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Place of next Convention, Chicago, August, 1893.

The World's Fair an Architectural Study.

To the architect whose visit to the Colum-
bian Exposition is made with a view to
study design and construction the build-
ings now in their completed state will not
only be interesting, but present the demonstration of
many problems that have never been met with in his
practice. In the main, the ordinary treatment in struc-
ture and design obtain, but there are enough digressions
to occupy weeks of time in examination and study. The
quality and the adaptability of the "staff" covering and
its application at once to broad plane surfaces and the most
intricate ornament and to sculpture, the grouping of the
several buildings and even the effect of polychromatic
treatment of a façade, all will give to the thoughtful
student a field of investigation that is almost limitless.
Many governments have recognized this and have pre-
sented requests for detail plans and photographs. The
Royal Institute of British Architects have given to the
Godwin Bursar of this year, Mr. Bannister F. Fletcher,
the task of reporting upon the construction, and as a result
the Institute will receive much interesting data, a set of
tracings from the working drawings, and it is probable
this will be supplemented by a full set of photographs for
its library. The Director of Works has placed the entire
construction office at the disposal of the Royal Institute's
representative, and as that gentleman, not only by his cre-
dentials but in his personality, has won the favor and
coöperation of those with whom he has come in contact,
his report from an architectural standpoint will repay the
Institute many times for his mission. While Mr. Fletcher
is the only architect sent to the Fair thus far by a foreign
society for the purpose of collecting data, the sultan of
Turkey, the German government and others have, through
their commissioners, expressed a wish for similar data.
But it is to the individual architect who attends the Fair
and makes a stay of sufficient length to study the problems
that most interest him that the greatest benefit will accrue,
for he can photograph and sketch design, ornament and
construction, and find a solution to almost every problem
where large masses, grouping and landscape effects are
the main features.

The "Ford's Theater" Disaster at Washington.

The attitude of the United States govern-
ment in its relation to public buildings has
received a most pointed and forcible illus-
tration in the recent wrecking of "Ford's
Theater," in Washington. Here was a building that was
used as a theater before the Civil War and since occupied
as a government bureau. Its unsoundness was a matter
of common remark. Congress would not appropriate
money for a new building and condemn the old, because
there were other appropriations that meant influence and
votes, while no one in Washington was interested except
employés who knew that to complain would mean dis-
charge, and who each day believed that they were taking
their lives in their hands when they entered the structure.
The supervising architect "could only make recommen-
dations," congress alone could act. It is also probable
that the inspections which it is claimed have been made
were also political ones, made by men who were political
appointees. In fact, the rottenness of the whole system
of government supervision of building stands out in all

its glaring incompetency in the light of this awful affair. But all the unsafe buildings under government control are not in Washington. Two years ago the supervising architect reported the postoffice at Chicago as unsafe. As not less than twelve years ago the writer thrust a cane its full length into a crack in that structure, and disruption has continued ever since, such a verdict is not surprising. But congress still ignores the great danger both employes and public constantly incur in the second largest postoffice in the country, just as it has ignored the dangerous condition of "Ford's Theater," and will probably wait for some such calamity to call its attention and force its action. We do not claim that this occurrence is in any way due to the supervising architect's office, but we do claim that it is due to the system under which the government erects and supervises its buildings, and hope that the results of the inquest upon the victims of this disaster will call attention to the statements made by the house committee on buildings and grounds of the last congress in relation to the office of the supervising architect, so that the next congress will pass a suitable bill for its reorganization.

Registration called for in America and England. It is hoped that those who have labored for the passage of an architects' registration bill in the several states will not lose interest because of the outcome of the efforts put

forth in the state of New York, and which were defeated by a politician who happened to be governor, possessed of the power to veto. In England the profession is divided upon the question, the majority of the members of the Royal Institute of British Architects claiming that such action is not necessary. The argument there may be good, that the Institute in its charter and the privileges granted its members by municipal bodies is legalized sufficiently, but in this country the American Institute does not hold an equal position. Its influence is strong as an association, but the architect finds that it is of little benefit to write "F. A. I. A." after his name. In time this might be changed, but that method which will give the greatest security to public and profession alike, is the passage of legal enactments which will establish the profession as a profession, and give its members a standing legally, when now they can only establish such by individual effort, and the greater number of the competent suffer for the sins of those who may be incompetent or otherwise undeserving of the confidence of the public.

The Columbus Statue on the Chicago Lake Front. The colossal statue of Columbus, by Kretschmar, which was recently placed upon the lake front, opposite the Auditorium, at Chicago, has excited considerable comment,

and this not entirely complimentary to the sculptor or the monument committee. While that artist has exhibited a certain degree of ability heretofore, and in this statue has shown an artistic imagination that should yet bring him credit as a sculptor, the work under consideration is most unfortunate. From one point of view the pose has a certain degree of dignity, but from all others the effect is bad—very bad, even grotesque. The face is coarse, when there was a rare chance for an ideal treatment; the pose is one of surprise; the draperies are spread to a wind that seems to blow from all directions. This is from the artist's standpoint. The public view, as reflected in the newspapers, is amusing. Each writer has some humorous

comparison to make, the general trend of which is that Columbus is discovering the ballet girls in Kiralfy's "America," a spectacular performance at the Auditorium, or is amazed at seeing several prominent citizens, presumably the projectors of the monument, enjoying the performance of a skirt dance in the Auditorium hotel parlors, one imaginative genius suggesting that the great navigator was in pursuit of a lake front mosquito. This failure in producing what was intended to be an historical commemoration of this Columbian year (a failure upon which both artists and public agree) is, we believe, largely due to insufficient study of the model, with too great haste in its execution. This was not necessary, for the sculptor Gelert had already modeled a Columbus that was in every way dignified and full of thoughtful energy, with a pedestal that was thoroughly studied, and this could have been erected within the same limit of cost and by a sculptor who has already won a place among those who stand first in the profession in America. Yet this model was not taken into proper consideration, if at all, and the result is a matter of regret to public and projectors alike. Great works of art cannot be designed either by the yard or the minute, and if this statue of Columbus serves no other purpose beside that of lending a point to the pencil of the paragraphist, it will be to show that rarely can an artist produce a great work with haste as a spur and an untrained imagination as a guide, and that bronze and stone perpetuate both our greatest thoughts and our greatest mistakes.

Abuse of World's Fair Sanitary Privilege.

There is one defect in the arrangements for public comfort at the Fair that requires immediate remedy, and that is in the toilet and sanitary department. In order that the apparatus might be provided for and with the least cost to the Fair, sanitary concerns were invited to present bids for the supply of all apparatus. The firm that presented the most attractive proposal agreed in substance that it would place closets and lavatories where designated by the chief of construction throughout the Fair buildings. All apparatus should be of the first class, and attendants should be furnished and the toilet rooms kept in perfect condition throughout. In consideration for this the concessioner was to be allowed to charge a small fee for the use of one-half of toilets, and though it is more than a year since we saw these articles of agreement, the impression is that each lavatory should contain both free and paid closets, and in equal proportion. Entered into in good faith by the authorities of the Fair, this firm has already abused its privilege to an extent that has brought more complaint, and with greater reason, than all other departments together. In half the buildings there are no free closets, or these are placed so remote from the main lines of travel as to be practically useless. Where there are free and paid closets together, the former are kept, and it would seem purposely, in a filthy condition, while attendants are employed who discourage their use. While the main object of this firm would seem to be the advertisement of its wares, the effect is obviously the opposite from beneficial. The Council of Administration, however, is both prompt and powerful, and it is hoped that this abuse of privilege will be at once adjusted by its abatement or the cancellation of the concession which in the hands of any of the well-known manufacturers of sanitary goods would be properly conducted, while now it acts against the best interests of the Fair.

DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE.

BY CHARLES E. ILLSLEY, A.M., C.E., ARCHITECT.

CHAPTER VI—INTRODUCTION TO CONVERGENT PERSPECTIVE.

THE methods of isometric and cabinet projection hitherto explained are invaluable for delineating constructive details to large scale, as shown by the illustrations, especially where the depth in comparison with their breadth and height is inconsiderable. Representing, as they do, at one glance, three or more sides of an object, they are far more intelligible than ordinary plans and elevations, while equally serviceable as working drawings, since they are made "to scale," and scale measurements can be taken directly from them. Moreover, they fall strictly within the standard definition of perspective, and may readily be mistaken for ordinary or convergent perspectives; yet, having no

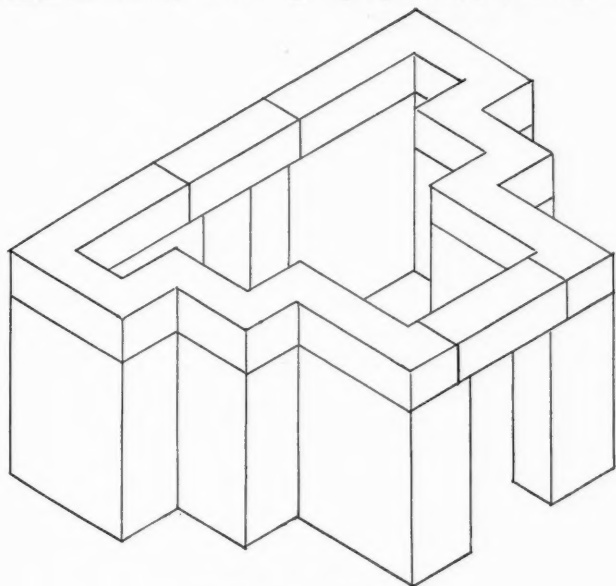


FIG. 95.—ISOMETRIC DRAWING.

vanishing points, they are constructed to scale with as great facility as any plane figure, and their general adoption for constructive details would effect quite a saving in time and labor as well as in tedious verbal explanations often completely misunderstood.

68. But where the "third dimension" becomes considerable, as with entire buildings whose receding sides may equal or exceed their fronts, these methods are less satisfactory. The parallelism

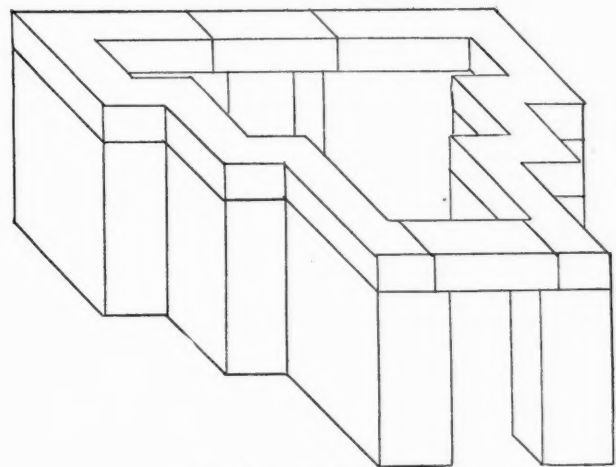


FIG. 96.—CABINET PROJECTION.

of receding lines, so picturesque for a short distance, quickly offends the eye beyond this limit, making parallel lines seem actually divergent, while a drawing which shows the remote face of an object at precisely the same size as its nearest face, becomes, when the remote face is at all distant, an anomalous distortion which is unsightly.

These remarks may be illustrated by comparing Figs. 95, 96, 97 and 98. Of these Fig. 95 is an isometric drawing of an irregular stone foundation, Fig. 96 is a cabinet projection of the same, Fig. 97 is a parallel perspective of it, and Fig. 98 represents it in oblique

perspective. Each of these four drawings is made to the same scale; the differences in the results are due solely to the different methods employed.

69. For the reasons above given, we require in the delineation of entire buildings a system of drawing which shall take into

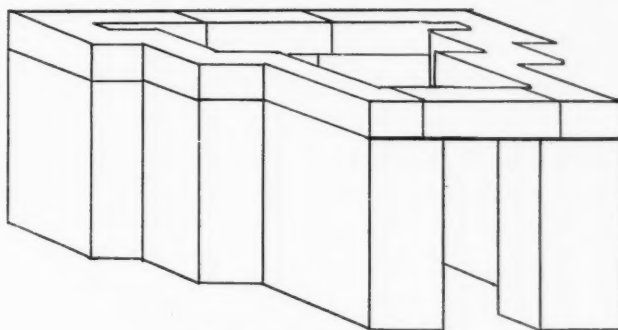


FIG. 97.—PARALLEL PERSPECTIVE.

account the apparent convergence of receding lines and the reduction in the apparent size of distant objects, a system which locates the eye not at an imaginary standpoint infinitely far away, but at a fixed and real point comparatively near the object viewed. A drawing so developed might be called *convergent perspective*, or *real perspective*, in distinction from the *quasi parallel* perspectives shown in previous chapters and which relate to an *imaginary* standpoint. In ordinary language it is known simply as "*perspective*."

The observer will henceforth be stationed quite near both to the object viewed and to the plane of the picture. (See Fig. 26.) The visual rays (Section 24), no longer parallel, will converge toward the eye of the observer. This center of convergence is commonly designated the point of station, or P. S.

70. While it is the aim of projection drawing to show objects as they are rather than as they seem, it is the aim of real perspective to show them as they seem, which is often quite different

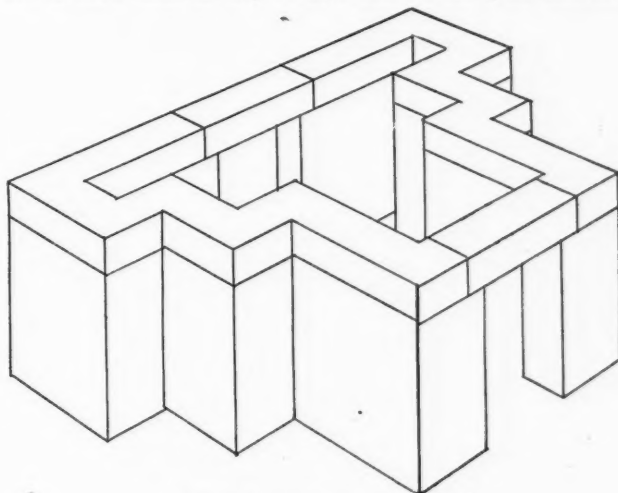


FIG. 98.—OBLIQUE PERSPECTIVE.

from what they are. For instance, we may know that a telegraph pole a mile away is of precisely the same height and thickness as one near at hand, but it does not look so to the eye. We may know that the fences which border a railway are just as far apart in the dim distance as where we stand, but their farther ends seem much nearer together. In a projection drawing the distant pole would be as tall and thick as the nearest one, and the fences would be parallel for their entire length; a perspective makes the distant pole the smaller and makes the fences converge, just as they seem to do. Exterior effects count for so very much in architecture, that it is quite as important for the architect to know how a projected building will *look*, as how it will *be*. To the owners the former is often the prime consideration.

71. The term *linear perspective* is defined in Section 24 and illustrated by Fig. 26.* Were visual rays themselves visible, so that

*Linear perspective deals only with the lines which seem to bound an object and define its parts. There is also *aerial perspective*, which notes the effects of distance, atmosphere, reflections, etc., on the colors, lights, shades, etc., of objects near and remote. To landscape painters it is more important than linear perspective; but it has little bearing on architectural design.

they could be traced from all parts of an object directly to the eye and the points marked where they pierce the plane of the picture, our perspective could be drawn at once by simply joining these points with straight lines. Visual rays cannot be seen and traced in this way, yet their intersections with the picture plane may be found by the rules of projection drawing, and a complete perspective thus obtained. This method is shown in detail in Prof. S. Edward Warren's ingenious book on "Linear Perspective" (see footnote to Chapter V), and forms the basis of the ordinary practice of perspective drawing, as will be shown hereafter.

The method by projections, while complete and correct, is toilsome and slow, and has been largely superseded by expedients based on certain phenomena of vision referred to briefly in Chapter II, which now require farther attention.

72. The apparent size of an object depends mainly on its *visual angle*, i. e., the angle at the eye between visual rays from its extremities. This angle varies inversely with the distance between eye and object—the greater the distance the less the angle. (See Figs. 25 and 99.) Hence, theoretically, the angle becomes zero when the distance is infinite, and, in fact, within a very moderate distance compared with infinity the visual angle becomes so very small that it ceases to be perceptible, and the object itself "vanishes," as we say.* This is why the rails of a

track and the parallel fences beside it seem to converge as they recede. Their distance apart is unchanged, as we all know, but the visual angle it subtends is less and less as the track stretches away from the eye so that it seems to grow continually smaller and smaller, and, if the track be visible far enough, the space between the rails will finally "vanish" entirely and they will seem to meet and coalesce. The same phenomenon is observable with a receding line of telegraph poles of uniform height. Each successive pole from the eye will subtend a smaller and smaller visual angle, whence the poles will appear to grow smaller and smaller as the line stretches away into the distance.

73. Another phenomenon connected with receding objects is that horizontal lines above the level of the eye apparently descend in the distance, while those below the level of the eye rise with like uniformity. Also, lines at the right of the observer converge as they recede to various points before him or at his left, while corresponding lines at the left stretch away to "vanishing points" at the right. Other lines still display no convergence whatever, but retain their true shape and position at all distances. These apparently complicated phenomena of lines, directions and angles, which seem to the eye so different from what they really are, result from simple principles relating to the visual angle; and, in place of confusion, they are all governed by laws and observe a harmony which, once known, may be traced throughout.

74. The direction in which the observer looks at any moment is called the *line of vision* for that moment. When not stated otherwise, he will be assumed to stand on the same level with the plane of the picture (Fig. 26), whose position is always vertical, and to look directly at it on a level line at the height of the eye, and "normal," i. e., perpendicular to the picture plane. Such a line of vision may be designated as the *normal line of vision*, in distinction from lines of vision in other directions, as when

*This "vanishing" is not due wholly to the diminution of the visual angle; it is also influenced by atmospheric refraction and absorption, and by loss of reflected light. A small object with polished surfaces well illuminated is seen farther than a larger object of dull exterior and ill-lighted.

the observer turns his glance sidewise or upward or downward. The latter may be called *oblique lines of vision*. The object viewed may be anywhere beyond the picture plane.*

In what follows, the term "line of vision" will generally be understood to mean the *normal line of vision*, as explained above, and all lines will be understood to be "straight" unless otherwise shown.

75. In Fig. 26 the observer occupies three successive stand-points relatively to a stationary object; in Fig. 99 the same object stands in different positions while the observer is stationary. In both cases it will be seen that the visual angle diminishes alike as the distance from eye to object increases, and that the visual ray from the top of the object is highest when the object is nearest the eye (or the eye is the nearest the object, as in Fig. 26), while the visual ray from the same point is lowest when the object is most remote. This is why the near object seems highest and the distant one lowest; the eye estimates its altitude by the elevation or depression of the visual ray from it.

Likewise for points below the eye: their relative positions also are estimated by the direction of the visual ray. This ray is lowest from the base of the nearest object (Fig. 99), and highest from the base of the farthest one, hence the former appears to the eye decidedly lower than the other. In other words, the visual ray

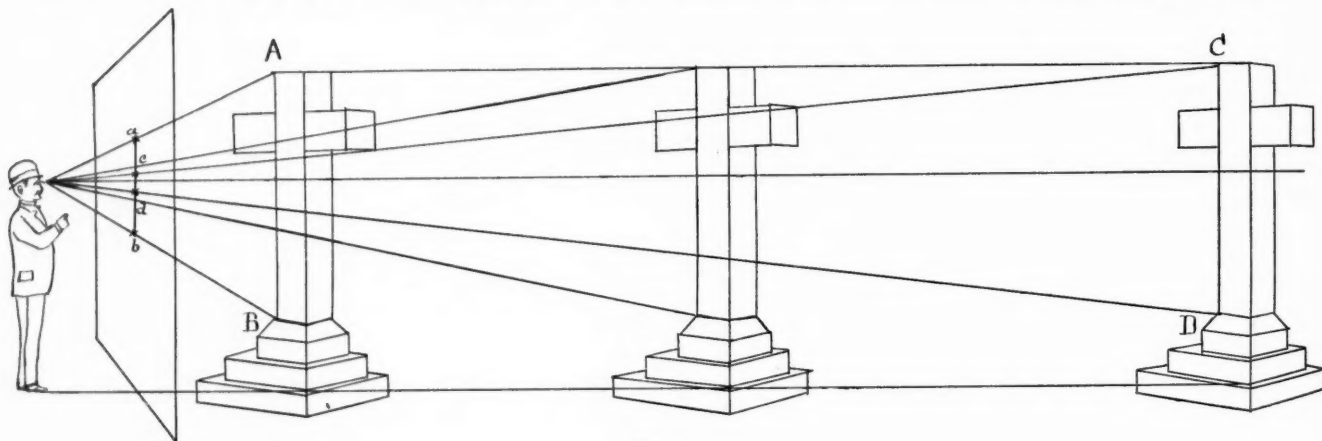


FIG. 99.

from an object above the eye declines as the object, or the observer, recedes, whence the object itself *seems* to fall, though in fact, it remains at the same level; vice versa, the visual ray to an object below the eye rises with increased distance, whence the object itself appears to rise.

76. Points at the level of the eye do not vary in apparent altitude as they recede or approach. Whatever their position, whether far or near, all such points seem to retain their level, neither falling nor rising. This results naturally from the preceding principles. If all horizontal lines above the eye descend as they recede, and all such lines below the eye rise as they recede, it must follow that horizontal receding lines at the level of the eye will neither rise nor fall, but remain at the same height. When the horizontal lines are normal (perpendicular) to the plane of the picture, the line which they seem to approach as they recede is the normal line of vision (Section 74), while a system of parallels receding in any other direction apparently converges toward an oblique line of vision parallel to the system.

77. The same principle controls parallel lines at either side of the eye; they apparently converge toward a line of vision parallel with themselves. Hence, lines equally distant from the eye, as in the cylinder of lines (Fig. 100), if continued far enough will form an apparent cone, as in Fig. 101. If too short for that, they will form a frustum of a cone, with the remote base more or less reduced in size. Lines not equally distant form under the same circumstances a pyramid or a frustum of one. (Fig. 102.)† The only line which neither rises, falls nor deflects to one side or the other as it recedes, however far into the distance, is the line of vision itself, which is the only line the eye cannot see. It perceives only the terminal point where this line meets the eye. Every other point, lying exactly behind this one, is hidden by it.

*In architectural perspective the plan of the object is usually placed so that one side or one corner shall touch the picture plane, as will be shown farther on.

†A frustum of a cone or pyramid is the lower portion after a part of the top has been cut off.

Receding parallel lines wholly at one side of the eye appear as an oblique cone (Fig. 103), or an oblique pyramid (not illustrated), or as their frusta. Relatively to these, the line of vision, which in space is parallel to the lines themselves, becomes apparently the axis within the cone or pyramid, as in Figs. 101 and 102, or the perpendicular from the vertex to the base, as in Fig. 103.

78. An important class of lines, as remarked in Section 73, neither rise nor fall from their true direction at any distance; these are lines sensibly parallel with the observer, and sensibly as near him at one end as at the other. Both ends being equally near, the visual rays from both will be of equal length and slant; hence they will appear alike. The only effect of distance on such lines is to vary their lengths and positions; it does not alter their shapes.

79. In Section 77 it is shown how and why parallel receding lines in nature must appear to the eye to converge and form a cone (or pyramid) with its distant vertex upon the corresponding line of vision, i. e., the line of vision which is parallel to the real lines in space. When the observer looks directly before him, the point of this cone will be exactly in front at the level of the eye, and all parallel lines, wherever situated, will seem to converge toward it. This point, the terminus of the normal line of vision (Section 74), is called the *point of sight*. If the eye turns to the right or the left, taking for a moment an oblique line of vision, for the same moment all horizontal oblique lines parallel to the



FIG. 100.



FIG. 101.



FIG. 102.

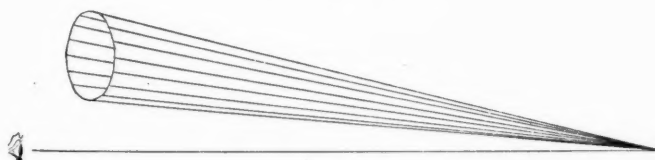


FIG. 103.

new line of vision will seem to form a new cone with its vertex at the end of the new or oblique line of vision. This might, therefore, be called an oblique point of sight; but, as the term "vanishing points" is commonly applied to all such points of sight, it will be retained for convenience.

Now, conceive a distant level line of infinite length to be drawn at the height of the eye. In this line will be found the vanishing points of all level lines which can possibly be drawn, at whatever altitude or depth. As mathematicians express it, this line is the "locus" of vanishing points for level lines. Since this must apply for every direction the line of vision can take, though it sweep all around the circle, our "locus" is in fact what astronomers call a "great circle," situated at the extreme limit of vision. This circle is called the horizon.

80. This circular locus of vanishing points or "horizon" is at the height of the eye. On a level plain of sufficient extent, it is the line where the earth and sky appear to meet (the earth's curvature being disregarded); it is no less marked at sea, where the "sky line" seems to meet the water.

Being at the level of the eye, the horizon is a subjective phenomenon entirely; it has no more existence in nature than a zenith or a nadir. It goes with the eye; it is higher with a tall man than with a short one; if a man ascends to a roof or the top of a steeple, he carries his horizon up with him, and brings it down when he descends. But, though so variable, the horizon is no less important, for to every man it is the limit of his vision,

the locus of vanishing points for horizontal lines (so called, perhaps, because they vanish in the horizon), and all nature, as he sees it, is intimately related to his horizon, however it may differ from every other man's horizon.

81. In illustration of these principles a number of photographic views "from nature" are given.

82. Fig. 104 is from a photograph of the Metropolitan Opera House, New York. One oblique point of sight (Section 79) is about eight feet above the sidewalk and slightly at the left of the picture. Place a ruler at the base of the capitals from which the round arches in the first story spring. While six of these openings are in one receding face and three are in another, it will be found that all the capitals from which they rise are very nearly on a horizontal line, the most distant ones at the same level as the nearest. The bases of the piers and the sidewalk lines below rise in each face as they recede, while above this level the string courses and cornices descend toward the distance and their rate of descent increases rapidly with each successive story. By applying a straight edge to the cornice and to the sidewalk lines the left vanishing point can easily be found, as also the vanishing point for the lines at the right. It will be interesting to find these points and then notice how invariably every belt course, sill course and other horizontal line in each face converges to its proper vanishing point.

Fig. 104 is an illustration of what is termed "oblique perspective," the principal surfaces being oblique, as it were, to the observer, while Fig. 103 is a "parallel perspective," one principal surface being parallel with the observer (Section 78). In parallel perspective the surface not parallel (with rectangular buildings) is, of course, at right angles to the spectator, so to speak.

Fig. 105 is a parallel perspective of the Propylæum, at Munich, Germany. The point of sight is at the middle of the space between the central pair of columns and at the base of the shrubbery below the obelisk in the extreme distance. To this central focus the receding lines of the cornices at the sides of the towers, the lines of the roadway and sidewalks in front, and all others which are parallel with them, will be found to point far more unerringly than the magnetic needle points to the pole. The "trueness" of lines in the front is also very marked. There is no convergence and no distortion.

In THE INLAND ARCHITECT, Vol. XIII, No. 3, were published photogravure illustrations of the Victor Emanuel Arcade, at Milan, Italy. One is an exterior view, the other is an interior, both in parallel perspective. They are very interesting to the student of perspective for the clearness with which lines straight and curved in the fronts are shown in their natural shape and direction, and for the pronounced and emphatic convergence of all receding lines to the distant point of sight.

In Fig. 107 this point is at the center of the distant opening, and but slightly above the sidewalk level. In both views the reader may be interested to trace the convergence of receding lines.

Fig. 108 is a parallel perspective of an interior, namely, that of the Spanish Hall in the imperial palace in Prague, Germany. The point of sight is in the distant wall, about six feet above the floor and at the left edge of the pilaster to the right of the niche with statue. The apparently steep rise of the polished floor is to be noted, and the pronounced descent of the level ceiling as it recedes. Were the room long enough the floor would appear to continue its rise till it reached the point of sight on the distant wall, and the ceiling would apparently continue its descent till it actually reached the same level. Then, the floor and ceiling having met, the distant wall would have "vanished."

Fig. 109 is an oblique perspective of an interior in the War and Navy Department building, at Washington, D. C. It may be studied in the same way as the preceding illustrations.

(To be continued.)

THE Vatican, the ancient palace of the popes of Rome, is the most magnificent building of the kind in the world. It stands on the right bank of the Tiber, on a hill called the Vaticanus, because the Latins formerly worshipped Vaticanum, an ancient oracular deity, at that place. Exactly when the building was commenced no one knows. Charlemagne is known to have inhabited it over one thousand years ago. The present extent of the building is enormous, the number of rooms, at the lowest computation, being 4,422. The length of the statue museum alone is over a mile.

HEATING AND VENTILATION OF RESIDENCES.

BY JAMES R. WILLETT.

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HOT-WATER HEATING—USUAL METHOD.

THESE are various ways to arrange the pipes from boilers to radiators and from radiators to boilers. The usual way is by feed-pipes leading from boiler to stacks of radiators—that is, radiators which are directly over each other, but on different stories. Plates VII and VIII exhibits an example of this method.

The water passes into the radiators, and there it gives off its heat, and then passes out from the radiators into a return pipe, which is represented by the colder column, and returns to boiler. This process continues as long as there is fire in the boiler. The feeds and returns are separate pipes.

The pipes leading to the upper story, having a higher column of warm water, have more motive force and therefore have a tendency to rob the lower-story radiators. These are made smaller. In other words, the size of the pipe is decreased as it goes upward from story to story, while the return pipe increases as it descends. See left hand of elevation, Plate VII.

Another way of checking the excessive flow to radiators in upper stories is to supply the radiators on lower floor from the top of the tee, and to supply the radiators in the upper stories from the side branch of tee. See right hand of elevation, Plate VII.

The feed connection to the radiators usually has a valve upon it, so that it can be shut, and the circulation of water prevented; while the return connection has no valve.

In this method of hot-water heating, air cocks are needed at the top of each radiator, there being no other way to allow of the escape of the air. Pet cocks are sufficient.

There are two pipes, a feed and a return; and there are two connections with each radiator, the feed and the return, usually both connected with the bottom of radiator, but sometimes the feed connects with the top of radiator.

This method requires more radiator surface than the overhead method already described. The requisite amount is found by calculating that required by the overhead method and then adding twenty-five per cent.

The grate area, expansion tank, etc., will be ascertained in the same way as in the overhead method.

The expansion tank should be connected with boiler by an independent pipe one inch diameter without a valve, running from bottom of tank to bottom of boiler.

One objection to the foregoing method is that each stack of radiators has two pipes, a feed and a return. As the feed usually runs through the rooms, to clothe it would render it large and unsightly, therefore it is usually left uncovered, and since it gives off heat this tends to diminish the rapidity of the circulation. Another objection is that the upper-story radiator has a tendency to rob the radiator in a lower story. These radiators, so to speak, "fight" each other.

The plans of apparatus given on Plates VII and VIII were kindly prepared by Mr. George Phillips. The section was prepared to show different methods of piping.

These plans are for the same house that is shown in Plates I, II and III.

HEATING BY STEAM—LOW PRESSURE STEAM—GRAVITY RETURN—ONE-PIPE METHOD.

Low pressure steam may be defined as a pressure not above fifteen pounds per square inch above the pressure of the atmosphere. The atmosphere, as you know, has a pressure of about fifteen pounds per square inch; and what is termed low pressure steam is not usually more than five pounds pressure above atmosphere, though it may be run up higher. When we speak of pressure we always mean a pressure shown by a steam gauge on the boiler, and means that much above the pressure of the atmosphere.

When the condensed water in the radiators returns to the boiler by its own weight it is called "gravity" return.

With regard to piping from main pipes to radiators:

Up to some years ago there were two pipes for this purpose. One main pipe passed out through the top of the boiler and through branches called "feeds" carried the steam to the radiator where it was condensed, and the water resulting therefrom returned by means of other branch pipes called "returns," to a main return which led to the bottom of the boiler. This is what is called the two-pipe method. Of late years, however, the tendency is to use what is called the one-pipe method.

In the one-pipe method the main usually rises from the top of the boiler as close to the ceiling in the basement as is practicable, then turns and runs horizontally, but with a downward slope so as to reach points below the radiators in the upper stories.

After reaching all these points, this main drops beneath the floor of basement, and returning enters at the bottom of the boiler. From the upper, horizontal portions of the main, branches are taken running upwards to reach the radiators above; there being but one connection with each radiator. This pipe, called by the trade a "riser," has to carry the steam to the radiator and return the water from the radiator. It has been found that if this "riser" is made sufficient size it will do both and do them well. It has the advantage of having but one connection and therefore but one valve to each radiator.

In the two-pipe method you have two connections with the radiator and a valve on each. If the feed is left open while the return valve is shut then water collects in the radiator, and when the feed

is opened again and steam enters it, is condensed and noise, which is called pounding, ensues. The water being in the radiator it may freeze, since there is no circulation through the radiator of the steam. On the other hand, if feed should be shut and the return valve left open, no steam enters the radiator, and any steam already in the radiator is condensed and a vacuum formed therein which may cause water to pass up the return pipe into the radiator. Now, this is not a safe proceeding, since the passing of the water from the boiler lowers the water line and may lower it dangerously.

In a steam boiler the water must be kept a certain distance above the smoke tubes or flues. Water must not be kept too low, for then the metal composing the boiler is exposed on the one side to the heat of the smoke flue, while on the other side there is no water to convey away the heat and the metal (iron or steel) may be injured thereby; besides, when other water enters the boiler and strikes this exposed metal surface it may generate steam so rapidly as to cause an explosion.

With the one-pipe method there is but one valve. If it is open it admits the steam and also allows the water to pass away; if it is shut it allows neither the steam to enter nor the water. A person cannot therefore, misuse the radiator in this respect, while with the two-pipe radiator it is a common occurrence for careless people (and all people are careless) to leave one of the valves shut while the other is left open.

We saw, not very long ago, in one of the architectural papers of the country, the statement that the one-pipe method was not regarded as a reliable and efficient one by experts in heating and contractors of repute. However that may be in the locality where such a journal is published it is certainly not true of Chicago. There the two-pipe method for buildings, especially large ones, has become almost, if not quite, obsolete; and not only is this true with the young men who contract for putting in heating apparatus, but the old contractors, who, until a few years ago knew no other than the two-pipe method, are now using the one-pipe method almost exclusively. No one who has ever used a well-designed one-pipe method will ever use the two-pipe method except under special circumstances.

We will here speak of the "low pressure, one-pipe, gravity return" method exclusively.

It may be noticed that in the main, since it pitches downward, both the water and the steam flow in the same direction and therefore they do not "fight" each other. The condensed water in the mains returns to the boiler through a main return.

In the branches or risers the steam is moving one way and the water in the other, and this requires large pipes, especially in the horizontal portions of the branches.

Plates X, XI and XII illustrate the above described methods of steam heating. Plate XIII, first section, also illustrates it.

Sometimes the steam is supplied by the "overhead" method, which is similar to the overhead method of hot-water heating, except that there is but one connection with a radiator and that is at its bottom, a main feed being run up to attic whence branches run out and downward, supplying the radiators as they descend. This is a good method, probably the best. Plate XIII, second section, illustrates it.

What has been said in regard to steam heating refers to what is known as a low pressure gravity apparatus, that is, the steam is at a low pressure and when condensed into water returns to the boiler directly by its own weight. This is almost exclusively the way used for ordinary residences, but for large apparatus the water is sometimes returned to a tank, usually called a receiving tank, and from thence pumped into the boiler. It is sometimes, however, returned from the receiving tank into the boiler by what is called steam traps. These traps, however, do not usually work well except in what is termed a high pressure apparatus.

It is becoming the custom, nowadays, on large work and especially where steam of a high pressure is needed for other purposes, to run the boiler at a high pressure and to run the heating apparatus at a low pressure. This is accomplished by having a "pressure regulator," or governor, on the house-heating main. By means of this pressure regulator, while the pressure on the side toward boiler may be high and fluctuating, the pressure of the side from the boiler, that is of the side toward the heating apparatus, is kept at a low and nearly steady pressure. This, as we mentioned, is used in large buildings; sometimes in flat buildings, which might be termed residence buildings.

By this means the steam pressure in the boiler is kept high and well adapted to run elevators, pumps, laundry and other machinery, etc., while the pressure in the heating apparatus is kept low. Plates XIV and XV illustrate this method.

The connection from steam pipe to radiator should connect with the bottom of radiator, which connection should have a valve upon it.

Each radiator should have an automatic air-cock upon it.

For steam radiator, the sections or loops forming the radiator are connected at the bottom only.

To ascertain the necessary surface in the direct radiators.—For direct radiators take the formula:

$$Q = R F J.$$

Where Q = Total square feet radiator surface required in a room.

$$R = \text{A constant} = 0.8.$$

J = A factor depending on the exposure of the room usually.

1.4 for north and west exposures.

1.0 for south and east exposures.

For bathrooms take $J = 2$.

For kitchens take $J = 0.5$.

Direct radiators in entrance halls or near outside doors should be largely increased as heretofore mentioned. The factor J may be taken as 2, or twenty-five to fifty square feet may be added. It is always a good plan to have large radiators near outside doors.

The quantity of fresh air that is necessary to ventilate the residence is to be obtained by rules already given, and this air should be admitted through direct-indirect radiators into stair halls as heretofore mentioned.

The indirect radiator should contain at least one-half of a square foot of surface to each square inch of cross sectional area in fresh-air duct. It is better if the surface of the indirect radiator was increased fifty per cent or more.

The diameters of main feed can be taken from Table V. No return from a main should be more than two sizes smaller than the feed at its commencement (or than its largest dimension). If the main should also be used as a return, which is neither usual or desirable, except in special cases, then such main should be made one size larger than given in Table V.

Mains should rise vertically from boiler in basement as high as is practicable, that is as high as basement ceiling permits, and then turn and run horizontally, but with a downward slope, so as to reach within a few feet of the necessary points to supply the radiators. Then after having supplied the branches it usually turns and runs down below the basement floor and returns to boiler. In all cases it should have a slope and, at its lowest point, a waste cock so that it can be emptied.

The diameters of branch pipes necessary to supply the radiators can be taken from Table V, hereinafter given, but a branch or riser when it leaves the main has to run nearly horizontal (but with an ascending slope) from the main to the point where it turns and runs vertically upward. This horizontal portion should

and the tubes, or other heating surface, become uncovered by the water.

It is also necessary to have steam space in the boiler above the water.

For residences you usually must take some ready-made type of boiler. When you know the required grate area, select one having not less than the calculated grate area.

A pop safety valve should always be put on a steam boiler; usually one-inch valve is sufficient.

A pressure gauge should be put on a steam boiler.

HOT-AIR FURNACE HEATING.

Heating by hot-air furnace is a method by which air is heated by what is termed a furnace, and then passed into and through the building.

The hot-air furnace is practically a stove inclosed in a casing, leaving some space between the stove and the casing.

Air, presumably fresh, is admitted at the bottom of this space, and, being heated by the furnace, it passes upward and is led through pipe ducts to various portions of the building.

We will use the formula already given:

$$Q = R F J = \text{cross sectional area of hot-air pipe square inches for the room in question.}$$

The value of R should be calculated by the rule already given for radiator surface.

In first-story rooms take $F = 1.4$.

In second-story rooms take $F = 1.2$.

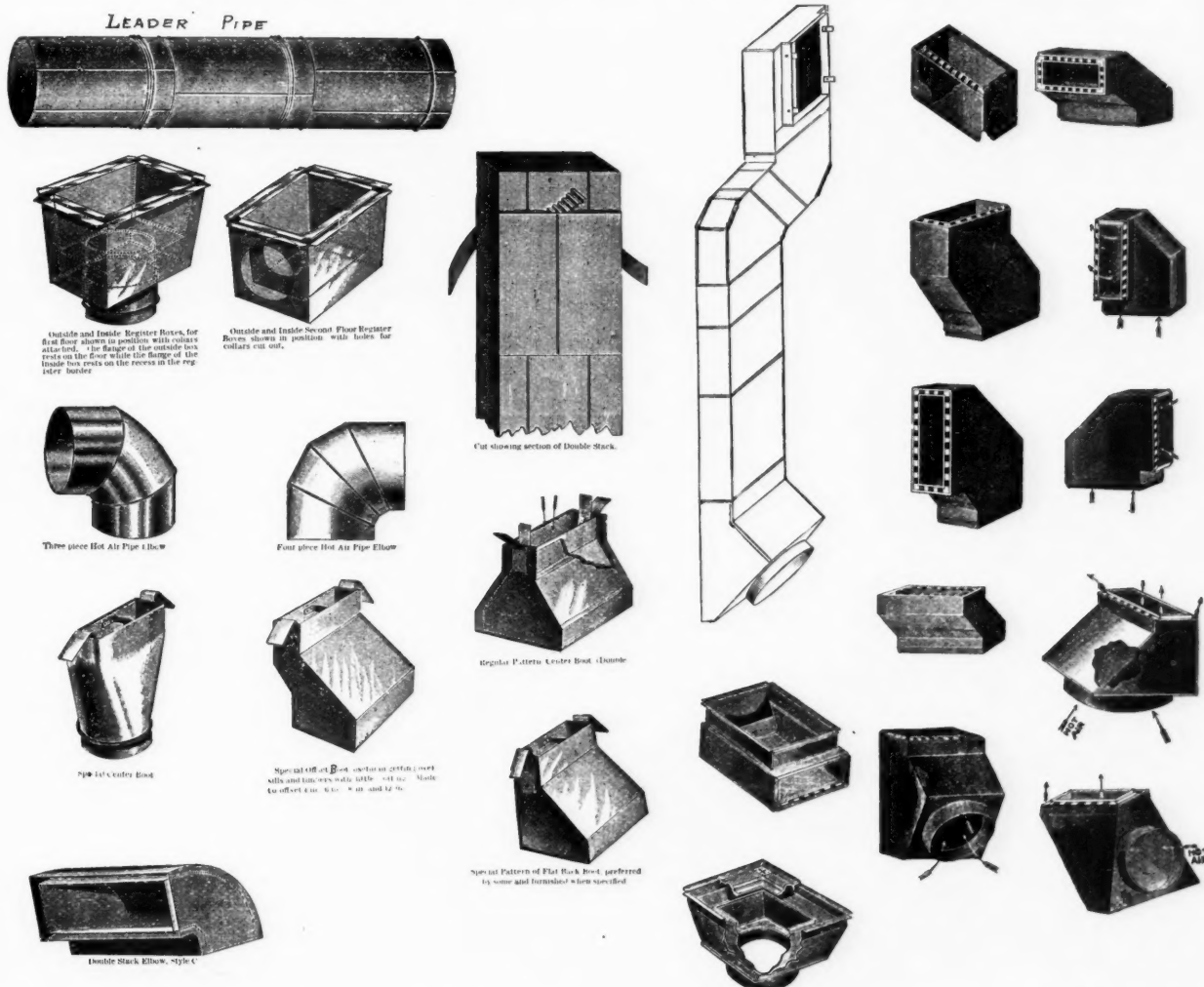
In third-story rooms take $F = 1.0$.

Take $J = 1.4$ for north and west exposures.

$= 1.0$ for south and east exposures.

Calculate the value of Q for each room.

THE FOLLOWING ARE ILLUSTRATIONS OF SOME OF THE FURNACE FITTINGS THAT ARE USED:



be one size larger than the vertical portion, that is it should be one size larger than given in Table V, which is intended for the vertical pipe.

Add together the square feet of direct radiation and indirect radiation obtained as before mentioned, multiply their sum by 1.1. Considering the product as radiator surface, take the corresponding grate area from Table II.

For steam heating it is important that the boiler has capacity to hold a sufficient volume of water, so that when enough of the water has been evaporated to fill the pipes, radiators, etc., with steam, the water line in the boiler will not be lowered too much,

In the first-story rooms the registers, through which the hot air enters, are usually placed in the floor. There are several reasons for this. The partitions of first story are usually occupied by the flues of the second story. Furthermore, ordinarily the partitions would not be large enough to allow of the necessary area of cross section, which is required to be much larger in the first than in the second story.

Round hot-air pipes, called by the trade "leaders," run from the furnace horizontally, but with an upward pitch or slope, to the register boxes in first floor; the upward pitch of these leaders should be made as great as is practicable. These leaders may be

of a single thickness of tin, since they are entirely below the basement ceiling, and do not come in contact with woodwork. Each leader should have a damper in it close to the furnace.

Table VI gives the trade sizes of the leaders.

All flues, pipes, boxes, etc., of every description that may be inclosed in partitions, etc., or that may come in contact with woodwork, should be made of two thicknesses of tin, with air space between. It is also desirable that such pipes, etc., should be thoroughly wrapped with asbestos felt pasted on to the pipes.

The register boxes may be placed in the first-story floor and the leaders should enter them by a curved elbow, what the trade calls a three-piece, or better, a four-piece elbow. Indeed all elbows should be curved and not rectangular.

The vertical hot-air pipes to rooms in second story are called by the trade "stacks." These stacks have usually to pass up within the thickness of stud partitions in first story, and are largely governed by that consideration.

The ordinary stud partitions are made either of 2 by 4 inches or 2 by 6 inches studs. Therefore it is advisable that the outside thickness of the stacks should not exceed 4 inches or 6 inches as the case may be.

The breadth of these stacks is also determined somewhat by the distance of the studs apart. These studs are usually 12 inches or 16 inches between centers, leaving a net space of from 10 to 14 inches for the stacks.

"The custom of placing heads on both ends of stacks and projecting the stacks into the basement and taking collars for round pipes from the side of the stack has been almost abandoned, inasmuch as it has been learned by experience, that by running the stacks down just below the floor line and attaching a boot of suitable shape to the stack, a much better circulation of air is obtained, and a neater and nicer job as well. The expense of the work done this way is no greater than by the old method, for a joint of stack is saved and the two extra heads on the stack."

The above is quoted by kind permission from the catalogue of the "Excelsior Steel Furnace Company, of Chicago."

Though unusual, it is sometimes practicable to carry a stack to upper story outside of a partition. It may be perhaps run inside of a closet or other similar place. In such case it is well to make the stack round instead of rectangular.

Usually when the stack arrives at an upper-story floor it is turned and runs between the joists a short distance, and has its outlet through a register in the floor. Sometimes, however, the stack continues up in the partition just above the baseboard, and the outlet and register are placed at that point. It is perhaps preferable to continue the stack up in the partition to seven feet above the floor, and to place the outlet and register there.

The connection between the furnace and the end of an upper-story stack below the basement ceiling is made by a horizontal leader pipe the same way as described for first story.

Table VII gives the trade sizes of stacks. Do not vary from them if it can be avoided.

It is frequently impracticable to make the stacks to second and upper stories as required by calculation on account of the partitions not allowing thereof. In such cases it is well to enlarge the hot-air flue to hall in first story to the amount of the deficiency.

The registers for any story should be made fifty per cent larger than the sectional area of the pipe with which they connect, or rather than the "calculated" area of said pipe. That is, add fifty per cent to the calculated area of the pipe, and the result will be the gross area of register that should be used.

Wall registers should be convex registers.

There are a great number of patterns of registers made, too numerous to be given here. There are also different styles of finish for which see manufacturers' catalogues.

Table VIII gives a list of the sizes which are mostly used.

(To be continued.)

NOTES FROM OUR FRENCH EXCHANGES.*

ARCHITECTURE IN ITALY.

WHILE the general thought and general tendency in the United States appears to be in the direction of forcing architects to be also engineers, whether they desire or not, it becomes curious to note that this course seems to have been carried into effect in Italy with most disastrous results to modern architecture. And this in a country where by instinct and nature everyone is supposed to be artistic.

Recently the French government has had a report made to it upon the state of the architectural profession in Italy, and in the course of this lengthy document, published in *L'Émulation*, is given the courses of studies in certain architectural schools. Following this the report goes on to say: "A French architect cannot but be struck in looking over these courses at the very little time that is actually devoted to the study of architectural design and composition and at the exaggerated amount of time given to the sciences." But it is also interesting to notice the feeling of the Italians themselves upon this point, as shown in the following extracts: Counting the three years necessary in the preparatory schools for admission, and then three years in the lower classes and four years in the upper classes of the schools, it requires that a young man devote ten years to these special lines of study before he can be the recipient of an architect's diploma. In these studies mathematics have the preponderant rôle, and there has, it is

evident, been formed a good engineer, but has there also been made a good architect? The facts answer this question. The great architects of antiquity and modern times have been artists, and not mathematicians. Ictinus and Chersiphron appear to have begun as sculptors. Michael Angelo and Bernini certainly developed their ideal of beauty as sculptors. Some painters have known how to build admirably, and a man of a pure taste like Perrault had shown himself a constructor of ability.

Italian civil engineers have a world-wide fame, and many French corporations, as well as the Brazilian and Servian state railroads, obtain most of their employes from Naples, but, on the other hand, the new buildings erected in Italy, and especially at Naples, are absolutely ugly, and prove the utter incapacity, from an artistic point, of the local architects. A course of instruction, where the artistic side is relegated to the second place, cannot form artists, for no work of art is possible where the imagination and sentiment are left out of the question.

The present condition of architecture in Italy is not brilliant, and everybody knows it; but the question is how to better it. And the answer is, let the architect again become the artist; take him away from the engineering schools and let him grow up in the art schools, with only just enough science so that he can plan a building that will not fall down. Do not overwhelm him with a mass of undigested information, which acts as a bit and holds back the imagination. Ictinus, Giotto, Orcagna, Palladio, and a hundred other architects were artists full of independence, while Michael Angelo, the designer of the cupola of St. Peters, knew nothing of higher mathematics. That such, in fact, is the cause of the decline of architecture in Italy begins to be appreciated by the authorities themselves, and in June last a bill was introduced to modify somewhat this condition of instruction, although evidently it had to be adroitly worded to avoid giving offense to the ever present and insatiable "practical man," who would desire nothing but pure mathematics. In conclusion, a curious confirmation of this theory is pointed out in the present state of architecture at Milan, which undoubtedly has the most artistic modern work of Italy, and here it is that a reasonable amount of art instruction is inserted in the courses of the architectural school, although some higher mathematics are crowded to the wall.

CAUSES OF THE VITIATION OF AIR IN INHABITED ROOMS.

The causes of the vitiating of air in inhabited rooms, according to *Le Moniteur des Architectes*, are of two kinds, one unavoidable, the other avoidable. The first owe their origin to the breath thrown out from the lungs, and also perspiration, secretions of the skin, and artificial lighting. In breathing, man absorbs a certain quantity of oxygen, and gives out carbonic anhydride, not to mention traces of ammonia. The skin also breathes like the lungs, but its action is very secondary, being only about one-fortieth of the lungs. On the other hand, however, it is the seat of an insensible perspiration, which, in the course of twenty-four hours, gives out a very considerable quantity of water vapor, which, added to that emitted from the lungs, represents approximately in twenty-four hours, 1,000 grammes (2½ pounds). Besides, the skin secretes organic matters, several of which have strong smell, while the vapor of water sent out from the lungs is always full of organic matter, the rapid decomposition of which is the cause of that sickening smell noticed in halls where many people are assembled. These substances are a most powerful cause of unhealthiness of habitable rooms, since the simple increase of the carbonic acid gas does not of itself explain the difficulty of breathing such impure air and its injurious effects on the system.

This gas is only a true poison in very large quantities. The larger the quantity, the more difficulty there is in breathing, but this inconvenience only appears when the air contains it in great excess. Pettenhofer was able to breathe for several hours, without inconvenience, air containing $\frac{1}{100}$ part of carbonic acid. Forster remained ten minutes in a wine cellar containing $\frac{1}{100}$, but it is to be remarked that this carbonic gas was not the result of respiration, but had been made by chemical agencies. The vapor of water can scarcely be held accountable for the bad effects, so that it must be the decaying organic matter sent off from the lungs in the act of breathing, and the secretions of the skin held in solution by the vapor of water. Direct experiments have, in fact, clearly demonstrated this: In a closed vessel, animals very quickly perish, even when the carbonic acid gas is absorbed as formed, and the oxygen is replaced as used. Another fact, if the condensation on an ice-water pitcher in a crowded room be taken, this water is almost immediately found to be foul. Finally, Mantegazza showed that if two birds of the same size, weight and species, were placed under two glasses of the same dimensions, and if the carbonic acid gas in one is absorbed by quick lime, and in the other the organic matter by charcoal, the second lives much longer than the first. Hence, it is well established that carbonic acid gas is not the principal cause of the unhealthiness of confined air, but that the organic matter exercises the greater influence. Also, there is another point (although not very agreeable to speak of), that is, the cleanliness of the person. In case one has a suspicion in this direction, as is often the case with servants and workmen, the ventilation ought to be of the most vigorous kind. Unfortunately, filth and poverty are synonymous, and poverty and insufficient living space go hand in hand.

To these first causes of the unavoidable vitiating of the air must be added the artificial lighting by kerosene, gas, etc., as ordinarily used, which send out great quantities of unbreathable gases, some of them highly poisonous. Possibly some method may be devised to utilize the heat from lamps, etc., for ventilation,

*Translated and arranged for THE INLAND ARCHITECT by W. A. Otis.

but, in general, at the present time, all such methods are not practicable, and the poisoning of air from these sources cannot be put down to neglect.

A poor system of heating, bad location of water closets and kitchens, and the access of air from cellar into the house, are all causes of vitiation of the air that are avoidable. If an architect is careful, he will only have to combat unavoidable causes in ventilation, the others being easily recognized, and correspondingly easy to remedy.

ASSOCIATION NOTES.

BROOKLYN INSTITUTE OF ARTS AND SCIENCES.

At the annual election of the Department of Architecture of the Brooklyn Institute the following officers and committees were elected for the ensuing year: President, Mr. Walter Dickson; Vice-President, Mr. Isaac L. Ditmas; Secretary, Mr. Albert L. Brockway; Treasurer, Mr. Gustave A. Jahn. Committee on Current Work—Albert E. Parfitt, William Danmar, R. L. Daus. Committee on Museum and Library—R. M. Upjohn, Barr Ferree, Washington Hull. Committee on Competition and Awards—A. G. Thomson, George L. Morse, George P. Chappell. Committee on Professional Practice—William B. Tubby, Isaac L. Ditmas, Charles T. Mott. Committee on Social Intercourse—James H. Merritt, H. P. Fowler, F. J. Berlenbach, Jr. Committee on Finance and Audit—William Adams, C. F. Edminster, Louis De Coppet Berg. Committee on Exhibition—James H. Merritt, William B. Tubby, George L. Morse, Albert E. Parfitt, Franklin W. Hooper, Barr Ferree. Committee on Architectural School—Louis De Coppet Berg, William B. Tubby, George L. Morse, Professor William H. Goodyear, Professor Franklin W. Hooper. Committee on Collecting Photographs of and Preservation of Colonial Architecture—William Danmar, George W. Wundram, Pierre Le Brun, Albert E. Parfitt.

The department contains one hundred practicing architects and two hundred students in offices and studying architecture. Its annual exhibition of drawings just closed was the most successful it has had.

The Architectural School averaged sixty pupils of advanced grades, meeting five evenings each week, under able teachers. Lectures by Professors Plimpton, Sturgis, Goodyear, and practicing architects were given weekly before the Institute and class. The Advisory Board has monthly meetings of a social as well as business character. Many of its members practice in New York city and reside in Brooklyn. It is in the fourth year of its prosperity.

SKETCH CLUB OF NEW YORK.

The April meeting of the Sketch Club was held on Saturday, May 6, at the Hotel Viano, the club having recently given up its rooms on Forty-second street, with the intention of leasing others in the fall.

After the dinner Mr. James Cantwell, artist, addressed the meeting on the subject of outdoor sketching, referring to his own experience, and offering many suggestions. Mr. Julius Harder, of Chicago, a former president of the club, was present at the dinner and spoke of Chicago and the Fair buildings. The decision on the April competition for a memorial library was made by ballot by the members present, Robert Kendrick receiving first mention, and Charles H. Isreah second. There will be one more meeting of the club before the summer vacation.

KANSAS CITY CHAPTER A. I. A.

At the June meeting of Kansas City Chapter, American Institute of Architects, held June 3, Architect J. O. Hogg read a paper on "Graphical Methods of Finding Strains in Roof Trusses." The gist of his argument was that all forces may be analyzed, and if we know their direction and the amount, we can by a graphical method find their resultants and the manner in which they act upon the different members of a truss. The meetings of Kansas City Chapter have been largely attended the past few months and much interest has been aroused.

NEW PUBLICATIONS.

LOGARITHMIC TABLES, by Prof. George William Jones, of Cornell University; Fourth edition; London, Macmillan & Co.; Ithaca, New York, George W. Jones, 1893. Price \$1.00; sent free by mail.

This is an octavo volume of 160 pages, 6½ by 10, well bound in cloth, and containing eighteen series of tables. These embrace four-place, six-place and ten-place logarithms of numbers from one up to ten thousand, four-place and six-place logarithms of the six principal trigonometric functions, and a five-place table of natural sines, cosines, tangents and cotangents, tables of prime and composite numbers with their factors from 1 to 2,000, tables of squares, cubes, square roots and cube roots, reciprocals and quarter squares, also of Bessel's coefficients and of binomial coefficients, a table of ordinates of the probability curve, probability integrals, etc., and a limited table of weights, measures, and of constants relating to chemistry, physics and engineering. This work is far above the needs of architects or engineers in ordinary practice. It is better adapted to the classroom, laboratory, observatory and for investigators in the higher mathematics. For such uses it is most admirably adapted, being beautifully printed on fine, strong, white paper, in a handsome, round-faced, large type, which it is a pleasure to read. The proportional differences between successive logarithms are given on every page, thus saving the labor of calculating them;

and in the arrangement of the lines and columns and of the various formulæ every possible convenience is provided to facilitate the use of the tables. The price of the book is exceedingly low for a work of such high quality.

NORMAN MONUMENTS OF PALERMO AND ENVIRONS: A study by Arne Dehli, architect, author of "St. Mark's and Venice" and "Ravenna," assisted by T. Howard Chamberlain, architect. Price, \$5. Ticknor & Co., Boston; A. C. McClurg & Co., Chicago.

M. Arne Dehli, architect and author of several works on Italian architecture, with the aid of Mr. T. Howard Chamberlain, has made a study of the Siculo Norman monuments of Palermo and environs, which is being published in Leipsig, London and Boston, in four parts folio, each containing eighteen plates besides sketches inserted in the text. Part I is already in print. The architecture of Sicily is comparatively little known, although the fame of Monreale and of La Martorana almost rivals that of the Alhambra. The portion before us is in paper cover. It contains sixteen pages of text in large type, describing briefly the topography and history of Palermo, and giving a general review of its architecture and monuments. Of the eighteen plates, 14 by 18, three are photo-grain views of the city with its harbor and of its principal buildings, two are photo-grain views of doorways of the cathedral of Monreale, and one is a beautiful photo of clustered columns in its cloister. One set of these columns is covered with an exquisite carved intaglio in quasi Arabesque, while the adjacent set is covered with a zig-zag mosaic of equal beauty. There are, besides, seven engraved plates of mosaic detail in floors, walls, dadoes, pilasters, etc., and four plates of carved foliage on capitals, super capitals, etc., in which the acanthus forms predominate. This work is printed on fine paper, the engraved plates are drawn to scale, and the mosaic patterns are accompanied by full notes as to colors, etc.

PUMPING MACHINERY.—A practical Hand Book relating to the Construction and Management of Steam and Power Pumping Machines, by William M. Barr, member American Society Mechanical Engineers, with upward of Two Hundred and Sixty Engravings covering every essential detail in Pump Construction. J. B. Lippincott & Co., Philadelphia, 1893. Price, \$5.

When an architect or an engineer wants to learn something about pumps it is a satisfaction to know just where to go for the information. This excellent book of Mr. Barr's seems to meet every requirement for a comprehensive reference manual sufficiently free from technicalities for the average reader. The work is an octavo of 447 pages, copiously illustrated with admirable cuts and plates. It is filled with practical information of precisely the kind which a busy man most wants and wants in such shape that he can get it at once without being obliged to read a hundred pages more or less of preceding matter in order to understand it. There are nineteen chapters, embracing pressure pumps, steam and power crank pumps, direct acting steam pumps, duplex pumps, compound direct-acting steam pumps, fire pumps, mining pumps, rotary pumps, centrifugal pumps and high-duty pumping engines, direct acting and with fly-wheels. Six chapters are devoted to the details of pumping machinery, such as water pistons, plungers, valves and seats, air and vacuum chambers, suction and delivery pipes, etc.

The literary quality of the book is of a high order, the dry and technical minutiae of pumping machinery being discussed with a simplicity and intelligence which make a very entertaining volume.

MOSAICS.

JULES F. WAGMAN, formerly with D. H. Burnham, architect, has commenced practice, with offices in room 64 at 70 La Salle street, Chicago.

G. W. E. FIELD, formerly of the firm of Read & Field, architects, of Cincinnati, has opened an office at 12 North Ninth street, Richmond, Virginia, where he will continue practice.

The dissolution of partnership between Bernhard Becker and E. O. Fallis, of Toledo, is announced, each continuing practice, the former at room 37, Chamber of Commerce building, Toledo.

THE Circular of the School of Architecture of the University of Pennsylvania, just received, is a very attractive four-page leaflet, in two colors, describing in brief and comprehensive form the advantages offered by that institution, its faculty, course of instruction and equipment. It is of special interest to note that in addition to the regular four-year course, there is a special course of two years' duration consisting of strictly professional work. More than this, a new departure has been inaugurated in the establishment of a two-year course in interior decoration or interior architecture, to which women are admitted. The profession of interior decoration is a new one, but is steadily increasing in favor, and the course offered appears excellent.

THE Century Company will show in their exhibit at the Columbian Exposition a great number of interesting original manuscripts and drawings for important illustrations in the *Century* and *St. Nicholas*. Manuscript poems by Tennyson, Longfellow, Whittier and Bryant will appear in the *St. Nicholas* exhibit, with the manuscript of the first chapter of "Little Lord Fauntleroy," by Mrs. Burnett, and original stories by other well-known writers. The originals of famous letters and documents quoted in Messrs. Nicolay and Hay's "Life of Lincoln" will be shown, including a certificate of a road survey made by Lincoln in 1834, with bill for his services at \$3 a day, the letter of the committee apprising Mr. Lincoln of his first nomination for the presidency and his reply, the corrected copy of the inaugural address from which he read, March 4, 1861, the original draft of his proclamation calling for

75,000 men, drafts of important messages to Congress, as submitted to the cabinet, Mr. Lincoln's written speech on presenting Grant his commission as lieutenant-general, and the autograph copy, in pencil, of General Grant's reply. Letters from General Grant to the editors of the *Century* regarding his papers for the War Series—the last from Mount McGregor—will be exhibited, with original manuscripts by General McClellan, Joseph E. Johnston and others. The *Century* Company will show also how an illustration is prepared for the magazine, from the artist's drawing to the printed page, by wood engraving and by various photo-engraving processes; how the "Century Dictionary" was made, with copies of the earliest English dictionaries, and manuscripts and proofs of the "Century Dictionary" in various stages. This exhibit, with that of other publishers, will be found in the north gallery of the Manufactures and Liberal Arts building.

THE NEW CATALOGUE OF THE YALE AND TOWNE MANUFACTURING COMPANY.—Ever since the Yale lock became famous, the Yale and Towne Manufacturing Company, of Stamford, Connecticut, has maintained a high reputation for successful innovations on the old order of things. Their latest achievement is in the line of trade catalogues. The ponderous regulation catalogues of lock makers, in which their multifarious products were all depicted of full size, have long burdened and filled up the scanty space architects usually have for such literature, who have nevertheless been reluctant to consign to the waste basket books which have plainly cost so much money and which they may some day wish to consult. By simply showing their wares on a reduced scale, without in the least impairing the value of the cuts, the Yale and Towne Company have compressed Catalogue No. 14 within the limits of a very convenient duodecimo $5\frac{1}{2}$ by 8 and but three-quarters of an inch thick, there are three hundred pages of the finest calendered book paper beautifully printed and embellished by the most artistic cuts that photography can produce, handsomely bound in vellum cloth and leather, in olive green and tuscan red. The result is a volume which for beauty of exterior will not suffer in comparison with any other productions of the bookmaker's art.

BEGINNING with Volume V, the first number of which has been issued, the *Technology Quarterly* will be published by the Society of Arts of the Massachusetts Institute of Technology, under the title, *Technology Quarterly and Proceedings of the Society of Arts*. The *Quarterly* thus becomes an official publication of the Institute. Its character, however, will not be greatly changed, although the publication of all the principal papers read before the Society of Arts will slightly increase the proportion of technical subjects. It is proposed, also, to make the members of the society and the alumni of the institute better acquainted with the progress of the institute in new courses of study, methods of instruction, equipment, etc., and it is hoped, therefore, that it will receive the hearty support of the alumni. In order to make the price of subscription more nearly equal to the cost, and in view, also, of the fact that the membership fee of the Society of Arts is \$5 per annum, the executive committee have placed the subscription price for those not members of the society at \$3 per annum, postpaid. Members of the society will receive the *Quarterly* free of charge. Full sets of the first four volumes, except Vol. I, No. 1, will be supplied to members of the Society of Arts, if they desire, at \$5 for the set. The *Quarterly* will be sent to the present subscribers unless instructions are received to the contrary.

"A TRAVELED Frenchman was asked the other day how the buildings of the Columbian World's Fair compared with those of the last exposition in the French capital. He replied: 'The buildings in Paris were what you might have expected in Chicago; the buildings in Chicago are what you might have expected in Paris.' This is the significant sentence used by Charles Dudley Warner in the *Study* to point a moral to the United States. 'This result,' he says, 'has been reached by the exercise of practical good sense. The genius appropriate to the task was appealed to. Those having the Fair in hand called in experts, not ward politicians, as has been too often the practice of the government when erecting public buildings. As a consequence we have scattered all over our land government buildings, customhouses, postoffices, courthouses, built by first-rate politicians, good story-tellers, able lawyers or brilliant veterinary surgeons—rarely by good architects. Some of these buildings are hideous, some commonplace, nearly every one uninteresting. There are scores of these as alike in architectural negligence as loaves of bread. There was once a man who was architectural boss for the government that will take years and years and conflagrations to recover from. Think of the presumption of this man putting up a federal building in Boston while Richardson was alive! Millions of money wasted that might have gone into works of art that would have been instructive to the people—educated and raised the taste. Alas! Jackson Park shows us too late how beautiful we might have been.'"

OUR ILLUSTRATIONS.

Classical Designs in Furniture, by Stephen M. Wirts, Chicago. Residence for G. Rounsavell, Chicago. Frederick W. Perkins, architect.

House for R. Chester Frost, Chicago. William D. Cowles, architect.

The School, Tippecanoe. Crapsey & Brown, architects, Cincinnati, Ohio.

Bushnell Building, Springfield, Ohio. Shepley, Rutan & Coolidge, architects.

Residence for J. B. Ruhland, St. Charles, Illinois. W. W. Boyington & Co., architects.

Church Tower in Truyes, France, and Old House in Angers. Drawn by John Johnson, Chicago.

Presbyterian Church, Du Bois, Pennsylvania. W. J. East, architect, Pittsburgh, Pennsylvania.

Station at Rockford, Illinois, Chicago & North-Western Railway. Charles S. Frost, architect, Chicago.

Original design for Festival Hall, World's Columbian Exposition, Chicago. Francis M. Whitehouse, architect.

Main Entrance, Transportation Building, World's Columbian Exposition, Chicago. Adler & Sullivan, architects.

Denver Architectural Sketch Club Competition. A village church in the thirteenth century English Gothic style, to seat 350 persons. First-place design by Harvey Pridham.

Metropolitan Opera House, New York; the Propylæum at Munich; Spanish Hall, Imperial Palace, Prague (Figs. 104, 105 and 108), illustrating Chapter VI of article on Direct Methods of Architectural Perspective, by C. E. Illsley.

Photogravure Plate: Residence of D. E. Taylor, Scranton, Pennsylvania. E. G. W. Dietrich, architect, New York. Residence of Thomas E. Jones, Scranton, Pennsylvania. E. G. W. Dietrich, architect, New York.

PHOTOGRAVURE PLATES.

(Issued only to subscribers to the *Photogravure* edition.)

First Presbyterian Church, St. Louis, Missouri. John G. Cairns, architect.

Residence of Dexter Tiffany, St. Louis, Missouri. Grable & Weber, architects.

Residence of Mrs. E. Bent, St. Louis, Missouri. Eames & Young, architects.

Residence of F. W. Humphrey, St. Louis, Missouri. Eames & Young, architects.

Residence of G. E. Sterling, St. Louis, Missouri. Eames & Young, St. Louis, and Rossiter & Wright, New York, architects.

Highland Park Club, Highland Park, Illinois. Pond & Pond, architects, Chicago. An exterior view and view in reception hall are shown.

BUILDING OUTLOOK.

OFFICE OF THE INLAND ARCHITECT,)
CHICAGO, JUNE 15, 1893.)

The usual developments in trade and in financial channels during the past few months have exerted very little effect indeed upon industrial affairs. The productive forces have been even more actively at work during the past five months than during the same time last year. Profits in trade have not been as large, perhaps; but the volume of exchanges as measured by yards, gallons and tons has been greater, and that in face of bank failures all over the world, declining values, and threatening insolvency of vast interests. It is pleasant to take a view of the industrial situation at this time. The mills, shops and factories of the country are, as a rule, crowded. Outside operations are not being checked. House and factory building is if anything more active than last year, not only in the larger cities but in the smaller towns. Building material is in active demand everywhere and for some kinds even fractionally higher prices are paid this year. Brickmakers and lumber dealers report a very good demand in all sections. Planing mills have had no idle days. Carpenters, painters, masons, bricklayers and all classes of skilled workmen connected with the building trades are and have been busy, and according to all indications there will be no cessation in activity until cold weather. One very encouraging feature is the large amount of new work along the lines of most western railroads. Throughout the East the industrial reports are all of a favorable character. A lockout is threatened in the iron trade at Pittsburgh, but so far as known no other labor troubles are threatened. Commercial failures are in excess of last year, but not to an alarming extent. Gold exports to the extent of sixty-five million dollars this year cause alarm to moneyed interests. Financial conditions are unsettled in many quarters of the globe. A liquidation is in progress, but relief from that drastic process may be remote. Railroad building in this country is still at a low ebb, but it is probable that the construction of electric lines will employ a vast amount of capital in the near future. Those who measure national prosperity by the amount of speculation indulged in and enormous individual fortunes built up will not find much to comfort them at this time. The great body of the common people are doing well and are measurably content. There is nothing to cause alarm beyond an unsettled financial system, and in some respects it is to be regretted that such a country and people as this should not have a broad, definite and permanent monetary system.

SYNOPSIS OF BUILDING NEWS.

Architects are invited to furnish for publication in this department monthly or occasional reports of their new work before the letting of contracts. Reports of buildings costing less than \$5,000 are not published.

Chicago, Ill.—Architect W. G. Barfield: For G. Hofman, at Western Springs, a two-story, basement and attic residence, 30 by 54 feet in size; to be of frame construction with stone basement, have hardwood finish, electric light, hot-water heating, etc. For O. Marsh, at La Grange, a two-story, basement and attic frame residence, to have a stone basement, all the sanitary improvements, electric light, mantels, furnace, etc.

Architect D. A. Lapointe: For Mrs. Julia Howe, a three-story and basement residence, 25 by 80 feet in size, to have a stone front, oak interior finish, mantels, electric light, bells, speaking tubes, heating, fine open plumbing, laundry tubs, etc.; cost about \$15,000. For S. H. Warner, on Washington boulevard, a two-story, basement and attic residence, size 25 by 75 feet, to have a handsomely designed front of raindrop stone, hardwood interior finish and mantels, electric light, bells, speaking tubes, heating, laundry tubs, etc.; cost about \$15,000.

Architect George Grussing: For John Collins, at 901 Walnut street, a three-story flat building, 48 by 64 feet in size; to be of stone front, all the sanitary improvements; cost about \$16,000. For Mrs. Johnson, at Sixteenth street and Trumbull avenue, Lawndale, a two-story and basement flat building, 25 by 52

feet, to be of pressed brick and stone front, have all the improvements, and cost about \$10,000. For Albert Koch, at 904 Walnut street, a three-story and basement flat building, 24 by 64 feet in size, to be of stone front, have hardwood finish, the sanitary plumbing, laundry tubs, etc.; cost about \$10,000. For Dennis Considine, on Fulton street near Sacramento avenue, a three-story flat building, 24 by 65 feet, to have a handsome stone front, hardwood finish and mantels, all the sanitary conveniences, laundry tubs, modern heating apparatus, electric bells, speaking tubes, etc.; cost \$10,000.

Architect J. H. Moore: For F. W. Morgan, on Washington boulevard near Kedzie avenue, a two-story, basement and attic residence; size 47 by 75 feet, to have a front of pressed brick and stone, hardwood interior and mantels, electric light, steam heating, the best of open plumbing, etc.

Architect Frederick Ahlschlager: For S. Glickmann, corner of Brown and Fourteenth streets, a four-story and basement store and apartment house, 65 by 100 feet in size; to have a handsome stone front, hardwood finish and mantels, electric light, heating, all the sanitary improvements, electric bells, speaking tubes, laundry tubs, etc.; cost about \$38,000. For S. Meisler, on Fourteenth and Morgan streets, a four-story and basement store and flat building, 50 by 100 feet in size; to be of stone front, have hardwood finish and mantels, the best of sanitary improvements, electric light, steam heating, etc.; cost \$30,000.

Architect Frederick Foehringer: For Louis Grimme, on Adelaide avenue, a two-story and attic frame residence; size 22 by 70 feet; to have a stone basement, all the sanitary conveniences, laundry tubs, bells, speaking tubes, etc. For J. Busan, on Mohawk street, a three-story and basement flat building, 22 by 110 feet in size; to have a front of pressed brick with stone trimmings, bathrooms, closets, mantels, laundry tubs, bells, speaking tubes; cost \$15,000.

Architect Oscar Cobb: Made drawings for finishing hall and making into theater for Steinberg Opera House, at Traverse City. Also, finished drawings for a three-story business block and theater; size 66 by 165 feet; to be erected at Fairbault, Minnesota, for the Fairbault Opera House Company; to be of pressed brick and stone, have steam heating, electric light, etc.

Architects Church & Johnson: For J. A. Sackley, at 1268 Washington boulevard, a two-story, basement and attic residence; size 27 by 61 feet; to have a stone front, hardwood interior finish, mantels, heating, the best of sanitary improvements, etc.; cost about \$15,000.

Architect Simeon B. Eisendrath: For Henry Wittekind, on Twenty-fourth place, a three-story and cellar flat building, 22 by 71 feet in size; to be of pressed brick and stone front, have all the sanitary plumbing, etc.

Architect W. K. Johnson: Has completed drawings for the Ottawa county courthouse, to be erected at Grand Haven, Michigan. It will be two stories and basement, 72 by 100 feet in size, of stone basement and first story, and above of stock brick with stone and terra cotta trimmings. Will put in electric light, steam heating, plumbing arrangements, and all conveniences; cost about \$50,000.

Architect E. J. Ohrenstein: For D. G. Swartz, remodeling house and adding one story; new plumbing, etc., at Polk street near Halsted. For Mrs. Mary Williams, on Thirty-sixth street and Parnell avenue, a three-story and basement store and flat building, 41 by 70 feet in size, to be of light colored pressed brick, with stone trimmings on two sides; have hardwood finish and mantels, all the sanitary conveniences, electric bells, speaking tubes, laundry tubs, etc.; cost about \$15,000.

Architect George Beaumont: For B. Harris, at 450 Marshfield avenue, a three-story flat building, 26 by 72 feet in size, to be of stone front; hardwood finish and mantels, steam heating, electric light, all the plumbing specialties, etc.

Architect L. G. Hallberg: For Charles Lindeel, on Newport avenue near Halsted street, a three-story flat building, 25 by 60 feet in size; to have a front of Bedford stone, all the sanitary improvements, bells, tubes, etc.

Architect Arthur C. Morey: For W. N. Hinrich, at Areyle Park; a three-story store and apartment house, 50 by 66 feet in size; to be of pressed brick and stone front; have all the sanitary improvements, oak and pine finish, steam heating, electric light, etc.; also preparing drawings for North End Masonic Temple, to be erected at 615 and 617 Clark street; it will be four stories, basement and attic, and 50 by 152 feet in size; to be of stone and pressed brick; have hardwood finish, tilework, marble and mosaic work, electric light, steam heating, iron store fronts, billiard room, bowling alley, clubrooms, etc.

Architect J. T. W. Jennings: For the University at Madison, Wisconsin, a three-story and attic horticultural building, 60 by 75 feet in size; to be of light colored pressed brick, with brick and Waukesha limestone trimmings; there will be also six greenhouses of glass and iron construction.

Architects Bauer & Hill: For Joseph Rosenberg, on the southeast corner of Cottage Grove avenue and Twenty-eighth street, a four-story store and flat building, 88 by 95 feet in size; to be of stone, terra cotta and pressed brick front, have hardwood finish and mantels, all the sanitary improvements, etc.; cost about \$40,000.

Architects Kley & Lang: For Ferdinand Sczuck, on the southeast corner of Division and Paulina streets; a three-story store and flat building, 25 by 100 feet in size; to be of pressed brick and stone on two sides; have hardwood finish and mantels, all the sanitary improvements, etc. For Joseph Derosa, at 227 North Center avenue, a three-story and basement flat building, 25 by 60 feet, to be of pressed brick and stone front; have all the sanitary improvements, etc. For Julius Schult, on Leavitt street near Milwaukee avenue, a two-story and basement store and flat building, 104 feet front; to be of St. Louis pressed brick and stone front; have all the sanitary conveniences, etc.

Architect L. C. B. Bourgeois: Made plans for railway station, to be erected on One Hundred and Fifteenth street, opposite to entrance to Mount Hope cemetery. For C. W. Spaulding, at Edgewater, two two-story, basement and attic residences; to be of frame with stone basements, have hardwood finish and mantels, the best of sanitary improvements, laundry tubs, electric light and hot-water heating.

Architect E. H. Turnock: Made plans for Congregational Church; size 60 by 80 feet; to be erected at Sheffield, Illinois; Rev. A. W. Ackermann; to be of frame with stone basement, have stained glass windows, electric light, etc. Also made plans for M. E. Church; to be erected at Downer's Grove; to be of frame with stone basement, have stained glass windows, electric light, furnace heating, plumbing, etc.

Architect E. Clark: For Richard Blackburne, on Humboldt boulevard, north of North avenue, a three-story apartment house; size 22 by 50 feet; to be of frame, have all the sanitary improvements, mantels, electric light, bells, speaking tubes, etc. For Oliver Poyer, at corner of Mead and Cortland streets, a two-story frame flat building; bathrooms, closets, mantels.

Architect A. Druiding: Made plans for a Catholic Church; size 47 by 108 feet; to be erected at Deerfield, Michigan; it will be constructed of pressed brick and stone, have slate roof, stained glass windows, heating, gas fixtures, etc. Also making plans for a Catholic Church; size 45 by 105 feet; to be built at Clintonville, Wisconsin; to be of local brick with stone trimmings, have hardwood finish, gas fixtures, pews, furnace heating; cost \$20,000. Also making drawings for a R. C. Church, to be erected at St. Henry, Ohio; it will be 68 by 103 feet in size; of pressed brick and stone with slate roof, steam heating, hardwood finish, gas fixtures, sanitary plumbing, etc.; cost about \$50,000. Also getting out drawings for a church; size 50 by 125 feet; to be erected at Odin, Kansas; to be of stone all round with slate roof, have hardwood finish and pews, stained glass windows, gas fixtures, steam heating and sanitary arrangements; cost \$35,000.

Architects Thomas & Rapp: Preparing drawings for a two-story and basement school; size 88 by 72 feet; to cost about \$30,000; it will be constructed of buff pressed brick and have sanitary conveniences, heating, etc.; location, Oak Park.

Architect James Burns: For J. P. Nelson, on Ashland avenue and Erie street, a three-story store and flat building; size 48 by 54 feet; to be of pressed brick and stone front, have bathrooms, closets, mantels, washbowls, electric wiring, etc.; cost about \$13,000.

Architect Joseph Bettinghofer: For Edward Harbester, at 359 North avenue, a three-story and basement store and flat building, 25 by 76 feet in size; to be of pressed brick and stone front, wrought-iron store front, brick bay windows, copper cornice, cypress finish for interior, bathrooms, closets, mantels, skylights. For Frank Deppe, at 1163 North Clark street, a three-story and basement flat building, 25 by 76 feet in size; to be of stone front, bay windows

and portico, have copper cornice, oak finish throughout, electric wiring, heating, the modern sanitary improvements, bells, speaking tubes, etc. For John Adler, on Woodside avenue, near Grace street, a frame house, 22 by 58 feet in size; to have sanitary plumbing. For G. Joelten, corner North avenue and Town street, a four-story and basement store and flat building, size 22 by 90 feet; to cost \$15,000; it will have two fronts of pressed brick and stone, cypress finish, bathrooms, closets, mantels, etc. For John Albeck, on Graceland avenue, near Clark street, a two-story frame flat and store building, size 22 by 92 feet; to have brick basement, cypress finish and sanitary plumbing.

Architect Henry Ives Cobb: For the Dime Savings' Bank, Cleveland, Ohio; a ten-story attic and basement, with sub-basement office building; it will front 70 feet 8 1/4 inches on Euclid avenue, and 205 feet 8 1/4 inches on Bond street; the first two stories will be of stone and above of Roman pressed brick to the seventh story, and the remainder of terra cotta; it will be entirely fireproof, of steel construction with steel rail footings; the first floor will be used for banking purposes; will put in marble, tile and mosaic work, electric light, elevators, etc.

Architect A. Druiding has completed plans for the buildings to be erected at Cincinnati, Ohio, for St. Joseph's Convent; the total frontage will be about 400 feet; they will be constructed of pressed brick and stone, have the best of sanitary improvements, heating, lighting, etc. He has also completed drawings for the Polish church, to be erected on Carpenter street; it will be 175 feet long by 102 feet front, with transept 110 feet long; there will be a school in the basement.

Architects Ostling Bros.: For Mrs. Berry, at Deming Court, near Larrabee street, a three-story and basement flat building, 27 by 80 feet in size; to be of stone front, have all sanitary improvements, steam heating, and cost \$16,000.

Architect J. J. Egan has just let contracts for the new wing for the Chicago Industrial School, to be built on Forty-ninth street and Indiana avenue; it will be five stories, 110 by 60 feet in size, of pressed brick with stone trimmings. Also just let contracts for the new wing to be built to Mercy Hospital, on Twenty-sixth street and Calumet avenue; it will be four stories and basement, 90 by 150 feet in size, of stone for the first story and Roman tile and terra cotta above. Also preparing plans for parochial residence; two-story, basement and attic, 20 by 60 feet in size; to be of pressed brick and stone front; to be erected at Clinton, Iowa.

Architects Faber & Pagels: For Lorman P. Shriver, at Sheridan Park, a two-story, basement and attic residence, 22 by 48 feet in size; to be stone front, have hardwood finish, etc.

Architect Cass Chapman: For Mr. Hopson, at Park row near Illinois Central station, four-story store and flat building, 25 by 120 feet. Also finishing drawings for Grace Reformed church, 56 by 100 feet in size, to be erected at Fort Wayne, Indiana. Also completed plans for a three-story store and flat building, 23 by 62 feet in size; to be erected on Emerald avenue and Thirty-second street. Also made plans for Allen F. Murray, at 326 Oakwood boulevard, for a two-story stable, 23 by 40 feet; to be of pressed brick and stone, have sanitary plumbing, living rooms, etc.

Architects Lamson & Newman: For J. Y. Gavitt, on the southwest corner of Jackson boulevard and Whipple street, two two-story residences, 50 by 72 feet in size; to be of stone front, have hardwood finish and mantels, steam heating, electric light, etc.; cost \$20,000.

Architects Flanders & Zimmerman: Have just commenced work on the four-story apartment house, 50 by 85 feet in size; to be erected at Indiana avenue, south of Thirty-ninth street, for J. O. Malley, first story to be of stone and above to be of buff pressed brick and stone; will put in steam heating, electric light, the best of sanitary and modern conveniences.

Architect Robert C. Berlin: For M. R. Kelley, on School street near Clark, a three-story flat building, 22 by 52 feet in size, to be of pressed brick and stone front, have all the sanitary plumbing, mantels, heating, etc.

Architects Dixon & Brooks: For William Snyer, on Jackson avenue near Fifty-sixth street, two three-story and basement residences, 37 by 60 feet; to be of stone front, have hardwood finish, electric light, heating, etc.

Architect J. E. Schiller: For R. H. Stearns, at Berwyn, a two-story basement and attic residence, 27 by 45 feet; to have a stone basement and the remainder of frame, have hardwood finish and mantels, electric light, laundry tubs, furnace, etc.

Cincinnati, Ohio.—Reported by Lawrence Mendenhall: The skies have been unusually leaky this spring, and the month of May will certainly go down in weather history as one of the most rainy months for years. As a result trade in most every branch has been delayed, but with a good prospect later on. Cincinnati architects are securing in addition to city work their full share of outside business. The Cincinnati man is bound to be heard from. Although the buildings now in process of erection are not skyscrapers, or palaces, yet several large office and store buildings, and many beautiful residences will adorn Cincinnati and her suburbs. The Phoenix Club building will also be an edifice of which all Cincinnatians can well be proud, while the Rawson, Kittredge, Specker, Carothers, Whitman and Barnes buildings, and Shoemaker, Goepfer, Segal, Chatfield, Lawson and Doctor Davis' residences, together with several beautiful churches, will also speak well for Cincinnati, and her citizens.

Architects Des Jardins & Hayward have prepared plans for a residence for Mr. Jacob Fecheimer, Cincinnati; materials: pressed brick, slate roof, furnace, hardwood, grates, mantels, stained glass, blinds, etc.; cost \$12,000. For Dr. D. W. Clancy, Seventh and John streets, Cincinnati, a residence; materials: pressed brick, slate roof, grates, mantels, stained glass, blinds, etc.; cost \$5,000. For Mr. Isaac Winkler, Cincinnati, a residence; materials: brick, slate roof, furnace, grates, mantels, gas, plumbing, etc.; cost not given.

Architect Emil G. Rueckert has prepared plans for the Butchers' Hide Association for a large warehouse; size 75 by 130 feet; two stories high; materials: common brick, tin roof, elevators, cement floors, gas and plumbing; cost \$18,000.

Architect Nash & Plympton can give information concerning a theater; materials: brick, terra cotta, furnace, scenery, chairs, frescoing, etc.; cost not given.

Architects Rieg & Marty have prepared plans for Mr. Harry L. Sunderbruch, florist, Cincinnati, Ohio; materials: pressed brick, slate roof, furnace, grates, mantels, oak and pine finish, stained glass, etc.; cost \$10,000.

Architect Henry E. Siter has been authorized to prepare plans for a public school; address Jacob E. Cormany, Board of Education of Cincinnati; cost to be \$75,000.

Architect S. S. Godley has drawn plans for a large hotel at Connersville, Indiana, for the McFarlan Building Company; materials: glazed rock, face brick, terra cotta, stone, iron, tin roof, elevators, grates, mantels, etc.; cost \$85,000. Residence for Mr. W. L. Hunt, care of Fleischman Yeast Company, Cincinnati; materials: pressed brick, slate roof, furnace, hardwood, grates, mantels, stained glass, etc.; cost not given.

Architects Crapsey & Brown report: For the Baptist Congregation at Dayton, Kentucky, a church edifice; materials: brick, stone trimmings, slate roof, pine finish, gas, pews, stained glass, etc.; cost \$12,000.

Architects Dittoe & Wisenall report: For the Christian Congregation at Covington, Kentucky, a church edifice; materials: brick or stone, slate roof, hardwood, stained glass, pews, gas, plumbing, furnace, etc.; cost \$20,000. Also, houses for Bradford Shinkle, Esq., Covington, Kentucky; materials: pressed brick, slate roof, gas, plumbing, furnace, pine finish, etc.; cost \$20,000.

Architect G. W. Drach reports: For Dr. J. M. Ratliff, Clifton (Cincinnati), Ohio, a residence; materials: frame and plaster, shingle roof, furnace, glass, gas, plumbing, wood mantels, etc.; cost \$6,000. Also, for Edward Hart (Fifth near Walnut), Cincinnati, five frame houses; materials: frame, shingle roof, furnace, glass, gas, plumbing, grates, mantels; cost \$18,000.

Architect G. W. Rapp has prepared plans for a boiler and water house for Cincinnati Gas Company; it will be three stories high and occupy a space 55 by 135 feet; cost not given.

Architect W. C. Lawrence has prepared plans for the African M. E. Church on Walnut Hills, Cincinnati; materials to be brick, stone, slate roof, pine finish, pews, organ, etc.; cost \$6,000.

Architect E. H. Moorman (Glenn building) is one of the new young architects of which our craft can be proud. He has lately opened an office and already has his time well employed. He has prepared plans for residences

for Mr. E. Jones, Mr. P. Langdon and Mr. H. Smith, who can be reached care architect.

Cleveland, Ohio.—Architects Shengle & Dalman report: A stone, brick and terra cotta Odd Fellows' Temple at Canton, Ohio, 45 by 113 feet, four stories high, fitted for store rooms, offices and lodge rooms; slate and tin roof; cost, \$35,000; the main lodge room will be two stories high. J. W. Dalman withdraws from the firm June 17, to assume the duties of City Building Inspector, to which office he has just been appointed. Mr. Shengle will continue the business.

Architects Lehman & Schmidt report as follows: Tifereth Israel Congregation Temple, 100 by 150 feet (auditorium is 76 by 76 feet), to be built of stone in the Romanesque style, slate roof; cost, \$75,000. For Hubbard Cooke, a five-story manufacturing block of brick, 50 by 160 feet; cost, \$14,500.

Architect Arthur N. Oviatt reports: A stone and frame residence, 40 by 72 feet, covered with slate, for W. H. Quayle, on Euclid avenue; cost, \$10,000. For H. D. Burner, on Euclid avenue, a frame residence, 40 by 60 feet, finished throughout in hardwood, heated by steam and very thoroughly equipped with electricity; cost, \$16,000; stable for same to cost \$3,000. For J. J. Purcell, a frame residence, on Bolton avenue, 60 by 36 feet, hardwood finish, slate, furnace heat; cost, \$6,000. Mr. Oviatt is also preparing plans for a stone and frame house for himself, 36 by 55 feet; cost, \$5,000.

Architect J. N. Richardson reports: A one-story brick and cut stone engine room for the Cleveland City Cable Company, iron roof trusses; cost, \$10,000. For W. C. North, a frame residence, 40 by 50 feet, slate roof and furnace heat; cost, \$5,000. For the Cleveland Wheel Club, an addition of one pressed brick story to their recently leased building on Huron street, between Prospect and Euclid; to cost \$6,000; the Cleveland Wheel Club have a five-year lease of the building, which for years has stood in an unfinished state; it was originally intended for an apartment house and two stories finished in stone; a gravel roof is now being placed upon the addition, to be removed at the expiration of the lease, and three stories added, the whole to be used for an apartment house.

For the Cleveland Yacht Club, a frame clubhouse, to be three stories, 72 by 100 feet, with dock 82 by 110 feet; cost, \$12,000; the structure will be placed twenty-five feet from the shore to the rear of the building; the first floor will be used for storage purposes, second for billiard rooms, ladies' and gents' parlors, committee rooms, etc.; third floor will be used for a large amusement hall, and an observatory will surmount the structure; a private breakwater will be built about 200 or 300 feet from the shore and 700 feet long, at an estimated cost of \$1,000 to \$2,000.

Architect B. F. Van Develde reports: A brick and cut stone addition to the Convent of the Good Shepherd, at the corner of Stirling avenue and Sibley street, 72 by 192 feet; to cost \$80,000; four stories and finished basement, slate roof, Gothic style.

The Garry Iron and Steel Roofing Company, of Cleveland, Ohio, have largely increased their capacity by adding a 150 horse-power engine and several other machines necessary to improve and expedite their work as the rapid increase of business demands it.

Architects Colburn & Barnum report: A frame residence for P. J. McMyler, at Lakewood, Ohio, 44 by 61 feet; to cost \$10,000. Additions to summer cottage for W. H. Gaylord, at Collamer, Ohio; cost, \$6,000. A four-story pressed brick, cut stone and terra cotta block at corner of Pearl and Carroll streets, for Mr. George W. Merrell, 60 by 124 feet, steam heat, electric elevators and electric light. For Professor F. M. Comstock, of Case School of Applied Science, a modern frame and shingle residence, 32 by 50 feet; to cost \$5,500.

Architect Henry Ives Cobb, of Chicago, through his representative, William Knox, reports: The Cleveland Syndicate Building, to be built on Euclid avenue, Bond and Vincent streets, 71 by 205 by 47 feet on ground, basement and eleven upper stories, ten stories finished for stores, banks and offices, the top one for tanks, etc., and a photograph gallery at the Vincent street end; the first and second stories will be of Berea gray sandstone, six stories above of Roman buff brick, the three top stories and cornice to be of most elaborate terra cotta, highly decorative; the style and construction of the building will be similar to the Hartford Building, Chicago.

Denver, Colo.—Architects Lang & Pugh: For C. J. Kinna, a two and one-half story stone and brick residence, size 33 by 42 feet; cost \$10,000.

Architect F. E. Kidder: For Hebard & Wiggins, a two-story business block, stone and brick, size 26 by 119 feet; cost \$8,000.

Architect E. C. Greaser: For C. S. Anderson, a two and one-half story dwelling, stone and brick, size 32 by 50 feet; cost \$16,000; contractors, Coe Bros.

Architect D. W. Orr: For Thomas Ryan, a two-story brick terrace, size 32 by 125 feet; cost \$10,000.

Architect C. Drayer: For R. Treen, a two-story house, size 25 by 49 feet; cost \$5,000.

Architects Bartlett & Pettie: For Emma Cox, a two-story dwelling, brick and stone, size 27 by 36 feet; cost \$5,000.

Architect William P. Feth: For J. D. Persing, a two-story dwelling, size 32 by 40 feet, brick and stone; cost \$5,000. Also for M. Milkorn, a two-story stone dwelling, 37 by 37 feet, cost \$7,000.

Architect F. E. Edbrooke: For Daniels and Fisher, a one-story addition to business block, stone and brick, size 125 by 175 feet; cost \$25,000.

Architect J. J. Huddart: For J. Milheime, a two-story brick residence, size 41 by 54 feet; cost \$10,000.

Detroit, Mich.—Architects Malcomson & Higginbotham: For the St. Joseph Protestant Episcopal church, size 72 by 120 feet; stone, Romanesque order, interior red stone; cost \$40,000. For W. S. Stapleton, a two-story residence, stone and brick; cost \$18,000. For George E. Wasey, a two-and-a-half-story stone residence; cost \$15,000. For R. L. Webb, a two-story brick double residence; cost \$6,000.

Architect A. E. French: For H. Williams, a two-story brick house; cost \$5,000. Also F. H. Jerome, a two-story frame house; to cost \$5,000.

Architect G. W. Lloyd: For N. Flattery, a three-story double residence, size 44 by 100 feet, Ashland brownstone and brick; cost \$20,000. For D. Match, a three-story brick building; cost \$22,000.

Architect George W. Myers: For W. W. Smith, a two-story frame house; cost \$5,000. For George E. Frothingham, a two-story frame clubhouse; cost \$5,000.

Architect J. E. Mills: For A. Grosfield, a block of three-story brick stores and flats; cost \$12,000.

Architect F. J. Shefferley: For Capt. W. H. Stevens, a cobblestone residence; to cost \$10,000.

Architect George C. Oldfield: For W. G. Newton, a two-story brick residence; to cost \$7,000.

Architects C. Varney & Co.: For John P. Kerscht & Co., a block of six three-story brick store and flat buildings, pressed brick and brownstone; cost \$30,000. For W. W. Hannam, a three-story brick double residence; to cost \$12,000.

Architect William Joy: For Andrew S. Nelson, a two-story frame residence; to cost \$6,000.

Architects Donaldson & Meier: For the Tarrant & Vosey Organ Manufacturing Company, a two-story brick addition.

Architect Thomas Hyland: For L. S. Rogers, a two-and-a-half-story brick house; to cost \$6,000.

Architects E. A. Walsh & Son: For George Smith, a two-story brick residence; cost \$5,000. For William May, a two-story brick dwelling; cost \$5,000.

Architect E. E. Myers: For Rev. D. M. Cooper, a brick and stone residence; to cost \$20,000.

Architect E. C. Van Leyen: For Mrs. Joseph Holbrook, two two-and-a-half-story brick residences; to cost \$16,000. For John Walsh, additions and improvements to residence; cost \$5,000.

Architects Spier & Rohms: For Frederick Toepel, a two-story brick residence; cost \$6,000.

Architect H. J. Rill: For the St. John's German Catholic Society, a two-story parochial residence; cost \$6,000.

Architect John W. Coghlan: For Shattuck & Davis, a two-and-a-half-story brick residence; cost \$10,000.

Architect W. D. Butterfield: For Valpey & Co., a four-story brick block; to cost \$18,000. For Shattuck & Dans, a two-story brick double residence; to cost \$12,000. For the Congregational Society, of Wyandotte, a \$10,000 brick church.

Architect T. J. Frenier has opened an office at No. 29 Whitney Opera House block, for the practice of his profession, and starts out with a number of orders for residences and other buildings.

Kansas City, Mo.—Architects Gunn & Curtiss: For Tarrant county, Texas, a courthouse at Fort Worth, 230 by 150 feet, three stories and basement, with clock tower 200 feet high; to be built of Texas granite and limestone in the Renaissance style; cost \$400,000.

Architects Matthews & Sanders: For the Masonic Building Association, at Warrensburg, Missouri, a Masonic hall, stores and offices, 92 by 50 feet, of brick and stone, three stories; to cost \$20,000.

Architect L. G. Middaugh: For J. J. McPherson, a brick and brownstone residence at the northwest corner of Elma and Prospect avenues, two stories with interior finished in hardwood; to cost \$12,000.

Architect Walter C. Root: For the House Realty Investment Company, a brick residence, at Wabash and Independence avenues, two stories and basement, with slate roof; to cost \$8,000.

Architect G. M. D. Knox: For Thomas Green, flat houses at Eleventh and Wyandotte streets, 38 by 60 feet, three stories, of pressed brick and stone; to cost \$20,000.

Architects Van Brunt & Howe: For Drury College, at Springfield, Missouri, a girls' dormitory, 140 by 100 feet, two stories high, of brick; to cost \$25,000. For the University of Kansas, at Lawrence, a library building with a capacity of 140,000 volumes; to cost \$70,000. For Chancellor Snow, of the Kansas State University, a residence at Lawrence, Kansas, of brick, two stories; to cost \$9,000.

Architect W. F. Hackney: For the city of Pittsburg, Kansas, a high school building of pressed brick and cut stone, two stories and basement, and having ground dimensions 63 by 88 feet; to cost \$25,000.

Architects Vrydagh & Shepard: For Christ M. E. church of Allegheny City, Pennsylvania, a parsonage, two stories, attic and basement, of brick; to cost \$15,000.

Architect L. G. Middaugh: For the Sisters of St. Joseph, a brick addition to the hospital at Pennsylvania avenue and Seventh street, three stories, 60 by 60 feet, of brick; to cost \$8,000. For the Logans Memorial Church Society, a brick and stone church at Twenty-second street and Prospect avenue; to cost \$20,000.

Architect G. M. D. Knox: For the Loose factory of the American Biscuit and Manufacturing Company, a five-story brick building at Second and Main streets, 60 by 142 feet, of brick; to cost \$45,000.

Architect F. B. Hamilton: For Mitchelson & Hibbard, a three-story brick business block, at 308 Delaware street; to cost \$8,000.

Louisville, Ky.—Architects Drach & Thomas report as follows: Addition to the Hospital College of Medicine; to be three stories high; pressed brick, stone and terra cotta trimmings, slate roof; situated corner of Preston and Chestnut streets; cost \$35,000. Block of seven houses for the Home Investment Company; to cost \$30,000; brick, stone trimmings; situated corner of First street and Burnett avenue. Block of three houses, frame, for William Porter; to cost \$9,000; situated in South Louisville. Residence for William L. Lyons; to cost \$6,000; brick with stone trimmings, metal roof; First street near Oak. Residence for Harry Lyons; cost \$5,000; brick, stone trimmings; First and Ormsby streets. Brick residence for J. B. Pirtle; cost \$6,500; corner of First and Ormsby streets. Residence for Mr. William Porter; to cost \$6,000; brick with stone trimmings. Stable for the Cave Hill Cemetery Company; brick with stone trimmings, slate roof; to cost \$10,000; situated corner of Dulaney street and Douglas place. Three dwellings for John Doerhoefer, Third and B streets; cost \$15,000. Residence, I. I. Sweeney, Owensboro; cost \$7,500. Public Schools, Owensboro, eight-room house; cost \$9,000. Hodge Tobacco Company, Henderson, four-story factory, 60 by 150 feet in size; cost \$18,000.

Milwaukee, Wis.—Architect J. J. Egan, of Chicago: For the St. Patrick R. C. Society, a one-story church building; size 70 by 140 feet; brick and stone; to cost \$75,000.

Drs. Alberts & Junge have purchased a site and are having plans prepared for a four-story medical college.

Architect C. F. Ringer: For Mrs. E. Peters, a three-story building; size 22 by 90 feet; stone and terra cotta; cost \$10,000.

Pittsburgh, Pa.—Architect B. P. Little: For the school district of Homestead, a three-story brick school building.

Architects Barberger & East have also prepared plans for the new Nineteenth Ward School.

Portland, Ore.—Architects Ellicott & Lazarus: For William M. Ladd, a two-story club house, for "M. A. A. C."; size 60 by 100 feet; concrete, brick and frame, steam heated; cost \$35,000.

Rochester, N. Y.—Architect William Walker is drawing up the following plans: A dwelling house for Mrs. A. E. Woodbury, East street. Alterations to house for Hon. Charles S. Baker, Lake avenue. Two houses for Dean Alvord, Rutger street; cost \$9,000. Alterations to residence of Dr. Hayward, East avenue. Block of stores and offices on East avenue; cost \$20,000. House for John H. Kinne, on Frank street; cost \$5,000.

Architects Nolan, Nolan & Stern have completed a building for Messrs. Garson & Kemgood, on Clinton street; cost about \$9,000. For Louis Maier, a three-story brick block; cost about \$7,500; and for the Eureka Club Society a club building costing about \$100,000 when all completed; latter is finished in the most modern way; front of building on Clinton street is of buff, terra cotta and brick of like color, three stories high, with theater hall in back of building; the front facade is of the character of the Century Club, New York. They also completed plans and began building operations for a six-story clothing manufactory for Messrs. Michaels, Stern & Co., to cost about \$75,000.

Architects A. J. Warner & Co.: A new building for the Infants' Orphan Asylum, to be erected on Clifton street; cost \$25,000.

Extended alterations to the Cook Opera House, on Saint Paul street, W. J. Brockett, superintendent-architect.

St. Louis, Mo.—Architect J. B. Schaefer: For the Tin Foil and Metal Company, a two-story factory; size 92 by 113 feet; brick and stone; cost \$75,000. Mrs. S. A. Thager will build a two-story brick residence, on Morgan and Sarah streets; to cost \$8,500.

Architects Jas. Stewart & Co.: For the Ravenswood Distillery Company, a seven-story warehouse; brick and iron; cost \$15,000.

Architect G. W. Heimbarger: For R. N. Denham, Fort Worth, Texas, a two-story flat building; size 22 by 80 feet; brick and stone; cost \$5,000.

Architects Jungeneid & Co.: For the Lungstras Dyeing and Cleaning Company, a four-story brick factory, size 39 by 40 feet; to cost \$13,000.

Architects Beinke & Wees: For S. Bowman, a three-story brick and stone flat building, size 48 by 96 feet; to cost \$20,000. Also for Mrs. Laumeier, a two-story residence, size 34 by 60 feet, brick with stone foundation; to cost \$18,500.

Architects P. F. Meagher & Son: For George Pinkel, a two-story brick store building, size 42 by 52 feet; to cost \$16,000. For the Rev. Joseph Shields, a two-story Catholic church, brick, stone foundation, size 40 by 109 feet; to cost \$15,000.

Architect W. A. Swasey: A two-story residence, brick and stone, size 32 by 61 feet; to cost \$14,000.

Architects Grable & Weber: For John F. Yeager, a three-story store and flat building, size 32 by 65 feet, brick and stone; to cost \$18,000.

St. Paul, Minn.—Architects Buechner & Jacobson report plans for a brick addition to Bethesda Hospital, on Ninth and Wacanta streets; it is to be four stories high, 55 by 55 feet, and fitted with all modern conveniences; to cost about \$25,000.

Architect George Bergmann reports plans for a frame dwelling on Bellows street, between Delos and Bluff streets, for George Michel; it will cost \$5,000 and have all conveniences.

Architects Herman Kretz & Co. report plans for a two-story pressed brick and stone store building, 60 by 80 feet, on West Seventh and Warsaw streets; Frank Machiavee is the owner.

Herbert G. House, of Chicago, will have plans drawn for two apartment houses, to be 60 by 333 and 80 by 330 feet, respectively, on Woodward and Partridge streets; they will be of stone and brick, four stories high and fitted with all hotel conveniences.

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STEAM HEATING—RETURN TO BOILER.

PLATE X.

BUILDING

For
THC: 0.000000

O. H. CLOON
N.W. Corner Webster Avenue, by 35TH St.
CHICAGO ILL. 9016

SHEET No. 26.

BASEMENT-PLAN

SHOWING

STEAM-FITTING

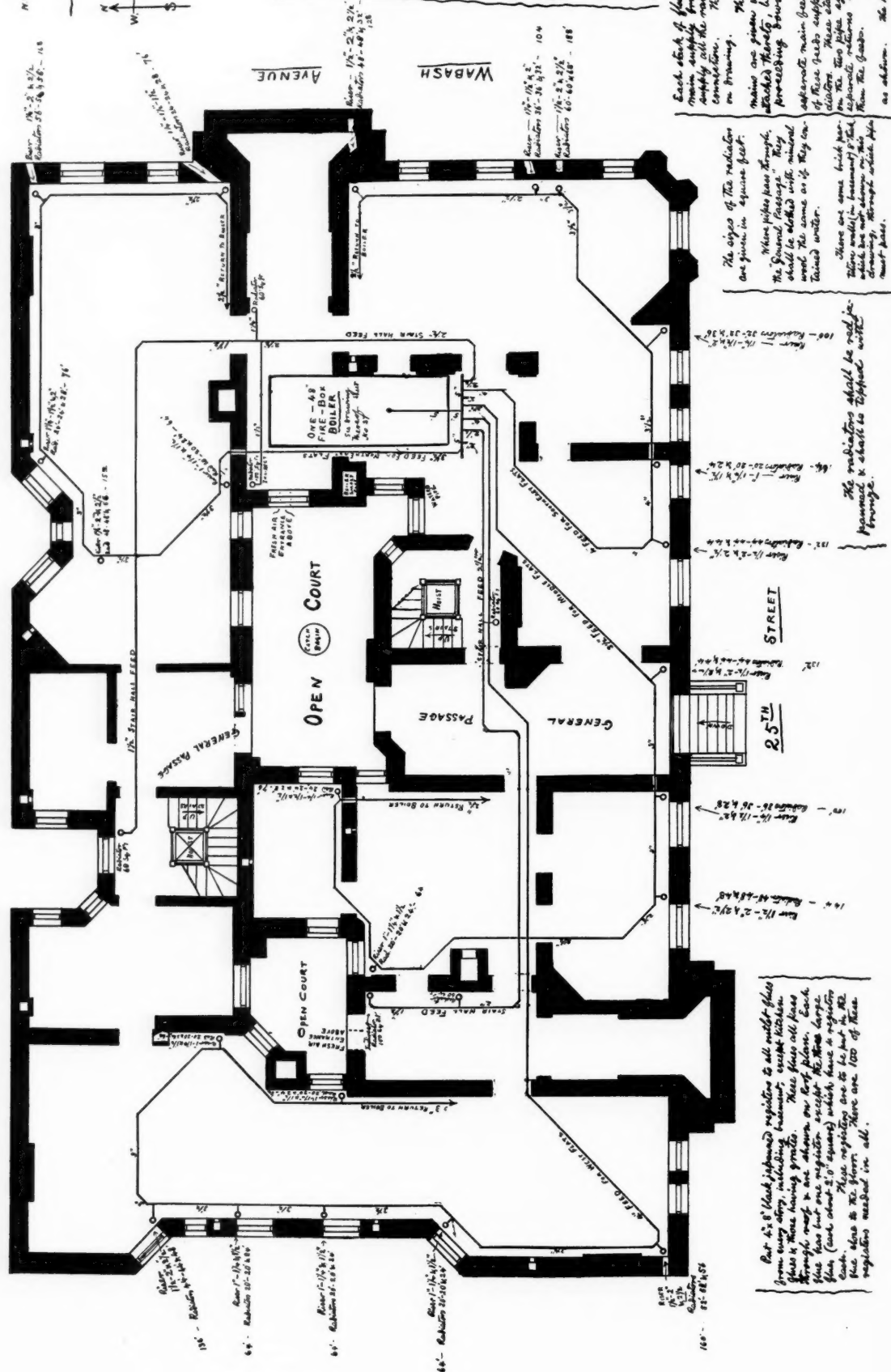
SCALE $\frac{1}{4}"$

W. J. D. ...

VILLEYT W FASLEY
ARCHITECT

107 DEARBORN STREET
CHICAGO, ILL.

CHINESE

[illegible]

The signs of the radiation
are given in square feet:

"Where pipes pass through
the General Passages" they
shall be clothed with mineral
wool the same as if they con-
tained water.

There are some high places
below walls in basement of the
building which are not shown on the
drawing. Through article of
must be filled.

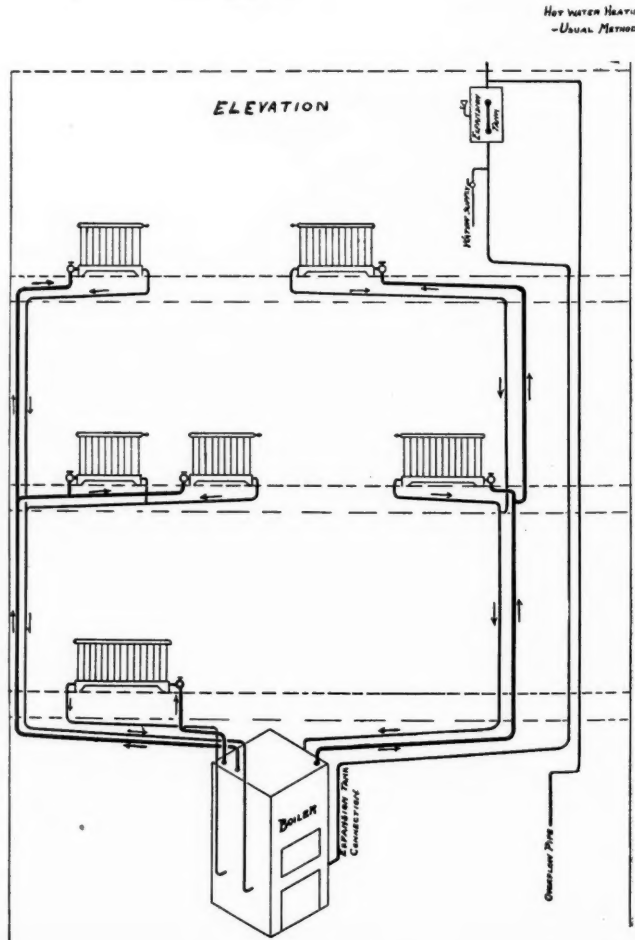
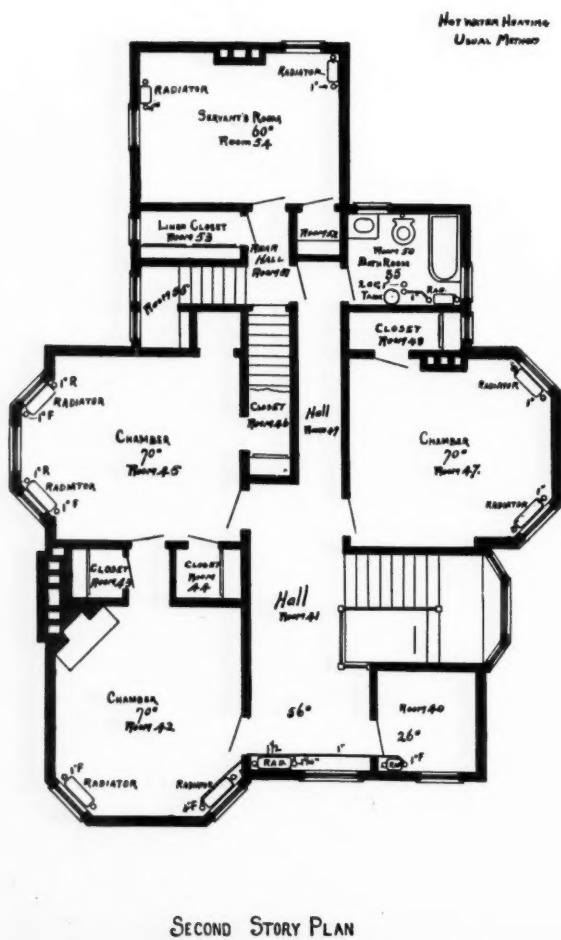
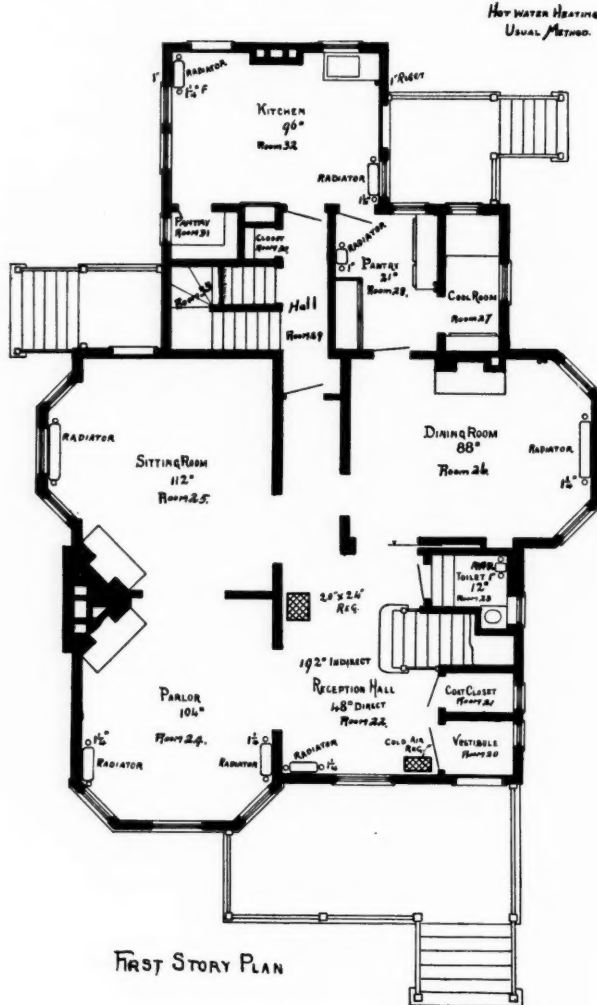
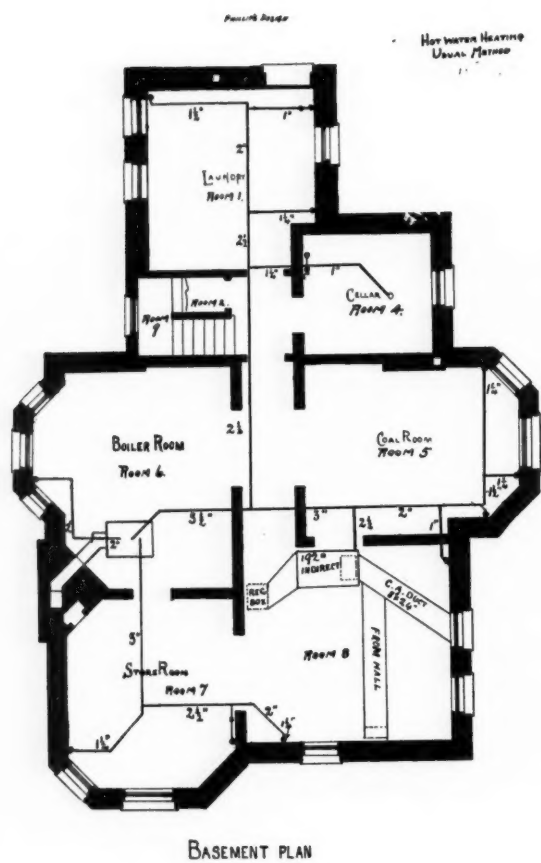
The radiators shall be red painted & shall be tipped with bronze.

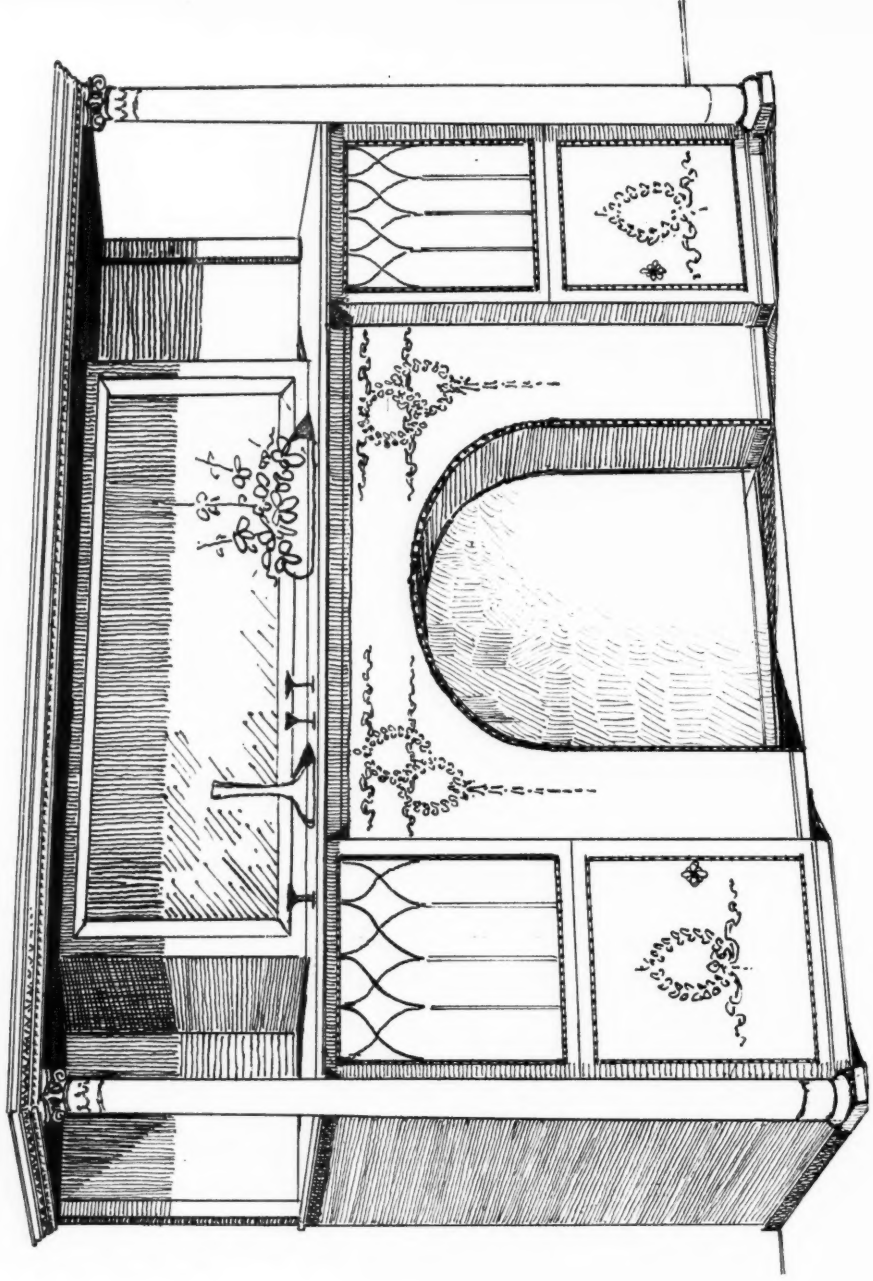
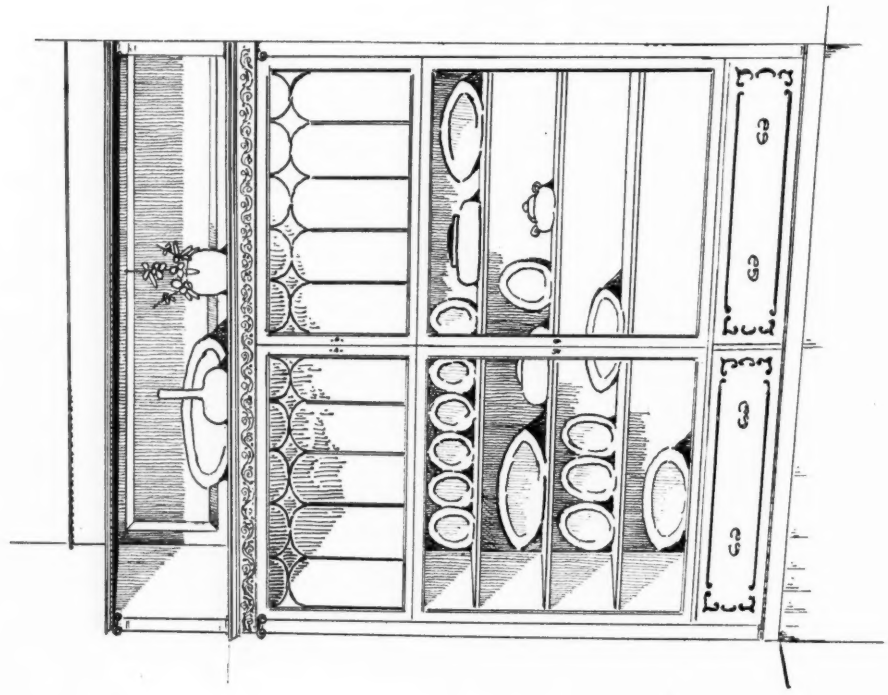
Drawing, through which pipe
must pass. The heater shall have flange on each end
as shown. Cut up heater, with all the middle
of heater.

Flange.

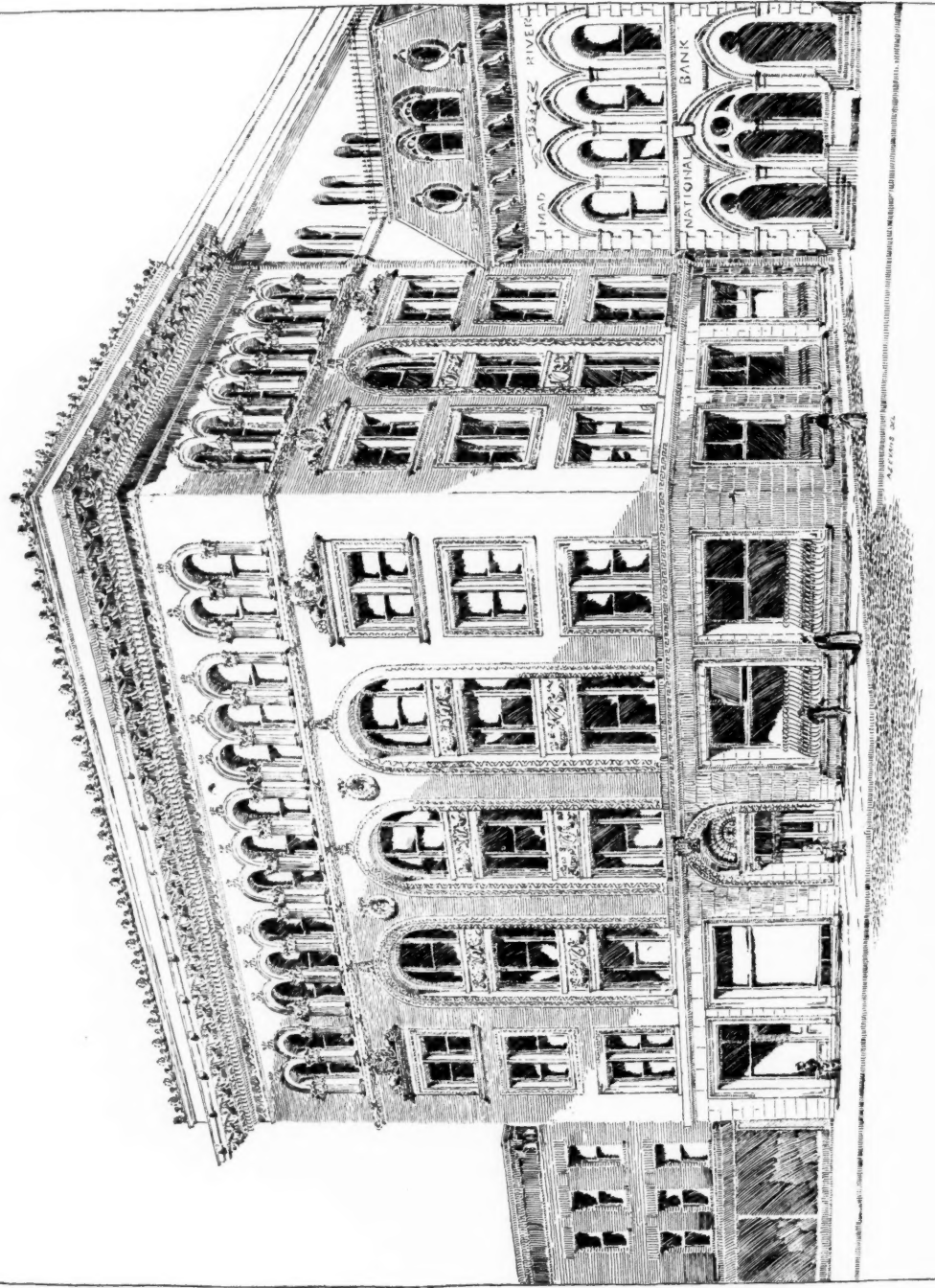
(Squares raised in air.)

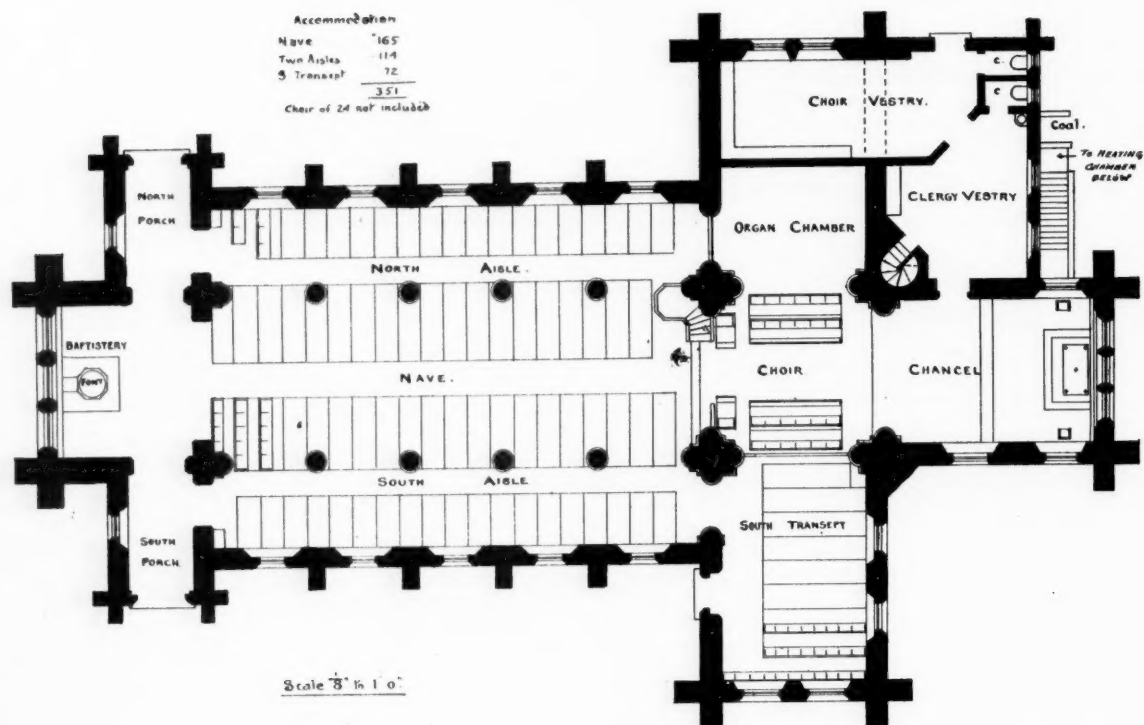
STEAM-HEATING BOILER.





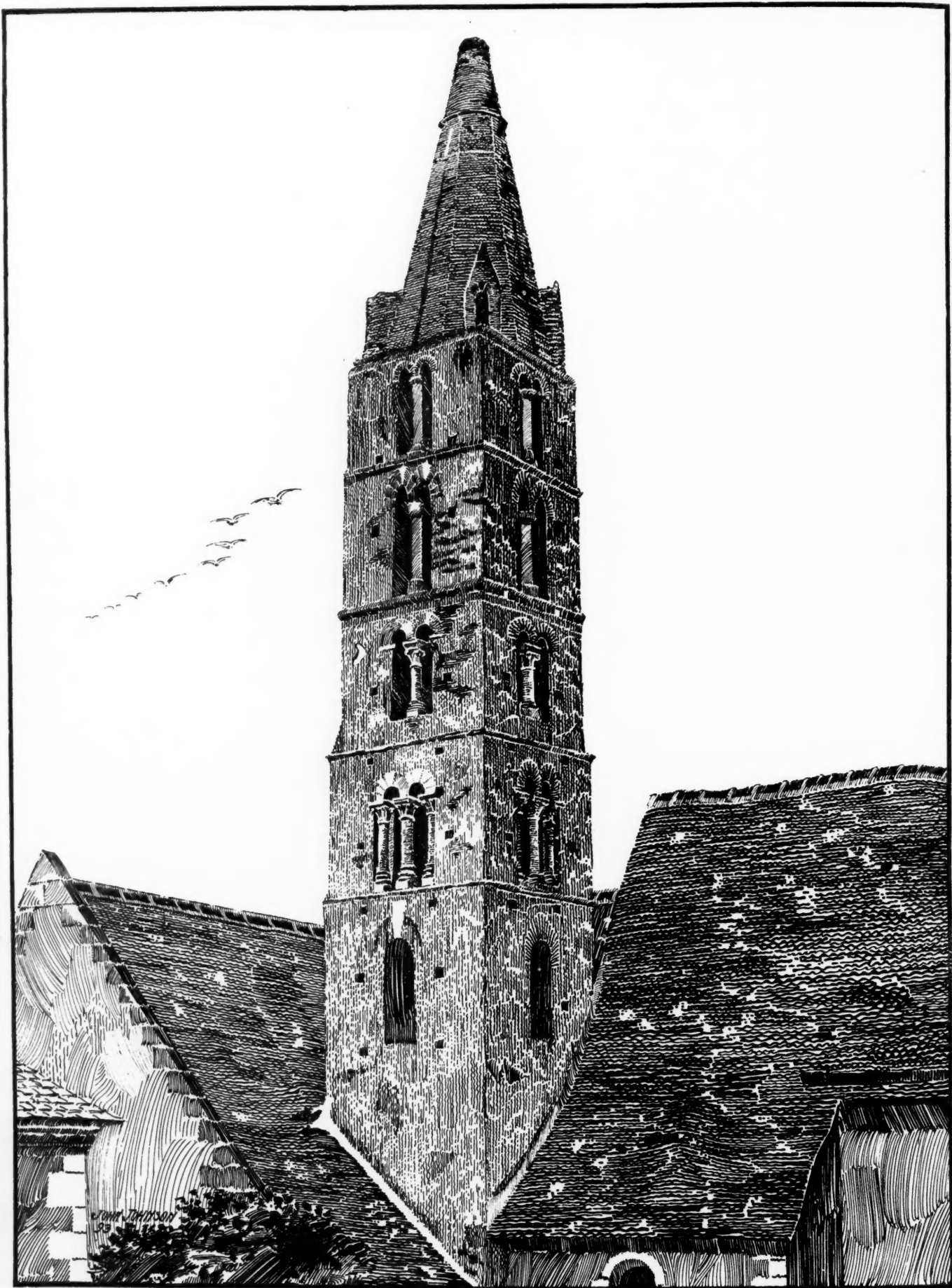
BUSWELL BUILDING
SPRINGFIELD OHIO.





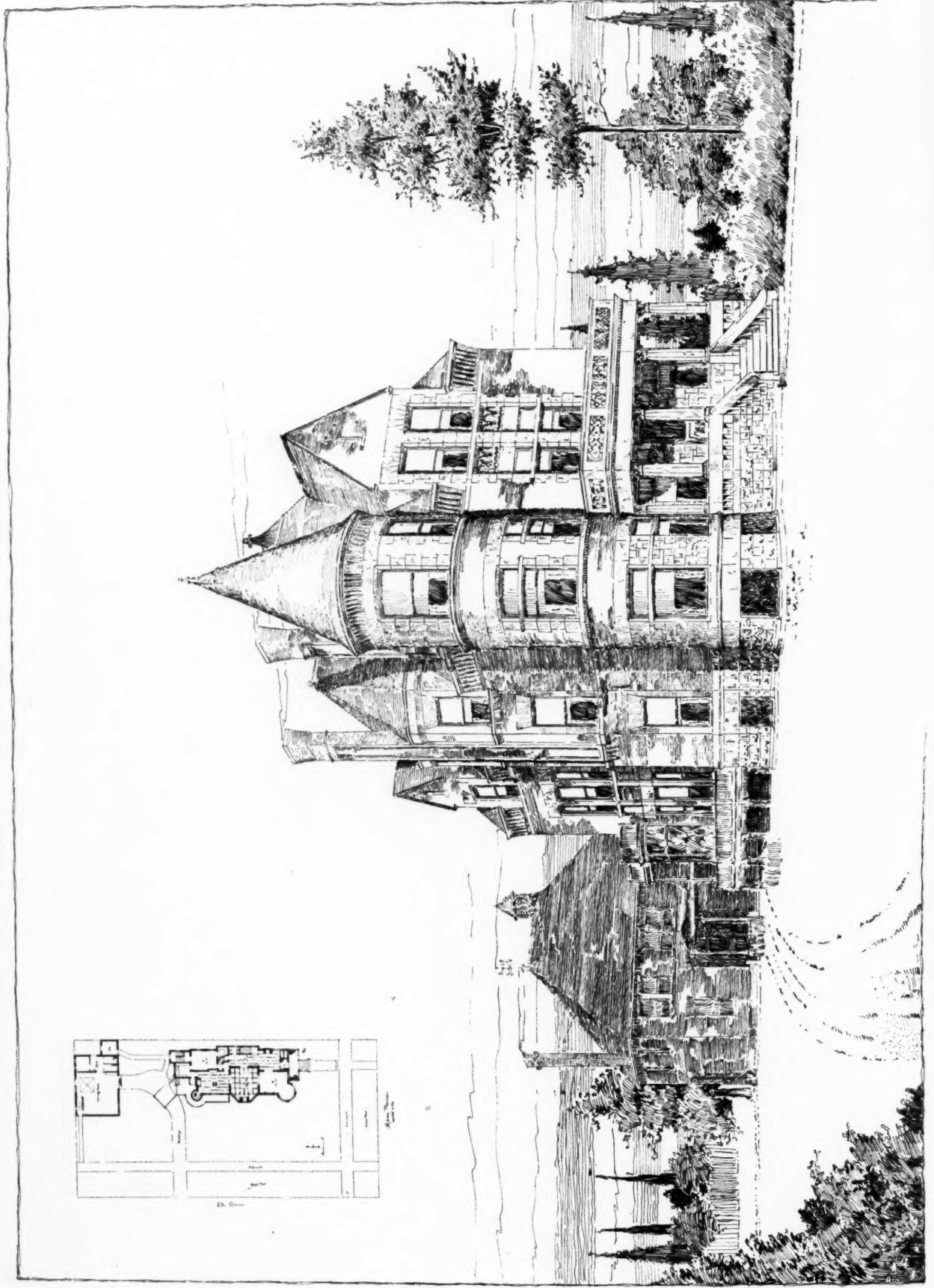
DENVER ARCHITECTURAL SKETCH CLUB COMPETITION. A VILLAGE CHURCH IN THE THIRTEENTH CENTURY ENGLISH GOTHIC STYLE, TO SEAT 350 PERSONS.

FIRST-PLACE DESIGN BY HARVEY PRIDHAM.



CHURCH TOWER IN TRUYES, FRANCE.

DRAWN FROM PHOTO BY JOHN JOHNSON, CHICAGO.



HOUSE FOR R. CHESTER FROST, CHICAGO.
WILLIAM D. COWLES, ARCHITECT.

HOUSE FOR R. CHESTER FROST, CHICAGO.
WILLIAM D. COWLES, ARCHITECT.



THE PROPYLÆUM AT MUNICH.

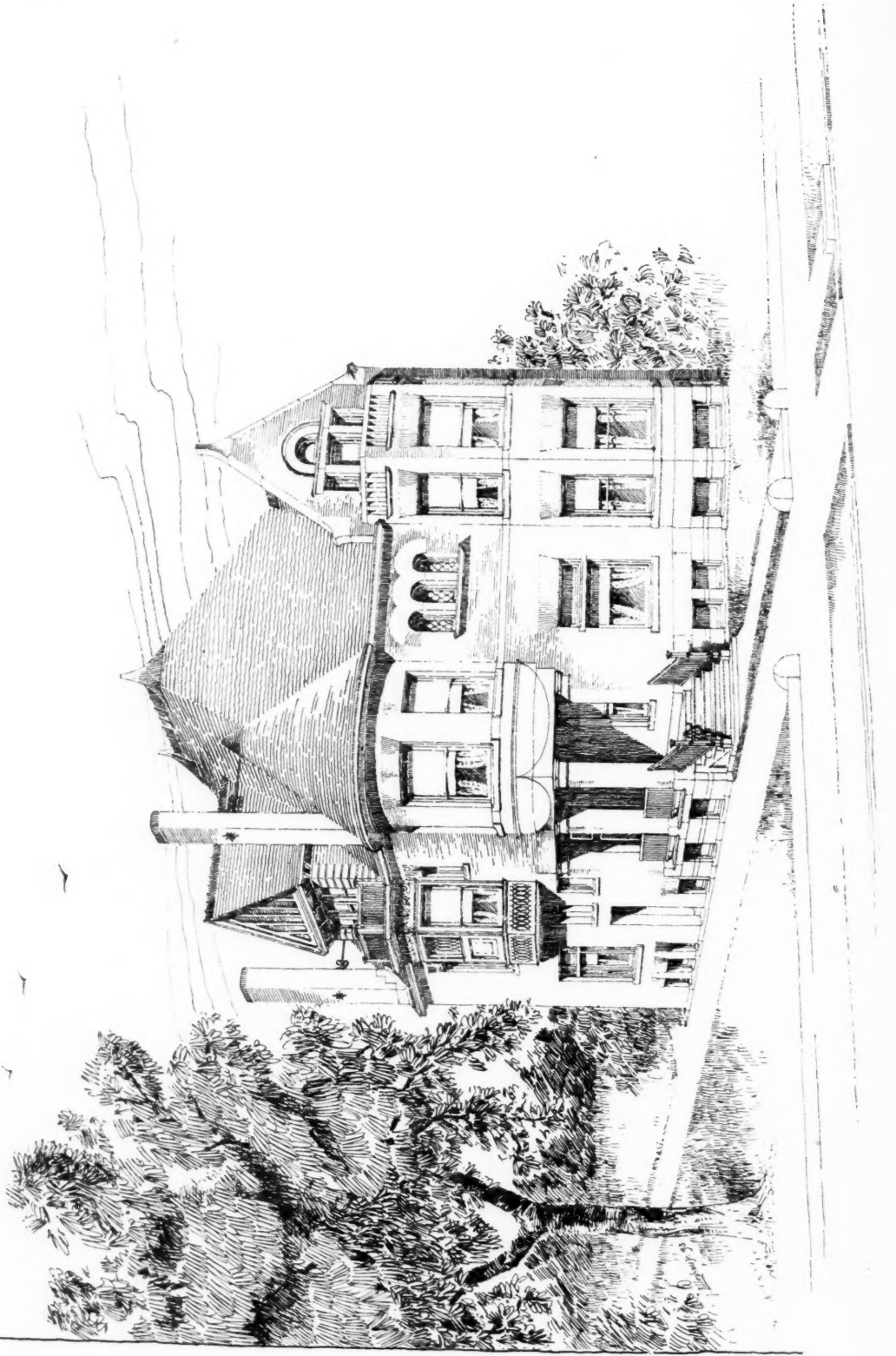
ILLUSTRATING DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE, BY C. E. ILLSLEY. (FIG. 105.)

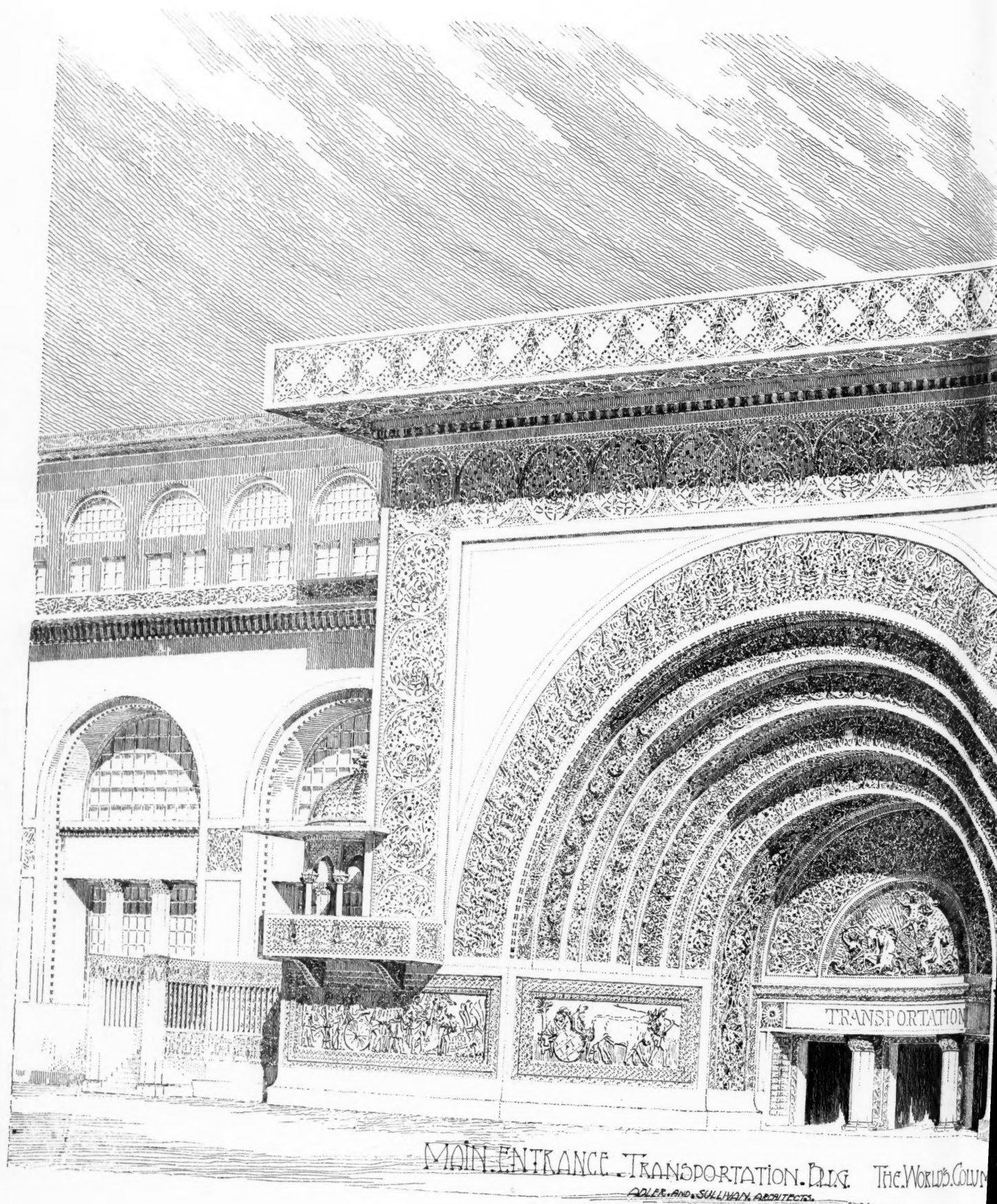


METROPOLITAN OPERA HOUSE, NEW YORK.

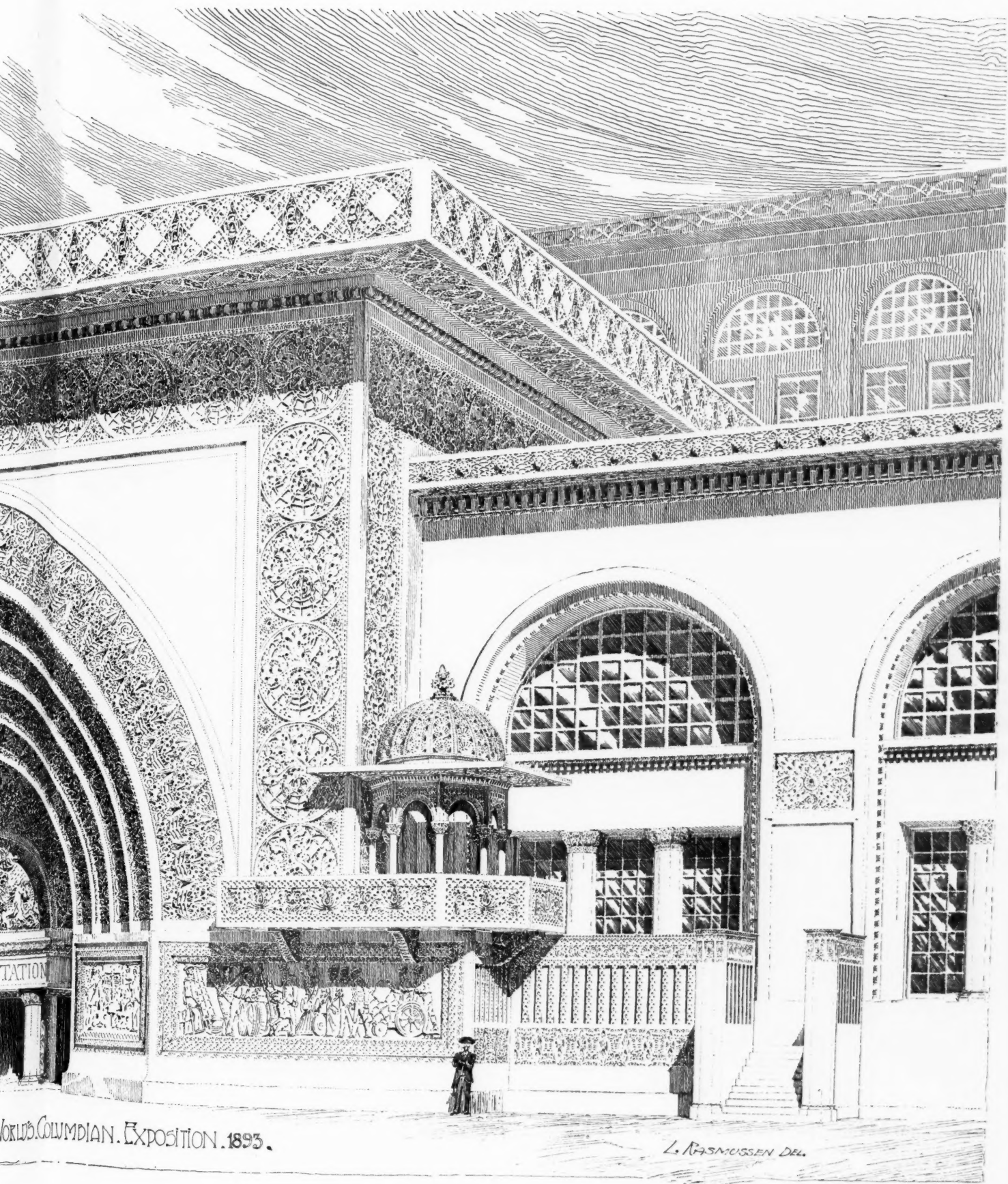
ILLUSTRATING DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE, BY C. E. ILLSLEY. (FIG. 104.)

RESIDENCE FOR MR & MRS G. ROUSSEAU, CHICAGO
FREDERICK W. PERKINS, ARCHITECT



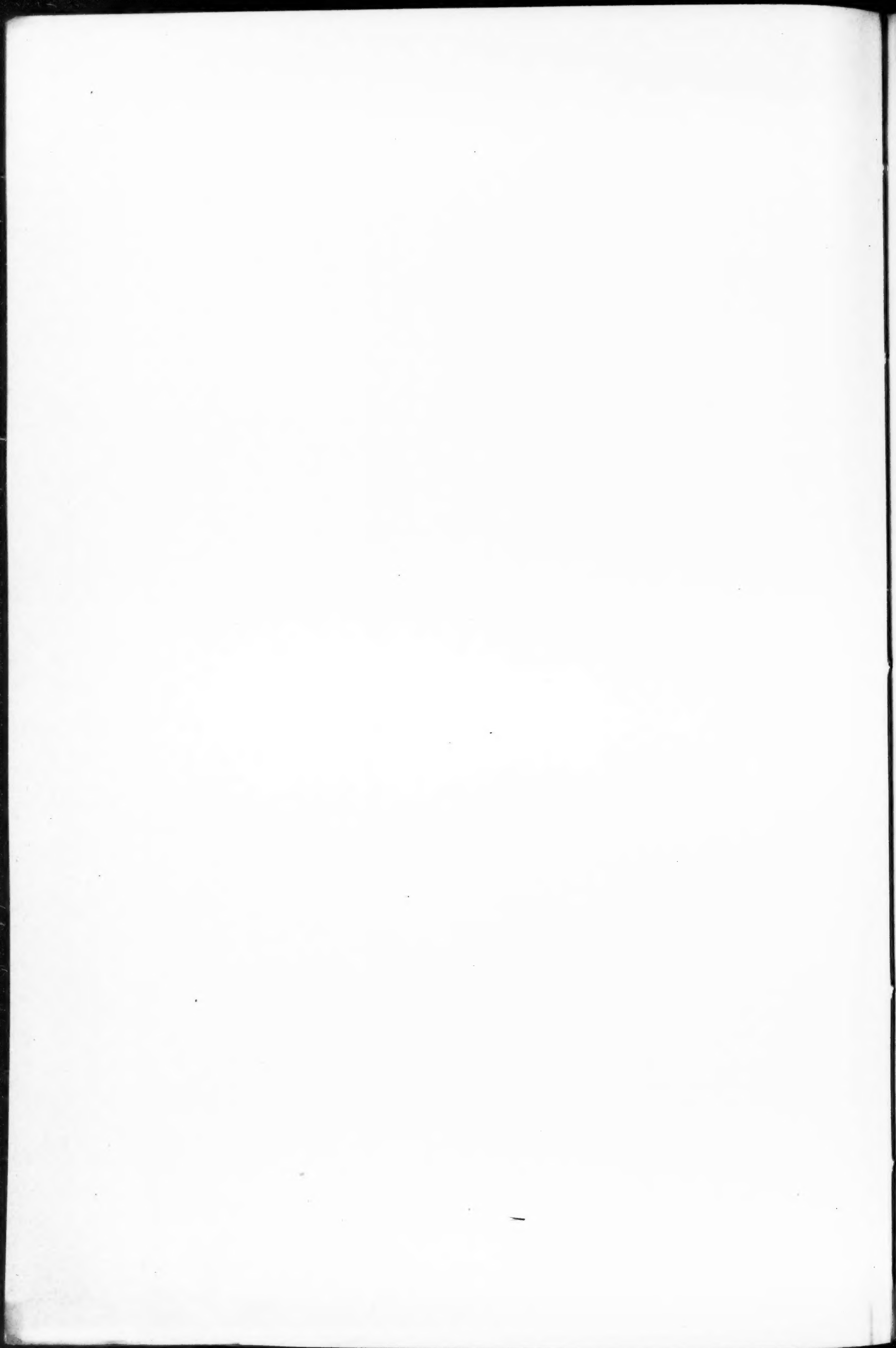


MAIN ENTRANCE TRANSPORTATION BLDG. THE WORLD'S COLUMBIAN EXPOSITION
ADLER AND SULLIVAN ARCHITECTS



WORLD'S COLUMBIAN EXPOSITION. 1893.

L. RASMUSSEN DEL.





RESIDENCE OF D. E. TAYLOR, SCRANTON, PENNSYLVANIA.

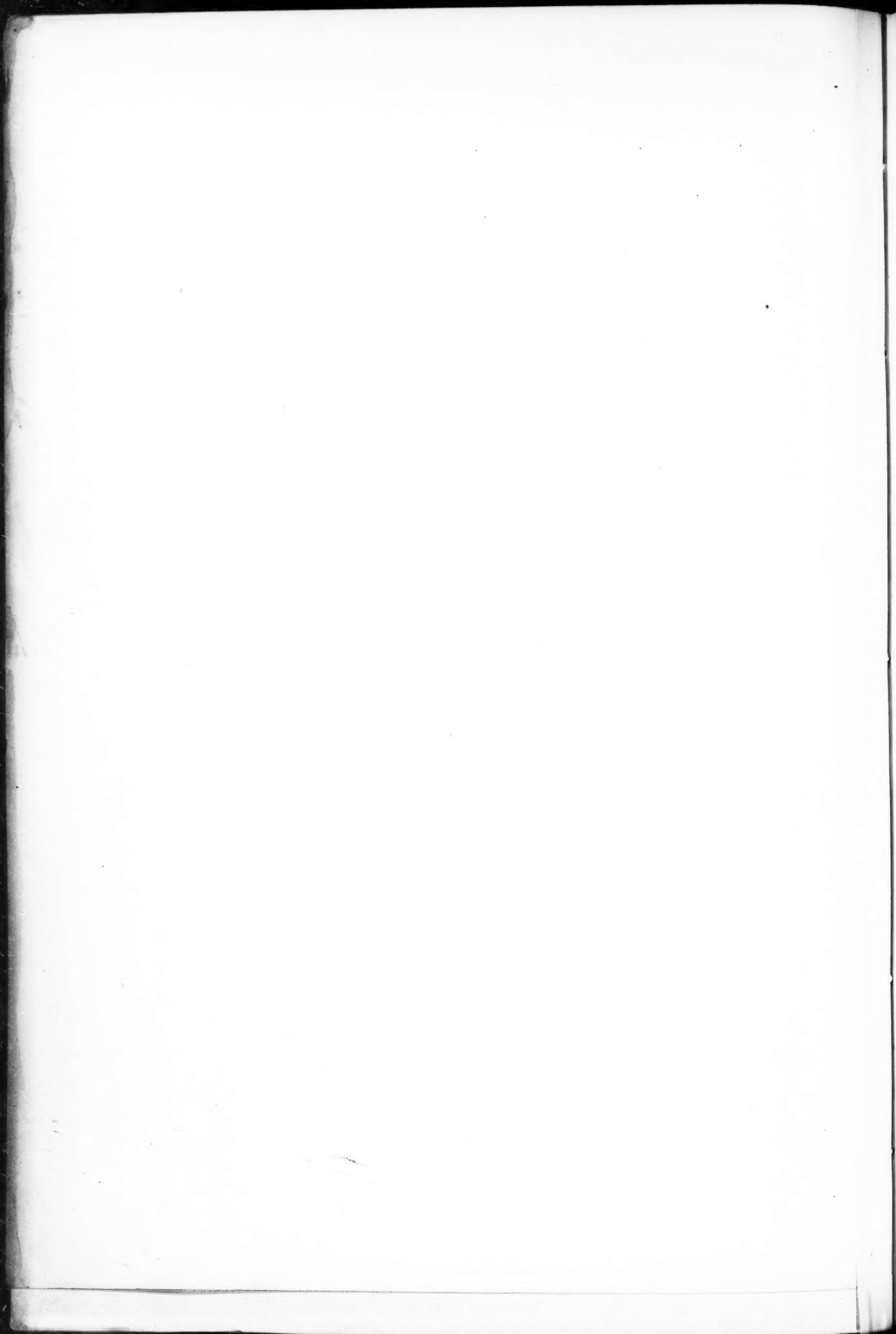
E. G. W. DIETRICH, ARCHITECT, NEW YORK.



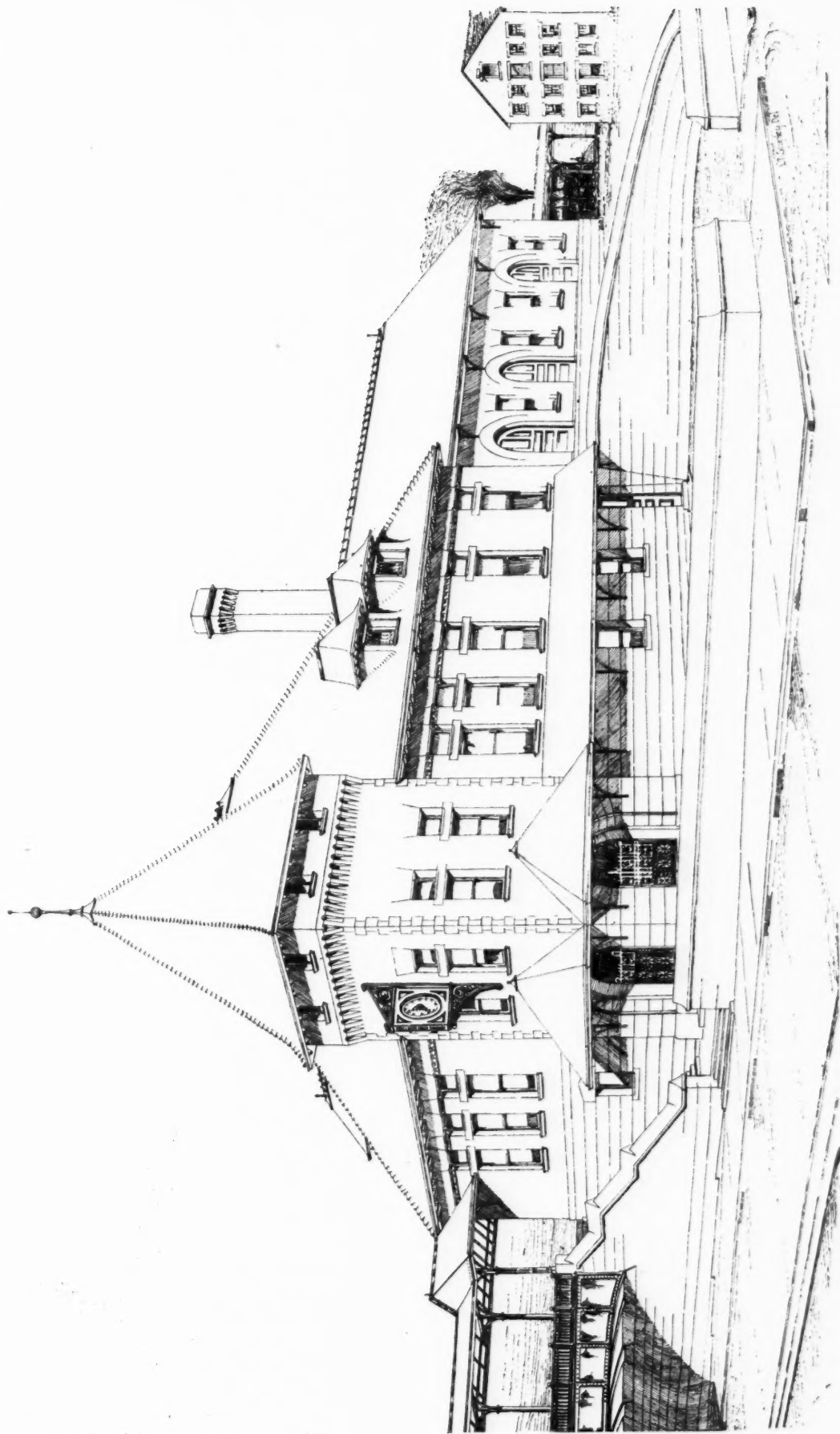
INLAND ARCHITECT PRESS.

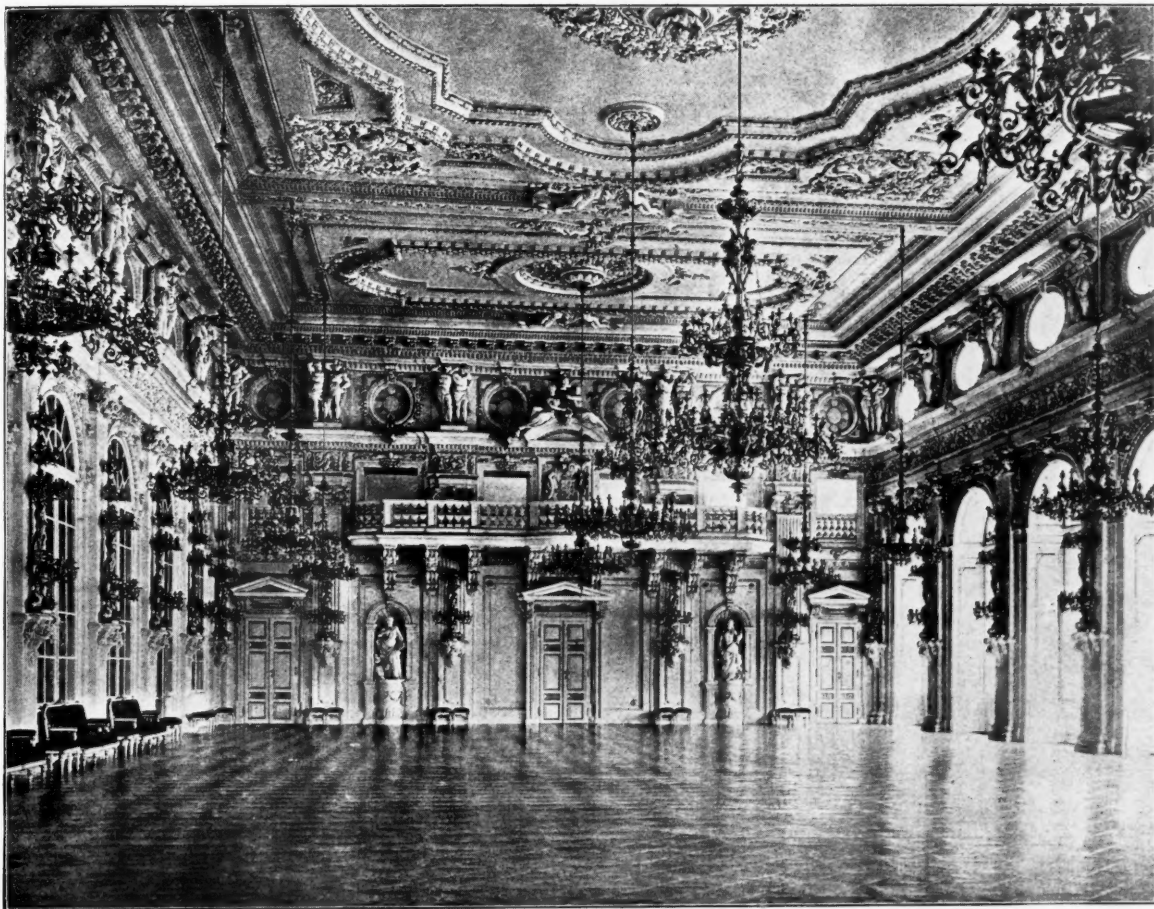
RESIDENCE OF THOMAS E. JONES, SCRANTON, PENNSYLVANIA.

E. G. W. DIETRICH, ARCHITECT, NEW YORK.



STATION AT ROCKFORD ILL.
CHICAGO AND NORTH WESTERN RY.
Charles S. Frost Architect Chicago





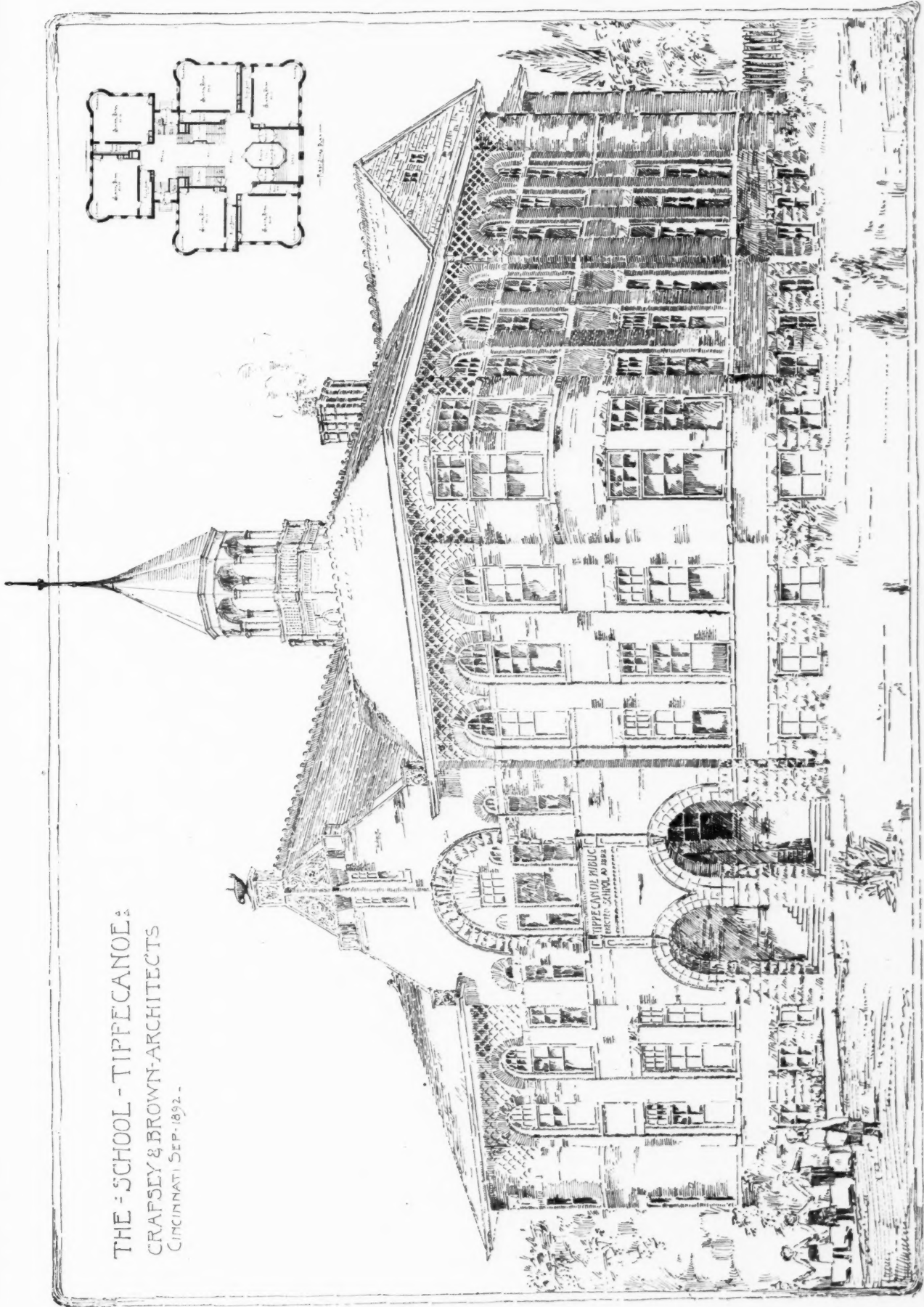
SPANISH HALL, IMPERIAL PALACE, PRAGUE, GERMANY.

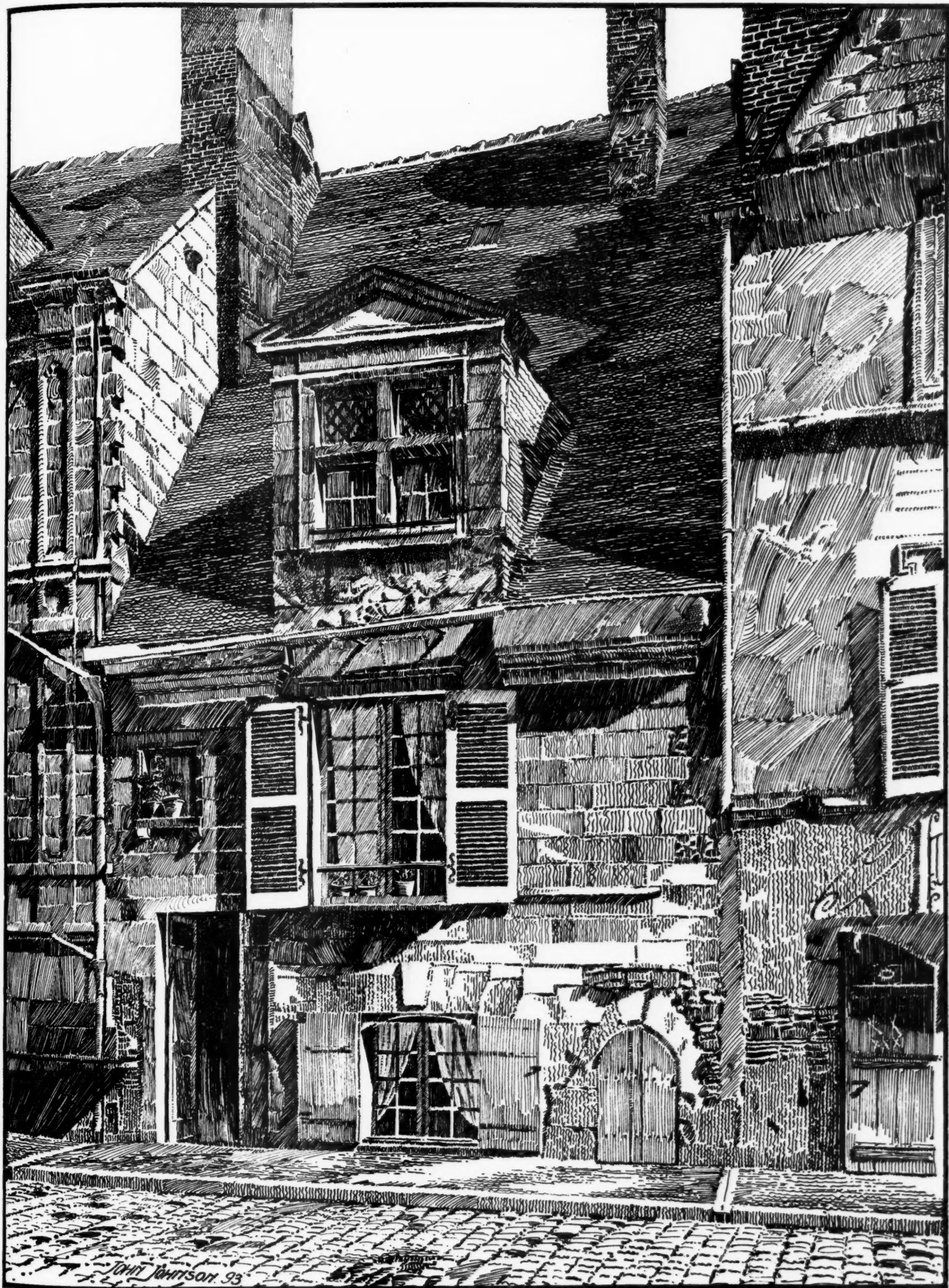
ILLUSTRATING DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE, BY C. E. ILLSLEY. (FIG. 108.)



Residence for
Mr. J. B. Ruhland
of Charles, Ill.
W. W. Doynton & Co. Architects.

THE - SCHOOL - TIPPECANOE
 CRAPSEY & BROWN - ARCHITECTS
 CINCINNATI SEP. 1892.

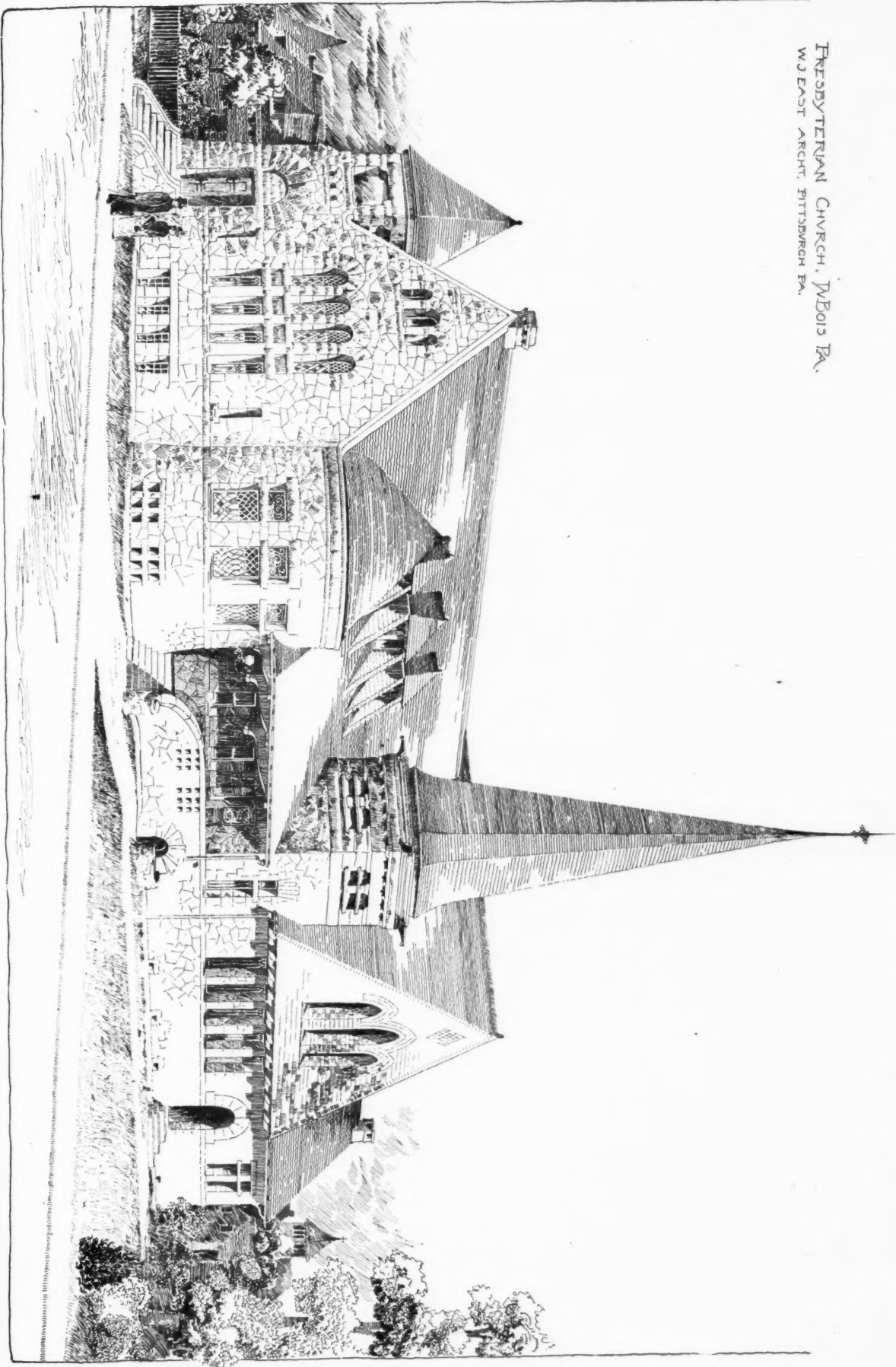


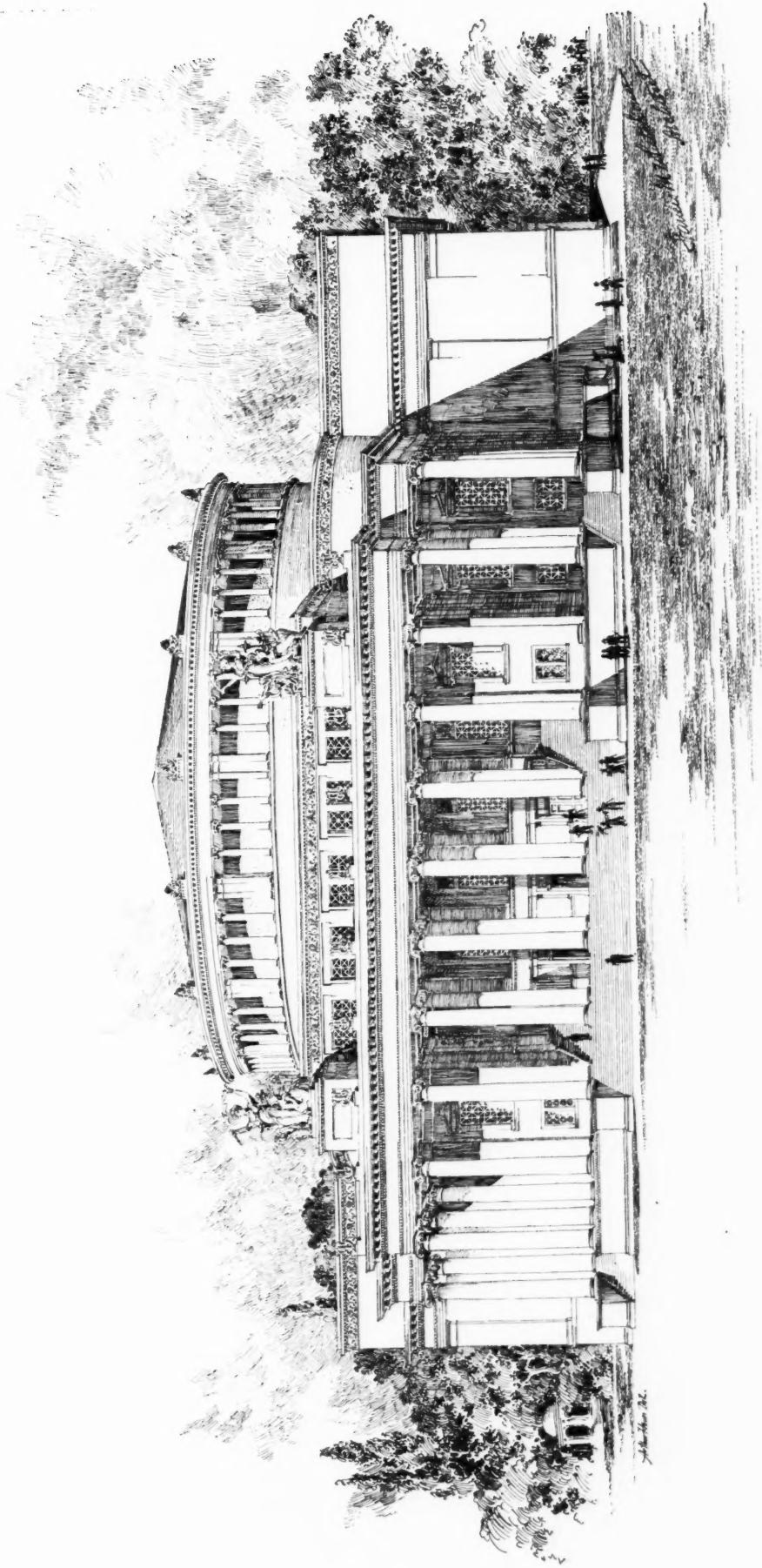


OLD HOUSE IN ANGERS, FRANCE.

DRAWN FROM PHOTO BY JOHN JOHNSON, CHICAGO.

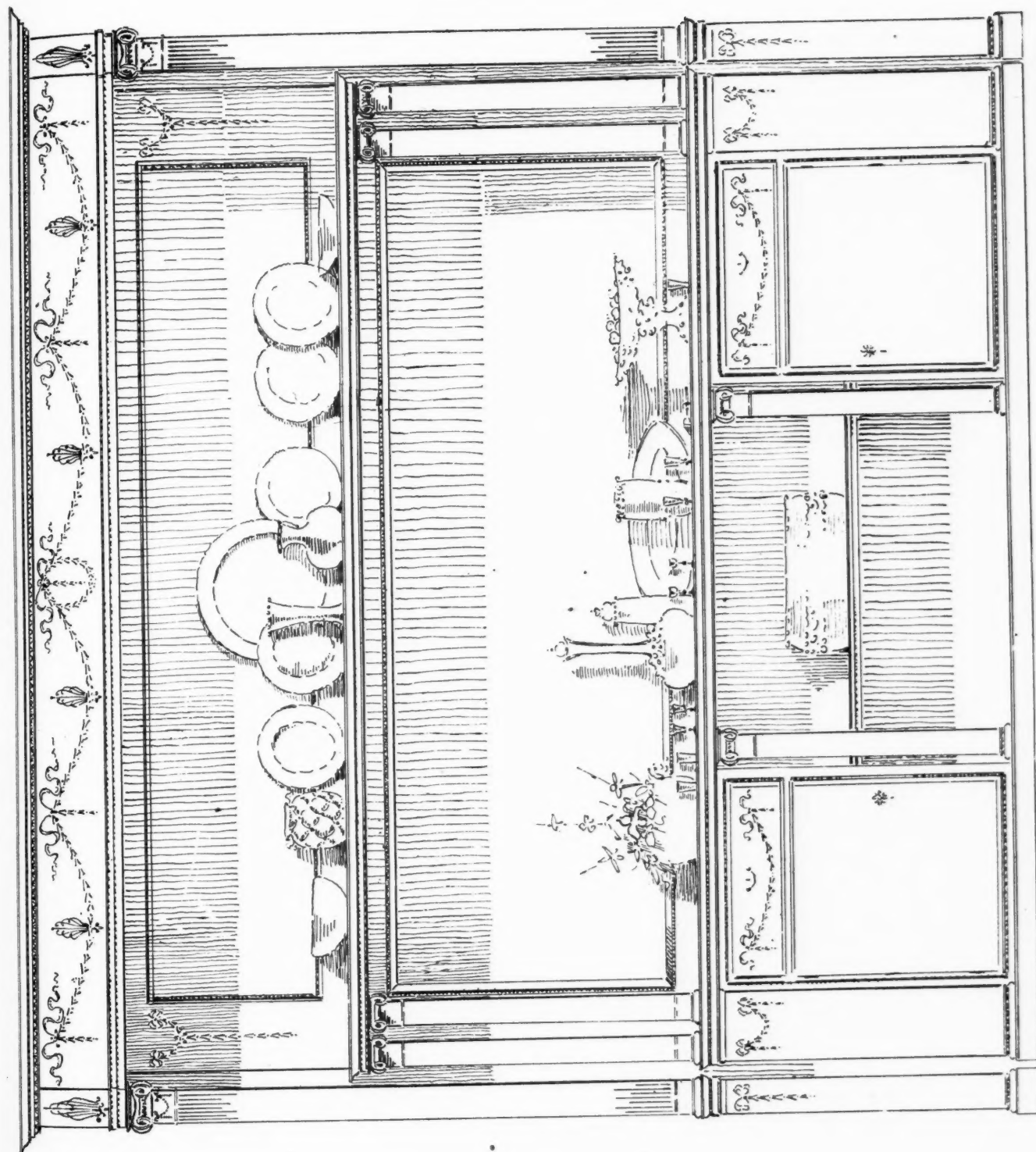
PRESBYTERIAN CHURCH, DEBOIS PA.
W. LEAST ARCHT. PITTSBURGH PA.





ORIGINAL DESIGN FOR FESTIVAL HALL, WORLD'S COLUMBIAN EXPOSITION, CHICAGO.

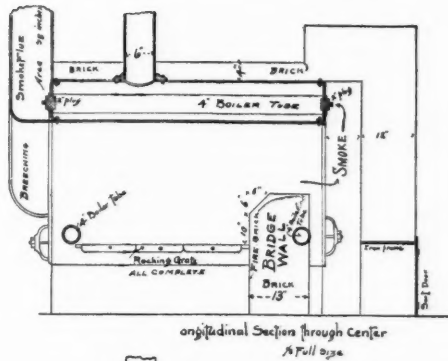
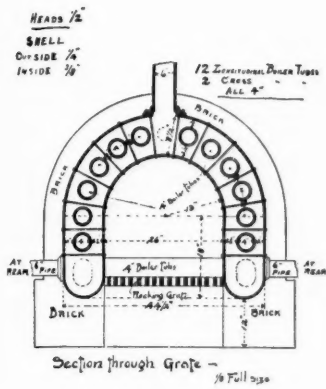
FRANCIS M. WHITEHOUSE, ARCHITECT.



CLASSICAL DESIGNS IN FURNITURE, BY STEPHEN M. WIRTS, CHICAGO.

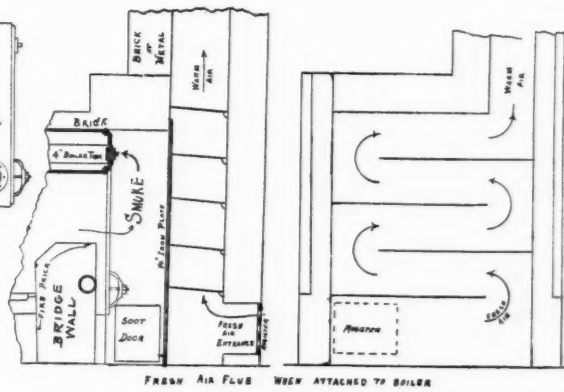
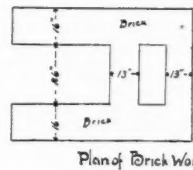
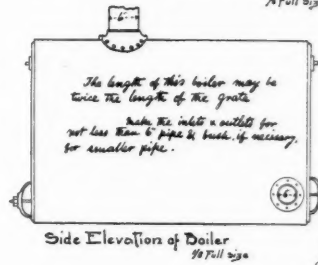
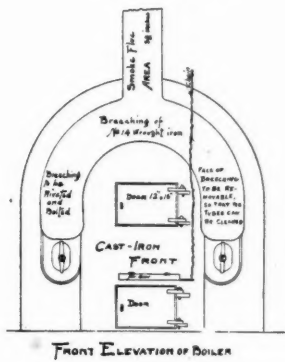
HOT-WATER HEATING.

PLATE IX.



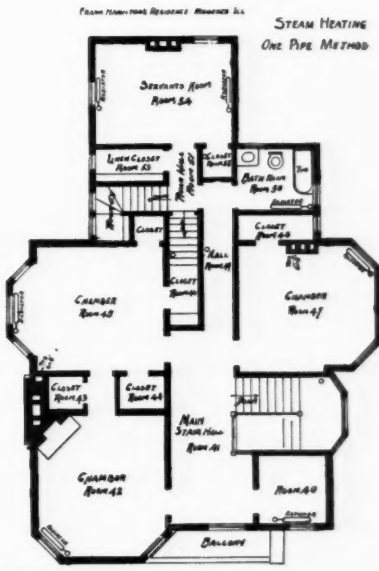
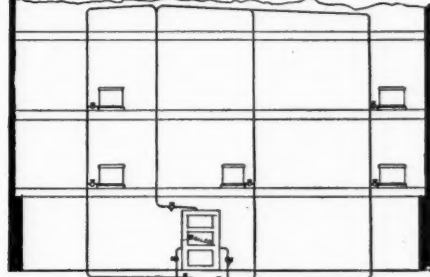
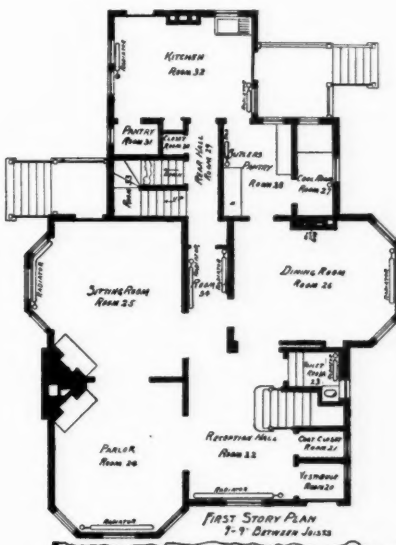
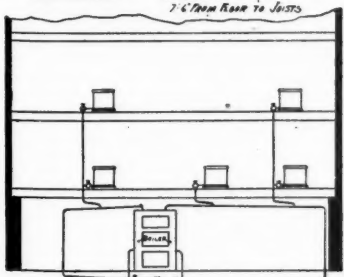
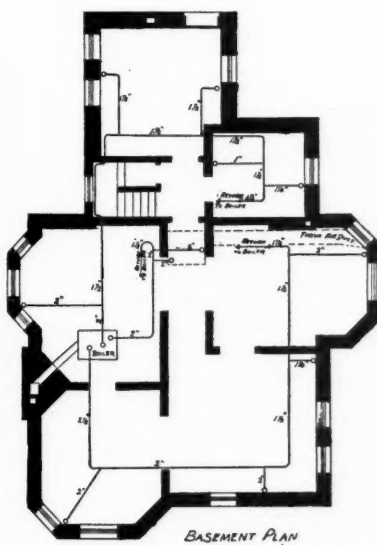
SADDLE
HOT-WATER
BOILER

WILSON & PIERCE
ARCHITECTS
CHICAGO



STEAM HEATING—RETURN TO BOILER.

PLATE XIII.



SCALE
PLANS, 1/4" = 1'-0"
SECTIONS, 1/8" = 1'-0"

