

THE INLAND ARCHITECT AND NEWS RECORD

VOL. L

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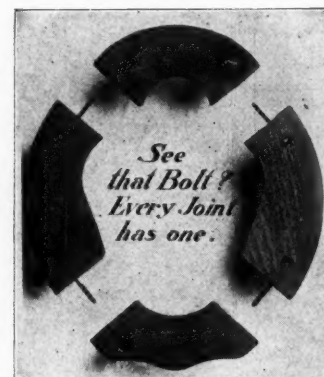
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A Monthly Journal of

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Constructive, Decorative and Landscape

ISSUED ON THE 15TH

Entered at Chicago, Ill., Postoffice as second-class matter.

PUBLISHED BY PORTER, TAYLOR & CO.

PONTIAC BUILDING, CHICAGO, ILL.

NEW YORK OFFICE: 320 Broadway. Phone 636 Worth

SUBSCRIPTION:

\$10.00 a year in advance—Single copies, \$1.00

Vol. L.

SEPTEMBER, 1907

No. 3

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A Valuable Aid to System in the Office.

An experienced and successful architect remarked recently that in these days of sharp competition, and multiplication of details nothing was of more importance in an architect's office than thorough system. To be effective the system should be as nearly automatic as possible. Every document and memorandum to be filed should find its place quickly and easily under such classification that it and related matter could be located at once when wanted, and after examination be replaced with scarcely an effort for future reference. The system should be expansive enough to care for all information that an architect desires to preserve, including catalogues, magazines, and drawings. In such a system probably the first consideration is the selection of the method of classification. For many years the Dewey system of classification has been the favorite with libraries, and with many others who have adapted it to their need. Till recently no exhaustive attempt has been made to apply the Dewey system to the manifold requirements of the architect. Within a few weeks the University of Illinois has published, "Bulletin No. 13" devoted to "An Extension of the Dewey Decimal System of Classification Applied to Architecture and Building."

The Dewey System at University of Chicago.

This extension has been prepared by Dr. N. Clifford Ricker, F. A. I. A., professor of architecture of the University of Illinois. The Dewey system has been in use for several years in the University of Illinois, and Dr. Ricker has had the benefit of close contact with the practical working of the system. This experience, coupled with the long connection of Dr. Ricker with the subjects of architecture and building, has enabled him to arrange this extension in such manner as to be of the utmost use to the architect in caring for his ever increasing data on building. The aim of the work is "(1) The suggested classification of all materials relating to each one of the architectural styles together, in order to bring them into the most compact and convenient arrangement for the study of the history of architecture. (2) The careful separation of 690, building materials and trades; 721, architectural construction; and 729, architectural forms and design, making it now easy to assign any topic to its proper place." The present work supplements in a degree Bulletin No. 9 issued by the University of Illinois and entitled, "An Extension of the Dewey Decimal System of Classification Applied to the Engineering Industries, by L. P. Breckenridge and G. A. Goodenough, 1906." Copies of these bulletins may be obtained by applying to the Director of the Engineering Experiment Station, Urbana, Illinois.

THE SMALL PUBLIC LIBRARY

BY EDWARD L. TILTON, ARCHITECT—Continued

FOLLOWING is a brief description of some of the accompanying illustrations:

Figures 5, 6 and 7 illustrate a library for the State College at Lexington, Ky. The six alcoves on the main floor (figure 6) are for the separate accommodation of the various departments such as: engineering, chemistry, physics, etc., while the two small stack rooms are devoted to general subjects. The building will accommodate 45,000 volumes on floor and balcony. A newspaper or periodical room and a study are on the main floor while the mezzanine room over the entrance may be used by the librarian or for seminar purposes.

The basement contains a lounging room for the girl

students and space for work rooms. The building is 56 feet square an economical form since it provides the maximum floor area for the minimum lineal amount of enclosing walls and ensures easy supervision from the delivery desk.

Its cost complete including furniture and accessories will be \$26,500—constructed of red brick with light terra cotta trimmings and red tile roof.

Figures 8, 9 and 10 show the exterior and floor plans of a library building for Swarthmore College, built of stone with light terra cotta trimmings com-

pleted and furnished for \$50,000. The main floor consists of a large high ceiled room with alcoves for special departments similar to the one above described for Lexington. The position of the delivery counter enables the



FIG. 5.—LIBRARY, STATE COLLEGE, LEXINGTON, KY.

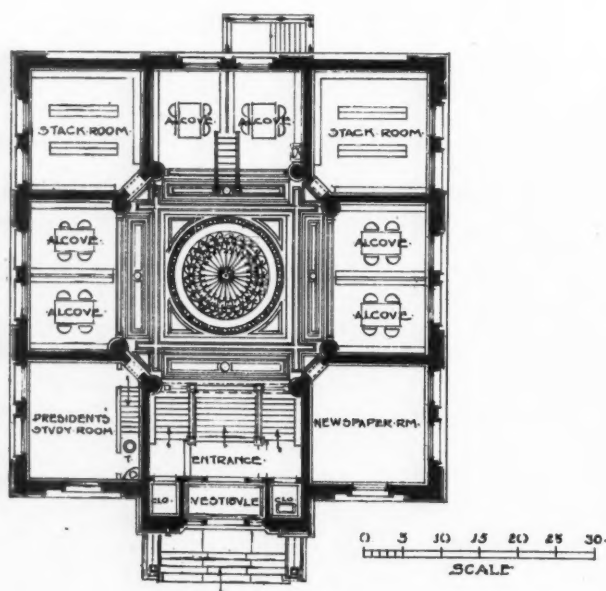


FIG. 6.

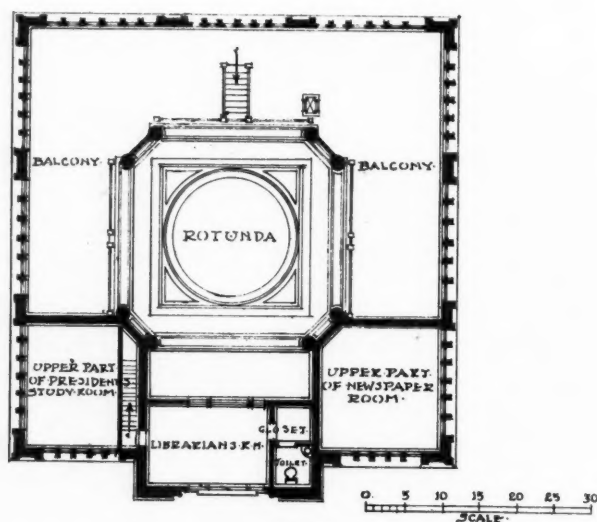


FIG. 7.

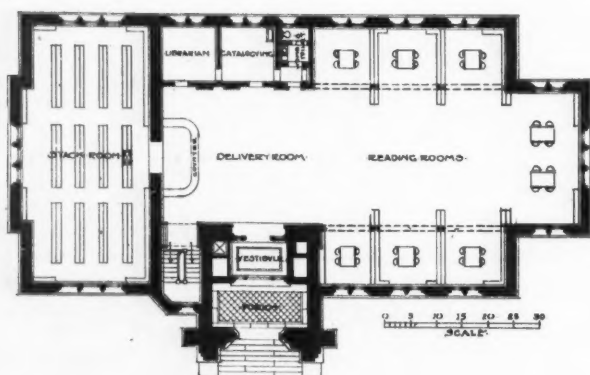


FIG. 9.

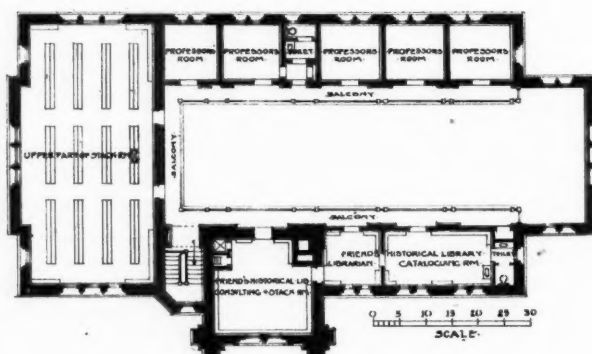


FIG. 10.

librarian to control the entire building either by direct oversight or by command of stairway and entrance.

The second floor contains professors' or seminar rooms opening from the balcony and the Friends' Historical Library. This valuable collection required fire-proof quarters which are provided in the tower.

The main stack room will hold 75,000 volumes in three tiers of seven shelves each, and the entire building 100,000 volumes. The building is thoroughly lighted by large ceiling lights over the central portion besides the windows.

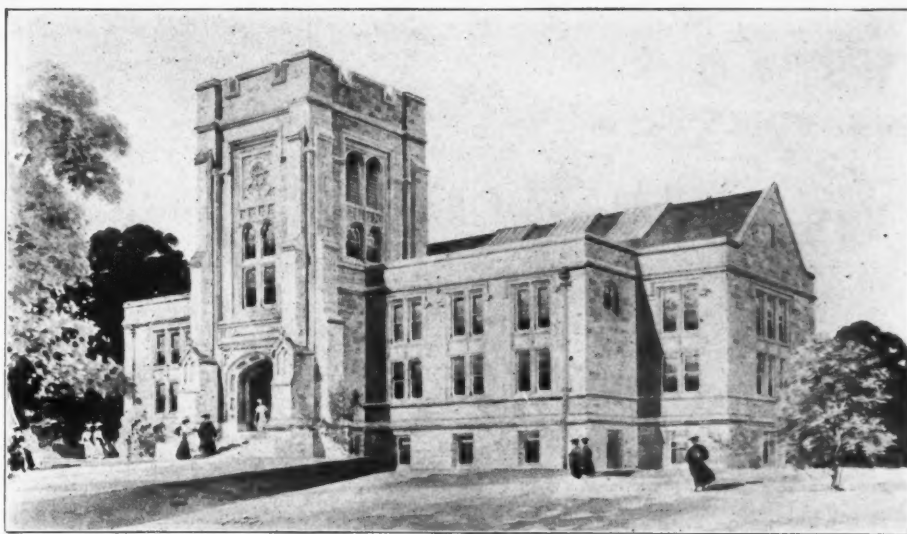


FIG. 8.—LIBRARY, SWARTHMORE COLLEGE.

SOME BUFFALO CHURCHES

DESCRIPTION BY CHARLES E. ILLSLEY, ARCHITECT



HERE is no more attractive object in a landscape, none on which the eye more loves to dwell and linger than a well-designed and appropriate church edifice, which seems to harmonize with and hallow its surroundings. Such is the new North Presbyterian church on Delaware avenue, Buffalo, N. Y., George Newton, architect. The style is late Early English Gothic; the material quarry faced blue limestone ashlar with sawn white limestone quoins, coping, jambs and other trim. A view of this church is shown in the illustration pages of this number.

The plan is simple—a broad, low nave and transepts, a sturdy square tower in front, and, at the other end, a very shallow chancel facing an open court or quadrangle. This is bounded on two other sides by chapel, Sunday school, parlors, study, etc., and on the fourth, or street, side by an arcaded, covered passage from church to chapel. The grouping is picturesque and apparently convenient. The accessories in modern churches, all of which were unthought of two centuries ago, are now often, as here, fully equal in size to the church itself, sometimes even larger.

The buttressed front tower with its tall, closed belfry and its flat roof, with paneled and crocketed pinnacles at the corners and delicate traceried stone parapet between, seems in perfect harmony with its surroundings and is attractive from every standpoint. There may be some question, however, as to the durability of the traceried stone parapet in a Buffalo climate and in so exposed a position.

The side windows are low but are supplemented by large slated dormers trimmed with heavy, trefoiled bargeboards. These light the auditorium through deeply cut, rather narrow recesses in the slant ceiling. The general illumination may be ample per square foot, but the unavoidable contrast by day between the glare on the vertical walls of these dormer light-tunnels, so to speak, and the comparatively dull strips of unilluminated main ceiling between is a drawback to this otherwise good mode of lighting.

All windows on the street fronts are fitted with stone tracery, instead of the wood tracery so common in this country. This feature alone adds dignity and charm. All openings in stone walls have splayed, molded, sawn-stone jambs and labels. The rich tracery in the tower window is a mixture of decorated and perpendicular styles—a dubious innovation. Decorated tracery has its own peculiar grace and so has perpendicular tracery, but they do not harmonize well in the same opening. The cost of the church was \$150,000.

The new English Lutheran church on North Main street, Buffalo, Lansing and Beierl architects, shows impressively how pleasing a modest, well proportioned and well grouped church exterior may be without either spire or tower to set it off. The front gable, flanked by small octagonal turrets, frames a rich mullioned window over the main entrance. The vestibule is broad and deep. At one side is a cosy waiting room; at the other side rises a wide stair to the gallery, whose floor forms the vestibule ceiling.

There is a sort of unwritten law in church planning that a gallery must form part of the auditorium and be reached by a stair within, or people will not use it. This Lutheran church is no exception—with a full attendance in the pews below not an occupant can be seen in the gallery.

The side walls are comparatively low, and a row of dormers supplements the lighting from the aisle windows, as with the Delaware avenue church already mentioned, but without any tunnel-like recesses. These are avoided by a clever expedient. The hammer beam style of ceiling projects some fourteen feet at each side. From the paneled lintel resting on the hammer beams rise low imitation clear-story walls which run up into a 3 center curved nave ceiling. Clear-story windows, practically flush with the wall except at their tops, stand opposite each dormer and admit a flood of light to every portion without any contrasts. The outer dormers are divided in three lights with clear glass. The clear-story windows are mullioned in two lights, with golden hued opalescent glazing. The same golden tinted opalescent glass pre-

dominates in all the windows, and the general result is a full illumination everywhere with a warm, cheerful tone which is very pleasing.

In order to obtain unity of effect every church interior must have a center of interest. In Episcopal and Lutheran churches this center is naturally the chancel, which should be wide, deep and lofty. In this instance the chancel is seven sided, lighted by five tall, handsome stained-glass windows and with a semi-vaulted ceiling with plaster ribs and intersections. The lofty chancel arch is heavily molded, and tall, slender, grouped piers rise from the floor at each angle of the apse, with molded caps on which start the ribs of the vaulting. Concealed behind the chancel arch moldings is a row of electric lights from

floor to apex of arch on each side, spaced about one foot apart. These are on a separate circuit from all other lights, and when the chancel alone is illuminated by them it forms one of the most attractive centers for the whole interior which could be designed. The main organ front is practically hidden from half the congregation, being set flush with one side of the chancel. Thus it does not compete with the chancel as a center of interest. The cost of this Lutheran church, a view of which is given in the illustration pages of this number, was \$120,000.

The necessary limits of this paper forbid more than an allusion to the admirably lighted Sunday school, nor to the fine, high basement plastered and finished throughout and as perfectly lighted as the auditorium above.

ARCHITECTURAL AND STRUCTURAL ENGINEERING

BY MAURICE M. SLOAN, ARCHITECTURAL ENGINEER—Continued



As the term "fireproof construction" came to supposedly represent the highest type, it was also the most expensive form of building construction known. Not only was this term exploited by the engineer and architect, but the layman used it indiscriminately, and it became an important factor in the advertisement of public and civil buildings, such as hotels, apartment houses and theaters.

After several of these so-called "fireproof" buildings had been destroyed by a more or less severe fire the term was used by engineers and architects especially, with considerable more caution, and they began to differentiate between the term "fireproof" and "fire-resisting."

A building may be destroyed by fire in any of the following ways: A fire from the exterior, due to the burning of an adjacent hazard, a fire in the interior caused by the ignition of the building from any cause; and the burning of the stock or goods within the structure. There is also a distinction between materials which are non-combustible and those which are fireproof. A material may not be liable to ignition and may not burn under intense heat, and yet it is entirely possible for such a material to possess characteristics which will cause it to deteriorate or become worthless after subjection to a very high temperature. Such materials as these undoubtedly offer advantages for the construction of fire-resisting buildings, or buildings which will not readily ignite, and which will resist moderate fires, and prove sufficiently enduring to allow an ordinary fire to be extinguished before great harm has been accomplished. On the other hand, a fireproof building, it being supposed that such a structure can be built, would indicate a building capable of resisting a severe fire from the burning of its contents, or one which would withstand the ravages of a conflagration to such an extent as to allow the structure to be repaired at a small percentage of the first cost.

It is fairly evident from a survey of the last two great conflagrations that have occurred in this country since the fireproof type of building became prevalent, that it is no more possible to design a fireproof building within practical and commercial limits than it is to design an unsinkable ship. The best the architect can therefore accomplish is to so plan and design the details of construction that they will provide the greatest possible resistance to destruc-

tion by fire, and no better data can be accumulated for this purpose than a survey of the lessons taught by the Baltimore and San Francisco conflagrations. One fact stands out in both of these great fires, and that is that the heat of a great conflagration, due to the burning of many blocks of city property and, fanned by a prevailing wind, if concentrated upon a structure, will destroy it beyond reclaim with our present materials of construction.

In the planning of a fire-resisting building the several means by which such a structure can be destroyed, as previously stated, should be considered. If the building is to resist incipient ignition it undoubtedly should be constructed in the interior with entirely non-combustible materials. Wood construction should, of course, be omitted, non-combustible material being substituted for the wooden finished floors, and metallic doors and other trim used for the interior work. In order to further protect such a building against its destruction from ignition of the stock or goods within the building it should be sub-divided into compartments no less fire-resisting than the building itself.

If the structure is to resist fire from adjacent hazards, its exterior must present an unbroken front of fire-resisting materials. Most buildings, from the fact that they are faced with stone, brick or terra-cotta, accomplish this in the construction of the walls, and the openings are protected by the metallic window frames, sash and wire glass; here, however, is an element of weakness unless such frames and other openings are made to close automatically, for several buildings which have otherwise been thoroughly protected have been destroyed through the failure to have such safe-guards.

The competition in fireproof construction, on account of the numerous systems exploited, is such as to give rise to much literature with grossly exaggerated facts, or at least with data so arranged and presented as to be misleading. While the architect or engineer is usually sufficiently expert with regard to fireproof construction as to differentiate between facts that actually exist and the statements and data furnished by the several fireproofing companies, yet in many instances reports are circulated upon such high authority, and yet so diametrically opposite as to the results of tests upon different systems of construction as to raise doubt even in the minds of the profession as to what is the best system of fireproofing.

(To be continued.)

PARISIAN APARTMENT HOUSES

BY T. M. CLARK, ARCHITECT—Concluded



HE exterior of this charming little building is shown by Fig. 13. The student of compactness in planning will be interested to note that the entire lot, surrounded on three sides by other buildings, which accommodates, in eight stories, twelve apartments of seven rooms, and two of six rooms, besides two gardens and a bicycle house, measures only sixty-seven by seventy-seven feet.

In Fig. 14 is shown the "story plan" of a house just completed in Paris, with only one apartment on each floor. Although hardly such a masterpiece of planning



FIG. 13.—EXTERIOR OF APARTMENT HOUSE ON RUE CESAR FRANCE.

as the last building considered, this is an interesting and thoroughly modern structure. It will be observed that there is a private route from the kitchen to the dining-room, instead of the usual one through the entrance "galerie"; an advantage which would be appreciated by American housekeepers. The elevator, also, instead of running in the well-room of the staircase, as is the almost invariable rule, has an enclosure to itself, and is thus better protected against fire, although at some sacrifice of space. The irregular shape of the lot is cleverly utilized, and the little dwellings are, in general, well lighted and attractive. Each apartment has four bedrooms, and there are no separate servants' rooms in the roof, a decided gain for morality and humanity. Many people in this country will be interested to know that these apartments, which are situated on a rather narrow street, between the Saint-Lazare railway station and the fashionable Monceau quarter, let for about a thousand dollars a year.

As a contrast to these plans, of the most advanced modern type, it may be of interest to show some of the Parisian apartment houses of fifteen or twenty years

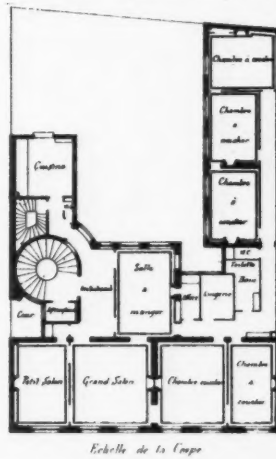


FIG. 15.—PLAN OF APARTMENT HOUSE IN THE BOULEVARD SAINT-GERMAIN.

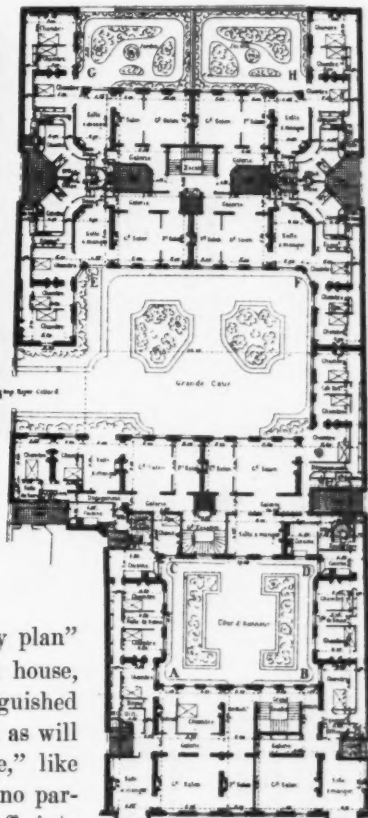


FIG. 18.—PLAN OF LARGE APARTMENT HOUSE, BY M. NERROT.

ago. Fig. 15 is the "story plan" of a comparatively recent house, by one of the most distinguished of living architects. Here, as will be seen, the "antichambre," like most of that period, is of no particular shape, tapering off into narrow passages at each end. There are five bedrooms, which

would be quite unusual in a modern building, and all of them are reached only by passing through the dining-room. This arrangement was very common at the period to which the house belongs, but is quite obsolete now, fortunately for people who come home late with their storm clothes on,

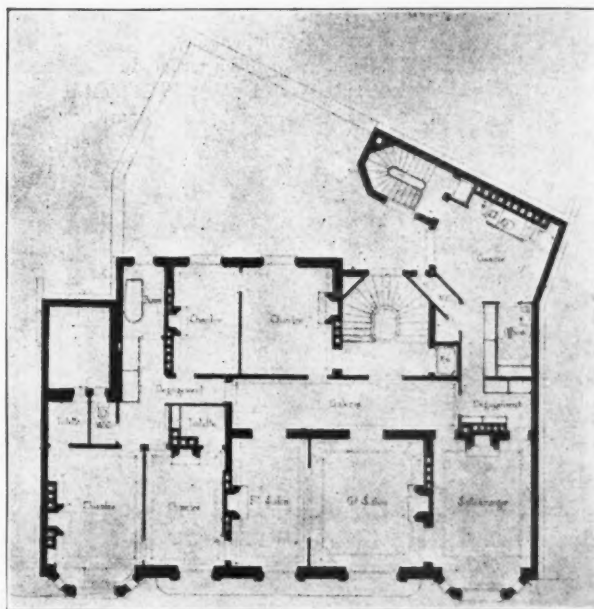


FIG. 14.—SMALL MODERN APARTMENT HOUSE, PARIS.

and prefer not to face their guests in that array. The staircases, as will be observed, are feebly lighted; and, although there is an elevator, it opens inconveniently on a very small landing.

Fig. 16 gives another plan, of rather later date, in which, also, the two principal bed-rooms are reached through the dining-room. Otherwise, this is rather a

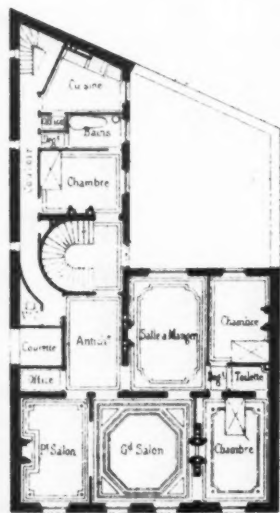


FIG. 16.

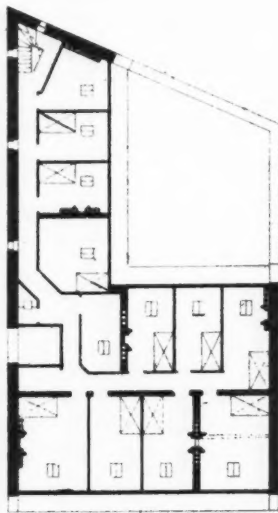


FIG. 17.

pretty plan, the antechamber, especially, being unusually large and symmetrical for that period; but it may be doubted whether a pantry close to the parlor door would commend itself to housekeepers of the present day. In this house the system of devoting the upper roof story to servants already prevails, the eighth floor plan (Fig. 17), showing twelve small rooms lighted only by skylights.

As an example of the skill of modern French architects, the story plan is given (Fig. 18) of a very recent apartment house of large size, built on a deep lot with a narrow frontage at one end only. The professional reader will not fail to admire the masterly way in which eight spacious and handsome apartments, beautifully arranged and unusually well lighted, are contrived on each floor under these unpromising conditions. The staircases in particular are managed, as will be noticed, with consummate ability. Each service stairway is perfectly convenient for two apartments on each floor, while two of the principal staircases serve, each, two apartments on each floor, while the other serves four, at the same time that it is sufficiently lighted as are also the four halls or "galeries," opening from it.

REINFORCED CONCRETE WORK

BY F. D. WARREN, ARCHITECT—Continued

PROVIDED they be of brick, a sanitary base should be molded at the walls, along with the floor proper and finished with the floor finish. The smoother the finish applied, the more effective is the base against leakage of water from story to story. Another advantage of the base is that it prevents dust and foul waste from collecting in the space between the wall and the edge of the floor.

The possibilities that may be attained with plaster work are unlimited. Finishes nearly as smooth and repellant as glass may be obtained by the proper selection of materials and care in applying the finishing washes of cement and water, followed by a dexterous use of a trowel in rubbing the surface. The other extreme is the pebble and slop-dash work applied to the exteriors of buildings with splendid effects in contrast against wood finish or smooth reliefs of molded concrete. The former surface is especially adapted to tanks and water proof surfaces; the latter, to sidings of buildings. Between these extremes, there are uses for all grades of finishes according as the adaptation may require.

Only recently has the demand arisen and the needs raised for ornamental work, cast from sand or special molds. In the past, imitations have been reproduced from other materials or the exteriors of concrete buildings have been void of decoration, much to the disfavor of its use in such places. The time is at hand when much advancement along these lines is being made and it is safe to predict that the architecture of the new construction will not be in decadence in the future. New ideas will have to be met, older ones set aside or modified to the adaptation, but the problem must be solved and it is the duty of all architects to take up the matter and not allow the prevailing sentiment, namely, that a handsome exterior of concrete is an impossibility, to gain further foothold.

Even with this mark of disapproval few, even at present, will deny it a foremost place among the classified building materials. That this is a fact, is because its standing has been reached solely on its merits and not from a general concentration of harmonious endeavor on the part of architects and engineers. Under such conditions it is gratifying that its status has become so widely recognized by the public. On the other hand, with the probability that standard methods of figuring will be devised and standard regulations adopted, whether they be for the better or the worse, the effect is bound to be stimulating. The future of reinforced concrete is an assured success.

EFFECT OF PERCENTAGE OF REINFORCEMENT UPON THE DESIGN OF REINFORCED CONCRETE.

The effect of the percentage of reinforcement upon the design of reinforced concrete has reached such a state of affairs and has brought out so many diversified arguments and suggestions relative to the proper and economical design of the construction, that further discussion may not be unwelcome. It is purposed to consider the matter with no object in view other than an impartial discourse of certain facts brought out by careful experimentation at the hands of well known and reliable authorities. That these facts and their bearing upon the design have not been recognized to a greater extent in the past, is a matter of much wonderment.

Primary Effect.—The primary effect that results from a change in the percentage of reinforcement is the location of the neutral axis; an increase in the amount of steel used lowers its location, while a decrease raises its location. Since the strength of a beam varies as the area of the section of the concrete subjected to compression above the neutral axis, the effect of a change in the amount of reinforcement is a corresponding change in the strength of the beam itself.

(To be continued.)

MECHANICAL HEATING AND VENTILATION

BY WILLIAM G. SNOW—Concluded



WHEN the heaters are used merely to temper the air, that is to raise its temperature from zero to about 70° or a trifle higher, a depth of 10 or 12 rows of pipe is found to be sufficient—this when the velocity of air between the pipes is 1,000-1,200 feet per minute. Of course, shallower heaters with lower air velocities would serve the same purpose but would require an unnecessarily great amount of pipe.

Tempering coils are used when the heating is done by direct radiation in the rooms or by supplementary indirect radiators or coils placed at the base of the flues.

When the heating is done entirely by blower coils the heaters, with low pressure steam, must be made 20-24 rows deep.

A simple basis for computing the size of a heater of one of the common types made up of one inch pipes

Exhaust ventilation alone is of little use in making the occupants of these rooms comfortable. Cold air discharged through ducts with the air outlets pointing toward the floor in front of each boiler is one of the most effective methods of introducing the air supply. Similar discharge openings should be provided in the engine room at intervals.

The boilers themselves will, as a rule, provide sufficient exhaust ventilation for the boiler room. The engine room should have a separate exhaust fan unless a suitable connection can be made with a vent shaft leading to the roof.

In the case of important rooms occupied at times by many persons either upward or downward ventilation is employed; the former is probably the system most commonly adopted in theaters and legislative halls. The space below the floor is used as a plenum chamber, individual

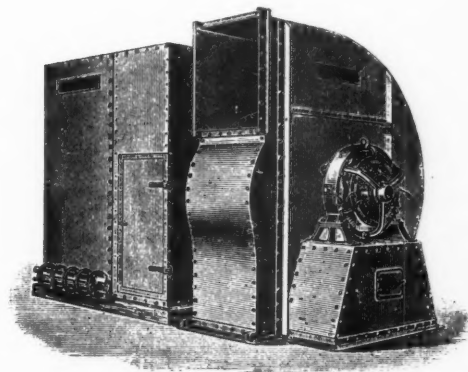


FIG. 7.

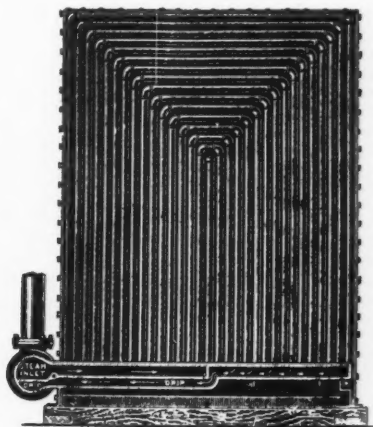


FIG. 6.

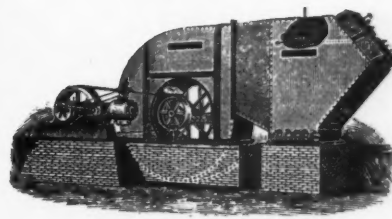


FIG. 8.

screwed into cast iron bases is to allow (with low pressure steam and a velocity of approximately 1,000 feet per minute between the pipes) 2,000 heat units per square foot of pipe surface per hour. Since one heat unit will raise the temperature of approximately 50 cubic feet 1° from 0°, to raise 30,000 cubic feet per minute 70°, for example, would require 30,000 cubic feet by 70° rise by 60 minutes per hour divided by 50x2,000 which is equal to 1,260 square feet or approximately 3,780 lineal feet of one inch pipe.

Of course, the steam pressure and air velocity materially affect the condensation of steam and the rate at which heat is given off but the above figures represent fair average practice for modern city buildings where exhaust steam is utilized for heating.

Fig. 6 illustrates a common type of heater used in connection with fans and Figs. 7 and 8 show two common methods of combining these pieces of apparatus known as "draw-through" and "blow-through" apparatus respectively.

In the case of long ducts, it is common practice to place supplementary heaters near the ends of same rather than heat the air at the main heater considerably above the desired final temperature in order to offset the loss of heat by radiation from the ducts, which in many cases causes overheating of the basement.

Turning now to the subject of ventilation, this does not, as a rule, receive the attention it deserves when applied to boiler and engine rooms.

seat inlets being provided, the air ascending to the ceiling through openings in which it escapes to ducts leading to exhaust fans. This is a system of air removal, whereas the downward system is one of air dilution.

With the latter the exhaust should be stronger from the galleries or balconies than from the floor, otherwise some of the vitiated air from these points will be drawn down through the seating space in the auditorium.

If the building has little exposed wall surface so that to avoid overheating the air must be supplied at a temperature a number of degrees below that of the room, care must be taken to so introduce it that cold down-draughts will not be felt by the occupants. A greater supply of air must be provided by this method to maintain a given standard of purity in the air of the room than with the upward system with individual inlets.

The downward system with inlets in the walls is in many cases the only practicable one to install. When there is considerable exposure the air must be admitted at a temperature higher than that of the room, therefore no down-draughts will be felt since the air will reach the floor gradually by becoming chilled along the exposed walls.

In the case of ball rooms or large banquet halls used only at intervals in hotels, it is preferable to provide a separate system of air supply and exhaust ventilation for these rooms rather than connect them with the main system.

Absolutely independent control may then be secured and the principal apparatus run at the proper speed to meet the requirements of the main portion of the building, whereas if the fan were made large enough to supply the entire building it would be necessary to so reduce the speed when the ball room were not in use that difficulty would very likely be experienced in securing the proper distribution of air through the ducts due to the low fan speed.

For removing dust from the air, cheese cloth bags or screens through which the air is allowed to pass at a velocity preferably not to exceed 60 feet per minute, have been superseded in the larger plants by modern air washing devices with their spraying nozzles or outlets beyond which are placed eliminators for removing from the air the moisture held in suspension.

In conclusion the writer is constrained to add a plea that architects be as liberal as possible in apportioning space for mechanical heating and ventilating apparatus, ducts and flues in order that the building may be a success when viewed from a hygienic as well as from an artistic standpoint.

TABLE I.
STEEL PLATE FAN CAPACITIES AND HORSE POWERS.

Revolutions capacity in cubic feet per minute under working conditions and proper size standard motor required.

Diameter wheel in feet.	Width of housing in feet.	Height of housing in inches.	1/2-ounce pressure			3/4-ounce pressure			1-ounce pressure		
			Revs.	Cu. ft.	H. P.	Revs.	Cu. ft.	H. P.	Revs.	Cu. ft.	H. P.
4	2	80	293	8,000	3	358	10,000	5	414	12,000	7 1/2
4 1/2	2 1/2	90	260	11,000	3	318	13,000	5	367	15,000	10
5	2 3/4	100	233	13,000	5	285	16,000	7 1/2	330	18,000	15
5 1/2	3	110	213	16,000	5	260	20,000	10	301	23,000	15
6	3 1/2	120	195	22,000	7 1/2	238	27,000	15	275	32,000	20
7	4	140	167	30,000	10	204	35,000	20	235	42,000	30
8	4	160	147	32,000	15	179	40,000	20	207	48,000	35
9	4 1/2	180	130	41,000	15	158	50,000	30	183	60,000	45
10	5	200	117	52,000	20	143	65,000	40	165	75,000	60
12	6	240	98	73,000	25	120	90,000	50	138	105,000	80

TABLE II.

CAPACITY AND HORSEPOWER OF CONE FANS.

Diameter of wheel.	Revolutions per minute.	Delivery cubic feet air per minute.	Horsepower of motor.
4	300	8,000	3
5	250	12,500	5
6	200	17,500	7 1/2
7	175	25,000	10
8	150	30,000	15
10	125	50,000	20
12	100	69,000	25

The general proportions of the cone fan to which this table applies, known as the Briggs type, are diameter of fan 1.000, diameter of inlet 0.742, width of blades at tip 0.100, width of fan at inlet 0.175.

TABLE III.

CAPACITY AND HORSEPOWER OF PROPELLER FANS.

Diameter fan wheel in feet.	Revolutions per minute.	Delivery cubic feet air per minute.	Approximate horsepower of motor.
1 1/2	900	1,500	1/4
2	650	3,000	1/2
2 1/2	500	5,000	3/4
3	425	7,000	1
3 1/2	375	9,000	1 1/2
4	325	12,000	2
4 1/2	300	15,000	3
5	250	20,000	5
6	200	25,000	7 1/2

UNNATURAL STANDARDS OF TILING

BY C. J. FOX, PH. D.



BAKED clay product are tiles. They are placed in the kilns where they remain subjected to a terrific heat for several days, so that even the most expert fireman cannot tell exactly in what shade of color or in what exact size they will be taken out. The action of the fire in transforming the plastic clay biscuit into a rigid solid mass harder than granite, marble or other stone, is a most uncertain quantity and nobody can tell just what effect it will produce upon the color and other properties of the tile. It is known, for instance, that clay contracts when baked in the kiln, but the amount of this contraction in the individual tile can in no manner be calculated to a mathematical certainty. One thirty-second of an inch is the range of variation which the tile manufacturers have adopted as a limit beyond which their "firsts," as they call their first-class products, cannot go.

The color of the clay tile, as well as the color of the glazes that are applied to it, is likewise an uncertain factor. Two individual tiles made of the identical material and placed side by side in the same saggar may, when taken from the kiln, show a considerable difference in shade. This is true to such an extent with even the white glazed tile that many manufacturers sort their finished product before it leaves the factory, into several different shades

of white. For this purpose they have to employ a color expert whose trained eye can discover at a glance these different but almost imperceptible shades.

Such fastidiousness, however, is contrary to artistic taste. To be beautiful and artistic, it is necessary first of all to be natural. In architecture this fact calls for recognition of the natural limitations of the different building materials, each one of which has its special uses for which its particular qualities make it most adaptable. Wood, granite, marble, sandstone, brick, tile and all other building materials have their own natural limitations, and a failure to appreciate this fact has led some inexperienced architects, and a large portion of the public to employ these different materials under conditions which make them appear ludicrous.

Tiles come naturally in slightly different shades and sizes, and to attempt to match either color or size exactly is to adopt an unnatural standard and to attempt to make this material assume artificial qualities which do not properly belong to it. Owing to the natural divergence in tints of tiles of the same colors, even a white glazed tile wall should not have a monotonous monochrome appearance. The natural variation in size calls for a wide joint between the tiles, and any attempt at careful matching gives the wall or floor an unnatural appearance.

BALTIMORE'S NEW WHOLESALE MARKET



OW to improve traffic and sanitary conditions, as well as aesthetically enhance the general appearance of the city were the problems confronting the mayor and municipal council immediately after the great Baltimore fire. The burned district commission (Mr. Sherlock Swann, chairman) was created more specially to meet and solve these problems which involved the widening and straightening of streets and squares and consequent condemnation of much property. The burned area had been laid waste so completely that theoretically speaking almost any revision of the thoroughfares and readjustment of grades seemed feasible. But in point of fact a practical solution bordering on a lay-out of generous lines with a well advised scheme at the bottom was well nigh an impossibility. The contention was hard and bitter with the property owners; in some cases the city was successful, in others the property owners; in many a compromise was effected.

In the case of widening certain streets, the owners on one side advocated that the other suffer the pruning of its lots and vice versa, while the Traction Company impartially favored a trimming in rigid equality of each, that their rails might retain the center of the roadway. Only a city government backed with such prerogatives as those enjoyed by many of continental Europe could have coped completely successfully with such a situation. The actual results attained in Baltimore, however, by the burned district commission, while not reaching the acme of perfection, theoretically possible, bear the stamp of sound judgment in the knowledge of the city's requirements and thorough appreciation of the character of its growth. In the teeth of the greatest difficulties, hampered for time and money, sound sense was necessary with a quick decision, and the commission, hard worked, harassed, maligned, and distrusted eventually through firmness, persistency, and tireless energy acquitted itself to the satisfaction of the citizens of the Greater Baltimore.

One of the problems requiring and necessitating a prompt solution by the commission was the renovation of Baltimore's Old Marsh Market Space. Previous to the fire Marsh Market space, lined with flimsy, dilapidated market buildings and hemmed in with low, squalid and congested houses, was the usual setting for every crime on the court calendar. The worst elements found there a common refuge and its name was a by-word and synonymous with all forms of degradation and misery. Out of this consolidation of Ghetto, Chinatown and Bowery the pruning knife of the commission carved a splendid plaza with regular wide and intersecting streets and called this plaza Center Market Space. A commission was then appointed to study the rebuilding of the Center Markets, under the name of the Center Market Commission with Gen. Felix Agnus as chairman. After considerable preliminary work the commission ultimately selected the Baltimore architects, Messrs. Simonson & Pietsch, to prepare the plans for the new market buildings.

The program prepared required the lay-out of three market buildings together with the necessary accommodations for the Schools of Art & Design of the Maryland Institute. The market buildings should comprise the

wholesale fish market, wholesale produce market and general retail market. The first two of these buildings are the subjects of illustrations in this number and below is given the architects' description of the work.

The site, almost at the water-front and marking the extreme eastern boundary of the fire line is located in an extremely low part of the city. Owing to these conditions and the presence of old foundation walls and footings and much new filling, concrete piles were used for underpinning. Resting on these, a capping of concrete footings forms the foundation base for the masonry walls. The buildings are constructed entirely fireproof with steel columns and girders and concrete floor slabs. All exterior walls are of face brick with terra cotta trimmings. The drainage, ventilating and lighting systems installed are of the best and the material used throughout of the most substantial and characteristic kind. The fish market provides twenty-six stalls for the merchants on the first floor together with twenty-six offices on the floor above. These offices open on the galleries a vast clear story hall, lighted by sky-lights as well as by the great entrance-arch openings at either end. Four staircases located two at each entrance give access to the second floor and on this floor are also toilets for both sexes. The merchants are in direct communication with their offices above by means of speaking tubes and dumb waiters, twenty-six of which are also fitted up in the building.

The shipping and receiving is operated at the back of each stall which is closed with a rolling steel door opening on the side street. Each merchant is, therefore, independent and has every means of handling his goods. Scales for each stall are likewise furnished with electric light and abundant water supply. The building occupies the center of the group being flanked on either side by the produce and retail markets. It is a pleasing and harmonious composition of well defined lines and vigorous characteristic silhouette.

The wholesale produce market adjoining immediately to the south covers a far greater area than the fish market but required no provision whatever for market stalls. Here the goods are sold directly from the wagon, and shelter and means for the easy circulation of a great number of vehicles and pedestrians was all requisite. Steel sheds, so designed as to afford quantity of light and air were devised to cover the drivers and walks while on the plaza front a great sheltering entrance vestibule for teams and buyers gave a proper and dignified setting to the whole.

On the second story of the great vestibule a space of 40x220 feet affords ample office space for the city street cleaning department. The building, like the fish market, is of brick with terra cotta trimmings and crowned with a tile roof of extremely bold and pleasing color effect. The façade frankly marks the entrance of the teams and buyers on foot. The color scheme of the steel sheds is in two shades of green, in lively contrast to the deep red brick work and white granolithic walks. Ample water supply and electric light equipments are provided. Both buildings were constructed within the limit of time and money appropriation and are considered models of their kind.

THE A. I. A. SCHEDULE OF CHARGES

VIEWS OF ARCHITECTS OF VARIOUS SECTIONS



UNITED general interest has been displayed by the architects in the opinions that have been published in these columns for the past few months on the subject of the Institute Schedule of Charges. A further selection from the contributions received is presented below. The views expressed range from the recommendation of a strict adherence to the present schedule, to the absolute dispensing with any general schedule—each man to charge what he deems advisable.

Philadelphia, June 29, 1907.

I am of the opinion that the schedule of charges adopted by the American Institute of Architects should be adhered to as being just and liberal to the profession if uniformly demanded. Non-conforming members of the Institute cause all the trouble and those so offending should be promptly expelled.

Very truly yours, W. B. Powell.

Philadelphia, July 12, 1907.

I have been for some years urging the Institute to adopt higher charges all along the line. I have increased my own charges considerably, and know of no profession which is so underpaid as the architects. Our expenses are far greater than other professions if we turn out work in the proper way. I think that in everything, except perhaps preliminary studies, the rates should be almost doubled. Believe me,

Yours very truly, Wilson Eyre.

Baltimore, Md., July 26th, 1907.

The proposed change in the schedule of practice as adopted by the American Institute of Architects has been considered by us at various times and after carefully weighing the many interests involved we do not see for the present any benefit to be derived by change in the schedule as now recognized. We think it is very much more important to use every effort to sustain and keep up the standard as established by this schedule.

Yours truly, Josias Pennington.

Atlanta, Ga., June 29th, 1907.

The past year we have been as busy as we could be. We could not have done any more if we had attempted it, and yet we have made comparatively very little. This, I think, goes to show that the present schedule of charges is too small for work which costs from \$10,000 to \$50,000, which is the average cost of houses in small towns. I think that for large buildings running up into the millions, the present rate would be fair remuneration; but for work done in small towns it seems that it is entirely inadequate to the training an architect must have, to the attention he must give his work and to the responsibility involved.

Very truly yours, G. L. Norrman.

Philadelphia, June 27, 1907.

We feel that in very many instances the present remuneration is inadequate. The duties of the profession have so multiplied and the details so greatly increased that with certain classes of work increased commission would

be welcomed by us. We also feel that the schedule could be improved in many ways and consider that the flat 5 per cent commission which is usually charged for all kinds of work, except perhaps interior decoration and work of this class is too general. It would seem to us that a more definite schedule could be made, and it would be along these lines that we would like to see the present one amended.

Yours very truly, Watson & Huckel.

Pittsburg, Pa., June 26, 1907.

I believe the building public, as well as the courts, have been so educated to a general 5 per cent commission for architects' services that it would be rather difficult to successfully change the schedule of charges as a schedule. In my own practice I use it simply as a minimum, and in special undertakings charge in accordance with the services rendered. In a few instances I have found it difficult to go beyond the set schedule. It might, therefore, be to our advantage in some instances to not have it, though as I have already stated, the public are educated to its existence and I fear it will continue to stare us in the face. It is a matter, therefore, that would require more thought to arrive at an intelligent conclusion than I have given the subject. I am,

Yours truly, S. F. Heckert.

Philadelphia, July 6, 1907.

The subject "Remuneration of an Architect for his Service" is of course a very interesting one. I personally do not believe it is the proper time to agitate the question of raising the minimum percentage on which an architect may base his commission. I believe that the increase will come as soon as the majority of the public appreciate the fact that an architect does not charge his commission because he supplies so much paper with pencil or ink lines on. To quote some one "The Public must be educated so that it be impossible for Speaker Cannon to ask, Who is McKim, Mead and White?" He would not dare to admit that he did not know of Kipling.

I also believe that one of those to be educated is the architect himself, in public life and in his duties as a citizen.

Trusting this may be of interest.

Yours very truly, Adin B. Lacey.

Boston, Mass., July 5, 1907.

In regard to remuneration for architects' services, I would like to state that I have given this matter more or less consideration myself and wrote an article some few years ago, which came out in the *American Architect*, in regard to proper schedule to be adopted by the architects in general. I do not see how it is possible for the American Institute of Architects to make a schedule which will be applicable to all sections of the United States. It seems to me that each city should have a schedule to suit its local conditions. Personally, for my own work in Boston, I feel that the requirements set forth in the American Institute of Architects' charges are

altogether too small to be able to do the best work and superintend everything satisfactorily here in Boston. The same might not apply to architects who do work in other cities. I am not prepared at this time to state just how much the schedule should be increased, although in 1904 I got up a schedule of charges to apply to my own personal work. There is apparently some feeling among the architects of Boston that the present schedule should be increased, and next winter I hope to use every effort to have this brought about by our local chapter. I should be very glad to report to you later what we do in the matter. At present there seems to be no united action among the Boston architects, which strikes me as a great detriment to the profession in general.

Yours very truly, George Hunt Ingraham.

New York, August 17th, 1907.

I fear no good can be accomplished except by reforming the entire system of architects' charges. The crux of the matter is found in the fact that any percentage charge, large or small, will appear as a brokerage fee, unnecessarily large and arbitrary to a person who is unfamiliar with the work to be done and the time, skill and responsibility involved. And there is only one way to bring the magnitude and variety of architects' services before the public and that way is to bring it before them. In other words, *services must be specified and defined* as much as possible. The American public is neither stingy nor unreasonable but it is constitutionally averse to paying a penny for anything just because somebody or somebody's society or organization says so.

Now, it is the easiest thing in the world to demonstrate in a dozen ways the benefits of capable architectural work in building. But we cannot go before an intelligent public with a rule which proclaims (by implication) that all kinds of services by all kinds of architects for all kinds of buildings are worth the same 5 per cent and expect to be taken seriously. And that is pretty nearly the way the rule is working now. We cannot get complete planning and detailing, adequate superintendence and proper building administration for 5 per cent and hardly for 10 per cent—it will undoubtedly run a good deal nearer 15 per cent in most cases and often above it.

It would seem most rational that the architect receive a retainer and fee for himself in proportion to his ability and standing. The cost of preliminary drawing and estimates, of details and scale drawings, specifications, superintendence, letting and administration, accounting and certification should be easily gauged by the books of large offices in the different cities and might be charged for as a percentage on the cost or any way to be agreed upon. Standard sets of plans, specifications, details, drawings, vouchers, etc., and other instruments of service should or might be distributed by the Institute which would still further tend to arrive at a more satisfactory understanding in advance as to the magnitude of the work and render the contract between client and architect more definite and clear to both. Incidentally, a good many relations would clear with such a businesslike understanding. The 5 per cent rule is simply an accident and incidentally our building administration has been completely dislocated trying to keep within it.

Yours truly, Arue Dehli.

At the meeting June 10 of the Illinois Chapter, A. I. A., each member present was asked his views as to the ad-

visability of a change in the schedule of charges. The following are among the opinions expressed:

"Favor the abolition of the schedule."

"I do not believe in a schedule of charges. An architect should charge what he thinks advisable."

"I charge 7 per cent for residences and 10 per cent for cabinet work, 5 per cent on any other class of work."

"Seven and one-half or eight per cent is fair compensation for designing residences. Prefer to design warehouses at 4 and 5 per cent."

"Favor advancing the schedule of charges for dwelling houses from 5 to 7 or 7½ per cent, the other classes of construction to remain as now."

"Have been trying to get 5 per cent, but find it difficult in some instances because other architects cut below that price."

"Have been charging 10 per cent for low cost houses and as a rule do not believe that 7 per cent is enough. Eight per cent is about right. For work at a distance from the office traveling expenses should be included."

"I charge 7 per cent on houses costing \$5,000, over that figure 5 per cent. When I design a house costing \$7,000 or \$8,000 I do not make as much money as I should. Favor an advance to 7 per cent."

"The Institute should fix a minimum scale and leave it to the architect to charge more. It is wise to have a schedule of charges for use as a basis in court proceedings."

"It is a mistake for the Institute to have a schedule. If it were not for the schedule we would be getting 10 per cent for work for which we are now receiving 5 per cent. A schedule is a reflection upon the profession."

"We refuse anything costing under \$8,000 to \$10,000 and charge 7½ per cent. Where large buildings require complicated equipment an additional charge of 5 per cent is made over what would be called the ordinary building."

"Maintaining any schedule of prices involves the charge of trades unionism, against the profession and injures it. The dignity of the chapter would be raised by an abolition of the schedule. Rules should be established and, when members violated them, they should be dismissed and disgraced."

"Our firm charges 8 per cent for designing residences. Recently we had a commission for some complicated foundry work involving designing of trusses. We gave the work to an engineer and found the cost of the engineer's work was much more than we could possibly get for it. The schedule of prices should be advanced."

Other communications regarding the schedule of charges will be published in following numbers of THE INLAND ARCHITECT. Those who have not done so are invited to send their views.

ASSOCIATION NOTES.

AMERICAN INSTITUTE OF ARCHITECTS.

The nominating committee of the A. I. A. have selected the following ticket: For president, Cass Gilbert of New York; first vice-president, J. M. Donaldson, Detroit; second vice-president, W. A. Boring, New York; secretary and treasurer, Glenn Brown, Washington; directors, Frank Miles Day, Philadelphia; R. Clipston Sturgis, Boston; George Cary, Buffalo; auditor, J. G. Hill, Washington.

ILLINOIS CHAPTER A. I. A.

The annual meeting of the chapter was held at the Art Institute the evening of September 9. The attendance was large. The chapter committee on arrangements for the A. I. A. convention to be held at Chicago, November 18, 19 and 20, reported progress. The Art Institute has placed its building at the disposal of the convention, and this center of art will be the center of architectural interest as well during the convention. Memorial resolutions on the death of W. Le Baron Jenney were passed by a rising vote. The election of officers resulted in the following selections: President, Dwight Heald Perkins; first vice-president, R. C. Fletcher; second vice-president, Samuel N. Crowen; treasurer, R. C. Berlin; secretary, Peter B. Wight.

RHODE ISLAND CHAPTER A. I. A.

Forty members of the Boston Society of Architects were the guests recently of the Rhode Island Chapter in a tour of the city of Providence. Among the buildings visited were the Capitol, the Normal School, and proceeding in turn to St. John's Episcopal church, the old State House, the Dorr homestead, First Baptist church, the Rhode Island School of Design, the Pendleton house, the Beckwith house, at the corner of Benefit and College streets, the Providence County Court House, the John Carter Brown Library, all the buildings of Brown University, the Edward Dexter house, the First Congregational church, the Crawford Allen house, the John Brown house, the John Carter Brown house, the Carrington house, the Thomas Poynton Ives house, the Athenaeum, the John Hoppin house, the Central Congregational church and the Edward Dexter house.

"It was one of the great opportunities of our lives," said J. Randolph Coolidge, who headed the Boston delegation, in his speech at the University Club dinner, and the other visitors were similarly and equally enthusiastic. Providence had achieved in civic improvement what Boston had hoped for, but had not begun, Mr. Coolidge declared.

NEW PUBLICATIONS.

SANITATION IN THE MODERN HOME. A Suggestive Guide to the Architect and House Owner in Designing and Building a Residence, Providing a Healthful, Comfortable and Convenient Home. Edited by Jno. K. Allen. Published by Domestic Engineering, Chicago, 1907. Price, \$2.

The author, as editor of Domestic Engineering, is in constant touch with the latest developments in the sanitation of buildings and in the appliances for its promotion. In addition to a thorough knowledge of his subject, the author has a keen sense of the essentials involved, and the faculty of stating his facts and conclusions clearly and understandingly. Each chapter takes up in logical sequence a vital division of sanitation, and dwells upon its important questions. Among the subjects treated are: Selection of Site, Preparation of Soil, The Ideal Home, The Housekeeper's Wants, The Cellar, The Laundry, Heating, Ventilation, Temperature Control, Cold and Hot Water Supply, The Kitchen, The Bathroom, Lighting, The Stable. A separate chapter is devoted to Electricity in the Home. Much of the contents will be new to the house owner and the builder, as well as to the architect who has not followed the subject closely. It is full of practical suggestions, based on the latest research, to all interested in healthful homes and their surroundings.

RUMFORD FIREPLACES AND HOW THEY ARE MADE. By G. Curtis Gillespie, M. E., Architect. containing Benjamin Count of Rumford's essay on "Proper Fireplace Construction," a plea for the more general consideration of the form and proportion of a very much neglected feature of our homes and buildings, with nearly two hundred illustrations, including the original Rumford drawings, diagrams for fireplace construction, and numerous ancient and modern mantels and fireplaces, one hundred andirons designs and other details and fixtures, together with Preface and explanatory notes. New York: William T. Comstock. One 12mo. vol., cloth. Price \$2.

While based on the original Rumford essays, which are given in full with the original drawings, this work is also an elaborately illustrated essay on fireplaces and their fixtures, ancient and modern. The author claims that Rumford's form and proportions are best suited to accomplish good heating in the fireplace, and no later designer has been able to improve upon them. This portion of the book is of much interest to the architect, the mason and the heating engineer. The book is elaborately illustrated and gives many designs for mantels, fireplaces and their accessories, which will render it valuable to the decorative designer. The book is thoroughly practical and the diagrams and drawings can be worked up into actual fireplaces which will not only adorn but heat the rooms they are in, and will not smoke. The work is brought out in an attractive form.

STRENGTH OF TIMBERS.

Extensive tests to determine the strength of the commercial timbers of the United States are being made by the Forest Service. Such information is of great value to architects and engineers in that it enables them to use more economically the products of the forest. The tests are made on large beams. The material is generally tested while green, since timber is weakest in the green condition. The strength of a beam is indicated by the greatest fibre stress developed during the test. Technically speaking, this breaking strength is termed the modulus of rupture. By using it the load that any beam will carry can be calculated. In the table below the first column gives the green breaking strength of our principal commercial timbers. The second column gives the greatest load that a timber five inches wide and twelve inches high, with fifteen feet between the supports, would hold if the load were concentrated midway between the supports.

Species.	Breaking strength in bending. lbs. per sq. in.	Breaking load concentrated mid- way between sup- ports, for a beam 5 x 12 in. x 15 ft. lbs.
Longleaf pine	7,772	20,700
Douglas fir	7,500	20,000
Western hemlock	5,783	15,400
Loblolly pine	5,580	14,900
Tamarack	4,562	12,300
Norway pine	3,975	10,600

If, instead of being concentrated at one point, the load were uniformly distributed over the entire length of the beam, the beam would hold twice as much. In order to insure safety, in practice beams are seldom allowed to carry more than one-sixth their breaking loads.

OUR ILLUSTRATIONS.

- Lutheran Church, Buffalo, Lansing & Beierl, architects.
- Apartment Building, Chicago, Edmund R. Krause, architect.
- Residence of R. J. Dunham, Lakeside, Ill., W. C. Zimmerman, architect.
- North Presbyterian Church, Buffalo, George F. Newton, architect, Boston.
- Colonial Trust Company Building, Baltimore, Ellicott & Emmart, architects.
- Stable for Messrs. Lyons and Dunham, Lakeside, Ill., Howard V. Shaw, architect.
- Jesse Spalding School, Chicago, Dwight H. Perkins, architect for Board of Education.
- Residence of Mr. Lyons, Lakeside, Ill., Howard V. Shaw, architect. Front and rear views are shown.
- Remodeled Entrance, The Rookery Building, Chicago, Frank Lloyd Wright, architect for remodeling.
- Wholesale Markets, Baltimore, Md., Simonson & Pietsch, architects. The Fish Market and the Produce Market are shown.
- Edgewater Exchange, Chicago Telephone Co., Pond & Pond, architects. General exterior view and entrance detail are shown.
- Store Building for H. Jevne Co., Los Angeles, Cal., John Parkinson, architect. An exterior and an interior view are given.
- Correction.*—The title in the July number, "California Hall, Hearst University, etc.," should have been: California Hall, University of California, John Galen Howard, architect.
- Residence of Jackson Johnson, St. Louis, Barnett, Haynes & Barnett, architects. The views shown are: Exterior, view in stairway hall, views in dining room, music room, drawing room.



Illustrating a Concrete Block House of Dr. H. C. Howard, Champaign, Illinois, Prof. F. M. White, Architect, roofed with Asbestos "Century" Shingles, laid French Method.

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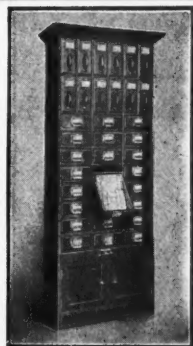
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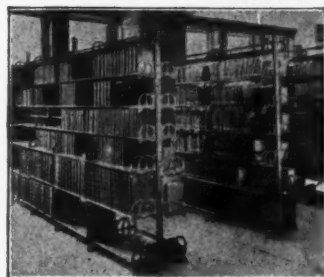
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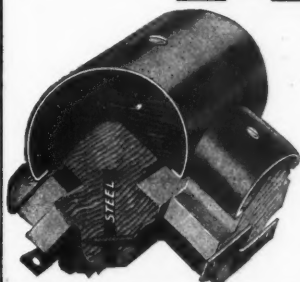
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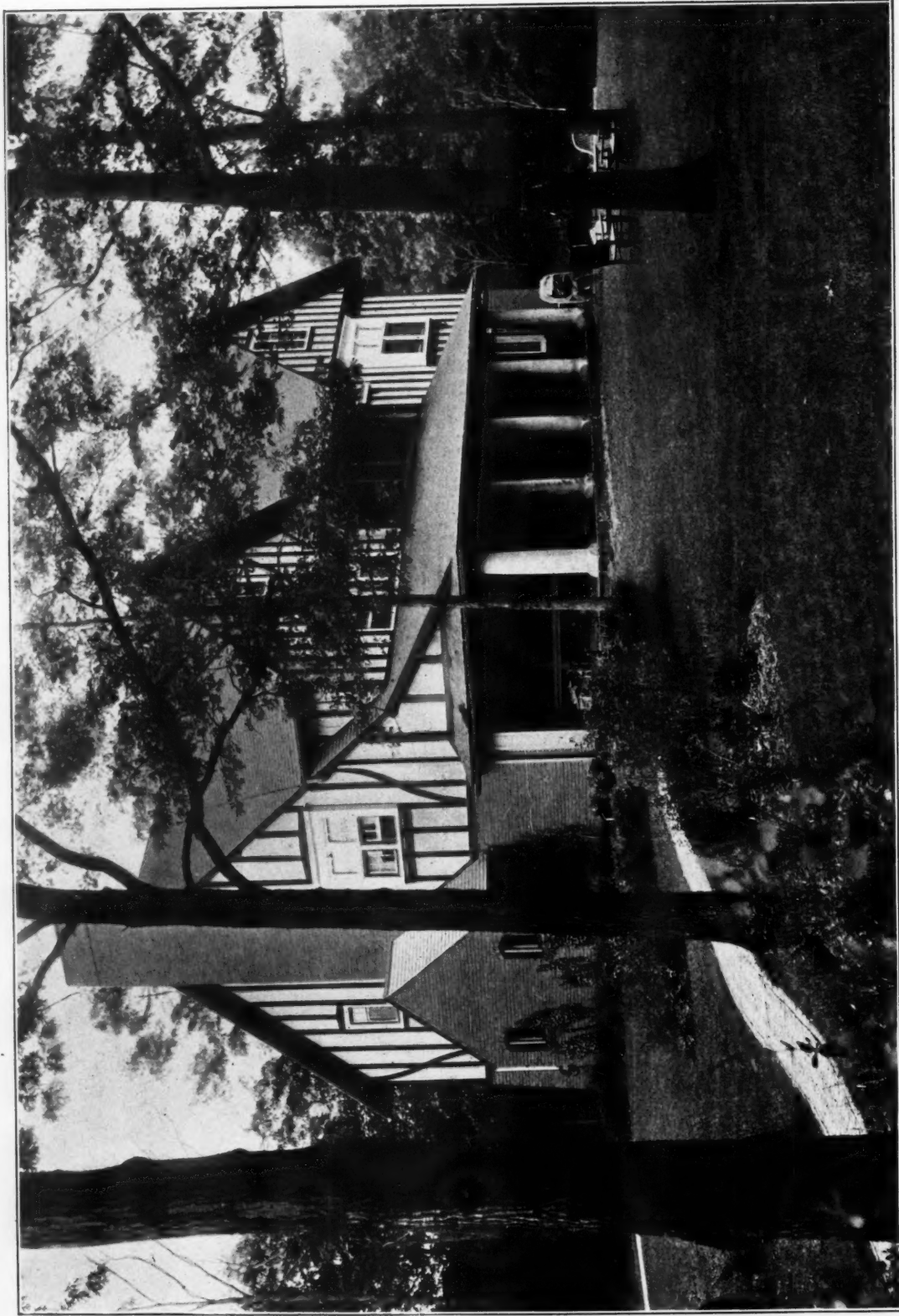
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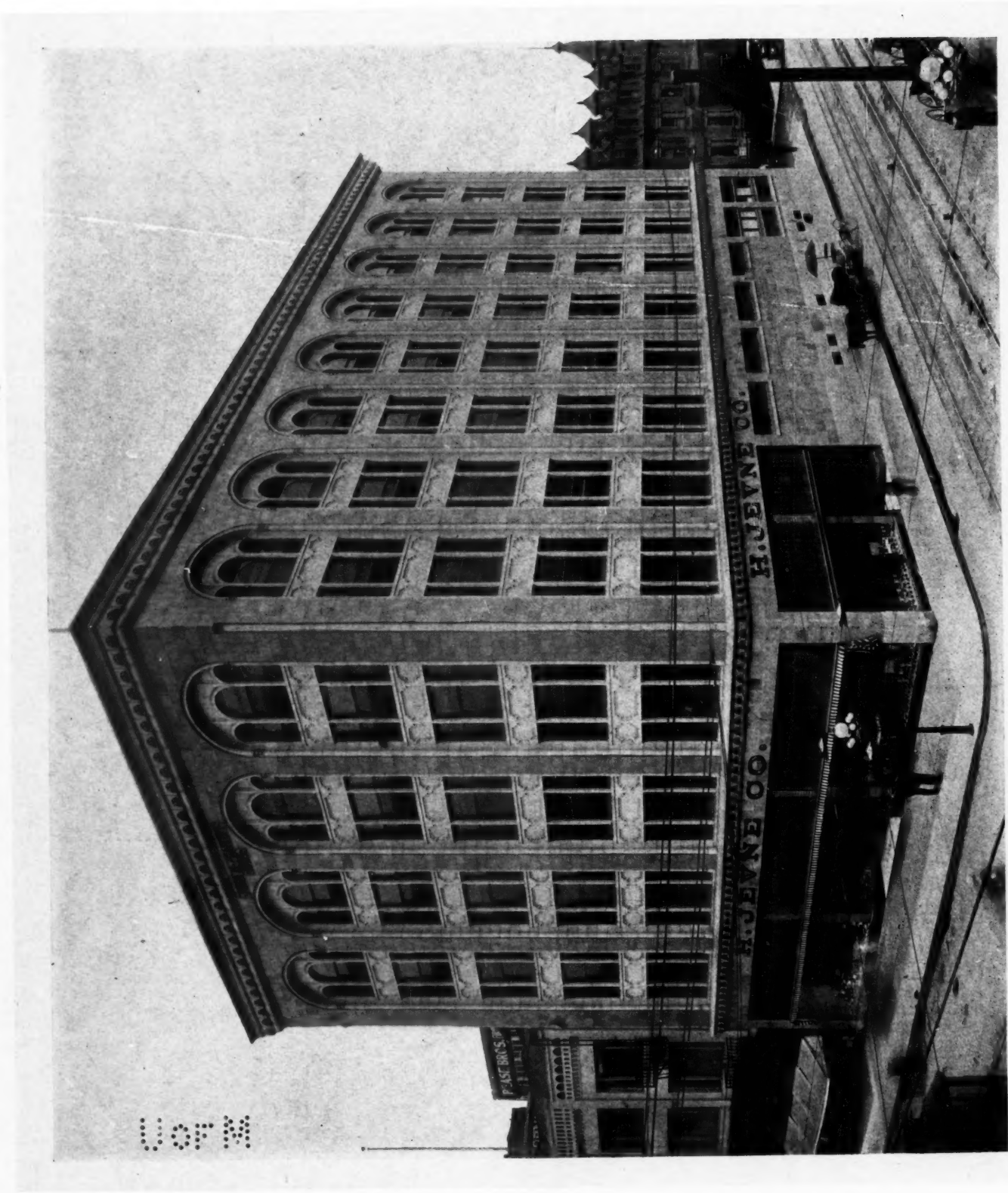
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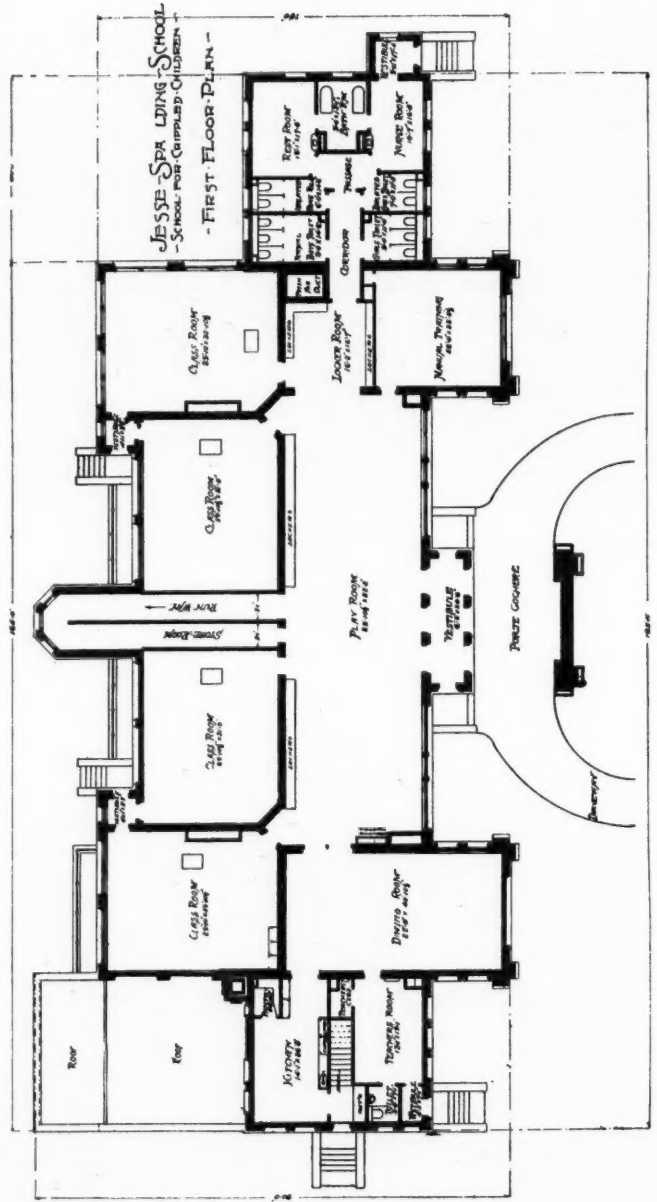
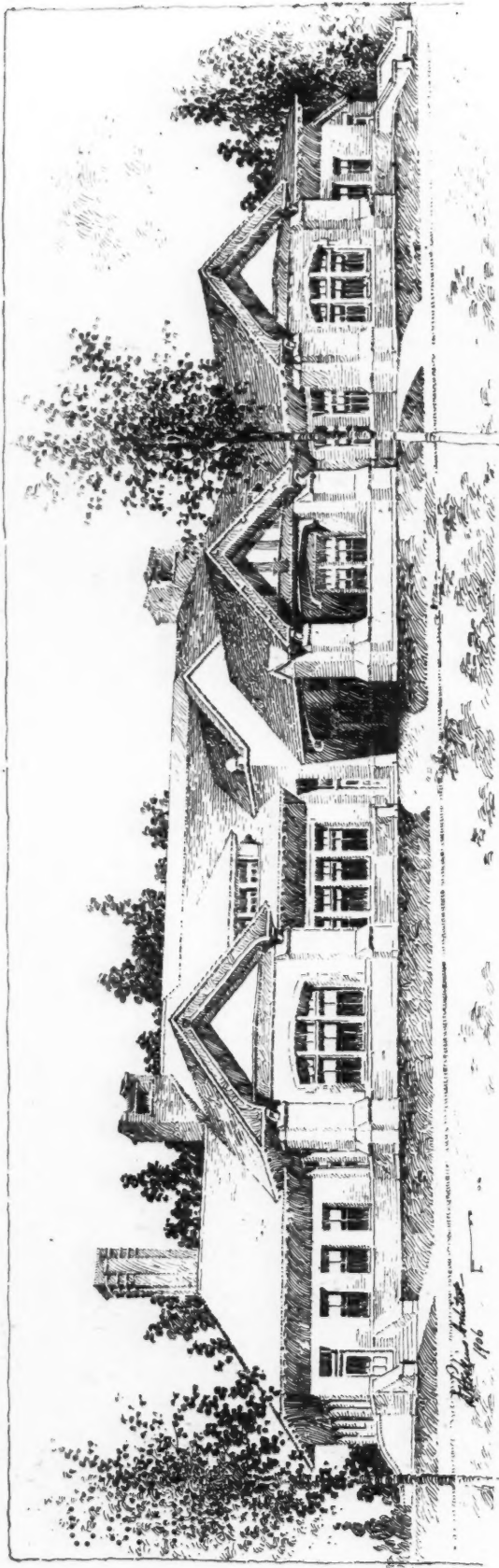
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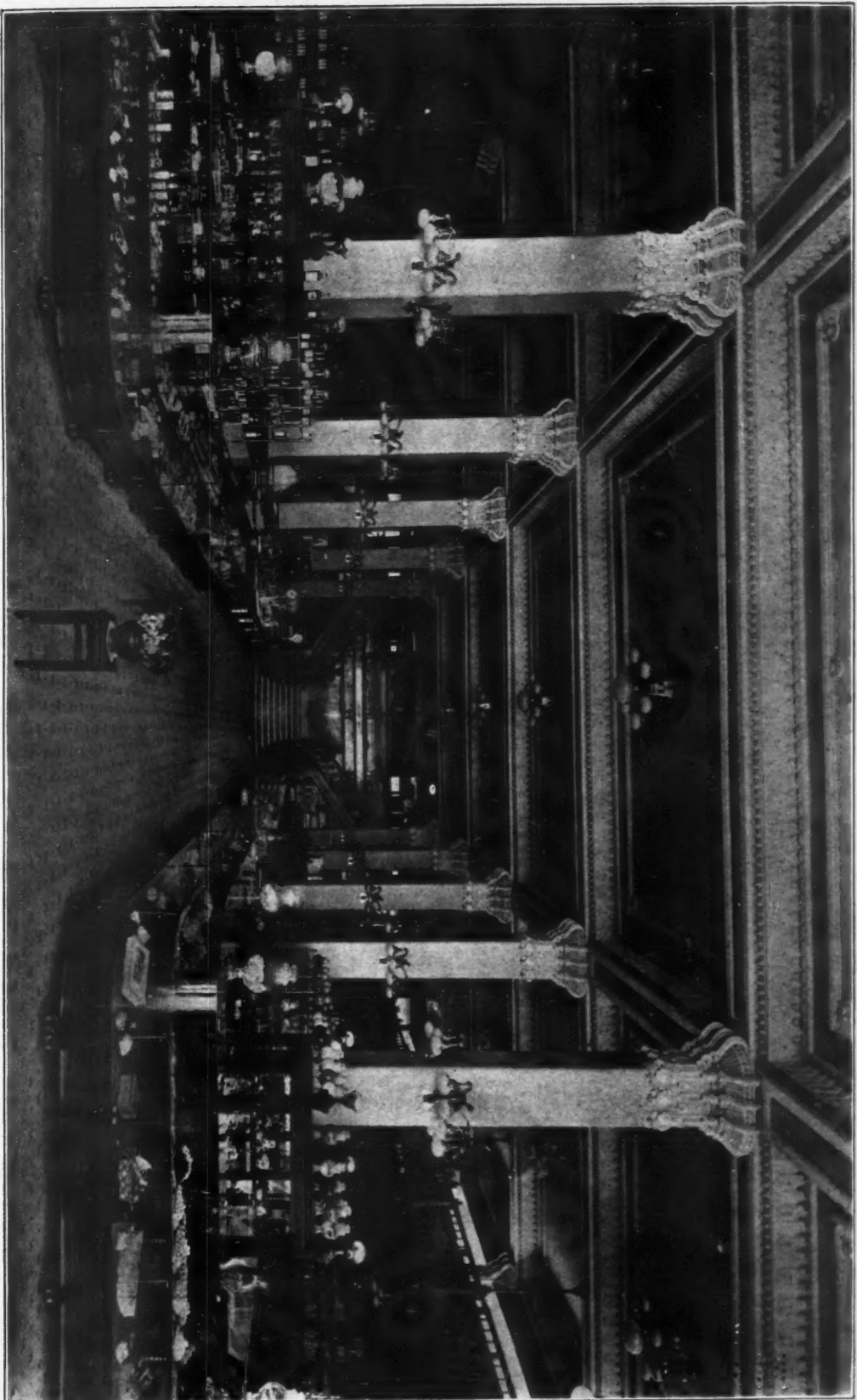


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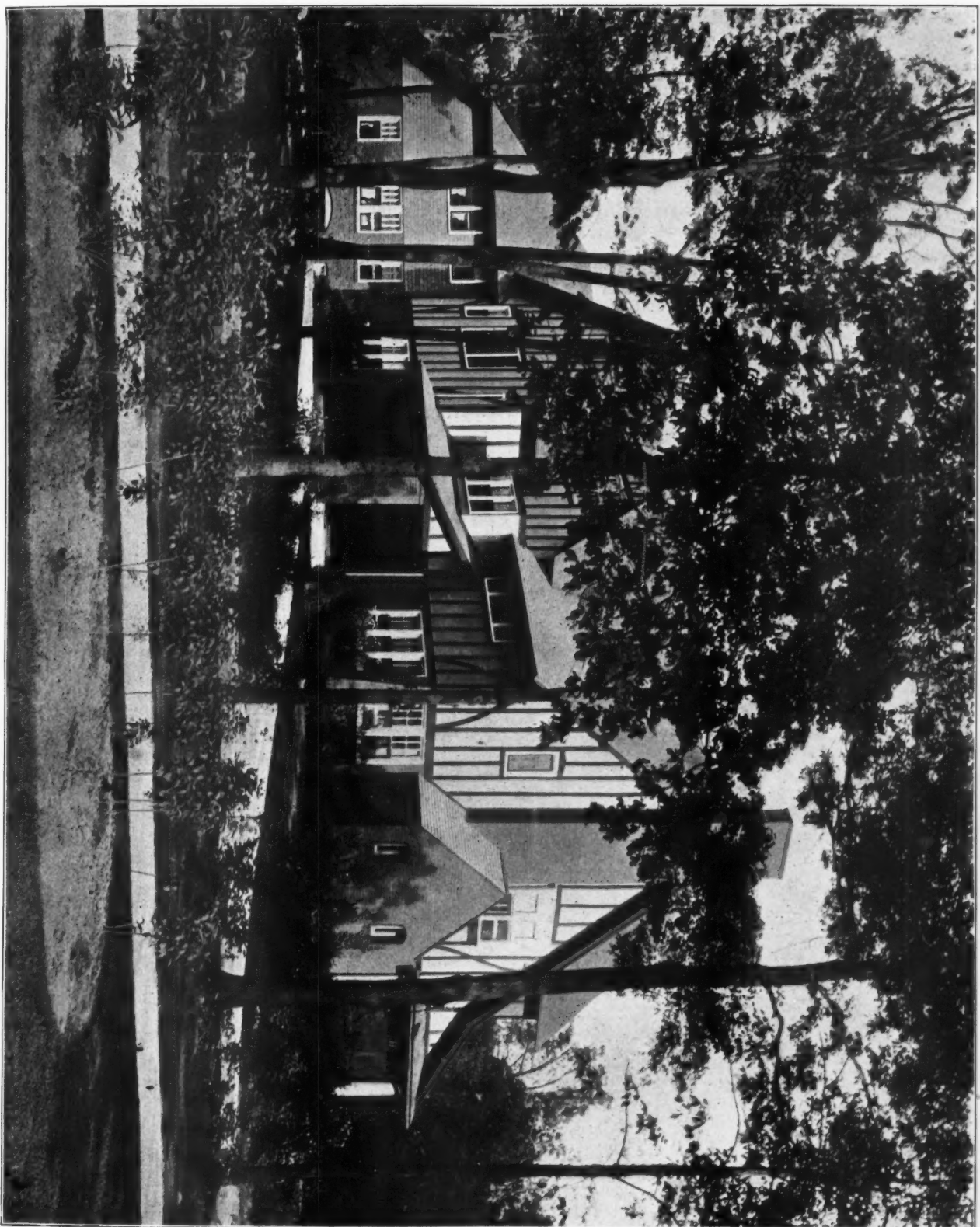
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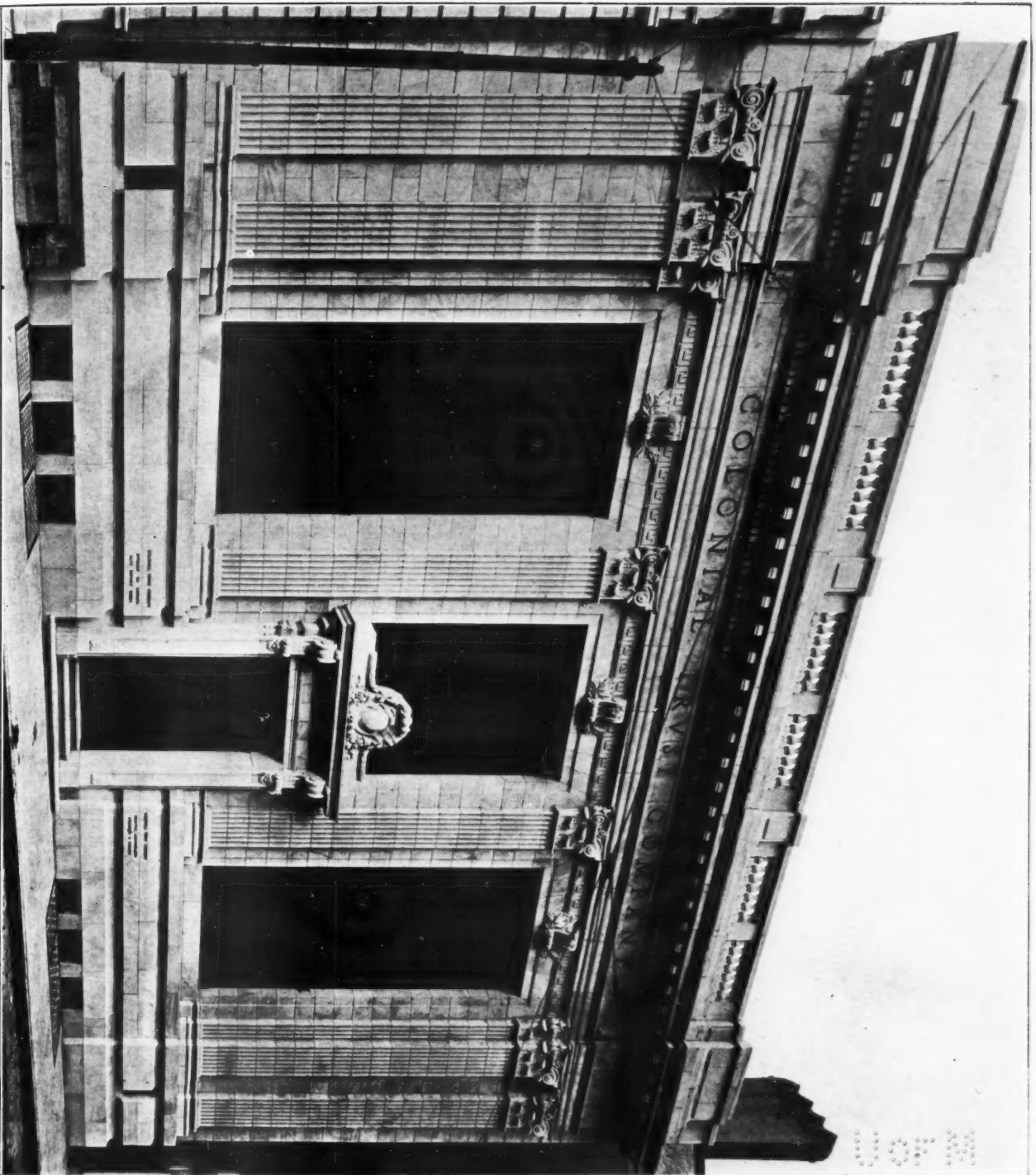
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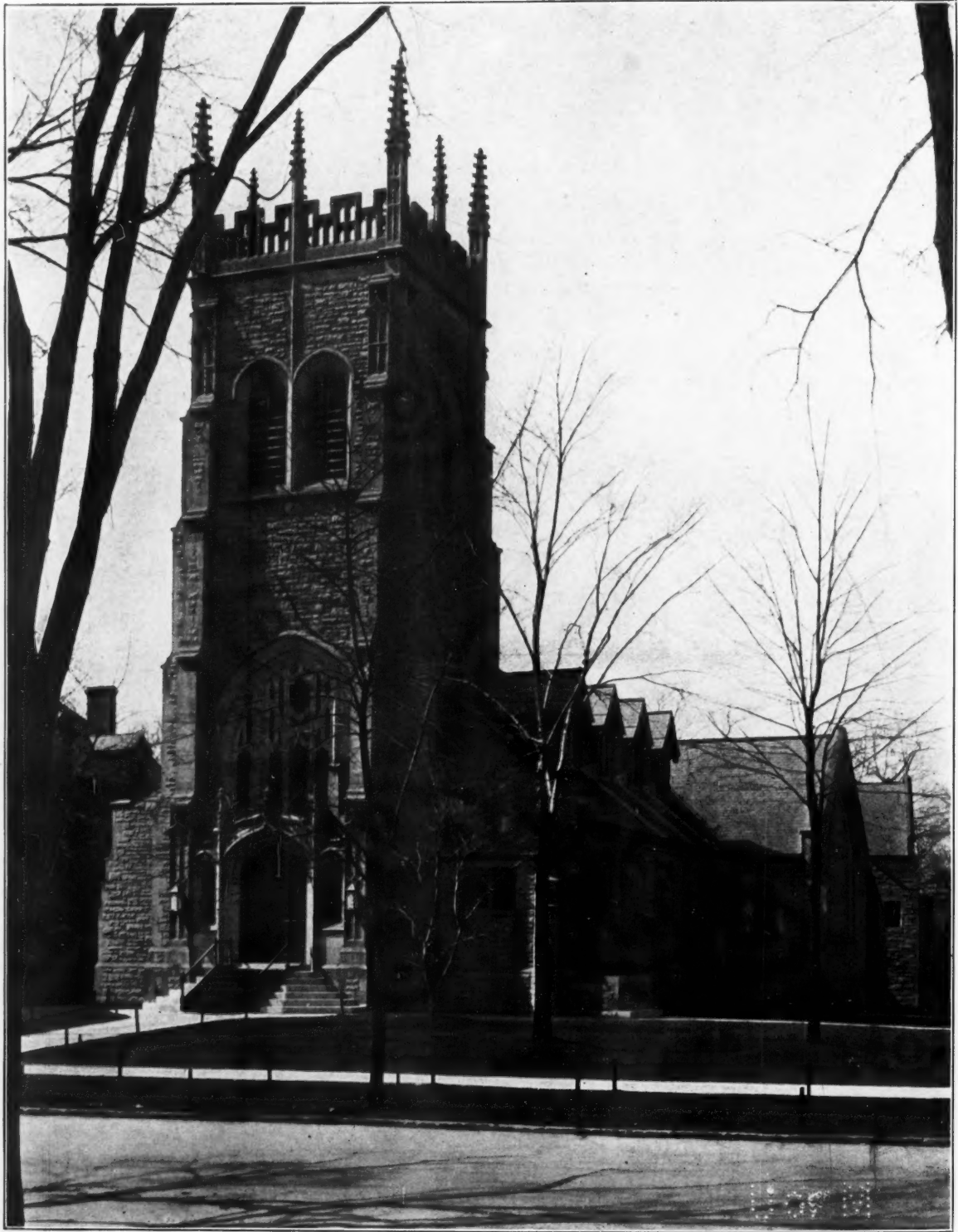
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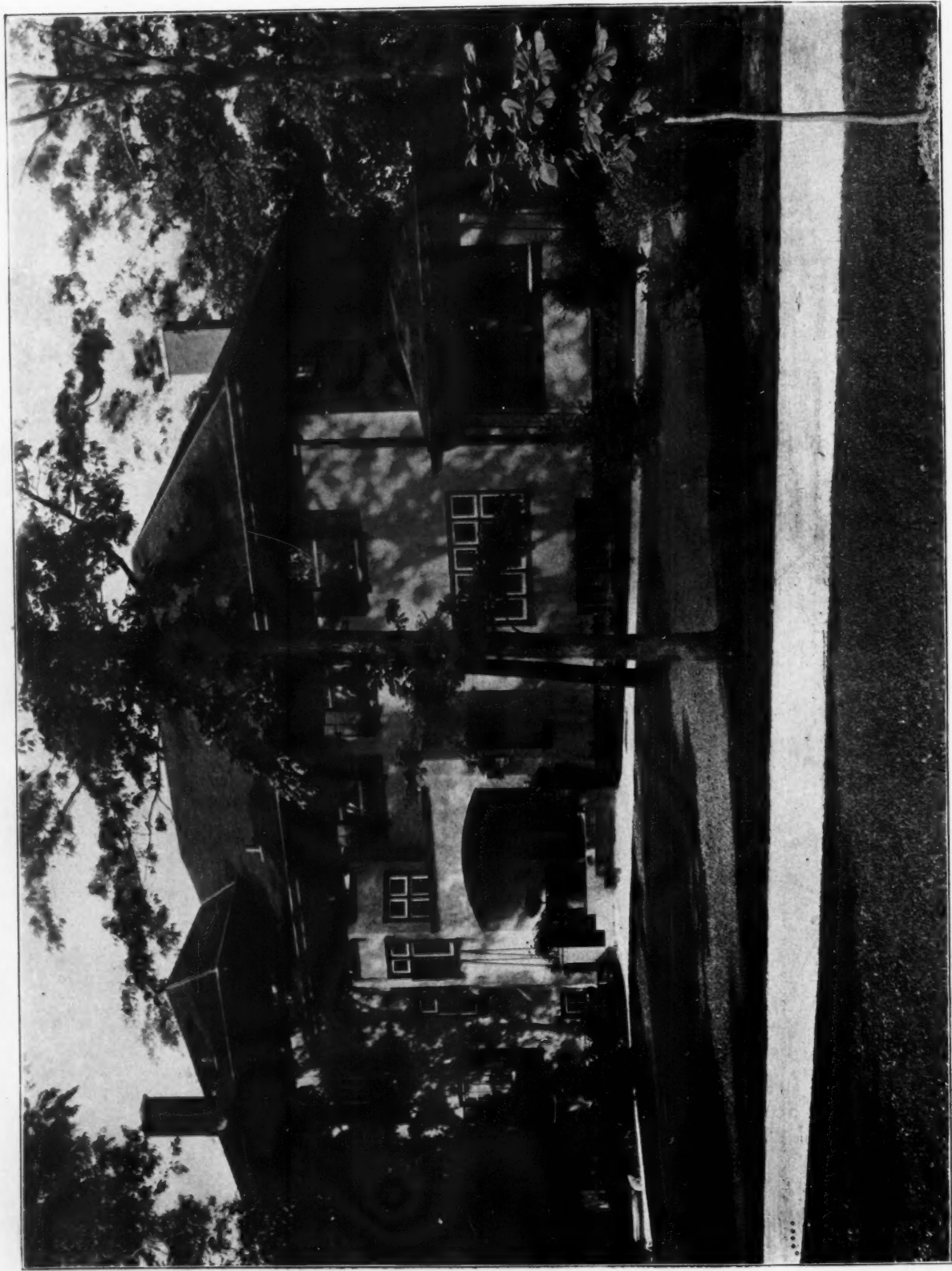
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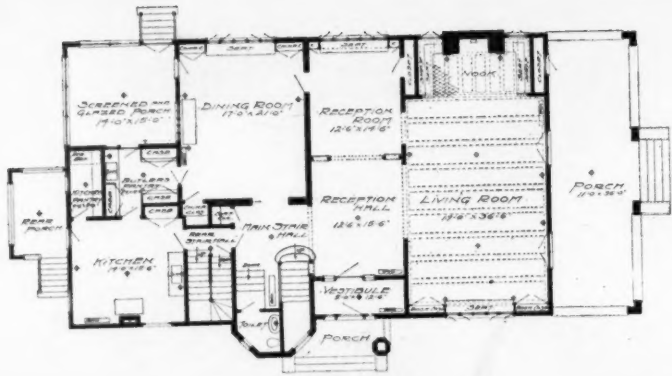
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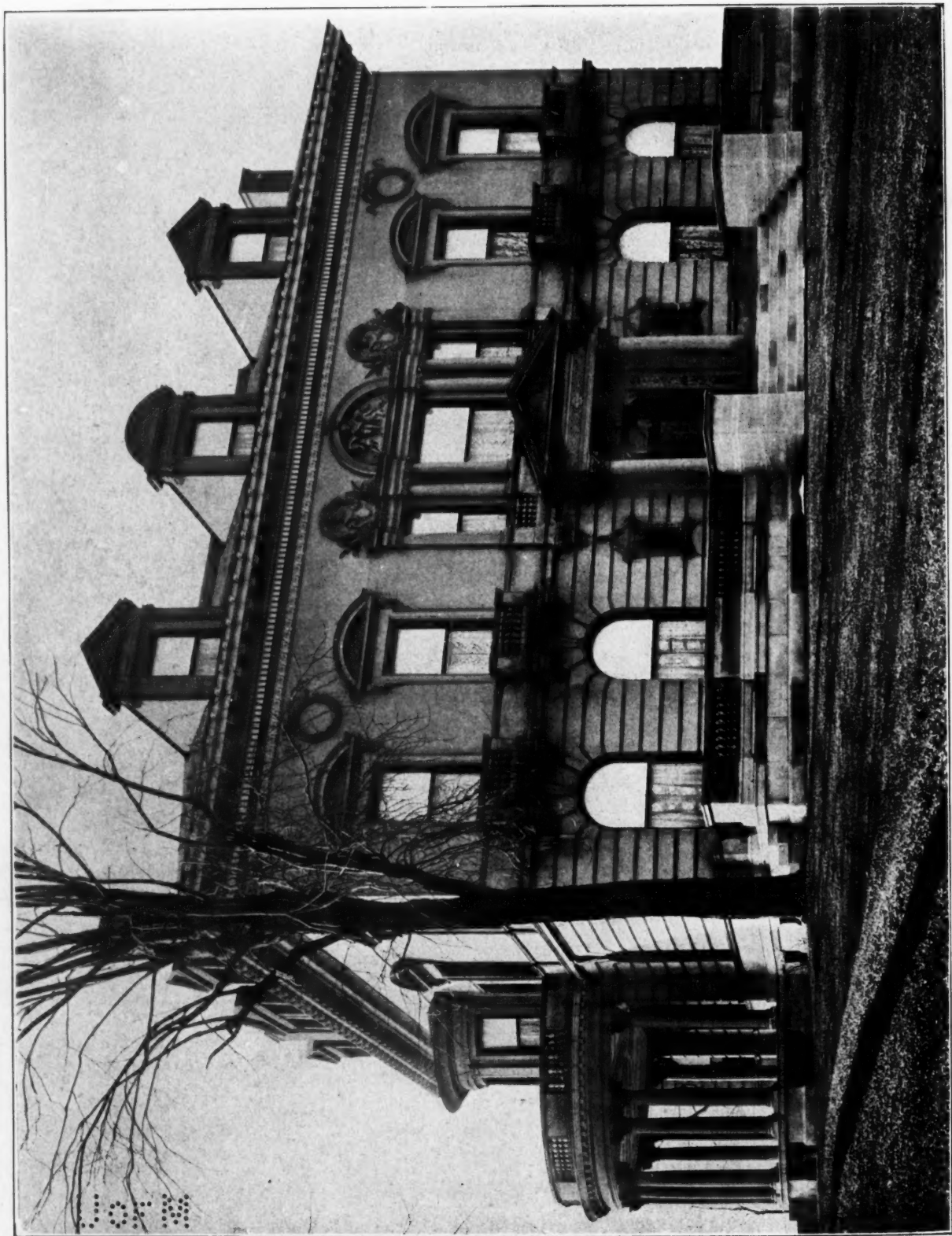


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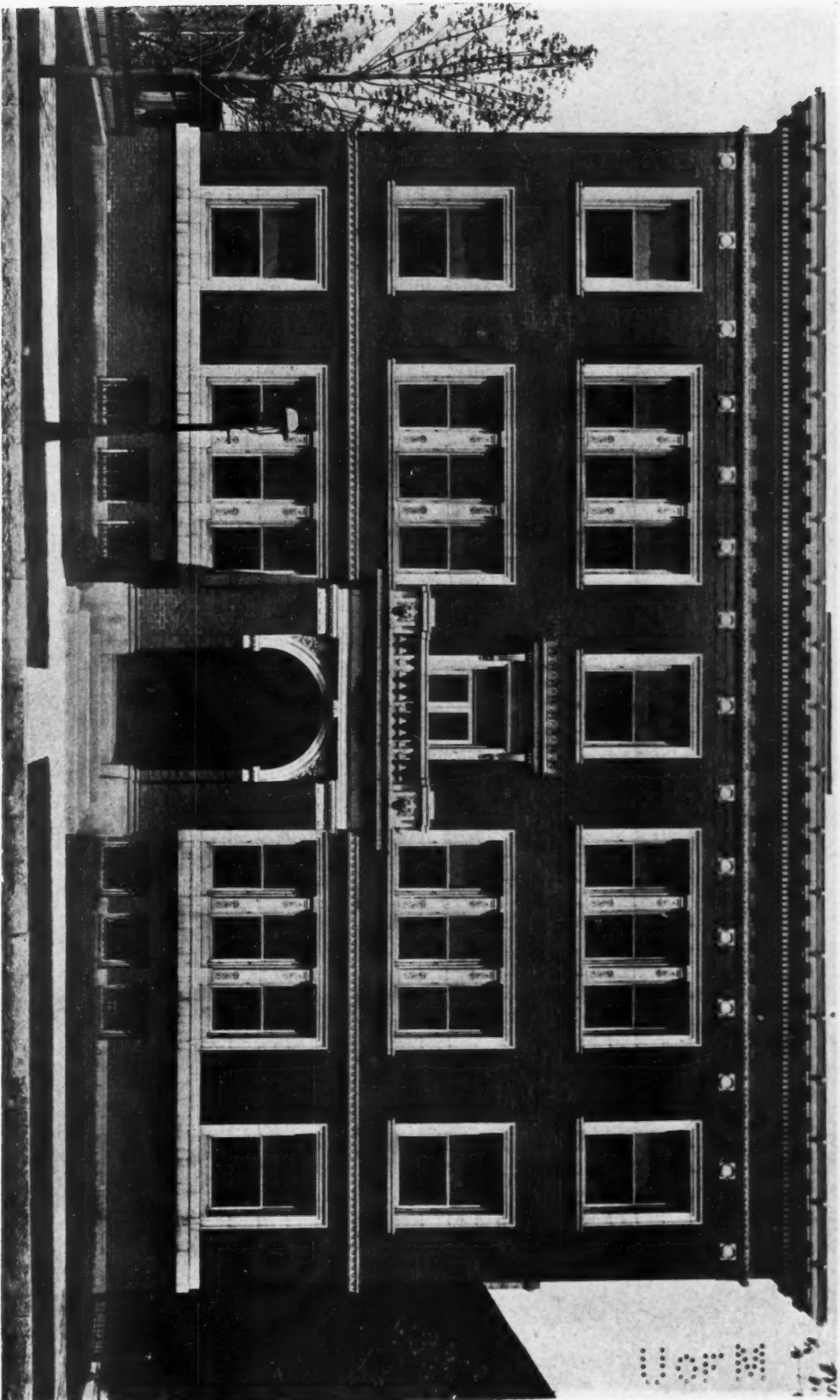
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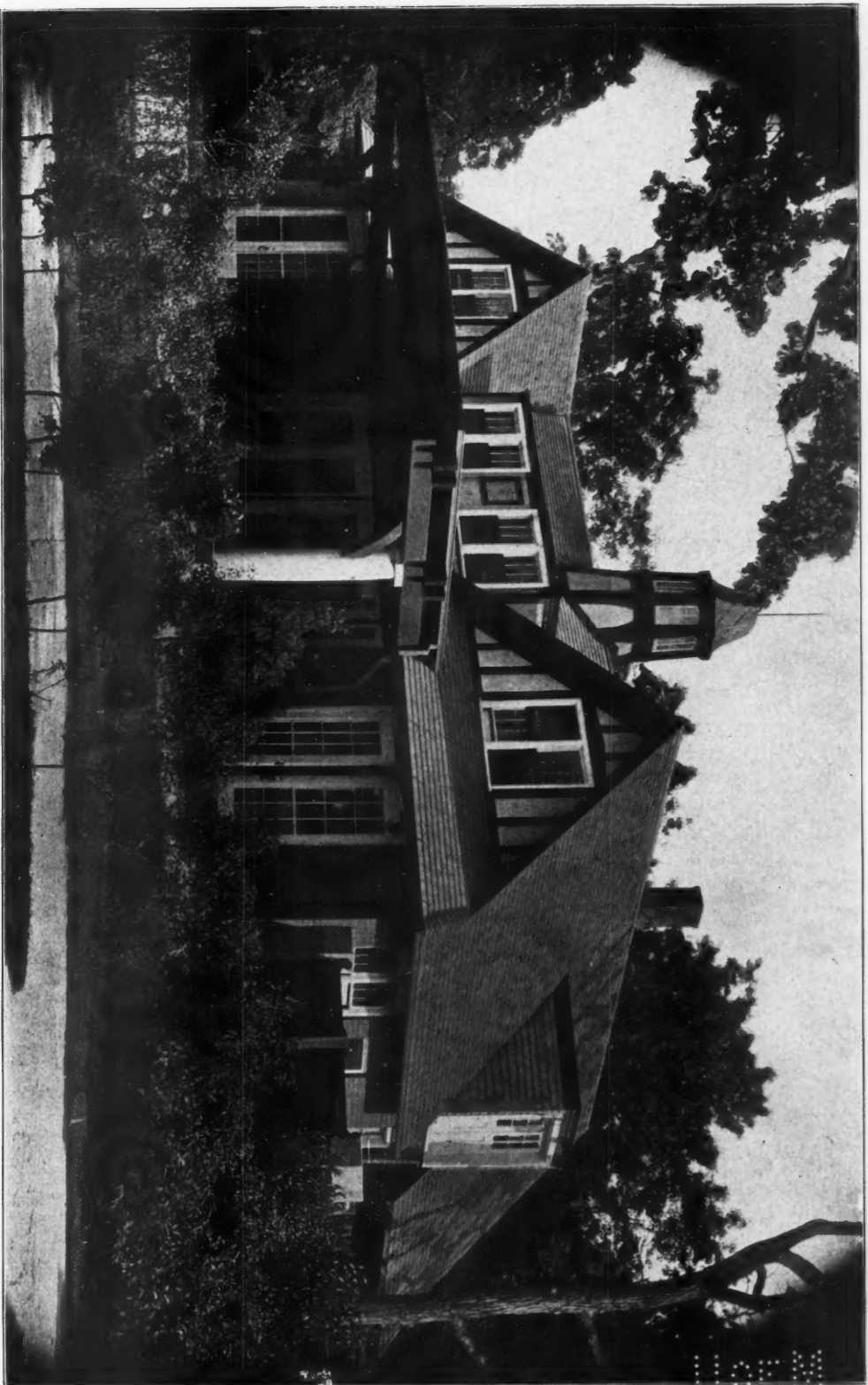
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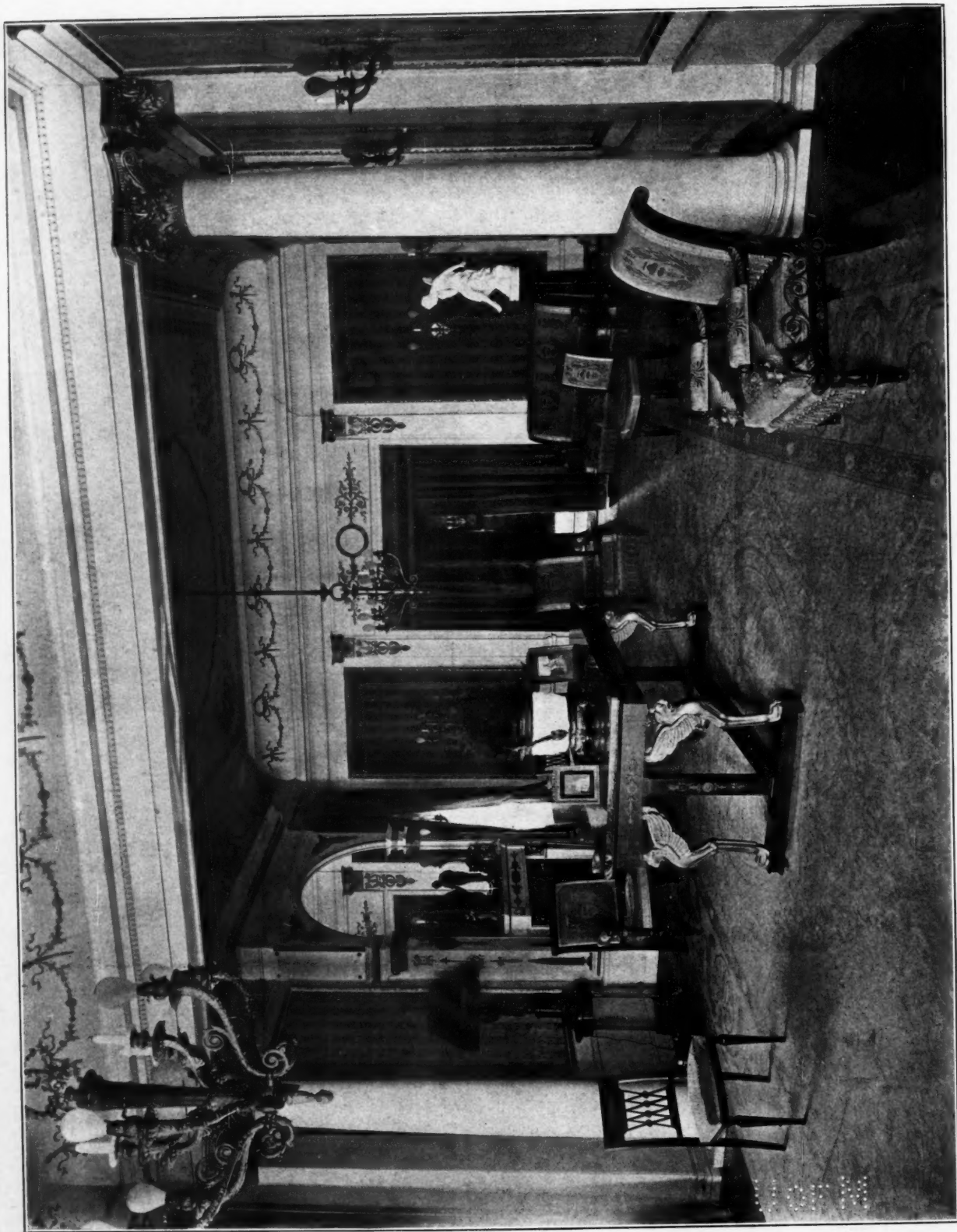
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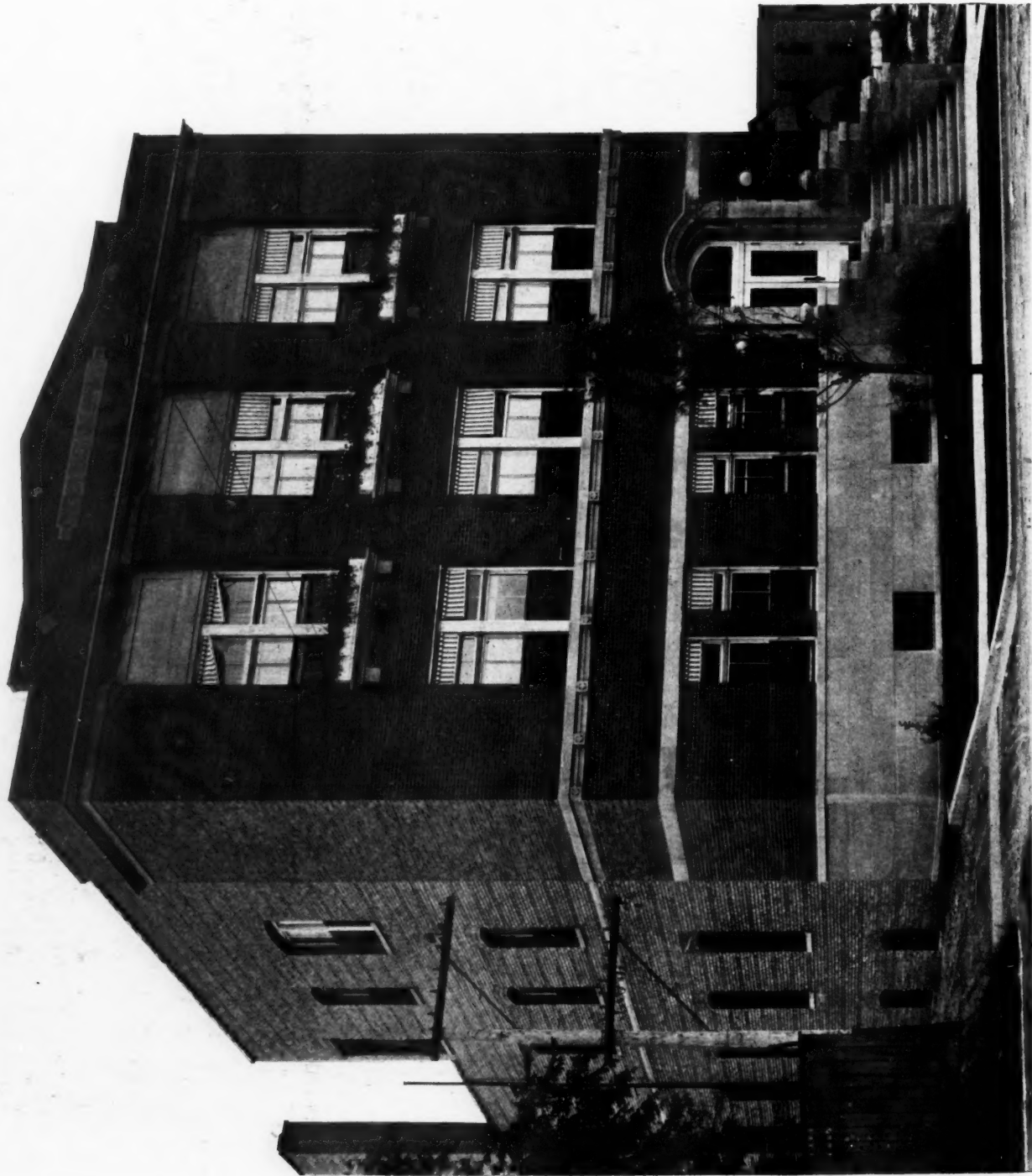
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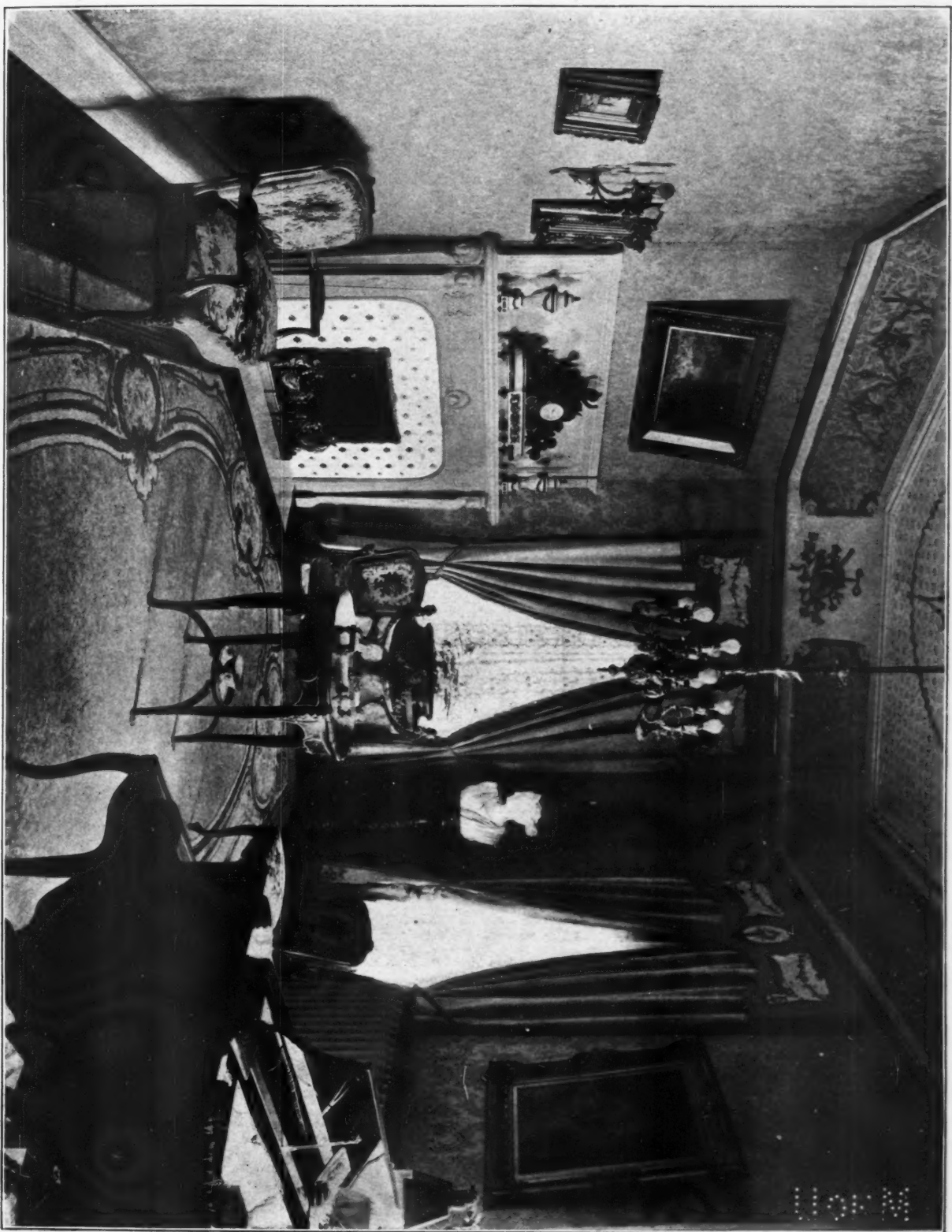
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