the educator, or of the engineering, sanitary, or hygienic expert." He has himself built some most attractive schools, and is disposed to give the element of beauty in design its proper place. In the text of his work he has used to advantage the sixth volume of the fourth part of the "Handbuch der Architektur" noticed in our first article. His Boston schools are illustrated in a monograph by Francis W. Chandler entitled "Municipal Architecture in Boston from Designs by Edmund M. Wheelwright." Boston, Bates & Guild, 1898; 2 vols.

Joseph A. Moore: Inspector of public buildings, state of Massachusetts. The School House, its Heating and Ventilation, published by the author, 1905 ; 8° (.24 by .16 by .015), 8 + 204 p., ill., plans; cloth, $1.80. This book has a chapter on the architecture of schools, but is mainly devoted to a thorough discussion of the hygienic phase of the subject.

Felix Clay, B.A.: Architect. Modern School Buildings, Elementary and Secondary; A treatise on the planning, arrangement, and fitting of day and boarding schools . . . with special chapters on the treatment of class rooms, lighting, warming, ventilation, and sanitation. London, Batsford; New York, Scribner's Sons, 1903; 4to (.285 by .195 by .05), 20 + 459 p., ill.; cloth, 25s. net. Clay's book gives English practice mainly and develops the scientific side of the subject. It is, apparently, the latest of the special works.

Libraries.

John Willis Clark, M.A., F.S.A.: Author of the Architectural History of the University of Cambridge. The Care of Books; an Essay on the Development of Libraries and Their Fittings, from the Earliest Times to the End of the Eighteenth Century. Cambridge, at the University, second ed. 1902; 4to (.27 by .18 by .04), 18 + 330 p., ill., pl., plans; cloth, 18s. net. The vast production of books in modern times has forced upon us the stack system and has made our libraries mechanical. It is pleasant to be brought into contact with the sympathetic *intimité* of older methods of housing books, when they were less plentiful, and more keenly delighted in. Clark's "Care of Books" is a thorough discussion of the development of library construction from the earliest efforts to the moderm period. Every architect who builds libraries should have this book, and will do well to return, when he can, to the earlier types. The illustrations are made from old examples hardly to be found elsewhere.

Theodore Wesley Koch: Librarian University of Michigan. A Portfolio of Carnegie Libraries, being a separate issue of the Illustrations from "A Book of Carnegie Libraries." Ann Arbor, Michigan, George Wahr, publisher, 1907; 8° (.25 by .16 by .02), 120 plates in portfolio, abundant plans; $2.50 net. The creation of the Carnegie foundations, coming rapidly, and resembling each other closely, has forced the development of a peculiarly modern type of small library buildings, which have been for the most part as well designed as possible. Mr. Koch's portfolio presents the series well, with many photographs and plans. His general work on Carnegie libraries will be valuable when it appears, although only incidentally concerned with architecture.

Free Public Library Commission of Massachusetts. Ninth Report, Boston, Wright and Potter Printing Company, state printers, being Public Document No. 44, 1899; 8° (.23 by .15 by .05), 17 + 465 p., many photographic illustrations ; apply to the secretary of the Commonwealth of Massachusetts. This report is especially valuable for a large number of photographic illustrations of working libraries. There are no plans. At the end of the volume is a section on the general library legislation of Massachusetts, beginning with 1798.

Theaters.

Edwin O. Sachs: Chairman of the British Fire Prevention Committee and E. A. Woodrow. Modern Opera Houses and Theaters; examples selected from playhouses recently erected in Europe; with descriptive text. A treatise on theater planning and construction, and supplement on stage machinery, theater fires, and protective legislation. London, Batsford, 1896-97-98; fol. (.575 by .415 by .055), 3 vols., ill., 220 pl., 32 paged pl.; 315s. unbound. A part of the third volume has been published separately under the title, "Stage Construction," Batsford, 1898. These three large volumes on theaters constitute the most exhaustive treatise published on this subject. All the most important theaters built up to the date of publication are included, as well as a thorough discussion of theoretical matters connected with the subject. Notwithstanding its cost the book should be in every considerable office.

William H. Birkmire: The Planning and Construction of American Theaters. New York, John Wiley, 1896; 8° (.235 by .155 by .025), 10 + 117 p., 38 pl., 2 paged pl.; cloth, $3.00. Birkmire's little book contains an excellent sketch of the history of American theaters and descriptions of the leading buildings; but its chief value is in the careful account of American methods of construction and legal limitations.

William Paul Gerhard, C.E.: Consulting engineer. Theaters; Their Safety from Fire and Panic, Their Comfort and Healthfulness. Boston, Bates & Guild Co., 1900; 8° (.22 by .15 by .02), 5 + 110 p.; cloth, $1.00. In his publications on theater construction Mr. Gerhard's point of view is that of the practical engineer looking out for the many details essential to the comfort and safety of crowded buildings.

William Paul Gerhard, C.E.: Theater Fires and Panics, Their Causes and Prevention. New York, John Wiley & Sons, London, Chapman & Hall, 1896; 8° (.19 by .13 by

.015), 7 + 175 p.; cloth, $1.50. This book contains a valuable bibliography of material on theaters, which includes books and articles in periodicals.

Hospitals.

Sir Henry Burdett, K.C.B.: Editor of the *Hospital.* Hospitals and Asylums of the World; their origin, history, construction, administration, management, and legislation; with plans of the chief medical institutions accurately drawn to a uniform scale, etc. London, J. & A. Churchill, 1891-93; text, 4to (.27 by .19 by .06), 4 vols., plates, 1903; fol (.51 by .35 by .02), 1 vol., 112 pl.; cloth, 168s. net. Vols. II and IV contain bibliographies. Burdett on hospitals is the most important and most extended work on the subject. The entire history of this class of buildings is given, with the practice in every country; and abundant examples. The research on which the work is based has been exhaustive, so that up to its date of publication it may be considered a complete body of practice in hospital architecture. For the practice since 1893 one must depend upon reports in the architectural journals, where detailed drawings of all important hospitals may be found.

Albert S. Ochsner, B.S., F.R.M.S., M.D.: Professor of clinical surgery, University of Illinois; and Meyer J. Sturm, B.S., architect. The Organization, Construction, and Management of Hospitals; with numerous plans and details. Chicago, Cleveland Press, 1907; 4to (.28 by .21 by .04), 600 p., ill.; cloth, $7.00. The book of Ochsner and Sturm does not take the place of Burdett with its fine body of examples; but on the theoretical side it is better, being based upon later practice. The sections devoted to lighting, plumbing, ventilation, and like matters are valuable in themselves and in their general application.

Sir Henry Burdett: The Cottage Hospital; Its Origin and Progress, Management and Work, etc. London, J. A. Churchill, 1877; 12mo (.19 by .13 by 0.25), 13+5 +272 p., ill., 1 pl.; 3d ed. rewritten, enlarged 1896; cloth, 10s. 6d. We cannot, in our bibliography, include the long list of Sir Henry Burdett's publications on hospitals, but this little work on the cottage type may be profitably added.

Bridges.

Edward Cresy (1792–1858): Architect, civil engineer, F.S.A. A Practical Treatise on Bridge-Building, and on the Equilibrium of Vaults and Arches, with the Professional Life and Selections from the Works of Rennie. London, John Williams Library of the Fine Arts; New York, Wiley & Co., 1839; fol. (.575 by .465 by .015), 3 p., 18 copper plates; 42s. Modern books on bridge building are entirely concerned with structural matters, and are to be classed with engineering and not architecture. Of the old books on masonary bridges, Cresy is probably the best, giving the fine English practice of the early nineteenth century.

Greenhouses.

Lord & Burnham Co.: Greenhouses as We Build Them, and other catalogues and circulars of greenhouse construction. New York office, St. James Building, 1907. In the absence of special works on this subject we may recommend the catalogues of a leading firm of architects which has devoted itself to this type of buildings.

The Arts Allied to Architecture.

Civic Art.

Georges Eugène Haussmann, Baron, 1809-1891; Préfet de la Seine 1853-1869: Mémoires. Paris, Victor Havard, 1869-1893; 8° (.23 by .155 by .04); 3 vols., 5 por.; 22.50 francs, unbound. The reconstruction of Paris by Napoleon III was the first large attempt to meet the problems of civic construction. In a surprising number of cases these problems were met and solved correctly. The best record of the work is in these reminiscences of a clever old man. Anyone undertaking the study of civic art should commence with Haussmann's Mémoires. He will be immensely amused by the way.

J. Stübben, Stadt-Baurath in Cologne: Der Städtebau, being the ninth half volume of the fourth part of the Handbuch der Architektur. Darmstadt, Bergsträsser, 1890; 4to (.275 by .2 by .04); 9+561 p., ill., 12 pl., 104 paged pl., 1 table; 32 marks. As important as the building, is its emplacement in the general plan of the city or town. The complete art of the city has been thoroughly illustrated by Stübben in his Städtebau, which is the standard manual on this subject.

Camillo Sitte: Director of the Gewerbeschule in Vienna. Der Städtebau nach seinen Künstlerischen Grundsätzen. Vienna, Carl Graeser & Co., 3d. ed., 1901; 8° (.225 by .145 by .015); 7+180+4 p., ill., 4 pl.; cloth, 7 marks. The Haussmannizing of Paris carried the French sense of classic symmetry to its logical conclusion. The effect in Paris is fine, but copied in every European city the result was a degree of monotony, against the burden of which a more modern school, with Sitte at its head, rebels. Sitte's book is held to the artistic side of the subject, and is sympathetic toward all the older schools of civic arrangement.

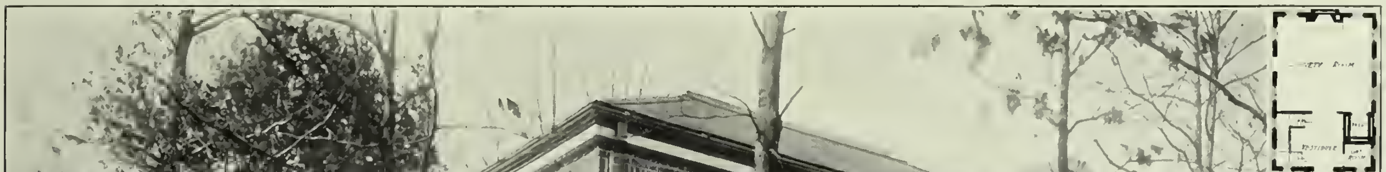
Charles W. Eliot: President of Harvard University. Charles Eliot, landscape architect. Boston and New York, Houghton Mifflin & Co. 1903; 8° (.23 by .16 by .03); 2 vols., ill., pl., portraits, maps, plans; cloth, $3.50. The second volume of this book covers the period during which Mr. Eliot was the landscape architect to the Metropolitan Park Commission of Boston, and is the best record of the intelligent reconstruction to which that city has been subjected.

Charles Mulford Robinson: Modern Civic Art; or, The City made Beautiful. New York, G. P. Putnams Sons, second ed. 1904; 8° (.23 by .155 by .035); 12+381 p., photographic pl.; cloth, $3.00. It would be pleasant to notice more of Mr. Robinson's enthusiastic work on civic art, but this one volume must suffice. "Modern Civic Art" is for the general reader and intended not so much to instruct as to interest him in multitudinous matters which are often forgotten and neglected.

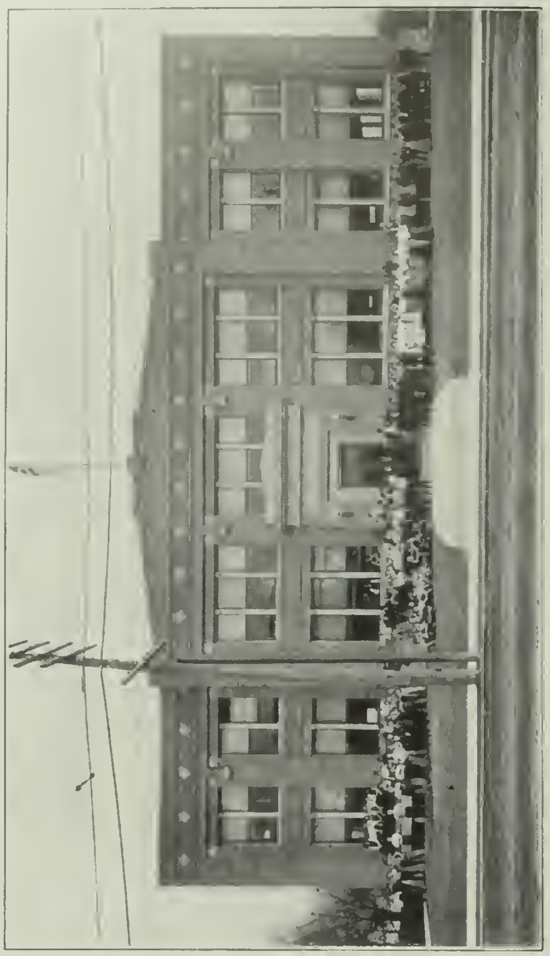
Jardinage.

Edouard André: Jardinier principal de la Ville de Paris. L'Art des Jardins, traité général de la composition des Parcs et Jardins. Paris, Masson éditeur, 1879; 4to (.29 by .21 by .07); 8+888 p., 520 ill., 11 pl.; 35 francs, unbound. André was in the line of succession after the great Alphand as the supreme authority in the management of the *Jardinage* of Paris. He prints many historical plans, but the chief value of his book is in its practical side. It is concerned mainly with the modern informal class to which practically all our parks belong.

TOMB AT LAKE FOREST CEMETERY, LAKE FOREST, ILL.
James Gamble Rogers, Architect.



SAWIN MEMORIAL HISTORICAL BUILDING, DOVER, MASS.
Philip B. Howard and Walter P. Henderson, Associated, Architects.



FACTORY FOR HENDERSON LITHOGRAPHING COMPANY, CINCINNATI, OHIO.
Tietig & Lee, Architects.

HOME OF THE INDIANAPOLIS STAR, INDIANAPOLIS, IND.
Vonnegut & Bohn, Architects.

TWO MANUFACTURING BUILDINGS AT CHICAGO.
Hill & Waltersdorf, Architects.

Little Wenham Hall.

EDITOR OF THE BRICKBUILDER.

Dear Sir: — In making an extensive search through the various libraries of the country for interesting pictures of brickwork I have encountered numerous references to "Little Wenham Hall" in Suffolk, England, in which a number of writers have commented in a very interesting way on the brickwork.

Singularly enough, however, I have been unable to find a photograph of this building in any of the eastern libraries, and thinking that it might interest your readers I sent a photographer to the building and obtained two fairly good photographs, one at small scale, and one taken at close range showing the brickwork in detail. If you care to do so I should be pleased to have you publish these pictures.

In "Domestic Architecture in the Middle Ages", T. Hudson Turner, I found the following description:

"The history of this building is involved in great obscurity. In the year 1281 the manors of Great and Little Wenham of Stamford, County Suffolk, were held by Petronilla de Holbrok. The estate of Little Wenham was subsequently the seat of the family of Brews, whose descendants possessed it in the reign of Henry VIII. The material of the walls of this house is chiefly brick mixed at parts with flints. These bricks are mostly of the modern Flemish shape, but there are some of other forms and sizes, bearing a general resemblance to Roman brick or tiles. The color of the bricks varies considerably. The buttresses and dressings are of stone. The plan is a parallelogram with a square tower at one angle, on the outside the scroll molding is used as a string and it is continued all round, showing that the house is entire as originally built. The ground room is vaulted with a groined vault of brick with stone ribs which are merely chamfered; they are carried on semi-octagon shafts with plainly molded capitals. The windows of this lower room are small plain lancets widely splayed internally."

LITTLE WENHAM HALL, SUFFOLK, ENGLAND.

DETAIL, LITTLE WENHAM HALL.

Very truly yours,

J. PARKER B. FISKE.

(Fiske & Company, Inc.)

Combination Life Rail and Surface Drainage Overflow for Plunge Baths.

A VALUABLE invention in the form of special shaped enameled bricks, which furnish a combination life rail and surface drainage overflow for plunge baths, has been very generally adopted in recent work. The ideas expressed and developed in the design were conceived and worked out for the purpose of eliminating many vital objections and faults which are commonly found in almost every plunge bath which has been built. By the use of these special shaped bricks a complete and efficient surface drainage system is obtained which removes all scum, dried skin, saliva, and other floating matter from the surface of the water, and prevents the accumulation of this objectionable matter on the sides of tank, thus reducing to a minimum the necessity of cleansing. Dirt from the feet of observers mixed with drippings from bathers — a common nuisance in most plunge rooms — is by capillary attraction diverted into the gutters which extend around the tank, while the overflow of the tank serves to carry the soiled water in the gutters off through the drainage outlets.

One of the especially valuable features of this invention is the life rail, which is formed at the water's edge by the use of the brick. The rail so formed is much more convenient and practical than festooned life ropes, or rigid bronze railings which are usually placed high up to prevent interference with the swimmer. It is helpful to the nervous beginner, as he does not have to reach high out of the water, which action has a tendency to force the body under water. It has the advantage over the metal rail in not interfering in any way with the diver. The cap courses can be made vertically flush with the life rail if desired. The life rail is a help to the swimmer in getting out of the tank, and if need be it is a convenient place in which to expectorate.

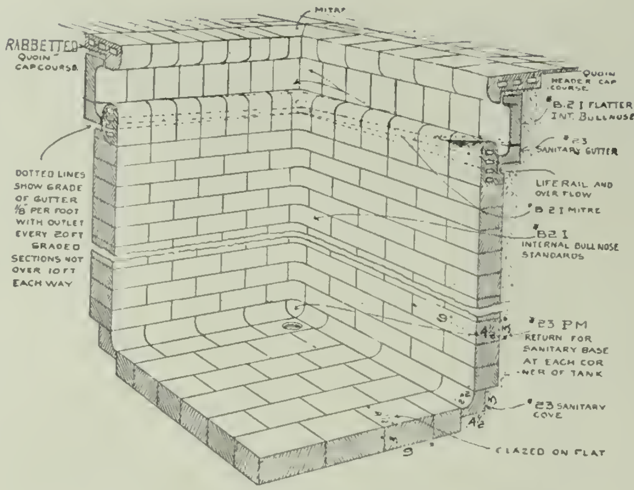


FIG. 1. PERSPECTIVE OF CORNER OF PLUNGE.

Fig. 1 shows the life rail, gutter, and quoin finish cap course.

Fig. 2 shows in sections A and B how easily the distance between water level and floor line can be varied to suit special requirements. The nearer together these are the more ideal are the conditions, including greater ease in getting out of the tank.

PLUNGE BATH IN Y.M.C.A. AT STAMFORD, CONN.
Equipped with life rail, surface drainage and sanitary gutter combination in enameled brick.
Tracy, Swartwout & Litchfield, Architects.

A cap course of marble may be used if preferred, and is advisable as it can be furnished with fine fluting or corrugation not practical in enameled brick. Furthermore with marble the thickness of cap course, from rabbet to the top, may be made less than with brick. Thickness of overhang must be slightly in excess of total fall of gutter—usually 1¼ inches in 10 feet=⅛ inch per foot.

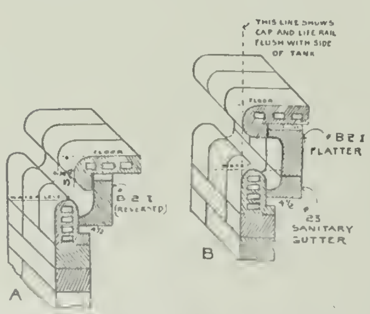


FIG. 2. SECTIONS SHOWING HEIGHTS OF FLOOR ABOVE WATER LEVEL OBTAINED BY USING ONE OR MORE COURSES OF STANDARD OR FLAT STRETCHERS ABOVE SANITARY GUTTER.

Fig. 3 shows plan and perspective of return of gutter behind life rail, also the miter finish of the inverted gutter and the turn of the life rail around the four vertical corners of the tank, which are made with Internal Bullnose finish, eliminating sharp corners and facilitating cleansing. The removal of overflow is accomplished by the sloping gutter, as shown in Fig. 1. Outlets are usually located in sides and ends twenty feet apart, with ten foot grade sloping each way on one eighth inch fall to the foot. Flooding of the floor is impossible if the number and size of outlets are sufficient. The lip in the life rail is especially strong and the cap course needs no special bonding if set in cement. If desired, metal tie rods may be used to give an added strength to either.

It may be observed that the removal from the surface of all impurities by this arrangement makes the bath look far more inviting, whereas under the old methods surface impurities are only removable by emptying the tank, by which process they are deposited on the sides and bottom of the tank, which have to be washed off with a scrubbing brush and hose—this in turn throwing the whole tank system out of commission for a considerable time. Furthermore the dirt and scum once having been allowed to dry on the surface of the tank require considerable effort to remove it, and this leads to the use of rough cleansing materials which ultimately tend to dull the face of the lining.

THE natatorium in the Phipps Building, Pittsburg, Grosvenor Atterbury, archiect, illustrated in the plate form of this issue, has a Guastavino glazed tile ceiling over the swimming pool. The span of the ceiling arch is about fifty feet, the length about one hundred and twenty-five feet. The color scheme is cream white and green, the border tile being in a dull mat glaze, with panels in corrugated tiles of a more lustrous green. Guastavino tiles are used in the steam-rooms, rest-rooms, lavatories, galleries, etc.

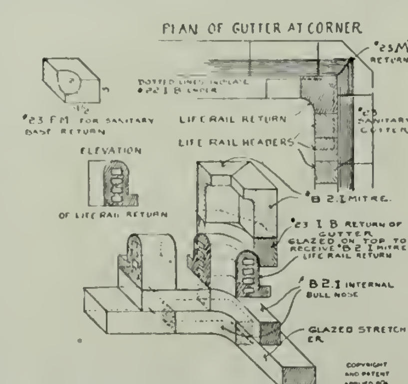


FIG. 3. PERSPECTIVE PLAN OF GUTTER AT CORNER.

Editorial Comment and Miscellany.

THE Council of Fine Arts held its first meeting in Washington, February 9. Of the thirty members composing the council, twenty-six were present. In organizing, Mr. Trowbridge, of Trowbridge & Livingston, was elected chairman, and Mr. James Rush Marshall, of Hornblower & Marshall, was chosen secretary. Various sub-committees were formed, so that questions submitted to the council by the president or his cabinet officers may be considered by those familiar with special subjects, and then presented to the entire council for action. Under the established custom, whereby the orders of one president remain in effect until changed or rescinded by another, the council will continue to exist after Mr. Roosevelt's departure from the White House. Already Mr. Taft has shown his sympathy with its object and work. The most important action of the council at its initial meeting was to report strongly in favor of locating the Lincoln Memorial at the extreme western end of the Mall, where it was first designed to be placed by the Senate Park Commission's Plan.

WHITE BUILDING, SEATTLE, WASH.
White mat glazed terra cotta, executed by Atlantic Terra Cotta Company. Brick furnished by Hydraulic Pressed Brick Company.
Howells & Stokes, Architects.

A STATE Art Commission for New York is provided for in a bill recently introduced into the legislature. The commission is to be composed of eleven members: The governor, the presidents of the Albright Art Gallery of Buffalo; the Albany Historical Society; the Metropolitan Museum of Art, and the Brooklyn Institute of Arts and Sciences; the commissioner of education, and five persons to be appointed by the governor — including one painter, one sculptor, and one architect, and two other persons not members of any branch of the profession of fine arts—from lists to be supplied by the Fine Arts Federation of New York, the Central New York Chapter, and the Buffalo Chapter of the American Institute of Architects.

DETAIL BY FRANCIS H. KIMBALL, ARCHITECT.
New York Architectural Terra Cotta Company, Makers.

The term of office is to be three years, except in the case of the first members of the commission, whose terms are to be fixed by lot at one, two, and three years. They are to receive no compensation other than reimbursement for expenses.

IT HAS been estimated that the amount of wood annually consumed in the United States at the present time is twenty-three billion cubic feet, while the growth of the forest is only seven billion feet. In other words, Americans all over the country are using more than three times as much wood as the forests are producing. The figures are based upon a large number of state and local reports collected by the government and upon actual measurements.

DETAIL BY J. WALTER STEVENS, ARCHITECT.
Winkle Terra Cotta Company, Makers.

HARVARD UNIVERSITY offers to members of the associate societies and to the individual members of the Architectural League of America, three scholarships in architecture for special students. The scholarships will be forwarded to those who stand highest in a competition in architectural design to be held in May. The competition will be conducted in the various cities by the League through the organizations affiliated with it; on a program prepared by the architectural department of the Harvard University, and will be judged by the professor of architecture in the university and a Boston architect selected by the League. These scholarships entitle their holders to free tuition in Harvard University for one year. The cost of such tuition otherwise is $150 per year. If the number of candidates and the quality of the work done in the competition should warrant such action, the department of architecture of Harvard University will recommend to the authorities the award of similar scholarships to the two competitors standing next highest on the list to the successful ones. Candidates should notify Emil Lorch, chairman of the Committee on University Fellowships, Architectural League of America, Ann Arbor, Michigan, by April 10 of their intentions to take part in the competition.

MANUFACTURERS' BUILDING, MINNESOTA STATE FAIR GROUNDS.
Built of pink face brick, made by Twin City Brick Company.
Clarence H. Johnston, Architect.

A JAPANESE Commission appointed for the purpose of studying the effects of earthquakes upon buildings has recommended a system of channeled and fitted bricks. It also endorses the method of thickening the walls with a concave curve at the base, resembling the roots of a tree as they grow into the trunk. The latter scheme has been tried with success in southern Italy.

FACTORY OF THE NILSON MACHINE COMPANY, BRIDGEPORT, CONN.
Walls built of terra cotta hollow tile of warm rich orange tones, made by Henry Maurer & Sons.
Meloy & Beckwith, Architects.

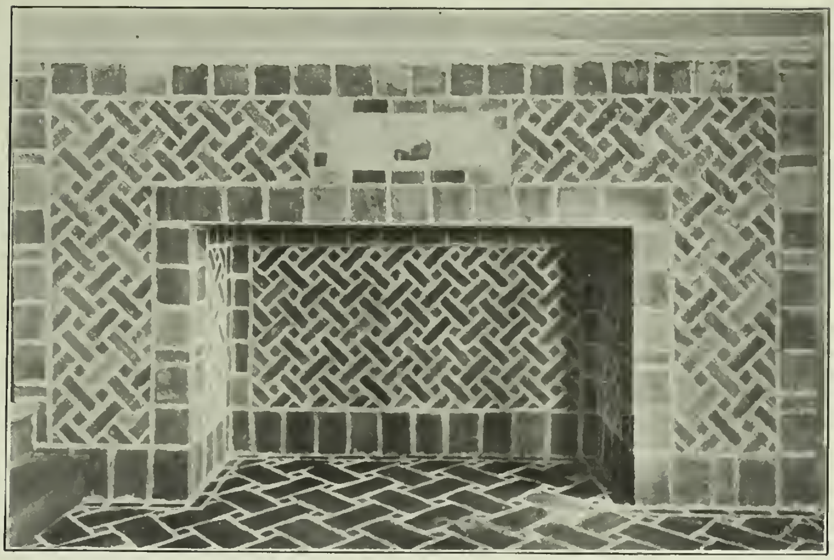
A NUMBER of American women have subscribed $25,000 for the competition of the Paris Prize to be held by the New York Society of Beaux Arts Architects. The income will send a student to the Beaux Arts every three years. The winner in the competition is to receive $250 quarterly for two and a half years. The subscribers of $5,000 each are: Mrs. Goelet, Mrs. Harry Payne Whitney, Mrs. Auchmuty, Mrs. W. K. Vanderbilt, and Mrs. Alex. G. Cochran. The preliminary competition, open to every American, was held March 13 at 36 East Twenty-second street, New York.

THE passage of what is known as the commissioner's bill at Washington provides for the supervision of the building and loan associations of the District of Columbia by the Comptroller of the Currency. "This gives the thousands of depositors the protection and advantage of governmental supervision for the first time," declares Commissioner Macfarland.

GREAT activity in building is to be observed among the colleges of the country. Marquette University has announced a plan for centralizing its now scattered buildings. An engineering building to cost about $200,000 will be started within six weeks. A law building to cost $100,000 will follow, and later a gymnasium. . . . A bill pending in the Minnesota legislature carries an appropriation of $300,000 for the purchase of a tract of fifty acres to be added to the present campus of the University of Minnesota. Upon this ground is to be located the new men's building, for which $250,000 is now available. The regents will signalize their "greater campus" scheme by putting into effect a large pro-

PUBLIC SCHOOL, CHICAGO.
Built of "Shawnee" brick, made by Ohio Mining & Manufacturing Company. Furnished by Thomas Moulding Company, Chicago.
Dwight H. Perkins, Architect.

gram of construction. The legislature has been called upon for more than $1,000,000 to be devoted to the erection of new buildings, and it is hoped that several times that amount may be spent on improvements within the next five years. Mr. Cass Gilbert has been retained to supervise the work of beautifying the campus and effecting a new alignment of the buildings. . . . At the University of Michigan a men's dormitory seems now assured. It is being planned six stories in height and to house three hundred students. A commons building is also being projected for the near future. . . . The University of Virginia has retained Warren H. Manning, the Boston landscape architect, to carry out, as far as may now be possible, the original design of Jefferson's for the development of the natural and artificial features of the campus. . . . The fund for the Harper Memorial Library at the University of Chicago has been completed, and there is now on exhibition, in the office of Shepley, Rutan & Coolidge, a plaster model showing this and other neighboring buildings as the group will appear when completed. . . . The University of Maine is about to dedicate its new Hall of Agriculture. . . . Williams College has received the gift of a large tract of land, and from another donor a sum of money for improving this property for the purposes of intramural sport.



A FIREPLACE IN THE GAINSBOROUGH STUDIO, WEST 59TH STREET, NEW YORK CITY.

Built of "Tapestry" bricks and tiles which range in color from Indian red through varying shades of brown, purple, olive, and blue. Fiske & Company, Inc., Makers. Charles W. Buckham, Architect.

GROUP OF APARTMENTS, CHICAGO.

Faced with wire cut dark red brick, made by Western Brick Company, Danville, Ill. Borst & Hetherington, Architects.

RAILWAY DEPOT, NEWBURG, OHIO.

Roofed with Imperial Spanish red tile, made by Ludowici-Celadon Company. R. Trimble, Architect.

ONE of the finest appointed municipal lodging houses in the world was the one opened in New York a few weeks ago. It is equipped with electric elevators, shower baths, fumigating retorts, immaculate sleeping quarters, and extensive commons. It will accommodate nine hundred men. By eleven o'clock of the evening on which it was thrown open three hundred and eighty-three persons had registered.

THE plaza of the new Union Station at Washington is to be ornamented by the Columbus Memorial Statue and large architectural fountain for which Congress appropriated $100,000. The modeling of the statue has been awarded to Lorado Taft, who is a relative of the President.

THE State Association of Architects has been formed in Pennsylvania. The association comprises delegates from the Chapters of the American Institute of Architects in the state. D. Knickerbacker Boyd of Philadelphia was elected president, and William L. Baily, secretary and treasurer. Among the topics considered by the association at its first meeting, which was held at Harrisburg on February 23, was the revision of the building laws and the registration of architects.

IN GENERAL.

Mrs. W. K. Vanderbilt, Sr., has donated something over $1,000,000 for the erection of four model tenements for persons suffering with tuberculosis.

City Engineer Darnell of Kansas City has been studying the various methods by which large cities dispose of their sewage, and declares that of Columbus, Ohio, the largest and best in the country.

The Ethical Culture Society of New York has commissioned Robert D. Kohn to design a new hall to be built at Central Park, West and Sixty-fourth streets.

MAT GLAZE FAIENCE WALL FOUNTAIN, NAVAL Y.M.C.A., NORFOLK, VA.
Modeled by Francis G. Plant, executed by Hartford Faience Company.
Louis Jallade, Architect.

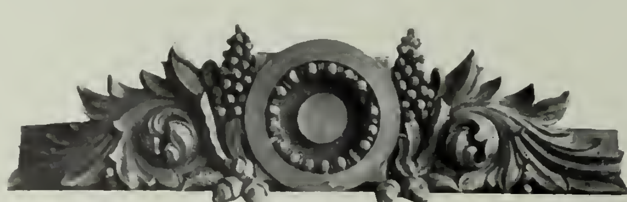
As recently as 1908 there were in use in Kentucky as many as four thousand five hundred old log cabin schoolhouses.

The American Institute of Architects, through its secretary, Glenn Brown, the Octagon, Washington, D. C., has issued a circular in which is given the revised schedule of charges as recorded by the convention which was held at Washington in December.

Y.M.C.A. BUILDING, INDIANAPOLIS, IND.
Terra cotta trim, made by Indianapolis Terra Cotta Company. Walls faced with Hydraulic-Press Brick.
Foltz & Parker, Architects.

The municipality of Pau, France, has erected a beautiful building for the Wright Brothers, and thus architecture has come to serve aerial navigation as it already provides the terminii of every other form of navigation and transportation. The new building is 70 by 50 feet and contains, besides six bed rooms and a kitchen, enough space for two aeroplanes.

At a Vassar College luncheon in New York a few weeks ago, Sir Caspar Purdon Clarke told how the Metropolitan Museum was steadily to enlarge to six times its present size. It will then occupy twenty acres of ground in Central Park. The money for this expansion is steadily coming in, and Sir Caspar declared that patience was all that was necessary to see the construction of the largest art museum in the world.



DETAIL BY GEORGE ROOSEN, ARCHITECT.
New Jersey Terra Cotta Company, Makers.

The Columbus Society of Architects, Columbus, Ohio, has petitioned Congress to approve and adopt the site selected by the Burnham Commission for the Lincoln Memorial at Washington.

The firm of Lohman & Place, architects, Seattle, Wash., has been dissolved. George Lohman will continue the practice at the same address, 16 Hancock Building.

The preliminary examinations for the Rotch Traveling Scholarship will be held at the office of the secretary, C. H. Blackall, 20 Beacon street, Boston, on Monday and Tuesday, April 12 and 13, to be followed by the sketch for competition in design on Saturday, April 17. The successful candidate receives $2,000, to be expended in foreign travel and study during two years. Candidates must be under thirty years of age, and have been engaged in professional work during two years in the employ of a practising architect resident in Massachusetts.

George Lawrence Smith has opened an office for the practice of architecture at 22 Congress street, Boston.

Charles G. Badgley, architect, Seattle, Wash., has removed his office to the White Building.

Potter & Lundberg, architects, Tacoma, Wash., have dissolved copartnership. C. F. W. Lundberg retains the present offices in the Provident Building. Mr. Potter has formed a copartnership with A. P. Merrill, under the firm name of Potter & Merrill, office 317 Provident Building. Manufacturers' samples and catalogues desired.

W. E. Nelson, architect, has opened an office in the Shupert Building, San Angelo, Texas. Manufacturers' samples and catalogues desired.

SPECIAL SHAPED BRICK FOR PLUNGE BATHS.

THE special shaped bricks used in forming the life rail, cap course, and gutter for plunge baths, illustrated and described on another page of this issue, are the invention of the American Enameled Brick & Tile Co. of New York. These bricks have already been used in baths for the Y.M.C.A. at Stamford, Conn., Tracy, Swartwout & Litchfield, architects; Sailors' Home, New York City, Boring & Tilton, architects; Racquet and Tennis Club at Cambridge; Willard School, Troy, N. Y., M. T. Cummings & Sons, architects; Episcopal Guild Hall, Marquette, Mich., Carleton & Kuenzli, architects.

We reproduce here an illustration which appeared on

CLAY PRODUCTS OF THE UNITED STATES.

The pyramid of burned clay would be 4,294 feet high and represent a value of $158,942,369.

KESSNER BUILDING, CHICAGO.

Terra cotta exterior, executed by Northwestern Terra Cotta Company. Jenney & Mundie, Architects.

the first page of the *Scientific American* for January 30, giving a graphical comparison of the magnitude of clay products for the year 1907.

The total value (probably estimated) is given as $158,942,369, divided up as follows:

	Quantity.	Value.
Common brick	9,795,698,000	$58,785,461
Vitrified paving brick	876,245,000	9,654,282
Front brick	585,943,000	7,329,360
Ornamental brick	....	361,243
Enameled brick	....	918,173
Fire brick	....	14 946,045
Stove lining	....	627,647
Drain tile	....	6,864,162
Sewer pipe	....	11 482,845
Architectural terra cotta	....	6,026,977
Fireproofing	....	3,162,453
Hollow building tile or blocks	....	1,088,165
Tile, not drain	....	4,551,881
Miscellaneous	....	3,000,201
Pottery	....	30,143,474

COMPETITION FOR A HOUSE.

To be built of Terra Cotta Hollow Tiles at a cost not exceeding $10,000.

FIRST PRIZE $250., SECOND PRIZE $150., THIRD PRIZE $100.

PROGRAM.

THE problem is a house with walls, floors, and partitions built of Terra Cotta Hollow Tiles.

The cost of the house, exclusive of the land, is not to exceed $10,000.

A detailed statement of costs must accompany each design, this statement to be typewritten on one side only of a sheet of paper measuring 11 inches by 8½ inches.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The particular object of this Competition is to encourage a study of the possibilities in the use of Terra Cotta Hollow Tiles in the exterior walls of houses. Here is a material which is durable, economical in original cost and construction, desirable in its weatherproof qualities, and one which is capable of meeting the esthetic demands of the designer. Its largely increased use, especially in the eastern section of the country, is evidence of its popularity as a building material which has passed the experimental stage.

The plan should provide accommodations for a family of five — three adults and two children — and two servants. There are no restrictions as to size, shape, or style of house — except the cost — nor the size, shape, or location of lot.

CONSTRUCTION.

While the method of construction for walls, floors, and partitions is to be determined by the designer, the following suggestions are offered as being practicable and admissible.

First. Outside walls may be of Terra Cotta Hollow Tiles eight inches thick (12 inches by 12 inches by 8 inches), the blocks being heavily scored on two sides. Stucco may be used for an outside finish and plaster applied direct to the block for interior finish.

Second. Outside walls may be of Terra Cotta Hollow Tiles ten or twelve inches thick with same finish as suggested above.

Third. The outside walls may be faced with brick, with a backing of eight inch tiles.

Fourth. The outside walls may be built with outer and inner walls, with an air space of two inches between, using in the outside wall a four inch hollow tile, and on the inside a six inch tile. The treatment of the face of such a wall, and the manner of bonding the outer and inner walls are left to the designer.

For the floors, one of the long span hollow tile terra cotta block systems now on the market, which are adapted up to spans of twenty feet without the use of steel beams, or a system which employs hollow tile terra cotta blocks in connection with light steel construction. The roof need not be of fireproof construction.

DRAWINGS REQUIRED.

On one sheet the front and a side elevation at a scale of four feet to the inch; also plans of floors at a scale of eight feet to the inch. On another sheet details showing clearly the scheme of construction for the exterior walls, the floors and partitions, together with other details drawn at a scale sufficiently large to show them clearly. Graphic scales to be on all drawings.

The size of each sheet is to be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are not to be mounted.

All drawings are to be made in black line without wash or color. All sections shown are to be cross-hatched in such manner as to clearly indicate the material, and the floor plans are to be blocked in solid.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of THE BRICKBUILDER, 85 Water street, Boston, Mass., on or before June 1, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three well-known members of the architectural profession.

In making the award the jury will take into account: first, the fitness of the design in an artistic sense to the materials employed; second, the adaptability of the design as shown by details to the practical constructive requirements of burned clay; third, the relative excellence of the design.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $250.
For the design placed second a prize of $150.
For the design placed third a prize of $100.

In the study of this problem competitors are invited to consult freely with the manufacturers of burned clay fireproofing, or their agents. This Competition is open to everyone.

The prize and mention designs will be published in THE BRICKBUILDER.

THE BRICKBUILDER

VOLUME XVIII | APRIL 1909 | NUMBER 4

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

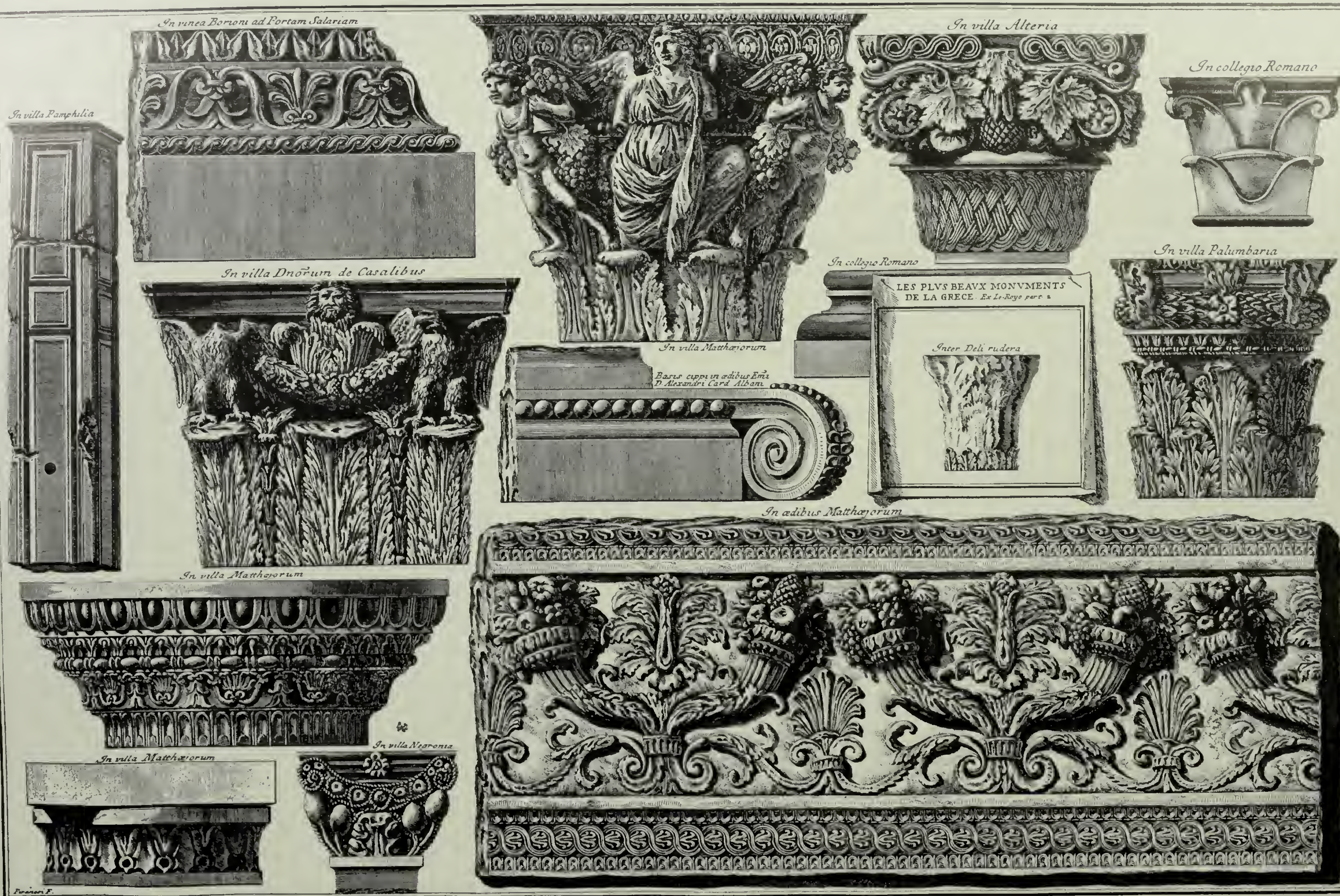
CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

CASS GILBERT; PELL & CORBETT; POND & POND; RIPLEY & RUSSELL; STRATTON & BALDWIN; HORACE TRUMBAUER.

LETTERPRESS



CAPITALS AND OTHER ARCHITECTURAL DETAILS FROM ANCIENT ROMAN BUILDINGS. GIOVANNI BATTISTA PIRANESI, DEL.

THE BRICKBVILDER

VOL. 18 NO. 4 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· APRIL 1909

Gymnasiums—Their Plan and Equipment—III.

BY M. B. REACH.

Gymnasiums for Armories.

GYMNASIUM work in the armory assumes a different character from similar work in educational institutions in that there is less trained, compulsory, or educational work and more individual or voluntary application. The gymnasium is recreative and looked upon as a social factor planned to further cement the purposes of the body organization — a club feature as it were. Consequently it is of secondary rather than primary consideration in the plans of the building. This is an era of physical upbuilding, however, and the work of the gymnasium pervades all organizations to greater or lesser degree, and the architect who knows his conditions will plan accordingly.

Where possible the gymnasium or recreative room should be separate from the main drill hall, which, at best, is ill adapted for apparatus work. A room of not less than 40 feet by 60 feet should be assigned for this purpose, and I recommend, without running track or gallery. If the building conditions will permit a separate room for hand ball it would be found most desirable. The end or side walls of the gymnasium could be designed for this purpose, but it would interfere with other work and play in that room, and a separate provision, therefore, for this popular game is advisable.

I do not know of any gymnasium that includes in its equipment a regulation hand ball court, which should be about 60 feet long, 24½ feet wide, and 35 feet high in the front, tapering down to 33 feet at the back wall. Most gymnasiums content themselves with the front wall. Where possible, however, the two side walls add materially to the science, pleasure, and sport of the game, and the majority of hand ball is probably played in a room not over 20 feet wide, 25 or 30 feet long, with a ceiling height of perhaps 15 or 16 feet.

The general specifications for the gymnasium room may be taken from the preceding instalments of this article.

Fig. 12 fairly represents a typical equipment, of which the following is a list:

Four triplicate pulley weights, two rowing attachments, two abdominal mat attachments, one wrist roll, one vaulting horse, one vaulting buck, one parallell bar, one low parallel bar, one horizontal and vaulting bar, one spring board, one pair jump standards, two jump boards, one inclined board, one adjustable ladder, six traveling rings, one pair flying rings, one trapeze, two climbing ropes, one climbing pole, one striking bag disc, one pair basket ball goals, mats, miscellaneous small and calisthenic apparatus.

Where it becomes absolutely necessary to use the main drill hall for gymnasium purposes certain provisions should be made to care for types of overhead apparatus that can ill be spared from a needed equipment. Owing to the great height of the overhead truss work and also the usual arched construction, it proves an expensive operation for the gymnasium contractor to provide suitable supports, and when installed they are apt to look, as they are, after-thoughts that fit poorly in their environment.

As most armories, I believe, have a spectators' gallery this might be utilized to good advantage if suspended at proper height and made of ample width. As I write this it occurs to me that I have seen an armory with a wide gallery at one end, but whether of sufficient height for apparatus I do not recall. I would assume that a very considerable seating capacity was desirable and a wide gallery in itself of great utility. This would be enhanced where the hall was used for a gymnasium, if suspended 16 feet from the floor. For the best usage it should approximate 25 feet in width, although 5 feet less than this could be recommended as workable. A gallery of this description would well care for all needed suspended apparatus excepting the traveling rings, which advisedly should be suspended adjacent a side wall similar to arrangement shown in Fig. 13. This fixture could be supplied by the gymnasium outfitter in pipe construction or made part of the truss work plan.

Fig. 13 suggests an armory equipment following out the ideas outlined in the foregoing. The apparatus shown in this plan is generally covered by the list for Fig. 12. All apparatus on the floor is portable.

Gymnasiums for Clubs.

The average "club" gymnasium is generally found to be somewhat between the institutional class and that exemplified by the armory, with a leaning toward the latter. Class or educational work will be found to some extent with a regular physical director in charge. Group work, however, is irregular. The room is more recreative in character and the use by the individual subservient to his inclination. The equipment of apparatus will parallel that shown for the armory, with the addition of a few more wall pieces for class work.

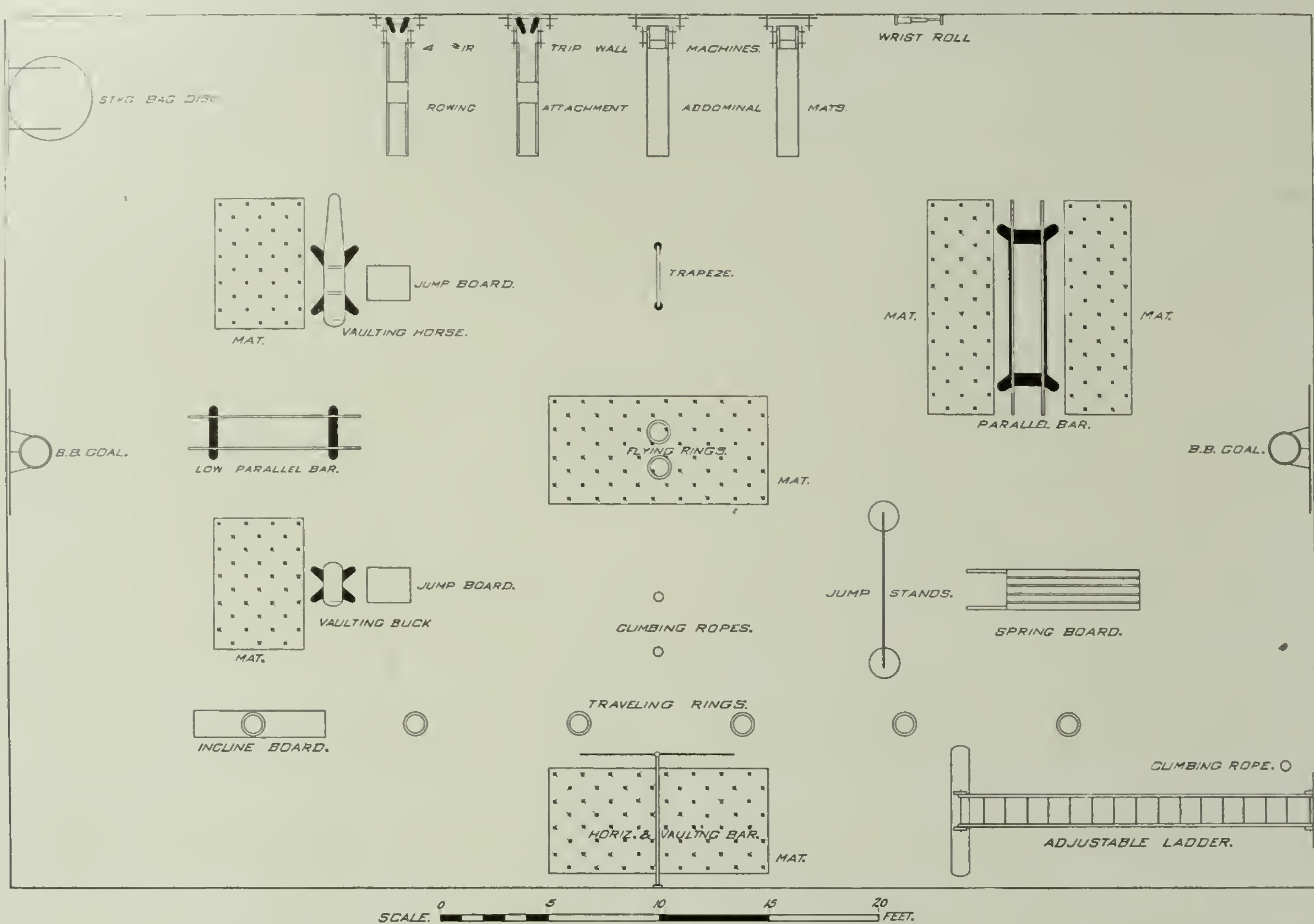

WRIST ROLL
ROWING ATTACHMENT
TRIP WALL MACHINES.
ABDOMINAL MATS.
JUMP BOARD.
VAULTING HORSE.
MAT.
TRAPEZE.
PARALLEL BAR.
B.B. GOAL.
LOW PARALLEL BAR.
FLYING RINGS.
JUMP STANDS.
SPRING BOARD.
VAULTING BUCK
CLIMBING ROPES.
TRAVELING RINGS.
INCLINE BOARD.
CLIMBING ROPE.
HORIZ. & VAULTING BAR.
ADJUSTABLE LADDER.
SCALE. 0 5 10 15 20 FEET.

FIG. 12.

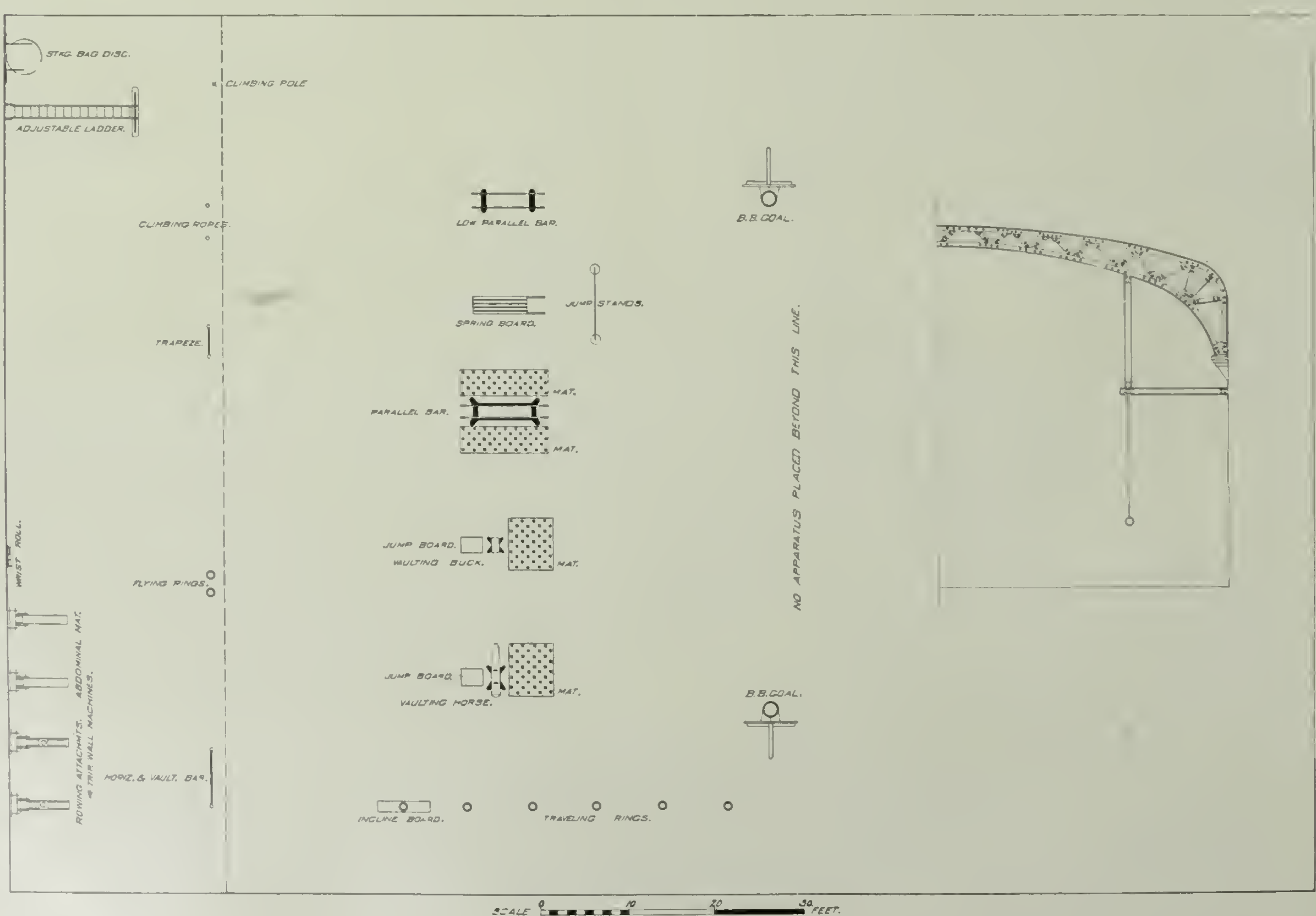
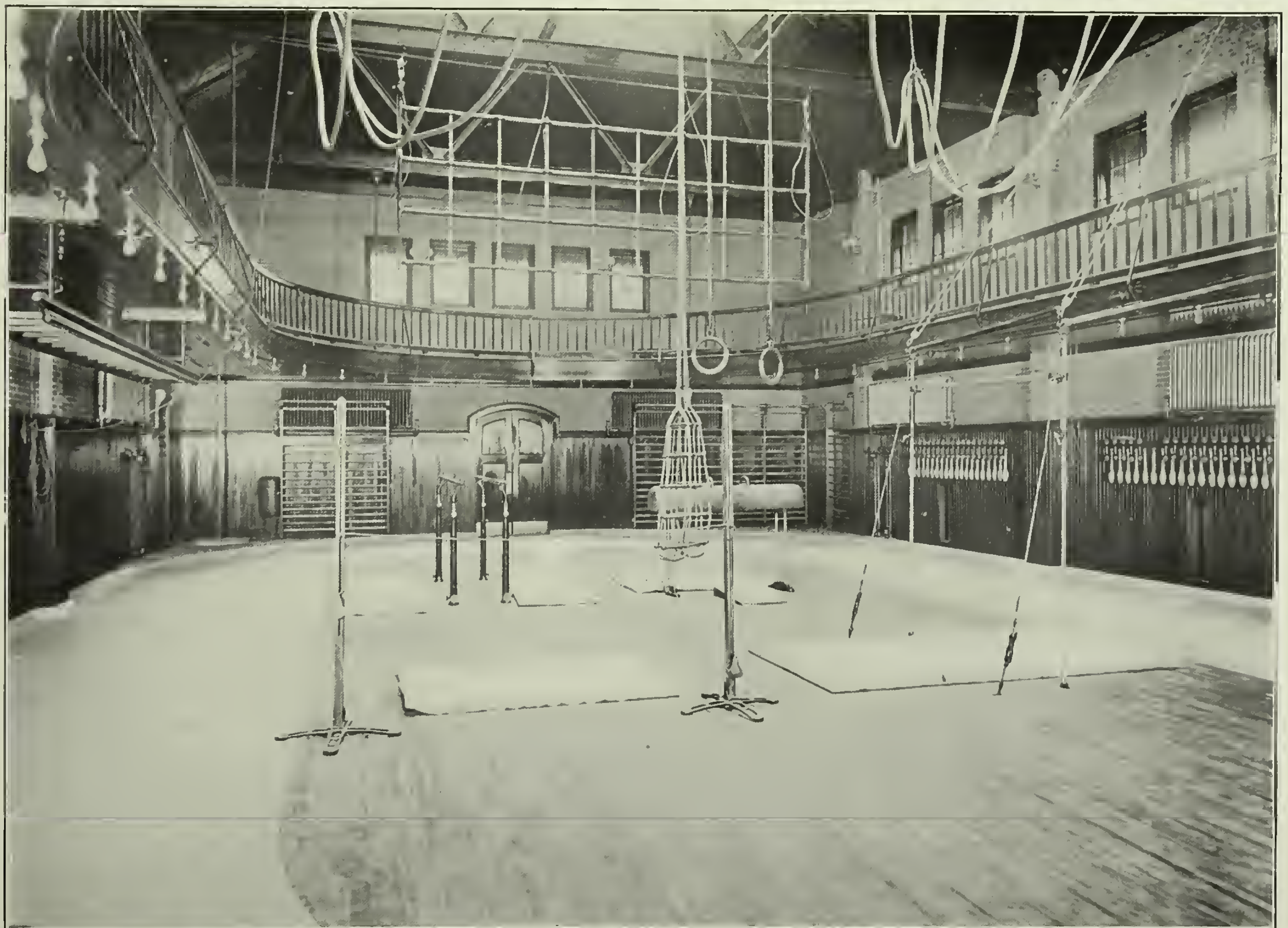

STAG. BAG DISC.
CLIMBING POLE
ADJUSTABLE LADDER.
CLIMBING ROPES.
TRAPEZE.
FLYING RINGS.
HORIZ. & VAULT. BAR.
LOW PARALLEL BAR.
B.B. GOAL.
SPRING BOARD.
JUMP STANDS.
PARALLEL BAR.
MAT.
JUMP BOARD.
VAULTING BUCK.
VAULTING HORSE.
INCLINE BOARD.
TRAVELING RINGS.
NO APPARATUS PLACED BEYOND THIS LINE.
SCALE 0 10 20 30 FEET.

FIG. 13.



GYMNASIUM FOR THE WESTERN PENNSYLVANIA INSTITUTION FOR THE BLIND, PITTSBURG, PA.
Janssen & Abbott, Architects.

Other than in the design of a large athletic club I would recommend the elimination of a running track. A gallery might prove desirable at one end of the room, but this feature may depend upon the space available for gymnasium use. Except in the case of a very minor club I would suggest that there be no curtailment upon a clear space of 40 feet by 60 feet.

Adjoining the gymnasium room there should be courts for hand ball and a fair sized room for boxing. Some clubs provide a separate room for wrestling, and as this art receives more or less attention, particularly in athletic clubs, no mistake would be made in suitable provisions for its indulgence. It is possible, however, to count a wrestling rug of 16 or 18 feet square a part of the gymnasium equipment, and a corner of the room set off for its use. This should only be tolerated in circumstances that provide ample room for the regular work of the gymnasium proper. The rug with mat underneath is cumbersome, heavy, and not easily moved, consequently may be considered as practically a permanent fixture in estimating the working capacity of the room. The proportion of space per capita, outlined in my first instalment, would probably hold good here. There is, however, the thought that those gymnasiums leaning more towards the recreative side will demand more space. Man in his play calls for more room than man in his work, and becomes more disgruntled if his needs are not reasonably fulfilled, particularly where he is paying for the purpose of playing. I have frequently heard criticisms from different members of clubs I have visited of inadequate facilities in one department or another, and up to a certain reasonable point such criticisms are justified. It is my opinion, however, that a gymnasium of 60 feet by 80 feet would prove ample accommodation for almost any club excepting the occasional and rare metropolitan athletic club. With 40 feet by 60 feet as the minimum and 60 feet by 80 feet as the maximum the problem of space is fairly well confined. In a gymnasium of the latter size the question of the track or gallery may be decided upon the merits of the individual case. I am showing no plans of equipment, owing to similarity of list already illustrated as typical of an armory gymnasium. There would be an increased number of chest machines and possibly some bar stalls.

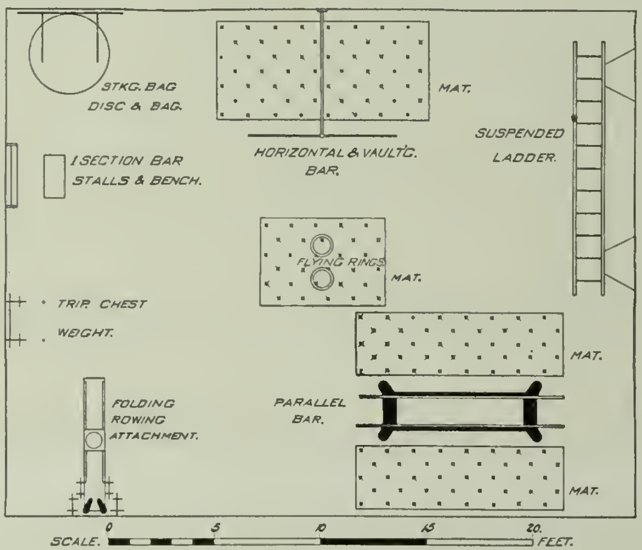


FIG. 14.

The Private Gymnasium.

The private gymnasium, which may be accepted as meaning that in a home, can hardly be treated by rule. The individual and conditions offer too great a possibility of variety, no two cases being alike. Briefly, a very complete home equipment can be installed in a room from 20 feet to 25 feet wide and 30 feet long. The ceiling height may be 16 feet as the maximum and 14 feet as the minimum.

Fig. 14 shows a typical equipment of which the following is a list:

One triplicate chest weight, one section bar stalls and bench, one folding rowing attachment, one folding horizontal and vaulting bar, one parallel bar, one pair flying rings, one suspended ladder, one striking bag disc and bag, mats, medicine balls, and calisthenic apparatus.

Gymnasiums for Women.

As a manufacturer I particularly like to see a woman's gymnasium beautifully clear as to side walls and free from running tracks regardless the size of room. Some, if not the most prominent educators in women's gymnastics, hold a sustaining opinion in this question. I, therefore, feel safe in taking my stand that running tracks sacrifice more good than they accomplish under these conditions.

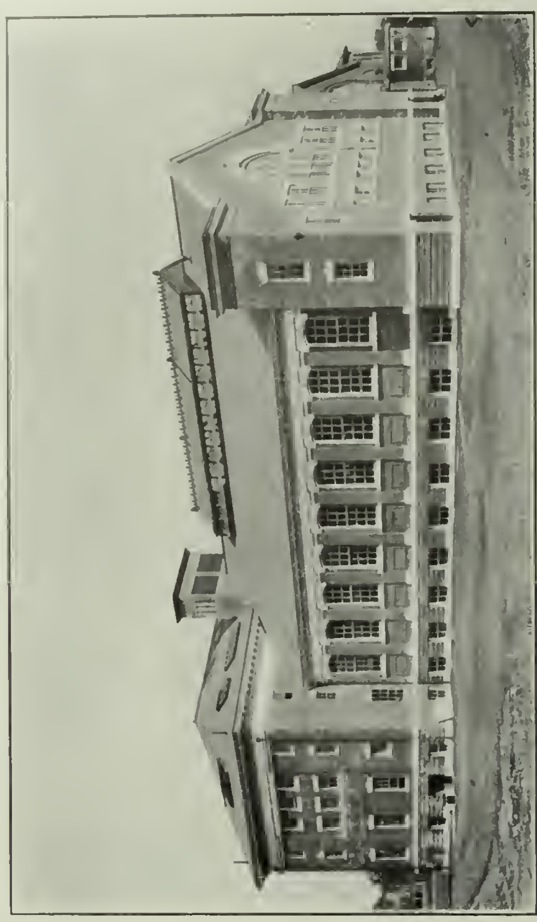
Practically all of our more prominent gymnasiums for women are equipped after what is known as the Swedish system. This calls for more overhead work than is usually installed under the American system, but requires no modification in the suggestions previously made as to truss construction. A running track projecting out into the room frequently cuts into a very much needed amount of space for overhead apparatus and further interferes with the most ideal arrangement in providing means for getting such apparatus out of the way. In the ordinary gymnasium there is not so much of it, and as a rule it is attached to hoists and pulled up against the ceiling. In the Swedish equipment there is apt to be a very considerable quantity of such apparatus (see Figs. 15 and 16) and the regular hoisting arrangement is both slow and difficult for a woman to handle. By way of illustration suppose we consider a gymnasium having fifteen climbing ropes. (They are apt to range from twelve to twenty in number.) If the ceiling were 20 feet high each rope would weigh approximately 16 pounds, and being hoisted in groups are heavy. The preferable arrangement is to suspend each rope from a traveling carrier overhead, the carriers being chained to each other the proper distance apart. One pull brings an entire nest of ropes into position, the guiding or pulling rope being wrapped around a wall cleat to hold them in place, and with equal ease they may all be pushed back flat against the wall and stored in limited space.

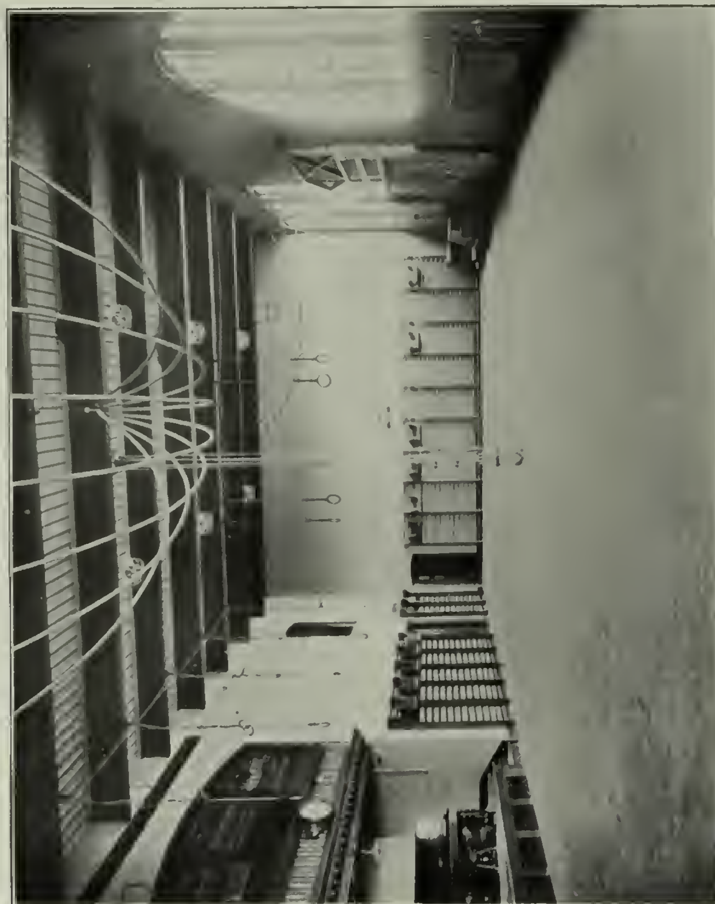
Other apparatus is also more or less detrimentally affected by the running track, according to type and use. A spectator's gallery at each end I consider advantageous in most institutions if the room is not too small, and even at times a gallery may be provided along one side. In

FIG. 15. GYMNASIUM FOR STATE NORMAL SCHOOL, BRIDGEWATER, MASS.

FIG. 16. GYMNASIUM FOR STATE NORMAL SCHOOL, BRIDGEWATER, MASS.
Hartwell, Richardson & Driver, Architects.

MAIN GYMNASIUM.





SMALL GYMNASIUM.

GYMNASIUM FOR THE TOWN OF BROOKLINE, MASS.

F. Joseph Untersee, Architect.

GYMNASIUM AT WOMEN'S COLLEGE, CLEVELAND, OHIO.
Hubbell & Benes, Architects.

GYMNASIUM FOR HEBREW ORPHAN ASYLUM, BALTIMORE, MD.
Parker, Thomas & Rice, Architects.

GYMNASIUM, UNIVERSITY SCHOOL FOR BOYS, BALTIMORE, MD.
Joseph Evans Sperry, Architect.

GYMNASIUM FOR STATE NORMAL SCHOOL, BRIDGEWATER, MASS.
Hartwell, Richardson & Driver, Architects.

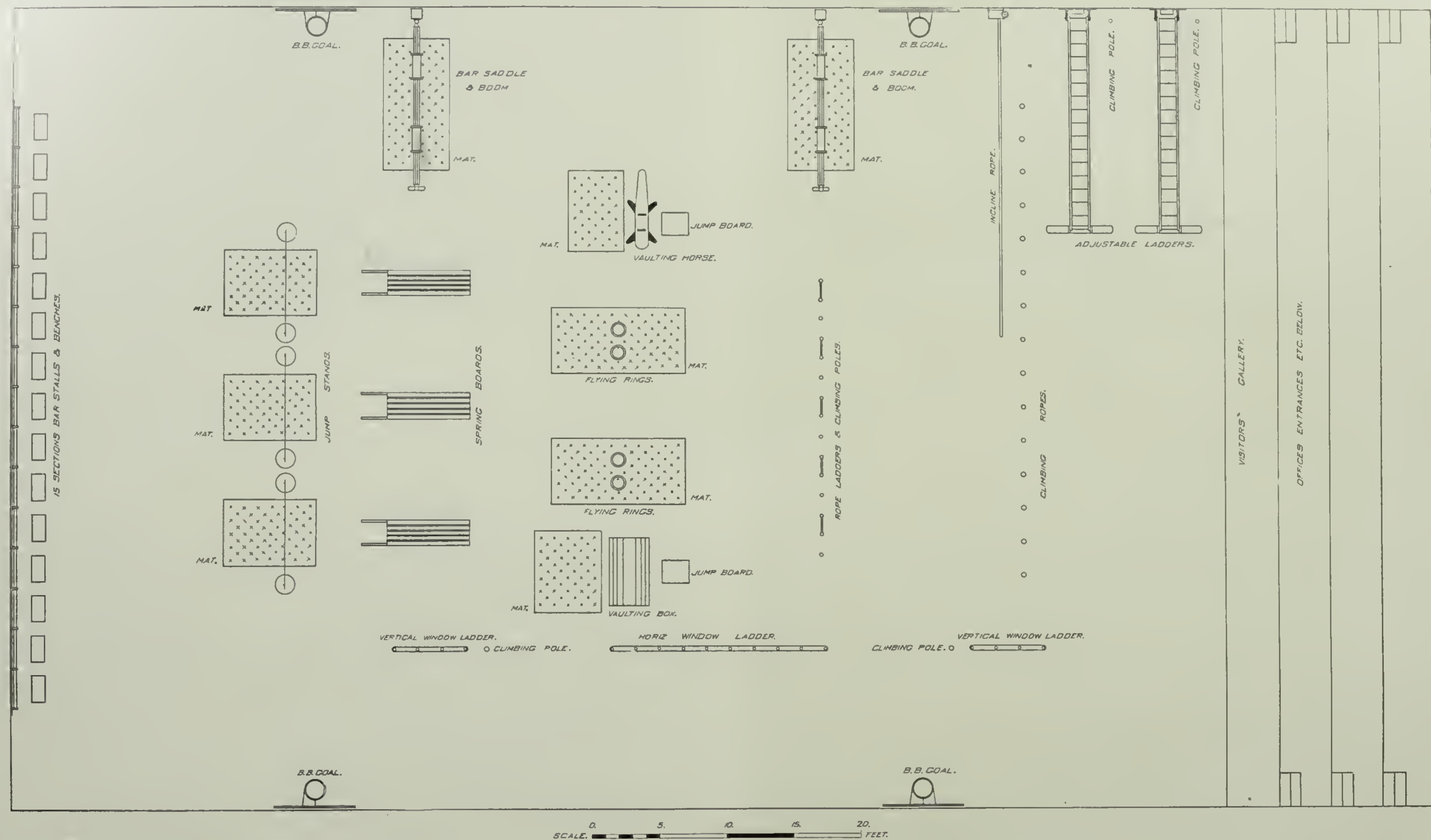
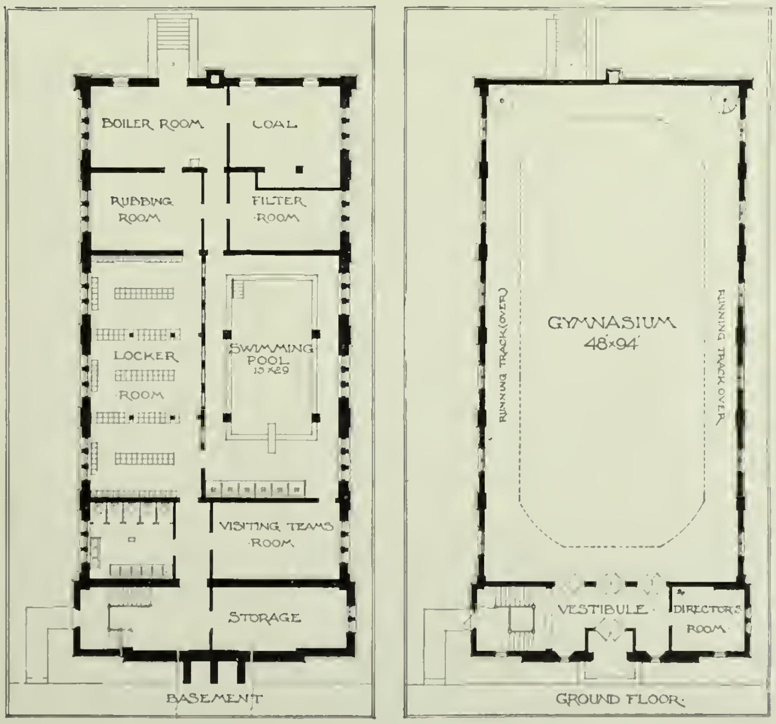


FIG. 17. PLAN FOR A WOMEN'S GYMNASIUM — size, 60 feet by 90 feet — equipped with two booms, four bar saddles, fifteen section bar stalls, fifteen bar stall benches, one vaulting horse, one vaulting box, three jump boards, six balance beams, three pairs jumping standards, three spring boards, fifteen climbing ropes, one inclined rope, two adjustable ladders, two vertical window ladders, one horizontal window ladder, five rope ladders, nine climbing poles, two sets basket ball goals, two pairs flying rings, mats, miscellaneous small apparatus.

any event such galleries should not be less than 10 feet from the floor and preferably 12 feet.

It has always appealed to me as particularly good where the seating space in a gymnasium extends *back* from the wall line at about 12 or 15 feet up, and *over* the smaller rooms, in juxtaposition to the gymnasium, that require only about half the ceiling height — offices, examining rooms, dressing rooms, halls, etc. This may be done at either sides or ends and not interfere with the equipment in any way.



HOBART COLLEGE GYMNASIUM.
Arthur C. Nash, Architect.

The floor plan shown in Fig. 17 serves as a type for a women's gymnasium and equipment of which the following is a list:

Room 60 feet by 90 feet. Two booms, four bar saddles, fifteen sections bar stalls, fifteen bar stall benches, one vaulting horse, one vaulting box, three jump boards, six balance beams, three pairs jumping standards, three spring boards, fifteen climbing ropes, one inclined rope, two adjustable ladders, two vertical window ladders, one horizontal window ladder, five rope ladders, nine climbing poles, two sets basket ball goals, two pair flying rings, mats, miscellaneous small apparatus.

THE average American citizen loses nearly ten dollars a year by fire to one dollar lost by the average European. The nation, the state, and the municipality are partly to blame, but the real blame rests on the citizen himself. Six hundred and fifty thousand parcels of property burned and a fire loss of $2,500,000,000 is the record of fire damage in the United States for a period of twenty-one years. Of the property burned 170,948 were dwellings.

The Housing Problem—II.

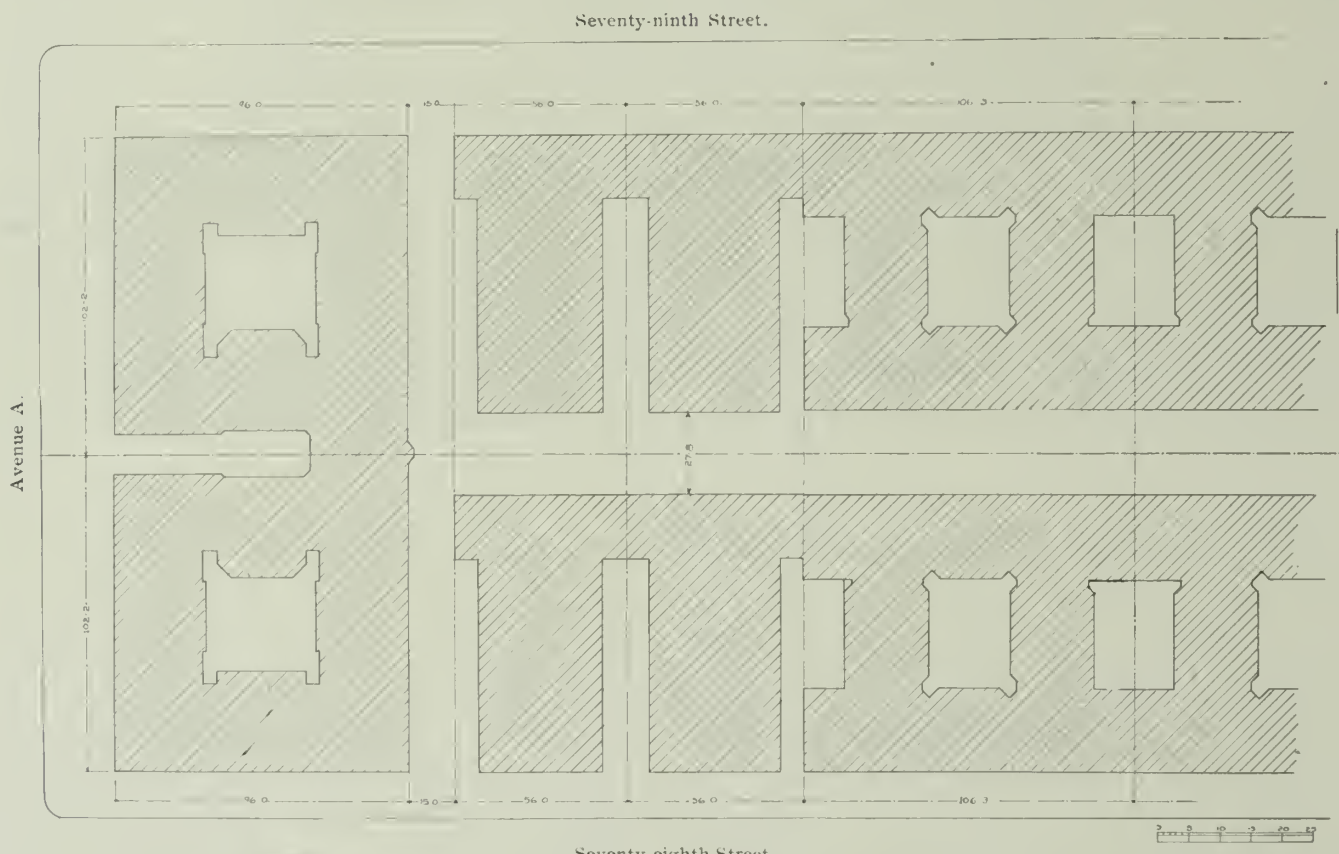
BY GEORGE B. FORD.

THERE are two points of view from which the design of model tenements may be considered. The first is the practical point of view. The second is the social or humanitarian point of view. With very few exceptions the plans of existing tenements have been considered only from the practical side. The arrangement that will give the maximum number of rooms per floor on a given sized lot has been reduced almost to a type. Many of these plans are marvels of ingenuity in giving the maximum rental space on a given lot. In every case the existing building codes have been stretched to their limit. The cost of construction through processes of elimination and experiment has been reduced almost to a minimum. It must be admitted that from the speculative standpoint the last word has been said in tenement design, but one cannot help questioning whether the builder of such tenements is really getting the maximum return possible for his money invested. The great question is: Should return on investment be solely a pecuniary one? This brings us to the other point of view, the social or humanitarian. This is the only side of the question on which progress can be made. How can we better living conditions? How can we improve family life? In searching for a point of departure in considering this subject I noticed in an 1895 Report of the United States Bureau of Labor, a report edited by Dr. E. R. L. Gould on the "Housing of the Working Classes," four requisites to model housing — "Privacy," "Health," "Safety," "Comfort."

PRIVACY may be treated as one of the features conducive to comfort, so that with these heads of Safety, Health, and Comfort we have a basis on which to commence studying the question.

SAFETY may be taken as freedom from trouble arising from one of the following causes: Fire, contagion, vermin, or burglary. Protection against fire is well cared for in the present building laws and is simply a matter of fireproof construction and isolation. The same is true in a large measure for protection against vermin. Protection against burglary or against contagion is largely a matter of isolation and is much more easily attained in a fireproof house than in a non-fireproof house. There is no object in dwelling upon the question of safety at greater length, because most of the matters pertaining to it are too well known to need discussion.

HEALTH is a vital factor in model housing. It may be considered from the following points of view: The question of obtaining light and sunlight in the apartments. The question of obtaining air and ventilation. The question of avoiding dampness. The question of avoid-

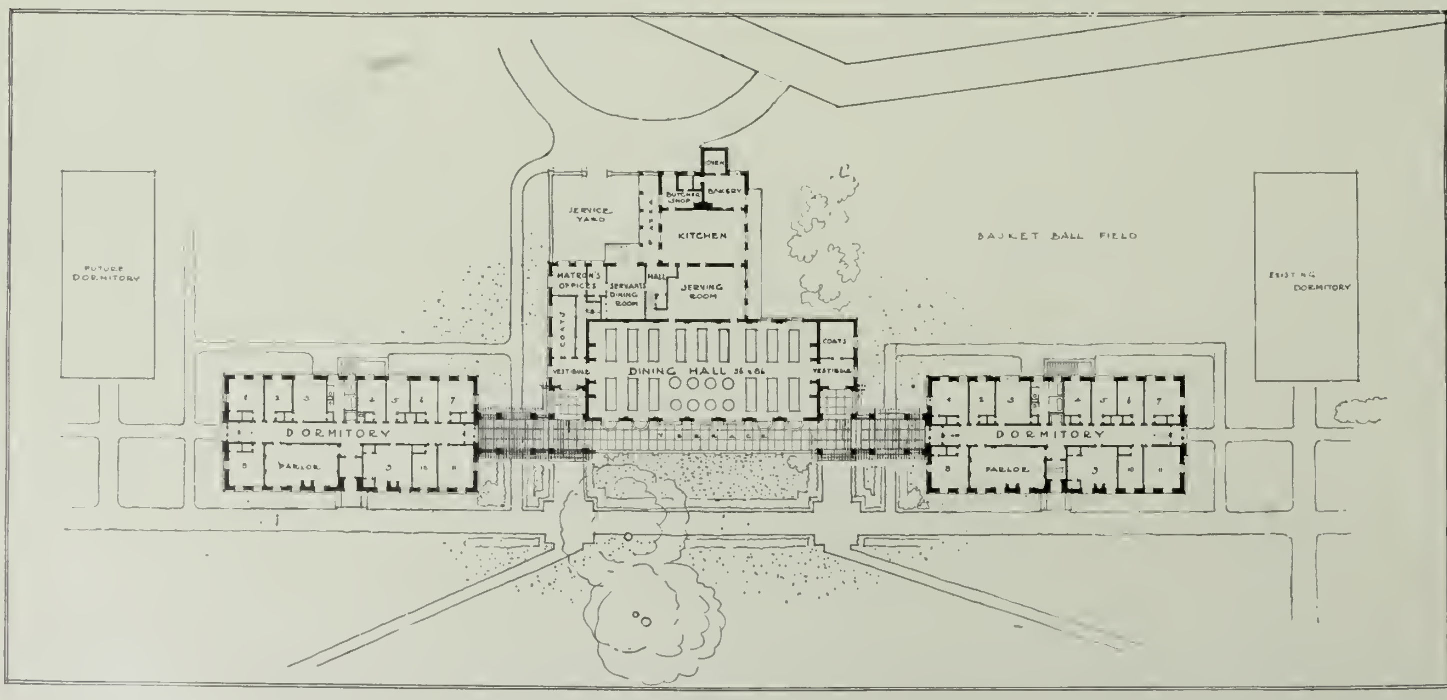


BLOCK PLAN OF MODEL TENEMENTS FOR CITY AND SUBURBAN HOMES COMPANY, AVENUE A, BETWEEN SEVENTY-EIGHTH AND SEVENTY-NINTH STREETS, NEW YORK.

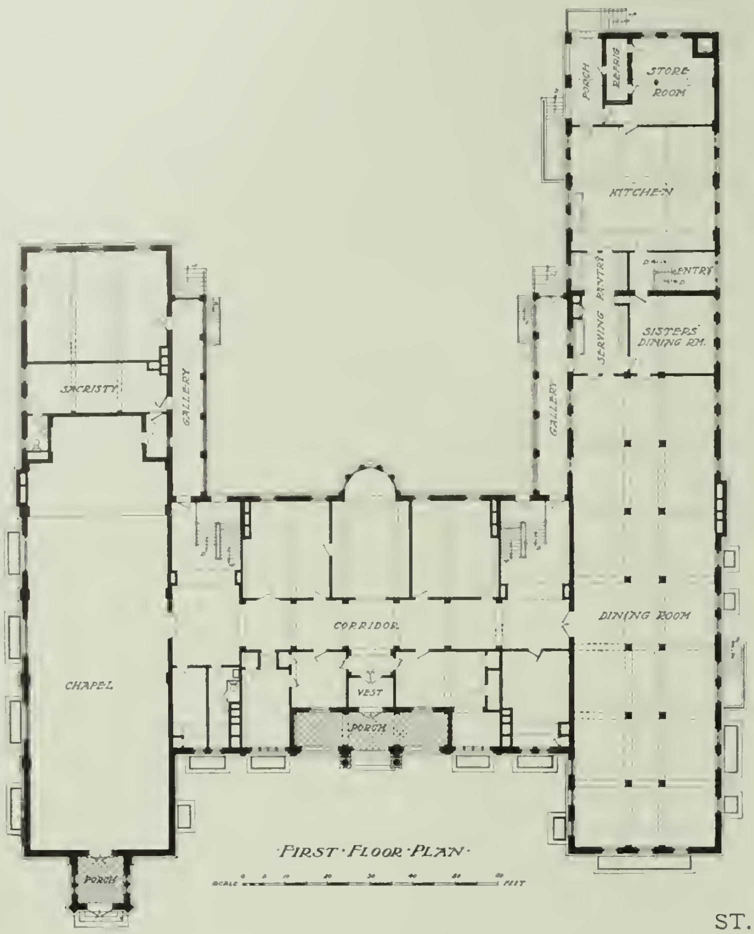
Three types of plans in one group.

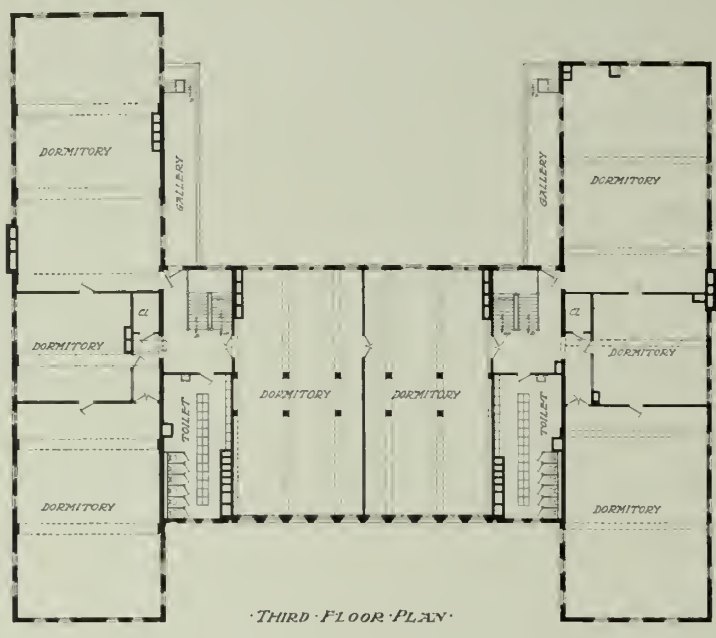
DINING HALL, WHEATON SEMINARY, NORTON, MASS.
RIPLEY & RUSSELL, ARCHITECTS.

DORMITORY, AND GROUP PLAN, WHEATON SEMINARY, NORTON, MASS.
RIPLEY & RUSSELL, ARCHITECTS.



ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.
STRATTON & BALDWIN, ARCHITECTS.



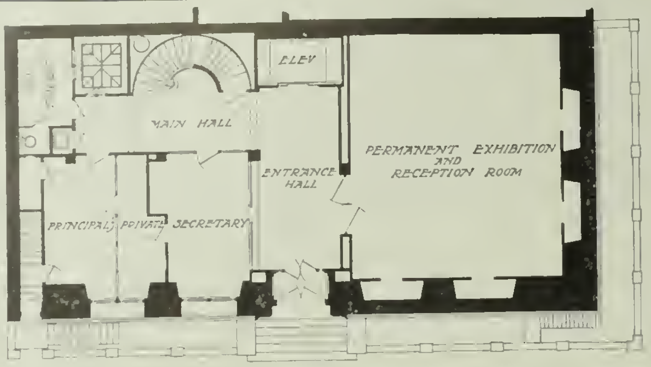


FLOOR PLANS

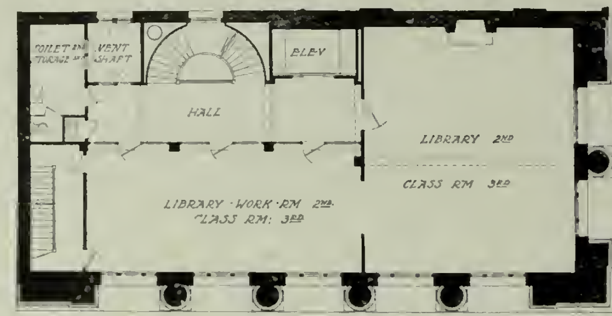
ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.

STRATTON & BALDWIN, ARCHITECTS.

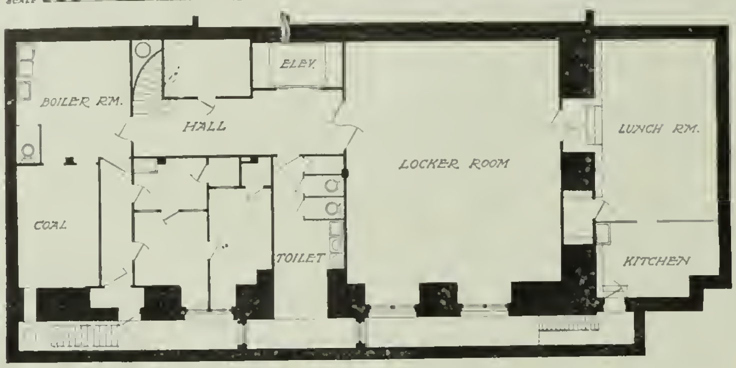
NEW YORK SCHOOL OF APPLIED DESIGN FOR WOMEN, NEW YORK, N. Y.
PELL & CORBETT, ARCHITECTS.



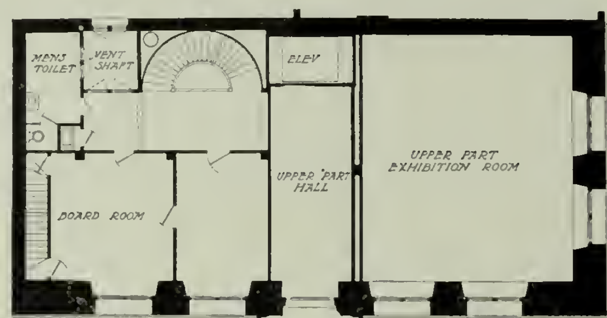
·GROUND · FLOOR · PLAN·



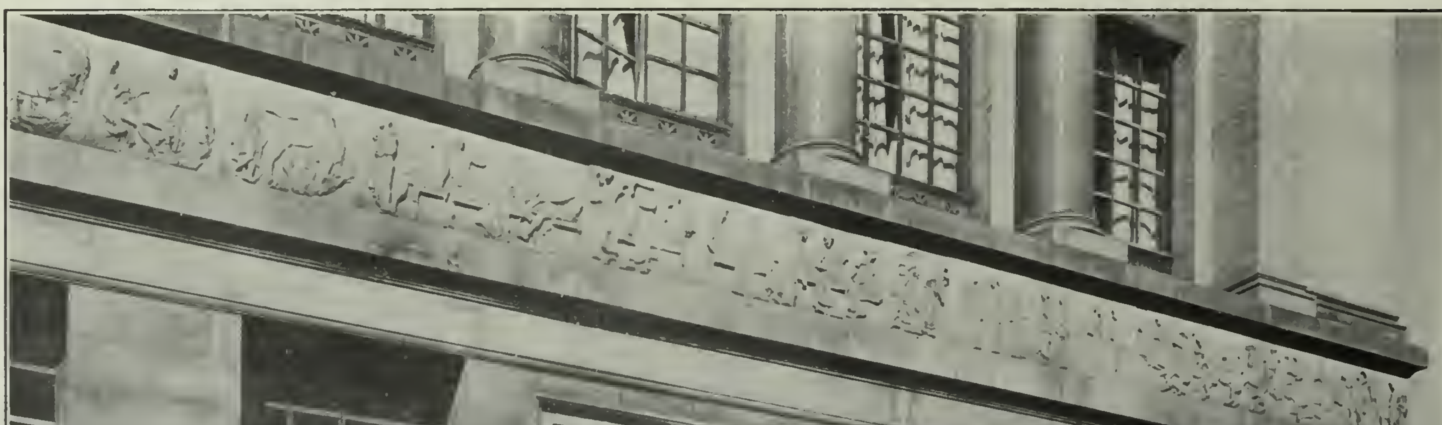
·SECOND · & THIRD · FLOOR · PLANS·



·BASEMENT · FLOOR · PLAN·



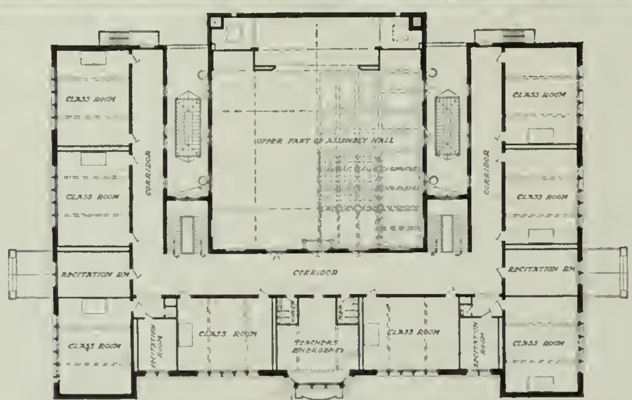
·1ST · MEZZANINE · FLOOR · PLAN·



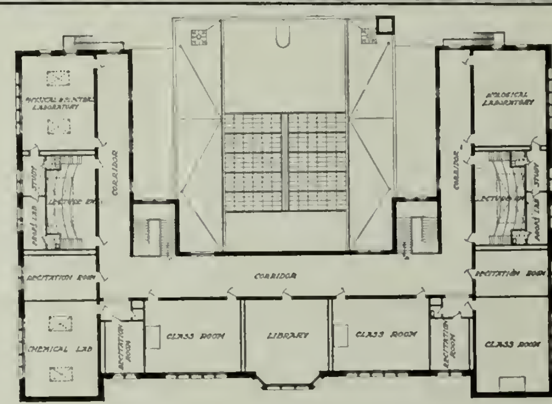
FLOOR PLANS AND DETAIL OF FIRST STORY.

NEW YORK SCHOOL OF APPLIED DESIGN FOR WOMEN, NEW YORK, N. Y.

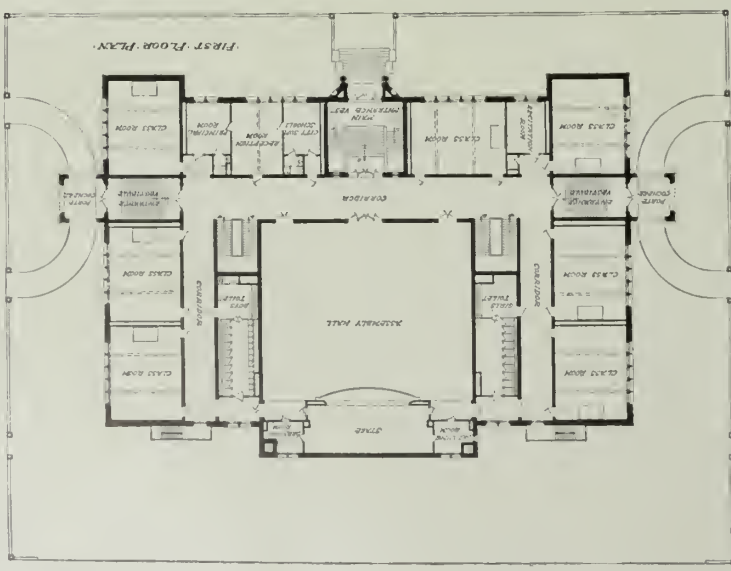
PELL & CORBETT, ARCHITECTS.



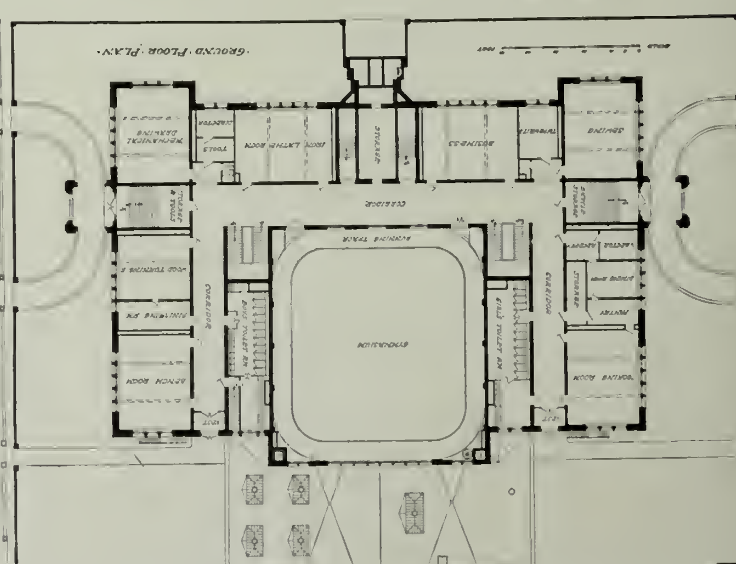
SECOND FLOOR PLAN



THIRD FLOOR PLAN



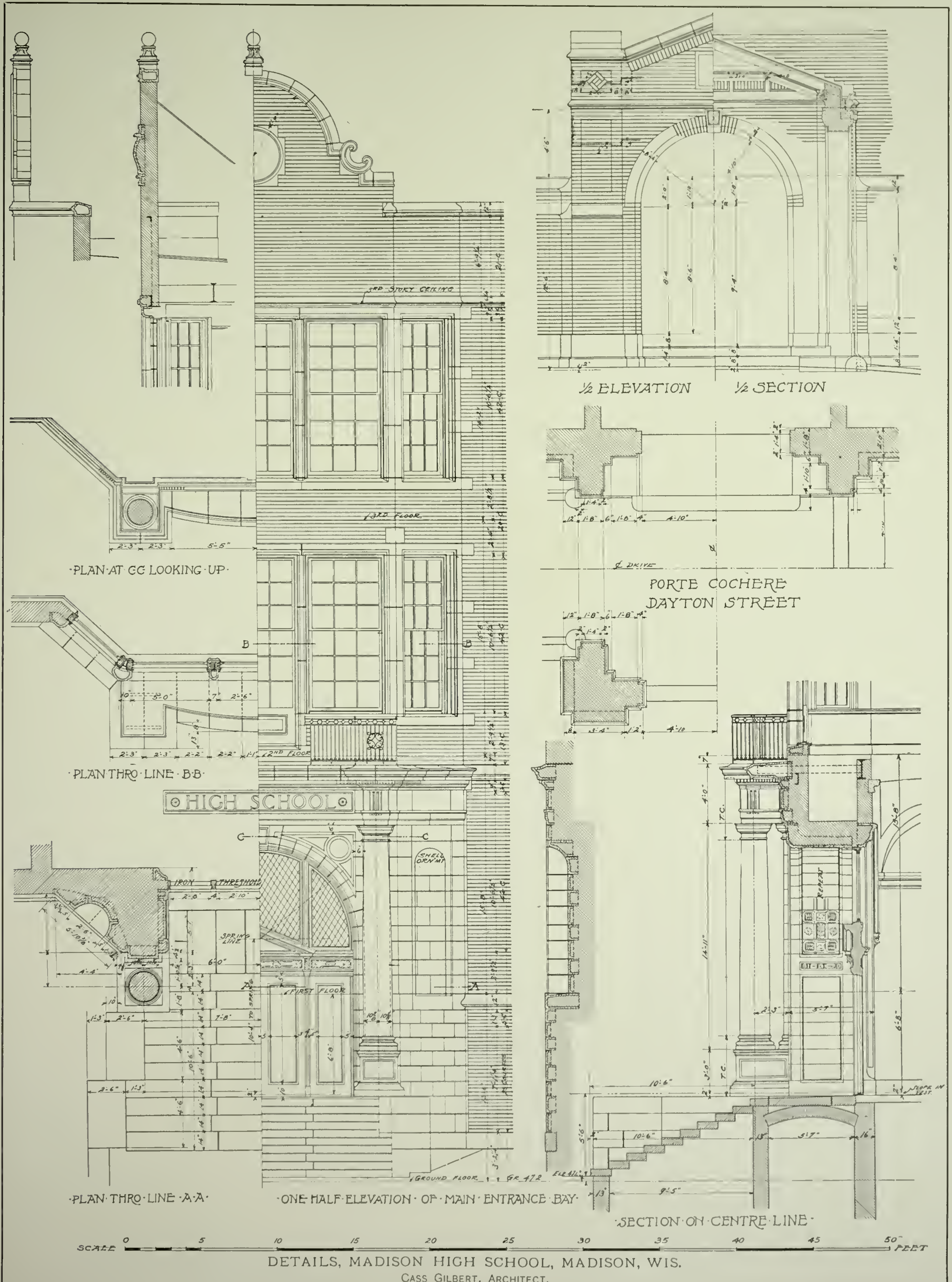
FIRST FLOOR PLAN



GROUND FLOOR PLAN

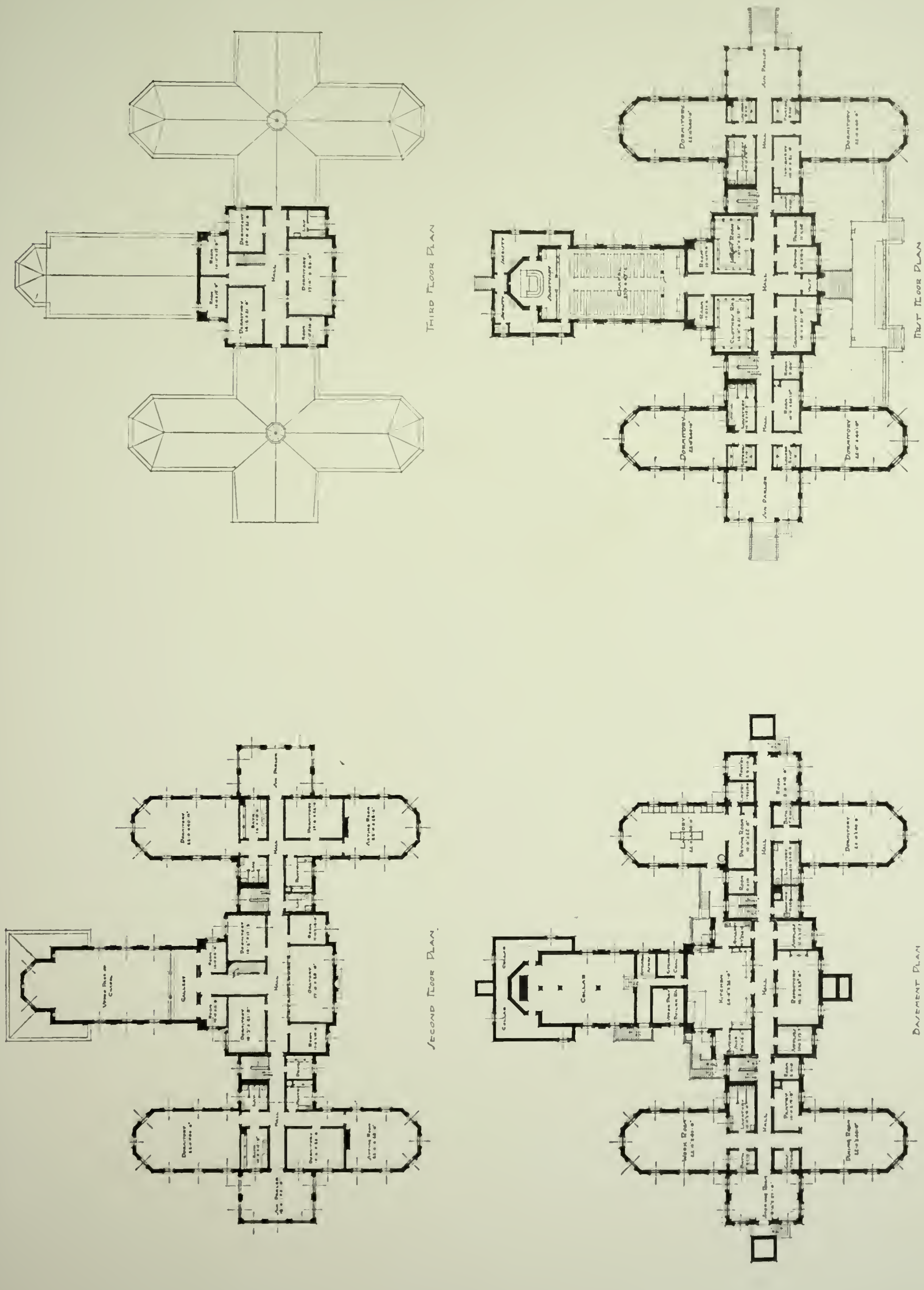
MADISON HIGH SCHOOL, MADISON, WIS.
CASS GILBERT, ARCHITECT.

DETAILS OF MAIN ENTRANCE, MADISON HIGH SCHOOL, MADISON, WIS.
CASS GILBERT, ARCHITECT.



DETAILS, MADISON HIGH SCHOOL, MADISON, WIS.
CASS GILBERT, ARCHITECT.

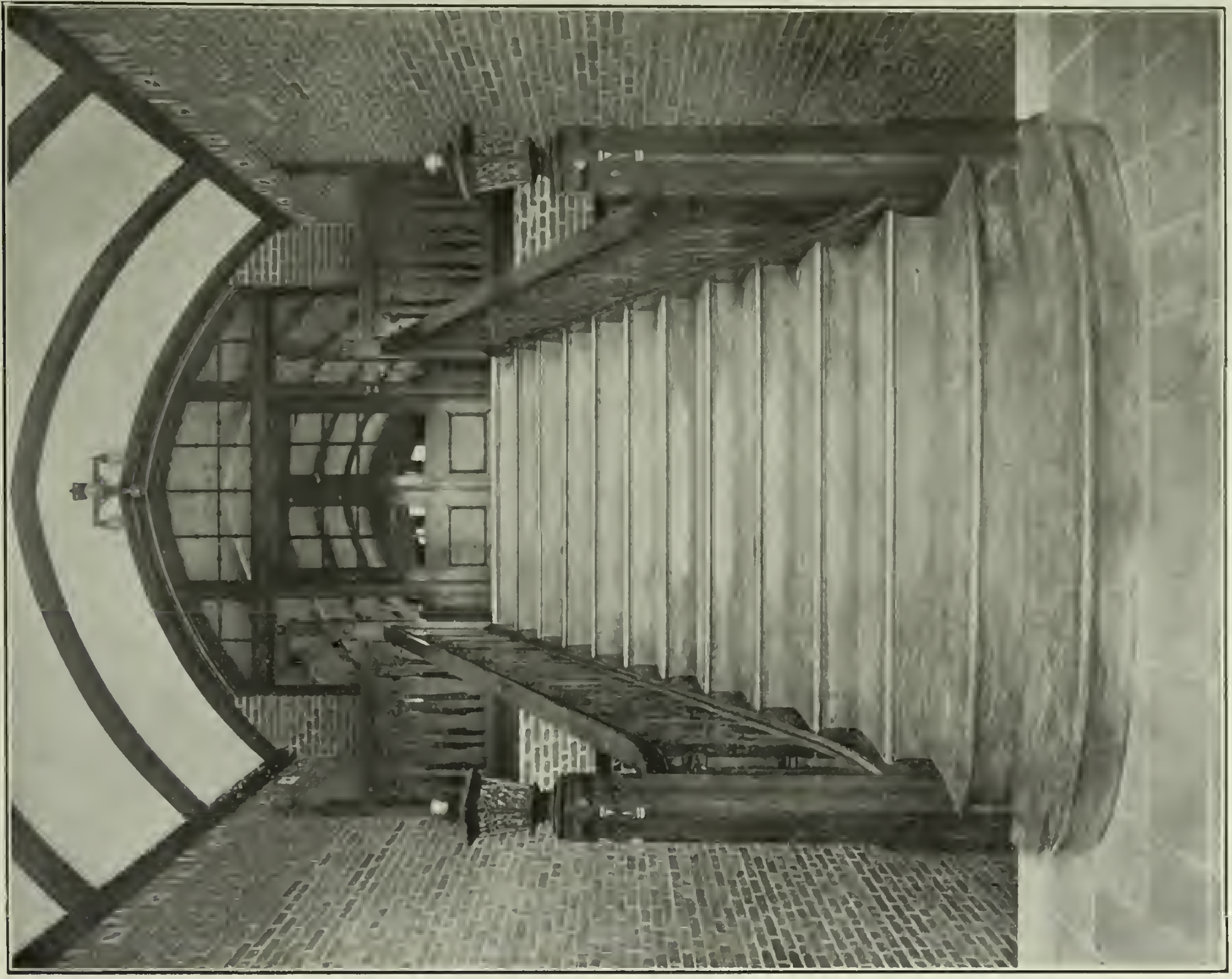
MALONEY HOME FOR AGED MEN, SCRANTON, PA.
HORACE TRUMBAUER, ARCHITECT.



FLOOR PLANS, MALONEY HOME FOR AGED MEN, SCRANTON, PA.

HORACE TRUMBAUER, ARCHITECT.

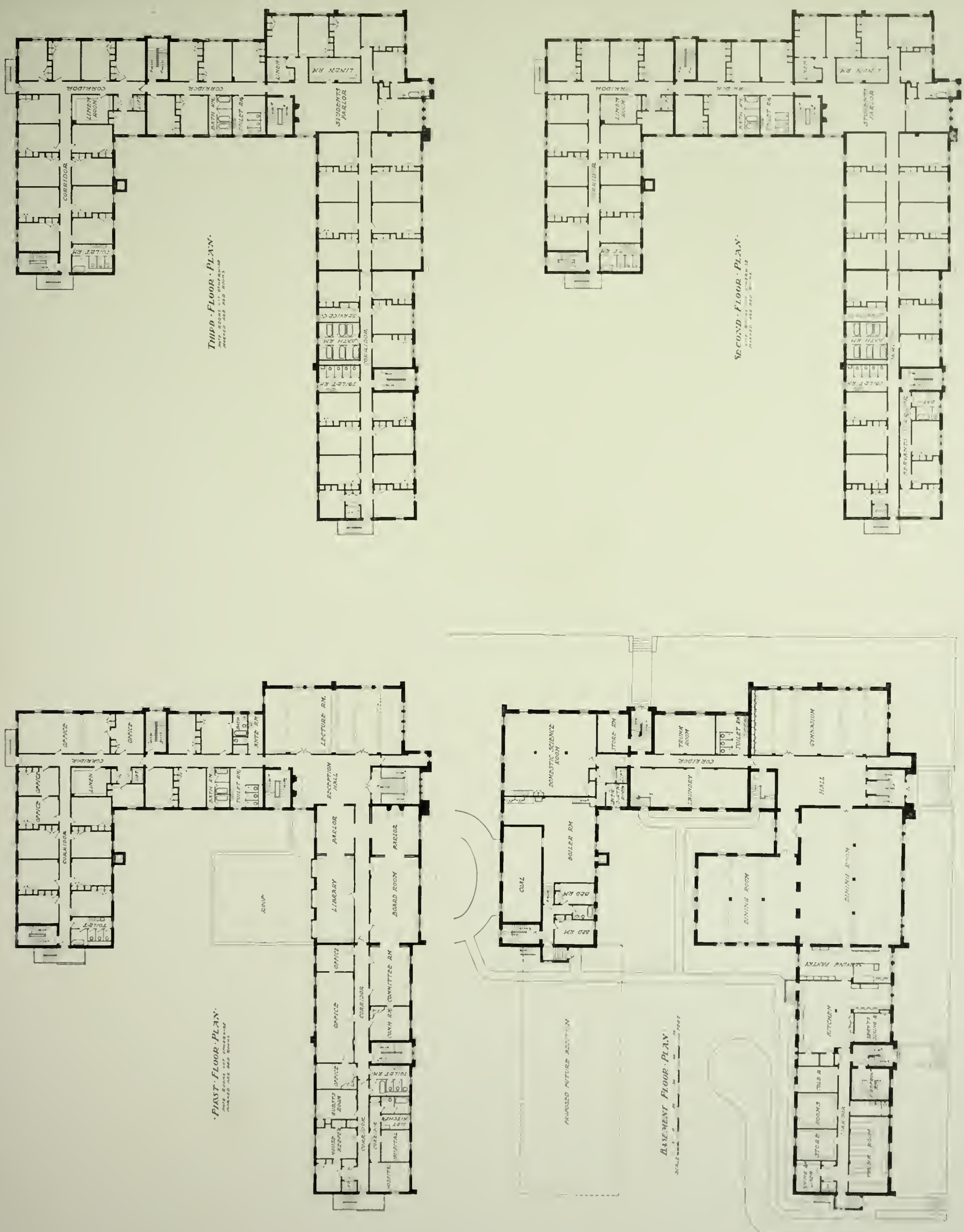
DETAIL OF FRONT ELEVATION.



DETAIL OF MAIN ENTRANCE.

BUILDING FOR THE WOMEN'S BAPTIST HOME MISSION SOCIETY, CHICAGO, ILL.

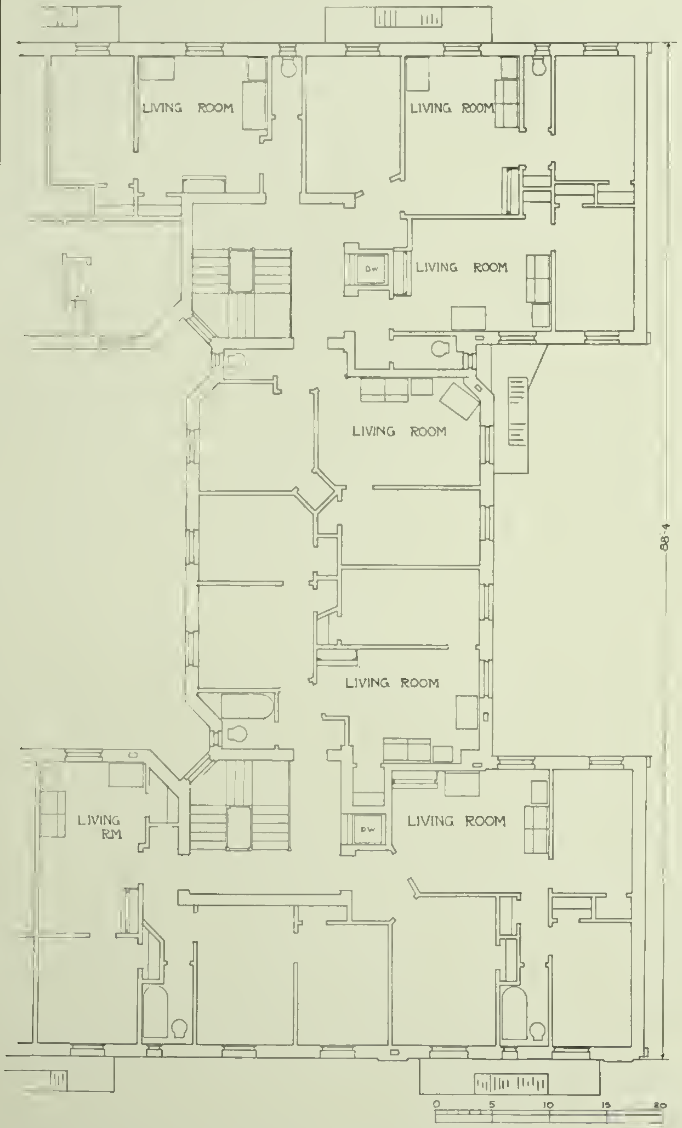
POND & POND, ARCHITECTS.



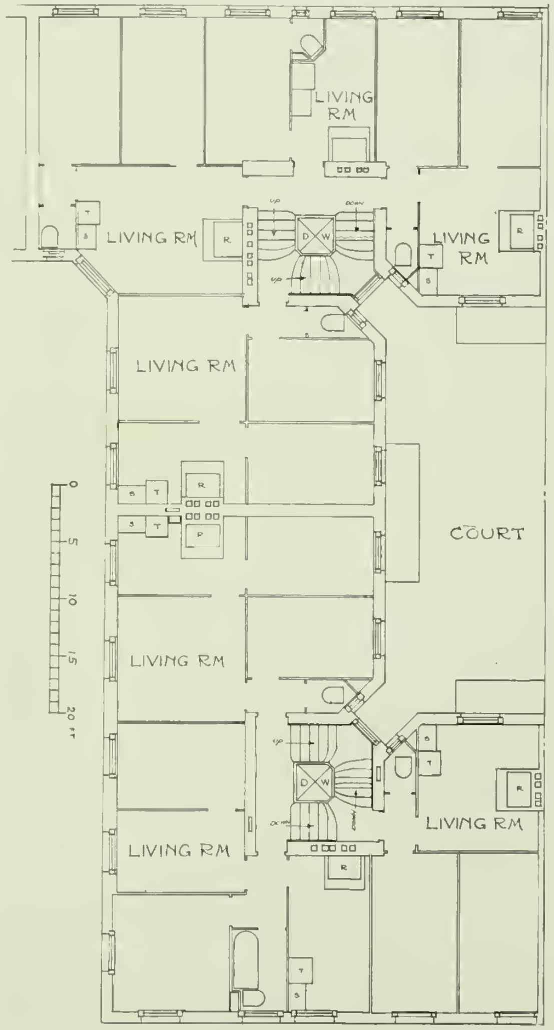
FLOOR PLANS, BUILDING FOR THE WOMEN'S BAPTIST HOME MISSION SOCIETY, CHICAGO, ILL.
POND & POND, ARCHITECTS.

BUILDING FOR THE WOMEN'S BAPTIST HOME MISSION SOCIETY, CHICAGO, ILL.

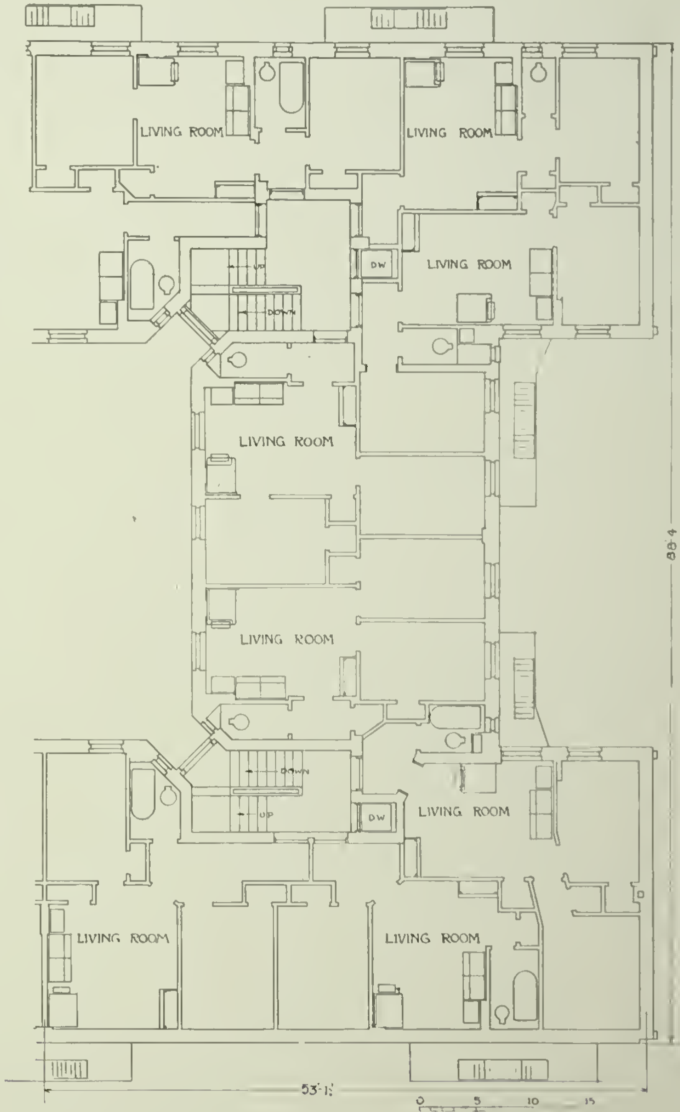
POND & POND, ARCHITECTS.



Plan of Typical Unit. Kitchen in living room; seven suites and 23 rooms per floor; lot 52′ 0″ by 100′ 0″; fireproof halls only.



Plan of Typical Unit. Two types combined; seven suites and 23 rooms; building 88′ 0″ by 45′ 0″.



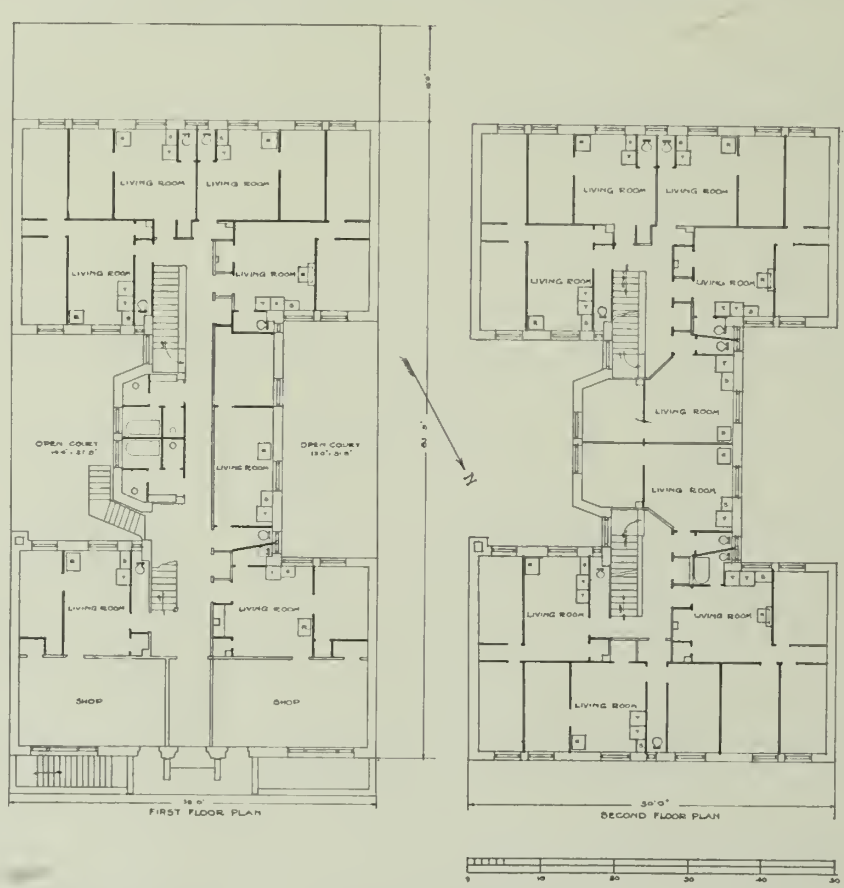
Plan of Typical Unit. Eight suites and 22 rooms per floor; lot 53′ 0″ by 100′ 0″.

MODEL TENEMENTS FOR CITY AND SUBURBAN HOMES COMPANY, NEW YORK.

ing contagion. The question of obtaining sufficient warmth in winter, and the question of having good sanitary arrangements.

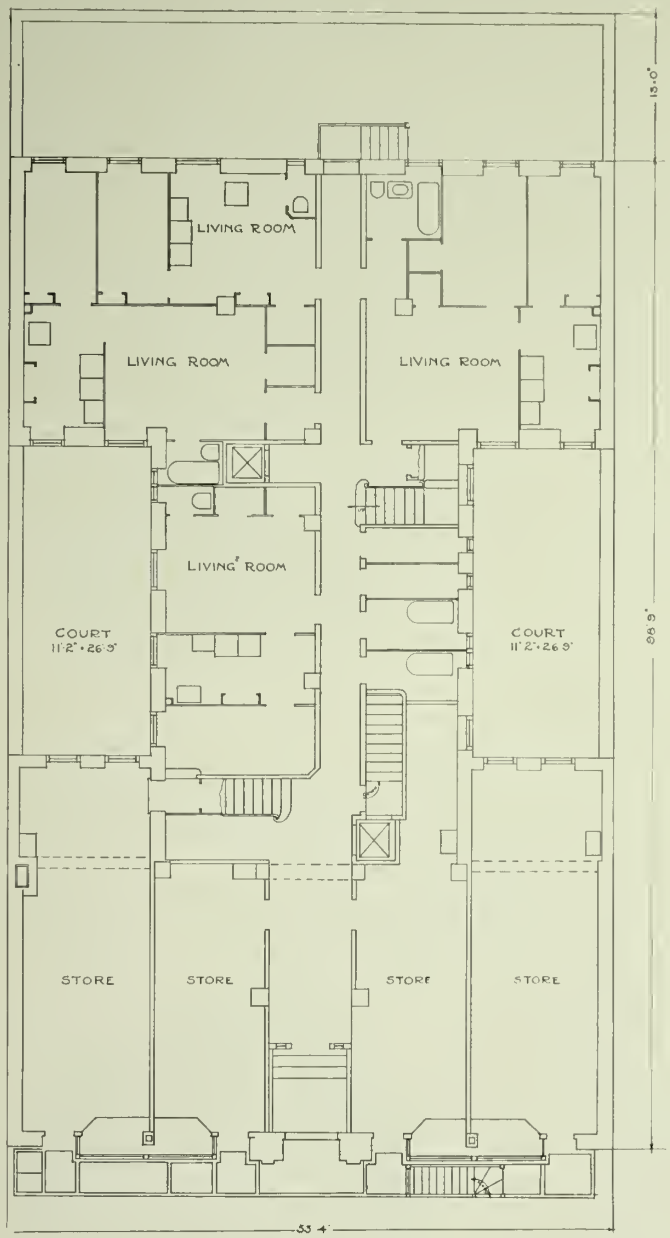
Light and Sunlight. The whole question of improving housing hinges on the necessity of obtaining a certain amount of sunlight in every living room and every sleeping room for a certain time every day. It is absolutely essential to health for it is practically the only agent that exterminates the germs of contagion and disease. This was brought out in the International Tuberculosis Congress in Washington. A few hours of sunlight per day will kill or render harmless the most virulent tuberculosis germs. The effect of sunlight on the bacteria of other diseases is similar. Now, if some method can be devised which will fill every living room and sleeping room for a few hours a day, even on the shortest day in the year, with sunlight, then we have made a long step in advance in the solution of the question of better tenements. This means that every window must have an unobstructed outlook to the south, or to some point south of southwest or southeast. If all courts can be made to open south, or to have any southerly orientation, it means that some sunlight must reach every one of these windows for, at least, an hour a day on the shortest day of the year. If all blocks of houses were only two rooms deep, and ran in northerly and southerly directions, that is, between streets running nearly in a northerly and southerly direction, then this obtaining of sunlight would be comparatively easy. Unfortunately, no cities are laid out on this principle, so that we are forced to make the best of conditions as we find them. In New York City, the street plan is the worst possible from this point of view. In New York, the great majority of the residential streets run east and west, which means that, as tenements are at present built, one half of the windows must face north, thereby never receiving any sunlight at any time of the year. Conditions, even in New York, might be greatly alleviated, if all interior courts were abolished, and outer courts were always made to open to the south or nearly south. These courts should be larger at the open end than at the closed end, in order to give the maximum light to the further end of the court, and, at the same time, obtain the maximum rental space. The height of all tenements should be limited, so that on the shortest day of the year, at noon, when the sun is at its highest point, its rays of light will reach the bottom of the ground floor windows of every room facing on these courts. This would mean limiting the height of such buildings to five, and, in some cases, to four stories.

Air and Ventilation. A free circulation of air through the dwelling is of almost as much importance from the standpoint of health as the obtaining of light and sunlight. It is evident that the first step towards obtaining such ventilation is to get rid, once and for all, of the interior enclosed court. At best, even in the largest enclosed courts, there is comparatively little circulation of air. Wind blowing across the roofs does not penetrate into such a court. In outer courts, the circulation of air depends upon whether they open in the direction of the prevailing wind or not. If they do not open in such a direction, ventilation there will be almost as stagnant as the interior court. Here again, the ideal principle is to have the blocks of houses only two rooms deep from front to rear wall, opening on streets or alleys along either side. Further, these blocks of houses should be broken into small units by open spaces, or open stairs, between. This question of stairs is a much debated one. In America, with the exception of the White tenements in Brooklyn, and the new Shively tenements in New York, open stairs in tenements have practically never been tried. In Europe, especially in London and Brussels, they are the rule rather than the exception. The stair has been called the vertical street. As such, as long as it can be protected from rain and snow, there is no reason why it should not be open like the street. There is no question but that such a stair is far more sanitary and far more healthful than the customary disease-breeding enclosed



MODEL TENEMENTS, EAST 40TH STREET, BETWEEN FIRST AND SECOND AVENUES, NEW YORK.

Fireproof, seven stories high, economical arrangement, good investment.
William Emerson, Architect.



FIRST FLOOR PLAN, TENEMENT HOUSES FOR SHEPHERD K. DE FOREST, ESQ., 203–205 EAST TWENTY-SEVENTH STREET, NEW YORK.

Ernest Flagg, Architect.

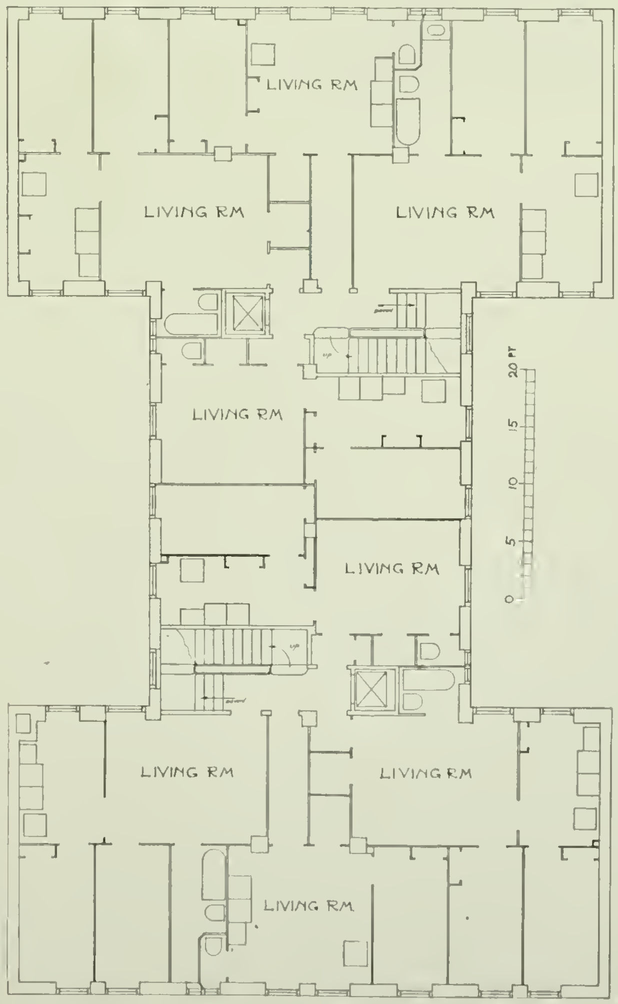
stairway which we have now. And such a stair might just as well go a little further than these open stairs of Europe, and be opened along two opposite sides, instead of one side only, coming in between two blocks of buildings, and acting as a ventilating space between them. Here, as in the case of light and sunlight, there is a certain maximum of efficient height. In the case of the open stair this would seem to be, for normal conditions, in the neighborhood of five stories.

Contagion. The avoiding of contagion is similar to the above in its conditions. What applies to the one would apply to the other. The more the different apartments can be separated from one another by a circulation of air between them, and by permanent masonry construction, the less danger will there be of a spread of any form of contagion or infectious disease.

Health in Winter. It is necessary that the warming of the apartment in winter should not be according to the customary method of simply heating over and over again the stagnant air of the rooms. Fresh air must be introduced, and foul air must find its way out of the rooms. This means that the fresh air from out of doors must pass over heat coils under the windows, circulate along the floor, up the back walls of the room, along the ceiling, back to the space above the windows, where there will be some opening for its egress. This should be, further, so arranged that it will not be easy for the tenant to plug up these openings to the outer air.

Dampness. It is essential to health that the rooms should not be damp. This is almost entirely a matter of the construction of the exterior walls according to one or another of the well-known systems of damp proofing, or the leaving of hollow spaces between the outer walls and the plastering.

Sanitary Arrangements. This phase of the question, which is so vital to health, is quite well cared for in most of the present building codes, but it is, further, essential that the toilet room should open to the outer air, and not into an enclosed court or shaft, and that there should be some means of obtaining a circulation of air through it, so that there may never be a chance for air to stagnate there. With the type of plan only two rooms deep, between narrow streets, running north and south or nearly so, this is comparatively easy to obtain.



TYPICAL FLOOR PLAN, TENEMENT HOUSES FOR SHEPHERD K. DE FOREST, ESQ., 203–205 EAST TWENTY-SEVENTH STREET, N. Y.

This plan is exceptionally economical of space, giving about maximum return possible on a fireproof building. It gives eight suites of 28 rooms per floor on a lot 53′ 0″ by 100′ 0″.

Ernest Flagg, Architect.

Terra Cotta Hollow Tiles for Walls of Houses.

BY C. H. HUGHES.

TERRA COTTA made into hollow blocks and tiles, has brought out a new type of construction, which is well adapted for walls of suburban houses of a moderate cost. The block is practically the same as used in the floors of large office buildings, but is manufactured of a denser material and is much heavier and thicker. It has dovetailed scorings on four sides, forming a mechanical bond for the stucco on the exterior and the plaster on the interior. The standard size is 12 inches long, 12 inches wide, and 8 inches deep, which is strong and deep enough for the average country house wall, but should an exceptionally heavy wall be required a 12 inch by 12 inch by 10 inch or a 12 inch by 12 inch by 12 inch block can be used. Some houses are now being built with a 12 inch wall consisting of two 6 inch by 12 inch by 12 inch blocks, tied together about every 12 inches on the bed joint with galvanized corrugated wall ties. The blocks are laid in cement with the cores vertical. The joints are broken vertically giving an air space from the top to the bottom, except where interfered with by doors and windows.

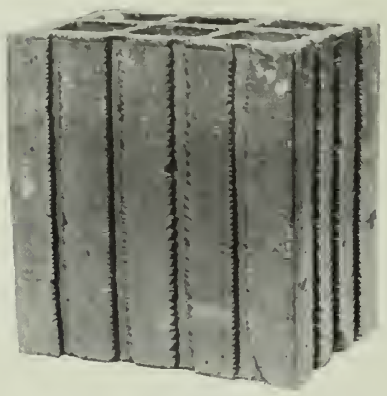


FIG. 1. A STANDARD BLOCK.
Size 12" by 12" by 8".

The height of a block is 12 inches and as walls have to be stopped at predetermined heights, this can be accomplished without chipping the blocks and leaving ragged and rough ends. In making the blocks, before they have hardened, a wire is drawn through them at right angles to the cores. The halves harden as one, yet they can be readily broken apart by lightly hitting with a trowel or hammer.

With 8 inch blocks no special corner blocks are necessary, but where 10 inch and 12 inch blocks are used they are, as the 10 inch only gives a 2 inch bond on the corners and the 12 inch none at all. To get a bond for these sizes a 16 inch by 12 inch by 12 inch block (Figs. 3 and 4) is used for both.

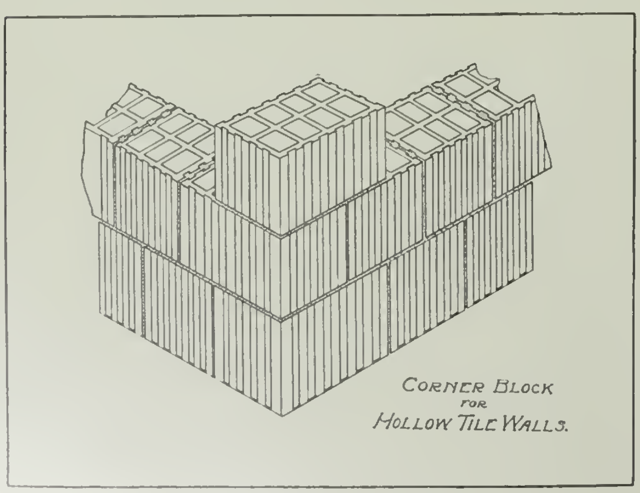


FIG. 3.

When a stucco finish is desired, the cement is applied in two coats, first a rough scratch coat about ½ inch thick and then a finished coat of ¼ inch. Owing to the scoring on the blocks the cement gets a firm grip on them, and will not crack and fall off.

FIG. 2. A JAMB BLOCK.

Figs. 5 and 6 illustrate the wall construction of a house built at St. James, Long Island, N. Y., L. A. Butler and Ford, Stewart and Oliver, architects.

By modifying the size and shape of the blocks, they are suitable for window sills, lintels, and other details which were formerly built of concrete or brick. Take for instance the window openings as shown in Figs. 2 and 7. Here a jamb block is used with the main portion, 8¼ inches long by 8 inches deep by 12 inches high, and with a lip 3¼ inches long by 2½ inches deep. On the end of the lip will be noticed a dovetail score for taking the cement finish. Behind the lip the window frame is placed. This arrangement secures a water-tight joint around the frame, and prevents any moisture from getting in on the inner face of the wall.

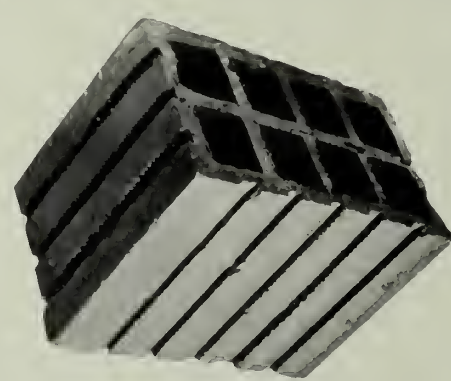


FIG. 4. A CORNER BLOCK.
Size 16" by 12" by 12".

For window sills, the wall is finished off with 4 inch by 12 inch by 12 inch blocks with the 12 inch faces horizontal, which cover the vertical cores so no water from the outside can work in.

The blocks are adaptable for lintels, as is shown in Figs. 6 and 7. Two rows of 2 inch by 12 inch by 12 inch blocks are used, one on the outside of the wall and the other on the inside, with the space between them filled with concrete which is re-inforced by steel rods. There are two points in this construction that are particularly note-

FIG. 5. HOUSE, ST. JAMES, L. I., N. Y.

worthy: First, in a house built of terra cotta blocks that are to be given a stucco finish, the old method was to use solid concrete beams for the lintels, but it was always found difficult to match the shade of this concrete with the stucco or vice versa. With the new method, the walls, lintels, and window sills can be given the stucco

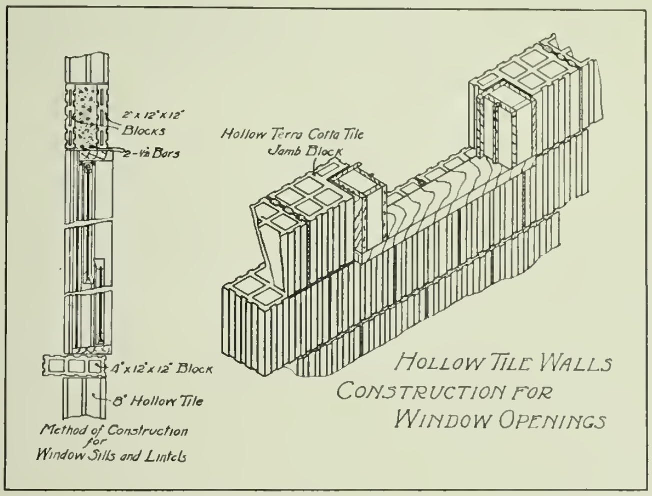


FIG. 7.

finish at the same time, thus securing one shade throughout. Second, the concrete lintels admitted dampness to the inside of the house, but none is admitted when blocks are used.

The floor construction is naturally divided into two classes, viz: fireproof with terra cotta floors and concrete beams, and non-fireproof with wood joists. Fig. 8 shows

FIG. 9. HOUSE, ST. JAMES, L. I., N. Y.

the fireproof construction. On top of the wall blocks 1 inch by 8 inch tile slabs are laid, and on them rest reinforced concrete beams. Between the beams are the floor blocks with the cores parallel to them. Blocks are laid on the outside, covering the ends of both the beams and floor blocks. Above the floor, the wall is built the same as below.

Referring to Fig. 9, a house at St. James, L. I., it will be noticed that the concrete beams are about 2 inches

FIG. 6. HOUSE, ST. JAMES, L. I., N. Y.

above the blocks, and here the floor was ultimately covered with a layer of concrete.

For a non-fireproof floor the wall is stopped and a course of brick is laid. On the outside, 3 inch blocks are placed and behind them a layer of cement, and then more blocks bringing the wall up to the regular thickness. The floor joists rest on top of the bricks and the ends are covered with concrete. See Fig. 10.

Fig. 11 is of a fireproof roof built of blocks with reinforced concrete rafters. The blocks are laid in rows

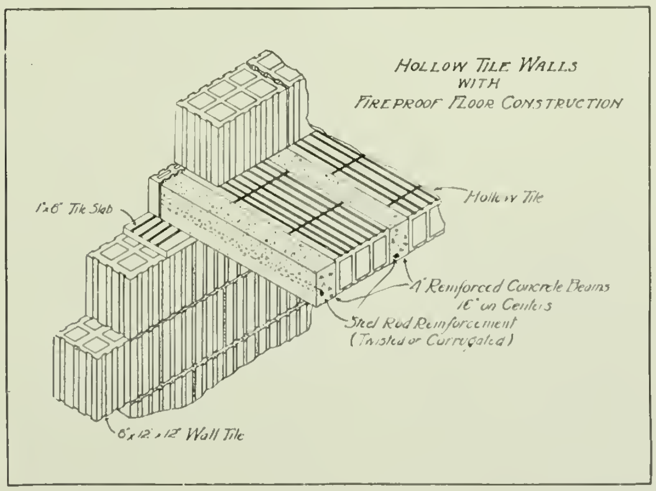


FIG. 8.

with the cores horizontal and with about 4 inches of concrete reinforced by a steel rod between the rows.

For an ordinary wooden roof, bolts are placed in the cores of the two upper blocks and the cores filled with cement. See Fig. 12. Across the top, a plank is laid, that is held in position by the bolts with nuts and washers on the ends. The rafters rest on the plank and the usual roof construction is then followed.

Besides the fireproof qualities the blocks have the further advantages of being sanitary, and walls and floors built of them are moisture and sound proof. The air

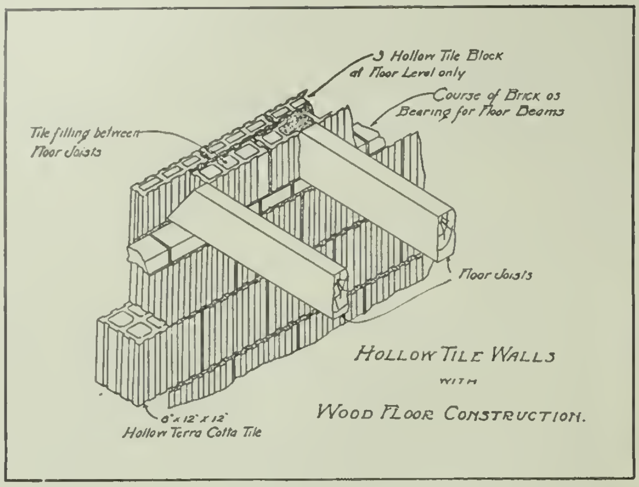


FIG. 10.

space is also a very important feature, as sudden changes of temperature are not so noticeable in the house, which is kept warmer in winter and cooler in summer.

Fig. 13 shows a house at Cedarhurst, Long Island, N. Y., L. Boynton, architect. Note the stenciling of the stucco under the roof eaves, which is done in red and blue imitating Italian Mosaic work. From the roadway it is impossible to distinguish it from the real. With a stucco finish no painting is required — and the combination of cement and terra cotta has a long life.

Should color effects be desired, they can be readily obtained by using different kinds of clay. Colors rang-

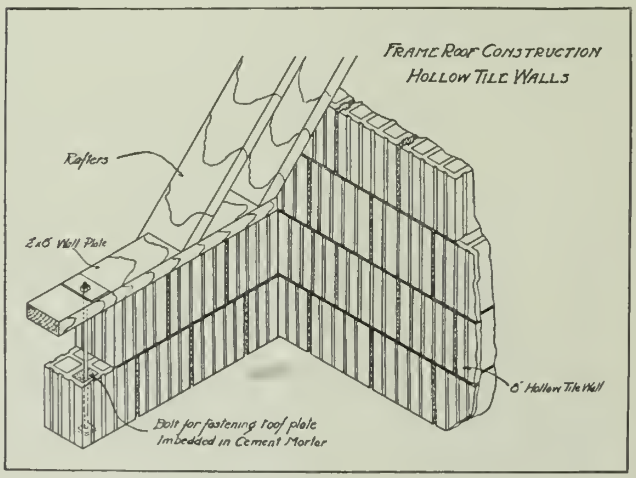


FIG. 12.

ing from a light buff to a deep chocolate brown are in common use.

To entirely disapprove any statements made on the weakness of terra cotta under compression, tests have been made on blocks at the Engineering Laboratories of the Massachusetts Institute of Technology, Boston, Mass. Three blocks 12 inches high by 12 inches long by 10 inches wide with an outside shell ⅞ inch thick and webs ¾ inch, with six cores, of hard dense material were tested in an Emery machine. Each sustained a load of 300,000 pounds, or 5,560 pounds per square inch of sectional area, which was the full load capacity of the testing machine.

The first cost of a house should not be taken as the basis on which the contract is awarded. The maintenance and repairs should be carefully considered and the prospective owner should before deciding make an estimate on the valuation of the house in five years. If such an estimate is made, it almost always shows the advantage of terra cotta block construction over all others.

The following figures while more or less approximate (they were approved by two well known architects and

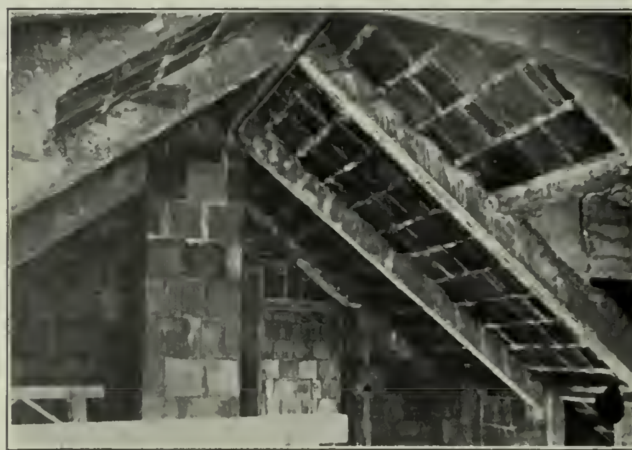


FIG. 11. ROOF BUILT OF BLOCKS WITH REINFORCED CONCRETE RAFTERS.

two reliable builders) give an idea of the cost of a house using different types of construction in the vicinity of New York City. The figures are perhaps fair for any large city.

Frame construction, all wood	$10,000
Brick outside walls, wooden interior	11,000
Stucco or expanded metal, wooden interior	10,250
Hollow terra cotta blocks stuccoed, wooden interior	10,500

FIG. 13. HOUSE AT CEDARHURST, L. I., N. Y.

Hollow terra cotta blocks stuccoed, fireproof throughout, except roof	12,000
Hollow terra cotta blocks faced with brick, fireproof floors	14,000
Brick walls, fireproof floors	15,000

Houses can be built with terra cotta blocks for walls and floors with wooden roofs, at a cost of twenty-two cents per cubic foot; if built with wooden floors and roof, at eighteen cents per cubic foot.

Editorial Comment and Miscellany.

MADISON HIGH SCHOOL, MADISON, WIS.

CASS GILBERT, ARCHITECT.

THE building was designed in the Jacobean style of architecture, which style was considered best adapted for school buildings and permits the minimum width of piers and mullions, and the maximum area of window openings lighting the rooms. The adoption of this style of architecture is considered more intimate, and follows the style of the old college buildings at Oxford and Cambridge in England, and has been used with great success in some of the more recent school buildings in America.

The exterior expresses logically the arrangement of the plan, window and door openings being placed frankly where they appear in the numerous rooms. The exterior is faced with vitrified face brick and trimmed with Bedford stone. The brick are rough and uneven in color, thus giving a color quality to the wall and a certain vigor and strength. The unevenness of color and roughness of texture supply in part the "texture" quality which would otherwise have to be given by carved detail or ornament. The very wide mortar joints add to the color effect and to the appearance of rugged strength not otherwise possible in a building of flat surfaces and wide window openings.

The construction of the building is of substantial character, the corridors and stairways being fireproof. The minimum amount of woodwork has been used, the finish being simple and practical throughout. The corridors are lined with face brick. The floors thereof are of cement, insuring a sanitary condition in the building.

PARKVIEW APARTMENTS, MADISON AVENUE, NEW YORK.
Gray terra cotta from sidewalk to roof furnished by Atlantic Terra Cotta Company.
Harde & Short, Architects.

A large assembly room with a stage and dressing room adjacent thereto is located on the main floor of the building and provided with ample exit therefrom. On account of lack of funds the original design of the architect could not be completed. The room lacks in that respect, and also lacks color decoration which should be done in harmony with the style of the building.

A large and spacious gymnasium extending the full height of the basement and ground story is located directly under the assembly hall, amply lighted by extensive windows from the rear. Showers, lockers, and toilet rooms for boys and girls are located on each side adjacent to the gymnasium.

The heating and ventilating plant is located directly in the rear of the gymnasium and outside of the limits of the building proper. The building is heated by a combination system, i.e., steam for heating purposes and forced blast tempered air for ventilating, and so arranged that either the direct or indirect system can be used independent of each other.

The building has been planned as a central high school building and comprises, besides the regular studies, instructions in manual training and domestic economy.

On the third floor are located biological, chemical, physical, and electrical laboratories and lecture rooms, the library and free-hand and mechanical drawing rooms. On the second floor are located class and recitation rooms, also teachers' retiring room. On the main floor are located class and recitation rooms and offices of the superintendent and principal. In the ground story are located the manual training and domestic economy departments. Ample toilet facilities are provided, the main toilet rooms being located in the ground and first story. Private toilet rooms are also provided for the superintendent, principal, teachers' retiring room, and manual training director.

The building has been substantially constructed and its cost (approximately fourteen cents per cubic foot) compared with the buildings constructed in recent years in different cities of the United States is certainly very low. It is doubtful if the building could be duplicated at the same cost.

CASINO AT DEAL BEACH, N. J.
Roofed with Ludowici-Celadon tiles.
David Ach, Architect.

AT THE meeting of the Philadelphia Chapter, A.I.A., held on the evening of April 13th, a resolution was adopted that the chapter make application to the board of directors of the American Institute of Architects for authority to include in the territory of the chapter, in addition to the city of Philadelphia and vicinity, all other territory in the state of Pennsylvania not granted to any other chapter, in order that the Philadelphia Chapter may incorporate in its by-laws a provision for non-resident membership as there are many men in active practice in the various parts of the state, some of whom are members of the Institute, although not attached to any chapter. A motion was also adopted that it is the sense of the chapter that the work of the American Institute of Architects should be given all possible publicity with a view of forming higher professional standards and educating the public in architectural matters and urging the president and board of directors of the American Institute of Architects to appoint a Committee on Publicity to give, with the approval of the said board, the affairs of the Institute generally as much publicity as possible. In view of the fact that the fortieth anniversary of the founding of the Philadelphia chapter will occur in October next, a committee consisting of Messrs. W. D. Hewitt, George R. Stearns, Albert Kelsey, Horace W. Sellers, John T. Windrim, Ed. A. Crane, and D. Knickerbacker Boyd was appointed to take steps for a fitting commemoration of the event.

UNIVERSITY CLUB, CHICAGO.
Fireproofed throughout with terra cotta hollow tile. Made by National Fire-proofing Company.
Holabird & Roche, Architects.

At a convention of the Pacific coast architects held March 22d, the Architectural League of the Pacific Coast was formed, and the following officers were elected: President, Willis Polk, San Francisco; vice-president, E. F. Lawrence, Portland; secretary, J. D. Myers, Seattle; treasurer, Myron Hunt, Los Angeles. The objects of the league as set forth in its constitution are as follows: The securing of affiliation between chapters of the American Institute of Architects and architectural clubs; the formation of similar organizations in cities where none now exist; the establishing of a circuit of annual architectural exhibitions; an annual convention of architects; the promotion of scholarship work by draftsmen.

ADVANCES in the price of rooms in the new dormitories at Yale will add about five and one half per cent to the annual revenue from these buildings. This plan is apparently a substitute for the proposed increase of tuition, which was not received with favor when raised in the corporation a year ago. Thus does improved architecture improve university finance. In future no low priced dormitories are likely to be

TERRA COTTA COLUMN FOR CHICAGO AND NORTHWESTERN DEPOT.
Made by American Terra Cotta and Ceramic Company.
Frost & Granger, Architects.

built unless ordered by donors. The lower prices will continue, however, to apply to the older buildings, while the rooms in the new Haughton Hall will rank next to Vanderbilt Hall (the highest priced dormitory) in rentals. All prices are considerably lower than those charged in private dormitories.

ONE of the bills introduced at the last session of Congress, and destined to come up for consideration in the future, was that of Representative Landis' providing $250,000 for the erection of a summer home for the President. It is proposed to build the mansion on the reservation of the Military Academy at West Point. This would avoid the necessity of purchasing land and would enable all the money to be devoted to the building of the executive's summer home. . . . On February 19, Representative Bede of Minnesota introduced a bill appropriating $100,000 for the erection of homes in Washington for the Speaker of the House and the Vice-President.

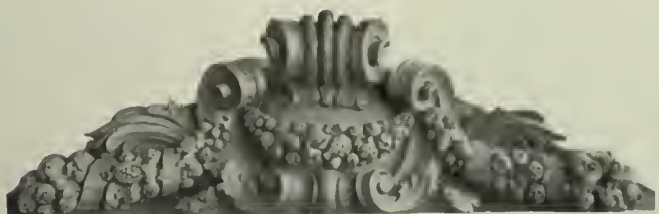
AT THE instance of real estate interests, Senator Agnew has introduced a bill at Albany to amend the lien law of New York State. One feature is that the interest of an owner of real property shall not be affected by the lien for labor or materials which may have been performed or furnished at the request of a tenant or purchaser, "except upon the written consent of the owner or his agent." Another change provides that the lien shall be limited to the amount unpaid on labor performed or materials furnished.

DETAILS is the title of an architectural journal which made its first appearance in January of this year. It is published monthly at 392 Strand, London, England, (subscription price, 12 shillings). The contents will consist entirely of illustrations which will be made from especially-taken photographs reproduced to a large size, and accompanied in every case by measured or scaled drawings, and by such particulars as are necessary or interesting. Examples of modern work by leading English and French architects will be given, as well as fine examples of old work. The work is edited by Mr. R. Randal Phillips, an architect by training, and for a number of years associate editor with the *Builders' Journal and Architectural Engineer*, London. Mr. Phillips will no doubt be remembered by readers of THE BRICKBUILDER as our London correspondent.

CORN EXCHANGE BANK, CHICAGO.
Built of brick made by Ohio Mining & Manufacturing Company, Thomas Moulding Company, Chicago, Agents.
Shepley, Rutan & Coolidge, Architects.

DETAIL BY A. C. LONGYEAR, ARCHITECT.
South Amboy Terra Cotta Company, Makers.

SAMUEL CABOT (Inc.), Boston, Mass., has just issued a very interesting booklet treating of waterproof stains for staining and waterproofing all kinds of cement buildings —plaster, stucco, rough-cast, concrete, or blocks. We



DETAIL BY JOHN DAYTON, ARCHITECT.
New Jersey Terra Cotta Company, Makers.

DETAIL.
Executed by New York Architectural Terra Cotta Company.

STORE BUILDING, CHESTNUT STREET, PHILADELPHIA.
Terra Cotta by Conkling-Armstrong Terra Cotta Company.
William Steele & Sons, Architects.

are especially glad to call the attention of our readers to this booklet, because it answers in detail very many questions that have been asked of us. It would be needless to here give a résumé of the contents of the work for a copy will be sent on application. It is perhaps enough to say that the whole subject is adequately covered and the standing of the firm is a guarantee of the reliability of the statements made.

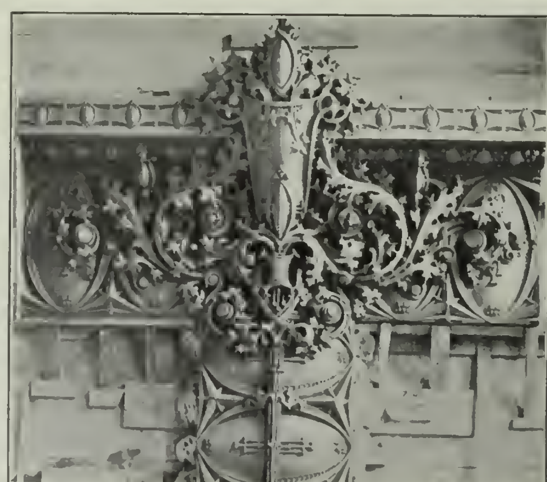
IN GENERAL.

Olof Z. Cervin, architect, formerly of Moline, Ill., has removed his office to Rock Island, Ill.

St. Paul is to have a new twelve-story hotel. The cost is placed at $1,000,000 and the doors are to be thrown open to guests the first of next year. One of the novelties advertised for it are "dust-proof doors."

Putnam & Cox, of Boston, are the architects for the projected $1,000,000 gymnasium for Harvard.

The manager of the Hotel Astor, New York, declares that he will spend $20,000 in devoting 60,000 square feet of the Hotel Astor roof to an airship station, which is to be in readiness May 1st, for the use of aeroplanes and dirigible balloons.



DETAIL BY CHARLES F. WHITTLESEY, ARCHITECT.
Made by Northwestern Terra Cotta Company.

Photographs of the architects were placed beside those of several notable persons in the sealed copper box embedded in the corner-stone of the new chapel at the West Point Military Academy. The setting of this stone took place on April 5th.

President Butler, of Columbia, Seth Low, of the National Civic Federation, or Justice Gaynor is declared acceptable as umpire in the dispute between the carpenters and sheet metal workers of New York City as to which trade has the right to hang the metal doors now used in large buildings.

DICKSON BUILDING, NORFOLK, VA.
Built of "Ironclay" brick. Made by Ironclay Brick Company.
Ferguson & Calron, Architects.

A bill before the New York legislature provides for the establishment of a state school of sanitary science and public health at Cornell. The provision for extension work by means of reports and bulletins promises to be of material aid to the building industry in putting before it the results of the university's laboratory and research work.

The Park Board of Denver determined April 2d upon the expenditure of about $2,750,000 to complete what is known as the MacMonnies Civic Center. This consists of the parking of a space in the neighborhood of the Capitol grounds, the building of a fountain, and the erection of a museum.

The second annual exhibition of the Portland, Oregon, architectural club was held in the galleries of the museum of fine arts, March 22d to April 10th.

LANDSCAPE PANEL FOR FIREPLACE.
Executed in faience by Rookwood Pottery Company.

In addition to the work exhibited from the offices of Pacific coast architects there was a liberal exhibition of work contributed by eastern architects. The "Year Book," published under the direction of M. A. Vinson, is a notable example of club catalogue work.

The second exhibition of the New Jersey Chapter of the American Institute of Architects was held in the Newark free public library, March 18th to 31st. The catalogue was well up to the standard of those issued in connection with architectural exhibitions. The officers of the chapter are: Charles P. Baldwin, president; Fred W. Wentworth, vice-president; Thomas Cressy, second vice-president; George W. Von Arx, treasurer; Hugh Roberts, secretary.

"Western Colonial" bricks, made by the Western Brick Company, of Danville, Ill., were used in the St. Francis Home for Orphan Boys, Detroit, Mich., Stratton & Baldwin, architects, illustrated in the plate form of this issue.

At the meeting of the Illinois Chapter A.I.A., held April 12th, the Building for the Women's Baptist Home Mission Society, Chicago, Pond & Pond, architects, illustrated in this issue, was awarded the Gold Medal by the Chapter. The body of the building is built of a side cut red paving brick with light gray bricks in the frieze and gables. The bricks were made by the Western Brick Company and furnished by Thomas Moulding Company, their Chicago agents.

DETAIL FOR SCHOOL BUILDING.
Executed in terra cotta by Brick, Terra Cotta & Tile Company.
Henry C. Pelton, Architect.

The interior trimmings in the Natatorium, Phipps Building, Pittsburg, Pa., Grosvenor Atterbury, architect, illustrated in THE BRICKBUILDER for March, were executed in polychrome terra cotta by the Atlantic Terra Cotta Company.

Sayre & Fisher bricks were used in the Home for Aged Men at Scranton, which is illustrated in the plate form of this issue.

The kitchens in the dining hall of the Wheaton Seminary, illustrated in the plate form of this issue, are finshed in white enameled brick made by the American Enameled Brick & Tile Co.

John W. Gates has notified the town council of Port Arthur, Texas, that he will erect a $100,000 hospital there and large business college buildings and dormitories, all of which he will give to the town.

A COMPLETE set of specification blanks for architects and builders has just been published by T. Robert Wieger, architect, Denver, Colo., formerly with Frank E. Kidder, architect and author. The specification fully comprehends all branches of work for all classes of buildings in a brief, concise, and yet complete manner, and is a great help and time saver to architects and builders. The blanks are neatly printed, one side, on bond paper, 6¾ inches by 10¾ inches. The complete set has forty-four pages. These blanks may be obtained from Mr. Wieger in one or more sets, as desired, at a nominal cost.

THE NEW BUILDING ESTIMATOR, *by William Arthur*. A Handbook of Cost Data for Estimating all Classes of Buildings. A practical working guide to figuring the cost of labor and material in building construction, from excavation to finish; with various examples of work presented in detail, and with labor figured chiefly in hours and quantities. A handbook for architects, builders, contractors, appraisers, engineers, superintendents, and draftsmen. With 437 pages, including a 13-page index. Cloth bound. Price, $2.50, delivered. David Williams Company, Publisher, New York.

COMPETITION FOR A HOUSE.

To be built of Terra Cotta Hollow Tiles at a cost not exceeding $10,000.

FIRST PRIZE $250., SECOND PRIZE $150., THIRD PRIZE $100.

PROGRAM.

THE problem is a house with walls, floors, and partitions built of Terra Cotta Hollow Tiles.

The cost of the house, exclusive of the land, is not to exceed $10,000.

A detailed statement of costs must accompany each design, this statement to be typewritten on one side only of a sheet of paper measuring 11 inches by 8½ inches.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The particular object of this Competition is to encourage a study of the possibilities in the use of Terra Cotta Hollow Tiles in the exterior walls of houses. Here is a material which is durable, economical in original cost and construction, desirable in its weatherproof qualities, and one which is capable of meeting the esthetic demands of the designer. Its largely increased use, especially in the eastern section of the country, is evidence of its popularity as a building material which has passed the experimental stage.

The plan should provide accommodations for a family of five — three adults and two children — and two servants. There are no restrictions as to size, shape, or style of house — except the cost — nor the size, shape, or location of lot.

CONSTRUCTION.

While the method of construction for walls, floors, and partitions is to be determined by the designer, the following suggestions are offered as being practicable and admissible.

First. Outside walls may be of Terra Cotta Hollow Tiles eight inches thick (12 inches by 12 inches by 8 inches), the blocks being heavily scored on two sides. Stucco may be used for an outside finish and plaster applied direct to the block for interior finish.

Second. Outside walls may be of Terra Cotta Hollow Tiles ten or twelve inches thick with same finish as suggested above.

Third. The outside walls may be faced with brick, with a backing of eight inch tiles.

Fourth. The outside walls may be built with outer and inner walls, with an air space of two inches between, using in the outside wall a four inch hollow tile, and on the inside a six inch tile. The treatment of the face of such a wall, and the manner of bonding the outer and inner walls are left to the designer.

For the floors, one of the long span hollow tile terra cotta block systems now on the market, which are adapted up to spans of twenty feet without the use of steel beams, or a system which employs hollow tile terra cotta blocks in connection with light steel construction. The roof need not be of fireproof construction.

DRAWINGS REQUIRED.

On one sheet the front and a side elevation at a scale of four feet to the inch; also plans of floors at a scale of eight feet to the inch. On another sheet details showing clearly the scheme of construction for the exterior walls, the floors and partitions, together with other details drawn at a scale sufficiently large to show them clearly. Graphic scales to be on all drawings.

The size of each sheet is to be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are not to be mounted.

All drawings are to be made in black line without wash or color. All sections shown are to be cross-hatched in such manner as to clearly indicate the material, and the floor plans are to be blocked in solid.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of THE BRICKBUILDER, 85 Water street, Boston, Mass., on or before June 1, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three well-known members of the architectural profession.

In making the award the jury will take into account: first, the fitness of the design in an artistic sense to the materials employed; second, the adaptability of the design as shown by details to the practical constructive requirements of burned clay; third, the relative excellence of the design.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $250.
For the design placed second a prize of $150.
For the design placed third a prize of $100.

In the study of this problem competitors are invited to consult freely with the manufacturers of burned clay fireproofing, or their agents. This Competition is open to everyone.

The prize and mention designs will be published in THE BRICKBUILDER.

THE BRICKBUILDER

Volume XVIII MAY 1909 Number 5

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

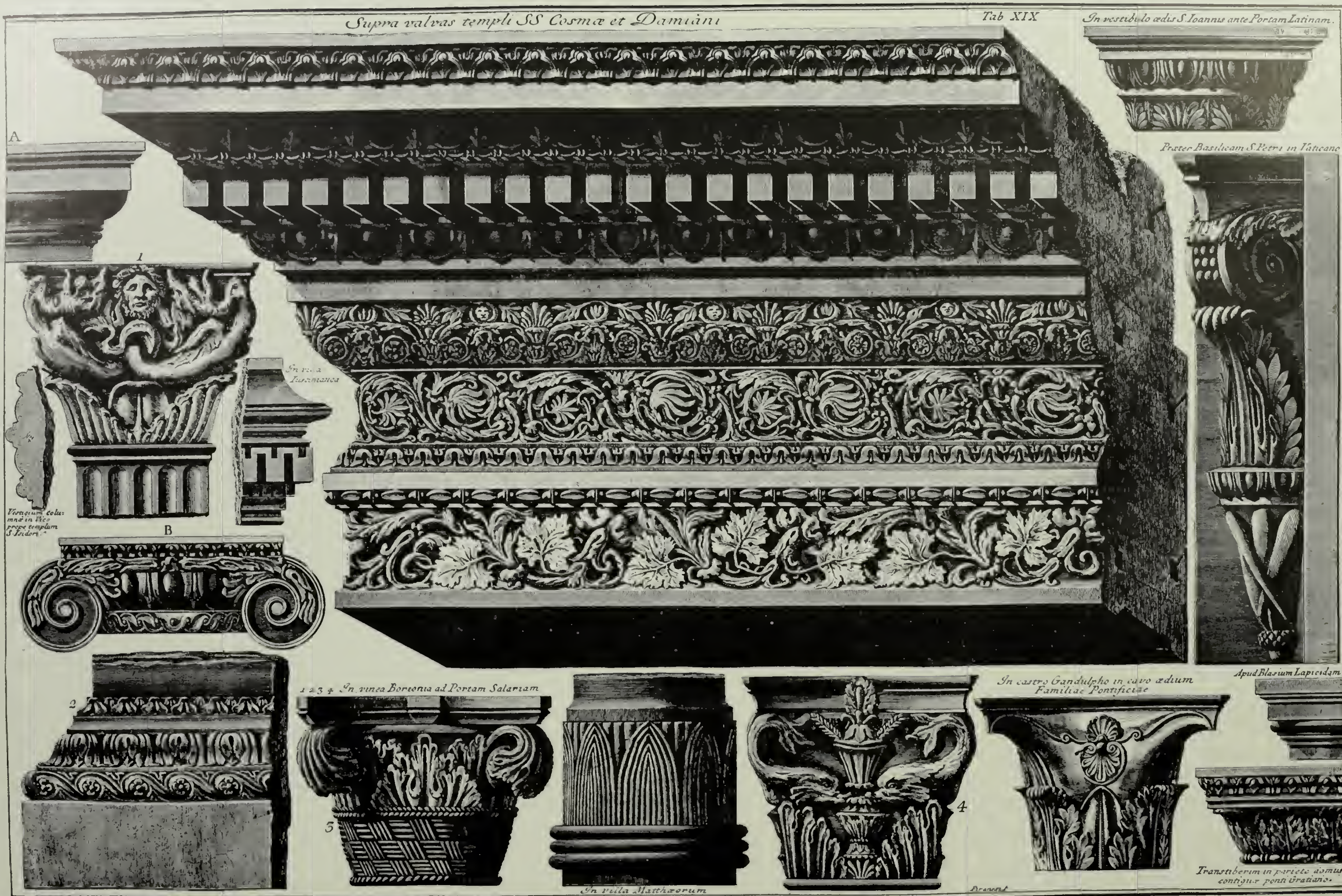
CONTENTS

PLATE ILLUSTRATIONS

From Work by

KIRCHHOFF & ROSE; LEHMAN & SCHMITT; McKIM, MEAD & WHITE AND BEARDEN & FOREMAN, ASSOCIATED; GEORGE S. MILLS; A. F. ROSENHEIM; THOMAS, CHURCHMAN & MOLITOR.

LETTERPRESS



CAPITALS AND OTHER ARCHITECTURAL DETAILS FROM ANCIENT ROMAN BUILDINGS. GIOVANNI BATTISTA PIRANESI, DEL.

THE BRICKBVILDER

VOL. 18 NO. 5 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· MAY 1909

Gymnasiums—Their Plan and Equipment—IV.

BY M. B. REACH.

IT WILL be observed in studying the plans and equipments of men's and women's gymnasiums that there is sufficient similarity between equipments to permit their adaptation to either with comparatively few changes in the nature of additions. In a co-educational institution where one gymnasium is planned to accommodate the two sexes the extra cost of equipment is in comparatively small ratio, and the general scheme of arrangement would remain very much the same. Separate entrances to the gymnasium from the locker rooms must be provided and the location of locker rooms should insure the proper degree of privacy. I like the scheme where the entrances to separate dressing rooms from the gymnasium are at each end of the gymnasium and by the offices of the director in charge. Hence, in an institution having a director for men and one for women, as is usually the case, their offices and examining rooms can be so located as to properly guard against any intrusion through the gymnasium and permit the inside work of each to be carried on at all times.

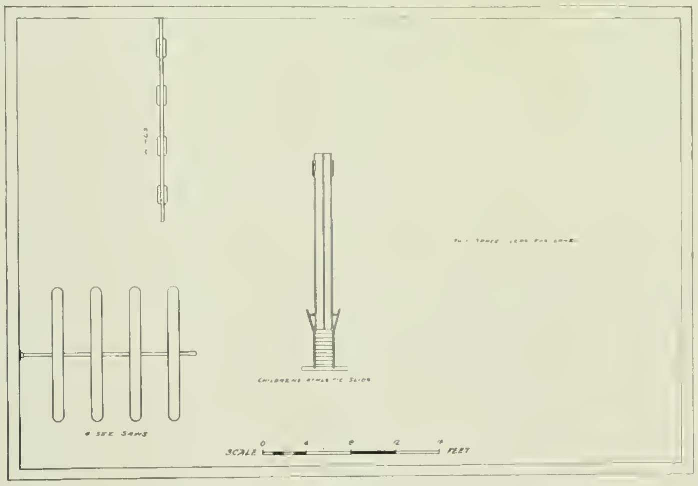


FIG. 18. PLAYROOM FOR CHILDREN.

Equipment: Four swings, four see-saws, one children's athletic slide, small game apparatus, bean bags, hoops, jump ropes; rubber balls, etc.

The merits of coalescing the working equipments must be judged by conditions. In some instances it is in every way practical, efficient, and economical. In others I think it a mistake. A church gymnasium, which usually is, and should be, in the adjoining parish house or guild hall, can be so operated with the best of results. Gymnasiums of this class are social and recreative; the work and hours may be regulated to satisfy all, and accomplish the purposes of the organization. The same rule would undoubtedly hold true in many normal schools and colleges. Very often there is a decidedly predominating majority of one sex which simplifies matters and seldom do we find the frightful amount of congestion and specific conditions that exist in other institutions where combined work is objectionable. It devolves into a problem of simple mathematics after all — amount of work to be done divided by the working hours. We all experience similar problems and when obvious that adjustment is necessary we add the machinery, men, or rooms and go ahead to get the result. Unfortunate it is at times, that our scheme of education is so lacking in practical methods.

Any modern public school has provisions made in its plan for a gymnasium. Gymnasium work is gradually being accepted by our educational bodies as necessary, and therefore desirable. In is a compulsory part of the curriculum. Our schools, particularly our city schools, are all crowded and under congested conditions of this kind. I hold that one gymnasium for girls and boys combined is inadequate and about as productive of results and progress as a motor car of 60 horse power size and design with a single horse-power engine.

The school hours are short and the attendance large. Class work for the individual two or three times a week is almost farcical. If there is any merit in this branch of work, any profit, mental, physical, or moral, why such half-hearted measures? Why not provide the maximum of efficiency and reap a paying result? We are undoubtedly making serious mistakes in designing school buildings that cannot possibly accommodate the children of the present in any satisfactory manner, and which are constantly growing more congested. Education through play is now sweeping the country broadcast. Schools having yards are equipping them with gymnastic and playground apparatus. Others bemoan the fact that they are destitute of opportunities to keep abreast. Schools in New York are utilizing their roofs.

These are the present conditions at the inception, almost, of this broad educational policy. What will be the conditions ten years hence when the movement commences to show its growth? So far as new buildings are concerned it depends entirely upon the enlightened archi-

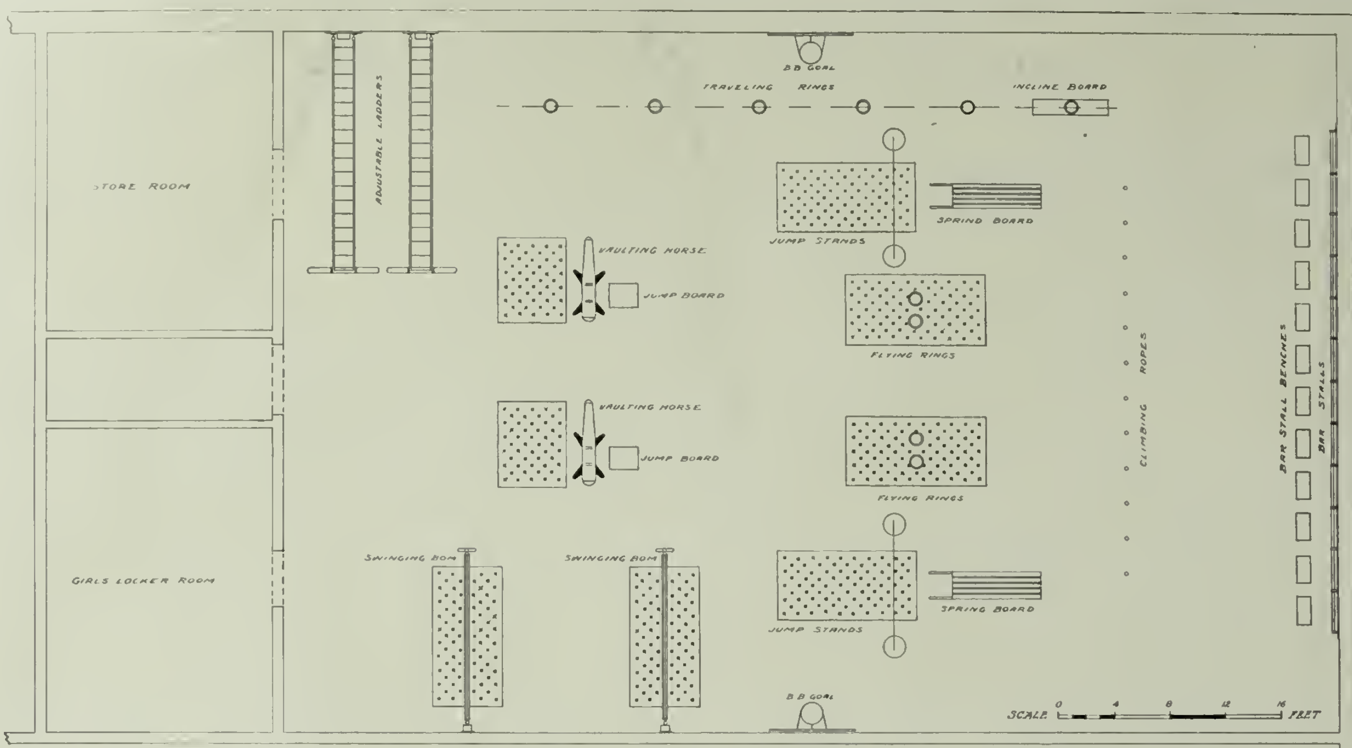


FIG. 19. A GIRLS' GYMNASIUM.

Equipment: Twelve sections bar stalls, twelve bar stall benches, twelve climbing ropes, two spring boards, two jump standards, two pairs flying rings, six traveling rings, one incline board, two swinging booms, two vaulting horses, two jump boards, two adjustable ladders, basket ball goals, mattresses, miscellaneous small apparatus.

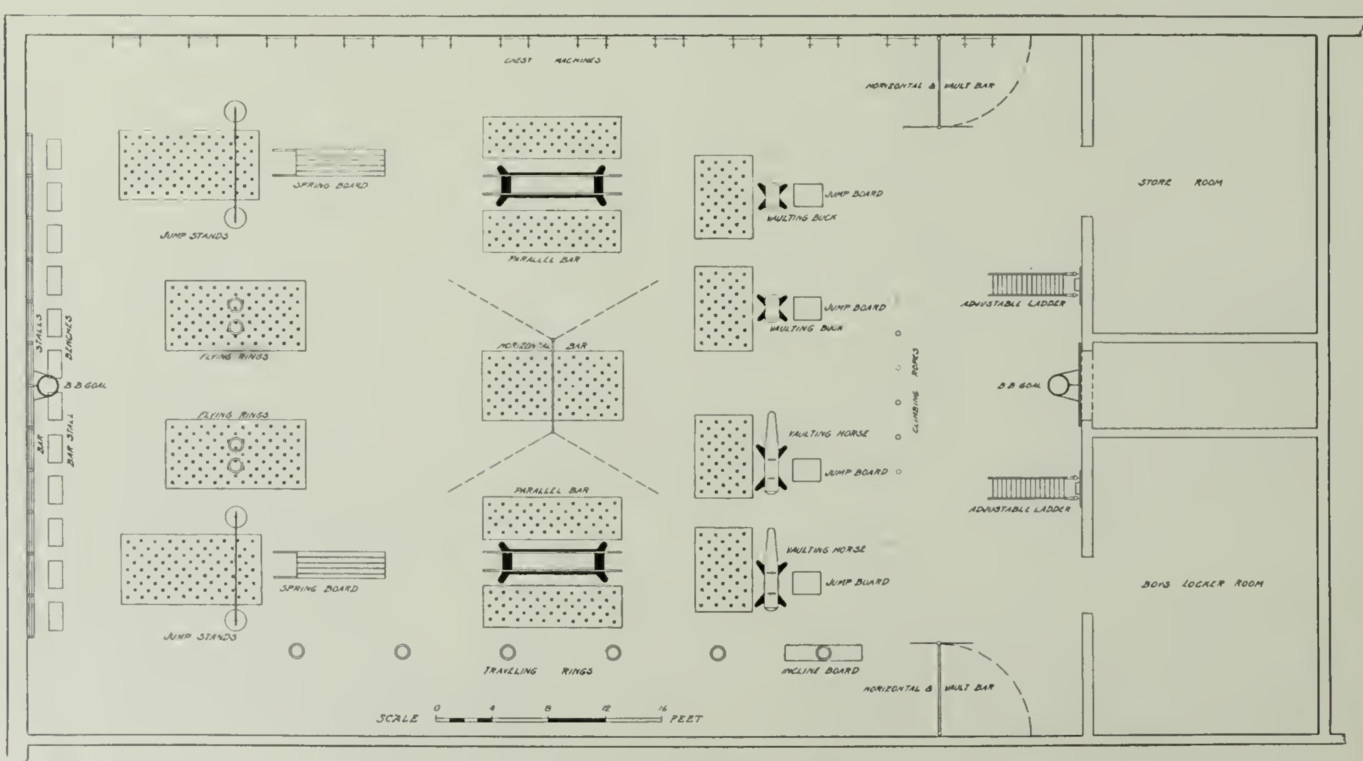
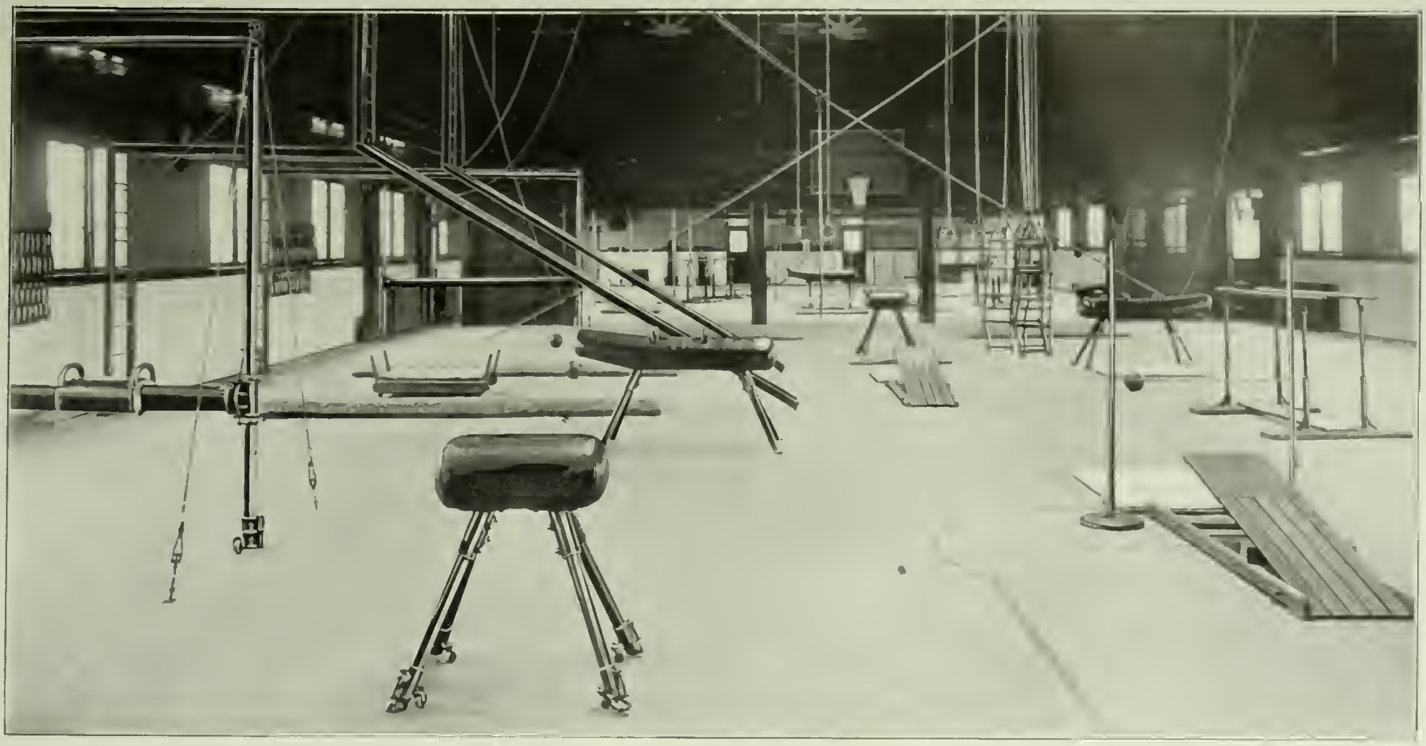


FIG. 20. A BOYS' GYMNASIUM.

Equipment: Twelve sections bar stalls, twelve bar stall benches, two pair jumping standards, two spring boards, two pair flying rings, one suspended horizontal bar, two parallel bars, two vaulting horses, two vaulting bucks, four jump boards, one incline board, six traveling rings, six climbing ropes, two horizontal and vaulting bars, two adjustable ladders, twelve chest machines, one pair basket ball goals, mattresses, miscellaneous small apparatus.



GYMNASIUM FOR MEN AND WOMEN, STATE NORMAL SCHOOL, CEDAR FALLS, IA.

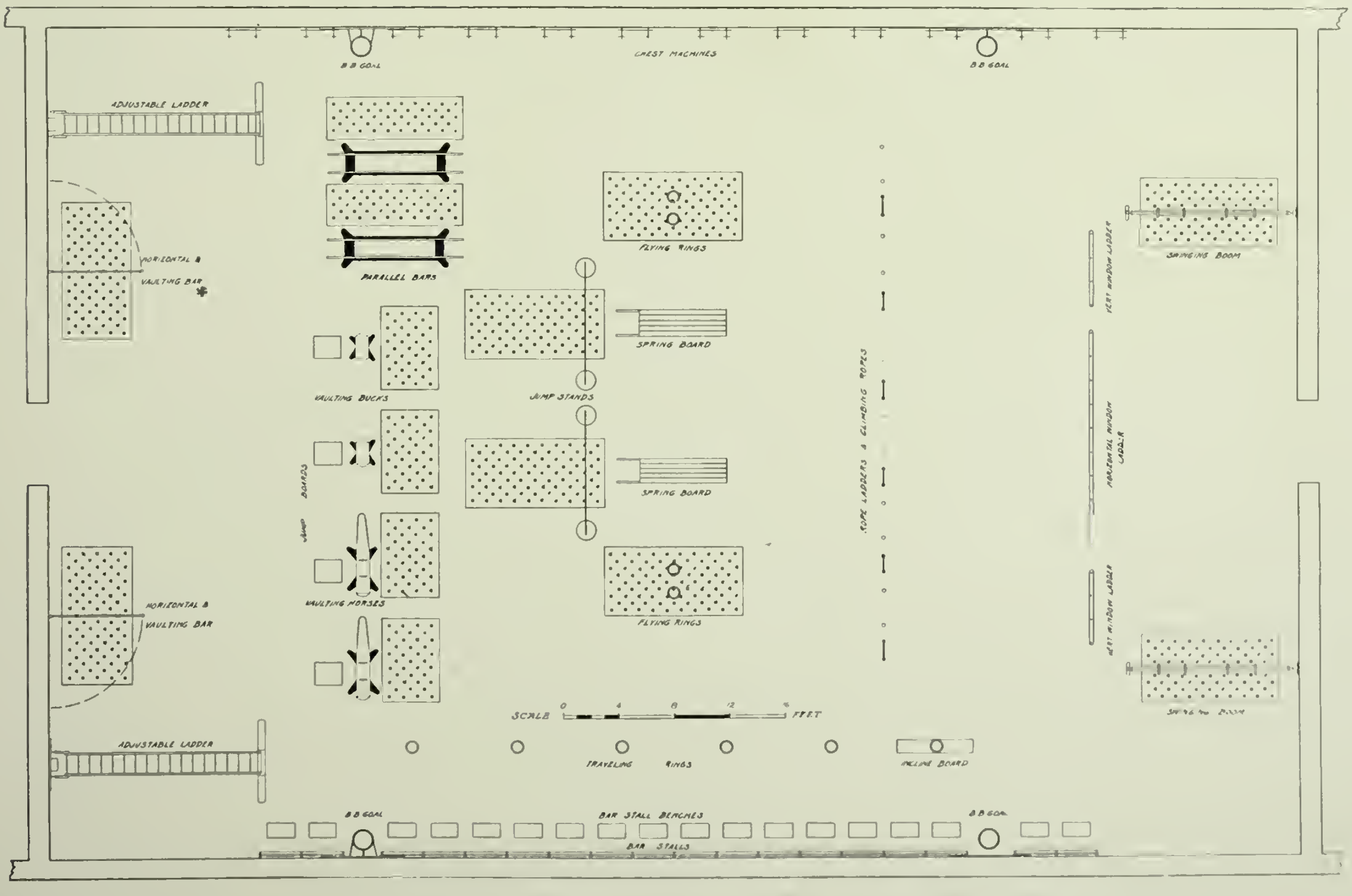
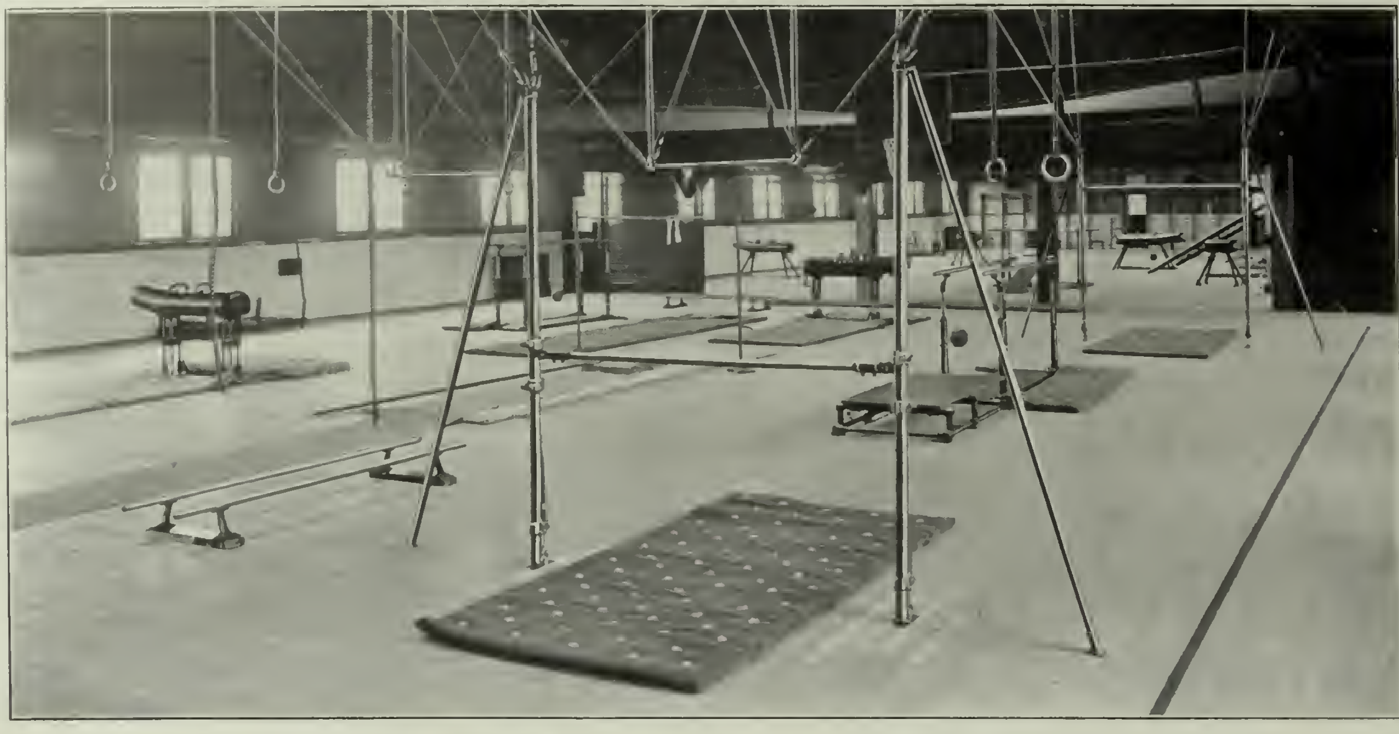


FIG. 21. CO-EDUCATIONAL COLLEGE OR NORMAL SCHOOL GYMNASIUM.

Equipment: Two horizontal and vaulting bars, two adjustable ladders, two vaulting horses, two vaulting bucks, two parallel bars, four jump boards, two pair jumping standards, two spring boards, two pair flying rings, six traveling rings, one incline board, six rope ladders, twelve climbing ropes, one horizontal window ladder, two vertical window ladders, two swinging booms, twelve chest weights, eighteen sections bar stalls, eighteen bar stall benches, two pair basket ball goals, mattresses, miscellaneous small apparatus.



GYMNASIUM FOR MEN AND WOMEN, STATE NORMAL SCHOOL, CEDAR FALLS, IA.

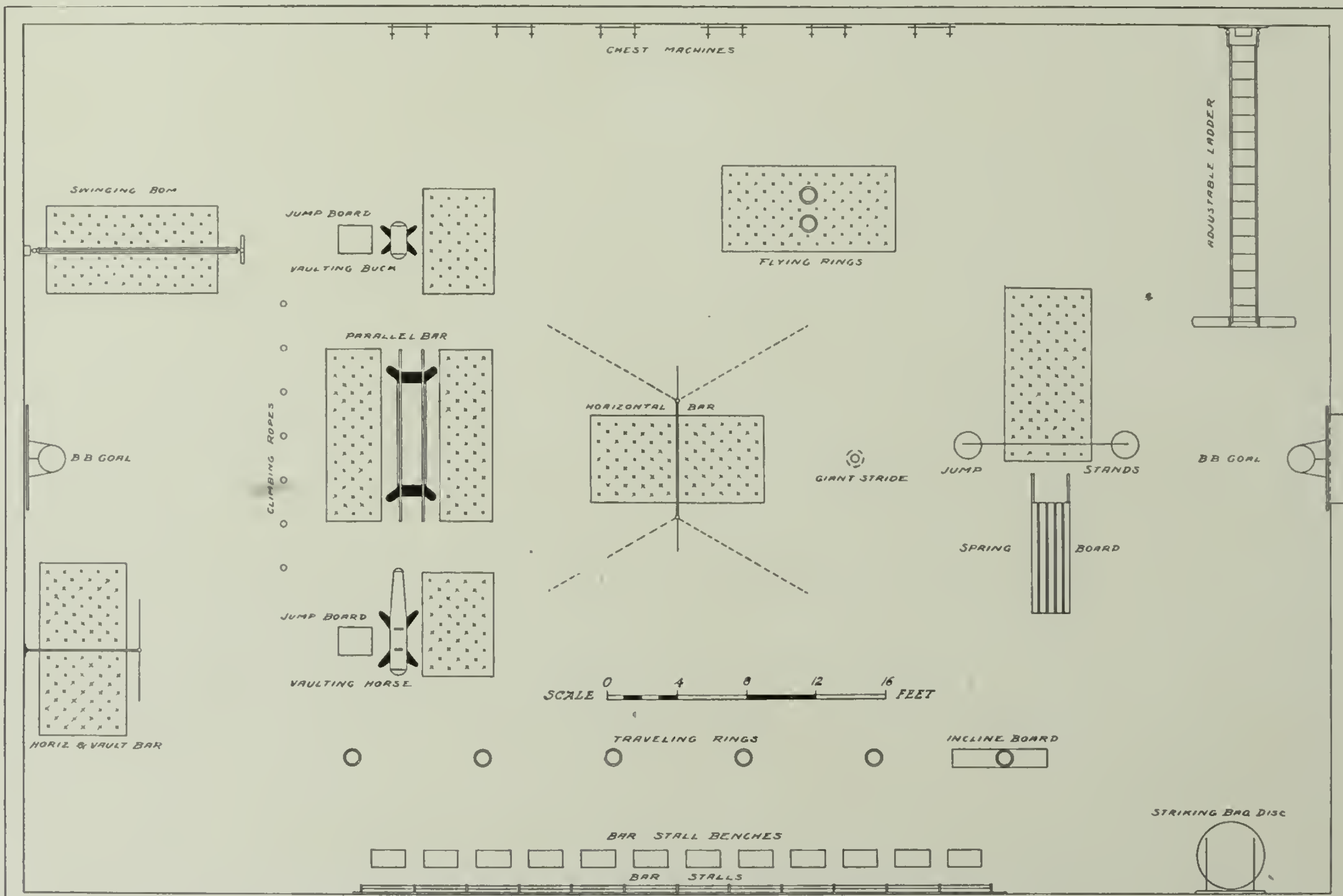
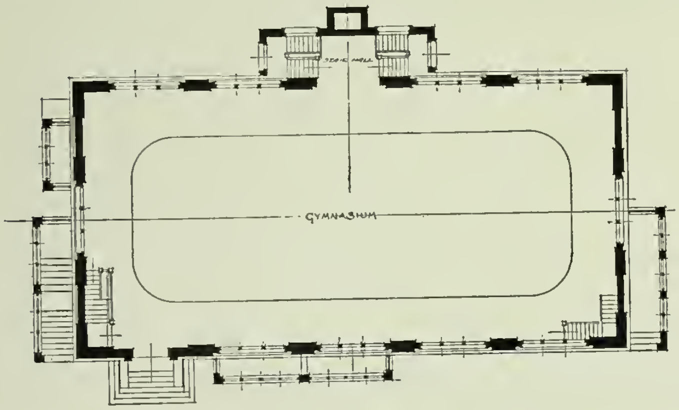


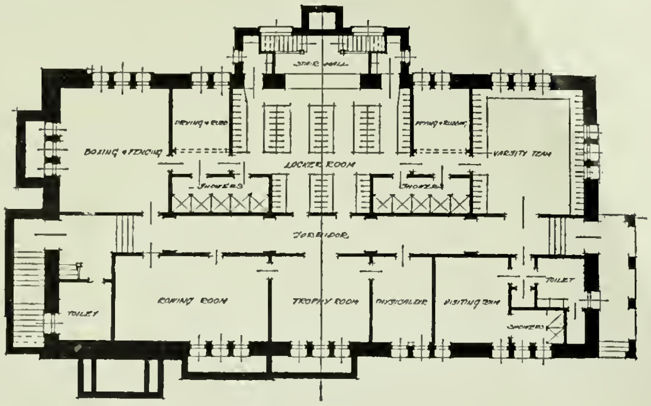
FIG. 22. A CHURCH GYMNASIUM.

Equipment: Twelve bar stalls, twelve bar stall benches, six chest weights, one vaulting horse, one vaulting buck, two jump boards, one parallel bar, one horizontal and vaulting bar, one suspended horizontal bar, one adjustable ladder, six traveling rings, one pair flying rings, six climbing ropes, one giant stride, one striking bag disc, one swinging boom, one pair jump standards, one spring board, one incline board, one pair basket ball goals, mattresses, miscellaneous small apparatus.

NEW GYMNASIUM AT ST. JOHN'S COLLEGE, ANNAPOLIS, MD.
Wyatt & Nolting, Architects.



BASEMENT PLAN.



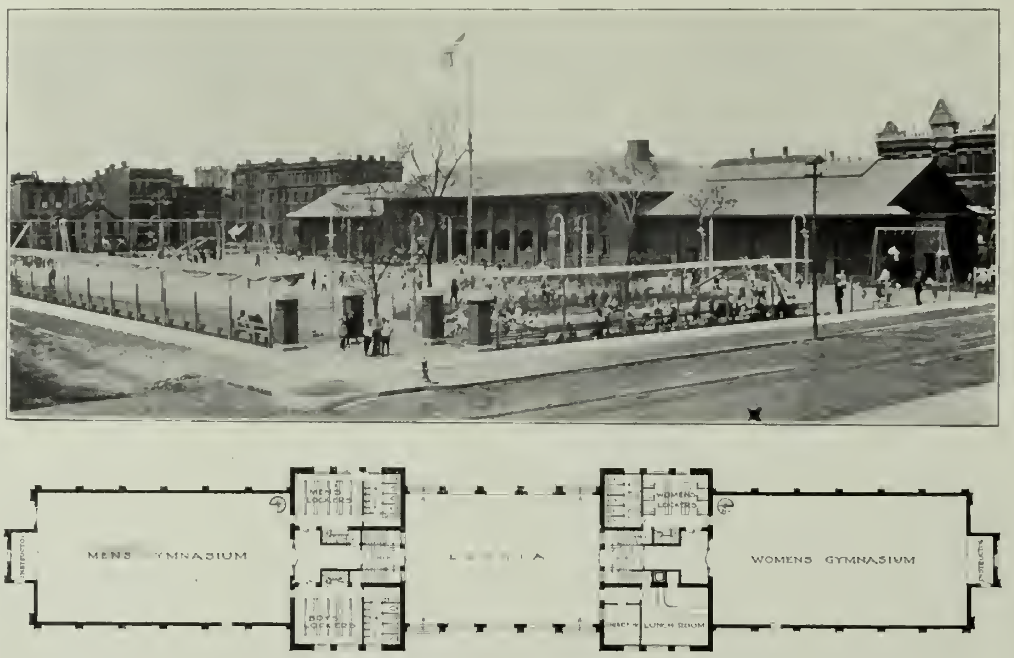
FIRST FLOOR PLAN.

GYMNASIUM AT GEORGETOWN UNIVERSITY.

GYMNASIUM AT GEORGETOWN UNIVERSITY, WASHINGTON, D. C.
Ewing & Chappell, Architects.

tect and the school board. Schools with one small gymnasium will be as badly off as the school of to-day without a yard. Most of our schools carry the children from primary through the grammar grades. The smaller children should have a good-sized playroom, preferably on the ground floor. This might be equipped with a few pieces of play apparatus such as slides, teeters, and swings. There should be a separate gymnasium for boys and one for girls. It might be said that in a school suffering for room the space of one gymnasium would mean another needed class room or two. Granted that it would increase the school capacity to the extent of one hundred pupils, devoted to gymnasium work it would make it possible to accommodate at least four or five times that number during the average school period, and extend by just that much a branch of educational work, heretofore badly neglected, but now recognized as an important factor in producing the best kind of children. In one case there is a larger plant incomplete. In the other a smaller plant of greatest working efficiency. However the rule may be applied to educational methods commercially there would be no choice.

PARISH HOUSE GYMNASIUM, CHRIST CHURCH, CINCINNATI.



GENERAL VIEW AND FIRST FLOOR PLAN, GYMNASIUM, SEWARD PARK, CHICAGO.
Perkins & Hamilton, Architects.

The gymnasiums could both be located on the top floor or possibly the one for the girls midway in the building.

Fig. 18 serves as a type for playroom — plenty of light and air. Fig. 19, a girls' gymnasium and equipment. Fig. 20, a boys' gymnasium and equipment. While I have illustrated in the latter two figures rooms 50 feet by 75 feet it may be understood that 40 feet by 60 feet provides opportunities for good work. It is, of course, desirable to have the greater space if obtainable. In a boys' gymnasium 50 feet by 75 feet it might be found desirable to provide a running track. That may be governed by the individual conditions. I would not suggest a track for an elementary school in any smaller room, and not at all if the room is to be used by both girls and boys.

There is gradually growing into prominence another sort of educational center in the shape of the municipal gymnasium and playground. I will treat of the equipment of such buildings in my next article, but mention them now as belonging to the co-educational series. The rules applied to public school gymnasiums hold good here. The same congestion prevails and the gymnasiums are apt to be crowded at all open hours. Undoubtedly the best ends are attained where separate provisions are made for men and women, or boys and girls. The object of the public gymnasium is to provide a place where children may go for a better kind of fun than they obtain in the streets. While seemingly social and recreative it really does not belong in that class of gymnasiums because fundamentally it is educational in principle, only the educational pill is homeopathically administered and is sugar coated. This gymnasium, therefore, should be open to all boys and girls when they otherwise would be on the street, and the less its work is curtailed the better its effects. Then also, the problem of administration is greatly simplified where separate provisions are made for the care of both sexes.

Most plans drawn up follow out these lines. I see some, however, from time to time, that unite the two parts and have, therefore, made mention of the subject.

Warming and Ventilating with Special Reference to Hospital Buildings—I.

BY D. D. KIMBALL.

IT IS not possible in an article of this character to cover the entire field involved in the warming and ventilating of hospital buildings, but it is the purpose of the writer to give, in as concise form as possible, a brief treatise on the subject which shall give to the architect and builder a definite idea of the history, literature, practices, and value of ventilation.

An explanation of some well established standards and methods of warming and ventilating as applied to hospital buildings, and some rules and formulas will be given. The elements, forces, and difficulties involved will be briefly considered, and brief references will be made to the subjects of air filtration, air cooling, and relative humidity.

Probably the earliest recorded application of the principles of ventilation was made about the middle of the fifteenth century to the mines of Saxony, it having become necessary to supply fresh air to replace gases which formed and interfered with respiration and use of the miner's lamp. This work consisted of the use of fires in ventilating shafts, and later of large bellows and paddle wheels for the horizontal tunnels. Long before this, however, doctors had realized the need of fresh air for the sick and the importance of a constant renewal of the air supply within the homes of the sick. The development of building ventilation seems to have begun with the work of Sir Christopher Wren in the House of Parliament about 1660. This work went through various stages and was not perfected until about 1835 by Dr. Reid, the old system having been destroyed by fire.

Modern ventilation work may be said to have commenced with the work of Tredgold, an English engineer, who published in 1824 a work of great value, which was revised and reissued in 1835. In France the earliest attempts at building ventilation occurred about 1840 in connection with a Paris hospital, in fact all the earliest attempts at ventilation in France were in connection with hospital buildings.

The subject of ventilation in the United States began to receive consideration about 1849 when the Committee on Public Buildings of the House of Representatives in the State of Massachusetts reported upon the ventilation of Representatives' Hall, a second report being made early the year following.

In 1866 a report was made upon the ventilation of the Halls of Congress, followed by other similar reports on the ventilation of the House of Representatives.

It was not until about 1862 to 1864 that the amount of air really required for ventilation was correctly determined, this being developed as the result of the work of the Army Sanitary Commission in connection with an investigation into the sanitary condition of the English army during the Crimean war.

Dr. Parkes in his manual of Hygiene stated in 1864 that 2,000 cubic feet of air per hour per occupant in a room should be furnished, which coincides with the average present practice.

The earliest literature upon the subject of real interest appeared about 1815. Among the earliest authorities of value are Thomas Tredgold, already referred to; E. Peclet, 1854 and 1861, and M. Pettenkofer, 1858. Among the later authorities of value should be mentioned Wm. J. Baldwin's books on steam and hot water heating, etc., and Professor Carpenter's "Principles of Heating and Ventilation." One of the most convenient books upon heating will be found to be "Steam Heating" by Wm. G. Snow, while for a very complete and general history and discussion of the subject "Ventilating and Heating," by Dr. John S. Billings, will be found most interesting. Among the most valuable contributions to the development of this science will be found to be the transactions of the American Society of Heating and Ventilating Engineers, which record many valuable tables, tests, and discussions. There are a number of current magazines treating more or less extensively of this subject, among which might be mentioned the "Heating and Ventilating Magazine" treating of heating and ventilating work exclusively, and the "Sheet Metal Worker" devoted largely to this subject.

The necessity for providing artificial heat during the fall, winter, and spring of the year is apparent, a lack of heat or a surplus thereof involving discomfort, and both alike endangering health. In the case of hospital warming especially is it most desirable that the temperature should be kept as nearly uniform as possible.

The value of ventilation is still too little appreciated even in hospital work. The word "appreciated" is used advisedly as it is more a lack of appreciation than a matter of real ignorance. It is not uncommon to find a member or members of a building committee, and even an architect, willing to sacrifice the ventilation of a hospital building to save money with which to secure architectural effect, more space, or other equipment. Such a committee or such an architect fails to realize that a hospital without adequate ventilation is little better than a hospital without medicine, and fails to realize also that a hospital properly ventilated will reduce the average number of days required to effect a cure from twenty-five per cent to forty per cent, greatly increase the percentage of cures, and increase the capacity of the same hospital in proportion to the lessened number of days required to effect a cure.

At the S. R. Smith Infirmary at Staten Island a comparison was made in two wards of the same nature, containing the same class of patients, in which case it was found that in the ward without ventilation an average of sixteen days was required to effect a cure, while in the ventilated wards the average was ten days. In the Dublin Lying-In Hospital the death rate under old conditions reached fifty per cent of those born, while for an equal period with improved sanitary conditions the death rate fell to five per cent. It has been reported that in the Boston City Hospital the death rate changed under the improved conditions from forty-four per cent to thirteen per cent in the surgical wards and from twenty-three per cent to six per cent in the other wards. Such instances can be multiplied, so that there would seem to be as ample reason for the installation of suitable ventilation as for the provision of medicine.

The matter of ventilation involves principally the matter of air supply and it may, therefore, be well to consider the nature and composition of the air and the part which it plays in ventilating work.

The air is made up approximately as follows:

Nitrogen	78.30 parts in 100
Oxygen	20.70 ,, ,, ,,
Carbonic Acid	.04 ,, ,, ,,
Watery Vapor	.01 ,, ,, ,,
Ammonia	Trace

The above varies slightly in different localities, but such variations as are found are apt to be in the greater amount of ammonia and watery vapor which may be found, the latter sometimes forming four per cent of the weight of the air. There may be other gases found in the air but they are usually considered as local impurities. There is also a certain specially active form of oxygen called ozone in an amount which it is difficult to measure.

The process of respiration changes the composition of the air breathed to approximately as follows:

Nitrogen	75 parts in 100
Oxygen	16 ,, ,, ,,
Carbonic Acid Gas	4 ,, ,, ,,
Watery Vapor	5 ,, ,, ,,

The importance of a renewal of the air to supply more oxygen, and also of bringing about the removal of the vitiated air with its products of respiration and emanations from the body as indicated by the carbonic acid gas in the air, will be readily seen by noting the change in the composition of the air as it is discharged from the lungs.

As will be seen from the above the nitrogen forms the bulk of the atmosphere. It is practically inert in the processes of combustion and respiration, excepting so far as it takes up some heat and renders the oxygen less active. Ozone, which is of more recent discovery, may be considered practically as oxygen. The solid matter and bacteria found in the air will be referred to later under the subject of air filtration.

The two elements which are of the most interest in a discussion of the subject of ventilation are carbonic acid gas, referred to below, and the oxygen, the latter being universally known to be necessary to the burning of a candle or the maintenance of life.

A fire may be put out by an extinguisher which will largely increase the carbonic acid gas in the air, and likewise the process of oxidization in the body is arrested if the amount of carbonic acid gas in the air is unduly increased or the supply of oxygen is stopped or seriously diminished.

Oxygen is that element in the air which is of the greatest importance to human beings. It is essential in both heating and ventilating work, being the active element in combustion and in the similar processes which go on within the human lungs where it acts upon the carbon and impurities in the blood, forming chemical compounds which are thrown off during respiration. As the oxygen is essential to life and is contained in the air, there must be a sufficient amount of fresh air supplied to give the necessary oxygen.

Because a room is large and contains a large amount of air for each occupant does not lessen the importance of ventilation if the room is to be occupied for any considerable length of time, for the air within the room will soon become vitiated and must be removed and replaced. In a room containing 1,000 cubic feet of air, per occupant, less than one hour is required to so impoverish the air that it will contain twelve parts of carbonic acid gas in 10,000 parts of air if no fresh air is supplied. A lack in the supply of fresh air brings about a diminished amount of oxygen and an increased amount of carbonic acid gas; that is, it lessens the upbuilding elements while increasing the destructive forces. Physical energy is a direct result of oxidization of carbon within the body, and mental energy is quite as dependent as physical energy upon the supply of pure air. The withdrawal of a quantity of oxygen from the air equal to one five-hundredth of its volume reduces the luminosity of a candle light one twentieth, and the vital energy of the human being suffers quite as much.

A standard temperature of 70° for an occupied room is generally accepted, and there is no reason why there should not be an equal insistence upon a standard as to the quality of air, for there is no difficulty in determining the proper quality of the air to be breathed or in procuring such air.

The following paragraph is quoted from Professor Carpenter's book:

"The breathing of impoverished air results of necessity in the dulling of the vital fire in the body and the keen edge of intellect. It means a weakened body and a dulled mind. A lowered vitality of the body, besides exposing it to an increased liability to communicated, contracted, or constitutional disease, also impairs its effectiveness as a vital mechanism. The aggregate of physical and mental vitality lost through ignorance or indifferent regard, and even culpable disregard of the exact and delicate dependence of the activities of body and mind on the maintenance of a normal, including atmospheric environment, surpasses all common conception or belief. That air quality is fully as important as food quality in the production of vital energy is a conception which has yet to be borne in upon the public, if not the professional belief and conscience."

The air supply should be as carefully considered in the selection of a home, school, or hospital as the question of food supply. The evil effects of long-continued breathing impure air are not such as to attract immediate notice unless the impurity is great or the condition as to temperature and moisture are such as to produce immediate discomfort. The injury inflicted upon the system by breathing air deficient in oxygen or otherwise contaminated is only noticeable after a lapse of time and is then more often assigned to other causes. By careful and long-continued study the bad effects of breathing foul air have been fully demonstrated, demonstrated beyond dispute, by comparing the results of the occupancy of well ventilated and poorly ventilated prisons, ships, barracks, hospitals, etc.

Ventilation in a hospital is of greater importance than elsewhere for the reason that the patients therein are in a weakened, exhausted, and enervated condition and are, therefore, especially susceptible to the effects of impure air or unsanitary surroundings. Shocks due to accidents, or a collapse sometimes attending surgical operations, reduce the vitality and render the patient unusually susceptible to lack of proper surroundings. The vital resistance is diminished or in some cases apparently lost, making necessary the most helpful of sanitary conditions.

The liability of the spread of disease by contagion or infection is greatly increased by insufficient ventilation. Diseases of the respiratory tract are especially aggravated by defective ventilation.

The demand for proper ventilation would seem to be part of a general desire for cleanliness. Few of us would care to put on underclothing immediately taken from another person or put into our mouths articles of food and drink which have been in other people's mouths, yet we take into our lungs with but little or no hesitation the air that has but just come from other people's mouths and lungs or from close contact with their soiled clothing or bodies.

The evidence of results obtained in buildings properly ventilated is constantly reducing the number of those who oppose proper provision for good ventilation in public buildings and particularly in hospitals. Nevertheless such cases frequently occur and only very recently has a case occurred where a member of a building committee opposed proper ventilation methods because the cost of installation seemed great, and it is to be regretted that the architect seemed to approve of the position of this committeeman for no better apparent reason than that he needed the money for use in the construction of the building. This committeeman's argument was that he had no special ventilating system in his home, yet the members of his family when sick seemed to get well just the same, entirely neglecting the fact that in the case of the hospital there are many sick people confined as against the one in the home, and that the one sick person in the home has the constant attention of one or more people, while in the case of the hospital there are many patients dependent upon the care of comparatively few nurses who know nothing about ventilation and give no attention thereto. The statement offered does not prove that the sick one would not have obtained a quicker recovery had there been a proper system of ventilation in the home, nor does the fact that death did not ensue offer proof that another under similar conditions would not have died or at least have suffered severely for lack of proper ventilation. The further fact is overlooked that usually the entire cubic contents of the house may be considered as applied to the patient in the home as against perhaps 1,000 cubic feet of space per patient in the hospital.

The further argument was offered that the windows could be used, thus securing natural ventilation. No adequate ventilation can be obtained from windows in cold weather without subjecting the patient to most dangerous drafts, as the air obtained therefrom is necessarily cold and heavier than the air within the room.

The statement that money was not available for ventilation might just as well be applied to the supply of medicines. It would be better to utilize less expensive construction or build a slightly smaller hospital properly ventilated, which would accomplish more than the larger building lacking ventilation.

Complaint that the system of warming and ventilation as designed is complicated is unfortunately true in a few cases, and the engineer designing a system which is complicated and difficult to operate is to be condemned, whether the hospital be small or large. This, however, is not a good reason for condemning ventilation as a whole, as a system may be designed for even a large hospital which will be simple and readily operated. The further statement that the system will not be used if installed is without value as affecting this matter, for the same statement might be applied to the medicines or the other equipment of the hospital, to the shame of those in charge.

If much has been made herein of the importance of this matter it is because it is felt that too frequently the architect, as well as the committeeman, lacks a proper appreciation of the importance of the subject. The architect is the professional adviser of the owner and should see to it that a thing so vitally affecting the purpose of the building receives proper consideration.

This lack of appreciation is often the greatest difficulty encountered in the design of proper ventilating systems. It is often allied to another difficulty, that of a lack of sufficient funds with which to provide for ventilation after satisfying the owner's demand for space and ornamentation of the building.

Another serious difficulty is often found in the unwillingness of architects or owners to grant sufficient space, properly located, for the installation of flues, registers, or radiators.

Poor building construction will frequently involve the heating engineer in trouble, particularly in the matter of loosely fitting windows or window frames. It has been demonstrated by tests that the difference between windows loosely fitted and windows properly fitted with metal weather stripping is such as to permit of a reduction in certain cases of as much as twenty-five per cent of the radiation surface that would be installed if windows were without stripping.

Too great care cannot be used in the selection of materials used in the installation of the heating and ventilating system. This statement is not intended to give warrant to the selection of materials which are unnecessarily expensive, but inasmuch as the heating and ventilating system constitutes the working element of the building it is of special importance that only good materials be used. It is better that less marble or limestone be used in the ornamentation of the building, or that less space be enclosed, than that the success or life of this important part of the building should be endangered.

The warming of a building involves the warming of the air contained therein, the warming of the walls, furniture, etc., and the furnishing of sufficient heat to make good the losses through and about the windows, through the walls, and heat losses due to ventilation.

The ventilation of a building, particularly a hospital, involves the introduction of a constant quantity of fresh air, in such a way as to give a thorough distribution throughout the building without drafts.

The point at which the fresh air is taken from the outside must be selected with a view to securing air as free from dust or other impurities as possible rather than with a view of its nearness to the heating surfaces.

A complete ventilating system may involve a filter system or humidifying system, and if the building be so located that it is desirable to use the building during the summer without opening the windows, because of the quality of the air in the vicinity, it may be necessary to provide methods of filtering, dehumidifying, and cooling.

Frequently the heating effects of gas lights must be taken into consideration, as well as heat gains from the occupants of the room which amount to approximately 400 B.T.U. per hour per occupant. An ordinary gas jet (16 candle power) will give off 3,000 B.T.U. per hour; a Wellsbach 640 B.T.U. per hour; a 1,200 candle power arc lamp 3,600 B.T.U. per hour, and a 16 candle power incandescent light 160 B.T.U. per hour; while a 5 foot, 16 candle power gas light vitiates as much air as four adults.

The heating effect of electric lights and persons occupying a room are well illustrated in a test recently made in a theater while occupied. The air entered the building from the outside at 48°, picking up a sufficient amount of heat from the ducts, walls, and floors before entering the room to raise it to 54° at the point of discharge in the floor, and the temperature was further raised to 70° during its passage to a point six feet above the level of the floor, all without the use of any part of the heating system.

There are many refinements in calculation which are important in the case of the large work but which are ordinarily neglected, as for instance the increase in volume of air as it is warmed. Assuming that 1,000 cubic feet of air at zero degrees Fah. is taken in through the fresh air intake and is raised 120° in passing through the heater its volume is increased to approximately 1,260 cubic feet. After reaching the room and becoming diffused it quickly cools to 70°, at which its volume becomes approximately 1,100 cubic feet. It will, therefore, be seen that the amount of air actually secured for ventilating purposes depends on the point at which it is measured. Ordinarily it is perfectly safe to neglect this change in volume if the air is measured at its lower temperature, excepting in the adjustment of volume dampers applied to individual rooms, in which case such corrections may be required as to insure a slight excess of entering air over the air exhausted in order to secure a plenum condition in the room which will aid largely in preventing indrafts through the windows, etc.

The formula used in making such a correction is as follows:

Let V = the original volume of air ;
V_1 = the final volume of air ;
T_1 = original absolute temperature :
T_2 = final ,, ,,

$$\text{Then } V_1 = \frac{V\,T_2}{T_1}$$

Absolute temperature equals 460° plus the number of degrees above zero at which the air is measured.

In the case of the air introduced to and exhausted from a room the air is usually breathed at approximately 70°, at which temperature it may be properly measured.

A theoretical discussion of flues, fans, radiator efficiencies, and the hundred and one other details involved in warming and ventilating engineering may not be undertaken within the limits of a discussion of this nature, but concrete methods with definite rules, formulas, and tables as will be most frequently required in the practice of such engineering will be given.

The proper temperature for living rooms, school, and similar rooms is ordinarily considered to be 70°. The relative humidity, however, has much more to do with comfortable temperature than is generally supposed, and this matter will be referred to later. With a proper relative humidity there is no question but what a temperature of 68° would be better than 70° for the class of rooms above mentioned, and there are many homes and some schools in which this, and sometimes less, is maintained as a standard. In England, with its more humid climate, 60° is the usual standard. For churches and other auditoriums, where people are inclined to sit with more or less of their wraps upon them, a temperature of 62° and sometimes even 60° is quite sufficient, while in gymnasium drill halls, etc., a temperature of 60° or less is satisfactory. In hospitals the temperature should ordinarily be 68° to 70°, except in special cases where a less temperature is desirable, and in such places as operating rooms and their connecting rooms, in which a temperature of 85° is desirable with methods provided for raising this to 98° if necessity arises, as in a case of shock to the patient.

Certain hot rooms in hot baths are maintained at 160° to 180°. In this connection it is interesting to note that while one may enter a room at this temperature, it is impossible to stand water at a temperature over 120° because of the more rapid transmission of heat in the case of the water.

The temperature of occupied rooms should be uniform, and the requirements of the Massachusetts statute that there shall not be a variation of more than 3° in the different parts of a school room is not unreasonable. Indeed in hospital work this is more than would be permissible.

Tests of Brick Columns and Terra Cotta Block Columns.

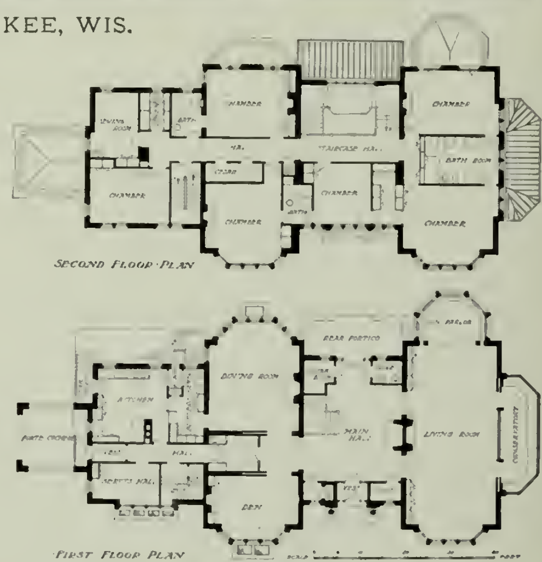
ARCHITECTS and engineers will be interested in a publication of the Engineering Experiment Station of the University of Illinois on the properties of brick and of terra cotta block in compression, as determined from experimental work carried on in the materials testing laboratory. The publication is Bulletin No. 27, Tests of Brick Columns and Terra Cotta Block Columns, by Arthur N. Talbot and Duff A. Abrams. It gives the results of tests of a number of piers or short columns built under a variety of conditions. Hard and soft bricks and blocks were used; and lime mortar, natural cement mortar, and lean and rich Portland cement mortar were tried. The effect of indifferent workmanship was determined. Both central and eccentric loadings were used.

HOUSE, LAKE DRIVE, MILWAUKEE, WIS.

KIRCHHOFF & ROSE, ARCHITECTS.

HOUSE, STABLE AND GARAGE, MILWAUKEE, WIS.
KIRCHHOFF & ROSE, ARCHITECTS

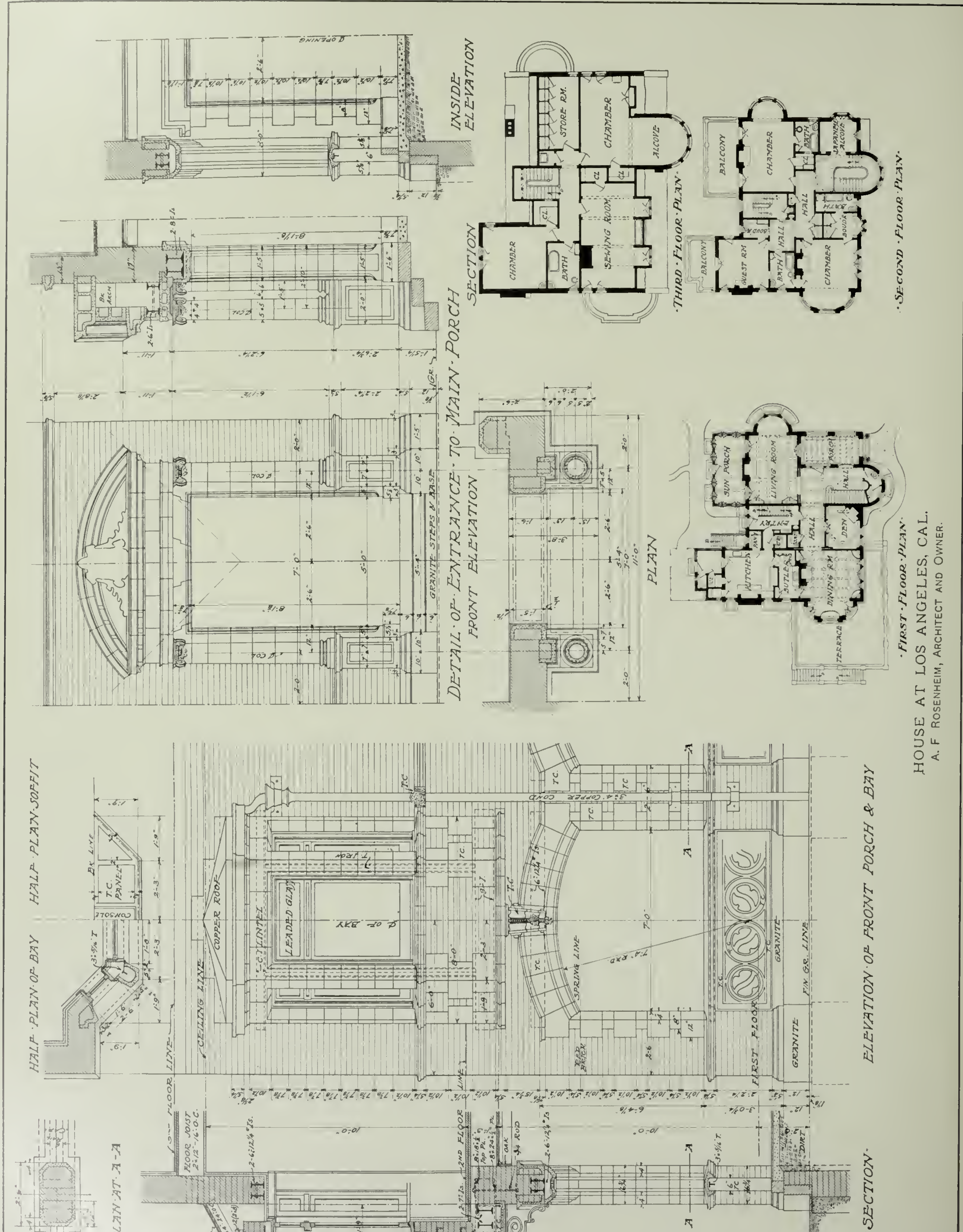
DETAIL OF MAIN ENTRANCE TO HOUSE.



PLANS OF HOUSE

PLANS OF STABLE AND GARAGE.

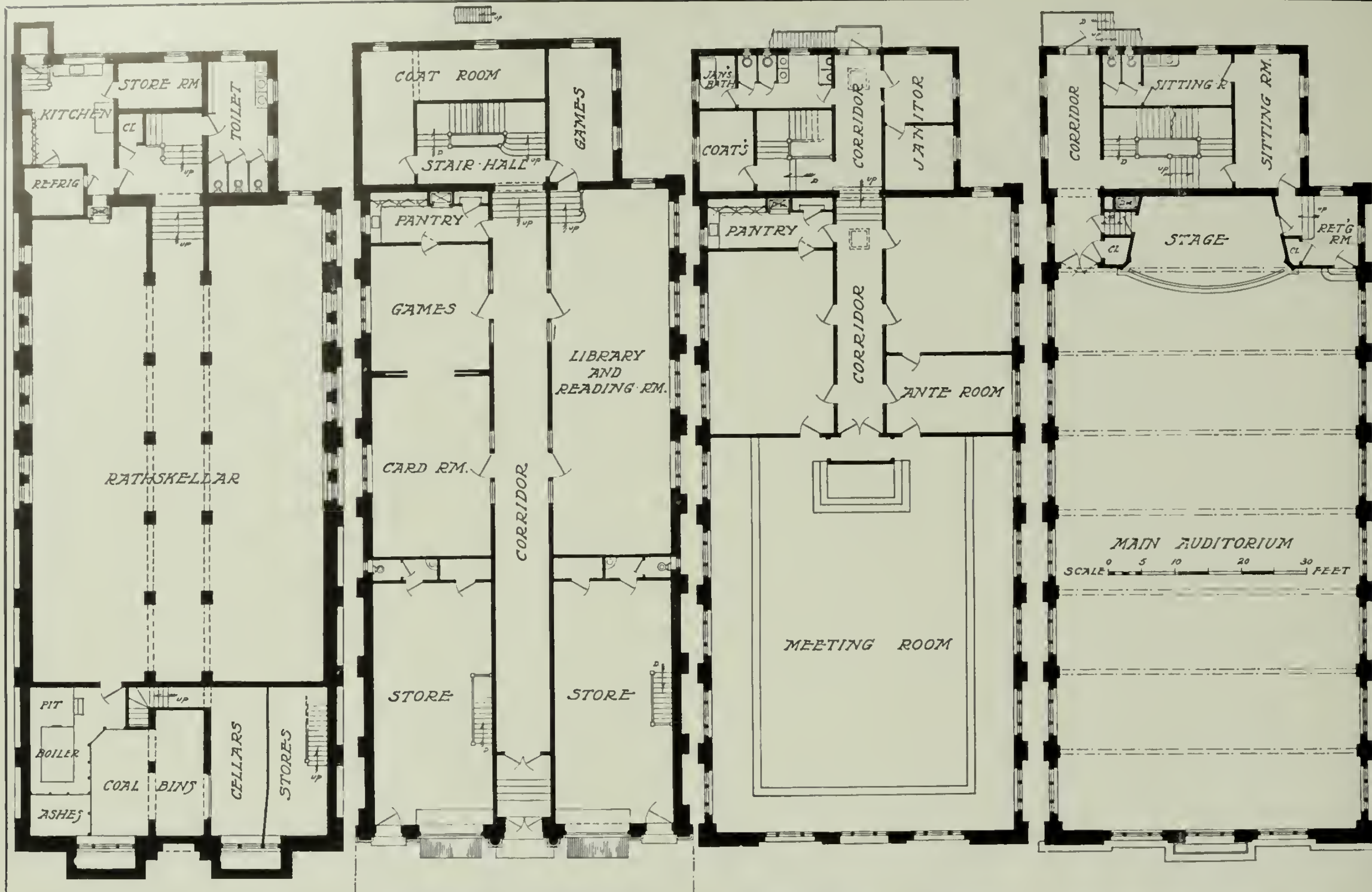
HOUSE AT LOS ANGELES, CAL.
A. F Rosenheim, Architect and Owner.



HOUSE AT LOS ANGELES, CAL.
A. F ROSENHEIM, ARCHITECT AND OWNER.

DETAILS OF ENTRANCE PORCH.

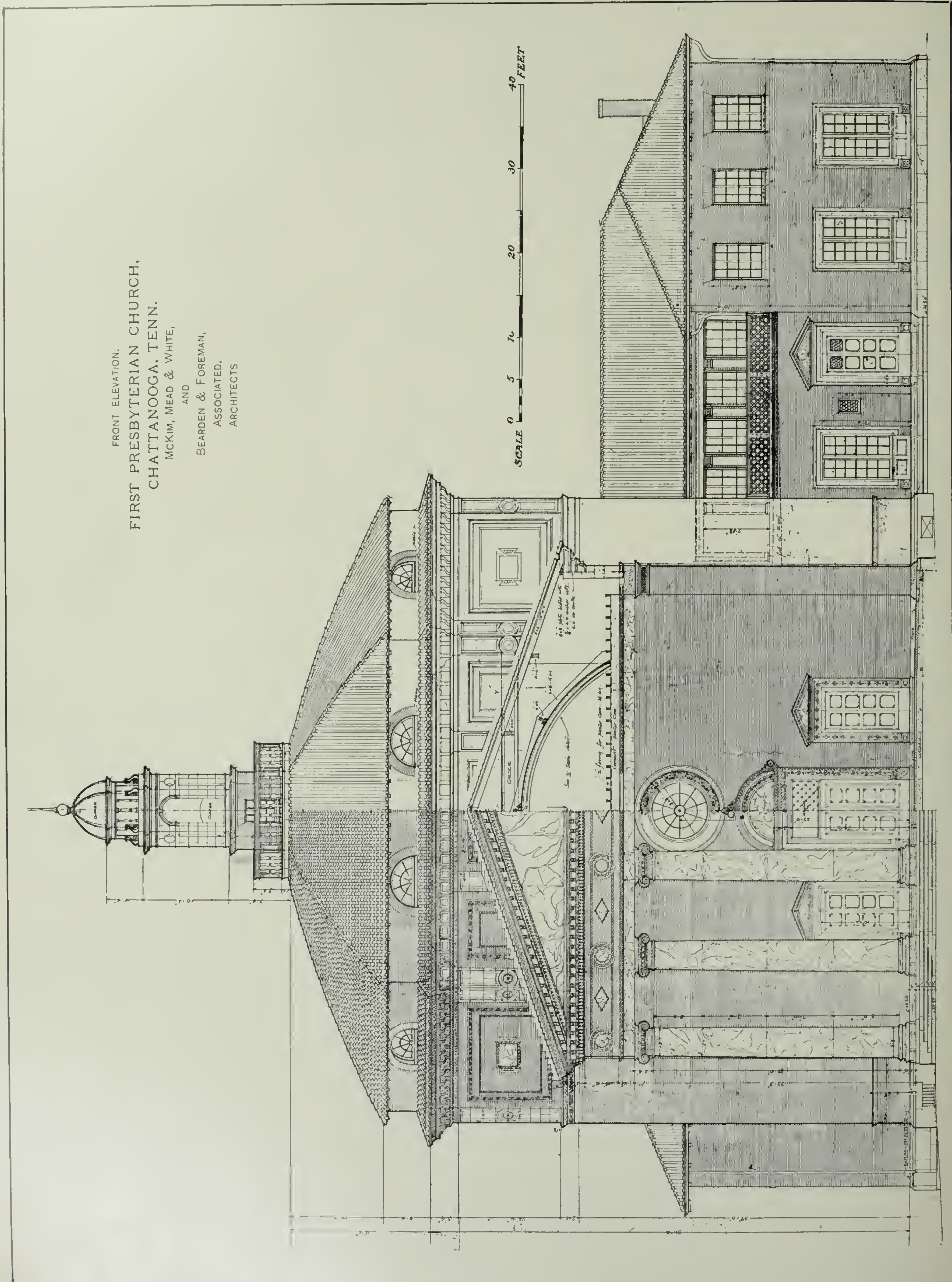
HOUSE AT LOS ANGELES, CAL.
A. F. ROSENHEIM, ARCHITECT AND OWNER.



·BASEMENT · PLAN· ·FIRST · FLOOR · PLAN· ·THIRD · FLOOR · PLAN· ·SECOND · FLOOR · PLAN·

BUILDING FOR THE FRATERNAL ORDER OF EAGLES, CAMDEN, N. J.

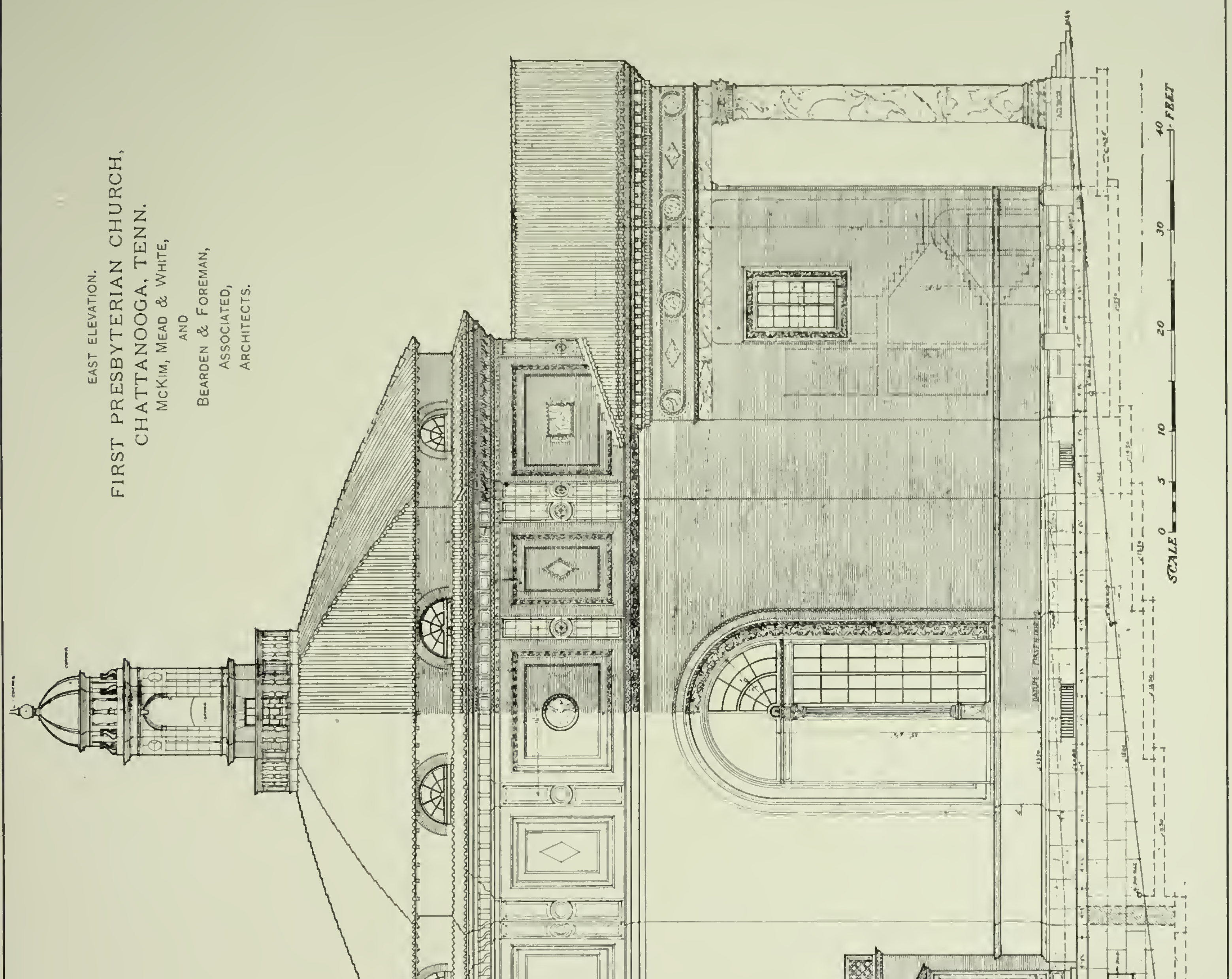
THOMAS, CHURCHMAN & MOLITOR, ARCHITECTS.



FRONT ELEVATION.

FIRST PRESBYTERIAN CHURCH,
CHATTANOOGA, TENN.

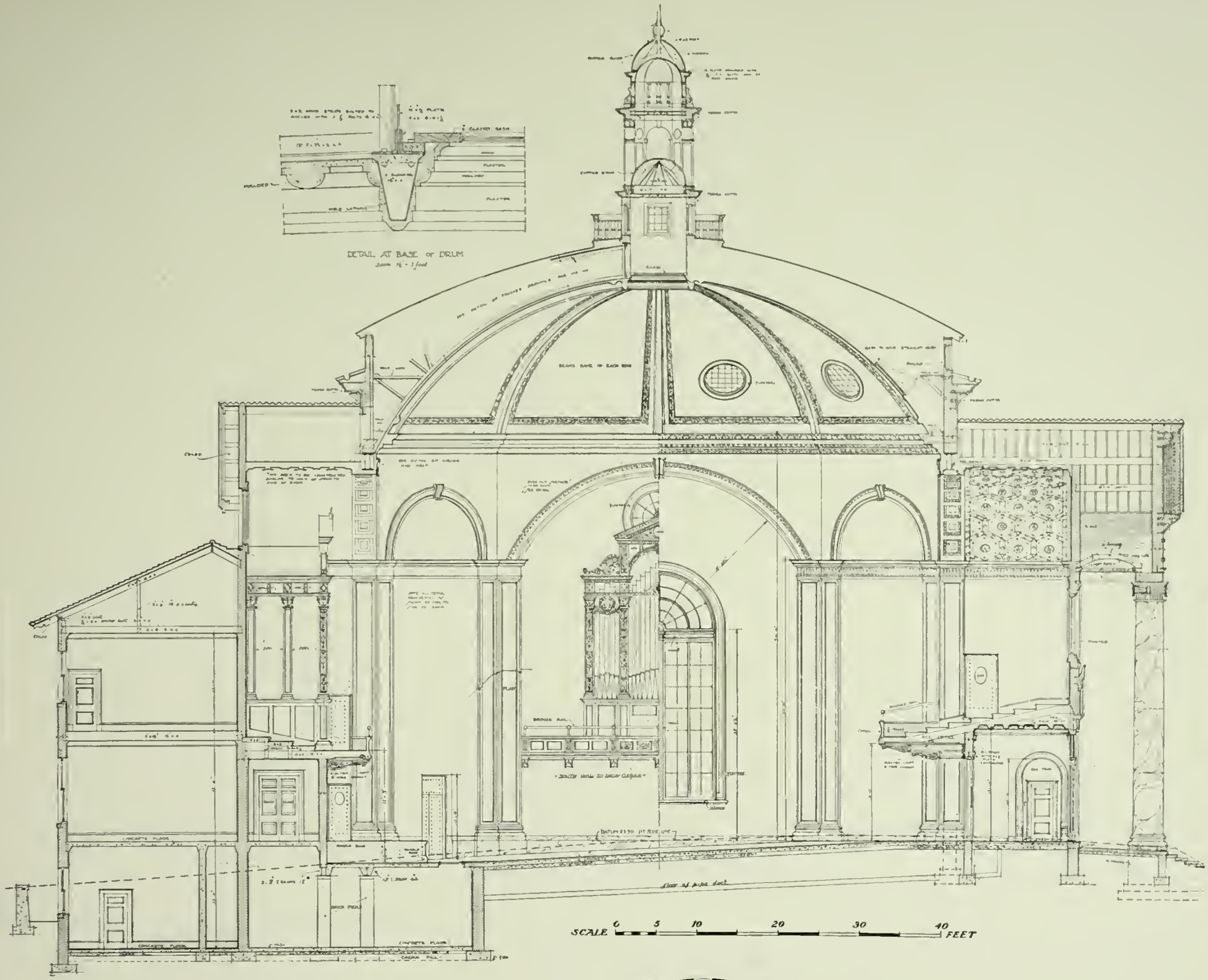
McKIM, MEAD & WHITE,
AND
BEARDEN & FOREMAN,
ASSOCIATED,
ARCHITECTS



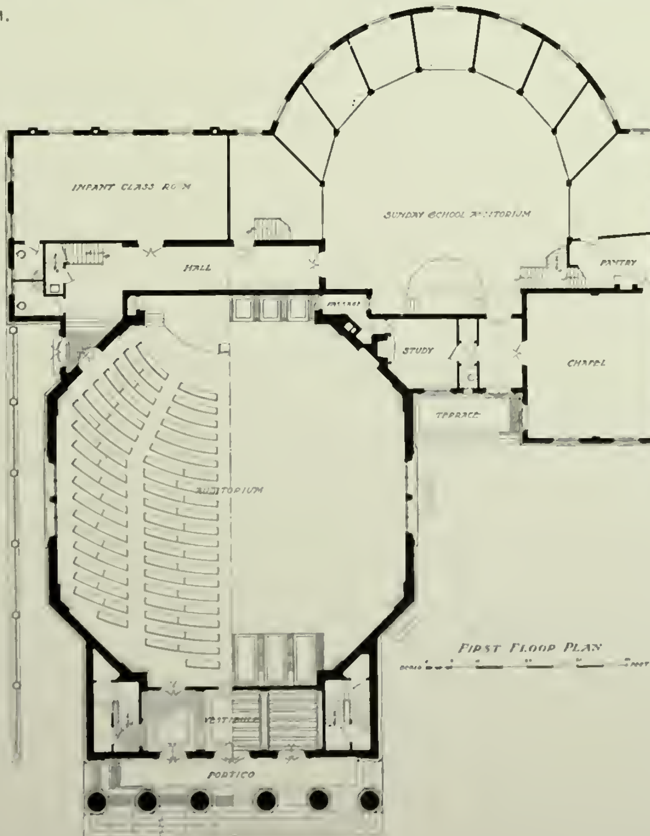
EAST ELEVATION.

FIRST PRESBYTERIAN CHURCH,
CHATTANOOGA, TENN.

McKIM, MEAD & WHITE,
AND
BEARDEN & FOREMAN,
ASSOCIATED,
ARCHITECTS.



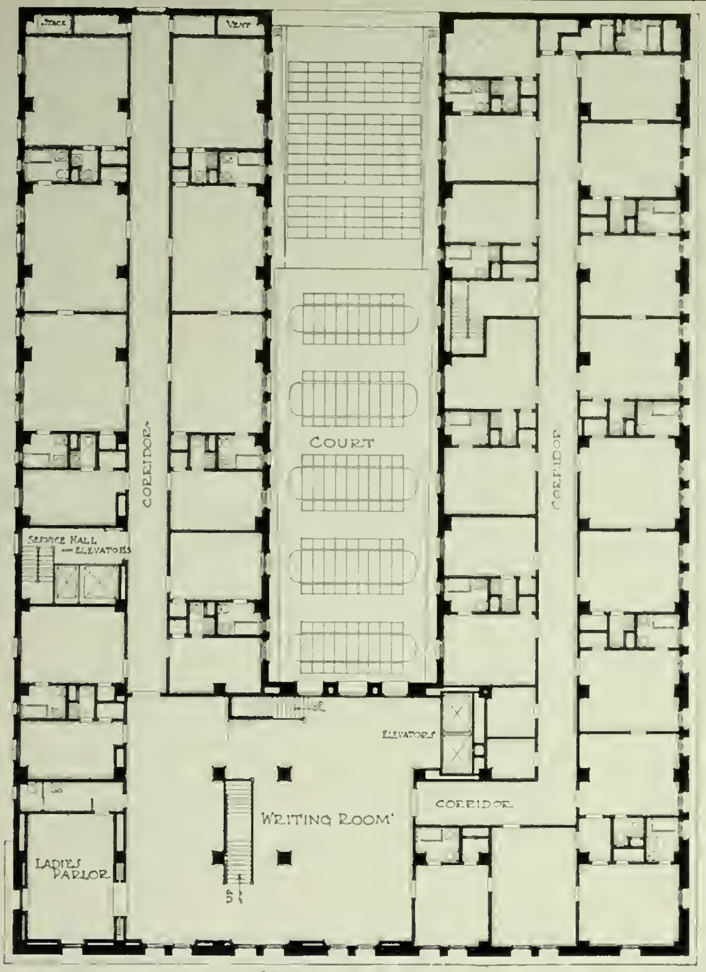
SECTION THROUGH AUDITORIUM.



FIRST PRESBYTERIAN CHURCH, CHATTANOOGA, TENN.

McKIM, MEAD & WHITE,
AND
BEARDEN & FOREMAN,
ASSOCIATED, ARCHITECTS.

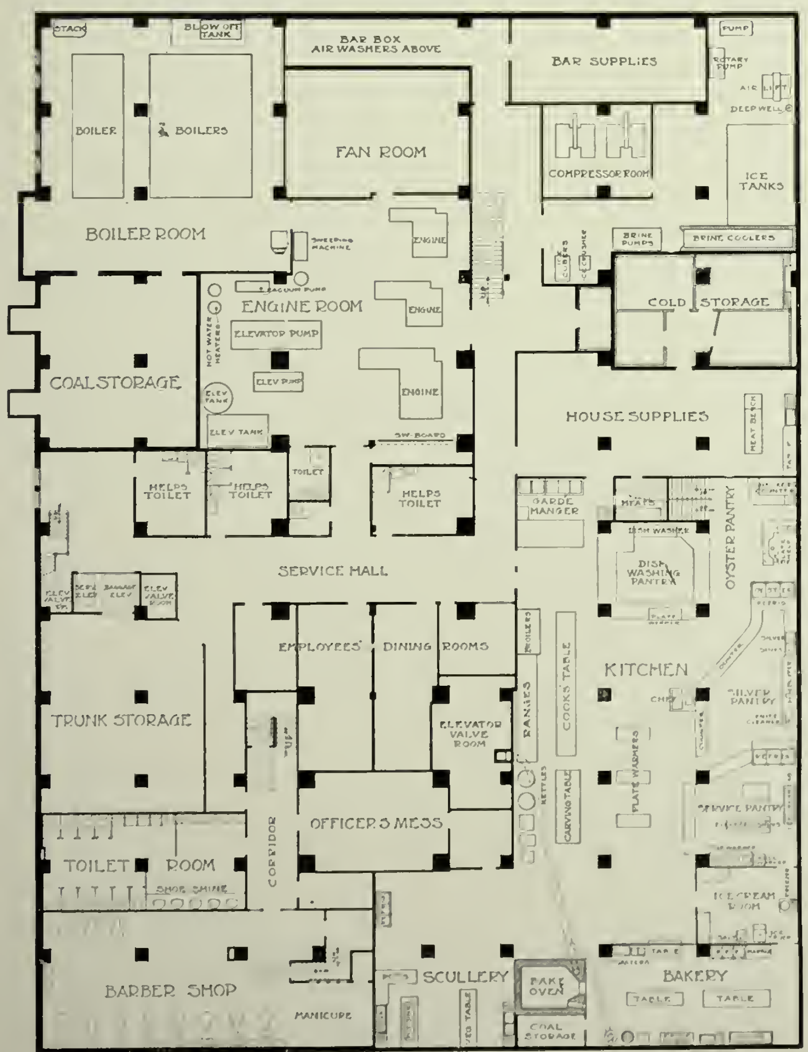
HOTEL SECOR, TOLEDO, OHIO.
GEORGE S. MILLS, ARCHITECT.



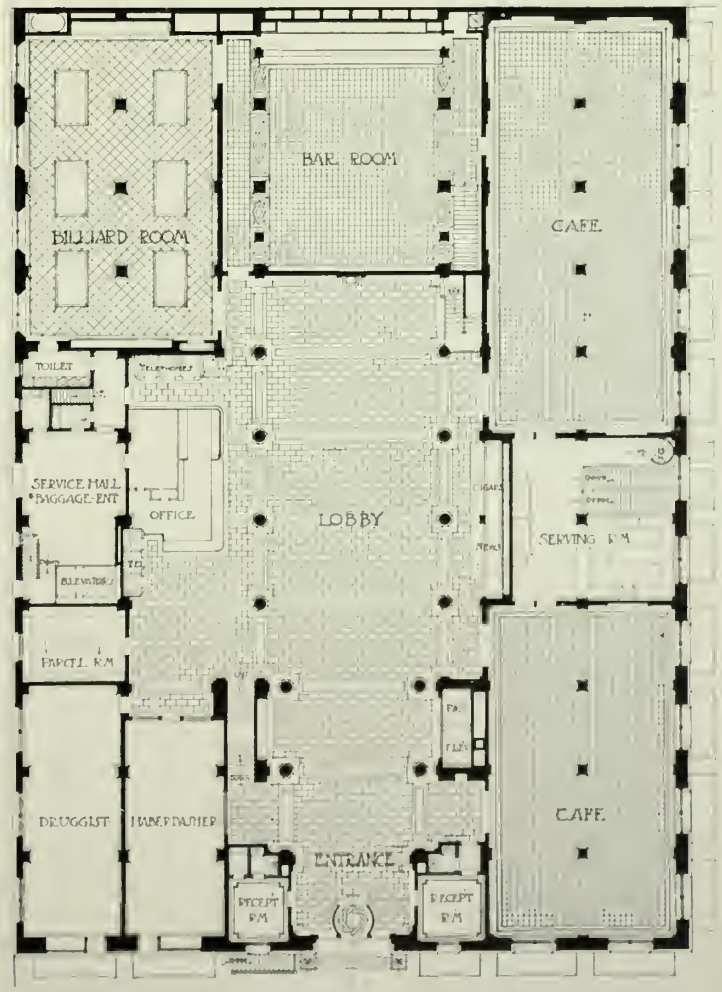
SECOND FLOOR PLAN.

NINTH FLOOR PLAN.

ALSO TYPICAL, EXCEPT THAT SPACE OCCUPIED BY BALL ROOM SUITE CORRESPONDS WITH RIGHT WING.



BASEMENT PLAN.

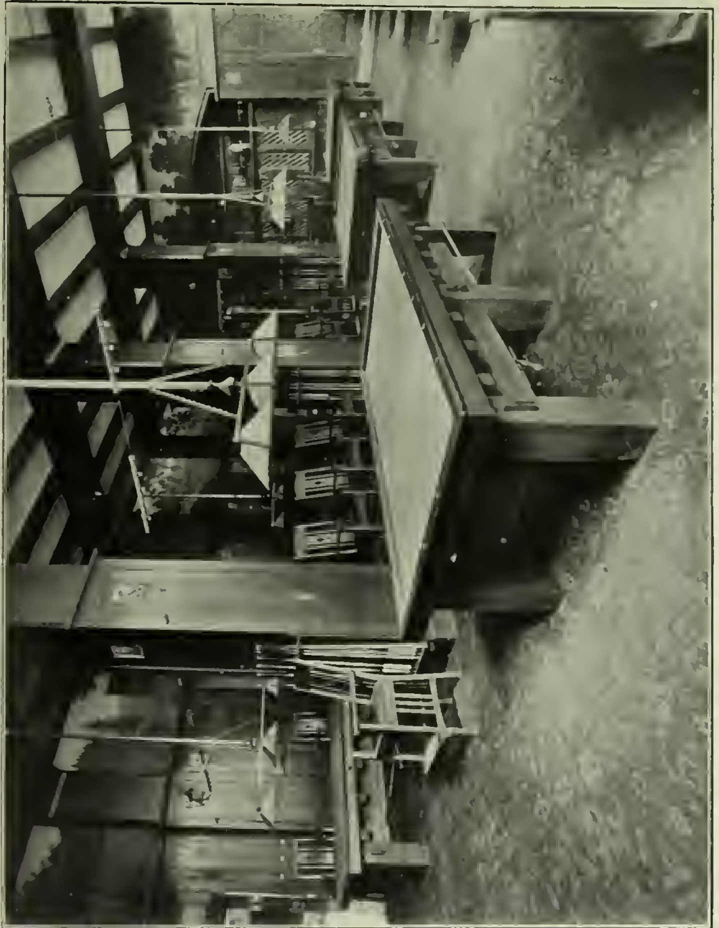


FIRST FLOOR PLAN.

FLOOR PLANS, HOTEL SECOR, TOLEDO, OHIO.

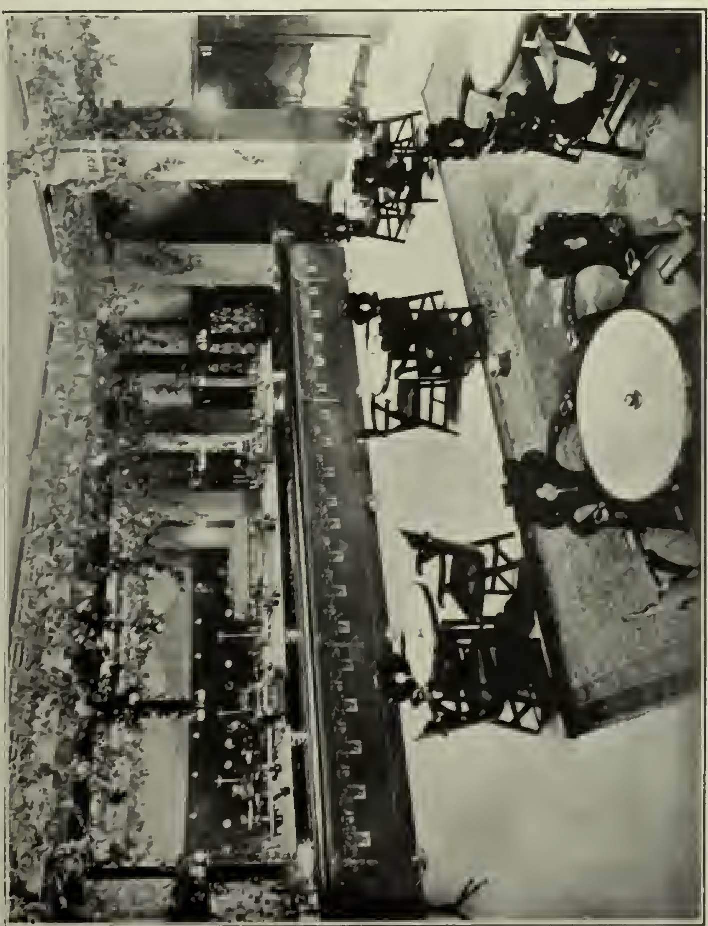
GEORGE S. MILLS, ARCHITECT.

VOL. 18. NO. 5. PLATE 68.

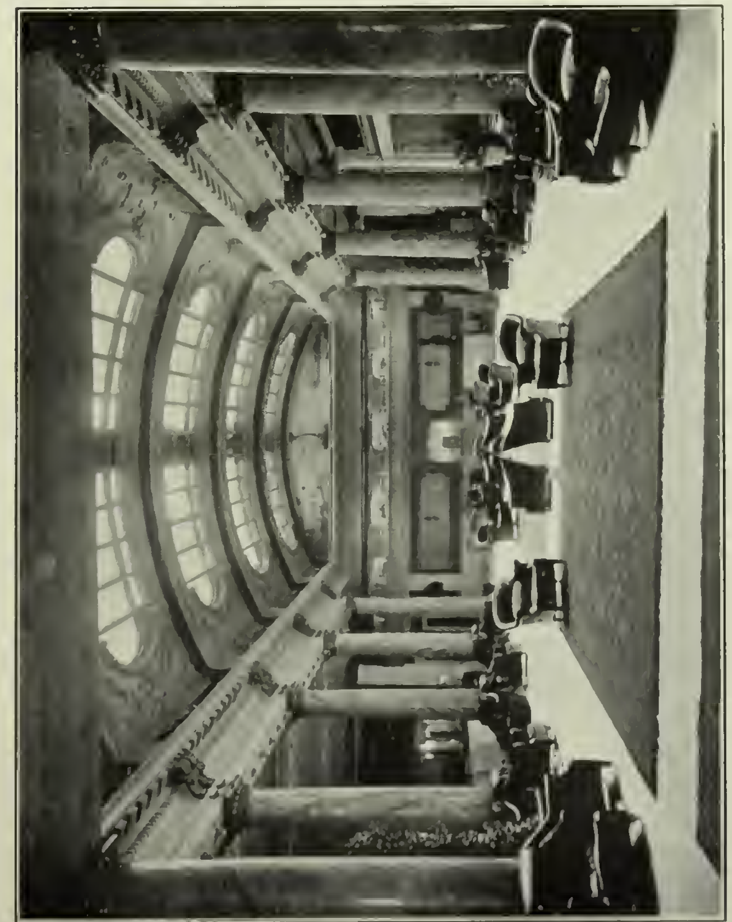


BILLIARD ROOM.

DINING ROOM.



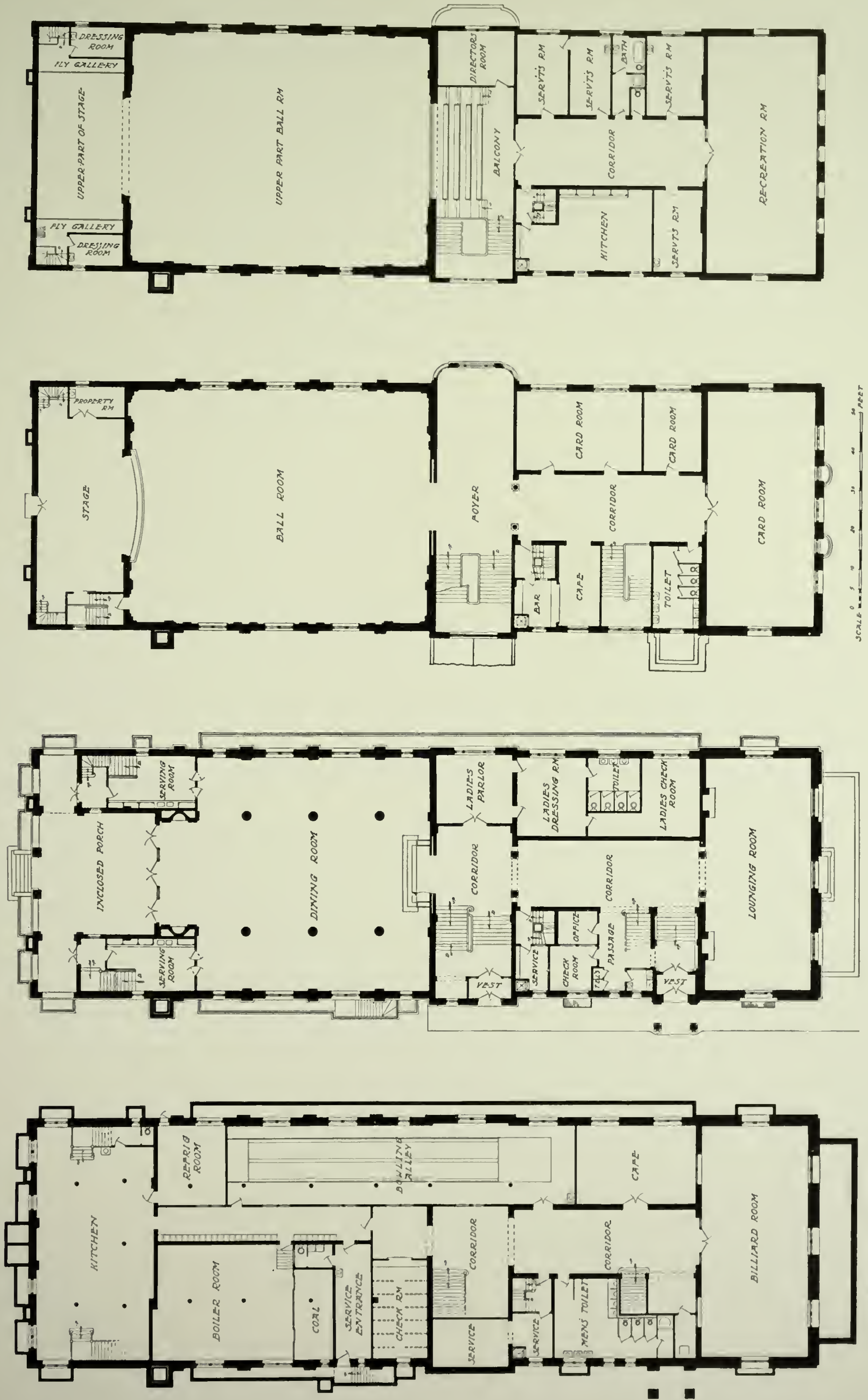
BAR ROOM.



MAIN LOBBY.

HOTEL SECOR, TOLEDO, OHIO.

GEORGE S. MILLS, ARCHITECT.



FLOOR PLANS, CLUBHOUSE FOR THE EXCELSIOR CLUB, CLEVELAND, OHIO.
LEHMAN & SCHMITT, ARCHITECTS.

CLUBHOUSE FOR THE EXCELSIOR CLUB, CLEVELAND, OHIO.
LEHMAN & SCHMITT, ARCHITECTS.

In the central loading columns of high-grade building brick laid with rich Portland cement mortar carried from 3,220 to 4,110 pounds per square inch, and the results ranged down to 1,360 pounds per square inch for columns laid in lime mortar and 1,030 pounds per square inch for columns of soft brick laid in rich mortar. The terra cotta block columns carried from 2,700 to 3,790 pounds per square inch. The columns were found to fail at much lower loads after repeated loading than when a single application of the load was used. The tests under eccentric load show that the columns resist eccentric loading well, following closely the laws of mechanics of materials.

The fact is brought out clearly that the stronger the individual brick or block the stronger the masonry, and that the strength of the mortar used affects largely the resisting strength of the structure. It is also evident that the better the individual piece the more important it is to have a mortar of high resisting strength. Clay workers and builders will be interested in seeing how much gain in strength of structure is obtained with the higher grade of brick and also in the great advantage found in the use of a rich, strong mortar. The effect of the attempt to represent hurried or careless workmanship in laying up work was a loss in strength of say, fifteen per cent to twenty-five per cent, a smaller decrease in strength than was expected. The results of these tests go to show that wherever good material and workmanship are insured a higher load may be applied on masonry of this kind than is usually permitted.

The following is a summary of the conclusions arrived at as a result of these tests:

"Both brick columns and terra cotta block columns gave high strengths in all cases where strong mortar and care in building were used. For central loading the strength of the brick columns ranged from 3,220 to 4,110 pounds per square inch, and the strength of the terra cotta block columns from 2,700 to 3,790 pounds per square inch, the columns having the highest resistance not failing at the full capacity of the machine. The effect of the strength of the mortar is apparent in the carrying capacity developed in the columns; lower loads were found in columns built with one fifth Portland cement mortar than in those with one third Portland cement mortar, still lower loads in those with one third natural cement mortar, and still lower loads in those having one half lime mortar. The effect of the quality of the brick is shown in the columns made with inferior brick, which carried only thirty-one per cent as much as columns built with the better grade of brick.

In the case of the terra cotta columns, the blocks which were culled out as somewhat inferior gave a column strength perhaps thirty per cent less than the columns built with superior blocks. The effect of the attempt to represent hurried or careless workmanship in two brick columns and in three terra cotta block columns was a loss in strength of about fifteen per cent and twenty-five per cent, respectively.

"The ratio of the strength of the columns to the compressive strength of the individual brick and block is of interest. In the well built brick columns loaded centrally, the ratio of strength of column to compressive strength of individual brick ranged from 0.31 to 0.37, and in the underburned clay brick column the ratio was 0.27. In the terra cotta block columns with central loading the ratio of strength of column to that of individual block was 0.74 for the incompleted test and 0.83, 0.85, and 0.89 for the others.

If, as seems to be the case, the strength of the brick or block to resist cross-breaking is an element in determining the strength of the built-up column, a deeper or thicker brick would give higher column strength. It is possible that this partially accounts for the fact that the ratio is found to be higher for terra cotta block columns than for brick columns. The tests suggest that the ability of individual pieces to resist transverse strength is an important element in the strength of the completed column. This suggestion may have an important bearing on the advantageous size of the component blocks which may be used in a compression piece where high strength is desired.

"The strength of the column is greater than the strength of the mortar cubes in both brick and terra cotta block columns, excepting only the soft brick columns which had brick of low compressive strength. It is evident that the strength of individual brick or blocks and the strength of the mortar both enter into the resistance of the column. The relative effect of the two depends upon the character of the material. It is evident, however, that the better the individual piece the more important it is to have a mortar of high resisting strength.

"The results obtained in applying the load eccentrically were found to agree very well with those obtained from ordinary analysis. When the amount of eccentricity in the application of the load is known or may be estimated closely, the ability of the column to resist this action may be calculated quite closely. It is apparent from the results that the calculated resisting stress in the column on the side of maximum compression is higher than that which causes failure in centrally loaded columns. The higher stress developed with eccentric loading is probably due to the influence of the restraint of the less stressed interior portion. The tests made by applying and releasing a single load a number of times gave failures at loads below those which produced failure in similar columns at a single application of the load. The phenomenon is common in materials of the nature of brick and terra cotta.

"It is apparent that the quality of workmanship in laying up such columns has an important bearing upon the resisting strength. The work of building columns, however, is not difficult and requires only ordinary care. Full joints and an even bearing are important, and the ordinary workman ought to be able to construct columns of high strength. In the tests made on columns intended to represent poor or careless workmanship, the decrease in strength was not as much as anticipated. However, it must be understood that careful and trustworthy work is essential and that a few poor joints will materially reduce the strength of the structure. Wherever good material and good workmanship are insured the strength of masonry of this kind may be utilized with advantage."

Copies of the report may be obtained gratis upon application to the director, Engineering Experiment Station, Urbana, Illinois.

The Housing Problem—III.

BY GEORGE B. FORD.

WE HAVE considered the important features which make for healthier living conditions, and they may be summarized as follows:

The most healthful conditions are obtained when the blocks of tenements are only two rooms deep, divided into blocks of units, between which are open stairs. These blocks will run north and south, or nearly so, and will be separated by narrow streets. If such conditions are not obtainable, then the requisites are as follows:

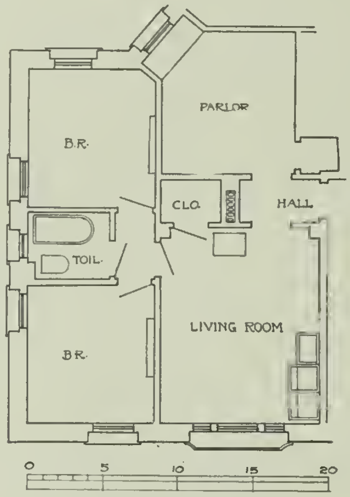
Interior enclosed courts must not be tolerated. Yards and open courts must be sufficiently wide to admit light and sunlight on the shortest day of the year to the ground floor windows. Such courts should open south, or within forty-five degrees of south.

Tenements should not be over five stories in height.

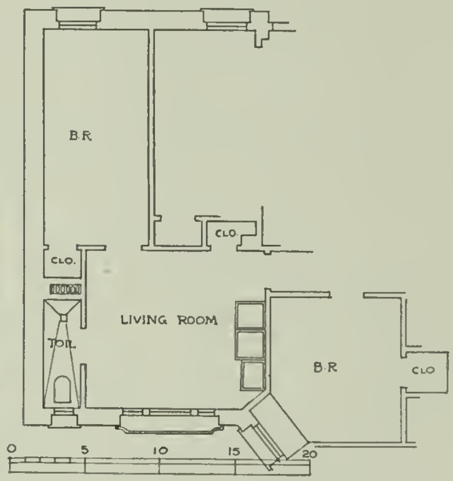
As to the interior, the air should circulate through the apartments, from front to back, through all the rooms, including the toilets. Circulation of air is necessary in winter as well as in summer, the heat coils being so arranged as to permit of the warm air being always fresh. Dampness should be avoided by attention to the construction of the exterior walls.

Good surroundings, clean, well arranged living quarters must raise the standard of living of tenants, and not only that, but they will effect the whole neighborhood. As an example, witness the vastly improved condition of the neighborhood of the Phipps houses on East Thirty-first street in New York. Here within a little over a year after the buildings were open for occupancy, the neighbors have one and all improved the appearance of their houses. Environment may be bettered as follows:

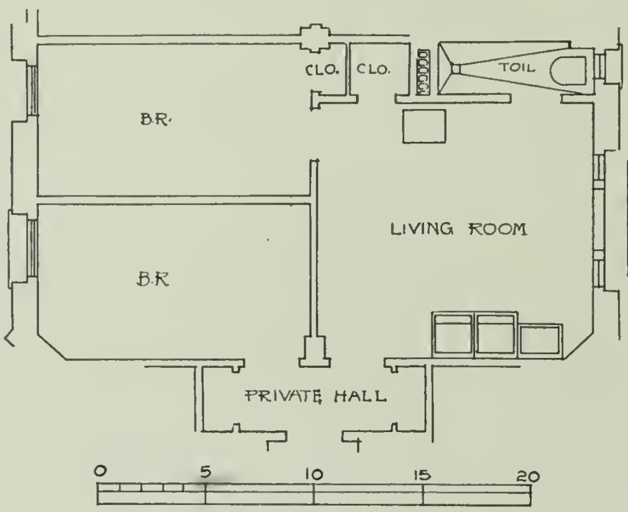
By giving more privacy; by making housekeeping and the care of children easier; by bettering the conditions under which home work may be carried on; by bettering sleeping conditions; by giving better opportunity for recreation and play, and by making the surroundings in every way more cheerful.



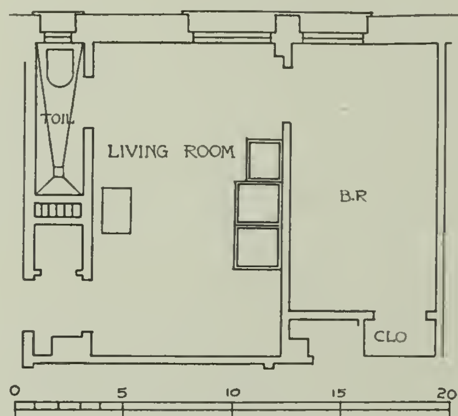
FOUR ROOM SUITE.



ANOTHER THREE ROOM SUITE.



THREE ROOM SUITE.
Large window in living room; private vestibule.

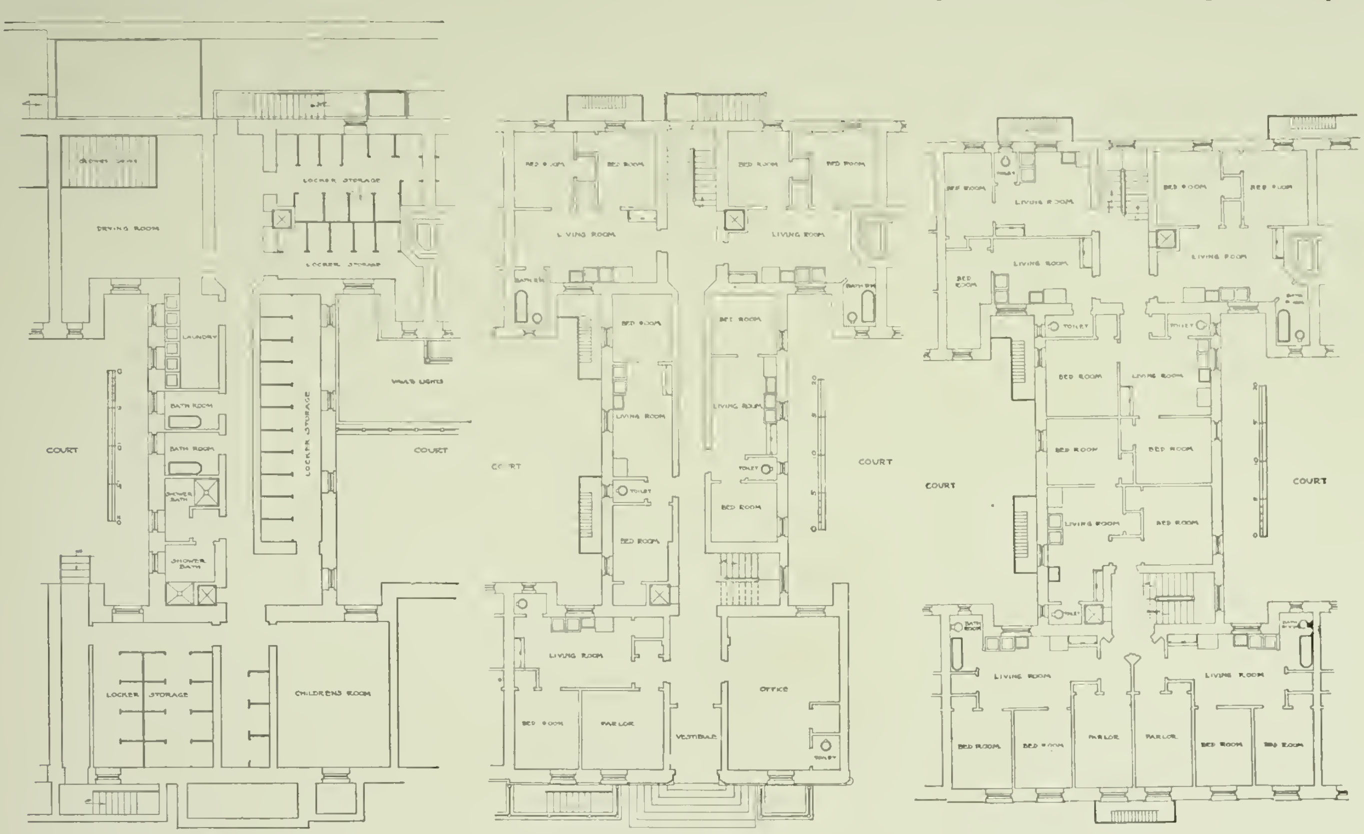


TWO ROOM SUITE.
Shower bath and water closet.

PHIPPS HOUSES NO. 1, NEW YORK.
Grosvenor Atterbury, Architect.

Let us take up each of these subjects in turn.

PRIVACY. — The important things which interfere with privacy from without are noise, sights, and smells. The continual din and racket of the streets, of the passing teams, of the hawkers, the elevated, street cars, children playing in the streets; of the piano across the court, and people carousing late at night, and all the thousand and one noises in the air shaft or the interior court; these are nerve racking at best. Again the sordidness and dirtiness of the streets, walls, stairs, and corridors, the refuse and garbage lying in heaps; these cannot but have a detrimental effect on the tenants. And again, the intolerable odors of the streets with the clouds of dust flying all day long, uncollected heaps of garbage, the courts with their accumulated stench of years; these cannot add to the comfort of those who are condemned to live in such places. All this may be avoided in new districts by scientific town planning along the lines which we described in the second chapter. Streets, bordered with trees and grass plots, houses two rooms deep, long open yards between the rears of the houses (these yards to be planted



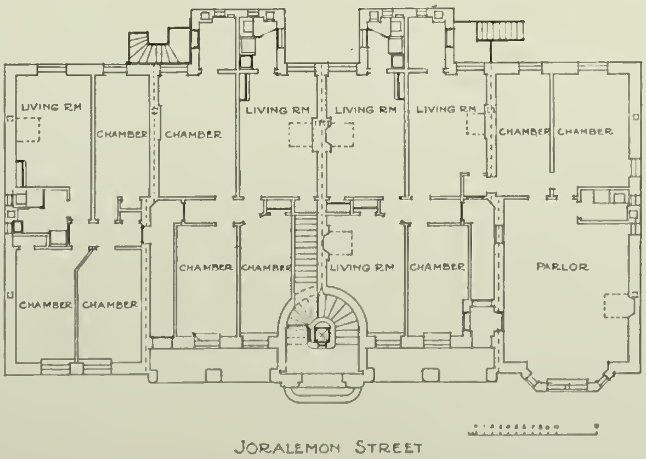
BASEMENT PLAN. GROUND FLOOR PLAN. TYPICAL FLOOR PLAN.

PHIPPS HOUSES NO. 2, FOR COLORED PEOPLE, WEST 63D STREET, NEW YORK.
Whitfield & King, Architects.

and used as playgrounds and small parks); add to this open courts and open stairs and scrupulous cleanliness on the part of the landlords and very few of the evils mentioned would be possible.

Inside the apartment it is essential to secure privacy, especially for the women, to allow them a chance to receive visitors without having to do so in the same room with the rest of the family or without passing through rooms occupied by the others. There should be privacy in the location of the bath room so that it can be entered without passing through any of the living or sleeping rooms. These points can almost always be arranged by a little ingenuity in planning.

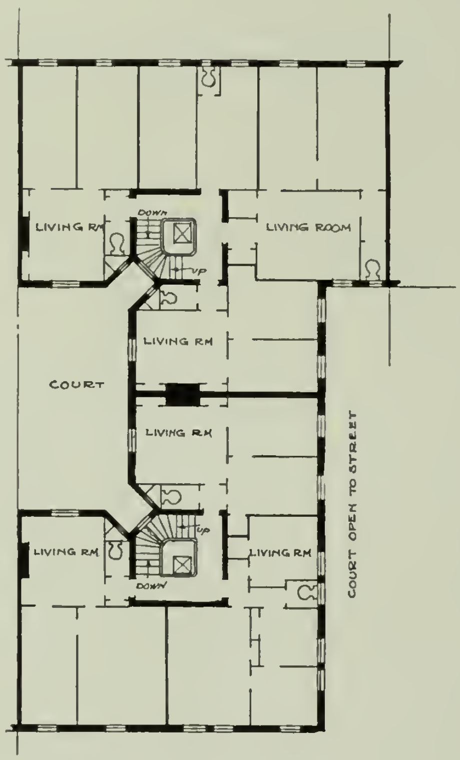
Care of Children.— For the health and care of babies, clean surroundings, plenty of warmth, plenty of sunlight, and good ventilation are essential. For bathing of children a small, separate bath in the kitchen is desirable. Such has been used to good advantage in the Rothschilds tenements in Paris, designed by Monsieur Rey. For sleeping, a good circulation of air is necessary. For exercise and play some means must be devised to keep the children off of the street. This is possible either on roof gardens especially arranged for the purpose as in the Phipps houses No. 1 in New York, or in a large, planted interior court as in the A. T. White tenements in Brooklyn, some of the Boston co-operative houses in Boston, or as in many of the most recent German tenements. For play in rainy weather it is possible to reserve a large, open space in the basement of the tenements, such space to be made as bright and well ventilated as possible. In all three cases the maximum of sunlight is desirable. For schooling, a kindergarten in the building is most desirable, as has been proved in the Phipps houses No. 1 and in many of the German tenements. To allow children to go up and down stairs easily a lower hand rail at a convenient height for them should be provided, and further the treads of stairs should be bowed so as to allow a



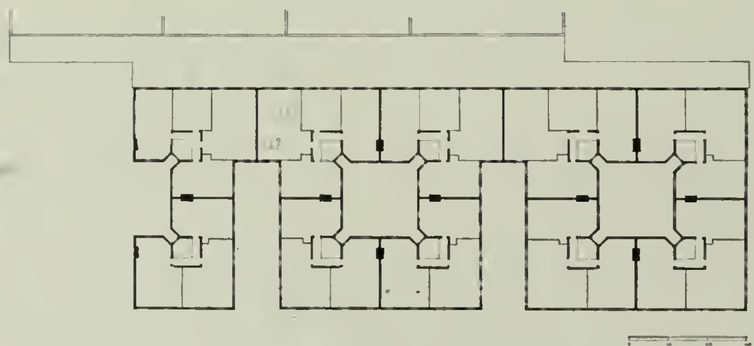
A. T. WHITE TENEMENTS, BROOKLYN.
The pioneer model tenements of America; open stairs; all rooms face open air.

narrower tread next to the rail. This again has been arranged successfully in the Rothschilds tenements in Paris.

Housekeeping.— It is a question whether the kitchen should be in the living room or whether there should be a small kitchen entirely apart from the living room. The cooking, dish-washing, laundering, etc., has to be done where the children may be readily watched at the same time. The best arrangement for securing this end would seem to be a kitchenette leading off of the living room, such to open into the latter throughout its whole length by folding doors. This has worked to good advantage in certain of the better modern light-housekeeping apartments but it has not yet been tried in tenements. For cooking, a gas stove has proved preferable in New York model tenements. It does away with all the space required for coal and ashes with all their attendant dirt. It keeps the whole apartment in much better condition and in general is much easier to handle. It further allows the rooms to be much cooler in summer. It saves, too, considerable space in flues. For the washing of dishes a white enameled iron sink is desirable. The small galvanized iron sinks put in the majority of tenements in New York are anything but convenient or hygienic or conducive to cleanliness. Washing and ironing must be done in the apartment, because the mother can not absent herself from her children. There should be two tubs in the kitchenette. These tubs should be of white enameled earthenware like those placed in many of the recent tenements in New York. They should be adjacent to and just beyond the sink for the convenience of using the space on their covers in dishwashing. For drying the clothes, steam driers may be provided in the basement. The majority of housewives prefer, however, to dry their clothes in the open air. It is not desirable to leave the drying clothes on open lines on the roof, because of the dust and smoke and because of the danger of such clothes being stolen. In certain recent tenements in France and Germany, an open air drying-space has been provided on the roof, such being under cover and divided into locker compartments with lattice partitions, with louvres and dust screens about the exterior. They have worked well and have not proved costly. For cleanliness in sweeping and dusting it is desirable that all corners should be rounded, those of the walls and ceilings as well as those of the floor; that all trim and doors and windows should be as simple in their moldings as possible. The floors are preferably of hardwood, also the trim. In many foreign tenements dust chutes have been provided, leading from the kitchen or back hallway to a large receptacle or incinerator in the basement. There should be an incinerator anyway in the basement in any large group of houses, to take care of the garbage. For convenience in table setting there should be a glass-doored cupboard in the same room as the dining table. This cupboard should be as convenient as possible to the sink. For chamber work, to permit of watching children while it is being done, there should be an open view across to the living room; further the chambers should be convenient to the toilet. Closets should have rounded corners and should be open on two opposite sides if possible with louvres to permit of ventilation of the clothes hanging within. For the care of food there should be a larder open to the outer air, either under the window sill of the kitchen or on a specially constructed interior shaft, constantly provided with purified fresh air. This latter device is successfully provided for in the Rothschilds tenements.



PLAN OF TYPICAL UNIT.



BLOCK PLAN.

MODEL TENEMENTS FOR THE CITY AND SUBURBAN HOMES COMPANY, NEW YORK.

Ernest Flagg, Architect.

These are a few of the features which conduce to the ease and comfort of housekeeping. In practice they will readily suggest others. They embody little extra expense, but will make a very material difference in the pleasantness of family life.

Home Work.—Many tenement dwellers must work at home on clothes, dresses, flower-making, etc. The mothers must earn something. They cannot be separated from their children. To make such home work as agreeable as possible, good sanitary conditions, good ventilation, good light, large living room, convenient to the place where cooking is going on, good light at night, with gas fixtures in the center of the room; all these features are essential.

Sleeping Arrangements.— For healthfulness and comfort in sleeping a means for adequate ventilation must be provided. The windows should extend from the floor to the ceiling, with a means of opening them at top and bottom. If possible there should be sunlight in the room during the day. The walls should be painted, corners rounded, and everything should be done which would make the room more sanitary. The room should be large enough to provide as an absolute minimum four hundred cubic feet of air space to each individual sleeping therein. The sleeping rooms should be near the toilet.

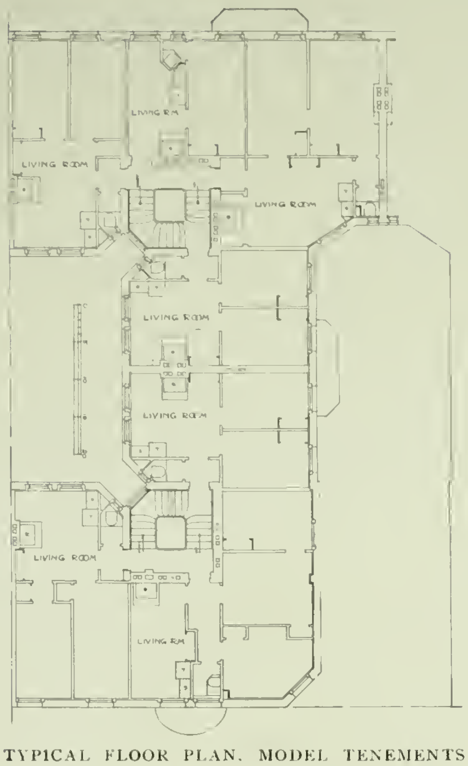
In order to keep the younger members of the family at home evenings, it is advantageous to have there features which will attract them. In certain recent German and French tenements in a park-like yard behind the houses, there have been provided cafés, restaurants, club rooms, billiard rooms, libraries, and in the open air, seats, fountains, a place for a band to play, a place for small entertainments to be given, and about it all a charming landscape setting. This, for a comparatively small cost, has added immensely to the attractiveness of the houses.

Further, the city parks and squares and playgrounds should all be as accessible as possible. People must have a place for relaxation after the day's work. If they cannot have it at home, they will go elsewhere to find it. Hence the desirability from the family standpoint, of making the home surroundings attractive.

Cheerfulness is the one thing which the majority of city tenements lack. They are in most cases unutterably dingy and gloomy. This is bound to have a material effect on the physical and moral nature of the tenement dwellers. How can it be avoided?

Openness. — There should be no interior courts. Exterior courts to be as wide as possible. Windows should be large and airy, opening on to balconies as in certain recent French and German tenements. The rooms should not be too long in proportion to their width. Rows of houses two rooms deep on the north and south plan, above described, will give a maximum openness.

Color. — The colors both of the exterior and the interior of the tenement should be light and warm in tone. Dinginess should be avoided in every possible way. The people themselves demand light colors in their rooms. Abroad, it is the custom to repaint the plaster of the exterior walls every year or so, varying the color from year to year and from house to house. This gives a great deal of variety and charm to the street.



TYPICAL FLOOR PLAN, MODEL TENEMENTS FOR CITY AND SUBURBAN HOMES COMPANY, EAST 68TH AND 69TH STREETS, NEW YORK.
Seven suites and 21 rooms; lot 50′ 0″ by 100′ 0″.
Ernest Flagg, Architect.

Architectural Lines. — The barrack type of tenement so common in America and formerly in Germany, and the institutional type of tenement should be avoided. The sky line should be broken and the street line should not be continuous for more than one hundred feet without a break. Attention to this feature means little additional cost but means a great deal in the possible charm of the tenement.

Natural Surroundings.—Growing things, especially trees, are purifiers of the atmosphere. They add immensely to the pleasantness of surroundings. Their cost is the minimum. In every way possible, use should be made of trees, shrubs, lawns, flowers, vines, window boxes, plants, anything which will bring nature into the decorative scheme of the dwellings.

Orientation. — Each room should be considered in itself as to what is its most desirable exposure. Practically none of the rooms should face north exclusively. Sunlight is essential for cheerfulness. This avoidance of a northern exposure may be obtained by the north and south plan which we have already described.

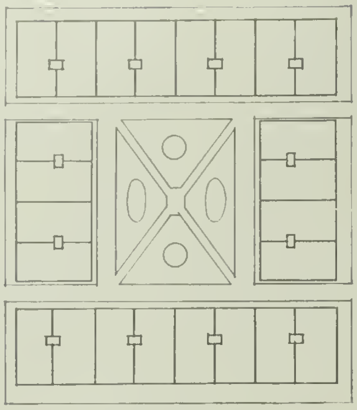
In case this street plan is impossible, all courts should be made to open out and as nearly south as possible, thereby bringing sunlight into the maximum number of rooms.

These features will add greatly to the general happiness and well-being of the tenant, and like the matters previously described, will make a happy family life much more possible.

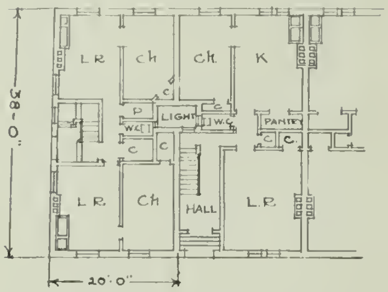
The conditions and arrangements which make for ideal tenements from the standpoint of comfort and the bettering of family life are similar to those which seem to work the best from the standpoint of safety and health. This shows the necessity of scientific city planning, how, if we are going to give the working people those living conditions which are their right, we must lay out a comprehensive plan for the whole future of the tenement districts. This has not yet been done in America. The agitation for it is strong, and within a compara-

PLAN OF TYPICAL UPPER FLOOR OF C. F. BISHOP TENEMENTS, HESTER STREET, NEW YORK.
Ernest Flagg, Architect.

tively short time there is going to be a demand for such comprehensive city plans. For such we must be prepared with a reasonable and adequate solution. I believe that with certain modifications depending on the peculiarities of each individual problem, the typical north and south plan as worked out by Monsieur Rey, of Paris, will solve this problem. I believe that it will make homes out of what have previously been mere shelters from the elements. It will attract rather than repel the working members of the families. The fathers, sons, and daughters who have been away during the day will feel more inclined to stay at home evenings. Family life will be happier and more genuine. It will breed better citizens, it will make more efficient workers, and men better suited to deal with the problems of government and of life. It will create not Beings, but Men.

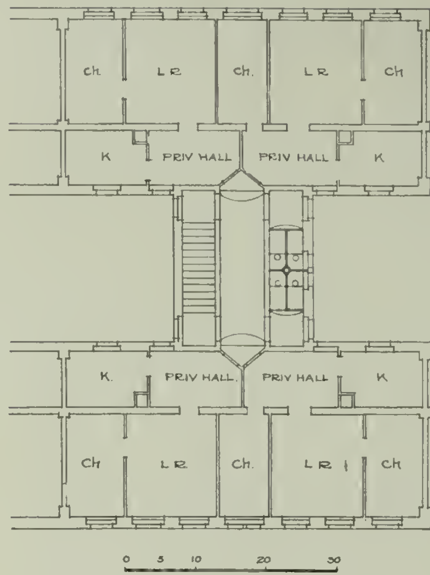


BLOCK PLAN.



TYPICAL FLOOR OF UNITS.

HOUSES OF THE BOSTON COOPERATIVE BUILDING COMPANY, HARRISON AVENUE, BOSTON.



BLOCK BUILDING OF THE COOPERATIVE BUILDING ASSOCIATION OF DRESDEN, GERMANY.

All living and sleeping rooms are on the outside. Large windows are a feature.

CELLAR PLAN

FIRST FLOOR PLAN

SECOND FLOOR PLAN

BUILDING FOR THE SUNSHINE MISSION,
550 WEST 40TH STREET,
NEW YORK.
Werner & Windolph, Architects.

Editorial Comment and Miscellany.

IN THIS issue we begin the publication of a series of articles, treating of warming and ventilating, prepared by Mr. D. D. Kimball, a member of the American Society of Heating and Ventilating Engineers, and of the Richard D. Kimball Company, Consulting Engineers of New York and Boston.

While written with special reference to the needs of hospital buildings, these articles cover briefly the history and literature of ventilating work, the difficulties and forces involved in this field of engineering, and, particularly, the value and importance of ventilation, especially in hospital buildings.

Warming and ventilating are differentiated, and their close association is explained; the composition of the air and its part in ventilating work is made plain; and the volume of air required to maintain definite standards of ventilation is given; proper standards of warming and ventilation are set forth, and the various systems commonly used are described, the fitness of each for different classes of buildings being discussed. A series of formulas is given covering that part of the work by means of which the size of radiators, boilers, chimneys, pipes, flues, ducts, and other details may be determined.

In a series of articles of this nature, it is not possible to cover the entire field of ventilating engineering, or to discuss the theory of the work, but sufficient details are given to enable one generally familiar with the practices of the trade, to design an ordinary system, or, what is quite as important, to correctly check or judge of any plans for warming and ventilating work that may be presented to the architect. In presenting this series of articles, we recognize the fact that the architect is the professional adviser of his client, and as such should be able to convince the client of the value of ventilation, and give substantial proof therefor, as well as to be able to decide on the best system to be used for the work in hand.

DETAIL BY NEW YORK ARCHITECTURAL TERRA COTTA COMPANY.

DETAIL OF CARNEGIE LIBRARY, BROWNSVILLE BRANCH, BROOKLYN.

The bricks range in shade from soft gray through several shades of yellow to a real brown. The joints are three-quarter inch, tooled smooth. Special size brick used in cornice and coping. Blue and green tiles are used for decoration. Brick furnished by Fiske & Co., Inc.
Lord & Hewlitt, Architects.

But relatively few architects appreciate the fact that thorough ventilation will increase the capacity of a hospital building from twenty-five per cent to forty per cent, by reducing to that extent the average number of days required for a cure. It is hoped that this and similar statements made and proved in these papers will lead the architect to insist that this vital feature of a building shall be considered by his clients quite as important as the building's arrangement or its ornamentation.

The architect's position as professional adviser to his client assumes a certain familiarity with anything which so vitally affects the success of the enterprise, and if these articles assist him in this important matter, their purpose will have been achieved.

DETAILS FOR SCHOOLHOUSE, PHILADELPHIA.
Conkling-Armstrong Terra Cotta Company, Makers.
J. Horace Cook, Architect.

POWER TO LIMIT BUILDINGS.

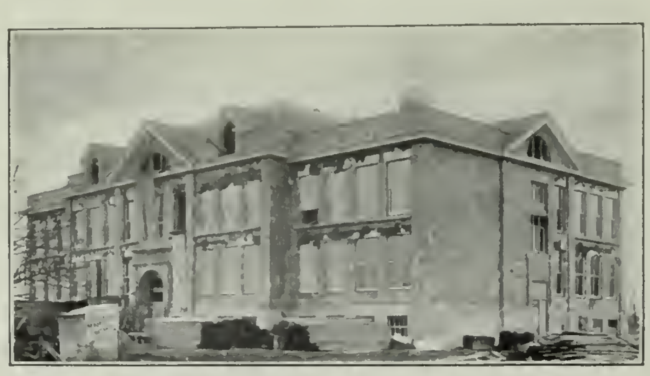
THE decision of the United States Supreme Court in the case of Francis C. Welch, trustee, against the building commissioner of Boston, has an application to every city in the country where skyscrapers are erected or contemplated. In supporting the commissioners in their refusal to grant a permit to Mr. Welch to erect a building 124 feet high, it upholds absolutely the right of a state, under its police powers, to limit the height of buildings in an arbitrarily determined section of a city without offering compensation to property owners.

An act of the Massachusetts legislature, passed in 1904, divided the city of Boston into two sections, business and residential, and limited the height of buildings in the former to 125 feet and in the latter to 80 feet. The land on which Mr. Welch desired to erect his building was in the residential section, and the application was refused by the building commissioner. Appeal was then made from the commissioner to the Board of Appeal on the ground that the acts of the former were unconstitutional. The board supported the commissioner, and the case was taken to the courts. The decision supports that of all the previous tribunals.

SMALL STORE BUILDING, CHICAGO.
Front of terra cotta made by Northwestern Terra Cotta Company.
Marshall & Fox, Architects.

The case was the first that has come before the Supreme Court on the question of building restriction, and its decision is of wide import.

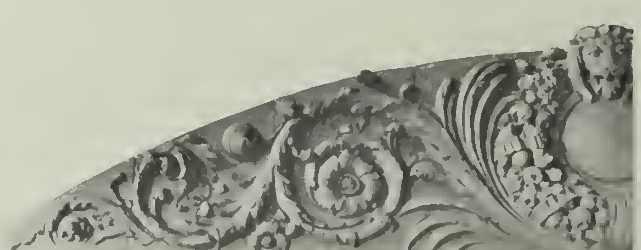
The contention of Welch was that the law was unconstitutional, being unelastic, and hence unreasonable and not a proper exercise of the state police power. The Supreme Court, however, held that the law was reasonable and properly in the interest of the public health and safety.



SCHOOLHOUSE, ROSELLE PARK, N. J.
Walls of terra cotta hollow tiles made by National Fire-Proofing Company. Cost of building complete, $65,000. Fire-proof throughout except roof timbers.
Pierce & Bickford, Architects.

DAMAGES were awarded a tenant for the loss of vault privileges under the pavement by the United States Circuit Court in New York a few weeks ago, but the case is to be taken to the United States Court of Appeals. The Pabst Brewing Company, having leased from Charles Thorley a building that stood at the southerly end of the triangle now occupied by the Times Building, made a considerable outlay in fitting up the sub-surface space as a rathskeller. In 1904 the city revoked the vault privilege as the space was needed for the subway.

The Pabst Company vacated the property and brought suit. The judgment just awarded amounted to $88,830 and was based on $45,000 for the value of the lease in 1902, $18,000 for the loss of decorations and other improvements unfit for use elsewhere, and the balance for interest losses. If the judgment holds, there will no doubt be a change in the wording of future leases in New York, for the covenant has customarily been to permit the tenant "to peacefully and quietly enjoy the property," etc.



DETAIL BY EAMES & YOUNG, ARCHITECTS.
Winkle Terra Cotta Company, Makers.

The decision also affects innumerable other properties, the improvement of which includes vault accommodation obtained by the payment of a small fee. If the privilege is revokable, there must henceforth be economy in subterranean equipment and furnishing.

WITH considerable spirit Baltimore rejects the proposal of the Pennsylvania Railroad to build a new station in the city which will cost only half a million. Pointing to Washington's magnificent new structure, it demands a grand union station commensurate with the importance of Baltimore and its future needs. Until this be assured there is talk of withholding concessions desecried by the railroads. The art commission, whose opinion of the plans will have influence, includes among prominent citizens, architects Douglas H. Thomas, Jr., Josias Pennington, and Joseph Evans Sperry.

THE Twelfth Competition of the John Stewardson Memorial Scholarship in Architecture has been awarded by the managing committee to Grant Miles Simon, an undergraduate of the school of architecture at the University of Pennsylvania. Five mentions were awarded, all to members of the University school of architecture or its atelier, as follows: First, Lucius Read White; second, Roy Childs Jones; third, Charles L. Bolton; fourth, George S. Koyl; fifth, Earl F. Bankes. The jury consisted of Messrs. Edward L. Tilton, Robert D. Kohn, John Mead Howells, and John V. Van Pelt, all of

New York. The Stewardson Scholarship grants $1,000 for a year's travel and study in Europe. It is open for competition to any person under thirty years of age who has studied or practised architecture in the state of Pennsylvania for at least one year preceding the date of the final examination. In this year's competition thirty-one (31) designs were entered from four ateliers (Pittsburg, Wilkes-Barre, T Square Club, and the University Atelier in Philadelphia) and from the school of architecture, University of Pennsylvania.

OLIVER BUILDING, PITTSBURG, PA.
Exterior of dull cream enameled terra cotta, made by Atlanta Terra Cotta Company.
MacClure & Spahr, Architects.

ON APRIL 28th unusual honors were paid to the memory of Major Pierre Charles L'Enfant, the French engineer who, under the authority of George Washington, laid out the city of Washington. Having been disinterred from its resting-place on Digges Farm, in Maryland, the body was taken to the Capitol at Washington under military escort, and there, in the rotunda which forms the center of his plan for the city, it lay in state while Vice-president Sherman and Ambassador Jusserand paid tribute to his memory. In the afternoon the body was taken under military escort to the Arlington National Cemetery, where religious services accompanied its interment.

THE first annual exhibition of the Minneapolis Architectural Club was held in the galleries of the Builders' Exchange, April 17th to May 3d. The club catalogue was made unusually interesting by a number of colored prints.

HOUSE AT INGRAM, PA.
Built of "Bradford Red" Brick, made by Bradford Pressed Brick Company, Bradford, Pa.
F. J. Osterling, Architect.

HOTEL SECOR—TOLEDO.

GEORGE S. MILLS, ARCHITECT.

(See illustrations in plate forms.)

THE building is 120 feet by 169 feet, ten stories and basement. The cost was 24½ cents per cubic foot, measured from average footing level to highest part of roof, leaving out court. The building is equipped with three 250 horse power water-tube boilers; three generators; ice making and refrigeration plant; four plunger elevators; complete ventilating plant; artesian well; pumping plant, etc.

There is a ball room and convention hall on the ninth floor, and servant's quarters and laundry on the tenth floor.

Every room has in connection either a complete bath room or toilet room with lavatory and water-closet.

IN GENERAL.

John Scott & Co., architects, announce the removal of their offices from the Moffat Building to the Ford Building, Detroit.

Arthur S. Meloy, formerly of Meloy & Beckwith, architects, Bridgeport, Conn., has opened an office in the Post Office Arcade of that city. Manufacturers' catalogues desired.

The partnership of Mills & Pruitt, architects, Columbus, Ohio, has been dissolved. Wilbur T. Mills will continue at the present address, 49 North High street, while Edwin E. Pruitt has opened offices in the Young Men's Christian Association Building.

Arthur Dillon, Hugh McLellan, and Henry L. Beadel have associated under the firm name of Dillon, McLellan & Beadel, for the practice of architecture. Offices 1123 Broadway, New York.

HOUSE AT ST. PAUL, MINN.
Built of "Autumn Leaf" brick, made by Twin City Brick Company.
Clarence H. Johnston, Architect.

McLaughlin & Siebert, architects, have opened an office in the Wright Building, Pittsfield, Mass. Manufacturers' catalogues and samples desired.

At the annual meeting of the Detroit Architectural Club, held April 5th, the following officers were elected for the ensuing year: Dalton R. Wells, president; Oscar Gottesleben, vice-president; D. J. V. Snyder, secretary; J. H. Gustav Steffens, treasurer.

The annual exhibition of the Washington Architectural Club was held in the Corcoran Gallery of Art from May 4th to 11th. Combined with this exhibition was another of etchings and colored woodblock prints by Baroness Hedwig Lckow.

The Bellevue-Stratford Hotel in Philadelphia is to be enlarged by the erection of a sixteen-story addition containing three hundred and sixty bedrooms.

DETAIL BY LONG, LAMOREAUX & LONG, ARCHITECTS.
American Terra Cotta & Ceramic Company, Makers.

At the first annual meeting of the Seattle Architectural Club the following officers were elected for the ensuing year: D. J. Myers, president; J. C. Stanley, vice-president; H. O. Mouldenhour, secretary; E. E. Ziegler, treasurer.

McGREGOR MEMORIAL HOME, CLEVELAND, OHIO.
Roofed with Imperial Spanish Tile, made by Ludowici-Celadon Company.
Badgley & Nicklas, Architects.

The old Hotel Metropole in New York, owned by the Coe estate, is to be torn down and a six-story fireproof business building erected on the site. The foundation walls of the new structure are to be made strong enough to support the weight of twenty-four additional stories if later needed. Henry Ives Cobb is the architect.

The New York Produce Exchange is considering selling its property, which contains about 70,800 square feet and is valued at $6,000,000. Only a small proportion of this area is needed by the Exchange for its own use; and with the money received from a sale, therefore, it is proposed to build, for about $1,000,000, a new exchange building fronting Broad street. The remaining $5,000,000 will be held or disbursed among the members.

Another well-known hotel in New York that is to give way to the march of improvements is the Belvedere, a German hostelry on Fourth avenue. A sky-scraper is to take its place, as was the case with its neighbor, the Florence House, on the opposite side of Fourth avenue.

The New York State Commission in Lunacy and the Board of Managers of the Long Island State Hospital have bought 548 acres of ground at Greenvale, Long Island for $412,000. This property will be used for the establishment of the newly planned Long Island State Hospital and is intended for patients committed from Brooklyn.

M. J. G. Crosset Montagne, a well-to-do French architect, was the passenger in the automobile taxicab which was run down by James Hazen Hyde's automobile at the intersection of the rue Rocher and the rue Vienne in Paris, on October 29th, and as a result of which Mr. Hyde has just been sentenced to prison for one month.

The Shuberts are to build new theaters in Minneapolis and St. Paul.

Tracy, Swartwout & Litchfield, of New

DETAIL BY HELMLE & HUBERTY, ARCHITECTS.
South Amboy Terra Cotta Company, Makers.

York, won the competition for the new Post Office and Federal Building at Denver. There were sixteen competitors. The official cost of the building is put at $1,500,000.

The architectural terra cotta used in the Hotel Secor, Toledo, George S. Mills, architect, illustrated in the plate forms of this issue, was furnished by the Atlantic Terra Cotta Company. The terra cotta for the church at Chattanooga, McKim, Mead & White, architects, is being furnished by the Atlanta Terra Cotta Company.

S. B. Dobbs, of Philadelphia, will supply the light gray impervious brick which is to be used for the interior of the immense building which is being erected in Philadelphia for the Curtis Publishing Company, Edgar V. Seeler, architect. These bricks will take the place of the usual plastered walls. This is one of the largest contracts ever let for a high grade face brick.

DETAIL BY SCHWARTZ & GROSS, ARCHITECTS.
New Jersey Terra Cotta Company, Makers.

"Ironclay" bricks, made by the Ironclay Brick Company, of Columbus, Ohio, and furnished by O. W. Ketcham, Philadelphia, were used in the Eagles' Building, Camden, N. J., Thomas, Churchman & Molitor, architects, illustrated in the plate forms of this issue.

Hydraulic-press brick—impervious gray—will be used in the new Hermitage Hotel, Chattanooga, Tenn. Carpenter, Blair & Gould, of New York, architects.

Dark red wire-cut bricks, made by the Western Brick Company, of Danville, Ill., were used in the house at Milwaukee, Kirchhoff & Rose, architects, illustrated in the plate forms of this issue.

COMPETITION FOR A BRICK HOUSE.

Cost not to Exceed $10,000.

FIRST PRIZE, $500. **THIRD PRIZE, $150.**

SECOND PRIZE, $250. **FOURTH PRIZE, $100.**

MENTIONS.

PROGRAM.

THE problem is a house with walls built of brick. Porches, verandas, or piazzas may be in part or wholly of brick or wood.

The cost of the house (exclusive of the land) including heating — equipment complete; plumbing — including all fixtures; gas piping and electric wiring — with fixtures, is not to exceed $10,000.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The plan should provide accommodations for a family of five — three adults and two children — and at least one servant. There are no restrictions as to size, shape, or style of house — except the cost — nor the size, shape, or location of lot.

The particular object of this Competition is to obtain designs for a BRICK HOUSE of moderate cost. It is especially desired that the treatment of the exterior shall show the possibilities in obtaining charming but restrained effects by the use of bond and jointing and pattern. The BRICK HOUSE is rich in precedent, and the material, whether considered from the esthetic or the practical standpoint, meets in the fullest measure the demands put upon it. To summarize; — the Competition calls for A CHARMING BRICK HOUSE OF MODERATE COST.

CONSTRUCTION.

The methods usually employed in the construction of brick walls may be followed, except that the walls are to be wholly of brick and of sufficient thickness to safely carry the load. The program does not call for a fireproof house, although that form of construction is not objected to. The choice of brick is left to the designer.

DRAWINGS REQUIRED.

On one sheet a pen and ink perspective, without wash or color, drawn at a scale of four feet to the inch. Also plans of first and second floors at a scale of eight feet to the inch. In connection with the plan of the first floor show as much of the arrangement of the lot in the immediate vicinity of the house as space will permit.

On another sheet, at the top, the front elevation drawn at a scale of eight feet to the inch, — and below the elevation, a sufficient number of details to properly show the brickwork and the special features of the design, — drawn at half inch scale in black ink without wash or color. Sections shown are to be cross-hatched in such manner as to clearly indicate the material, and floor plans are to be blocked in solid.

The size of each sheet is to be exactly 24 inches by 18 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 22 inches by 16 inches. The sheets are not to be mounted.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., on or before Sept. 15, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three or five well-known members of the architectural profession.

In making the award the jury will take into account the fitness of the design in an artistic sense to the material employed; the adaptability of the design as shown by details to the practical constructive requirements, and the excellence of the plan.

Drawings which do not meet the requirements of the program will not be considered.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. The full name and address of the architect will be given in connection with each design published. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $500.
For the design placed second a prize of $250.
For the design placed third a prize of $150.
For the design placed fourth a prize of $100.

This Competition is open to everyone.
The prize and mention drawings will be published in THE BRICKBUILDER.

THE BRICKBUILDER

VOLUME XVIII JUNE 1909 NUMBER 6

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

MAGINNIS, WALSH & SULLIVAN; NEWHALL & BLEVINS; WILLIAM STEELE & SONS COMPANY; PRIZE AND MENTION DESIGNS SUBMITTED IN THE COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

LETTERPRESS

THE MOUTH OF THE CLOACA MAXIMA AND THE EMBANKMENT ALONG THE TIBER RIVER, ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

The Cloaca Maxima, or great vaulted drain of the Roman Forum was built about B. C. 600, of blocks, some of which are 5½ feet long and 3 feet thick, while the discharging archway consists of three concentric arches, the innermost one being 13¼ feet wide. The stones are fitted with the greatest accuracy and without cement. Servius Tullius completed the first great wall of Rome, enclosing the seven hills. Between the Aventine Hill and the Capotoline Hill it took the form of a retaining wall along the river. When Piranesi made this engraving this section was still to be seen, but now it is concealed behind the new embankment built to protect Rome from inundations of the Tiber River.

THE BRICKBVILDER

VOL. 18 NO. 6 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· JUNE 1909

Warming and Ventilating with Special Reference to Hospital Buildings—II.

BY D. D. KIMBALL.

THE ideal condition as it relates to ventilation, is the maintenance of the quality of the air within as near as possible to that of the outdoor air. It is customary to determine the quality of the air by the measurement of the number of parts CO_2 (carbonic acid, sometimes called carbonic acid gas, or carbon dioxide). The quantity of this varies in different localities, as in cities and towns, and under different weather conditions, and is variously stated by authorities to be from less than three to more than six with an average of approximately four parts CO_2 in ten thousand parts of air.

It is an easy matter to determine the cubic feet of air required per hour per person to maintain a given standard of purity by the use of the following formula:

$$V = 10{,}000 \frac{G}{S - P}$$, in which

V = cubic feet fresh air per hour per person
G = ,, ,, CO_2 given off per hour per person (usually 0.6)
S = the standard of purity to be maintained in parts of CO_2 in 10,000 (should not be over eight)
P = standard of purity of fresh air (usually four)

There should also be provided 1,440 cubic feet of air per hour for each cubic foot of gas burned.

It is important if one desires to provide for definite conditions that this standard of quality of the air should be thoroughly understood, as is too often not the case even among men claiming to be engineers. An instance occurred recently in which a school board questioned a supposed engineer as to the number of parts CO_2 in 10,000 parts of air permissible and received the surprising answer that "it might be four hundred to five hundred."

The air within occupied buildings is to be considered entirely satisfactory if it contains six parts CO_2 in ten thousand parts of air, but eight parts is perhaps more often accepted as the maximum in a properly ventilated room. Inconvenience is usually felt, if conditions long exist, particularly by those nervously disposed, at ten parts, while ill effects are felt when this reaches twelve parts, and fifteen to twenty parts may be considered serious. The loss of the sense of smell is not uncommon when the air contains over twelve parts in ten thousand so that the conditions may not be so apparent to the occupant of the room.

The last report of the New York State Factory Inspection Department makes the surprising statement that thirty to forty parts was not uncommonly found in factory lofts, and that one place was found where fifty parts CO_2 were present, but these conditions can be called nothing less than shocking.

It may be well to explain that CO_2 in itself is not a poison. Its presence in the air may be taken, however, as a direct indication of the condition of the air.

A surplus of this gas can only be prevented by positive methods of removing the vitiated air, associated with a method of replacing it with a sufficient amount of fresh air which must be warmed during cold weather. The exact amount of fresh air required may depend somewhat upon local conditions or the cubic feet of space per occupant, and with reasonable exactness, may be mathematically determined. Certain definite standards as regularly accepted by engineers are given below.

Cubic feet of air to be supplied per minute per occupant:

School rooms	30
Theaters	15 to 30
Churches	15 to 30
Hospitals, ordinary wards	40 to 60
,, surgical wards	60 to 100
,, contagious wards	100 to 150
epidemic conditions	100 to 150
operating room	100

These figures may be more or less modified by local conditions or by limitation of the amount of air that may be introduced without drafts. This latter condition, and sometimes financial considerations, have commonly limited the air supplied to theaters and churches to the minimum amount named above. The amount of air required to be introduced into hospital wards heated by an indirect system is often determined by the heating requirements, and as a rule should not be less than an amount per hour equal to four and sometimes six times per hour the cubic feet of space in the rooms, in other words, four to six changes of air per hour.

It is not best to introduce fresh air into the toilet and bath rooms, kitchens, serving rooms, service rooms, laundries, etc., in hospitals, but there should be removed therefrom an amount of air equal to not less than four changes per hour, and this may be increased to six or eight changes per hour in the case of large kitchens. will be replaced by air drawn from the corridors, etc., and the danger of odors passing to the patients' rooms will be reduced to a minimum because of the direction of the movement of the air.

While the above may be accepted as a general rule, it must be borne in mind that these figures as to air supply are to be modified in some cases by a proper consideration of the occupant of the room, his condition, the cubic feet of space per occupant, the extent of wall surfaces, quality of the air, its temperature, humidity, etc.

It is a safe rule that pure air should be supplied in the maximum rather than in the minimum quantity tolerable, the natural limits being the matter of drafts, cost of installation, and the cost of operation, all of which must be given careful consideration. Drafts are quite as serious as ordinarily vitiated air. By special means of diffusion of the entering air, it has been found possible to make as many as twelve changes of air per hour in an occupied room without causing drafts, which is more than is ordinarily required. The use of such diffusers is not always permissible.

In determining the method to be used in the warming and ventilating of a hospital building one of the first questions to be determined is whether a steam or hot water system shall be used.

The objections sometimes raised against steam heating systems are largely removed by the use of an automatic temperature controlling system, or by the use of the newer systems of graduated hand control of the radiators, such as the Thermograde or Webster Modulation systems, by means of which a small or large amount of steam is admitted to the radiator, and thus a small or a greater amount of heat is obtained therefrom. The use of these systems increases the economy of the steam system, making it without doubt more economical in operation than the hot water system.

The steam system is particularly suitable for hospital warming and ventilating because of its quicker response to changes in temperature and sudden demands for heat, and the avoidance of such objections as may be raised to a hot water system, which would include difficulty of controlling in accordance with sudden changes in temperature, the larger radiators and pipes requiréd, danger of serious results in case of a leak, the greater danger of serious breakdowns, and of serious results therefrom, and the extra cost of installation.

The discussion of possible methods of hospital warming and ventilation will therefore be largely confined to the details of a steam system.

The best system for this work will be that which makes use of direct radiation in certain portions of the building and indirect heating in other portions. A system using direct radiation only is not excusable from any standpoint as it entirely eliminates ventilation. A system using direct radiation with flues which are intended to withdraw the vitiated air is no more satisfactory, as it much resembles an attempt to withdraw air from a bottle and results in little or no ventilation but plenty of very objectionable drafts.

A system which makes use of direct radiation in the corridors, toilet rooms, bath rooms, service rooms, duty The heating of such rooms should be provided for by direct radiation. The air withdrawn from such rooms rooms, kitchens, etc., with indirect heating in the private rooms, wards, operating rooms, and other rooms used for medicinal or surgical work will be found the most satisfactory.

There are many serious objections to the use of direct radiators in the wards, based on the fact that the radiators, with their pipe connections and valves, are difficult to keep clean and when otherwise than clean they are unsanitary. Wherever used in the hospital they should be supported without legs from the wall and be of such pattern as to give the most space possible between the sections. The Astro pattern or the Pressed Steel radiation is recommended for use in hospital work.

The direct-indirect, or semi-direct, radiator is not suitable for hospital ventilation. Where used it is customary to determine the proper amount thereof by adding twenty-five per cent to thirty-three and one third per cent to the amount of direct radiation that would be used in the same place, there being no better rule for determining the amount required because of the varying amount of service secured from this type of radiator. It is even more unsanitary than the regular direct radiator because of its flue construction and its air connections. Absolutely no dependence may be placed upon the amount of air obtained from this type of radiator. Under the best conditions an average size radiator will furnish not more than enough air for one patient while quite as often no air is introduced by this type of radiator, and it is not uncommon to find the air going out through this radiator, being drawn out by force of the wind current without driving from the side of the building on which the radiator is placed. For the greater part of the time but very little air is introduced by this type of radiator and only at times and under the best conditions is a definite amount of air supplied by direct-indirect radiation. Its use can only be excused on the ground of its low cost of installation.

A system consisting entirely of indirect heating might be considered ideal aside from the cost of installation and the cost of operation, if ample means were provided to insure against breakdowns. Ventilation would be insured, and unsanitary and unsightly radiators would be eliminated.

The best system would seem to be, as suggested above, one in which some direct radiation and more indirect radiation is used.

Many systems of ventilation may be designed for the same building, and extensive experience is required to determine which is best. Enough has already been said to condemn the use of a direct radiation system or one which depends on the windows for so-called natural ventilation.

For a small hospital or even a large one consisting of a group of small buildings, a gravity ventilating system will be found to give very satisfactory results. In this system there should be provided for each room a separate indirect radiator with its casing, which may take the form of a sheet metal stack casing or a brick heating chamber, the latter possibly containing a group of indirect radiators. A direct connection to the warm air flue the full size thereof, and a cold air connection with an area of seventy per cent to eighty per cent of the area of the warm air connection, are required. The warm air connection should contain at the base of the flue a mixing damper by means of which the temperature of the air may be controlled, this damper being operated automatically, if possible, or by hand, from the room above. The cold air connection should contain a tight fitting damper closing against felted stops at an angle of 45° to prevent leakage and noise. Over the inlet to the cold air pipe should be placed a one fourth inch mesh galvanized iron wire screen, painted black, and a number ten iron wire guard may be used in addition, if desired. Both of these air connections should be as short as possible, particularly the hot air connection.

The position of the indirect radiator in its relation to the warm air riser or flue should be such that the cold air, when admitted to the flues by the operation of the mixing damper, will enter the room at the back or top of the warm air current so that it will not fall to the breathing level and be felt as a draft.

The position of the warm air riser or inlet to the room, as well as the method of determining the amount of the indirect radiation, will be referred to below.

The size of the warm air riser is determined by the velocity of the air therein, which will depend upon its temperature and the height of the flue. In the indirect gravity systém the temperature of the air admitted is usually limited to about 30° to 40° above the temperature at which the room is to be maintained, it being better to introduce more air, if necessary to secure additional heat, rather than greatly increase the temperature of the entering air. Under these conditions approximately the following velocities may be counted upon in the warm air riser in a gravity system, the outside temperature being zero and the air entering the room at 100° to 110°.

Register placed at floor (first)	120 ft. per minute
,, ,, 8 ft. to 10 ft. above radiator .	240 ,, ,, ,,
,, ,, 16 ,, ,, 18 ,, ,, ,, .	300 ,, ,, ,,
,, ,, 26 ,, ,, 28 ,, ,, ,, .	380 ,, ,, ,,

Therefore, the amount of air to be supplied per minute in cubic feet, divided by the proper velocity in feet per minute, as above, will give the area of the flue in square feet. It is desirable that the flues should be made as nearly square as possible. If in a large room this involves a very large flue or register it is better to provide two or more smaller flues with a corresponding number of indirect radiators. This division of flues will lessen the liability of drafts due to the movement of a large amount of air at one point.

The removal of the vitiated air in a gravity system is accomplished by a series of ventilating flues of sufficient size to remove approximately as much vitiated air as there is fresh air admitted through the warm air flues and registers. With the outside temperature below 40° above zero a sufficient velocity of the air in properly sized and constructed flues is usually secured without the use of accelerating or aspirating coils, but with the outside temperature above this it is necessary to make use of accelerating coils placed either in the flue just above the register opening or in collecting chambers in the attic, preferably in the former position because the velocity of the air in the flue depends on the height of the column of the hot air, this being measured from the position of the coil to the top of the flue. The velocities thus secured in the vent flue will depend on the extent to which the temperature of the air passing through the flue exceeds the temperature of the outside air. Thus when the temperature of the outside air is high, approaching the temperature of the air in the room, it is necessary to use these accelerating coils to increase the temperature of the air in the flue. Ordinarily an amount of radiating surface in these coils which will raise the temperature of the air passing through the flue 20° is sufficient, in which case velocities approximately as given in the table below will be assured when the inside and outside temperatures are nearly alike, with an increasing velocity as the outside temperature lowers.

The velocity of the air in a vent flue, with the air therein warmed 20° above the temperature of the outside air, is as follows :

Height of flue above coil 10 ft.	153 ft. per minute
,, ,, ,, ,, ,, 20 ,, ...	216 ,, ,, ,,
,, ,, ,, ,, ,, 30 ,, ...	264 ,, ,, ,,
,, ,, ,, ,, ,, 40 ,, ...	306 ,, ,, ,,
,, ,, ,, ,, ,, 50 ,, ...	342 ,, ,, ,,
,, ,, ,, ,, ,, 60 ,, ...	378 ,, ,, ,,

To determine the amount of accelerating surface required, multiply the number of cubic feet of air to be exhausted per hour, by the number of degrees which its temperature must be raised (usually 20°), divide the result by 55 and then divide this quotient by the number of heat units obtainable from one square foot of surface in the accelerating coils, which is approximately as follows :

Height of flue above coil 10 ft.	290 heat units
,, ,, ,, ,, ,, 20 ,, ...	305 ,, ,,
,, ,, ,, ,, ,, 30 ,, ...	334 ,, ,,
,, ,, ,, ,, ,, 40 ,, and above	400 ,, ,,

Ordinarily when the height of the fresh air and vent flues measured from inlet to outlet is equal the same size is made use of in both flues.

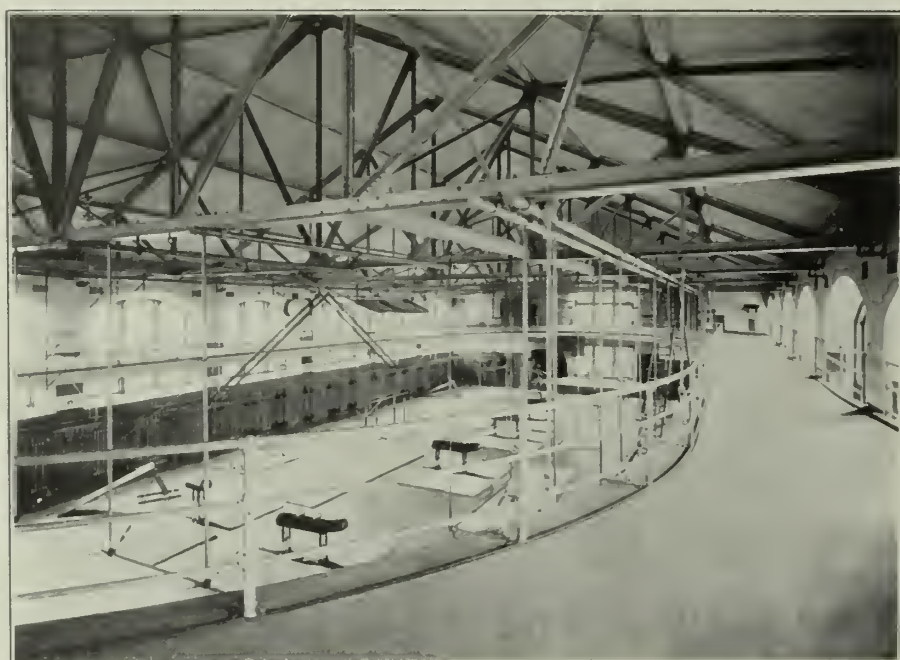
The only objection that is ordinarily raised against the gravity system in small or medium size buildings is its dependence upon weather conditions, but this objection may be overcome by skilful designing, in which a careful determination of the size of the flues, amount of indirect radiation, and the amount of surface in accelerating coils plays an important part.

Quite as important is the proper construction of the fresh air and vent flues and risers, the inside of which must be made smooth, whether of metal or brick. The turns or bends therein must be gradually made and such bends or turns should be as few as possible. In the case of brick flues the joints should be carefully made and the surface of the flue should be either smoothly plastered or given a good brush coat of thin cement mortar. The top of the flue as it turns into the room should be rounded, and the brickwork at the bottom of the opening should be chamfered off on the inside.

Gymnasiums—Their Plan and Equipment—V.

BY M. B. REACH.

IT SEEMS to the writer that of all forms and types of buildings designed for gymnasium and recreative purposes the modern municipal building is worthy of greatest study and most careful execution. Calling, as it does, for all the qualities of other buildings and institutions where such features are incorporated, it presents many additional problems that the others lack, and its scope of work is so infinitely broad that the problems of construction and selection confronting the architect must call for the best there is in him. While my articles supposedly are confined to the subject of gymnasiums and their epuipment, there are so many companion features in a public institution of this kind, and the relationship of work is so close and in a way interdependent, I find myself called upon to consider them in their broad relation and to some extent treat of the building as a perfect whole. Albeit my treatment of foreign subjects must be cursory and superficial in the extreme.



GYMNASIUM, COLLEGE OF THE CITY OF NEW YORK.
Showing running track.

As intimated in my preceding article, the fundamental reason of an institution of this character is a relief to conditions of life in our congested districts, and life is made up of men and women, boys and girls, and for purposes of differentiation, babies. Each element of that group should be provided for in some way or another every day, sufficient in period to make practical results possible, interest permanent, and the investment pay.

I am speaking now of the municipal gymnasium building set down in the heart of a congested city district. This class of people all have a well developed capacity for fun and recreation, and to provide features for one and not the other is not only unfair but must *seem* so to those left out. I think, of course, that primarily the building should be designed largely for the younger set, but provisions for older people included also. I further believe that there is immense value in the principle of "keeping things moving." If for instance certain prescribed hours prevent girls or boys from using the gymnasium, provide a counter attraction. Have some place for them to go in the building at any time during childhood's natural hours.

A summary of features incorporated in various municipal gymnasiums and baths shows a wide variety of departments of utility and pleasure. We find pools, showers, lockers and dressing rooms, club rooms, library, gymnasiums, play rooms, sewing, nursery, assembly hall, playground, indoor games, roof garden, laundry — truly a goodly assortment of attractions. In the specifications of one bath house referring to the laundry we find that . . . "The largest part of the laundry is for public use, and will accommodate three women at one time, each being provided with two earthenware wash trays, hot and cold water, steam wringer and steam dry room space. The steam dry room is constructed entirely of metal and contains twenty racks. One corner is set aside for the laundry machinery for washing towels. This consists of a 46 inch rotary washer and a centrifugal extractor." It being asserted that many homes among the poor were inadequate to permit of a large family washing without the greatest inconvenience, cleanliness and health were sacrificed to the conditions of environment. The boy who finds it troublesome to wash his face usually has a dirty face. The inference is plain.

Undoubtedly the gymnasium, pool and showers form the nucleus around which the rest of the building is constructed. The details of the latter form a separate study beyond my ken and I will, therefore, avoid any extended reference to the many problems of heating, ventilating, etc. The live steam system of heating pools is adopted in many I know of as being quick, economical, and efficient. In Cleveland the showers of a bath house visited are heated by automatic gas heaters and said to be very satisfactory. It sounds like a good summertime proposition. The free public bath of St Louis (H. W. Powers, architect), plans of which accompany this issue, have been freely commented upon as being very good. The construction comprises brick carrying walls and reinforced interior with white enameled brick upon the front elevation.

The interior arrangement provides on the top floor eighty marble showers (hot and cold combined) arranged for men and women separate; the second or mezzanine floor (hung from the top floor) provides for the necessary dressing rooms and a running shower as an equipment to the pool.

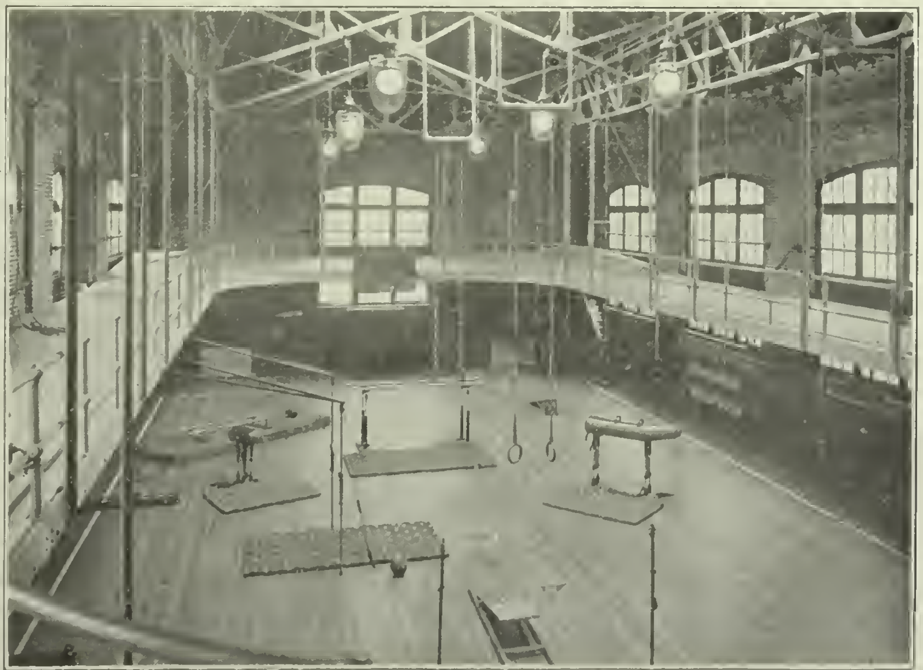
The basement floor provides a boiler, coal, and storage tanks for heating the shower water as well as the swimming pool, the water of which is heated by one large cast-iron American Radiator Boiler, which circulates the water through boiler and pool until the desired temperature of 80° is reached.

GYMNASIUM, Y. M. C. A., BROOKLYN, N. Y.
Showing running track.

The walls of the pool were made of reinforced concrete 7 inches thick and provided with skim and gangway drains. The entire inside was plastered with medusa white cement and troweled smooth. Thus far no leaks have been apparent.

It is, of course, desirable to have a separate set of showers for the pool, preferably placed so that access to the pool be made through the showers. As a supplement to a skim drain a gargoyle might be placed at one end, spraying the surface of the pool and keeping the top water working toward the drains. I recall seeing a very unique shower bath arrangement used by Mr. Ernst Hermann, in the gymnasium operated by the T. G. Plant Company of Boston for their employees. The dressing rooms for women had a detachable curtain which also fitted the entrance to the individual showers. This curtain wrapped around the body served as a robe in passing to and from showers and hooked into place effectively screened the occupant of the booth. There were sixty dressing rooms and a corresponding number of showers, the bathing being done in classes like regular gymnasium work. I believe that the best shower is that which hits the body obliquely and not from directly overhead.

In a large municipal building of the class described it possibly would be found expeditious to have one large sized gymnasium rather than two small ones, particularly so if suitable play rooms and other features were provided. In smaller buildings, such as are usually found in connection with playgrounds, I favor the segregation of the work for opposite sexes. The type of building used in the Lincoln Park System of Chicago, or South Park, Chicago, seems to be that usually adopted by various park departments and architects as appropriate. Separate club rooms for boys and girls, assembly hall, library as a branch of the City Public Library, showers, lockers, and gymnasiums, in connection with a well equipped athletic field and playground all serve to beguile youth from the streets and start a better man or woman for the community.



GYMNASIUM, GEORGETOWN UNIVERSITY, WASHINGTON, D. C.
Showing running track.

Fig. 24 shows a suggested equipment and floor plan for a municipal gymnasium in Boston, Newhall & Blevins, architects. The list of apparatus is as follows:

Twenty sections bar stalls, twenty bar stall benches, twelve chest machines, two No. 79 horizontal and vaulting bars, two No. 0 vaulting horses, two No. 0-B vaulting bucks, two

No. 78 parallel bars, two pair No. 119 jumping standards, two No. 58 spring boards, four No. 25 jump boards, one No. 28 incline board, one hydraulic rowing machine, six traveling rings, No. 126, 2 pair No. 125-A flying rings, two suspended horizontal ladders, twelve No. 98 climbing ropes, six No. 212 rope ladders, six climbing or sliding poles, one striking bag disc, two giant strides, six 5 feet by 10 feet by 2 inch mats, two 3 feet by 10 feet by 2 inch mats, six 5 feet by 6 feet by 2 inch mats, fifty pair three quarter pound dumb bells, fifty pair one pound dumb bells, fifty pair three quarter pound Indian clubs, fifty pair one pound Indian clubs, four steel locking cabinets, four dozen nickeled steel wands, four dozen wood wands, three locking wand racks, four dozen bean bags, one bean bag cabinet, four dozen short skipping ropes, one half dozen long skipping ropes, two medicine balls, No. 1, two medicine balls, No. 2, two medicine balls, No. 3, one steel cabinet for storing game apparatus.

GYMNASIUM, SEWARD PARK, CHICAGO.

In Play Room.

One pair basket ball backstops and goals, two official basket balls, one children's slide, four see-saws, infant hammock, and box chair swings.

The gymnasium is of excellent size and offers good opportunity for a nice running track. The bar stalls are placed along the edge of running track, serving as a cage to protect wall apparatus behind when games of various kinds are in progress, and also forming a partition behind which the various pieces of floor apparatus may be moved when it is desired to clear the floor.

The hand ball court in this particular instance is a strong feature of attraction and seemingly worthy of the space given. I think, however, this is a local condition, and in many cases space could be saved for other purposes by curtailing the regulation size of the court. The provision of the play room on the side is a good one, and if this can be also utilized for mothers to bring their sewing to while their infant is at rest and happy in a hammock swing particularly designed for his use, a worthy and desirable feature is added.

So far as apparatus is effected, great ceiling height in a play room as shown is unnecessary. Children's swings if attached to a frame out of doors would range from 8 to 10 feet high. A room of this description will ofttimes be crowded, however, and means suitable to provide a healthful amount of oxygen should be provided. Presumably from my standpoint a ceiling of 14 to 15 feet high would seem a happy medium. There is not certainly the same hard and fast rule that obtains in gymnasium equipments.

If a separate room is proposed for basket ball, volley ball, etc., I would recommend a ceiling height of 16 feet as a minimum standard.

The floor plan of the gymnasium at Seward Park, Chicago, — Perkins & Hamilton, architects — illustrated

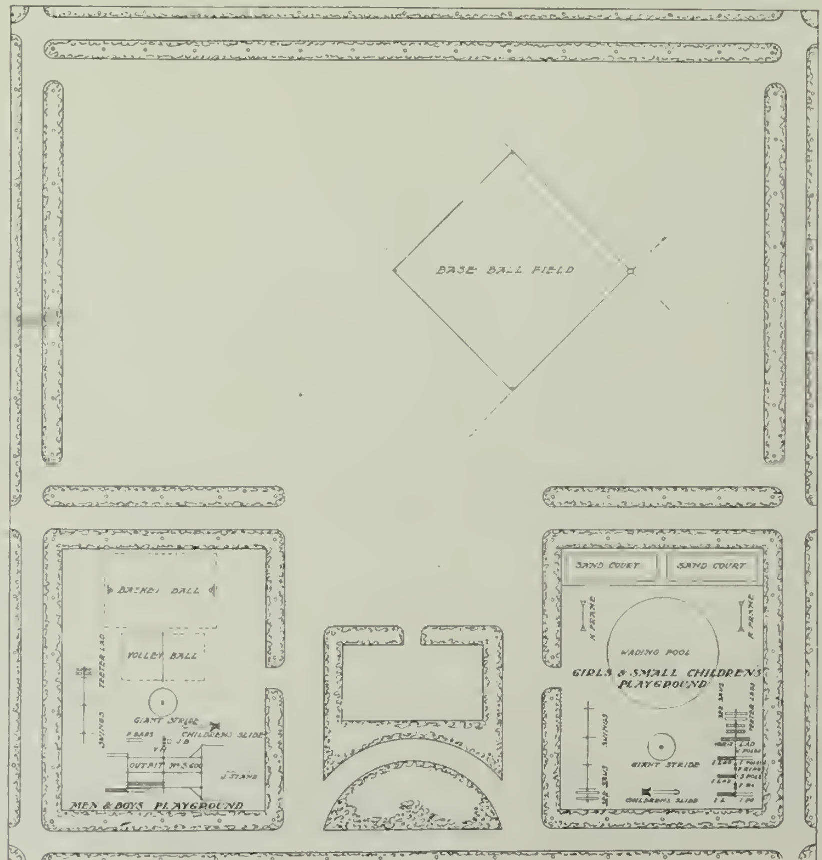


FIG. 23. PLAN FOR PUBLIC PLAYGROUND.

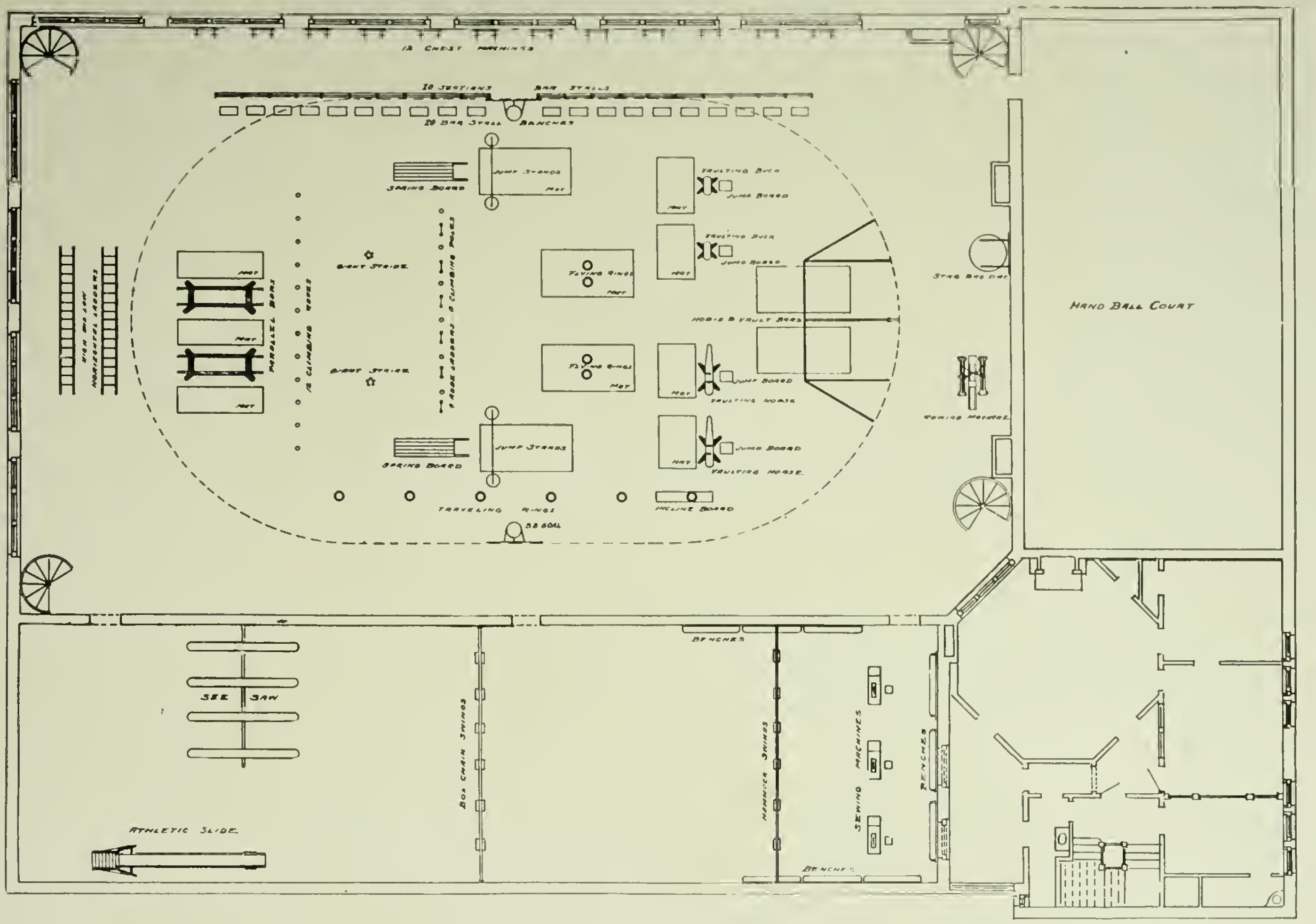


FIG. 24. PLAN FOR MUNICIPAL GYMNASIUM.

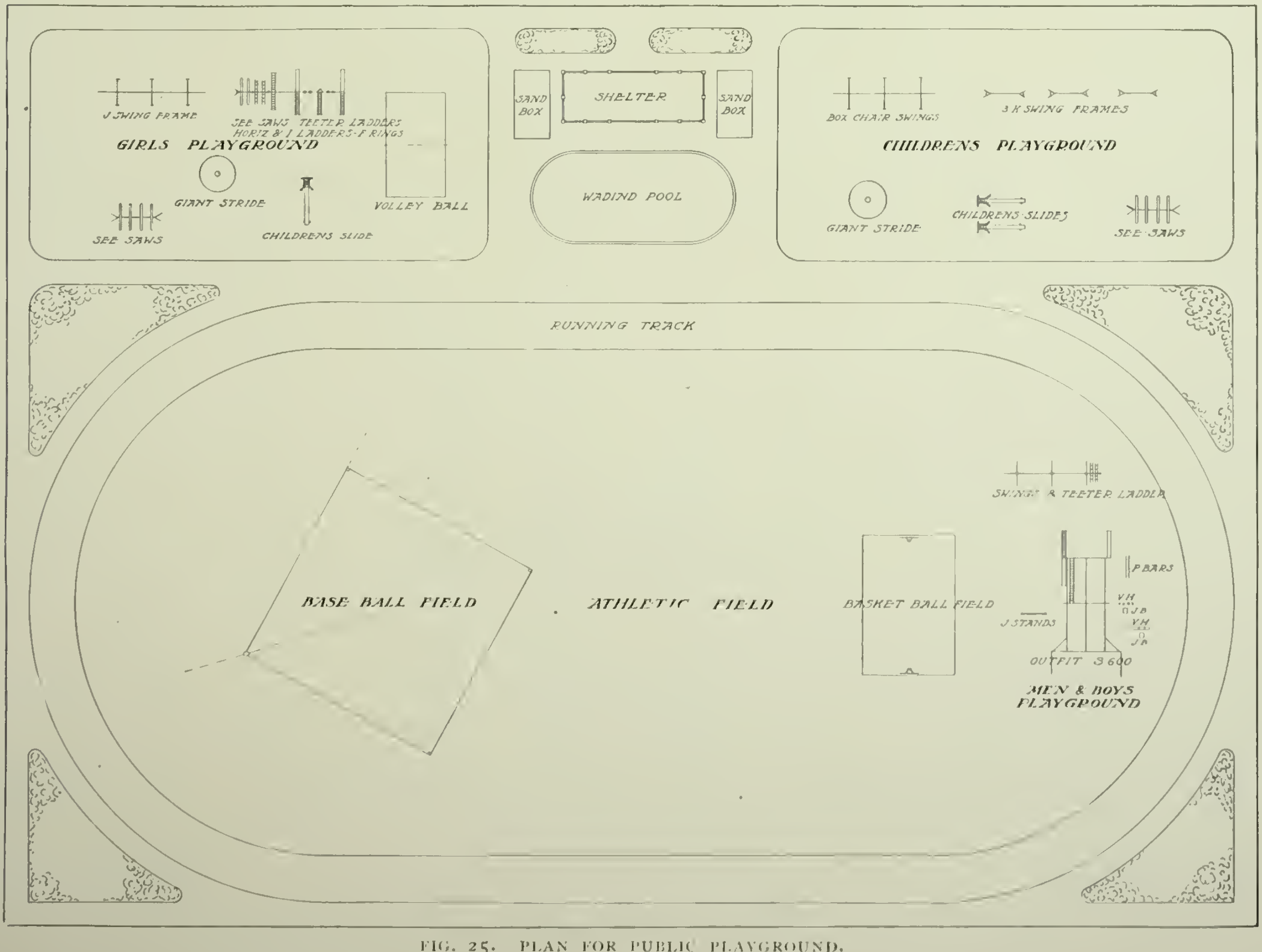


FIG. 25. PLAN FOR PUBLIC PLAYGROUND.

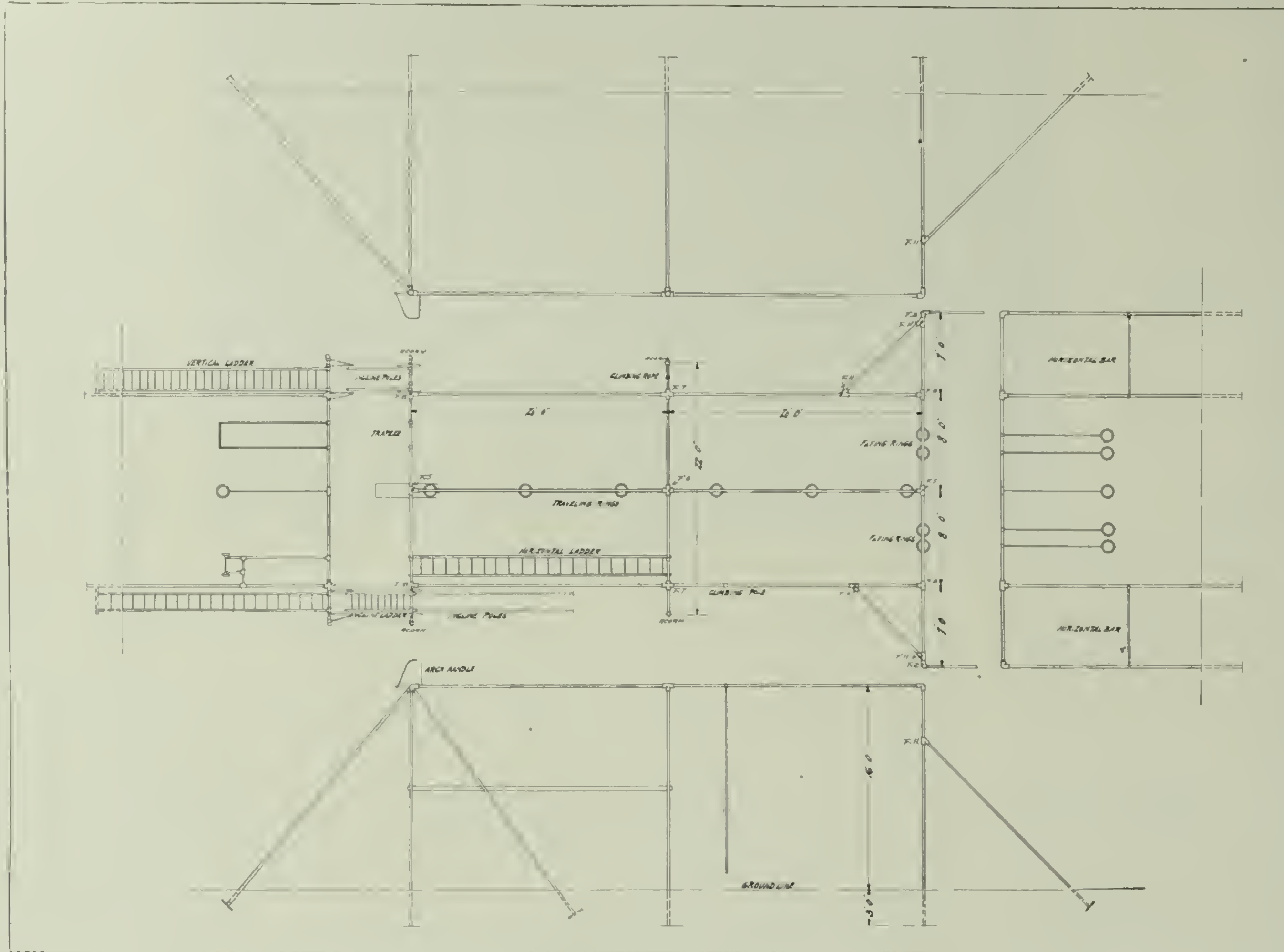


FIG. 26. TYPICAL LAYOUT FOR PLAYGROUND.

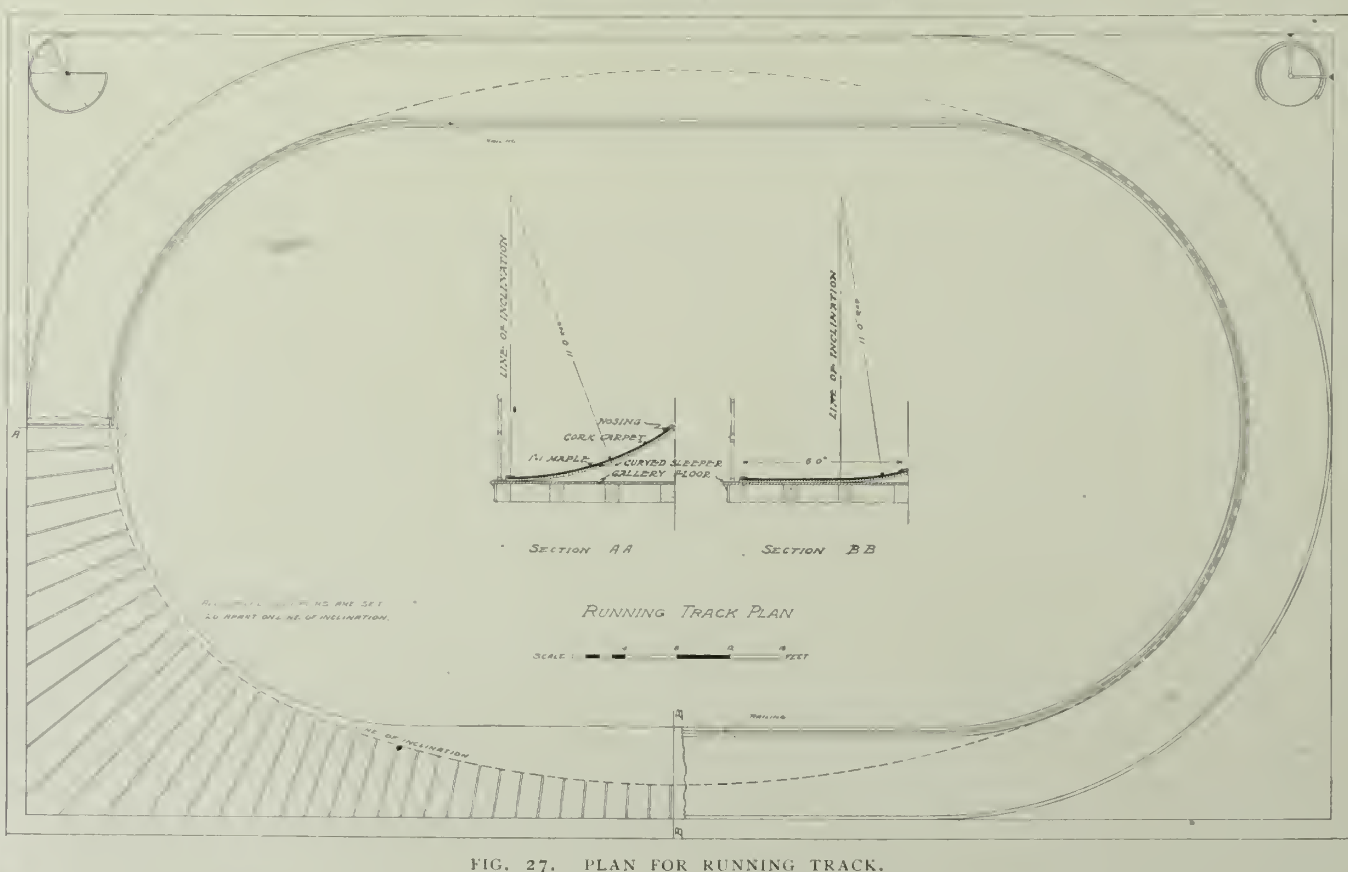


FIG. 27. PLAN FOR RUNNING TRACK.

in preceding article, is to my mind representative of the type of building appropriate to the playgronnd work. The separate equipments in gymnasiums for girls and boys would approximate the equipment shown and described under school gymnasiums.

Figs. 23 and 25 may be accepted as properly belonging to this article typifying playground layouts; there being a never ending variety of frames in their various combinations of apparatus. I will not attempt to cover this field, but merely show one of a popular combination, Fig. 26. The framework is made of 3-inch pipe 16 feet above ground, usually grouted to a depth of 3 feet, although in loose soil this had better extend to 4 feet. Girls' frames are 14 feet above ground grouted to the same depth under. Playground apparatus and equipment may be selected with the thought in mind that the child using it is a reincarnated monkey, bird, or fish, and that selection will be popular. Apparatus that affords climbing, as ladders in various combinations, or swift motion as in swings, sliding, etc., or wading pools, all charm the child and hold its interest day in and day out.

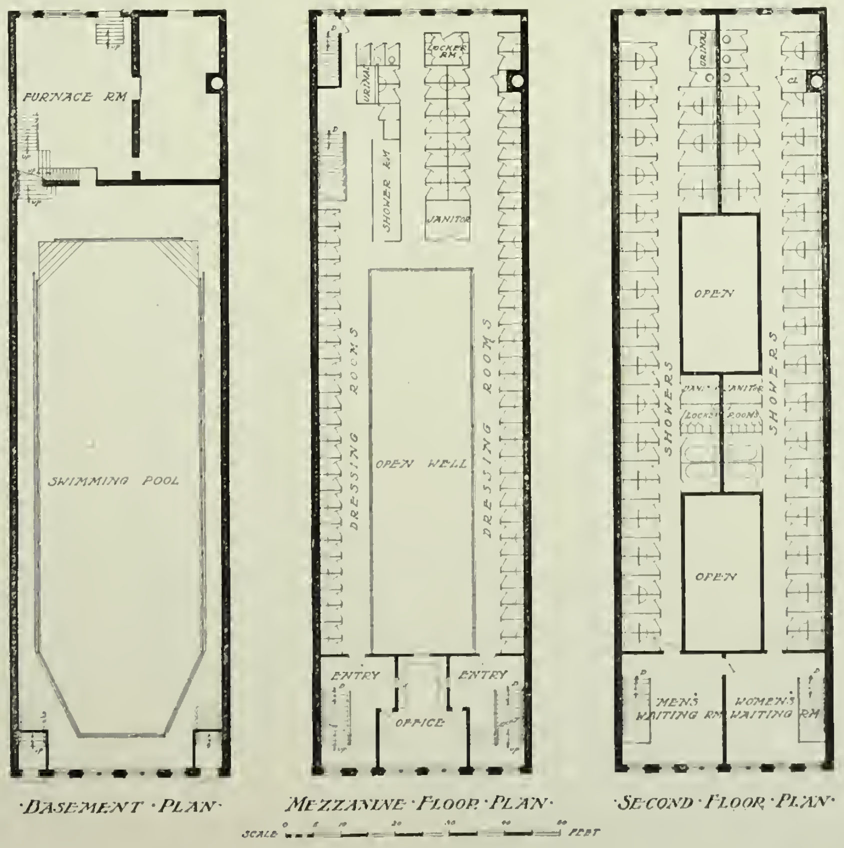
FIG. 28. SHOWING CONSTRUCTION OF RUNNING TRACK.

Running Track.

(Fig. 27.) The best shape and fastest indoor running track is that having the oval ends. Obviously, however, this form of track can only be used successfully in the gymnasium of ample accommodations as it cuts so into the space of the room. If (and this conjunction is as usual important) the gymnasium room is of sufficient size for its purpose, I would recommend a track at least 6 feet wide. In the case where the work in the gymnasium is curtailed the lesser feature (i.e., track) must be sacrificed. The question of banking can but be treated in individual cases. My company and any other standard company of merit prepare such plans for architects without charge. In designing a four-cornered track care should be taken to avoid getting the corners too sharp. I think a 15 foot radius as small as it is desirable to use.

Most tracks nowadays are suspended from overhead at their outside edge. This seems to be the generally accepted form of construction. The suspension rods should be outside the gallery rail, which may, if desired, incline outwardly although I do not hold this necessary or even desirable if the track is made sufficiently wide in the first place.

As it is not recommended to lay a track cover on a cement surface, owing to depreciation in the life and resiliency of the track and its counteracting effect on the runner, buildings of cement construction should provide in their plans timbers embedded in cement as shown in Fig. 28, to which the concaved superstructure may be anchored. Imported cork carpet at least $\frac{5}{16}$ inch thick serves as the best sort of track covering. This should be thoroughly stretched before putting down and held in such way as to permit some come and go to prevent track bulging when used a while. It is always well to provide a sliding pole, preferably brass tubing $2\frac{3}{4}$ inches in diameter, $\frac{1}{8}$ inch walls, as a quick means of descent from the track — the sliding pole "well" to be protected with railing. In the case of high ceilings the top of pole may be braced as shown in plan, 6 or 8 feet above track.



PLANS OF PUBLIC BATHS AT ST. LOUIS.

Note. This installment concludes the series of articles by Mr Reach treating of "The Gymnasium." Architects in need of information of a special nature regarding gymnasium equipment may obtain it by addressing M. B. Reach, care A. G. Spalding & Bros., Chicopee, Mass.— Editor.

Competition for a House to be Built of Terra Cotta Hollow Tiles.

REPORT OF THE JURY OF AWARD.

THE competition was for a house to be built of Terra Cotta Hollow Tiles, to be covered upon the exterior by either stucco or brick. The problem was a thoroughly practical and modern one with simple direct requirements, clearly stated and of such a nature as to be easily met. It was such a problem as to-day engages the attention of many architects and owners. Out of many sets of drawings submitted to the jury nearly every one had exceptionally good qualities, and designs were well stated and invariably well drawn.

Terra cotta block architecture demands absolute simplicity of treatment and does not lend itself readily to vagaries in design, either as to mass or detail. The material limits expression to a greater extent than almost any other material in use to-day, with the possible exception of concrete. The designs submitted reflected clearly the growing grasp of architects and designers upon terra cotta as a building material, which we are rediscovering and adapting to everyday uses.

First Prize. A charming design, beautifully planned and proportioned in its parts and finely expressed as to its elevation. The author had a clear conception of the mass of his house as a whole, and of the material he was to use in constructing it. Simple, direct, and clean cut, the design answered perfectly the basis of criticism established by the program as to its fitness, adaptability, and relative beauty. In the elements of the plan the rooms were finely arranged; the chimneys as an important part of the design were most effectively placed, both as to plan and elevation; the roof, while simple, was sufficiently cut up to give gables on the exterior, where they are of great aid to a design. In short, it was almost an ideal development of the problem, and one of which the designer may be proud.

Second Prize. This design was remarkably like the first as to plan and was as successful in many of the elements considered by the jury. The type of design, as a whole, was less interesting because of the absolute rigid simplicity of the exterior treatment. The plans of the first and second prizes are so similar in elements that they might well have been produced in the same office. It was in the expression of the plan, in the exterior, that the marked difference comes. The "A" Roof, in builder's language, is usually stiff and difficult to treat, and this design would have profited had the author loosened the strings of his imagination a trifle. The charming group formed by the entrance door, porch, trellis, and stair window shows a settled sense of proportion very finely expressed and the whole shows a fine grasp of the principles involved in using this building material.

Third Prize. This design is marked by its adherence to precedence in working up the elevations of a very fine plan. There is a nice distribution of parts well balanced, and the house as built would have a certain class, so called, that would be most effective in certain settings. The design is most adaptable to the material to be used, and with all, is quiet, well balanced, and a bit trim. But for a house of this size and character it was thought that the first and second prize plans expressed, perhaps, a little more freely the ordinary conception of what an American house should be if the designer were not too much influenced by precedent and historic examples.

First Mention. This design was far more pretentious than those preceding, but still well within the province of the terra cotta block building. There were some elements of this design that were of such a peculiar nature that they could have been dispensed with without much damage to the result. The cornice which is applied to the main body of the house and does not extend to the upper line of the house, seems rather to befog judgment of what otherwise would have been a very straightforward and honest expression of the material used. With all, the design was a good straightforward effort, with a fair plan and well proportioned exterior, with the single exception of the cornice, which really detracted from a design which was almost too well presented as to draftsmanship.

Second Mention. Here was a design based upon a plan that was frankly and simply expressed, with a very economical arrangement. The elevation was almost too tense and straightforward, but quite beautifully balanced. Here again one wishes that the author could have loosened his hand a little and allowed his imagination to play such a part with the design that would seemingly leave less of the $10,000 appropriated unexpended. Fitting as to the material to be used, adaptable also, the design was a trifle stiff and labored.

Third Mention. Here the author has erred to the other extreme; here the imagination has been allowed to rule to a charming extent. Planned beautifully, well considered, distinctly possible, well expressed except in the elevation where scale has been run away with. The whole beautifully treated, with an abundance of detail which would tax the ingenuity of any architect to get it built for the money appropriated.

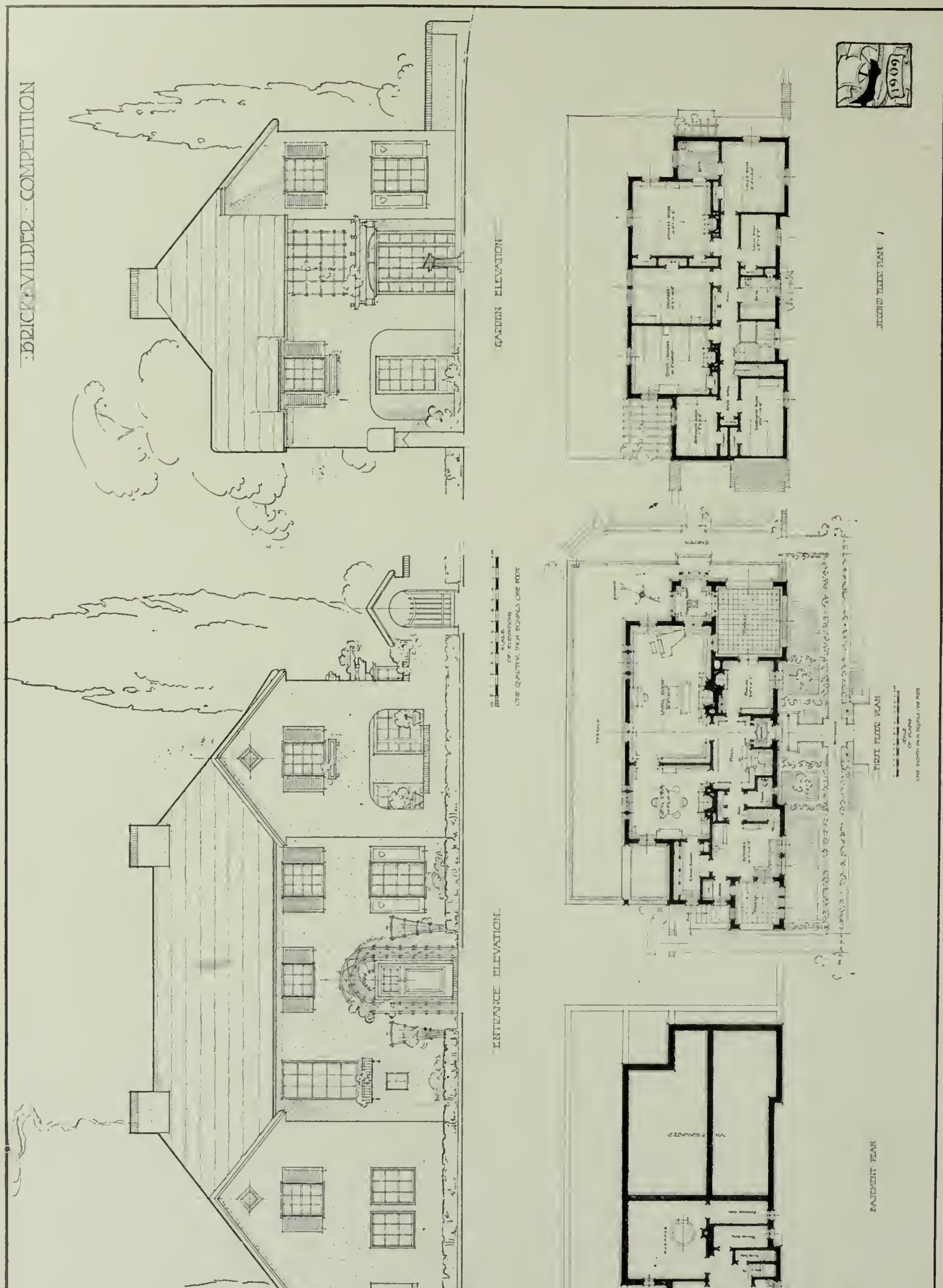
Fourth Mention. This design, based upon another fine plan, well expressed, well balanced, and one such as would make a beautiful house, has been worked up with almost too much modesty and Quakerish expression and suggestion. Such extreme balancing of parts and proportion it would perhaps be well to avoid in a house of this size and type.

Fifth Mention. A rather elaborate but extremely interesting plan and elevation, but it has unfortunately overstepped the problem and has become almost a mansion instead of a house. The purpose seems to be best suited to an Italian climate, and the whole design savors of Italy and is not so outspoken of terra cotta block construction as some of the others. An unevenness in the elevation is caused by the excessive height above the second story windows, which of course lends to the general design, but detracts from the house on practical conditions. It does not seem to come quite so well within the limits of house construction as did the others.

Sixth Mention. A distinct return to the house type, but suggestive of brick architecture rather than terra cotta block. The plan and elevation are quiet and dignified, beautifully treated in detail, and windows and doors well proportioned, the entrance doorway and windows above being especially effective. This design failed, however, in that direct expression of the material used, so well shown in some of the others.

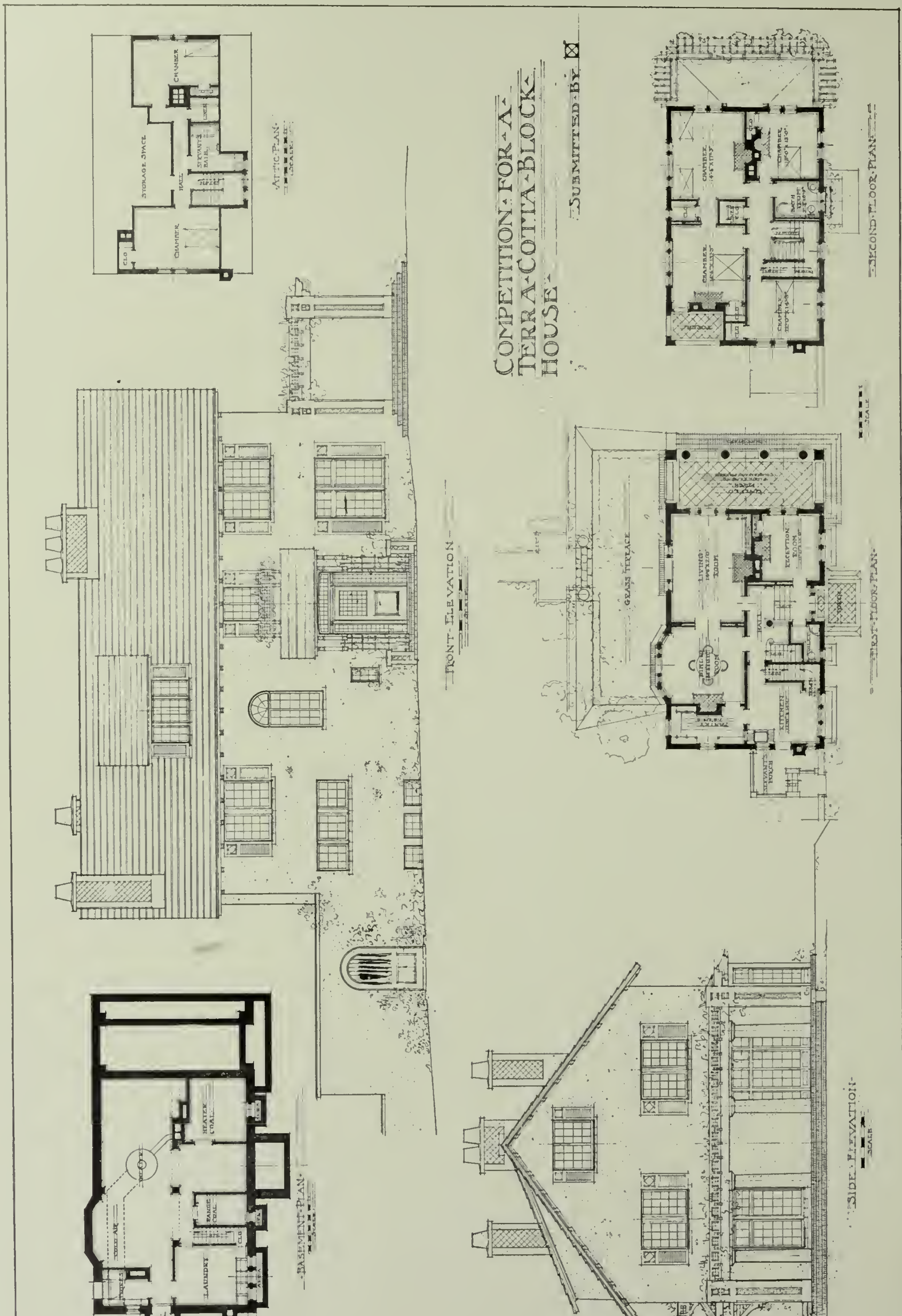
Thomas Fox,
Louis C. Newhall,
Addison B. LeBoutellier,
James Purdon,
William E. Putnam, Jr.

Jury of Award.



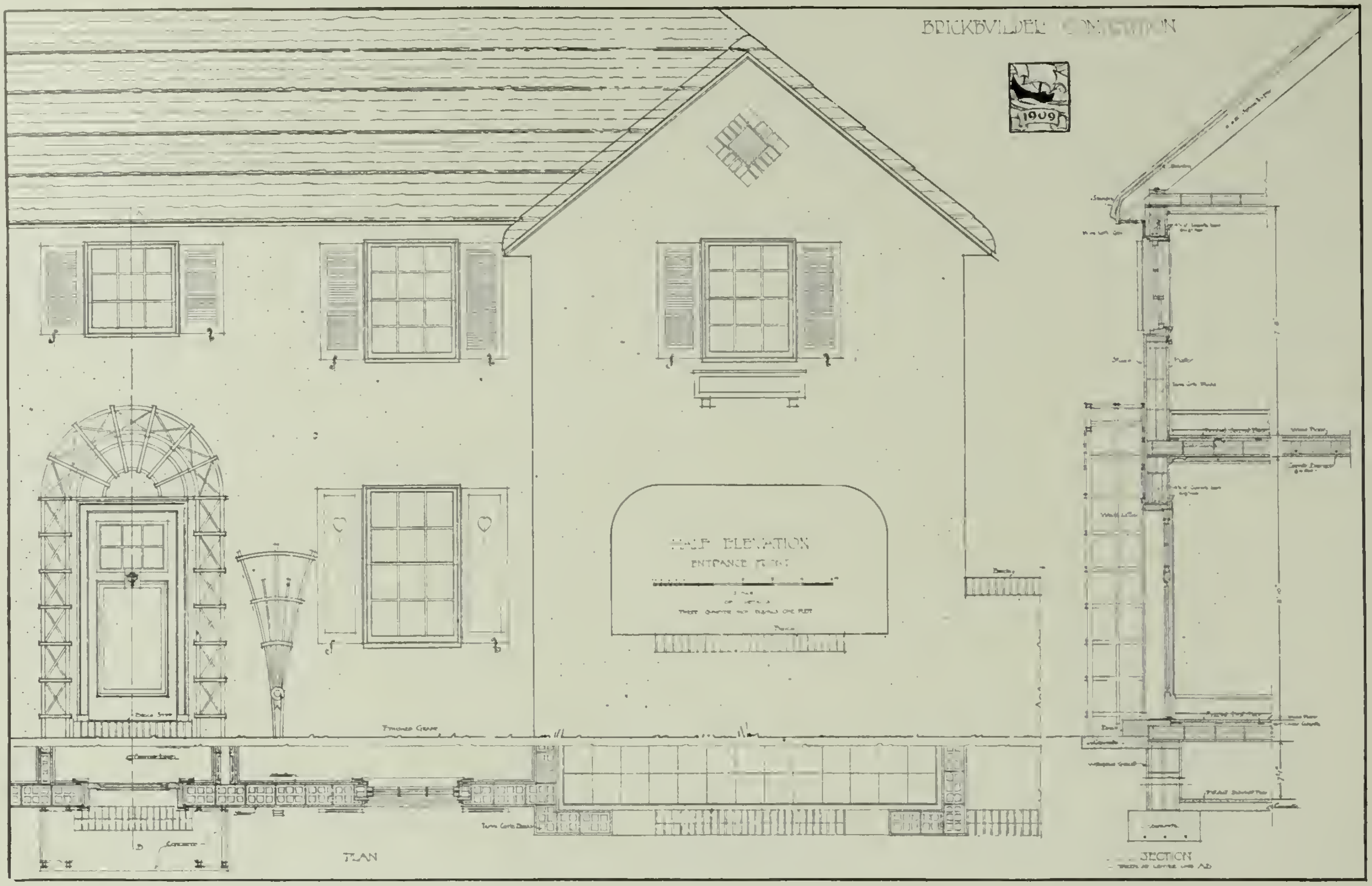
FIRST PRIZE DESIGN. THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

SUBMITTED BY A. H HEPBURN, BOSTON, MASS.



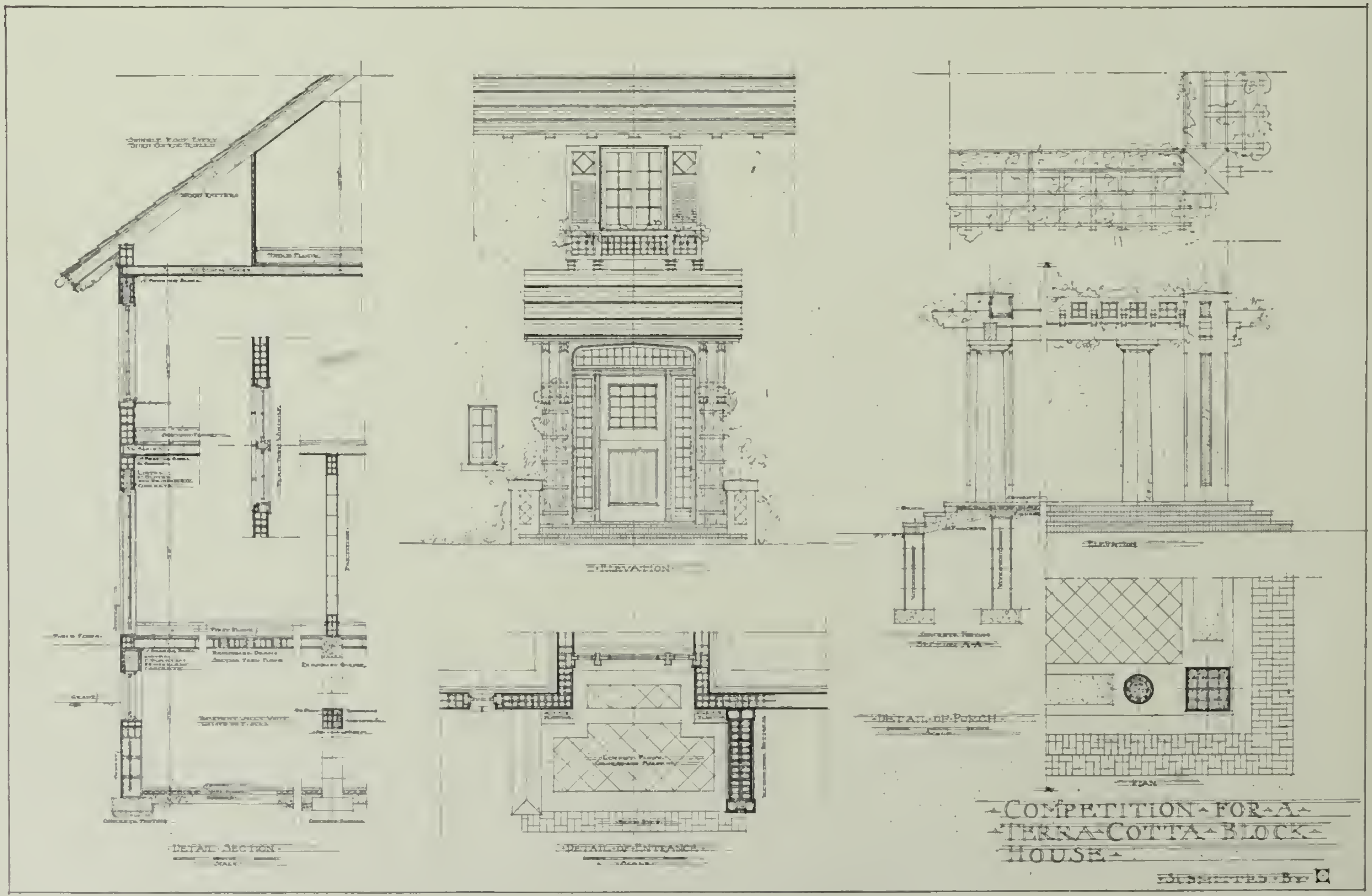
SECOND PRIZE DESIGN. THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

SUBMITTED BY WILLIAM G. HOLFORD, BROOKLYN, N. Y.



DETAIL FIRST PRIZE DESIGN.

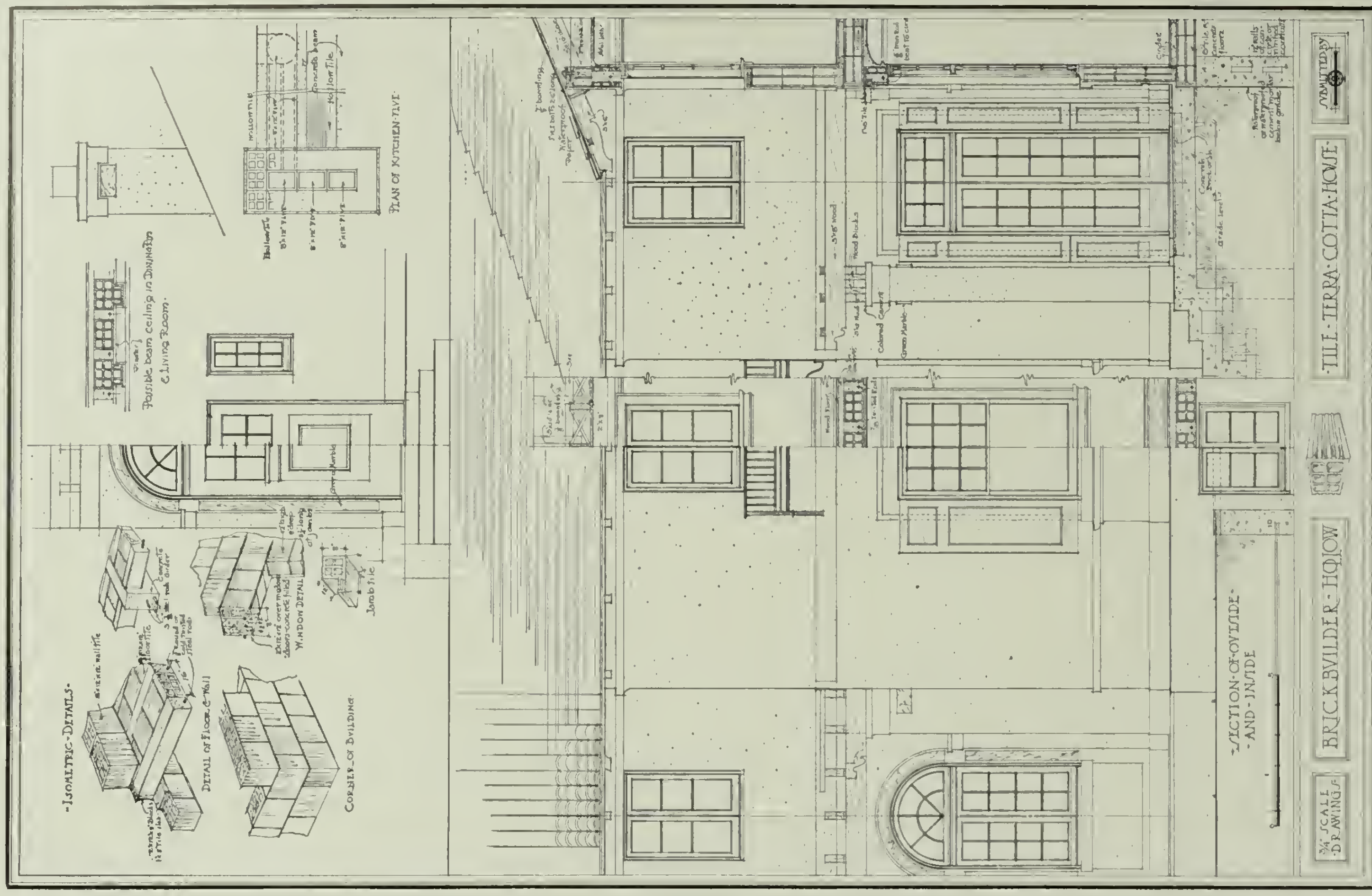
Submitted by A. H. Hepburn.

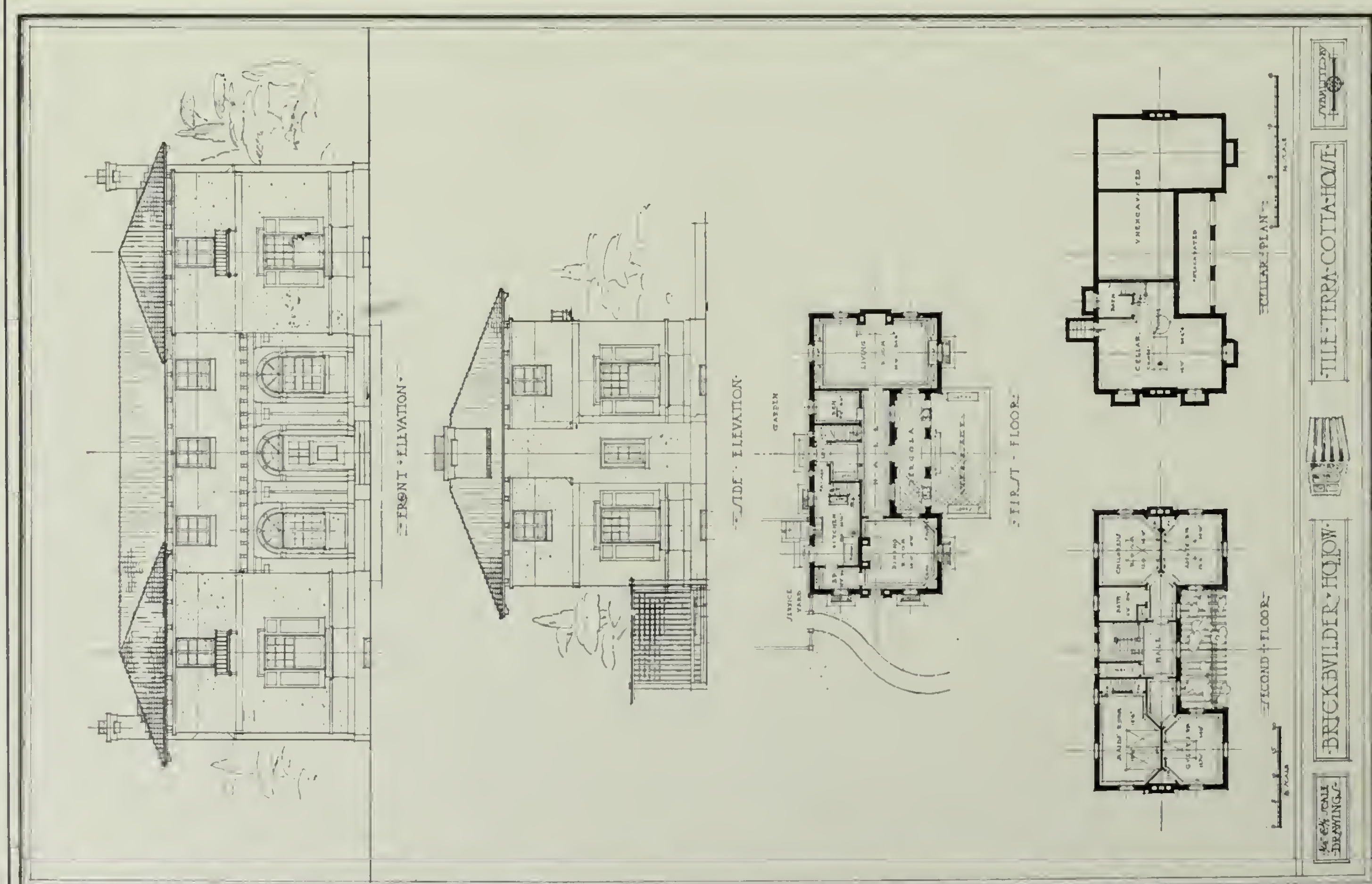


DETAIL SECOND PRIZE DESIGN.

Submitted by William G. Holford.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.



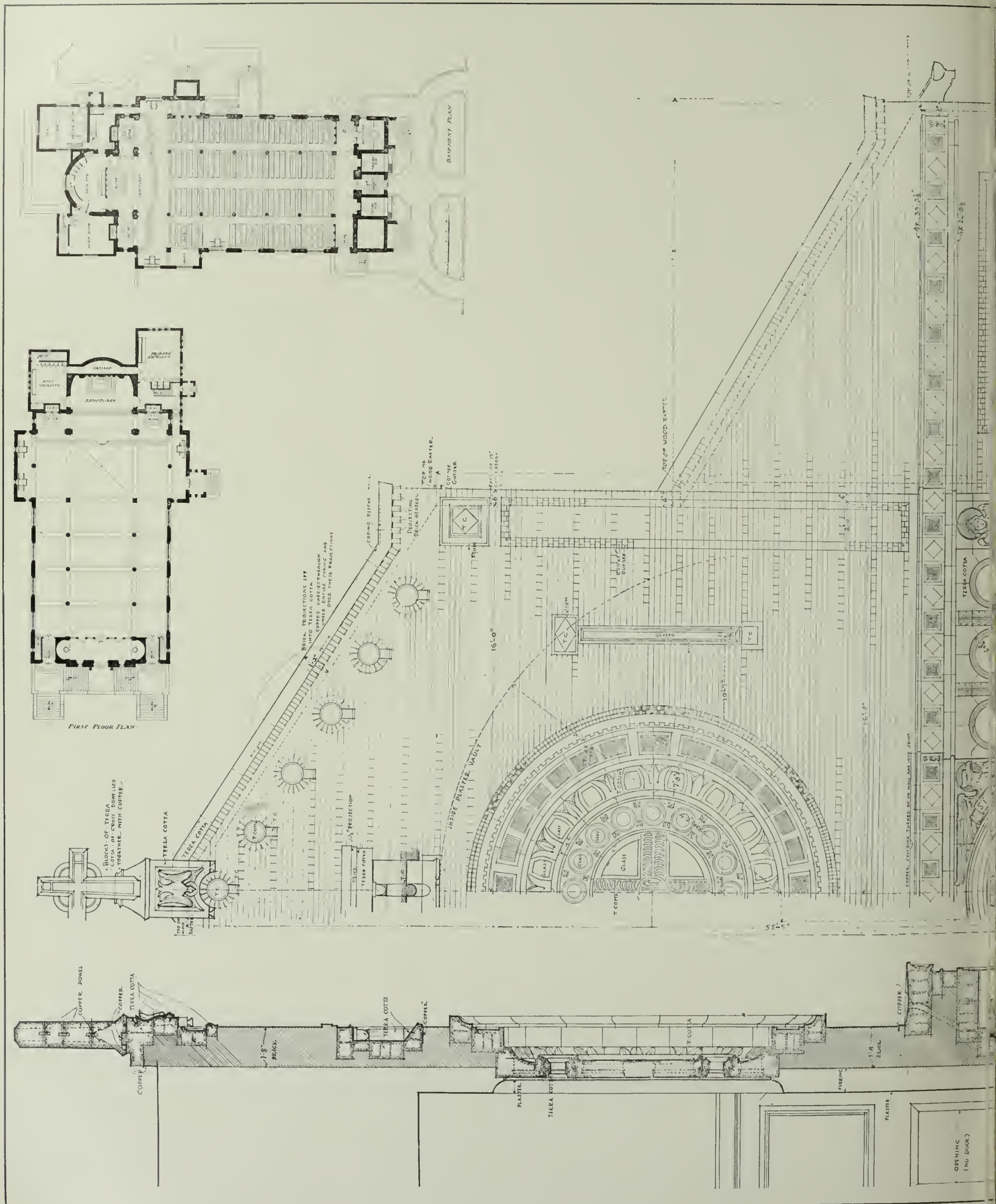


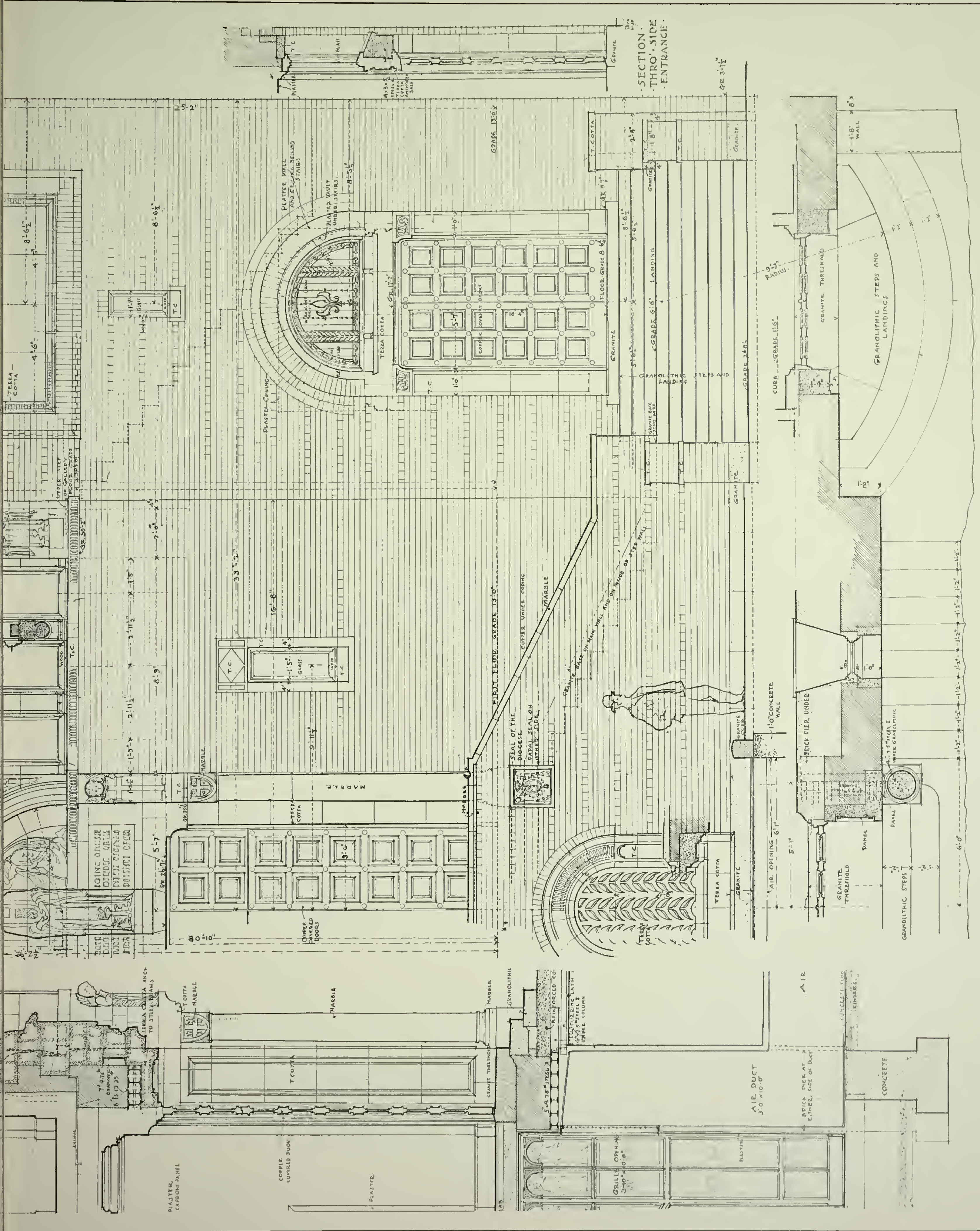
THIRD PRIZE DESIGN. THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

SUBMITTED BY FREDERICK JOSHUA MESEKE AND ALFRED G. WHELLER, NEW YORK CITY.

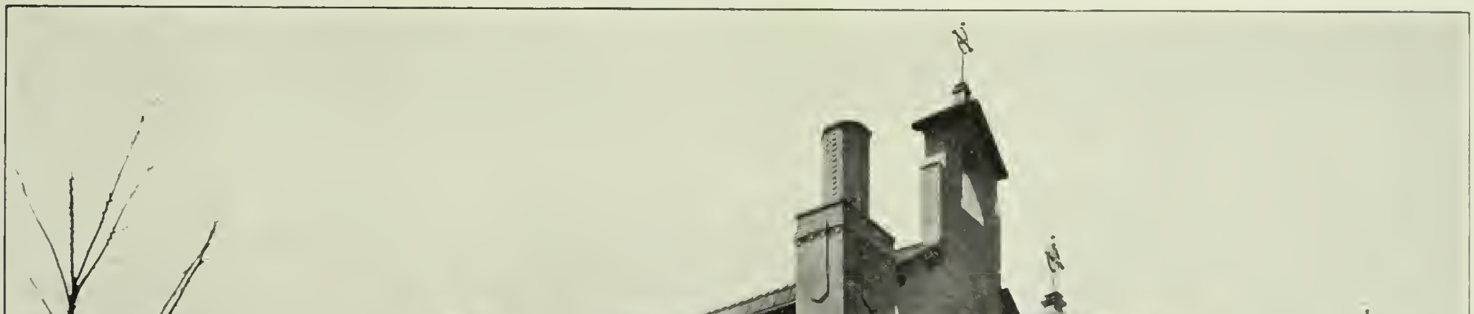
NEW PAVILION FOR THE AMERICAN LEAGUE BASE BALL CLUB, PHILADELPHIA, PA.
WILLIAM STEELE & SONS COMPANY, ARCHITECTS AND BUILDERS.

ST. CATHERINE'S CHURCH, SOMERVILLE, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.


FIRST FLOOR PLAN
BASEMENT PLAN
SANCTUARY
TERRA COTTA
INSIDE PLASTER VAULT
GLASS
16'-0"
55'-5"
COPPER
OPENING (NO DOOR)

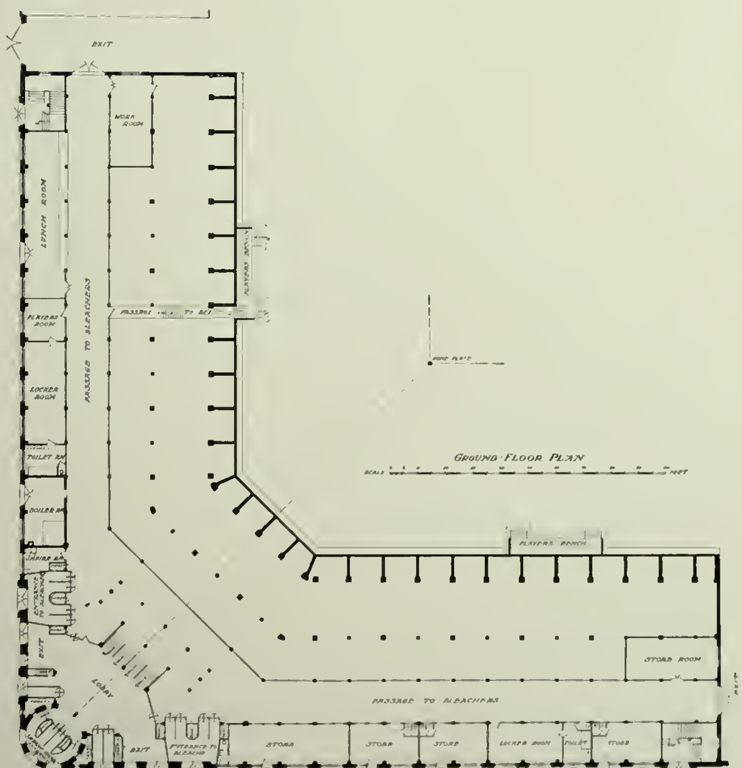


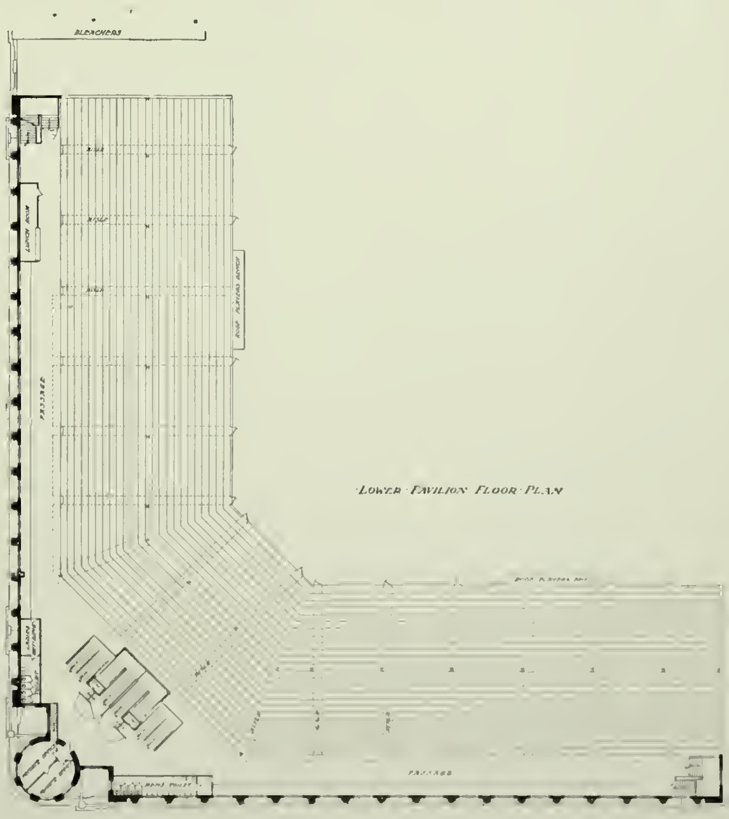
DETAIL OF FRONT ELEVATION, AND PLANS, ST. CATHERINE'S CHURCH, SOMERVILLE, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.



ST. CATHERINE'S CHURCH, SOMERVILLE, MASS.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.

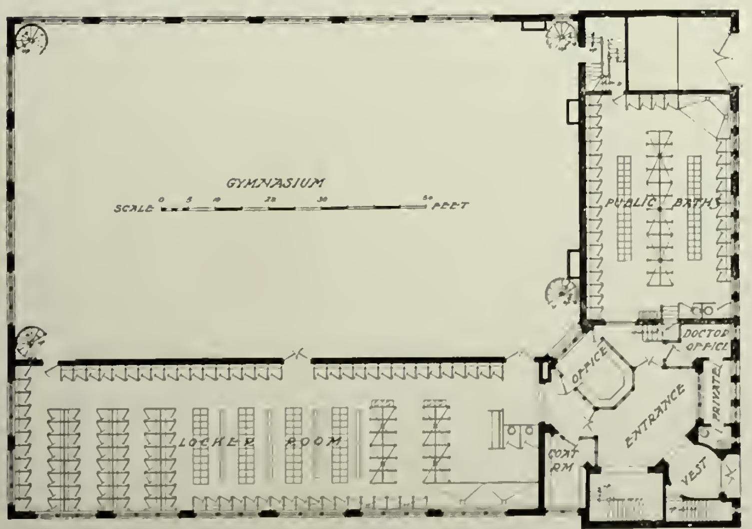
VIEW OF PAVILION FROM THE FIELD.



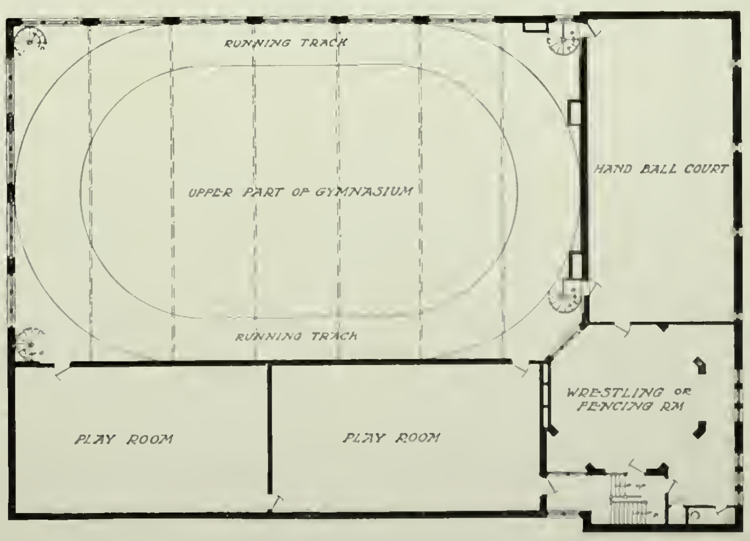


NEW PAVILION FOR THE AMERICAN LEAGUE BASE BALL CLUB, PHILADELPHIA, PA.
WILLIAM STEELE & SONS COMPANY, ARCHITECTS AND BUILDERS.

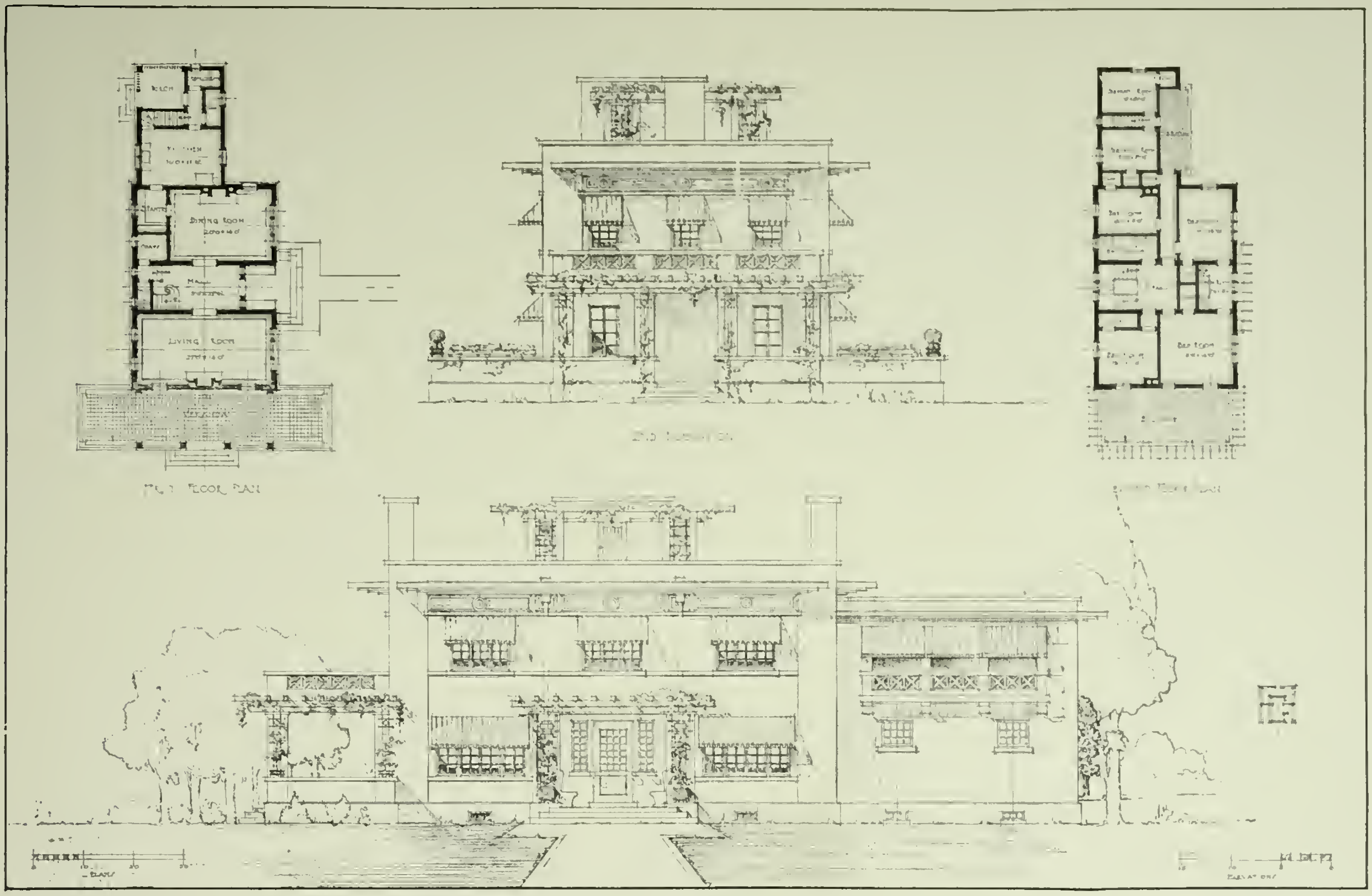
MUNICIPAL GYMNASIUM AND PUBLIC BATHS,
EAST BOSTON, MASS.
NEWHALL & BLEVINS, ARCHITECTS.



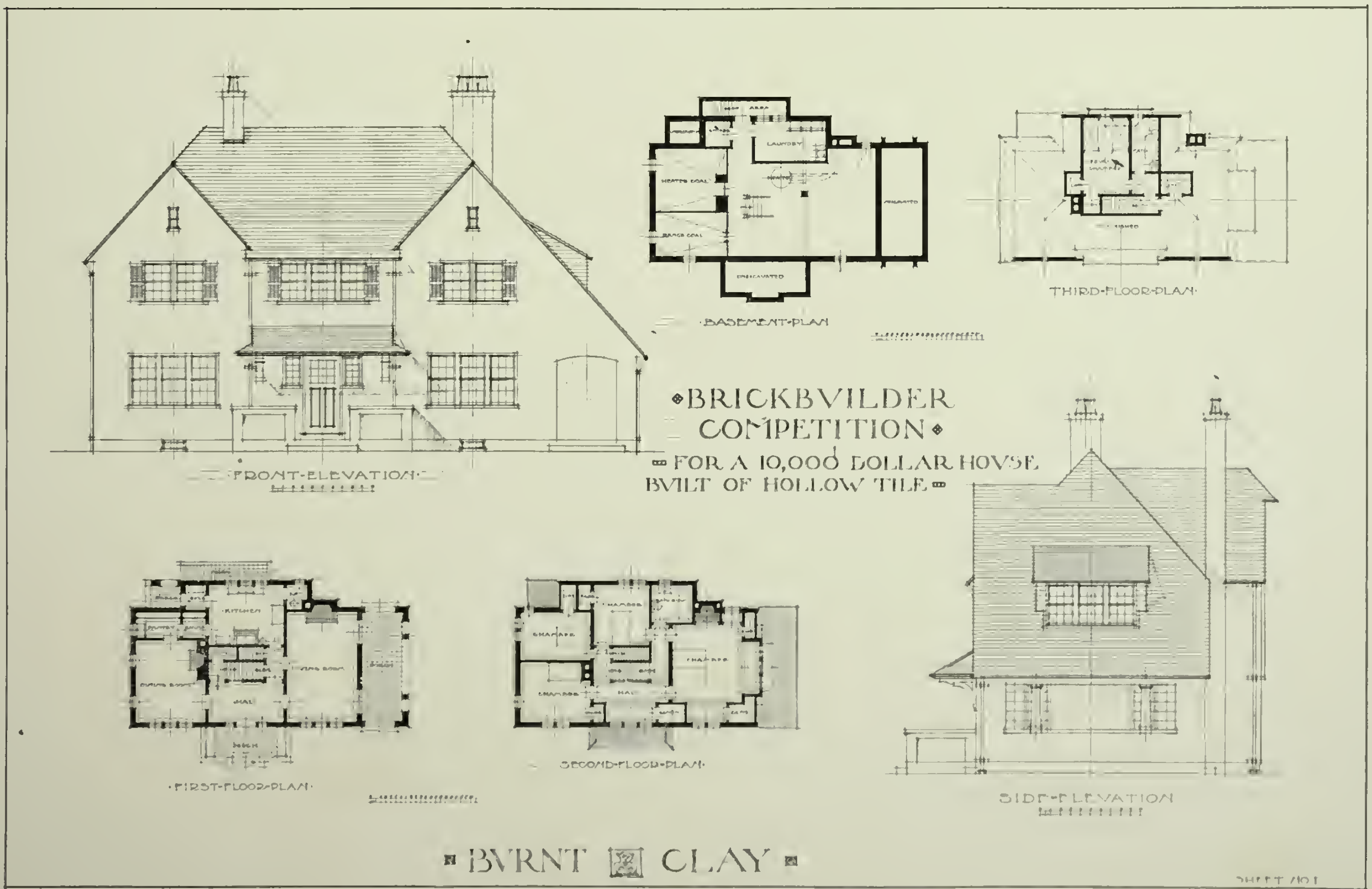
·ENTRANCE·HALL·PLAN·



·SECOND·FLOOR·PLAN·

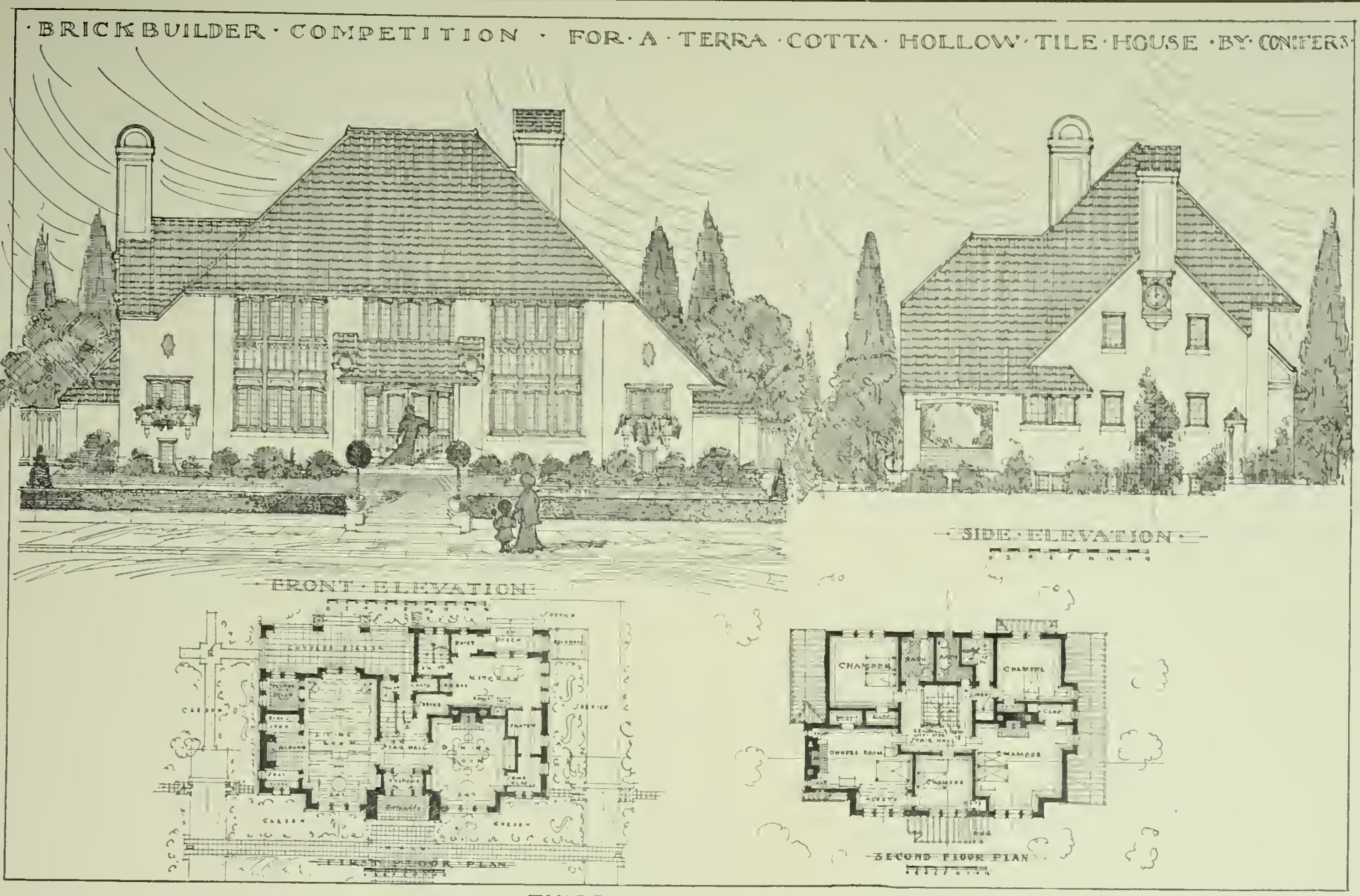


FIRST MENTION DESIGN.
SUBMITTED BY FREDERICK G. FROST, NEW YORK CITY.



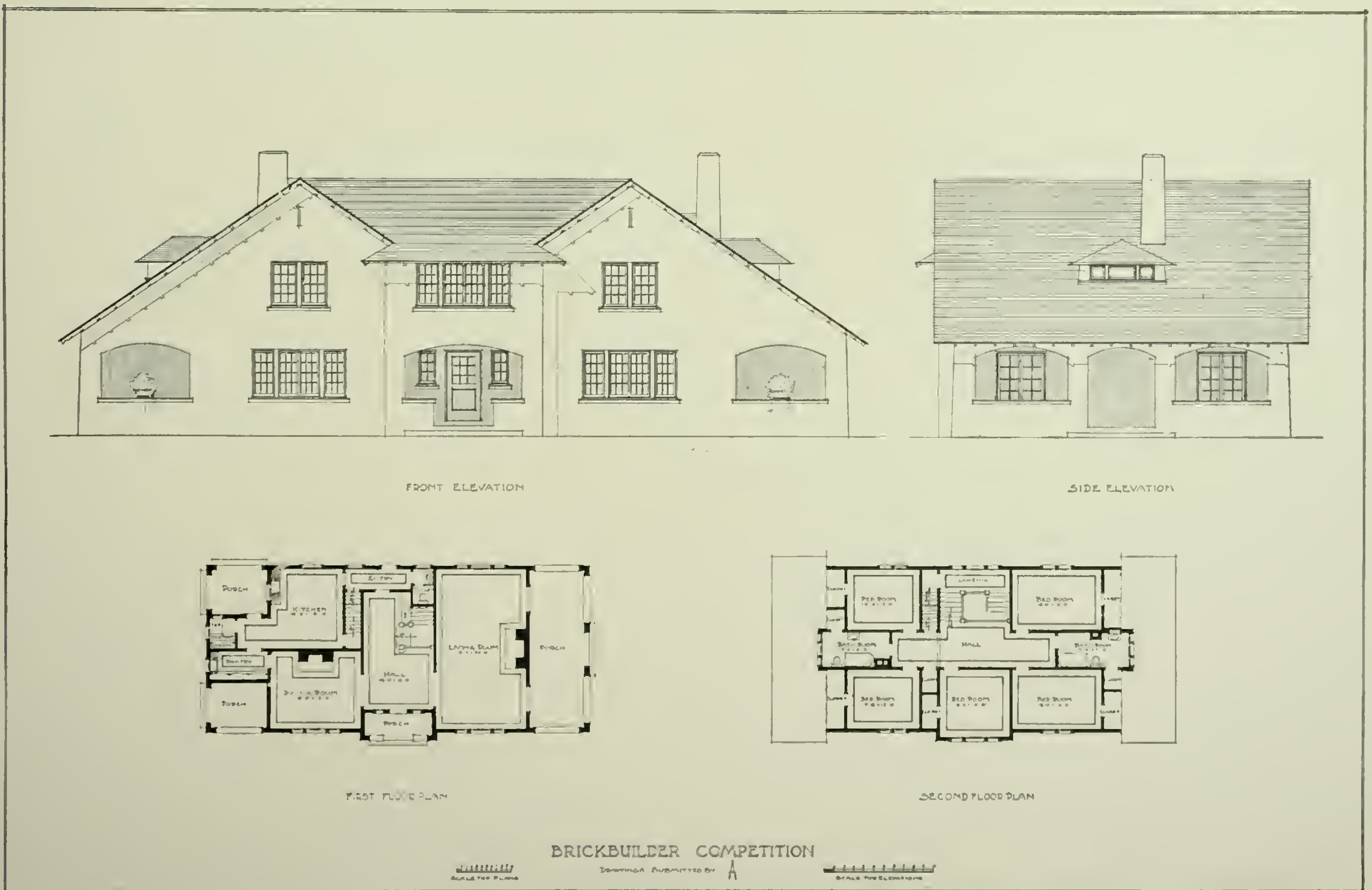
SECOND MENTION DESIGN.
SUBMITTED BY A. C HOWARD, WALLINGFORD, PA.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.



THIRD MENTION DESIGN.

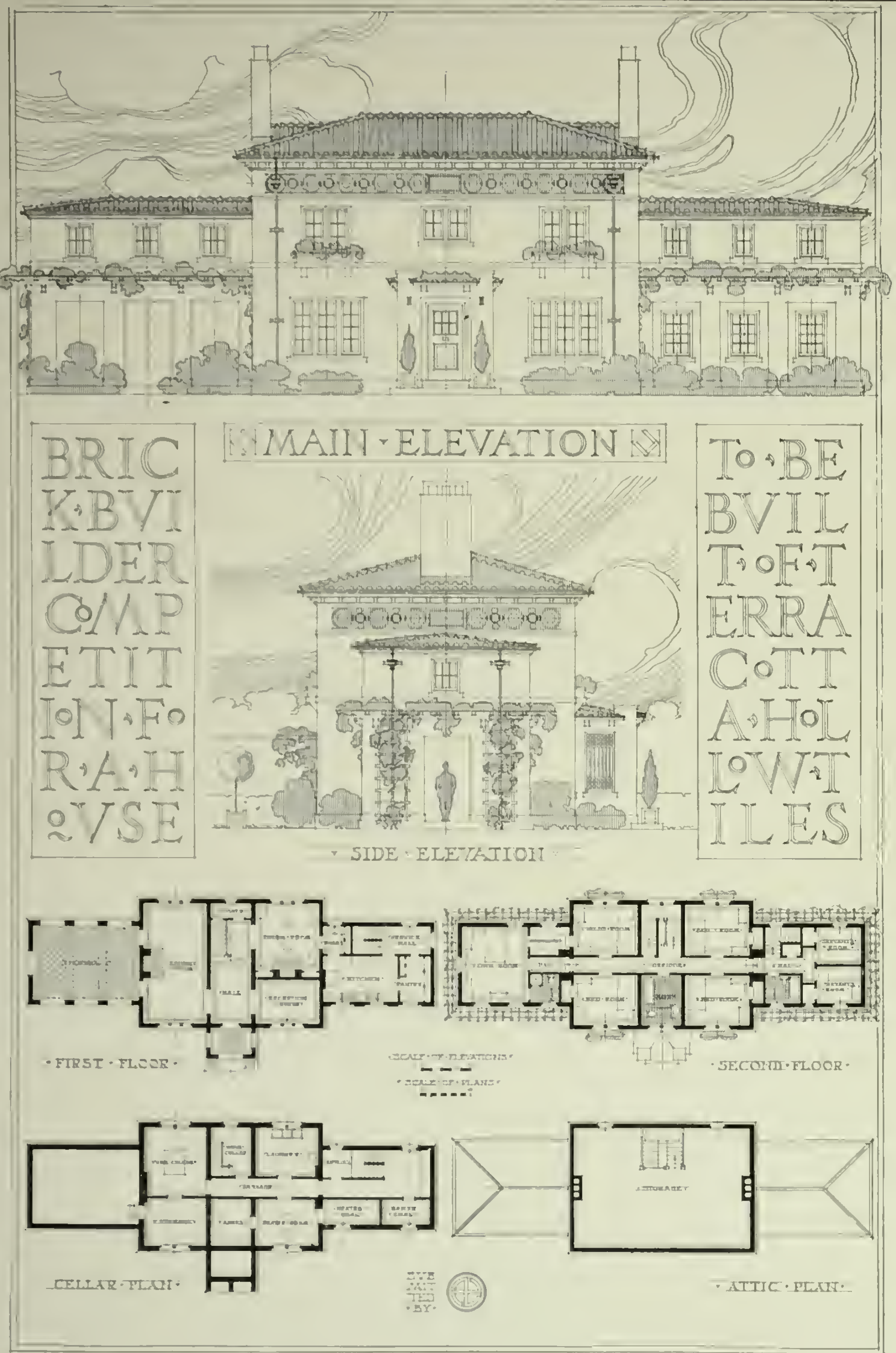
SUBMITTED BY HOMER KIESSLING, BOSTON, MASS.



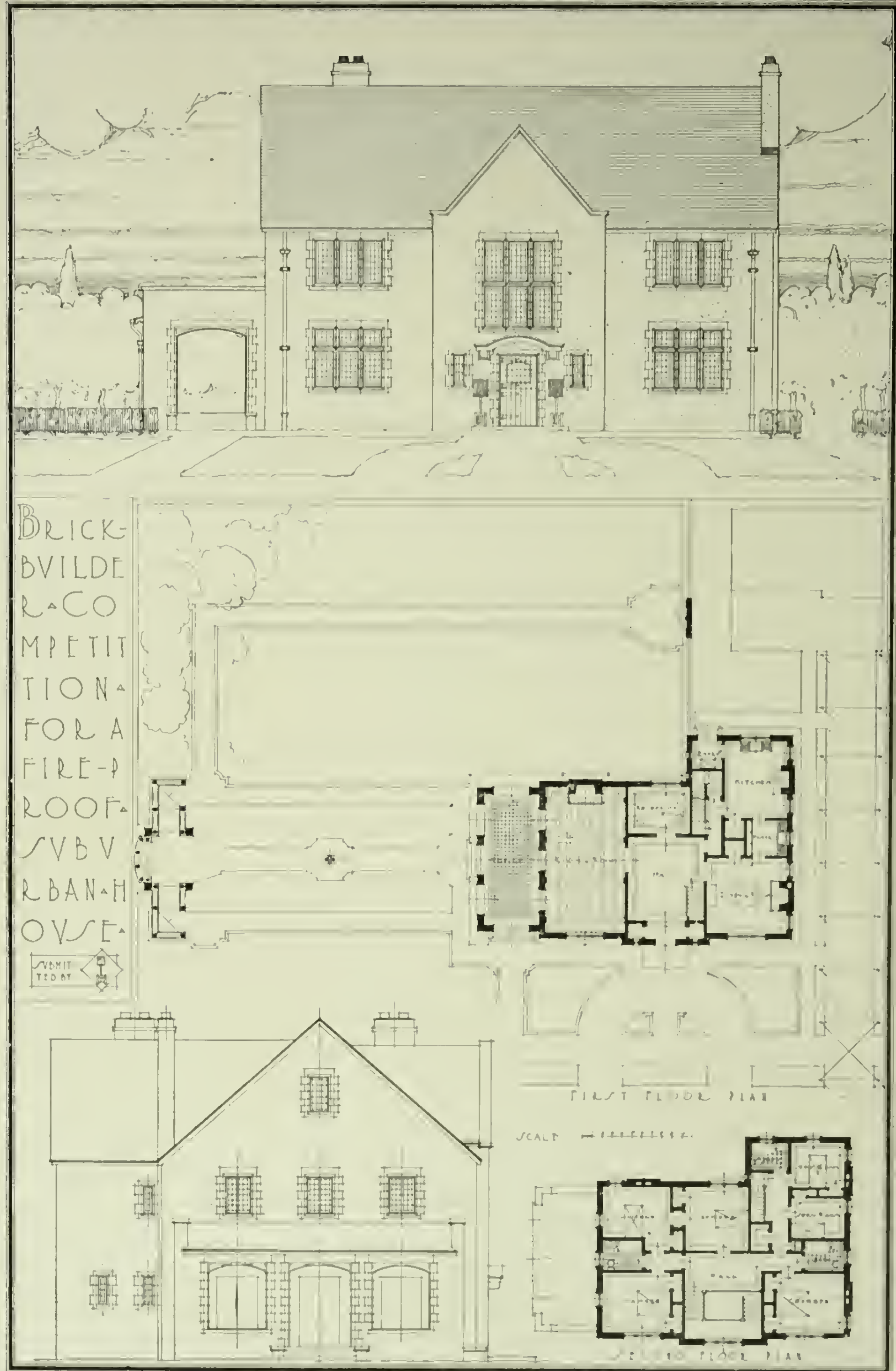
FOURTH MENTION DESIGN.

SUBMITTED BY E C GUTZWILLER AND H. W. BRUNNO, HAMILTON, OHIO.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.



FIFTH MENTION DESIGN.
SUBMITTED BY J. MARTIN BROWN, NEW YORK CITY.



SIXTH MENTION DESIGN.
SUBMITTED BY R. E. MONSON AND C. R. NEWKIRK, NEW YORK CITY

THE BRICKBUILDER COMPETITION FOR A HOUSE
TO BE BUILT OF TERRA COTTA HOLLOW TILES.

Competition for a House to be Built of Terra Cotta Hollow Tiles.

ESTIMATES OF COSTS FOR THOSE DESIGNS WHICH ARE ILLUSTRATED IN THIS ISSUE.

FIRST PRIZE DESIGN

SUBMITTED BY A. H. HEPBURN.

Estimate of Cost.

Excavating	$120.00
Concrete footings; terra cotta block walls and partitions; floors of terra cotta block and concrete beams; outside walls stuccoed; labor, etc.	3,300.00
Terraces, garden walls, etc.	150.00
Concrete cellar floor	125.00
Chimneys	350.00
Roof (frame—shingled)	765.00
Inside plastering	395.00
Inside and outside finish	1,400.00
Doors, windows, and blinds	1,200.00
Finished floors	275.00
Painting	400.00
Heating	250.00
Plumbing	700.00
Electric wiring	150.00
Cutting and jobbing	120.00
Total	$10,000.00

Description.

Footings		Concrete
Basement walls	12 in. by 12 in. by 30 in.	Vitreous conduits
Outside walls	8 in. by 12 in. by 12 in.	Terra cotta block
Inside partitions	4 in. by 12 in. by 12 in.	Terra cotta block

Floors terra cotta block and concrete beams; finished wood floor laid on felt; concrete basement floor; outside stuccoed; inside plastered; white trim.

SECOND PRIZE DESIGN.

SUBMITTED BY WILLIAM G. HOLFORD.

Size of house, 31 ft. 0 ins. by 47 ft. 0 ins. Height, measured from basement floor to half way up the pitch of the roof, 31 ft. 6 ins.; cubical contents 45,895 cu. ft., which at a total cost of $10,000 gives a working allowance of 21¾ cents per cubic foot, which experience proves is sufficient to cover the cost of a house of this type.

Estimate of Cost.

Excavating, brick, and concrete work	$1,000.00
Finished fireplaces, cement floors on porches	250.00
Terra cotta blocks, floors, and walls	2,450.00
Lumber and shingles	700.00
Inside and outside finish and stairs	650.00
Tin work, gutters, and conductors	200.00
Windows, doors, frames, blinds, etc.	300.00
Rough and finished hardware, flashing, building, paper, etc.	145.00
Electric wiring, heating, and plumbing	1,500.00
Inside and outside plastering	705.00
Staging for outside plastering	50.00
Carpenter labor, mason	1,050.00
Inside and outside painting	420.00
Floors	500.00
Miscellaneous, teaming, etc.	80.00
Total	$10,000.00

THIRD PRIZE DESIGN.

SUBMITTED BY FREDERICK JOSHUA MESEKE AND ALFRED G. WHEELER.

The cost of the hollow tile in this building is based on information given on a piece of work in New Jersey, 17 miles from New York.

Area first floor	1,470 sq. ft.
Area second floor	1,290 sq. ft.
Total floor area	2,760 sq. ft.
Cubical contents from one third cellar height to middle of roof	37,428 cu. ft.
Mean perimeter of house	184 ft.
Cost per cubic foot	24.45 cents

Height of Stories in Clear.

Cellar	6 ft. 9 ins.
First floor	9 ft. 3 ins.
Second floor	8 ft. 6 ins.
Area of terrace (not included in house)	286 sq. ft.
Number of windows	39
Number of doors	27

Estimate of Cost.

Excavating	$125.00
Hollow tile construction and floors, including erecting, hauling, etc.	1,615.00
Concrete work (floors, etc.) stone steps	385.00
Roof tile	630.00
Carpentry — inside and outside finish and stairs	198.00
Windows, doors, and blinds	900.00
Rough lumber	210.00
Painting and glazing	325.00
Hardware, bells, iron work, tin work, best quality	260.00
Heating, two pipe system	550.00
Kitchen heater, boiler, etc.	110.00
Wiring	175.00
Gas piping, fixtures, etc.	350.00
Brick work in mantels, hearths, and flue lining	120.00
Plastering (interior and exterior)	850.25
Plumbing and sewerage	675.00
Scaffolding and sundries	75.00
Wood flooring	375.00
Waterproofing foundations, cellar, and first floor	394.00
Total	$8,322.25
Contractor's profit ten per cent	832.23
Total cost of house	$9,154.48

FIRST MENTION DESIGN.

SUBMITTED BY FREDERICK G. FROST.

Estimate of Cost.

Excavation	$180.00
Masonry	4,360.00
Concrete and stucco work	550.00
Plumbing	1,000.00
Carpentry	1,025.00
Trim	1,800.00
Painting, etc.	325.00
Hardware	250.00
Roofing and metal work	200.00
Wiring	275.00
Total	$9,965.00

SECOND MENTION DESIGN.

SUBMITTED BY A. C. HOWARD.

Estimate of Cost.

Excavations	$138.00
Basement walls, stone	632.00
Basement floor, cement	170.00
First, second, and third floors, concrete and terra cotta at 10c.	1,596.00
Outside walls, 10 in. hollow tile at 23c	615.00
Plastering outside walls	450.00
Hollow tile partitions, 6 in. at 17c., 3 in. at 12c.	425.00
Inside plastering	635.00
Tile floors, porches, terrace, bath	300.00
Fireplaces	125.00
Flooring and sleepers	250.00
Roof framing, sheathing, and shingles	600.00
Flashings, gutters, tin work, conductors	150.00
Carpenter work	1,200.00
Hardware	175.00
Mill work	500.00
Mantels	125.00
Painting and Glazing	300.00
Plumbing	700.00
Heating	750.00
Electric wiring	125.00
Miscellaneous	39.00
Total	$10,000.00

THIRD MENTION DESIGN.

SUBMITTED BY HOMER KIESSLING.

Estimate of Cost.

Excavation	$195.00
Basement floor	175.00
First, second, and third floors	983.00
Outside walls	1,666.50
Inside walls	622.50
Terraces (tiling)	150.00
Plastering outside	480.00
Plastering inside	438.00
Mill work and wood finish	2,040.00
Painting and glazing	475.00
Plumbing	900.00
Hardware	150.00
Fixtures	130.00
Electric wiring	145.00
Heating (hot water)	650.00
Plastic slate and roofing tiles	150.00
Roof framing	250.00
Extras, odd jobbing	100.00
Total	$10,000.00

FOURTH MENTION DESIGN.

SUBMITTED BY E. C. GUTZWILLER AND H. W. BRUNNO.

Estimate of Cost.

Excavating	$124.00
Concrete footings and cement work	232.00
Terra cotta tile floors	1,306.00
Outside terra cotta walls	1,153.00
Inside terra cotta walls	810.00
Interior plastering	519.00
Exterior stucco	338.00
Carpenter work	2,650.00
Painting and glazing	278.00
Plumbing and gas fitting	850.00
Hardware	100.00
Electric wiring	250.00
Steam heating	660.00
Roofing and metal work	516.00
Total	$9,916.00

FIFTH MENTION DESIGN.

SUBMITTED BY J. MARTIN BROWN

Estimate of Cost

Excavating and grading, at 33c. per cu. yd.	$600.00
Cost of tile at factory	1,217.20
Shipping, at 80c. per ton	150.40
Cement, reinforcing, and mason work	917.00
Mill work, including all wood work except floors	1,000.50
Tile roof, at $35.00 per square	550.00
Exterior stucco, at 15c. per sq. ft.	720.00
Floors, at 20c. per sq. ft.	550.00
Painting	350.00
Plumbing	1,700.00
Heating (hot air)	450.00

Lighting (electric)	$260.00
Hardware	350.00
Sundries	150.00
Plastering, at 35c. per sq. yd.	315.00
Total	$9,310.10

SIXTH MENTION DESIGN.

Submitted by R. E. Monson and C. R. Newkirk.

The cost to build this design in the vicinity of New York City it is estimated would come within the proposed limit of $10,000 and is based on information and data derived from recent work of this character where the cost has been from 18 to 20 cents per cubic foot.

Estimate of Cost.

Excavating	$150.00
Concrete footing and cellar floor	190.00
Structural terra cotta	4,225.00
Architectural terra cotta	450.00
Rough cast (outside walls) and plastering	720.00
Tile floors (bath rooms)	150.00
Metal work	60.00
Wood framing, sheathing, and shingles	650.00
Finish carpentry	1,360.00
Plumbing	900.00
Heating	775.00
Hardware, painting, and glazing	360.00
Total	$9,995.00

DESIGN SUBMITTED BY CLAUDE W. BEELMAN.

Estimate of Cost.

Bond	$50.00
Insurance	25.00
Permit	15.00
Excavation	175.85
Concrete and cement work	216.15
Tile walls and floor construction	3,000.00
Brick work	1,350.00
Carpenter and mill work	2,265.75
Tile floors and wainscoting	335.00
Plastering	451.00
Steel lintels	20.55
Terra cotta coping	105.00
Furnace	350.00
Finish hardware	150.00
Rough hardware	50.00
Paint and glass	417.00
Tin and galvanized iron	126.75
Plumbing	575 00
Wiring	150.00
Grading	65.00
Cement walks	51.30
Range	45.00
Total	$9,989.35

DESIGN SUBMITTED BY RUSSELL EASON HART.

This estimate is based on the current prices of the materials and labor, and the author believes that they are very nearly correct. Estimating by cubage the size of the house would allow about 20 cents per cubic foot. Basement under part of house sufficient to accommodate heating and coal storage.

Estimate of Cost.

Excavating	$100.00
Cement floor in basement	75.00
Terra cotta blocks for walls, partitions, and floors laid up	3,600.00
Stucco for second story walls	150.00
Roof, including shingle tiles, framing, etc	650.00
Porches and pergola	850.00
Interior finish carpentry, plastering, etc.	2,150.00
Plumbing	600.00
Hardware, painting, and glazing	250.00
Heating	450.00
Wiring and fixtures	200.00
Metal work for flashing leaders, etc	75.00
Architectural terra cotta	450.00
Incidentals	350.00
Total	$9,950.00

DESIGN SUBMITTED BY FRED B. O'CONNOR.

Estimate of Cost.

Excavation, concrete footings, terra cotta blocks, cellar floor, basement windows, coal bin, all cellar walls, and piazza piers	$510.00
Outside walls, stucco, plastered, and fireplaces	3,700.00
Floor construction	520.00
Roof construction — shingle tile on blocks and tees	1,900.00
All carpenter work above foundation	1,650.00
Painting and hardware	300.00
Heating	550.00
Plumbing	670.00
Lighting and fixtures	200.00
	$10,000.00
Deduction for wood framing instead of steel for roof	200 00
Total	$9,800.00

DESIGN SUBMITTED BY WILLIAM F. THOMPSON.

Estimate of Cost.

Excavating	$175.00
Foundation walls and footings	300.00
Chimneys and fireplaces	350.00
Cementing of cellar	75.00
Plastering, interior	450.00
Terra cotta walls	1,500.00
Plastering, exterior	300.00
Rough lumber	1,100.00
Mill work and stairs	1,500.00
Rough and finished hardware	350.00
Glazing	$150.00
Carpenter's labor	1 300.00
Painting	375.00
Plumbing	800.00
Heating	600.00
Electric wiring and fixtures	500.00
Metal leaders and gutters	175.00
Total	$10,000.00

DESIGN SUBMITTED BY ARTHUR H. BEHR AND ROBERT C. WINTER.

Estimate of Cost.

Excavation	$80.00
Foundations, brick work	250.00
Hollow tile wall construction	2,330.00
Johnson floor construction	1,240.00
Book-tile partition work	750.00
Ornamental terra cotta	660.00
Cement	210.00
Cellar paving	110.00
Iron work	215.00
Lumber and carpentry	455.00
Mill work	285.00
Flooring	140.00
Plastering and stucco work	390.00
Cut-stone, front steps	60.00
Roofing tile	725.00
Flue lining	35.00
Copper work	170.00
Stair work	115.00
Plumbing	455.00
Gas piping	35.00
Electric wiring	40.00
Hot air heating	380.00
Painting	150.00
Glazing	40.00
Fireplaces	320.00
Faience tiling	60.00
Bath and porch floor tile	75.00
Lighting fixtures	145.00
Hardware	80.00
Total	$10,000.00

DESIGN SUBMITTED BY ROBERT H. WAMBOLT.

Foundation of vitrified conduits. Concrete footings and basement floor. Porch and piazza paved with brick. First, second, and third floors of terra cotta tile and reinforced concrete. Roof framing of wood. Red tile roof. Walls, both exterior and interior, of terra cotta tile plastered. Exterior stuccoed — color, pink. All exterior wood work painted white. Iron work painted black.

Estimate of Cost.

Excavating	$100.00
Concrete floor and footings	200.00
Brick work	450.00
Tile work, fireplaces, etc.	200.00
Terra cotta and labor	3,200.00
Exterior plastering	400.00
Interior plastering	450.00
Tile roof	400.00
Framing	700.00
Inside and outside finish	1,150.00
Doors, windows, etc.	900.00
Finish floors	250.00
Cutting and jobbing	100.00
Heating	200.00
Plumbing	700.00
Electric wiring	150.00
Painting	250.00
Ornamental iron	200.00
Total	$10,000.00

DESIGN SUBMITTED BY FERNEKES & CRAMER.

Estimate of Cost.

Excavating	$150.00
Tile masonry, cement, and concrete work	4,600.00
Outside and inside plaster	500.00
Carpenter work	2,020.00
Painting and glazing	600.00
Tin work	80.00
Heating	600.00
Electric work	200.00
Tile floors	263 00
Plumbing	600.00
Incidentals	387.00
Total	$10,000.00

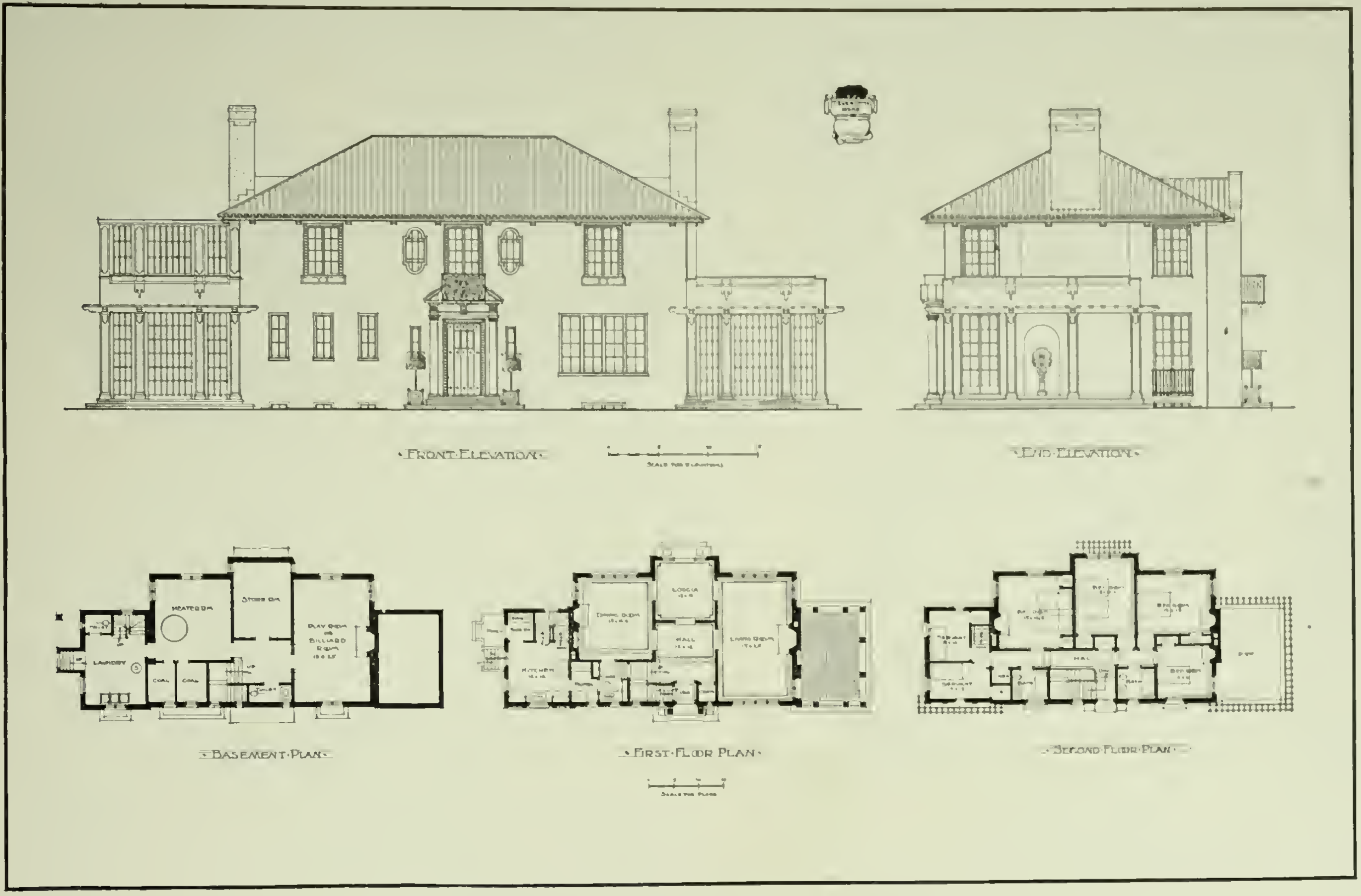
DESIGN SUBMITTED BY FRANK LE BARON AURELIO AND CHARLES FRANK GIFFORD.

Estimate of Cost.

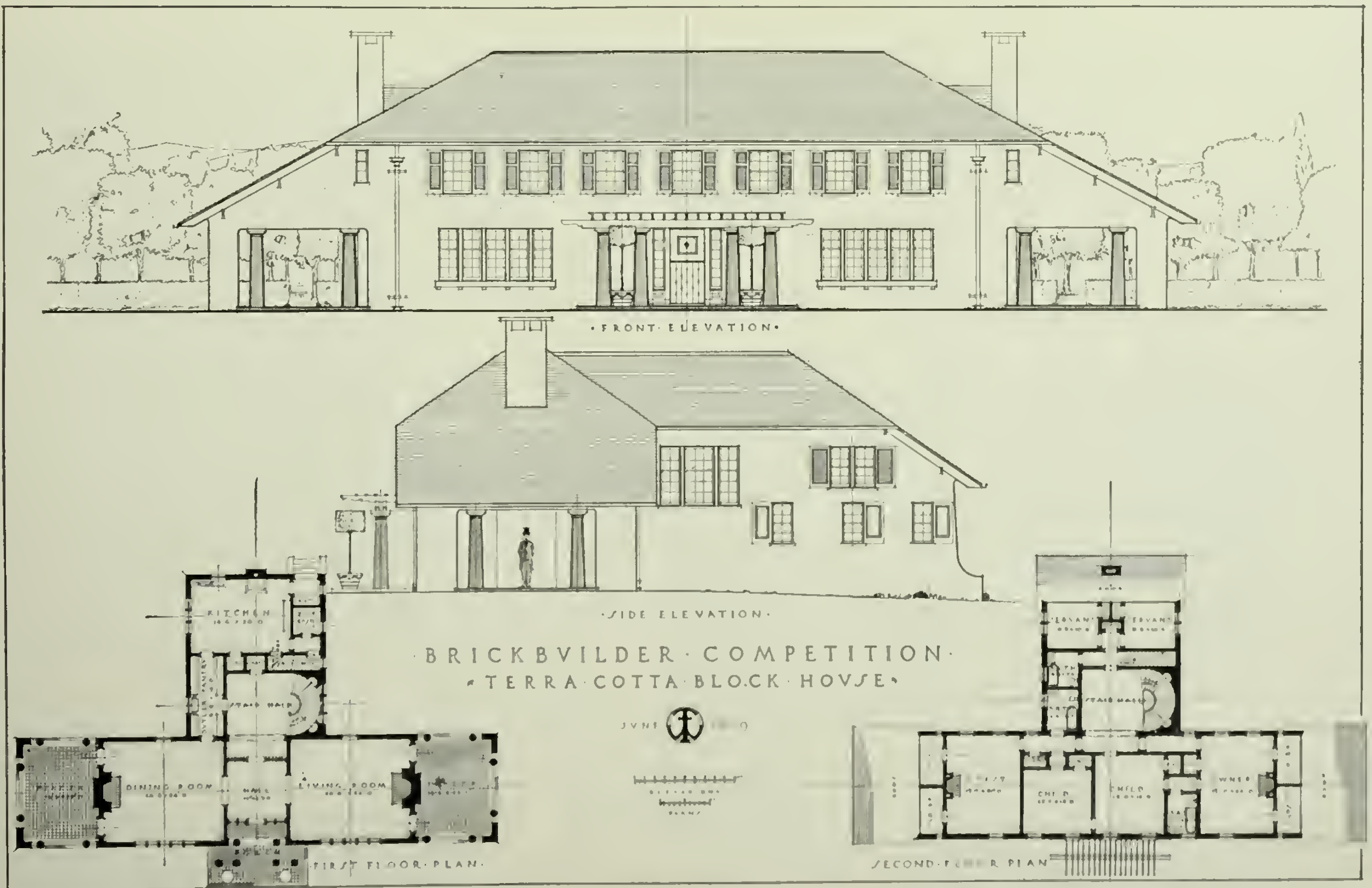
Excavation	$75.00
Masonry	5,850.00
Plastering (interior)	285.00
Carpenter work	1,525.00
Tile, roof	486.00
,, floors and wainscot	125.00
,, Moravian	65.00
Painting and glazing	375.00
Plumbing and heating	835.00
Electric work	65.00
Hardware	110.00
Sheet metal work	85.00
Incidentals	100.00
Total	$9,981.00

Cubic contents, 40,950 cu. ft.

Estimate from similar executed work — 24 cents per cubic foot... $9,828.00

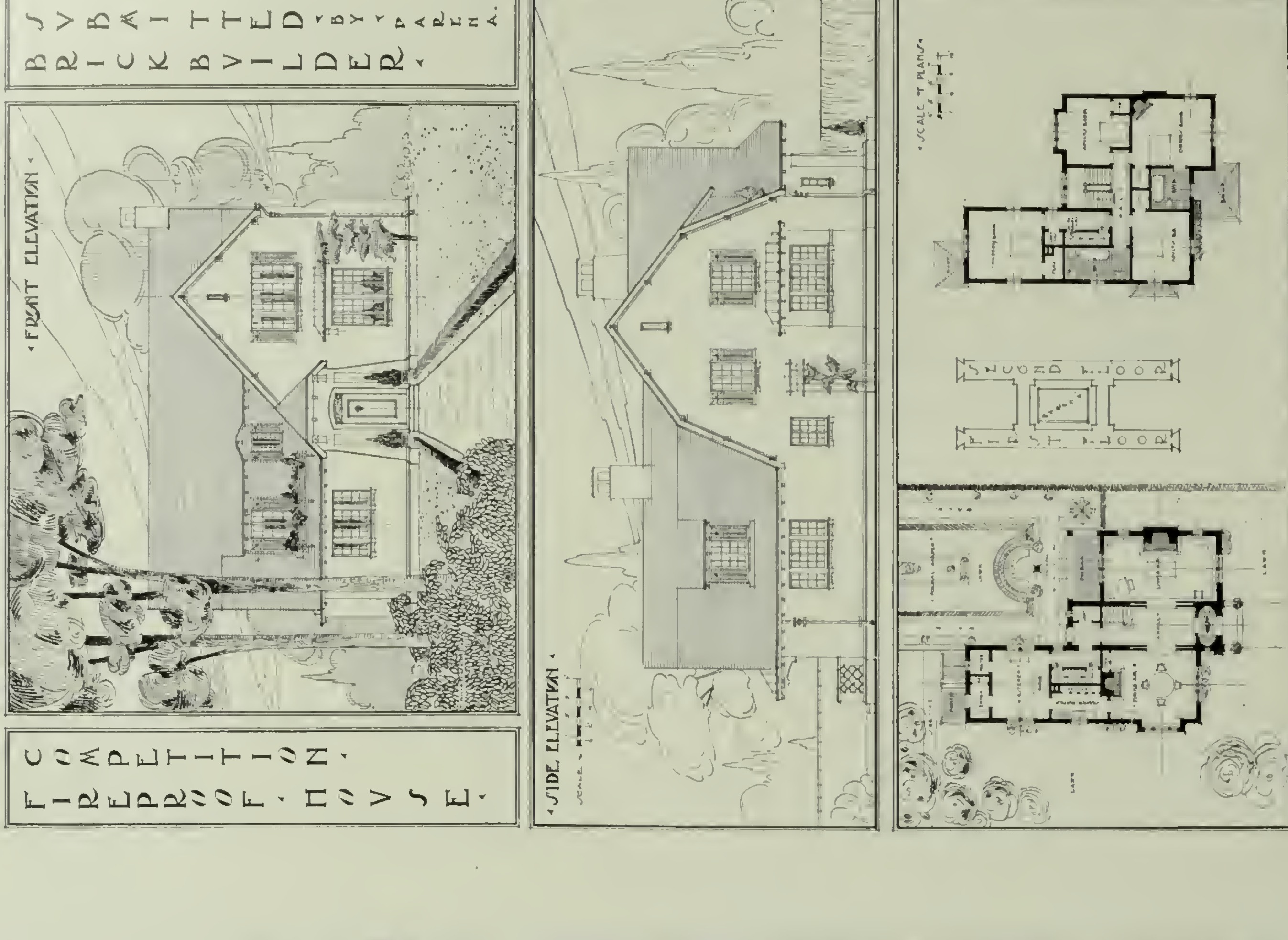


SUBMITTED BY ROBERT H. WAMBOLT, BOSTON, MASS.

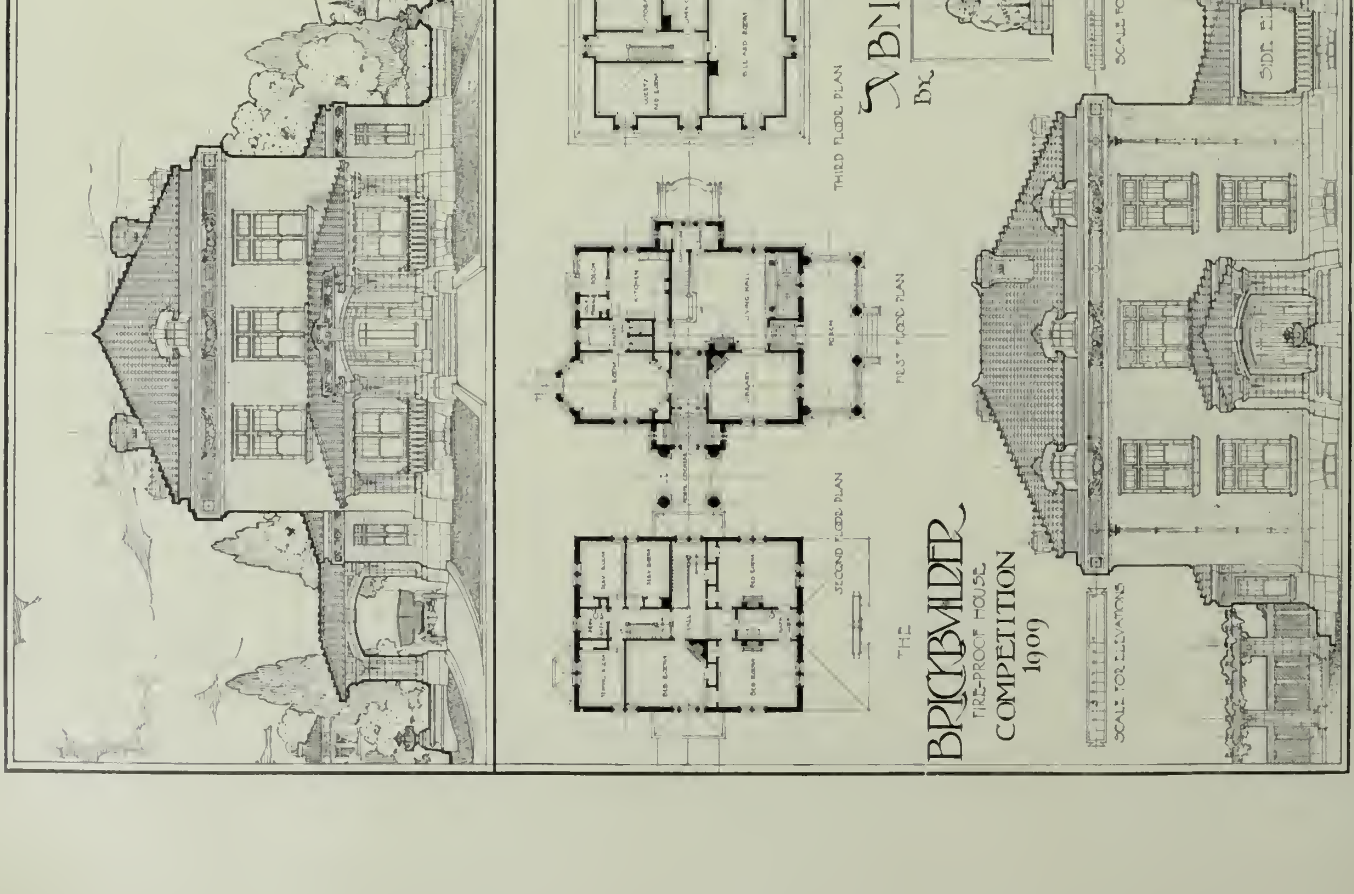


SUBMITTED BY WILLIAM F. THOMPSON, NEW YORK CITY.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

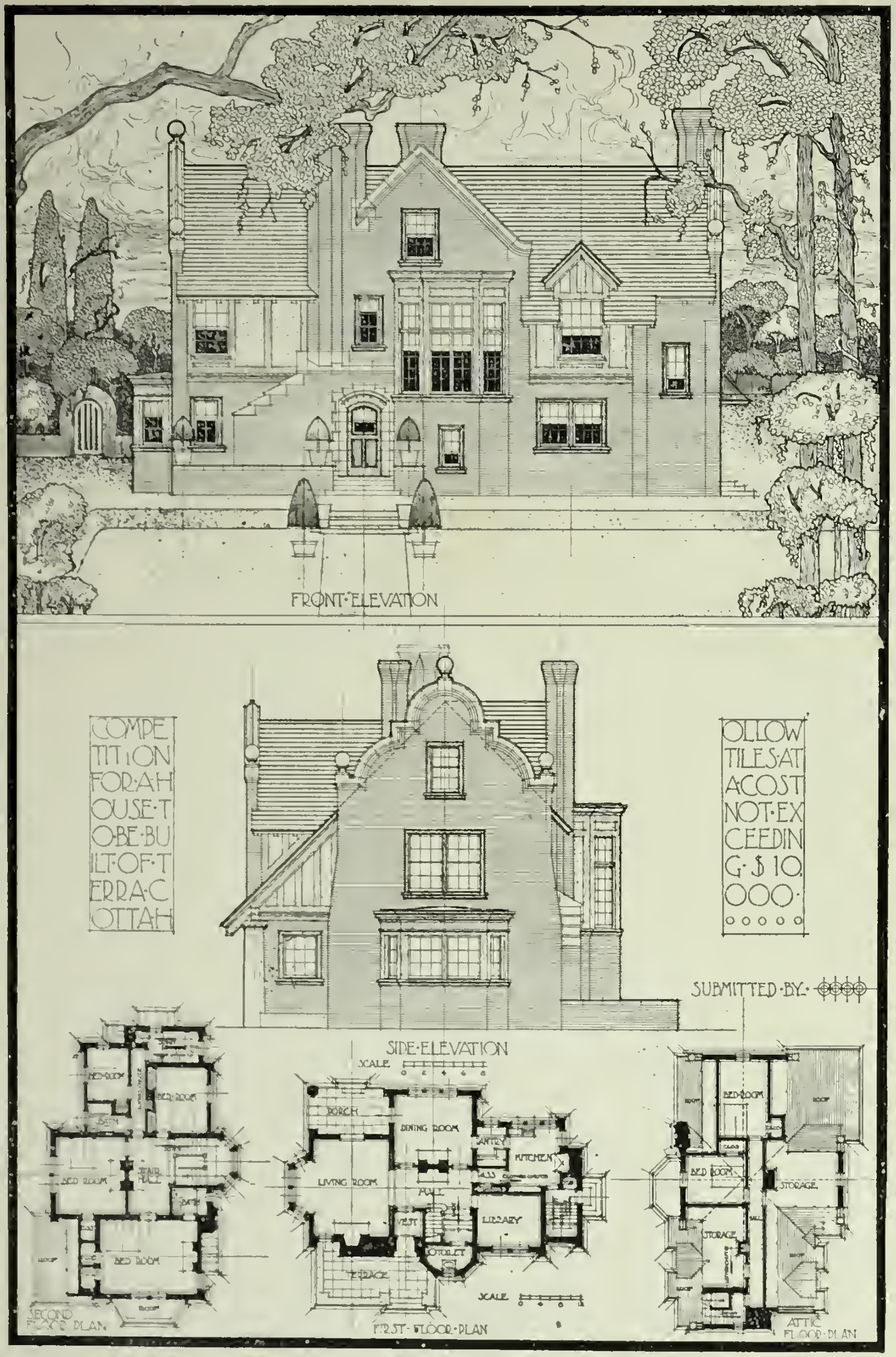


SUBMITTED BY FRED B. O'CONNOR, ALBANY, N. Y.

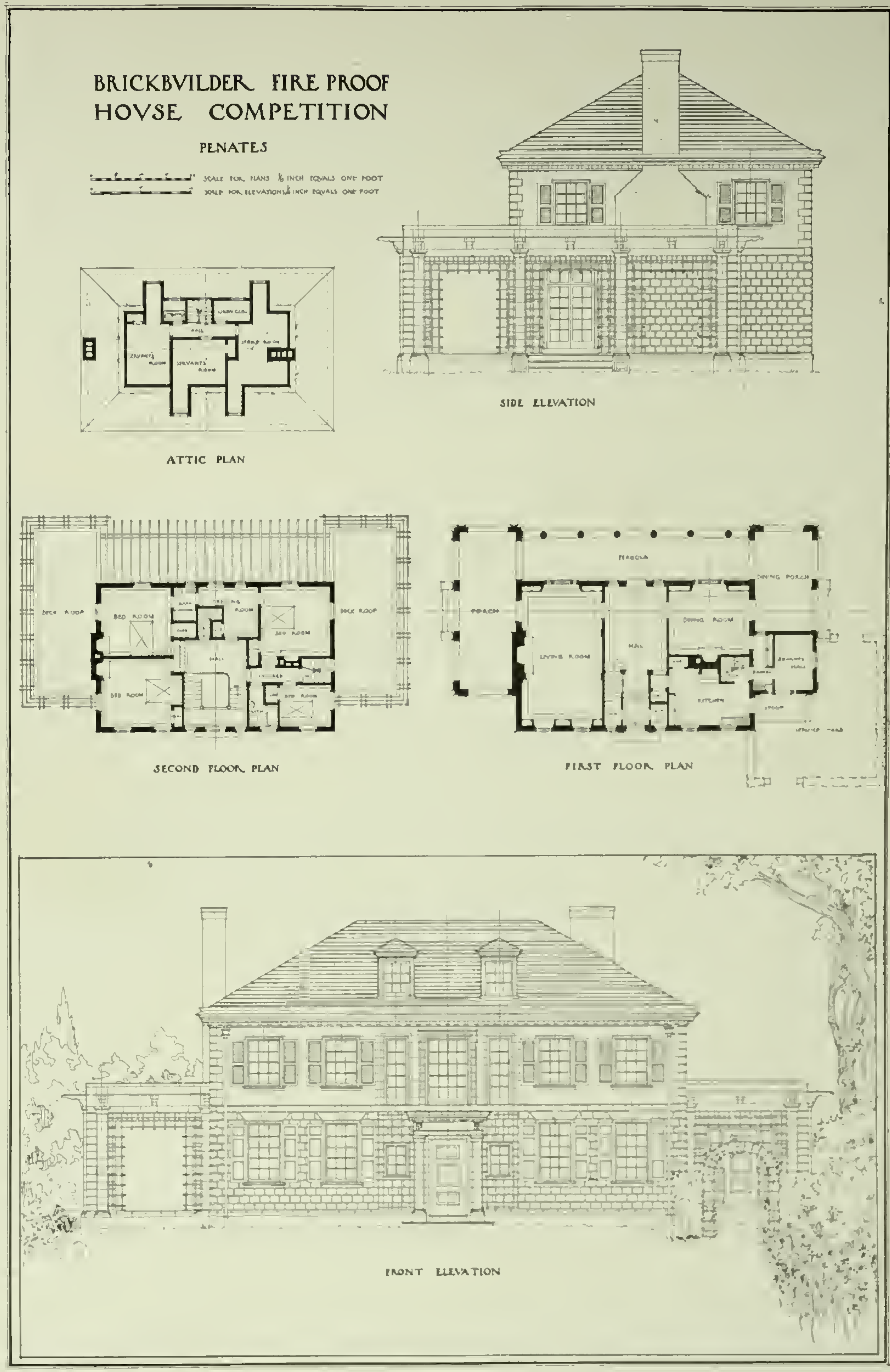


SUBMITTED BY ARTHUR H. BEHR AND ROBERT C. WINTER, PHILADELPHIA, PA.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

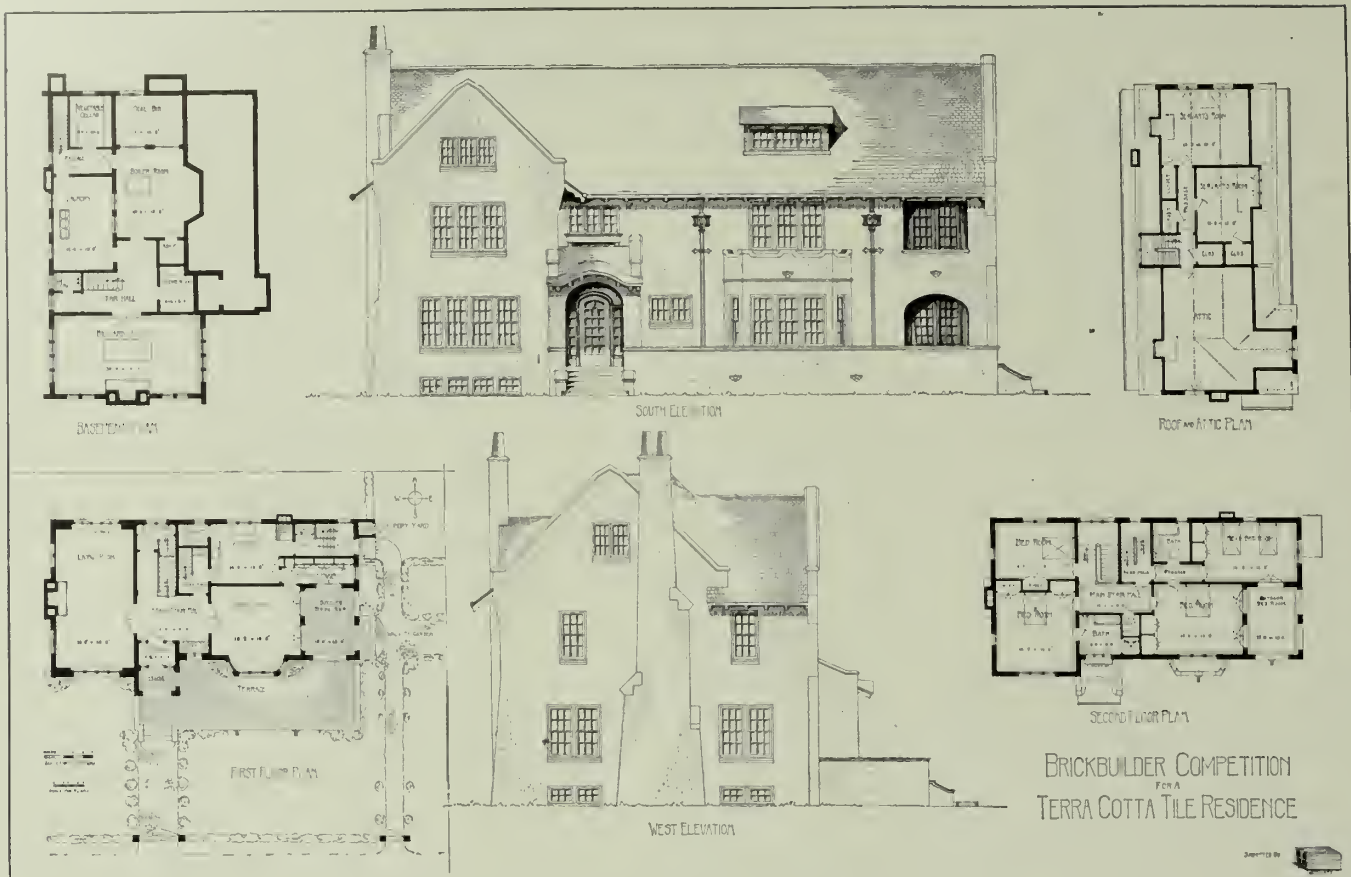


SUBMITTED BY CLAUDE W. BEELMAN, INDIANAPOLIS, IND.

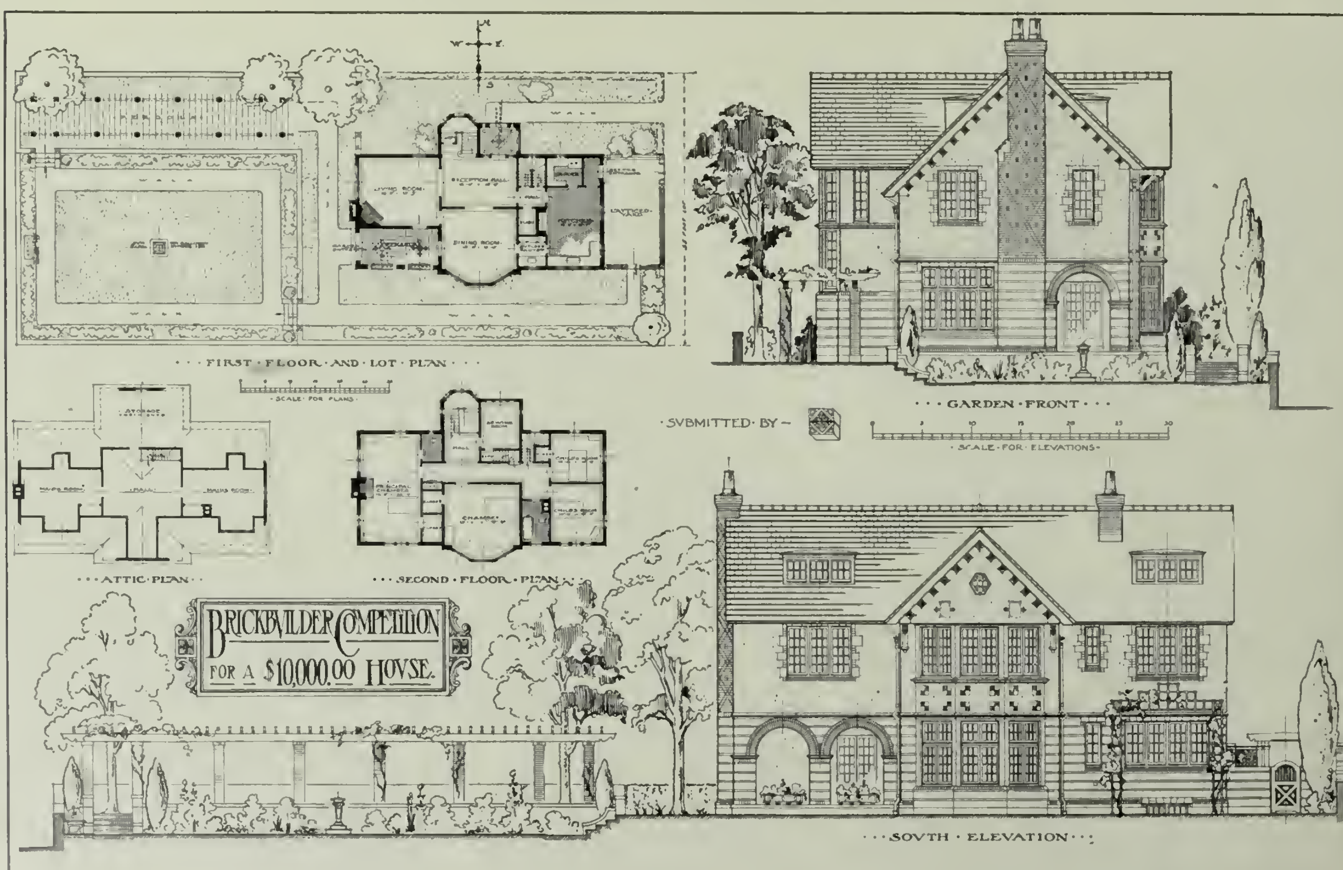


SUBMITTED BY RUSSELL EASON HART, NEW YORK CITY.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.



SUBMITTED BY FERNEKES & CRAMER, MILWAUKEE, WIS.



SUBMITTED BY FRANK LE BARON AURELIO AND CHARLES FRANK GIFFORD, HARTFORD, CONN.

THE BRICKBUILDER COMPETITION FOR A HOUSE TO BE BUILT OF TERRA COTTA HOLLOW TILES.

Editorial Comment and Miscellany.

PAVILION FOR THE PHILADELPHIA AMERICAN BASE BALL CLUB.

THE park contains about 250,000 square feet, or approximately 6 acres. The distance from the home plate to the flag pole in deep center field is 515 feet. Spectators leave the grounds through three 12, three 16, and two 18 foot gates, in the addition to six large exits under the grand stand. The seating capacity of the grounds is 23,000. Of this number 10,000 may be accommodated in the grand stand, and 13,000 in the field bleachers. There are no columns or posts to obstruct a view of the entire field — in fact all the seats in the pavilion and bleachers are so arranged that a clear view may be had of the entire field. The outer edges of the field have been banked so that spectators standing in rows one above the other have a clear view of the field. A garage has been built under the right field bleachers which will accommodate 200 cars, and another under the left field bleachers which will accommodate as many more. Steel folding chairs are used in the pavilion. The players' quarters contain reception and lounging rooms, locker room, and shower baths, in addition to toilet rooms.

FOUNTAIN ON GROUNDS OF W. GOULD BROKAW, GREAT NECK, L. I.
Modeled by R. Hinton Perry. Executed in cream white glaze terra cotta, by Atlantic Terra Cotta Company.

THE city planning conference at Washington, which enlisted the names of, and was honored by the presence of some of the most eminent men in the country, had for its chief ends the housing of city populations, the wiping out of slums, the making of city life wholesome and fairly livable to the poor man. It declared for the provision of air, light, and space at whatever cost to the community as a safeguard against disease and crime which would later require a yet greater outlay to eradicate. It dwelt less with the esthetic aspect of city planning than with the practical and everyday needs of the life of the masses; or as Secretary MacVeagh expressed it: "City planning in general should be directed less along the lines of providing automobile driveways and bridle-paths in the outskirts and more to the cleaning up of the congested centers of population, where disease and vice and crime breed."

DETAIL BY NELSON & VAN WAGENEN, ARCHITECTS.
South Amboy Terra Cotta Company, Makers.

AT THE annual meeting of the National Board of Fire Underwriters held in New York last month the president of the association, Mr. J. Montgomery Hare, said he could see no indication of any permanent reduction of fire losses in this country. Since 1880 population has increased seventy-three per cent while the annual fire loss has increased one hundred and forty-three per cent. After stating that we lead in the world in the destruction of property by fire he remarked: "Questions of construction explain a part of the difference, and climatic conditions may play their part, but when everything is considered I believe that the conclusion will follow that the main reason is recklessness here, as against the care, forethought, and wise supervision in Europe."

THE commission authorized by the last session of Congress to obtain plans for a proposed memorial amphitheater to be erected in the National Cemetery at Arlington, Va., has made its report. A firm of New York architects has prepared a design for a roofless structure covering 34,000 square feet, seating about 5,000 people, and affording standing room in a surrounding colonnade for many more. A feature

DETAIL BY ANDREW SANDEGREN, ARCHITECT.
Northwestern Terra Cotta Company, Makers.

of the plan is a crypt for the burial of distinguished men, and provision is also made for memorial busts or portrait statues. The ultimate cost is placed at $695,000. The commission is composed of President Taft (while Secretary of War), Secretary Cortelyou, Eliot Woods, I. G. Kimball, and Ex-Governor Curtis Guild.

PANEL BY EDWARD L. TILTON, ARCHITECT.
Made by Atlantic Terra Cotta Company.

The only structures exceeding it in height are the two life insurance towers in New York and the Eiffel Tower in Paris.

ALLAN ROBINSON, president of the Allied Real Interests of New York has criticized the proposed new building code as increasing the cost of future construction by the following requirements: Limiting the spacing of beams and employing additional tie rods, increasing the floor loads which may be placed in certain kinds of buildings, restricting the use of properly constructed cast-iron columns, requiring automatic sprinklers in all fireproof loft buildings, requiring standpipes of a kind owned by one interest, providing that all buildings six stories and higher must be equipped with auxiliary fire pumps, providing for one specific kind of paint for structural steel, the formula of which paint is owned by one interest, and the requiring of heavier wood joist and girders in houses of ordinary non-fireproof construction.

UPON May 8th ground was broken at Mount Nilson, near Pasadena, Cal., for the Carnegie Solar Observatory Company's telescope tower. There are to be two towers, in fact, one inside the other, with three inches clear space between them and being connected only at the base. The object of this is to prevent vibration. The dome will be 175 feet above the ground, and the cost of the tower will be $50,000.

THE Washington monument is soon to be eclipsed at the national capital. The navy department is planning to build in Rock Creek Park a 600 foot tower to serve as the keystone of what will probably be the greatest wireless telegraphy station in the world, as it will enable the navy department to converse with navy yards on the two American coasts, with ships anywhere in the North Atlantic and at Gibraltar. The tower will be 50 feet in diameter at the base and 8 feet in diameter at the summit.

THE Harveyized nickel steel vault installed in the new down-town building of the Knickerbocker Trust Company is said to be the first of its type ever constructed. It is 31 feet long and 23 feet deep and rests on a foundation independent of that of the building.

It is built of 3½ inch steel within a 2 foot wall of concrete. Two combination and one four-movement time locks control twenty-three 4 inch steel bolts which secure the 17 ton outside door. The 10 ton inner door is equally securely held. Hanging in front of the paying tellers at 60 Broadway and at 34th street and Fifth avenue are slates on which written messages are electrically transmitted and reproduced.

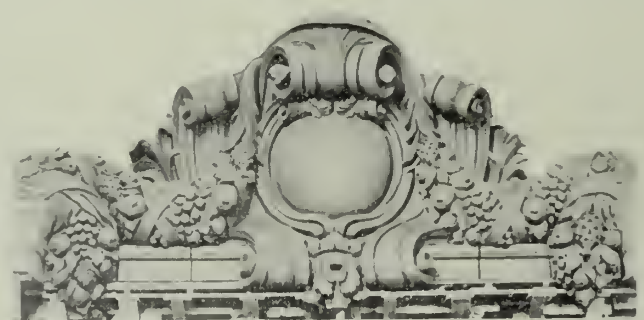
DETAIL BY MOORE & LANDSIEDEL, ARCHITECTS.
New Jersey Terra Cotta Company, Makers.

IN GENERAL.

President Taft has dissolved the National Fine Arts Council instituted by Theodore Roosevelt.

The real estate speculators in Philadelphia, who attempted to "hold up" Mr. Henry Phipps, have at last given title to the one parcel of land needed for the site of the proposed tuberculosis hospital in a congested portion of that city. The building, for which Mr. Grosvenor Atterbury is the architect, will now go forward without delay.

On May 28th the Governor's Room of the New York City Hall was reopened to the public after something like a year's labor had been spent on restoring it to conform to the style of the early days of the last century. The architect's drawings of the original building and documents in the possession of the McComb family were drawn upon, and the cost of the work, about $25,000, was defrayed by Mrs. Russell Sage.



DETAIL BY KNIGHT & COLLINS, ARCHITECTS.
Brick Terra Cotta and Tile Company, Makers.

The pleasant college town of Amherst, Mass., is soon to have its "Amherst Inn." One hundred thousand dollars is already in hand for it and Messrs. McKim, Mead & White have prepared the design.

Ludlow & Valentine have been appointed official architects for Stevens Institute of Technology, Hoboken, N. J., which has in contemplation extensive developments in the building line.

Mellen C. Greeley has opened an office for the practice of architecture in "The Baldwin," Jacksonville, Fla.

The Atelier conducted by Eli Benedict, architect, at 1947 Broadway, New York, will be open day and evening during the summer.

At the annual meeting of the Washington Architectural Club, held in June, the following officers were elected for the coming year: Percy C. Adams, president; Richard L. Watmough, first vice-president; B. C. Flournoy, second vice-president; Charles S. Salin, secretary; Daniel J. E. Lix, treasurer.

BUILDING FOR PACIFIC MUTUAL LIFE INSURANCE COMPANY, LOS ANGELES, CAL.
Exterior of Architectural Terra Cotta, made by Conkling-Armstrong Terra Cotta Company.
Parkinson & Bergstrom, Architects.

President Frost, of Berea College, has announced that the great industrial school for negroes will be established near Shelbyville, Ky. The erection of buildings will begin in a short time, there being a fund of $350,000 now available.

The American Embassy Association has been formed in New York for the purpose of aiding the provision of suitable residences for our ambassadors abroad. Twenty very prominent men comprise the executive committee.

F. H. Chapin has been made third vice-president of the Hydraulic Press Brick Company of St. Louis, and will succeed William H. Hunt as resident manager of the Hydraulic Company at Cleveland.

The bricks used in St. Catherine's Church, Somerville, Maginnis, Walsh & Sullivan, architects, illustrated in this number, were furnished by Fiske & Co., and the architectural terra cotta by the Atlantic Terra Cotta Company.

The Jewettville Pressed & Paving Brick Co. has purchased the plant of the Buffalo Clay Manufacturing Com-

UNION RAILWAY STATION, AUGUSTA, GA.
Built of Light Buff Brick, made by Columbus Brick Terra Cotta Company.
Frank P. Milburn, Archtiect.

pany, which is situated near their own plant at Jewettville, N.Y. The newly acquired plant is modern in its entire equipment, and of large capacity. This addition will enable the Jewettville Company to handle successfully large operations, which require their high grade red front impervious brick.

O. W. Ketcham supplied the brick for the pavilion for the American League Base Ball Club, Philadelphia, illustrated in this month's issue.

BORLAND BLOCK, CHICAGO.
Built of brick, made by Ohio Mining & Manufacturing Company, Thomas Moulding Company, Chicago Agents.
Shepley, Rutan & Coolidge, Architects.

The New Jersey Terra Cotta Company will supply the architectural terra cotta for the following new buildings: Columbia Theater and Office Building, New York City, W. H. McElfatrick, architect; Bank Building, Myrtle St., Brooklyn, L. Berger & Co., architects; two apartment buildings for Cathedral Realty Company, New York; apartment, Broadway and 64th St., New York, Buchanan & Fox, architects; hotel, Pittsburg, Pa., M. H. Dickinson, architect.

The terra cotta used in the Oliver Building, Pittsburg, illustrated in THE BRICKBUILDER for May was supplied by the Atlantic Terra Cotta Company, and not the Atlanta Terra Cotta Company, as stated.

NEW BOOKS.

The Organization, Construction and Management of Hospitals, with numerous plans and details, by Albert J. Ochsner, M.D., and Meyer J. Sturm, architect. Second edition revised and enlarged. Chicago, Cleveland Press.

Medieval Architecture: Its Origin and Development, with lists of monuments and bibliographies, by Arthur Kingsley Porter. This important work is now ready and is offered to subscribers. The first two volumes deal with the history of the origins of the Gothic architecture and its development in Normandy and the Ile de France, and are sold as a set. Price $15.00. There will also be a third volume which will be sold separately, and will treat of the Saxon, Norman, Early English, Geometric, Flowing, and Perpendicular styles of English architecture. This volume is in active preparation, and its publication will be announced later. Especial pains have been taken with the illustrations, which have been much depended upon to tell the story of changes and developments as well as to make clear technical words and constructions. Descriptions in words have always been eliminated where it was possible to substitute a visual image. The 201 reproductions in the first two volumes are half-tones or line cuts, with very few exceptions full page in size, and include many original photographs and drawings made expressly for this work. New York, The Baker & Taylor Co.

SCHOOLHOUSE, DANVILLE, ILL.
Faced with wire cut dark brown brick, made by Western Brick Company.
Jenney, Mundie & Jensen, Architects.

DETAIL BY G. AJELLO, ARCHITECT.
New York Architectural Terra Cotta Company, Makers.

The Building Mechanics' Ready Reference — Plumbers', Steamfitters', and Tinners' Edition, by H. G. Richey, Superintendent of Construction United States Public Buildings. 16mo, vi + 529 pages, 201 figures. Morocco, $1.50 net. New York: John Wiley & Sons.

CAR BARN, BALTIMORE.
Terra Cotta made by O. W. Ketcham.
Simonson & Pietsch, Architects.

COMPETITION FOR A BRICK HOUSE.

Cost not to Exceed $10,000.

FIRST PRIZE, $500. **THIRD PRIZE, $150.**

SECOND PRIZE, $250. **FOURTH PRIZE, $100.**

MENTIONS.

PROGRAM.

THE problem is a house with walls built of brick. Porches, verandas, or piazzas may be in part or wholly of brick or wood.

The cost of the house (exclusive of the land) including heating — equipment complete; plumbing — including all fixtures; gas piping and electric wiring — with fixtures, is not to exceed $10,000.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The plan should provide accommodations for a family of five — three adults and two children — and at least one servant. There are no restrictions as to size, shape, or style of house — except the cost — nor the size, shape, or location of lot.

The particular object of this Competition is to obtain designs for a BRICK HOUSE of moderate cost. It is especially desired that the treatment of the exterior shall show the possibilities in obtaining charming but restrained effects by the use of bond and jointing and pattern. The BRICK HOUSE is rich in precedent, and the material, whether considered from the esthetic or the practical standpoint, meets in the fullest measure the demands put upon it. To summarize; — the Competition calls for A CHARMING BRICK HOUSE OF MODERATE COST.

CONSTRUCTION.

The methods usually employed in the construction of brick walls may be followed, except that the walls are to be wholly of brick and of sufficient thickness to safely carry the load. The program does not call for a fireproof house, although that form of construction is not objected to. The choice of brick is left to the designer.

DRAWINGS REQUIRED.

On one sheet a pen and ink perspective, without wash or color, drawn at a scale of four feet to the inch. Also plans of first and second floors at a scale of eight feet to the inch. In connection with the plan of the first floor show as much of the arrangement of the lot in the immediate vicinity of the house as space will permit.

On another sheet, at the top, the front elevation drawn at a scale of eight feet to the inch, — and below the elevation, a sufficient number of details to properly show the brickwork and the special features of the design, — drawn at half inch scale in black ink without wash or color. Sections shown are to be cross-hatched in such manner as to clearly indicate the material, and floor plans are to be blocked in solid.

The size of each sheet is to be exactly 24 inches by 18 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 22 inches by 16 inches. The sheets are not to be mounted.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of The Brickbuilder, 85 Water Street, Boston, Mass., on or before Sept. 15, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three or five well-known members of the architectural profession.

In making the award the jury will take into account the fitness of the design in an artistic sense to the material employed; the adaptability of the design as shown by details to the practical constructive requirements, and the excellence of the plan.

Drawings which do not meet the requirements of the program will not be considered.

The prize drawings are to become the property of The Brickbuilder, and the right is reserved to publish or exhibit any or all of the others. The full name and address of the architect will be given in connection with each design published. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $500.
For the design placed second a prize of $250.
For the design placed third a prize of $150.
For the design placed fourth a prize of $100.

This Competition is open to everyone.
The prize and mention drawings will be published in The Brickbuilder.

THE BRICKBUILDER

VOLUME XVIII | JULY 1909 | NUMBER 7

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

ALBERT B. GROVES; LORD & HEWLETT AND PELL & CORBETT, ASSOCIATED; NEWHALL & BLEVINS; OLDS & PUCKEY; WOOD, DONN & DEMING.

LETTERPRESS

THE SO-CALLED "TEMPIO DELLA TOSSE," NEAR TIVOLI.

GIOVANNI BATTISTA PIRANESI, DEL.

With its vaulted dome and circular form this building resembles the so-called Temple of Minerva Medica, although it is smaller in size. It has not the usual characteristics of a temple and it has too many windows to be a tomb. It may have been a Nymphaeum, of which many were built in and near Rome, usually in the form of a lofty chamber decorated with columns, statues, and pictures, with a stream of spring water gushing from a fountain in the center so as to form a cool and agreeable retreat in summer.

THE BRICKBVILDER

VOL. 18 NO. 7 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· JULY 1909

Thatched Roof Effects with Shingles.

BY HARRIE T. LINDEBERG.

HOUSE AT POCANTICO HILLS, N. Y.

YEAR by year the public shows an increasing interest in the artistic qualities of domestic architecture, and while we have many worthy examples of large and formal residences, our humbler domestic work, in charm, repose, and distinction is wofully lacking.

The increased interest however, following the increased desire for country life, and outdoor living, has given rise to a demand for modest homes designed with the same high standard of work and care in detail that the architect gives to his larger problems. Many capable architects are unwilling to give consideration and time from their more important commissions to these smaller problems, which is undoubtedly the cause of the lamentable work scattered through our countrysides and suburbs.

The architects who have ability and are willing to put conscientious study in a small house, have long realized the fact that this type of work involves as much attention to detail as the larger houses, and greater ingenuity to bring forth successful results.

WAGON SHED, WESTCHESTER COUNTY, N. Y.

In this country, the old farm buildings of New England and the South, built by men who had no other end than utility in view, are still the best examples of our domestic architecture. In these we seldom see roof lines broken into useless gables, or unmeaning ornament and showy paint—all of which are a source of wasteful expense and depressing things to live with. In our climate a house in the country should be low or give the effect of being low. Two stories should be sufficient, and there is a peculiar charm in rambling single story wings.

GATE LODGE, WESTCHESTER COUNTY, N. Y.

There is also a charm in passing through casement windows of the living room or dining room, down but a single step to the lawn or out upon the brick terrace. A house high up is never quite so friendly to its garden or lawn.

In a country house the greatest beauty is that of fitness of purpose and suitability of situation. Our homes should pretend to be nothing but what they are; neither fantastic in outline nor frivolous in detail, and they will then contain no qualities which will detract from simple dignity. We should use where possible the local materials at hand, for where we find used in any given part of the country the materials nature provides, there is found the most beautiful architecture, because it is the most appropriate.

FARM BUILDING, WESTCHESTER COUNTY, N. Y.

The preeminent beauty of the English countryside is in no small measure due to its cottages and farm buildings, generally pleasing in themselves and always in harmony with their surroundings. Each is built for comfort and convenience, each suiting its position and each a renewed proof, if one be needed, that what is best adapted to its purpose is the most beautiful. The successful roofs in the English cottages owe their charm to the fact that they are unbroken in surface and treatment.

Unquestionably the roof is one of the principal features in country house designing, sheltering as it does the whole building and conveying at once a kindly feeling of homeliness.

There is probably no falser note in the builder's art than the use of one material in imitation of another; while in commercial work, through conditions well understood, we often build falsely, it is with no intent of crudely imitating thatch that I have studied the problem here presented, but rather to produce the texture which the thatch roofs contain and not to make the pretense that a cedar shingle can imitate the English thatch.

The aim of the manufacturers of practically every building material, is to produce exact shape, smooth surfaces, and uniformity in color, and our workmen have been taught to lay every material, whether it be brick, stone, or shingles, with absolute accuracy, as the standard of the best work, thus producing that soulless uniformity which may be the pride of the workman, but is the despair of the artist.

It was some years ago, with a commission to design a number of farm buildings with unusually attractive settings, that the problem presented itself of finding a material for the roofs which would carry out the charm of other materials at hand.

With the regulation roofing materials such as shingles, tile, and slate, the problem seemed a discouraging one until I remembered that many years ago Mr. McKim, in some domestic work at Lenox tried an experiment of laying the courses of shingles on a stable roof at varying exposures to the weather, with the result that the roof surfaces gained somewhat in texture.

With this example in mind I came across Mr. Magonigle's admirable Irwin House at Glen Ridge, N. J., which showed the sky lines softened by bending the shingles slightly at the gables and laying them in horizontal courses varying in exposure from 2 inches to 5 inches to the weather.

The accompanying illustrations merely show how this idea has been developed and carried out.

In the first place a slightly convex surface is given to the whole roof by furring on each rafter from 4 inches to 6 inches in height in the center of the roof and diminishing the furring to nothing at the ridge and eaves. The furring strips are then laid on horizontally about 4 inches on centers. At the gables the furring is constructed with the greatest care by 1 inch by 2 inch shingle-strips running with the roof rafters, which carry the general convex lines of the roof to meet the hanging verge board.

At the rounding of the gables the furring is brought well forward on the verge board and then returned against it, forming in section an arc of a circle. This rounding at the gables is greatest at the apex and diminishes towards the eaves. Often on a main roof it is desirable when a decided softening of the gable is wanted, to drop the roof rafters gradually at the ridge for a distance of 3 or 4 feet back from the verge board. To be effective the dropping at the verge boards must necessarily be sudden.

COTTAGE AT EAST HAMPTON, L. I., N. Y.

Aside from the rounding of the gables and the softening at the eaves and ridges, perhaps the best feature of this roof is its texture produced by laying all of the courses of shingles out of the horizontal in long irregular waves, so that the courses vary in exposure to the weather 1 inch to 5 inches.

After two courses of shingles have been started at the eaves with the butts together, these long sweeping curves should be laid out on the roof with a soft pencil by the architect himself.

To keep the laying from becoming too irregular it is sometimes necessary to introduce an absolutely horizontal course in every eight or ten courses of shingles. Even then almost constant supervision is necessary in the case

COTTAGE AT WOODMERE, L. I., N. Y.

FARM HOUSE, WESTCHESTER COUNTY, N. Y.

HOUSE AT KINGSTON, N. Y.

of inexperienced workmen, in order that the waving may not become too affected, or from failing in the other direction by appearing stilted and set.

It is only in the rounding of the gables or on quick turns in angles between the side walls of a dormer and the roof surface, that it is necessary to steam or wet the shingles. When dry the cedar shingle is decidedly brittle, but steamed or wet it will bend most accommodatingly.

CHICKEN HOUSES, WESTCHESTER COUNTY, N. Y.

In some cases of very quick curves it is found necessary to back-saw or split the shingles into narrow strips and in all cases of quick curves the shingles must be nailed through the butts.

STABLE, MOUNT KISCO, N. Y.

HOUSE, MOUNT KISCO, N. Y.

As a matter of fact the construction of the furring is of the first importance, for with this clumsily or cheaply done, no dexterity in the laying of the shingles will bring successful results.

Every valley must be rounded, every ridge softened and absolutely no sharp angles permitted in the entire roof surface.

In my early experiments I used sheet lead or zinc to cover the apex of the gables and the ridge of the house, but as the workmen became more experienced I found that a perfectly tight ridge could be constructed with the shingles themselves, which is naturally more effective as the increasing weathering of the shingles makes a constantly increasing contrast between their tone and the color of the lead or zinc ridge.

FARM BUILDING, WESTCHESTER COUNTY, N. Y.

I have been asked if these roofs are effective as far as durability and tightness are concerned. I can only say that as about fifty per cent more of shingles are used on a roof of this type than when shingles are ordinarily laid at 5 inches to the weather, it is a simple matter to see that such a roof must be more effective where the shingles have an average exposure of only 2½ inches to the weather.

It is of course obvious to the trained architect or student of design that these roofs can be used appropriately in but one way, and that is as an integral part of the design. To build these roofs on any structure not meant to receive them would be an architectural absurdity.

Yet this is frequently the most difficult fact to impress upon the layman.

Perhaps a letter received from a gentle lady in some western state (selected from many curious inquiries), most aptly illustrates this lack of understanding in the lay-mind. The lady wrote asking my firm its "charge per square foot" for "designing a thatch roof" for her house, the superstructure of which was already erected.

Warming and Ventilating with Special Reference to Hospital Buildings—III.

BY D. D. KIMBALL.

AS AN alternate for the gravity method of exhausting the air from the room to be ventilated there may be used an exhaust fan system, in which case the fan may be placed in the attic, on the roof, or in the basement, as may be found most convenient. The fan is thus used instead of the accelerating coils to insure a draft in the ventilating flues, its merit being its positive action and the possibility of reducing the size of the vent flues, if necessary, because of the increased velocity obtainable, although many experts make a practice of maintaining the same size of vent flues as in the gravity system of exhausting the air. The registers should, in any case, be as large as in the gravity system in order to prevent improper air velocities, resulting in drafts, in the room.

The objections to the use of the fan lay in the danger of its being noisy, the hum or noise of a fan being particularly trying in the case of persons suffering from nervous disorders, and in the possibility of the fan withdrawing more air than is supplied by the fresh air system, when not so intended, both of which objections may be removed by proper designing, the most important element in overcoming the first objection being the proper mounting of the fan and its motor or engine and the connection of the fan to the vent ducts, as will be explained later on.

It may easily be shown that where a large amount of air is to be moved it is less expensive to make use of a fan than to use accelerating coils, and it is usually quite as simple in operation.

A fan or blower may be made use of in supplying the fresh air instead of using a gravity system of air supply. Such a system is often called a plenum system. The air may still be heated by the indirect radiators at the base of the flues, being driven by the fan to and through the indirect radiators, in most cases being first partially heated by being passed through tempering coils at the fan. The indirect radiators at the flues are then called reheaters, and are made smaller. Such a system makes possible the individual control of the temperature of the different rooms and is an admirable system.

Where there are objections to the placing of indirect radiators at the base of the flues, as, for instance, where they would disfigure finished rooms in the basement, use may be made of what is known as the double duct system, in which two ducts are carried from the fan to the base of each flue, the upper duct containing air heated to a high temperature by being passed through the tempering and reheating coils located at the fan, the lower duct containing tempered air of a less temperature which has passed through the tempering coil only, the warm air duct being of sufficient size to carry all of the air required if necessary, the lower duct usually being of the same width and about two thirds the depth of the hot air duct. Branch connections are made from both ducts to the base of the vertical flue, with a mixing damper at the point of this double connection or junction. This damper is controlled from the room above by an automatic temperature controlling system, if possible, or by hand if necessary.

The hot blast system or single duct system without reheaters at the base of the flues, in which all the heating and regulating of the temperature of the various rooms of the building is done at the fan, is not to be recommended because of the total lack of proper means by which the temperature of the rooms may be controlled individually according to the different exposures or other requirements.

With the plenum system the vitiated air may be exhausted by the gravity method, or the air may be both introduced and exhausted by means of fans. In many cases this is not only desirable but, as in the case of large hospitals, it is necessary because of the volume of air which is required, and the limited space available for flues which necessitates smaller flues and a higher velocity of the air therein. When the entire dependence for warming and ventilating is placed upon a fan system great care must be used to so design the system as to insure against a breakdown.

In this connection it is well to note that a fan in itself seldom breaks down, but occasionally a motor or engine will give trouble, on account of which fact it is desirable that duplicate engines or motors be installed if possible, or at the least it is important that there be kept on hand duplicates of the important parts of the motors, etc., which will make possible quick repairs. It may be possible to install duplicate outfits complete, or two fans of such size that they may both be used ordinarily, each for a part of the building, while in case of breakdown to one the other may, by means of cross connections, be made to provide the entire building with a sufficient amount of air and heat to prevent discomfort.

In setting the fan, its bearings, and the engine or motors used to drive it, it is important that the foundations be kept entirely separate from any of the building foundations, in doing which it is wise to have a layer of sand one inch or more in thickness under and about the foundations on all sides. The fan wheel may well be mounted on a shaft having its bearings entirely independent of the fan casing, the foundation for these bearings being entirely independent of foundations for the fan, motor, or building. The peripheral velocity of the fan wheel and the velocity of the air through the fan discharge outlet should be kept as low as possible, but the safe maximum varies with different types of fans and under different conditions. In hospital work under usual conditions a peripheral velocity of the wheel of about 4,200 feet may be considered the maximum with a velocity of air through the fan discharge outlet of not over 1,800 feet per minute, this being regulated by the size of the fan discharge opening. In connecting the air ducts to the fan it is well to place a canvas sleeve consisting of two thicknesses of ten ounce canvas securely fastened to fan and duct, applying thereto four coats of lead and oil paint. This sleeve should be about 8 inches long. Particularly if the motor be an alternate current motor, it is wise to place the motor, belt, and fan pulley in a room having no connection with the air chamber or ducts, by extending the shaft through the wall, and in some cases it is even necessary to provide a wood box lined with hair felt and canvas held in place by wire to cover the motor, belt, and fan pulley.

There are many hospital superintendents who object to the use of the fan system, while quite as many will be found who prefer the fan system. Both have their proper places and both may, by proper design, be made to cover a large range of service. Objections raised to the fan system are usually by superintendents who have had unfortunate experiences with fan systems which have been so designed or installed that the operation of the fans has been noticeable in the wards and rooms of the hospital, or else drafts or other unsatisfactory results have been obtained therefrom. A fan system can always be installed which will be noiseless and satisfactory, and so that no difference in operation can be detected when compared with the gravity system. On the reverse hand in a great many cases a gravity system can be installed which will give just as positive and satisfactory results as the fan system, and in small buildings it is usually more desirable.

Much might be said of the matter of the proper location of fresh air and vent flues, and the location of their openings into the rooms. Both warm air and vent openings and their connecting risers may, to advantage, be placed on the outside walls if properly insulated, or they may be placed on the crosswise partitions, the warm outlet being placed nearer the outside wall with the vent riser on or near the inside wall. It is not wise to place both warm air and vent openings on the inside walls, as the air moving from the warm air opening to the outside wall, dropping down there as it is cooled and then passing back across the floor will cause drafts and cold floors unless direct radiators are used on the outside walls, which, as previously stated, are undesirable in rooms occupied by patients.

The air opening from the warm air flue into the room may be placed about eight feet above the floor, or it may be placed under the window, the latter arrangement meeting with much favor among engineers and hospital superintendents. In this latter position the warm air as it enters the room meets with or opposes the downward current of air formed by the cooling effect of the windows and walls and so prevents drafts. It is found that the diffusion of the air throughout the room, with the volume dampers in the fresh air and vent ducts properly adjusted, is thorough.

The proper location of the opening for the removal of the vitiated air is also much discussed, the principal point of difference in opinions being as to whether the opening shall be at the floor or at the ceiling. There are strong advocates of both positions. The opening at the ceiling doubtless involves the greatest expense of operating as it takes more heat out with the air removed, but either position will give satisfactory ventilation if properly designed and managed. If the outlet is placed high the inlet must be low and enough fresh air must be supplied to maintain a slight plenum condition in the room. The general consensus of opinion has long favored the bottom opening and it may be counted upon to give entirely satisfactory results. Many engineers provide both top and bottom openings, usually with a switch damper so arranged that the top opening may be used in summer, when it is desirable to relieve the heat of the room as much as possible or when special occasion demands, the bottom opening being used during the cold weather.

It is difficult, in the light of recent tests, to maintain that a majority of the CO_2 settles to the floor for, because of the temperature at which the air is exhaled from the lungs and the movement of the air in the room, it will be found in varying amounts throughout the room. The aim therefore should be to secure the introduction and thorough diffusion of a constant amount of fresh air throughout the room and the constant removal of a like amount of the vitiated air.

In operating rooms it is important that both top and bottom vent openings be provided, as in the use of ether and chloroform the fumes of one rise to the ceiling while the fumes of the other settle to the floor. It is customary to provide a separate fan for the ventilation of the operating room, especially because it is desirable to provide for the rapid removal of the air immediately following an operation.

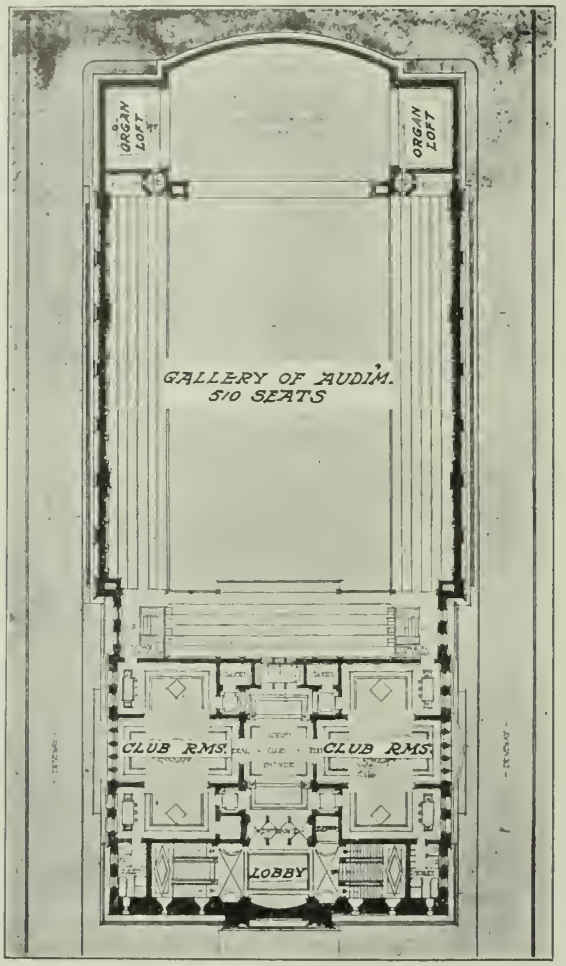
In every fresh air and vent flue there should be provided a volume or adjusting damper by means of which the amount of air to be supplied to or removed from the room may be regulated. In the case of an air opening into a room placed above the level of the head a velocity of the entering air of 300 feet per minute may be safely permitted, while in the case of an opening placed below this level a velocity of 150 feet per minute is the maximum permissible and 100 feet per minute is often desirable, as in the case of operating rooms or openings placed near beds.

In hospitals and schools it is becoming common practice to omit the registers at the air openings. The architect tries to eliminate all square corners and recesses for the collection of dust so that there would seem to exist no warrant for putting in a register or register face which has a multitude of small corners in which and back of which dust may collect. A neat sheet metal outlet box to which the plaster may be brought is installed without the register, and in the case of the fresh air inlet deflecting plates are usually included in the outlet box to diffuse or divide the current of air and so reduce the velocity as it enters the room.

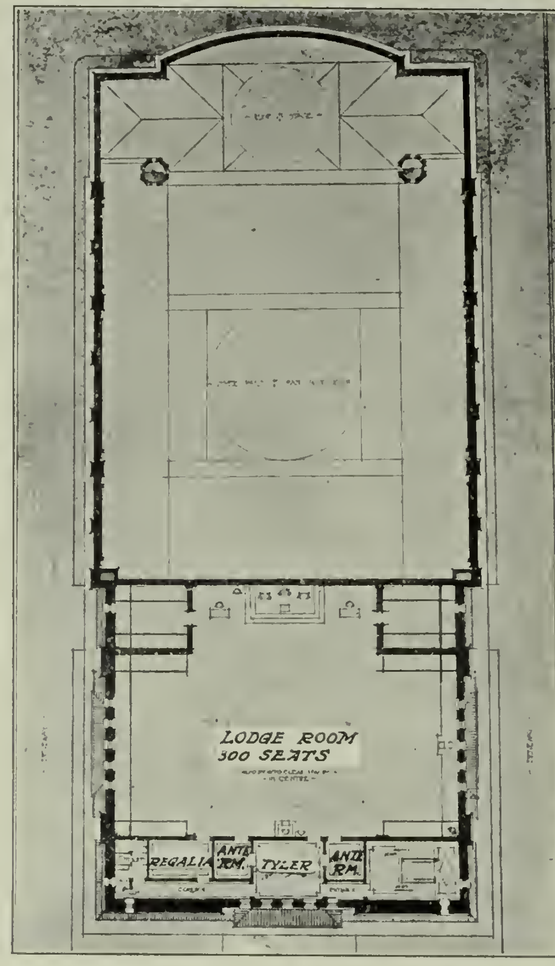
Hospitals designed for certain diseases require special treatment, as in the case of hospitals for contagious diseases, in which special care must be used in the arrangement of flues and an extra amount of air must be provided, or as in the case of hospitals for tuberculosis patients, in which it is customary to open the wards to the outdoor air at various times, in view of which requirement the system should be designed to make possible the rapid heating of the rooms.

In the hospital special consideration should be given to the matter of the location of the boiler plant. If possible it should be placed in an outside building because

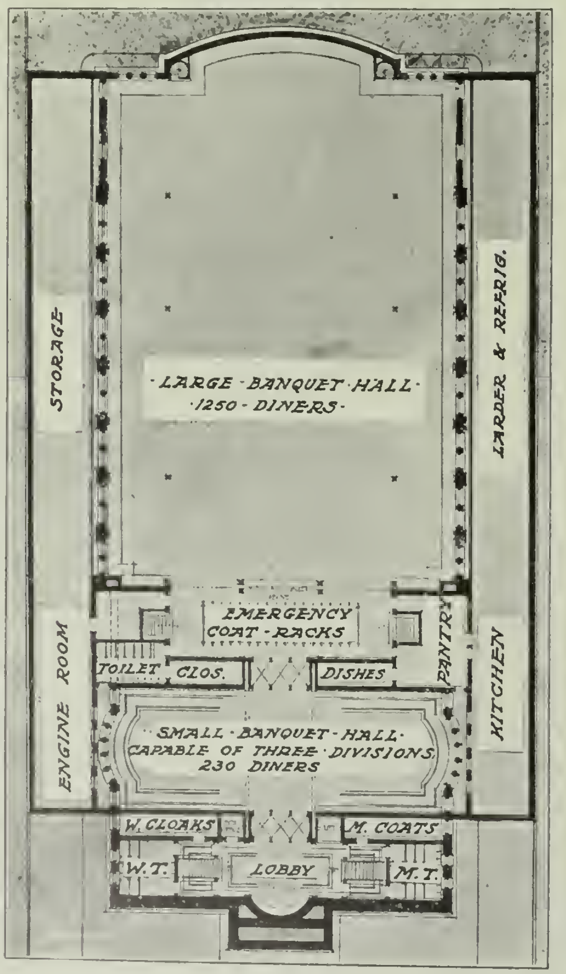
IREM, TEMPLE, WILKES-BARRE, PA.
OLDS & PUCKEY, ARCHITECTS.



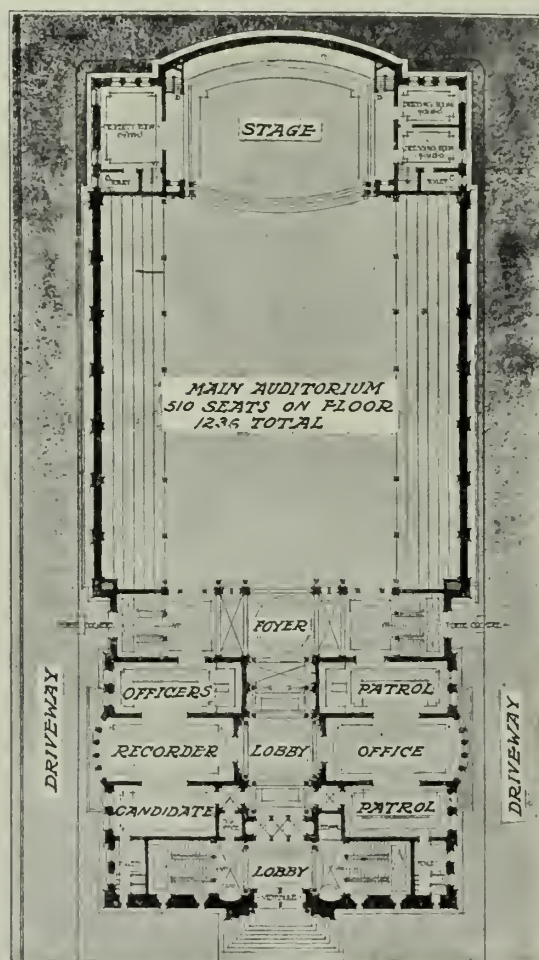
SECOND FLOOR



THIRD FLOOR



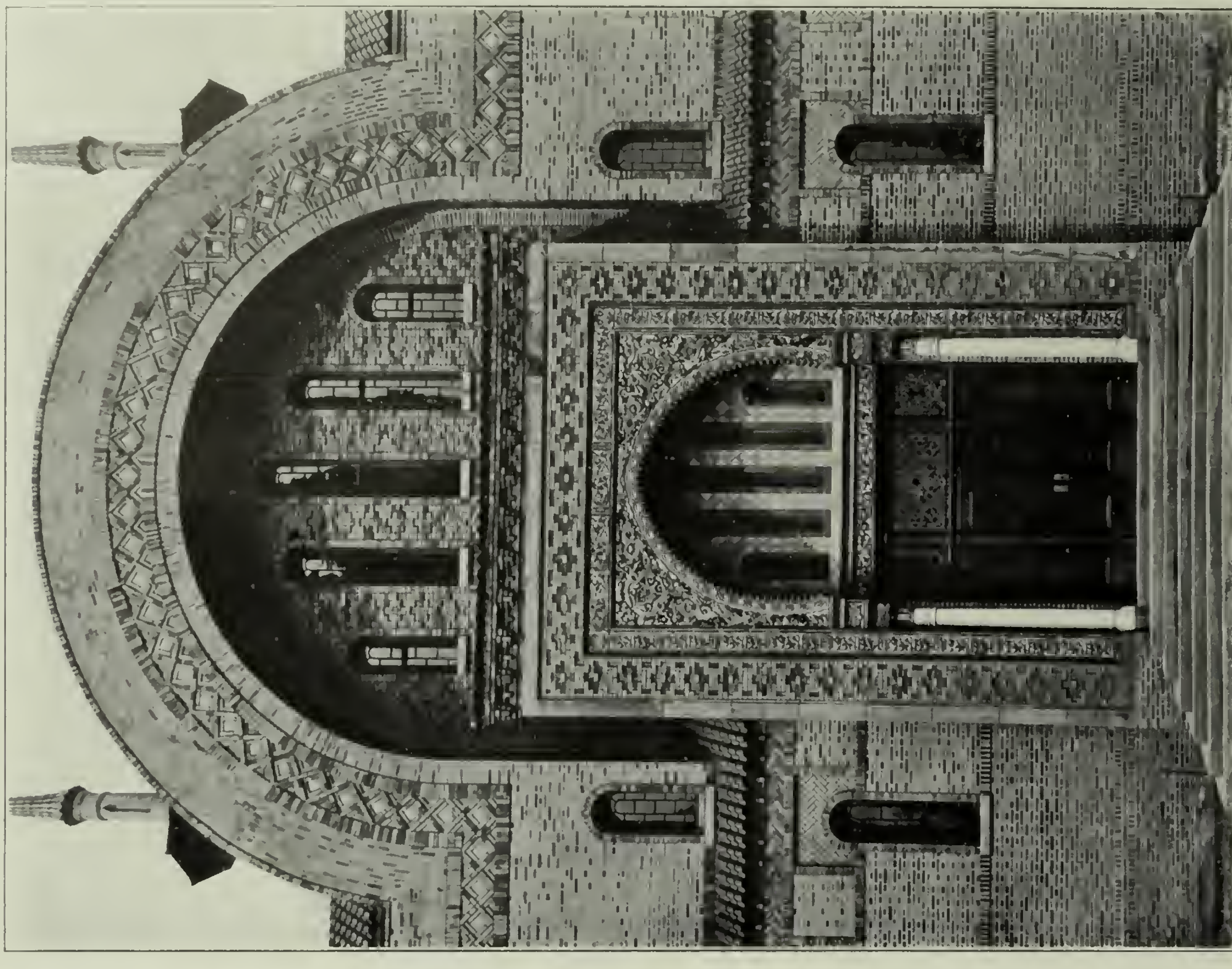
BASEMENT

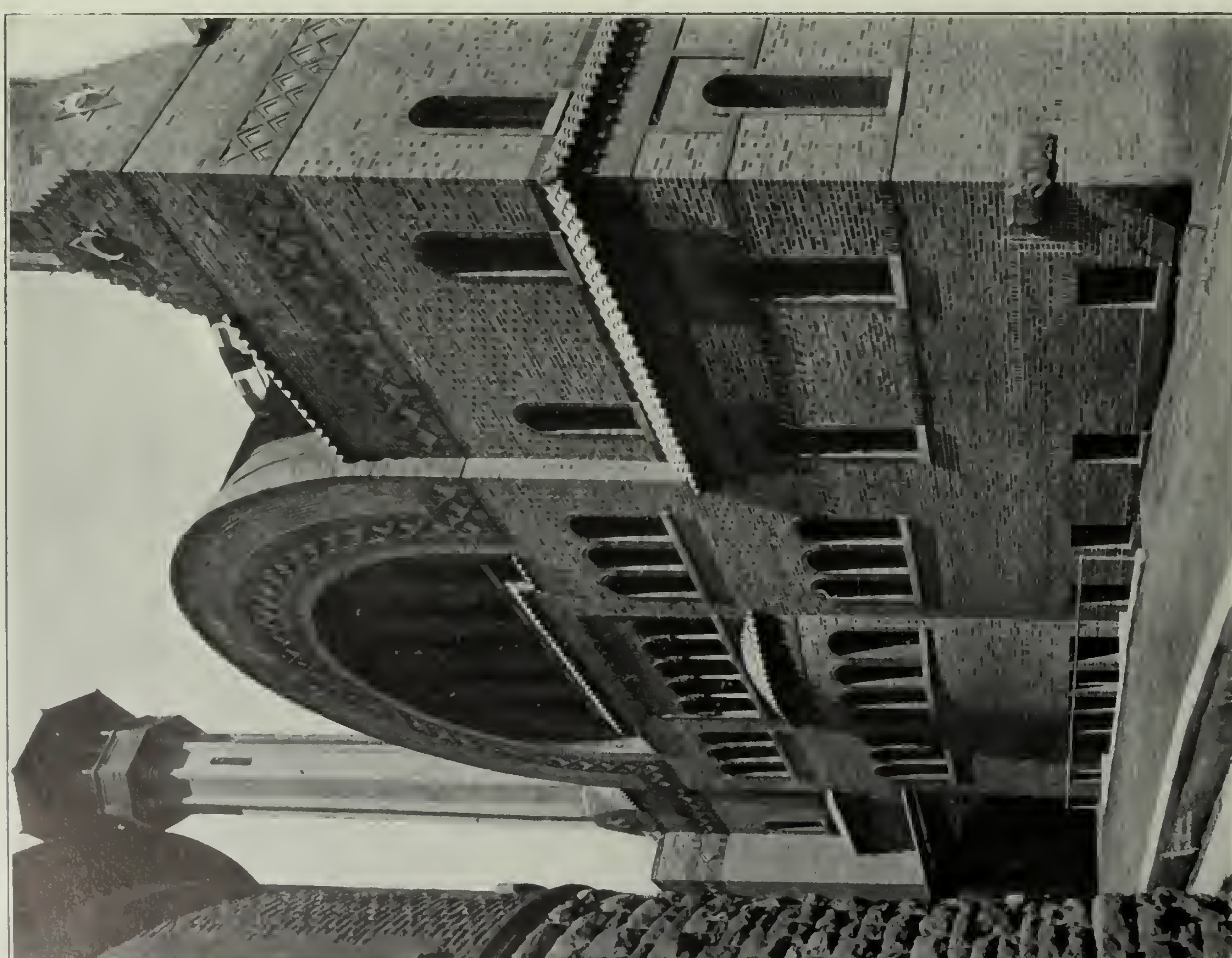


FIRST FLOOR

FLOOR PLANS, IREM TEMPLE, WILKES-BARRE, PA.

OLDS & PUCKEY, ARCHITECTS.

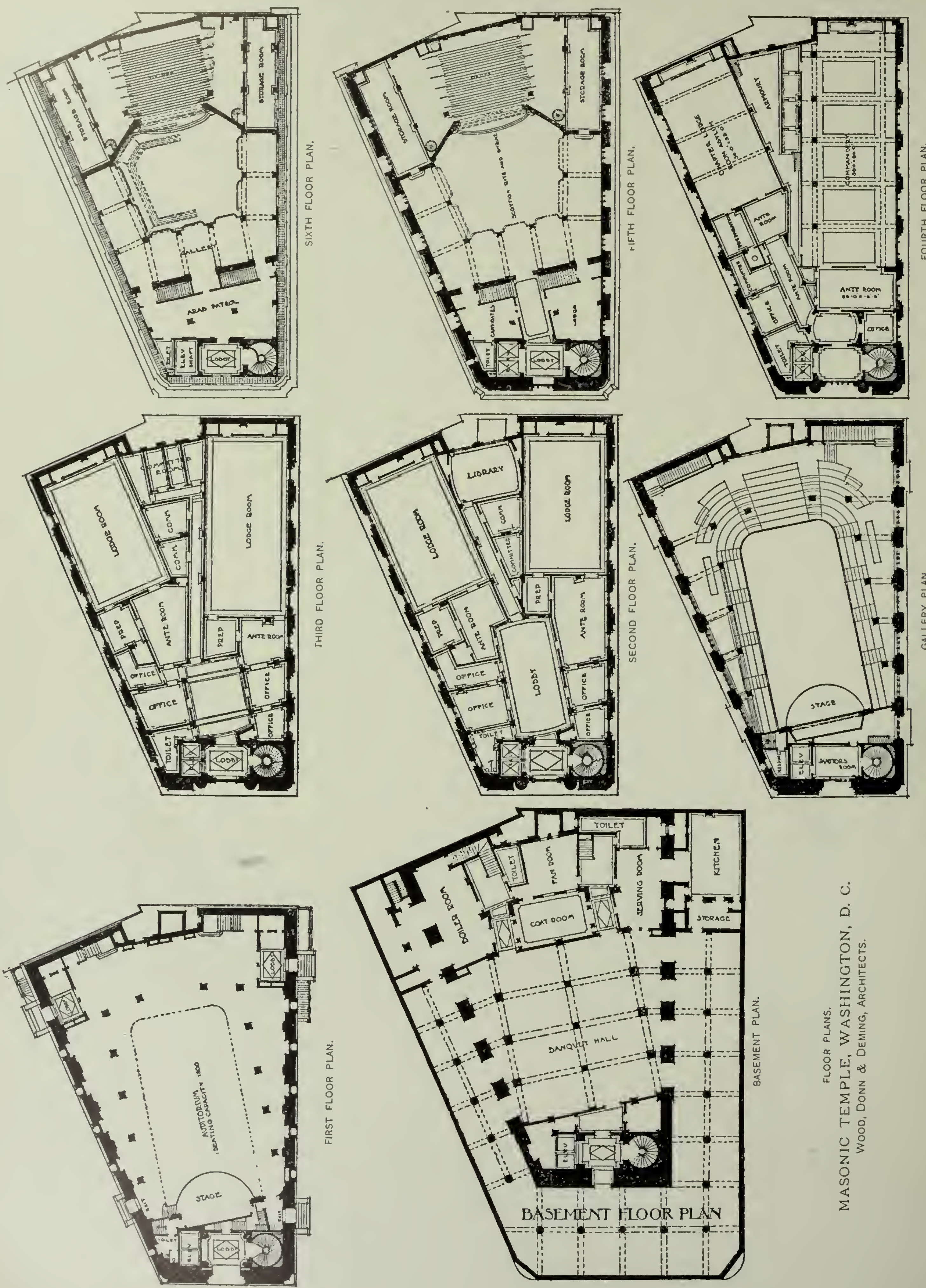




DETAILS, IREM TEMPLE, WILKES-BARRE, PA.

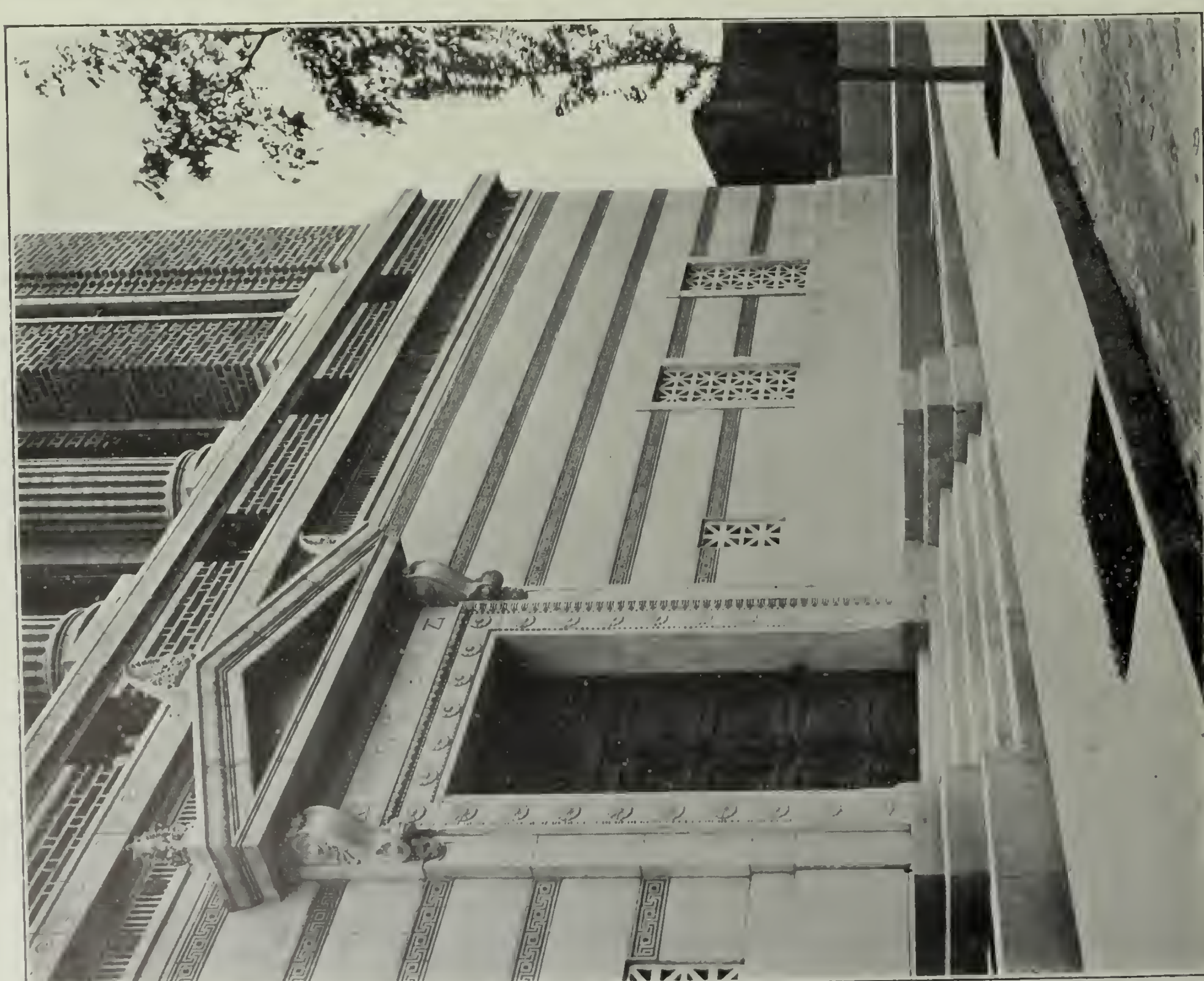
OLDS & PUCKEY, ARCHITECTS.

MASONIC TEMPLE, WASHINGTON, D. C.
WOOD, DONN & DEMING, ARCHITECTS.



FLOOR PLANS.
MASONIC TEMPLE, WASHINGTON, D. C.
WOOD, DONN & DEMING, ARCHITECTS.

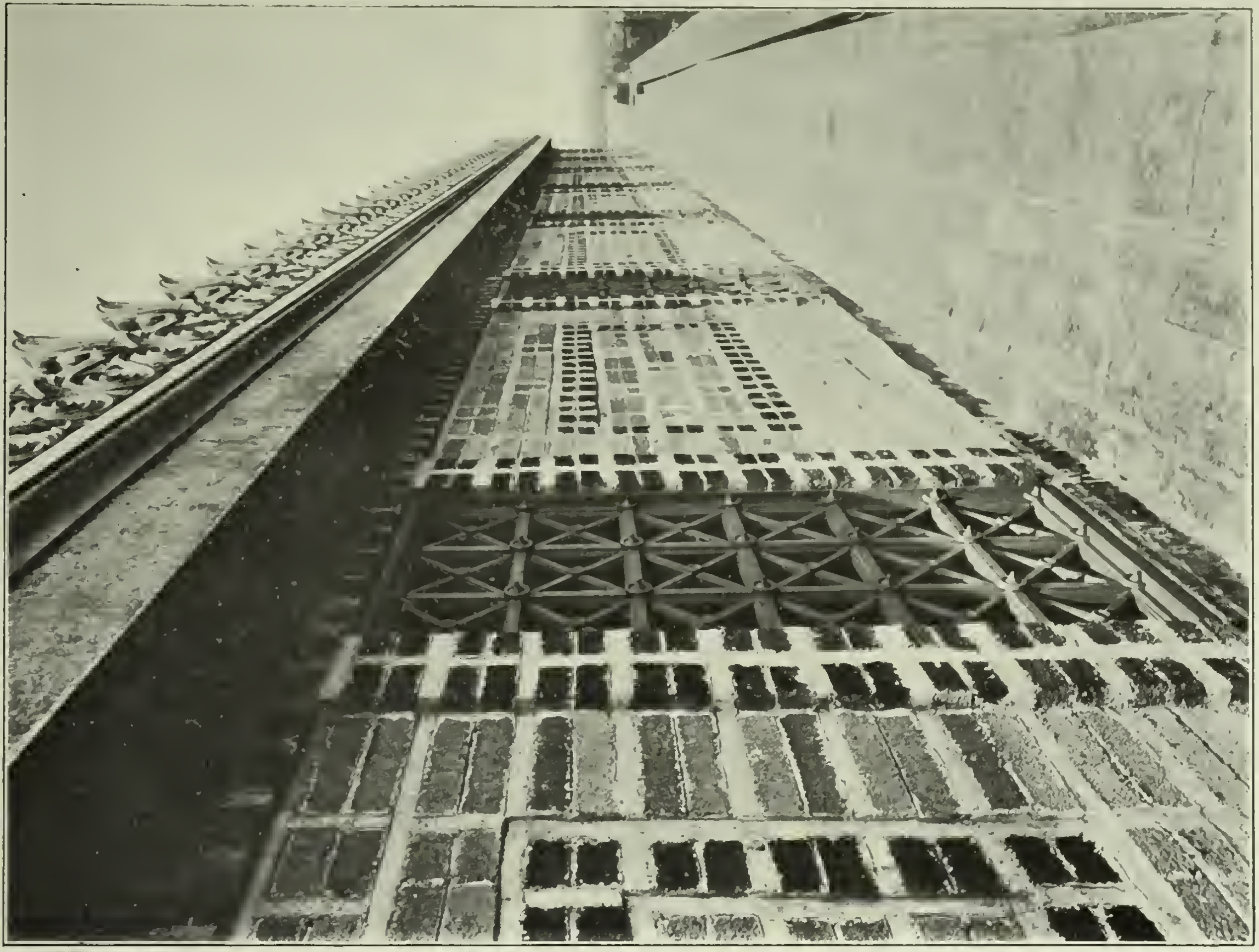
MASONIC TEMPLE, WASHINGTON, D. C.
Wood, Donn & Deming, Architects.

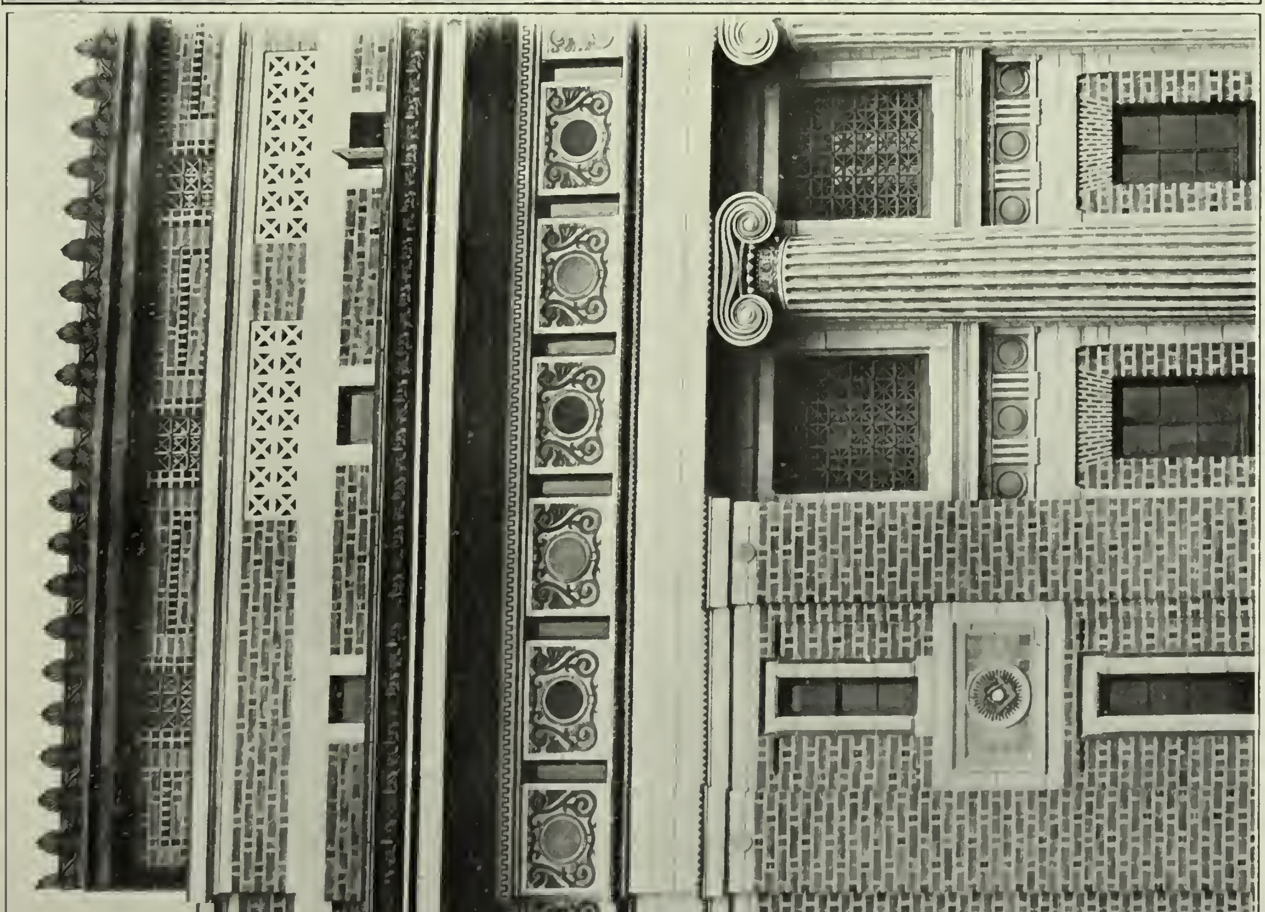


DETAILS, MASONIC TEMPLE, BROOKLYN, N. Y.

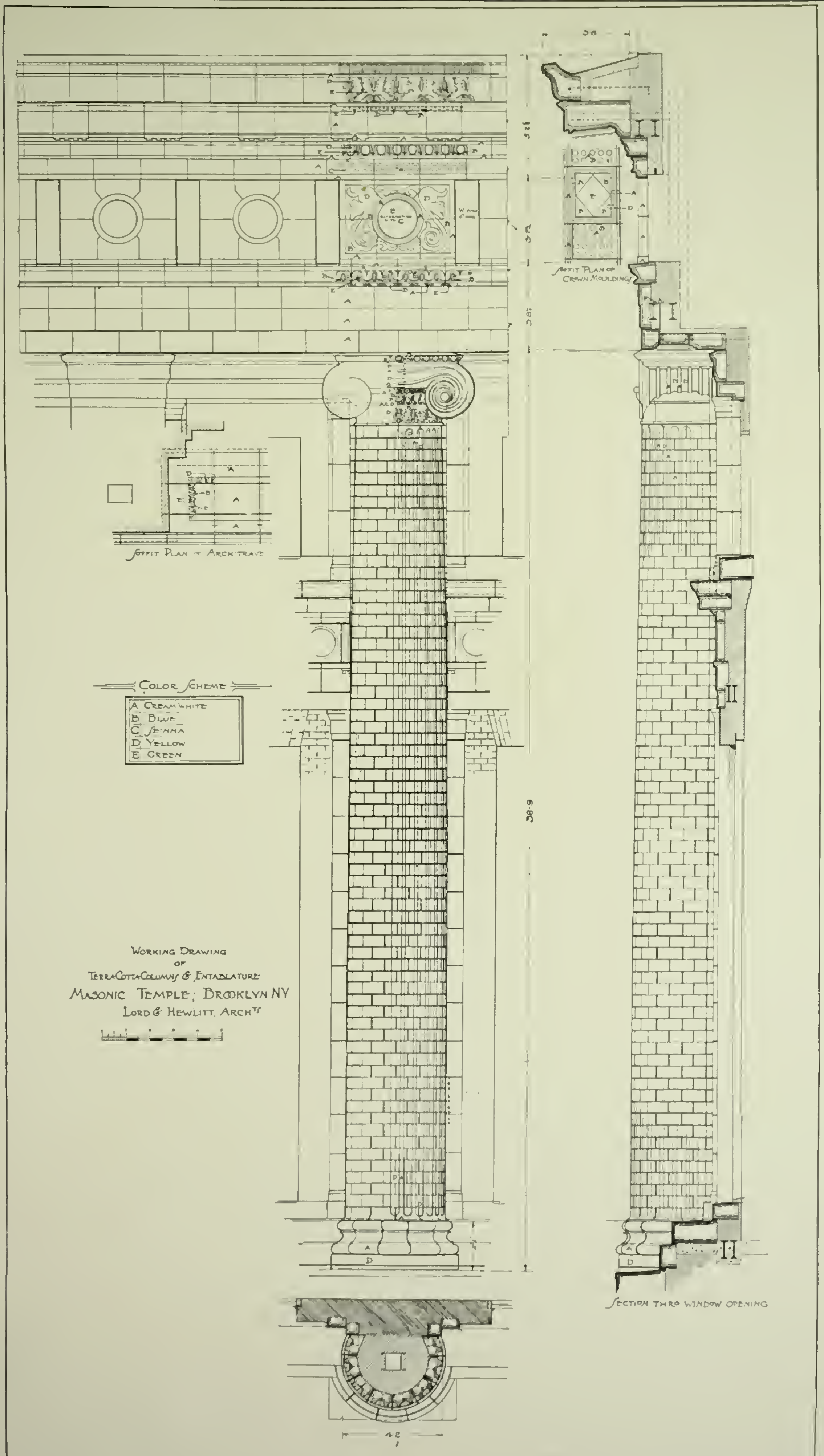
LORD & HEWLETT, ARCHITECTS, PELL & CORBETT, ASSOCIATED, ARCHITECTS.

MASONIC TEMPLE, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS, PELL & CORBETT, ASSOCIATED, ARCHITECTS.

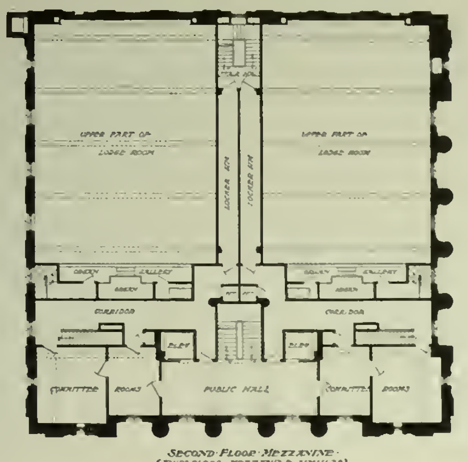




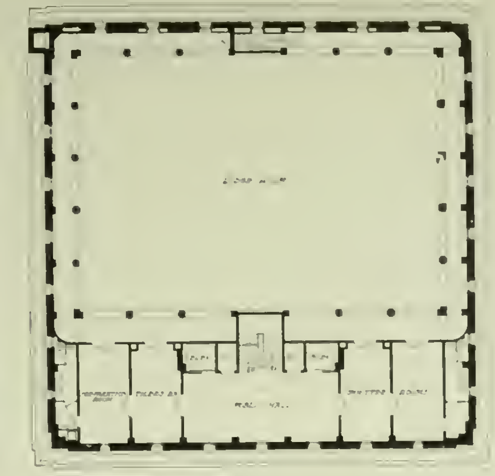
DETAILS, MASONIC TEMPLE, BROOKLYN, N. Y.
Lord & Hewlett, Architects, Pell & Corbett, Associated, Architects.



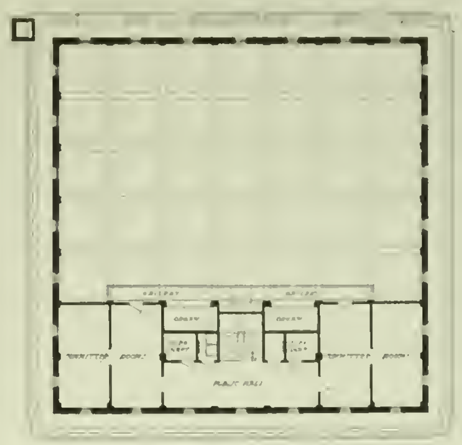
DETAILS, MASONIC TEMPLE, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS, PELL & CORBETT, ASSOCIATED, ARCHITECTS.



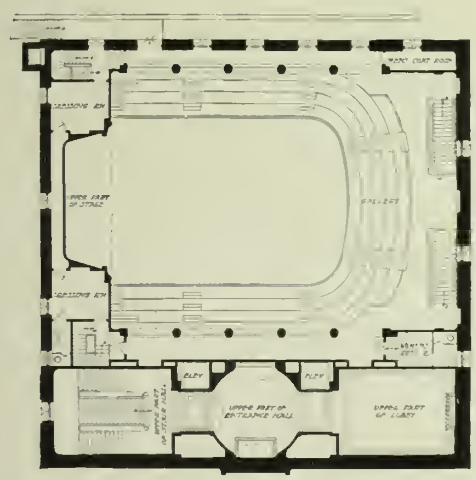
SECOND FLOOR MEZZANINE
(THIRD FLOOR MEZZANINE SIMILAR)



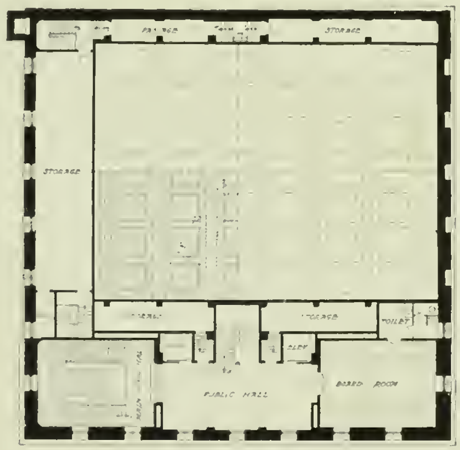
FOURTH FLOOR PLAN



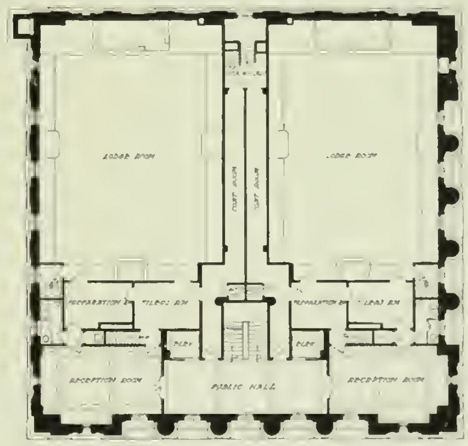
FOURTH FLOOR MEZZANINE



FIRST FLOOR 1ST MEZZANINE

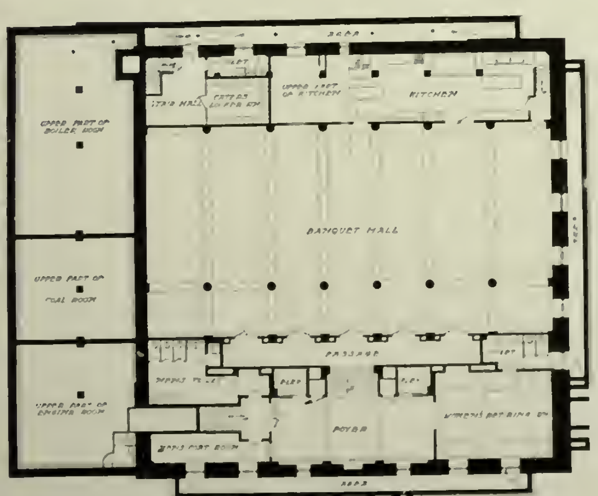


FIRST FLOOR 2ND MEZZANINE

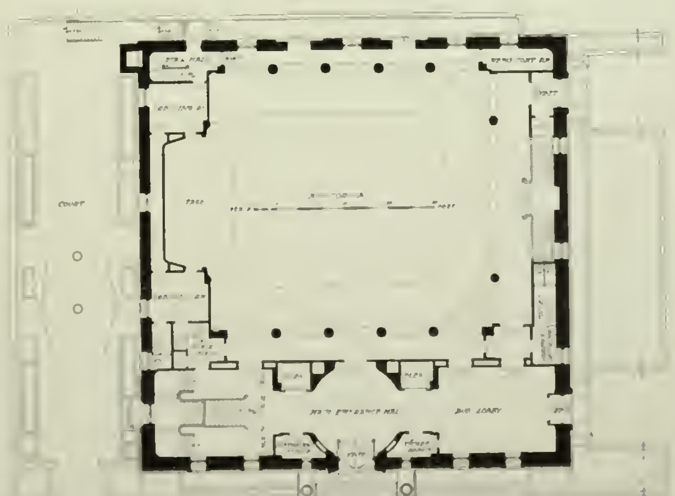


SECOND FLOOR PLAN
(THIRD FLOOR SIMILAR)

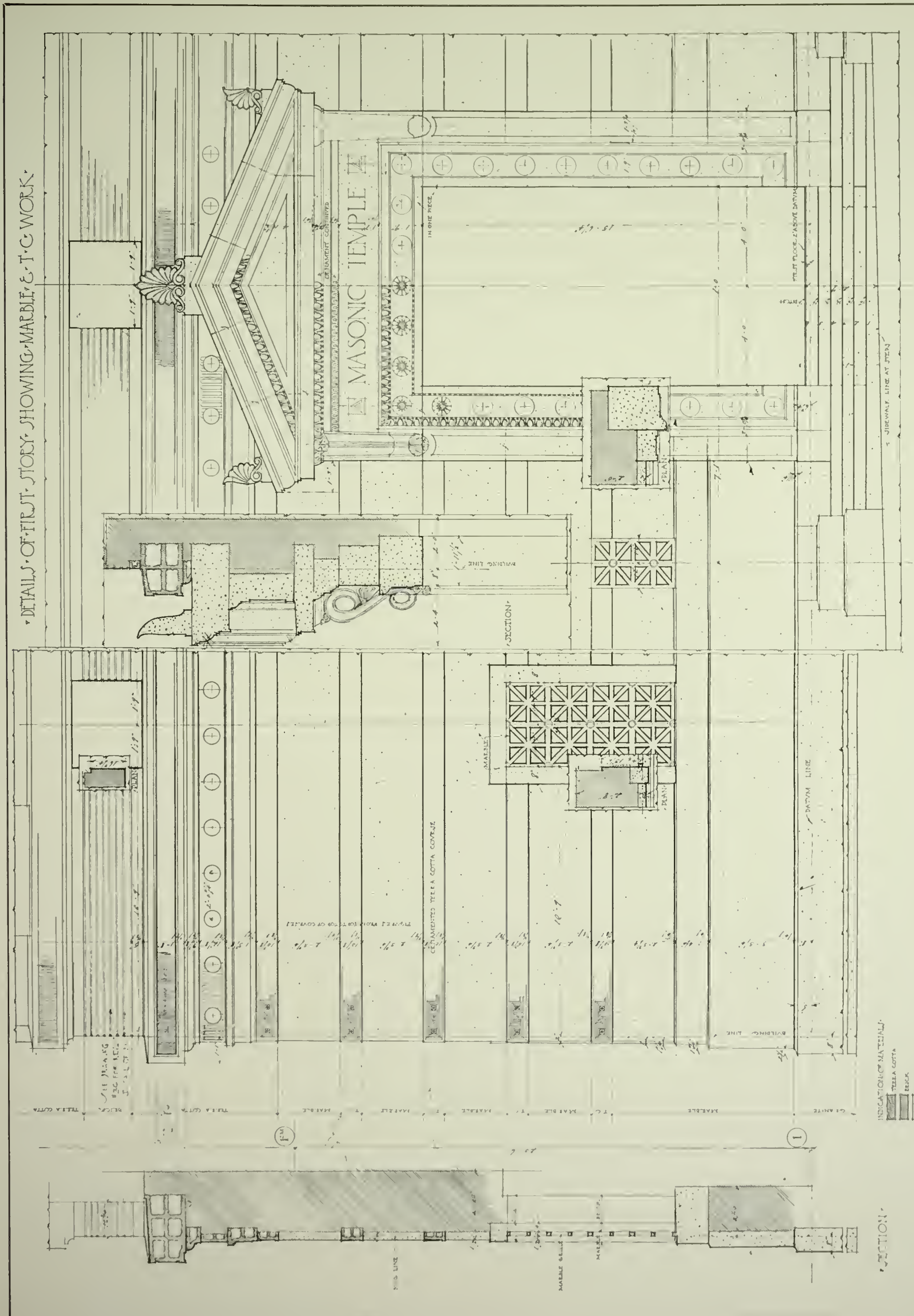
FLOOR PLANS, MASONIC TEMPLE, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS.
PELL & CORBETT, ASSOCIATED, ARCHITECTS.



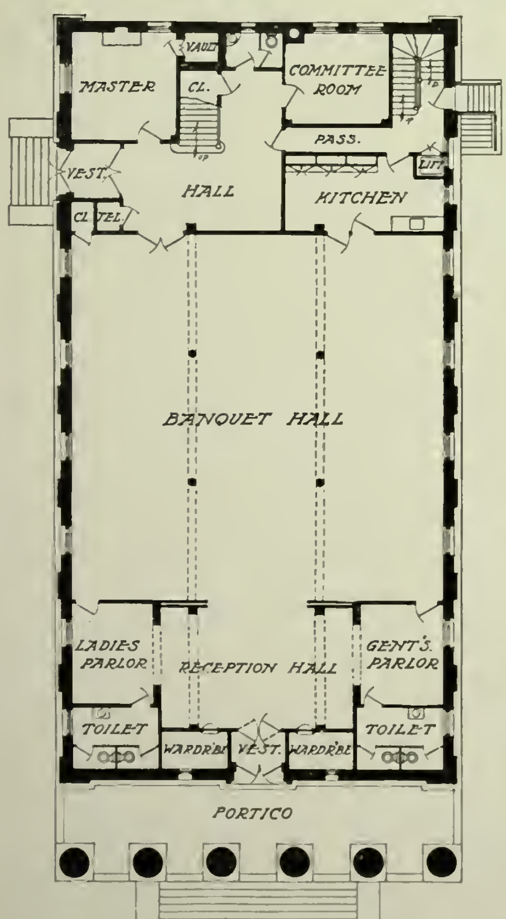
BASEMENT PLAN



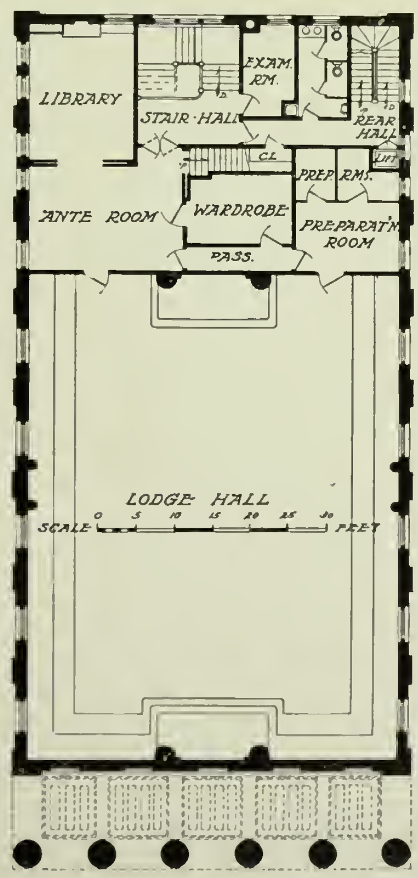
FIRST FLOOR PLAN



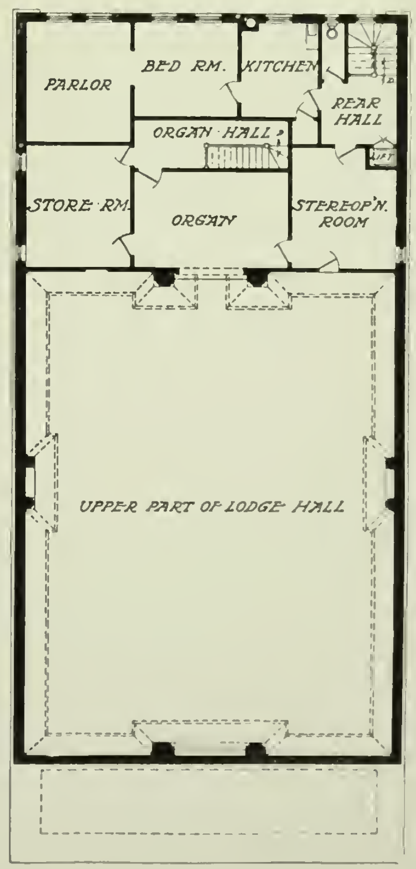
DETAILS, MASONIC TEMPLE, BROOKLYN, N. Y.
LORD & HEWLETT, ARCHITECTS, PELL & CORBETT, ASSOCIATED, ARCHITECTS.



·FIRST·FLOOR·PLAN·

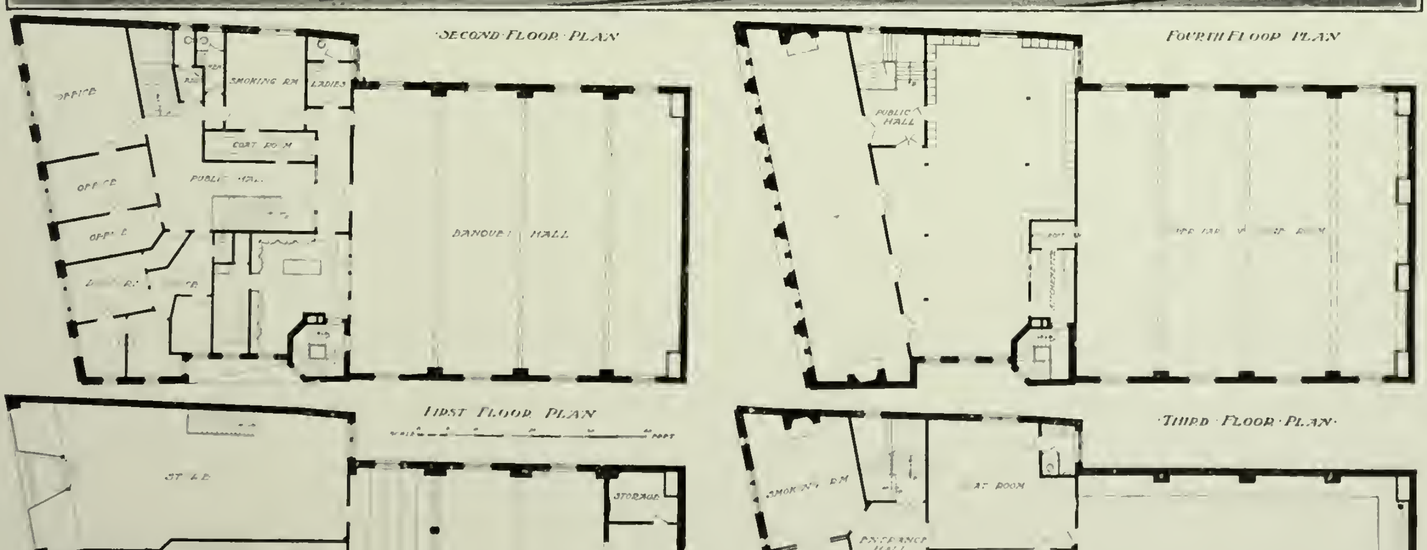


·SECOND·FLOOR·PLAN·



·MEZZANINE·FLOOR·PLAN·

TUSCAN TEMPLE (MASONIC), ST. LOUIS, MO.
ALBERT B. GROVES, ARCHITECT.



ODD FELLOWS HALL, MALDEN, MASS.

NEWHALL & BLEVINS, ARCHITECTS.

of the desirability of removing as far as possible from the building the noise, gases, and dust incident to the operation of the plant. If the hospital consists of a group of buildings a central plant is in every way desirable, not only for the above reasons but because of the increased economy of operation and decreased cost of maintenance. Such a plant may, to advantage, be combined with a lighting plant, which, because of the use of the exhaust steam in the heating plant, results in securing the necessary electric current at practically the cost of the interest and depreciation charge on the cost of the lighting plant. To such a combined plant is frequently added the laundry plant, vacuum cleaning plant, water filtration plant, etc.

In undertaking to give some rules and formulas it is possible to refer here to those only that are most commonly used with an aim to cover the needs of the average steam heating and ventilating system for a small building.

The warming system and the ventilating system of a hospital building are inseparably one. A system of ventilating can be made to accomplish both warming and ventilating, while every ventilating system requires for the greater part of the year the warming of the air provided thereby.

In the design of the plant there must be first determined the total amount of heat required to overcome the losses through the windows, doors, walls and skylights, roofs and floors, and in addition there must be determined the amount of heat carried out with the vitiated air removed by the ventilating system.

The unit of measure of heat is the British Thermal Unit, usually abbreviated to B. T. U. or termed "heat unit," which is the amount of heat required to raise one pound of pure water 1°, or to be exact, from 62° to 63° Fahrenheit. This equals 778 foot pounds, or 33,305 heat units equal one horse-power, and one pound of ice in melting is equal to 142 heat units. The importance of a clear understanding of this unit of measure is imperative as all heat calculations are based thereon. It should serve the heating and ventilating engineer as the two foot rule serves the carpenter.

With the required number of heat units known the radiator and boiler capacity is easily determined, and then the size of pipes and other details follow.

The use of a rule-of-thumb method of determining the radiation required cannot be too strongly condemned, particularly the method of allowing a certain number of cubic feet of space to each square foot of radiation. It is not uncommon to find in the same building some rooms requiring 1 square foot of radiation to 30 cubic feet of contents, while other rooms will require but 1 square foot of radiation to 200 cubic feet of space, the difference being due to the difference in the sizes of the rooms, the ratio of cubic contents to exposed walls and glass areas, the points of the compass, construction, etc.

For buildings made up of rooms of not over 12,000 to 16 000 cubic feet of space each, heated by direct radiation, Professor Carpenter's formula for determining the square feet of radiation required will be found very satisfactory.

This rule is as follows: Add together the area of the glass surface in square feet, one quarter of the area of the exposed wall, cubic feet of space times .04 (use .04 for the first floor rooms, .02 for rooms on upper floors, and .06 for halls, etc.), and multiply the sum of these three items by the proper factor taken from the following tables:

FOR DIRECT RADIATION.

	Temp. of Outside Air.	Temp. of Room.	Atmos. Pressure. 212	2 lbs. 219	10 lbs. 240	Hot Water 160	Hot Water 180
Steam.	+10	50	.16	.14	.12	.225	.20
	0	50	.20	.19	.15	.28	.25
	−10	50	.25	.21	.19	.33	.30
	+10	60	.21	.18	.165	.31	.30
	0	60	.25	.22	.196	.37	.35
	−10	60	.29	.26	.23	.44	.41
	+10	70	.26	.27	.22	.41	.34
	0	70	.32	.28	.245	.47	.40
	−10	70	.35	.32	.26	.55	.45
	+10	80	.33	.30	.24	.54	.435
	0	80	.38	.33	.27	.62	.50
	−10	80	.42	.38	.31	.70	.56

Ordinarily assume two pounds pressure in steam and 160° in hot water.

FOR INDIRECT RADIATION.

		Factor to obtain sq. ft. of Heating Surface.		Cu. ft. air per sq. ft. Heating Surface per hour.		B. T. U. per sq. ft. Heating Surface per hour.	
		First Floor.	Second and Third Floor.	First Floor.	Second and Third Floor.	First Floor.	Second and Third Floor.
Steam.	Zero to 70° Steam 212°	.73	.49	1 88	294	324	486
	Zero to 70° Steam 228°	.69	.46	1 96	294	338	507
	Zero to 60° Steam 212°	.46	.31	1 88	282	324	486
Hot Water.	Zero to 70° Water 160°	1.06	.70	1 28	192	220	330
	Zero to 70° Water 180°	.89	.59	1 50	225	260	390

212° equals atmospheric pressure; 228° equals five pounds pressure.

For first floor rooms with indirect radiation and having floor registers in the wall near the floor approximately fifty per cent more indirect radiation than direct radiation will usually be found to be required to do the same work.

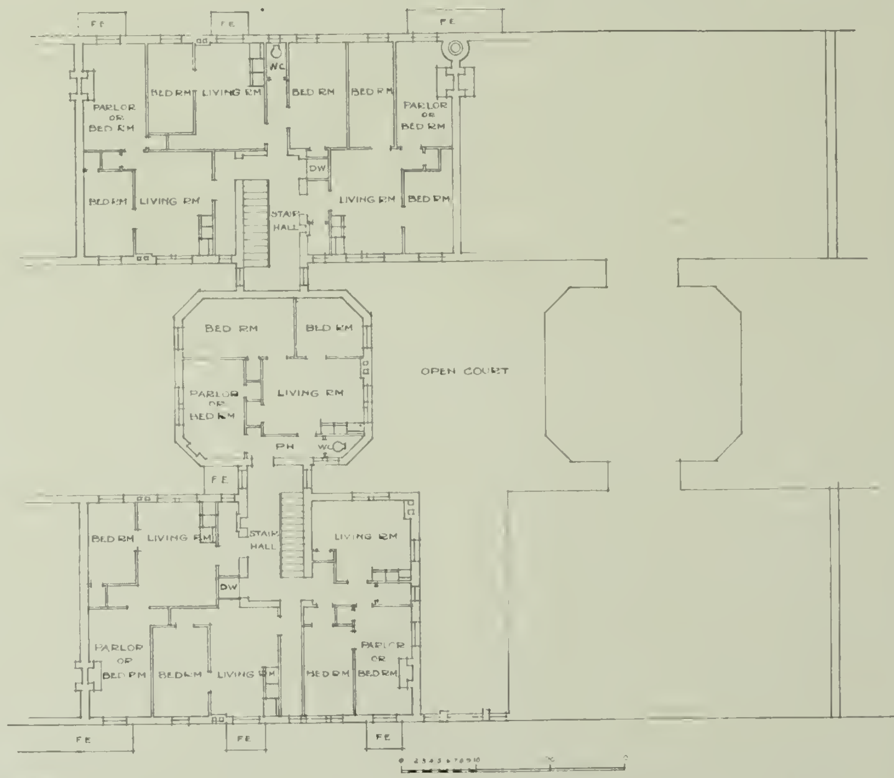
THE Campanile of St. Mark's has now reached such a height as to make an almost startling object-lesson on the terribly prosaic state of hardness, tightness, smoothness, novelty, and rigid repair in which the ages of antiquity possessed the buildings we hold venerable," says the London *Chronicle*. "It is a perfect facsimile of the original belfry tower of which the fall gave a shock to all hearts," it continues, "and that beautiful tower, before it fell, had a surface, a sweetness, an imperceptible disintegration which was the bloom of time. A random touch of green lodged between its bricks, thanks to the birds or the winds. Its successor is an almost hideous disappointment, and looks like nothing but a part of some monstrous factory."

The Housing Problem—IV.

BY GEORGE B. FORD.

IN THE illustrations of the previous articles we have studied what is being done in housing in the larger cities in America. In the text we have considered what can be done in the way of model housing. We will now consider what cannot be done with regard to housing, that is to say, we will see what is allowed and what is prohibited by the tenement code or buildings laws of the different cities of America.

New York City was the first to pass a tenement code, this some eight years ago. It was as the outcome of investigations, revealing an appalling state of affairs, that a restricting tenement code became an absolute necessity. This was soon followed by special tenement laws in Boston, Baltimore, Philadelphia, Chicago, Pittsburg, and Washington, and by state laws in New York, New Jersey, Pennsylvania, Connecticut, and Wisconsin. The tenement codes of Chicago, Baltimore, Cleveland, and San Francisco are considered the best. The constitutionality of tenement house legislation was determined by a final decision in the United States Supreme Court in 1906. In these tenement codes the question of safety and health are taken up in some detail, but the question of comfort as affecting housing is barely touched upon. This is as should be expected because safety and health are far more vital than comfort. The question of safety is considered only in regard to safety from fire, and health; in relation to light and air, sanitary arrangements, cleanliness, and over-crowding.



FIRST PRIZE DESIGN, SUBMITTED IN COMPETITION FOR NEW YORK MODEL TENEMENT.
Harde & Short, Architects.

Definition of Tenement. In New York, New Jersey, Pennsylvania, and Connecticut, and in the cities of Cleveland, San Francisco, Washington, Minneapolis, St. Paul, Denver, Rochester, Syracuse, Columbus, and Los Angeles, a tenement house is defined as a building which is occupied as a residence by three or more families living independently of each other and doing their own cooking on the premises, or by two families or more on one floor so living and cooking. Chicago, Milwaukee, and Toledo include all houses occupied by two or more families; Boston, Baltimore, Providence, and Kansas City fix the limit at four or more families or three or more families on any floor.

Fireproof Tenements. In New York, Rochester, Louisville, Denver, and New Jersey every tenement house over six stories in height must be fireproof. In Chicago, Boston, Cleveland, San Francisco, and Washington all over five stories must be fireproof, while in Pennsylvania, St. Paul, and St. Louis all tenements over four stories must be fireproof.

Wooden Tenements. New York, New Jersey, Boston, St. Louis, Milwaukee, Cleveland, Providence, Washington, Toledo, Kansas City, Syracuse, Cincinnati, and San Francisco limit wooden tenements to three stories in height, with a maximum of accommodation of three families, or two stories in height with two families per floor.

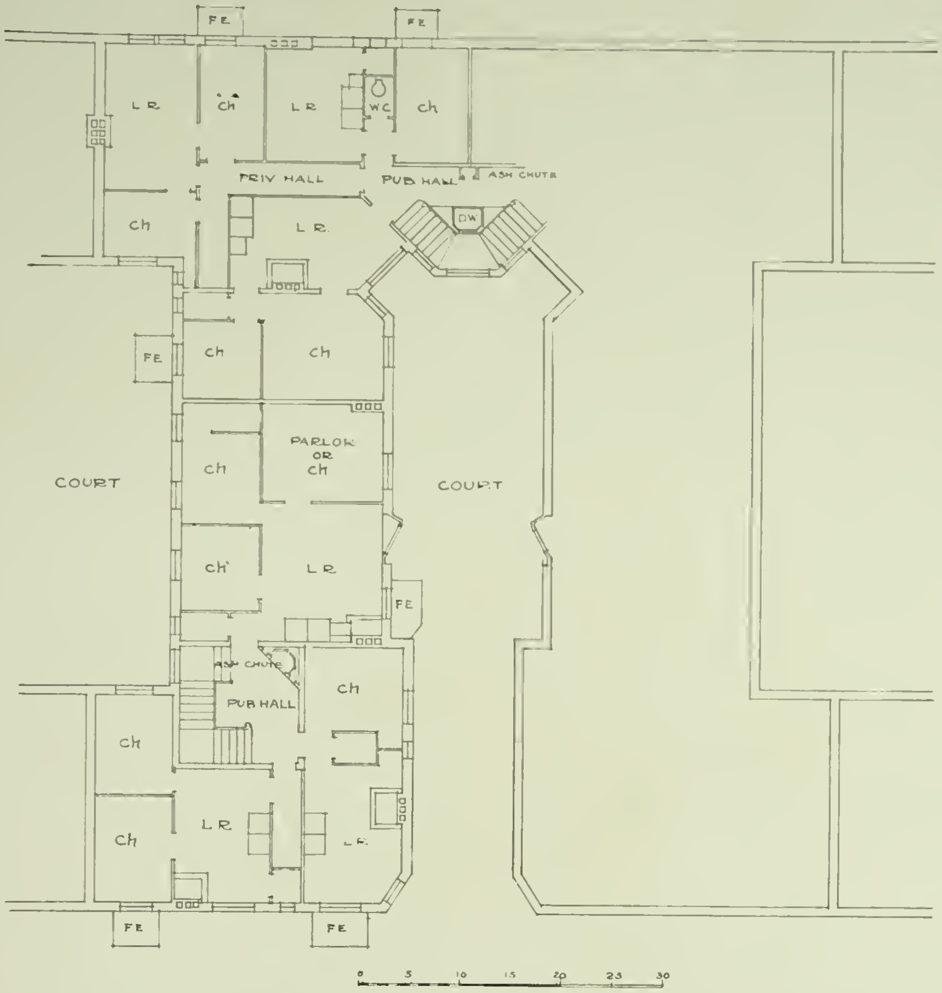
Fire Escapes. New York and New Jersey require a fire escape opening directly from one room in each apartment in each story above the ground floor. These fire escapes are elaborately detailed as to construction, with angle of stairs, etc. Chicago is nearly the same, not quite as stringent, while most of the other cities require some sort of fire escape on all tenements over three stories in height.

Stairways. In New York and New Jersey every tenement must have at least one flight of stairs from entrance to roof at least 3 feet wide. This shall be fireproof throughout. In Chicago and Cleveland every tenement must have two flights of stairs from entrance to roof, to which every apartment should be accessible. Boston, San Francisco, and Providence are similar to New York.

Hall and Stair Partitions. In New York, Chicago, Cleveland, and St. Louis the stair hall with its entrance from the street must be enclosed on all sides with fireproof non-combustible walls, and the doors opening on to these must be fireproof and self-closing. In New Jersey and Boston these partition enclosing walls may be of wooden studs with wire lath.

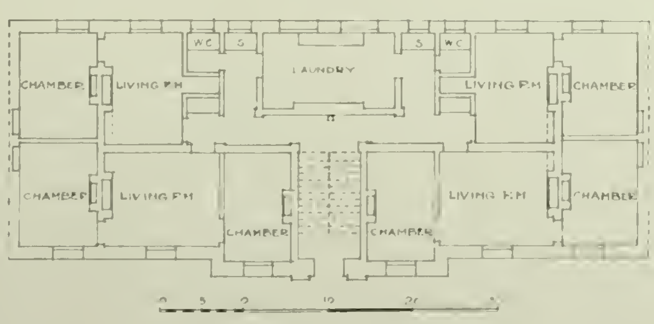
SHAFTS. In every city light and vent shafts and elevator and dumb-waiter shafts must be fireproof throughout.

GENERAL. In nearly every city it is required that in every tenement house living or sleeping rooms should have at least one window opening directly on a street, yard, or court, the top of which window shall be within one foot of the ceiling.



SECOND PRIZE DESIGN, SUBMITTED IN COMPETITION FOR NEW YORK MODEL TENEMENT.
Israels & Harder, Architects.

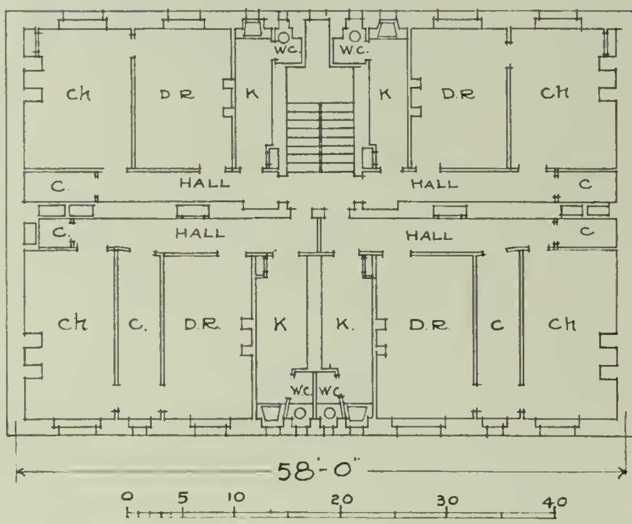
HEIGHT OF TENEMENTS. New York, New Jersey, Chicago, Baltimore, and Cleveland limit the height of tenements to one and one half times the width of the widest street on which the building faces. The same is true in San Francisco except for fireproof structures. In Boston the limit is two and one half times the width of the street with a maximum height of 125 feet. In St. Louis tenements are limited to 150 feet and those on streets 60 feet or less in width, to two and one half times the width of the street. Washington limits all tenements to the width of the streets between building lines with a maximum height of 90 feet. Providence limits all to 90 feet unless fireproof. Rochester permits no tenement to exceed in height four times its horizontal dimension. In Liverpool, Glascow, and Berlin, tenements are limited in height to the width of the street, and in Edinburgh to one and one quarter times the width of the street. In Paris the height limitation averages about one and one half times the width of the street.



BLOCK S–PEABODY AVE.
PIMLICO BUILDINGS, PEABODY TRUST, LONDON.

PERCENTAGE OF LOT OCCUPIED. New York and Baltimore allow seventy per cent of an interior lot to be occupied. Connecticut, Chicago, San Francisco, and Washington allow seventy-five per cent to be occupied. Cleveland allows only sixty-five per cent to be occupied. For corner lots New York, Connecticut, Cleveland, Baltimore, and Washington all allow ninety per cent to be occupied. Chicago allows eighty-five per cent and San Francisco ninety-five per cent to be occupied.

YARDS. In New York at the rear of every tenement house on an interior lot there must be a yard extending across the whole width of the lot at least 12 feet deep and this depth shall be increased 1 foot for every 12 feet of added height above 60 feet. The same shall be deducted for every 12 feet below 60 feet, with a minimum depth of 10 feet. On corner lots the rear yard must be 10 feet in depth. In New Jersey the rear yards for tenements 50 feet in height must be 16 feet deep. In Pennsylvania the rear yard must occupy twenty per cent of the area of the lot and never be less than 8 feet in depth. On corner lots this is reduced to ten per cent. The Connecticut law is similar to the New York law. In Chicago the rear yard of interior lots must occupy ten per cent of the area of the lot with a minimum depth of 10 feet. In corner lots the rear yard should equal eight per cent of the lot. In Boston, tenements 50 feet high or less must have a rear yard 12 feet deep, which increases 1 foot in width to each additional 10 feet in height above 50 feet. For corner lots the yard must be at least 6 feet wide and should increase correspondingly. Balti-

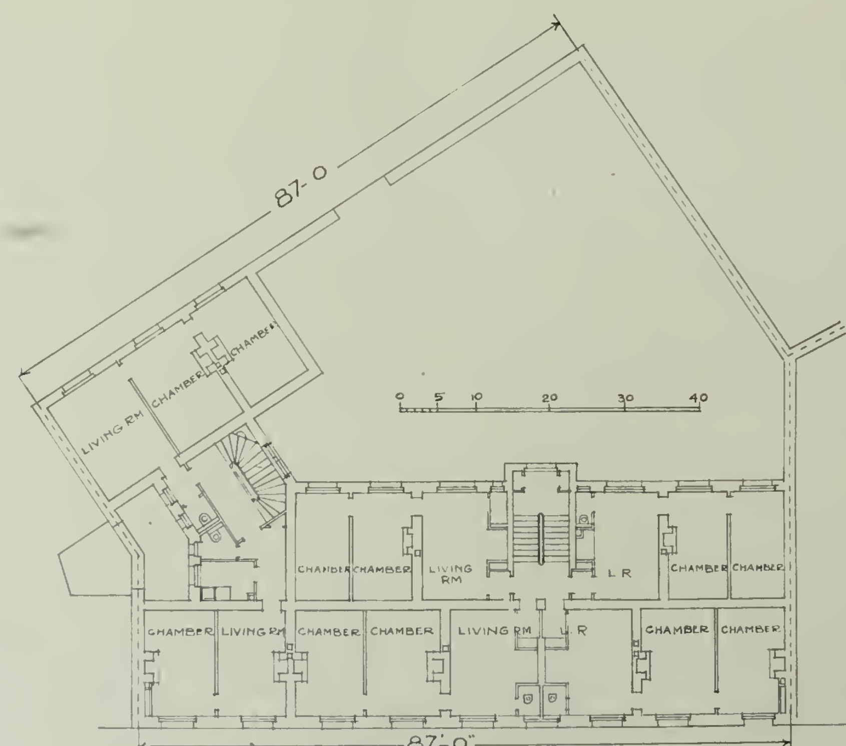


MODEL TENEMENT AT 14 RUE JEAN ROBERT, PARIS.

more and San Francisco are similar to New York. In Cleveland buildings up to 40 feet high on interior lots must have a yard 10 feet wide and for each additional 12½ feet the yard must be increased 1 foot in depth. Washington requires a yard 10 feet deep on an interior lot, and for each additional foot over 20 feet in height of a building the yard must be increased 6 inches in breadth.

In London the rear yard must contain 150 square feet and be at least 10 feet in depth. In Manchester, England, the rear yard must contain 250 square feet, in Liverpool, 150 square feet and 10 feet of depth for buildings under 30 feet high, and 15 feet of depth for buildings over 30 feet high. Dundee, Scotland, requires the yard to equal in area one third of the lot area. Edinburg requires the yard to equal three quarters of the area of the lot occupied by the building, and if the building exceeds four stories in height the area of the yard must equal the area of the building.

Courts. In New York outer courts on lot line must be 6 feet wide for tenements 60 feet high and increased or decreased 6 inches in width for each 12 feet added or subtracted from the above 60 feet in height. If the length of the court exceeds 65 feet, its width must be increased 1 foot for every 30 or less feet above 65. Outer courts between wings or parts of the same building are double these figures. Inner lot line courts must be at least 12 feet wide and 24 feet long for tenements 60 feet in height, and increased or decreased 6 inches in width and 1 foot in length for every 12 feet, or fraction, added or subtracted from the above 60 feet, except that in tenements four stories or under in height, for only two families on a floor, courts may be 8 feet by 14 feet. Inner courts not on the lot line double these figures. Every inner court must be provided at its base with an intake from street or yard at least 3 feet wide by 7 feet high. In New Jersey outer courts on lot line for tenements over three stories in height must be 2 feet 8 inches wide. Inner lot line courts for tenements exceeding four stories in height must be not less than 8 feet by 14 feet, and increased 6 inches in width and 1 foot in length for every added 12 feet above 50 feet. Pennsylvania requires that the distance from every window in a tenement house to the party wall line opposite to it must be at least 8 feet. Courts and open spaces between tenement houses and between the wings of a tenement house must be 12 feet wide. Inner courts are forbidden. In Chicago inner courts for four story buildings must contain 160 square feet with 8 feet as least width. For six stories the inner court must contain 400 square feet with 16 feet as least width. For outer courts the least width is half of the above, except where the outer court is enclosed between wings, when the dimensions are the same as the above. In Boston outer lot line courts must be at least 6 feet wide for tenements 50 feet high or less. Between wings this is doubled. Inner lot line courts must be at least 8 feet wide for tenements 50 feet high, and must have an area of at least 80 square feet. Inner courts not on a lot line are double these figures. In Baltimore a four story tenement must have 225 square feet in its inner court with a minimum width of 8 feet. A six story tenement requires 350 square feet with 11 feet as minimum width. In Cleveland outer lot line courts for four stories must be 6 feet wide, and for six stories, 9 feet wide. Inner lot line courts for four stories must be 6 feet wide with a minimum area of 108 square feet; six stories high, 9 feet in width, with an area of 243 square feet. Courts not on the lot line are double these figures. In San Fran-



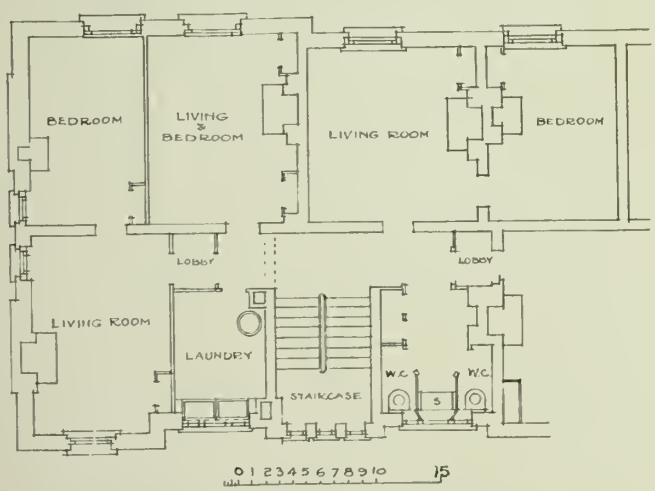
65 BOULEVARD DE GRENELLE

DWELLINGS FOR THE PHILANTHROPIC SOCIETY OF PARIS.

cisco outer courts for tenements four stories high must be 4 feet wide, and for six stories, 8 feet wide. For inner courts these widths are doubled with a minimum area of 160 square feet for four stories, and 400 square feet for six stories. London requires that the width of an enclosed court in front of a habitable room window should be equal one half the height measured from the window sill to the top of the opposite wall. Glascow requires that in front of at least one half of every sleeping room window there should be an open space equal to three quarters the height of the wall from the floor of the room to the roof. In Berlin outer courts must be 8 feet wide, and between opposite windows 20 feet wide.

Rear Tenements. In most cities rear tenements are forbidden. Where they exist, an open space of from 25 to 30 feet between them and the front tenement is required. In Chicago, Baltimore, Kansas City, and Columbus this open space is 10, 15, 20, or 25 feet according to whether the lower tenement is one, two, three, or four or more stories in height. Washington requires the difference between such buildings to be equal to one half the height of the tenement plus one half the height of the lower building.

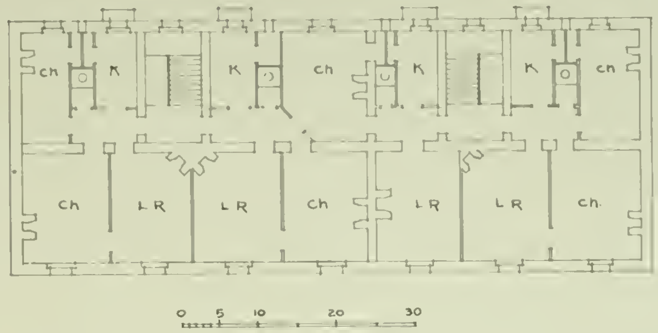
Air and Vent Shafts. Every vent shaft in New York 60 feet in height must have an area of at least 20



ASSOCIATED, SINGLE AND TWO ROOM TENEMENTS, WESTMINSTER BLOCK DWELLINGS, LONDON.

square feet. In New Jersey when 50 feet high, it must have 9 square feet of area. In Chicago, for a four story building, it must have 36 square feet, for a six story building, 72 square feet. In Boston, when 50 feet high, the area should be 15 square feet. In Cleveland, for four stories, the area should be 32 square feet, for six stories, 72 square feet.

Area and Height of Rooms. New York, New Jersey, Connecticut, Chicago, and Baltimore all require that every apartment shall contain one room with not less than 120 square feet of floor area, and that all other rooms except toilet rooms should contain at least 70 square feet. In Cleveland and San Francisco we find it the same except that the 70 square feet is increased to 80 square feet and in Boston to 90 square feet. In most cities water closets shall be at least 2 feet 4 inches wide. In New York, New Jersey, and Baltimore rooms shall be 9 feet in clear from floor to ceiling. In Connecticut, Chicago, Boston, Cleveland, and San Francisco, 8 feet 6 inches, while in Pennsylvania, St. Louis, Providence, and Grand Rapids they may be 8 feet. Most cities re-



MODEL TENEMENTS, RUE JEANNE D'ARC, PARIS. FIRST PRIZE, 1901 COMPETITION.

quire the window area of all habitable rooms to equal one tenth of the floor area.

Windows in Halls. Most cities require that all public halls in tenements should have windows opening directly to the open air.

Cellar and Basement Rooms. In most cities basement rooms may be occupied if 8 feet 6 inches in height with a ceiling at least 5 feet above the ground level.

Water Closet Accommodations. New York, New Jersey, Chicago, Boston, Cleveland, San Francisco, and Baltimore require a water closet within each apartment, provided that where apartments consist of one or two rooms, there must be a water closet for every three rooms.

Overcrowding. Most cities require that no living or sleeping room shall contain less than 400 cubic feet of air space for every person over twelve years of age and 200 cubic feet for every person under twelve. For Cleveland these figures become 500 and 300 respectively. In New Orleans 600 cubic feet are required per person, while in Denver the maximum is reached with 700 cubic feet. Four hundred and 200 cubic feet is the general requirement in Great Britain and on the Continent.

Cleanliness of Buildings. Every city has provisions for the inspection of tenement houses to see that the rooms, passages, stairs or water closets, cellars and courts of the houses be kept clean. In most cities there is further provision that the walls of all courts except such as face upon the street shall be whitewashed by the owner as often as the tenement department may require.

All the laws have provisions with regard to the administration and enforcing of their parts and into the details of which it is not necessary to go. These laws are excellent in a preventative way; they are good as far as they go, but they have an unfortunate tendency to prevent the development of new ideas in tenement planning, by throwing all sorts of obstructions in the way of any departure from the stock type. They do prevent a great deal of poor building and impossible arrangement, but they do not make it possible or advantageous for an owner to erect a tenement any better than the minimum required by law.

Note.— Further details in regard to these laws may be obtained from the excellent comparative summary of the Tenement Regulations of United States recently compiled by the Legislative Reference Department of the Wisconsin State Library at Madison, Wis.

Masonic Temple, Brooklyn, N.Y.

BY C. HOWARD WALKER.

ONE of the primary essentials of monumental architecture as taught in the schools, is that of the sense of the proportions of geometric solids in their relations to each other. The simplicity of an easily comprehended mass is in itself a far step towards architectural dignity, and when in addition to its planes and silhouette the details of its openings and of its embellishment are finely placed and in just proportions, there inevitably results monumental architecture of the best type. This statement is almost axiomatic, and is easily demonstrated by the consideration of a number of the noblest buildings of the past. Certainly the Pyramids are geometric solids pure and simple, and have been considered the epitome of dignity. The temples of the Greeks, the Mausoleums, whether square in plan like that of Halicarnassus, or circular like those of Augustus and of Hadrian, are simple geometric solids beautifully decorated with details, as are also the brick Campanile of North Italy and the Baptistries of Tuscany. Each of these has simple requirements of plan which can and rightly should be expressed by equally simple exteriors. It is the constant desire of the skilled architect to reduce the integral factors of his design to as few as possible as far as solids are concerned — to avoid eccentricities and unnecessary fantasy and finally to embellish adequately. When there appears a building which has all these attributes, which while containing a number of rooms of various sizes and several mezzanine stories has maintained great simplicity of mass associated with interesting detail, it is a natural conclusion that it has been thoroughly and well studied, and when in addition the scale of the detail has been carefully modulated to every portion of building and the areas of the different surfaces of tone and of color have been proportioned to each other, the further conclusion is that it has been intelligently and skilfully studied. Such a building is the Masonic Temple at Brooklyn, by Messrs. Lord & Hewlett and Pell & Corbett, associated. To have treated this building as a simple cube, which had monumental character at once from its mass, and then to have so proportioned an order upon its façades that the stylobate, order, and parapet are in admirable harmony while at the same time they accommodate and express the various mezzanine stories, is an admirable achievement.

Especially ingenious is the way in which two stories are obtained over the entablature without jeopardizing either the proportion or the weight of the parapet.

The windows immediately above the cyma, while entirely performing their work as light openings, are almost entirely concealed from below, and the setback of the top story and its change in tone completes the mass admirably. The whole method of obtaining two stories of windows above the entablature without losing the surface of the parapet and without making it too heavy is very successful. The relative scale of the detail to the various parts of the building has been carefully studied. The facias of the belt courses, broad in comparison with the curved moldings, give strong horizontal lines and shadows that define the factors of the mass. As has been mentioned, these factors are simple. There is a high stylobate containing the first floor and the first mezzanine.

The second mezzanine is contained within the plinth base of the order. The mistake of making the openings in this story too large or too high could very readily have occurred. As it is, they are longer than their height, and therefore are horizontal units, running with the plinth, not across it, and therefore becoming a part of it. It is perhaps open to question whether grills in these windows placed nearly upon the plane of the ashlar would not have still further maintained the integrity of the plinth, but probably the grills would have cut out too much light and have been impracticable. At first thought it seemed as if it would have been preferable to omit brick in this plinth course and to have made it wholly of light terra cotta, but perhaps this would have called attention to the window openings by contrast and have made them too important. Obviously the idea was to modulate the tones gradually into the brickwork, but it is doubtful if any such modulation is necessary between an order and the base upon which it stands. If this plinth course could have been all of terra cotta with windows with grills, it might have appeared a little more solid. This however is somewhat carping criticism, as the work is excellent as it is.

The order embraces three stories, when stories exist. It is the Ionic order of the Erectheion type. The stepped wall base is carried between the columns and softens the transition between the stylobate and order. The columns are engaged and are in antis, there being a double pilaster flanking the colonnade on the façade, with narrow windows between the pilasters. The corners of the building show beyond the outermost pilaster. Between the columns, about two thirds of the height of the shaft, is a Doric sub-entablature of terra cotta separating the two lower stories of the colonnade from the upper. This is carried on slender pilasters engaged with the columns. It is in excellent scale and well placed below the Ionic capitals. But a continuation of the belt is carried between the brick pilasters at either side of the colonnade as a panel with a roundel in the center. This panel appears to be the one detail which could have been improved. Before criticizing it, it should be acknowledged that it is very good as it is, but that it is open to the following suggestions : In the order, between base and epistyle, all the factors excepting the Doric belt are vertical in their motive. The vertical idea is echoed in the Doric belt by the triglyphs, but there is no such echo, nor is there a possibility of an echo in this isolated panel. It seems alone and interpolated. It is too heavy for the window trims above and below it, and its roundel is too conspicuous. All this does not appear on the elevation. It was the most natural thing possible to carry through the line of the Doric belt between the pilasters. In a building of one material where shadows alone count, it would have remained a minor detail, but with the contrast of brick and light terra cotta it becomes conspicuous. Perhaps its isolation is its chief fault, as no other portion of the building is unrelated to its adjacent parts.

There is one other detail of which a criticism is perhaps entirely a matter of personal prejudice, and may be put in the form of a question. When a building has delicate detail, and two grades of material, does not the finer material and the more delicate detail rightly frame the openings, and is it well to put a coarse trim inside a fine one? This is apropos of the plain brick trims to the windows between the columns and within the delicate pilasters. It is evident that this was done because of the dark tone of the brick and to maintain darkness between the shafts, but could not this have been done with deeply molded terra cotta trims with detail that gave more shadow than high light? It is only fair to say that this criticism is one which does not in any way imply lack of success in the design as it is, but is made entirely as suggestion, and as suggestion which undoubtedly is open to discussion, but which in reviewing a piece of work of the undoubted merit of this building, induces what is hoped may be interesting speculative thought as to certain details.

Editorial Comment and Miscellany.

THE MASONIC TEMPLE, BROOKLYN.

THE Masonic Temple for the Brooklyn Masonic Guild is erected on the northeast corner of Lafayette and Clermont avenues on a plot with 100 feet frontage on Lafayette avenue and 195 feet on Clermont avenue.

In a building devoted to so many interests, the exterior is important. The dignity of the Masonic Order demands that its Guild be housed in a structure of imposing character. The building is divided, practically, into three vertical heights, which might be likened to the proportions of an ordinary pedestal with a very high base; the base of the pedestal covering the height of the auditorium, the die of the pedestal covering the two lodge room floors, and the cap of the pedestal covering the room devoted to the uses of the commandery, etc. The auditorium and lodge rooms on the second, third, and fourth floors have been given their due prominence in the composition of the exterior.

On a base of great height and simplicity are superimposed eight Ionic columns on each of two façades fronting on Clermont and Lafayette avenues. On the other two sides are flat piers or pilasters against the wall surfaces, all of which is crowned by a cornice of great richness with appropriate balustrade and superstructure.

To approach a good standard of exterior decoration and color treatment, without employing the expensive materials commonly used for these purposes, there has been employed a combination of colored terra cotta, marble and face brick; the marble and terra cotta being used in alternate courses in the base, the terra cotta and brick in the treatment of columns and caps, and the colored terra cotta in the main cornice and portions of the superstructure, the idea being to construct the lower portions of the building with great simplicity, increasing the richness as the crowning features are approached. The crowning story sets inside of the building line. The space here will be used for a roof garden, accessible from the fourth mezzanine story.

The Guild has provided ample lodge rooms with their accessories; a large auditorium for public uses, and a banquet hall for the uses both of the fraternity and of the public, all these functions of the building being so arranged as to be used at the same time without interference with each other. Separate entrances are provided to lodge rooms and to the auditorium and the auditorium lobby, or independently of them both.

Banquet Rooms and Kitchen. The banquet hall will be capable of division into at least three parts, all served from a common kitchen and capable of being used by both the lodges and the public without interference in the service, or used as one large room seating about five hundred people — should occasion require.

The kitchen arrangements are made to attain the most complete, direct, and rapid service possible, amply lighted and provided with all modern conveniences for the handling of supplies and for either the preparation of food or the serving of caterer's supplies. There is a small mezzanine over a portion of the kitchen for caterer's lockers and toilets.

Attention is called to the public accommodations in connection with the banquet hall, such as a large public lobby communicating directly with the main staircase and elevators and with the women's retiring room, men's coat room, and their respective toilets. Upon this floor also are the boiler room, storage for coal, and the necessary accommodation for elevator, machinery, and other equipment in connection with the general administration of the building.

First Floor. For public entertainment and for the further uses of the fraternity, a large auditorium seating about one thousand people occupies the principal portion of the first floor. The auditorium has a unique arrangement of seating, it being the intention at times to use it for balls and receptions. For this purpose a series of secret doors have been provided in the stage front, and the seats which are made in sections run under the stage on trucks provided for this purpose. By this means the entire floor can be cleared in a very few moments.

The stairway and elevator service is convenient to the private entrance and private lobby on Clermont avenue, and designed for the use of masonic bodies exclusively. Two entrances leading to the auditorium are provided on Lafayette avenue.

All the conditions incident to a perfectly equipped modern auditorium have been fulfilled. Ample entrances and exits, stage and dressing room accommodations are provided for. The main staircase at the left of the private entrance extends to the second mezzanine floor, the principal room on this floor being the library and public lobby, the remaining portion of the area being taken up by the upper portion of the auditorium.

The grand entrance lobby is finished in imitation caenstone and marble, with marble and terrazzo floors in ornamental design. Leading from this lobby is a spacious stairway of marble and ornamental iron to the floors above and to the banquet hall in the basement.

The finish throughout is quarter cut white oak, finished natural, with Georgia pine, parquette, tile and marble floors.

A first class system of heating, ventilation, lighting, and plumbing has been installed, the heating being automatically controlled steam and forced draft. In most cases the radiators are concealed in wall pockets behind ornamental iron grills.

Above the auditorium are three important stories devoted to lodge rooms and their accessories in the way of spacious halls, reception rooms, tiler's and preparation rooms, coat rooms, committee rooms, dressing and toilet rooms.

ST. LUKE'S HOSPITAL, CLEVELAND, OHIO.
Roofed with Ludowici-Celadon Tile.
F. W. Streibinger, Architect.

SECOND AND THIRD FLOORS INCLUDING MEZZANINE FLOORS. The lodge rooms proper begin at the second floor. Attention is called to the very ample size of these lodge rooms, which are 37 feet by 57 feet and 39 feet 6 inches by 57 feet respectively. The various requirements of a lodge room are here shown, viz: commodious lobby convenient to the elevators and main stairways, large coat rooms, reception rooms, tiler's and preparation rooms, and private stairways leading to the committee rooms, and organ loft in a mezzanine story. The private stairway to the organ loft is accessible only from the lodge room. A mezzanine story over the coat rooms gives ample storage space for regalia and documents. The third and fourth floors have accommodations identical with the second.

DETAIL BY WILLIAM L. ROUSE, ARCHITECT.
South Amboy Terra Cotta Company, Makers.

The general arrangement of the lodge rooms, ante rooms, public halls, auditorium, and main staircase has been studied with a view to the absolute practical requirements necessary in a building of this character, and, further, to its future artistic embellishment as may be fitting in a building devoted to so important a purpose. With this end in view, it has been the aim of the trustees and the architects to arrive at the simplest arrangement possible and to give that proportion and symmetry to the various apartments which are so necessary to consistent and beautiful decoration.

The cost of the building was 40 cents per cubic foot, figured on a basis of a cube from the ceiling of the fourth floor mezzanine to the basement floor by the exterior dimensions.

The plans were drawn by Lord & Hewlett and Pell & Corbett, associated, architects, who were selected by competition into which fourteen competent architects had entered.

FIREPLACE BY CUDWORTH & WOODWORTH, ARCHITECTS.
Lower part in faience, modeled and executed by Hartford Faience Company.

MASONIC TEMPLE, WASHINGTON.

THE peculiar shape of the site made it possible to impress on the shortest but most important façade, facing fifty feet and eight inches on Thirteenth street, the character of the temple. The sides extend down New York avenue one hundred and thirty-two feet and six inches and H street one hundred and forty-four feet and three inches respectively, but here the windows are made much more archaic in character, and by their shape, size, and disposition lend mystic character to the structure.

The building is six stories high, with the first story about thirty feet in the main auditorium, the total height being one hundred and ten feet above the sidewalk, the greatest height allowed by law on this site. It is heated by steam, and has a special system of ventilation for the auditoriums, banquet hall, lodge and locker rooms. The structure is fireproof throughout, with steel-frame construction, — the exterior walls, however, are self-sustaining. The auditoriums and lodge rooms are practically free from columns with fifty-foot plate girders spanning from wall to wall.

The principal entrance is marked by a large semi-circular opening or doorway to distinguish it from the rectangular openings on the sides, which merely are entrances and exits to the auditorium.

LONGACRE BUILDING, 43D STREET AND BROADWAY, NEW YORK.
Executed in white mat terra cotta, having the texture of marble.
Atlantic Terra Cotta Company, Makers.
Charles A. Platt, Architect.

BASEMENT. The main portion of the basement and vaults extending out under the sidewalks on three sides of the building, is devoted to an immense banquet hall, seating about eight hundred people. This room is readily accessible from the main auditorium room on the first floor, and by stairways and elevators from any of the lodge rooms.

DETAIL BY HELFENSTELLER, HIRSCH & WATSON, ARCHITECTS.
Winkle Terra Cotta Company, Makers.

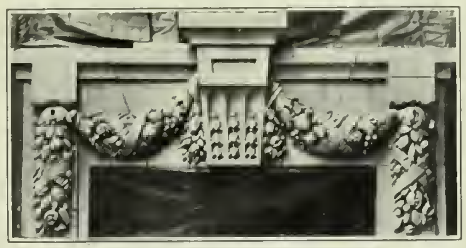
In connection to the banquet hall are two entrance halls with toilet for men, and toilet and dressing room for women, and coat and hat room. The service part consists of a large kitchen, storeroom, and service-room or pantry. Supplies can be brought in direct to the kitchen from the sidewalk.

The power part of basement consists of boiler and pump room, elevator machinery, coal vaults, and fan room for supplying fresh air to the banquet hall.

FIRST FLOOR. A large auditorium, practically at sidewalk level, occupies almost the entire floor. This auditorium with gallery will seat almost eighteen hundred people. The room has been designed as a music hall, and has a grand organ for use of choral society or oratorio concerts as well as for especially largely attended masonic rites.

An especially fine floor has been provided in the auditorium for dancing, and when balls are given the banquet hall can be used as a supper room, with separate stairways, dressing, coat and toilet rooms as described under the "Basement."

The auditorium is well provided with exits directly to the sidewalk Practically it has an entrance at each of its four corners. Access to auditorium can also be had from main entrance lobby of temple by masons on occasions when auditorium is used by them. There is a large entrance lobby, with two elevators and stairway, which repeat on each floor. The lobby in every case is made quite architectural, it being the public part of each floor.



DETAIL BY ESENWEIN & JOHNSON, ARCHITECTS.
Atlantic Terra Cotta Company, Makers.

SECOND AND THIRD FLOORS are given up to the Blue Lodges. There are four lodge rooms, with preparation and ante-rooms to each, together with committee rooms required, and offices for the use of grand officers.

There is a library on third floor in addition to the above.

DETAIL OF EXTERIOR OF DOME OF BUILDING FOR EVENING BULLETIN, PHILADELPHIA.
Executed by Conkling-Armstrong Terra Cotta Company.
Edgar V. Seeler, Architect.

FOURTH FLOOR is devoted to Knights Templar, with asylum and commandery, ante-room, etc. Space is provided for eight hundred lockers.

FIFTH FLOOR is for the Scottish Rite, with lodge rooms, preparation room, ante rooms, and an auditorium with gallery and stage. This auditorium is intended to be used by both the Scottish Rite and the Mystic Shrine, which occupies the sixth floor, and seats about seven hundred in floor and gallery.

The stage is so arranged that the most elaborate services of the Scottish Rite can be given in their entirety, with the ninety-nine sliding scenes required.

There are storage rooms on either side of the stage on the fifth and sixth floors.

Every floor has its toilet rooms.

The building cubes up to one million three hundred and sixty-eight thousand six hundred and ninety-six feet, which is figured from basement floor to average roof height. The complete cost of the building was $370,978.87, which is at the rate of about twenty-eight cents per cubic foot.

The architects were Wood, Donn & Deming.

CONGREGATIONAL CHURCH, ST. PAUL, MINN.
Built of variegated bronze brown brick, made by Twin City Brick Company.
Clarence H. Johnston, Architect.

IREM TEMPLE, WILKES-BARRE, PA.

THE building was erected for the Ancient Arabic Order of the Nobles of the Mystic Shrine. The entrance portal of this building is composed entirely of colored terra cotta with the exception of the two marble columns supporting the arch. The remainder of the building is in brickwork of ten different shades, ranging from a dark buff to a deep reddish brown. The roof is laid with red tile.

The total cost of the building, including everything except furniture, was $167,000. The building contains 826,000 cubic feet, measured from bottom of footings to an average of the height, which made the cost a trifle more than 20 cents per cubic foot.

Olds & Puckey, of Wilkes-Barre, were the architects, and the brick and tile work was erected by George T. Dickover & Son.

IN GENERAL.

Archie H. Hubbard has opened an office for the practice of architecture in Engineering Hall, Urbana, Ill.

F. Gordon Pickell has opened an office for the practice of architecture in the Union Trust Building, Detroit. Manufacturers' samples and catalogues desired.

RECTOR BUILDING, CHICAGO.
Architectural terra cotta, made by American Terra Cotta and Ceramic Company.
Jarvis Hunt, Architect.

Walter S. Gray has opened an office for the practice of architecture in the McCarthy Building, Roanoke, Va. Manufacturers' samples and catalogues desired.

Hydraulic-Pressed brick were used in the Masonic Temple, St. Louis, illustrated in this issue.

The third report of the Board of Architecture for the state of California has just been issued. It comprises the law, rules of the board, and list of certified architects. Frederick L. Roehrig, of Los Angeles, is the secretary of the board.

The Robert Fulton Monument Association of 3 Park Row, New York City, announces a competition among the architects of the United States for the purpose of securing designs for the memorial of Robert Fulton, costing $2,500,000, and to be erected in Riverside Park in the city of New York. Architects of experience and good standing are requested to apply to the association for forms on which to make application for the competition program and permission to have their names entered as competitors.

Prof. A. D. F. Hamlin, of Columbia University School of Architecture, has sailed for Constantinople, where he will make a survey of the Robert College property and draw plans for its future extension. Professor Hamlin was born in the Turkish capital, his father, Cyrus Hamlin, having been the founder of Robert College. Two of the present five buildings of the institution were designed by Professor Hamlin.

The roofing tiles for Irem Temple, Wilkes-Barre, illustrated in this issue, were furnished by the Ludowici-Celadon Company.

The Hydraulic-Press Brick Company furnished the brick for the Masonic Temple at Washington, illustrated in this issue.

The new Curtis Building, Philadelphia, Edgar V. Seeler, architect, will use six hundred thousand "Old English Colonial Red

Brick" made by Sayre & Fisher Company. The size of these bricks, which are made to match those which are used in some of the older buildings in London, is 9 by 4½ by 2¼ inches.

Fiske & Company furnished their "Tapestry" brick for the Masonic Temple, Brooklyn, illustrated in this issue.

The new plant of the Bradford Pressed Brick Company, at Bradford, Pa., William Hanley, proprietor, was formally opened on June 25th. Representatives of the company's selling agencies in the larger cities of the country were in attendance, and in addition others who are prominently identified with the burnt-clay industries of the country. A banquet was tendered the visitors on the evening of June 25th, at which the leading merchants, bankers, and professional men of Bradford were in attendanee. The whole country about Bradford is noted for its superior clays and shales, and the new plant will be devoted exclusively to the making, by the stiff mud process, of "Bradford Reds," a brick which is well-known throughout the building fraternity of the entire country.

GARAGE, CHICAGO.
Architectural terra cotta, made by Northwestern Terra Cotta Company.
Robert C. Berlin, Architect.

DETAIL BY LEON STERN, ARCHITECT.
Brick Terra Cotta & Tile Co., Makers.

The Columbus Brick & Terra Cotta Company, of Columbus, Ohio, has issued a new catalogue in which is illustrated, by drawings, their full line of special-shape bricks, and also an interesting series of buildings by prominent architects which have been built of their product. An especially interesting feature of this work is the presentation of drawings which give by number the different shape bricks which are needed for the different ornamental courses. Accompanying the catalogue there is a price list of all the ornamental brick made by the company.

The Masonic Temple, Brooklyn, is one of the most notable examples of glazed terra cotta in colors so far undertaken. As it is the latest example of polychrome terra cotta or architectural faience (the two terms being synonymous) so also may it be said to express the best in the art.

The predominant color is cream white and the material is made with a special vellum finish. The decorative treatment in colors is in yellow, green, sienna, and blue, and the selection of these colors was conceived in excellent taste and has been carried out skilfully Four or five colors were, in many instances, used on one piece. The manufacture of so large a quantity of colored glazed work was a task of no small magnitude and importance and it was absolutely necessary that a work so costly as this should not be delayed and that the elaborate color scheme should not only be produced successfully, but at the first burning, and this was done.

SWIMMING POOL, WORCESTER ACADEMY, WORCESTER, MASS.
Showing life rail and gutter built of patented enameled brick, made by American Enameled Brick & Tile Co.

The Atlantic Terra Cotta Company furnished the architectural terra cotta for three of the buildings illustrated in this issue, viz: the Masonic Temple, Brooklyn, Lord & Hewlett and Pell & Corbett, associated, architects; Masonic Temple, Washington, D. C., Wood, Donn & Deming, architects, and the Irem Temple, Wilkes Barre, Pa., Olds & Puckey, architects.

DETAIL BY SCHWARTZ & GROSS, ARCHITECTS.
New Jersey Terra Cotta Company, Makers.

The Irem Temple, the entrance to which is in terra cotta, is of Moorish design and is an excellent example of the possibilities of architectural faience. The colors employed are white, golden yellow, sienna, and blue, blue being used as a background.

The Masonic Temple, Washington, D. C., is of classic design and is done in grey limestone terra cotta.

COMPETITION FOR A BRICK HOUSE.

COST NOT TO EXCEED $10,000.

FIRST PRIZE, $500. SECOND PRIZE, $250. THIRD PRIZE, $150. FOURTH PRIZE, $100. MENTIONS.

PROGRAM.

The problem is a house with walls built of brick. Porches, verandas, or piazzas may be in part or wholly of brick or wood.

The cost of the house (exclusive of the land) including heating—equipment complete; plumbing—including all fixtures; gas piping and electric wiring—with fixtures, is not to exceed $10,000.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The plan should provide accommodations for a family of five—three adults and two children—and at least one servant. There are no restrictions as to size, shape, or style of house—except the cost—nor the size, shape, or location of lot.

The particular object of this Competition is to obtain designs for a BRICK HOUSE of moderate cost. It is especially desired that the treatment of the exterior shall show the possibilities in obtaining charming but restrained effects by the use of bond and jointing and pattern. The BRICK HOUSE is rich in precedent, and the material, whether considered from the esthetic or the practical standpoint, meets in the fullest measure the demands put upon it. To summarize: —the Competition calls for A CHARMING BRICK HOUSE OF MODERATE COST.

CONSTRUCTION.

The methods usually employed in the construction of brick walls may be followed, except that the walls are to be wholly of brick and of sufficient thickness to safely carry the load. The program does not call for a fireproof house, although that form of construction is not objected to. The choice of brick is left to the designer.

DRAWINGS REQUIRED.

On one sheet a pen and ink perspective, without wash or color, drawn at a scale of four feet to the inch. Also plans of first and second floors at a scale of eight feet to the inch. In connection with the plan of the first floor show as much of the arrangement of the lot in the immediate vicinity of the house as space will permit.

On another sheet, at the top, the front elevation drawn at a scale of eight feet to the inch,—and below the elevation, a sufficient number of details to properly show the brickwork and the special features of the design,—drawn at half inch scale in black ink without wash or color. Sections shown are to be cross-hatched in such manner as to clearly indicate the material, and floor plans are to be blocked in solid.

The size of each sheet is to be exactly 24 inches by 18 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 22 inches by 16 inches. The sheets are not to be mounted.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., on or before Sept. 15, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three or five well-known members of the architectural profession.

In making the award the jury will take into account the fitness of the design in an artistic sense to the material employed; the adaptability of the design as shown by details to the practical constructive requirements, and the excellence of the plan.

Drawings which do not meet the requirements of the program will not be considered.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. The full name and address of the architect will be given in connection with each design published. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $500.
For the design placed second a prize of $250.
For the design placed third a prize of $150.
For the design placed fourth a prize of $100.

This Competition is open to everyone. The prize and mention drawings will be published in THE BRICKBUILDER.

THE BRICKBUILDER

VOLUME XVIII | AUGUST 1909 | NUMBER 8

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

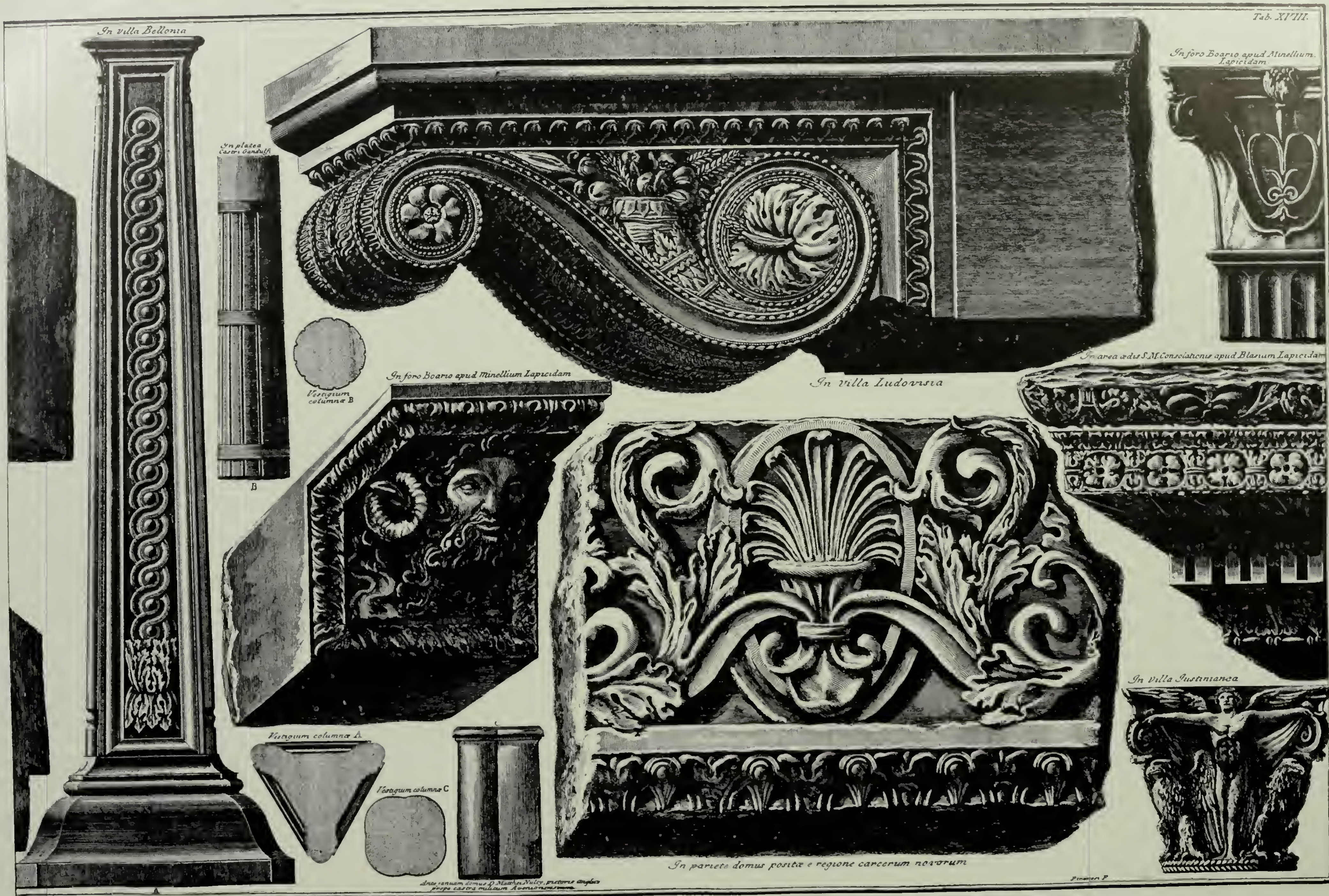
CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

ALDEN & HARLOW; ATTERBURY AND WALKER, ASSOCIATED; CHARLES C. GRANT; ROBERT D. KOHN; MAURAN, RUSSELL & GARDEN; POND & POND; WILLARD T. SEARS; WATTERSON & SCHNEIDER.

LETTERPRESS



ARCHITECTURAL DETAILS FROM ANCIENT ROMAN BUILDINGS. GIOVANNI BATTISTA PIRANESI, DEL.

THE BRICKBVILDER

VOL. 18 NO. 8 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· AUGUST 1909

Interesting Examples of the Use of Burnt Clay in Architecture.

BY CHARLES H. HUGHES.

THE use of clay products for covering steel columns and girders for walls of subway stations and trolley car shelters on the Queensboro Bridge connecting New York and Long Island City, and on the Williamsburg Bridge connecting New York and Brooklyn, admirably illustrates their adaptability for practical and for ornamental purposes.

The Queensboro Bridge is of the cantilever type, with five spans, one of which is 1,182 feet and forms the longest span on any cantilever bridge in America.

The illustration shows the colonnade beneath the bridge, on the New York side of the river. The steel columns supporting the floor of the approach to the bridge rest on large granite bases and are covered with glazed terra cotta blocks, from the top of which springs the vaulting.

The vaulting is built of two or more layers of burnt clay tiles, the inner courses being laid in Portland cement mortar. The finish course is of cream-white tiles with corrugated glazed faces, laid in lime mortar; the joints are then raked out and given raised joints, the pointing mixture being lime gauzed with Keene's white cement. Before the tile construction was started, the arching of the approach was waterproofed on the under side with two good mop coats of coal tar pitch applied hot.

SHELTER, APPROACH TO WILLIAMSBURG BRIDGE, NEW YORK CITY.
Palmer & Hornbostel, Architects.

By referring to the illustration it will be seen that in the ribs between the columns the tiles have the same width as the faces of the glazed terra cotta blocks on the columns; also that the courses of tiles on each side break joints with those of the center. Note particularly how nicely the terra cotta blocks at the top of the columns fit into the vaulting between the ribs. Looking at the ribs transversely, it will be seen that they are made of four layers of tiles — the fourth one however does not extend the full width of the rib. Nearly 50,000 square feet of tile is used in the colonnades.

The vaulting in the arch over First avenue is another example of this construction, with a greater span than in the colonnades. Here the arch has a span of about 60 feet. The tiles are the same color and size as in the colonnades, and cover an area of almost 10,000 square feet.

By using light colored tiles and terra cotta blocks a bright, cheerful appearance is given to the soffit of the approach, which would otherwise be dark and dismal. In the soffit of the large arch are several electric lights as well as in the colonnade arches.

Owing to local conditions the Long Island City approach is built with solid granite side walls, and the steel columns and girders are not treated as on the New York side.

The timbrel and terra cotta work in the Williamsburg Bridge, while similar in a general way to that in Queensboro, has however many different features.

In the center of the approach to the bridge on the street level are trolley car shelters. Within the shelters will be noticed entrances and exits to the station below the street. The roof of the shelter is supported by cast-iron columns, which have collars to receive the vaulting. The vaulted surfaces are of burnt clay tile 6 inches by 12 inches by 1 inch, with the lower course of cream-white glazed corrugated tile, making a finished surface similar to that under the New York approach of the Queensboro Bridge, but the most pronounced difference is in the arched ribs, extending from column to column and from the columns to the roof cornices. Referring to the illustration it will be seen that the transverse ribs are made

COLONNADE BENEATH APPROACH TO QUEENSBORO BRIDGE, NEW YORK CITY.
Palmer & Hornbostel, Architects.

up of two layers of tiles — that a tile the full width of the rib is always placed next to the column, and that the joints of the inner layer of tiles come directly over the center of the outer ones. The longitudinal ribs are also of two layers of tiles, which break joints. To secure a good bearing surface for the four ribs they are brought together about 12 inches above the top of the cast-iron columns.

One of the largest and most important of the new buildings in the Zoological Park, Borough of The Bronx, New York, is the Elephant House. It is one story high and in the center is a large polychrome dome. The walls of the house are of brick, with the outer face covered with buff Indiana limestone, and the inner face, where exposed as in the animal quarters, walls of keeper's rooms, etc., covered with Norman-shaped, mottled-faced brick laid in colored mortar with $^3/_{16}$ inch shove joints.

The dome has an exterior diameter of about 40 feet, with the base 48 feet above the ground and the top of the lantern 74 feet. It is the largest polychrome dome in this country and is similar to those on many of the old Mexican churches. The dome is built of rough tiles sufficiently thick to carry the weight of the lantern and furnish a support for the colored glazed tiling. The border tiles adjacent to the ribs are purple, the lowest band is a grayish blue, the next strong blue, then cream, and finally green. Above the green band is the panel leaf ornamentation, with a yellow background and blue leaves. Following the leaf ornamentation are more bands, similar in colors to the first, with another leaf ornamentation, and finally more bands corresponding to the lower ones. The dome has eight yellow ribs, and at the bases are ornamental finials in yellow and green. On top of the dome is the lantern, about 15 feet high and 5 feet in diameter, of polychrome terra cotta, with eight blue rectangular panels and eight small green ones near the top. Below the base of the dome is a frieze of yellow, blue, and white terra cotta tile, which stands out prominently against the buff limestone. With the sun shining the color effect is very striking.

Under the polychrome dome is another. This second one, forming the ceiling of the rotunda, is perforated by twelve ceiling lights 4 feet in diameter and one center light about 5 feet in diameter, through which light passes to the floor below. The tiles for the vaulting are semi-porous terra cotta 1 inch by 6 inches by 12 inches, and are laid in Portland cement mortar. A row of tiles follows the arches, and above them are bands encircling the rotunda, except where broken by the arches. The tiles forming the bands are of a lighter shade than those in the vaulting. The arches on the four sides of the rotunda have the bricks set radially, and above those over the center bay, the usual wall construction is followed to the roof. The walls of the rotunda are of limestone.

On each side of the rotunda are three bays, the end one being semi-circular. The arches over the center bay have the bricks laid row-lock, and finished off on the under side with five thicknesses of tiles laid in the herringbone pattern, the tiles breaking joints. The arches are built to the roof, and are continued transversely on both sides of the center bay as solid walls to the walls of the house, thus forming enclosures for the animals. The longitudinal arches are of five courses of radial brick, and above them the ordinary brick wall. In the soffits

ARCH SPANNING FIRST AVENUE, QUEENSBORO BRIDGE, NEW YORK CITY.

are five layers of tiles, laid with broken joints similar to those in the transfer arches.

The ceilings over all the bays are of tiles, 1 inch by 6 inches by 12 inches, the same as in the rotunda, and around the end bays are two light bands of tiles.

The interior of the house is well lighted and ventilated. Besides the rotunda lights there are windows in the walls above the arches and ventilators in the vaulting over the center bay. In the vaulting over the side bays are large rectangular skylights, while in each end bay are three windows.

The colors in the pitched roof are a decided contrast to those in the polychrome dome and to the buff limestone walls. The roof is covered with green glazed tiles set in panels with buff colored terra cotta ribs matching the limestone. There are three ribs forming four panels on each side of the dome, and then a limestone rib forming a gable, which marks the end of the straight portion of the house. The semi-circular ends have three buff terra cotta ribs, between which are laid green tiles.

Another excellent example of the use of tile vaulting in connection with architectural terra cotta is found in the Amety Baptist Church, New York City. The illustration shows how gracefully terra cotta and tiling can be joined to decorate even the most intricate structural problems. Of considerable interest are the penetrations of the soffits in the gallery arches which generally have a tendency to detract from the harmony of the whole structure, but are so finely executed in this church as to add to the interest of the entire scheme. The chancel rail and pulpits are constructed of architectural terra cotta.

DOME OF ELEPHANT HOUSE, ZOOLOGICAL PARK, NEW YORK CITY.
Heins & La Farge, Architects.

ROTUNDA AND BAYS, ELEPHANT HOUSE, ZOOLOGICAL PARK, NEW YORK CITY.
Heins & La Farge, Architects.

INTERIOR, AMETY BAPTIST CHURCH, 312 WEST 54TH STREET, NEW YORK CITY.
Rossiter & Wright, Architects.

Carved Brickwork — Some English Examples.

EVER since our houses were bespattered with stucco — surely the most baneful architectural disease we have yet suffered — the introduction of carved stonework on all classes of houses has been general. The most ignorant jerry-builder, throwing up his brick boxes on the fields of our suburbs, has always had paramount in his mind the necessity for some foliated stone capitals on either side of the entrance doorway, and on the little bay window with its harsh slate roof and Gothic finial. It is not good carving ; it is ill-devised, proportionless, coarse, and it sets on the house like fungus on a tree. Perhaps

BUSINESS PREMISES, VICTORIA STREET, LONDON.
Showing bays with carved brick treatment.

the builder, in his ignorance, is the better judge of the taste, or want of taste, displayed by his prospective clients, and as he buys his carved stone trimmings from the mason's yard at so much per dozen, or gets them hewn in place into such shape as they possess, it is hopeless to ask for something else. But with the better class house, intended for people who are supposed to have a fitter sense of things, with at least some appreciation of appropriate work, one is surprised to find so little in the way of carved brickwork, for such work has a peculiar charm on a brick house, and no great expense need be incurred in the execution of it.

Provided that the proper grade is secured, brick is a pleasant material to carve, and there is a softness about its outline which is peculiarly distinctive. Moreover, in the matter of weathering, carved brick is pleasing ; for,

CARVED BRICK PANEL, BUSINESS PREMISES, VICTORIA STREET, LONDON.

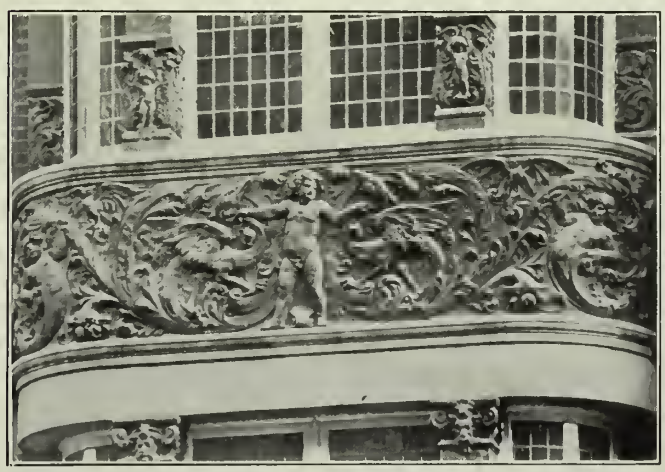
when forming the enrichment of a brick building, it mellows equally as the rest of the surface, yet preserving the crispness of relief which is wanted. Stonework on the contrary — especially light stonework — weathers independently, and so it appears as more or less of patchwork on a brick building ; and not infrequently it streaks the brick, or is streaked by it.

It might be thought that not sufficient contrast was gained by the use of brick carving on a brick building,

CARVED BRICK PANEL, VICTORIA STREET, LONDON.

and, in a measure, with bricks of uniform color, this is true. Where, however, as is usual, "rubber" bricks are used for the carved work and ordinary red bricks for the general walling, the slight difference in tint at once secures that variety of effect which is desirable.

Carved brickwork on a brick building seems to grow



CARVED BRICK PANEL, BUSINESS PREMISES, VICTORIA STREET, LONDON.

out of the surface instead of giving the appearance of being stuck on.

The accompanying illustrations of some examples in London serve to illustrate the possibilities of carved brickwork. It will be noticed what fine detail can be executed in the material.

The building in Victoria street is an excellent example of its use as a beautiful enrichment to a series of large bay windows. The carving here is executed with great care. Carried out so elaborately, it was, of course, an expensive item, but the excellent way in which it has withstood the London atmosphere proves its worth. Still more convincing in this respect is the carved brickwork to the doorways in King's Bench Walk, as this work dates from the Wren period, yet still retains its sharpness. In the frieze to the De Vere Hotel at Hyde Park Gate a much coarser treatment is apparent, and one which is not so commendable, for this frieze is close to the eye, being only about ten feet above the pavement, and in the endeavor to secure what passes for "breadth of effect" the carver has gone astray, and his fanciful little figures of squirrels and dogs that follow through the frieze are rather lost in the general heavy effect.

CARVED BRICK FRIEZE, DE VERE HOTEL, LONDON.

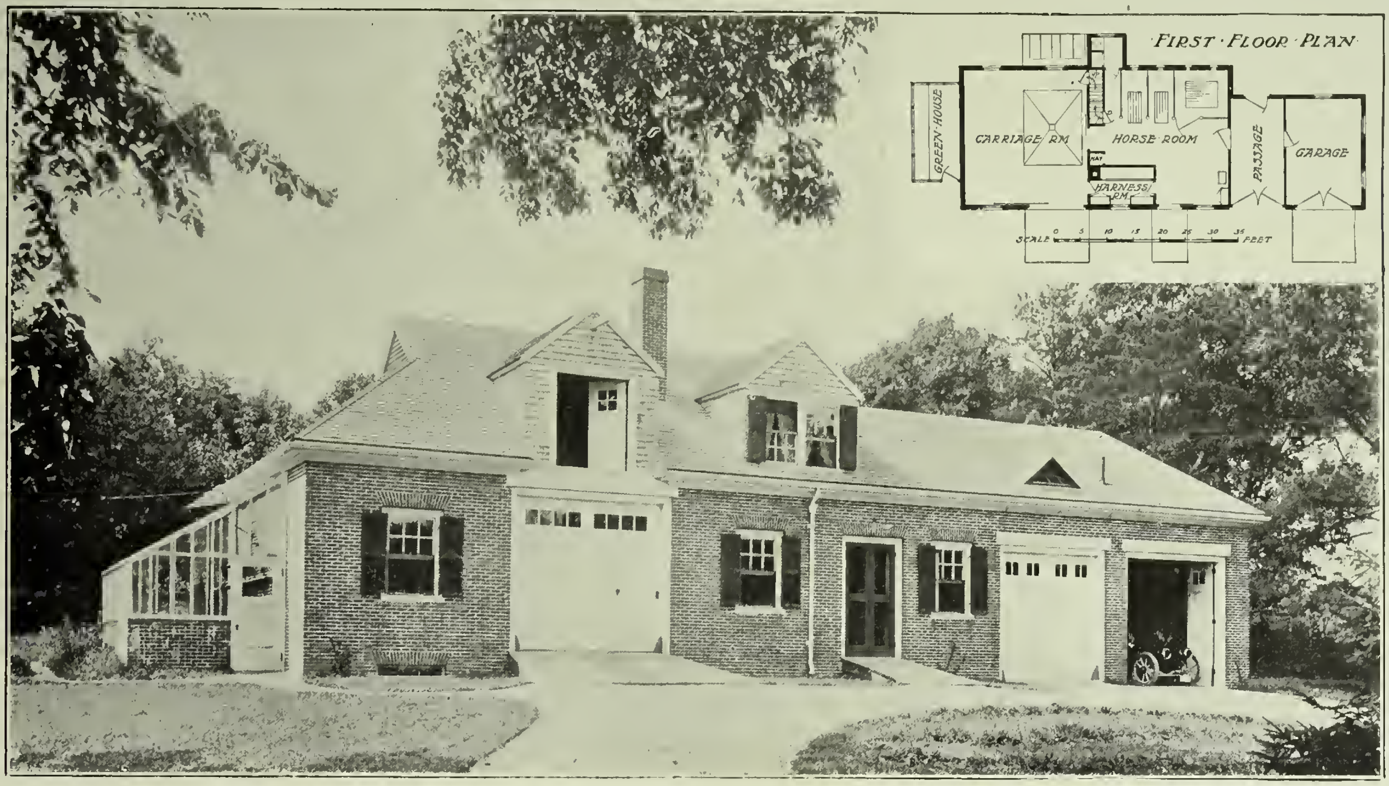
As a carved brick panel, the example on the block of shops and flats in Knightsbridge is a good one, delicate in outline and well designed in the manner of English renaissance detail. When we call to mind the average stone panel that is put on our buildings, the merit of this brick detail is clearly evident. The carving on the house in Prince Consort road serves its purpose as illustrating the use of carved brick in domestic work.

CARVED BRICK PANEL, APARTMENT HOUSE, LONDON.

Examples might be multiplied without number, but the foregoing suffice to illustrate the beautiful effect which can be secured by brick carving — blackening, may be, like all other material, in a city atmosphere, but preserving its texture in the purer air of the country, and acquiring its most beautiful appearance when, after long exposure, lichen spreads its soft veil over the surface and gives that touch of nature which adds the greatest charm to any building.

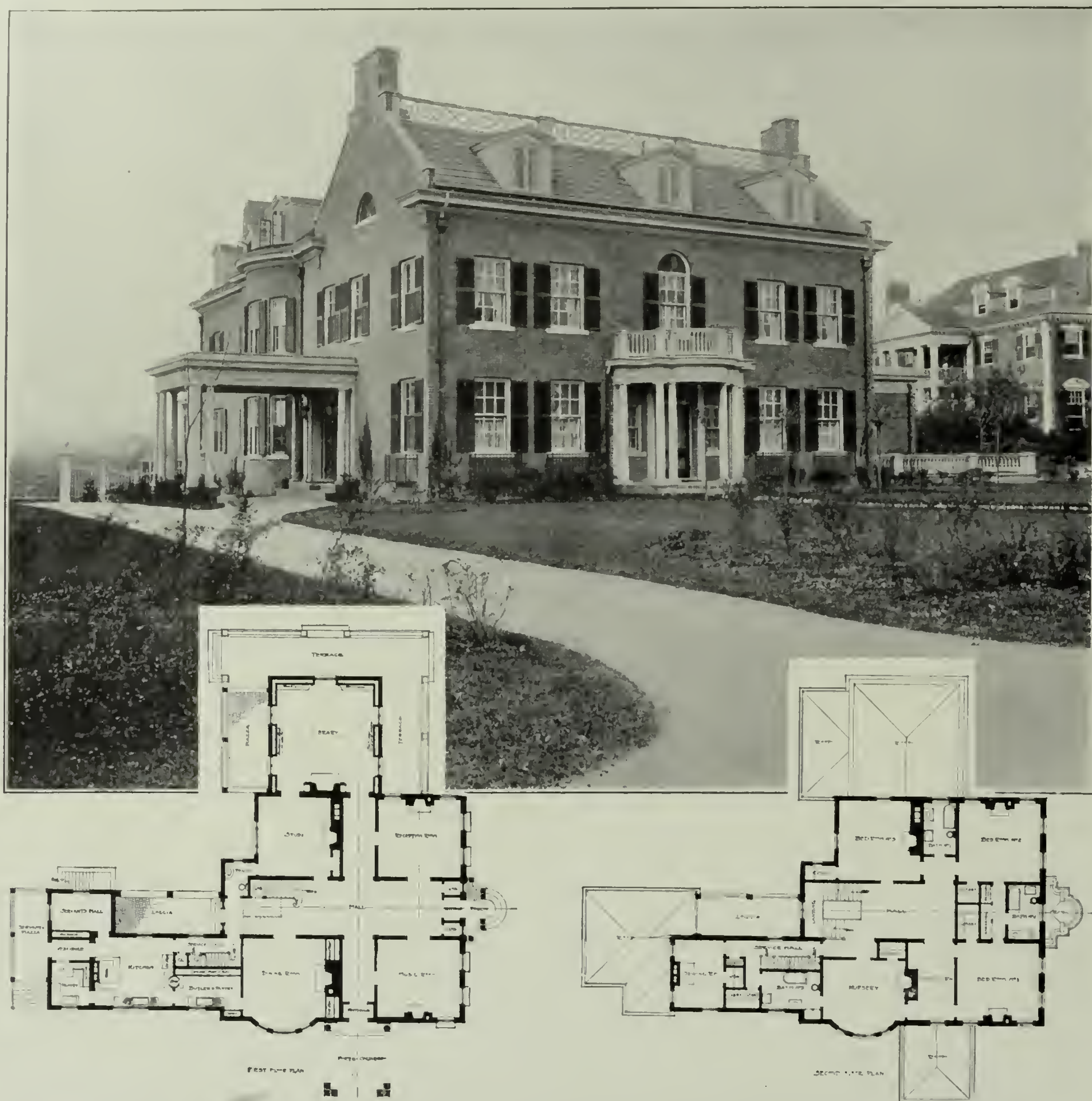
CARVED BRICK CAPITALS, DOORWAY IN KING'S BENCH WALK, LONDON.

CARVED BRICK ON HOUSE, PRINCE CONSORT ROAD, LONDON.



STABLE AND GARAGE.

HOUSE AT MILTON,[MASS.
F. E. Zerrahn and Stickney & Austin, Associated, Architects.

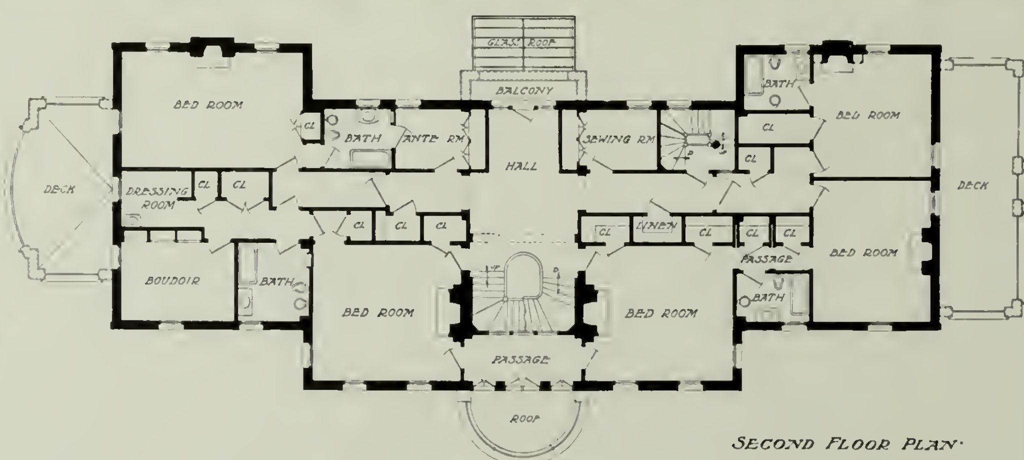


HOUSE AT CHESTNUT HILL, BROOKLINE, MASS.
Henry F. Keyes, Architect.

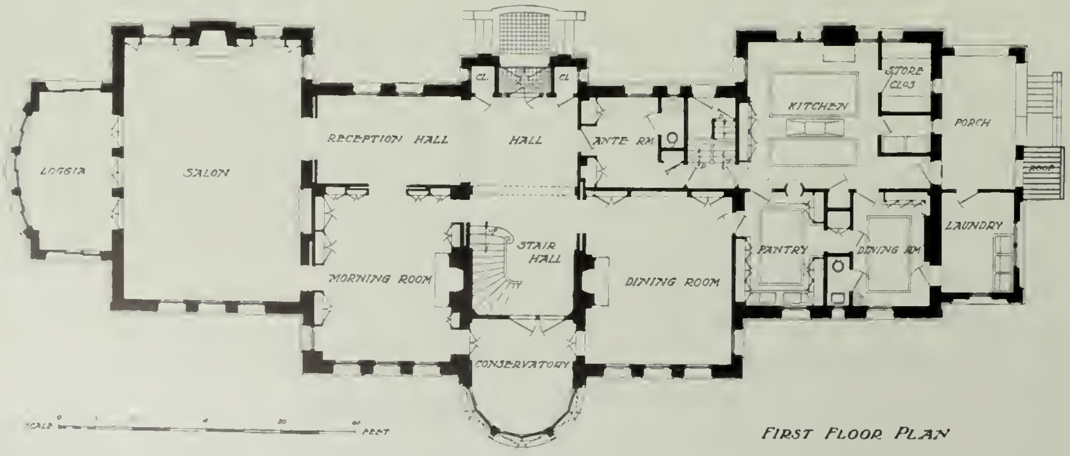
HOUSE AT LAKE FOREST, ILL

ROBERT D. KOHN, ARCHITECT.

HOUSE AT
LAKE FOREST,
ILLINOIS.

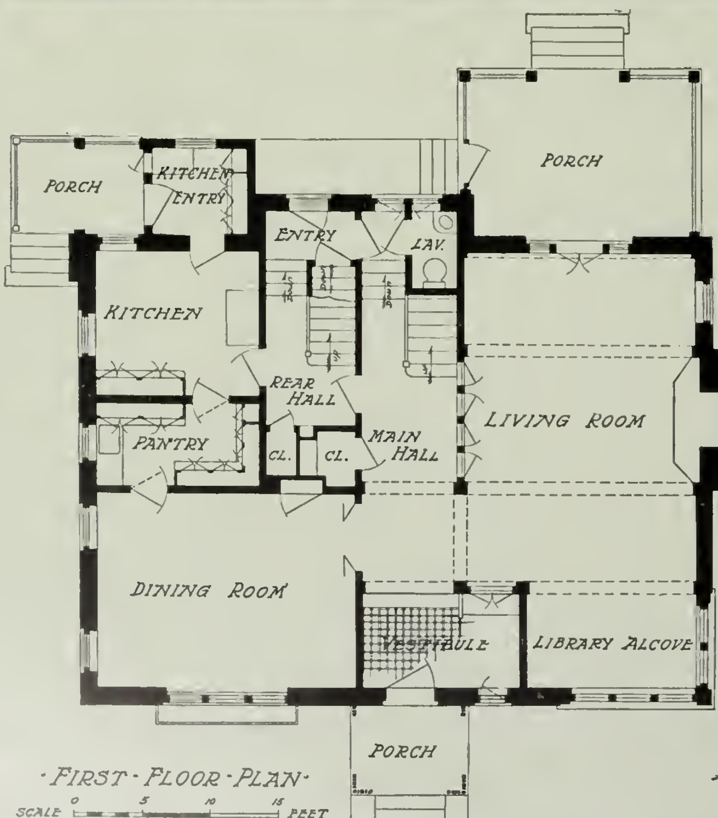


SECOND FLOOR PLAN



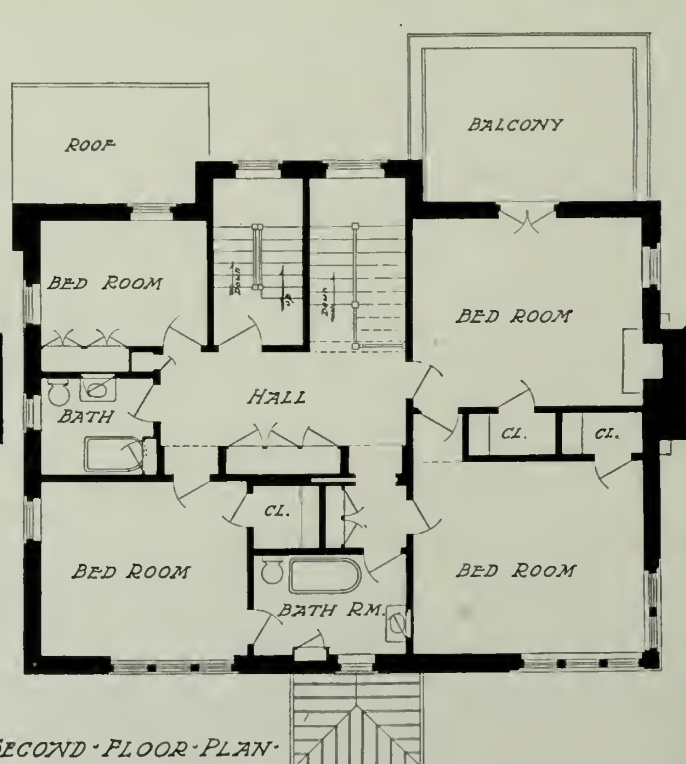
FIRST FLOOR PLAN

ROBERT D. KOHN,
ARCHITECT.



·FIRST·FLOOR·PLAN·

SCALE 0 5 10 15 FEET

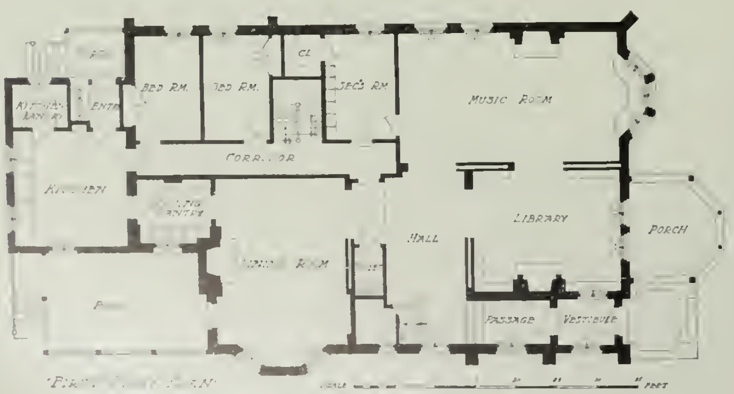


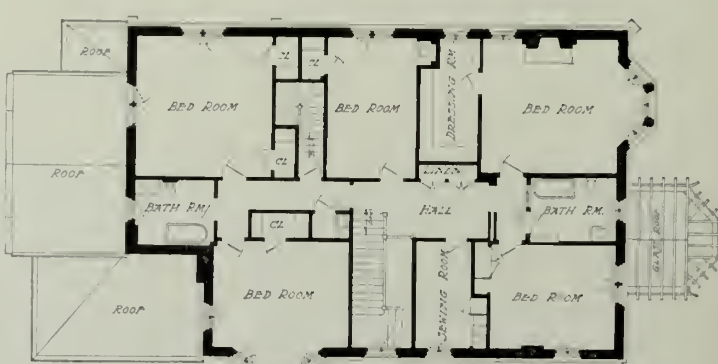
·SECOND·FLOOR·PLAN·

HOUSE AT CLEVELAND, OHIO.

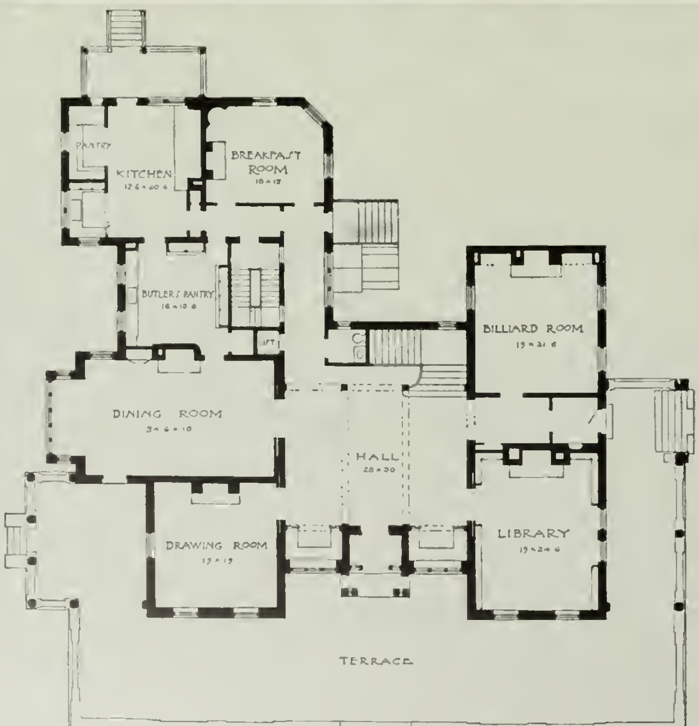
WATTERSON & SCHNEIDER, ARCHITECTS.

HOUSE, WOODLAWN AVENUE, CHICAGO.
POND & POND, ARCHITECTS.





·SECOND·STORY·PLAN·

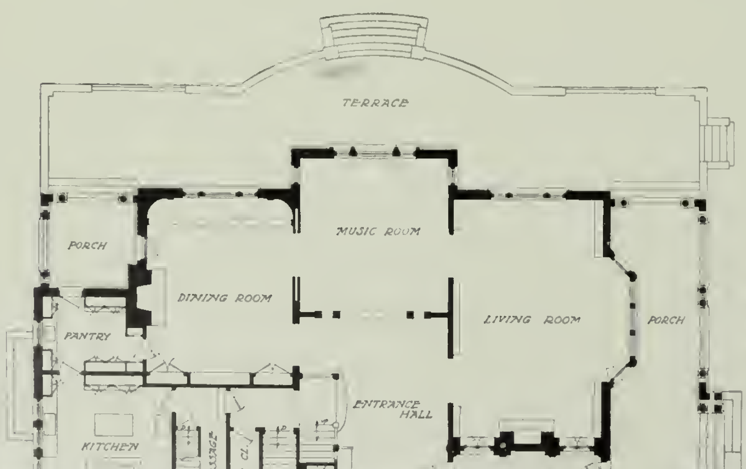


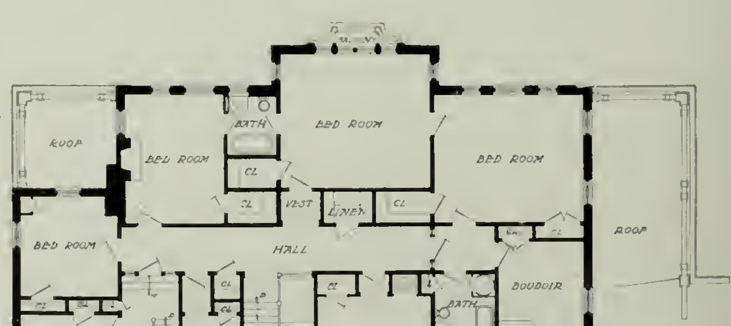
FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE FOR T. M. ARMSTRONG, ESQ., PITTSBURGH, PA.
ALDEN & HARLOW, ARCHITECTS.

HOUSE AT MONTCLAIR, N. J.
GROSVENOR ATTERBURY AND WALTER LESLIE WALKER, ASSOCIATED, ARCHITECTS.



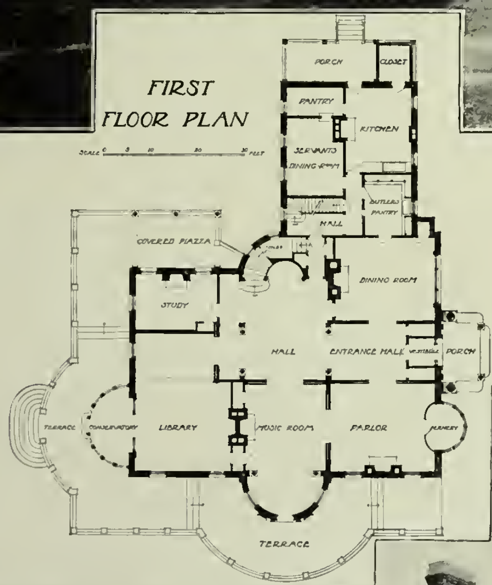


DINING ROOM.

HOUSE AT MONTCLAIR, N. J.

GROSVENOR ATTERBURY AND WALTER LESLIE WALKER, ASSOCIATED, ARCHITECTS

FIRST FLOOR PLAN



HOUSE AT
MILTON, MASS.
WILLARD T SEARS,
ARCHITECT.

SECOND FLOOR PLAN

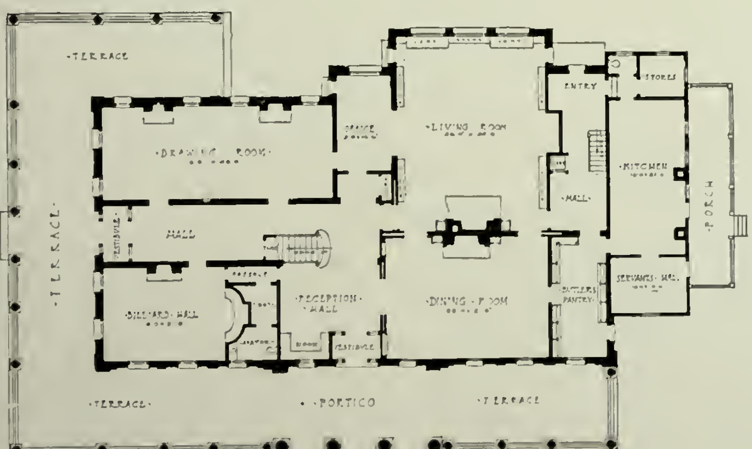
STABLE AND GARAGE.

THE GARDEN.

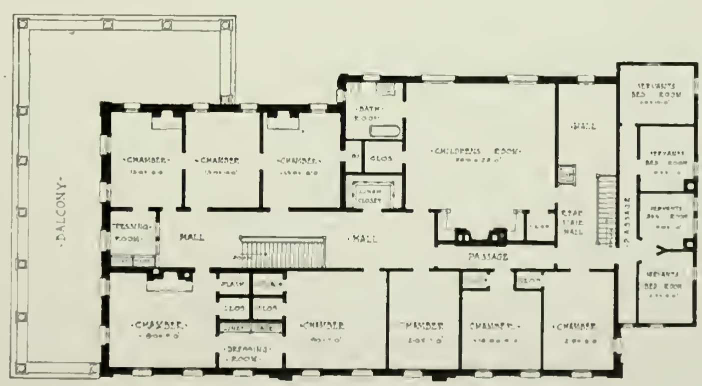
HOUSE AT MILTON, MASS.

WILLARD T. SEARS, ARCHITECT

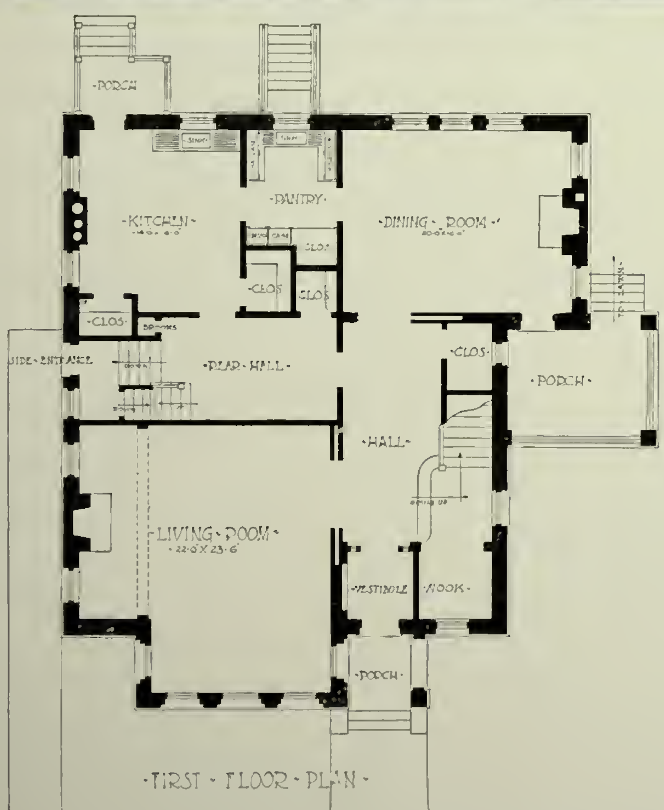
HOUSE AT CLARKSVILLE, MO.
MAURAN, RUSSELL & GARDEN, ARCHITECTS.



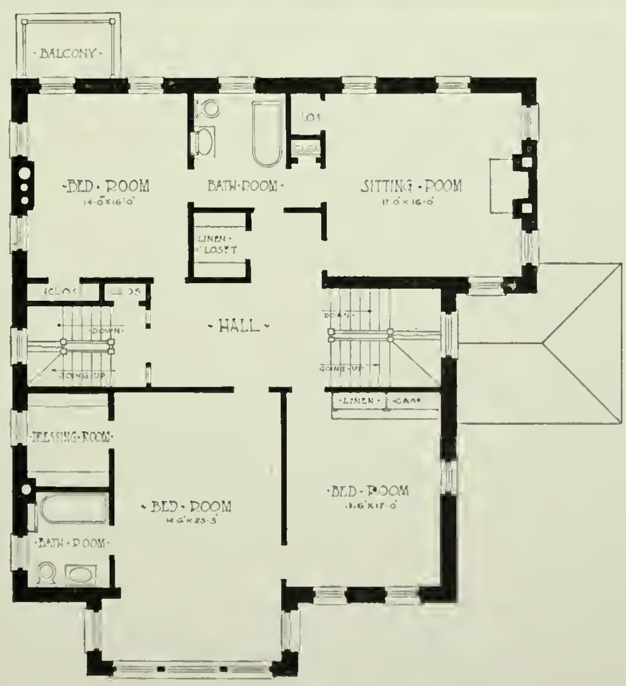
·FIRST· FLOOR·PLAN·



·SECOND·FLOOR·PLAN·



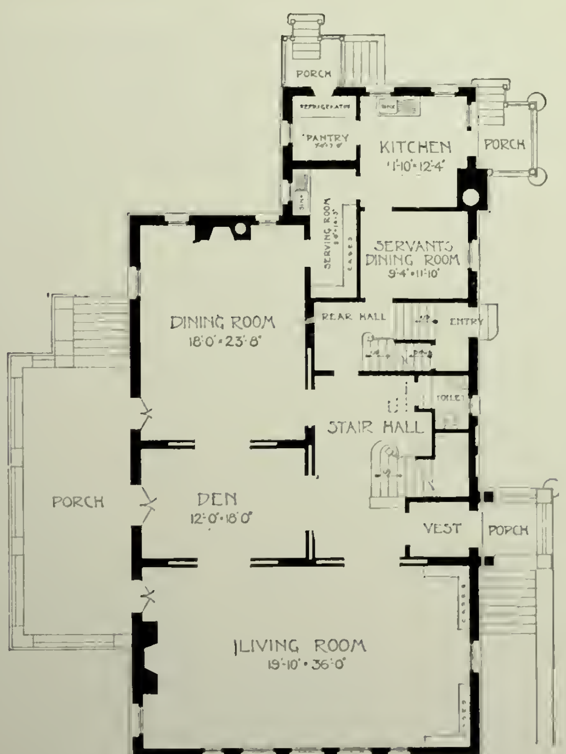
·FIRST · FLOOR · PLAN·



·SECOND·FLOOR PLAN

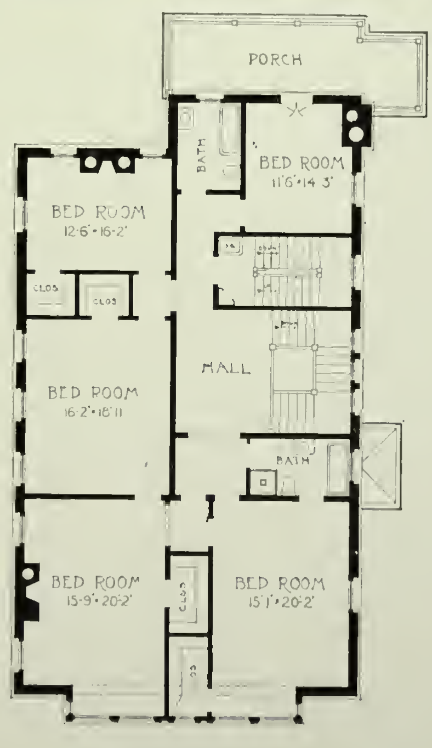
HOUSE, WESTMINSTER PLACE, ST LOUIS, MO.

MAURAN, RUSSELL & GARDEN, ARCHITECTS.



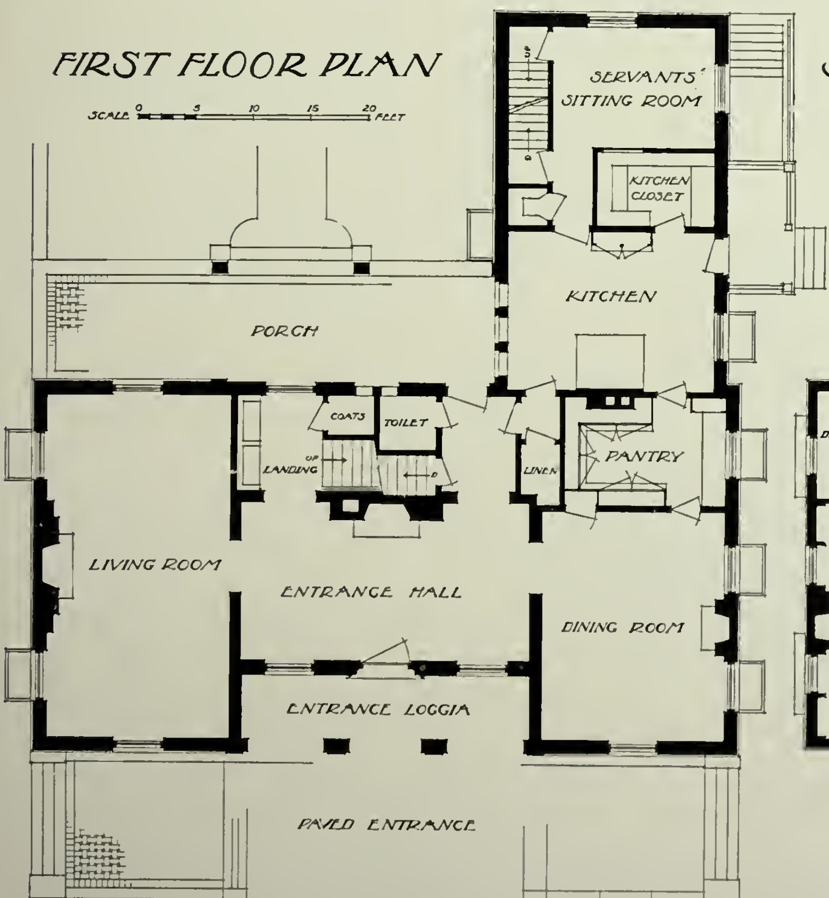
HOUSE,
WASHINGTON TERRACE,
ST. LOUIS,
MO.

MAURAN, RUSSELL & GARDEN,
ARCHITECTS.

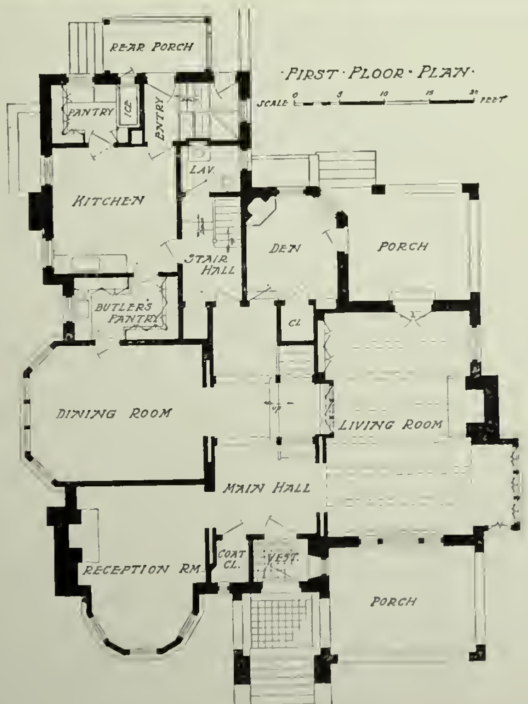


SECOND FLOOR PLAN

HOUSE AT HERKIMER, N. Y.
CHARLES C. GRANT, ARCHITECT.



HOUSE AT HERKIMER, N. Y.
Charles C. Grant, Architect.



HOUSE AT CLEVELAND, OHIO.
Watterson & Schneider, Architects.

material which he collected for supplementary publication. The published price is no measure of the present value of this book.

Alvan Crocker Nye, architect. A Collection of Scale Drawings, Details, and Sketches of what is commonly known as Colonial Furniture, measured and drawn from Antique Examples. New York, William Helburn, 1895; fol. (.425 by .315 by .025); 5 p., 55 pl.; $14.00, unbound. This book supplements Lyon's fine history well. For illustration Mr. Nye preferred structural drawing in line, which is much more informing than photographs can be.

John Kimberly Mumford. Oriental Rugs. New York, Charles Scribner's Sons, 1900; 4to (.285 by .22 by .045); 15 + 267 p. 32 plates in colored photographs, 2 maps, 1 table; cloth, $7.50. The larger works on Oriental carpets, the only carpets about which there is any literature, are beyond our reach. Of the smaller books Mumford is the best for our list. It gives the kind of information about rugs which one most wishes to get, the different types, the conditions under which they are made and the like.

Ornament.

Owen Jones (1809-1874); architect. The Grammar of Ornament, illustrated by examples from various styles of ornament. London, Day & Son, lithographers to the Queen, 1856, fol. (.565 by .38 by .08), various paging, ill., 100 pl.; £19, 12s. Smaller edition, London, Day & Son, 1865; small fol. (.35 by .23 by .05); 158 p., 112 pl.; £5, 5s. It is a pity that there is no book on the history of architectural decoration as such, showing the dependence of the decorative forms upon the structural, and the part which decoration plays in the development of style. In our list, we must make the best of a few of the leading works on the historical development of ornament in general. The best of these is Owen Jones "Grammar," a masterpiece, so far as the colored lithography is concerned. For those who cannot afford the large edition the smaller one is a satisfactory book, practically identical with the larger edition, except in size.

Alexander Speltz: architect. Der Ornamentalstil; translated from the second German edition by David O'Connor; Styles of Ornament exhibited in Designs and arranged in Historical Order with Descriptive Text. A handbook for architects, designers, etc. Berlin and New York, Bruno Hessling, 1906 ; 8° (.245 by .175 by .035); 8 + 656 + 38p., ill., 400 pl.; cloth, $6.70. This is an excellent history of ornament. Its field is broad, covering the entire series from the earliest to the latest. It lacks, as all these books do, a proper discussion of the development of types.

Iron and Glass.

J. Starkie Gardner. Iron Work, Part I, from the earliest times to the end of the medieval period; Part II comprising from the close of the medieval period to the end of the eighteenth century, excluding English work. Published for the Committee of Council on Education; London, Chapman & Hall, 1896; 12mo (.2 by .135 by .015); 16 + 202 p., 134 ill.; cloth, 3s. each part. The works on iron are for the most part collections of photographs which furnish suggestions to designers but give little readable information. The little Starkie Gardner books, done by a famous English iron-master, are as useful for their text matter as for their illustrations.

N. H. J. Westlake. A History of Design in Painted Glass. London, James Parker & Co., 1881; small fol. (.355 by .27 by .02); 4 vols., ill.; cloth, $19.32 in 1892. American glass at its best is as fine as any. A good monograph on this subject would be well worth while. Treating of the fine old medieval glass there are several good manuals, but Westlake is the best. It contains a vast array of illustrations; none in color however.

Monuments.

William Brindley & W. Samuel Weatherley, F.R.I. B.A. Ancient Sepulchral Monuments; containing illustrations of over six hundred examples from various countries and from the earliest periods down to the end of the eighteenth century, with descriptive and general index, London, Vincent Brooks, Day & Son, 1887; fol. (.385 by .26 by .05); 50 p., 212 ill.; $16.00 in 1893. The making of sepulchral monuments is so mechanical in these days that one forgets how much of reverence and artistic sympathy has gone into this work. Brindley and Weatherley is an excellent reminder; a most complete history of monuments with delightful lithographic plates.

Office Books, Architectural Utilities.

The Orders, etc.

Pierre Esquié, architect of the French Government, former member of the French Academy of Rome. The Five Orders of Architecture—the casting of shadows and the first principles of construction, based on the system of Vignola. Boston, Bates & Guild Co., without date, 4to (.32 by .25 by .025); 24 p., 76 pl.; $5.00. The method of the Regola delli cinque Ordini d'Architettura of Jacopo Barozzio da Vignola, published about 1563, has been retained in a large number of books on the orders, called Vignolas. Of these manuals that of Esquié is one of the best, and the American edition is certainly most convenient. It includes the Greek orders.

Josef Buehlmann, Professor of Architecture in the Technische Hochschule, Munich. The Architecture of Classical Antiquity and of the Renaissance; with descriptive text, translated from the German of the second (revised and enlarged) edition by G. A. Greene. New York, Bruno Hessling, without date, small fol. (.48 by .325 by .03); 10 + 48p., 75 pl.; $18.00, unbound. Buehlmann was intended for consultation upon the drawing table, giving extremely well a vast amount of information about orders, details, and fine architectural examples which the busy draftsman needs constantly. The plates are well drawn and usually give sufficient measurements.

William R. Ware, LL.D., Professor of Architecture Columbia University. The American Vignola: Part I. The Five Orders. Boston, The American Architect and Building News Co., 1902. Part II. Arches and Vaults, Roofs and Domes, Doors and Windows, Walls and Ceilings, Steps and Staircases. Scranton International Textbook Co., 1906, small fol. (.32 by .24 by .015); Text, ill., pl.; cloth, $4.00. Professor Ware's Vignola derives its chief value from a simplified method of drawing the orders, and other details of the classic scheme.

Warming and Ventilating with Special Reference to Hospital Buildings — IV.

BY D. D. KIMBALL.

FOR large buildings and large rooms, such as church auditoriums, the rule last referred to is not as applicable and the exact requirements in heat units for the heating of the rooms should be determined.

Within a reasonable degree of accuracy the amount of heat lost through different building materials is known. The number of square feet of each kind of surface exposed to a temperature less than the room temperature should be determined, which, multiplied by the loss in heat units per square foot, per degree difference in temperature, and this result multiplied by the difference between the minimum outside temperature and the inside temperature desired (usually assumed to be 70°), will give the amount of heat lost through the walls, windows, etc., and which must be made up by heat obtained from the radiation. Add to this the amount of heat carried out with the vitiated air withdrawn by the ventilating system, and the total amount of heat to be supplied by the heating system is known.

The number of heat units lost per square foot of surface through different materials used in ordinary building construction is given in the table in next column.

If the room is one which is not to be ventilated the warming of the air within the room, and the leakage of air about the windows and through the walls must be provided for, the method of doing which varies among engineers, some adding a certain percentage to the losses determined as above, and others making provision for the heating of a certain amount of air, usually equal to one change of the cubic contents of the room per hour. The latter method seems to meet with the most favor, and Professor Carpenter's rule which has been quoted is based on this method. It has the advantage of being definite and it will be found entirely safe. In this case when using the heat unit method last referred to multiply the cubic feet of space in the room by the difference between the minimum outside and the maximum inside temperature desired (usually taken as 70°) and divide the result by 55 (approximately the number of cubic feet of air raised 1° by one heat unit) and the quotient will be the number of heat units required for the heating of the air in the room. Add this to the heat units lost through walls, windows, doors, etc., determined as above, and divide the sum by the heat units obtained from one square foot of radiating surface and the quotient will be the number of feet of radiation required for the warming of the room.

For direct steam radiation it is customary to assume that 250 heat units are obtained from each square foot of surface, excepting that in the case of wall coils and wall radiators 300 heat units per square foot may be counted upon. Low radiators or single column radiators will give slightly better results, reaching as high as 300 heat units per square foot. Radiators which are set in recesses or chases are twenty per cent to forty per cent less efficient

HEAT LOSSES THROUGH BUILDING MATERIALS.

In Heat Units Per Square Foot Per Hour.

Kind of material.	Per deg. diff. inside and outside Temp.	For diff. in temperature of		
		60°	70	80
Single thickness of glass*	1.09	65.5	76.	87.
Double window	.46	27.6	32.2	36.8
Single skylight	1.16	70.	81.	93.
Double skylight	.48	29.	34.	39.
Pine doors 1″ thick	.41	25.	29.	33.
,, ,, 1¼″ ,,	.36	22.	25.	29.
,, ,, 1½″ ,,	.32	19.	23.	26.
,, ,, 2″ ,,	.27	16.	19.	22.
,, ,, 2½″ ,,	.23	14.	16.	18.
Oak ,, 1″ ,,	.58	35.	41.	47.
,, ,, 1¼″ ,,	.54	33.	38.	43.
,, ,, 1½″ ,,	.50	30.	35.	40.
,, ,, 2″ ,,	.43	26.	30.	34.
,, ,, 2½″ ,,	.39	24.	27.	31.
4″ Brick wall, unplastered	.52	31.	37.	42.
8″ ,, ,, ,,	.37	22.	26.	30.
12″ ,, ,, ,,	.29	17.	20.	23.
16″ ,, ,, ,,	.25	15.	18.	20.
20″ ,, ,, ,,	.22	13.	16.	18.
24″ ,, ,, ,,	.19	11.	14.	15.
28″ ,, ,, ,,	.16	10.	11.	13.
32″ ,, ,, ,,	.14	8.	10.	11.
4″ ,, ,, plastered one side	.49	29.	34.	39.
8″ ,, ,, ,, ,, ,,	.36	22.	25.	29.
12″ ,, ,, ,, ,, ,,	.28	17.	20.	22.
16″ ,, ,, ,, ,, ,,	.24	15.	17.	19.
20″ ,, ,, ,, ,, ,,	.21	13.	15.	17.
24″ ,, ,, ,, ,, ,,	.18	11.	12 6	14.3
28″ ,, ,, ,, ,, ,,	.16	9.6	11.2	12.8
32″ ,, ,, ,, ,, ,,	.14	8.	10.	11.
4″ ,, ,, furred, lath., plastered	.28	17.	20.	22.
8″ ,, ,, ,, ,, ,,	.23	14.	16.	18.
12″ ,, ,, ,, ,, ,,	.20	12.	14.	16.
16″ ,, ,, ,, ,, ,,	.18	11.	12.6	14.3
20″ ,, ,, ,, ,, ,,	.16	9.6	11.2	12.8
24″ ,, ,, ,, ,, ,,	.14	8.8	9.8	11.2
28″ ,, ,, ,, ,, ,,	.12	7.2	8.4	9.6
32″ ,, ,, ,, ,, ,,	.11	6.6	7.7	8.8
4″ Sandstone, 8″ Brick, plast. inside	.31	19.	21.	25.
4″ ,, 12″ ,, ,, ,,	.25	15.	18.	20.
4″ ,, 16″ ,, ,, ,,	.22	13.	15.	18.
4″ ,, 20″ ,, ,, ,,	.19	11.	14.	15.
4″ ,, 24″ ,, ,, ,,	.17	10.	12.	14.
8″ ,, 8″ ,, ,, ,,	.29	17.	20.	23.
8″ ,, 12″ ,, ,, ,,	.23	14.	16.	18.
8″ ,, 16″ ,, ,, ,,	.20	12.	15.	16.
8″ ,, 20″ ,, ,, ,,	.18	11.	13.	14.
8″ ,, 24″ ,, ,, ,,	.16	10.	11.	13.
12″ ,, 8″ ,, ,, ,,	.26	16.	18.	21.
12″ ,, 12″ ,, ,, ,,	.21	13.	15.	17.
12″ ,, 16″ ,, ,, ,,	.19	11.	13.	15.
12″ ,, 20″ ,, ,, ,,	.17	10.	12.	14.
12″ ,, wall**	.45	27.	32.	36.
16″ ,, ,,	.39	23.	27.	31.
20″ ,, ,,	.35	21.	24.	28.
24″ ,, ,,	.31	19.	22.	25.
28″ ,, ,,	.28	17.	20.	23.
		25°	35	45°
Ceiling, ordinary lath and plaster***	.62	15.5	21.7	27.9
,, lath, plaster, and double floor	.18	4.5	6.3	8.1
,, ,, ,, ,, single ,,	.26	6.5	9.1	11.7
Floors, single thickness, no plast.****	.45	11.3	15.7	20.
,, ,, ,, lath and plaster below	.26	6 5	9.1	11.7
,, double thickness, lath and plaster below	.18	4.5	6.3	8.1
,, double thickness, no plaster	.31	7.8	10.9	14.
4″ brick partition, plast. both sides	.43	10.8	15.1	19.4
8″ ,, ,, ,, ,, ,,	.33	8.3	11.6	14.9
12″ ,, ,, ,, ,, ,,	.26	6.5	9.1	11.7
Stud partition, lath. and plast. one side	.60	15.0	21.0	27.0
,, ,, ,, ,, ,, both sides	.34	8.5	11.9	15.3
Expanded metal and plaster 1½″ to 2½″ thick	.62	15.5	21.7	27.9
,, metal and plaster 2½″ to 3½″ thick	.50	12.5	17.5	22.5
		60	70	80°
Roofs, flat, varies from .06 to	.10	6.	7.	8.
,, sloping, varies from .10 to	.18	10.8	12 6	13.6

*For perfectly tight windows. For ordinary windows add 6 to 12%, loose windows 12 to 20%. **For limestone walls increase 10%. ***Unheated space above assumed to be 40°. ****Unheated space below assumed to be 35°.

than above. Direct hot water radiation is ordinarily figured at 150 heat units per square foot.

If the room is one which is to be warmed and ventilated by indirect radiation the amount thereof may be found by multiplying the number of cubic feet of air required per hour by the difference between the inside temperature desired and the minimum outdoor temperature, and dividing the result by 55 as before; this gives the number of heat units necessary to warm the air required for ventilation and this should be added to the number of heat units lost through the walls, windows, doors, etc., determined as above. Then divide this total by the heat units obtained from one square foot of indirect radiation as given below, and the quotient will be the number of square feet of radiation required.

The heat units obtained per square foot of radiation will be approximately as follows, the temperature of the steam being 220° (two pounds pressure), the air supplied to the indirect radiator being at zero, and the air entering the room at 100° to 110°.

Register placed at floor (first)	280	heat units per square foot.
,, ,, 8 to 10 feet above radiator	320	,, ,, ,, ,, ,,
,, ,, 16 ,, 18 ,, ,, ,,	440	,, ,, ,, ,, ,,
,, ,, 26 ,, 28 ,, ,, ,,	560	,, ,, ,, ,, ,,

If the air is heated by means of fan heater coils the efficiency of the surface is greatly increased because of the velocity at which the air passes through the coils which is customarily 1,000 feet per minute for warming and ventilating work of this character. The fan coil, which is ordinarily four or five sections deep, thus gives off from 1,500 to 1,600 heat units per square foot per hour. A shallow coil will give more and a deeper coil a less number of heat units per square foot per hour. To determine the size of the fan heater coil divide the total heat units required by the number of heat units obtained per square foot of surface in a fan coil. Allowance should be made for loss of heat in transmitting the air to the various rooms which is usually approximated at 5° to 8° drop in temperature for each 100 feet through which the air must pass before reaching the rooms.

Allowance must be made in determining the heat units lost through the walls, windows, etc., for the effect of the different exposures involved. If the radiation is figured as above recommended the following will be found sufficient in all but exceptional cases. For east and west exposures add ten per cent; for northwest, northeast, and north exposures add fifteen per cent; also add for buildings so located as to be badly exposed ten per cent; for buildings poorly built add fifteen per cent; for buildings heated during the daytime only and badly exposed add thirty per cent; for buildings intermittently heated add twenty per cent to fifty per cent.

With the total heat units required for warming and ventilating known, and from which the radiation has been determined as above, the boiler capacity may now be exactly determined.

The capacity of the heating boiler depends largely upon its grate area, and to some extent upon its heating surface, the value of which, however, is somewhat dependent upon its location. The grate area required depends upon the heating value of the fuel to be used. Anthracite coal contains about 14,000 heat units per pound of combustible, but the amount of ash and non-combustible matter in the coal will reduce the heating power to about 13,000 heat units per pound of coal as ordinarily used. Coke has about the same heat value and bituminous coal has slightly less, although in large plants it can be burned with quite as satisfactory results, providing sufficient chimney draft is available.

The efficiency of the boiler will depend upon its size, design, draft, etc. Sectional boilers vary in efficiency from approximately fifty per cent in small boilers to sixty per cent in the large boilers, while horizontal tubular boilers, well managed, will operate at from sixty-five per cent to seventy-five per cent efficiency. Under these conditions, therefore, approximately 7,000 to 9,500 heat units per pound of coal are delivered from boilers such as might be used in hospitals, the exact amount depending upon the kind and size of boiler used.

The size of the grate should be determined by dividing the total heat units required as determined in figuring the radiation, as previously explained, by 7,000 to 9,500 heat units, the exact figure depending upon the type of boiler selected. Not over 8,500 would be used in the case of a sectional boiler, and usually less. The quotient will be the pounds of coal which must be burned per hour to perform the heating work. This amount divided by the pounds of coal which may be burned per square foot of grate area per hour will determine the area of the grate. The pounds of coal to be burned per square foot of grate per hour depend on the size of the plant or kind of boiler, and the frequency of attendance. In small sectional boilers with 1 to 7 square feet of grate area from 3 to 5 pounds of coal may be burned per square foot of grate area per hour, and 7,000 heat units per pound of coal may be figured, while in sectional boilers having 7 to 13 square feet of grate area 5 to 6 pounds may be consumed and 8,000 heat units per pound of coal may be figured, and in large sectional boilers containing 13 square feet of grate area and above 6 to 7 and even 8 pounds of coal per square foot per hour may be burned without difficulty and 8,500 heat units per pound of coal burned will be secured.

In selecting sectional boilers make use of one which has not less than the above amount of grate surface and a manufacturer's rating not less than twenty-five per cent in excess of the radiation to be connected thereto. If part of the radiating surface is indirect radiation its equivalent in direct radiation figured on the basis of heat units obtained per square foot of radiation per hour should be allowed for. Ordinarily in the case of indirect radiations connected to registers in the first or second floor an addition equal to seventy-five per cent of the number of square feet of indirect radiation should be made, while in the case of direct-indirect radiation an allowance equal to one third the amount thereof should be made. If the boilers and mains are not covered with efficient insulating material the square feet of surface therein should be measured and added to the amount of radiation connected to the boiler before determining upon the size thereof. A boiler which is too small requires too frequent attention and is expensive to operate.

In the case of a tubular boiler (water tube or fire tube) used for heating purposes the grate area is to be determined in the same manner as in the case of sectional boilers, except that a greater efficiency in coal consumption may be figured. From 8,500 to 9,500 heat units per pound of coal may be assumed, the less amount in the smaller sizes and the larger amount in the larger sizes. In the case of this type of boiler it is also necessary to determine the amount of heating surface in the shell and tubes of the boiler, which determines the horse power or capacity of the boiler. In the usual low pressure heating plant with tubular boilers 36 inches in diameter, up to 54 inches in diameter, without a night engineer, figure from 5 to 6 pounds of coal per square foot of grate surface and 2,000 heat units per square foot of boiler heating surface; in boilers of larger size figure 8 to 9 pounds of coal burned per square foot of grate and 2,200 heat units per square foot of boiler heating surface, and in larger heating plants with constant attendance figure 10 to 12 pounds of coal burned per square foot of grate area and 2,600 heat units per square foot of boiler heating surface. In large central plants it is quite possible to burn 15 pounds of coal per square foot of grate area with natural draft, while obtaining 3300 heat units per square foot of boiler heating surface.

In the above manner is determined the amount of grate area and heating surface which determines the capacity of the boiler. The dimension of a horizontal tubular boiler which will contain the required amount of heating surface may be found in any first class tubular boiler manufacturer's catalogue. The catalogue of the D. M. Dillon Steam Boiler Works, of Fitchburg, Mass., will be found especially valuable in this connection.

In hospital buildings particularly it is not wise to install only one boiler. If the plant is small and one boiler will carry the entire load a second boiler should be installed as a spare boiler to be available in case of a breakdown and to make possible the frequent cleaning of the boiler in use. In larger plants it will be wiser to install three or more boilers, one of which shall always be a spare boiler.

The sectional boiler is usually set without masonry except that it be mounted on one or two courses of brick to give a deeper ash pit, which is often desirable, in which case these bricks should be laid in cement mortar so as not to affect the draft. This type of boiler should be thoroughly covered with a high grade of asbestos which may take the form of 1½ inch asbestos cement felting, wired on and finished hard and smooth.

The tubular boiler is always set in brick work laid on concrete footings 12 inches to 24 inches in depth, depending upon the size of the boiler and character of the soil. The outside walls should be double walls with 2 inches air space between, the outer being 8 inches and the inner or supporting walls being 12 inches thick at the point where the boiler rests on the wall. It is customary to taper the inside face of the wall from the grates to the point where the boiler is supported so there shall be 2 inches of space between the boiler and the wall until the point of support is reached, at which point the wall is closed in on the boiler or nearly so. The grates of these boilers are placed 24 inches to 27 inches above the floor and the boilers are placed 24 inches to 27 inches above the grates, the less dimension being used with the small sizes and the greater dimension with the larger sizes. There should be a space between the rear head of the boiler and the rear wall of the setting of from 20 inches to 24 inches, the rear walls being two 8-inch walls with 2 inches air space between, as in the case of the side walls. Where two or more boilers are set in battery the dividing wall is usually 16 inches to 24 inches in width at the boiler level, increasing with the size of the boiler as above, and tapering as in the case of the inside side walls. In heating work it is customary to line the front and sides of the fire box, up to the supporting lugs and back to a point 12 inches back of the rear of the bridge wall, also the bridge wall and rear wall of the setting with a high grade of fire brick. In large heating plants in constant use the entire combustion chamber back to the rear wall may well be lined with fire brick.

With the amount of radiation and the size of the boilers found as above, the size of the pipes connecting these two important elements of the heating system becomes important. Many formulas are available, the most of them being too elaborate for practical use in small work, as they give consideration to the steam pressure, length of pipe, number of fittings, etc. For buildings of the average size heated with 2 to 4 pounds steam pressure, in which the length of the pipes does not exceed 100 feet, or even 200 feet, the following table has been found to answer every purpose:

PIPE SIZES FOR SUPPLY AND RETURN MAINS.

Not over 100 feet long. Steam pressure 2 to 4 lbs.

Square Feet of Radiation.	Supply.	Return.
0 to 50	1″	¾″
50 ,, 100	1¼″	1″
100 ,, 150	1½″	1″
150 ,, 300	2″	1¼″
300 ,, 550	2½″	1¼″
550 ,, 1000	3″	1½″
1000 ,, 1500	3½″	1½″
1500 ,, 2000	4″	2″
2000 ,, 2500	4½″	2″
2500 ,, 3600	5″	2″
3600 ,, 5000	6″	2½″
5000 ,, 7000	7″	2½″ or 3″
7000 ,, 10000	8″	3½″

RADIATOR CONNECTIONS.

Direct Radiators (Steam).

2 Pipe Connection.			1 Pipe Connection.	
Sq. Ft. of Radiation.	Sup.	Ret.	Sq. Ft. of Radiation.	Supply.
0 to 48	1″	¾″	0 to 60	1¼″
48 ,, 96	1¼″	¾″	60 ,, 100	1½″
96 up	1½″	1″	100 up	2″

Direct-Indirect Radiators.			Indirect Radiators.		
Sq. Ft. of Radiation.	Sup.	Ret.	Sq. Ft. of Radiation.	Sup.	Ret.
0 to 36	1″	¾″	0 to 36	1″	¾″
36 ,, 72	1¼″	¾″	36 ,, 72	1¼″	1″
72 up	1½″	1″	72 ,, 120	1½″	1″
			120 up	2″	1¼″

Direct Hot Water.		Indirect Hot Water.			
Sq. Ft. of Rad.	Pipe.	Sq. Ft. of Rad.	Pipe.	Sq. Ft. of Rad.	Pipe.
0 to 40	1″	0 to 56	1¼″	235 to 405	3″
40 ,, 72	1¼″	56 ,, 80	1½″	405 ,, 585	3½″
72 up	1½″	80 ,, 150	2″		
		150 ,, 235	2½″		

Runouts to direct and direct-indirect radiators to be same size as radiator tappings, except that when they exceed 5 feet in length use next larger size pipe.

Riser sizes may be determined from table prepared by Mr. William G. Snow, on next page.

CAPACITY IN SQUARE FEET DIRECT RADIATION.

Pipe Sizes.	1 Pipe Up Feed.	2 Pipe Up Feed.
1"	50	70
1¼"	90	130
1½"	130	190
2"	210	330
2½"	300	570
3"	460	1020
3½"	620	1490
4"	800	2000

Down feed risers will readily carry twenty-five per cent more radiation.

To secure quiet results it is well that no supply riser should be less than 1¼ inch.

Return risers may be one size smaller than supply up to 1½ inches, two sizes smaller up to 2½ inches, and three sizes smaller above 2½ inches. In general a pipe used as a return will serve eight times as much radiation as it will supply.

Editorial Comment and Miscellany.

CLEANING BRICK BUILDINGS.

WRITING in *The Builders' Journal*, London, Mr. A. B. Searle says that a very popular means of cleaning brick buildings in this country is by the use of hydrochloric acid, and provided the acid is not too strong this method may be quite satisfactory. For many purposes acetic acid is more satisfactory than hydrochloric acid, as it is equally effective in its action on the dirt without having so corrosive an effect on the bricks. It is more expensive, but owing to its non-corrosive action buildings on which it is used remain clean longer than when the stronger "spirits of salt" is employed.

DETAIL BY O. C. WOLF, ARCHITECT.
New York Architectural Terra Cotta Company, Makers.

The amount of acid and water mixture required will vary somewhat with the care and skill with which it is applied, but will average about 4 square yards per gallon of mixture with ordinary care, and costing for acid about a farthing a square yard, with acetic acid, and half to one third of this amount for common hydrochloric acid.

DETAIL BY F. B. PYLE, ARCHITECT.
Conkling-Armstrong Terra Cotta Company, Makers.

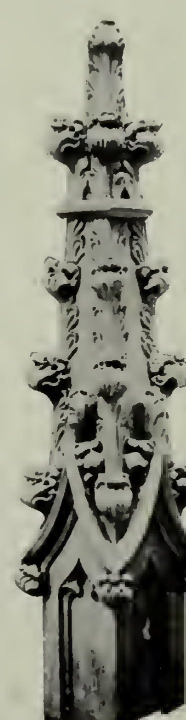
When acid is used to clean the face of a building the latter should first be washed over with clean water to remove all the dirt which can be taken off by this means. The surface is next treated with the weak acid — a hard brush, but not one of metal, being used — and finally the building is washed over with clean water to remove any material which has been loosened but not actually removed by the acid. This final washing may, if desired, be carried out by means of a powerful jet of water, care being taken to work from the top of the building downwards, so as to prevent all accumulation of unsightly spots caused by the "creeping" of the dirt, which always occurs when the building is played on irregularly with a hose.

Soft soap has been tried with much success, especially when it has been dissolved in thirty-six to forty times its weight of warm water (1 pound of soap in 4 gallons of water) and used whilst still warm. Apparently the most efficient cleaning is obtained by treating the building with clean water, then with the soap solution applied with a hard brush, and finally washing down with water just as was recommended above when acid is used.

Soap has little or no action on clean brickwork or stone, and its effect on soot and similar matters of a greasy nature is far more intense than that of any acid, so that when it is used buildings of either red or buff bricks rapidly regain their original color, unless the cleaning process has been so long delayed that nothing can ever remove the dirt from the bricks. Care must be taken to wash off thoroughly all the soap by means of a thorough playing with a hose or by the more expensive washing over with clean water, or discoloration will be produced. In actual cost the use of soft soap in the manner described works out at practically the same as for acid.

In buildings where the dirt is more of a dusty than a sooty character, it will not usually be necessary to employ any special cleansing material, as a powerful spray of water — such as that from a fire-engine — will usually clean the building sufficiently, providing that the surface of the bricks is reasonably close and dense.

In cleaning terra cotta work, special care must be taken that the surface is not destroyed, as much of the modern terra cotta has a finished or dense face, but an open or porous



DETAIL EXECUTED BY SOUTH AMBOY TERRA COTTA COMPANY.

TOURO SYNAGOGUE, NEW ORLEANS, LA.
Built of gray brick, made by Hydraulic-Press Brick Company, St. Louis, Mo.
Emile Weil, Architect.

body, and if once the face is removed it will be almost impossible to keep the building clean.

For buildings which are disfigured by a whitish encrustation, technically known as efflorescence or "scum," the use of very weak hydrochloric acid is almost essential, though even this does not always prove a complete remedy. The causes of "scum" are so numerous and complicated that it is difficult to provide any single means of removing this unsightly material.

Scum is chiefly caused by soluble salts in the bricks, which are dissolved when the latter become wet with rain, and as the water dries out it carries the salts to the surface of the bricks and there deposits them. If the scum were only thicker, it would be best to remove it by scraping the walls gently, taking care not to scratch the bricks, but this is not usually practicable, and the least harmful method is to brush the defective surface with a moderately hard-dry brush, when the bricks are thoroughly dry. Should this not prove effectual after several times, the surface may be washed over with a little weak acid, and then with water, the disadvantage of this latter method being that it may cause the formation of a larger proportion of soluble salts (through the action of the acid on some of the constituents of the brick), and the remedy may thus prove to be worse than the disease. The same, in a lesser degree, is true of repeated scrubbing of the wall with a wet brush and water.

The greater part of the scum which disfigures so many buildings is really due to faulty material or to the use of impure water in manufacture, and only in very few instances is it due to the absorption of soluble salts from careless storage of the finished bricks.

NORMAL SCHOOL, MILWAUKEE, WIS.
Faced with wire cut dark red brick, made by Western Brick Company.
Van Ryn & De Gellcke, Architects.

CHIMNEY "THROWING."

MR. W. LARKINS, well known as a "Steeple Jack," who carried out the difficult and dangerous work of the repair of the Nelson Statue and Column in Trafalgar Square, describes in *The Builder*, London, his recently adopted method of "throwing" large chimneys, and regulating the direction of their fall by means of a carefully measured cut into one side of the base of the chimney. Mr. Larkins says:

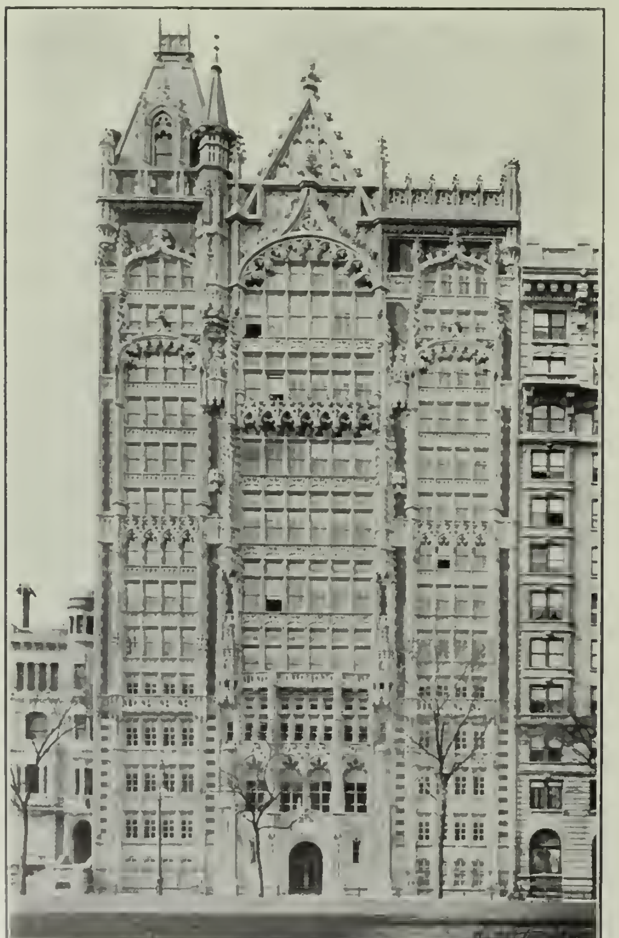
"The height ascertained, the pitch marked out with ropes, the center of the shaft is taken facing the space where the fall is desired. The circumference is next taken; then, from the center, the half of the diameter is taken each way; this gives the exact half of the chimney facing the place of fall. Then marks are made exactly at each foot on each side of the center line, until the halfway mark is reached. Then, commencing at center-mark, each foot-mark is numbered, the number corresponding on each side of the center-mark until the halfway mark is reached This ensures the cut being made accurately; as soon as the man on one side reaches, say, No. 4, he calls out to the man on the other side, to enable both to keep together. If the cut was, say, 6 inches out, it would mean the throw to be several feet out. If there is a good stretch of ground for the shaft to fall, a deep cut will throw the shaft like a tree, in fact, until nearly reaching earth. This causes the bricks to 'stretch' out half the length of shaft over its height; but if space is limited a thinner cut is made, which causes the opening to meet quicker, thus breaking the shaft up in its fall, and dropping it in half its own height.

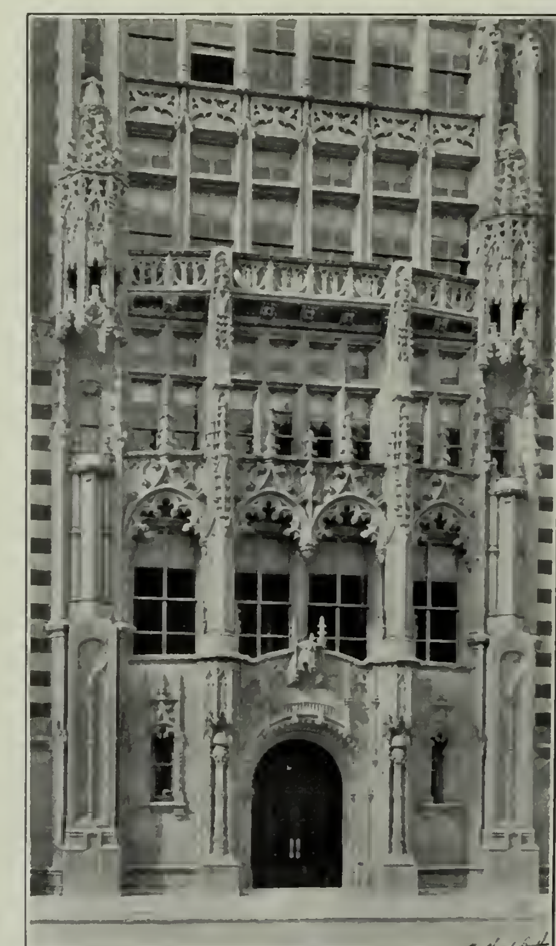
CENTRAL POWER STATION, NAVY YARD, CHARLESTON, S. C.
Built of light buff brick, made by Columbus Brick & Terra Cotta Company.

"When the half-way mark comes over a flue the arch must be propped up, or the tremendous weight of the shaft, coming on the arch as it commences to heel, will cause the arch to collapse, thus changing the line of fall and causing a disaster if houses or workshops are in the way.

"A strict rule to follow is never to pass in front of the opening, and keep a sharp lookout for signs of collapse; the first sign is the opening of a joint of the brickwork opposite the upper edge of the cut. A long disused shaft, or a rotten one, collapses when only one third is cut; a well-built or dry shaft often does not fall even when cut to the half-way mark.

"This method is the cheapest. The old method, to prop with timber and burn

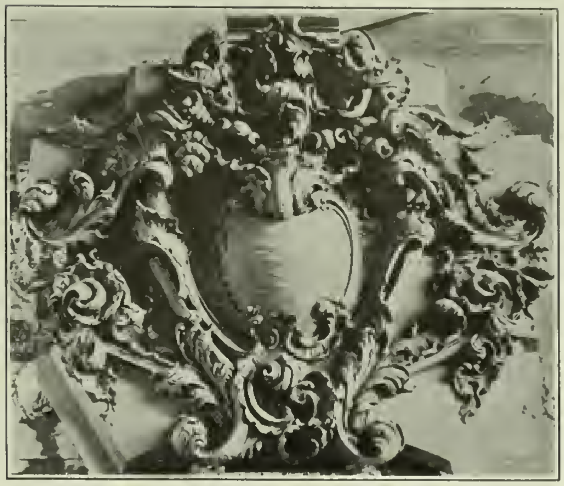




STUDIO BUILDING, 44 WEST 77TH STREET, NEW YORK CITY.
Entire front of building of "limestone" terra cotta, made by Atlantic Terra Cotta Company.
Harde & Short, Architects.

away, takes a great deal of labor, apart from timber props, inflammable material (oil, several casks of paraffin, etc.); also risk of fire to surrounding property. This cutting method costs only a trifle; although I must say I am the only steeple jack who adopts it — it being considered risky; but I accept all liability as to damage to property, etc.

"The highest chimney I have 'thrown' in this way was 300 feet high, and weighed over 3,000 tons; moreover, the shaft was 'tackled' by several other steeple jacks to demolish piecemeal, but they left the work after six weeks, during which time they made little impression on the chimney, so I obtained the contract to 'throw,' which was an entire success.



DETAIL BY TOLEDANO & WOGAN, ARCHITECTS.
Northwestern Terra Cotta Company, Makers.

"The two shafts which I have thrown since occupied three and a half hours, at a much lower tender for the cost of the operation than any other submitted."

ON JUNE 12TH a jury in Justice Amend's part of the New York Supreme Court rendered a verdict of $5,002.65 in favor of Abner J. Haydel, the architect who drew the plans for the country house of Charles A. Gould, ex-commodore of the Atlantic Yacht Club. Gould agreed in 1904 with the architect that the latter should design a "castle" to cost $150,000; and after accepting the plans, repudiated his obligation to pay the $8,000 which the architect claimed the drawings cost.

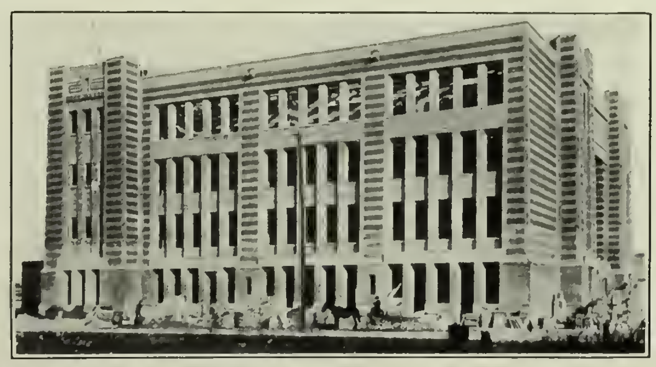
DETAIL BY SCHWARTZ & GROSS, ARCHITECTS.
New York Architectural Terra Cotta Company, Makers.

IN GENERAL.

F. E. Fagerquist, architect, has removed his offices to 124 Indiana Building, Oklahoma City, Okla. Manufacturers' catalogues desired.

James H. Ritchie, architect, has removed his offices from 110 State St. to 8 Beacon St., Boston.

Nichols & Hughes have opened offices for the practice of architecture in the V. B. Building, Dayton, Ohio. Manufacturers' catalogues and samples desired.



PUBLIC SCHOOL, CHICAGO.
Built of "Shawnee" brick, made by Ohio Mining & Manufacturing Company, Thomas Moulding Company, Chicago, Agents.
Dwight H. Perkins, Architect.

The Guastavino system of tile vaulting was employed in all the work illustrated in connection with the article "Interesting Examples of the Use of Burnt Clay in Architecture" published in this number. The architectural terra cotta was supplied by the Atlantic Terra Cotta Company.

The Combination Life Rail and Surface Drainage Tile, made by the American Enameled Brick and Tile Company, will be used in the following new work: Plunge for Mount Hermon School for Boys, Northfield, Mass., Parish & Schroeder, architects; plunge in house for C. K. G. Billings, Esq., New York City, Guy Lowell, architect. Over one million of their regular enameled bricks will be used in the Buffalo Water Work plant, Douglas County, County Court House at Omaha, large bakery at Chicago, and two new apartment houses in New York.

The German Lutheran Church, New York, G. W. Conable, architect, illustrated on page 166 of this issue, was built of brick manufactured by the Kreischer Brick Manufacturing Company, 119 East 23d St., New York. The architectural terra cotta was supplied by the South Amboy Terra Cotta Company.

NEW BOOKS.

Craftsman Homes. The two hundred and twenty-six pages carry over two hundred illustrations, showing among other interesting features: "A House with Outdoor Living Room;" "A Sleeping Porch;" "A 'Craftsman Farm' House;" "Craftsman Home for Two Families;" "A Craftsman Open-Air Dining Room;" "A Hooded Pergola;" "A Simple Water-Garden," and endless suggestions for the building, furnishing, and fitting of houses, and the arranging of gardens simple and beautiful to surround them. New York, The Craftsman Publishing Company.

Building Construction and Superintendence. By F. E. Kidder, C. E. Revised and enlarged by Thos. Nolan, M.S., A.M., Fellow of the American Institute of Architects, Assistant Professor of Architecture University of Pennsylvania. Part I., ninth edition, revised, Mason's Work. 628 illustrations; 985 pp. One 8vo vol. Cloth. Price, $6. New York, William T. Comstock.

Asphalts, Their Sources and Utilizations. Asphalt for dustless roads, recent improvements in asphalt industries, together with addenda treating on general waterproof construction. By T. Hugh Boorman, Civic Engineer and Asphalt Expert. New York: William T. Comstock. One 8vo vol. Cloth, $3.00.

COMPETITION FOR A BRICK HOUSE.

COST NOT TO EXCEED $10,000.

FIRST PRIZE, $500. SECOND PRIZE, $250. THIRD PRIZE, $150. FOURTH PRIZE, $100. MENTIONS.

PROGRAM.

The problem is a house with walls built of brick. Porches, verandas, or piazzas may be in part or wholly of brick or wood.

The cost of the house (exclusive of the land) including heating—equipment complete; plumbing—including all fixtures; gas piping and electric wiring—with fixtures, is not to exceed $10,000.

Designs which in the opinion of the jury call for a house which would cost more than the amount named to execute will not be considered.

The plan should provide accommodations for a family of five—three adults and two children—and at least one servant. There are no restrictions as to size, shape, or style of house—except the cost—nor the size, shape, or location of lot.

The particular object of this Competition is to obtain designs for a BRICK HOUSE of moderate cost. It is especially desired that the treatment of the exterior shall show the possibilities in obtaining charming but restrained effects by the use of bond and jointing and pattern. The BRICK HOUSE is rich in precedent, and the material, whether considered from the esthetic or the practical standpoint, meets in the fullest measure the demands put upon it. To summarize; —the Competition calls for A CHARMING BRICK HOUSE OF MODERATE COST.

CONSTRUCTION.

The methods usually employed in the construction of brick walls may be followed, except that the walls are to be wholly of brick and of sufficient thickness to safely carry the load. The program does not call for a fireproof house, although that form of construction is not objected to. The choice of brick is left to the designer.

DRAWINGS REQUIRED.

On one sheet a pen and ink perspective, without wash or color, drawn at a scale of four feet to the inch. Also plans of first and second floors at a scale of eight feet to the inch. In connection with the plan of the first floor show as much of the arrangement of the lot in the immediate vicinity of the house as space will permit.

On another sheet, at the top, the front elevation drawn at a scale of eight feet to the inch,—and below the elevation, a sufficient number of details to properly show the brickwork and the special features of the design,—drawn at half inch scale in black ink without wash or color. Sections shown are to be cross-hatched in such manner as to clearly indicate the material, and floor plans are to be blocked in solid.

The size of each sheet is to be exactly 24 inches by 18 inches. Strong border lines are to be drawn on both sheets one inch from edges, giving a space inside the border lines 22 inches by 16 inches. The sheets are not to be mounted.

Each set of drawings is to be signed by a *nom de plume* or device, and accompanying 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.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing), at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., on or before Sept. 15, 1909.

Drawings submitted in this Competition are at owner's risk from time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The designs will be judged by three or five well-known members of the architectural profession.

In making the award the jury will take into account the fitness of the design in an artistic sense to the material employed; the adaptability of the design as shown by details to the practical constructive requirements, and the excellence of the plan.

Drawings which do not meet the requirements of the program will not be considered.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. The full name and address of the architect will be given in connection with each design published. Those who wish their drawings returned, except the prize drawings, may have them by enclosing in the sealed envelopes containing their names ten cents in stamps.

For the design placed first there will be given a prize of $500.
For the design placed second a prize of $250.
For the design placed third a prize of $150.
For the design placed fourth a prize of $100.

This Competition is open to everyone. The prize and mention drawings will be published in THE BRICKBUILDER.

THE BRICKBUILDER

Volume XVIII SEPTEMBER 1909 Number 9

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

From Work by

LOUIS BOYNTON; CARRÈRE & HASTINGS; MacLAREN & THOMAS; MARSH & PETER; McKIM, MEAD & WHITE; THOMAS, CHURCHMAN & MOLITOR; TROWBRIDGE & LIVINGSTON.

LETTERPRESS

RUINS OF THE BATHS OF CARACALLA, ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

The baths of Caracalla, forming the most extensive ruins in Rome, although begun by Septimius Severus in 206, were chiefly built by the Emperor Caracalla (212-217 A. D.). Lofty vaulted halls, the "Tepidarium," or central resting hall, the "Calidarium," or warm vapor bath, the "Frigidarium," or cold swimming bath, with smaller rooms formed the central block of buildings which was surrounded by a large court of shrubberies, fountains, colonnades and statues, gymnasia, tennis courts, etc. The baths were rendered useless by the cutting of the aqueducts in the siege of 537. During the renaissance many well known statues, reliefs, cameos, medals, bronzes, etc., were recovered from the ruins, and much of the outer facing of brickwork was stripped from the walls.

THE BRICKBVILDER

VOL. 18 NO. 9 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· SEPTEMBER 1909

The Pictorial Representation of Architecture — The Work of Jules Guerin.

BY SAMUEL SWIFT.

IF EVERY client were a man of imagination, Mr. Jules Guerin's perspective drawings in color, made from architects' plans to emphasize the characteristic qualities of proposed buildings, might pass simply as artistic luxuries. But while imagination remains as rare as it is precious, among mankind in general, including the members of building committees, every substantial aid in bridging the gap between the architect's conception and the layman's appreciation may claim title as a necessity. The ordinary perspective view, drawn from a point arbitrarily assigned, is not much more than a diagram, repeating only the facts set forth in the plan and elevation, without the exercise of selective power. The client gets from it no generalization, no suggestion of the essential effect to be expected when the structure is translated from ink and paper to stone and steel. In forming his opinion of what the building will look like, the layman is thrown back upon the mere arithmetic of the design — the number of stories, the height and width of the façade, in feet; the number and distribution of windows, and other necessary considerations, which have their place but should be studied in the fuller light growing from a perception of the artistic character of the building in its entirety.

When clients can be brought always to demand and recognize beauty and distinction in the buildings they order, as well as utilitarian efficiency, the architectural millenium will doubtless be at hand. While this desirable state of things is not imminent, most architects will probably agree that public appreciation of what is worth while is gradually growing. The time to educate the client is before he builds. This is precisely the function of Mr. Guerin's drawings, which seek to eliminate, from the layman's view of a design, the non-essential elements, and to make clear to him the oft-quoted distinction between truths and facts. The truths of a work of art of any kind represent its holding in what is universal and enduring, the evidences of inspirational creative force that went toward its making. Its facts are the accidental forms or expressions assumed by its component parts, accidental in the sense that they bear no absolute relation to art principles, but only to one another, and for this particular picture, or statue, or poem, or building.

Thus, the exact number and the actual size of the windows on the thirtieth floor of the Singer Building are facts not important in themselves, except as they have made possible the judicious grouping of several tiers of windows into a vertical unit of design, so that the tower appears to be marked off into a series of such units, combining to give decorative quality to the whole. The imposing effect of this arrangement, now that the building is finished, as it makes itself felt upon the man in the street (or, better, the man on the ferryboat), would probably not have been even guessed by the layman confronted with nothing more communicative than a strict elevation, drawn when the building itself was still only on paper. Nor could the average perspective drawing of such a structure have been likely to go much farther, in foreshadowing to an inexperienced observer the fine proportioning of openings and wall spaces and the other successful features of Mr. Flagg's design. The writer cites this merely as a conspicuous and well known building; he has no knowledge of what preliminary drawings were made in this case, and the facts are immaterial. The point is that it would have required an artist, or the architect himself acting in the rôle of an artist, to elicit from the plan and elevation of such a building a fair idea of the character and potency that it has revealed when materialized.

In designing a building worthy of respect, the architect has in mind a more or less clearly defined entity of result, a general and unified impression for which he is striving. These essentials may be indicated in the architect's original sketch, but only in a tentative way. What Mr. Guerin seeks to do, in his perspective drawings in color, is to recreate, in a larger and finished way, the architect's original sketch, worked out in full flower, yet with everything not indispensable to the general effect either subordinated or eliminated. His drawing is meant to bear the relation to the routine diagram that a sensitive and illuminating portrait, painted or drawn or modeled, sustains to the soulless dullness of an ordinary photograph, accurate as to details but not in any sense interpreting the subject's personality. The photograph shows everything and accents nothing, therefore it tells little. The artistic portrait isolates for attention the features or the proportions truly significant and characteristic. In a building, the corresponding elements are those bearing the stamp of the architect's creative thought.

It is not a multitude of small facts but a few substantial truths that make up one's impression of a good building,

Jules Guerin, Del.

UNION TRUST COMPANY,
WASHINGTON, D. C.

Wood, Donn & Deming, Architects.

R. C. Sturgis, Architect.

THE FIRST NATIONAL BANK,
BOSTON.

Jules Guerin, Del.

For example, what layman can recollect offhand how many courses of windows, how many moldings, or even how many principal divisions are in the façades of the Flatiron, Times, West Street, Trinity, or other large New York structures? That is not what one needs to know about them. But if each of these edifices makes a certain individual imprint upon one's mind (and everyone of them assuredly does do this), then an artist's function, in making his drawings before these buildings were begun, would have been to single out and emphasize their prime qualities — the overshadowing, looming height of the Flatiron, the vigorous ascending lines of the West Street Building, the ecclesiastical richness of the Trinity façade, and the commanding aspect of the Times tower, with its purity and simplicity and its remarkable avoidance of coldness or sullenness of color. This factor of color is an important one for the artist-draftsman to take heed of in selecting a scale of values for his painting. Sometimes the architect himself fails to think in terms of color, and even finishes a design without knowing in what material it will be carried out. In such cases, the artist-draftsman can often be of positive assistance both to the architect and his client.

Having in mind the general principles that should govern an artist when acting as the interpreter of architects' plans, it will be interesting to observe some of the ingenious and effective methods of Mr. Guerin in making his drawings. Every case brings its own problems and Mr. Guerin has been guided through his by maintaining a broad spirit of fidelity to the purpose of the designs he has translated into pictures, rather than by slavishly adhering to unimportant facts. For example, in coloring the perspective view of a tall, rather narrow building, he found that to leave the upper part of the same shade of color as the lower part made it look weak at the top, so that it appeared to lean backward, causing the observer uneasiness. So he shaded it progressively heavier, from the bottom to the top of the central bronze window section, until the upper part was considerably darker than the lower. This gave the building, as pictured, a strength and rigidity equal at any point in its height to that at any other point, and this tautened up, so to say, the whole design. This solution could have been found only as Mr. Guerin found it, by experiment. What he did was to allow in his drawing for the loss of color value, or the equivalent gain in shadow, which nature has since conferred upon the building itself through the agency of aerial perspective.

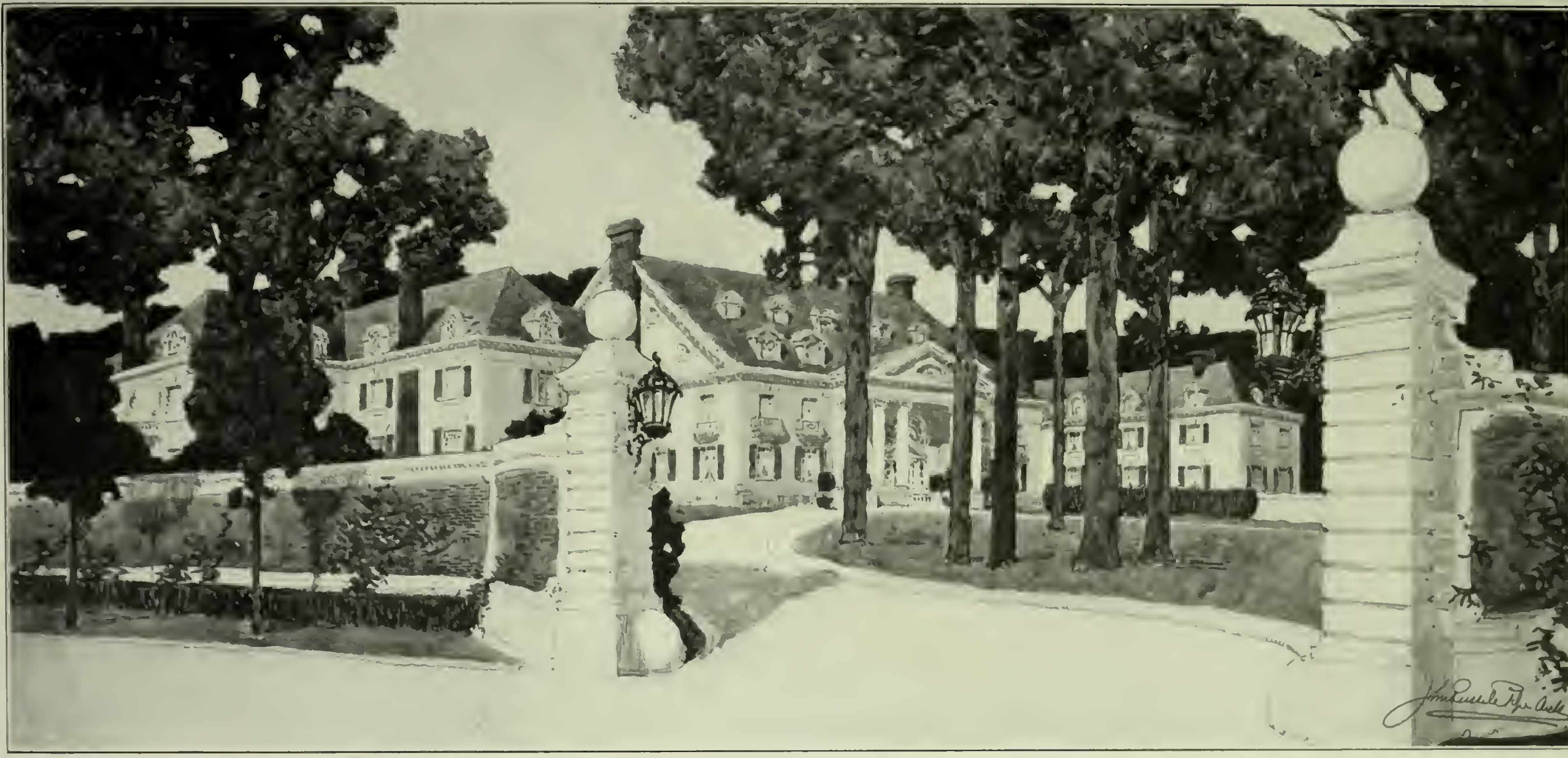
In picturing another tall building whose corner formed a sharp acute angle, Mr. Guerin noted that his upright lines representing the sides, when drawn parallel, made the building seem to bulge outward on each side at the top. He therefore chose an imaginary point of sight for these lines, and thus converged them enough to correct the false impression given by exact consonance with the facts. A point of sight for the vertical lines in a drawing is rarely needed, but it was just here that the artist's perception came in.

Similarly, in making a front elevation in color, without perspective, of a large building consisting of a central mass and two symmetrical wings, the relative length of the horizontal lines on either side of the central portion was such that they seemed to swell at the ends instead of remaining parallel. To correct this optical illusion, Mr. Guerin provided the impossibility of two simultaneous points of sight, one for either wing, and compressed the horizontal lines, both top and bottom, in accordance with these imaginary points, until the wings regained their proper appearance to the eye.

It is to his practical training in painting stage scenery for certain celebrated actors, nearly two decades ago, that Mr. Guerin owes much of his unusual command of perspective and his sensitiveness to its violation. There is just one point, in any theater, whence any given stage setting can look exactly right to the spectator. That point is chosen at random and it varies with each set of scenery. There is no convention as to where it shall be placed. But the aim of the scenic artist is to arrange his stage pictures so that from as many other parts of the theater as possible it will look approximately correct. The tormentor bar, hung from the proscenium arch, governs the view of the stage obtainable from the upper gallery. Its height for any given scene must be sufficient to allow the topmost spectator to see the full depth of the stage. This is a matter of nice adjustment, in designing the scenery, and it accounts for what may often seem to the uninitiated the exaggerated height of stage ceilings, in settings showing modern house interiors.

This brings up Mr. Guerin's insistence that in making colored perspective drawings from architects' plans the artist must be strongly a decorator. He must know how to get the most out of his available space, how to place the picture or design within the space, and how to select or create shadow shapes suited to the design. Some of the deep, flat, simple shadows that Mr. Guerin casts in his drawings have no existence in nature, but are invented for the occasion and introduced as effective factors in the composition. On the other hand, the case may be cited of a certain structure to be erected near a river front, which Mr. Guerin was to illustrate. It was provided with a series of arches, each with a heavy pendentive, but to have thrown dark shadows under these, according to the regular formula, would, in the artist's opinion, have hurt and weakened the lines of the arches themselves, and thus distorted the design. Here Mr. Guerin deemed that he could best be of service to the architect and to the layman for whom the drawing was made, by toning down the strength of these shadows and in some cases omitting them altogether.

Another controlling factor in rendering drawings of the sort under discussion effective is judicious choice of the atmospheric conditions to be represented in the picture. Most buildings will look their best under some particular degree of light, and this is true of both old edifices and new ones. To Mr. Guerin, for example, the buildings of southern Europe and of Egypt should always be seen in sunshine, bright, strong, and radiant. He would not regard a rainy day view of Venice as characteristic, if one were making an exposition of that city to those not already familiar with it. The Alhambra this artist found marvelously impressive when he saw it under a brilliant sky, with big, heavy shadows marking its walls, and a landscape background set with olive and other trees whose leaves shone almost black in the flood of noonday sun. But when Mr. Guerin saw the Alhambra on a rainy day, the strength of the picture



A RESIDENCE.

Jules Guerin, Del. John Russell Pope, Architect.

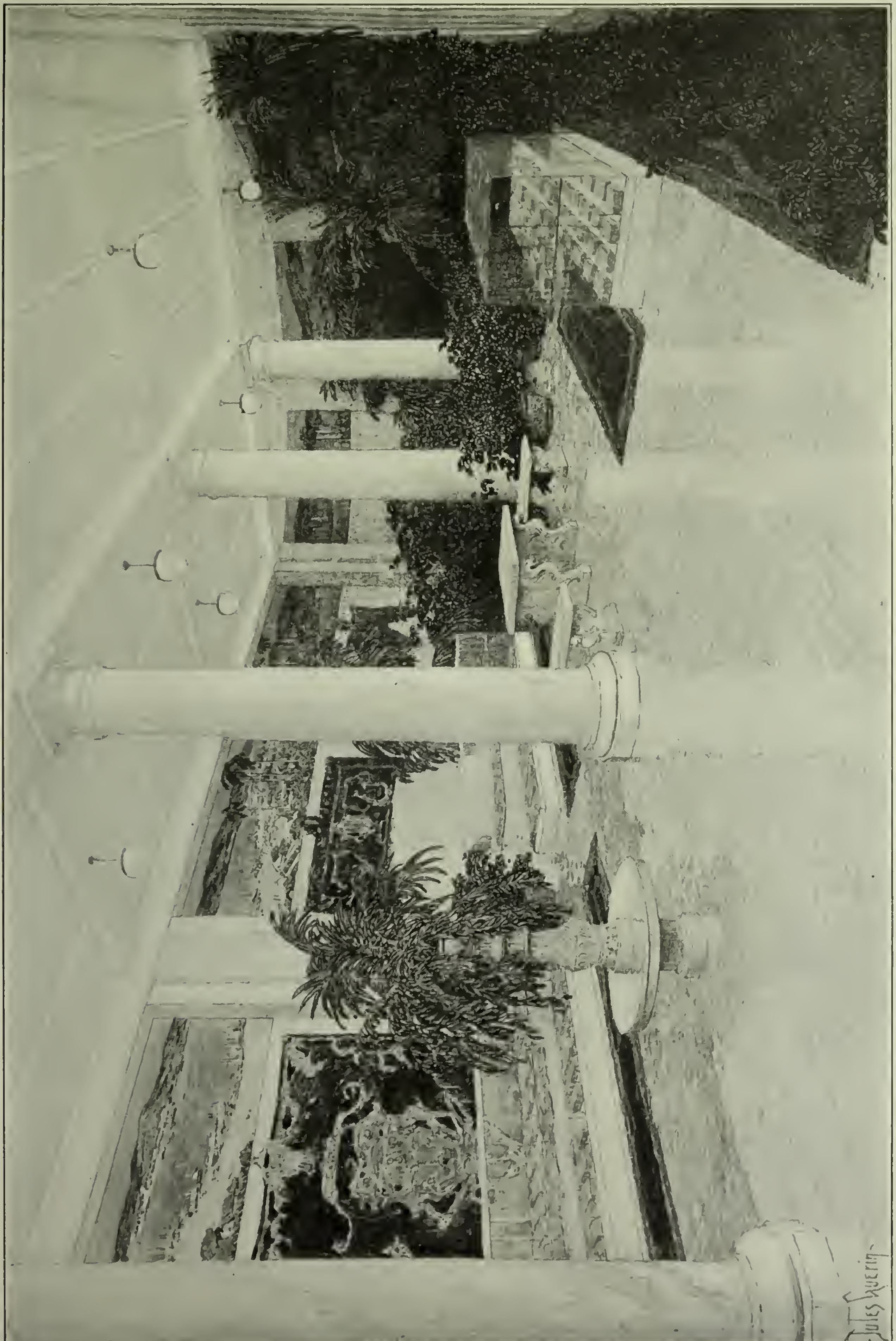
it made for him was gone. The etched tracery of carved stone faded, for him, into something thin, fussy, and nerveless, compared with what it had been when lighted by the regal blaze of Spanish sunlight. Again, to this sensitive observer, English houses and churches are well suited to rainy weather settings. Their color is soft and possesses a narrower gamut of values than the southern structures enjoy.

Coming nearer home, Mr. Guerin recently depicted a large and important public edifice, since erected in New York, with a gray sky as its heavenward neighbor, and a crowd of people warding off rain with their umbrellas as the human portion of the scene. This was the official perspective drawing of this building from the plans and its touch of unconventionalism was duly recognized and liked. Most of Guerin's New York pictures, however, are set under the normal brightness of our sunlit days.

Jules Guerin, Del.

A COUNTRY HOUSE.

Lindley Johnson, Architect.



Jules Guerin, Del.

INTERIOR HAVANA TOBACCO COMPANY,
NEW YORK CITY.

McKim, Mead & White, Architects.

Finally, a word as to the practical way Mr. Guerin goes about producing his curiously personal and illuminating pictures. After a careful study of plan and elevation, he determines the precise point of view, in angle and distance, from which the architect's draftsman is to make the preliminary perspective drawing. Sometimes the first choice of this point of view proves unsatisfactory and the drawing must be done anew, to give the best results. This preliminary work finished, the artist himself takes the drawing and colors it, omitting all but the absolute essentials, and introducing, if he deems them effective, foreground or background elements. He would have it, if possible, a picture beautiful from every aspect, subjecting it not merely to the test of a wall decoration, but almost to that of sculpture in the round, which must remain vital and communicative from all sides.

Decorative factors are often helpful in compassing this end. For example, Mr. Guerin once pictured a new country house with so gay an arrangement of shrubs and rhododendrons banked up in its garden that the prospective owner insisted on having this very effect carried out by the landscape gardener.

Examples of Mr. Guerin's successful work might be multiplied, but it all harks back, after all, to the efficacy of imagination and of personal and appreciative perception of what is real and what is vital in an architect's design.

Jules Guerin, Del. INTERIOR OF THE FIRST NATIONAL BANK, BOSTON. R. C. Sturgis, Architect.

The Housing Problem — V.

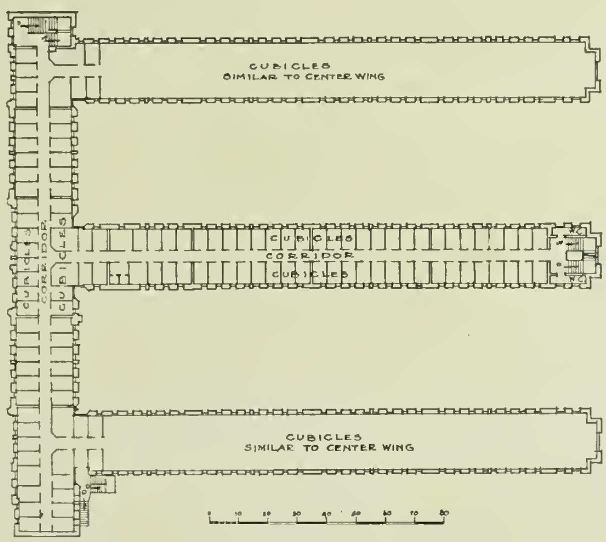
LODGING HOUSES.

BY GEORGE B. FORD.

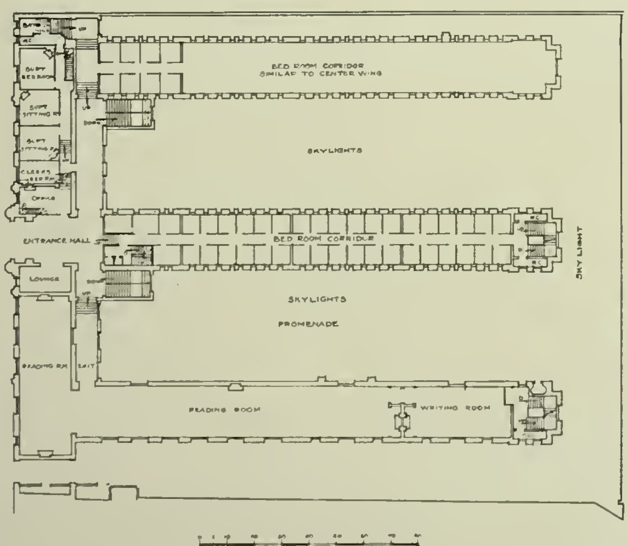
HAVING discussed the housing of the married, there remains to be considered the question of how to house the unmarried. This naturally has to be handled from two different points of view; the lodging of men as well as the housing of women. The moral question entering in, as it does, makes it more important that adequate living conditions be provided for working women rather than for working men, as the latter are able to exist in the ordinary boarding house while the women are not, and yet in spite of this fact practically all the attempts that have been made toward the solution of this lodging problem are for men. With the exception of the Trowmart Inn in New York and the four new buildings in Paris (one built by the government and the others by the Société Philanthropique), there seems to be almost nothing designed for lodging women. In considering this question reference will be made only to such buildings as are erected by persons sincerely wishing to alleviate the living conditions of the working people.

Lodging houses are divided into two classes — those where the lodger pays and those where he does not. In the pay lodging houses or men's hotels, such as the Mills Hotel No. 3 in New York, where one pays thirty or forty cents per night for room only and the Salvation Army Barracks in London, where one may have supper, bath, bed, and breakfast, all for four pence, the general considerations and requirements are the same. The first thought is accommodations; then for dining rooms and restaurants with proper care for the food, and finally for recreation. Attention should be given to the arrangements of bath rooms, laundries, and barber shops, while provision must be made for fire escapes, proper methods of heating and ventilating, and suitable provision for the sick. In addition to these, quarters ought to be planned for the superintendents, servants, and extra help.

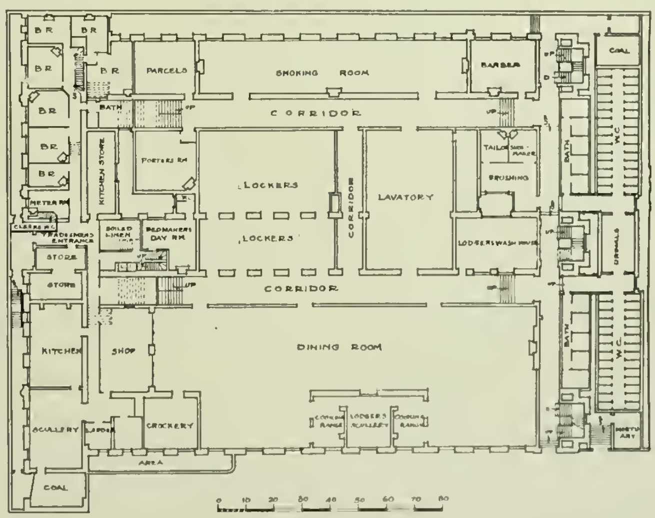
As for the sleeping accommodations there are two sorts — cubicles and private rooms. Single rooms cost too much in constructing and occupy too much space to permit of being used extensively in the cheaper lodging hotels and so the recourse to cubicles becomes necessary. These cubicles are usually large rooms with eight compartments on either side of a central aisle. The wooden partitions which separate the spaces are between 7 and 8 feet high, from the top of which a wire netting runs up to the ceiling to preclude all possibility of people entering while the owner is away or asleep. The minimum size for these compartments seems to be 6 by 8 feet, although in some cases they are 7 feet 6 inches by 5 feet 6 inches. The floors are usually fireproof with a wood finish, while all the trim is kept quite small with simple detail for sanitary reasons. There should be a window in each compartment as well as light, preferably electric. Each cubicle should have



FIRST FLOOR PLAN



GROUND FLOOR PLAN



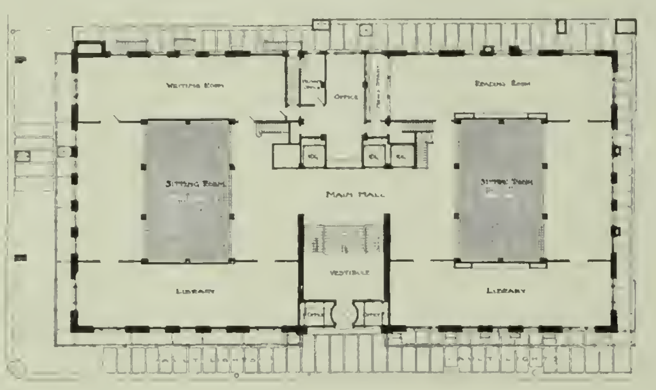
BASEMENT FLOOR PLAN

THE ROWTON HOUSE, LONDON.

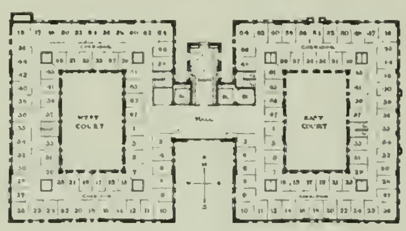
a guardian located if possible at the corners of the central corridors.

The private rooms are a little larger than the aforesaid compartments and rent at a higher price. These are located generally on corners or in a wing by themselves, with direct access to bath and toilet, as should be the case with all the rooms throughout the building.

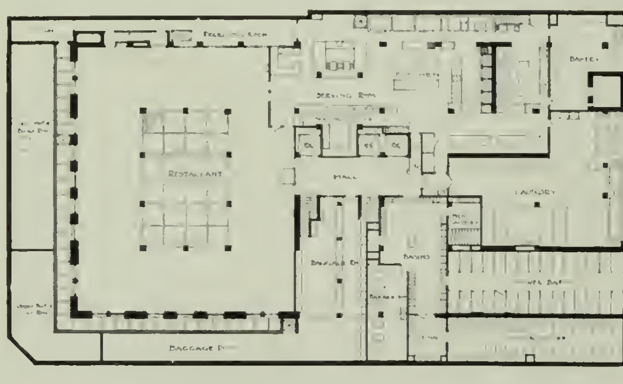
In most of the hotels the dining rooms are only for the lodgers, but at the Mills Hotels in New York the restaurants are accessible from the street. The dining rooms are located in a high, well lighted basement, with cheerful decorations, while the floors are of cement or tile: the restaurant of the new Albergo Popolari in Milan however has wooden floors. Here as elsewhere the trim and woodwork should be of the simplest design.



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN



BASEMENT PLAN

THE MILLS HOTEL, 36TH STREET AND SEVENTH AVENUE.
Copeland & Dole, Architects.

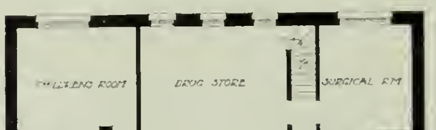
The general arrangement of the dining rooms is dependent on whether the meals are served table d'hôte or à la carte. In the Mills Hotels in New York the meals are table d'hôte, which necessitates the service of waiters who procure the food from a serving room outside the dining room. In the Rowton Houses in London, the London County Council Lodging Houses, and the Paris Lodging Houses the service is à la carte, and the diners procure their own food at a counter on one side of the room, which they pay for as they get it. Another feature of the London men's hotels is the arrangement made whereby the men can cook their own meals. There are alcoves leading off of the dining room which contain a series of ovens and fires, and by borrowing the necessary pans and kettles one may cook his own food, which is purchased by him at a store adjacent to the dining room or bought outside. The kitchens of these hotels should be well ventilated and thoroughly sanitary in every respect, having a direct entrance from the street. Special accommodations should be provided for a certain number of cooks and waiters in the way of a private dining room as well as a private passage through the basement to the street.

For recreation there should be several rooms on the ground or second floor exposed to the sunlight but so situated as not to be too hot in summer or too cold in winter. The rooms are better low studded and closed in with comparatively few doors with walls painted or tiled in warm tones, having a number of fireplaces. This is particularly well done in the case of the Rowton Houses in London. These six men's hotels built by Lord Rowton accommodate in all something over six thousand working men at six pence per night. Here the floors are of wood, the walls of dark warm color tile to a height of four feet, with warm tinted plaster above. The rooms are very narrow in proportion to their length, which gives them a home-like character. There should be a large general conversation room and several smaller rooms for reading and for writing. It is necessary also to have a stand where the men can buy cigars, papers, leave or call for laundry, etc. The man at this stand has charge of the library which should be one of the rooms mentioned above.

At the entrance to the building there is a turnstile and wicket where the superintendent and surveillant from their rooms adjacent can keep track of those coming in and out. The superintendent is usually a married man, requiring from three to six rooms with a separate entrance on the street.

Another feature which is provided for is a small hospital ward in a place well ventilated and lighted, and a morgue, preferably in the basement. There should be adequate provision for a number of tub, shower, and foot baths, as well as lavatories and wash basins. It is well to provide a room where the men may wash their own clothes, with facilities for drying and ironing. Special provision has to be made too for the care of fresh and soiled linen. If a number of buildings are run under one management, it is desirable to have a central laundry as is done by the Rowton Houses in London. Accommodations should be provided in the building for a barber, bootblack, and a clothes presser. Ample provision is required in the way of fire escapes, and if the building is above six stories, as in the case of the Mills Hotels in New York, there should be adequate elevator service.

It might be well at this time to show what change is necessary in planning working women's hotels. The cubicle system is not considered desirable for them though used in three of the women's hotels of the Société Philanthropique. As they spend much more time in their sleeping rooms, it is desirable that they should be larger, better lighted, and more home-like in every way. Women are often at the hotel a large part of the day and for that reason the decoration on the rooms should be as attractive and pleasant as possible.



FIRST FLOOR PLAN

NEW YORK DISPENSARY,

WORTH STREET,

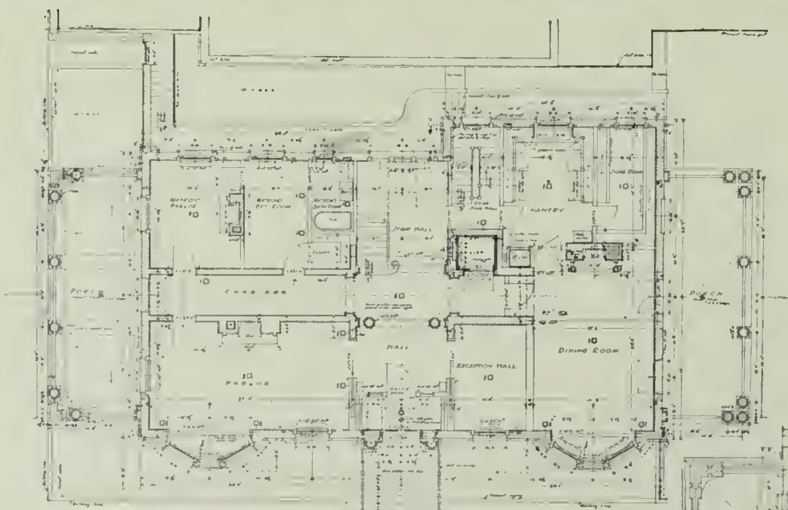
NEW YORK CITY.

Trowbridge & Livingston,

Architects.

SECOND FLOOR PLAN

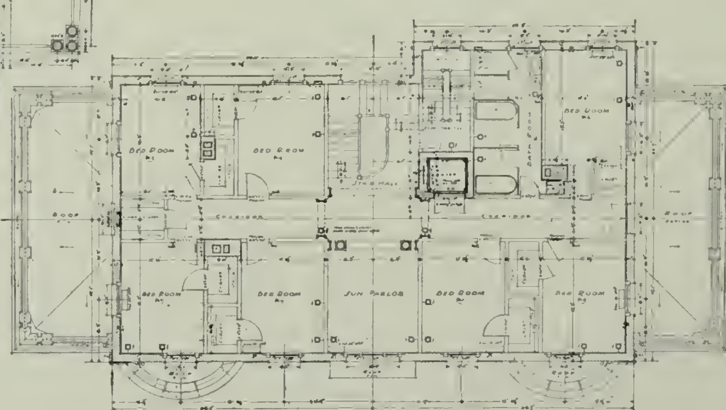
VOL. 18, NO. 9. PLATE 114.



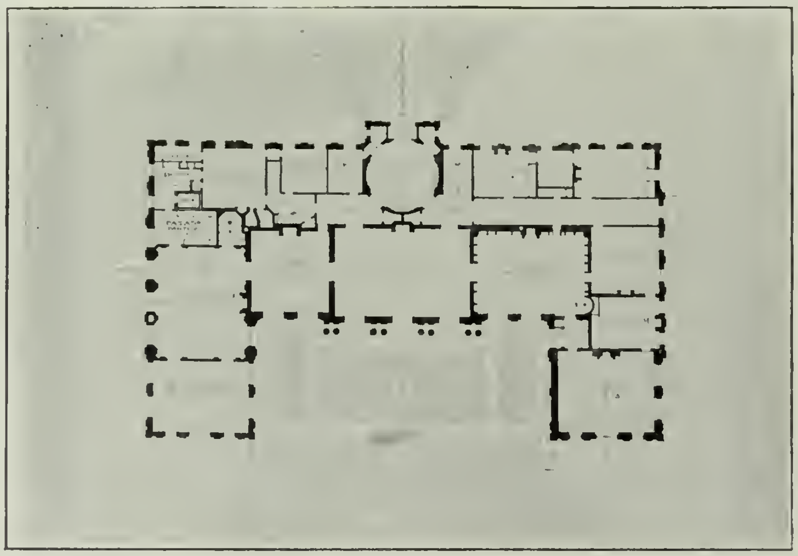
PLAN OF FIRST FLOOR

THE MARGARET EDES
HOME,
WASHINGTON, D. C.

MARSH & PETER,
ARCHITECTS.



PLAN OF SECOND FLOOR



" CLAREMONT "
A RESIDENCE
AT
BROADMOOR,
COLORADO.

MacLaren & Thomas,
Architects.

THE VESTIBULE.

DETAIL OF DINING ROOM.

THE DINING ROOM.

"CLAREMONT" RESIDENCE.

MACLAREN & THOMAS, ARCHITECTS.

THE SUN PARLOR.

THE LIBRARY.

"CLAREMONT" RESIDENCE.

MacLaren & Thomas, Architects.

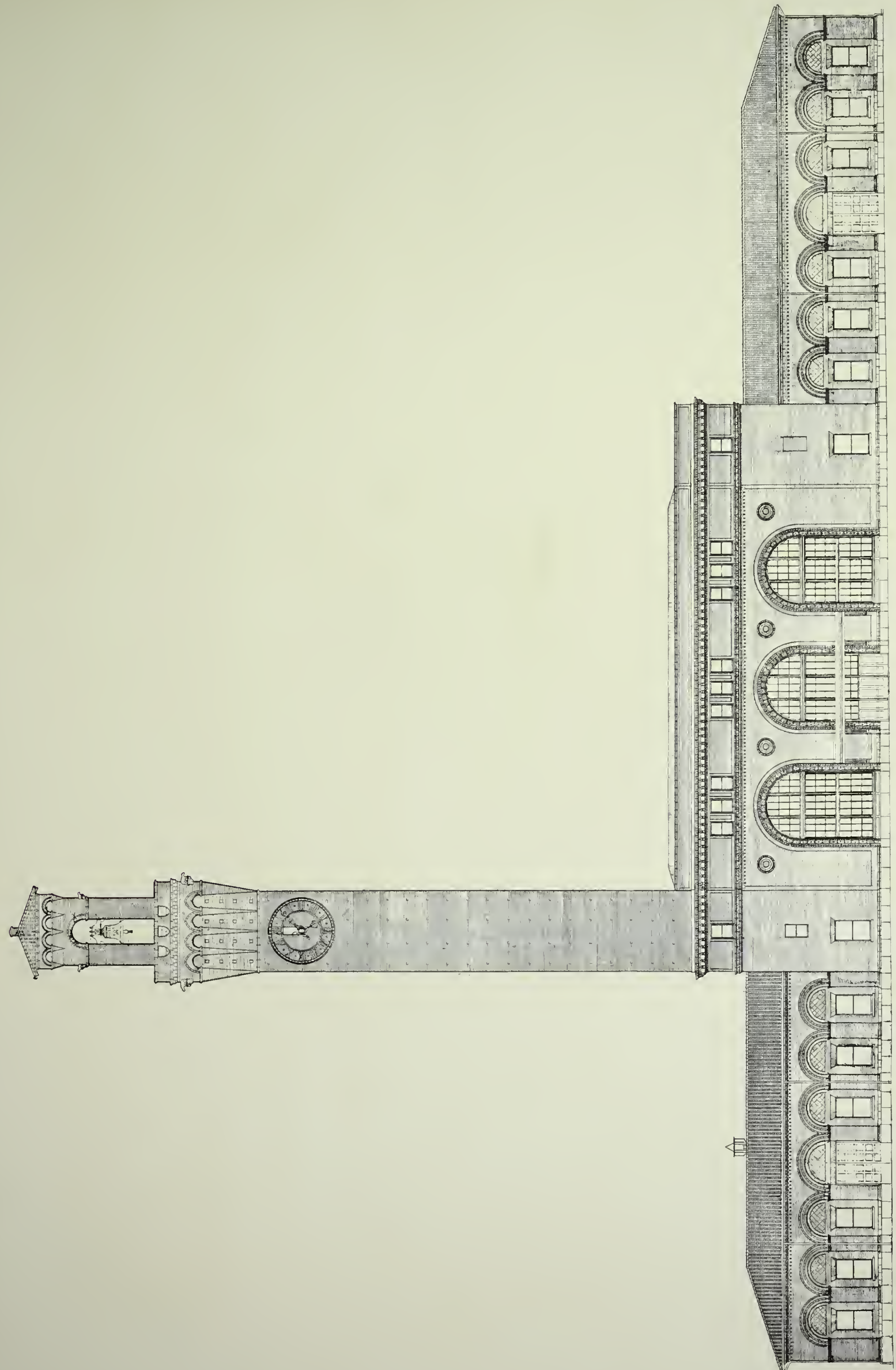
VIEW OF WING AND COURT.

VIEW OF COURT.

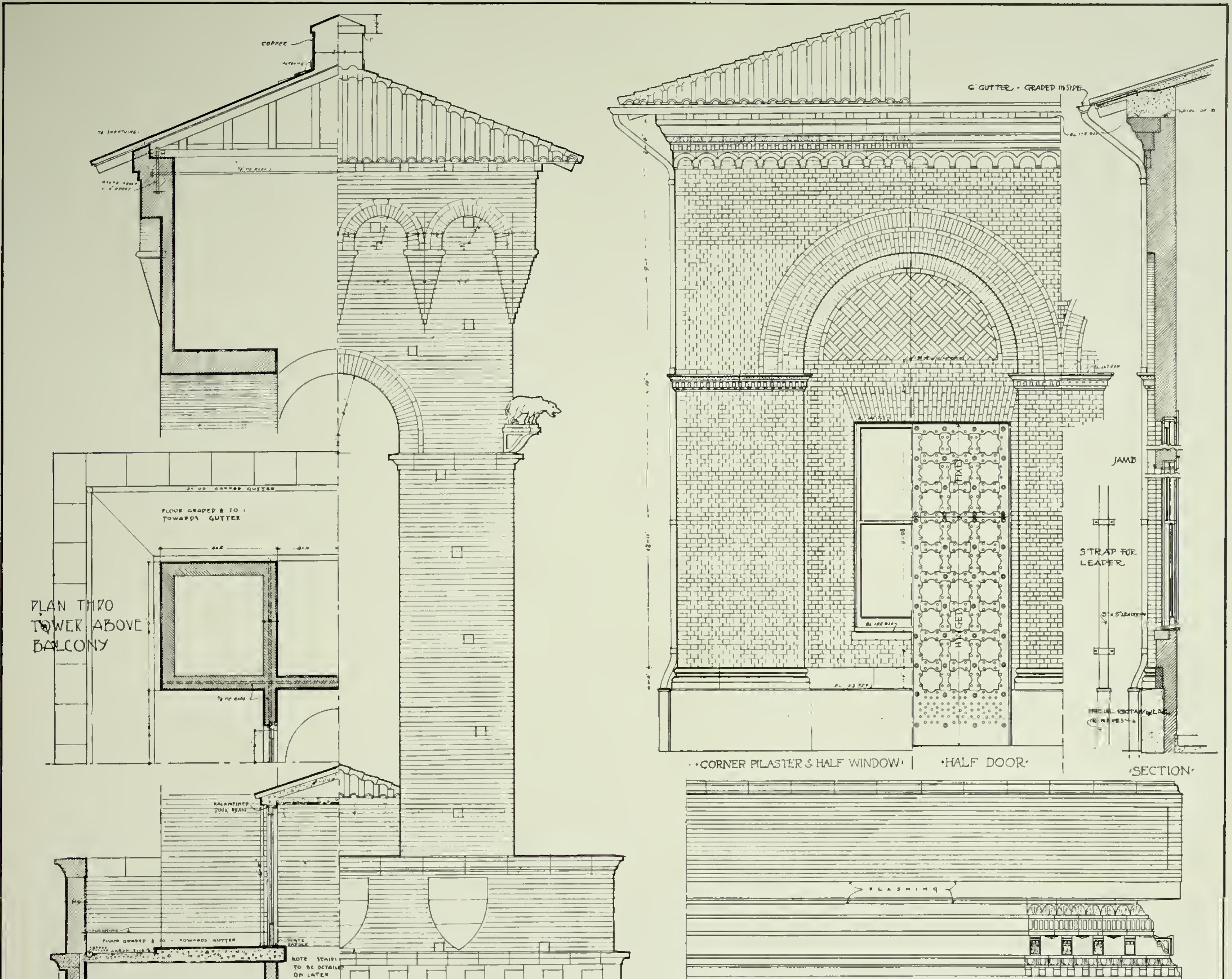
"CLAREMONT" RESIDENCE.

MacLaren & Thomas, Architects.

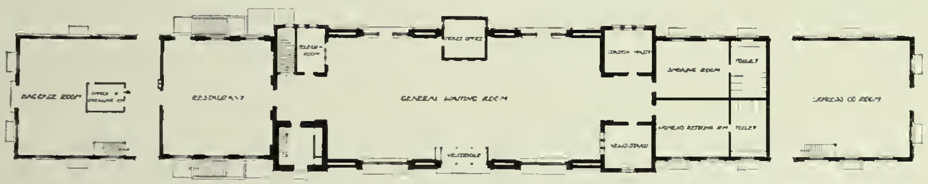
RAILWAY STATION AT WATERBURY, CONN.
McKIM, MEAD & WHITE, ARCHITECTS.



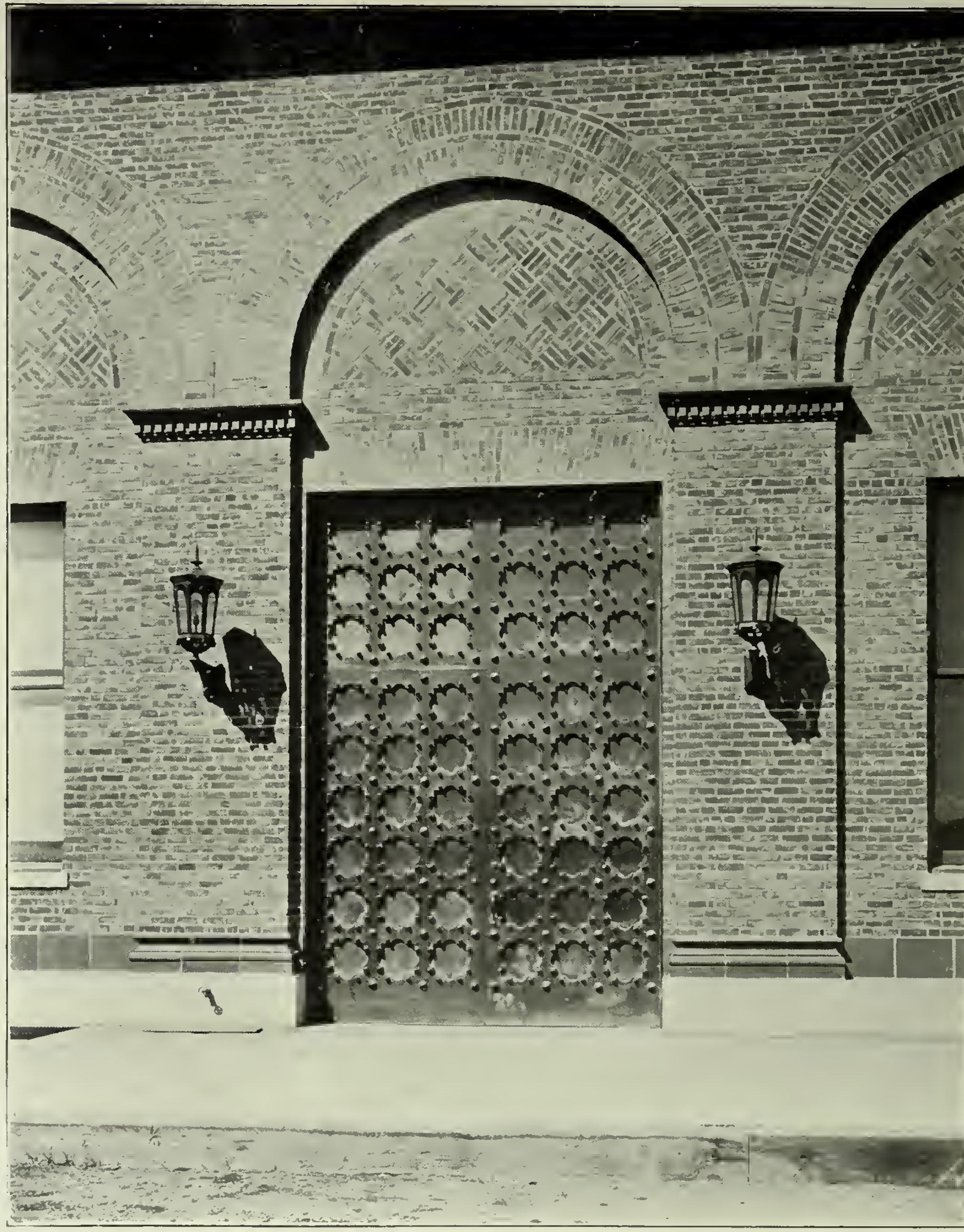
FRONT ELEVATION,
RAILWAY STATION AT WATERBURY, CONN.
McKim, Mead & White, Architects.



DETAILS OF RAILWAY STATION AT WATERBURY, CONN.
McKim, Mead & White, Architects.



FIRST FLOOR PLAN



DETAIL OF ENTRANCE TO BAGGAGE ROOM.

RAILWAY STATION AT WATERBURY, CONN.

McKIM, MEAD & WHITE, ARCHITECTS.

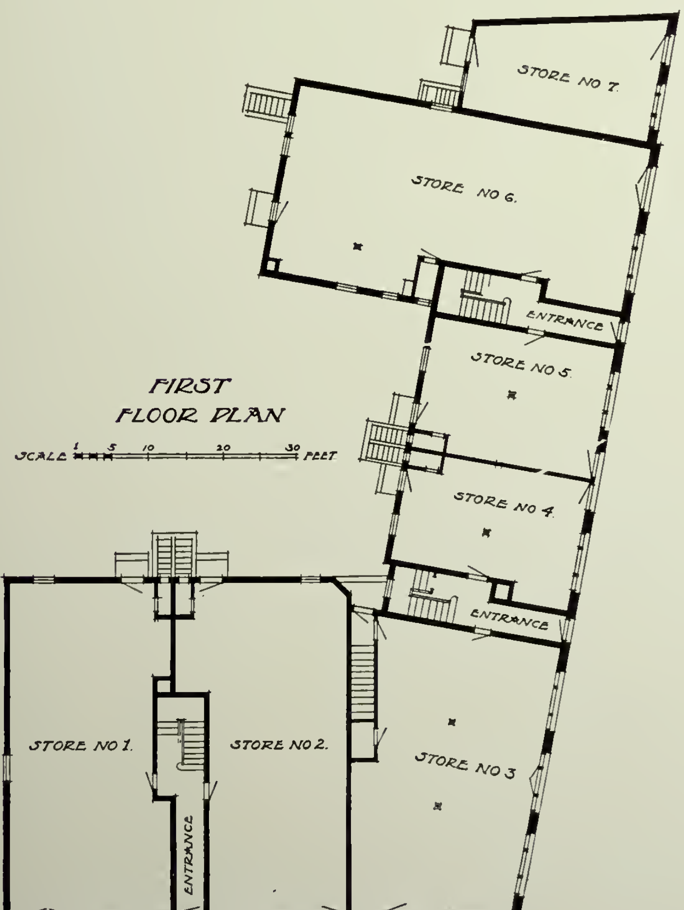
INTERIOR OF GENERAL WAITING ROOM.

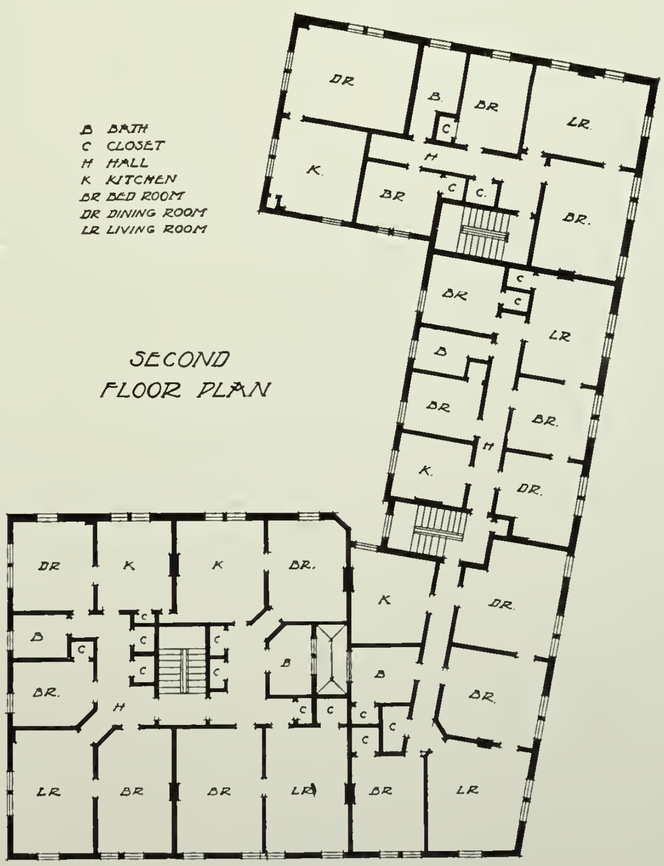
ENTRANCE TO GENERAL WAITING ROOM.

RAILWAY STATION AT WATERBURY, CONN.

McKim, Mead & White, Architects.

STORES AND APARTMENTS, CEDARHURST, L. I.
LOUIS BOYNTON, ARCHITECT.



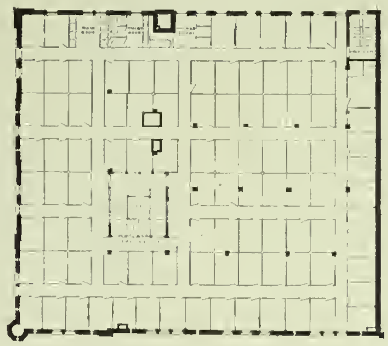


ST. MARY'S CHURCH, LAWRENCE STREET, NEW YORK CITY.
CARRERE & HASTINGS AND T. E. BLAKE, ARCHITECTS.

MEMORIAL CHURCH OF ST. PAUL, PHILADELPHIA, PA.
THOMAS, CHURCHMAN & MOLITOR, ARCHITECTS.,

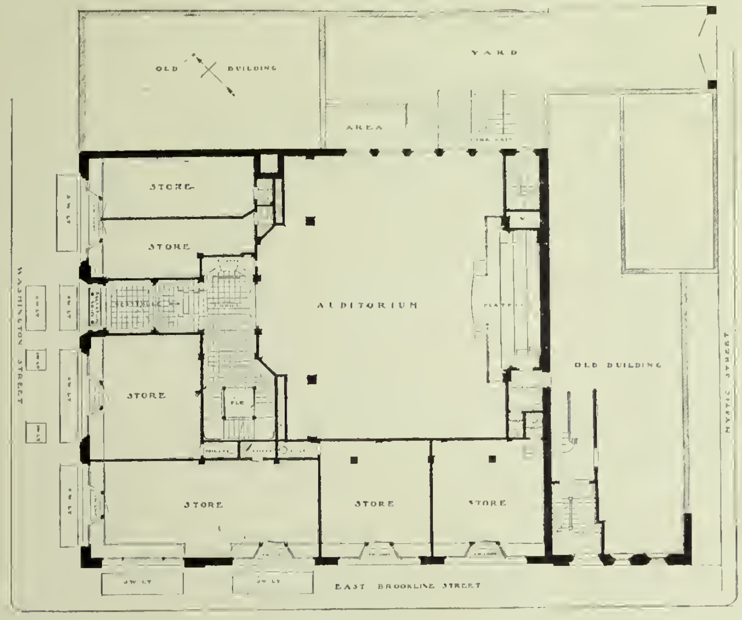
A special point should be made for reception rooms where they may entertain men callers. An attractive feature is a sewing room equipped with machines and possibilities for ironing and pressing. For women there should be bath rooms on each floor, with special accommodations for laundering, shampooing, clothes pressing, and ironing.

In the women's hotel, it is desirable that the dining room should be cozy and attractive, with small tables, and that the food should be served by waiters. A pleasant feature is the location nearby of a special tea room. This is worked out very prettily in the hotel for the women employees of the postoffice and telegraph service in Paris, a building built by the French government. For recreation the rooms are made small, with some pretense in having them inviting with a number of attractive corners about. Besides the gymnasium there should be provided a hospital ward.

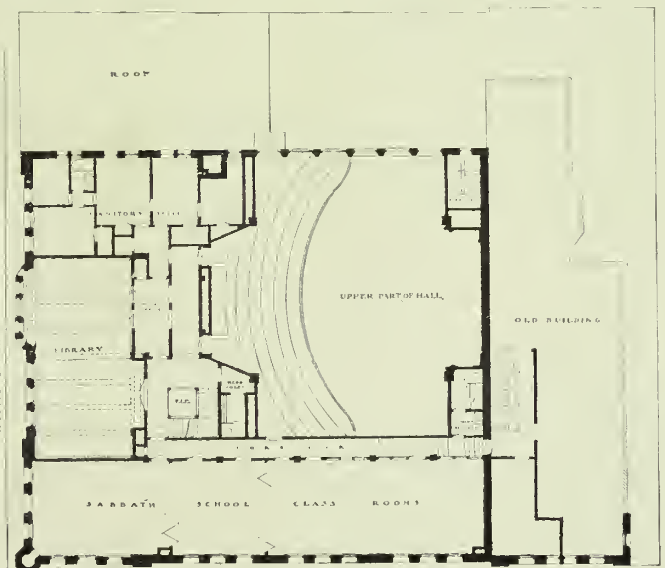


THIRD – TYPICAL HOTEL PLAN

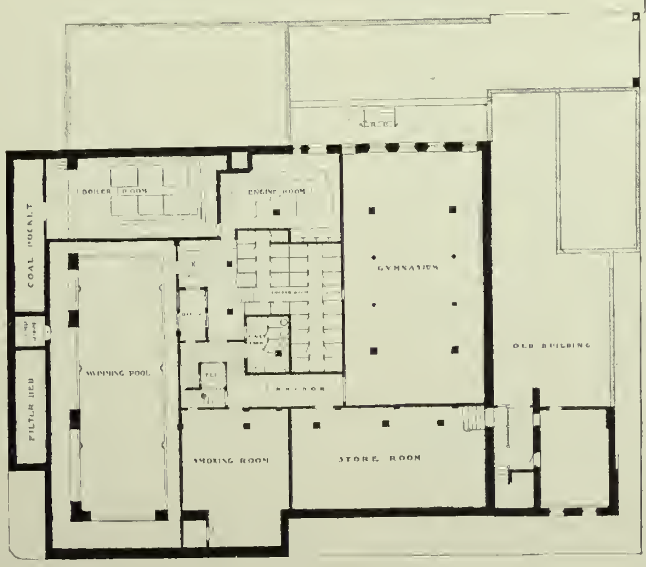
The municipal lodging house in New York is quite different in character from the foregoing buildings. The men enter one entrance at the left hand side of the building, while the women pass through another at the right. The whole of the second floor is devoted to women, all the rest of the building to men. Accommodations for women are the same as for the men only on a smaller scale. A man on entering goes into a waiting room first and then passes into a small room where he is examined by a physician. From there he enters a dining room where he is given a substantial meal, after which he goes down to a large room in the basement and undresses, his clothes being put into a wire basket or hung on an iron frame and taken down to large steam and formaldehyde fumigators where they remain over night. After a bath he is given a clean nightshirt and taken in an elevator to one of the upper floors, of which there are five, each one being open from end to end, and filled with small iron cots as closely spaced as convenient. Opening off from these rooms are toilet and washing conveniences. A special feature of these floors is the soiled linen chute at the rear. In the morning the man descends in the elevator to the dressing room in the basement where he puts on his fumigated clothes, passes up into the eating room where he is given breakfast, and then out directly to the street. All the entrances and passages are so partitioned off from one another that the man going in cannot in any way come in contact with the man going out. Among the minor features are the isolation rooms for those found with contagious diseases. The building is absolutely fireproof with the possibility of washing out each floor with a hose. A vacuum cleaning system is installed, especially for taking care of the blankets used on the beds. The attendants sleep on the top floor which is partitioned off into individual rooms. No attempt is made to avoid institutionalism in this building, it being purely a factory in character.



FIRST FLOOR · PLAN



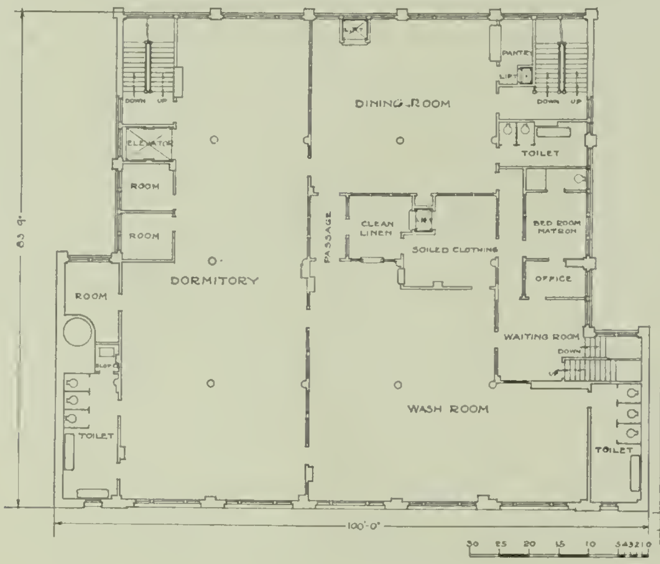
SECOND FLOOR PLAN



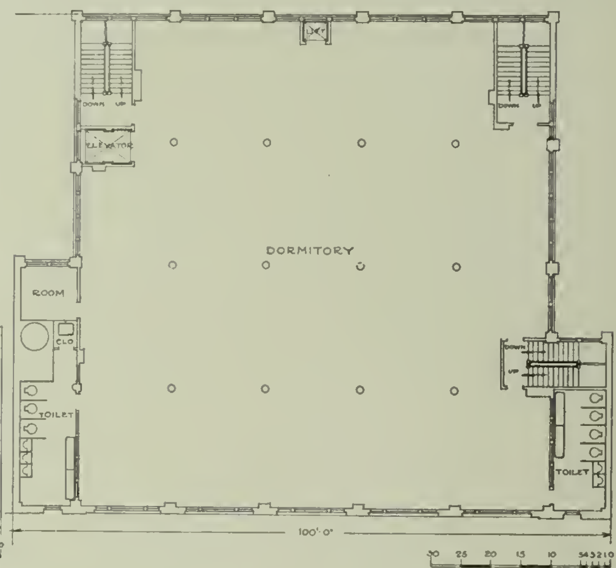
BASEMENT PLAN

SALVATION ARMY BUILDING.
Brainerd & Leeds, Architects.

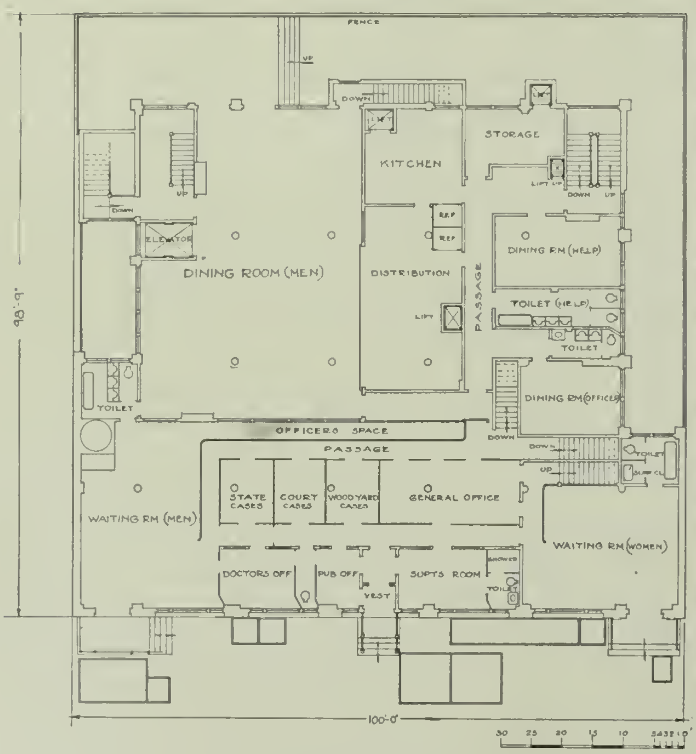
Among our best lodging houses in America are the three Mills Hotels in New York, in two of which twenty cents is charged for one night's lodging, while in the other thirty and forty cents is asked. England possesses excellent examples in the six large houses constructed by Lord Rowton in London, and three houses constructed by London County Council, which are identical in arrangement with the Rowton Houses. Then in addition to the above there are a number of large barracks belonging to the Salvation Army. They also have large working men's hotels in New York, Paris, Milan, Berlin, Vienna, and other cities throughout Europe. Birmingham has a large Rowton House while Paris has one working men's hotel, and three working women's hotels constructed by the Société Philanthropique, as well as one for government women employees. In Milan there is a working men's hotel similar in management to the Rowton Houses. London stands out by having accommodations for nearly twelve thousand working men in model lodging houses at six pence or less a night for a room. New York has a few special accommodations for working women, but the one building of architectural interest in this line of work is the Trowmart Inn on Abington Square.



SECOND FLOOR PLAN



THIRD FLOOR PLAN



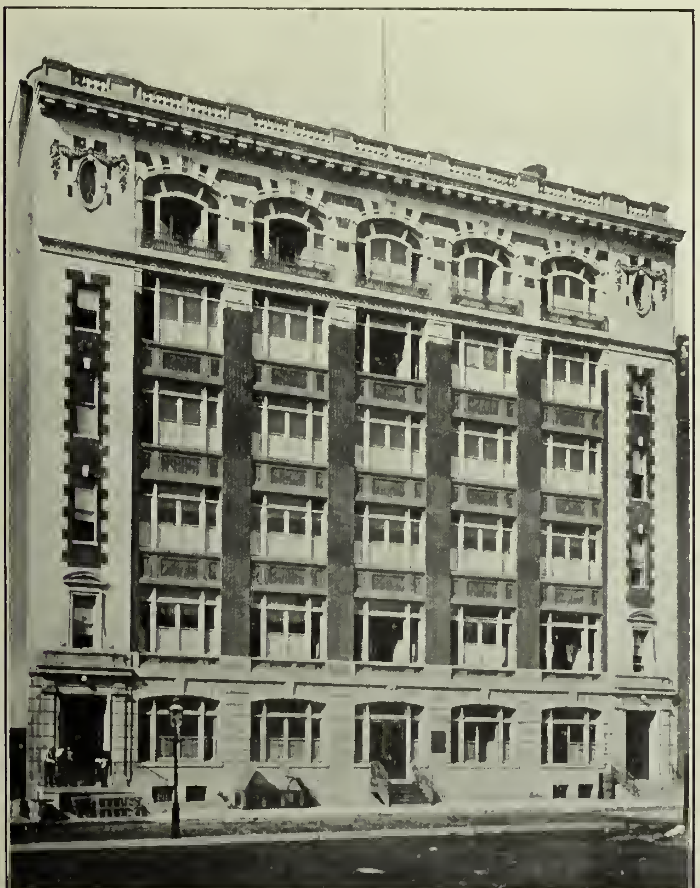
FIRST FLOOR PLAN

BASEMENT PLAN

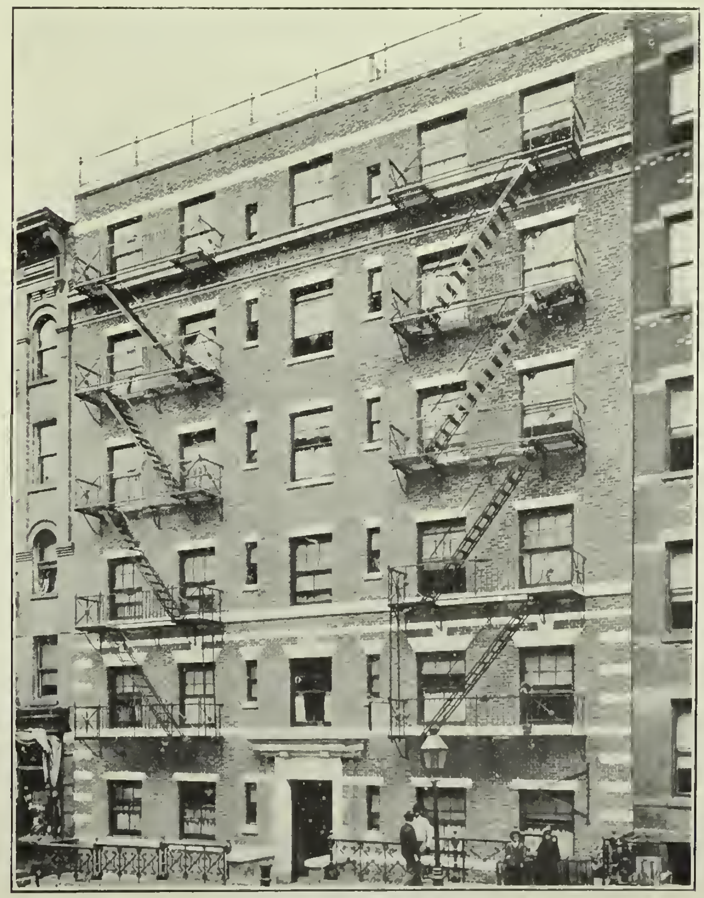
MUNICIPAL LODGING HOUSE, NEW YORK CITY.
Raymond F. Almirall, Architect.

TENEMENT AT 308 EAST 40TH STREET,
NEW YORK CITY.
William Emerson, Architect.

THE MILLS HOTEL, 36TH STREET AND SEVENTH AVENUE,
NEW YORK CITY.
Copeland & Dole, Architects.



MUNICIPAL LODGING HOUSE, EAST 25TH STREET,
NEW YORK CITY.
Raymond F. Almirall, Architect.



THE TUSKEGEE TENEMENTS, WEST 61ST STREET,
NEW YORK CITY.
Heins & La Farge, Architects.

Warming and Ventilating with Special Reference to Hospital Buildings—V.

BY D. D. KIMBALL.

IN DETERMINING the size of air ducts in the fan system of warming and ventilating a hospital building it is wise to limit the velocity of the air in the main ducts to 1,000 feet per minute, reducing the velocity in the branches and at the ends of the line to as low as 500 feet per minute, with a velocity as low as 300 feet per minute in upcast flues where possible. Therefore, by dividing the amount of air which must go through each duct by the above figures the size of the duct is found with sufficient accuracy for the average building conditions.

In all hospitals the heating of much water for domestic uses is necessary. It is customary to heat this water in service water heaters, which are steel tanks, usually made of ¼ inch steel with one head of ⅜ inch steel, and the other head cast-iron with manhole, this tank containing a brass steam coil. The tank should be tested to not less than fifty per cent above the working water pressure, while the steam coil should be tested to 125 pounds water pressure. This tank should have a hot water thermometer graduated from 30° to 250° and a small water relief safety valve, usually ¾ inch. The amount of hot water required may vary from 20 to 40 gallons per occupant per day, this being used through a period of not over ten or twelve hours. Assuming a maximum of one hundred patients there would be required, as a maximum, 4,000 gallons of hot water per day, or 400 gallons per hour, to be heated from approximately 50° to 145° or even 185°.

With steam at 5 pounds pressure approximately 5 square feet of heating surface in the brass heating coil are required for each 100 gallons of water to be heated to 145° and 8½ square feet for 185°. Therefore, for 400 gallons of water per hour 20 square feet and 34 square feet of heating surface in the coil would be required for 145° and 185° respectively, or 46 and 79 lineal feet of 1¼ inch brass pipe respectively. If iron pipe is used, which is undesirable, more surface is required, while slightly less pipe is required if copper is used.

If a storage of water is required the tank may be increased in size to hold three to four hours' supply, but in large plants quite as satisfactory results are obtained without this storage capacity by increasing the amount of coil surface so that it will heat the water quite as rapidly as it is used, in which case the steam coil should not be less than four times the amount determined as above.

For heating this water in summer, a summer heater must be provided, which may be a house heating boiler or a regular tank heater. The size of this may be determined as follows:

Multiply the gallons of water required per hour by 8⅓ (approximate weight per gallon in pounds), and this by the number of degrees through which the water must be heated, and divide the result by the number of heat units utilized per pound of coal (about 8,000), and then divide this by the pounds of coal which are to be burned per square foot of grate surface per hour, which will be two in very small heaters, and four to five in large heaters, and the result will be the grate area required.

In cases where such a heater must be used in the summer, the storage tank or service heater should be capable of holding the water required for a period of three or four hours to obviate the necessity of using a summer heater capable of heating the maximum amount of water required in any one hour. The summer heater may thus store up its heat during periods of a less demand, and the size of the summer heater may be reduced twenty-five per cent to thirty-three and one third per cent.

The chimney required for such a heater will be the same as that required for a sectional house heating boiler having the same grate area.

Assuming that the heater must run eight hours without firing additional coal, the American Radiator Company suggest this rule for heaters larger than their regular tank heaters.

Multiply the number of gallons per hour by the following factors:

For water at 100°	4.17
" " " 120°	5.65
" " " 140°	6.58
" " " 170°	8.00

and select that size of house heating hot water boiler having an equivalent rating for direct hot water radiation. If ample storage capacity is provided in the tank or coil service heater this rule will be found safe.

Small sizes of tank heaters may be determined by the manufacturers' capacity tables, although such lists generally over-rate the capacity of the heaters, and they should be checked by a comparison with the rule first given above. For heating water in baptistries or swimming pools a period of several hours may be allowed.

The size and height of the chimney have much to do with the success of a heating plant. The height of the chimney should be such that the top will reach above the highest surrounding structure, or the highest part thereof, and the flue should be either circular or as near square as possible.

For small plants the following table by Professor Carpenter will be found reliable:

DIAMETER OR SIDE OF CHIMNEY IN INCHES REQUIRED FOR VARYING AMOUNTS OF DIRECT STEAM RADIATING SURFACE.

Sq. Ft. of Rad. Sur.	H.P.	Height of Chimney in Feet.							
		20′	30′	40′	50′	60′	80′	100′	120′
250	2.5	7.4	7.0	6.7	6.4	6.2	6.0	6.0	6.0
500	5.0	9.6	9.2	8.8	8.2	8.0	7.6	7.3	7.0
750	7.5	11.3	10.8	10.2	9.6	9.3	8.8	8.5	8.2
1000	10.0	12.8	12.0	11.4	10.8	10.5	10.0	9.5	9.2
1500	15.0	15.2	14.4	13.4	12.8	12.4	11.5	11.2	10.8
2000	20.0	17.2	16.3	15.2	14.5	14.0	13.2	12.6	12.1
3000	30.0	20.6	18.5	18.2	17.2	16.6	15.8	15.0	14.4
4000	40.0	23.6	22.2	20.8	19.6	19 0	17.8	17.0	16.3
5000	50.0	26.0	24.6	23.0	21.6	21.0	19.4	18.6	18.0
6000	60.0	28.4	26.8	25.0	23 4	22.8	21.2	20.2	19.5
7000	70.0	30.4	28.8	27.0	25.5	24.4	23.0	21.6	20.8
8000	80.0	32.4	30.6	28.6	26 8	26.0	24.2	23.4	22.2
9000	90.0	34.0	32.4	30.4	28.4	27.4	25 6	24.4	23.4
10000	100.0	37.0	34.0	32.0	30.0	28.6	27.0	25.4	24.6
15000	150.0	----	----	38.4	36.2	35.0	33.0	31.0	29.2
20000	200.0	--	------	43.0	42.0	41.0	37.0	35.0	34.0
30000	300.0	-----	-- -	-----	50.0	48.0	46.0	43.0	41.0

The figures given are diameters in inches or the number of inches on the side of a square. The radiation should all be figured to the equivalent of direct radiation.

The dimensions of the smoke connections between the boilers and chimneys should not be less than that required by the boiler manufacturer, when sectional boilers are used, and in the case of tubular boilers may be approximately determined by making the flue area equal to eighty per cent to one hundred per cent of the total area of the boiler tubes.

All pipes should be covered with efficient insulating material as this will reduce the coal consumption and make possible a proper control of the heat in rooms through which the pipes pass, which is otherwise impossible. The best grade of pipe covering always proves to be the best investment.

The employment of the best contractors always pays both the architect and owner, although sometimes involving a slightly greater first cost.

Upon the completion of the installation of a warming and ventilating system proper tests should be made. Such tests involve a temperature test and a test of the ventilating system. The first is simple in cold weather, but in mild or warm weather it is necessary to know to what temperature the building must be heated to insure its being heated to 70° in zero weather. There is no accepted standard for this purpose, but the following table is frequently used.

TEMPERATURE PRODUCED IN A ROOM BY A GIVEN AMOUNT OF SURFACE WHEN OUTSIDE TEMPERATURE IS HIGH

Temperature of outside air.	Coefficient. Heat per sq. ft. per hour per deg.	Total heat per sq. ft. per hour.	Resulting temperature of room.	Difference temperature of radiator and room.
—10	1.85	288	64.7	155.3
0	1.80	270	70.0	150.0
+10	1.75	253	75.1	144.9
20	1.70	236	81.0	139.0
30	1.65	218	86.5	133.5
40	1.60	203	93.1	128.0
50	1.55	188	98.7	122.5
60	1.50	172	104.7	116.5
70	1.45	158	110.5	109 5
80	1.40	142	117.1	102.9
90	1.35	130.5	123.5	96.5
100	1.30	117	130.3	89.7

EXAMPLE: To determine by a test of the apparatus, when weather is 60°, whether a guarantee to heat to 70° in 0° weather is maintained, operate the apparatus as though in regular use and note the average temperature of room. If room has a temperature equal to or in excess of 104.7° Fah., it would have a temperature of 70° in zero weather, all other conditions, such as wind, positions of windows, etc., being the same as when tested.

$$\frac{104.7}{1.5} = 70° \text{ approx.}$$

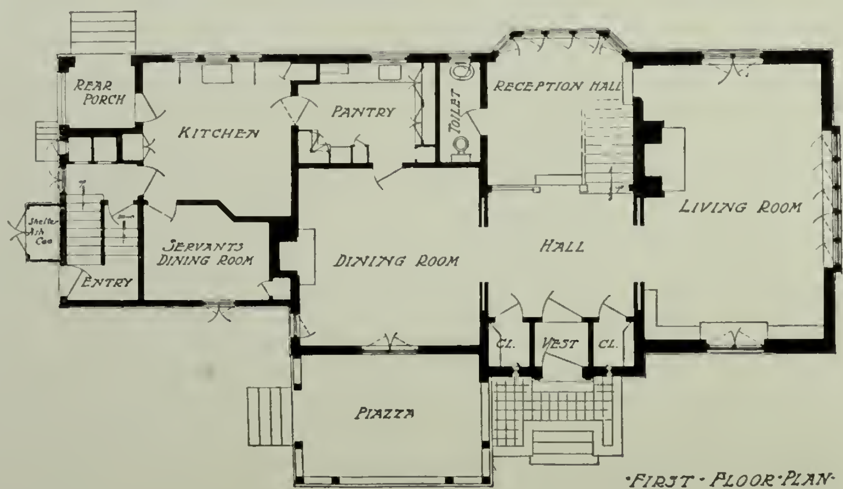
The temperature to which the heating plant must warm the building according to the requirement of the specification should be reached without forcing the boilers and should be maintained without the necessity of too frequent attention thereto. In the heating of residences and small buildings it is not unreasonable to require that the temperature shall be maintained without attendance being given to the boilers more often than once in six or eight hours. In medium sized buildings once in four hours is reasonable. A temperature test should not cover less than ten to twelve hours' continual running

The test of the ventilation is usually made by measuring the quantity of the air supplied, although the quality of the air in the room may also be tested if desired. In measuring the quantity of air the aim is to see that the amount actually supplied is in agreement with the amount intended for the room, this amount being regulated by the setting of the volume dampers previously described.

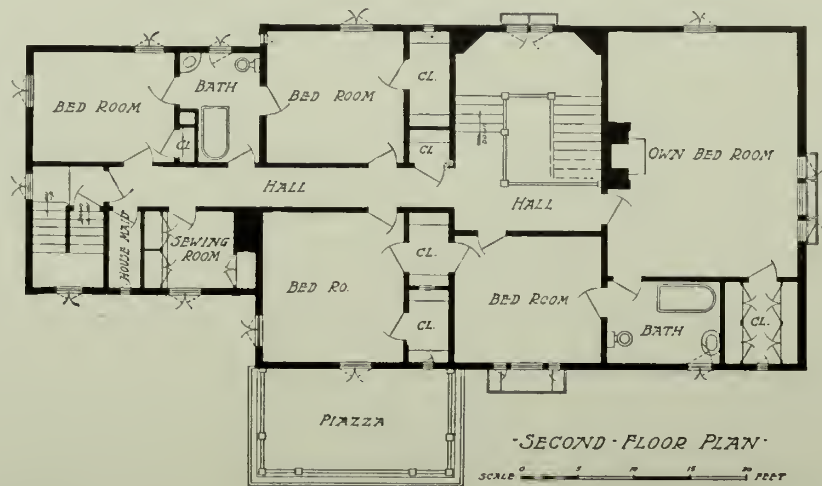
The volume of air supplied or exhausted from a room is measured by means of an anemometer. First, the net or working area of the opening is measured, and this area in square feet is multiplied by the velocity of the air as it passes through the opening. In measuring the air velocity through a fresh air register in a vertical position it will frequently be found that certain portions of the area are inefficient because of the fact that the velocity of the air in the flue carries the air to the top of the register. In such a case this inefficient area, sometimes equaling one quarter or one third the height of the register, may be covered and the remaining area taken as the net working area. A further deduction of one quarter to one third of the remaining area of the register face should be made, according to the pattern of register used, for the iron work of the face. In the case of the usual wire grille a deduction of ten to fifteen per cent is sufficient.

Holding the anemometer with its shaft in line with the direction of the movement of the air, the anemometer may be very gradually moved over the surface of the opening for a fixed period of time, say one minute, or an average of readings with the anemometer held a fixed time in from three to twelve places may be taken, the points selected being such as to give a fair average of the velocity of the air through the register. If the first method is adopted an average of not less than three readings should be used. The reading of the dials of the instrument will give the lineal feet of travel of the air for the period during which the instrument was used, and this divided by the number of minutes will give the velocity in feet per minute, which, multiplied by the net working area of the openings in square feet, will give the cubic feet of air per minute passing through the opening. A certain correction must be applied to the reading of the dials, as indicated by the manufacturers' correction chart accompanying the instrument. The anemometer is a delicate instrument, requiring careful use and frequent adjustment.

It may be desired to test the quality of the air in the room, the necessity for this occurring more frequently in occupied buildings. For practical purposes this involves the determination of the amount of CO_2 in the air in the room, for determining which there are several methods. That used by the inspection department of the Massachusetts District Police is known as Professor Wolpert's air tester, making use of lime water which is made turbid by the CO_2 in the air. Clear lime water, which is required, is not always available and the method is not particularly accurate. Another approximate method which will be found more convenient in use is that known as Professor Wolpert's Carbocidometer, which is especially recommended by Prof. J. H. Kinealy. A more exact method involving a more elaborate apparatus is that devised by Otto Pettersson and A. Palmquist. These devices will be found explained at length in Professor Carpenter's book.



·FIRST · FLOOR·PLAN·



·SECOND · FLOOR PLAN·

SCALE FEET

HOUSE AT ROCHESTER, N. Y.
Claude F. Bragdon, Architect.

PLATE ILLUSTRATIONS — DESCRIPTION.

Dispensary Building, New York City. — The Italian Renaissance seldom furnishes a more pleasing bit of architecture than this hospital on Worth street, New York City, by Trowbridge & Livingston. The façade, which is indicative of the interior arrangement, is quite expressive of the general use for which the building is designed. The brick is of golden tapestry effect and laid up in fine gravel mortar. The terra cotta trimmings around the entrance and window openings have a very decorative feeling and are in harmony with the whole design. The entire building is furnished with the most approved hospital methods. The floors consist of tile, while the walls and low partitions are of Keene's cement. Fireproof construction is used throughout the first floor. The building figures out at a cost of 24 cents per cubic foot.

Margaret Edes Home, Washington, D. C. — Here the Modified Colonial style has received a proper setting in the heart of old Georgetown — now West Washington. Standing as it does in the midst of many well preserved brick buildings of the early nineteenth century work, one cannot fail to observe how perfectly the architects, Marsh & Peter, have made this building harmonize with the general surroundings. It is, as the exterior and plans indicate, a home — domestic in its feeling and at the same time retaining its distinctive character as a semi-public institution. The interior is arranged as if built for one large family, and is made very attractive by having the yellow poplar trim finished in ivory white, the hard pine floor varnished, and the doors finished to represent mahogany. The construction is non-fireproof, and cost $35,000, making 22 cents per cubic foot.

"Claremont," Broadmoor, Colo. — With mountain ranges to the west and plains sloping far to the east, this location furnishes a most attractive setting for a residence designed in the style of Louis XIV. This environment, together with the climate, has allowed MacLaren & Thomas to face the whole structure above the first floor with dull enamel white terra cotta, and the general tone of this facing furnishes an agreeable contrast to the prevailing neutral tone of the landscape. The façades express frankly the interior treatment. The basement provides for two very large billiard rooms, while the second floor accommodates ten bed rooms and three bath rooms. The walls of the library are built of short leaf yellow pine and stained; those of the living room have oak, which is also stained; while the dining room and vestibule are finished in plaster with marble base. The floors of the more important rooms are of oak, the vestibules of tile similar to the bath rooms, while all other floors are of one quarter sawed pine. The heating arrangement is low pressure steam, with the use of thermostats. This building cost 46 cents per cubic foot, or $14 per square foot of area covered.

Railway Station, Waterbury, Conn. — This design of McKim, Mead & White for the New York, New Haven and Hartford Railroad Station is monumental in character and impresses one immediately with the charming results obtained from the Italian Renaissance. Of extreme interest is the tower which emerges gracefully from the main part of the building and furnishes an admirable location for the large clock. The base on the exterior is of granite, while the walls above are of sand struck red brick laid with ⅜ inch joint. The ornamental portions of this structure are terra cotta which tones in perfectly with the color of the brick. The roofing is of a warm red tile. Upon the interior the buff brick and terra cotta trimmings form the wall treatment, while Guastavino tile finishes the ceiling. The combination of materials found in the general waiting room are artistic as well as serviceable, and furnishes another splendid example of the harmonious treatment effected by the use of brick, terra cotta, and tile.

Stores and Apartments, Cedarhurst, L. I. — The architect of this building, Louis Boynton, has evidently derived his inspiration from the Italian work. The colors for the pattern scheme between the third story windows are mixed with cement and produce the "old fresco" appearance of many buildings found in northern Italy. These colors blend nicely with the face brick, which vary anywhere from light red to deep blue. The trimming effect of this tapestry brick, laid in Dutch bond, is strengthened by the use of half-inch joints with a gray tinted mortar. The window trims and belt courses are gray terra cotta, harmonizing with the general color scheme. Red tiling is used for the roof. The cost of the building was 17 cents per cubic foot.

St. Mary's Church, New York City. Carrère and Hastings have admirably adapted the Gothic to this church, making it very plain and attractive. The exterior is of red brick and presents a solid front from the walk to the top of the bell tower; the monotony of which is prevented by the arrangement of the concrete stone trimmings. The entrance being placed to one side affords a surface well suited for the large window treatment of the front façade. The windows throughout are unusually large and furnish plenty of light and ventilation. The red brick is used upon the interior also for the wall decoration and extends from the wooden floors to the ceiling which consists of an open truss treatment with plaster panels. Maple and oak are used for the woodwork.

Memorial Church of St. Paul, Philadelphia. — This structure furnishes us with an interesting example of the perpendicular Gothic, as applied to a small ecclesiastical building. Although the architects, Thomas, Churchman & Molitor, have treated both exterior and interior with ornate simplicity, still they have planned the terra cotta trimmings and tracery of the windows so as to lend a growing charm to the ensemble. The church is faced on the exterior with dark red brick and terra cotta. On the interior a buff colored brick extends from the cement floor to the open trussed wooden ceiling. The benches, choir stalls, pulpit, reading desks, etc., are of oak. An interesting feature of this little church is the side chapel which may be used for services of any nature in the winter time, being provided with a separate heating system, and so constructed as to be enclosed by itself. The seating accommodation of the church is a trifle over five hundred.

Editorial Comment and Miscellany.

CHARLES FOLLEN McKIM.

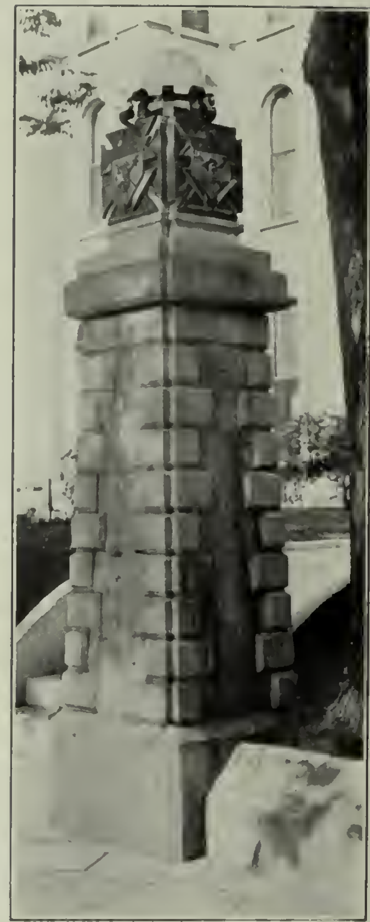
AS WE are about to go to press the announcement comes of the death of Charles Follen McKim, founder of the architectural firm, McKim, Mead & White. He died September 14th at his home in St. James, L. I. Mr. McKim was born in Chester County, Pa., August, 1847. He entered Harvard Scientific School at eighteen and spent the years from 1867 to 1870 at the Ecole des Beaux Arts. After touring the continent of Europe for two years he entered into his professional work and soon associated with him in partnership William R. Mead and Stanford White.

Mr. McKim's loss to his profession is inestimable. He was one of the highest authorities on civic planning and devoted considerable attention to the beautifying of our American cities. His work in connection with the firm covers a vast field and shows his remarkable versatility. His name is associated with the Columbia University Library; the Century, University, and Metropolitan clubs; the Pennsylvania Station; the Pierpont Morgan library; and the Municipal Office Building recently awarded to their firm, all of which are in New York City; also with the Boston Public Library; the War College and White House at Washington.

Mr. McKim was the founder of the American Academy at Rome and evinced such an interest in the promotion of architecture that he was awarded medals from King Edward of England as well as at the Paris Exposition of 1900. He belonged to many societies, among the most prominent of which are the American Institute of Architects, the Architectural League, Municipal Art Society, National Academy of Design, American Fine Arts Society, and Metropolitan Museum of Art.

CIVIC PLANNING — "1915" BOSTON EXPOSITION.

THE wonderful movement of civic planning is spreading throughout the United States as well as European countries. France already furnishes splendid examples of cities made monumental through the artistic temperament of her people. Her trouble lies in being overtrained, and the Parisian newspapers are more than alive to this danger. The editorials bitterly denounce the seemingly lack of taste for good architecture, and warn the people to take care lest they lose the artistic charm of their cities. In Germany the ideas of civic planning vary greatly from our own conceptions. They avoid long vistas which appeal to them as extremely monotonous; their streets vary greatly in width, possessing many curves and angles; while their crossings are planned in every possible manner so as to escape the square corners. But we find that Germany is alive to the great need of civic development, and that there is rapid progress in the improvement of the public taste in this direction.

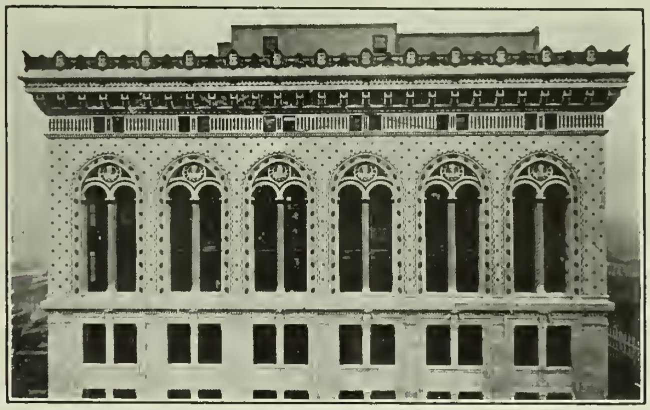


ENTRANCE POST OF K. OF C. BUILDING, LOUISVILLE, KY.
Executed by the Hartford Faience Company.
J. J. Gaffney, Architect.

England surely has great reason to lament the general apathy that prevails in regard to city planning. London, with her vast population and her commercial activity, has suffered greatly from her lack of foresight in not adopting Sir Christopher Wren's entire scheme, which was thoroughly practicable in its design of grandeur and dignity, as well as in the relief afforded to her congested centers. Had that wealthy metropolis accepted the proposed scheme, her lanes and alleys of to-day would have been avenues with vistas of architectural beauty. But England is gradually awakening, and we find evidences of this in the establishment of a chair for civic design in the University at Liverpool — a work which our own universities, that possess a course in architecture, might well take cognizance.

MINNESOTA STATE AGRICULTURAL SCHOOL.
Faced with buff brick, made by the Twin City Brick Company.
Clarence H. Johnston, Architect.

The *Architectural Review* of London, after carefully considering the progress of the civic movement in the United States, says, "As might have been expected, these (plans for future development) display a breadth of scope and handling quite outside anything that is met with on this side of the Atlantic." This statement can be readily understood if we take into consideration the vast schemes that have been planned for the beautifying of our cities by the best men in the architectural profession. The comprehensive design by L'Enfant for Washington has been given prestige by the sanction of the Federal Government. San Francisco rejected the opportunity of handing down to posterity one of the most beautiful cities in the world, and is cruelly building with no idea whatever for the future. Chicago, on the other hand, has been receptive to her best interests in civic improvement. Baltimore failed for some little time after her destructive fire to foresee the great benefit of planning. But recently under the guidance of selected men like J. M. Carrère, A. W. Brunner, and F. L. Olmsted, she is fast developing into one of our ideal municipalities. St. Paul and Minneapolis both needed an architect like Cass Gilbert to open their eyes to the wonderful possibilities for making these cities both monumental and artistic; Seattle established her Municipal Plans League, which selected C. H. Bebb to formulate ideas for future aggrandizement; Milwaukee has also been contemplating the adoption of a beautiful conception prepared by A. C. Clas; while Detroit, Cleveland, Los Angeles, and Portland, are seeking to formulate feasible plans which will eventually give to them the most valuable results artistically as well as commercially.



DETAIL OF EMPIRE BUILDING ENRICHED IN FIVE COLORS.

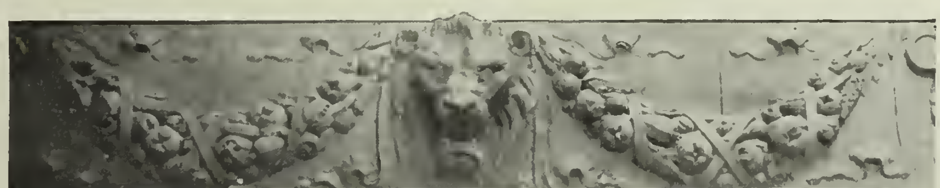
DETAIL BY MARK FITZPATRICK, ARCHITECT.
The Northwestern Terra Cotta Company, Makers.

EMPIRE BUILDING, BIRMINGHAM, ALA.
Entire building up to the band at the twelfth floor is of mottled cream colored terra cotta. Executed by the Atlantic Terra Cotta Company.
Carpenter, Blair & Gould, Architects.

DETAIL MADE BY BRICK, TERRA COTTA AND TILE COMPANY.

It is very evident, as exemplified at our nation's Capitol, that the plans for a city's reconstruction can progress only in proportion to the intelligence of the general public. We must educate the people in architecture and raise their taste to the level of our ideals. Realizing this fact, a number of leading citizens in Boston have come forward with the announcement, "1915" Boston Exposition. These "Directors of Boston" plan to show the people not only the present needs of their city, but also the future contingencies that may arise, and the proper way of meeting them. They will hold an exposition from November 1 to November 27, 1909, in the Old Art Museum, Copley Square. Here will be exhibited the local work of years that has made Boston what she is to-day, also the many ideas existing for the present as well as those contemplated for the future; the civic improvements that are being carried out in other American municipalities such as we have mentioned in the previous paragraph; and the conceptions of planning as undertaken by the European countries in connection with their inland cities as well as the coast towns that excel in their splendid harbors.

We cannot commend this movement too strongly, for the time is here when the problem of our rapid expansion must be met. Every city should have societies formed for the purpose of studying its future growth, and making comprehensive schemes for the



DETAIL MADE BY THE SOUTH AMBOY TERRA COTTA COMPANY.

needs of successive generations. Fortunate indeed will be the city that takes advantage of this civic improvement germ at the present time, for our country seems to be on the verge of a prosperity in architectural building that will surpass anything the world has ever known.

DETAILS EXECUTED BY CONKLING-ARMSTRONG TERRA COTTA COMPANY.

THE Architectural League of the Pacific coast has cleverly planned to hold its first annual convention in San Francisco, October 18th–20th, when that city will be adorned during the great Portola Festival, as never before, to commemorate the discovery of San Francisco Bay. Already fifty members have signified their intention of being present, while many of the eastern architects are expected to enjoy this special occasion while on their way from the Alaska-Yukon-Pacific-Exposition. During the convention the San Francisco Architectural Club will have charge of the League's first exhibition. This representative work of the Pacific coast architecture will undoubtedly show the marvelous results that have been accomplished by men of clever training and natural ability. We bespeak for this first meeting of western architects great success, and would refer all interested to M. A. Vinson, business manager, 803 Market street, San Francisco, Cal.

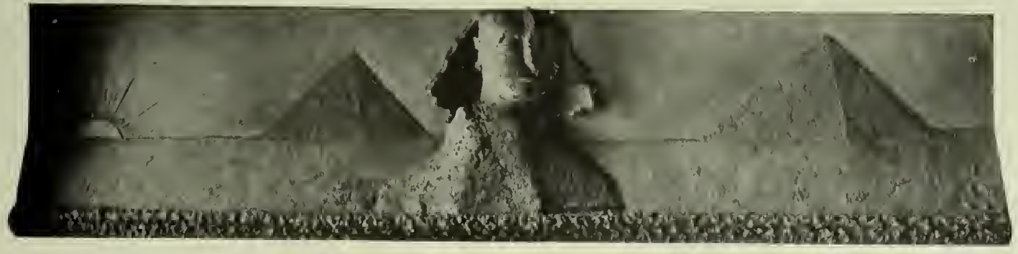
UNITED STATES POSTOFFICE, MARION, IND.
Built of light gray brick, made by the Columbus Brick & Terra Cotta Company.
James Knox Taylor, Architect.

GARAGES FOR THE DEMAREST AND PEERLESS COMPANY, NEW YORK CITY.
Exterior of white matt glazed terra cotta, made by the New York Architectural Terra Cotta Company.
F. H. Kimball, Architect.

The Cleveland Architectural Club will open their architectural exhibition in that city October 18th. A successful effort is being made to fill the Hippodrome Building with representative work throughout the States, especially those comprising the middle west. One of the many features worthy of note will be the strong exhibit of the leading mural painters.

DETAIL FOR SCHOOLHOUSE BY J. WALTER STEVENS, ARCHITECT.
The Winkle Terra Cotta Company, Makers.

REPORTS from some forty states, as compiled by the *American Contractor*, New York City, show gains varying from one to three hundred and fifty per cent. Hartford, Philadelphia, and Salt Lake City each furnish an in-



DETAIL FOR MURAT TEMPLE, INDIANAPOLIS, IND.
The Indianapolis Terra Cotta Company, Makers.
D. A. Bohlen & Son, Architects.

crease of over two hundred per cent. The total investment of $56,077,096 as compared to $40,585,996 for August, 1908, cannot fail to impress one with the wonderful prosperity that is gradually spreading through the country, and which indicates a commercial activity in the near future greater than we have ever experienced.

IN GENERAL.

Fiske & Company, Inc., supplied the Tapestry brick for the stores and flats at Cedarhurst, L. I., which is illustrated on plate number 124.

The terra cotta used in the Railway Station at Waterbury, illustrated in this issue, was supplied by the South Amboy Terra Cotta Company.

RESIDENCE AT SQUIRREL HILL, PITTSBURG.
Built of red roman brick, made by the Bradford Pressed Brick Company.

The exterior brick used for the Memorial Church of St. Paul at Philadelphia was supplied by Sayre & Fisher Company. For illustration see plate number 126.

The Northwestern Terra Cotta Company furnished the terra cotta used by Messrs. MacLaren & Thomas in the Claremont House, illustrated in this month's number of The Brickbuilder.

B. Morgan Nisbet and Frank H. Paradice, Jr., have formed a copartnership for the practice of architecture under the firm name of Nisbet & Paradice. Their offices are at 201 Overland Building, Boise, Idaho — at which address they solicit manufacturers' catalogues and samples.

RESIDENCE AT COLUMBUS, OHIO.
The green glazed shingle tile were made by the Ludowici-Celadon Company.
Frank L. Packard, Architect.

New York capitalists are said to be back of a plan to rebuild the St. Nicholas Hotel in Cincinnati.

George C. Sellon and E. C. Hemmings, formerly known as Sellon & Hemmings, architects, dissolved partnership August 1st. These men will continue business in Sacramento, and Mr. Sellon's address will be 5th Floor, 1005 K street, while Mr. Hemmings' address will be Suite 37, 1005 K street.

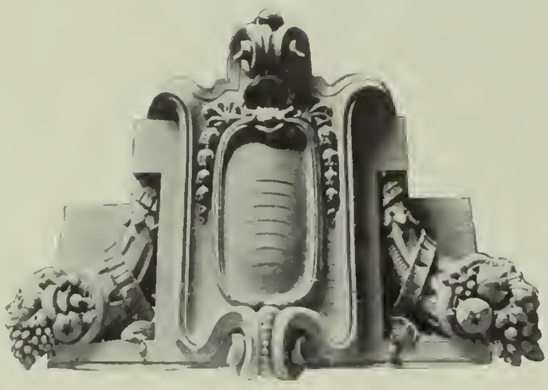
The tile used for the Railway Station at Waterbury and the stores and flats at Cedarhurst, L. I., were furnished by the Ludowici-Celadon Company. Both buildings are illustrated in this issue of The Brickbuilder.

Brazil and Japan are considering the purchase of premises for their ambassadors. Brazil, it is said, already has under consideration several lots in the neighborhood of Du Pont Circle, and it is believed the purchase of one of these will be announced this winter.

Pennsylvania and Ohio are the two foremost states of the Union with respect to cooperative building and loan associations. In the former state there are 389,500 members, with assets of $158,510,000; in the latter 380,000 members, with assets of $139,341,000. In New Jersey there are 156,300 members whose assets total $73,518,000.

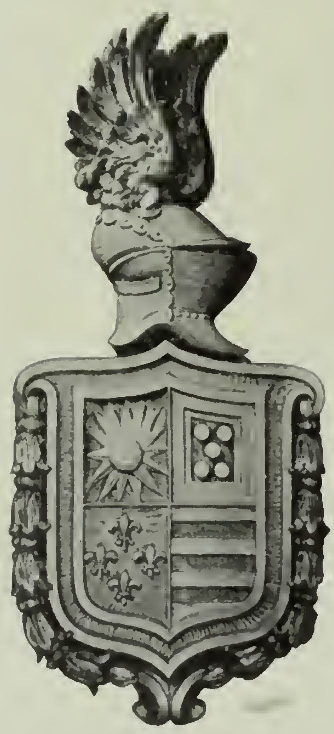
The New York Polyclinic Hospital has just acquired property in West 50th street on which it will erect a $1,000,000 building.

M. Bernier, the French architect, is to come to this country with a corps of assistants the latter



DETAIL EXECUTED BY THE AMERICAN TERRA COTTA AND CERAMIC COMPANY.

part of this month to prepare for the construction of the French Embassy at Washington. Five hundred thousand francs have been appropriated for the new building, which is to be a three story house, with the chancellery separate from the residence of the ambassador.



DETAIL EXECUTED BY THE NEW JERSEY TERRA COTTA COMPANY.

New York City is to make an exhaustive official test of the relative value of various fireproofing materials to determine those which are to be authorized in future changes of the building code. Miniature buildings are to be constructed and then subjected to the conditions made as nearly as possible the same as those prevailing in a great conflagration.

It is rumored that D. O. Mills will build another of the Mills Hotels in New York City.

NEW BOOKS.

House Painting. A study of paints and varnishes for the protection and ornament of houses. Written by A. H. Sabin, M.S., from an experience of many years in the manufacture and use of paints. 121 pp. New York, John Wiley & Sons.

The commission appointed by Act of Assembly of the State of Delaware, invites all qualified architects to enter a competition for the selection of an Architect for alterations and additions to the State House at Dover.

Program can be had on application by mail to the architectural advisor to the Commission, M. B. Medary, Jr., 1414 South Penn Square, Philadelphia, Pa.

WANTED — A December, 1899, issue of THE BRICKBUILDER for binding. Text only will be sufficient — Plates not required. Will pay a suitable price. Address, C. H. Cullen, 1493 Broadway, New York City.

THE BRICKBUILDER

VOLUME XVIII — OCTOBER 1909 — NUMBER 10

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

COPE & STEWARDSON; CRAM, GOODHUE & FERGUSON; CRAM, GOODHUE & FERGUSON AND GEORGE H. WILLIAMSON ASSOCIATED; ALBERT RANDOLPH ROSS; WILLIAM WARREN SABIN; PRIZE DESIGNS SUBMITTED IN THE COMPETITION FOR A BRICK HOUSE.

LETTERPRESS

CHURCH OF ST. URBANO, ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

The church of St. Urbano, formerly a Roman temple, is situated outside the gates of Rome, near the Appian Way. This building, as proved by the stamps on the bricks, belongs to the Antonine period of the Roman Empire (Second century, A.D.). It had a projecting porch with four Corinthian columns and capitals. It was transformed into a church in early Christian times. The columns were walled up in 1634 by Pope Urban VIII., as shown in Piranesis' engraving. The interior is entirely of brick and almost square. It contains frescoes of interest on account of their early date (1011) but much restored in later times.

THE BRICKBVILDER

VOL. 18 NO. 10 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN·MATERIALS·OF·CLAY· OCTOBER 1909

The Girard Estate's Operation of Eight Hundred Dwellings in Philadelphia—James H. Windrim, Architect.

BY THE will of Stephen Girard, large tracts of land within and without the city of Philadelphia came under the care of the Board of Directors of City Trusts. This body, organized in 1869, is composed of twelve citizens of standing and integrity, the mayor and presidents of Select and Common Councils exofficio. The steady income from the property of the famous "mariner and merchant" it is the task of these men to invest in the safest and surest channels. As the lands increase in value with the extension of population it is their care to so improve them as to reap the surest, if not the largest, profit.

Some of this land is situated in the southern part of Philadelphia, removed by three miles from the center of the city, and where much of the ground has been produced by filling in, where all is flat and where landlords can expect to obtain rentals of very moderate figures only. It was determined to improve this land by the erection of eight hundred small dwellings. At the present writing two hundred have been completed.

Now the Girard Estate cannot sell its property. And when it improves it, it must do so, not with a view merely to the morrow, but to long periods of time. It realizes that substantial construction pays in the long run. The result of this view is a revelation in operative building presented by the two hundred houses at 18th and Porter Streets. They have been built with a view of minimizing maintenance cost.

There are eight different types of houses. Two houses of each type are located beside two houses of another, and thus all the types appear in sequence and affording a relief from the monotony of thousands of street vistas in Philadelphia where houses have been built by the block. Midway between 17th and 18th streets, and parallel thereto, a new street has been opened and dedicated; and nowhere better than here can the different styles of houses be seen, for the new planting here does not interrupt the view.

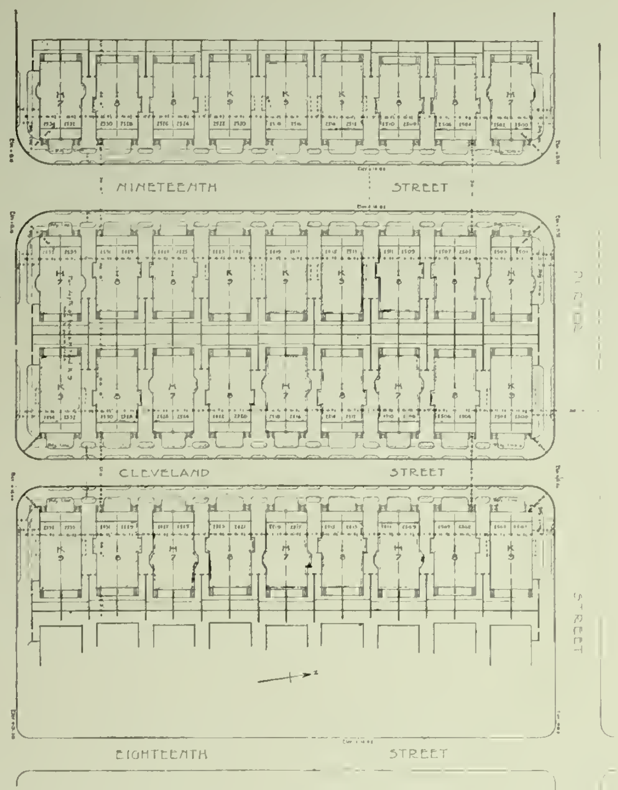
The houses range in cost from $2,200 to $3,200 each, including all fixtures, painting, and tree-planting. All

GIRARD ESTATE HOUSES. A CONTRAST.
The three-story house in solid row, common to Philadelphia, and the two-story house, semi-detached, unusual in built-up portions of the city. All are in the Girard Estate Operations.

A VIEW DOWN THE NEW STREET.

THE VARIOUS TYPES OF HOUSES; TWO-STORY AND SEMI-DETACHED.

GIRARD ESTATE HOUSES.



GIRARD ESTATE HOUSES. PLOT PLAN.

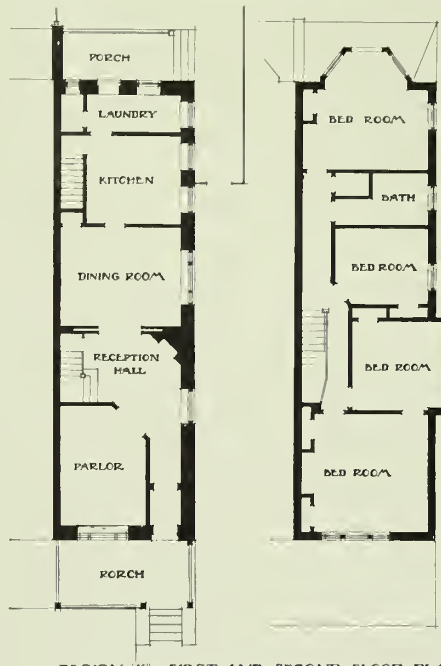
walls and cornices, where the houses occur in solid rows, as on 17th street, are of inflammable material. Tapestry and Roman bricks, rubble stone, and rough-cast are the chief materials.

Probably the most important feature of the enterprise is the power plant, situated a half mile distant, and supplying the houses with heat, electricity, and hot water, the cost of this being included in the rent. The heating method is hot water, the circulation of which is accelerated by means of a pump. The only ranges the houses contain are gas ranges, and each tenant pays the local company independently for the gas he needs. This is the only expenditure he has to consider in addition to the rent, unless it be the possibility of exceeding the amount of electricity allotted to his use for the current, and this commodity only, is metered. The rentals are based on the cost of construction and on the contribution which the power plant must make to the comfort of each tenant. The skilful engineers of the estate begin the latter computation, as they figure in advance upon many other building enterprises, with the cost of evaporating a quart of water.

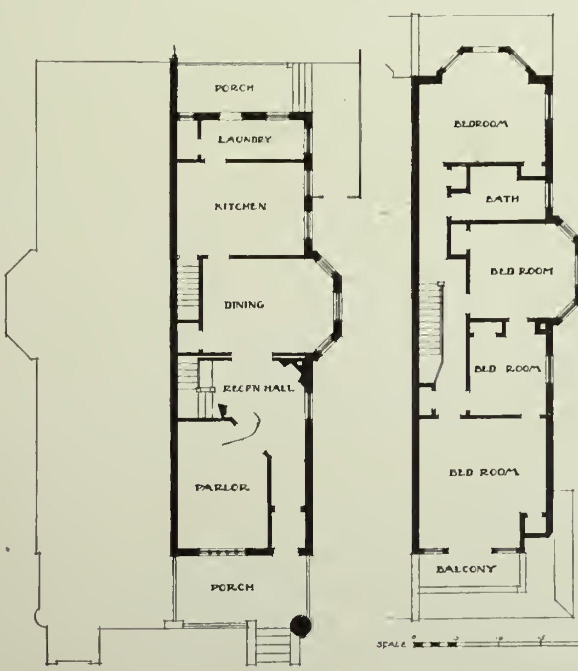
SCHEDULE OF RENTALS.

	Class A	Class B	Class C	Class D	Class E	Class F	Class G	Class H
January . .	$45.50	$44.50	$43.50	$42.50	$41.50	$39.50	$37.50	$35.50
February .	43.50	42.50	41 50	40 50	39.50	37.50	35.50	33.50
March . . .	41.00	40.00	39.00	38.00	37.00	35.50	33.50	31.50
April	38.00	37.00	36.00	35.00	34.00	32.50	30.50	29.50
May	34.00	33.00	32.00	31.00	30.00	29.00	27.00	27.00
June	34.00	33.00	32.00	31.00	30.00	29.00	27.00	27.00
July	34.00	33.00	32.00	31.00	30.00	29.00	27.00	27.00
August . . .	34.00	33.00	32.00	31.00	30.00	29.00	27.00	27.00
September .	35.00	34.00	33.00	32 00	31.00	29.50	27.50	27.50
October . .	38.00	37.00	36.00	35.00	34.00	32.50	30.50	29.50
November .	41.50	40.50	39.50	38.50	37.50	35.50	33.50	31.50
December .	43.50	42.50	41.50	40.50	39.50	37.50	35.50	33.50
Total	$462.00	$450.00	$438.00	$426.00	$414.00	$396.00	$372.00	$360.00
Average per month . .	$38.50	$37.50	$36.50	$35.50	$34.50	$33.00	$31.00	$30.00

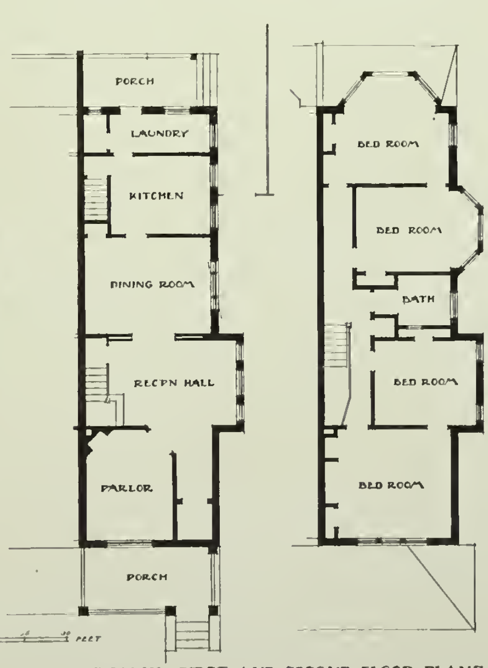
Although the houses have scarcely been finished, many are already rented; and a view of the neighborhood affords great satisfaction to those who see in wise planning and building the foundation of wholesome and happy living, as well as a chance to beautify the residential sections of the city.



DESIGN "K" FIRST AND SECOND FLOOR PLANS



DESIGN "H" FIRST AND SECOND FLOOR PLANS



DESIGN "I" FIRST AND SECOND FLOOR PLANS

GIRARD ESTATE HOUSES. TYPICAL PLANS.

Warming and Ventilating with Special Reference to Hospital Buildings—VI.

BY D. D. KIMBALL.

THAT the air contains solid matter may be plainly observed by noticing a shaft of sunlight in a partially darkened room. Much of it is practically harmless to the average person, being dust from the floor or furniture or dust brought in from the outside. With some of it will be found bacteria, in part harmless, even beneficial, but still other bacteria may exist in this dust which are of a harmful nature.

This may be accomplished by filtering the air, which may be done by either the "dry" or "wet" method. In the dry system the filtering cloth used must be carefully selected and the velocity of the air must never exceed 20 feet per minute through the cloth, a less velocity being preferable. The filtering cloth may be arranged on flat frames or in the form of bags, these usually being 8 inches to 12 inches in diameter, and of the necessary length up to approximately ten times the diameter to secure the necessary area of cloth. These bags are suspended from metal thimbles attached to a sheet metal diaphragm, the method of connecting being such as to make the bags easily removable. There should not be less than 3 inches between the surface of the bags. The air passes through the bags from the top.

In the wet method the air is passed through a spray chamber, always first being warmed to above the freezing point in cold weather, the spray chamber containing a series of nozzles designed to thoroughly fill the chamber with a fine water spray so that the air is thoroughly saturated and the dust is washed out. The air is then passed through a series of metal baffle plates at a velocity of about 500 feet per minute. In this eliminator practically all of the suspended moisture is removed from the air, the water draining to the settling chamber at the bottom of the air washer, from which it is recirculated through the washer by means of a small rotary pump.

The effect on the air passing through the spray chamber is to increase its moisture or humidity to such an extent that the air becomes practically saturated. In cold weather the reheating of the air which necessarily follows this passage through the washer, reduces the relative humidity of the air. During such weather it is possible to largely control the relative humidity of the air by controlling the temperature of the air or water or both in the spray chamber, but in warm weather the use of the air washer may become objectionable because of the increased relative humidity of the air caused thereby. On warm days the air washer may be used to cool the air slightly if an increased relative humidity is not objectionable.

Both methods of air filtration are largely confined to use in connection with a fan system of ventilation, although the cloth system may be used in a gravity ventilating system if the air velocity through the cloth is limited to 4 feet per minute.

Air cooling is sometimes essential in a hospital building. It is but little practised because of the cost of installation of suitable apparatus and the cost of operating the system.

A limited amount of air cooling may be done by forcing the air over ice in the form of cakes supported on properly spaced racks. The air will melt the ice and will also warm the resulting water. Each pound of ice in melting absorbs 142 heat units and if the water is warmed to 62° 30 heat units additional are absorbed, thus giving 172 heat units per pound of ice. Thus if 30,000 cubic feet of air per hour at 90° temperature is to be cooled to 80° temperature, the amount of ice required may be approximately found by multiplying the 30,000 cubic feet by 10°, then dividing by 55, and again dividing by 172 heat units, as above, and the result will be approximately 32 pounds of ice. The figure 55 is not exactly correct, but is here used to avoid confusion, as its significance has been previously explained. A liberal amount should be added for gains in the temperature of the air in transmitting it through flues, etc.

In undertaking to cool a room or a building the heat gains become a serious factor. The amount of such heat gains is determined in the same manner as the heat losses in designing a heating system. If a building to be built is to be cooled during warm weather it should be constructed with this in mind, with an aim especially to the reduction of heat transmission through the walls, and also the reduction of the air leakage about the windows, doors, etc., the latter especially having a serious effect on the success of the air cooling installation.

For a large problem only a mechanical refrigerating system is to be considered. In this system the brine at about 10° Fah. is circulated through the coils, over which the air is forced or drawn by a fan. The cooling of the air increases its relative humidity just as warming the air decreases it, with the result that it becomes uncomfortable unless some of the moisture is removed, to do which it is necessary to further cool the air and condense the moisture therein. The air is then reheated by means of a heating coil or by other absorption of heat until the desired temperature and the desired relative humidity result.

The cooling of a room or building requires sufficient refrigerating capacity to:

1. Overcome heat gains through walls, windows, roofs, floors, etc.
2. Overcome heat gains from occupants, lights, etc.
3. Cool the air to the necessary point.
4. Cool the vapor in the air to a point at which the air becomes saturated.
5. Condense the moisture to the form of water.
6. Cool the remaining vapor in the air to the necessary temperature.

The conditions surrounding each problem are such as to make it difficult to give any general rule as to the capacity required and each case must be the subject of careful determination.

The importance of the proper relative humidity of the air within our buildings is now receiving much more consideration than heretofore, both by physicians and heating engineers. The natural relative humidity of outdoor air usually varies from sixty per cent to seventy per cent, although on rare occasions it may be found as low as fifty per cent, and on other occasions it may approach one hundred per cent, the point of saturation. In the most arid regions only is as low as thirty per cent to forty per cent found, while Denver, with its "dry" climate, averages about forty-eight per cent. Yet in furnace heated houses as low as twenty-five per cent, and in rare cases as low as sixteen per cent has been found, this being due to the heating of the air within the house. It is easy to understand that passing from an indoor atmosphere of twenty-five per cent relative humidity to an outdoor condition of sixty per cent to seventy per cent is very trying to the delicate mucous membrane of the upper air passages Generally speaking dry air is an excitant, sometimes causing sleeplessness and irritability, while moist air seems balmy and has a soothing effect which tends to produce restfulness and sleep.

Also a reasonable amount of moisture in the air is essential to the preservation of furniture, books, pictures, etc.

Medical authorities assert that an atmosphere which is too dry will cause parched lips and tongue, a dry, feverish condition of the skin and, particularly in those children inclined to lung diseases, a serious irritating cough. Dr. W. M. Wilson of the Weather Bureau makes the following statement: "The evaporative power in the air at a relative humidity of thirty per cent is very great, and when the tissues and delicate membranes of the respiratory tract are subjected to this drying process a corresponding increase of work is placed upon the mucous glands in order to keep the membrane in proper physiological condition, so that nature in her effort to compensate for the lack of moisture in the air is obliged to increase the functional activity of the glands which result in an enlargement of the gland tissues." He especially points out that catarrhal troubles are relieved, and frequently cured, by providing sufficient moisture in the air.

It is interesting to note the intimate connection of temperature and relative humidity. The dry air absorbs moisture from the body so rapidly as to make one seem cold, even though the temperature as indicated by the thermometer seems quite sufficient. It has been found that a temperature of 65° with a relative humidity of fifty per cent to sixty per cent is quite as comfortable as a temperature of 70° with thirty per cent to forty per cent relative humidity; and the former, besides being more healthful, would result in an economy in the operation of the heating plant. It may soon be that no system of heating will be considered entirely satisfactory if indoor relative humidity is disregarded, not alone as a matter of health, but as a matter of comfort, the moist air producing a quieting and comfortable sensation, a sense of relaxation and poise contrasting strongly with the feeling of nervous tension which is so frequently experienced in a heated dry room.

A full discussion of this subject is beyond the possibility of this paper, but it will be well to explain the distinction between absolute humidity and relative humidity, absolute humidity being the weight of moisture in grains per cubic foot at a given air temperature, and relative humidity indicating the ratio of the weight of moisture in a given space to the weight which the same space will hold when fully saturated at the same temperature, expressed in percentage. The dew point is the temperature at which saturation is obtained for a given weight of water vapor or moisture.

The relative humidity of the air may be obtained by the use of the hydrodeik, which consists of a wet and dry bulb thermometer mounted on a frame with chart from which direct readings of the humidity may be obtained without further calculations. The Sling Psychrometer, as used by the Weather Bureau, is probably the most accurate instrument in general use.

If the air enters a room at 70° temperature and thirty per cent relative humidity, it will contain 2.39 grains of moisture per cubic foot, and if a relative humidity of sixty per cent is desired, 2.39 grains of moisture must be added to each cubic foot of air. There are several ways of introducing this additional moisture. In a small system it may be done by the use of evaporating pans or by injecting steam into the air, but such methods are subject to the objections that the evaporation from the water pans may be insufficient and the use of the steam may produce odors.

The relative humidity in a building provided with apparatus for the artificial introduction of moisture into the air may be regulated within reasonable limits. Where moisture is introduced by means of evaporating pans or by the injection of steam, the Humidostat may be used to control the relative humidity. In large installations the humidity may be controlled by making use of the air washer above referred to, the water or air being heated so that the capacity of the air for moisture is increased, the point to which it is heated being such that its absolute humidity at saturation will result in the desired relative humidity when the air is warmed to the temperature of the room to which the air is to be introduced.

The use of these air washers also makes possible a dehumidifying of the air under certain conditions which may be quite as important as humidifying at times when there is excess of moisture in the air. If the air is brought into contact with cold surfaces or cold water in sufficient quantities the temperature of the air will be reduced by the transmission of heat from the air to the water. If dehumidification is to be carried far it may involve the installation of a refrigerating plant to provide the cool water necessary, or a refrigerating plant may be used for this purpose as described for the cooling of air.

There are many details which, in a small system, may be, and usually are, neglected, but which in a large plant become vitally essential. It is not to be expected that, in an article of this character all of these matters can be taken up, or that they can, without extended study and experience, be fully mastered. The explanations, formulas, and data given will make possible the design of a small plant by one reasonably familiar with warming and ventilating work, while the design of a large or especially important work will always remain within the province of the experienced warming and ventilating engineer working in conjunction with the architect; nor is extended argument necessary to prove that such an engineer should be entirely independent of any contracting or manufacturing interests.

Terra Cotta: Its Character and Construction—I.

BY CHARLES U. THRALL

ARCHITECTURAL terra cotta, although one of the most important of building materials, and in these days of fireproof skyscraper construction, becoming more and more important as each year passes, is probably one of the least understood by most architects. Of course, it is known to be made of clay; is burnt in kilns; may be glazed and of almost any color; is hollow, therefore very light, weighing approximately 70 pounds to the cubic foot and will bear a crushing strain of 3,000 pounds per square inch: but such items as the direction and location of the interior partition walls and uses to which they may be put; the methods of support; the best location for joints; the necessary bonds; the sizes and shapes practical; etc., are all more or less hazy in the mind of the average architect. This may be accounted for :

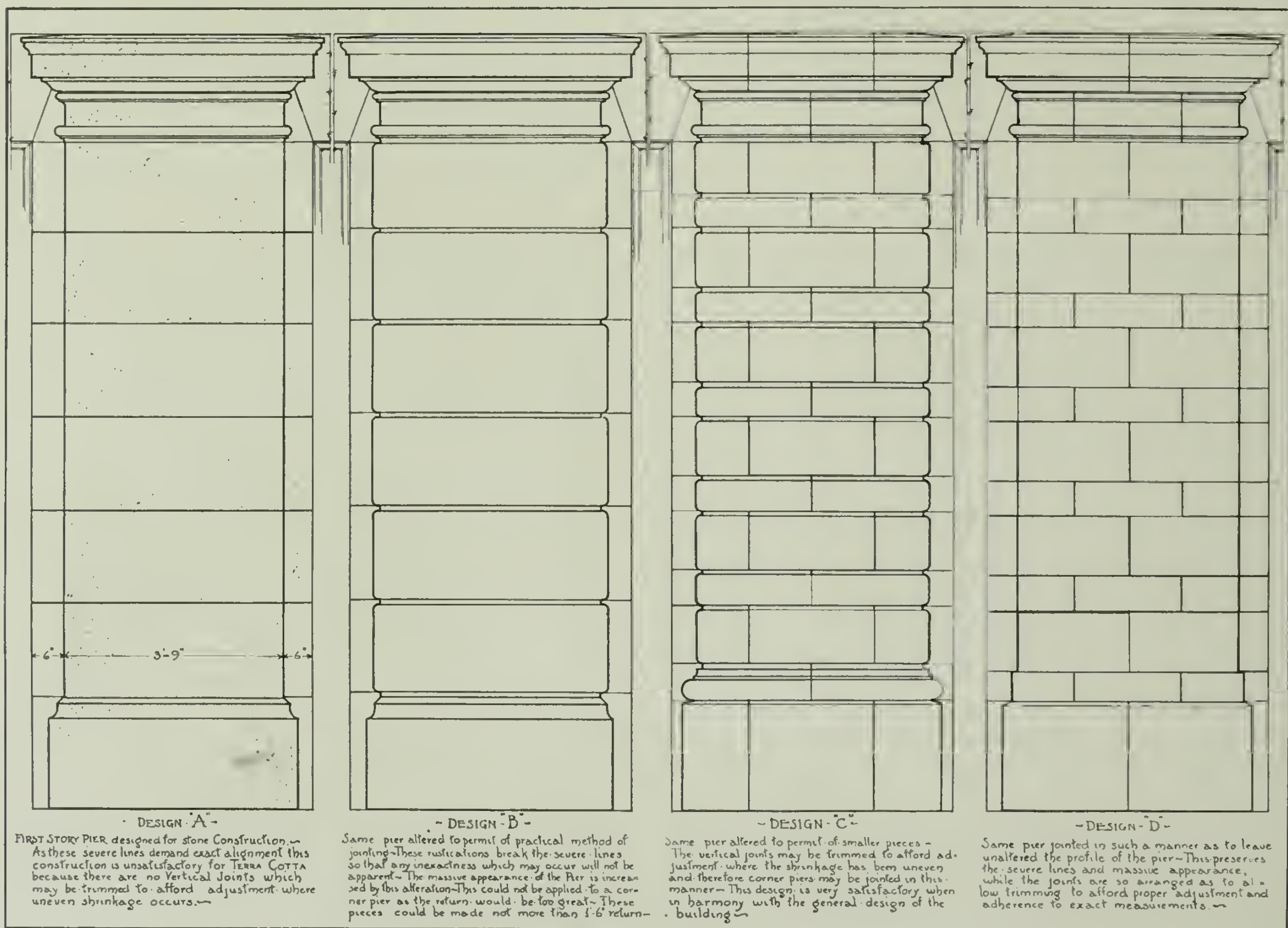


PLATE II.

FIRST. By the fact that it is a ceramic material which, because of its complex nature, demands in its manufacture a large amount of scientific attention, thus requiring of the architect more general knowledge of the technique of its manufacture than he usually takes time to acquire.

SECOND. Its appearance is so much like that of stone that architects will treat it as such without any thought that terra cotta has a distinct character, which demands a treatment consistent therewith, to obtain results that are either artistic or practical.

THIRD. There has been a growing tendency among architects to leave the making of the terra cotta details showing the construction and jointing entirely to the manufacturer, the architect finally examining and approving these drawings before the manufacturer proceeds to make the work. Very often this examination is very superficial, or is made without regard to manufacturing difficulties, the architect making changes and insisting upon impracticabilities which the manufacturer feels that he must attempt against his best judgment as he cannot afford to lose the time necessary to go back to the architect and explain the advantage of his method of jointing or detailing. This, of course, does not tend to educate the architect so that he may understand terra cotta as he should to use it to the very best advantage.

FOURTH. Although the manufacture of architectural terra cotta is centuries old, having been in practice six hundred years before the birth of Christ, it was left to the progressiveness of the American Age to develop that method of construction that makes terra cotta a necessity; therefore, there is very little literature which may serve as a guide for those inexperienced in its use.

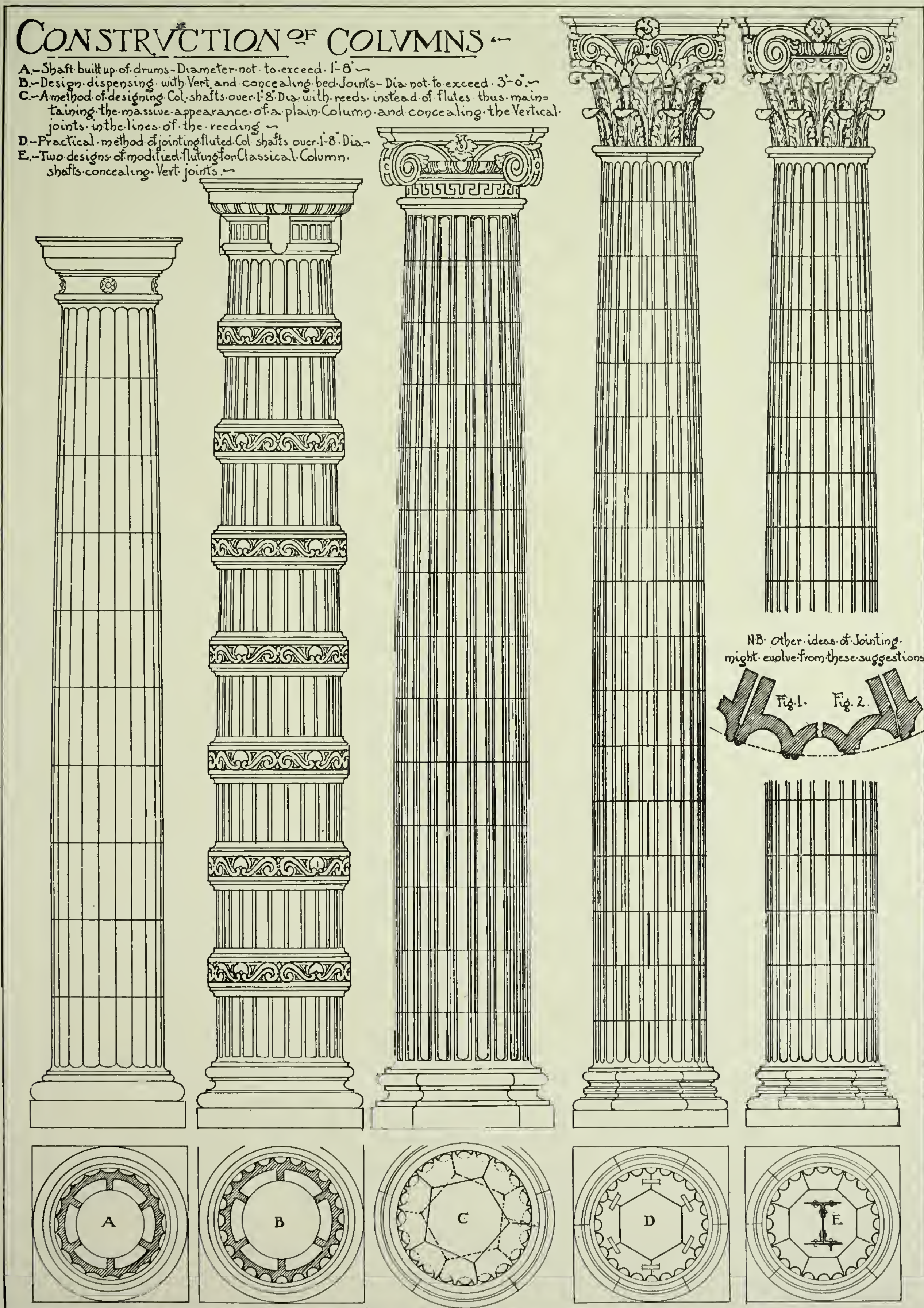

CONSTRUCTION OF COLUMNS
A.—Shaft built up of drums—Diameter not to exceed 1'-8"
B.—Design dispensing with Vert. and concealing bed Joints—Dia. not to exceed 3'-0".
C.—A method of designing Col. shafts over 1'-8" Dia. with reeds instead of flutes thus maintaining the massive appearance of a plain Column and concealing the Vertical joints in the lines of the reeding
D.—Practical method of jointing fluted Col. shafts over 1'-8" Dia.
E.—Two designs of modified fluting for Classical Column shafts concealing Vert. joints.
N.B. Other ideas of Jointing might evolve from these suggestions.
Fig. 1.
Fig. 2.
A
B
C
D
E

PLATE I.

Owing to the fact that a block will shrink approximately one inch to every foot while in the process of manufacture, and that the degree of this shrinkage is governed by so many influences, such as the size and shape of the block to be made, the stiffness of the clay when pressed in the mold, the dryness or absorbing power of the mold into which the clay is pressed, the exactness with which the clay ingredients have been mixed, the varying influences of atmospheric conditions while the block is drying, the extreme heat to which it is burned, which necessarily varies to some extent in the different portions of the kiln, due to a thousand and one causes, all make it a practical impossibility, even with the utmost care and skill to control this shrinkage to minute exactness. Therefore, a piece, say three feet (3′) long should shrink three inches (3″), but perhaps owing to the way it has to be laid in the kiln, or for some other cause, it might shrink ⅛ or ¼ of an inch too much or too little. Ordinarily the direction of the shrinkage in a block of terra cotta converges to a common center, but there are many pieces whose size and shape are such that the shrinkage strains pull against or away from each other, and consequently there is always a tendency to warp to a greater or less extent.

The leading manufacturers by careful methods and artificial means control this unequal shrinkage and warping tendency to a large extent, but as a safeguard the jointing should be arranged in such a manner that cutting or fitting may be done without injury to the members of the moldings or ornament and thus afford sufficient adjustment to counteract the fault of the warping and irregular shrinkage and thereby obtain proper alignment.

Take for instance the construction of a column whose flutes must take up properly or its beauty be lost entirely. If the diameter is approximately 1 foot 4 inches to 1 foot 8 inches or less, it is possible to obtain fairly good results with a column made in drums, as at "A," Plate 1, especially if the height of the courses is not more than 1 foot or 1 foot 4 inches. Such columns may be made with a hole in the center to admit a steel column, providing the steel is arranged so as to slide the terra cotta pieces down from the top of the steel column. But the best way to design a terra cotta column is to have bands around it, as shown at "B." The projection of the bands break the line of the flutes so that there are no members to take up, consequently any mechanical inaccuracies are not apparent to the eye, and both the top and bottom beds of the fluted piece could be trimmed if necessary to maintain certain heights. For example, the large columns to the central feature of the New York Hippodrome were originally designed without bands, but to avoid bad alignment the bands were added with very satisfactory results.

The large columns in the concourse of the Union Station at Washington were originally designed to be plain, but the diameter was so great that it was practically impossible to obtain satisfactory alignment without cutting the drums with vertical joints, but these unsightly joints on a white glazed column were not acceptable to Mr. Burnham. To put flutes on these columns would spoil their design, as the sinkage of the flute would detract from the massive appearance desired. It was finally decided to make the columns with flutes and reeds, as shown at "C," on Plate 1, and thus avoid a deep sinkage into the body of the shaft, such as a flute would make, and yet allow opportunity to place concealed vertical joints in the lines of the reeding which could be trimmed to afford adjustment.

When a column is fluted, it is not very objectionable to place vertical joints in the center of certain flutes, as the additional lines made by the joints are not particularly apparent, being lost in the many lines made by the fillets between the flutes, so that large columns or those with a steel column in the center are often treated in this manner, as shown at "D," but in the case of white glazed material it is better to design a special fillet so as to conceal the joint, as shown at "E," Fig. 1 and Fig. 2. Other ideas might evolve from these suggestions. For instance, the architects of the Masonic Temple, Brooklyn, have arranged their large columns to be made in very small pieces about four or five inches high and one foot long, the vertical joint being small and in the center of each alternate flute, while the horizontal joint is an inch thick. As the flutes are colored "yellow" and the fillets "cream" the design is very interesting, and the mechanical execution of the work is excellent.

Careful adaptation of design to material applies to any architectural feature—for instance, the 3 foot 9 inch pier, shown on Plate 2, design "A," although very simple for stone construction, is impractical for terra cotta, unless properly jointed. As all terra cotta now manufactured has a surface more or less vitreous, even if not glazed, the face cannot be trimmed or cut away without obliteration of the surface exposing the more porous and probably different colored body. Therefore, these large pieces of terra cotta which will probably vary in size to some extent cannot be cut to fit each other as there are no vertical joints to afford adjustment. If it is desired that these pier pieces be made without vertical joints, the introduction of the rustications with the corners rounded, as shown by design "B," will so break up the vertical line of the corner of the pier that any inexactness in size that might occur will not be apparent to the eye, as there are no faces that must meet each other in the setting, the jamb being jointed into pieces separate from the pier pieces and having sufficient joints to trim for adjustment. Even though there were ½ inch or more difference in the size of the pieces, they could be sorted out and the smaller ones placed at the top of the pier, while the larger ones are below, and it would be impossible without the aid of a straight edge to detect the variation. But if a corner pier occurred, this method would be impracticable on account of the extent of the returns making it impossible to keep the pieces square, 1 foot 6 inches being the extreme depth to which such pieces could be made. Therefore, design "C" would meet most requirements, as the corner piers could also be treated in this way, provided, of course, that it harmonized with the general design of the building.

In this design there are joints that could be trimmed wherever necessary to afford adjustment so as to keep the proper measurements, while the narrow pieces have far less tendency to warp.

If the suggestion of rustication cannot be used on account of the general design of the building and the severe straight lines of the pier must be maintained, design "D" will be very satisfactory as it has all the advantages of design "C" except the rustications. The pieces after being burned should be placed on the rubbing bed and the joints ground down until they are as straight and square as the best cut stone.

If on each course there were a very faint design of ornament of a guilloche or similar pattern which would be hardly more perceptible than a design on stamped leather, it would so break up the surface as to make any inaccuracies indiscernible. If the pier were white glazed terra cotta, this low, faint design of ornamentation would be very attractive. The reader may say, "Why use terra cotta at all, and have all this bother about designs and joints?" The answer is that for columns and piers, as well as for other architectural features, terra cotta has advantages that cannot be overlooked.

In regard to the columns there is the element of "cost." Fluted columns and Corinthian Capitols carved in stone are often eight times as expensive as terra cotta, owing to the fact that the terra cotta is made from molds from which many pieces may be reproduced at comparatively slight expense; therefore, in duplication, there is economy when terra cotta is used. Further, the modeling of a terra cotta Corinthian or Ionic Capitol, or in fact any ornamental feature, is more satisfactory than a similar feature carved in stone because in the case of terra cotta the modeling is made directly in the clay, so that every piece made may bear the tool marks or the direct impress of the artist's hand, while in the case of stone an otherwise beautiful ornamental feature is often spoiled by the heavy clumsy work of a stone carver who copies his work from a plaster cast of the artist sculptor's model. Then there is the advantage of the fireproof terra cotta shell protecting the steel columns encased therein; the fireproof qualities of terra cotta being acknowledged by the best authorities as being superior to those of any other material. Also the opportunity for a design in beautiful and lasting colors, the greatest range of shades is obtainable. Its durability when properly made is unquestionable. The ancients made tomb ornaments of terra cotta probably with a knowledge of its durability. Not only will it stand all the disintegrating influences of time, but it will retain the color of its glazed surfaces practically undimmed for ages.

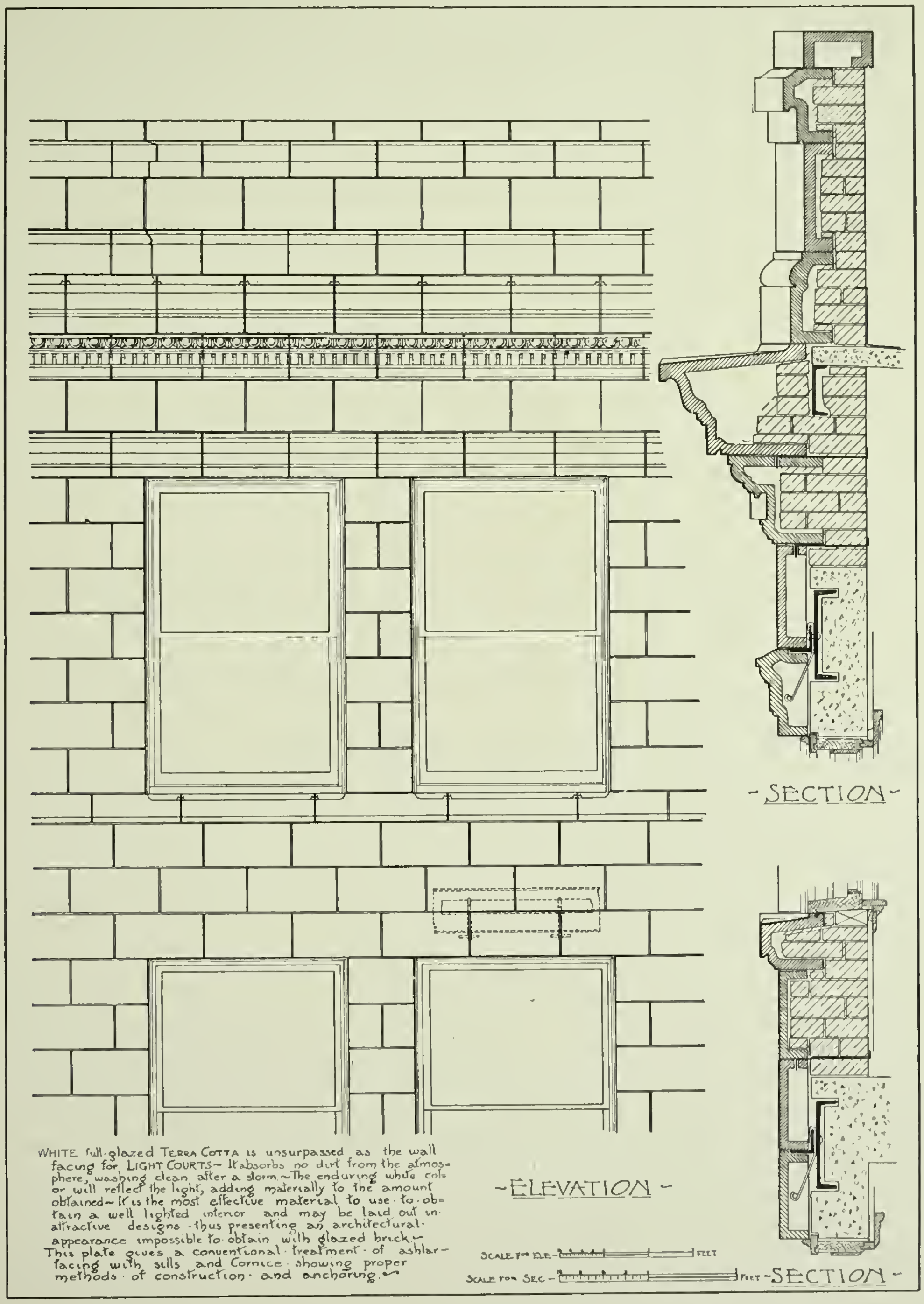


PLATE III.

Plate 3 shows a suggestion for the use of white glazed material for the light court of a skyscraper. Instead of the matt surface which is preferable from an artistic standpoint for exterior walls, the material should have a full lustrous glaze when used for light courts, as it will reflect more light than if built of any other material.

Competition for a Brick House.

REPORT OF THE JURY OF AWARD.

THE program of this competition is summed up in the words, "A charming brick house of moderate cost," and the jury was glad to find among the one hundred and forty-five designs submitted to them so many that literally comply with these terms. Selection is made somewhat easier by the care with which was considered the item of cost. The charm readily speaks for itself. It is notorious among architects that published designs, especially in non-technical journals, can usually not be built for anywhere near the marvelous prices or estimates with which they are accompanied. Since the object of this competition was to present a convincing case for the wider use of brick in dwelling houses, it was essential that the ten thousand dollar limit should be understood by the jury in the light of their experience as practicing architects. The program to them implies simplicity, modesty, a "sweet reasonableness," and includes good planning, good accessories, and an interesting use of brickwork.

First Prize. An able and characteristic brick design, with good plan, good mass, attractive "features," i.e., gables, chimneys, bays, and roof, a well studied and convincing effort.

Second Prize. A small and picturesque house, counting for far more than it would cost, a *multum in parvo* plan, simple mass, and modest but adequate details. The whole exterior depends for its effectiveness upon the color and texture of the brickwork, brought out by a somewhat daring contrast with shingled roofs. This effectiveness is almost unattainable in any other material.

Third Prize. This is a good design for other materials than brick, but an excellent design in brick by reason of such touches as the rounded gables and the slender chimneys. The plan is compact, and has agreeable rooms and abundant convenient closets. It would build well. The detail of brickwork is rather uninteresting, but the proportions of the building are notably good.

Fourth Prize. In this design the chief excellences of the first prize design are present in a different guise. Tall chimneys, strong gables, a high plain roof, and broad wall surfaces show the architect's skill in the use of the prescribed material. As if this were not enough, he has diapered his walls, as the scale details show, almost to the point of restlessness, an effect which is exaggerated, probably, by the rendering, for the design does not need to be carried out in red brick on yellow. The plan, though convenient, has some details unusual in this country. We do not serve meals from the kitchen through the back hall. The inglenook in the living room is an effective feature, both in plan and perspective. The bedrooms would be better for cross ventilation.

First Mention. A simple and effective design, somewhat reminiscent, clever details of brickwork, a pleasing perspective. The design as a whole too ambitious and dangerously near the limit of cost.

Second Mention. A simple, pleasing design, somewhat fussily rendered. It is, however, an excellent example of the kind of house that this competition was expected to bring out, economical of space and materials, and lending itself to accessories of porch, terrace, planting, and approaches. Good at the outset, it cannot fail to grow more beautiful with time.

Third Mention. A design that appealed to the judges, in spite of its presentation in a bird's-eye view, which is deplorable. The elevation and details show excellent taste and training. The plan is not so good as many of the others.

Fourth Mention. A design that, because of its assertive simplicity, cannot be overlooked. The detail of the brickwork is most interesting, and redeems the somewhat uncompromising angular mass. The plan is fussy, and the servant's room and bath in the second story, five steps below the remainder of the floor, would not readily fit the elevation.

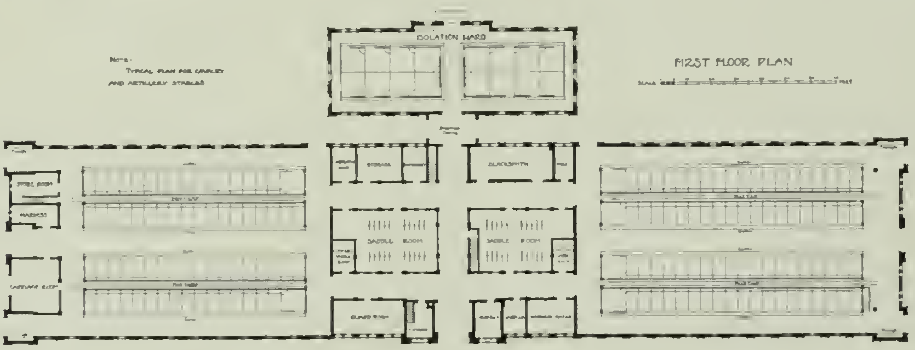
Fifth Mention. The published drawing does not do justice to the design, which is carefully studied, and gives a well proportioned picturesque exterior and very ample, perhaps too ample, accommodations on each floor. This and other designs show a servant's bedroom on the ground floor, a questionable arrangement in many localities.

Sixth Mention. One of the very few attempts to design a brick house with a flat roof, interesting in that respect and because of the detail of the brickwork, which vindicates a design that might also be worked out in concrete. Although simple in mass, the planning is so generous that this mention gives the designer the benefit of a very considerable doubt.

J. Randolph Coolidge, Jr.,
J. Lovell Little, Jr.,
Guy Lowell,
Hubert G. Ripley,

Jury of Award.

ARTILLERY STABLES.

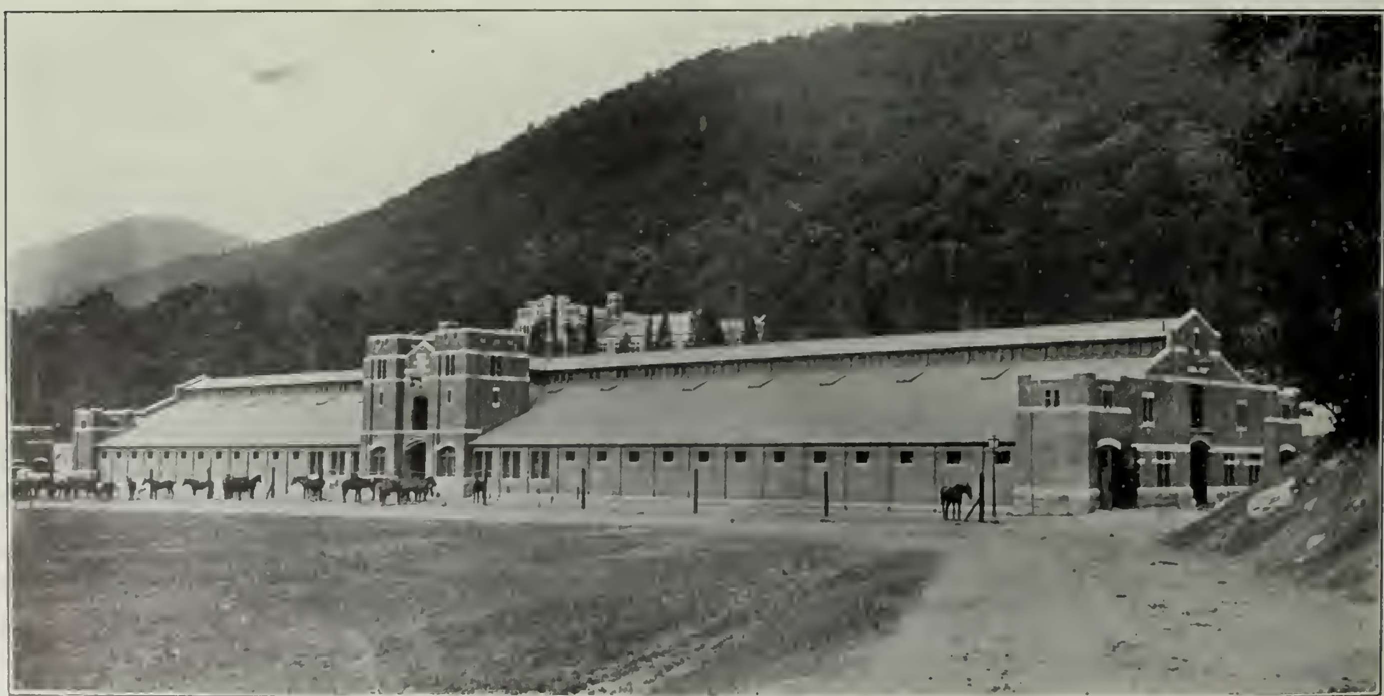


U. S. MILITARY ACADEMY,

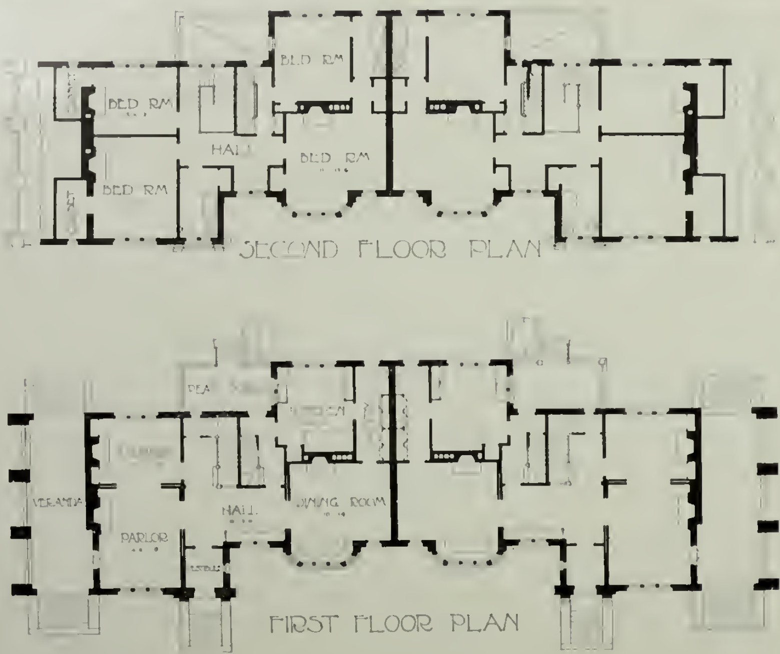
WEST POINT, N. Y.

CRAM, GOODHUE & FERGUSON,

ARCHITECTS.



CAVALRY STABLES.



CAPTAINS' QUARTERS, NO. 1.

U. S.

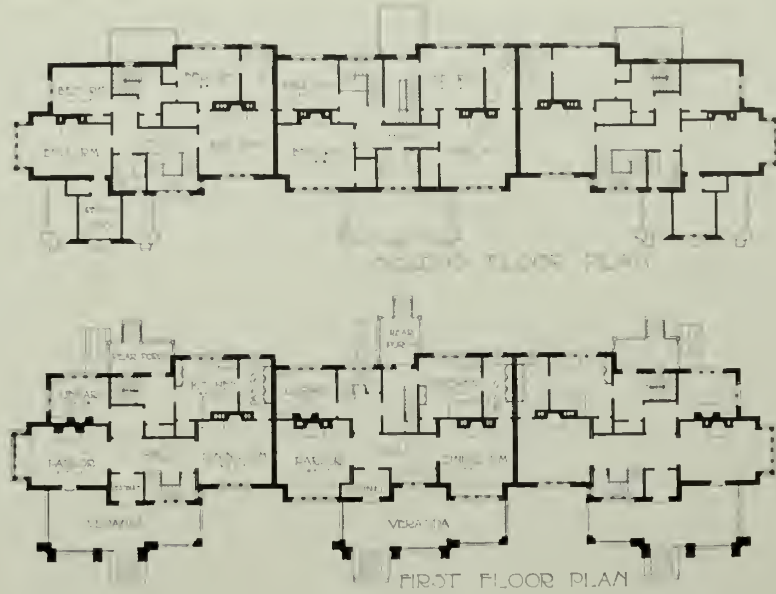
MILITARY ACADEMY.

WEST POINT, N. Y.

CRAM,

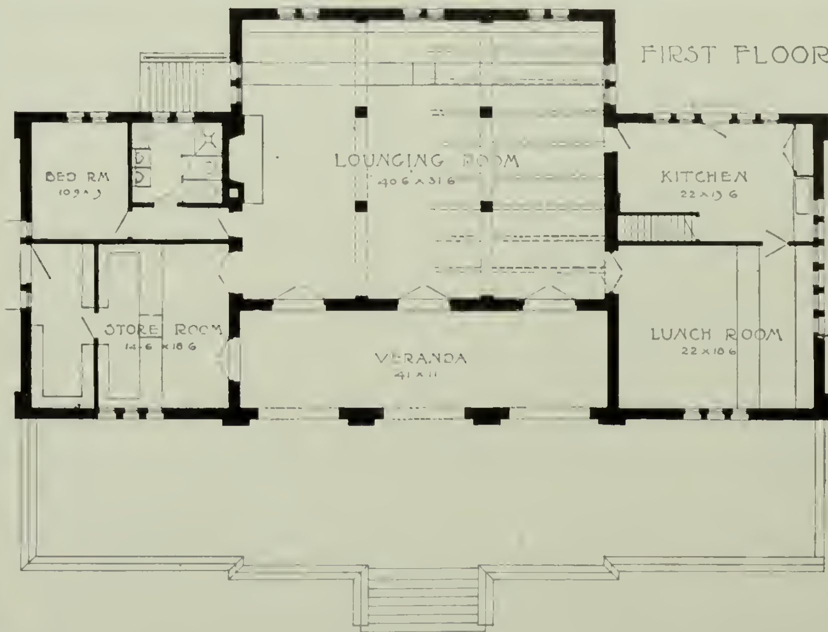
GOODHUE & FERGUSON,

ARCHITECTS.



LIEUTENANTS' QUARTERS, NO. 3.

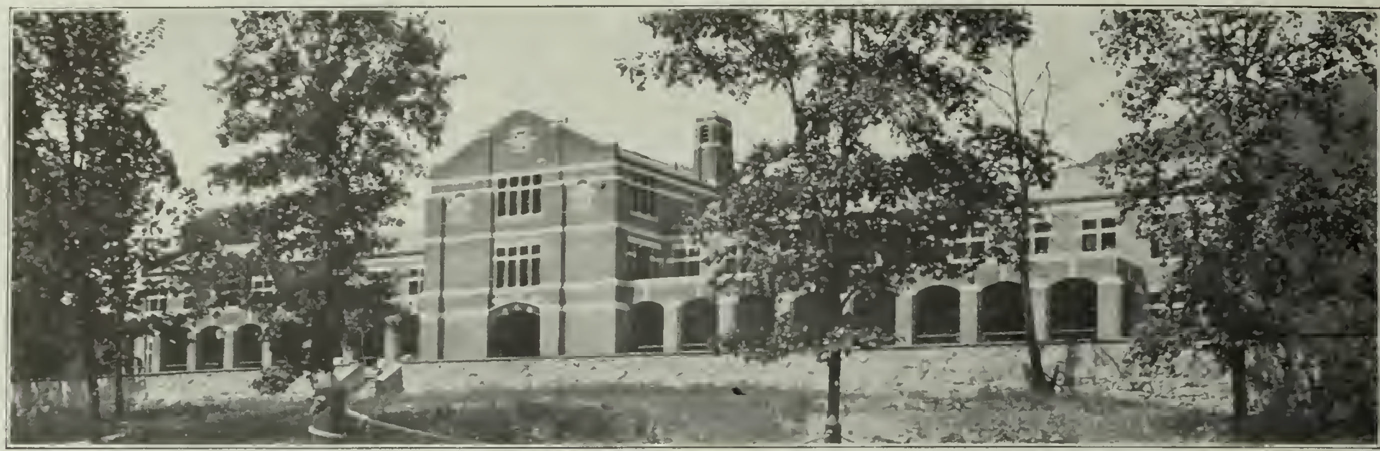
DETAIL OF ARTILLERY STABLES.



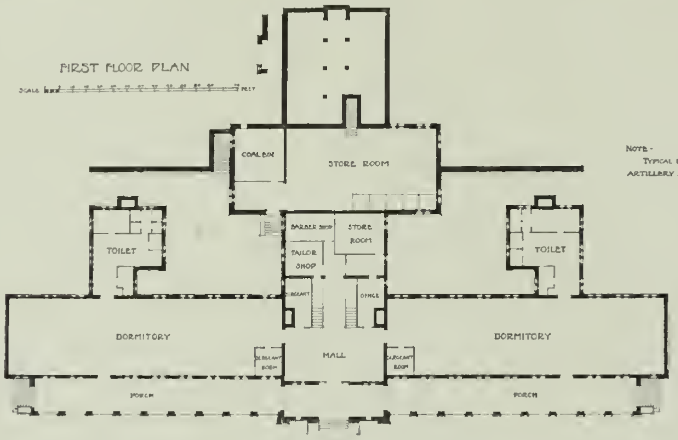
BRANCH POST EXCHANGE.

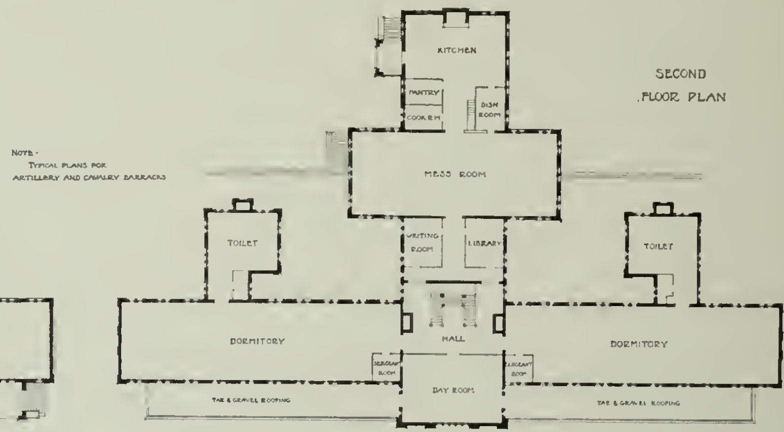
U. S. MILITARY ACADEMY, WEST POINT, N. Y

CRAM, GOODHUE & FERGUSON, ARCHITECTS.



ARTILLERY BARRACKS.

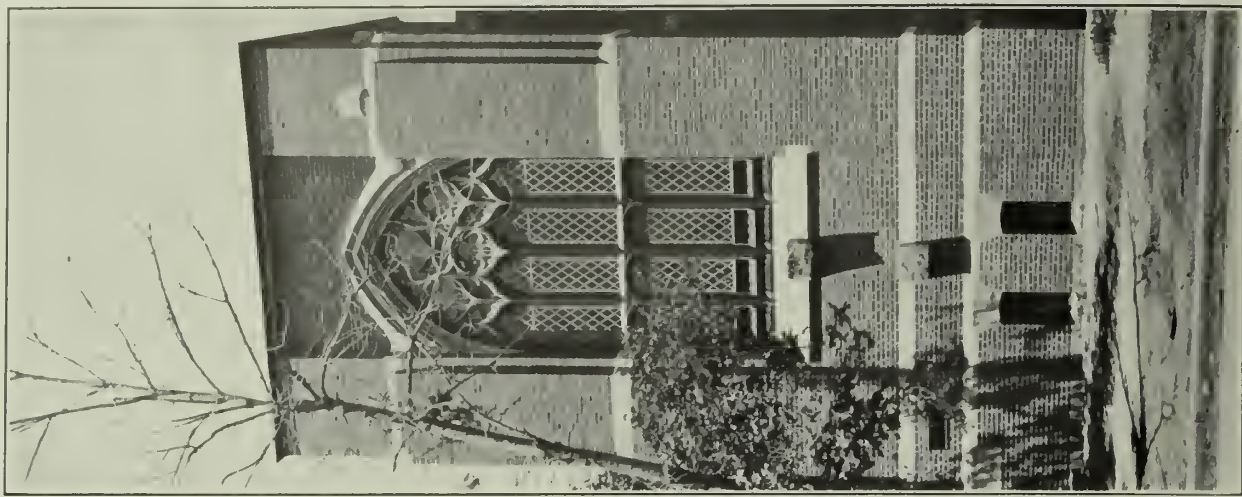




CAVALRY BARRACKS.

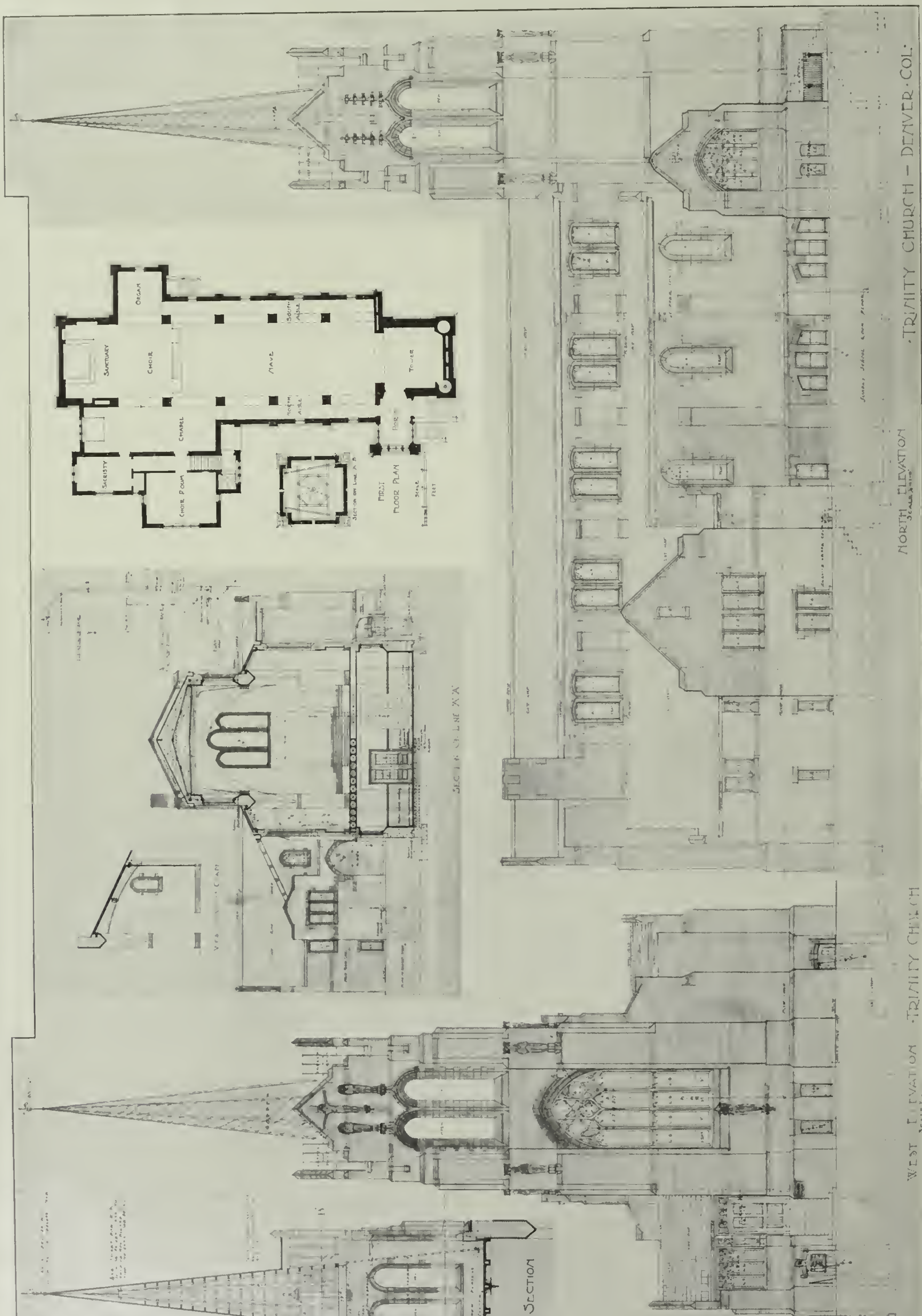
U. S. MILITARY ACADEMY, WEST POINT, N. Y.

Cram, Goodhue & Ferguson, Architects.

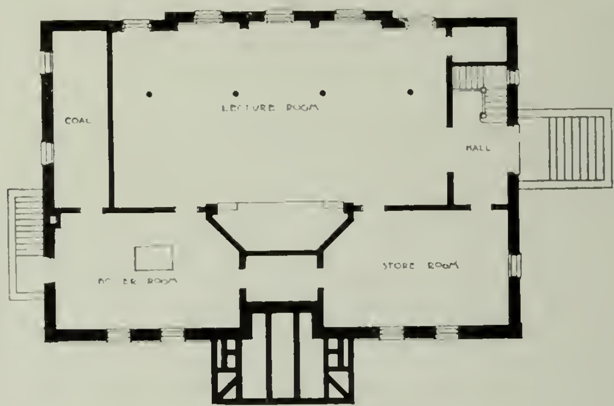


TRINITY MEMORIAL CHURCH, DENVER, COLORADO.

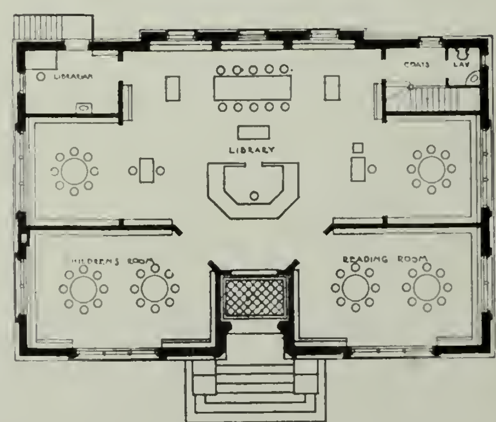
Cram, Goodhue & Ferguson, Architects. George H. Williamson, Associated.



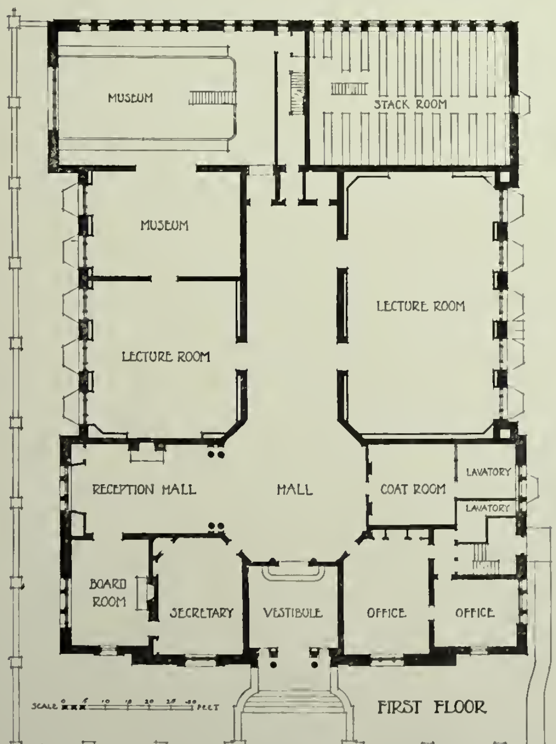
TRINITY MEMORIAL CHURCH, DENVER, COLORADO.
CRAM, GOODHUE & FERGUSON, ARCHITECTS.
GEORGE H. WILLIAMSON, ASSOCIATED.



BASEMENT

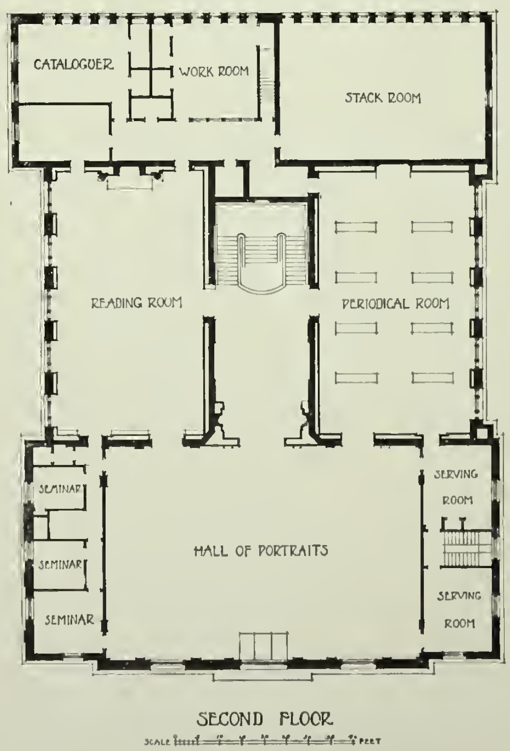


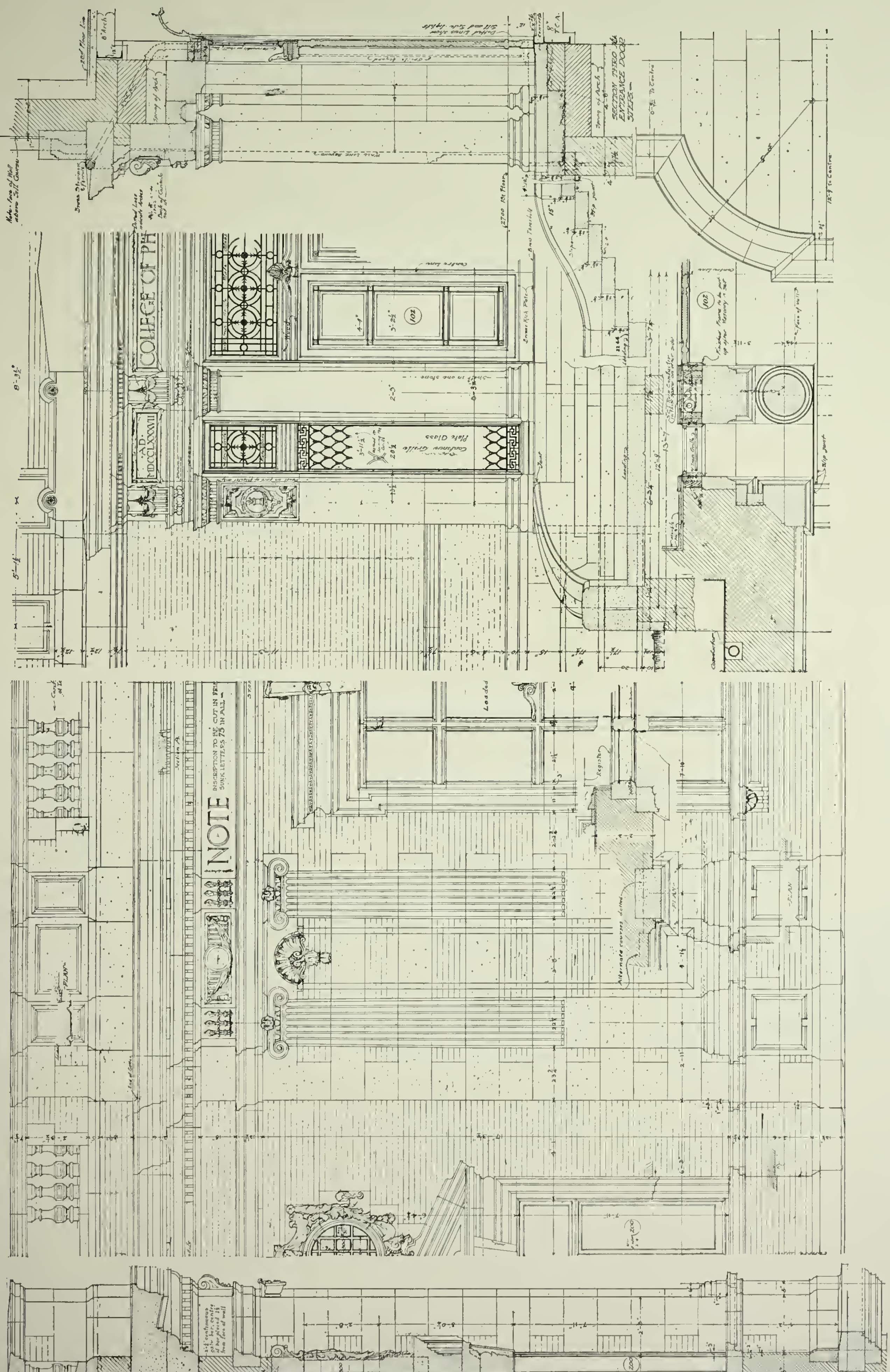
LIBRARY AT WILLOUGHBY, OHIO.
William Warren Sabin, Architect.



OFFICE BUILDING
AND
LIBRARY
FOR THE COLLEGE
OF PHYSICIANS,
PHILADELPHIA,
PA.

COPE & STEWARDSON,
ARCHITECTS.

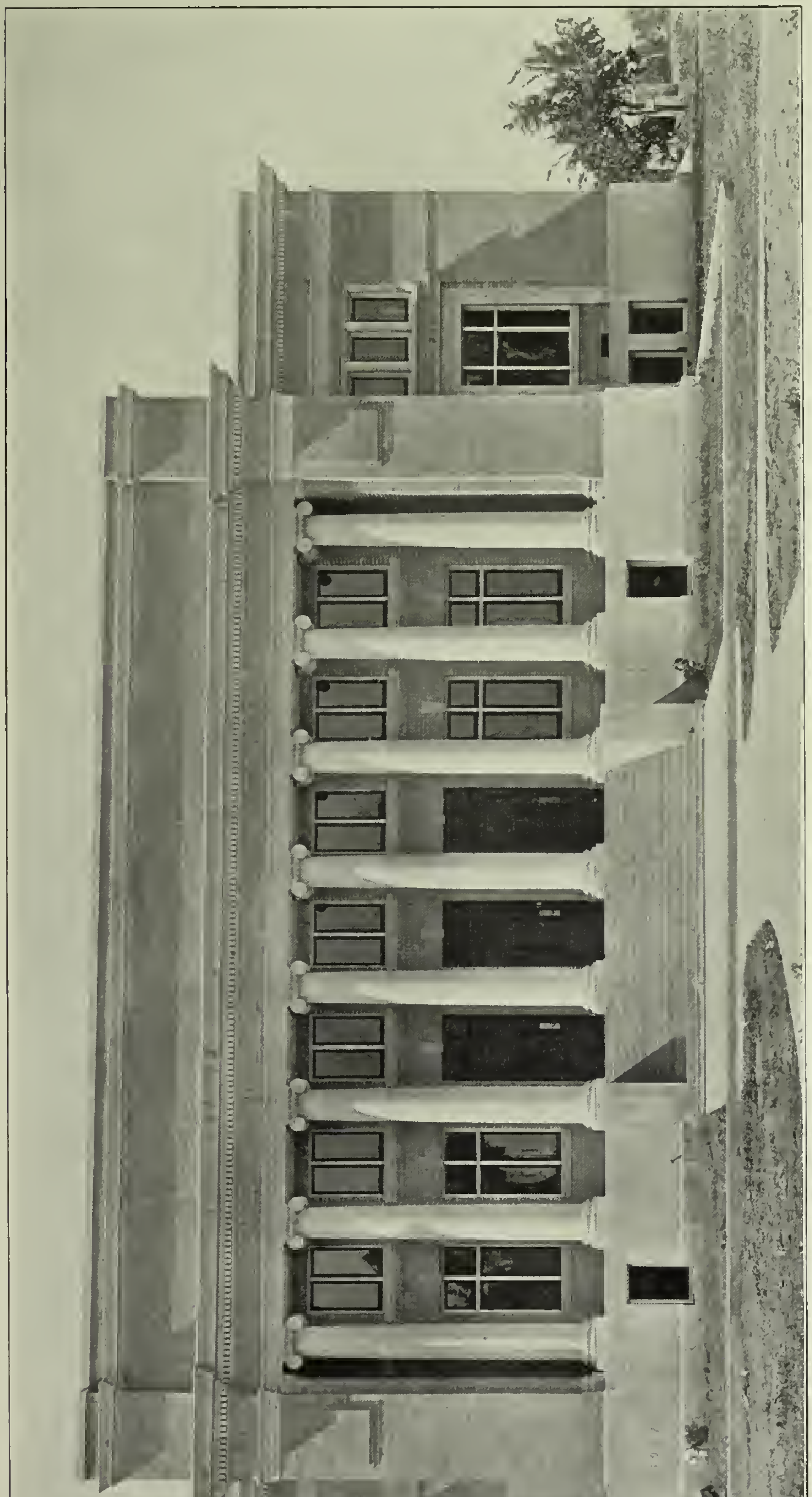


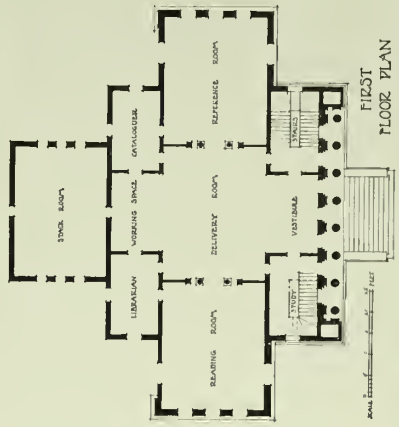


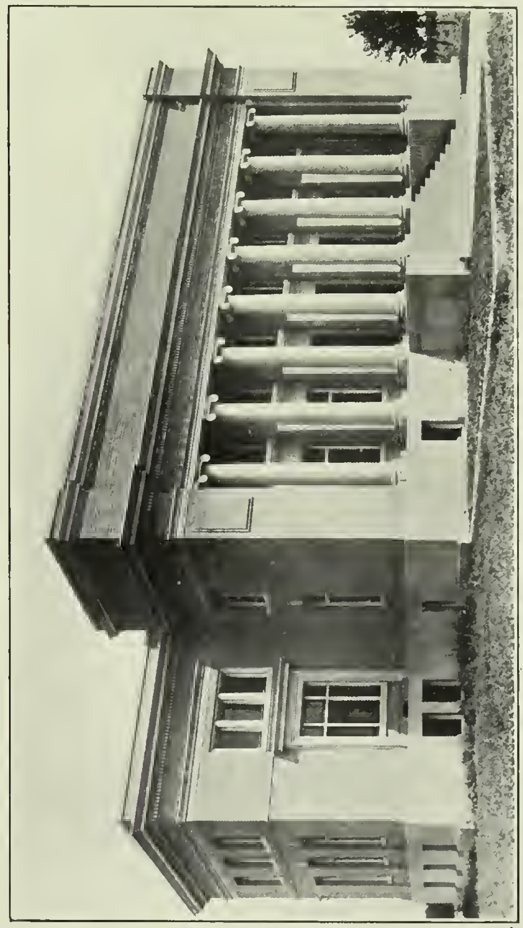
DETAILS OF FRONT ELEVATION.

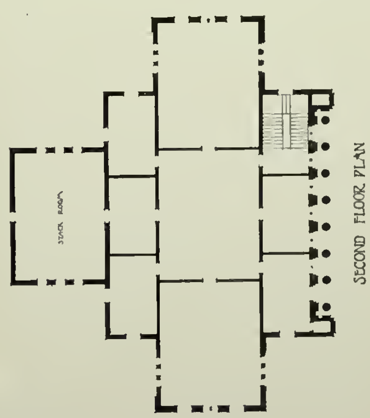
OFFICE BUILDING AND LIBRARY FOR THE COLLEGE OF PHYSICIANS, PHILADELPHIA, PA.

COPE & STEWARDSON, ARCHITECTS.



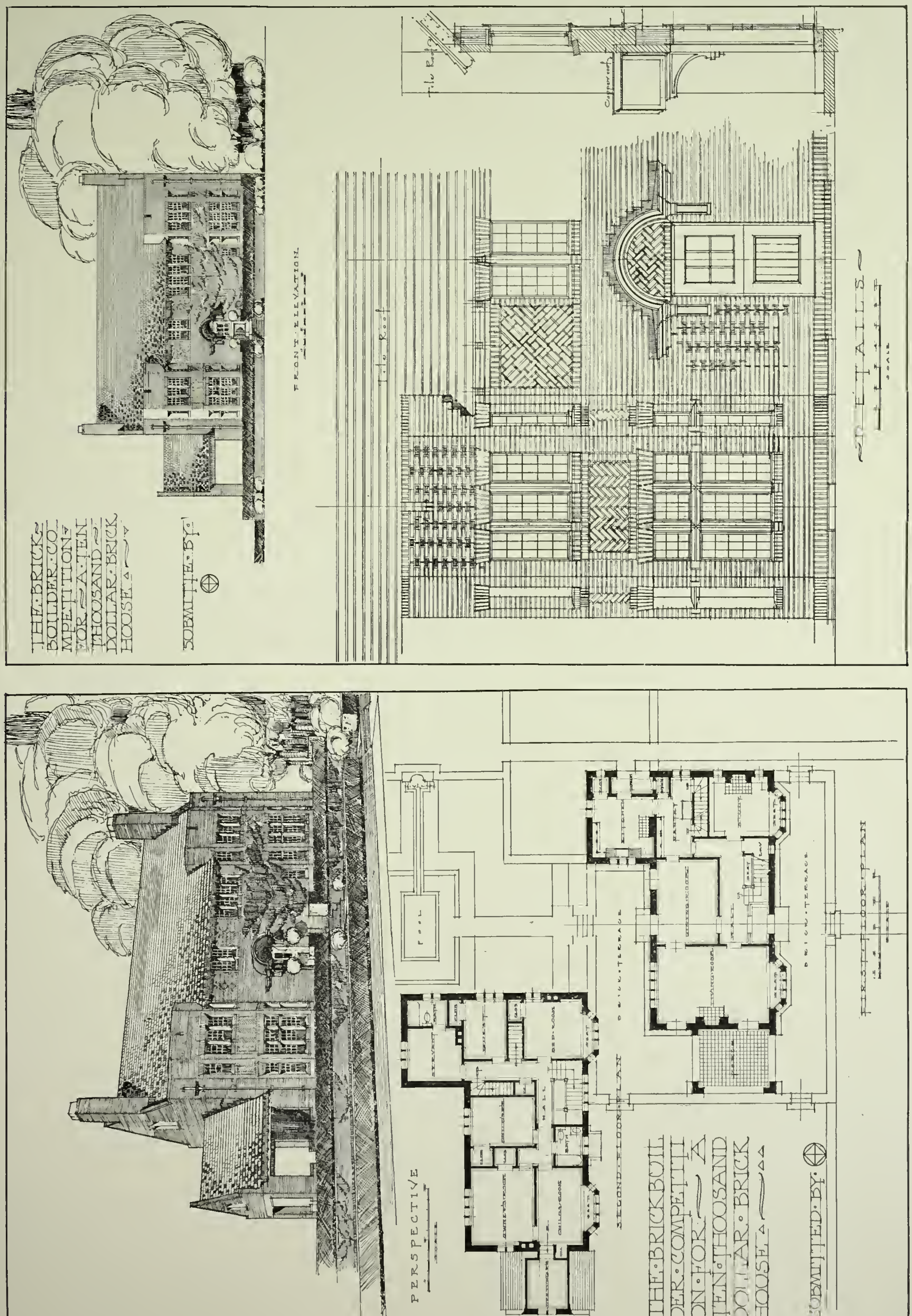




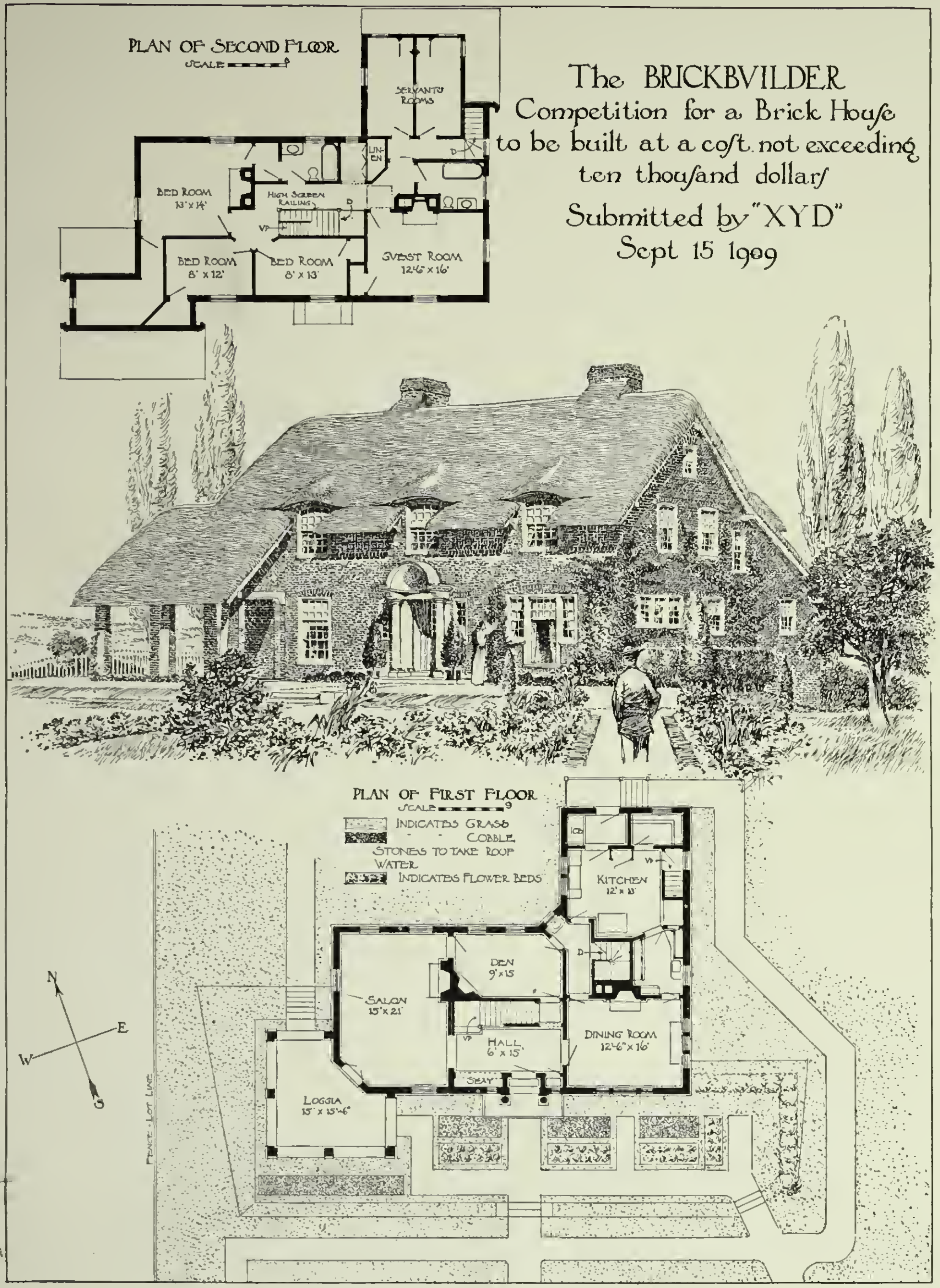


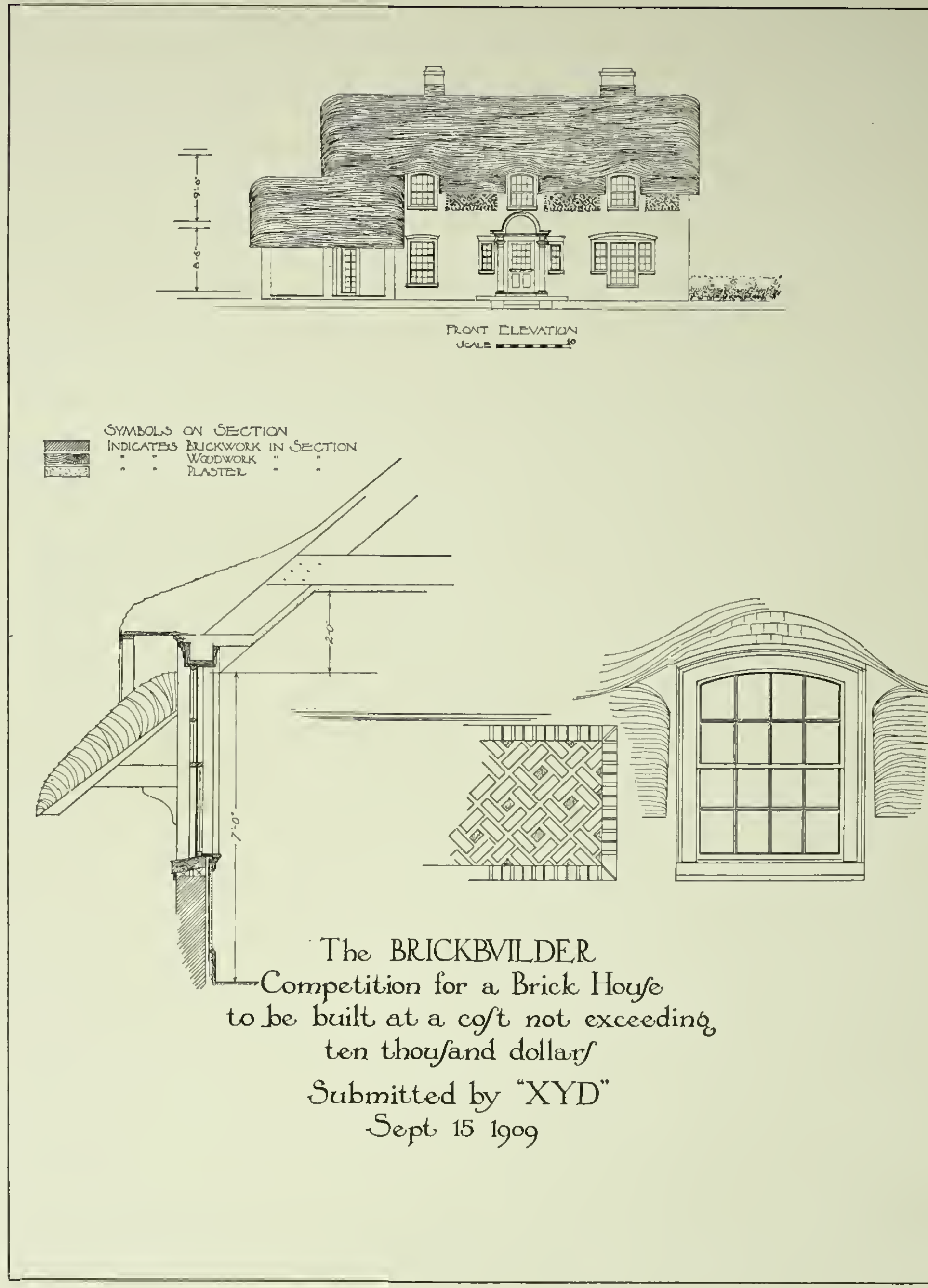
ALBERT RANDOLPH ROSS, ARCHITECT.

FAIRMOUNT COLLEGE LIBRARY
WICHITA, KANSAS.



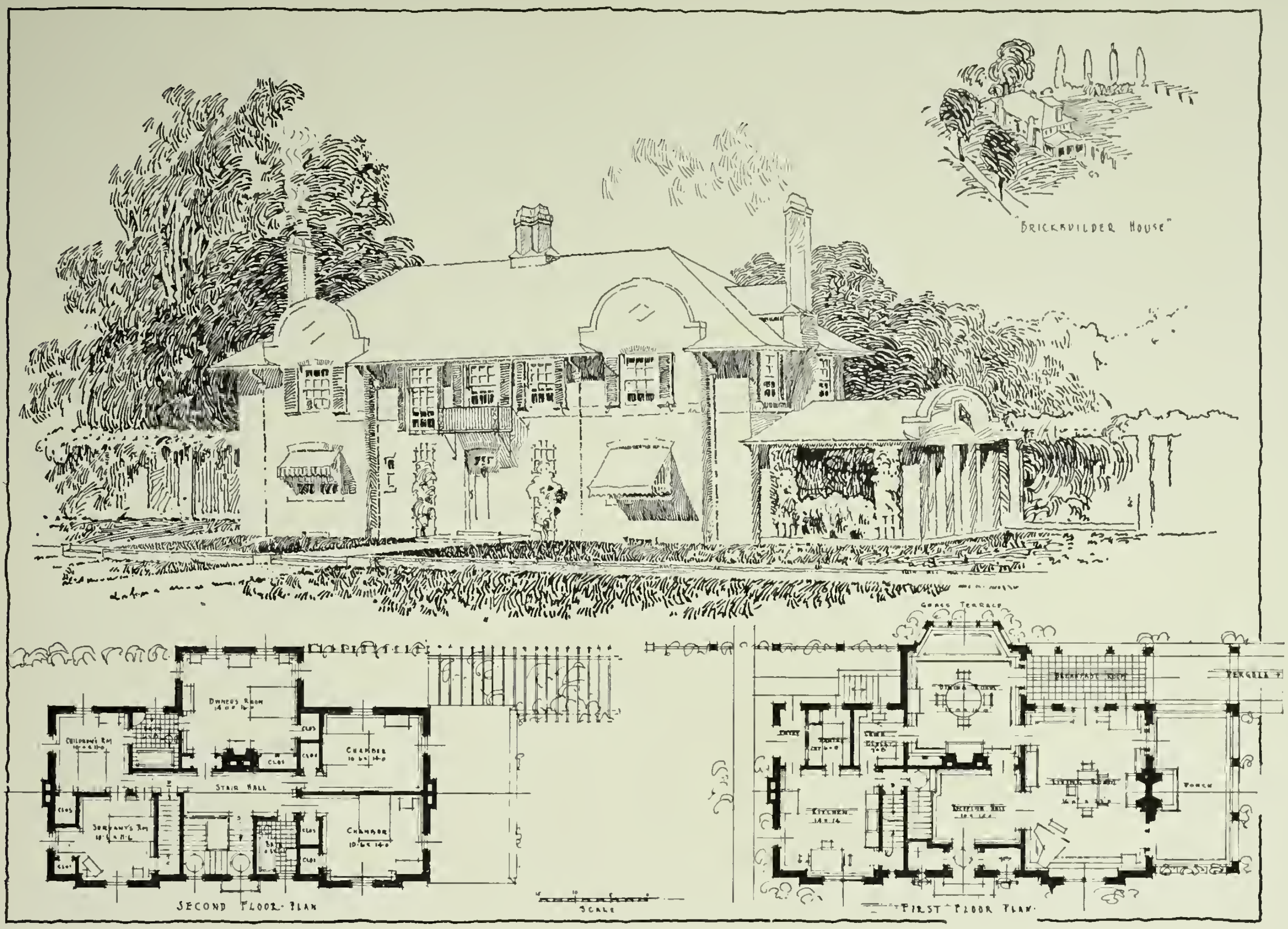
FIRST PRIZE DESIGN. THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.
SUBMITTED BY ROBERT A. TAYLOR, CAMDEN, N. J.

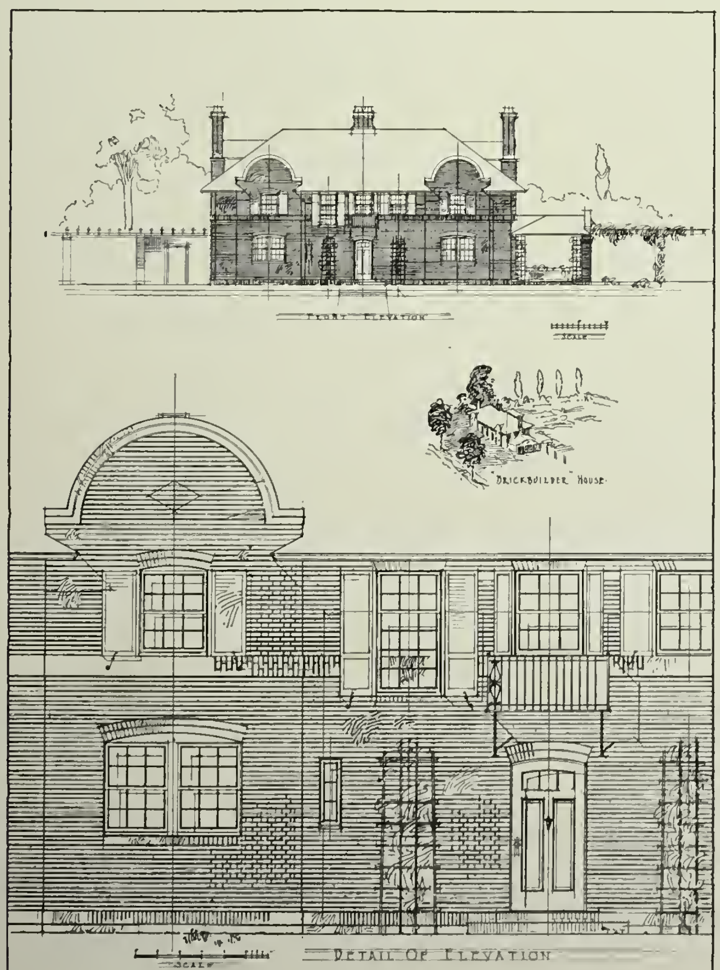




SECOND PRIZE DESIGN. THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.

SUBMITTED BY WILLIAM D. AUSTIN, BOSTON, MASS.





THIRD

PRIZE DESIGN.

THE

BRICKBUILDER COMPETITION

FOR A

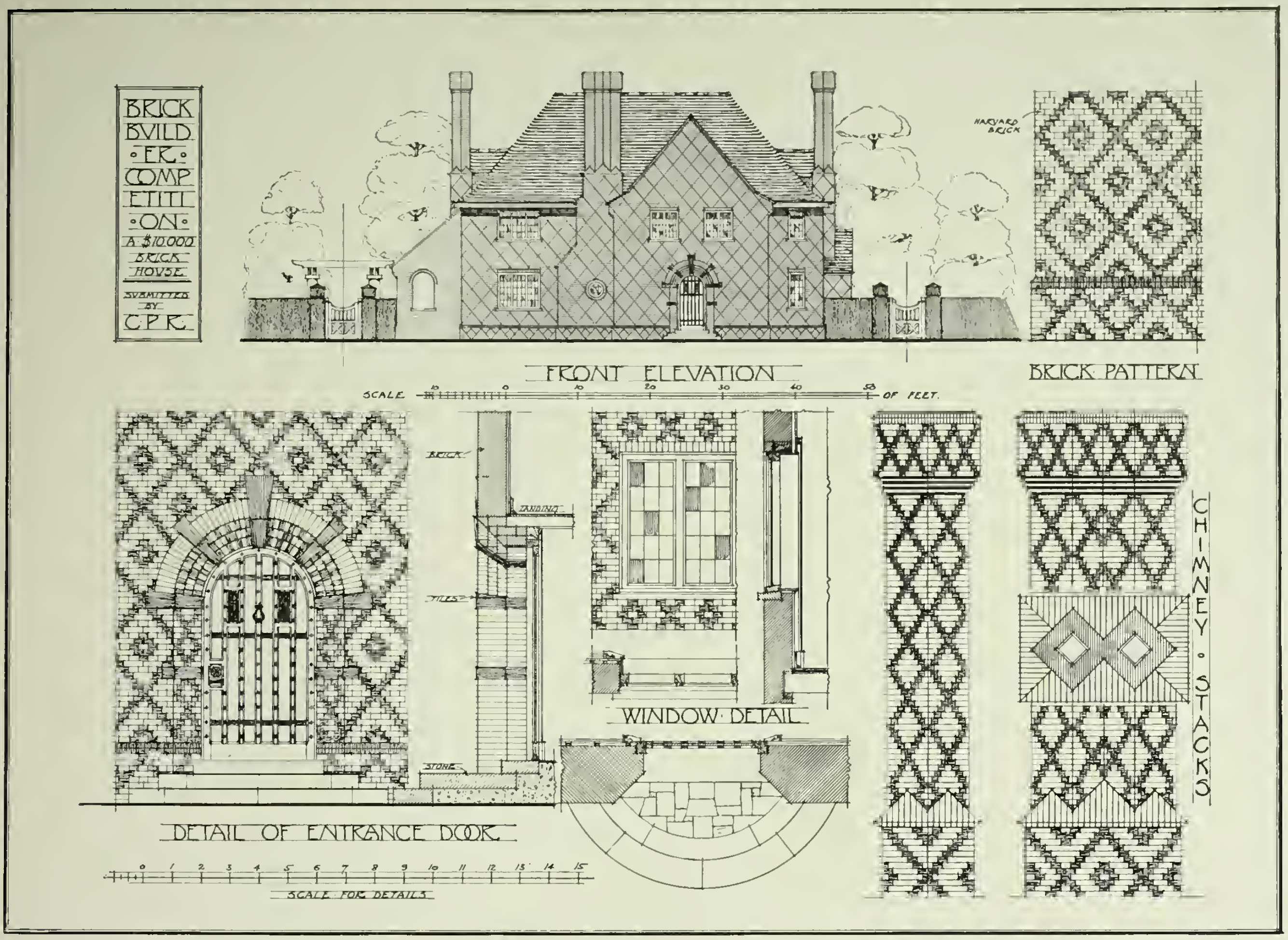
BRICK HOUSE.

SUBMITTED BY

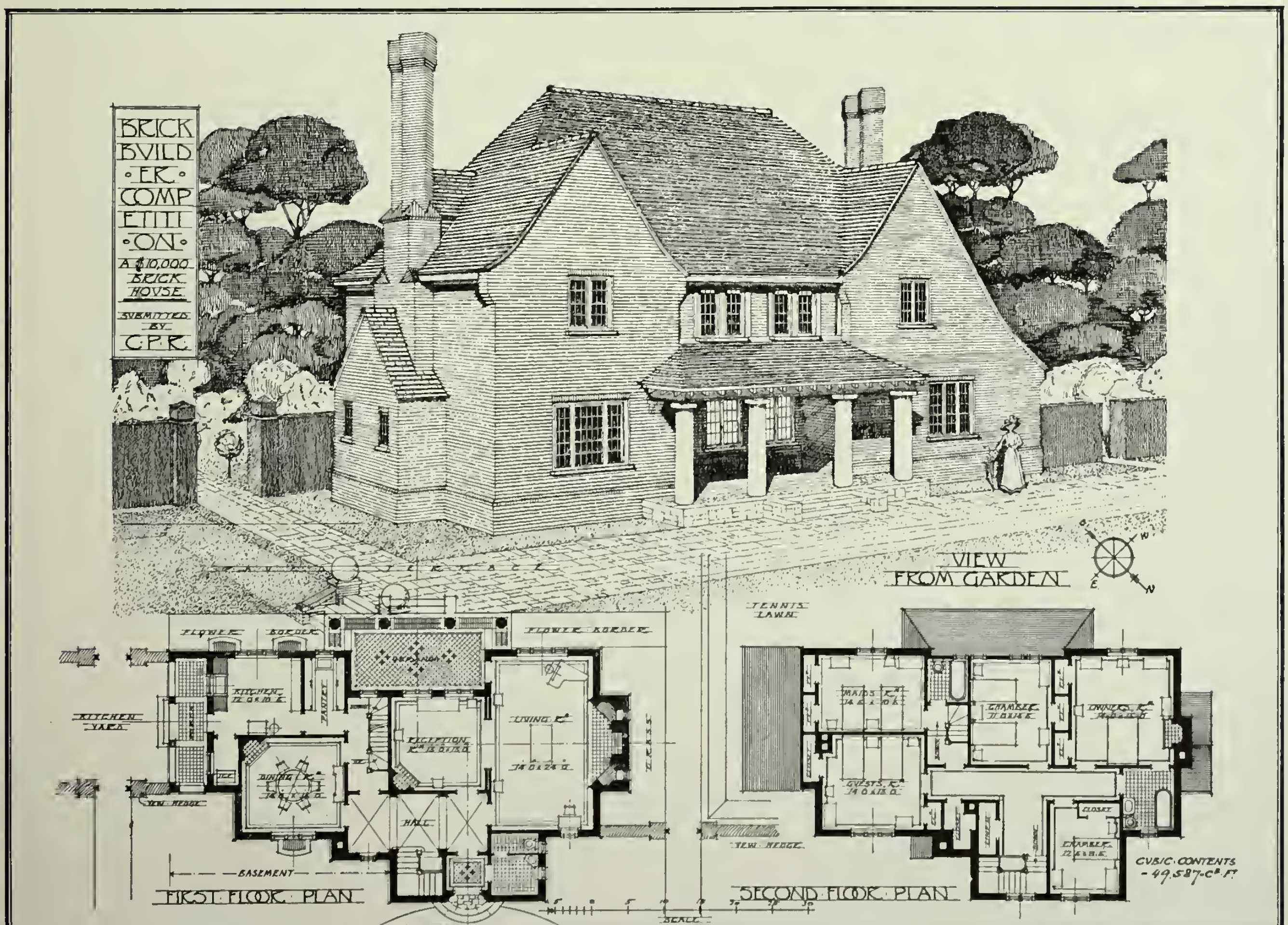
CHARLES C. CLARK,

BOSTON, MASS.

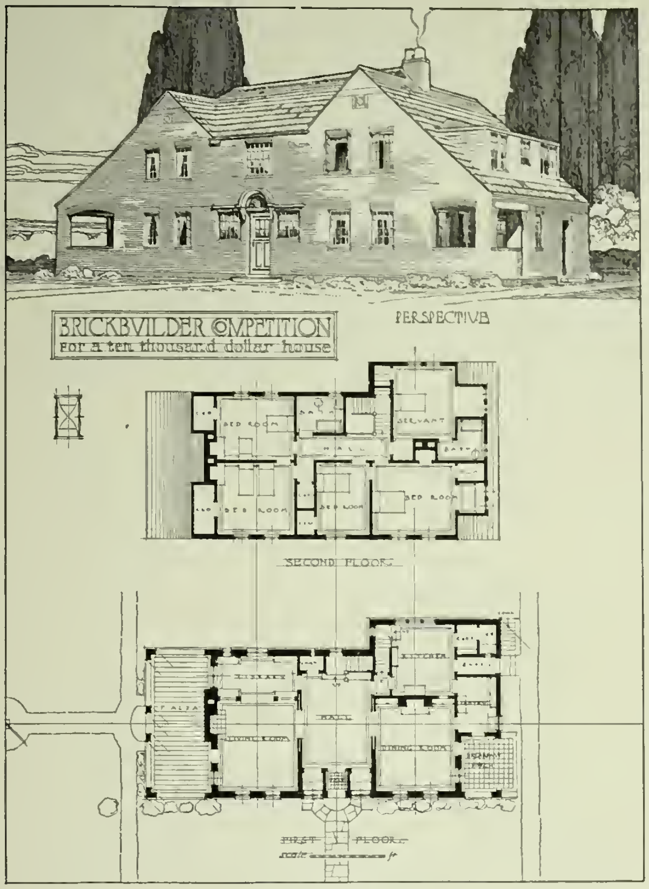
FOURTH PRIZE DESIGN.

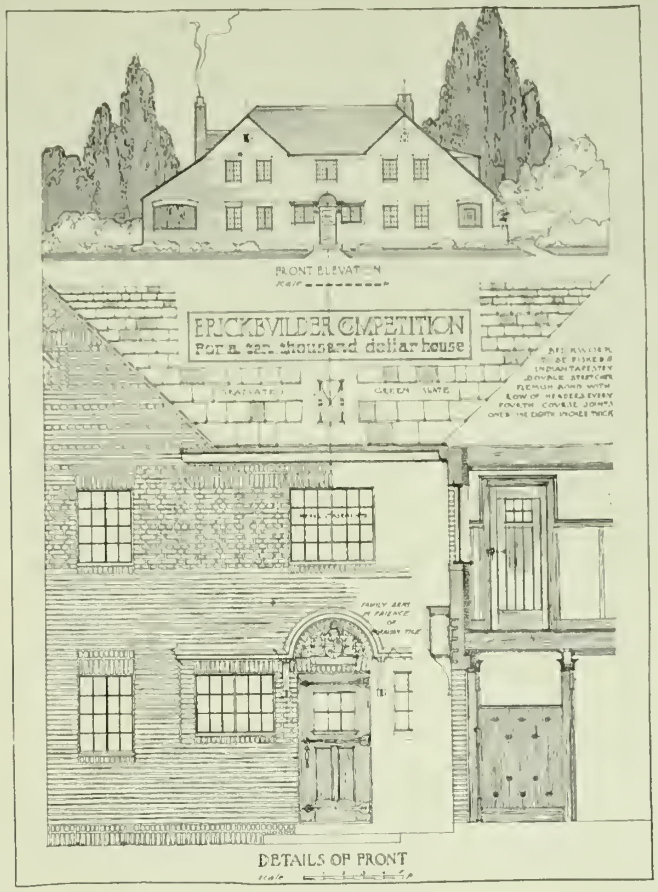


SUBMITTED BY HAROLD J. GRAVENOR, MONTREAL, CANADA.

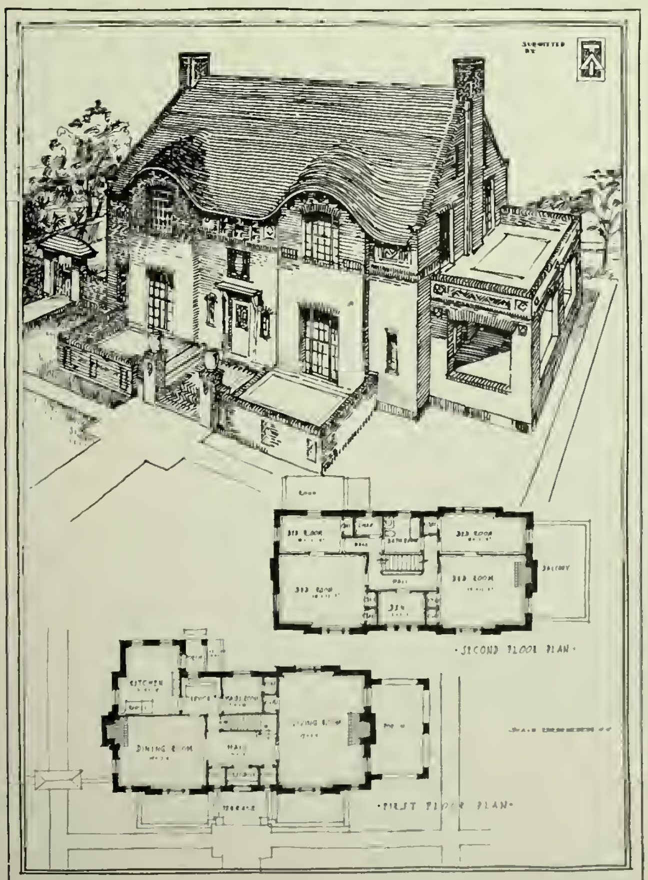


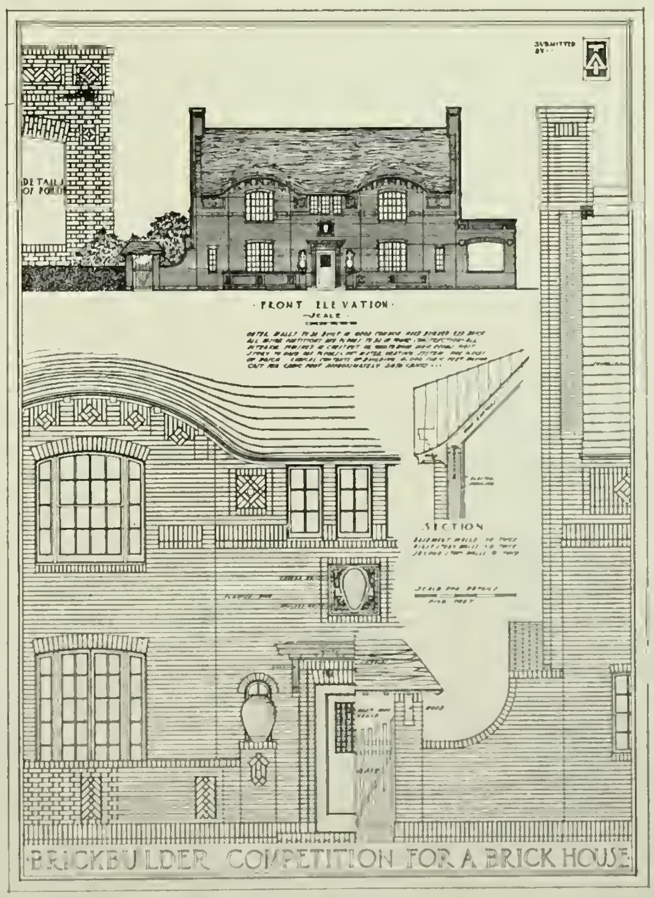
THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.





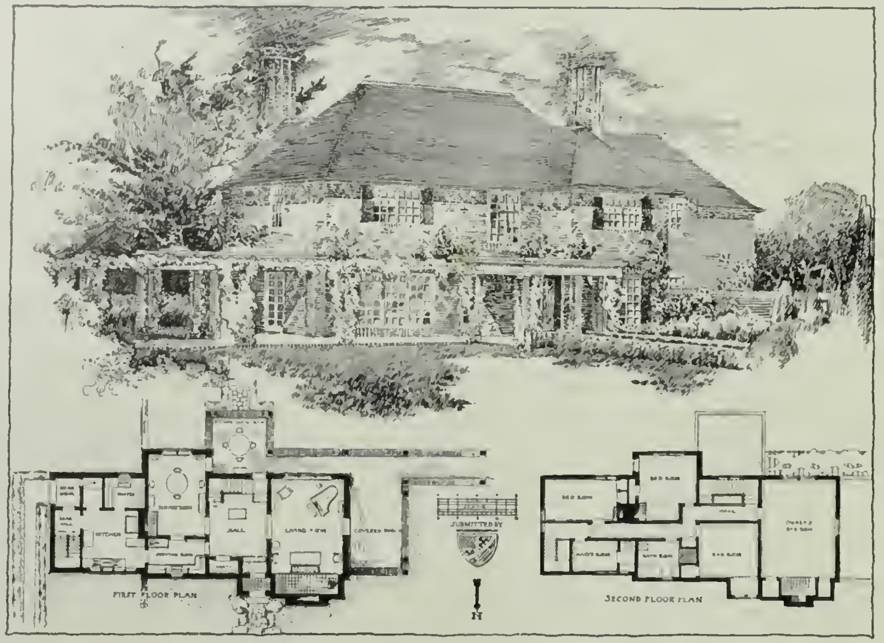
FIRST MENTION DESIGN. SUBMITTED BY E. DONALD ROBB, NEW YORK CITY.





THIRD MENTION DESIGN. SUBMITTED BY EUGENE WARD, NEW YORK CITY.

THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.



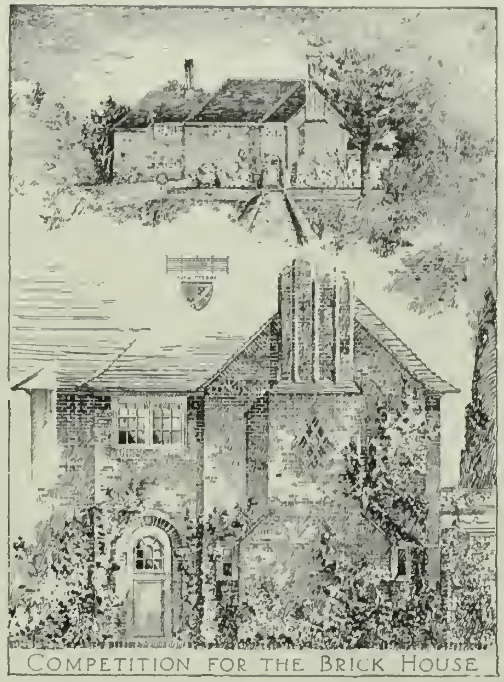
SECOND MENTION

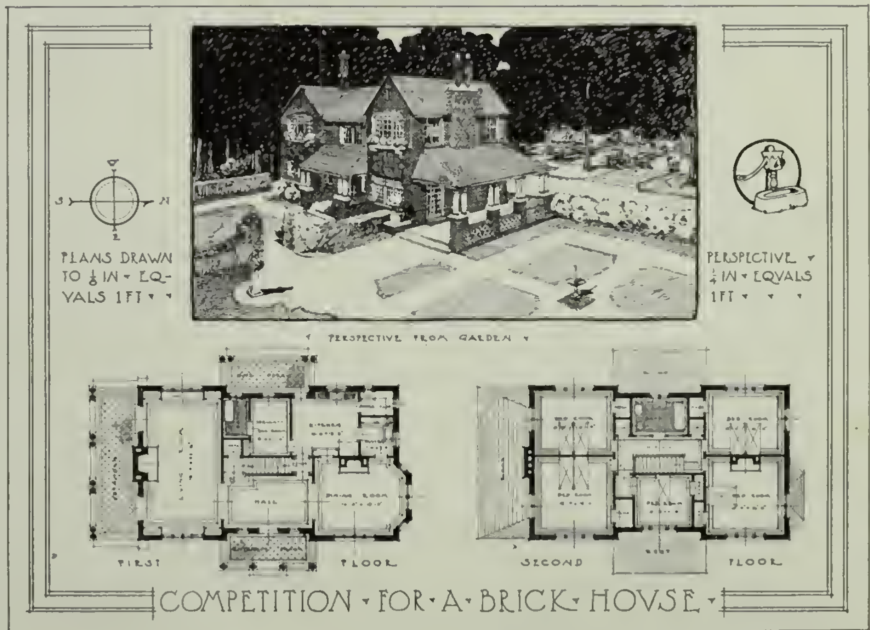
DESIGN.

SUBMITTED BY

DERBY & ROBINSON,

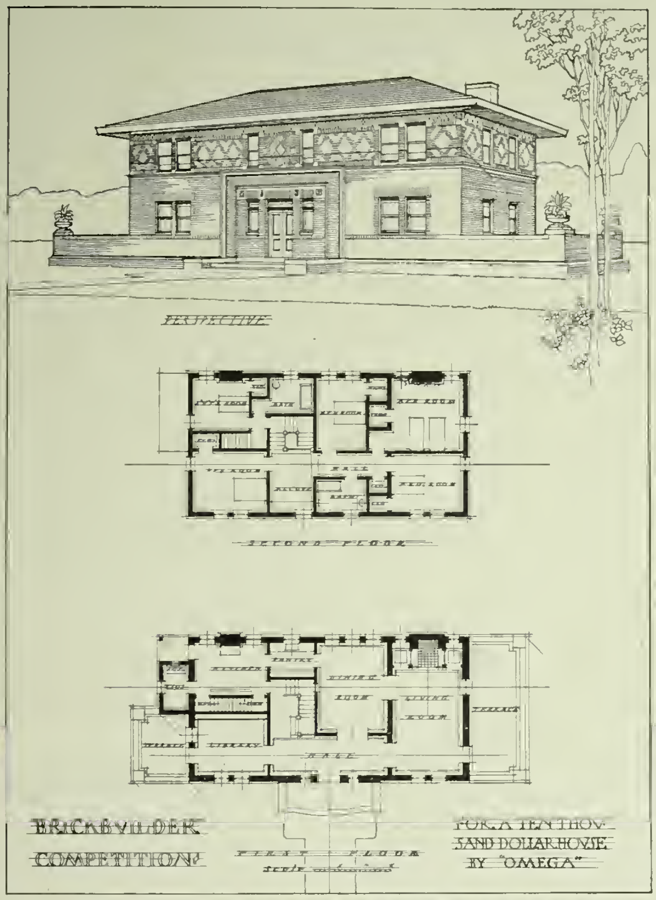
BOSTON.

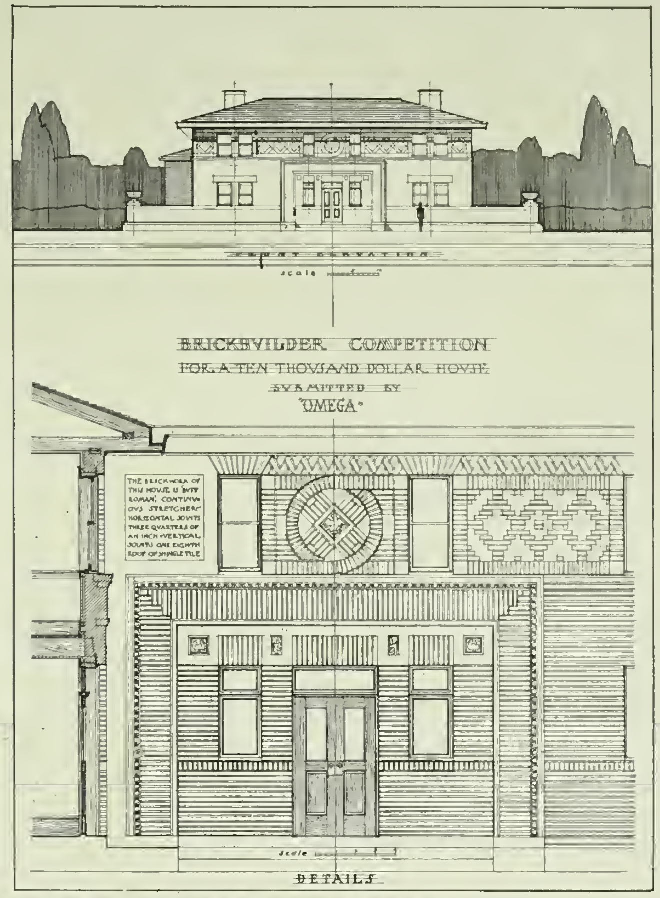




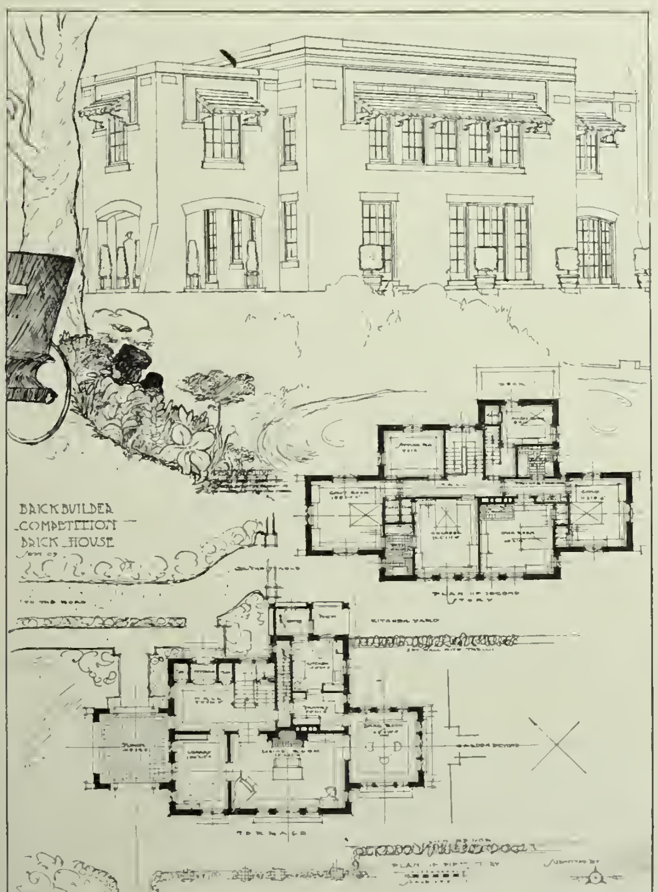
FIFTH MENTION DESIGN. SUBMITTED BY J. THEODORE HANEMANN, NEW YORK CITY.

THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.



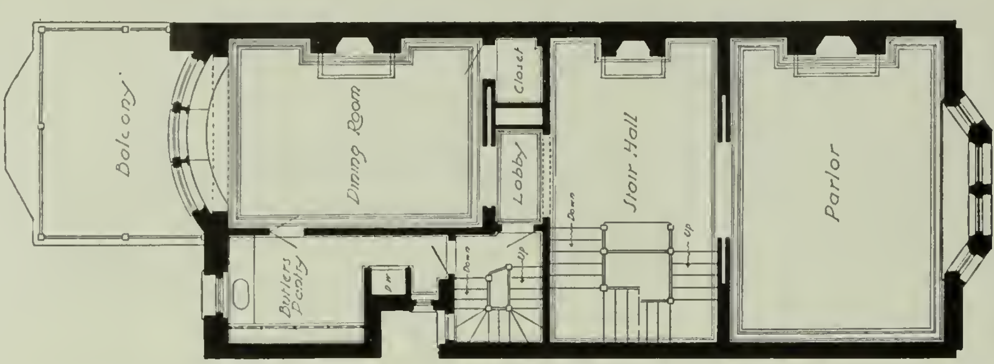


FOURTH MENTION DESIGN. SUBMITTED BY D. E. ROBB, MOUNT VERNON, N. Y.

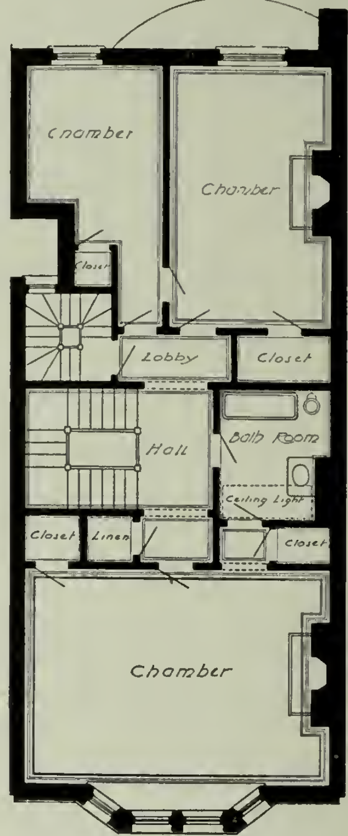


SIXTH MENTION DESIGN. SUBMITTED BY EDGAR STANLEY, CLEVELAND, OHIO.

THE BRICKBUILDER COMPETITION FOR A BRICK HOUSE.

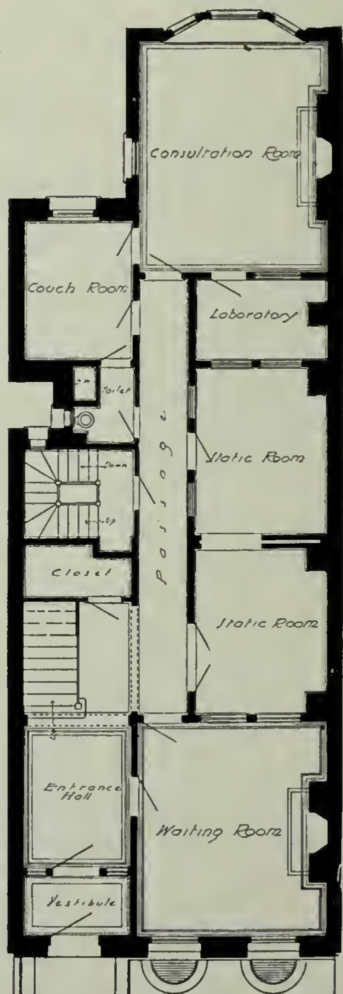


SECOND FLOOR PLAN.



THIRD FLOOR PLAN.

HOUSE AT WASHINGTON, D. C.
Marsh & Peter, Architects.



FIRST FLOOR PLAN.

Standard Architectural Books—VII.

ORDERS, ETC. —Continued.

WILLIAM R. WARE, LL.D.: Emeritus Professor of Architecture, Columbia University. The American Vignola: Part I. The Five Orders; Boston, The American Architect and Building News Company, 1902: Part II. Arches and Vaults, Roofs and Domes, Doors and Windows, Walls and Ceilings, Steps and Staircases; Scranton International Text-book Company, 1906: small fol. (.32 by .24 by .015); text, ill., pl.; 2 pts.; cloth, $4.00. Professor Ware's Vignola derives its chief value from a convenient method of drawing the orders and other details of the classic scheme.

CONSTRUCTION.

American School of Correspondence at Armour Institute of Technology, Chicago. Cyclopedia of Architecture, Carpentry and Building; a general reference work, etc., prepared by a staff of architects, builders, and experts of the highest professional standing, illustrated with over three thousand engravings. Chicago, American School of Correspondence; latest ed. 1908; 8° (.245 by .175 by .045); 10 vols, ill., pl.; cloth, $24.00. Contents: Vol. I., building superintendence, foundations, framing, city buildings, brickwork, contracts and specifications, studies in materials, the formal contract, government contracts, specifications, building law, review questions; vol. II., carpentry, laying out work, joints and splices, the wall, the floors, the roof, special framing, stair building, handrailing, estimating, typical estimate, review questions; vol. III., strength of materials, moment of inertia, statics, analysis of trusses, stress diagrams, masonry construction, building materials, foundations, masonry structures, retaining walls, construction of arches, review questions; vol. IV., reinforced concrete, cement, mixing concrete, finishing concrete, flexure in reinforced concrete, retaining walls, reinforced concrete columns, strength of T-beams, steamfitting, electric wiring, electric lighting, review questions; vol. V., steel construction, the steel frame, fireproofing, beams and girders, columns, trusses, framing details, foundations, mill building construction, riveted girders, elevators, review questions; vol. VI., mechanical drawing, lettering, geometrical drawing, orthographic projection, shade lines, intersection and development, isometric projection, architectural lettering, architectural drawing, rendering in wash, exhibition drawings, architectural design; vol. VII., freehand drawing, freehand perspective, perspective drawing, planes of projection, lines of measure, vanishing point, parallel perspective, shades and shadows, use of auxiliary planes, the Roman orders, intercoluminations, superposition of orders; vol. VIII., the classic Greek orders, Greek Ionic order, Greek Corinthian order, classic Roman order, early Roman Doric order, classic Roman Doric order, classic Roman Ionic order, classic Roman Corinthian order, glossary, bibliography, rendering in pen and ink, the steel square; vol. IX., tinsmithing, sheet metal work, practical workshop problems, tables for light gage work, coppersmith's problems, problems in heavy metal, skylight work, roofing, cornice work, miter cutting, problems in mensuration; vol. X., systems of warming, principles of ventilation, furnace heating, direct steam heating, indirect steam heating, direct hot water heating, indirect hot water heating, exhaust steam heating, vacuum systems, plumbing, review questions, index.

We have given the contents of each volume so that the reader may know the scope of the undertaking. The intention throughout is excellent, although, as in most works of this class, the quality is uneven. It is in the nature of an encyclopedia that it must pass through repeated revision to insure perfection.

Frank E. Kidder (1859-1905), C. E., Ph.D., F. A. I. A.: Consulting Architect and Structural Engineer. Building Construction and Superintendence: New York, William T. Comstock, 8° (.25 by .185 by .04); 3 parts, ill.; cloth, $3.00. Part I. Mason's Work, 260 ill., ninth ed., 1909; Part II. Carpenter's Work, 525 ill., seventh ed., 1908; Part III. Trussed Roofs and Roof Trusses, 306 ill., 1906. The late Mr. Kidder's building construction and superintendence covers the theory underlying all the practical operations of architecture as understood in the best American practice. In his active life Mr. Kidder met the many difficulties of his profession with their practical solution, and his published work is the permanent embodiment of his experience.

Frank E. Kidder. The Architect's and Builder's Pocket-book: A handbook for architects, structural engineers, builders, and draftsmen. New York, John Wiley & Sons, fourteenth ed.; 1905; 12mo (.175 by .105 by .06); 19+1,655 p., 1,000 ill., mostly from original designs; $5.00. It is not within the scope of Kidder's larger work to carry all the data of construction. This is done in the Pocket-book, which contains a fine general body of tables.

Ira O. Baker, C. E., Professor of Civil Engineering, University of Illinois. A Treatise on Masonry Construction. New York, John Wiley & Sons, ninth ed., 1903; 8° (.235 by .15 by .04); 13+556 p., ill., pl.; appendix, Specifications for Masonry, pp. 529-543; cloth, $5.00. Baker's Masonry Construction is especially competent in the discussion of the qualities of various materials. It deals with principles rather than with details, and its matter is arranged with much regard for order and proportion.

Charles F. Marsh, M. Inst. C. E., M. Am. Soc., C. E. Assoc., M. Inst., M.E., and William Dunn, F. R. I. B. A. Reinforced concrete. London, Archibald Constable & Co. Ltd., 1906; 4to (.285 by .2 by .05); 7+635+1 p., front, ill., tables partly folded, diagrams partly folded; cloth, 31s. 6d. net. Simple concrete in construction, as a technic of engineering, does not have place in this list; but reinforced concrete, which has become one of the most common and valuable methods of construction, should be represented by one treatise of the highest technical value. The work of Marsh and Dunn is the foundation of the best practice in this material. It gives complete discussion of the systems employed, of materials, the methods of practical construction, the data and calculations, and at the end a series of practical examples of works actually built.

Albert W. Buel, C. E., and Charles S. Hill. Reinforced Concrete; Part I. Methods of Calculation by A. W. Buel; Part II. Representative Structures, and Part III., Methods of Construction by C. S. Hill. New York, the Engineering News Publishing Company; 1906; 8° (*.235* by .16 by .04); 12+499 p., ill., tables partly folded, diagrams partly folded; cloth, $5.00. This is a simpler work than that of Marsh and Dunn, but quite as authoritative. The work is done by practical working formulas, and examples of representative structures, rather than by theoretical discussion.

Theodore Minot Clarke, F.A.I.A. Building Superintendence. A manual for young architects, students, and others interested in building operations as carried on at the present day. New York, The Macmillan Company, new edition, revised and rewritten; 1903, 8° (*.225* by .15 by .035); 6 + 306 p., ill.; cloth, $3.00. The purpose of this book is well given in its preface. It is a "simple exposition of the ordinary practice of building in this country, with suggestions for supervising such work efficiently." It meets the conditions of ordinary practice satisfactorily.

W. Frank Bower, Member of New Jersey Society of Architects. Specifications, a practical system for writing specifications for buildings. New York, William T. Comstock, second ed., 1898; small fol. (*.3* by *.25* by .015); *2* + *229* + *2* p.; cloth, $5.00. In a subject, which can hardly be brought to any finality, it may be questioned whether a book is the best form in which to present the material. Bower's work is probably as good a codification of general principles as is possible in a book.

Francis Ward Chandler, Professor of Architecture, Massachusetts Institute of Technology, Boston. Construction details prepared for the use of students of the Massachusetts Institute of Technology. Boston, The Heliotype Printing Company, 1892; fol. (*.52* by *.37* by .015); 1 p., *25* pl.; $10.00 in portfolio. This book gives in large scale plates all details of common building; framing, trim, bonds, etc., which are too often left to the mechanics employed. The measurements are given carefully, and the various materials presented in different colors.

Clarence A. Martin, Assistant Professor of Architecture Cornell University. Details of Building Construction. Boston, Bates & Guild Company, 1899; 4to (*.32* by *.25* by .915); 6 p., *32* pl.; cloth, $2.00. Professor Martin's book omits the subject of framing, but otherwise covers essentially the same field as Professor Chandler's work already noted. It is concerned simply with houses and minor public buildings. The plates are in line without color.

William Paul Gerhard: House-draining and Sanitary Plumbing. Twelfth ed., New York, D. Van Nostrand Company, 1907; *231* p., ill.; paper, 50 cents. Mr. Gerhard has published many thorough works on sanitary engineering, but perhaps no one of them is so immediately applicable to the needs of the housebuilder and householder as this compact treatise.

William R. Ware: Modern Perspective, a Treatise upon the Principles and Practice of Plane and Cylindrical Perspective. London and New York, The Macmillan Company, revised ed., 1900; text, 8° (*.22* by .03); 8 + *321* p.; atlas fol. (*.365* by *.3* by .02); *27* pl.; $5.00 unbound. Professor Ware's book treats the subject in the broadest way with full appreciation of its underlying psychology. This makes the book a little complex certainly, but in the end much more satisfactory. The application of perspective to pictorial representation is especially useful.

Henry Kerr McGoodwin, Instructor in Architecture at the University of Pennsylvania. Architectural Shades and Shadows. Boston, Bates & Guild Company, 1904; small fol. (*.32* by *.25* by .015); 118 p., ill., diagrams; cloth, $3.00. After structural conditions are satisfied, architectural design is almost entirely a matter of the disposition of dark and light, the entire array of decorative conventions having been created simply to vary the luminosity of surface. Mr. McGoodwin frankly takes this point of view, and in the selection of problems and their discussion keeps carefully in mind the effect desired. The execution of his illustrations is beautiful.

Architectural Jurisprudence.

John Cassan Wait, M.C.E., LL.B., sometime Assistant Professor of Engineering in Harvard University. Engineering and Architectural Jurisprudence; a presentation of the law of construction for engineers, architects, contractors, builders, public officers, and attorneys at law. New York, John Wiley & Sons, First ed., 1898; 8° (*.23* by .16 by .055); 80 + 905 p.; $6.00 calf. In the last analysis the architect as well as the engineer is a creator of property, and is in contact with the law of property in a complicated way. To meet the situation which arises in practice a special class is forming of practitioners, who understand both law and construction. A leader of these men is Mr. Wait, whose training and practice have been both in law and engineering. Of the books which he has published on his specialty we can mention but one, which is a complete presentation of the American law of building, supported by abundant references to other books, and the citation of all important cases.

Theodore Minot Clarke, Architect, Owner, and Builder before the Law. A summary of American and English decisions on the principal questions relating to building, and the employment of architects, with about eight hundred references, including also practical suggestions in regard to the drawing of building contracts, and forms of contract suited to various circumstances. New York and London, The Macmillan Company, 1905; 8° (*.23* by .17 by .035); *31* + *387* p.; cloth, $3.00. The large amount of legal practice connected in various ways with building in this country seems to call for a special reporting journal similar to the "Architects' Law Reports" in England. Until something of this sort appears, Clarke's book is a good substitute. In many difficulties which arise in practice it will give all the assistance required.

Frank Chouteau Brown: Letters and Lettering, a Treatise with two hundred examples. Boston, Bates & Guild Company, 1902; 8° (*.22* by .15 by .025); 18 + 214 p., ill.; cloth, $2.00. The necessity existing in every architect's office for information about all sorts of lettering has produced this book, which has been done with great thoroughness.

Editorial Comment and Miscellany.

PLATE ILLUSTRATIONS — DESCRIPTION.

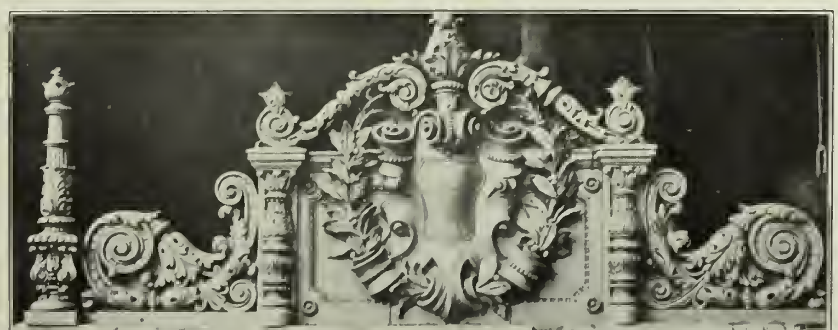
UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. — The situation of West Point on the Hudson River is extremely picturesque and furnishes an admirable location for a national institution of this sort. The monumental character of the buildings present us with an example of modern architecture unsurpassed in the harmonious distribution of the buildings as well as the dignity of style necessary for the proper training of military men. In planning for the needs of this academy, Cram, Goodhue & Ferguson have adhered to the Gothic style as consistently as possible without interfering with the practical requirements of the buildings. The tone of the red brick laid up in Flemish bond is in complete harmony with the ensemble and unites with the buff Indiana limestone trimmings in making an exceptionally artistic effect. Here also is one of those hillside propositions that required a vast amount of terracing similar to the great engineering feat already accomplished at Monte Carlo, France. This terracing has been well executed and extends from the broad artillery planes up to the top of this wild and rocky fastness. The floors of the buildings illustrated are mostly concrete, while the interior walls are of brick, with a wood finish of North Carolina pine. The cost of the buildings varies from 25 to 40 cents per cubic foot.

GROUP FOR A HOSPITAL.
Made by Conkling-Armstrong Terra Cotta Company.
John T. Comes, Architect.

DETAIL BY McKIM, MEAD & WHITE, ARCHITECTS.
Made by Atlantic Terra Cotta Company.

LIBRARY AT WILLOUGHBY, OHIO. — No setting could be more suitable for a small English Gothic library than this site at Willoughby, which faces an old "College Square" with its ancient landmarks still standing on all sides. William Warren Sabin readily grasped the possibilities of such a location and has produced a library which is modern in every respect and at the same time harmonizes perfectly with the old buildings that surround it. The effectiveness of the architecture is enhanced by the result of the half-inch joints being recessed deeply between the rough fire flashed shale brick, which is laid up with a row of headers every third course. The trimmings are of imitation stone which blend in with the tone of the brick facing. The roofing consists of green glazed tiling. The window frames are wood, stained to match the color of the stone. Upon the interior the walls are of sand finished plaster, which material is used also for the ceiling panels formed by plaster beams, all of which are painted in oil. Dark stained oak is used for all the interior trimmings. The radiators for the steam heating system are concealed behind the bookcases. The cost of the building was $12,500.

FAIRMOUNT COLLEGE LIBRARY, WICHITA, KANSAS. — Albert Randolph Ross, appreciating the value of dignity in our college architecture, has placed at the end of a quadrangle which constitutes the main entrance to the college group an adaptation of Roman classical architecture of the Ionic order. The plan is admirably expressed in the exterior treatment, the colonnade across the front indicating the public space upon the interior. Once more we see the effectiveness of a wide joint with a mortar that harmonizes in color with the hard burned light colored buff brick. The buff Indiana limestone is used for trimmings and adds considerably to the complete repose and dignity of the whole structure. Upon the interior we have plaster and stucco walls which are tinted with quiet gray green cold water paint. The floors are of oak with the exception of the public rooms, which are of mosaic. The trimmings are oak stained to harmonize with the tinting of the walls. The entire cost of the building was $40,000, which included furniture, equipment, etc.



DETAIL FOR A RESIDENCE.
Made by Atlantic Terra Cotta Company.
George Oakley Totten, Architect

THE Philadelphia Chapter of the American Institute of Architects at its last regular meeting passed a resolution on the death of Charles Follen McKim, from which the following is quoted:

"The quality of his work combined

to an unusual degree scholarly correctness and profound artistic feeling, with the result that his work, reverently following classical models, was yet imbued with that individuality inseparable from the best architecture."

"His whole influence ran counter to that striving for novelty and ostentation, which in a new and rich country most imperils the right development of its architecture, and acted as a constant stimulus to restraint, refinement, and the study of classical models."

DETAIL FOR SCHOOLHOUSE.
Made by Atlantic Terra Cotta Company.
John W. Donohue, Architect.

THE will of Charles F. McKim provides that a large share of his residuary estate be given either to the American Academy in Rome or to the president and fellows of Harvard University. By the following clause the terms of the gift are stated:

"If said endowment should be completed at the death of my daughter, or if then incomplete, the balance of the said trust I bequeath to the 'American Academy in Rome,' provided that at the death of said daughter the trustees of the Academy shall have in hand, cash, good securities, or in valid cash subscriptions, any portion of the said $1,000,000; but if for any reason the above legacy shall not vest in the Academy, I give and bequeath the balance of the trust to the president and fellows of Harvard University."

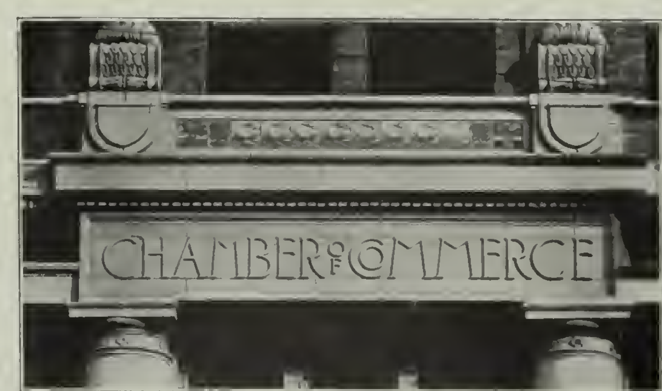
DETAIL BY GEO. F. PELHAM, ARCHITECT.
New York Architectural Terra Cotta Company, Makers.

If the money goes to Harvard, it is understood that a scholarship will be established in the School of Architecture, the student obtaining it to make a special study of Italian, Sicilian, and Grecian architecture. It is the style of these countries with which we associate Mr. McKim's name; and it is fitting that his bequest, in addition to his numerous works, may serve to sustain an active interest in it.

GLENN BROWN has been elected a member of the Avery Library Commission as successor to the late Russell Sturgis. This commission, which is made up of the librarian of Columbia College, the professor of the architectural department of Columbia College, and an architect who is not immediately connected with the college, is empowered by the will of Henry O. Avery to purchase all books for the Avery Architectural Library. In the Avery collection there are between 18,000 and 19,000 volumes. In addition to this, the University Library possesses in its circulating department an indeterminate mass of artistic material which is probably equivalent to 10,000 volumes. Altogether, the University Library contains between 28,000 and 30,000 volumes on various subjects connected with the fine arts — a much larger number than is to be found in any other library in America.

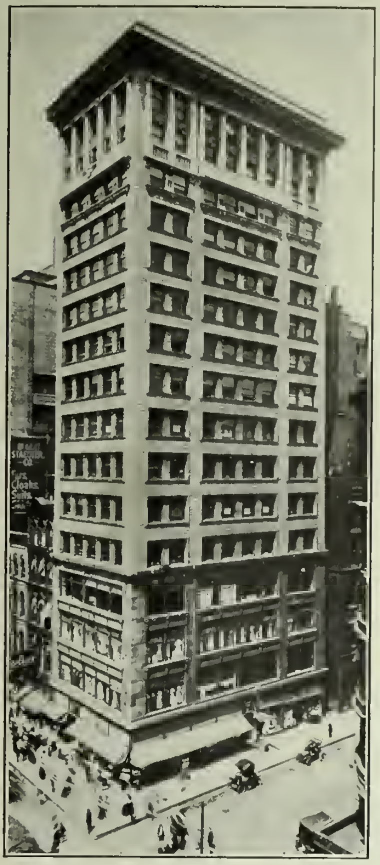
IT IS the understanding that not one of the great office buildings recently erected in New York has failed to return at least four per cent on the investment within two years from the time all the space was ready for tenants. This would seem to be confirmed by building plans for the future on the part of large interests, notably the Vanderbilts and the Pennsylvania Railroad, both of whom intend to improve the space they have available in the heart of New York.

MR. J. P. MORGAN'S effort to buy the famous Corte Reale at Mantua has been frustrated by the operation of the Italian law forbidding the sale of works of art. The building, formerly known as the Reggia is justly valued by the Italians as one of the most interesting royal residences in all Europe. It dates from 1302 and has played a conspicuous part in Italian history. Here the Gonzagas held court and Isabella d' Este lived. The palace has six hundred rooms. Miss Morgan, the financier's daughter, who is familiar with Italy and its history and art, urged her father to buy the palace; but his offer of $5,000,000 for it was made in vain.



DETAIL OVER ENTRANCE TO CHAMBER OF COMMERCE, BIRMINGHAM, ALA.
Executed in Faience by Hartford Faience Company.
Warren & Welton, Architects.

WHILE guests on Sir Thomas Lipton's yacht several years ago, Marie Corelli, the novelist, proposed to Edward Morris of Chicago, that the house built in Stratford in the sixteenth century by



MENTOR BUILDING, CHICAGO.
Built of brick made by Ohio Mining & Manufacturing Company. Thomas Moulding Company, Chicago Agents.
Howard Shaw, Architect.

Alderman Thomas Rogers, the father-in-law of John Harvard, and in which Harvard lived, should be rescued and preserved. It was then for sale and likely to be demolished. Mr. Morris was quick to act and purchased the property. Sir Thomas and Miss Corelli were named as trustees, the latter supervising the restoration of the building to its original state. Mr. Morris has presented the house to Harvard University and the dedication exercises were held October 6th.

IN THE reconstruction of the Parker Building, New York City, which was burned last year, the architect has specified 12 inch hollow terra cotta blocks for the floor arches. They are to be laid so that they will cover the bottom surfaces of beams and girders, protecting the metal members by 2 inches of fireproof material. The columns will have as protection a 3 inch thickness of hard burned terra cotta, joined together by Portland cement mortar. This covering will insulate the material from the fiercest heat capable of being generated in the building. The elevator shafts and stairways are to be enclosed in such a manner that, if a fire starts, it will not be able to spread from one floor to another, but will be confined to the level of its origin. In every detail the architect has planned to make the new structure absolutely fireproof.

MEASUREMENTS of the Greek Theater at Taormina, Italy, the auditorium referred to in ancient history and famous the world over because of its perfect acoustic properties, have been made by J. E. O. Pridmore, architect, Chicago. As the ruins are reported to have been completely demolished by the earthquake of December 28th, Mr. Pridmore probably has the only measurements in existence. He believes he will find the key to the wonderful acoustic properties of the theater and is confident that when he has made his diagrams he will discover a secret of construction that will be invaluable in the future building of American auditoriums.

McCORMICK BUILDING, CHICAGO.
Built of brick made by Columbus Brick & Terra Cotta Company.
Holabird & Roche, Architects.

TAPESTRY BRICKWORK.

THIS is the title of a new booklet which has just been published by Fiske & Co., New York and Boston. Needless to say, it is devoted in part to the possibilities which may be obtained structurally and esthetically by the use of "Tapestry Brick," of which they are the sole manufacturers. A goodly portion of the work, however, is given over to a presentation of some of the most charming brickwork which is to be found in the world — and brick as a building material is discussed by Claude Bragdon in his own inimitable way. The work is further embellished by eight colored plates, which, if not mechanically perfect, are as nearly so as the present standard of color work permits.

METHODIST CHURCH, NEW ORLEANS.
Built of Hydraulic-Press Brick
Diboll & Owen, Architects.

CONVENTIONS OF THE AMERICAN INSTITUTE OF ARCHITECTS AND THE ARCHITECTURAL LEAGUE OF AMERICA.

THE annual convention of the Architectural League of America will be

DETAIL BY SCHWARTZ & GROSS, ARCHITECTS.
Made by New Jersey Terra Cotta Company.

held in Washington, December 11th, 13th, and 14th. The convention of the American Institute of Architects will be held in Washington, December 14th, 15th, and 16th. The object in holding the two conventions at approximately the same time is that certain educational matters of importance to the profession may be given full consideration, and that some definite steps may be taken to bring about a more uniform and harmonious course of action on the part of the two bodies.

IN GENERAL.

At the annual meeting held Oct. 11, 1909, the following officers were elected by the Philadelphia Chapter, A. I. A.: President, William D. Hewitt; first vice-president, John Hall Rankin; second vice-president, Milton B. Medary; treasurer, C. L. Borie, Jr.; secretary, Arnold H. Moses; librarian, J. P. B. Sinkler.

Marcus R. Burrowes, architect, has opened offices in the Trussed Concrete Building, Detroit, Michigan. Manufacturers' catalogues and samples desired.

DETAIL BY HENRY LOOMIS CURTIS, ARCHITECT.
Executed in polychrome terra cotta by O. W. Ketcham Terra Cotta Company.

Warren & Welton of Birmingham, Ala., were associated with Carpenter & Blair as architects for the Empire Building of Atlanta, which was illustrated in The Brickbuilder for September.

What is probably the finest appointed country house in the middle west, or anywhere beyond the New York district, is the palace at Lake Forest into which J. Ogden Armour is about to move. About four rooms out of the one hundred or more have been fitted up under haste orders to make the owner comfortable.

DETAIL BY SOUTH AMBOY TERRA COTTA COMPANY.

The new $1,500,000 administration building of the Chicago Board of Education, and which Architect Dwight Perkins is designing, is to have eighteen stories instead of fourteen and is to be located on the lake front at the north end of Grant Park, if the consent of the municipal authorities can be obtained.

The New Jersey Terra Cotta Company of New York will supply the architectural terra cotta for the following buildings: Tilden Building, New York City, D'Oench & Yost, architects; Department Store, Charlotte, N. C., Wheeler & Stern, architects; High School, Lynn, Mass., Penn Varney, architect; New Residence on Riverside Drive, New York City, Schwartz & Gross, architects.

George W. Hellmuth and Louis C. Spiering, architects, St. Louis, announce the dissolution of the firm of Hellmuth & Spiering. Mr. Hellmuth has taken offices in the Chemical Building, while Mr. Spiering has located in the Liggett Building.

The firm of Whitfield & King, architects, New York City, has been dissolved. Henry D. Whitfield has taken offices at 160 Fifth Avenue. Gurdon S. Parker will be associated with Mr. Whitfield. Beverly S. King announces his association with Harry Leslie Walker, under the firm name of King & Walker, with offices in the Terminal Building, New York City, and the Studio Building, Atlanta, Ga.

Arnold & Punchard, Boston, were the landscape architects for the garden for H. S. Shaw, Esq., Milton, Mass., illustrated on Plate 107 of The Brickbuilder for September.

DETAIL FOR HOTEL.
Made by Northwestern Terra Cotta Company.
Toledano & Wogan, Architects.

The Harris Trust and Savings Bank will shortly have a permanent home on Monroe street, Chicago. The nineteen floors above the bank in the new building to be erected will contain offices, and the structure will represent an investment of $2,500,000.

At the suggestion of Mr. James Rush Marshall, architect, the engineering department of the City of Washington has acquired a new English publication entitled "Town Planning," which Mr. Marshall says is "the first of its kind of any consequence in the English language."

The new plant of the Bradford Pressed Brick Company, at Bradford, Pa., which produces a wire cut impervious red brick, has a

APARTMENT BUILDING, CHICAGO.
Faced with wire cut dark red brick, made by Western Brick Company.
H. R. Wilson, Architect.

daily capacity of 70,000. 2,000,000 of these brick were shipped on order during the month of September.

Sayre & Fisher Company supplied most of the brick used in the West Point Buildings which are illustrated in this number of THE BRICKBUILDER.

The exterior brick used in many of the houses for the Girard Estate were furnished by Fiske & Co. Inc. Illustrations of these buildings are to be found in this issue of THE BRICKBUILDER.

DETAIL BY LONG & LONG, ARCHITECTS.
Made by American Terra Cotta & Ceramic Company.

NEW BOOK

Structural Details or Elements of Design in Heavy Framing. By Henry S. Jacoby, Professor of Bridge Engineering in Cornell University. 8vo, ix + 368 pages, profusely illustrated with figures in the text, 6 folding plates, and 34 full page illustrations. Cloth, $2.25 net. New York, John Wiley & Sons.

CULINARY DEPARTMENT, WARM STORAGE ROOM, PLAZA HOTEL, NEW YORK CITY.
Finished in enamel brick, made by American Enameled Brick and Tile Company.

COMPETITION FOR A PUBLIC BATH AND GYMNASIUM BUILDING.

FIRST PRIZE, $500. SECOND PRIZE, $200. THIRD PRIZE, $100.

COMPETITION CLOSES JANUARY 17, 1910.

PROGRAM.

THE problem is a Public Bath and Gymnasium Building. The location may be assumed in any American city of about 50,000 inhabitants, or some section in a larger city. Competitors may choose between two sites, one at the corner of two intersecting streets, or one in the middle of a block. Both lots are ample in size to accommodate the building and are practically level.

In plan the building may be rectangular (block): or of the pavilion type, having a central motive and two wings, with the longitudinal axis parallel to the street.

The plan should provide for the following: —

IF OF THE BLOCK TYPE: —

In the basement: a swimming pool, six showers, a suitable number of lockers, dressing rooms and benches, toilet rooms, supply rooms, a small laundry for washing and drying, heating plant, and coal storage.

On the first floor: general waiting room, administration offices, at least fifty showers (forty with individual dressing rooms, and ten arranged in groups), lockers, dressing benches, toilet rooms, etc.

On the second floor, which may extend approximately two stories: a gymnasium, six showers, four sponge baths, a rubbing table, lockers, dressing rooms, benches, instructors' and medical attendants' rooms.

IF OF THE PAVILION TYPE: —

In the central part of the building: first floor to provide for a reception room and administrative offices. Second floor to provide a hall for lectures and other entertainments.

In one wing: a gymnasium with the same accommodations as recommended for the block type.

In the other wing: a swimming pool, the shower baths, and other features suggested for the block type.

GENERAL: —

In connection with the gymnasium a running track should be provided which will have not more than twenty-four laps to the mile. Other gymnasium apparatus need not be indicated.

Competitors are free to add any additional features to the plan and equipment which may seem desirable.

The exterior of the building is to be designed entirely in architectural terra cotta, employing color treatment in at least portions of the walls. It is suggested that large blank surfaces of gymnasium walls afford an excellent opportunity for design in terra cotta.

The following points will be considered in judging the designs: —

A. Rational and artistic treatment of the exterior.
B. Frank and logical expression of the prescribed material.
C. Excellence of plan.

It must be borne in mind that one of the chief objects of this competition is to encourage the study of the use of architectural terra cotta. There is no limitation of cost, but the designs must be suitable for the character of the building and for the material in which it is to be executed.

In awarding the prizes the intelligence shown in the constructive use of architectural terra cotta and the development or modification of style, by reason of the material, will be taken largely into consideration.

DRAWINGS REQUIRED.

On one sheet, at the top, the front elevation drawn at a scale of 8 feet to the inch. On the same sheet, below the front elevation, the floor plans drawn at a scale of 16 feet to the inch.

On a second sheet, at the top, the elevation of secondary importance drawn at a scale of 16 feet to the inch; immediately below half inch scale details of the most interesting features of the design. The details should indicate in a general manner the jointing of the terra cotta and the sizes of the blocks. The color scheme is to be indicated either by a key or a series of notes printed on the same sheet with the secondary elevation and details, at a size which will permit of two thirds reduction.

The size of each sheet (there are to be but two) shall be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets, one inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are not to be mounted.

All drawings are to be in black ink, without wash or color, except that the walls on the plans and in the sections may be blacked-in or cross-hatched.

Graphic scales to be on all drawings.

Every set of drawings is to be signed by a *nom de plume*, or device, and accompanying 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.

The drawings are to be delivered flat at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., charges prepaid, on or before January 17, 1910.

Drawings submitted in this competition must be at owner's risk from the time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned may have them by enclosing in the sealed envelopes containing their names, ten cents in stamps, if on cardboard twenty-five cents in stamps.

The designs will be judged by three or five well-known members of the architectural profession.

For the design placed first in this competition there will be given a prize of $500.

For the design placed second a prize of $200.

For the design placed third a prize of $100.

There have been published in THE BRICKBUILDER from time to time articles treating of the Public Bath and the Gymnasium, also illustrations of both types of buildings. This data, which may be of assistance to those who intend to enter this competition, will be found in the following issues: —

1909. February, March, April, May, June.
1908. February, March, April, May, June, August, November.

We are enabled to offer prizes of the above-mentioned amounts largely through the liberality of the terra cotta manufacturers who are represented in the advertising columns of THE BRICKBUILDER.

This competition is open to everyone.

THE BRICKBUILDER

VOLUME XVIII NOVEMBER 1909 NUMBER 11

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

COOLIDGE & CARLSON; CRAM, GOODHUE & FERGUSON; MARSH & PETER; NEWMAN & HARRIS; DWIGHT H. PERKINS; CHARLES F. SCHWEINFURTH; WHEELWRIGHT & HAVEN.

LETTERPRESS

THE TEMPLE OF VESTA AND THE TEMPLE OF THE TIBURTINE SIBYL, AT TIVOLI, NEAR ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

The small round temple of Vesta stands on the edge of the ravine, through which dash the waters of the Anio, forming the falls at Tivoli. It is seven yards in diameter and was surrounded by an open corridor of eighteen Corinthian columns (18 feet in height), of which ten remain. The temple dates from the time of Augustus, the best period of Roman art. Close by, shown on the right of Piranesi's engraving, is the temple of the Tiburtine Sibyl. It was long dedicated to St. George and used as a church, its Ionic columns being built into the walls. In 1885 some of the later supplementary buildings were removed and the church restored to its ancient form.

THE BRICKBVILDER

VOL. 18 NO. 11 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· NOVEMBER 1909

Two New Schoolhouses, Boston.

THE object of this article is to describe the most recent methods of the Boston Schoolhouse Commission, particularly as shown in the two new elementary schools — the Nathan Hale, a primary school, and the Bishop Cheverus, a grammar school. The problem of comfortably and properly housing, in the midst of the confusion and congestion of a large city, an army of one hundred thousand school children, is an elaborate one, but it may be conveniently classified for discussion under the following heads:

1. To accommodate the standard class of forty-four pupils, in a room as compact and economical as is consistent with the comfort and health of the inmates.

2. To give the pupils clean wholesome air, unvarying in temperature, and, if possible, in humidity.

3. To provide the rooms in which they work with abundant daylight, so directed as to favor to the utmost the eyes of the pupils.

4. To provide further a similar artificial illumination for night work.

5. To introduce into each room a certain amount of sunshine, as this has been proven essential to the best health and happiness of the children.

6. To furnish each pupil with a desk and chair especially adapted to the individual physique.

7. To encourage under proper conditions the spirit of play, indoors and out, by playgrounds and play rooms.

8. To provide clean and abundant toilets, wash rooms, and coat rooms.

9. To provide a nurse's room for the better care of children who are ill, or uncleanly in their habits.

10. To equip the building with every device needed to accomplish an easy and prompt administration of the school; including clock, bell, and telephone systems, fire exits, offices, and storerooms.

11. To provide an assembly hall for general exercises.

12. To give the children a building which will offer every reasonable discouragement to dirt and dampness; which will be cheerful, not easily marred or injured, safe from fire, and beautiful enough to lead the pupils' taste rather upward than downward; and to do all this with that rigid economy of the public funds which the citizens have a right to demand of their servants, the commissioners.

Let us examine in some detail the above summary of requirements for the two schools under discussion.

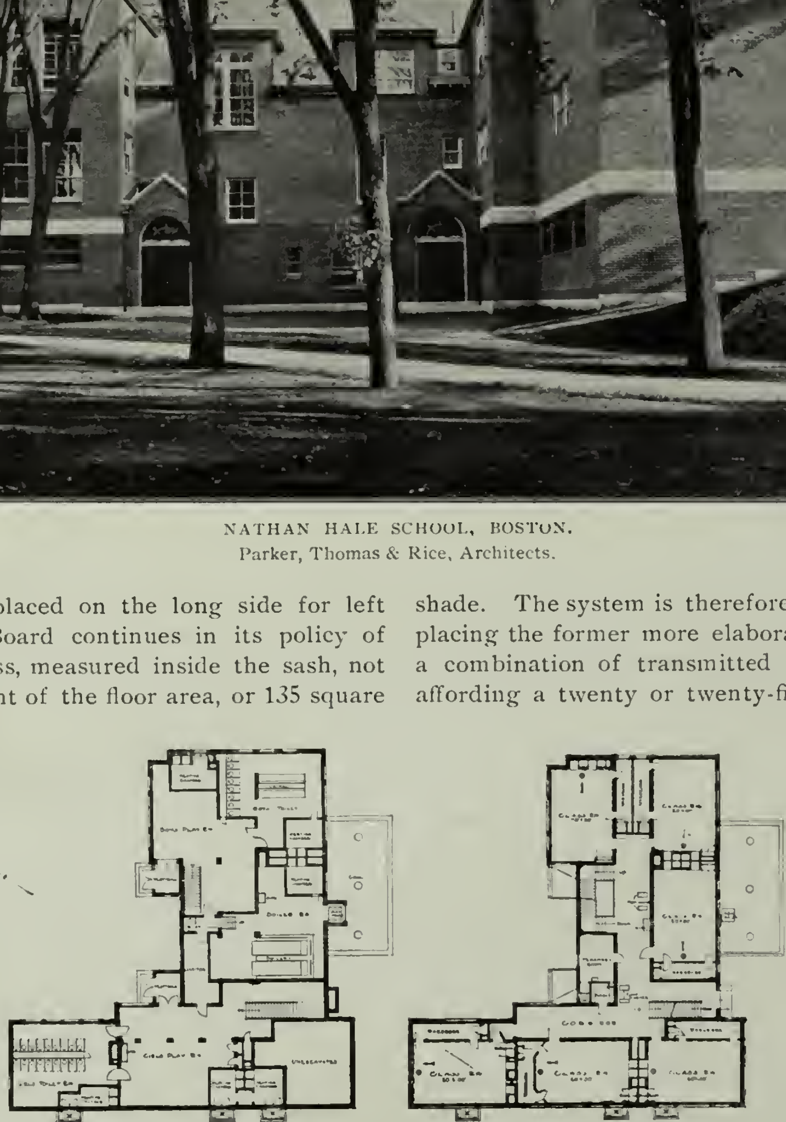
1. The size of the standard class room, seating forty-four pupils (formerly fifty-six) has been reduced from 24 feet by 30 feet by 13 feet (in height) for primary, and 26 feet by 32 feet by 13 feet for grammar, to 23 feet by 29 feet by 12 feet for all elementary grades. This reduction in the class room unit results in more material and labor per cubic foot, inasmuch as the walls, floor, and ceiling, which contain the labor and materials, decrease directly as the dimensions of the room, while the cube decreases as the square of the dimensions. This would indicate a higher cost per cubic foot, other conditions being the same. It is, therefore, surprising and gratifying to note that both of the two new schools, built under the above conditions, the Nathan Hale, a small building of twelve rooms, and the Bishop Cheverus, of sixteen rooms, cost but eighteen cents per cubic foot, an unprecedentedly low figure. The Nathan Hale cost $67,320, with a cube of 362,000, and the Bishop Cheverus $102,937, with a cube of 540,000. The cost per pupil in the Bishop Cheverus, $160.84, is far below the average, $197.13, while that in the Nathan Hale, $140.26, is the lowest but one on record, where the average (lower elementary) is $162.83.

2. The problem of heating and ventilation has become a more and more complex one. The department has recently adopted the more economical policy of doing its own engineering work, instead of employing for this work outside domestic engineers. There has been a systematic effort to get rid of the galvanized iron ducts by using concrete trenches under the basement floor both for fresh and tempered air, and building the vertical ducts of brick, pointed on the inside, or keystone blocks made smooth on one side. This reduces the cost by a considerable amount, and simplifies the construction, making less demand for repairs and renewals. Brick flues have been used for both the new schools. Both are also equipped with the gravity system of indirect heat, low pressure, gravity return, with supplementary coils at the bases of the vertical ducts. Motor driven fans are added for the cooking and manual training rooms in the Bishop Cheverus. The above system has been adopted generally as the most satisfactory for the smaller schools. The temperature of the air entering the class rooms is controlled by hand-mixing dampers, operated by the teachers. Each occupant of the room is provided with 30 cubic feet of air a minute, the amount required by the state law.

Experiments are being carried on to discover a practical method of maintaining a constant degree of humidity in the air. No system yet devised has given results sufficiently good to warrant the expenditure necessary to install it.

NATHAN HALE SCHOOL, BOSTON.
Parker, Thomas & Rice, Architects.

3. The windows are placed on the long side for left hand lighting. The Board continues in its policy of making the area of glass, measured inside the sash, not less than twenty per cent of the floor area, or 135 square feet for a room 23 feet deep. If the outside light is obstructed by neighboring buildings this allowance should be increased. The window head is always built square, and kept close to the ceiling, as the top light is the most efficient. The decrease in the height of window, owing to the one foot drop in the ceiling, is offset by the decrease in floor area, so that the proportion of window to wall is but little changed.



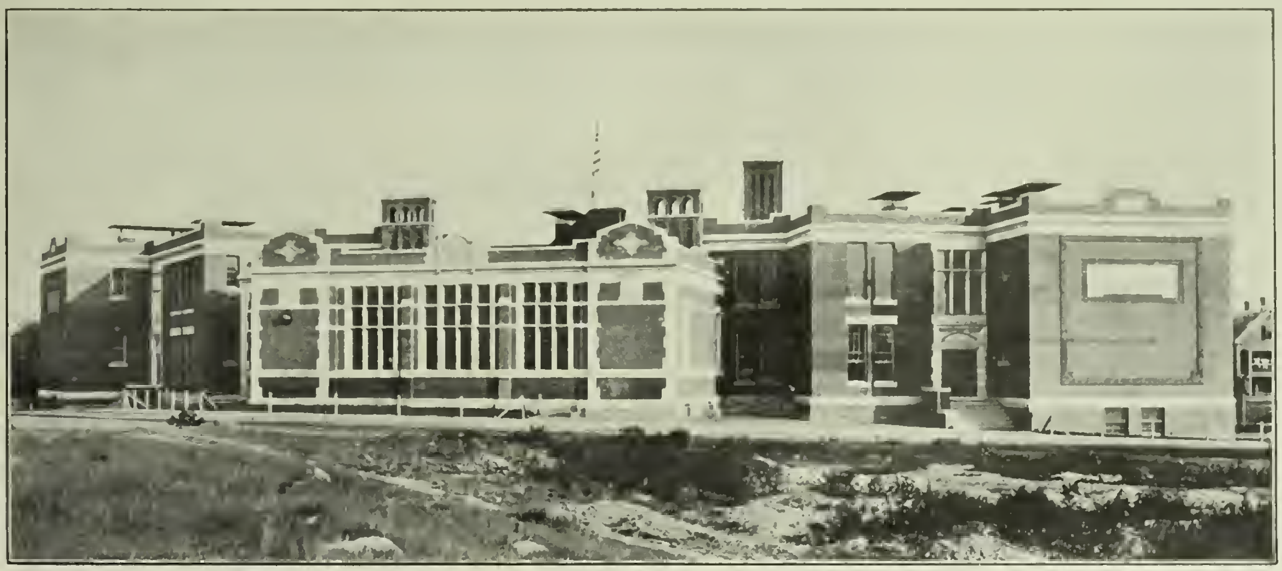
BASEMENT PLAN. FIRST FLOOR PLAN.

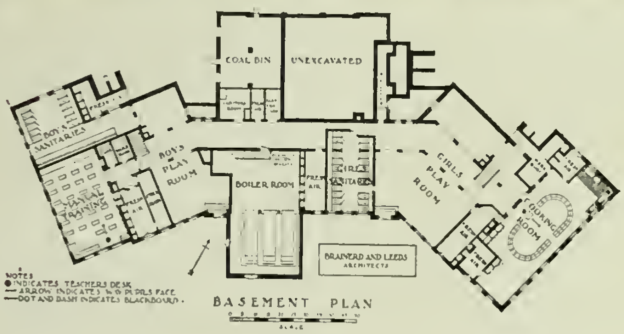
NATHAN HALE SCHOOL.

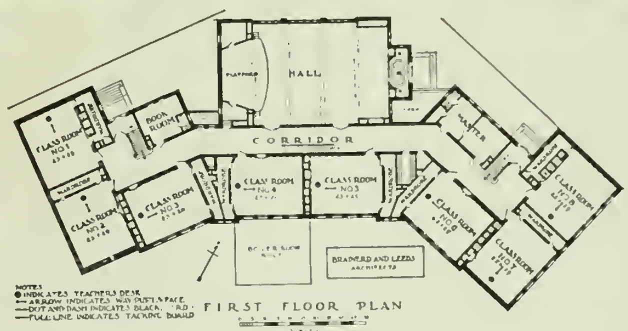
4. The rapidly growing need for night schools requires a complete equipment for artificial light in the class rooms. The number of outlets in each room has been reduced from nine to six in the Bishop Cheverus, and five, in the Nathan Hale. The fixture is a simple chain or stem pendant, with a 60 watt Tungsten or 100 watt G. E. M. lamp, and an acid etched holophane shade. The system is therefore one of direct light, replacing the former more elaborate fixtures designed for a combination of transmitted and reflected light, and affording a twenty or twenty-five per cent gain in the efficiency per watt to offset the reduction in the number of outlets. The change from reflected and transmitted to direct light has been the outcome of experiments which appear to demonstrate that direct light from above and slightly to the left of the pupil (accomplished by placing the lights forward and off center of the room toward the window wall), has two advantages over the former system. It utilizes a larger per cent of the light; and it affords some shadow, and in such a direction as distinctly to aid the unconscious sense of location of the pupil. It appears also to be a more cheerful light, and it is only for special cases, where drafting rooms require the most careful adjustment, that the Board now uses indirect light.

5. The selection of the lot and the planning of the

building are influenced as much by the requirement of sunshine in every class room as by any other considera-tion. It means lining up the class rooms on the east, Bishop Cheverus with an open U. Such a requirement makes a compact and symmetrical plan impossible. Nevertheless, the case of the Nathan Hale school is of







BISHOP CHEVERUS SCHOOL, BOSTON.
Brainerd & Leeds, Architects.

south, and west exposures, and running the corridor along the northern outside wall. To accomplish this the Nathan Hale school is designed with an L plan and the marked interest. The site is on a hill, and has a commanding ledge of Roxbury pudding-stone on the southern portion. The first floor is practically at the grade of the top of the ledge, with the entrance and playground on the inside of the L at the lower grade. This plan has worked out satisfactorily, and, notwithstanding the blasting necessary, the figures show the building to be an especially economical one.

6. To favor every weakness of physique, and make the pupil as comfortable as is possible, every chair-back is adjustable, as well as every desk. The patterns of casting used for these fixtures have been reduced to great simplicity and durability, but the benefit of the adjustable furniture will always depend largely upon the faithfulness with which it is used.

7. On the sunny side of the building are the play courts, paved with brick, planted with trees, where possible, and often affording the only suitable playing space in the neighborhood. The Board endeavors to obtain a lot which will contain about 35 square feet of vacant ground per pupil, the greater part of which is used for these playgrounds. The school basement contains two large play rooms, one for boys, one for girls. These are finished with granolithic floor, painted brick walls, and whitened ceiling, and are practically proof against injury.

8. The toilet accommodation has been cut from three closets per class room, two for girls, and one for boys, to 2.25, 1.5 for girls, .75 for boys, and from 36 inches of urinal to 33. The play rooms are equipped with slate sinks as formerly.

The fixtures consist in the wash-down closet with large local vent, and sealed and connection between earthenware and iron; and the slate range-urinal, flushed with water from a perforated pipe. In the Nathan Hale school the closets are flushed periodically by an automatic arrangement.

The wash sinks are placed in the play rooms, and additional sinks for drinking are provided in the corridors on all floors.

The wardrobes open off the class rooms, and are built with granolithic floors and base, painted burlap wainscot, and special heat and ventilation. The principle in the arrangement of the wardrobes has remained the same for several years.

9. The nurse's room is a recent and important factor in the school régime. It is designed along the lines of a modern hospital room, terrazzo floor, tiled wainscot, special device for shampooing and bath, if required, toilet, medical cabinet, gas stove, etc.

10. The administration has always been highly efficient. Every room is provided with a secondary clock, run from a master clock in the principal's office. In the primary schools, push buttons control the signal bells; in the higher schools they are operated automatically by master clocks, according to a prearranged program. There is a single center telephone system connecting all the rooms with the master's or his assistant's office.

11. The assembly hall has furnished almost the only opportunity for the display of any design. In the Bishop Cheverus school it is made the feature of the building, yet without extravagance. The floor is linoleum, and very quiet. The walls for 10 or 12 feet are painted burlap, capped with a small wood cornice, with tinted plaster above, and a heavily beamed plaster ceiling. The proscenium arch is modeled in plaster and is rich without being costly. The principal beauty of the room lies in the windows, which are leaded glass in stone mullions. Each window bears a group of stained glass shields, all together making a complete series of the coats-of-arms of the several states of the Union. The hall is on the ground floor, with independent exit directly to the street. Although this is highly desirable, it has been found possible only in this school and the Thomas Gardner. The hall is equipped for stereopticon work, and for the use of the reflectoscope. Common settees are being used for seating.

12. Throughout the design of the buildings the most careful consideration is given the use of materials and forms, in order to avoid dirt. The result has been the elimination of elaborate moldings in wood or plaster finish, and the universal adoption of the hospital base in its various forms, wood for wood floors, terrazzo for terrazzo floors, and cement for linoleum and granolithic floors. The Bishop Cheverus school has a cement "baseboard" as well as curved angle, in connection with granolithic floors.

To protect the building from dust the windows are all fitted with a metal weatherstrip. The cost of repairs is reduced to a minimum by constructing the sash of small panes and protecting the windows on the playgrounds with wire grilles. The wood finish is left natural, except for treatment with raw linseed-oil, rubbed in. This does not completely fill the pores and leaves a surface easily soiled, and apt to catch dust. It would seem that some better surface must soon be discovered.

The class room walls have painted burlap dadoes (with tinted plaster above) and can easily be washed. In the Bishop Cheverus school the same material is placed on the corridor walls, with good effect. The Nathan Hale corridors are common brick, painted a glaring white, and though irreproachably clean, present to the eye a rather barren and uninviting aspect. Salt-glazed brick gave promise of fulfilling the requirements but was found not to be economical. Here there has been an obvious difficulty in reconciling the practical to the esthetic; a process which can well be postponed until most of the vital practical questions have been settled one way or the other.

To safeguard the children against fire the most careful planning has been followed out. All doors from the building open out. Wardrobe doors are double swung. The children's entrances are always to the basement and are independent of but convenient to the staircases up. The main entrance or entrances are free of the staircases. The staircase leads to the basement, making basement entrances as well as the others available. The buildings are entirely fireproof, and the clearest approach to the stairs is considered the best. The use of metal doors for class rooms is being considered. This would make these rooms safe even if the corridors were filled with smoke. The heating plant is always isolated in the basement. In the Bishop Cheverus school it is in a low wing by itself.

A considerable saving has been made by building the roof frame of wood instead of steel or concrete. The roof is considered as practically isolated from the rest of the building, and as a recent decision of the Law Department has made this interpretation of the Building Law possible, the Board has been glad to adopt the above mentioned policy of economy.

The esthetic side of the school buildings, as already hinted, must await the crystallization of practical forms. A general style of Tudor design in brick and stone seems to be the predominant school exterior, and many beautiful compositions have resulted. In spite of the almost complete absence of stone trimmings from the Nathan Hale school, in spite of the rigid simplicity throughout, the design is distinctly excellent. The charm of the Bishop Cheverus assembly hall has already been touched upon.

In summing up, it is plainly visible that steady progress is being made towards providing ideal accommodation for the city's school children, progress not only on the scientific and engineering side, but even in the direction of more beautiful structures.

Three New Schoolhouses, Chicago.

DWIGHT H. PERKINS, ARCHITECT.

BERNHARD MOOS SCHOOL. In planning the Bernhard Moos School ample provision was made for playgrounds. The building was located so that two large recreation spaces were arranged in front, upon which the older students are privileged, while two more were fitted up in the rear for the smaller pupils. Adjoining the playgrounds in the rear of the school will be a number of carefully planned vegetable gardens. Encircling the ensemble will be rows of shrubbery and trees which will in time furnish protection as well as shade.

The exterior of the building is treated with a dark brown vitrified brick, which has a dull glaze, and trimmed with a terra cotta that matches the color of the brick. The planning has been carefully studied so as to meet future contingencies. The central portion of the present building contains an assembly hall, a gymnasium, heating apparatus, and toilets which will provide for future increase of class rooms,—twenty-six additional rooms being contemplated.

There are three stories and a basement, the floors of which are connected by iron stairs with asphalt treads. The stairs are wide and furnish excellent avenues for escape in case of fire, especially when the pupils are drilled to make a hasty and orderly exit. In addition to the stairways, at the opposite ends of the building, there is a flight leading from the ground level to the main floor of the assembly hall, which is located in the center of the schoolhouse. The second floor contains nine class rooms having maple floors, burlap wainscoting, and slate blackboards. The gallery of the assembly hall opens into the main corridor of this floor. The same number of class rooms similarly furnished are found on the third floor, while the remaining space is given up to a gymnasium, which is located over the assembly hall.

The interior finish is somewhat similar to the rest of the recently built Chicago schoolhouses, having all the corridor floors of asphalt. The entire basement, with the exception of the manual training and domestic science departments, is furnished with a concrete flooring.

The cubical contents of the building are 1,291,022 cubic feet, while the entire cost amounts to $205,000, making 15.87 cents per cubic foot.

ALBERT G. LANE TECHNICAL HIGH SCHOOL. This is one of the largest and best equipped technical institutions in the world. The exterior has been designed with two ideas in view, simplicity in character and a provision for the maximum amount of light. The exterior is a frank expression of the interior, which has been planned to facilitate the work necessary in accommodating eighteen hundred pupils. Plenty of playground surrounds the building, which affords a suitable setting for the mass of purplish brown brick that is tied together with harmonious trimmings of stone.

The division of instruction consists of four periods, three of which are in the daytime and one in the evening. From the plans we can see how the space has been allotted so as to have the various trades arranged by themselves and still closely allied to each other. In this way little time is lost by the scholars and such economy is necessary where so many pupils are accommodated in such a short part of each day.

The ground floor contains locker rooms, machine shop, woodworking, foundry, forge, pattern, wood-turning, and electric construction shops with lecture and testing rooms; also the power plant, generator, boiler and coal rooms. The shops contain four hundred benches, the laboratories are equipped with two hundred and twenty tables, while the drawing and drafting rooms have three hundred tables. The shops have a working capacity of four hundred pupils during one period, and a working unit of twenty-four, which is one half the unit of the other departments. Provision has been made for sufficient light and ventilation, as each shop has a skylight in addition to the side windows. The fresh air is distributed throughout the laboratories and shops by means of forced ventilation, which supplies also the class rooms and other parts of the building.

On the first floor are the principal's main and private offices, a museum, botanical and physiographical laboratories, a commercial department, and thirteen class rooms. Here also is the study room assembly hall. This hall has a seating capacity of nine hundred, accommodating five hundred on the main floor, while the remaining four hundred are in the balcony on the second floor. The seats on the first floor are constructed to serve as desks during the day sessions, and when lectures are to be held they can be easily lowered out of the way and replaced by extra portable chairs.

The second floor shows chemical laboratories, dark rooms, balance rooms, private laboratories, and lecture rooms. The lecture rooms are supplied with opaque shades at the windows, which permit of darkening for the use of the stereopticon. There are also on this floor drawing departments which comprise mechanical draftsmanship, architecture, and free-hand, all of which have easy access to the printing rooms located on the roof. Besides the six class rooms there is a library which contains over five thousand volumes. The corridor on this floor top of the ledge, with the entrance and playground on the inside of the L at the lower grade. This plan has worked out satisfactorily, and, notwithstanding the blasting necessary, the figures show the building to be an especially economical one.

6. To favor every weakness of physique, and make the pupil as comfortable as is possible, every chair-back is adjustable, as well as every desk. The patterns of casting used for these fixtures have been reduced to great simplicity and durability, but the benefit of the adjustable furniture will always depend largely upon the faithfulness with which it is used.

7. On the sunny side of the building are the play courts, paved with brick, planted with trees, where possible, and often affording the only suitable playing space in the neighborhood. The Board endeavors to obtain a lot which will contain about 35 square feet of vacant ground per pupil, the greater part of which is used for these playgrounds. The school basement contains two large play rooms, one for boys, one for girls. These are finished with granolithic floor, painted brick walls, and whitened ceiling, and are practically proof against injury.

8. The toilet accommodation has been cut from three closets per class room, two for girls, and one for boys, to 2.25, 1.5 for girls, .75 for boys, and from 36 inches of urinal to 33. The play rooms are equipped with slate sinks as formerly.

The fixtures consist in the wash-down closet with large local vent, and sealed and connection between earthenware and iron; and the slate range-urinal, flushed with water from a perforated pipe. In the Nathan Hale school the closets are flushed periodically by an automatic arrangement.

The wash sinks are placed in the play rooms, and additional sinks for drinking are provided in the corridors on all floors.

The wardrobes open off the class rooms, and are built with granolithic floors and base, painted burlap wainscot, and special heat and ventilation. The principle in the arrangement of the wardrobes has remained the same for several years.

9. The nurse's room is a recent and important factor in the school régime. It is designed along the lines of a modern hospital room, terrazzo floor, tiled wainscot, special device for shampooing and bath, if required, toilet, medical cabinet, gas stove, etc.

10. The administration has always been highly efficient. Every room is provided with a secondary clock, run from a master clock in the principal's office. In the primary schools, push buttons control the signal bells; in the higher schools they are operated automatically by master clocks, according to a prearranged program. There is a single center telephone system connecting all the rooms with the master's or his assistant's office.

11. The assembly hall has furnished almost the only opportunity for the display of any design. In the Bishop Cheverus school it is made the feature of the building, yet without extravagance. The floor is linoleum, and very quiet. The walls for 10 or 12 feet are painted burlap, capped with a small wood cornice, with tinted plaster above, and a heavily beamed plaster ceiling. The proscenium arch is modeled in plaster and is rich without being costly. The principal beauty of the room lies in the windows, which are leaded glass in stone mullions. Each window bears a group of stained glass shields, all together making a complete series of the coats-of-arms of the several states of the Union. The hall is on the ground floor, with independent exit directly to the street. Although this is highly desirable, it has been found possible only in this school and the Thomas Gardner. The hall is equipped for stereopticon work, and for the use of the reflectoscope. Common settees are being used for seating.

12. Throughout the design of the buildings the most careful consideration is given the use of materials and forms, in order to avoid dirt. The result has been the elimination of elaborate moldings in wood or plaster finish, and the universal adoption of the hospital base in its various forms, wood for wood floors, terrazzo for terrazzo floors, and cement for linoleum and granolithic floors. The Bishop Cheverus school has a cement "baseboard" as well as curved angle, in connection with granolithic floors.

To protect the building from dust the windows are all fitted with a metal weatherstrip. The cost of repairs is reduced to a minimum by constructing the sash of small panes and protecting the windows on the playgrounds with wire grilles. The wood finish is left natural, except for treatment with raw linseed-oil, rubbed in. This does not completely fill the pores and leaves a surface easily soiled, and apt to catch dust. It would seem that some better surface must soon be discovered.

The class room walls have painted burlap dadoes (with tinted plaster above) and can easily be washed. In the Bishop Cheverus school the same material is placed on the corridor walls, with good effect. The Nathan Hale corridors are common brick, painted a glaring white, and though irreproachably clean, present to the eye a rather barren and uninviting aspect. Salt-glazed brick gave promise of fulfilling the requirements but was found not to be economical. Here there has been an obvious difficulty in reconciling the practical to the esthetic; a process which can well be postponed until most of the vital practical questions have been settled one way or the other.

To safeguard the children against fire the most careful planning has been followed out. All doors from the building open out. Wardrobe doors are double swung. The children's entrances are always to the basement and are independent of but convenient to the staircases up. The main entrance or entrances are free of the staircases. The staircase leads to the basement, making basement entrances as well as the others available. The buildings are entirely fireproof, and the clearest approach to the stairs is considered the best. The use of metal doors for class rooms is being considered. This would make these rooms safe even if the corridors were filled with smoke. The heating plant is always isolated in the basement. In the Bishop Cheverus school it is in a low wing by itself.

A considerable saving has been made by building the roof frame of wood instead of steel or concrete. The roof is considered as practically isolated from the rest of the building, and as a recent decision of the Law Department has made this interpretation of the Building Law possible, the Board has been glad to adopt the above mentioned policy of economy.

The esthetic side of the school buildings, as already hinted, must await the crystallization of practical forms. A general style of Tudor design in brick and stone seems to be the predominant school exterior, and many beautiful compositions have resulted. In spite of the almost complete absence of stone trimmings from the Nathan Hale school, in spite of the rigid simplicity throughout, the design is distinctly excellent. The charm of the Bishop Cheverus assembly hall has already been touched upon.

In summing up, it is plainly visible that steady progress is being made towards providing ideal accommodation for the city's school children, progress not only on the scientific and engineering side, but even in the direction of more beautiful structures.

Three New Schoolhouses, Chicago.

DWIGHT H. PERKINS, ARCHITECT.

BERNHARD MOOS SCHOOL. In planning the Bernhard Moos School ample provision was made for playgrounds. The building was located so that two large recreation spaces were arranged in front, upon which the older students are privileged, while two more were fitted up in the rear for the smaller pupils. Adjoining the playgrounds in the rear of the school will be a number of carefully planned vegetable gardens. Encircling the ensemble will be rows of shrubbery and trees which will in time furnish protection as well as shade.

The exterior of the building is treated with a dark brown vitrified brick, which has a dull glaze, and trimmed with a terra cotta that matches the color of the brick. The planning has been carefully studied so as to meet future contingencies. The central portion of the present building contains an assembly hall, a gymnasium, heating apparatus, and toilets which will provide for future increase of class rooms,—twenty-six additional rooms being contemplated.

There are three stories and a basement, the floors of which are connected by iron stairs with asphalt treads. The stairs are wide and furnish excellent avenues for escape in case of fire, especially when the pupils are drilled to make a hasty and orderly exit. In addition to the stairways, at the opposite ends of the building, there is a flight leading from the ground level to the main floor of the assembly hall, which is located in the center of the schoolhouse. The second floor contains nine class rooms having maple floors, burlap wainscoting, and slate blackboards. The gallery of the assembly hall opens into the main corridor of this floor. The same number of class rooms similarly furnished are found on the third floor, while the remaining space is given up to a gymnasium, which is located over the assembly hall.

The interior finish is somewhat similar to the rest of the recently built Chicago schoolhouses, having all the corridor floors of asphalt. The entire basement, with the exception of the manual training and domestic science departments, is furnished with a concrete flooring.

The cubical contents of the building are 1,291,022 cubic feet, while the entire cost amounts to $205,000, making 15.87 cents per cubic foot.

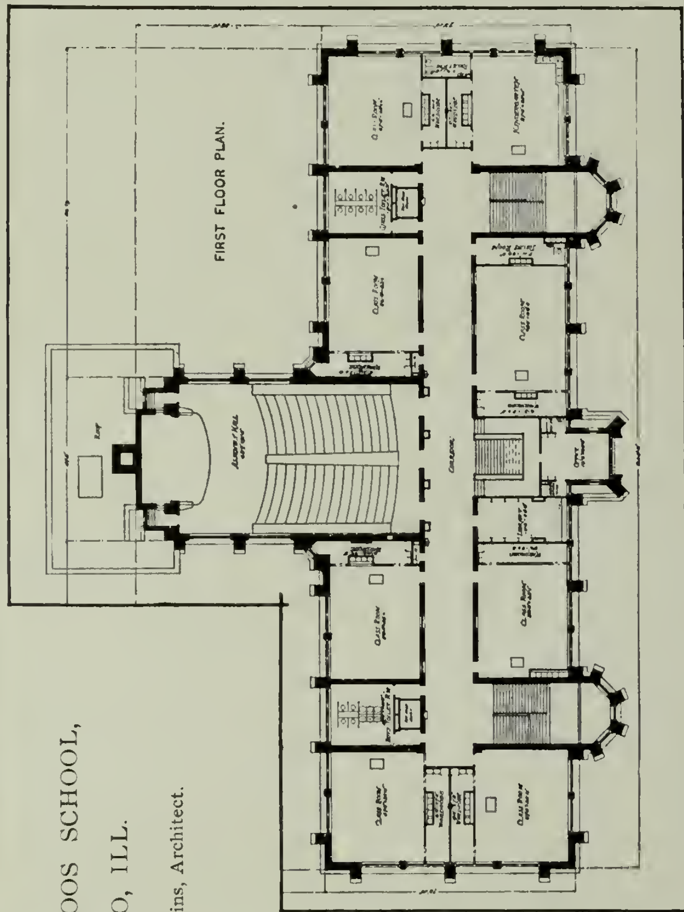
ALBERT G. LANE TECHNICAL HIGH SCHOOL. This is one of the largest and best equipped technical institutions in the world. The exterior has been designed with two ideas in view, simplicity in character and a provision for the maximum amount of light. The exterior is a frank expression of the interior, which has been planned to facilitate the work necessary in accommodating eighteen hundred pupils. Plenty of playground surrounds the building, which affords a suitable setting for the mass of purplish brown brick that is tied together with harmonious trimmings of stone.

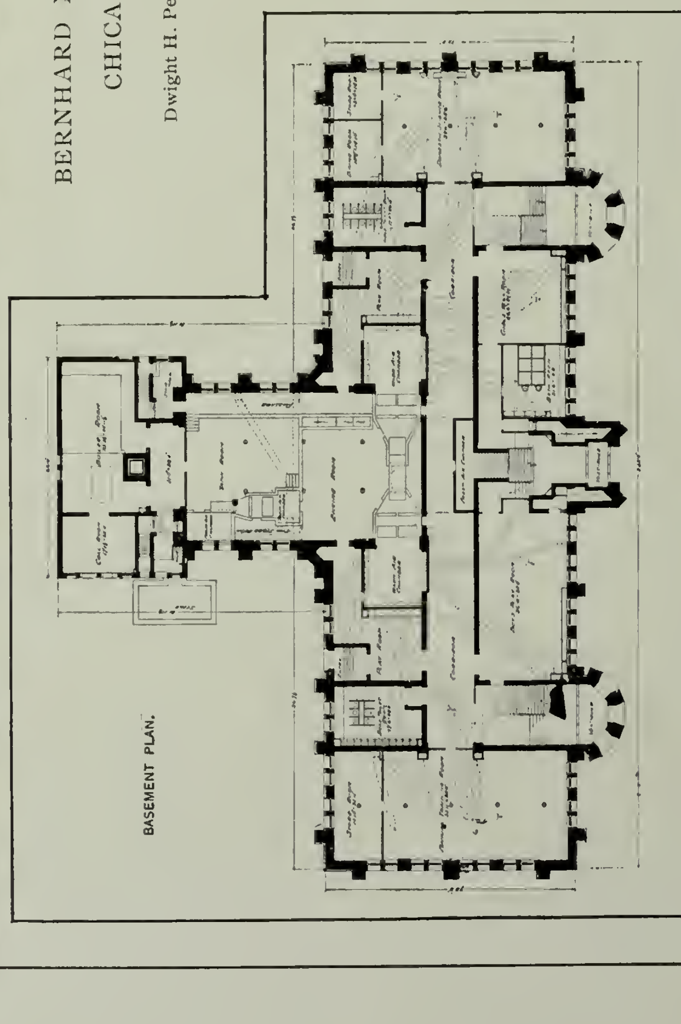
The division of instruction consists of four periods, three of which are in the daytime and one in the evening. From the plans we can see how the space has been allotted so as to have the various trades arranged by themselves and still closely allied to each other. In this way little time is lost by the scholars and such economy is necessary where so many pupils are accommodated in such a short part of each day.

The ground floor contains locker rooms, machine shop, woodworking, foundry, forge, pattern, wood-turning, and electric construction shops with lecture and testing rooms; also the power plant, generator, boiler and coal rooms. The shops contain four hundred benches, the laboratories are equipped with two hundred and twenty tables, while the drawing and drafting rooms have three hundred tables. The shops have a working capacity of four hundred pupils during one period, and a working unit of twenty-four, which is one half the unit of the other departments. Provision has been made for sufficient light and ventilation, as each shop has a skylight in addition to the side windows. The fresh air is distributed throughout the laboratories and shops by means of forced ventilation, which supplies also the class rooms and other parts of the building.

On the first floor are the principal's main and private offices, a museum, botanical and physiographical laboratories, a commercial department, and thirteen class rooms. Here also is the study room assembly hall. This hall has a seating capacity of nine hundred, accommodating five hundred on the main floor, while the remaining four hundred are in the balcony on the second floor. The seats on the first floor are constructed to serve as desks during the day sessions, and when lectures are to be held they can be easily lowered out of the way and replaced by extra portable chairs.

The second floor shows chemical laboratories, dark rooms, balance rooms, private laboratories, and lecture rooms. The lecture rooms are supplied with opaque shades at the windows, which permit of darkening for the use of the stereopticon. There are also on this floor drawing departments which comprise mechanical draftsmanship, architecture, and free-hand, all of which have easy access to the printing rooms located on the roof. Besides the six class rooms there is a library which contains over five thousand volumes. The corridor on this floor





BERNHARD MOOS SCHOOL,
CHICAGO, ILL.

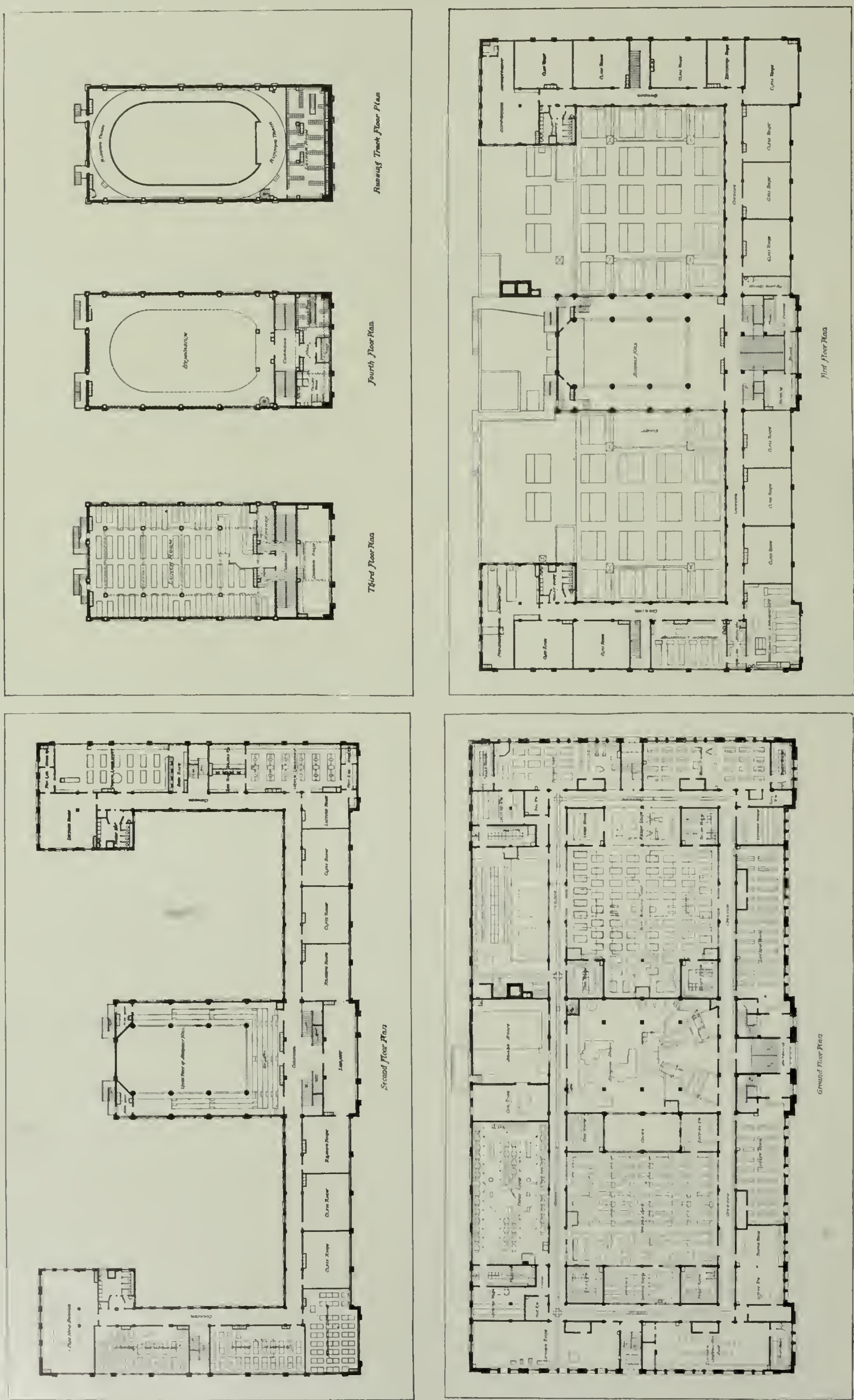
Dwight H. Perkins, Architect.

ALBERT G. LANE

TECHNICAL HIGH SCHOOL.

Dwight H. Perkins, Architect.

ASSEMBLY HALL.



PLANS OF THE ALBERT G. LANE TECHNICAL HIGH SCHOOL.
Dwight H. Perkins, Architect.

takes care of the people from the balcony of the large assembly hall, thus alleviating the congestion that usually arises.

The third floor is given up mostly to the lunch room, which feeds six hundred at a time and which accommodates all the pupils in about two periods. The kitchen and storerooms are located on this floor as well as an overflow space which can be utilized by the drawing department.

On the fourth floor are found the gymnasium, running track, toilets, showers, lockers, and instructors rooms. The lockers are of iron and arranged in stacks and alcoves, so as to form dressing rooms for six hundred and fifty students.

The cubic contents of the building are 2,518,534 cubic feet, costing $470,000, which makes approximately 18½ cents per cubic foot. The equipment amounts to $150,000 in addition.

Tilton School. This building has been designed after a careful study of the extremely rapid growth of the outlying districts near the city of Chicago. It is planned with a broad view of the future wants, as is shown by the dotted lines on the plans which indicate some future extension of the two wings. There are several radical changes from the typical school building, the most important of which is the elimination of the basement floor, making the first floor practically on the ground level.

A rather unusual appearance results from the horizontal bands upon the exterior. These courses are made up of buff brick, alternating in the light and dark tones. The base and lower trimmings are of Bedford stone, while above the first story is substituted terra cotta, which maintains the same color and texture as the adjacent brick. The towers lend considerable interest to what might otherwise prove a monotonous and tiresome treatment of the façade and at the same time provide for toilet rooms on each floor.

Upon the interior the floors of the corridors, toilets, and stairs are of asphalt, while those of the class rooms and assembly hall are of maple, which wood is considered to be one of the best upper floorings. Southern pine is used throughout for the woodwork, with the exception of the floors just cited. The walls of the play rooms and corridors are of glazed brick, while those of the assembly hall and toilets are of enameled brick. In the class rooms burlap is used for the wainscot and plaster for the remaining portion of the walls and the ceiling.

The arrangement of the first and second floors is clearly shown on the plate which illustrates this building. The assembly hall seats seven hundred and fifty people, is centrally located, and within easy access of the main entrances. On the third floor are planned six class rooms, a gymnasium, and library. The class rooms have unilateral light with blackboards on three sides. The entrances to all the rooms are close to one of the four main stairways, which afford ample exit facilities in case of fire. The fourth floor has also six class rooms, a construction room, and teachers' toilets. Each of the class rooms is provided with a wardrobe separated by means of vertical sliding doors, upon which are blackboard surfaces. The exhaust ventilation is through the wardrobe. Impervious materials are used extensively throughout the building, especially in the corridors and toilets, making the cleaning practical as well as economical.

There are 1,421,466 cubic feet with a total cost of $216,500, which figures approximately 15½ cents per cubic foot. This makes the cost of each class room $10,825, or $216.50 per pupil. Such an amount for each scholar would be exceedingly high were it not for the fact that when the rest of the building is completed the total cost will be $315,000, which comes to $168 per pupil. The assembly hall, facilities for heating, toilets, gymnasium, manual training and domestic science departments, have been planned with a view to accommodating the forty schoolrooms, which will be the capacity of the whole building after the future extension has been completed.

New Schoolhouse at Mount Vernon, N. Y.

ALBRO & LINDEBERG, ARCHITECTS. THOMAS R. JOHNSON, ASSOCIATED.

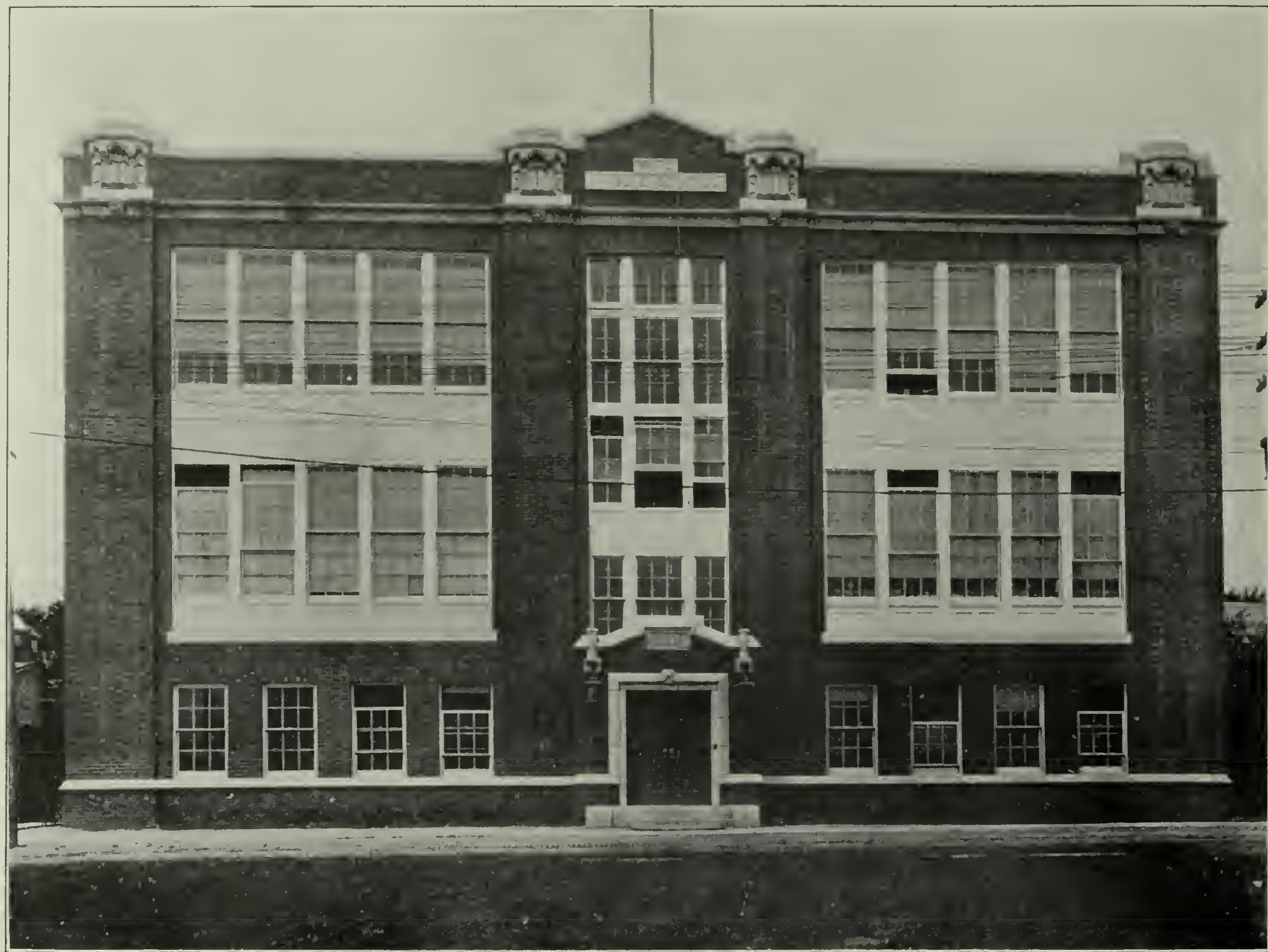
IN THIS building the windows extend practically the full length of the rooms and have very little framework to interfere with the light. The general tone of the façade is pleasing, the brick harmonizing with the gray terra cotta.

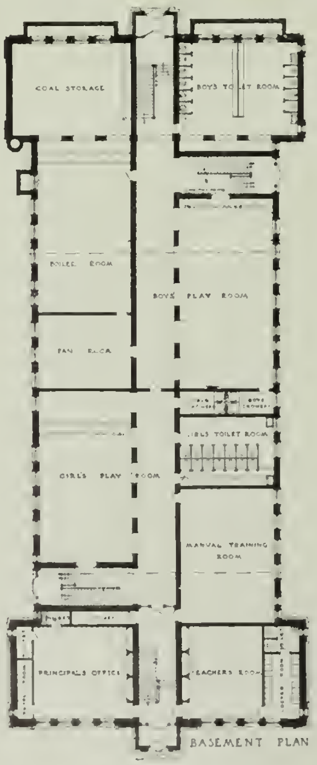
There are sixteen school rooms, each one accommodating fifty pupils. The assembly hall is large enough to seat all the students. There are two entrances to the hall, directly opposite each other, which lead to separate stairways. The two main stairs extend from the basement to the top, and have the uniform width of 5 feet. The floors of the corridors are of cement, while those of the class rooms are of hard pine. The trim used throughout is ash. The walls are of hard plaster.

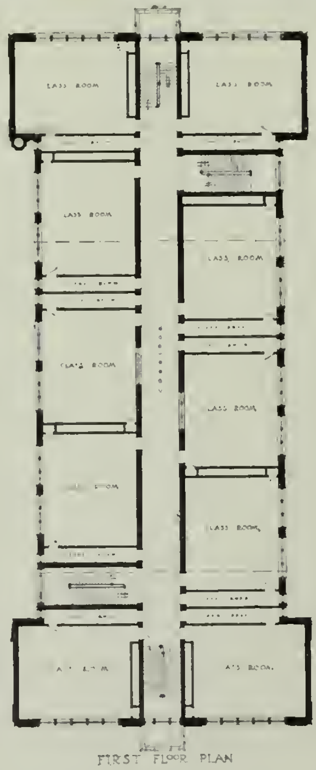
The basement has four entrances, arranged so that the boys and girls may enter their respective quarters directly from the outside. One of the entrances opens into the third division, which consists of the principal's office and teachers' room. There is a wardrobe for each class room, having an outside window and two doors, one of which opens directly into the corridor. These cloak rooms are 4 feet in width.

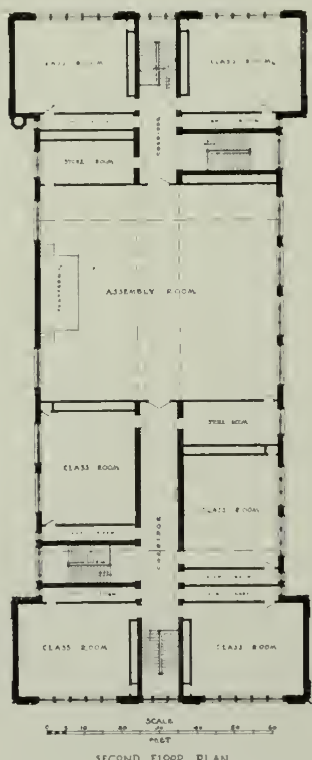
The building is heated by the indirect system in connection with hot water, and unites with it an appropriate system of ventilation.

The total cost of the building, including the heating, plumbing, electric wiring, and electric fixtures, was $90,169, or 15½ cents per cubic foot.





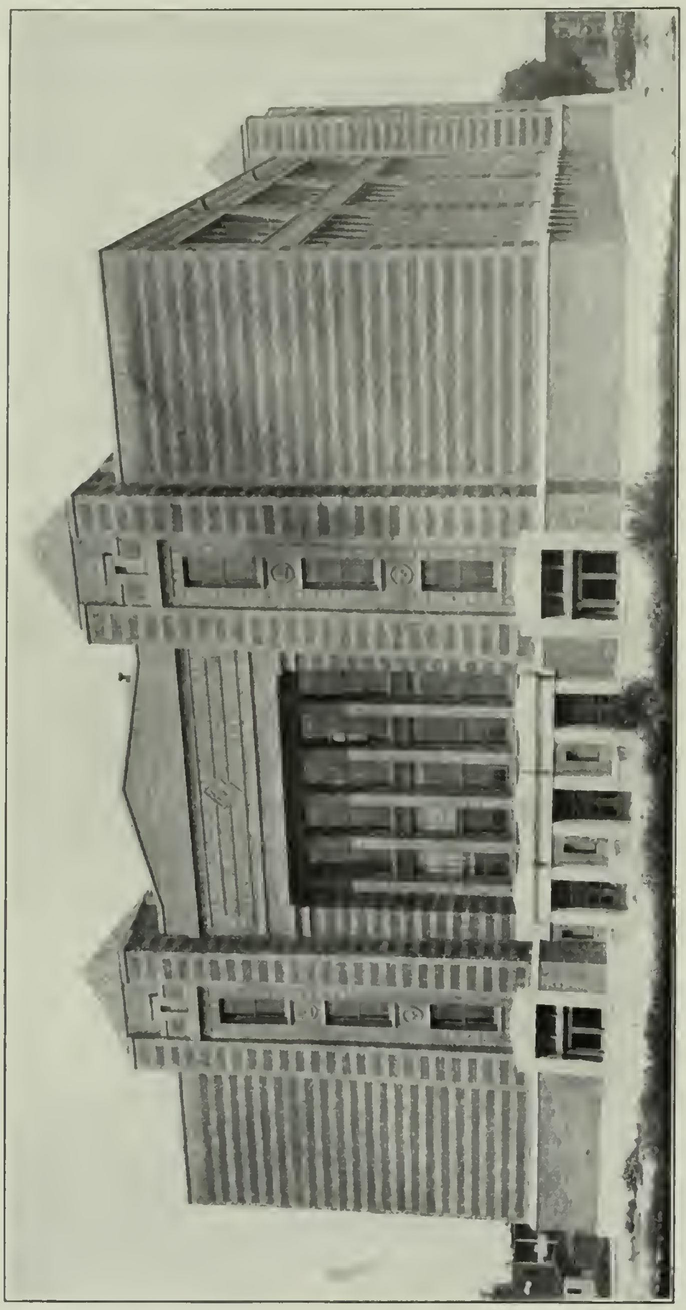


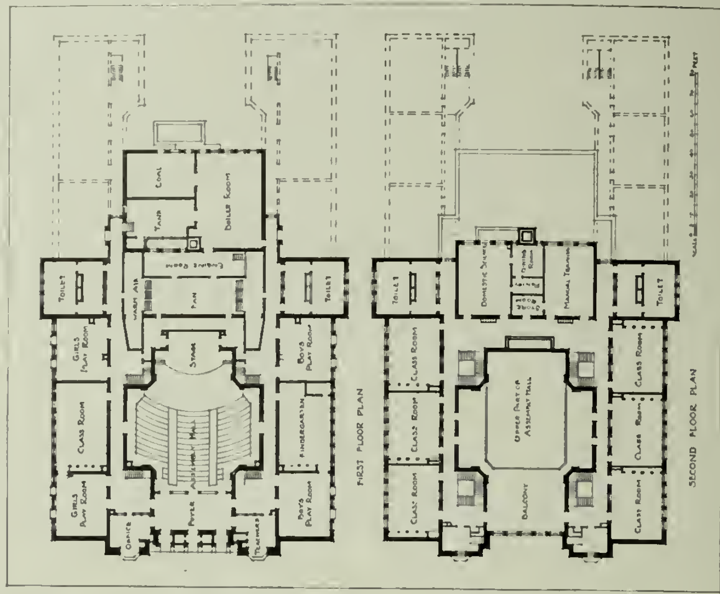


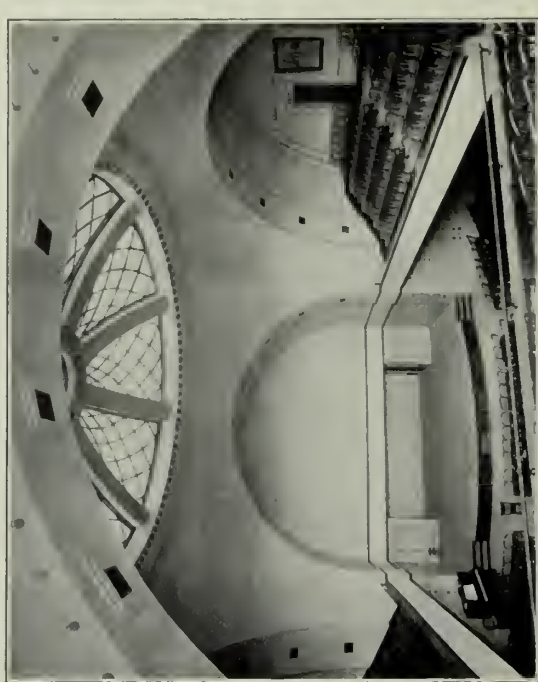
PUBLIC SCHOOL NUMBER 10. MOUNT VERNON, N. Y.

Albro & Lindeberg, Architects.

Thomas R. Johnson, Associated.



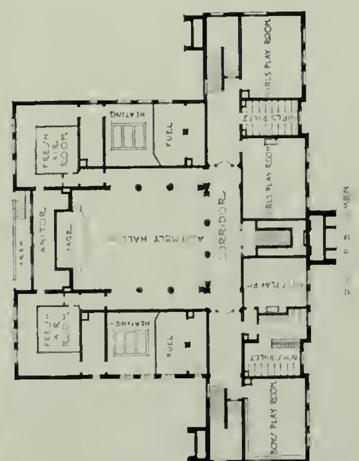




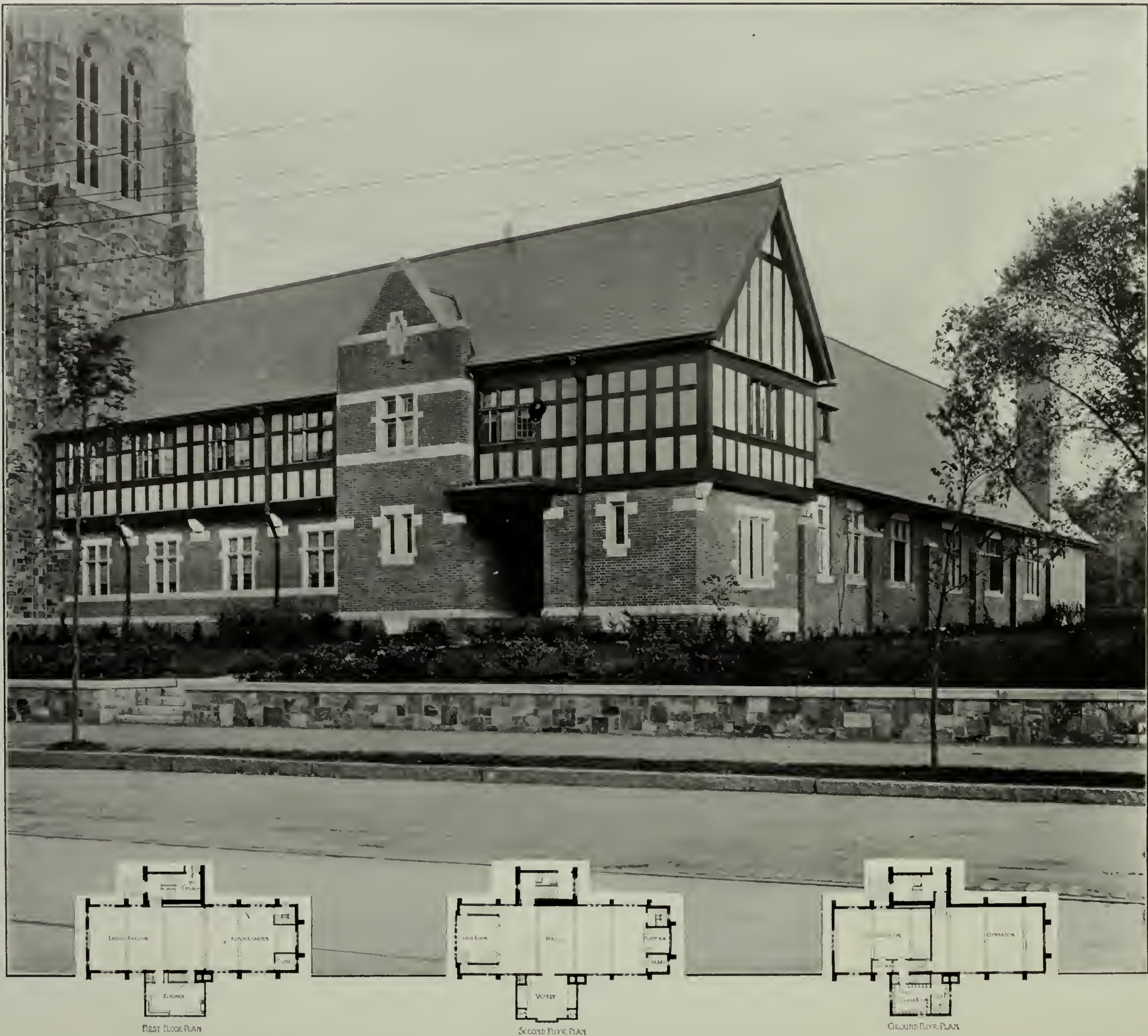
TILTON SCHOOL,
CHICAGO, ILL.
DWIGHT H. PERKINS, ARCHITECT.

VOL. 18. NO. 11. PLATE 142.

MARSH & PETER,
ARCHITECTS.



HENRY D. COOKE SCHOOL,
WASHINGTON, D. C.



PARISH HOUSE
FOR
UNITARIAN CHURCH,
WEST NEWTON,
MASS.

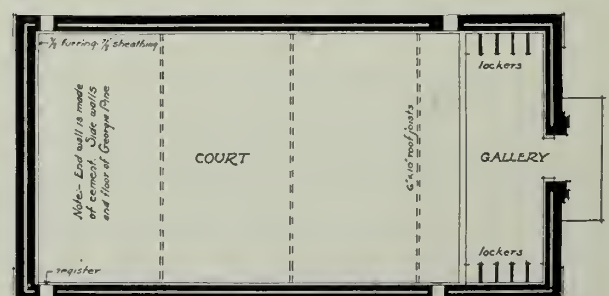
CRAM, GOODHUE
&
FERGUSON,
ARCHITECTS.

SQUASH COURT,

NORTH EASTON, MASS.

COOLIDGE & CARLSON,

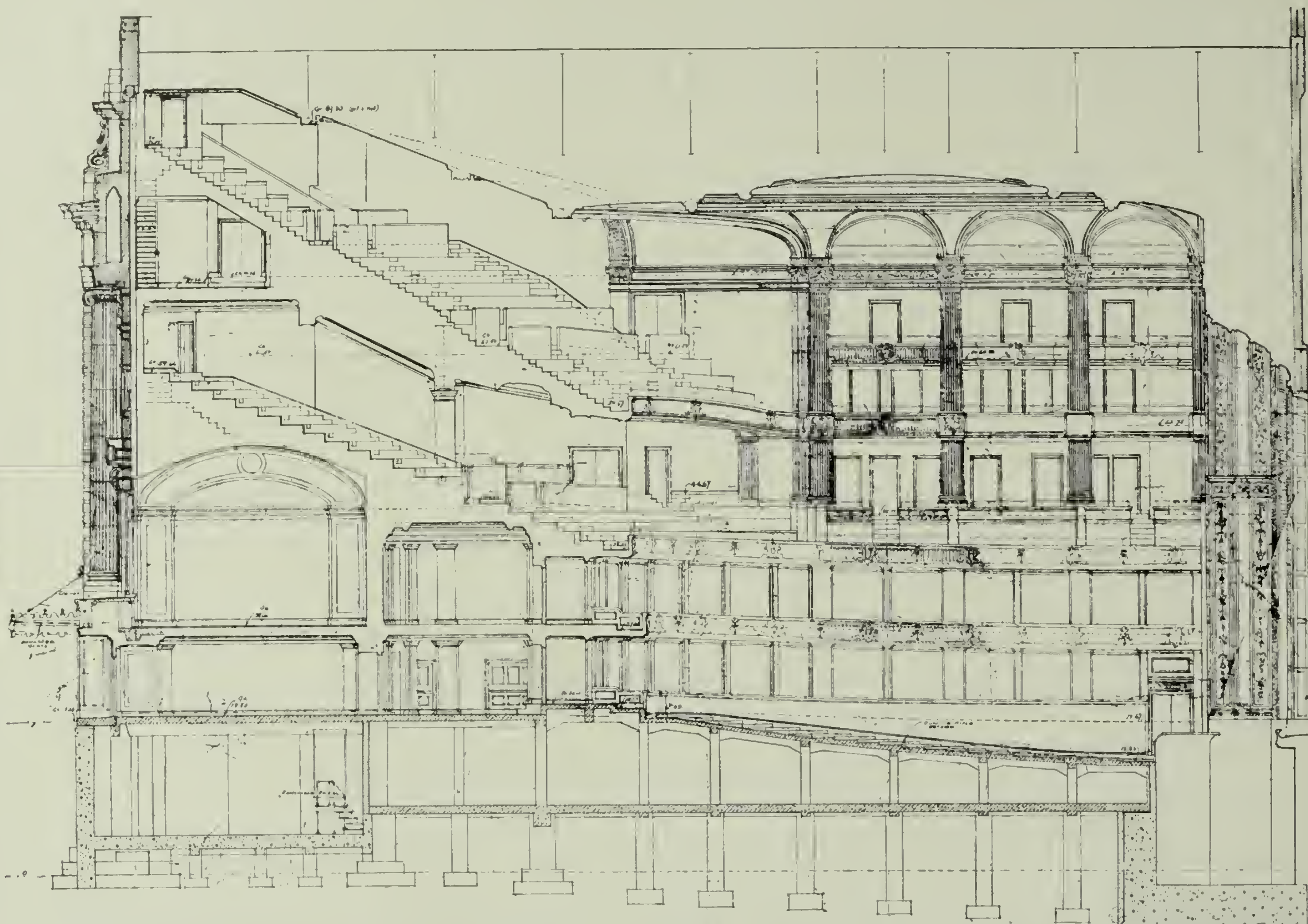
ARCHITECTS.



Note:- Brick on exterior has black headers-marble trimmings & wood cornice

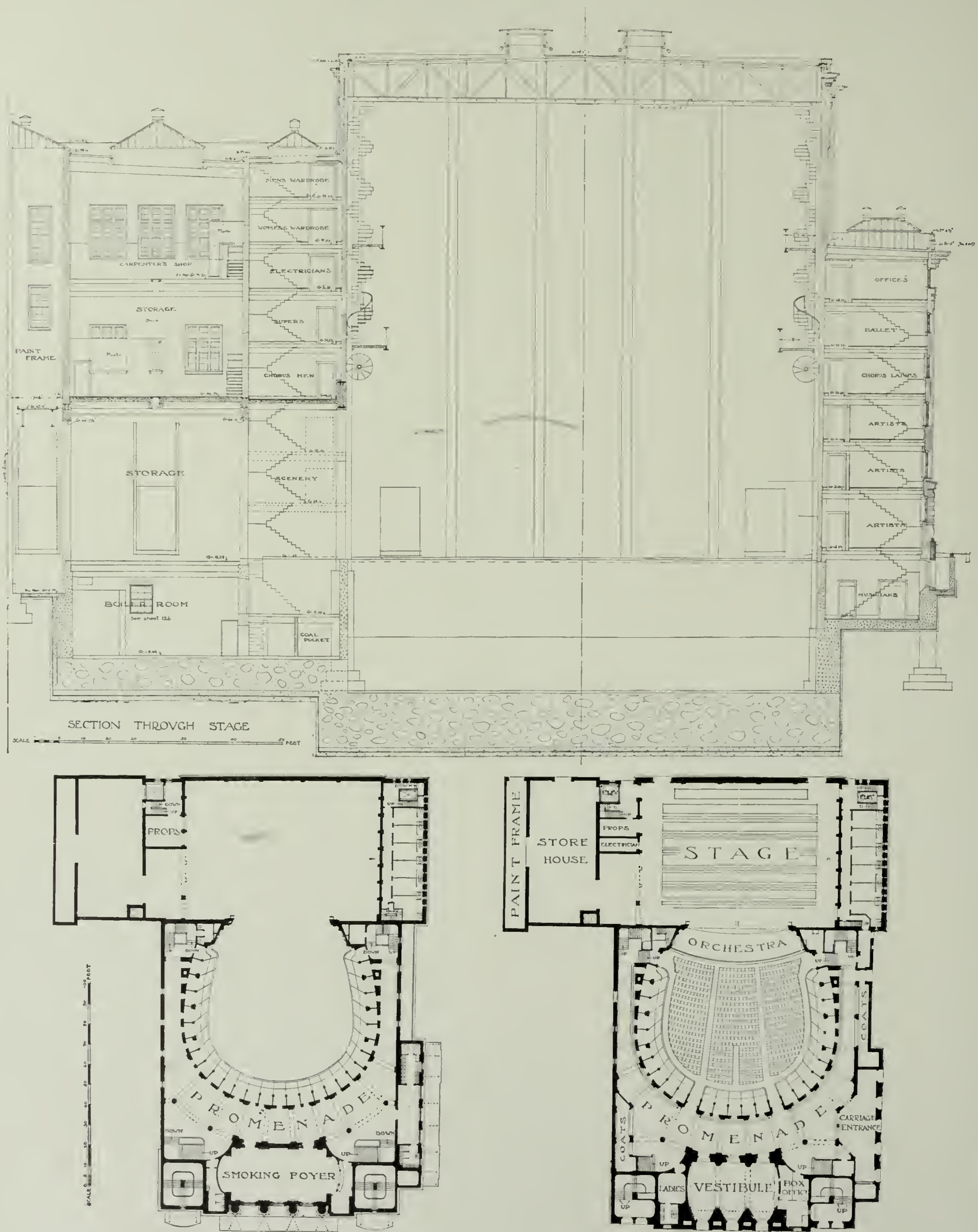
PLAN OF SQUASH COURT

Note:- Floor of gallery is 4'6" above the finished floor of the court.



LONGITVDINAL SECTION THROVGH AVDITORIVM

BOSTON OPERA HOUSE, BOSTON, MASS.
WHEELWRIGHT & HAVEN, ARCHITECTS.



SECTION AND PLANS.

BOSTON OPERA HOUSE, BOSTON, MASS.

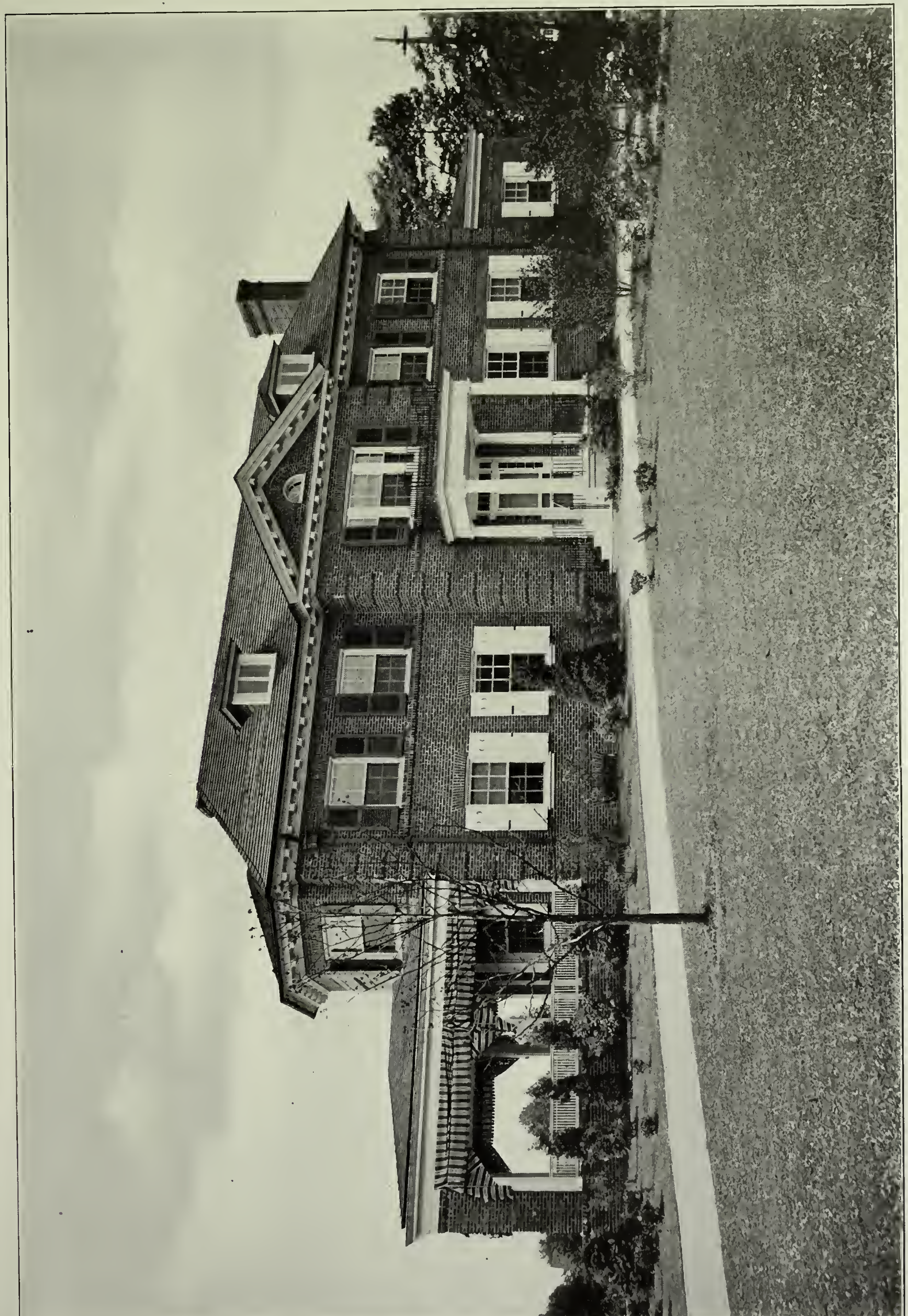
WHEELWRIGHT & HAVEN, ARCHITECTS.

BOSTON OPERA HOUSE, BOSTON, MASS.
WHEELWRIGHT & HAVEN, ARCHITECTS.

DETAIL OF MAIN ENTRANCE.

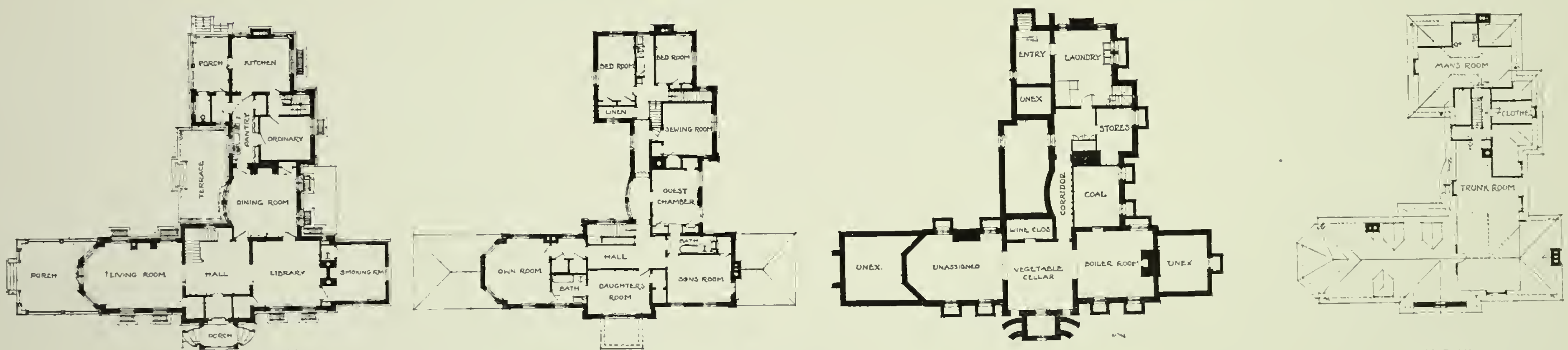
BOSTON OPERA HOUSE, BOSTON, MASS.

WHEELWRIGHT & HAVEN, ARCHITECTS.



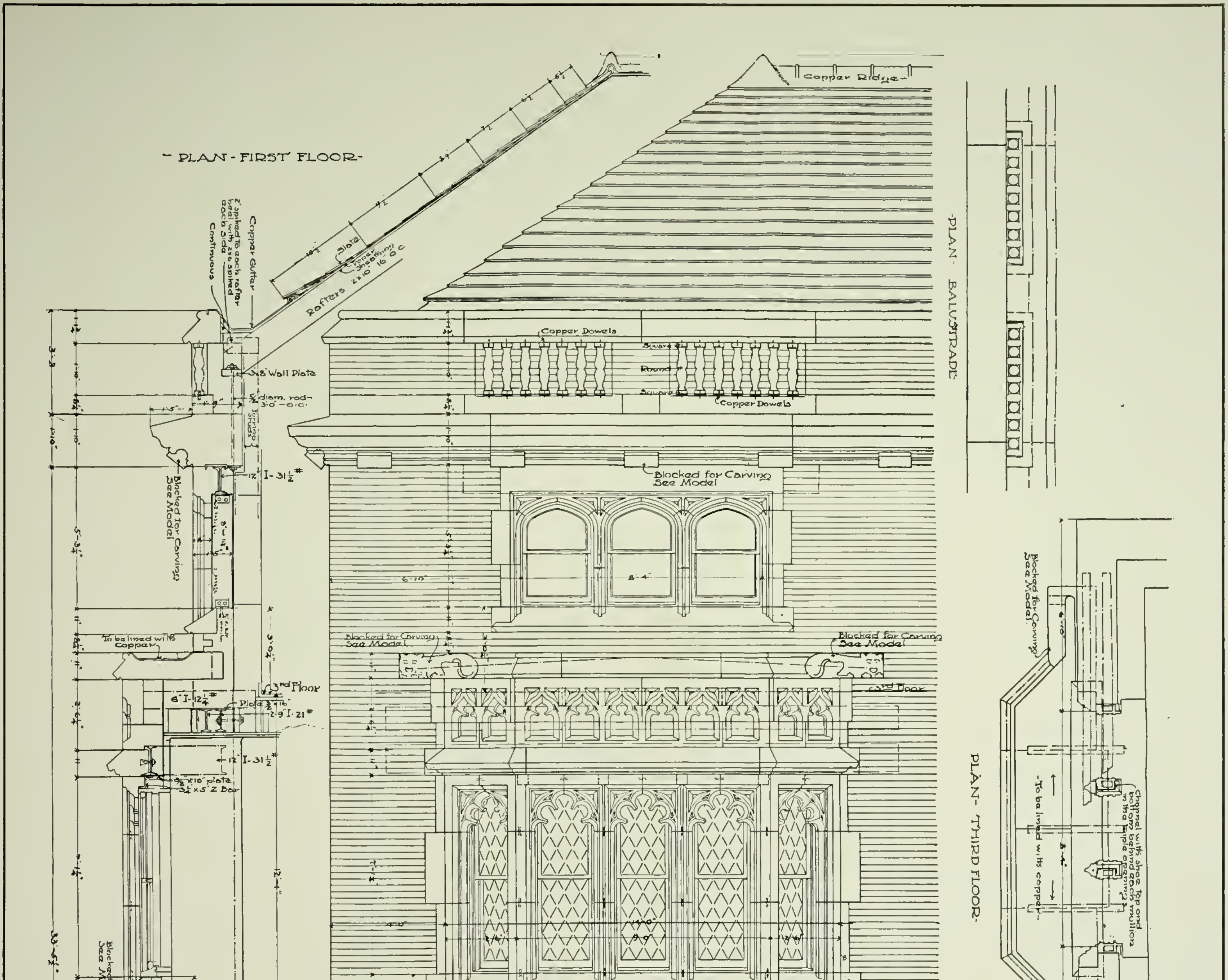
HOUSE AT CHESTNUT HILL, PHILADELPHIA, PA.

NEWMAN & HARRIS, ARCHITECTS.



HOUSE AT CHESTNUT HILL, PHILADELPHIA, PA.

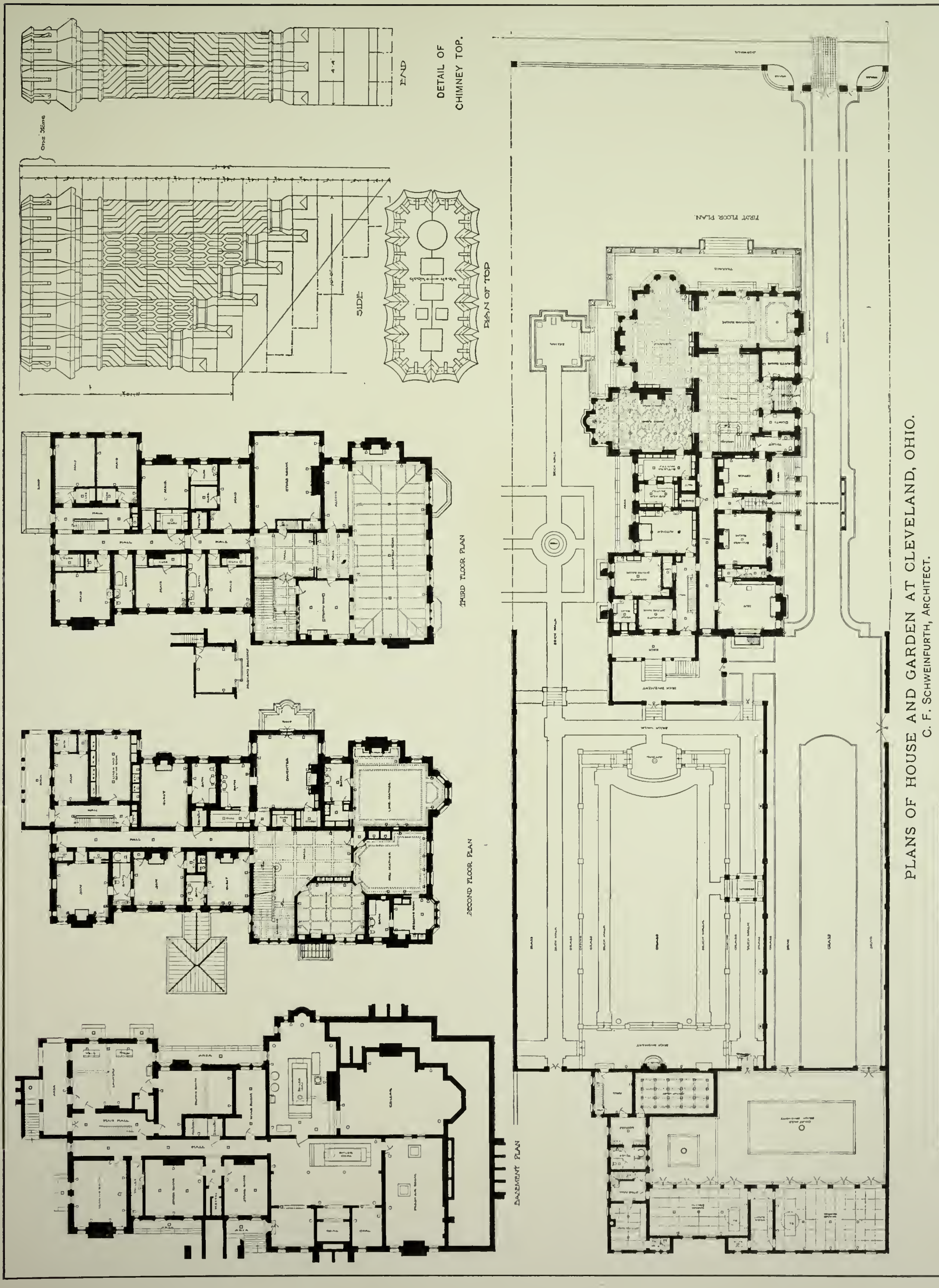
NEWMAN & HARRIS, ARCHITECTS.



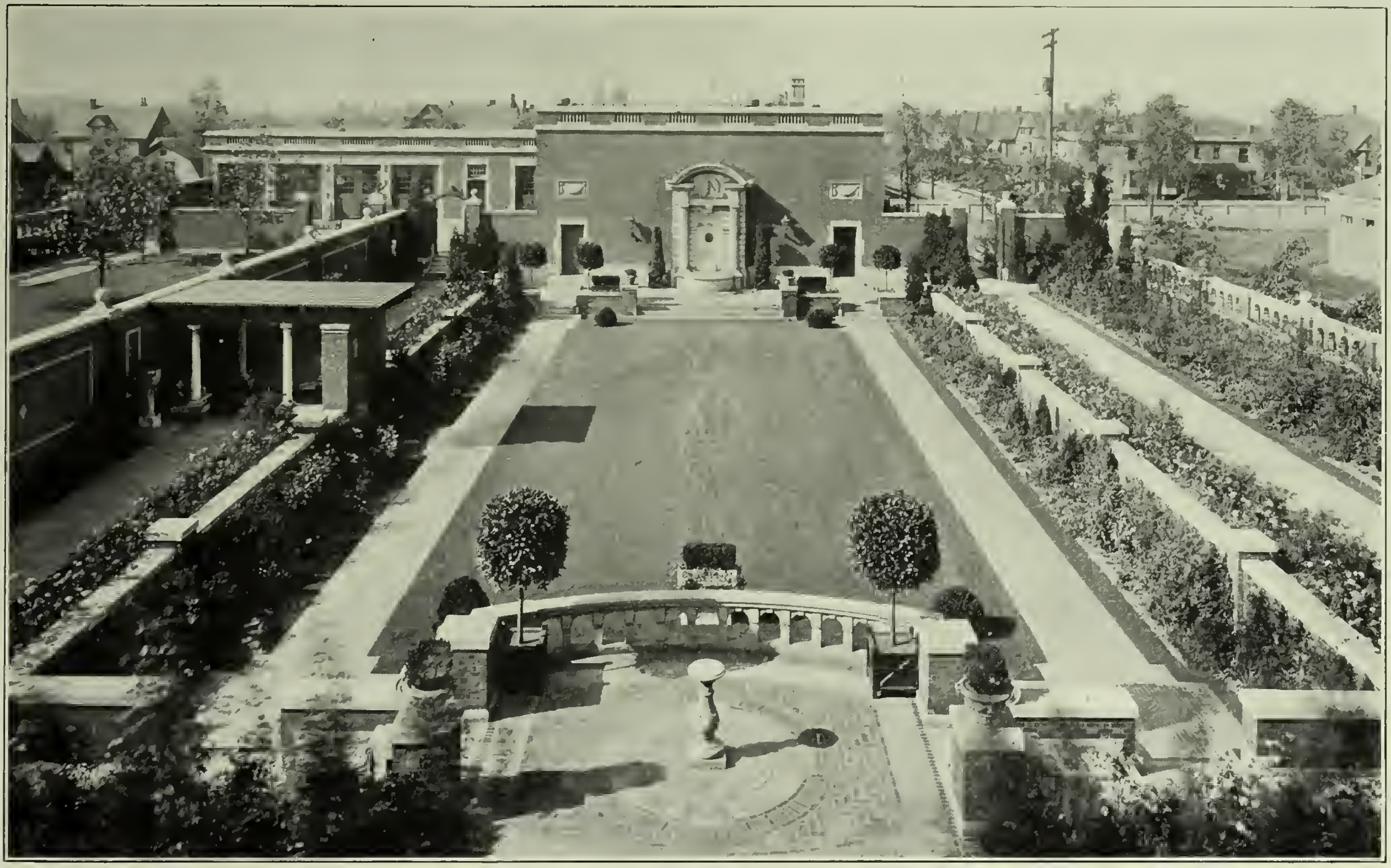
DETAIL OF ORIOLE WINDOW.

HOUSE AT CLEVELAND, OHIO.

C. F. SCHWEINFURTH, ARCHITECT.



PLANS OF HOUSE AND GARDEN AT CLEVELAND, OHIO.
C. F. SCHWEINFURTH, ARCHITECT.



GENERAL VIEWS OF GARDEN.
HOUSE AT CLEVELAND, OHIO.
C. F. SCHWEINFURTH, ARCHITECT.

GENERAL VIEWS OF GARDEN.
HOUSE AT CLEVELAND, OHIO.
C. F. SCHWEINFURTH, ARCHITECT.

DETAIL OF FOUNTAIN.

DETAIL OF ORIOLE WINDOW.

HOUSE AT CLEVELAND, OHIO.
C. F. SCHWEINFURTH, ARCHITECT.

Terra Cotta: Its Character and Construction — II.

BY CHARLES U. THRALL.

REFERRING again to what has been said concerning the designing of columns to be executed in terra cotta it needs to be emphasized that when an architect decides that a column shall be of terra cotta, and then disregards entirely the character of the material he has chosen, the result is almost invariably a failure, but when he will stop long enough to design a column that will be practical for terra cotta, he has made possible the first requisite of an artistic result, viz: good workmanship.

Because of its qualities, whether considered from the esthetical standpoint, the structural, or the physical, terra cotta is unexcelled as a building material for the modern tall building, and especially so on account of its lightness and conformability to the steel structure. In regard to its lightness, there are hundreds of dollars saved by its use as compared to stone, not only in freight charges but in the cost of the steel structure itself, which may be much lighter for a terra cotta building than for a stone building.

In the smoky cities of the west the non-absorbent surface of glazed terra cotta is the only surface that can be washed clean, and on that account white glazed terra cotta is coming into general use for this purpose, for once a year, at least, when the annual "wash day" arrives, the building built of this material stands out as white as the new fallen snow. The plates which accompany these articles will demonstrate the ease with which it may be molded to the adjoining materials, especially to the steel supports of the building, while its color possibilities may be used, not only for polychromatic design, such as the Academy of Music, Brooklyn, but also for most practical purposes.

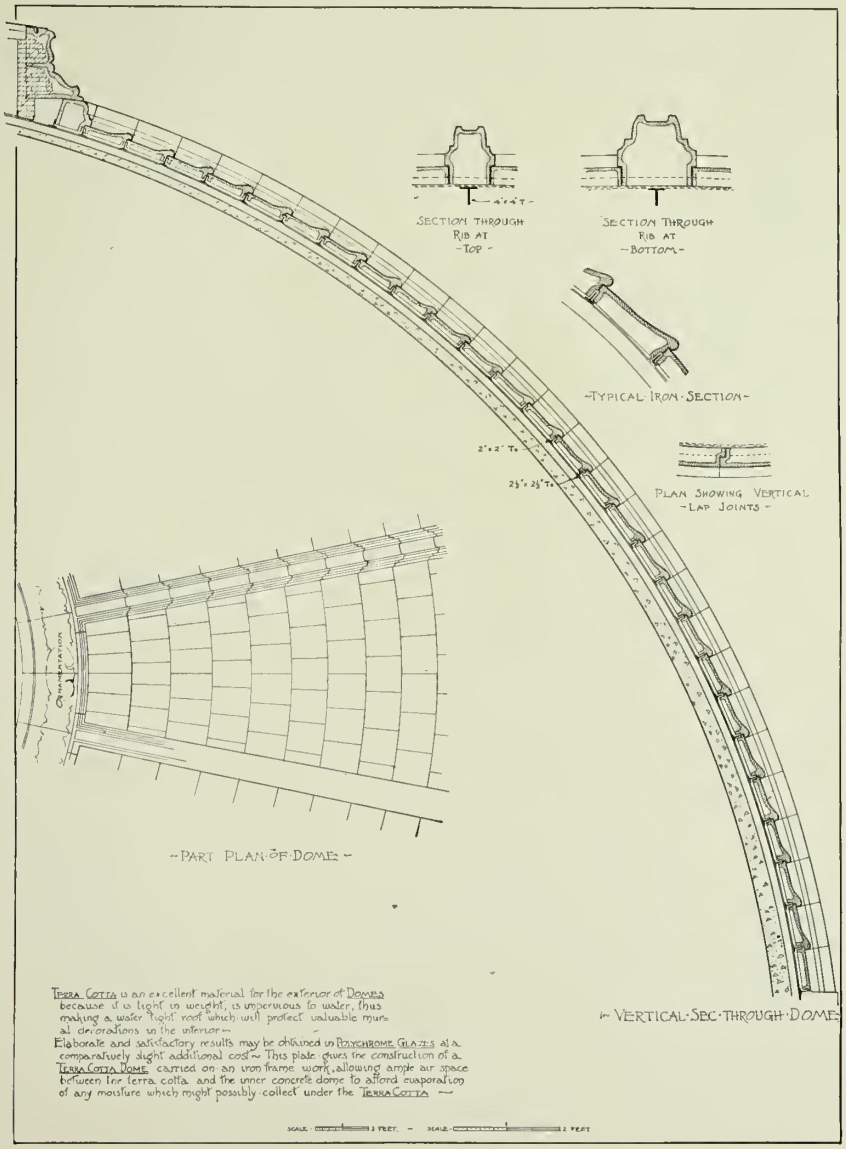


PLATE IV.

The conformability of terra cotta to other building materials, especially to structural steel and reinforced concrete, is shown in the dome of the First Church of Christ, Scientist, at Boston, which is illustrated by Plate 4. It is a simple though ingenious and very practical arrangement of concrete, steel, and terra cotta. The inner dome was made of reinforced concrete, very thin, intended to be self-sustaining but not necessarily carrying any additional load. The inner surface of the dome was intended to be decorated with mural paintings at very great cost, and therefore these should have ample protection from leaks which might mar their beauty. To obtain a water-tight roof the architects put 4 inch by 4 inch "T" irons extending upward from the base of the dome to its apex, the nib of the web resting on the exterior face of the concrete, but in such manner that practically no weight was transmitted to the concrete dome. Outside of these were placed smaller "T's" that formed hoops around the dome and were bolted or riveted to the uprights, these hoops forming shelves to receive the terra cotta exterior to the dome.

In the construction of a terra cotta dome the weight of the upper courses bearing down on those below causes a tendency to buckle at about one quarter the height of the dome unless the terra cotta is anchored back in some manner. The method shown on Plate 4 obviated this tendency as the weight of each course was carried on one of the iron hoops. There was also afforded ample air space to evaporate any moisture that might possibly collect under the terra cotta, and as a further protection from leaks water-tight joints were formed both vertically and horizontally.

Owing to the monumental character of the edifice, all of these precautions were deemed advisable, yet they were accomplished at a minimum cost, the concrete and steel being very light because the terra cotta blocks were so light (and in this case made thinner than ordinarily). The terra cotta was very inexpensive in comparison to other materials because of the duplications of like pieces, it being necessary to make molds of only one rib and one or two pieces of each course of one field. The cutting of the tapering rib and the curved faces of the field pieces would be very expensive in any other material. The dome was surmounted by a heavy ornamental course, above which was the lantern. This course was open at the back, into which was built the brick backing. A raggle was provided to receive a copper flashing above. It was necessary to make a mold of only two of the pieces forming this course.

The surface of the terra cotta for this dome is glazed, of a peculiar yellow color which catches the sunlight and reflects it so brilliantly that the dome attracts the eye almost as forcibly as the gilded dome of the State House.

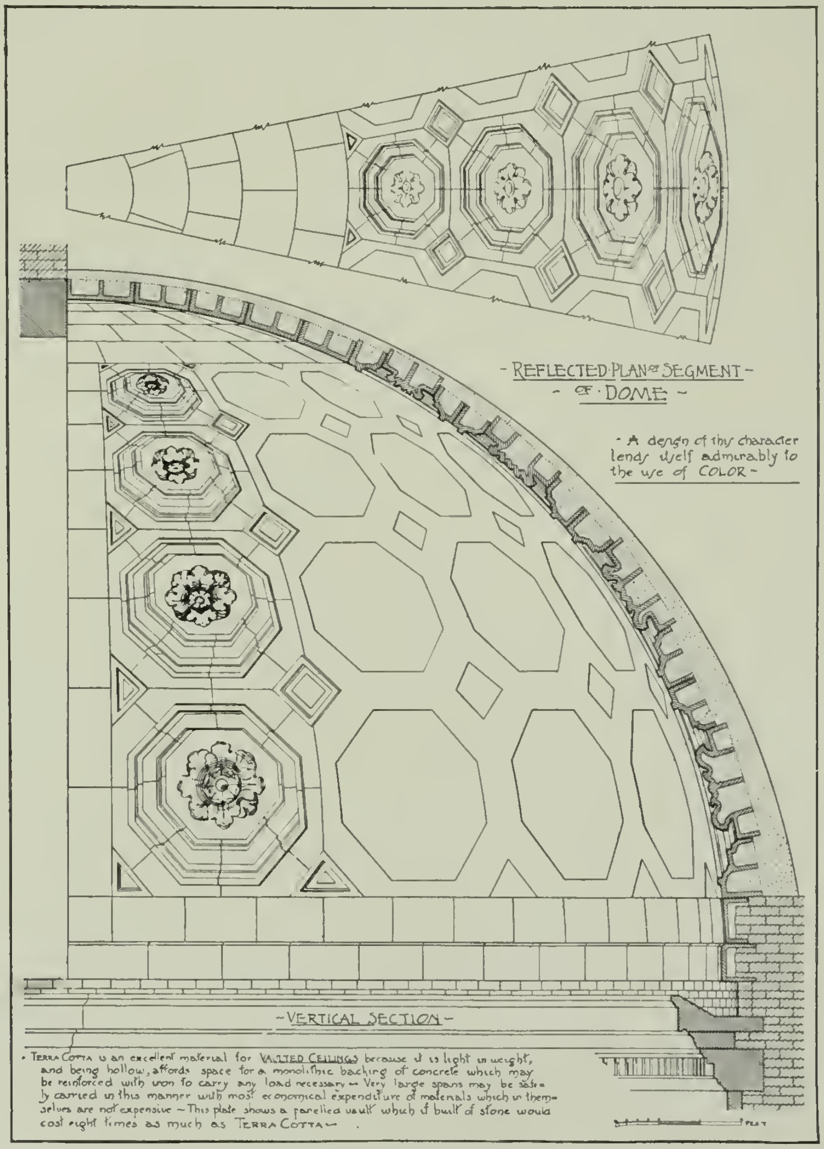


PLATE V.

Plate 5 illustrates another idea of combining terra cotta and concrete, forming a vaulted ceiling with a monolithic body. This plate shows a ceiling in the state entrance of the Union Station at Washington and was built of granite colored terra cotta resembling the granite of the main walls. After the terra cotta was all set on the wooden center, the concrete was poured into the open spaces in the back of the pieces and carried up to the required thickness, a very simple and inexpensive process. The converging moldings of the panels of such a vault are very expensive to make in any material, but in the case of terra cotta it is necessary to make molds for only four panels, one in each course, instead of thirty-six (36), the other thirty-two (32) panels being pressed at very slight cost from these molds. In addition to this the bond of the terra cotta blocks is very small, but with the concrete, although thin, will carry all the weight imposed. Therefore, the economy in the amount of materials used by this method, as well as their inexpensiveness, is of great importance. The joints of the terra cotta are all so placed as to permit such trimming as is necessary to produce proper alignment. Such a design treated in color would be most effective.

Plate 6 shows how the same idea was applied to other vaulted ceilings on the same building, the arches as well as the ceilings being backed with concrete, but in the case of the arches very much thicker, on account of the weight they have to carry. Note the arrangement of the joints in the ceiling so that the pieces would approximate the same size in all courses and thus avoid extremely long and impractical pieces in the outer courses. The first and second courses from the center have the same number of pieces, but the third course has two pieces for every one in the first and second course, whereas the fourth course has three pieces for every two of the third course, etc. Where the courses were cut by the granite arches the joints were arranged so as to coincide to some extent with some of the lines of the granite.

The reinforced concrete building properly requires an outward covering which may have an artistic treatment, and terra cotta is more suitable for this purpose than any other material, because it may be made very thin, and, on account of its lightness, may easily be anchored to the wall, the hollow spaces being then filled with concrete, so as to bear such crushing strains as may be imposed upon it.

The terra cotta, especially if glazed, also fulfils the practical purpose of acting as a waterproof face for the absorbent concrete and protects it from the action of frost or fire better than any other material would. Owing to the shrinkage, swelling and warping of the plank forms into which the concrete is poured to form the walls of such a building, it cannot be expected that those walls

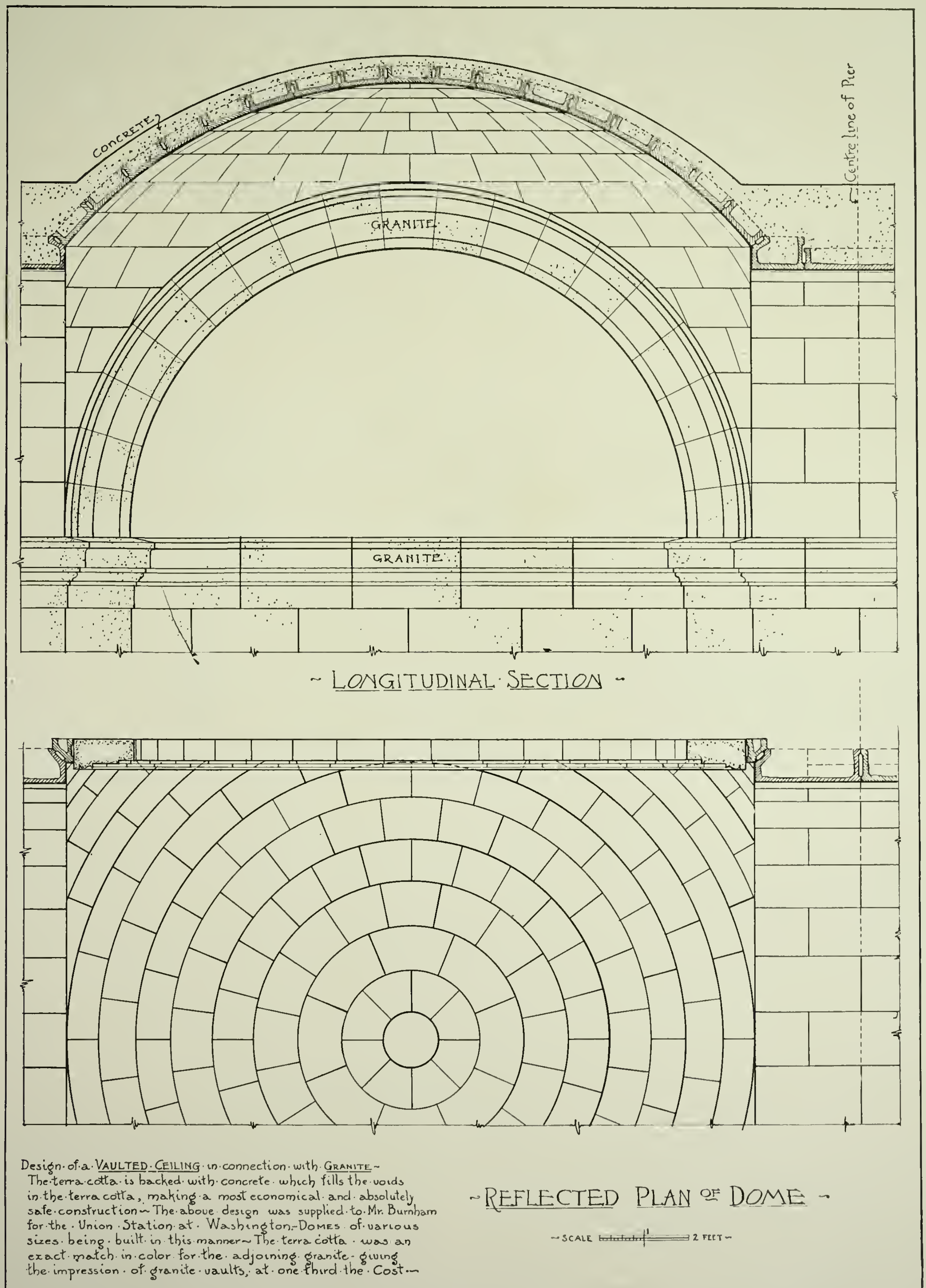

CONCRETE
GRANITE
Centre line of Pier
GRANITE
~ LONGITUDINAL · SECTION ~
~ REFLECTED PLAN OF DOME ~
~ SCALE 2 FEET ~
Design · of · a · VAULTED · CEILING · in · connection · with · GRANITE ~
The · terra · cotta · is backed · with · concrete · which fills the · voids
in · the · terra cotta, making · a most economical · and · absolutely
safe · construction ~ The · above · design was supplied · to · Mr. Burnham
for · the · Union · Station · at · Washington. - Domes · of · various
sizes · being · built · in · this · manner ~ The · terra cotta · was an
exact · match · in · color · for · the · adjoining · granite · giving
the · impression · of · granite · vaults, · at · one third · the · Cost ~

PLATE VI.

will be very accurate in their dimensions. This inaccuracy makes it necessary to arrange methods of adjusting the terra cotta to the concrete. For instance, holes are arranged in the plank forms through which are laid anchors which are embedded in the concrete when it is poured, but the location of these holes may not coincide with the exact position of the anchor holes or joints of the terra cotta. To overcome this difficulty holes are arranged in the ends of the terra cotta blocks through which are passed small rods around which are bent the anchors (see Plate 7). The top bed of the terra cotta is cut away so that the workman may put his hand inside the blocks and bend the anchors. The block is then filled with cement or fine concrete, if desired, and the next block is built upon the one set, there being a running dowel on the bottom of each piece to fit into the open space of the piece below, and in this way both the and adds to the cost of manufacture, as each piece has to be cut by hand.

Notice how the lintel course is carried on an iron plate bolted to the concrete. The holes in this plate should be slotted so as to allow adjustment, as the location of the bolts may be inaccurate unless the plate is put into position before the concrete is poured.

The bolt and clip shown in the third course at "B-B" is an excellent anchor for the large courses and a frequent setback in the wall is desirable to take the weight off of the courses below and thus prevent buckling. On account of the inaccuracies in the building plenty of space, say one inch or more, between the terra cotta and the concrete, should be allowed to prevent the necessity of cutting any of the terra cotta at the building, which is always an expensive operation, delaying the work. The same amount of space should be allowed where terra

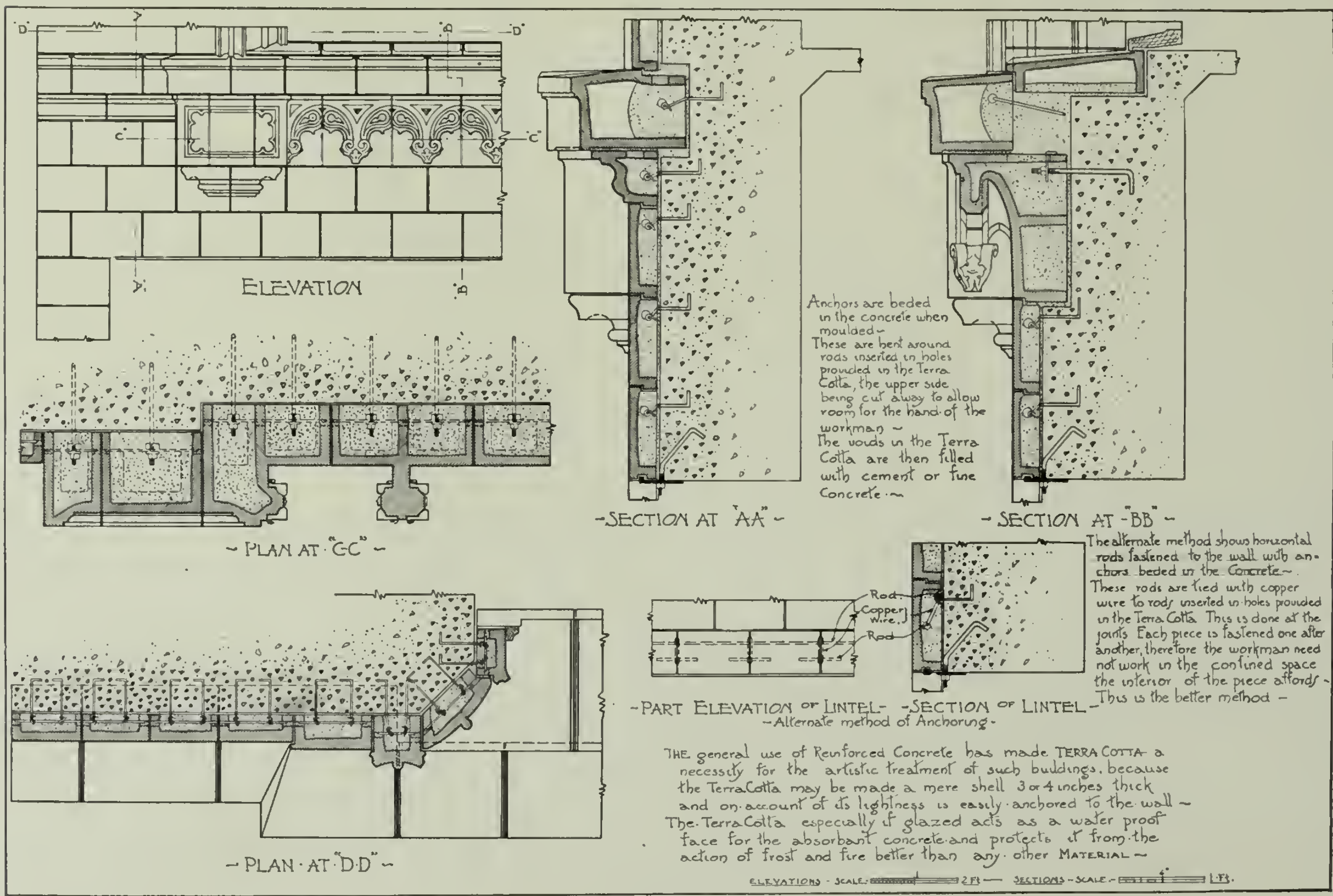


PLATE VII.

top and bottom of each piece are held in place unaffected by any inaccuracy in the wall or location of anchors. A better method in some respects is to fasten rods along the face of the concrete wall by bending the anchors around them, and as each piece is set, put a small piece of rod in its end, and with wire tie this piece of rod to the rod anchored to the wall, keeping the wire close up to the piece, so that when the adjoining piece is set the rod will fit into a hole in its end and the wire be confined in the joint. By this means the workman will have open space in which to work, and the top bed of the terra cotta need not be cut away. To cut this bed away weakens the pieces, makes more likelihood of breakage, cotta is used in connection with steel, as will be explained in a subsequent article.

One of the advantages of the use of terra cotta in connection with a reinforced concrete building is that no time need be lost waiting for the wall facing, as the building may be practically finished before beginning to set the terra cotta.

The idea embodied in the examples set forth in this article, all of which have been actually built, is that terra cotta is a veneer and may properly be used as such, in fact, it should be used as such; yet owing to the hollow space in the back of the pieces it is a veneer that becomes incorporated into the wall with no possibility of becoming detached. It is such examples as these that express the real character of terra cotta, displaying its practicability and its beauty, but without an intimate knowledge of that character on the part of the architects who design these features the happy results obtained would have been impossible. Therefore, architects who have not had a large experience in the use of terra cotta, or those whose ambition gives them courage to step into untrod fields, need the cooperation of the manufacturers which for obvious reasons the manufacturers are only too glad to give, to work out, not only such novel features as those mentioned in this article but those of more every day occurrence as well as those of color and texture.

The leading manufacturers have in their employ graduates of the best technical schools and universities, such as architects and ceramic chemists who are studying the various problems that arise, keeping abreast of the advanced thought in science, art, and construction, and who are always at the command of architects to demonstrate the great possibilities of this material in American architecture.

Plate Illustrations — Description.

Parish House for the All Saints' Church, Dorchester, Mass. The half timber work on the exterior is of plain oak and tones in with the gray of the wire-cut brick. The roofing consists of slate. Upon the interior of the Parish House the woodwork is of stained cypress, and the walls of plaster, except in the gymnasium where brick is used. The cost of the entire building, including heating, plumbing, and lighting, is $30,000. The cost per cubic foot is 19 cents.

McAllister House, Philadelphia, Pa. This residence has been constructed on a lot approximately two hundred and fifty by three hundred feet, with gardens laid out after the manner of the English in their general planting. The exterior treatment is of the English Georgian style and built of dark red brick with a purplish tinge running throughout. Upon the interior the colonial style prevails also. The dining room is paneled in white, the hall has an open string stairway with carved ends, white spindle balusters, mahogany rail, and spiral starting newel. White pine is used throughout the interior for all woodwork except the floors, which are of oak. The cost of the house is approximately thirty thousand dollars, or about thirty cents per cubic foot.

Boston Opera House. The exterior of this building has been treated in red brick and a dull glaze terra cotta of a cream tone with occasional touches of light blue. Provision has been made, exclusive of the main entrance, for a carriage entrance from the side; both have separate entries into the main foyer.

The floors of the entrance hall, the foyers, and the palm room are a combination of marble and terrazzo. The walls and ceilings are of hard plaster with a general tone of French gray. The stairs are constructed with steel and reinforced concrete with marble covering. The balustrade is of cast-iron with a mahogany rail.

The general color scheme of the auditorium is a dull gold against a quiet gray background. The ceiling decorations have some light blue in addition to the gold and gray. The upholstery and hangings throughout the main auditorium are in warm red. The seating capacity is 2,750.

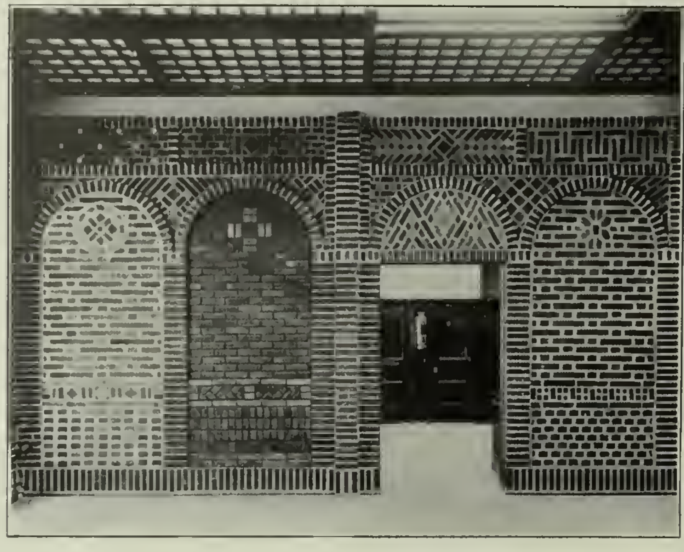
The ventilating system is designed to furnish each person with 1,200 cubic feet of fresh air per hour. The air is taken from the roof into a shaft 75 feet square and heated to 68° F. Thence it is discharged into three large plenum chambers under the auditorium and balconies, from where it is forced under pressure through metal tubes to an inlet underneath every seat in the building. The vitiated air is drawn through vent grilles located in the ceilings, carried through galvanized iron ducts to the main vent chamber and discharged from the building. Each opera box has a separate supply of fresh air. The heat loss on the exposed surfaces is counteracted by means of direct radiators controlled by thermostats.

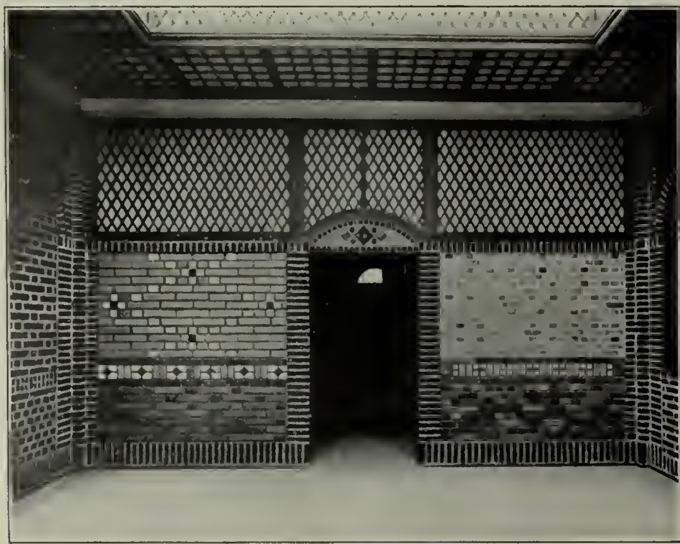
Henry D. Cooke School, Washington. The building is located in one of the most charming parts of Washington, within easy access of the car lines and yet removed far enough away from the main thoroughfare to escape the annoyance that arises when a school is located on a street of traffic. Nothing obstructs the sunlight or prevents a free circulation of air. Ample space surrounds the building, providing playgrounds and an excellent opportunity for gardens wherein the principles of agriculture and horticulture may be taught.

The building maintains a simple dignity, and demonstrates that a pleasing architectural effect can be produced by keeping the surfaces somewhat plain and with the ornamentation adapted to the general character of the whole building. The hard red bricks are laid in Flemish bond, with wide mortar joints, and relieved by the special architectural treatment at the entrance and in the frieze and window panels, where the pattern work consists of red brick and green tiles. The base of the building is granite, while the other trim is sand-blast white terra cotta. All the exterior woodwork, including the projecting soffits of the roof, is colored sage green, which harmonizes with the tones of the other materials.

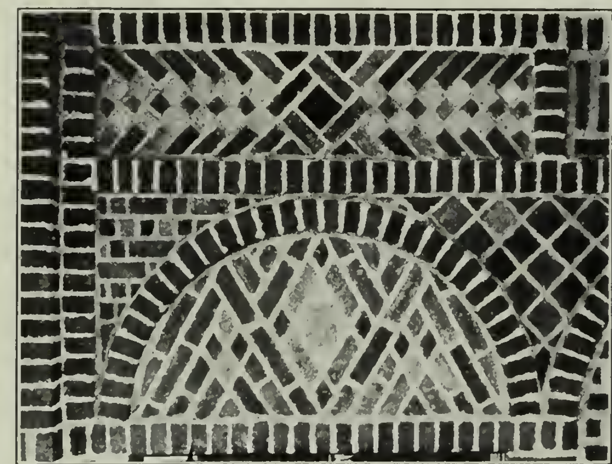
The building contains sixteen class rooms, each one of which has a cloak room and ample unilateral light, and an assembly hall which extends through the basement and first story with accommodations for six hundred and fifty pupils. The entire corridor space of the first floor can be utilized as a balcony for the assembly hall. The second story is planned similar to the first, differing only in its provision for rooms to accommodate the principal, a library, a resting place for the teachers, and some extra toilets. The interior walls are of masonry, while the first floor and the corridors of the second floor are of fireproof construction.

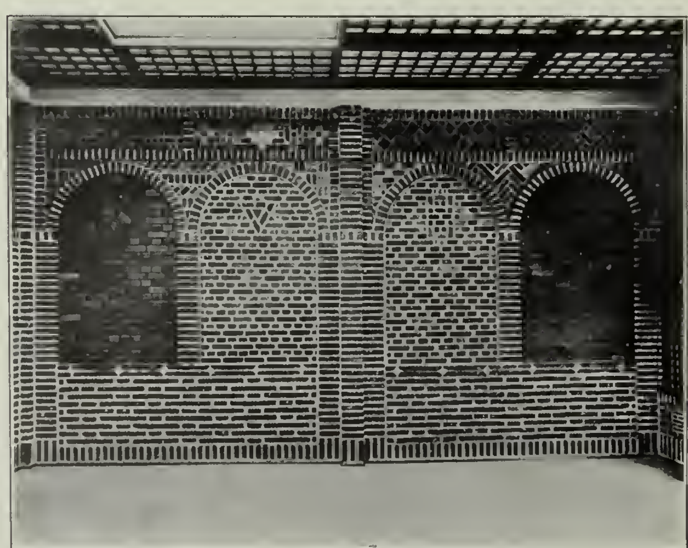
The total cost of the building was $103,000, and the cost per cubic foot 13½ cents.





THE accompanying illustrations show the treatment of wall surfaces in brick after designs by Addison B. Le Boutillier. They afford an excellent opportunity of showing the possibilities that may be obtained by using the various sizes and colors of brick. The panels are laid up in the different bonds, viz: English, Dutch, Flemish, and running bond, and suggest ornamental patterns made from the same brick. The length of the bricks range from eight to eighteen inches. In the panel which shows the Flemish bond, the very long stretcher is made by laying two 8 inch bricks together with a blind joint. The work throughout furnishes examples for belt courses, the different ways of treating headers, the manner of framing openings, and frieze effects. Beneath the window openings are patterns for the laying of walks with brick, as well as a scheme for the use of tiles 6 inches square. No attention in laying the brick was given to the color scheme, and yet one finds all the warm hues, such as the yellows, reds, and browns mixed in with shades of blues, grays, and greens. The mortar has been mixed to harmonize with the various tones of the brick and is tinted in red, white, gray, or brown. The rake and flush joints vary in width, the latter having the thickness of an inch in one of the panels. In the very wide joints small pebbles are used to effect a rough texture and at the same time increase the strength of the mortar. By a thorough study of the detail one can readily see that the work has been executed in a free manner, and little attention has been paid to the uniformity of the jointing or that the brick on one side of an axis should correspond exactly with those on the other, and yet the whole effect, with the natural balance of the light and dark colors, gives harmony and symmetry to the ensemble. This whole work is a display of "Tapestry" brick in the Boston offices of Fiske & Co., Inc.

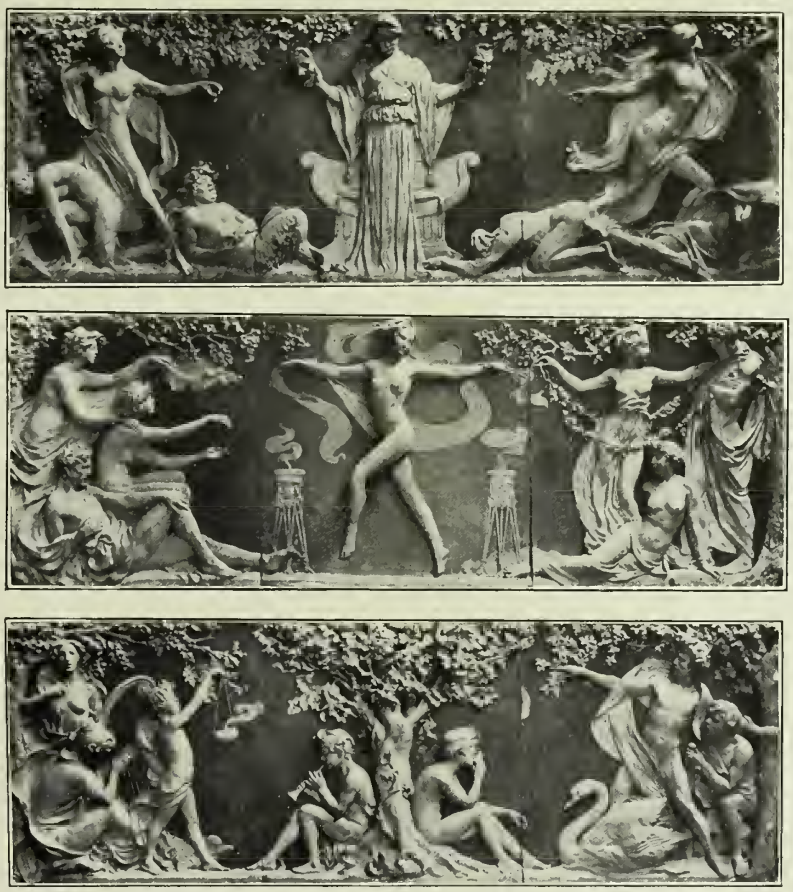




Editorial Comment and Miscellany.

PUBLIC SCHOOLS.

NOTHING could be of more vital interest to the American people than the growing desire for better housing of our school children that is taking root in the majority of our larger cities. In most cities competent men are selected to meet the ever increasing needs of the pupils. These public school commissions are spending every effort possible to find suitable quarters for the boys and girls that register, as well as securing healthier and better adapted buildings for them. The Board of Education in New York City is confronted with the problem of accommodating 70,000 children for whom no provision has been made. This is a condition that arises in the metropolis every year, but never before to such an extent, and the fault seems to belong elsewhere than upon the educational committee, who petitioned the Board of Estimate for an appropriation of $7,000,000 with which to build public schools, but to date they have received no definite reply to their petition.



DETAIL OF FRIEZE BETWEEN COLUMNS OF MAIN FAÇADE, BOSTON OPERA HOUSE.
The figures are in cream white on a light blue background. The work was executed in terra cotta by the Atlantic Terra Cotta Company.
Wheelwright & Haven, Architects.

England is now entering upon a new era in regard to her public schools. She is breaking away from her stereotyped building which holds little regard for modern methods and is now planning for the physical needs of the children as well as furnishing them with an abundance of light and fresh air. Of the features worthy of special commendation are the facilities for bathing. Believing that cleanliness should be a national virtue they have established shower, spray, and slipper baths. Furthermore they are teaching the pupils the essentials in domestic living and are providing dining halls in connection with well equipped kitchens. The best typical examples of English school planning which show proper regard for every modern improvement are found at Staffordshire, Letchworth, and Bradford.

Unusual interest is exhibited towards our public schools by the various art societies. The Chicago Water Color Club in conjunction with the Chicago Society of Artists have organized a rotary exhibition, loaning to the schools a collection of a hundred or more paintings which they allow to remain for several weeks at one place before removing them to another. Well known artists appear before the pupils and give interesting talks upon these works of art, thereby instilling into their young lives a knowledge of colors and their proper use. Other organizations like the Public School Art Society are decorating many of the schools in the poorer districts and have at the same time executed examples of model schools whereby all sections that are able to do so can beautify their own rooms. Surely such principles as these when adopted by the boards of education located in the various cities cannot fail to stimulate a keener appreciation for the good and beautiful among the children in our public schools — a vast majority of whom never receive a higher education.

COOPERATIVE APARTMENT HOUSE.

CONSERVATIVE calculation places the amount of capital at present invested in cooperative apartment house properties on Manhattan Island at between $25,000,000 and $30,000,000, says the New York *Evening Post*. While still a comparatively new idea in this country, the joint ownership of such city homes has been in vogue in Europe for centuries. Curiously enough, the supposedly uncommercial artist class have been the pioneers. The first apartment of this type was the "Rembrandt Studios" built on West 57th street by Jared Flagg and a number of artists in 1880. Within three years ten others were built. After the conspicuous failure of the "Navarro Flats" (owing to the error of building on leased ground), construction lagged until 1898, when Harry Ranger, heading a syndicate of artists, revived the idea. Steadily since then they have been becoming a stronger and stronger factor in the New York real estate field.

The essential features of the cooperative apartment house are its ownership by a stock corporation, the shareholders of which are entitled to acquire apartments on long-term leases, and that it permits the gathering together of select tenants, which besides creating a community of interests, adds to the value of the property and the prestige of the neighborhood. They have in fact increased the supply of middle-grade private dwellings which have been made impracticable by the growth in the value of land. The method nowadays is this: A number of friends decide upon a location, form their company, purchase the site outright, select their architect, and build themselves, thereby eliminating the middleman's profit. The company holds title to the ground. Upon payment of their subscriptions stockholders are given apartments for ninety-five years usually, sometimes nine hundred and ninety-nine years, in some cases in perpetuity. In all of these apartment houses there are a certain number of apartments to be rented to non-stockholders, and revenue for taxes, assessments, running expenses, and other fixed charges is thus provided. A stockholder knows at the beginning very nearly what his home is going to cost. The cooperative apartment recently completed opposite the Museum of Natural History exemplifies, perhaps, the progress that has been made in this type of structure.

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

A SEVERE blow to Chicago's plans for a "city beautiful" has been dealt by the superior court at Springfield, Ill., in holding that the $8,000,000 structure to house the Field Columbian Museum may not be erected in Grant Park, the lake-front playground. Upon this site the museum had been made the center of a system of parks, driveways, and other imposing buildings, which were to transform the city. Under the terms of the will the trustees of the museum still have three years in which to obtain a site; but it is doubtful if one near the heart of the city can be secured.

DETAIL BY JOHN W. VESTOR, ARCHITECT.
Made by Brick Terra Cotta & Tile Company.

AFTER nearly three years of labor the Commercial Club of Chicago, aided by the local architects, has published its comprehensive plans for the beautification of the city. The plans are contained in a volume of over one hundred and fifty pages, profusely illustrated by Jules Guerin, Fernand Janin, and others. The six chief objects aimed at are the following: The improvement of the lake front. The creation of a system of highways outside the city. The improvement of railway terminals and the development of a complete traction system for both freight and passengers. The acquisition of an outer park system and of parkway circuits. The systematic arrangement of streets and avenues within the city in order to facilitate the movement to and from the business district. The development of centers of intellectual life and civic administration so related as to give coherence and unity to the city.

DETAIL BY F. C. BONSACK, ARCHITECT.
Made by Winkle Terra Cotta Company.

THE annual report of the supervising architect of the Treasury, made public October 14th, states that during the last fiscal year twenty-one new government buildings and sixteen extensions of old buildings have been completed and eighty-five buildings commenced, while twenty-nine are still under contract. There are thirty-one extensions of Federal buildings in course of erection, fifty-six extensions yet to be placed under contract, and one hundred and forty-one sites for which no public buildings have as yet been provided. On July 1st last there was a balance of $4,476,308 available for sites and additional land, and $20,821,476 for construction, extension and repair work.

ARCHITECTS in the larger cities of the United States have been invited by officials of the Argentine Republic to submit, in competition, designs for a hospital group at Buenos Ayres. The buildings are to cost $10,000,000 and are to follow the system of twenty-four detached institutes of sixty beds in each. Houses for members of the faculty and residents, the electric lighting, water supply, heating, laundry, and other details, are to be presented in the plans. The program has been distributed by the consul general of the Argentine Republic at Washington. The competition is to close at noon, December 10th. The successful architect's compensation is to be five per cent, and he is to superintend the construction. The plans deemed second best are to obtain a prize of $10,000, and those considered third best will win $5,000.

DURING examination of a Chicago and Northwestern railroad bridge at Clinton, Iowa, a white worm about one half an inch long has been discovered attaching itself to the timbers far below the water line in such a manner as to soon render the bridge unsafe. Specimens of the worm have been sent to the University of Chicago for examination, and if found as destructive as is supposed another reason will have been discovered for the avoidance of wood construction.

PLANS for the William Rainey Harper Library, drawn by Shepley, Rutan & Coolidge, have been accepted by the board of trustees of the University of Chicago and ground will be broken this summer for the erection of this, the University's largest and most costly structure. Four structures, adjoining the library and forming integral parts of the design made public in Chicago July 9th, will be erected as soon as funds are obtained, the whole representing an outlay of about $1,000,000.

DETAIL BY SOMMERFELD & STECKLER, ARCHITECTS.
Made by New Jersey Terra Cotta Company.

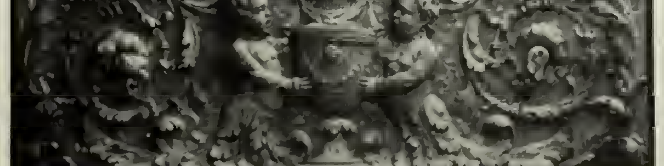
THE Wall street district is full. So it would appear with the erection of the Bankers Trust Company's sixteen or twenty story building upon what is about the only site left which is unimproved by tall buildings. This is the land on which Jonathan Edwards' famous church once stood. It has been leased for twenty-one years, or with options for renewals for eighty-four years, at an aggregate rental of $7,000,000. Within the past year investments aggregating some $15,000,000 are represented in the construction of new buildings upon or very near Wall street. Future banking structures must be erected north of the famous thoroughfare.

PRESIDENT DELANO, of the Wabash Railroad, has submitted to the City of Chicago the plans for a $100,000,000 transportation center to be built in that city. It includes new terminal facilities of the Western Indiana Railroad and contemplates the abandonment of present freight and passenger terminals and the centralization of many lines in a structure half a mile south of the present limits of the business district.

DETAIL BY G. AJELLO, ARCHITECT.
Made by New York Architectural Terra Cotta Company.

PROF. CHARLES RICKET, of Paris, claims to have discovered a means of purifying air in a room by use of an apparatus consisting of an air filter which mechanically sterilizes the air. Fine drops of glycerine are scattered along the walls of a cylinder, containing a suction fan, through which the air is whirled.

THE trustees of Princeton have selected the site of the Graduate College for the erection of which William Proctor has donated $500,000. It is to be a short distance southwest of the present campus. The prudential committee of the Yale corporation has voted in favor of erecting the new Physical Laboratory, for which $425,000 was recently given by William D. and Henry T. Sloane, on the Hillhouse property (Sachem's Wood) and at a point about midway on the Prospect street front. The development of the new site of the University of Pittsburgh is progressing rapidly. Upon the forty-three acres in the Oakland district of the city, and formerly a part of the Schenley Farms, the School of Mines and the School of Engineering have been reared and the School of Medicine is to be commenced at once. A memorial fountain is to be erected with the sum of $30,000 bequeathed by Christopher Magee. The University of California has completed the purchase of two hundred and fifty additional acres of ground adjoining the campus and comprising the entire inner portion of Strawberry Cañon. The trustees of the Andover Theological Seminary, which removed last year to Cambridge and became affiliated with Harvard University, have purchased about two hundred thousand square feet of ground in Cambridge. Upon this a group of buildings will be erected. The principal building, to be called "Andover Hall," will front on Francis avenue. By the $500,000 gift of Lord Strathcona, McGill University comes into possession of a quarter of a million dollars, the difference being donated by Andrew Carnegie. Rutgers College will break ground within a few weeks for a new chemistry building.



DETAIL BY SOUTH AMBOY TERRA COTTA COMPANY.

IN GENERAL.

Hugo H. Zimmermann has opened an office for the practice of architecture at 184 La Salle street, Chicago, Ill.

Lansburgh & Joseph, architects, of San Francisco, have dissolved their copartnership. G. Albert Lansburgh will continue practice with offices in the Gunst Building.

At the October meeting of the Cleveland Chapter A.I.A., W. Dominick Benes was elected president, Frederick W. Striebinger, vice president, and Emile Thebaud, secretary and treasurer.

Warren & Welton, architects, have removed to new and enlarged quarters, 1607-11 Empire Building, Birmingham, Ala.

The Architectural Club of Baltimore has removed from 6 West Eager street to its new rooms at 847 North Eutaw street.

The Avery Library Commission was created by the Letter of Gift of the founders, Mr. and Mrs. S. P. Avery, who established and endowed the library in memory of their son,

REFECTORY BUILDING, HUMBOLDT PARK, CHICAGO.
Roof laid with Ludowici-Celadon Tile.
Schmidt, Garden & Martin, Architects.

Henry O. Avery. The statement in our October issue that the library was established and endowed by Henry O. Avery is incorrect.

James C. Green announces that he has withdrawn from the firm of Kirby, Pettit & Green, and will continue the practice of architecture with offices at 103 Park avenue, New York City.

Announcement is made that the firm of Wills & Ingle has been dissolved. Hereafter Mr. Wills will continue business under the name of J. L. Wills, architect, Rookery Building, 127 Fourth street, Evansville, Ind.

Desjardins & Sheblessy, architects, Cincinnati, have dissolved their copartnership. Mr. Desjardins will retain the old offices in the Fourth National Bank Building, while Mr. Sheblessy has taken offices in the Provident Bank Building. Manufacturers' catalogues desired.

The Empire Building, for which Carpenter & Blair and Warren & Welton, associated, were architects, is located at Birmingham, Ala., and not at Atlanta, Ga., as stated in our October issue. Bruce & Morgan were the architects for the Empire Building at Atlanta.

DETAIL BY THOMAS HANNA, ARCHITECT. Made by Northwestern Terra Cotta Company.

The Year Book of the San Francisco Architectural Club issued in connection with the Fifth Exhibition and under the direction of the Architectural League of the Pacific Coast, is of more than ordinary merit and interest. The illustrations of work which is being done by the leading men of the coast is especially attractive and well worth studying. If we may venture a suggestion, it is that the illustrations would have had greater interest had more of them been from photographs of the buildings themselves rather than drawings.

After a struggle, lasting about thirteen years, Kansas City is to have an adequate union railroad station. The voters have overwhelmingly endorsed the new depot and terminal ordinance, and the railroad officials have acquiesced, promising that actual construction will soon be begun. The station is to cost about $3,000,000, and other improvements involved will cost about $12,000,000 additional.

Norfolk, Va., is about to pass upon a project to bring several railway systems through a tunnel, to be built under the Elizabeth River from Pinner's Point, into the business center of Norfolk and there terminate in a union station to be newly erected at a cost of about $1,000,000.

The architectural terra cotta used in the Cooke School at Washington, illustrated in the Plate Form of this issue, was furnished by the Atlantic Terra Cotta Company.

The terra cotta used for the Tilton School, illustrated in this issue, was supplied by the American Terra Cotta & Ceramic Co.

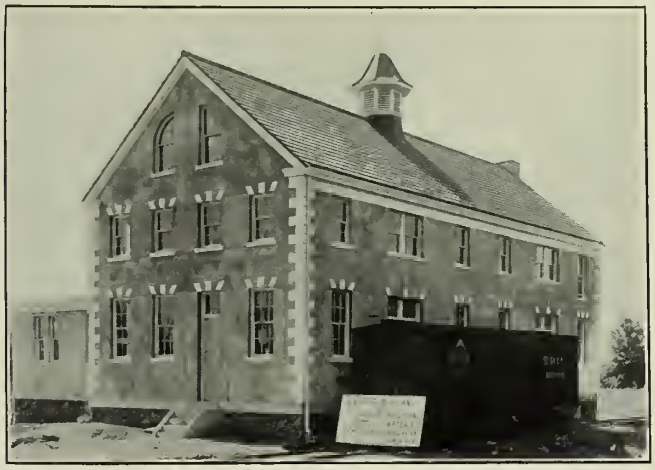
The Northwestern Terra Cotta Company furnished the terra cotta for the Bernhard Moos School, which is illustrated in this issue.

The enameled brick used in the Tilton School, Bernhard Moos School, and the Albert G. Lane Technical High School, the three new school buildings at Chicago, illustrated in this issue, was supplied by the Tiffany Enameled Brick Company.

We are indebted to the Boston *Post* for the photograph showing the interior of the Boston Opera House, illustrated in this issue.

The "Belnord," which is the new twelve story apartment house occupying the entire block bounded by Broadway, Amsterdam avenue, 86th and 87th streets in New York, is finished and opened to inspection. The facts about the building appearing in the advertisements soliciting tenants at rentals of $2,100 and upwards make interesting reading. The building is erected around an open court 231 by 94 feet and contains apartments of all sizes from seven rooms up, with two, three, and four bathrooms and two or three servants' rooms and baths. Each apartment has a foyer hall opening directly into the parlor or dining room. Each apartment has an individual fireproof storage room in the basement. The kitchens, butlers' pantries, and laundries face on the streets, and the bedrooms open on the interior court, insuring quiet to the sleeping or living rooms. The advantage of this is seen when it is realized that the width of the court is greater than that of the average city street. All kitchens are equipped with gas ranges and have a garbage receptacle built in the wall and ventilated. The refrigerators are artificially cooled. Wall safes are a feature of each apartment. A vacuum cleaning plant with an outlet in each apartment and a complete telephone system, mechanical and electrical plant, spell what is probably the last word in modern apartment house equipment.

HOUSE AT ST. PAUL, MINN.
Built of dark gray brick made by Twin City Brick Company, St. Paul.
Clarence H. Johnston, Architect.



A FACTORY BUILDING.
The walls of which are constructed of 12 inch by 12 inch by 12 inch terra cotta blocks furnished by National Fireproofing Company. Building is 44 feet by 80 feet, with two wings each 18 feet by 36 feet. Floors, frame. Cost, $13,000, or 10 cents per cubic foot. Tile contract, $1,247.

The architectural terra cotta used in the Boston Opera House, illustrated in the Plate Form of this issue, was supplied by the Atlantic Terra Cotta Company. All the columns shown and the trim were of a soft toned, cream white terra cotta.

"The Shubert Theatre" is the name of a new playhouse to be built in New York by the 39th street Theatre Company, of which Lee Shubert is the head. It is to be erected opposite the old Casino Theatre, on the site of the old Mystic Flats. The building will be seven stories high, and part of it will be fitted up as studios.

It is rumored that D. O. Mills will build another of the Mills Hotels in New York City.

COMPETITION FOR A PUBLIC BATH AND GYMNASIUM BUILDING.

FIRST PRIZE, $500. **SECOND PRIZE, $200.** **THIRD PRIZE, $100.**

COMPETITION CLOSES JANUARY 17, 1910.

PROGRAM.

THE problem is a Public Bath and Gymnasium Building. The location may be assumed in any American city of about 50,000 inhabitants, or some section in a larger city. Competitors may choose between two sites, one at the corner of two intersecting streets, or one in the middle of a block. Both lots are ample in size to accommodate the building and are practically level.

In plan the building may be rectangular (block); or of the pavilion type, having a central motive and two wings, with the longitudinal axis parallel to the street.

The plan should provide for the following:—

IF OF THE BLOCK TYPE:—

In the basement: a swimming pool, six showers, a suitable number of lockers, dressing rooms and benches, toilet rooms, supply rooms, a small laundry for washing and drying, heating plant, and coal storage.

On the first floor: general waiting room, administration offices, at least fifty showers (forty with individual dressing rooms, and ten arranged in groups), lockers, dressing benches, toilet rooms, etc.

On the second floor, which may extend approximately two stories: a gymnasium, six showers, four sponge baths, a rubbing table, lockers, dressing rooms, benches, instructors' and medical attendants' rooms.

IF OF THE PAVILION TYPE:—

In the central part of the building: first floor to provide for a reception room and administrative offices. Second floor to provide a hall for lectures and other entertainments.

In one wing: a gymnasium with the same accommodations as recommended for the block type.

In the other wing: a swimming pool, the shower baths, and other features suggested for the block type.

GENERAL:—

In connection with the gymnasium a running track should be provided which will have not more than twenty-four laps to the mile. Other gymnasium apparatus need not be indicated.

Competitors are free to add any additional features to the plan and equipment which may seem desirable.

The exterior of the building is to be designed entirely in architectural terra cotta, employing color treatment in at least portions of the walls. It is suggested that large blank surfaces of gymnasium walls afford an excellent opportunity for design in terra cotta.

The following points will be considered in judging the designs:—

A. Rational and artistic treatment of the exterior. B. Frank and logical expression of the prescribed material. C. Excellence of plan.

It must be borne in mind that one of the chief objects of this competition is to encourage the study of the use of architectural terra cotta. There is no limitation of cost, but the designs must be suitable for the character of the building and for the material in which it is to be executed.

In awarding the prizes the intelligence shown in the constructive use of architectural terra cotta and the development or modification of style, by reason of the material, will be taken largely into consideration.

DRAWINGS REQUIRED.

On one sheet, at the top, the front elevation drawn at a scale of 8 feet to the inch. On the same sheet, below the front elevation, the floor plans drawn at a scale of 16 feet to the inch.

On a second sheet, at the top, the elevation of secondary importance drawn at a scale of 16 feet to the inch; immediately below half inch scale details of the most interesting features of the design. The details should indicate in a general manner the jointing of the terra cotta and the sizes of the blocks. The color scheme is to be indicated either by a key or a series of notes printed on the same sheet with the secondary elevation and details, at a size which will permit of two thirds reduction.

The size of each sheet (there are to be but two) shall be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets, one inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are not to be mounted.

All drawings are to be in black ink, without wash or color, except that the walls on the plans and in the sections may be blacked-in or cross-hatched.

Graphic scales to be on all drawings.

Every set of drawings is to be signed by a *nom de plume*, or device, and accompanying 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.

The drawings are to be delivered flat at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., charges prepaid, on or before January 17, 1910.

Drawings submitted in this competition must be at owner's risk from the time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned may have them by enclosing in the sealed envelopes containing their names, ten cents in stamps, if on cardboard twenty-five cents in stamps.

The designs will be judged by three or five well-known members of the architectural profession.

For the design placed first in this competition there will be given a prize of $500. For the design placed second a prize of $200. For the design placed third a prize of $100.

There have been published in THE BRICKBUILDER from time to time articles treating of the Public Bath and the Gymnasium, also illustrations of both types of buildings. This data, which may be of assistance to those who intend to enter this competition, will be found in the following issues:—

1909. February, March, April, May, June. **1908. February, March, April, May, June, August, November.**

We are enabled to offer prizes of the above-mentioned amounts largely through the liberality of the terra cotta manufacturers who are represented in the advertising columns of THE BRICKBUILDER.

This competition is open to everyone.

THE BRICKBUILDER

VOLUME XVIII | DECEMBER 1909 | NUMBER 12

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba	$5.00 per year
Single numbers	50 cents
Subscription price, mailed flat to subscribers in Canada	$5.50 per year
To Foreign Countries in the Postal Union	$6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

Advertisers are classified and arranged in the following order:

Advertisements will be printed on cover pages only.

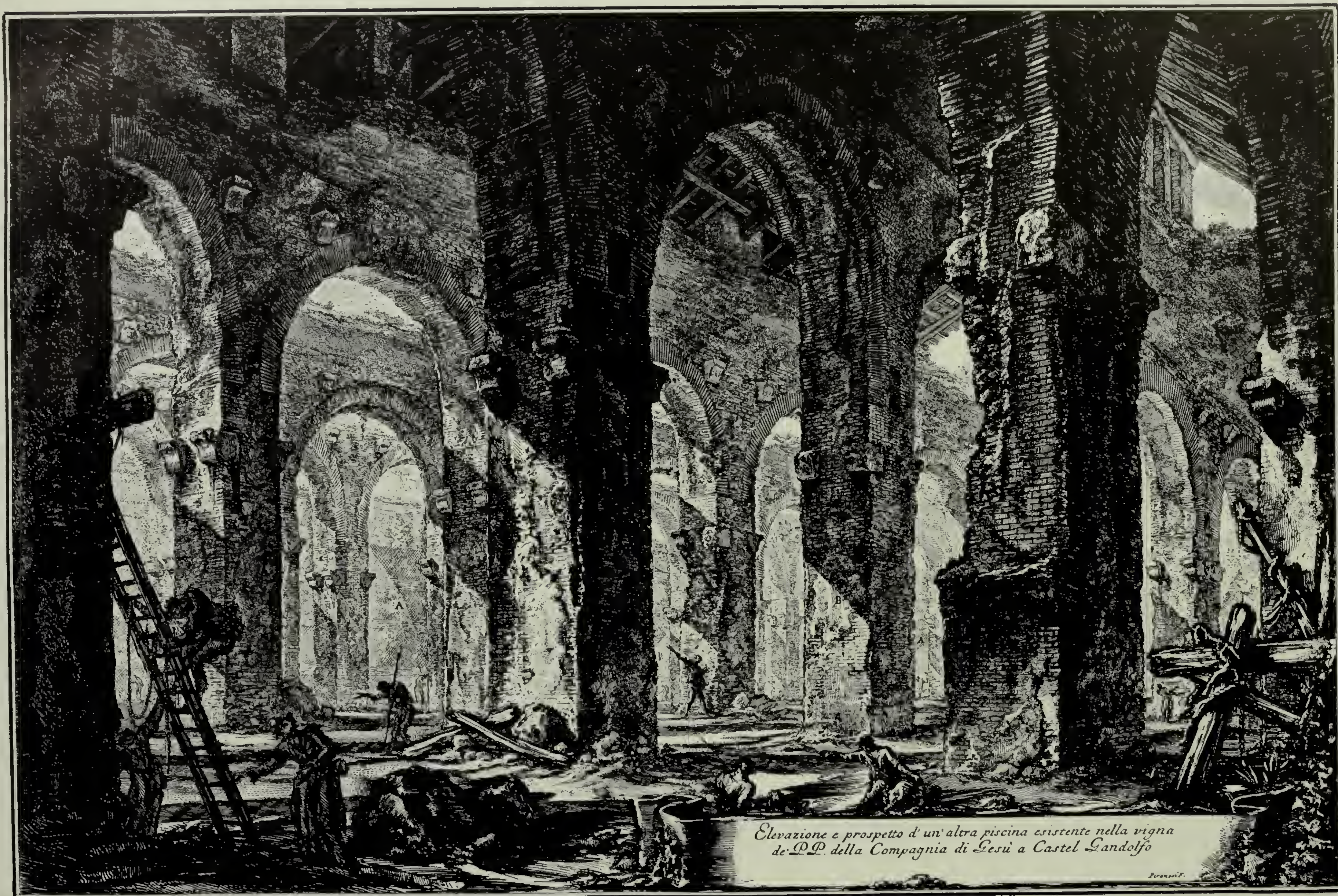
CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

BLISS & FAVILLE; DELANO & ALDRICH; HARDING & SEAVER; CHARLES BARTON KEEN; PARISH & SCHROEDER; PEABODY & STEARNS; JAMES PURDON; ROBINS & OAKMAN.

LETTERPRESS



REMAINS OF A RESERVOIR BELONGING TO THE EMPEROR DOMITIAN'S VILLA IN THE ALBAN HILLS NEAR ROME.

GIOVANNI BATTISTA PIRANESI, DEL.

Among the most striking structures of the Emperor Domitian's Villa at Albano are the huge reservoirs built in the side of the hill and practically under ground. In addition to the print shown here, Piranesi has engraved other plates representing plans and sections so that their exact construction may be followed out. In this one there are thirty pillars of the same size and construction as those shown in the engraving, all faced with brickwork, as are the four walls.

THE BRICKBVILDER

VOL. 18 NO. 12 DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN MATERIALS·OF·CLAY· DECEMBER 1909

Three Massachusetts Schoolhouses.

KILHAM & HOPKINS, ARCHITECTS.

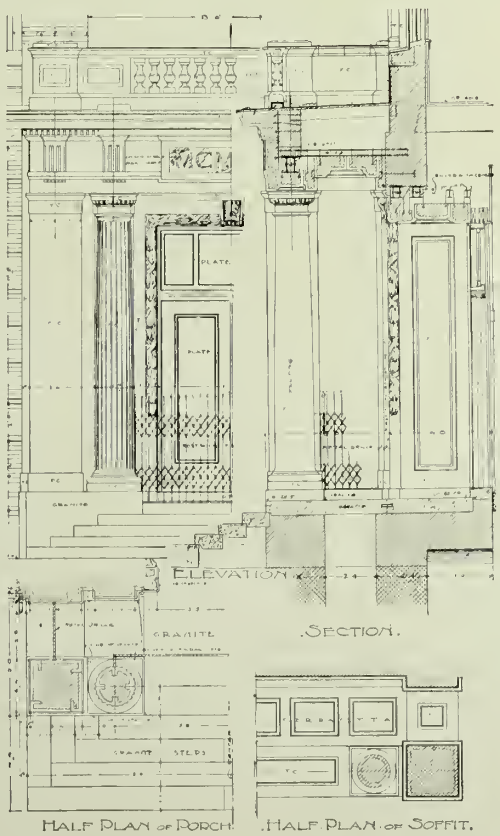
THE three school buildings illustrated in this article, the Salem High School, and the Williams and Shurtleff Schools in Chelsea, were all completed during the year 1909 and possess certain constructional features in common. The exteriors are of red water struck brick laid Flemish bond and terra cotta trimmings, with brick heat and vent ducts, and practically all brick interior walls. The boiler houses and considerable portions of the first floors are of reinforced concrete slabs on steel beams. The floors and roof frame are of steel girders and trusses, with Georgia pine joists, and are wire lathed throughout. The staircases are all fireproof, made of iron and slate and enclosed in brick walls. The roofs are of asphalt composition, with copper flashing carried up parapet walls and under copings. The ventilation is by the mechanical system, which forces the fresh air through concrete tunnels under the basement floor to the brick up-takes with automatic temperature control. The Salem High School has in addition a "forced hot water" heating apparatus.

All interior finish is in oak. Individual ventilating closets and urinals with slate partitions are used in every case. The "smoke doors" enclosing the stairways and the double entrances to each school room are requirements of the local inspectors of the Massachusetts District Police.

In these schools the intention was to have the costs moderate and the results most durable and attractive. While not strictly "fireproof" the buildings are nearly so in fact, and are fully as secure from fire danger. The costs per cubic foot given include in all cases general contract, plumbing, heating, ventilating, power plants, lighting fixtures, grading, seeding and curbing the grounds, granolithic outside walks and steps.

HIGH SCHOOL, SALEM. The building is located on a lot which is 25 feet above the level of the street. The architects have used the Georgian style in order to have the school harmonize with the colonial buildings of old Salem. The plan is practically a hollow square with the assembly hall in the center, and is specially arranged to permit of a future wing across the rear of the building.

The central pavilion emphasizes the vestibule and main entrance on the first floor, the school library on the second floor, and a large lecture room for science on the third floor. In addition to the library the second floor contains the gallery of the assembly hall, seven class rooms, four recitation rooms, and toilets. The third floor provides for three class rooms, four recitation rooms, laboratories for chemistry, physics, botany, and domestic science, as well as rooms for mechanical and freehand drawing.



DETAILS OF MAIN ENTRANCE, WILLIAMS SCHOOL.
Kilham & Hopkins, Architects.

The building is arranged for "home" desks for 864 pupils, with ten extra recitation rooms, beside rooms for special branches. The proportion of recitation to class rooms depends upon the curriculum of the school and it would seem to be fair to rate the capacity of a high school by the total seating capacity of class and recitation rooms.* Figured in this way the building accommodates 1,100 pupils and cost complete $272 per pupil.

There are four entrances to the building and the same number of stairways that run from the basement floor to the third floor, with a width of 5 feet in the clear. The floors of the corridors are terrazzo, while all other flooring is of maple finished with two coats of oil. Quartered oak with antique stain, three coat work well rubbed down, is used throughout the interior for trimming, with the exception of the assembly hall, which is treated in white, with gray walls. The assembly hall seats 1,400 people. The walls of the class rooms are colored in two tones of buff, the darker shade being used on the burlap to prevent soiling,

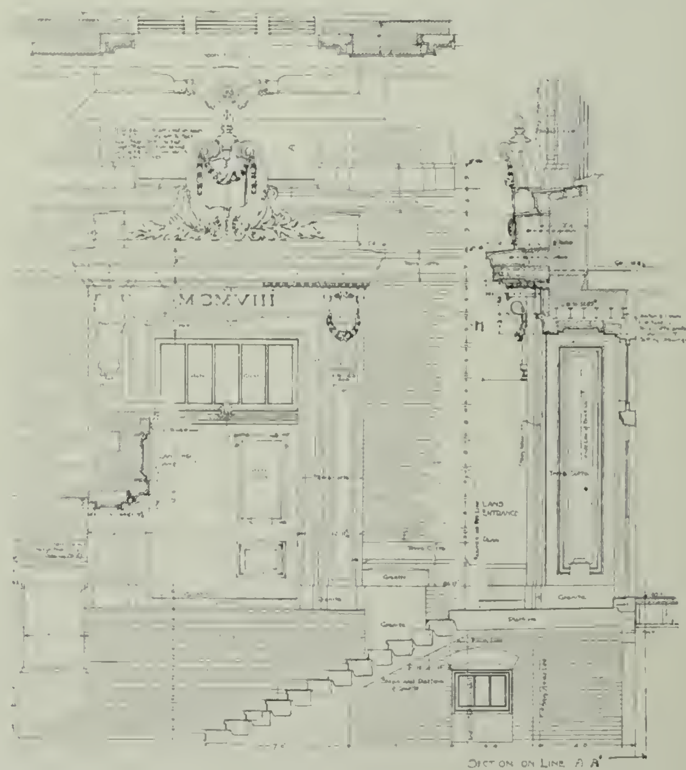
* Vide Boston Schoolhouse Commission Report, Vol. IV., page 2.

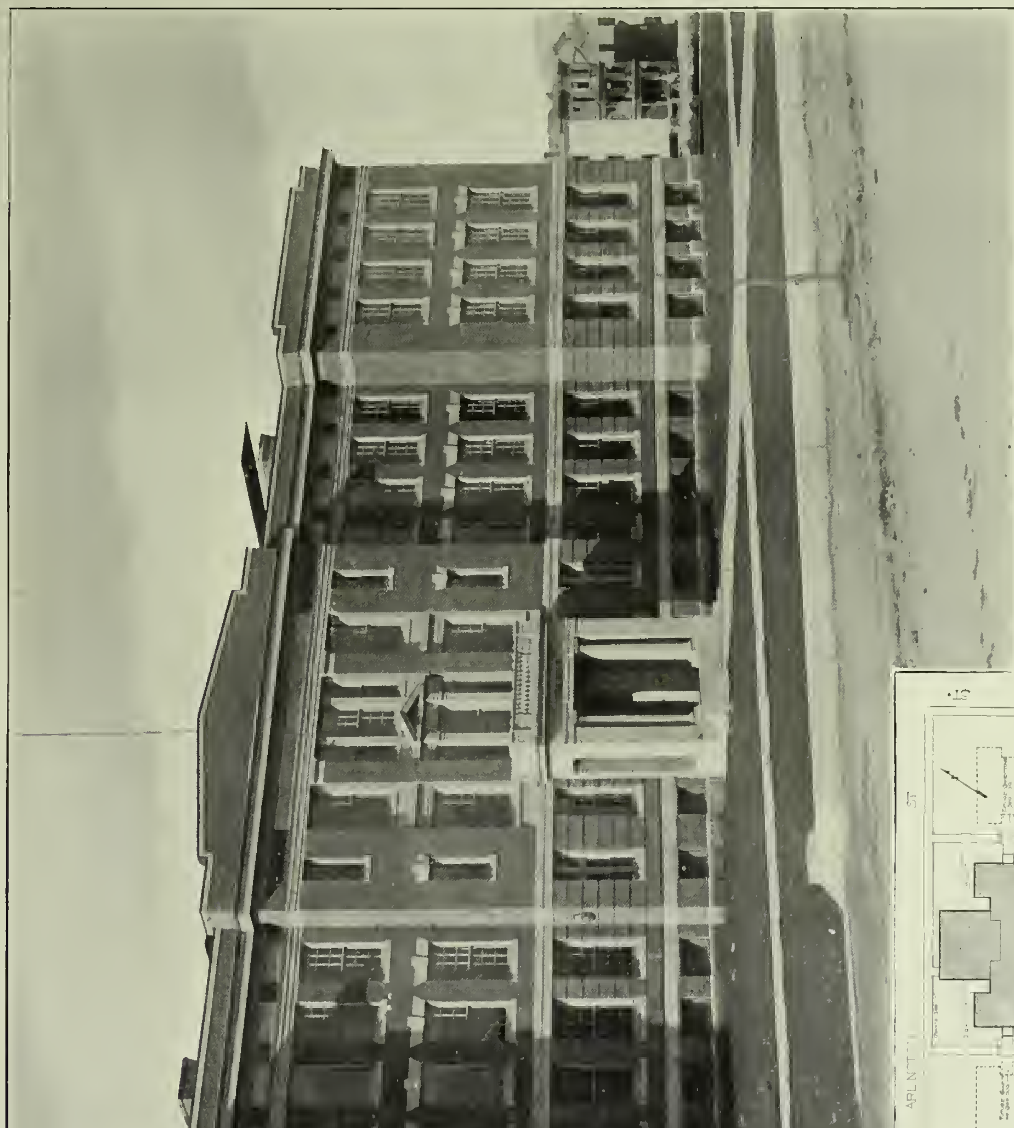
SALEM HIGH SCHOOL,

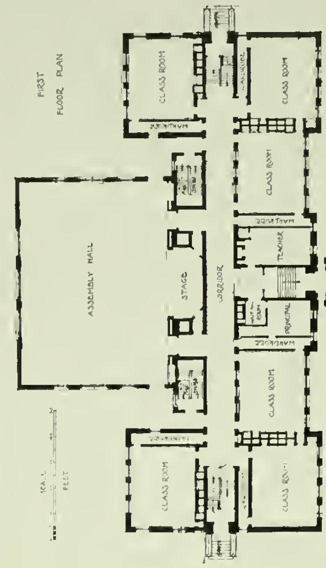
SALEM, MASS.

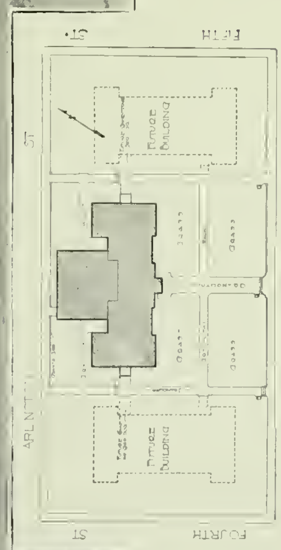
Kilham & Hopkins,

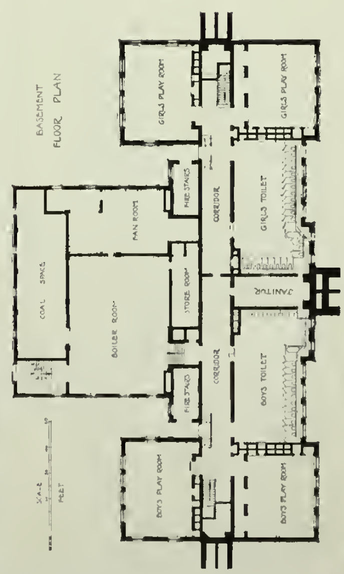
Architects.



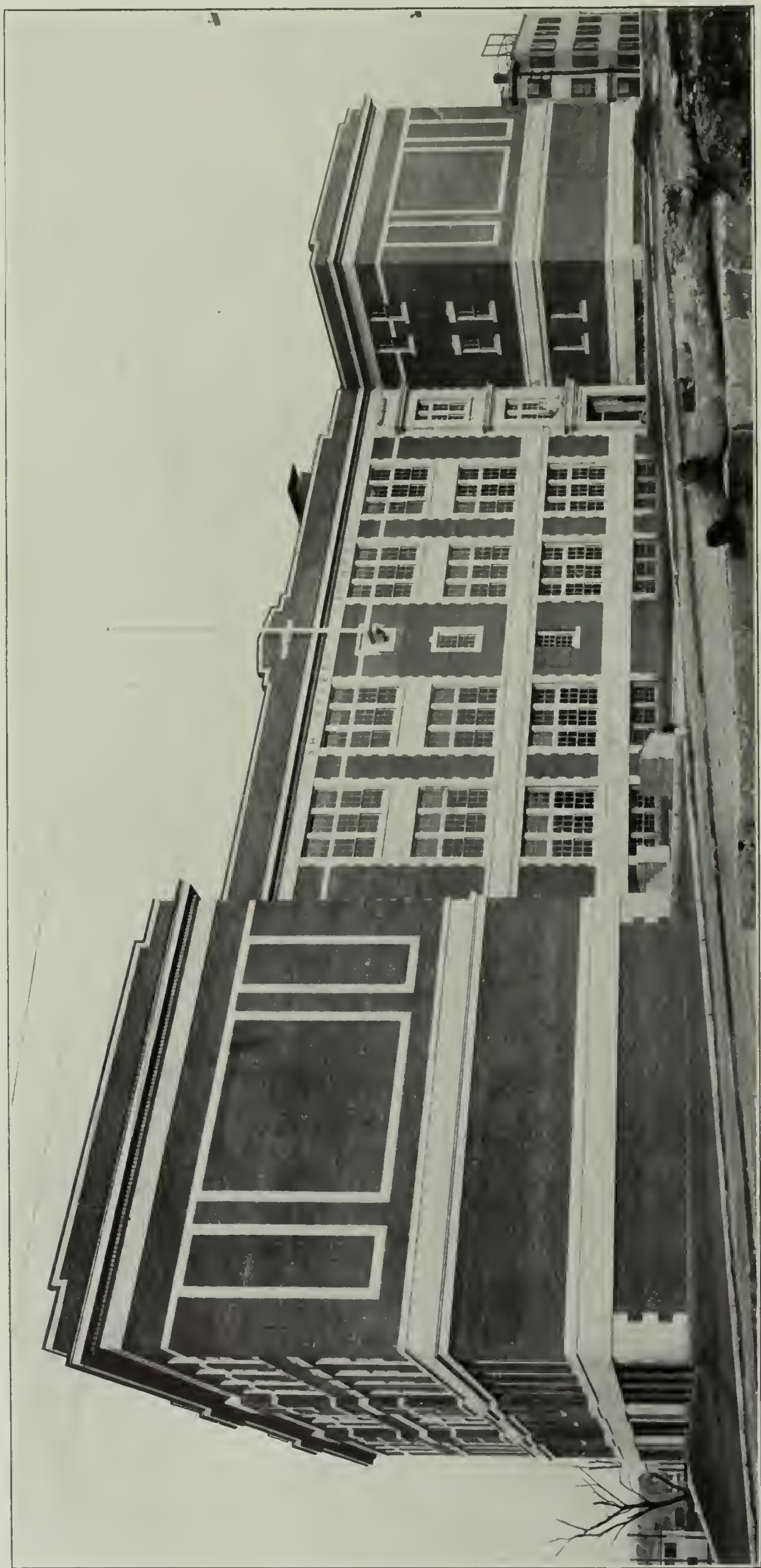






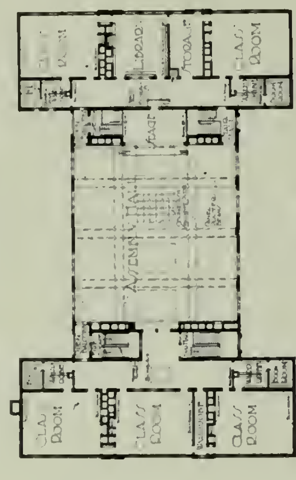


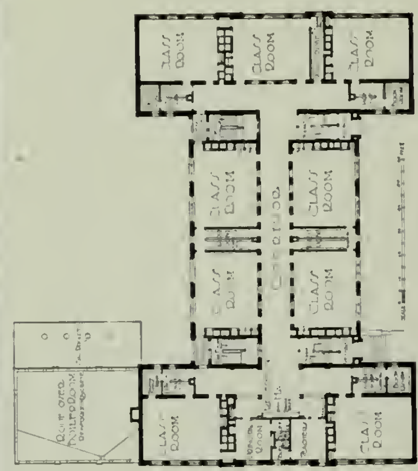
WILLIAMS SCHOOL,
CHELSEA, MASS.
Kilham & Hopkins, Architects.

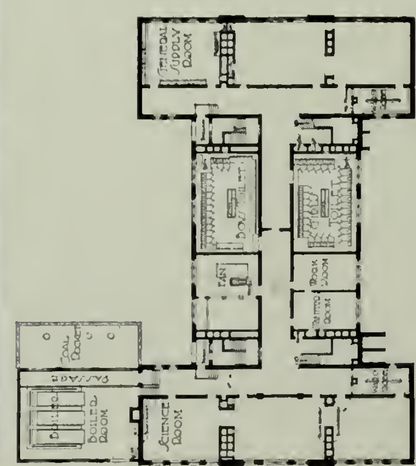


SHURTLEFF SCHOOL, CHELSEA, MASS.

Kilham & Hopkins, Architects.







while the lighter shade is used on the plaster above on account of its restfulness to the eyes.

The pupils' clothing is kept in individual ventilated steel lockers in two large and well lighted basement rooms. These lockers are 12 inches by 12 inches and 60 inches high. Basement entrances are arranged giving direct access to locker rooms. A complete chemical fire extinguishing plant is installed in the basement with ten stations throughout the building, equipped with hose reels and boxes, when by breaking the glass the pressure can be immediately applied. The building contains a complete independent electric lighting plant.

The total cost, including all furnishings and equipment, was about $300,000, and the cost of the building, exclusive of furnishings, about 16 cents per cubic foot.

Williams School, Chelsea. This building has been designed as the central structure of a future group of three and contains the assembly hall and boiler plant for the entire group. The other buildings are to have sixteen rooms each. The assembly hall is on the first floor and is arranged so that it may be readily used by the general public without entering the main building.

The floors throughout the building are of rift Georgia pine. The general trim is slashed oak. Slate blackboards and dadoes of burlap are found in all class rooms. The stair construction consists of iron everywhere, except the treads, which are of slate. In addition to the regular stairs there is a special type of fire escape stairs which are enclosed in brick towers included within the outside walls of the building and yet entirely isolated from the interior. They are so planned that no one can enter them without first passing out of doors upon an open balcony. This precaution was taken so that the towers would always be free from smoke in case of fire.

There are twenty class rooms which accommodate 50 pupils each, making the total number of 1,000 scholars. There are also four fully equipped basement rooms.

The cost of the entire building is $166,829, or approximately 16½ cents per cubic foot. The cost per pupil is therefore $166, which is high for the building already built but will be very moderate when the proportionate cost of the assembly hall is charged to the 1,600 additional pupils who will occupy the remaining buildings of the group.

Shurtleff School, Chelsea. This structure is one of two wings that have been planned and which will eventually be connected by means of the low fireproof boiler house. Through this boiler house will run a wide corridor, so that there will be easy access from one wing to the other. This plan gives an example of the H type of building, which affords a better opportunity of lighting the large rooms than the other well known types. The red water struck brick on the exterior blends harmoniously with the white terra cotta, presenting a very bold design at the corners as compared with the rather open and delicate style of the central feature. The mullioned windows are arranged so as to furnish the largest amount of light possible.

There are twenty-nine class rooms, beside manual training and domestic science rooms, which accommodate a total of 1,450 pupils. These rooms have burlap dadoes with tinted plaster above. The blackboards throughout are of slate. The floors are of rift Georgia pine, while the rest of the woodwork is of slashed oak. There are four stairways from the basement to the top floor, two of which are closed in and are only accessible from an open balcony, which allows of escape in case of fire by means of an avenue shut off from the rest of the building, and proof against smoke.

The indirect system of steam heating by means of fans is used in this school together with an automatic device for temperature control.

The cubical contents of the building is 1,041,646 cubic feet, while the entire cost is $161,203. The cost per cubic foot is about 16 cents and the cost per pupil about $114.

Both the Shurtleff and Williams Schools are lighted throughout with Tungsten lights, with seven outlets to each class room. In addition gas is provided for all corridors, stairways, and assembly hall. All electric lights in connection with exits are on a separate circuit from the rest of the building. Fire alarm, program clocks, and telephones are provided.

New Schoolhouse at Newton, Mass., Nonantum District.

RIPLEY & RUSSELL, ARCHITECTS.

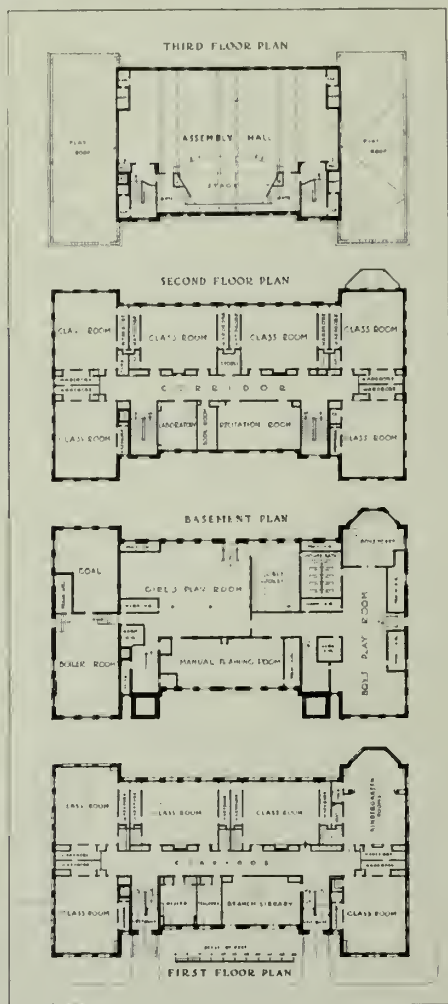
THE schoolhouse has a commanding site, situated on a small hill with ample grounds surrounding the building. A large athletic field has been planned on an adjacent lot, which, in connection with the large space given up to play rooms in the basement, assures the pupils of excellent opportunities for exercise.

The exterior is a very frank expression of the plan, which is symmetrical in its general arrangement. The brick is red with wide white mortar joints, all of which harmonize with the limestone trimmings. Green slate has been used on the roof and copper on the dormers and ridges. The windows are arranged to give the maximum amount of light.

The floors throughout the building are of Georgia pine, with no finish on them. The walls of the class rooms consist of rough plaster with a burlap dado 7 feet high, the color of which is a light soft green. The halls are finished in gray with woodwork of birch, stained red. Two flights of stairs run from the basement to the third floor and are constructed of iron with asphalt treads. Special provision has been made in the basement for ten shower baths. The class rooms are provided with closets in addition to the wardrobes.

The building is supplied with steam heat and is equipped with the "gravity" system of ventilation.

The school accommodates 800 pupils and cost $100,000. The cost per cubic foot was 16.6 cents, which included clocks, telephones, and bells. Including the cost of grading the extensive grounds, building walks, paths, etc., the cost per cubic foot was 17 cents.



SCHOOL AT NEWTON, MASS., NONANTUM DISTRICT.
Ripley & Russell, Architects.

Terra Cotta: Its Character and Construction—III.

BY CHARLES U. THRALL.

IT HAS been the custom in years past for manufacturers to joint their terra cotta into comparatively small pieces, and this custom has been accepted by architects as one of the necessary evils to be encountered in the use of the material. In a previous article it has been explained how very large pieces may at times be safely made, but ordinarily the best results are obtained when the blocks are not too large.

In some instances pieces that are quite small do not detract from the appearance of a design, as shown on Plate IX., but when white glazed terra cotta is used it is often objectionable to have a large number of joints discernible unless they carry out a structural idea, such as an arch, etc. Usually, in such a case, with a little care a design may be made so that many of the necessary joints may be hidden and the broad white surfaces give an impression of restfulness which would otherwise be lost.

Plate VIII. shows an example of this kind and contains many suggestions which are very valuable to consider in the ordinary run of work. The horizontal joints are a feature of the design, they being 1 foot 2 inches apart, probably look better than if the distance were greater, and at the same time, to facilitate the manufacture of the pieces, practically all of the vertical joints are hidden where the internal corners occur.

The first course to the pilasters, which acts as a base, has a projection so that if there is any irregularity in the shrinkage it will not be apparent, the course above being fully 2 inches less in length. This particular piece, although long, is a very safe one to make as it is almost square in section, and, being narrow, there is not much tendency to warp. The piece above this on which the moulding occurs is also made in one part in width, being very much the same kind of piece as that at the base, but it must coincide with the width of the one above it.

The third course of the pilaster and all those above, up to the course underneath the cap, are each divided into three pieces, there being a plumb joint separating the outer moulding from the ashlar panel. Owing to the fact that bricks may be built into the open spaces at the back of the terra cotta there is no objection to such a plumb joint even if it ran through several stories. The old idea of breaking bond, as is necessary in stone work, does not apply to terra cotta. On the Flatiron Building, New York City, the round corner at the point of the building is so constructed that there is a plumb joint at the internal angle where this round corner connects with the main wall, this joint running from the bottom of the building up to the cornice. In many other of our tall buildings this method has been employed so that there need be no misgivings about jointing terra cotta in such a manner, especially as every piece as now made by the leading manufacturers has an anchor hole in the top bed into which may be inserted a strap anchor, which is built into the wall, as shown on Plate XI. This, together with the building of the bricks into open spaces in the back of the terra cotta, firmly ties the material to the wall ; in fact, it is unnecessary to use an anchor in every piece. Sometimes it is well to put one in every third piece, and at other times in every third or fourth course. On buildings of moderate height, where there is slight projection to the course, anchors are not necessary at all.

The block at the corner, at the left of the pilaster at plan "A–A," is separated from the pilaster pieces with a plumb back-checked joint with the bond cut off at an angle.

As each piece of terra cotta must be "turned out" of the mould when it is rather soft the edges and corners which will show at the building should have some protection. This bond being made at an angle is so arranged that no corner which is to be finished will rest on the board on which the piece is "turned out," and in that way all the corners are protected from being chipped. At the same time the joint between the corner piece and pilaster is hidden by being back-checked. It is not necessary to run the bond of the moulding to the pilaster back of the face of the main wall pieces for any constructive reason, but simply to protect the edge which occurs at the internal corner from being marred when the pieces are "turned out" on the board, the bond being arranged in this manner for practically the same reason that the bond was cut off on an angle on the corner piece. Both of these pieces are so arranged that the open space is convenient for building the rough brick-work into the back of the terra cotta.

The ashlar panel pieces are somewhat more difficult to manufacture, owing to the fact that they are so thin, and on that account there is a greater tendency to warp. This is obviated to some extent by making the courses narrow. By hiding the joint behind the curve of the moulding there is afforded opportunity for adjusting the piece to the proper dimension. For instance, if these pieces should shrink slightly more than the piece at the second course of the pilaster there would be a larger joint than would be desirable. If they did not shrink enough it would necessitate cutting the pieces in the yard, which, of course, could be done, but by arranging a joint of this kind all the adjustment may be made, as a rule, without the expense of cutting, and still retain the appearance of tight joints. The pieces between the pilaster and the jamb of the window are arranged with the same idea so as to afford adjustment and protection to the edges. Up to the arch, therefore, no vertical joints are apparent. The arch is arranged with five voussoirs so as to maintain practically the same size pieces as the jamb pieces.

The frieze over the lintel is jointed in three pieces, but the joints are lost in the lines of the ornament.

The cornice to the window is rather more difficult to manufacture on account of the various members that must "take up." With the exception of the miter pieces the joint is placed under the plinth so that trimming can be done at that point to make the work fit.

The spandrel is so arranged that there is always a joint which may be trimmed and that there will be no two points which are so tied that they will not "take up." For instance, the piece at the side of the key in the spandrel where the jib shaped portion of the sunken panel occurs, has two points which must "take up" with the adjoining piece, viz: where the sinkage of the panel occurs. But as there is a joint arranged on one side of this panel, following the curve of the circular jamb piece to the window, there is opportunity to trim at this point. The inner arch is separated from the outer arch, and the ashlar portion of the large voussoirs to the main arch are separated by a joint around the outside line of the arch. This is also a matter of economy as each one of the arch pieces may be made from the same mould, whereas if the voussoirs were attached there would be many more moulds necessary as each voussoir is different from the other.

The pilaster piece directly under the cap is made in one part for the same reasons that the pieces at the foot of the pilaster were made that way. The ornamental cap is jointed in the center, the joint following the line of the ornament and coming around and slightly underneath the rosette so that the joint is entirely hidden. The hidden joints are made, as shown by the detail, tight on the face and wide at the back, so that the pieces may be moved backward or forward and have the same appearance of tightness on the face.

Observe that in this design the terra cotta is again used as a veneer, the bond of the material being very slight. If this design were made in stone it is very apparent that there would be much more weight imposed upon the wall. All of these joints are so arranged that the pieces may be laid upon the rubbing bed and finished to an exact size, plumb, and square. A design similar to this is very economical if executed in terra cotta, especially if the widths of the bays and piers are all kept at practically the same dimensions, as the duplication in such a design together with the lightness of the material would reduce the expense very largely. This design was actually executed in gray terra cotta, but it would look particularly well in white matt glaze material, and there are also features which, if treated in color, would make the design most attractive.

In the example shown in Plate IX. the jointing is a feature of the design and therefore there is no good reason for an attempt to hide the joints. The rosettes are all made in separate pieces as they alternate in design. The ashlar pieces, although practically the same size as those shown on Plate VIII., are a more difficult proposition to manufacture, as each piece should be true at every joint. The simplest kind of a piece, the ashlar, is one of the most difficult to make properly in terra cotta because it is thin in bond and therefore has a tendency to curl or warp. The fact that these pieces may shrink

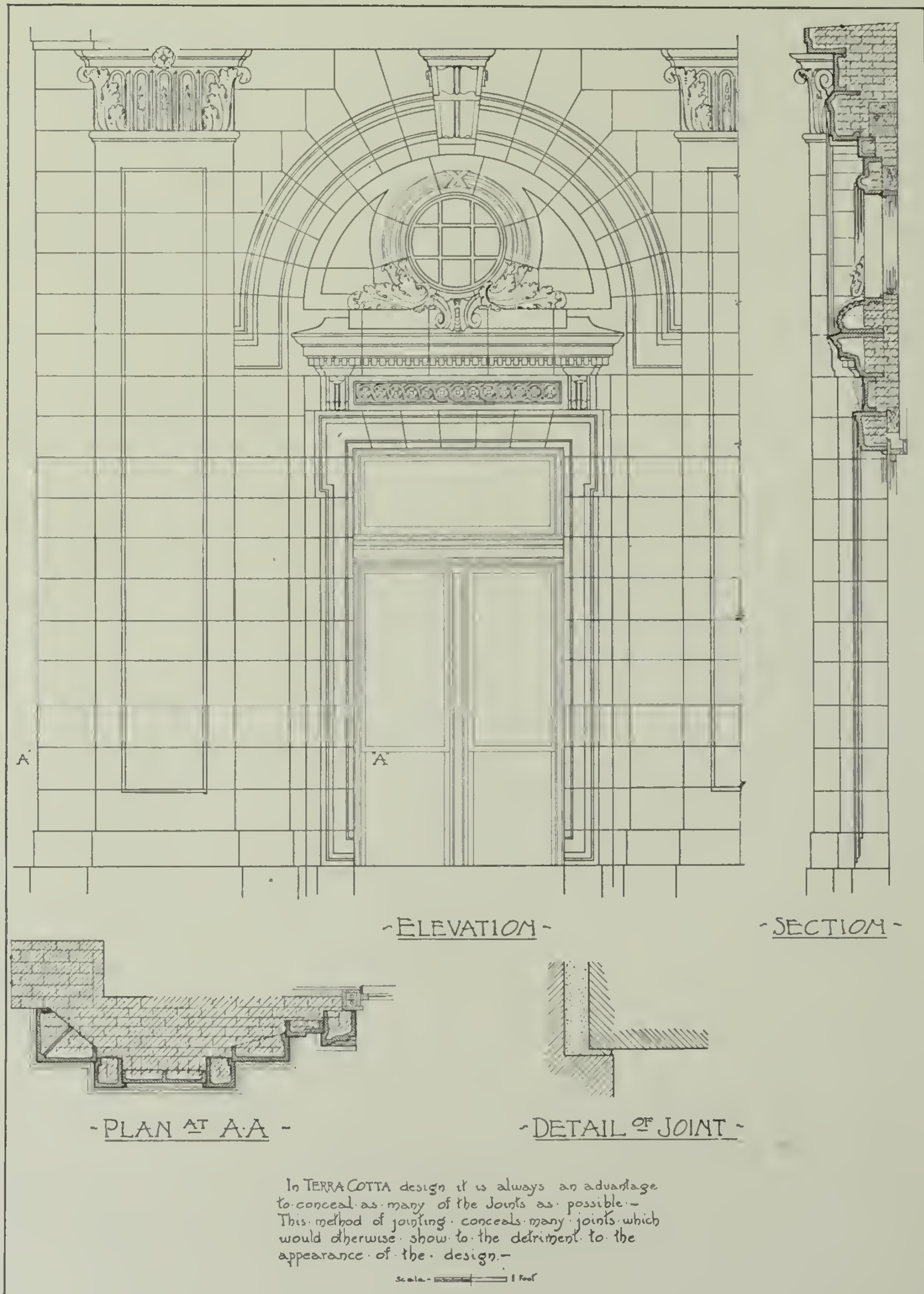


PLATE VIII.

irregularly in size can be easily overcome by use of the rubbing bed, but should a piece warp too much in the burning the only remedy is to make another one to replace it, and in this design the warping would be more noticeable than in the design shown in Plate VIII.

If the dado moulding were not so wide it would be possible to obtain better results as to alignment. The soffit of the jamb is separated from the face so as to afford a place to be trimmed to properly fit the material. This design was carried out to some extent in the Hudson Terminal Concourse, New York City. It was made in ment is usually of a high class for reasons explained in a previous article; second, the joints are more or less hidden in the ornament; and third, the surfaces and lines are so broken up by this ornament that absolute alignment is not so important and any slight inaccuracies in size or shape are undiscernible. When to the profuse ornamentation is added the effect of colored glazes, terra cotta becomes a medium for the expression of the highest type of architectural art.

As an example of profuse ornamentation, combined with colors, the Academy of Music in Brooklyn has at-

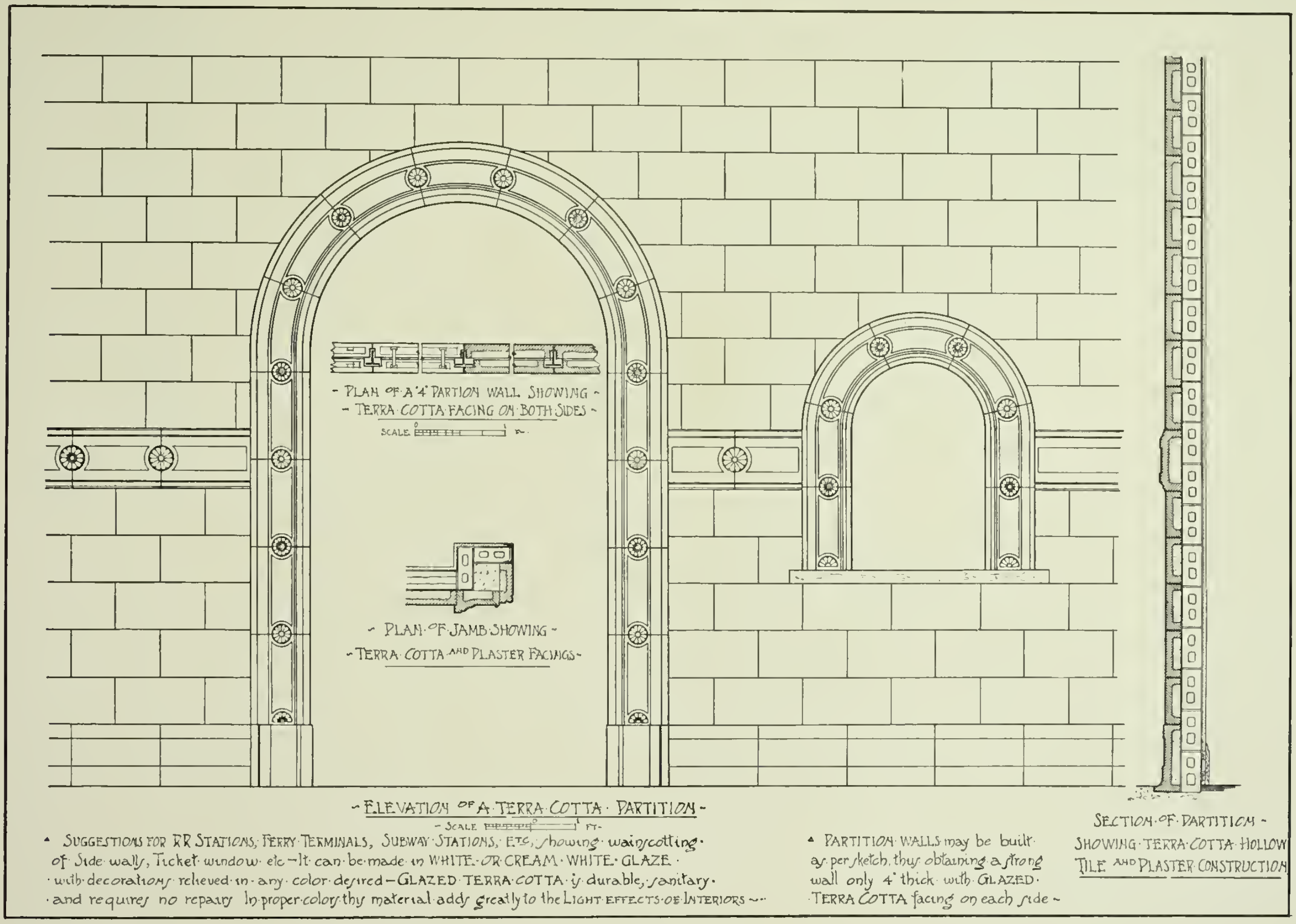


PLATE IX.

white glazed material, the fields of the panels in the dado moulding and jambs being colored yellow.

Terra cotta has many things to recommend it for purposes of this kind, especially for the interiors of railroad depots, ferry terminals, hotel and theater lobbies, department store entrances, hospitals, etc., where a large number of people congregate.

White or cream colored full lustrous glaze would lend brilliancy to light effects, which is particularly desirable in subway stations or other places which must have artificial light during the daytime. As the material is hard and the glaze impervious to water, terra cotta is very sanitary, can be washed absolutely clean with water, and being durable does not require repairs.

When there is profuse ornamentation, terra cotta always looks its best for three reasons: first, the orna- tracted much attention. Plate X., which illustrates the construction of the cornice for this building, suggests a most practical method of support for any cornice of this size and shape. Steel outlookers in the form of channel irons in pairs, placed back to back with 1 inch space between, are located over every alternate modillion. These channels are supported by braces placed at an angle of 45°. Parallel with the wall are placed angle irons, supported by the outlookers, and from these angle irons are suspended or anchored the several courses which are not built into the wall, as shall be explained in detail.

The first four courses are built into the wall in the regular way, the frieze being cut into two courses to afford adjustment in height. Care is exercised so that the bonds of not only these courses but all others as well shall clear the iron work by fully 1 inch, so that there shall be no undue cutting at these points. As the dentil course is firmly built into the wall its nib becomes the tipping point for the courses above, which need have only as much bond as it has projection. But as this course is not bonded into the brickwork it is anchored by a rod which is bent around a pin placed in the ends of the terra cotta pieces, the rod being confined in a groove in the joint. The rod is placed as far forward as possible but so as to clear the back of the bond of the piece above. the angles, or else wedges must be placed between the anchors and the angle iron.

The cornice is now built up to the top of the modillions, forming a bed for the hanging style which is jointed so that the soffit pieces have sufficient support by resting on the sides of the modillions and on the panel pieces between the modillions. But as a safeguard two pipes parallel to the wall are passed through the pieces and anchors are hooked around these and carried up over the angles. Over the modillions the bond of the hanging

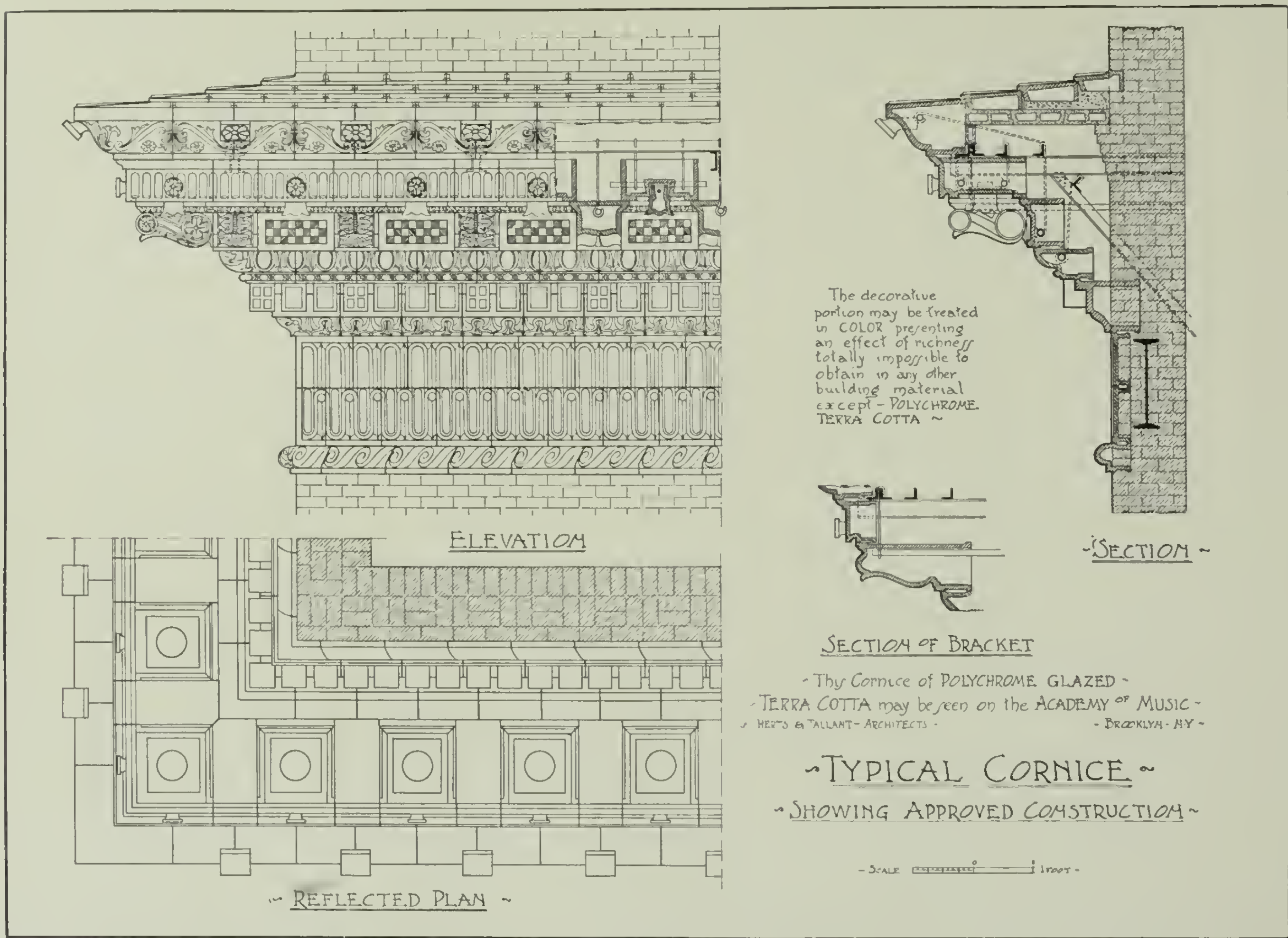


PLATE X.

The upper end of the rod is hooked around an angle iron placed conveniently for that purpose.

As the egg and dart course is now firmly built its nib forms the tipping point for the course above, therefore the bond of this course may also be short. The panels between the modillions are supported in the same manner as the egg and dart course, with dowel pins and hangers, but the modillions are carried on pipes extending into the open space at the back. The rear end of each pipe may be built into the brickwork, the forward end being supported by a hanger passing through a hole made in the top of the modillion and between the two outer angles where it may be bent over the angle or have a nut and washer, the washer being wide and resting on the web of the angles. By tightening the nut proper adjustment may be easily made, whereas without the nut greater care must be used in bending the anchors over style is cut away to allow space for the outlookers and anchors and also to reduce weight. Every alternate piece must be cut away in the back to allow for the end of the outlookers.

The rosettes in the soffit and those of the crown mould are made in separate pieces to facilitate manufacture and for convenience in setting. Being separate they will also permit an interchange of designs or colors if desired. As these rosettes are more frail than other pieces, especially when projecting so far as shown on this design, it is much better to have them separate so as to save breakage, which might delay the building. If desired the soffit and crown moulding pieces could all be set before setting any of the rosettes.

The dowel at the back of the rosette is inserted in a hole made for that purpose and cemented fast, and in the case of the soffit rosettes there is a hole in the dowel

well shall clear the iron work by fully 1 inch, so that there shall be no undue cutting at these points. As the dentil course is firmly built into the wall its nib becomes the tipping point for the courses above, which need have only as much bond as it has projection. But as this course is not bonded into the brickwork it is anchored by a rod which is bent around a pin placed in the ends of the terra cotta pieces, the rod being confined in a groove in the joint. The rod is placed as far forward as possible but so as to clear the back of the bond of the piece above. the angles, or else wedges must be placed between the anchors and the angle iron.

The cornice is now built up to the top of the modillions, forming a bed for the hanging style which is jointed so that the soffit pieces have sufficient support by resting on the sides of the modillions and on the panel pieces between the modillions. But as a safeguard two pipes parallel to the wall are passed through the pieces and anchors are hooked around these and carried up over the angles. Over the modillions the bond of the hanging

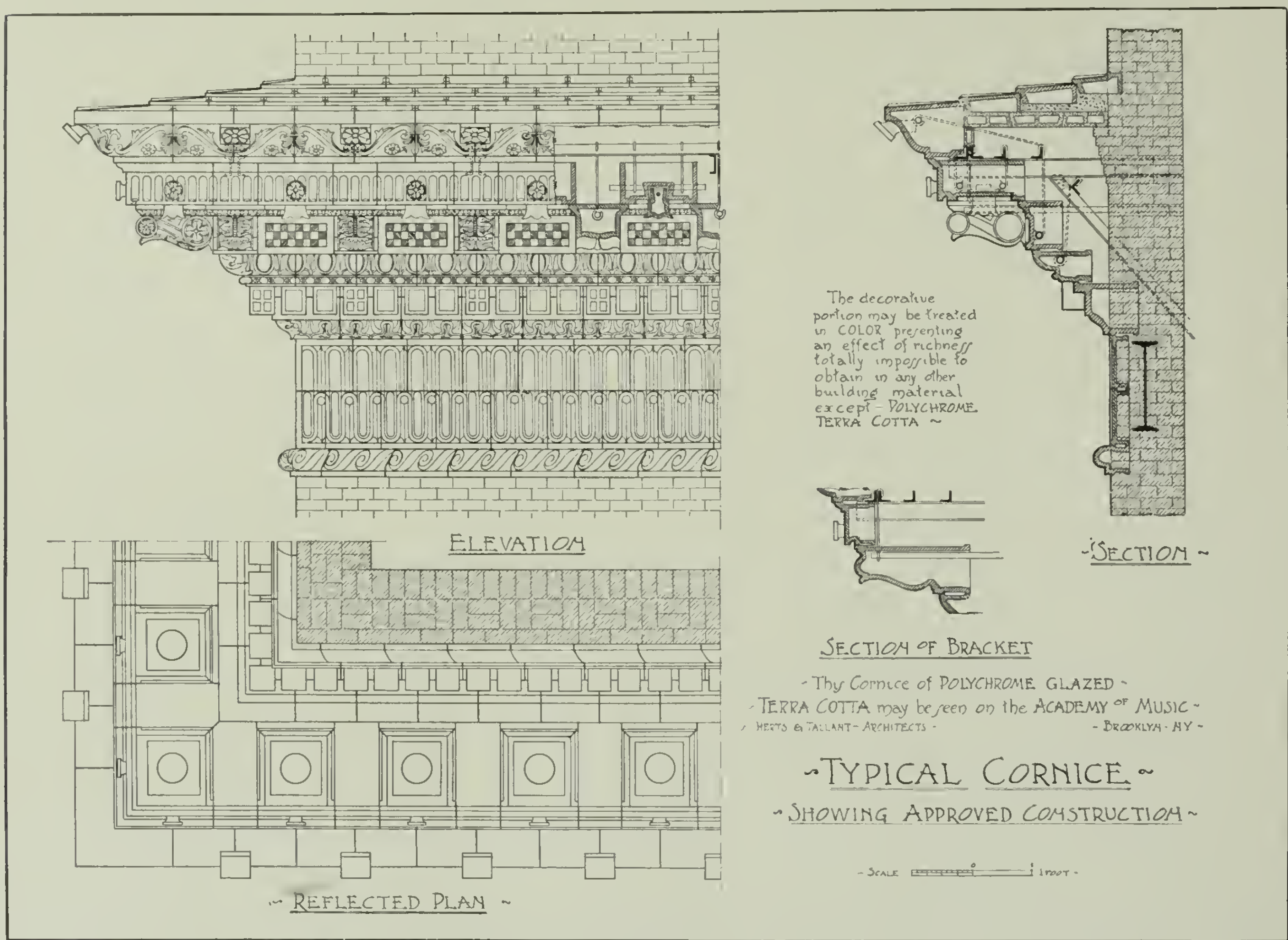


PLATE X.

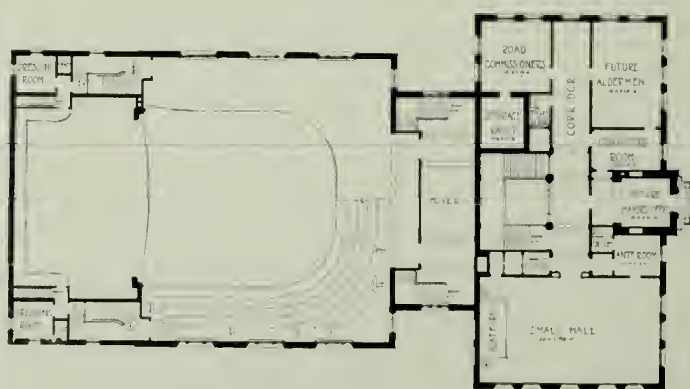
The upper end of the rod is hooked around an angle iron placed conveniently for that purpose.

As the egg and dart course is now firmly built its nib forms the tipping point for the course above, therefore the bond of this course may also be short. The panels between the modillions are supported in the same manner as the egg and dart course, with dowel pins and hangers, but the modillions are carried on pipes extending into the open space at the back. The rear end of each pipe may be built into the brickwork, the forward end being supported by a hanger passing through a hole made in the top of the modillion and between the two outer angles where it may be bent over the angle or have a nut and washer, the washer being wide and resting on the web of the angles. By tightening the nut proper adjustment may be easily made, whereas without the nut greater care must be used in bending the anchors over style is cut away to allow space for the outlookers and anchors and also to reduce weight. Every alternate piece must be cut away in the back to allow for the end of the outlookers.

The rosettes in the soffit and those of the crown mould are made in separate pieces to facilitate manufacture and for convenience in setting. Being separate they will also permit an interchange of designs or colors if desired. As these rosettes are more frail than other pieces, especially when projecting so far as shown on this design, it is much better to have them separate so as to save breakage, which might delay the building. If desired the soffit and crown moulding pieces could all be set before setting any of the rosettes.

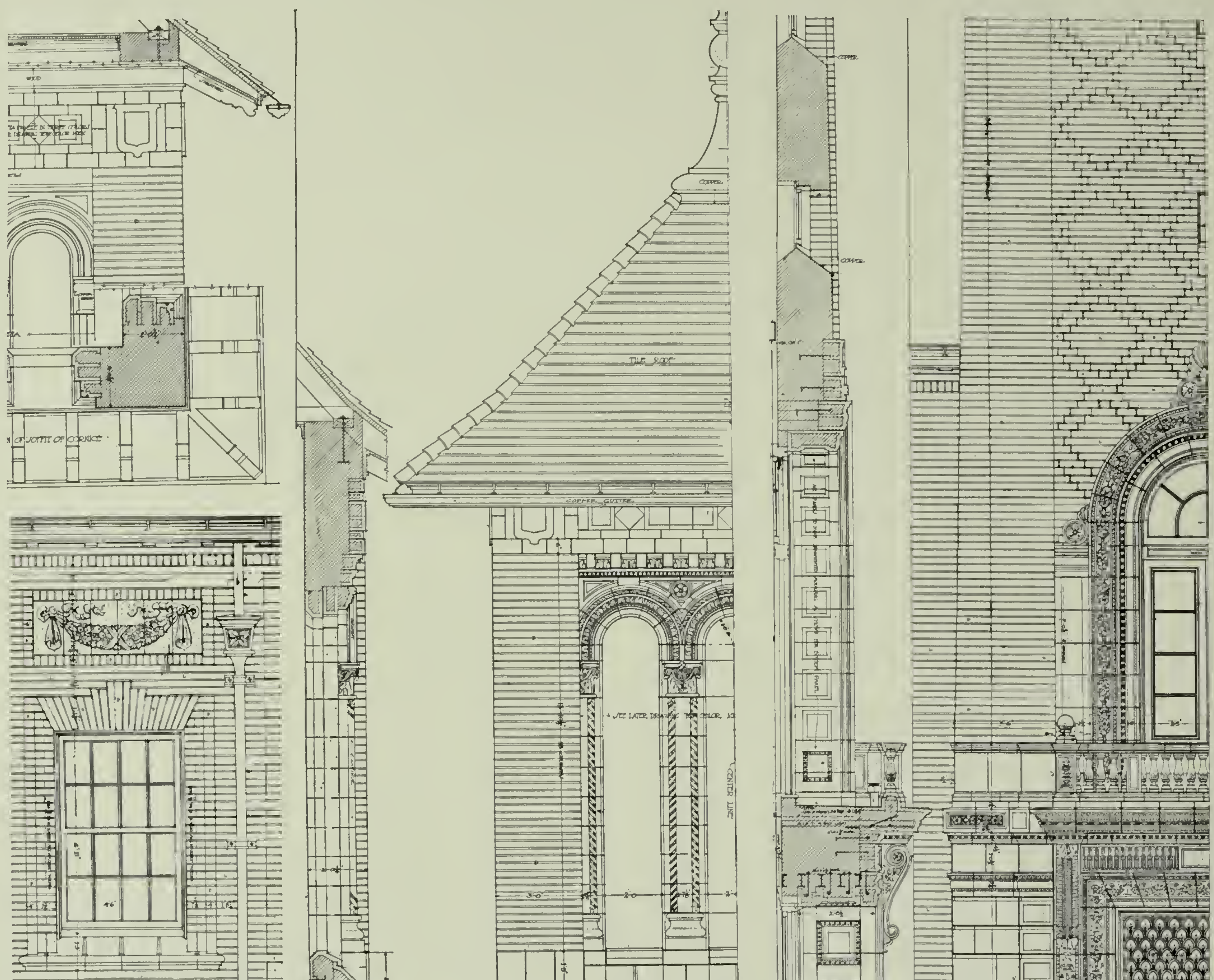
The dowel at the back of the rosette is inserted in a hole made for that purpose and cemented fast, and in the case of the soffit rosettes there is a hole in the dowel

FIRST FLOOR PLAN



SECOND FLOOR PLAN

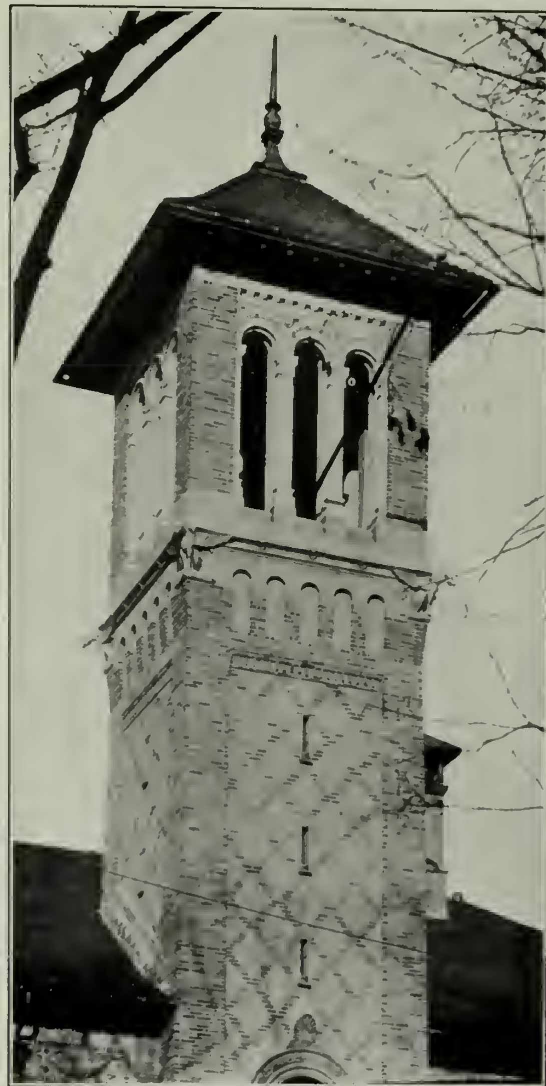
TOWN HALL, CLINTON, MASS.
PEABODY & STEARNS, ARCHITECTS.

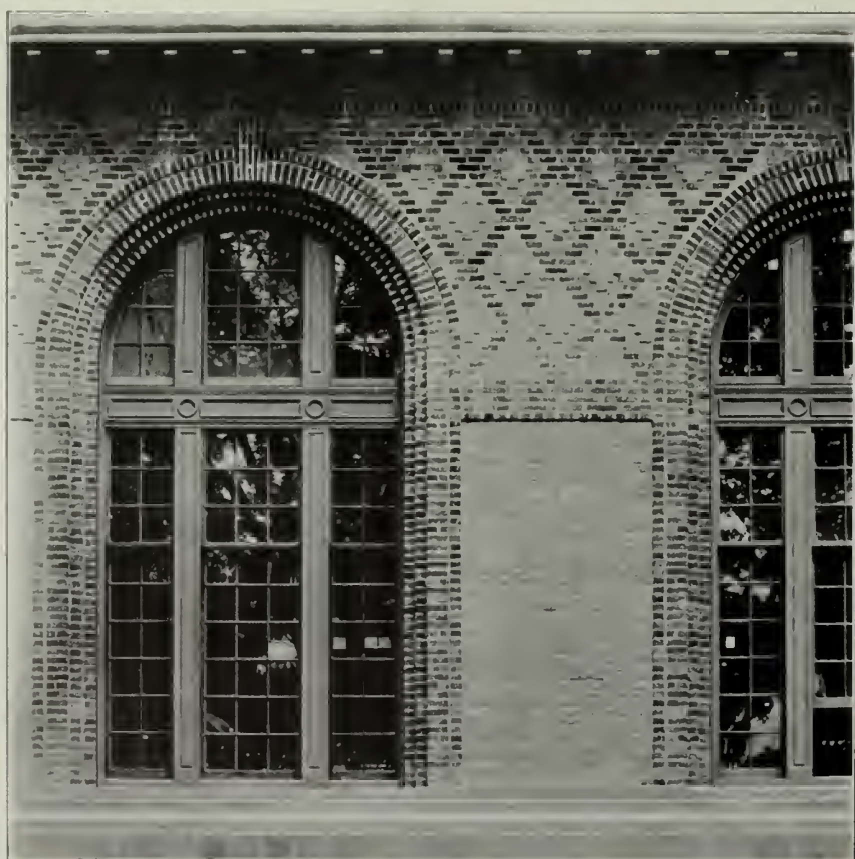


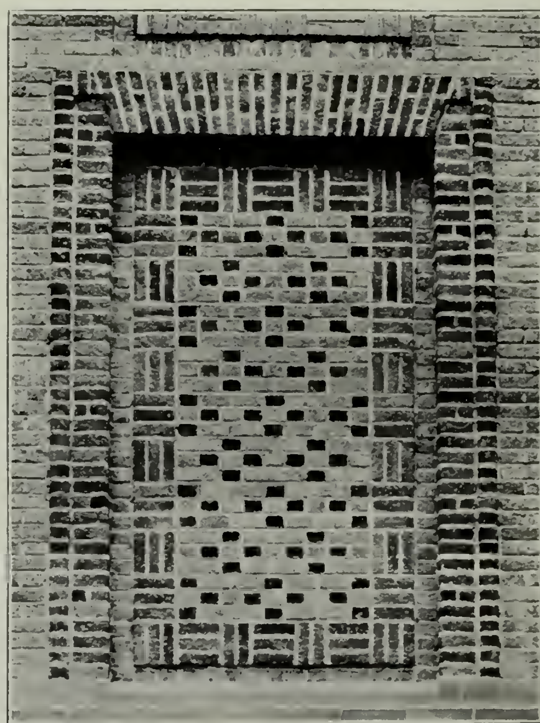
DETAILS OF WINDOWS, MAIN ENTRANCE, AND TOWER.

TOWN HALL, CLINTON, MASS.

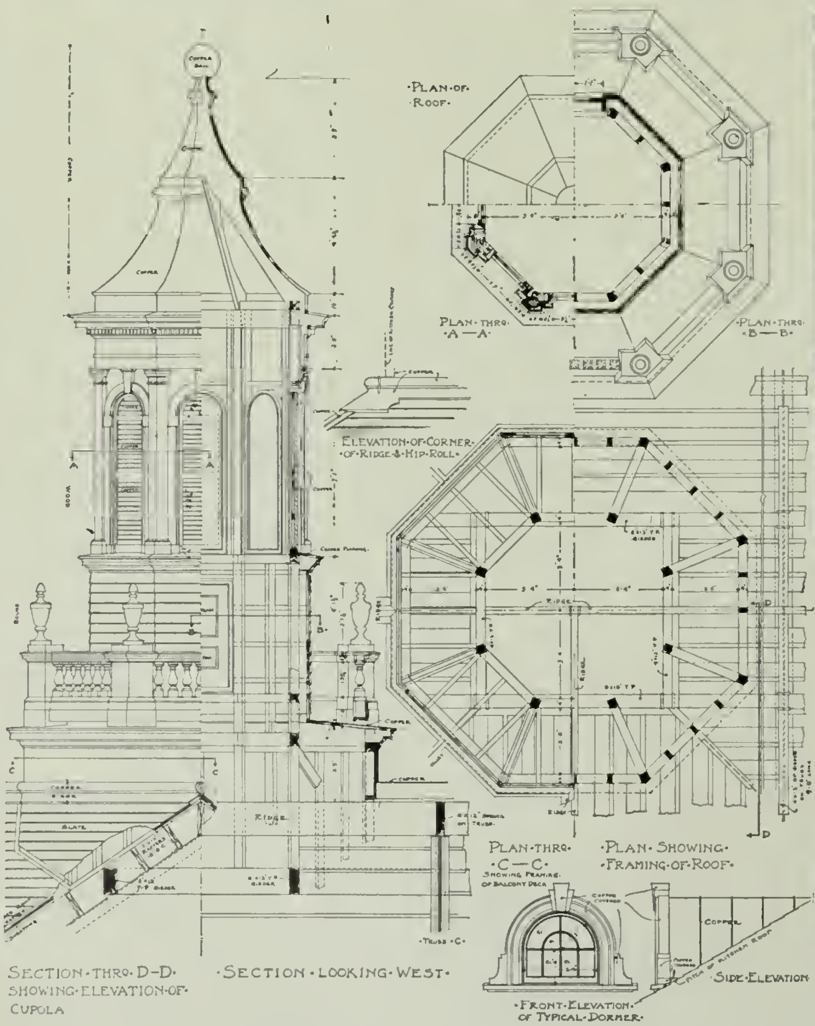
PEABODY & STEARNS, ARCHITECTS.

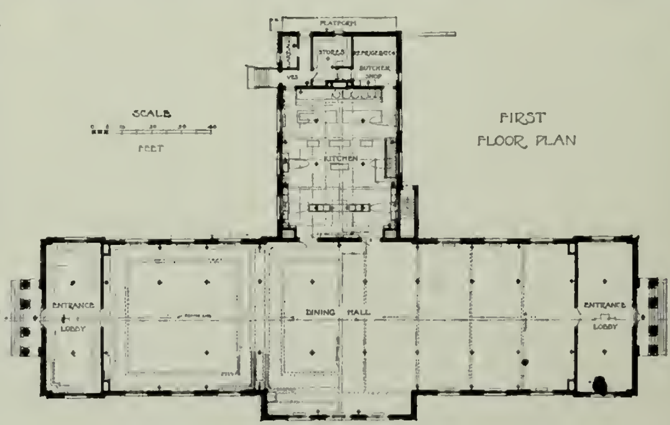






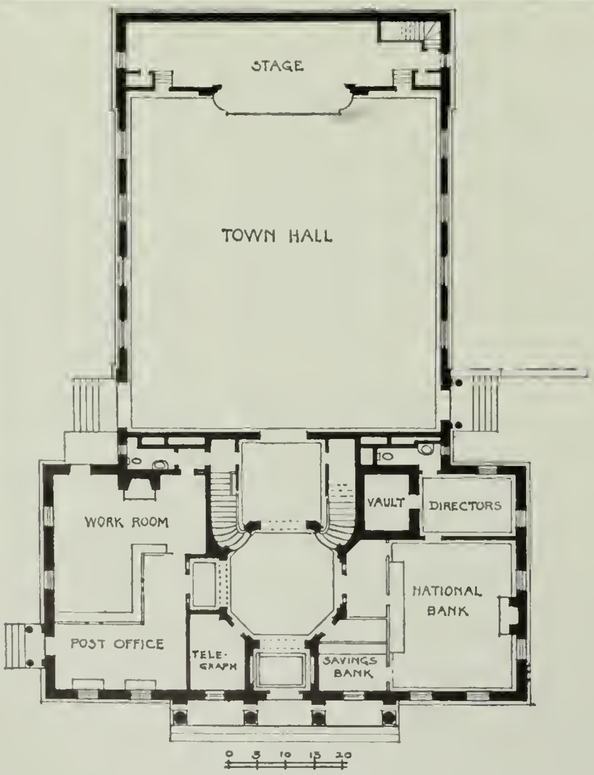
DETAILS OF
TOWN HALL, CLINTON, MASS.
PEABODY & STEARNS, ARCHITECTS.





DINING HALL AT MOUNT HERMON BOYS' SCHOOL, MOUNT HERMON, MASS.

PARISH & SCHROEDER, ARCHITECTS.



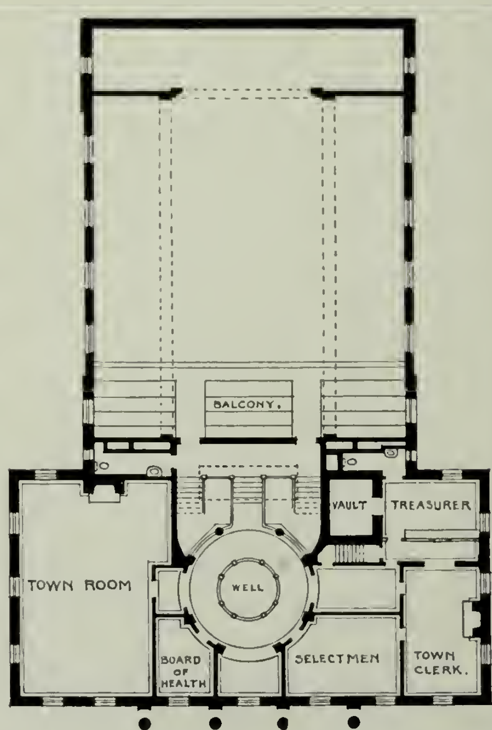
FIRST FLOOR PLAN

TOWN BUILDING,

LENOX, MASS.

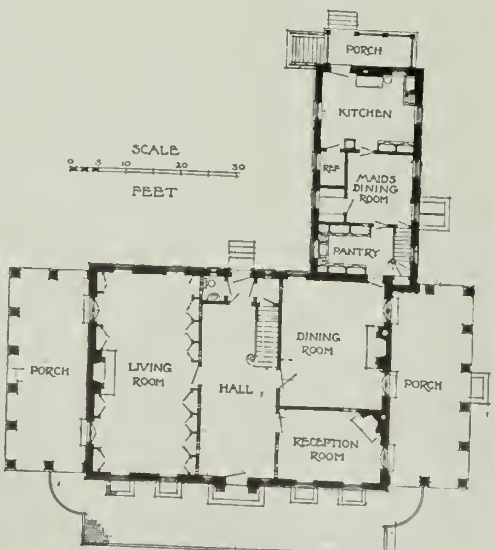
HARDING & SEAVER,

ARCHITECTS.



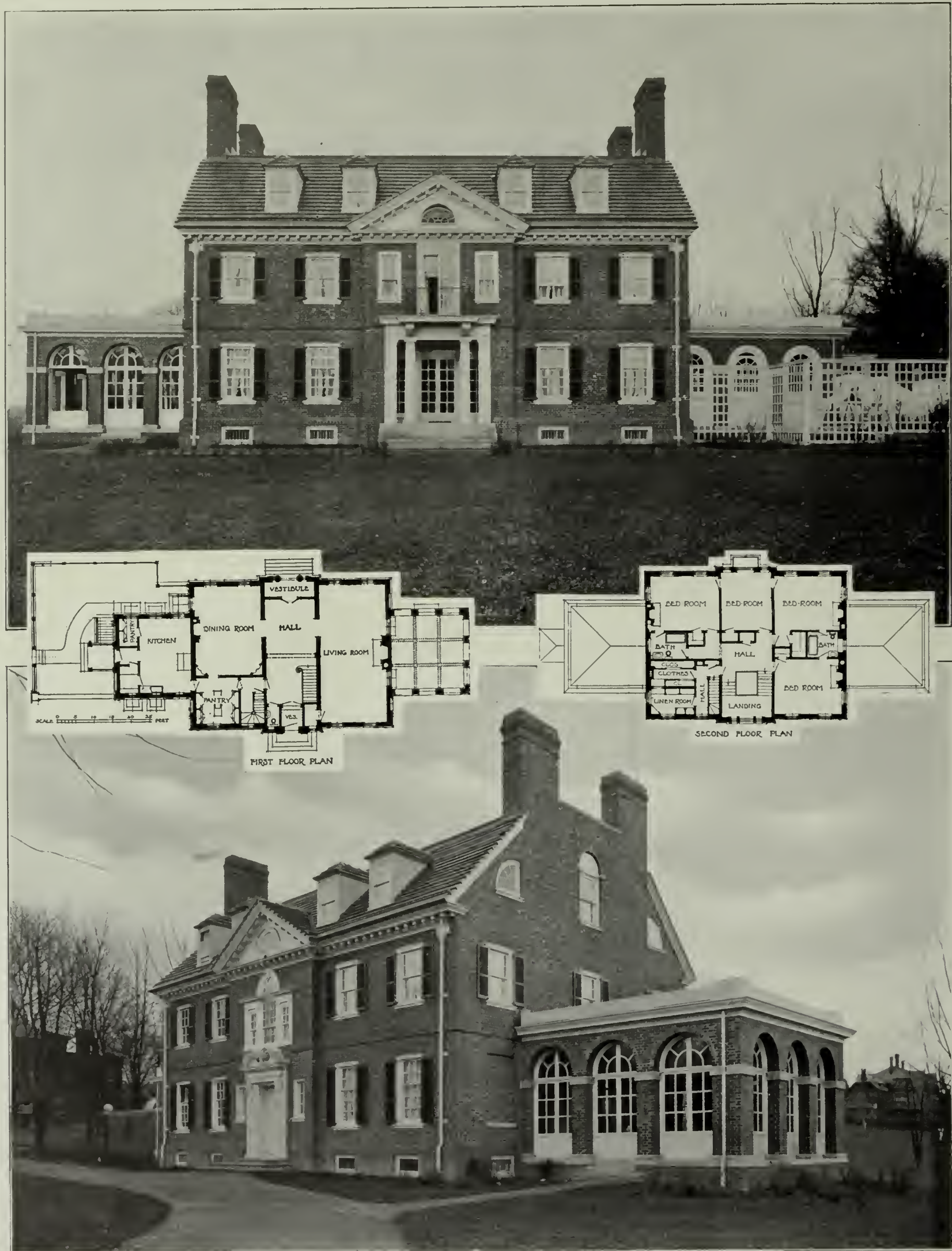
SECOND FLOOR PLAN

SECOND FLOOR

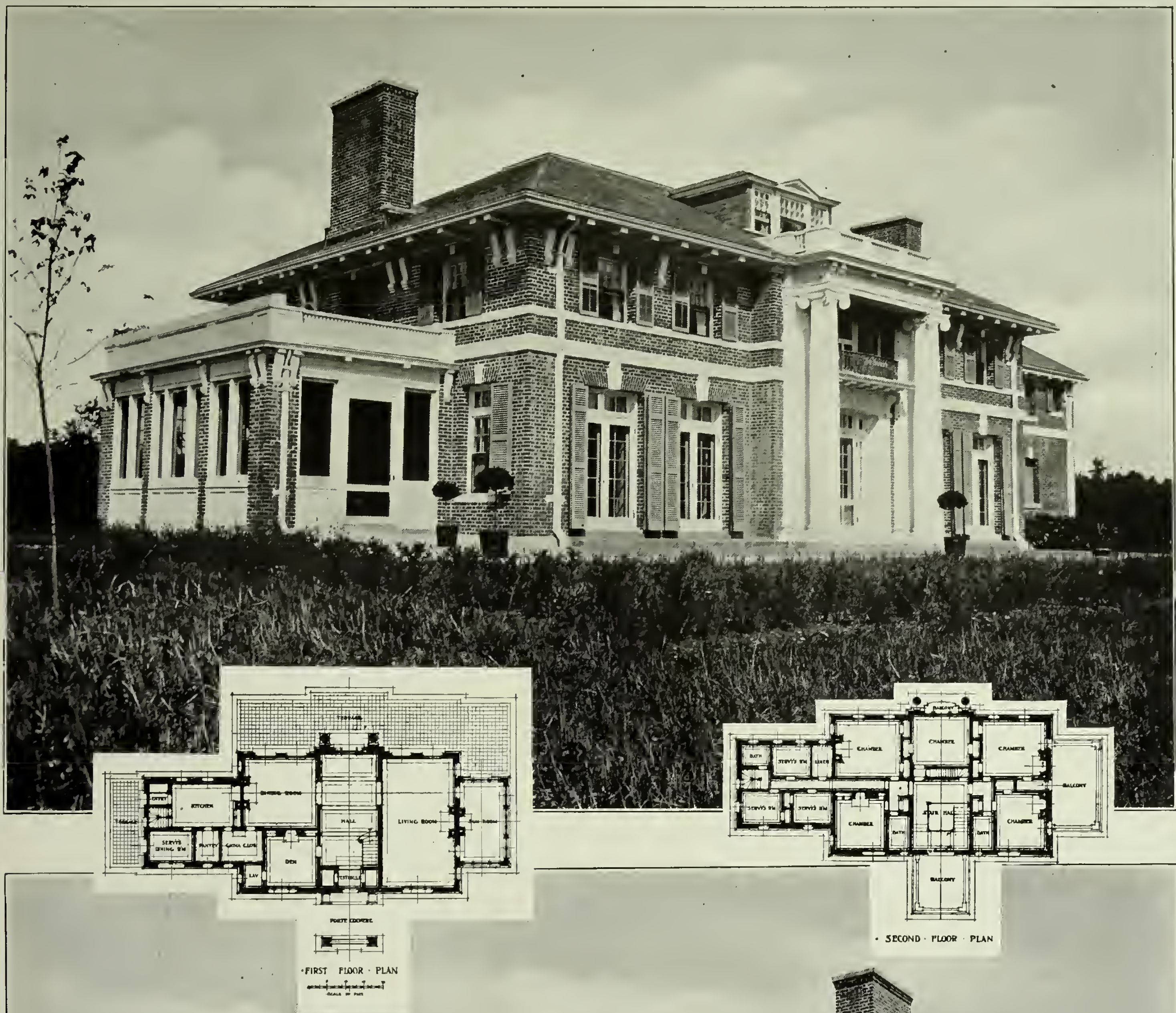


FIRST FLOOR

HOUSE AT VILLA NOVA, PA.
CHARLES BARTON KEEN, ARCHITECT.



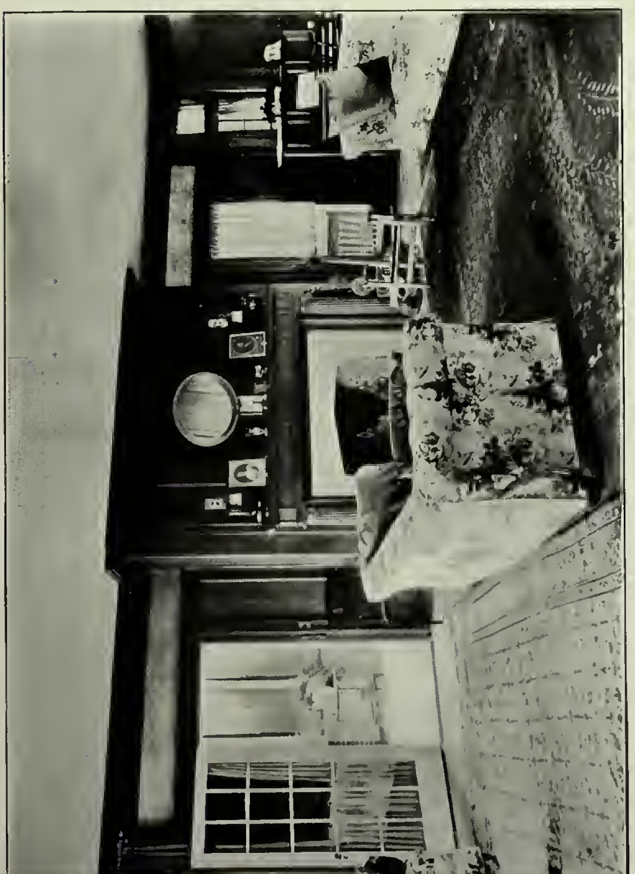
HOUSE AT BRYN MAWR, PENNSYLVANIA.
CHARLES BARTON KEEN, ARCHITECT.



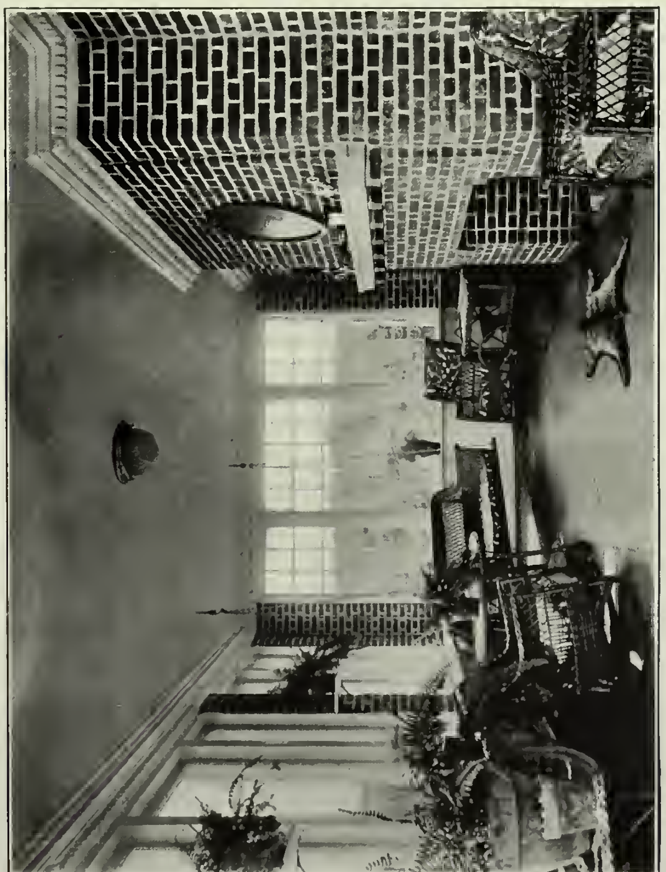
HOUSE AT DOVER, MASS.
JAMES PURDON, ARCHITECT.

HOUSE AT DOVER, MASS.

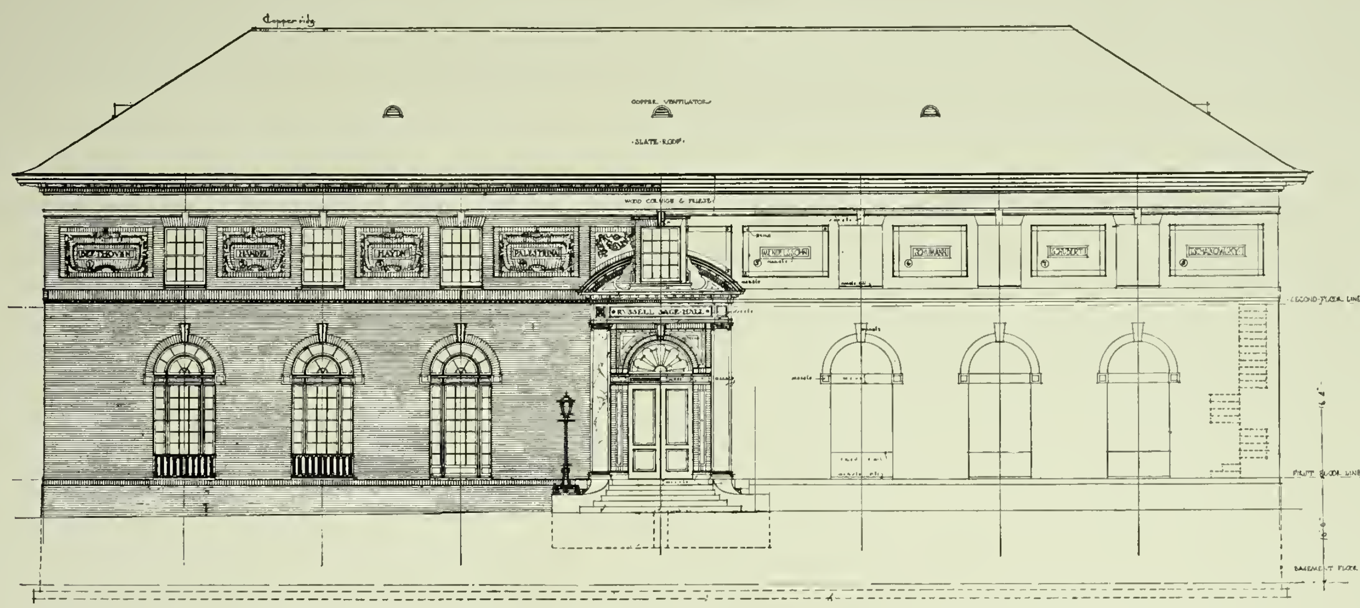
JAMES PURDON, ARCHITECT.



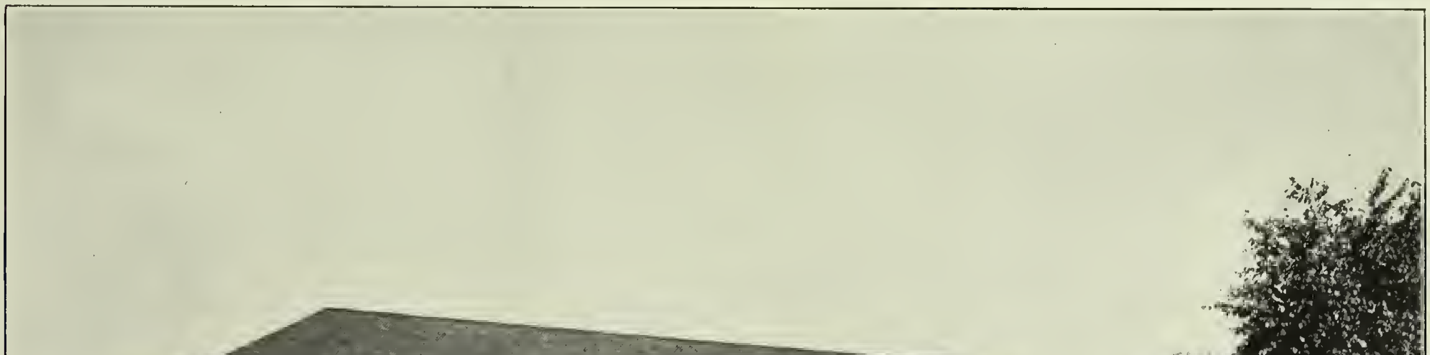
LIVING ROOM.



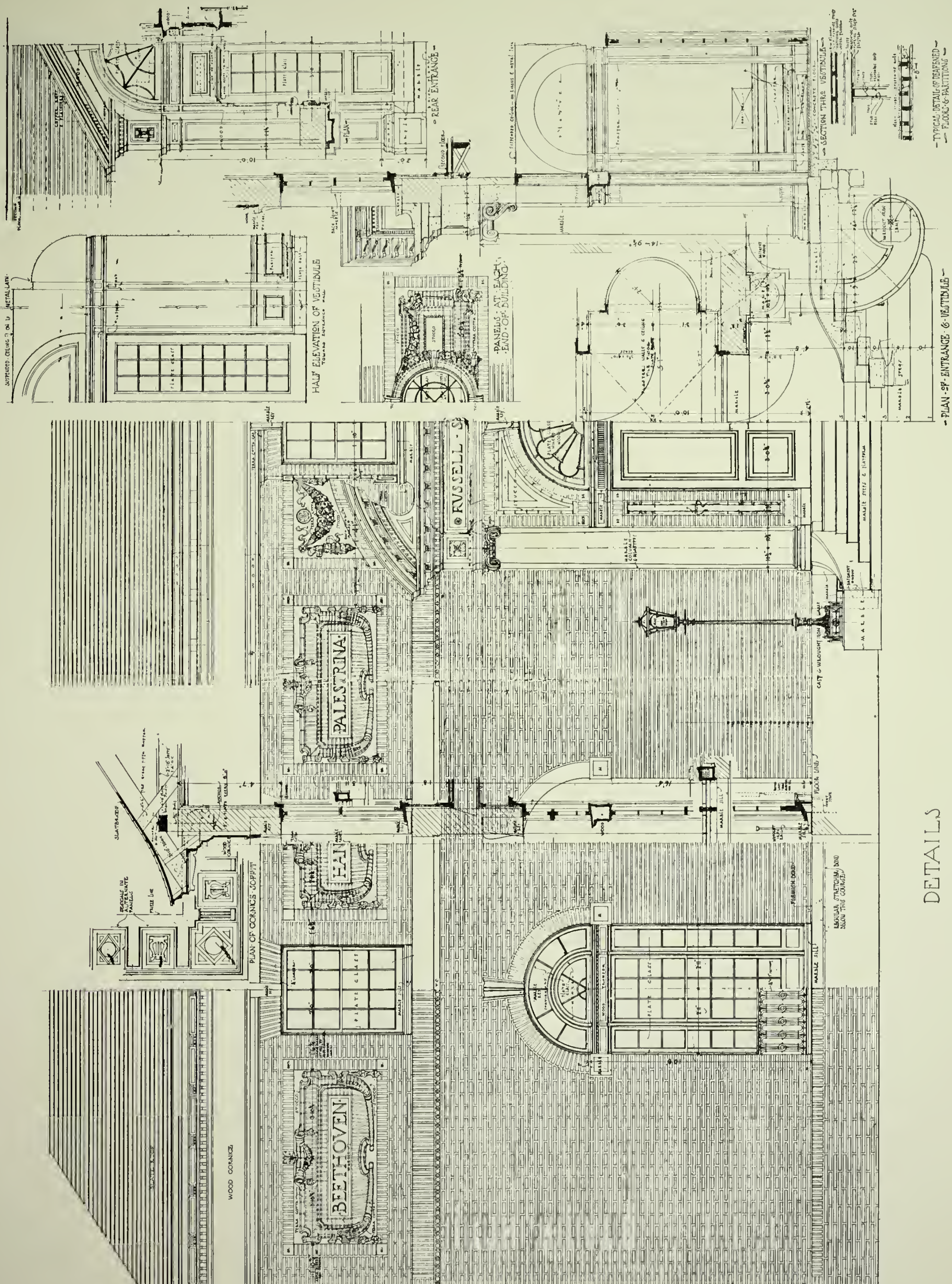
SUN PARLOR.



FRONT ELEVATION

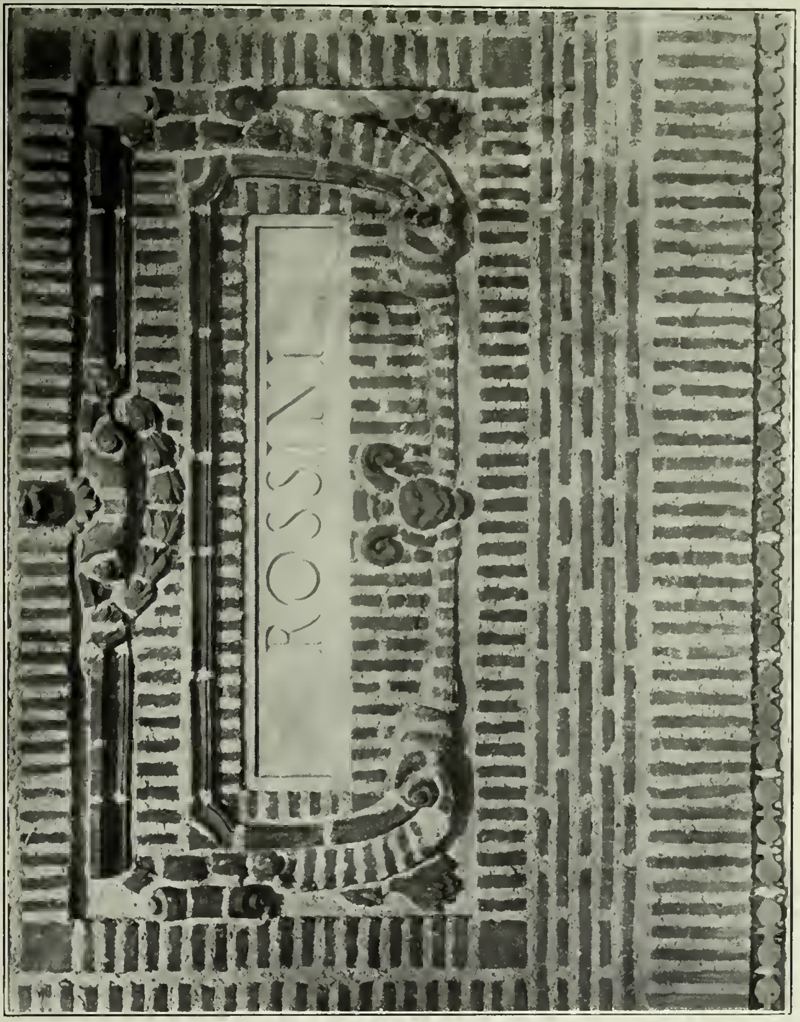


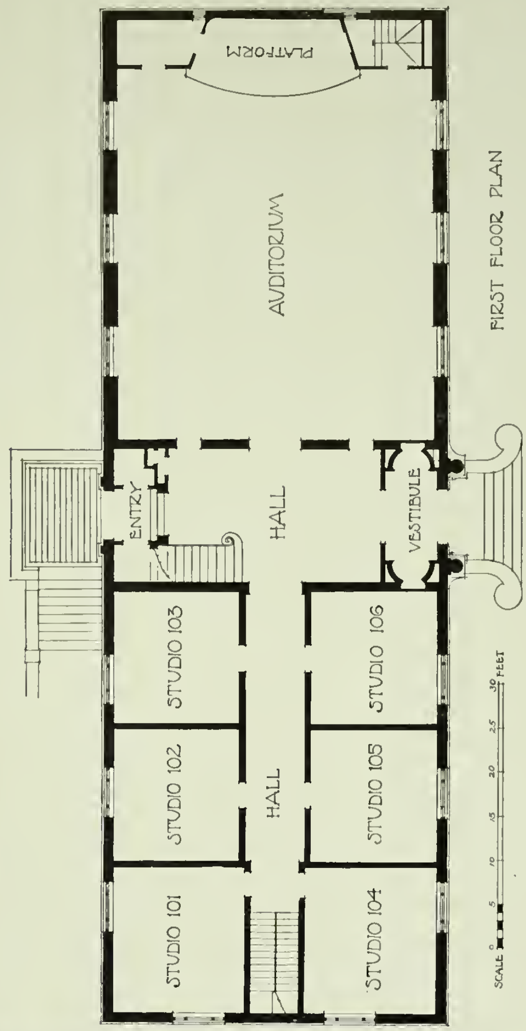
RUSSELL SAGE HALL, NORTHFIELD, MASS.
DELANO & ALDRICH, ARCHITECTS.



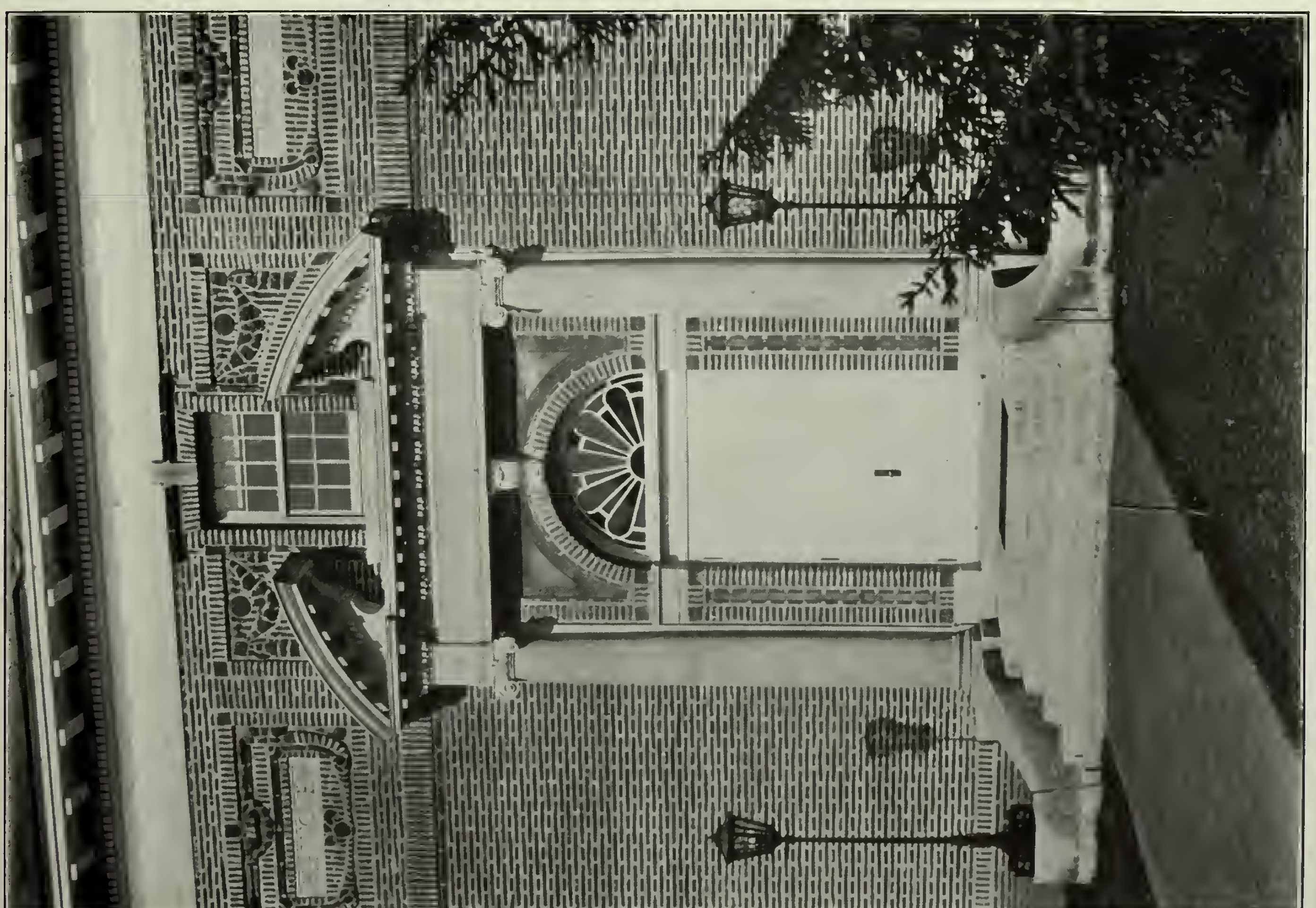
DETAILS

RUSSELL SAGE HALL, NORTHFIELD, MASS.
DELANO & ALDRICH, ARCHITECTS.



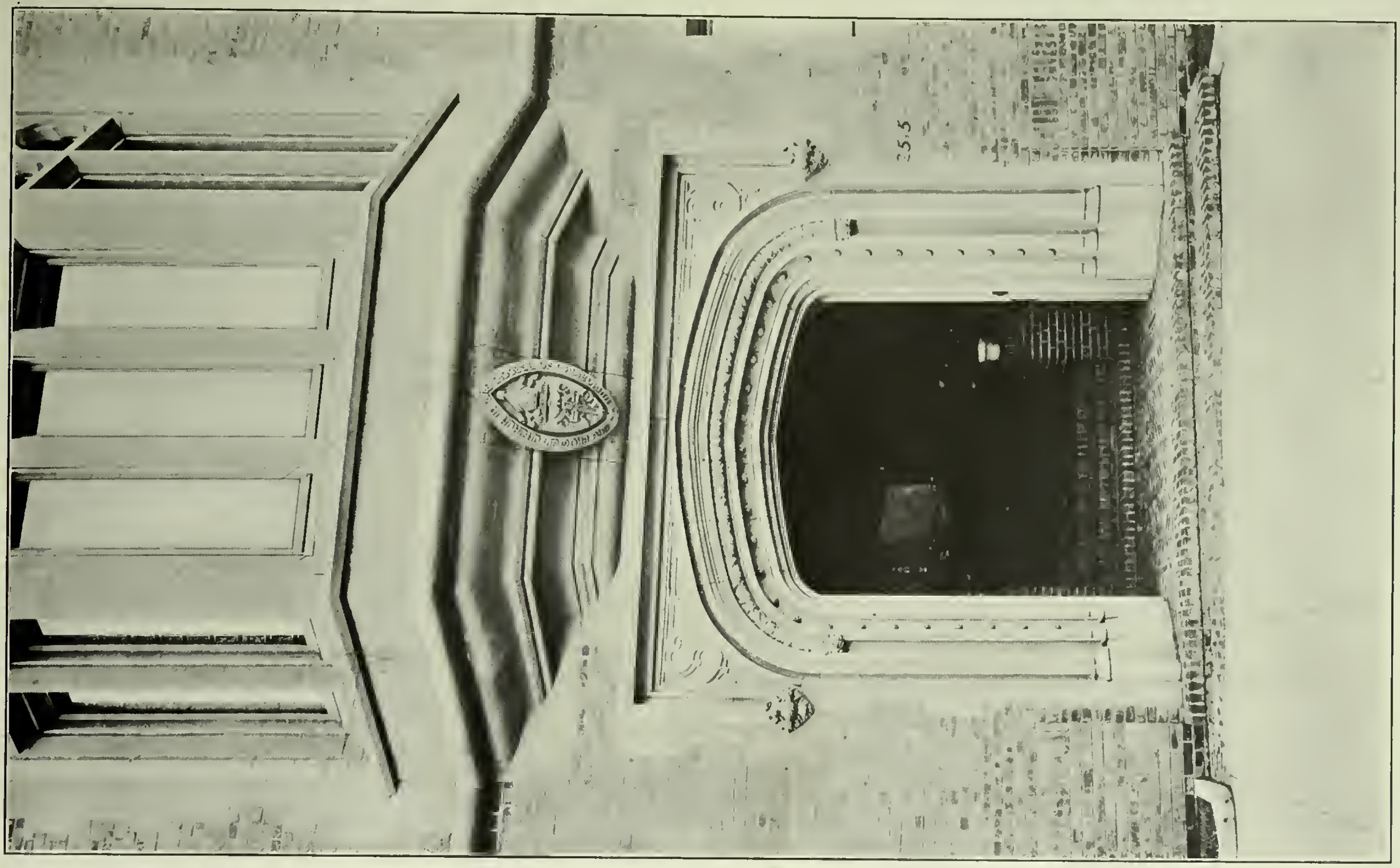


FIRST FLOOR PLAN



RUSSELL SAGE HALL, NORTHFIELD, MASS.

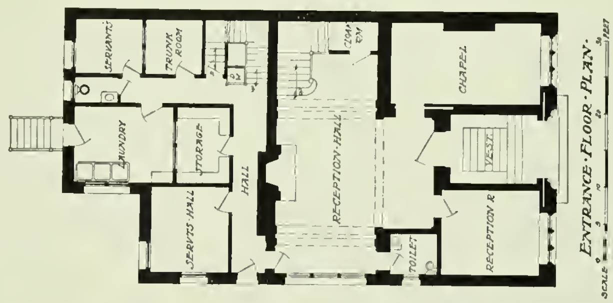
DELANO & ALDRICH, ARCHITECTS.



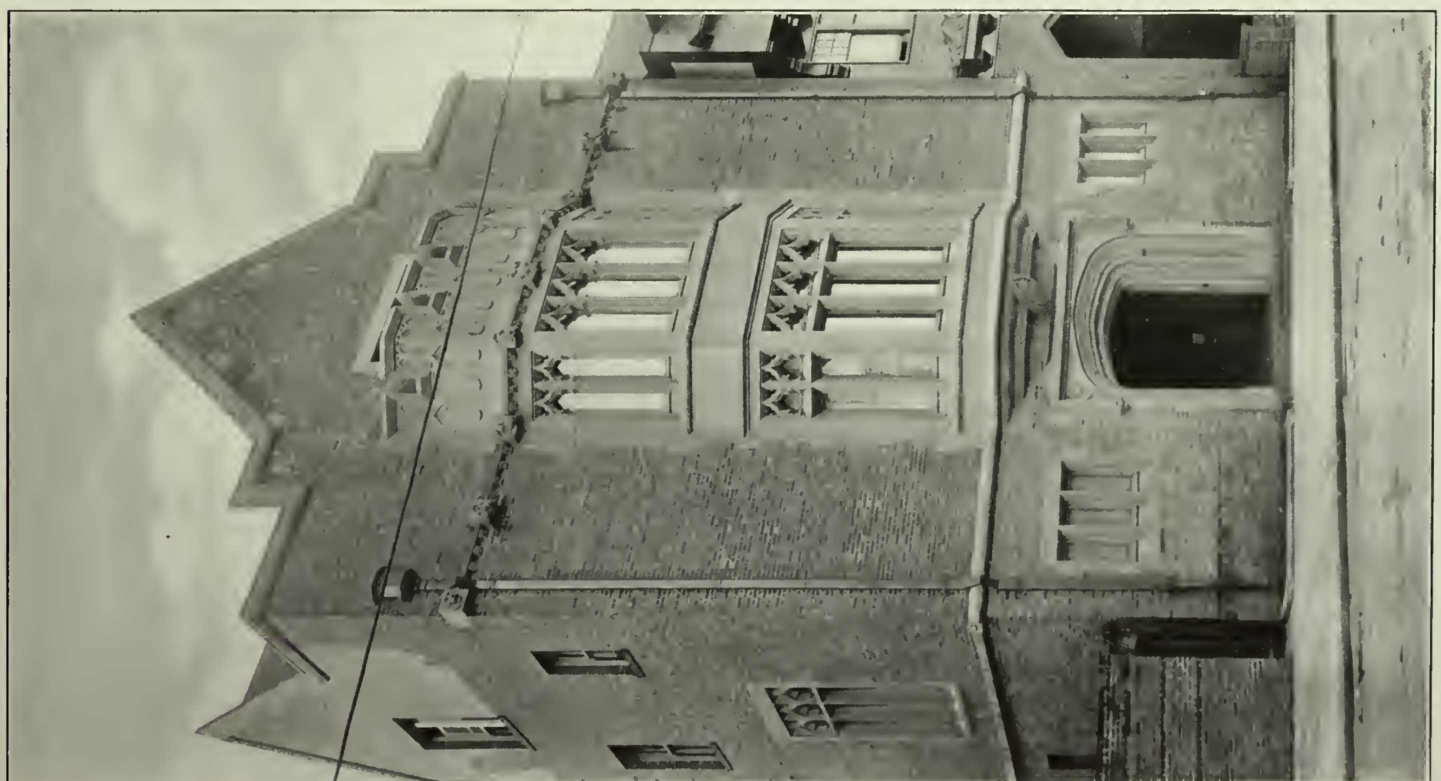
FIRST · FLOOR · PLAN ·

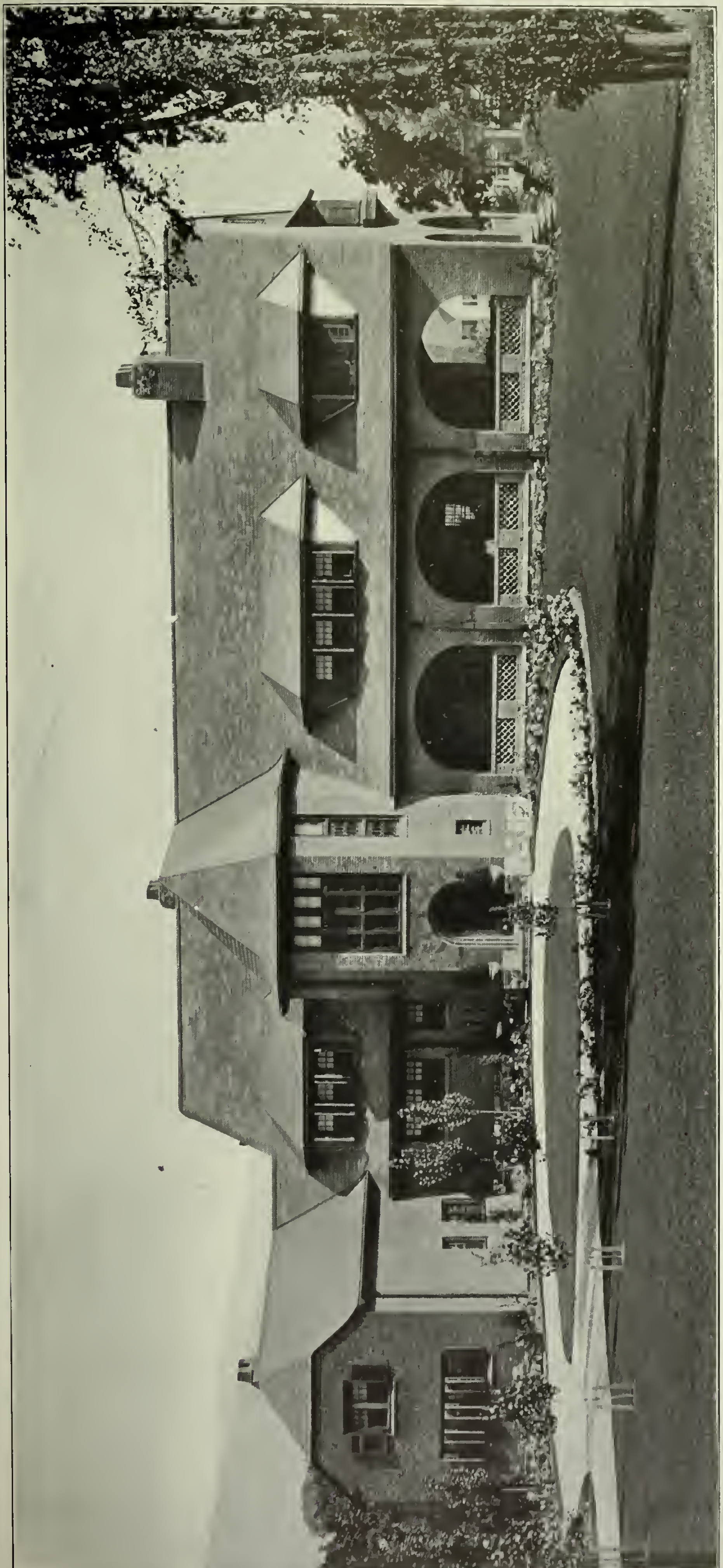
HOUSE FOR THE PROTESTANT EPISCOPAL BISHOP OF CALIFORNIA, SAN FRANCISCO.

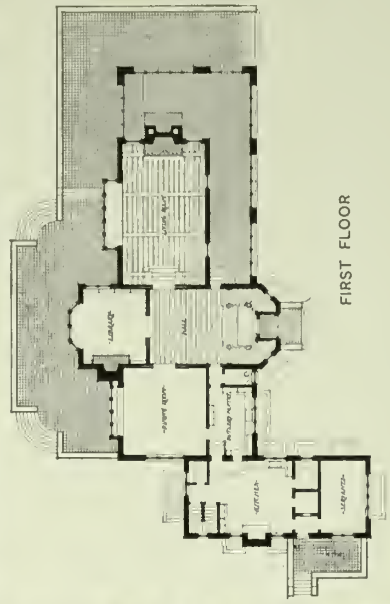
BLISS & FAVILLE, ARCHITECTS.



ENTRANCE · FLOOR · PLAN ·







FIRST FLOOR

ROBINS & OAKMAN, ARCHITECTS.

SECOND FLOOR.

HOUSE
AT
WILLIAMSTOWN, MASS.

through which is pushed from the back a pin long enough to have ample rest on the inside face of the soffit panel.

The crown moulding is then set and anchored, as shown, after which the hollow brick bed for the wash courses is laid and the wash courses cemented, completing a cornice which is characteristic of terra cotta, being very light in weight and properly jointed so as to be adjustable to its steel support.

Plate XI. shows a slightly different cornice with less of steel supports. This method of support is in universal practice for the ordinary cornice of about three feet projection, and consists of outlookers formed by two angle irons placed back to back, with an inch space between to allow room for anchor bolt, and located over every modillion. The back end of the outlookers is held down by a continuous channel iron, bricked in and bolted down every 6 feet. By this means the location of the outlookers may be adjusted to suit the terra cotta.

The modillions are supported in the same way as were those shown in Plate X. The dentil course is anchored with ordinary strap anchors. The chenneaux has dowel pins in the center of each piece and the top of the brick bed of the cornice is covered with copper, forming a gutter, the edge of which is flashed in the joint between the crown mould and the chenneaux.

Raised joints are used on both cornices as these are preferable to covered joints, being made wide so as not to interfere with the cutting of such joints as may be necessary.

Covered joints are apt to be broken off before the work is finally set and it is difficult to get a tight mortar joint where covered joints are used because the cover interferes with pointing up.

Finally terra cotta is a ceramic material as distinct from stone as it is from wood, therefore it has an individual character which gives it a value of its own and consequently it should not be used merely as an imitation of something else, but designed so as to display all of its special characteristics of color, form, and texture.

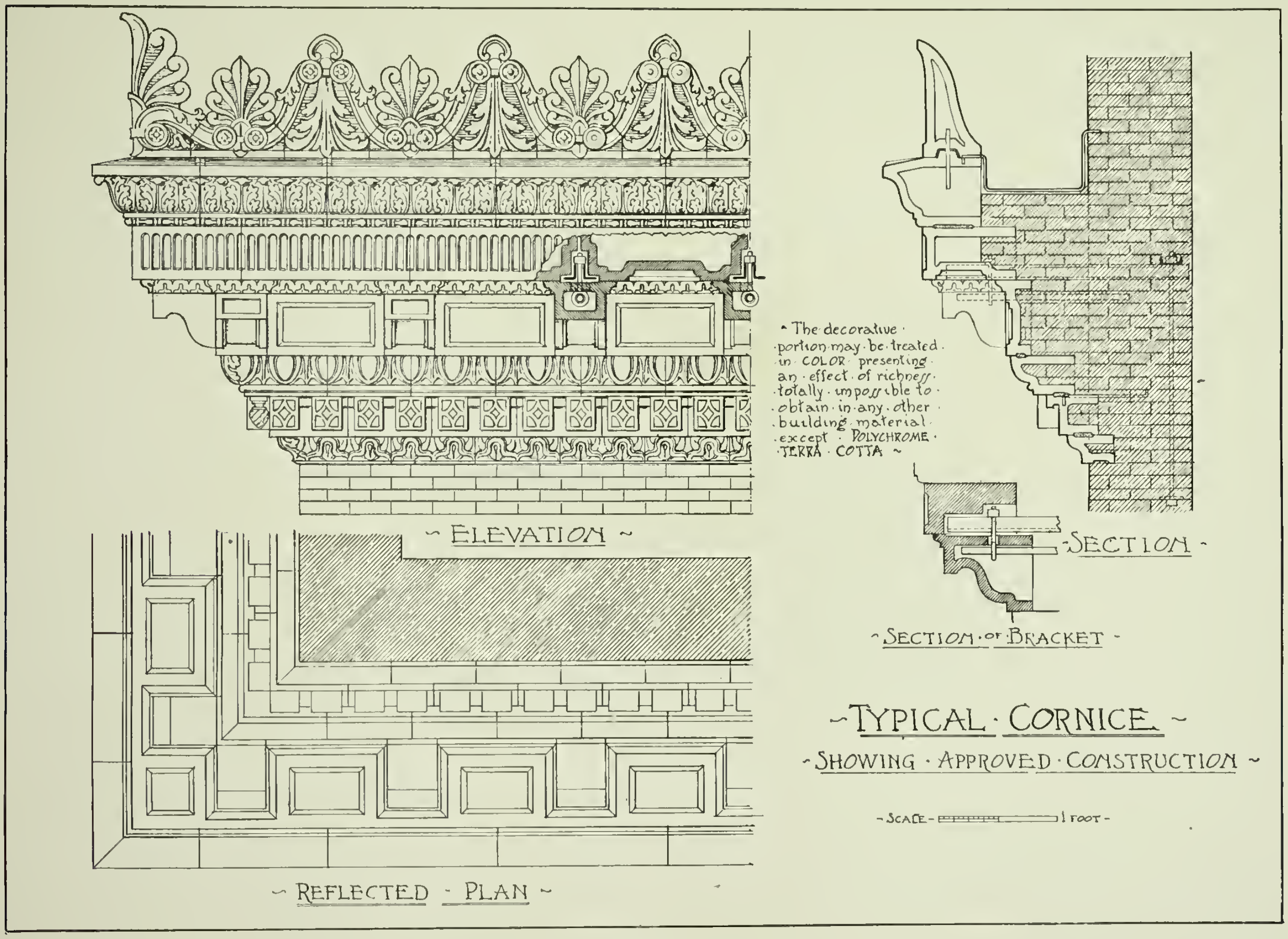


PLATE XI.

Much of our recent work, and also many of the designs submitted in THE BRICKBUILDER's Theater Competition of last year, demonstrate that when architects understand the character of terra cotta it can be used to produce works of art of a very high grade.

A new era in terra cotta is opening before us which may result in a new era in architecture because the American architect is looking for opportunities for original conceptions and as the possibilities of original treatment of wood or stone are practically exhausted and of metal nearly so, he may find that terra cotta is the one and only material having possibilities of novel treatment producing beautiful effects thoroughly consistent with the highest type of his art.

Composite Hollow Tile

AND REINFORCED CONCRETE FLOOR SLABS—A SUBSTITUTE FOR PLAIN REINFORCED CONCRETE.

BY GEORGE S. DREW, JR.*

IN ITS simplest form a floor slab of reinforced concrete consists of a comparatively thin mass of concrete spanning from one wall or support to another, and having steel in some form, usually rods, plain or deformed, incorporated in its lower surface as at "A" in the accompanying diagram, Plate I. In such a slab only that portion of the concrete located above the "Neutral Axis" (b) can be said to actively resist compression, and in ordinary practice this constitutes about twenty-five per cent of the entire mass. Of the remaining portion only a small part, possibly another twenty-five per cent directly above and surrounding the reinforced rods, is subjected to a secondary activity in transmitting the tension stresses to the reinforcing steel. It is therefore obvious that fully one half of such a slab is composed of inert material doing no work and practically doubling the dead weight of an ideally constructed floor of the same strength.

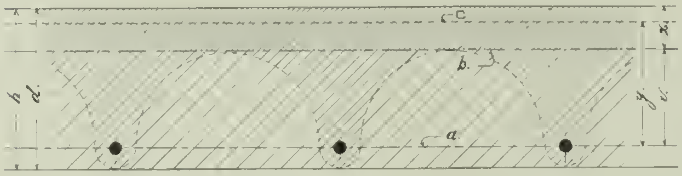


PLATE I.

TYPICAL SECTION OF A REINFORCED CONCRETE SLAB.

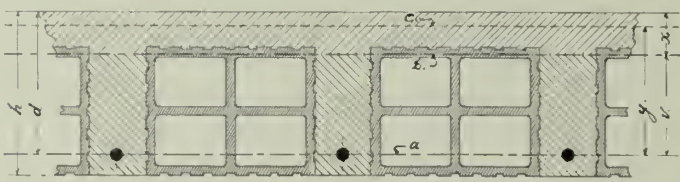


PLATE III.

TYPICAL SECTION OF A COMPOSITE REINFORCED SLAB.

a. Plane of Reinforcement or of Tensile Stress. *b*. Plane of Neutral Axis. *c*. Plane of Mean Compressive Stress. *d*. Effective Depth of Slab. (1.) *x*. Distance from Neutral Axis to Plane of Maximum Compressive Stress. (.3d) *v*. Distance from Neutral Axis to Plane of Tensile Stress. (.7d) *y*. Distance from Plane of Mean Compressive Stress to Plane of Tensile Stress. (.9d)

In order to save this waste of material and reduce the excessive dead weight of such structures, many devices and expedients, all purely mechanical, have been resorted to.

The most obvious expedient for the reduction of the dead weight is to reduce the thickness of the slab, and in most of the systems now in use this is accomplished by a variety of methods whereby the length of the span of the reinforced slab is shortened, most of them involving the use of either steel or reinforced concrete beams spaced at varying intervals, as the main carrying system, somewhat as illustrated at "A" and "B" in Plate II. These devices are all more or less open to the criticism that while the slabs are as thin as possible, they are still plain slabs and open to all the economic objections set forth above; that the centering is complicated and its cost increased by the use of concrete beams, and that if steel beams are used, their greater cost must be added and means taken to protect them from fire. Then again in either case in order to secure flat ceilings it is necessary to resort to some form of metal furring on steel members attached to the lower chords of the floor beams, adding greatly to the constructive cost.

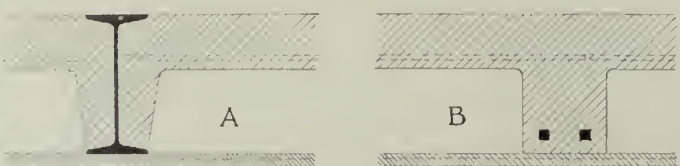


PLATE II.

TYPICAL FORMS OF FLOOR CONSTRUCTION.

Perhaps the simplest and most efficient method of overcoming these difficulties yet devised is the use of ordinary hollow terra cotta partition blocks in conjunction with reinforced concrete in the manner illustrated in Plate III.

In this system the hollow tile blocks are set end to end in continuous rows across the space to be spanned, the rows separated from 3 to 5 inches from each other and the edges of the tile supported on a simple centering of loose planks. The reinforcing steel is then placed in the spaces between the rows of tile and the interstices filled with concrete, which is also spread over the top of the tiles to the required depth to bring the neutral axis of this composite slab practically coincident with the upper surface of the tile and giving in reality a series of T-shaped reinforced concrete beams.

A comparison of Plate I. with Plate III., the two being drawn to the same scale, illustrates clearly the comparative advantages of the latter over the former type of construction.

The combined area of the tile and concrete in the one instance is only .55% of the area of the concrete in the other, with an equivalent saving in weight. This approximates ideal conditions very closely by the almost complete elimination of the inert concrete of the simple slab, replacing it with the hollow tile. The area of concrete in compression, i. e., that above the plane of the neutral axis, need not be diminished and enough concrete is retained between the tiles to fully develop the tensile strength of a steel rod of sufficient area to balance the resistance to compression exerted by the concrete above the tile. Furthermore, this system beyond the saving in dead weight over a plain slab of equal strength affords a flat ceiling surface

* Head of Architectural Department, Westinghouse Church Kerr & Co., New York.

ready to receive the plaster without resorting to furring or other costly expedients.

A practical demonstration of these and other advantages inherent in this system of construction was recently afforded the writer in the erection of the Hotel Nassau, at Long Beach, L. I.

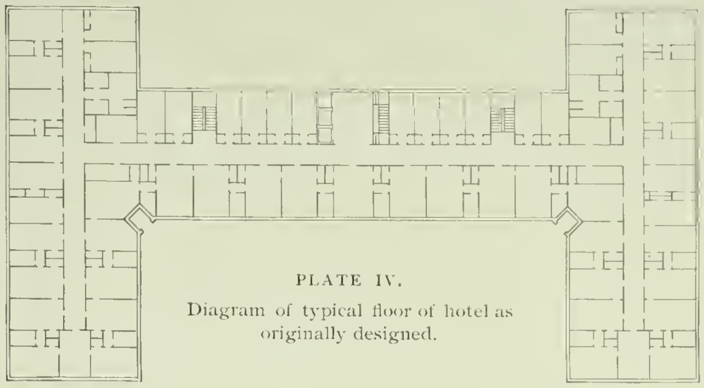


PLATE IV.
Diagram of typical floor of hotel as originally designed.

When on the 11th day of November, 1908, the Nassau Hotel Company placed the work of erecting and equipping this hotel in the hands of Westinghouse Church Kerr & Co., two factors, those of speed and economy, were even more than usually accentuated in the problem presented. At that time the plans for the building above the foundations, which had already been built, had not been completely developed, and so many modifications of the original conception were required by the owners that it fell to the writer's lot as architect for the constructing engineers to practically recast the entire conception both as to plan and method of construction, so far as the limitations imposed by the foundations and retention of some of the more essential features of the exterior treatment would permit.

HOTEL NASSAU.
View from boardwalk looking west.

As originally projected, the building consisted of an H-shaped structure 260 feet long by 140 feet wide, six stories and basement in height, and containing two hundred and forty-three guest rooms, eighty-three private baths, and two servants' dormitories, in addition to the public rooms and the various service departments. The southerly courtyard formed by the wings of the H was entirely covered by a two-story structure containing eleven shops fronting on the boardwalk, the roof forming an open terrace overlooking the ocean and the promenade. The wings of the building were approximately 50 feet in width, containing a central corridor with rooms on either side. The entire area covered amounted to nearly 32,000 square feet, and the total volume of the projected building to slightly more than 2,000,000 cubic feet. A diagram illustrating the arrangement of a typical floor is given in Plate IV.

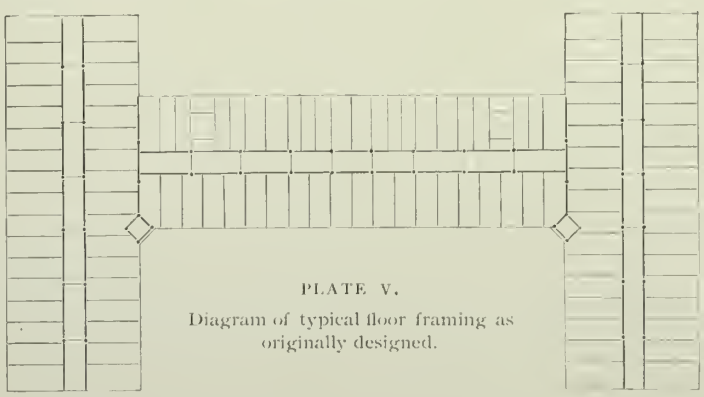


PLATE V.
Diagram of typical floor framing as originally designed.

In order to complete the building in the one hundred and eighty-three possible working days between the signing of the contract and the 19th of June, 1909, the day set for the opening of the hotel to the public, and at the same time observe the utmost economy in construction, required a most careful and thorough study and selection of both the materials and methods to be employed.

The plans for the structural steel which had been elaborately worked out contemplated the use of Bethlehem sections throughout, and these, it was at once found, could not be delivered early enough to permit of the completion of the building within the specified time. The substitution of standard shapes meant an increase of about twenty per cent in the tonnage and a corresponding increase in cost which both the owners and the engineers were loath to contemplate. It was at this point that a systematic study of the proposed floor construction was undertaken with a view to securing greater economy, with the following results :

The typical floor construction as originally designed consisted of 12 inch 36 pound I-beams, 8 feet apart on 20 foot spans, carried by two lines of girders and columns coincident with the corridor partitions. A diagram illustrating this framing is given in Plate V. Between these floor beams and flush with their upper flanges were 4½ inch reinforced concrete slabs supported on the lower flanges by concrete haunches. Below the beams were suspended the metal lath and furring for the plastered ceiling, substantially as shown at "A," Plate II., while above the beams was 2 inches of granolithic finish flush with the carpet nailing strips. The analysis of weights and costs for this construction was as follows:

	Weights.	Costs.
Steel floor beams	5 lbs. per. sq. ft.	$ .13 per sq. ft.
2 in. granolithic finish	25 ,, ,,	.08 ,, ,,
4½ in. reinforced concrete slab and haunches	60 ,, ,,	.34 ,, ,,
Hung ceiling plastered (3 coats)	10 ,, ,,	.10 ,, ,,
Total	100 ,, ,,	$ .65 ,, ,,

Calculation showed that by the use of 12 inch hollow tile blocks with 4 inch ribs of reinforced concrete, it would be possible to span directly from the walls to the girders, eliminating the entire system of floor framing. A comparative analysis of the weights and costs by this system resulted as follows:

	Weights.	Costs.
2 in. granolithic finish	25 lbs. per sq. ft.	$ .08 per sq. ft.
12 in. tile and reinforced concrete	68 ,, ,,	.37 ,, ,,
Plastered ceiling (two coats)	7 ,, ,,	.05 ,, ,,
Total	90 ,, ,,	$ .50 ,, ,,

It will be seen that the depth required for construction in both cases was the same, viz: 15 inches; that the dead weight was slightly in favor of the long span construction, thereby making it possible to use the same amount of steel in girders and columns for either construction, and that the estimated cost was 15 cents per square foot of floor in favor of the hollow tile and reinforced concrete. Another consideration which led to the adoption of this method of construction was the additional stability given the exterior bearing walls by the practically monolithic plate built in at every story and the equal distribution of the floor loads, permitting a substantial reduction in the thickness of the lower wall sections and a corresponding further economy. The experience of the field force during erection was found to fully justify the wisdom of this decision.

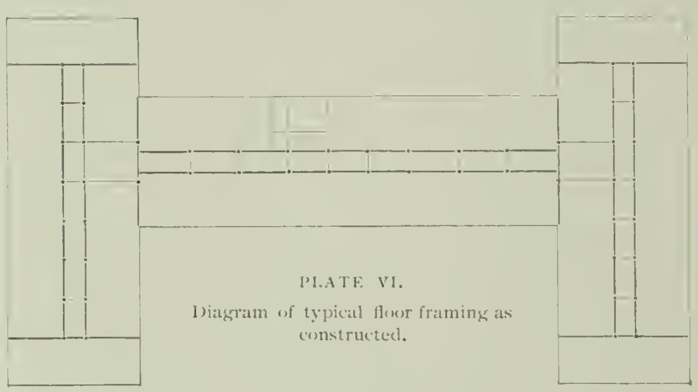


PLATE VI.
Diagram of typical floor framing as constructed.

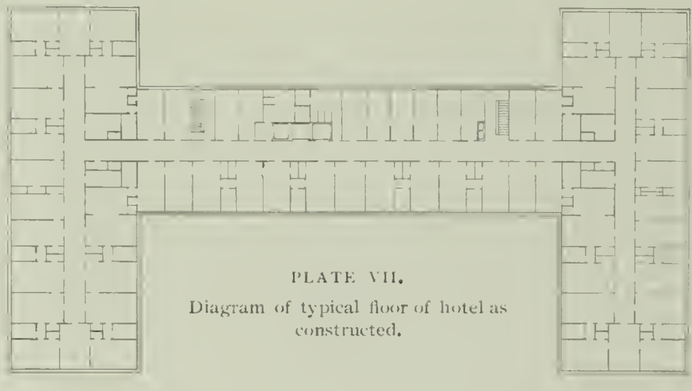


PLATE VII.
Diagram of typical floor of hotel as constructed.

On December 15th, thirty-four days after signing the contract, the erection of steel from this simplified design, illustrated in Plate VI. (involving less than one half the original tonnage), was begun and was pushed steadily on to completion. It was found that the costs both of handling the tile and erecting the centering were below those estimated and that this part of the work could be pushed with even greater celerity than had been supposed, it having been found quite possible to center and lay an entire floor containing 22,000 square feet in two days, quite as fast as the masons could carry up the walls to receive the floors.

Another advantage attending the use of this form of construction was the facility with which plumbing and other pipes and ducts could be incorporated and concealed in the floor construction by simply leaving out or breaking out a row of tile without impairing the sufficiency of the structure.

In designing these floors they were calculated to carry safely a live working load of 80 pounds per square foot without the aid of the 2 inch finish which was not applied till after the partitions were set and tests on various portions of the floors failed to produce a deflection of more than 5/16 of an inch at four times this load.

To the unusual flexibility of design arising from the adoption of this type of construction was largely due our ability to meet the changes and additions exacted during construction by the growing requirements of the owners and lessees, which resulted in a much more elaborate and efficient equipment than was at first desired.

As completed, the hotel proper contains two hundred and ninety guest rooms, one hundred private baths, sixty-two servants' sleeping rooms, two servants' dormitories, a roof garden, and a greatly elaborated service equipment. The typical floor plan of the hotel as erected is diagrammed in Plate VII., and a fairly accurate idea of the proportions and size of the building is given by the accompanying illustrations. The three-story annex erected to the south of and adjoining the hotel proper contains in addition to the power plant and main kitchen a large dining room and thirty servants' sleeping rooms.

The café, café kitchen, and the bar were opened to the public on Saturday, May 29th, and the remainder of the buildings, with the exception of the roof garden which was not finished till July 15th, on Saturday, June 19, 1909, no inconsiderable achievement when the location, transportation facilities, and the weather conditions prevailing through the most inclement season of the year are taken into account.

HOTEL NASSAU.
General view from the beach

Specifications for Office Buildings.

BY FREDERICK W. WINTERBURN.*

THE secret of writing a good specification, if there is any secret about it, is intimate knowledge and infinite care, with concentration of thought upon every detail and requirement of the building in hand until one can see it in his mind's eye, complete in every respect. It is also not enough that one shall thus discern it but he must also describe it in terms that will be understood by all concerned in the construction.

Specifications should be confined strictly to describing what it is impractical to show on the drawings. This brings the specification within its legitimate compass, i.e , specific instructions. They should be pertinent, concise, and positive. The writer should know what is wanted and state it clearly. He should have an intimate knowledge of the requirements of the building, the cost, kinds and qualities of materials, as well as the quantities that will be required and whether procurable in order that they may be had on time and in quantity.

When the best material obtainable is called for or when a less costly grade will do, the author must be familiar with the vernacular of the several trades that enter into the construction, in order that the mechanics may understand him. It is especially important that he be familiar with the traditions of the trades and the workmen and, as far as may be, the rules of the trade unions, so that disputes may be avoided, for such a contention between unions delays the building just as surely as a strike.

A general knowledge of the law in relation to building is required — not alone the local building laws, but the common or general law as well. Rights of owners, contractors, workmen, tenants, adjoining premises, and other legal questions are likely to arise, as well as what the courts have generally enforced, and what they will not, for strange as it may seem the general specifications of to-day contain clause after clause that it would be impossible to enforce by law.

The architect must remember that he stands between client and contractor ; that each will read and interpret from his own point of view. General clauses will mean but little to the contractor, but to the owner they will loom large and beget great expectations that will later lead to disappointment. It is of little use to give an elaborate description, say of all locks, and then fail to state what doors shall be provided with them. The young architect should guard against elaborate general clauses ; he should be specific, mandatory, finishing if possible by a general clincher which will take care of all overlooked items.

Care must be taken to not say too much, for many a clause has been nullified by having too many words. Take this instance. "The contractor shall cut off smoothly, all mason and brick work from adjoining buildings that project over the property lines." In this case a concrete wall had to be trimmed and iron beams cut off, for which the contractor claimed an extra on the plea that concrete was not masonry in trade parlance and iron beams were neither masonry nor brick work. It will be seen at a glance that a stroke of the pen through the words "mason and brick" would have cured the defect. The better way would have been to make the clause more concise and say, "Cut off all projections." That would have been specific, inclusive, and shut off all argument as to interpretation of what was called for. This the architect must constantly bear in mind and carefully scan his clauses to see that while all things necessary are included he has not gone beyond the safety line and added confusion that will not fail to plague and vex him in the near future.

Another fault should be avoided ; having generally included certain work in a specific clause do not go on and partially specialize. For instance, "All walls and ceilings throughout shall be plastered three coats," and then go on to say that "basement ceilings shall be plastered." In this case the contractor does not plaster the basement walls, claiming that basement ceiling only was called for. He wants extra for basement walls, as he did not figure for them. You can see his contention is sound. If you had stopped with the simple first clause, it would have included every wall and ceiling and shut off all controversy and the dreaded extra.

Another vexation is the guarantee. If you want the contractor to build a waterproof cellar and guarantee it free of expense to the owner for a set term of months or years, say so, and then stop right there. If you go on and carefully particularize manner and materials he shall use, he will carefully follow your instructions. When the cellar leaks, you order him to make good, but he claims that the work is as per specifications and his responsibility ceased when he did what was called for. The owner following your advice refuses to pay. The contractor then sues and much to your surprise and the owner's disgust, wins his case. This at first glance seems unfair and unjust, but when carefully considered we find the courts are right. You cannot enforce a penalty for a failure of results and at the same time compel a specific performance of the work as it should be done in your judgment. If you are an expert you must assume the responsibility. If you shift the responsibility upon the contractor then you must stand aside, for he now assumes the responsibility, relying on his own judgment as an expert as to what is required to attain the result called for.

Many attempts have been made to prepare a set of skeleton specifications that could be filled out to suit different buildings, and the writer himself has spent much time in preparing them for use in the office, but the results were unsatisfactory and a second lot never was printed. The general clauses to our specifications however have been in use for many years. We have edited them from time to time, adding and cutting out, always striving for simplicity and directness. In practice we have found them equal to every occasion and have many times seen them copied in specifications of other architects, even including the errors which we had weeded out later.

The following fourteen clauses are generally necessary

* Of the firm of Clinton & Russell, architects, New York City.

for all classes of buildings. They are for the "Masons' Specifications," and the same are used for all other contractors with slight modification.

Drawings and Specifications. The drawings and specifications shall be carried out to the letter, and are intended to cooperate, i.e., anything shown on the drawings and not mentioned in these specifications, or vice versa, shall be done the same as if both specified and shown.

Figured dimensions shall govern over scale measurements.

Variations from the plans or specifications shall not be made without written authority from the architects covering every instance.

Wherever the words, "this contractor" appear in the specification, they shall designate the contractor for the work under the specification.

If this contractor observes errors or inconsistencies in the drawings or specifications, he shall without delay notify the architects that proper adjustment be made.

Measurements. This contractor shall verify at the building all measurements relating to his work and shall adjust the joining and fitting of his work to the other works. When building is up to curb level, this contractor shall employ a city surveyor to verify the walls and certify that they do not trespass on adjoining property or streets.

Permits. Building permit will be obtained by the architects. Vault permit, if required, by the owner. Water permit and all other permits and privileges necessary for the prosecution of the work herein specified, shall be obtained and paid for by this contractor.

Watchman. The building will be considered as in charge of this contractor, and he shall keep a watchman on the premises continuously from the time work is turned over by the excavating contractor, until building is completed and delivered over to the owner.

Responsibility. This contractor shall make his work conform to the law, to the City Ordinances, and to the requirements of the Superintendent of Buildings.

This contractor shall be responsible for all loss or damage to life, limb, or property that may happen through any operations under his charge; and shall hold the owner harmless against all loss or damage from such cause or causes.

This contractor shall guard all dangerous places by suitable railings, danger lights, etc., as required by the law and the police regulations, or as directed by the architects.

Administration. This contractor shall give the work personal supervision and keep a competent superintendent in charge on the building during the progress of the work. He shall supply a sufficient number of strong ladders, firmly braced, and maintain access to all parts of construction.

He shall maintain a sufficient number of steam or electric power hoists to elevate required materials for the rapid progress of his work.

He shall maintain an office, with telephone connection on the premises; this office shall have in conjunction with his own accommodations, a table for plans and a drawer with lock, for the use of the architects.

This contractor shall co-operate with the other contractors on the several works, so that work will be prosecuted in proper sequence and will not have to be taken down to allow the construction of work that should have had precedence.

The permanent elevator wells shall be left free and no one will be allowed to use them except the contractors for elevator work.

Extra Work. No work shall be considered as extra, unless same is done under a written order from the architects, said order stating the amount or manner of compensation.

Defects. This contractor shall make good any defective materials or workmanship which may occur in his work within twelve (12) months after the completion of this contract, and the issuance of the final certificate by the architects shall in no way exempt this contractor from the obligation of remedying and correcting defects within the twelve months aforesaid.

Cutting and Patching. This contractor shall do all required cutting of his work for other trades and shall do all patching and repairing of his part of the work after them, that may be necessary. He shall leave all his work sound, clean, and perfect at completion of the building.

Rubbish Removal. During construction and up to full completion of the building, this contractor shall clean up and remove all rubbish whatsoever resulting from his own part of the work, or from the work of all other contractors; he shall keep the building broom clean and shall not let rubbish or waste materials accumulate on the premises or streets, removing same whenever directed by the architects.

Materials, Etc. This contractor shall furnish sufficient labor, materials, plant, tools, scaffolding, and appliances whatsoever necessary for the complete carrying out of his work as herein set forth. Where not specifically called for, all materials shall be of the best kind and quality suitable for the work.

Workmanship shall be the best.

Water in Cellar. This contractor shall keep the excavations or cellar free of water, emptying same whenever called upon to do so by the architects.

Bridge. Build a strong bridge over all sidewalks. This bridge to have a roof strong enough for the stone masons to set their work from. It shall be kept in repair during the progress of the building and removed when ordered by the architects.

Old Cisterns, Trimming, Etc. Fill in with concrete and masonry any old cisterns or wells that may be discovered on the premises. Cut and trim off smoothly any projections found on adjoining walls, so that walls may be carried up plumb and close to lot line from the bottom.

As specifications invariably have to be prepared in a hurry, it will be found a great convenience as well as a saving of time to write the specifications over a former one. Extra copies of all specifications are written and filed away. Then when one has to be prepared, a copy is selected as close to the type as possible and used as a form, from which, by cutting out, interlining and substituting new clauses with desired additions, copies for the typewriters can be prepared very quickly. These will require very careful attention in correcting.

Care should be taken of all instances where clauses are found to be defective during construction, also of wording that allows different interpretation, or is easily misconstrued. Note all useless clauses, mistakes, omissions, and blunders. The same error should never be tolerated again.

It is better practice to group the different trades in separate specifications around the general contractors specifications, which always include all mason work. This is a help, both to the general contractor, as it allows him to hold the subcontractors down to strict performance of the work, as well as the contractors themselves, who may know definitely what they are estimating on. Such a course entails great care on the architect's part to see that no discrepancies occur between the different trades, and again the warning comes not to depend on general clauses to cure this. The better way is to be exact, make all the points meet. The more definite and plain the drawings and specifications are made, the closer the estimates will run.

It is best to have lists of all work in every trade, by means of which omissions can be checked off and everything necessary to a perfect building be included. It lowers the dignity of the architect to offer an excuse to the owner because certain improvements have not been provided, and the best of clients usually receives the assurance somewhat skeptically, "that as they were not included they were not figured for, therefore he can have them if he so desires." It is well to have everything included and ask the client if he desires ice water for tenants, thermostats, vacuum cleaning, etc., all down the list, and let him do the weeding out. It gives him a higher appreciation of your ability.

In conclusion, we would emphasize the point that the specifications are never greater than the man who writes them. They must be evolved, not copied, and written by one who possesses an intimate knowledge on such matters and who combines in himself the qualities of carefulness, keenness, and patience.

Plate Illustrations—Description.

Town Hall, Clinton, Mass. The building is situated at the corner of two principal streets and faces a large park. The heavy foliage as well as the proximity of an old wooden church made the selection of color for the building an important item, while the character of the neighborhood influenced the scale. Buff brick in two tones has been used for the exterior together with trimmings of terra cotta shaded to match the lighter or body bricks. Five-eighths inch joints deeply ruled are used throughout together with considerable pattern brickwork. In the upper part of the tower three colors are introduced in glazed terra cotta. The roof is of red shingle tile. The Town Hall proper, which contains the customary offices, is connected by the main hall to the large auditorium, so planned as to be used either with the main building or separately. The auditorium is a special feature of the building, being provided with a stage, dressing rooms, supper room, etc., large enough to accommodate the social needs of the town as well as the town meeting. The color scheme is green and gold with an ivory tinted vaulted ceiling which is divided into panels and ornamented in low relief.

The Dining Hall at Mount Hermon Boys' School. The building is of Harvard brick with granite wall trimmings, wood cornice, and portico columns. The foundation walls are of concrete and have been surfaced back by hand with bush hammer to effect a harmonious treatment with the granite water table. The interior arrangement is T shaped in plan, formed by large dining hall in the center of the main building, 50 feet by 162 feet, and with large vestibules or anterooms at each end. The wing contains a kitchen, storage rooms, etc., on the main floor, and a bakery, servants' dining room, toilet, etc., in the basement. The main dining hall accommodates eight hundred persons and is of sufficient height to be in good proportion with the large dimensions in plan. The interior walls are faced with Harvard brick above a light gray impervious brick dado. The cost of the building, including the construction, kitchen apparatus, electric fixtures, etc., was $65,000. The size in cubic feet from the surface of the cellar floor to the roof surface is 576,000 cubic feet, amounting to 12 cents per cubic foot, exclusive of the architects' commission.

Town Building, Lenox, Mass. The building is constructed of water struck bricks and cement mortar with white marble trimmings. The cornice is of galvanized iron and the columns of wood with composition capitals. The cost of the building was approximately $40,000.

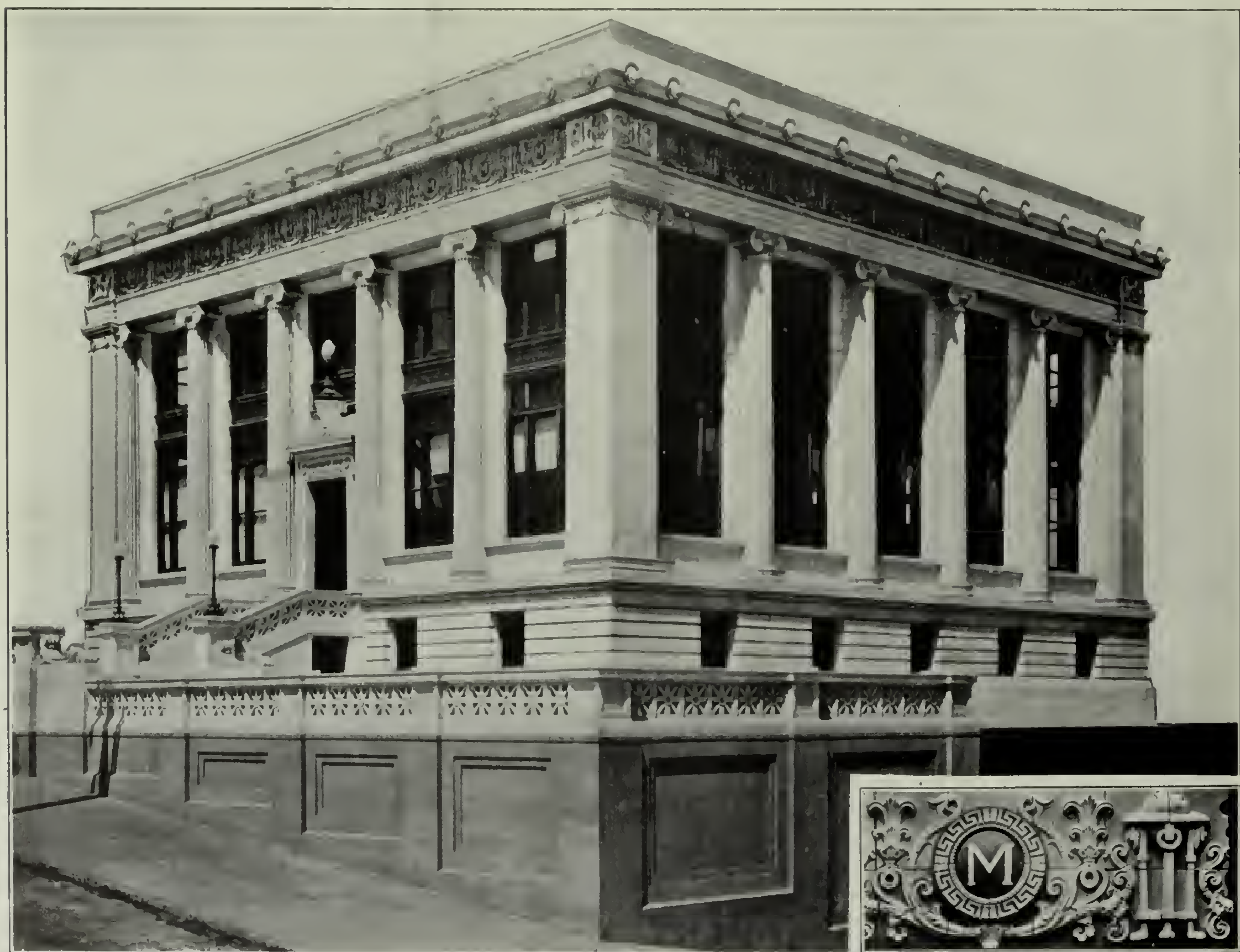
House at Dover, Mass. The house which is situated on one of the southerly slopes of Pegan Hill was originally planned for composite construction, i.e., brick walls with wood floors and partitions; but abundant sand and gravel being close at hand it was changed to a fireproof building. The general style is a modified French Renaissance, with walls of dark red brick, trimmings of cast white marble, composed of white cement, sand, and marble dust; and a roof of gray green slate. The terraces are laid in red cement in quarry tile effect, with the curbings, water table, steps, etc., in granolithic.

The interior is of a simple colonial style. Finished hard wood floors have been used throughout with the exception of the service portion of the house, which has been finished in cement with a red quarry tile effect, and in the bath and toilet rooms, which have white cement. The walls of the first floor rooms are largely panelled in wood, red ash being used for the living room, clear pine reaching to the ceiling and painted a pearl gray for the dining room, and black swamp cypress for the den. White cement panelling is used in the hall with whitewood fluted pilasters, beamed ceiling, and colonial staircase.

Russell Sage Hall, Northfield, Mass. The building follows the Colonial style in its outlines, while the detail of the brickwork in general is patterned after the Roman models. The architects of this building endeavored to produce a decorative effect through the medium of rich ornamentation, and at the same time preserve the general color scheme throughout. From a distance the building gives a reddish gray appearance which gradually changes, in approaching, to a pronounced brick treatment in colors that range from a light red to a deep purple. The panels containing the names of musicians on white marble are highly ornamented, but are kept in perfect harmony with the rest of the building. The various models of the different panels were first made of plaster, upon which the brickwork was laid off. After this the plaster models were cut in pieces to serve as new models for the shapes of the various bricks. Rough cut mortar joints 1 inch in width were used for laying in Flemish bond the bricks, which are 18 inches by 1½ inches by 6 inches. The cost of the building was $44,000.

House for the Protestant Episcopal Bishop of California. The building is treated in a dark cherry brick, laid in gray joints, with the central oval window and other trimmings of gray sandstone. Upon the interior, the dining room is finished in cedar and white enamel, the reception hall in oak with caen stone mantle, and the living room in red wood with walls of deep red velour. The steps and walls of the vestibule are brick. Adjoining the reception hall is a small chapel which may be used for private ecclesiastical affairs, weddings, etc., and arranged so as to interfere in no way with the living portions of the residence. The attic floor plan consists of five chambers and two bathrooms. The entire cost of the building was $32,000 or about 20 cents per cubic foot.

House at Williamstown, Mass. The west front of the house, parallel to the street, is approached by a straight drive of 350 feet. A wide brick terrace extends from the house to the garden, making this side the main living quarters. The covered terraces are glazed in during the winter. The exterior walls, steps, terrace floor, sills, water table, balustrade, coping, etc., are of dark red local brick, laid in English bond. The roof is covered with red and green slate, while the woodwork is of pine stained a dark brown. In planning, the rooms of the main floor are connected by large openings while the floor levels follow the natural grades. The house is set on a slight eminence which makes the floor of the kitchen and living room slightly lower than the central portions, effecting a greater height to the living room. The woodwork in the library, in the stair hall, and in the living room, is of ash, wax finished, stained dull gray and brown. The house contains approximately 174,425 cubic feet. These figures are taken from the bottom of the footings to the top of roof rafters at a point midway between the eaves and the ridge. Steps and uncovered porches are not included. The cost of the house complete, including heating, plumbing, electric wiring and lighting fixtures, was 19 cents per cubic foot.



METROPOLITAN LIFE INSURANCE BUILDING AT SAN FRANCISCO.
The frieze of the main cornice, a detail of which is shown, was executed by the Rookwood Pottery Company in architectural faience. The background is of a soft blue with the reliefs in white, except the circle back of the "M," which is in a harmonious green.
N. Le Brun & Sons, Architects.

Editorial Comment and Miscellany.

THE New York *Times* of December 12th presented to its readers short personal interviews on all phases of American growth during the last century. The "Growth in Architecture" in America was treated by Thomas Hastings and William A. Boring, and "Architecture As It Was," by Oscar Fay Adams.

Mr. Hastings forcibly prefaced his remarks with this statement: "When you ask me what has happened in architecture in the last fifty years, I would say that one has only to think of the old North Washington Square houses and how different things are that have happened since their erection." Mr. Hastings continued his thought by denouncing the ever-present pessimists and claiming that never had architecture righted itself so quickly as our own after the setback some fifty years ago. He believes, however, that our archeological spirit of selecting all styles of the past is the greatest calamity that ever happened in the history of art, and attributes to all allied arts a desire for novelty rather than beauty. He thinks also that this archeological tendency has fathered the realism of our artists, which possesses little respect for traditions. But after commenting on the modern confusion of the last half century, Mr. Hastings remarks: "It seems to me, however, that in the last fifteen years there have been indications of very great promise coming from this chaotic condition of things, and this, I believe, is the outcome of a very remarkable advance in educational work." While he praises the healthy influence of the Beaux Arts, the colleges and educational ateliers, he condemns the practice of planning "ugly things" under the guise of their teachings.

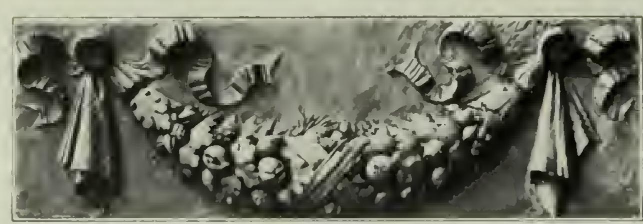
Mr. Boring believes that the change in our architecture has kept pace with the changes in our manner of living and doing business. He refers to the business building of fifty years ago as a "lifeless shell," while to-day it is a system of muscle, nerve, and blood. He also shows how our needs have been adequately met as exemplified in the growth of practical Christianity, which has given us buildings for charitable and humanitarian purposes; in the rise of social activity, which has produced our theaters and playhouses; in the growth of education with its vast outlay in libraries and museums; and also in the rush to our cities with the immense plans for accommodating this ever-increasing mob. In closing Mr. Boring says: "If the present activity continues, with its accompanying public interest and growth of good taste, we may hope to have developed, before another half century rolls by, an American style of architecture which will express the national sentiment in buildings and meet the complex utilitarian requirements and yet exhibit the rare qualities of pure style and intrinsic beauty."

THE NEW BLACKSTONE HOTEL, MICHIGAN AVENUE, CHICAGO.
Architectural terra cotta made by the Northwestern Terra Cotta Company.
Marshall & Fox, Architects.

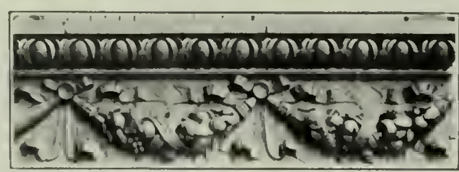
Mr. Adams in referring to the growth of American architecture says that "the dark ages of architecture in America were at their gloomiest in the year 1859." He portrays the decline of the Georgian style and the rapid growth of the so-called Italian villas, which in turn gave way to the "French-roofed" dwelling. Not only were the new buildings using the "French roof," but the older ones were remodeled to meet this new style. After this Mr. Adams pictures how the last half of the present century has brought about a complete revolution in the ideas of the people. Instead of the dull, commonplace design, the nation has awakened to a real appreciation of true art. To quote his words: "Stolidity has been superseded by a perception of beauty in architectural lines, and vigor and even audacity have taken the place of timidity. Ugliness

DETAIL BY NEVILLE & BAGGE, ARCHITECTS.
New York Architectural Terra Cotta Company, Makers.

is no longer admired as it once was, and beauty is no longer misconceived. It is not merely a change that has come to pass in architecture since 1859, it is a revolution that has been achieved."



WHAT is said to be the largest "fireproof home" building scheme yet undertaken is going forward at Orange, N. J. It represents an investment of about a quarter of a million dollars and consists of a colony of houses built entirely of terra cotta. Six thousand tons of the hollow blocks (or 500,000 square feet) have been shipped from the factories at Perth Amboy. Twelve houses have been started, and it is expected that within a year twenty-four will be finished. In the walls the blocks are laid end to end, giving continuous vertical air chambers. In the floors they are laid flat alternating with concrete beams. A street has been planned through the property and terminating in an ornamental square which will be used as a playground for children. Mann & MacNeille are the architects.



DETAILS, CLINTON TOWN HALL, CLINTON, MASS.
Executed in terra cotta by Atlantic Terra Cotta Company.
Peabody & Stearns, Architects.

ANOTHER New York apartment house of the co-operative type is nearing completion on Park avenue at the northeast corner of 61st street. It will be fifteen stories high and will represent an investment of more than $750,000. It is said to be the best of its type, both in construction and organization. The projectors of the building will occupy a large portion of it, and the remainder will be rented by a local real estate firm to tenants congenial to the owners. The floors are to be divided into three separate apartments. These apartments will be duplex, i.e., covering a part of two floors and as closely resembling a private dwelling as is possible under the circumstances.

A TRACT of twenty-two hundred acres in the Ramapo Mountains, between Suffern and Tuxedo, on the line of the Erie Railroad, is the basis of a unique plan in the development of real estate. The managers of the Erie Real Estate Company propose to develop the land on the lines of a model town, communistic in the sense in which all purchasers of building sites will play their part in the government of what is declared to be a co-operative colony. A fine railway station and a town hall are among the first buildings to be erected. The land lies at an altitude of 600 to 1,000 feet and is but one hour's ride from the Hudson Terminal buildings.

PANEL FOR HOSPITAL AT UNITED STATES NAVAL TRAINING STATION, NORTH CHICAGO.
American Terra Cotta & Ceramic Company, Makers.
Jarvis Hunt, Architect.

FOUR model six-story tenements for the special accommodation of tuberculosis sufferers are soon to be built on the upper East Side by William K. Vanderbilt in New York City. The cost, exclusive of sites, will be $650,000. The plans show roof gardens, open-air balconies, and other distinctive features. Only moderate rents will be charged, and skilled physicians will have supervision over the little colony.

IN GENERAL.

The Philadelphia Chapter of the A. I. A. gave their fortieth anniversary banquet on the evening of Saturday, December, 11th.

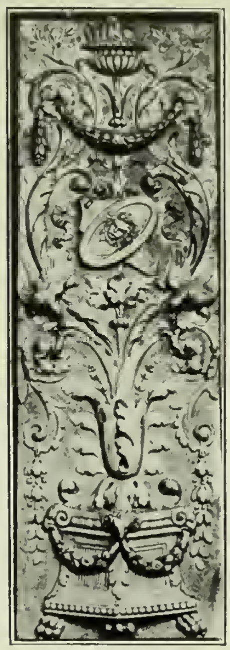
A memorial meeting in honor of the late Charles Follen McKim, was held in the auditorium of The New Theater, New York, on the afternoon of Tuesday, November 23d. There was a large attendance of architects, many of whom came from distant cities. Many men distinguished in the arts and sciences were also in attendance.

On the evening of November 24th, at the Hotel Brevoort, New York City, a dinner was given to Cass Gilbert, president of the American Institute of Architects, by the members of his staff, in honor of his fiftieth birthday. During the evening, made memorable by good fellowship, Mr. Gilbert was presented with a handsome bronze loving cup, as a token of remembrance and esteem. The dinner was presided over by J. R. Rockart. Short addresses were made by Mr. Gilbert and the following guests: W. R. Mead, Edward Blashfield, Walter Cook, D. C. French,

E. E. Garnsey, Prof. Warren P. Laird, and George D. Seymour.

A Charter has been granted to the Southern Pennsylvania Chapter of the American Institute of Architects. The granting of this Charter and the establishing of this Chapter, which is to cover several counties of Pennsylvania, with its headquarters at York, will be of far-reaching importance to the public and to the profession. It will mean a still further widening in this state of the scope and influence of the American Institute.

The Southern Pennsylvania Chapter was organized with the following officers: John Hall Rankin of Philadelphia, president; D. Knickerbacker Boyd of Philadelphia, vice-president; B. F. Willis of York, secretary; J. A. Dempwolf of York, treasurer.



DETAIL EXECUTED IN TERRA COTTA BY THE SOUTH AMBOY TERRA COTTA COMPANY.

The twenty-fifth annual exhibition of the Architectural League of New York will be held in the Building of the American Fine Arts Society, 215 West 57th street, from January 30th to February 19th. Last day for return of entry slips, December 27th. Last day for the reception of exhibits, January 14th. Exhibits discharged, February 21st. Further information may be had from Harvey Wiley Corbett, secretary of the exhibition committee, 215 West 57th street, New York.

CAPITAL EXECUTED IN TERRA COTTA BY THE NEW JERSEY TERRA COTTA COMPANY.
L. Berger & Co., Architects.

The National Association for the Study and Prevention of Tuberculosis, offices, 105 East 22d street, New York, has published a pamphlet entitled, "Some Plans and Suggestions for Housing Consumptives." Lack of space prevents a review which this work merits. The pamphlet was published for free distribution, and there can be no doubt that it will have a value for every architect who is interested in the subject.

The Phipps House, Trowbridge & Livingston, architects, was awarded the medal of honor for 1909 by the New York Chapter of the American Institute of Architects.

Charles U. Thrall, whose series of articles treating of "Terra Cotta: Its Character and Construction" is finished in this issue, is the superintendent of the Tottenville, Staten Island, plant of the Atlantic Terra Cotta Company.

Harry I. Goddard & Selby H. Kurfiss have formed a copartnership under the firm name of Kurfiss & Goddard. Their offices are at 1214 Scarritt Building, Kansas City, Missouri, at which address they solicit manufacturers' catalogues and samples.

Albert C. Kuball, of Cincinnati, formerly at 2101 Reading road, is now located in Suite 611, Lincoln Inn Court.

The exterior brick used for the Town Hall at Clinton, Mass., and for the Russell Sage Hall at Northfield, Mass., both buildings illustrated in this issue, was furnished by Fiske & Co., Inc.

Sayre & Fisher Co. furnished the brick for the exterior treatment of the houses at Villa Nova and Bryn Mawr, Pa., illustrated in this issue.

What is believed to have been the first presidential mansion in the United States is the old Van Altren House, which stood under one of the immense arches of the Brooklyn Bridge on Cherry Hill, New York City. It was to this house that President Washington returned after taking the oath of office, and there he resided from April 23, 1789, to Feb. 23, 1790. It is now being torn down to make room for a structure paying larger revenue.

DETAIL BY CROW, LEWIS & WICKENHOEFER, ARCHITECTS.
Made by Conkling-Armstrong Terra Cotta Company.

The terra cotta used in the Town Hall at Clinton, Mass., illustrated in this issue, was furnished by the Atlantic Terra Cotta Company.

COMPETITION FOR A PUBLIC BATH AND GYMNASIUM BUILDING.

FIRST PRIZE, $500. **SECOND PRIZE, $200.** **THIRD PRIZE, $100.**

COMPETITION CLOSES JANUARY 17, 1910.

PROGRAM.

THE problem is a Public Bath and Gymnasium Building. The location may be assumed in any American city of about 50,000 inhabitants, or some section in a larger city. Competitors may choose between two sites, one at the corner of two intersecting streets, or one in the middle of a block. Both lots are ample in size to accommodate the building and are practically level.

In plan the building may be rectangular (block); or of the pavilion type, having a central motive and two wings, with the longitudinal axis parallel to the street.

The plan should provide for the following: —

IF OF THE BLOCK TYPE: —

In the basement: a swimming pool, six showers, a suitable number of lockers, dressing rooms and benches, toilet rooms, supply rooms, a small laundry for washing and drying, heating plant, and coal storage.

On the first floor: general waiting room, administration offices, at least fifty showers (forty with individual dressing rooms, and ten arranged in groups), lockers, dressing benches, toilet rooms, etc.

On the second floor, which may extend approximately two stories: a gymnasium, six showers, four sponge baths, a rubbing table, lockers, dressing rooms, benches, instructors' and medical attendants' rooms.

IF OF THE PAVILION TYPE: —

In the central part of the building: first floor to provide for a reception room and administrative offices. Second floor to provide a hall for lectures and other entertainments.

In one wing: a gymnasium with the same accommodations as recommended for the block type.

In the other wing: a swimming pool, the shower baths, and other features suggested for the block type.

GENERAL: —

In connection with the gymnasium a running track should be provided which will have not more than twenty-four laps to the mile. Other gymnasium apparatus need not be indicated.

Competitors are free to add any additional features to the plan and equipment which may seem desirable.

The exterior of the building is to be designed entirely in architectural terra cotta, employing color treatment in at least portions of the walls. It is suggested that large blank surfaces of gymnasium walls afford an excellent opportunity for design in terra cotta.

The following points will be considered in judging the designs: —

A. Rational and artistic treatment of the exterior. B. Frank and logical expression of the prescribed material. C Excellence of plan.

It must be borne in mind that one of the chief objects of this competition is to encourage the study of the use of architectural terra cotta. There is no limitation of cost, but the designs must be suitable for the character of the building and for the material in which it is to be executed.

In awarding the prizes the intelligence shown in the constructive use of architectural terra cotta and the development or modification of style, by reason of the material, will be taken largely into consideration.

DRAWINGS REQUIRED.

On one sheet, at the top, the front elevation drawn at a scale of 8 feet to the inch. On the same sheet, below the front elevation, the floor plans drawn at a scale of 16 feet to the inch.

On a second sheet, at the top, the elevation of secondary importance drawn at a scale of 16 feet to the inch; immediately below half inch scale details of the most interesting features of the design. The details should indicate in a general manner the jointing of the terra cotta and the sizes of the blocks. The color scheme is to be indicated either by a key or a series of notes printed on the same sheet with the secondary elevation and details, at a size which will permit of two thirds reduction.

The size of each sheet (there are to be but two) shall be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets, one inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are not to be mounted.

All drawings are to be in black ink, without wash or color, except that the walls on the plans and in the sections may be blacked-in or cross-hatched.

Graphic scales to be on all drawings.

Every set of drawings is to be signed by a *nom de plume*, or device, and accompanying 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.

The drawings are to be delivered flat at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., charges prepaid, on or before January 17, 1910.

Drawings submitted in this competition must be at owner's risk from the time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned may have them by enclosing in the sealed envelopes containing their names, ten cents in stamps, if on cardboard twenty-five cents in stamps.

The designs will be judged by three or five well-known members of the architectural profession.

For the design placed first in this competition there will be given a prize of $500. For the design placed second a prize of $200. For the design placed third a prize of $100.

There have been published in THE BRICKBUILDER from time to time articles treating of the Public Bath and the Gymnasium, also illustrations of both types of buildings. This data, which may be of assistance to those who intend to enter this competition, will be found in the following issues: —

1909. February, March, April, May, June. **1908. February, March, April, May, June, August, November.**

We are enabled to offer prizes of the above-mentioned amounts largely through the liberality of the terra cotta manufacturers who are represented in the advertising columns of THE BRICKBUILDER.

This competition is open to everyone.