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THE twelfth Autumn Exhibition of the National Academy of Design will open on Monday, December 18, and close on Saturday, January 13. As before, only original works in oil, pastel or sculpture are admitted, which must be by living artists, and must never before have been publicly exhibited in New York or Brooklyn. Works will be received on Friday, Saturday and Monday, November 24, 25 and 27, and lists must be sent to the superintendent before November 20. Varnishing day is Friday, December 15. Exhibitors must themselves attend to the delivery and removal of their works, and not more than three works will be received by any one artist. A competent person will attend to sales of works, on which a commission of ten per cent will be charged. All contributions will be subject to the judgment of a jury of selection. We have received also the usual notice of the opening of the schools of the Academy for the season of 1893-4, beginning October 2 and ending May 12. The classes are substantially the same that they were in our own student days, we do not like to say how many years ago; but since then prizes have been founded, both in the shape of medals and money, besides the recent William F. Havemeyer scholarship of seven hundred and fifty dollars, to be expended in foreign study, and the Academy student, if he is obliged to depend upon himself perhaps a little more than he always likes, has plenty of incentive to effort.

A CURIOUS case, involving the rights of the sender of a letter, has been brought to the attention of the Post-office authorities at Washington. Not long ago, a woman named Horton, living in San José, Cal., wrote a letter to a man named Hagan, who lived in Oakland. She put a special-delivery stamp on the letter, and wrote on the envelope: "Do not deliver to any one except the person addressed, and him in person." The postmaster at Oakland tried to find Hagan, without success, but, faithful to the direction written on the letter, refused to deliver it even to a member of Hagan's family, and at last returned it to the postmaster at San José. While the letter was in the latter's hands, the woman herself met Hagan in the street in San Francisco and shot him. She was arrested, and claimed that she killed him in self-defence. Hagan's relatives, however, surmised that the letter which she had written him, and which had not been delivered, contained threats, which would show that the murder was premeditated, and they tried to get possession of it, on the ground that it belonged to them, as his representatives. It has been the general rule of the Post-office Department that letters should be delivered to the person to whom they were addressed, or, if he could not be found, to any of his family, and the

question was whether the wish of the sender, as indicated on the envelope, was paramount to the custom of the Post-office. It appeared, however, that a special rule had been recently adopted, expressly providing that the sender of a letter might order its delivery to one person alone, and that this direction should be respected, and the postmaster at San José was therefore notified to return the letter only to the Horton woman or her authorized representative. Naturally, the murderess will take care that any incriminating evidence that there may be in it shall never see the light, and the prosecution will have to get on without it. In this particular case, it seems as if the arm of justice in California must be either very short or very weak, or the letter would have been brought into court, notwithstanding the rules of the Post-office. Even if the Post-office officials think it their duty to guard the secrets of criminals, the criminals themselves are not entitled to conceal the evidence against them, and there seems to have been no reason why the letter should not have been seized as soon as it left the possession of the postmaster at San José.

WE have received an unusually large assortment this week of invitations to architects to "submit plans" for "as large, handsome and convenient structure as can be completed at a cost not to exceed \$70,000," etc., the architect being either required to deposit two thousand dollars, to be forfeited in case there shall be no bids from competent contractors when the plans and specifications are ready for estimate, to carry them into execution for a sum within that limit; or, in another case, to submit with his design "a written tender of the cost of such plans and specifications." The "invitation" containing the latter condition is a curiosity in various ways. It calls for designs for a normal school-building, to cost fifty thousand dollars, including "laboratories," and a gymnasium with a "running track supported on iron brackets." The circular is dated August 22, and competitors are required to furnish plans of basement, first floor, second floor, attic and roof, with elevations of all sides and at least one section, all drawn on tracing-cloth at a scale of one-eighth of an inch to one foot, and accompanied with "complete and concise" specifications, and an estimate of cost, on or before September 8. Without any reflection upon this particular committee, we may remark that experienced architects usually infer from invitations giving such preposterously short time for preparation that the work has already been promised to some one in the background, and that the "invitations" are designed simply to obtain, at the expense of the profession, ideas for the benefit of the individual behind the scenes, some condition being cleverly added to the programme, by means of which the competitors can be got rid of after their ideas have been secured. What sort of ideas the Normal School Committee will obtain from the people who would pay any attention to their circular it would be interesting to know.

M. YVES GUYOT, whose encounter with the French walking-delegates was mentioned in these columns a few weeks ago, has put some reflections on the subject of labor-reform into a pamphlet, which has been published by Charles Delagrave, Paris, under the name of "*La Tyrannie Socialiste*," and will undoubtedly find many readers among those who, in their hearts, loathe the insolent egotism of the "workingmen's champions," but who have not the courage to defy their enmity. Speaking of the Socialists, who, in Europe, and to an increasing degree here, have usurped the control of the associations of workingmen, he says emphatically that their doctrines and methods are borrowed from Germany, and, so far from promoting the advance of liberty, are retrograde and reactionary, their whole system being devoted to the establishment of partial tyrannies, suited to be merged, later, in the comprehensive single tyranny to which it inevitably tends. To tie the Republican party of France to the tail of a system like that is, he thinks, to abandon all its noble traditions of freedom and respect for human rights, and he protests against the weakness which has allowed the pushing, crowding, loquacious labor-reformers to impose their sophisms on legislation, to the detriment of liberty. We need hardly say that the same observations apply here as in our sister Republic across the sea. Here, as there, the doctrine that men can combine

to force other men to join them, and can conspire to rob, starve, injure and even kill those who refuse to obey their orders, although still strenuously resisted by the courts, has found its way into legislation, and here, as there, it is likely to grow more aggressive as its control over elections becomes more complete, until some one finds the courage, like M. Yves Guyot, to expose himself to the vengeance of what is now a great, unscrupulous and cruel power for the sake of bringing back his countrymen to the principles of true liberty. The task is not likely to be an easy or pleasant one, but it will have to be undertaken before long, and whoever is brave enough to lead in it will find himself famous. Already, M. Yves Guyot, by his memorable speech on the Bourse du Travail, has set his fellow-citizens to thinking seriously on these matters, and the result of their cogitations may undoubtedly be traced in the elections of this week, in which, while the moderate Republicans have made an immense gain, the Socialist influence in the Chamber of Deputies has been much reduced.

AN important competition has just been decided in Paris. Since the burning of the Opéra Comique, there has been a great deal of discussion as to the way in which designs should be obtained for a new building. The Government officials in charge of the matter were for a time possessed with the idea, which is rather common among gentry of that class, that suitable plans for the structure might, by some sort of hocus-pocus, be obtained for less than it was worth to make them; but a series of experiments convinced them that they were mistaken, and a competition was at last opened on the usual terms. This competition attracted the best architects in France, and much interest has been shown by the profession in the result. By the final decision of the jury, the first prize, with the execution of the work, was awarded to M. Louis Bernier, of Paris, an architect of very great talent, and, as a pupil of M. Daumet, probably known to some of our readers. The second prize, a money premium of six thousand francs, was awarded to MM. Larche and Nachon, and the third, of four thousand francs, to M. Blondel. A further sum of ten thousand francs was divided among five competitors, MM. Gaspard André, of Lyons, Esquié, Adrien Chancel and Dupuis, and Duvert and Charpentier; while honorable mentions were awarded to MM. Ballu, Bernard, Cousin, Blavette, Bréasson and Camut, Breffendille, Brumeau, Courtois-Suffit, Dauphin, Delestre, Gervais, Gerault, Henry and Massa, Leclerc, Mayeux, Morice, Paulin, Gray and Bossis, Pujol, Raulin, Ruy and Loison, Schmit, Tronchet, Rey and Richard. It will be observed that this list of "recompenses" includes the names of a large part of the most distinguished architects in France, and M. Bernier may feel a just pride in having surpassed rivals of such fame. He has, however, already won so high a place in the profession that his victory cannot be called a surprise. He won the prize of Rome in 1872, besides a gold medal and the Cross of the Legion of Honor, at the time of the Exposition of 1889.

LA SEMAINE DES CONSTRUCTEURS gives an account of the proceedings of the jury which awarded the prizes. The jury consisted of twenty-two members. Five of these, MM. Coquart, Ginain, Gaudet, Deslignières and Sédille, were architects chosen by the competitors; five other architects, MM. Garnier, Pascal, Daumet, Moyaux and Vandremere, holding the official rank of General Inspectors of Civil Buildings, were designated by the Government, and to these were added M. Bouvard, the distinguished Inspector-General of Architecture to the City of Paris, who represented the Prefect of the Seine; M. Bunel, the architect of the Prefecture of Police, designated by the Prefect of Police; M. Roujon, the Director of Fine Arts; M. Carvalho, the Director of the Opéra Comique; M. Regnier, the Government Commissioner of subsidized theatres; M. Jules Comte, Director of Civil Buildings; two senators, MM. Bardoux and Morris; two deputies, MM. Mesureur and Delaunay; and two members of the Municipal Council, MM. Sauton and Caron. It will be observed that twelve out of the twenty-two jurors were professional architects, and, of the others, three or four, at least, were entitled to a place on it by their special knowledge of the requirements of theatres. Five meetings of the jury were held. At the first, a general inspection was made of the eighty-four designs submitted, and it was discovered that some

of them exceeded the limits of site imposed by the programme. In a few of these the projections beyond the limit were slight, and apparently inadvertent, and would be easily corrected on more careful study. The jury, therefore, decided that, as there was evidently no intention of exceeding the limit, the slight inexactness of the drawings ought not to exclude such designs; but in the case of three plans, which intentionally exceeded the limit fixed by the programme, it was decided that they ought not to be considered at all, and they were accordingly set at once aside.

WHO decide among the eighty-one designs remaining, the jury began by eliminating the worst. This was done little by little, until only twenty-two remained, among which the prizes were to be distributed. The votes were then taken by ballot, the first ballot being on the question of the award of the first prize, carrying with it the execution of the work. Only twenty of the jury being present and voting, a majority would be eleven votes, and at the first ballot M. Bernier received eight, MM. Duvert and Charpentier being next with four, and the others being scattered. A second ballot was therefore taken, in which three of the admirers of MM. Duvert and Charpentier seem to have gone over to M. Bernier, who received eleven votes, MM. Larche and Nachon being next with five. This ballot was decisive, and the first place was awarded to M. Bernier. The next ballot was for the second prize. Strange to say, MM. Duvert and Charpentier, who received four votes for the first place on the first ballot, received only one vote for the second place, and MM. Larche and Nachon easily took the second prize with thirteen votes. The third prize was awarded, on the first ballot, to M. Blondel, M. Esquié coming next. In place of a fourth prize, five equal prizes were offered, of two thousand francs each, and each member of the jury wrote five names on his ballot. The result of the vote was that only three competitors, MM. André, Duvert and Charpentier and Esquié, received more than two votes, and it was necessary to take a second ballot, each voter putting two names on his ballot. Again, only one person, M. Chancel, received a majority of votes, and a third ballot was required, which resulted in awarding the last of the prizes to M. Dupuis. The other selected competitors were consoled with honorable mentions, and so ended one of the most noted of modern competitions.

AN important step toward rapid transit in Paris is being quietly taken by one of the great Railway corporations, the Orleans Railway Company, which owns a short suburban line, extending to Sceaux, with a station in the remote depths of southern Paris, beyond the Observatory. Wishing to make this line more available, as well as to give a short local line within the city itself, the company has for some time been extending its tracks northward from its present terminus. The new extension is something more than a mile and a half in length, and is nearly all underground. From the present station, the tracks run in the open air for about three hundred yards, and then enter a tunnel, emerging again near the Observatory, where there is to be a way station. Another open cutting of a hundred yards leads the line to a second tunnel, more than a mile long, under the Boulevard Saint-Michel, which it follows to the Garden of the Luxembourg, where there is to be a new terminus, close to the Pantheon. The tunnel is already complete, with the exception of about a hundred yards, and it is expected that the line will be open to traffic by the end of next year. This will make the Sceaux station the most central in Paris, considering the Louvre to be the central point, and the effect of the change on the traffic of the line will probably be important. If this new movement on the part of the Orleans Railway Company should inspire the other lines to make similar extensions, the convenience of the public would be greatly promoted. An underground extension of the same length as that of the Sceaux line would bring trains from the present Saint-Lazare station to the Louvre, and a rather longer one would extend the Lyons railway to the same point, very much to the advantage of travellers, who, arriving from the Mediterranean, and wishing to take the first train for Havre, are obliged to load their baggage on a cab and thread the crowded streets for about three miles to the proper station.

OFFICE-HELP FOR ARCHITECTS.¹—XVII.

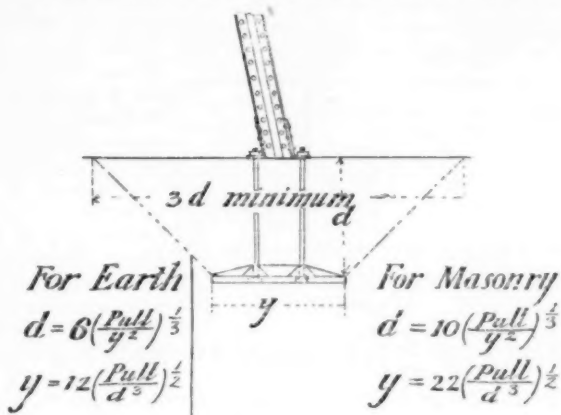


Fig. 69.

SECTION IV.—TOWERS:

§ 243. **Type:**—In architectural practice, towers are used for wind-mills and for the towers of buildings or alone. When alone they are usually of masonry and then are proportioned as a chimney, § 285.

§ 244. **Proportioning:**—Wind-mill towers must be made stiff enough, as well as strong enough, and therefore the pressures against the wheel should be assumed at 30 pounds per square foot against a surface equal in area to the area of a circle of diameter equal to the diameter of the wheel, acting in a horizontal direction against the wheel. A pressure of 50 pounds per square foot should be allowed for all exposed surfaces and for all platforms, tanks, etc. The vertical loads will be the weight of the tower, the weight of the mill, which will be about 1 ton [See Chapter XII], the weight of the tanks, if any, and of the platforms. The effect of the wind on the mill and other exposed surfaces will probably cause an upward reaction on the windward side of the tower which must be met by anchor-bolts. (Fig. 69.) The *SL*, *WL*, and *WR* diagrams must be carefully drawn and tabulated and the sizes of the pieces determined from them. If a curved profile is used for the legs of the tower, the lines representing the several pieces must be drawn straight from joint to joint and then the bending-moments found for the parts, by measuring the distance in inches from the line connecting the joints to the neutral axis of the piece and multiplying it by the strain found.

The size of the anchor-plates through which the bolts pass must be such that a weight of earth or masonry will have to be lifted equal to twice the upward resultant, to disturb the tower. Towers for ornamental purposes, for buildings, etc., must be treated for stiffness also. The loads will be those due

to wind-pressures, figured at 50 square feet on the entire projected area of the tower, wind-pressure on flag giving a pull on the pole at the centre of the flag of 3 pounds per square foot of flag, the weight of the tower acting downward, and the

upward pressure of the wind acting under the lantern, which may be neglected.

Referring to Figure 70, the tower should be laid out in skeleton and the calculation worked out as follows:

Starting at the top with the assumption that the flag, 10' 0" × 15' 0", is carried on a pole with its centre 25 feet above the ring, we should have the pull at the ring (5) equal to 2,250 pounds, if we take moments at (4). Plotting this for the strains in the curved ribs, we would find a tension on one side and a compression on the other side, each equal to 2,970 pounds which, multiplied by the distance from the straight lines

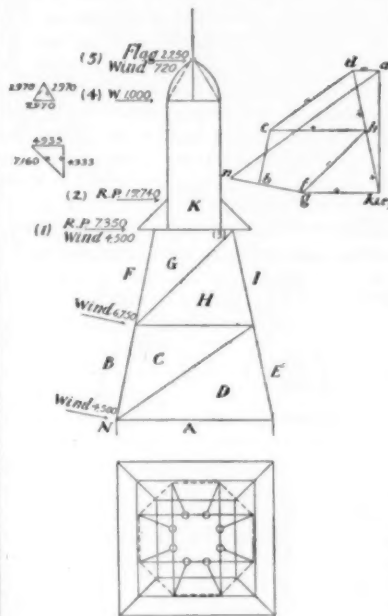


Fig. 70.

to the centre of the curved line, would give a bending-moment of 29,700 inch-pounds, requiring an *R* of 2.38. As this is to be divided among four members, and as it will be convenient to make each member either a *T* or two *L*s back to back, we would use for each member two 3" × 2" × $\frac{3}{8}$ " *L*s curved to the proper shape. For the spider on which the pole rests, we would make the socket of cast-iron and assume that the weight of the pole and the weight of the metal would be about 1,000 pounds, we would then have a bending-moment of 24,000 inch-pounds to be divided between two members, and we would use a 3½" × 3" × $\frac{1}{4}$ " *L*. This would be riveted to a ring at (4) which ring would be a 5" × $\frac{3}{8}$ " plate encircling the heads of the columns.

For the part between (2) and (4) where the columns of the

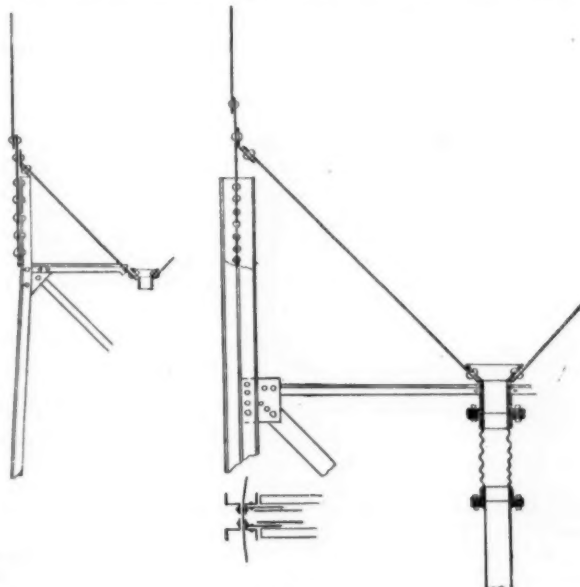


Fig. 71.

lantern would come, no sway-bracing is practicable; we must therefore find the bending-moment at (2) from (4) and (5). This amounts to 971,000 inch-pounds requiring an *R* of 77.8 for all of the columns or 19.4 for each one of the four, and for this purpose we would use a 9" 22* *I* encasing it in the column.

¹ By George Hill, Consulting Engineer. Continued from No. 920, page 100.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
parallel to.	□ square feet.
÷ divided by.	□ square inches.
× multiplied by.	* read 8 pounds per lineal foot.
+ added to.	C channel bar.
a ² a multiplied by itself.	I I-beam.
a > b: a greater than b.	T T-iron.
a < b: a less than b.	L angle iron.
a ÷ b: a divided by b.	D deck beam.
	● round section.
1 ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.	
l = the length between supports of any beam or girder or height of any column, always in feet.	
b = breadth of any beam or girder, always in inches.	
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.	
L = total load uniformly distributed coming on any piece in pounds.	
W = concentrated load on any piece in pounds.	
s = span of any arch or truss between centres of end pins in feet, or spread of footing course.	
A = area of any section in square inches.	
M = maximum bending-moment in inch pounds.	
a = distance of centre of gravity of section from either top or bottom edge in inches.	
I = moment of inertia, neutral axis through centre of gravity.	
R = moment of resistance of section.	
r = radius of gyration, in inches.	
Sc = safe compressive strain in pounds per square inch.	
St = " tensile " " " " " " "	
Ss = " shearing " " " " " " "	
S = strain per square inch in extreme fibre.	
P _a = upward reaction of support at left-hand end of beam.	
P _r = " " " " " right " " " "	
e = distance of centre of gravity of load from left hand of beam.	
f = " " " " " right " " " "	

To hold these columns in place, we would have a pressure at (2) taking moments about (1) equalling 19,740 pounds, one-quarter of which equals 4,935, which, resolved, gives a pressure along the gusset-plate of 7,160 pounds requiring .57 square inch of section. We would then use a $\frac{1}{2}$ " plate and $3'' \times 2'' \times 7\frac{3}{4}''$ Ls in pairs around it, riveting them to the flanges of the beam. The platform at (1) would be made an octagonal $\frac{3}{4}''$ plate carried on beams as shown, the beams being made to resist the bending-moment transmitted to the outer end by the diagonal thrust from the connection which amounts to an R of 7.1. The effect of the pressure of the lantern at (3) on the beam, taking moments about the end of the beam, would be such as to require an R of 9.9 and we would therefore use a $7'' 15\frac{1}{2}''$ cantilevering it over the joints at $F K$ and $K I$. A beam of the same size would be coped in between these beams and cantilevered beyond them for supports as shown. The 9" columns forming the lantern would be further stiffened by having $\frac{1}{4}''$ plates put in the vertical height between (1) and (2), riveted up to the webs of the beams and stiffened along the top edge with a $3'' \times 2'' \times 7\frac{3}{4}''$ L. This brings the analysis of the tower down to the level of the joint $G K$ from which point below it is simple. At $F K$, however, moments must be taken about $N B$ to determine the effect of the wind-pressure on the lantern at this point and that is as shown.

For the $W L$ analysis given, the assumption is that the reaction at $A E$ is vertical. The effect, however, on the tops of the columns at these points would be divided equally between them. If the frame is carried out in this way, there will be quite a surplus of strength in the connections which is very desirable. It should be the aim in designing all towers where sway-bracing is impracticable to obtain a sufficiently wide spread as at $G K$ to secure the joints, making them amply strong.

§ 245. Details:—For ordinary towers Ls are the most useful shapes and should be used. The connections should be made with plates of the thickness of the Ls and riveted up generally with the rivets in single shear in the diagonals and double shear in the legs. When the tower is meant for the support of a large metal tank, the bottom of the tank should be made hemispherical or conical and riveted to the sides, then the legs can be fastened to the rings formed by this double thickness of plate, reinforced or carried down if necessary, and a great economy of floor-framing effected. [See Chapter XII, and Figure 71.] The pressure on the rivets will be equal to the total weight of water when the tank is full, and the riveting must be of sufficient strength to carry it. A sufficient number of $1\frac{1}{2}''$ bolts should be provided for the anchorage to resist the overturning effect of the wind assumed as acting on a plane equal to the projection of the tank against a vertical plane, with a pressure of 50 pounds per square foot when the tank is empty. The anchorage plates must be of sufficient size to lift masonry or earth equal to twice the weight of the upward resultant. If the tower have a curved profile the bending-moment due to the curve must be allowed for in the sizes. Generally wood may be used when it is twenty times the section of the metal pieces, or having the sizes of a wooden tower that experience has found to be sufficiently stiff, a steel tower can be made having the parts one-twentieth of the area, if the r is sufficient and R is large enough for the bending-moments due to curved sections. Generally r is so small that the sections must be doubled in area, or made one-tenth of the area of the wood.

SECTION V.—TRUSSED ARCHES:

§ 246. Type:—Usually a trussed rib of metal in which the thrust is taken up either by heavy abutments, by tension-rods running from end pin to end pin or by the lower chord of the rib, when its shape will admit of it. Wrought-iron or steel must be used for spans of large size and are generally cheaper and better for all spans.

§ 247. Proportioning:—The truss and the strain-diagrams must be drawn to a large scale with very fine lines and the strain-diagrams carried out to a closure to prove the accuracy of the work. The results must be fully tabulated as explained in § 235. The end pin should be made of ample size to reduce the pressure within reasonable limits, say 15,000 pounds per square inch. The parts should also be accessible for examination and painting. The lower part of the rib should be made with a solid web-plate filling the entire space between the

chords. The plate should be stiffened with Ls on the line of the diagonal bracing, well riveted. The bases which carry the truss should be made very like a column base with the spread sufficient to properly distribute the load on the foundations.

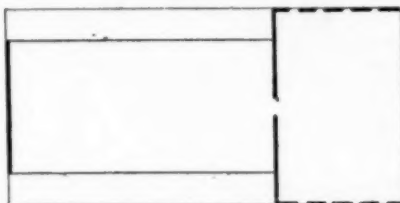


Fig. 72.

train-shed of the P. R. R. illustrated in the *Engineering Record*, Vol. XXVIII, No. 2.

§ 248. Details:—The centre connection must be made with a large pin so as to admit of free movement of the truss under changes of temperature, or changes in the condition of loading. The top and bottom chords are carried out usually to make a finish at the apex but they should be made with a slip-joint. The chords are usually made of Ls and plates and are bent to a curve, in this case the bending-moments must be provided for. Connections between the diagonal bracing and the chords should be made with plates put between the Ls of the chords and riveted through. As to spacing of the ribs, see § 235. The tension-members, taking the entire thrust when made as a tie connecting the skew-backs, should be made with large plates and carefully boxed with creosoted timber so as to be at all times accessible for painting.

SECTION VI.—BRACING OF SKELETON CONSTRUCTION:

§ 249. General:—A skeleton-construction building is a tower or girder placed vertically. Its height therefore must be limited to five times the width of the lot or the least breadth of the building, whichever is less, with the addition of two or three stories if the building stands between new buildings of good height. Usually the building will be so arranged as to admit of proper diagonal bracing along the heavy lines of Figure 72. Generally the length of the building is sufficiently great to provide ample rigidity in the other direction, although it would be well to secure bracing in the walls shown with a heavy broken line. The bracing should be carried continuously from the foundations through to the roof, and should be analyzed in manner similar to that shown in Figure 73. The wind-pressure should be taken at 15 pounds per square foot and the strains due to it added into the other column strains. Should it be practicable to obtain additional bracing at some other point, as for example on each side of the elevator-well, trusses should be placed there also. In the case given, the assumption is that the bracing is for a $50' \times 100'$ building in the interior of a block, as shown on Figure 72, and the analysis is for the pair of trusses which are shown to be on the end of the court and at the upper side of the elevator-well. In this case we would have as wind-pressures those due to the wind acting on the eight upper stories of a twelve-story building on a length thereof of 65'. The assumption is that if there are

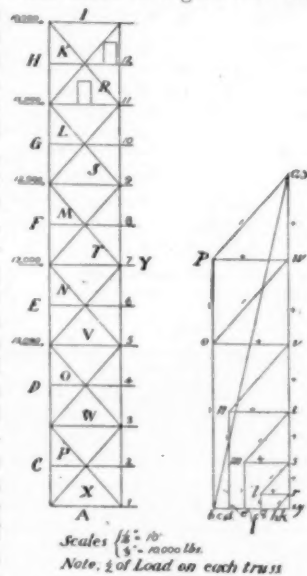


Fig. 73.

two portions of a building properly braced, the entire building will be sufficiently braced, since the floor-arches, floor-boardings, column-connections, etc., will be sufficiently rigid to warrant the assumption that each floor acts as a horizontal girder to transmit the pressures to the points of support. Three kinds of connections can be made, one in which the pressures are

carried directly to the joint, one in which they produce a bending-moment in the column and one in which they produce a bending-moment in the girder. The architectural requirements determine which method should be used. If the building is not more than twice as high as it is broad, the diagonal bracing may be omitted, but the column and girder connections must then be made riveted throughout. The column-connections in fact, should always be made so as to develop the full transverse strength of the section.

(To be continued.)

MODERN ASYLUMS FOR THE INSANE.¹—IV.

WARDS FOR EPILEPTIC, ACUTE, CHRONIC AND WORKING PATIENTS.—EPILEPTIC WARDS.



Fig. A.

- | | | |
|-----------------|-----------------|--------------------------------|
| A.N. Annex. | C. Corridor. | P. Porch. |
| A. Attendant. | D.O. Day-room. | S. Single room. |
| B. Bath-room. | D.O. Dormitory. | S.T. Stores. |
| B.T. Boot-room. | Lav. Lavatory. | S.C. Ward Scullery or Kitchen. |

It is highly desirable in all asylums that there should be in each section a small ward in which newly admitted patients may be placed under special observation, with a view to subsequent classification. Dormitories with single rooms should be set apart and arranged for the care and supervision (especially during the night) of epileptic and suicidal patients, and it is particularly needful to have an ample supply of single rooms for the epileptics. A provision should be made of an open panel four and one-half inches wide in the centre of doors of these rooms. This panel should be placed above the middle rail. This class of patients must be carefully watched, not only on account of the dangerous nature of the fits to which they are subject, but also for the protection from possible violence of other patients, nurses and attendants. Such open panels are not necessary in other rooms. For obvious reasons no associated dormitory should be planned to contain less than three patients.

An epileptic fit frequently comes on with great suddenness and the patient requires immediate attention. At times the assistance rendered by one official is quite insufficient, hence the absolute necessity for the architect to make every arrangement with a view of affording the fullest possible opportunities of supervising the day-rooms and dormitories and of glancing in at the patients in the single rooms unobserved and without disturbing the possibly sleeping patient.

We have frequently observed such patients both during and after a fit, and the sleep that usually follows the attacks is doubtless most beneficial to the patients, and undoubtedly affords a welcome respite to the attendants. We direct special attention to the importance of so disposing the buildings and airing-court for this class, that patients of the chronic, working, infirm or other description shall have as little view of them as may be, because the struggles and painful aspects of an epileptic fit are bad for any sane person to witness and cannot fail to excite the inmates of an asylum suffering from mental diseases of all kinds.

There should be, at least, two small rooms or lobbies provided near to the recreation-room, theatre and church, to which epileptic patients seized during a performance or a service may be immediately removed to receive attention or medical aid.

As an instance of the care and watchfulness required over epileptic cases, two cases of suffocation have been recently reported at Cane Hill Asylum. It is therefore the duty of the architect to devote all his skill in providing ample means to assist those who have the management and control of these unfortunate creatures. Accommodations should be provided for not less than one attendant to every ten patients, and one-fifth the dormitory accommodations should be arranged in single rooms of about one hundred superficial feet in area for each room. One padded-room is requisite to each thirty epileptic patients. A small kitchen is needed for preparing sick-diet, and one bath for every fifteen persons, which should be either placed in the annex or in a special room near to the dormitory.

In many asylums the "epileptic" sleeping accommodation is

entirely arranged upon the upper floors, but the danger of staircases to this class of patients is, of course, always present, and were it possible to economically arrange things otherwise, it would be well to keep all the epileptics upon the ground-floor level. This, however, is difficult to accomplish when taking into consideration the question of cost.

The epileptic buildings should, as already stated, always contain a large proportion of single rooms; these and all other rooms should be well lighted and cheerful so as to prevent the resemblance to prison-cells so frequently found in old, and sometimes even in new asylums. Where the windows are placed high up and over the roofs of adjoining corridors, there is a strong indication of want of skill and knowledge on the part of the designers, as well as a total disregard of the best interest of the poor patients.

In the Figures A and B, we illustrate two examples of epileptic wards, showing what in our opinion should and should not be adopted.

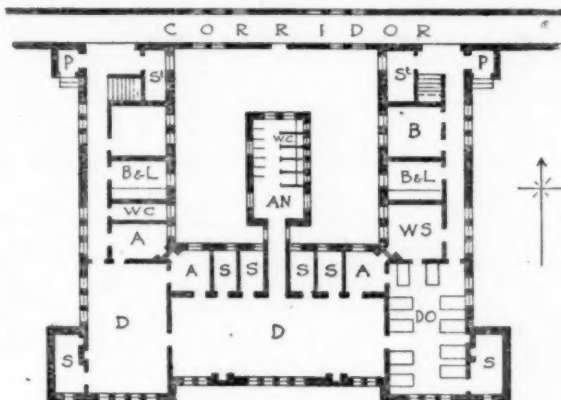


Fig. B.

- | | |
|---------------------------|--------------------------------|
| A. Attendant. | D.O. Dormitory. |
| A.N. Annex. | P. Porch. |
| B. Bath-room. | S. Single room. |
| B & L. Bath and Lavatory. | S.T. Stores. |
| D. Day-room. | W.S. Ward Scullery or Kitchen. |

In plan A it will be seen at a glance that one of the worst features is the arrangement of three rows of beds in the dormitory; we have pointed out in a former chapter that there should never be more than two rows. The number of single rooms in this example is insufficient as compared with the number provided for in the dormitory, and the attendants' rooms, besides being inadequate in number, are badly placed as regards opportunities of observation over the ward generally. The day-room is badly arranged and it would have been better to have subdivided it, in order that the patients might be sub-classified according to their mental condition.

In Figure B is shown, also, a plan of a ward for epileptics, with accommodation for about sixty persons on the ground-floor and first floor, with six rooms on each floor devoted to single rooms and attendants. Room-space is provided for one attendant to every ten patients, and the rooms have openings to command both the day-rooms and dormitories. In this scheme there is a difference between the upper and ground floors; on the upper floor there would be only one day-room, but two associated sleeping-rooms, thus making with the two floors, accommodation for sixty patients. There would be two bath-rooms and lavatories on each floor, as well as provision for lavatories and water-closets in the annex. It will be noted that the day-rooms would have respectively a southern and western aspect. In this example a boot-room would be provided near each entrance, where the patients would leave their boots, and thus prevent dirt and dust being carried far into the building. One boot-room should be kept exclusively for the occupants of the upper floor, as it is always desirable to separate and sub-classify the inmates as much as possible. It will be noticed that a ward dining-room is not provided in this scheme (B), presumably for economical reasons. Therefore, in such cases, the patients would either have to dine in the general dining-room, which is undesirable, or one of the day-rooms would have to be used for a dining-room; if this were intended it shows the advantage of the plan in Figure B over that in Figure A, inasmuch as in B the day-room is divided and in A it is not.

To illustrate the necessity of providing space for "recent" cases where they can be properly examined and proper diagnosis made of the case, we may be pardoned for a slight digression from the strict architectural part of the subject by quoting a case which recently occurred in the Birmingham Borough Asylum. The same day a certain patient was admitted an entertainment was given at which all patients whose physical and mental condition would allow, as well as the greater part of the attendants, were stated to have been present, and the "recent" patient being considered harmless was left in a ward, where, it is said, a porter had charge, parading the various rooms. While the porter was in one part of the asylum, the newly admitted patient was seized with a violent mania and attacked his fellow-inmates who were in bed, killing one by splitting open his skull. [It should be remarked that this asylum is planned on lines now considered out of date, namely, the "corridor" system.] This

¹ By George H. Bibby, F. R. I. B. A., F. R. Hist. S., and Ernest A. E. Woodrow, A. R. I. B. A. Continued from No. 918, page 67.

as we have remarked, illustrates the need of a room for "recent" cases where the attendants can watch their patients, for in a common room the patient may be more watchful than the attendants, with the advantage that he has only the attendants to watch, while the attendants have several besides him.

In plan Figure B the day-rooms are so placed that such an event as the above, provided reasonable watch is maintained, is nearly impossible, as any disturbance in either day-room could be witnessed from two attendants' rooms through the glazed doors or inspection windows. The dormitory is similarly overlooked from the attendants' room and the ward scullery.

With regard to the passages and minor rooms, the safety of the inmates must depend upon the vigilance of the officers, quite as much as upon the disposition of the plan by the architect.

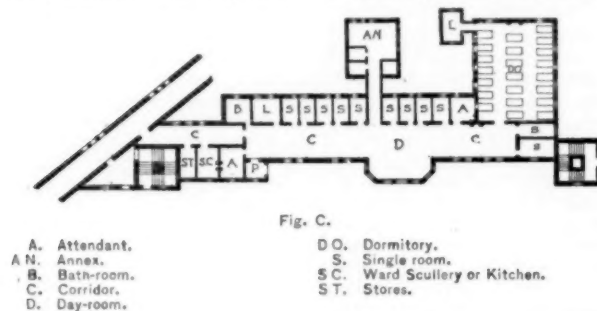
It should not be forgotten by the designer of an epileptic ward that patients may, and do have a dozen or more fits within twenty-four hours, and each fit demands instant attention, and that the officers must sometimes remain for a considerable time with the sufferer until he sleeps or can be removed to a single room.

It has been stated by an authority upon mental disease that many habitual criminals spring from families in which epilepsy exists, and that the cause of their death is often tubercular diseases, or diseases of the nervous system. "Crime," he states, "is a sort of outlet in which the unsound tendencies are discharged; they would go mad if they were not criminals, and they do not go mad because they are criminals."

Other epileptics are of a furious character, while others again are sometimes possessed by terrifying ideas, perceiving in those around them assassins attempting their lives; in these cases their fury is uncontrollable. The result of long-continued epilepsy is to impair and weaken the mental faculties, producing first failure of memory and subsequently a condition of dementia, but in the end both the moral and intellectual senses are involved in a common ruin. It is for this condition of mankind the architect must provide when designing epileptic wards in a modern lunatic asylum.

WARDS FOR THE ACUTE AND RECENT CASES.

In the wards for the acute and turbulent patients there should be one padded room for every thirty or thirty-five patients, which number



should be under the care of at least three attendants. There should be a liberal supply of single rooms, as well as a storeroom and two baths, with a lavatory, which could be so arranged as to be a dressing-room or ante-room to the bath-room. The closets, urinals, brush-room, slop-room, etc., should be provided as in all other wards and be placed in the annex, with sufficient means afforded for isolated ventilation.

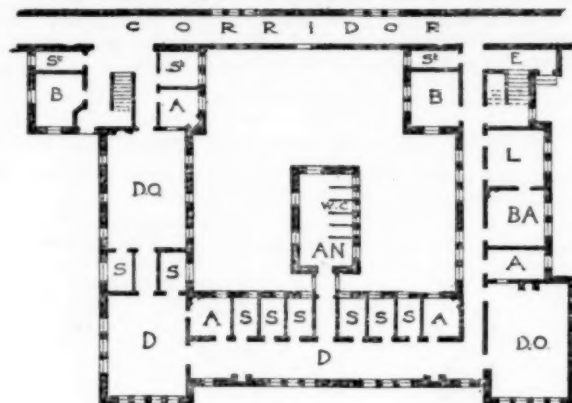
Following the plan we have adopted in illustrating other wards of a modern lunatic asylum, we give in Figure C a plan for an acute-patients' ward which contains several features that should be carefully avoided. The large dormitory is so arranged that the patients and attendants have only one exit in case of fire or panic, and this point, in view of the dangerous condition of this class of patients, must have special consideration. The same remarks, already made as to the limit of two rows of beds in the dormitories apply here, there are obvious objections with regard to control, privacy and other conditions in having three rows of beds. Two attendants' rooms are not sufficient, a third should be provided where the number of patients is so large. The plan is so disposed that the medical superintendent would have to pass through the whole of the apartments and retrace all his steps, before reaching other scenes in his round of duties. This is a great waste of both the time and energy of an officer whose duties are most onerous and of the greatest importance. It is for the architect to contrive all parts of the asylum with a view of economizing the strength and labor of the medical and other officers.

In Figure D is a plan of an "acute" block which may be looked upon as a well thought-out scheme. The very-noisy cases can be easily separated from the other patients in the day-room and the dormitory, single rooms and attendants' rooms are well placed for purposes of observation and control and are conveniently arranged both for day and night duty. The medical superintendent after passing through all the rooms on the ground-floor, and seeing everything and all the patients, could ascend to the first floor by the one staircase, pass through the rooms and descend by the other staircase without reversing the same ground twice over. The upper floor would be

used probably for recent cases, otherwise the plan would be similar to the floor below.

WARDS FOR CHRONIC AND WORKING PATIENTS.

The building to be provided by the architect for the reception of the chronic and working patients need not be as near the medical



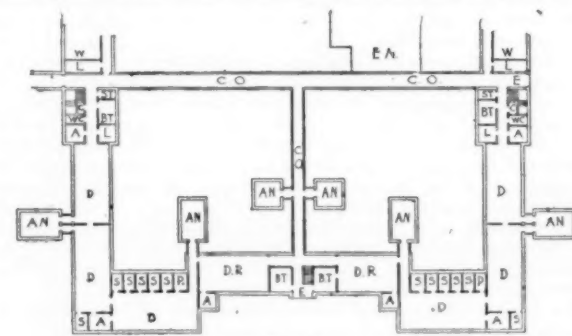
officers' quarters and administrative officers as some of the other blocks, as for instance, the infirm and epileptics. Care must be taken so that those patients who can be employed in the grounds or upon the farm may not have to traverse the corridors or apartments occupied by, or adjacent to, other patients, for it must be remembered that these patients will often, though quite harmless, be noisy; apart from this their farm-work necessarily causes them to be less clean than those incapable of much work or the occupants of the workshops.

The workshops should, of course, be erected quite close to the ward devoted to the working patients, and arranged so that they may be reached under a roofed passage, if not through an enclosed corridor.

Attendants' rooms are required for this class of patients at the rate of one attendant for every fourteen or fifteen patients. The dormitory and day-room should not contain more than twenty patients each, so as to secure good supervision and opportunities for sub-classification. Although it is desirable to have a separate dining-room in this ward for those patients whose infirmities prohibit their assembling in the general dining-room, yet as the majority of this class can use the common dining-hall, the block should be placed somewhat near to it. There should be a few bath-rooms attached to this ward, although the greater number could, and probably would, use the general bath-room, which it will be our duty to describe hereafter.

The water-closet and lavatory accommodations should be upon a liberal scale both for day-rooms and dormitories, and placed so as to afford ample opportunities of control by the officers, on account of the filthy tendencies of certain descriptions of the chronic patients.

We give an illustration in Figure E of an arrangement of a portion of an asylum for chronic and working patients. In this block of buildings there are three entrances from the main corridor of the



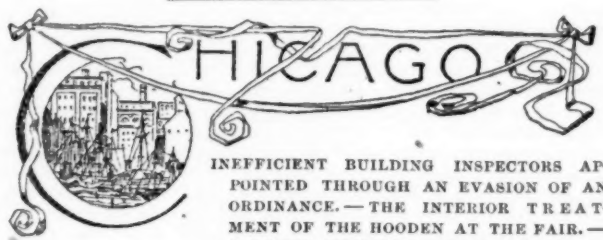
asylum and three entrances from the airing-court, which in a case like this might conveniently be divided into two or three parts, so as to secure some outdoor separation and classification of the patients liable to quarrel or undesirable as companions to one another. Near each of the entrances, it will be seen, there is a boot-room: these and the attendants' rooms are very conveniently arranged near to

the outer doors, thus affording every facility to the attendant to keep an eye upon patients both in the grounds and in the buildings; other and intermediate attendants' rooms are provided, as also a number of single rooms, the water-closet and lavatory accommodation is divided, so that patients need not pass through other day-room or dormitory than the one they are warding in. The patients who are either able or can be persuaded to work would be placed on the eastern side near the workshops and entrance to the farm land.

In Colney Hatch Asylum, where the average number of patients in 1891, was 2,250, we learn that forty-seven per cent of the male and fifty-nine per cent of the female patients were induced to employ themselves in one way or another, and these figures when compared with many asylums are not looked upon as high. The providing of work and exercise for the patients must be looked upon as a matter of the utmost importance. To turn the inmates out like criminals or wild beasts into the airing-court, is a practice by no means calculated to assist their mental recovery, to improve their habits or give them any contentment. The staff of attendants and nurses is not only required for supervision and safe custody, but to promote employment and amusement, especially encouraging outdoor work and exercise. In all cases, the architectural arrangements must be such as to facilitate the action of the medical officers and others in their endeavors to provide occupation for the patients under their care who may prove to be capable of it. It is strange that lunatics from town districts are often more excitable than those from agricultural localities.

In our next paper we purpose considering the arrangements of the administrative block which in most asylums forms the centre, with the males on one side and the females on the other.

(To be continued.)



INEFFICIENT BUILDING INSPECTORS APPOINTED THROUGH AN EVASION OF AN ORDINANCE.—THE INTERIOR TREATMENT OF THE HOODEN AT THE FAIR.—A DUTCH INTERIOR.—FURNITURE.

AS previously mentioned in these letters, the City of Chicago had nearly adopted a new building ordinance one of whose provisions was the appointment of the building inspectors by competitive examination. This was to take place before a board composed of the Commissioner of Buildings and four other members, one each from the Illinois Chapter of the American Institute of Architects, the Board of Chicago Underwriters, the Builders' and Traders' Exchange and the Carpenters' Council, each appointed by his own organization.

This was the first attempt to introduce into our municipal offices the principles of civil service and the issue was promptly met by the politicians of the City-hall, who appreciated that it was an entering wedge for a possible future extension of that most pernicious system, based upon the capability of a man, and not upon his "pull." Accordingly when in the month of May this board duly met at the City-hall no over-eager and friendly cooperation was visible from the powers that be. Apparently the Building Commissioner himself, appreciating the fact that all the defects and deficiencies of the entire office would be laid to him, desired good and capable men. Especially had he reason to do so, as the last incumbent of the position was the object of repeated attacks, both from the press and from coroners' juries, because of the utter incapacity and rottenness of that office. But the pressure of "inflowence" was mighty and however willing the spirit, the flesh was certainly weak.

It was quickly discovered that, whatever the capabilities of parties, the general and indiscriminate applicant was certainly not allowed to appear before the board. Only those who had sufficient influence to make it desirable for the mayor to put his name on the list were allowed in the hallowed precincts of the examining room. Notwithstanding that members of the board received no pay whatever and were frequently obliged to grievously neglect their own business, they went into the work most seriously and conscientiously that there might be no mistake in judgment. The most unpromising candidates were allowed time to attempt to answer ten questions, when generally each member felt that the candidate's ignorance was fully demonstrated in three answers. As the result of a prolonged series of most tiresome sittings, nearly eighty applicants were examined, of whom only twelve were deemed of sufficient capability—although the requirements were not high—to be recommended to the board. From this, the general calibre of the candidates can easily be imagined. Of this number, however, only four were appointed!!!

The meetings of the board were not terminated by regular adjournment agreed upon among its own members, but by order of the Commissioner. The demagogues, seeing that by any such series of examinations they were sure to lose all chances of supplying places to their friends, took another tack. They secured the passage of an "order of council" (which can never supersede an ordinance)

directing the Commissioner to appoint such parties as passed the examinations to his satisfaction. Armed with this authority, appointments were at once made, and as a result several saloon-keepers, a number of ignorant so-called mechanics, and four really capable men now constitute our efficient (?) Board of Building Inspectors.

Although the true state of affairs was known, yet no one appeared particularly interested to investigate, until the Board of Underwriters threatened to advance their rates in this city owing to the incapacity of the inspectors of the Building Department. This stirred up considerable talk and numerous newspaper articles for a few days, but without any appreciable result except a statement from the Building Commissioner that the board had paid no attention to him, and he did not feel bound by its action. Here it appeared that the matter would probably rest as it seemed to be no one's especial business to get into a legal fight with the city government. However, a committee of the Builders' and Traders' Exchange has now taken the matter under consideration and it is to be hoped will find some way to effectually force the issue.

A feature at the World's Fair most interesting to architects and architectural students, is the study of interiors that can be made in different places. Some of these are most carefully studied and are quite historical, affording very charming opportunities for inspection and comparison. In one of the previous letters from Chicago there was mentioned the Hoo-den or Phoenix Palace erected by the Japanese government on the Wooded Island. The descriptions that were given us before the actual work was begun promised much of interest, but did not in any way exaggerate the attractions of the actual display. The palace consists of three pavilions, each one representing a special epoch in Japanese decorative art. The most southern pavilion represents rooms in a shogun's villa about the middle of the fifteenth century. These rooms are especially charming and curiously enough lack all touches of brilliant color which are so distinctly associated in our minds with Japan. In fact the entire decoration of the rooms is in black and white. The floor has the ever-present Japanese matting, each breadth being bound with a white and blue material, the matting itself being made over a padded frame, so that the whole thing can be lifted from the floor in sections. The walls are covered with canvas, the canvas being painted a dead white. The frames of the sliding screens and windows are black lacquer, while the ceiling and heavier woodwork of the room is of white cedar. The treatment of the wood, as frequently noted by travelers, is especially attractive, being apparently without finish in one sense of the word, as signifying either varnish, shellac, etc., but presents the smoothest and softest of surfaces, while no bit of the natural grain is lost. The design of the woodwork like all the rest of the work in the rooms is of extreme simplicity, absolutely no carving or moulding being present: only an occasional gilt chrysanthemum serves as decoration. The ceiling is made of what are seemingly twelve-inch boards, overlapping after the manner of shingles, while beams run at right angles to them. The white walls are relieved by an occasional bit of decoration in monotone, a flight of swallows executed in the most dainty of Japanese impressionist manner or an occasional palm tree. Built into the room are several small recessed cabinets, while above these are little sliding doors of white with the black and gray decoration. Two kakemonos hang on the wall and the whole room though severely simple is extremely attractive.

The central pavilion of the Hoo-den represents three rooms in a palace of a daimio, at about the middle of the eighteenth century. This style we are told is that of the golden days of the Tokugan and the golden past can be accepted without question. The extreme of ornamentation, farthest removed from the simplicity of the first pavilion, is here reached, the decoration being most elaborate both in color and design. The central room of the three is evidently the room-of-state in the house of the noble, while the room to the left across a passage is apparently the dining-room, gorgeous in service of red and gold lacquer. The ground-color of all the walls is of dull gold, the two smaller rooms having a fan decoration which is not at all satisfactory. The colors of the fans are of the strongest and most intense kind. The decoration of the central room consists of different panels, of the most impressionist kind of Japanese landscape. The central and largest one stands forth strong and fine, a gnarled pine-tree tossed by the winds, while waves swirl around its base. Most of the panels are of the lightest and brightest description. Colored jars and pots stand around, one containing a stunted cedar, another a cherry-tree in full bloom. The floor is covered with the same straw matting and the woodwork is still of the white cedar. The applied gilt decoration is no longer simple, but elaborate, while above the openings are placed screens of wood carved most profusely, carving resting on carving and colors running riot. The ceilings are divided into squares by bands of lacquer, while within each panel rests a cock, conventionalized almost beyond recognition, but of the proudest and bravest hues. The effect of the whole apartment, especially when filled with the gay dresses of the Orientals must have been gorgeous in the extreme and very beautiful.

The third pavilion is of the earliest style of the thirteenth century and here the chief characteristic seems to be the use of the pure primary colors, placed side by side, with utter fearlessness. Little or no lacquer is used in the room, and the woodwork is extremely simple, but the whole wall-space is covered with the brightest of ornamentation apparently stencilled on, in which a prominent feature is horizontal bands of blue, dashed with white crossing through the

designs at frequent intervals. The raised matting mats only partially cover the floor, the kakemono does not appear either on the wall or lying rolled, as in the other pavilions, and the screens, of which there is an unusual number, are curious movable silk curtains hung on lacquer bars. The window-screens are of a sort of bamboo matting, which roll up and tie with huge tassels of the brightest red dye.

It is very curious to notice how in these examples of three art epochs of Japan the same spirit seems in a measure to prevail, as was shown in the European epochs which somewhat correspond to them in time. First we have the thirteenth-century work, the chief characteristic of which seems to be the use of the pure primary colors. Though this was not by any means the only characteristic of Romanesque decoration, still it was a very strong one, strong enough indeed to make the similarity between the Occidental and Oriental work quite striking.

In the middle of the fourteen hundreds Japan apparently enjoyed severe simplicity in her decoration, while Europe with the advent of the Renaissance found her things of beauty in the simplicity suggested by antique forms. In the eighteenth century Japan ran riot in golds and elaborate designs in her decoration, while Europe was covering herself with rococo elaborations. That these similarities can be more than coincidences it is difficult to understand, but the curious fact of the resemblance certainly exists for those who give the matter thought. The work of the fifteenth century corresponds to what is our usual preconceived idea of Japanese decoration, while the other two epochs are surprises. These pavilions afford very delightful examples of interior study and decoration, and are well worth careful inspection.

Standing apart by itself, as they do, though not in their immediate neighborhood, is a very excellent example of an old Dutch house. This exhibit has not for its chief object the displaying of the old Dutch style of furniture, being in itself actually the setting for the exhibition of the Van Houten Cocoa people. The whole thing is most excellently carried out, however. Being built of wood, outside it is only a poor imitation of a steep-roofed, ordinary Dutch brick house, but inside everything is certainly most picturesquely arranged. On the northern side of the entrance one long room of modern workmanship, but quite in the spirit of the old Dutch style, is used for the serving of cocoa, but on the southern side two smaller rooms rich in the old Dutch carving and Delft china serve as a sort of museum. These are extremely well carried out and if all is not old within them, it is, at least, an excellent reproduction of the old. A wainscoting of Delft tiles harmonizes with blackened woodwork, and the windows throughout the building are of pale olive-green glass in leaded panes. The only color of the serving-room is the olive-green, relieved by the bright blues of the Delft china, which is introduced wherever it can be used. The whole picturesque interior is increased by the costumes of the serving-girls, who wear the curious coiffures of the different districts of Holland. The entire picture is carried out.

In the Building of the Liberal Arts the furniture displays of the different nations are extremely interesting, and are so placed as to often make very good interior studies, full of national characteristics. The furniture of our own nation has less characteristic setting and the display itself is not a very general one. Quite aside, however, from any feeling of national pride, which it goes without saying, intelligent people leave at home when they visit a World's Fair, our furniture stands out most distinctly as combining in the highest degree excellence of design and workmanship, with a general character of comfort and ease. We have, it is true, had no Morris nor Eastlake nor Chippendale, the names of our designers are unknown to the general public, but most certainly many of the good qualities of our work seem to be the good qualities inspired by many and different nations, till a truly admirable style has been the result. The marquetry work done by some of the Grand Rapids manufacturers is really charming and it is only to be regretted that more of the Eastern firms have not thought fit to send some of their good work, making the exhibit more general and thorough.

The furniture of that nation which in grace and elegance stands farthest from us is that of Germany, if we take as typical their modern furnishings, than which nothing could be worse. The forms of the gilded furniture which attempts to assume the French characteristics are extremely awkward and are only equalled by the very bad coloring. Two especially hideous examples of modern German work are two chairs which are proudly labelled, "For the new palace at Potsdam." That anything could be more inartistic it would be hard to imagine, unless we except some of the very painful portraits, in bronze, marble and paint, of the young Emperor, whose face would certainly need a master to idealize it into refinement, at the best.

In this modern style nothing that is simple can appear beautiful to the German eye. There are two large rooms in the German exhibit, one furnished to suit the most approved nineteenth-century taste in all the abomination of gilt and stuffy elegance, while the sixteenth-century room possesses many features that are charming. In the modern German room where the most elaborate display is made, bad forms vie with bad colors for the mastery and stuffy elaborateness of hanging and upholstery with atrocities in gilded and painted woodwork. The Germans, like the French and Austrians, occasionally paint decorative figures and scenes on their woods, pro-

ducing an almost papier-maché effect whose good taste is always questionable. When, however, the work is as poorly executed as on some of the German furniture, the question is promptly answered.

Quite distinct from this modern school of German furniture and furnishings which appears to have for its secret, perhaps unconscious, inspiration, the models of France, there is the style which keeps to the simple forms of the old German times, which is extremely good. It is in this kind of furniture that we get that excellent treatment of wood-finish, before spoken of, and the unaffected furnishings of rooms whose simplicity and truthfulness is their great charm. One entirely delightful example of this kind of work comes from Simon Schneller, in the form of an old German dining and hunting room. The chief features of the rooms are German Gothic, with here and there a little touch of Renaissance carving introduced. The colors used in the room are green and burnt-sienna, the whole thing at first appearing so simple that it hardly seems designed. The frieze around the room is a conventionalized hunting-scene in greens and browns. A settle of very good design has above it, really being part of itself, a cabinet, behind whose faded green silk curtains old books peep out, while above, coarse pottery and old pewter tankards are arranged. The chairs are covered with brown leather and the design of them is good, while the tall clock has Gothic features about it. Next to this hunting-room is a very pretty Gothic room from some Nuremberg firm. There are several pleasing features about this exhibit which are well worth especial study.

Next to the Germans in the march of improvement stand the Austrians. Their chief furniture exhibit that has any attempt at artistic setting is the reproduction of the *salon* of the Princess Metternich. Here a little of the grace displayed by the French appears, and the colors themselves are at least harmonious. In this especial room the ceiling is fairly well frescoed, while the unpainted portions are creamy white, with gilt rococo tracery. This cream-and-gilt treatment is also used on the walls to frame-in tapestries. The furniture is all gilded or lacquered, even the grand piano having a case painted in the papier-maché style. Satin draperies are hung wherever possible, and the entire room is bristling with upholsterer's art. This would naturally be expected in a manner in an exhibit of this kind, but that it is boldly placarded a reproduction of the Princess Metternich's room, leads one to trust a little in the faithfulness of the reproduction. There is absolutely no repose about it, and neither in part or as a whole would it serve as a background for any fine work of art that might be placed in it.

The gilt and lacquered style we see perfected in the French work. Of its kind it is truly excellent. If the French make a gilded chair that is neither comfortable nor useful, you can at least be sure of one thing, that it will be the best thing of its kind made; that the design will be good; in fact that it will have, as an enthusiastic auctioneer said the other day of an old Dutch chair, "chaste extremities." The French have some very dainty bedroom furniture, forming with the bedrooms themselves a very pretty exhibit.

The display in the shape of a well-studied room of the twelfth-century style in the Danish pavilion has already been mentioned, and should not be missed, when a special study of the furniture of the Fair is being made.

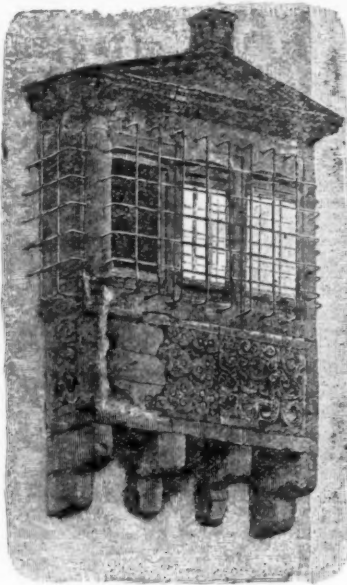
England's furniture display is very interesting, though resembling that of the United States, in that it is chiefly a display of furniture, rather than any attempt at interior studies. This furniture is perhaps more formal and has less of generous comfort about it than our own, while it excels ours neither in design nor workmanship. There are in this exhibit some very beautiful specimens of marquetry and inlaid work, and some most charming and interesting Chippendale furniture. This is especially worth careful inspection by people who are making designs in this direction a specialty, as these are reproductions either of specimens in private collections or in the South Kensington Museum. A very attractive bookcase is from the latter place, while a clock, tables, desk and chairs are from private collections. An entire exhibit is made of mediæval carved-oak furniture, which, however, has almost too little study of design to be entirely satisfactory.

The most attractive display in England's furniture exhibit is made in the Hampton & Son's reproduction of the banquetting-hall at Hatfield [see the *American Architect* for August 26], the country-seat of the Marquis of Salisbury. This reproduction is most excellent in all particulars. The room is two-thirds the size of the original, being forty feet in length. This display becomes one of unusual interest, as the original hall is one of the best examples of pure Elizabethan style. One of the special features of the room is the flat ceiling, which here shows its commencement for large halls of this character, all previous ones having gabled, heavily-timbered roofs. At one end of the room a minstrels' gallery extends across the entire length, while the opposite end is covered with a carved-oak screen. By permission of the owner of Hatfield, it is said, plaster models were made of the carvings, etc., by the exhibitors, so that the reproduction is very reliable. All the details of the room are most carefully carried out, and well worth study. A large, open fireplace is in the centre of the room, with all its appointments, while above it hangs an old tapestry. Another firm uses the room as a setting for reproductions of Elizabethan plate. This may be fine, but it is a little difficult to judge of them placed as they are, where the visitor can only view them from behind the railing anywhere from ten to twenty feet away. This exclusiveness on the part

of the English exhibitors is very absurd. Examples of the silver and gold smith's art are usually expected to require close inspection, but in several exhibits in the English section this desire for privacy makes a farce of the whole display.

Italy has some very excellent furniture, though not placed to afford studies of interiors. Of the carved woodwork, that of this country takes a high rank, and most certainly stands alone in its unique character. The carving is treated in as realistic a manner as are the works of the actual sculptors of Italy, but, by its excellence of execution, offers charming results. Besides the carved furniture, there are many good examples of inlaid work, and specimens where leather work is successfully introduced. A certain picturesqueness seems to attract one in this display, but few are the traces of ease and comfort, so essential to the English and Americans, found in this furniture of Italy.

SOME EXPERIMENTS ON CONCRETE BEAMS.



Oriol at Schloss Offenbach.

THE title of a paper in Vol. CXI of the "Proceedings of the Institution of Civil Engineers" (1892-3, Part I), caused us to turn to it with considerable interest, says the *Builder*. The title runs:—"Strength of Concrete Slabs," by Sidney Richard Lowcock, Assoc. M. Inst. C. E. We trusted to find that, at last, some valuable experiments had been made which might furnish data for the construction of concrete floors. The experiments of Colonel Seddon¹ on concrete slabs, supported on all the four sides and uniformly loaded until they broke, were in the right direction, but further experiments on other kinds of concrete, and more especially on slabs fixed on all the sides, were needed, so that more accurate constants might be deduced.

Our hopes that Mr. Lowcock's paper would disclose the results of such experiments were speedily overthrown, for the "concrete slabs" were neither more nor less than beams, supported at the two opposite ends and loaded in the middle. As far as they go, the tests are useful; we cannot but regret, however, that they did not go further, and, if Mr. Lowcock will continue them in the direction indicated by the title of his paper, he will confer a benefit on architects and engineers alike.

A brief résumé of the experiments will be of interest. The slabs, or, rather, beams, were made with good Portland cement (which had a tensile strength of 665 pounds per square inch at seven days), and "clinker obtained from furnaces which burned ash-pit refuse." The clinker was crushed in an ordinary mortar-mill, and was afterwards passed through a screen with three-fourths-inch meshes, and thoroughly washed with clean water. Unless the washing was carefully done, it was found that the concrete "swelled and blew after setting." Three different proportions were adopted, namely: (A) 1 part cement to 4½ parts clinker; (B) 1 part cement to 6 parts clinker; and (C) 1 part cement to 6 parts clinker as above, and 2 parts clinker ground to the fineness of coarse sand. The concrete was well rammed into greased wooden moulds. Slabs of three different sizes were made of each mixture, namely, 21 in. × 18 in. × 4 in., 30 in. × 18 in. × 6 in., and 39 in. × 18 in. × 9 in.; they were kept dry until tested. The supports for the different-sized slabs were 12, 18 and 27 inches apart respectively.

If we base our calculations on the formula $W = \frac{2}{3} C \frac{B D^2}{L}$

(where W and C are in hundredweights, and B , D and L in inches), we can find the value of C for the different mixtures. For concrete (A)—proportion 1 to 4½— $C = 1.9^2$ at the age of fifteen days, and 2.8^3 at the age of twenty-one days; for concrete (B)—proportion 1 to 6— $C = 1.2^4$ at the age of fourteen days, and only 1.1^5 at the age of twenty-one days; for concrete (C)—proportion 1 to 8— $C = 0.3^6$ at the age of fourteen days, and 0.4^7 at the age of twenty-one days.

The individual beams in the last two series vary considerably,

some being twice as strong as others, and, as the total number of "slabs" of these series was only fifteen, of which four were damaged prior to testing, the "constants" deduced are not very reliable. Indeed, all the tests were carried out at too early dates. The single beam of the 8 to 1 concrete, which was tested at the age of fourteen days, was "not dry through," and, consequently, not in a fit state for being broken. In the other cases, also, more uniform and more valuable results would have been obtained if the beams had been a little older. But the tests will have the effect of drawing further attention to the importance of keeping the supports of concrete floors in position for as many weeks as possible, more especially when the proportion of cement to aggregate is small. They also corroborate previous experiments, which have shown the unsuitability of concrete, when used alone, for resisting transverse stresses, for the beams tested by Mr. Lowcock yielded suddenly and totally, no sign of fracture, except in one instance, appearing before the collapse.

It must be borne in mind, however, that the beams were merely supported at the ends. Had they been fixed, the probability is that the lower surfaces would have cracked long before the beams actually collapsed. In other words, the concrete would have formed itself into a kind of arch, part of it opposing a compressive resistance to the stress of the load, and part of it (underneath) being at the same time cracked, and, consequently, worse than useless. It is this behavior of fixed concrete beams and slabs which renders it impossible to calculate their strengths from constants deduced from experiments on beams and slabs which have been merely supported. We hope that the next gentleman who tests concrete beams and slabs will see to it that some of them have their ends and edges securely fixed. In this way only can a rule be formulated which shall foretell the strength of other beams and slabs with an approximation to accuracy.

On the whole, Mr. Lowcock's tests give somewhat low results, but this is due to the early dates at which the tests were made, and, perhaps, partly to the nature of the aggregate. A beam composed of equal volumes of Portland cement and coke breeze, and tested in 1891 by Mr. David Kirkaldy, yielded a constant of 5.9, although the beam was only seven days old; while a much larger beam, composed of one part Portland cement and four parts clean breeze, and tested by Colonel Crozier, yielded a constant of no less than 4.1, but the age of the beam was forty-three days. As the strength of Portland cement varies pretty nearly as the cube root of its age (within reasonable limits, of course), a beam similar to that tested by Colonel Crozier might be expected to furnish a constant of 3.3 at the age of twenty-one days, or 17 per cent in excess of the average obtained by Mr. Lowcock for beams of slightly inferior composition, but only six per cent in excess of the strongest beam of similar composition tested by him. The twenty-one days' tests of the 4½ to 1 concrete are, therefore, remarkably similar to Colonel Crozier's test, but the results of the experiments on the two weakest concretes are not sufficiently regular to be of much use. This really does not matter much, as coke-breeze concrete weaker than 1 to 4 or 5 is seldom used where it will be subject to transverse stress.

It may be added that the weight per cubic foot of the 4½ to 1 concrete was 118 pounds, and the compressive strength, at the age of fifteen days, was 1,120 pounds per square inch.

In the same volume of "Proceedings," four papers on graving-docks are printed, together with the discussion and correspondence which followed the reading of the papers. Some interesting information on concrete is given, but to this we merely allude in passing. A few words of Sir Benjamin Baker on theoretical investigations of strength may, however, be quoted, as they have a special significance when spoken by an engineer who must have had recourse very largely to such investigations. After referring to the strength of concrete beams, he said: "Bearing upon the general question of the value of theoretical investigations of strength, in cases such as a flat concrete invert, as compared with direct practical experience, I may say that several cases recently have made me a little nervous as to whether the results of the high technical training of the present day with many young engineers do not lead to a dangerous confidence in theoretical deductions and the use of formulas. No one can charge me with contempt of theory; but cases have been brought under my notice rather frequently of late showing too great confidence on the part of young engineers in theoretical deductions, in preference to going to the same extent as their predecessors had been in the habit of doing to previous examples, in order to see what was the right proportion to adopt in a particular work." And again: "Theoretical knowledge is no substitute for the practical experience upon which our predecessors in this institution have chiefly relied."

Certainly it sounds somewhat strange to hear a master of theoretical investigations (for the designer of the Forth Bridge cannot have been otherwise) discounting such investigations in this way, but there can be no doubt that his words are words of wisdom, and are especially to be pondered in connection with calculations of the strength of concrete beams. For the ordinary rules, which give the strength of fixed beams as double that of beams simply supported at the ends, do not apply to concrete. Fixing the ends of a concrete beam may treble or even quadruple its strength, while, instead of yielding without previous fracture, the under side of such a beam may crack long before the upper surface yields. From this, it is

¹ See the *Builder* for December 17, 1892, page 482.

² Average of three tests.

³ Average of three tests.

⁴ Average of three tests.

⁵ Average of two tests.

⁶ One test only.

⁷ Average of three tests.

clear that a concrete beam with fixed ends is, to all intents and purposes, an arch, and theory has not yet, on account of the paucity of experiments, formulated a rule for calculating the strength of such an arch.

Sir Benjamin, however, does not condemn theory; he would merely have it conformable to right practice, as it ought to be.

LEGEND OF ST. GUDULE.

LOOKING only to the picturesque and quaint side of the Middle Ages, as typified in Gothic arches, corbels carved grotesque and grim, stained windows, old turreted walls and pretty old-world costumes, we are apt to think of the mediæval times as a lesser golden age, a time of milk-maids and musical shepherds and sucking doves. But every now and then, as when the wind shifts the sand on some road through the Sahara, the skeleton of a man turns up to remind us that there was grim reality in those old days, too, and cruel suffering, and wild, mad hate. Then as our imaginations are touched in this new direction, we come, as in the museum of Brussels, on some sharp-spiked iron mace or three-pronged spear, or oftener some strange instrument of torture, a mere curiosity of mechanical ignorance, perhaps, to us to-day, but a very terrible reality to the condemned victim who entered the torture-chamber and saw the massive bolts and chains ready to crush the life out of him or tear him asunder; a very terrible reality to him, we may be sure, a few minutes later, when, already stripped and chained on the iron frame, he felt the first keen, wild throb of pain from twisted spike or red-hot iron pincers, that told that the frightful work was begun which, after dragging on for hours that seemed ages, was to hurl him screaming through the gates of death.

Yes, under the fair outward covering of dainty shepherdesses and sucking doves, which represent to us the Middle Ages, when people were "goodly knaves" and wore "leather jerkins," there lurks an element of grim tragedy as dark as anything that our struggle-for-life century can show.

The Middle Ages are a type of the world in this. Like some fair Corsican valley which to the mystery is full of nature's calm beauty hidden under a purple mist, while in the hearts of the peasantry are the seeds of ravishment and murder and revenge, so the Middle Ages. The purple mist of time has hidden from us their harsher features; calmed their wild, shrieking pain in death, and turned the terrible torture-chamber into a mere museum of curiosities, in which we while away an idle hour of a summer holiday.

And there is much more in Brussels to remind one of those by-gone days, before the Genoese navigator sailed westward from the blue shores of Portugal. Most notable of these relics of the past is the old Cathedral Church of Saint Gudule, with its ancient Gothic arches, weather-beaten and time-stained, its ghoul-like monsters and hideous dragons carved in stone at the end of every water-spout, and inside its quiet, old-world atmosphere, laden with the dust of ages, and watched over by the innumerable dead whose bones lie close-packed beneath the flagstones.

Most curious among the antiquities of the old Cathedral of St. Gudule is the mechanical clock, now rusty and time-stricken, but once a very marvel of ingenuity. The clock was like a church in miniature, with its big doorway and pointed spire, on the top of which rested a golden angel, whose trumpet sounded to mark the hour. The angel Gabriel, standing on the left of the clock-tower, waved a lily branch, as if to salute the Virgin standing on the other side. Then the doors of two niches opened and showed two skulls, in front of which lay little books whose pages turned of themselves, showing a different text for every hour of the day. Then the silver bells in the clock-tower used to sound a sweet, melancholy chime, and on a little stage was acted all the drama of the Passion, from the treacherous kiss of Judas to the last moments of the crucifixion. The angel sounded his trumpet once more and then all became silent and immovable as before.

Many years ago, they say, a prince came to lay siege to the city, but, in spite of all his armies, in spite of the great wooden towers that showered down mighty stones, and arrows and flaming torches, his efforts availed him nothing. A miraculous cloud spread round the walls, like a second rampart; the Holy Virgin and the angels appeared in the middle of the cloud and hurled back the stones and arrows and flaming torches amongst the assailants, many of whom were slain. The prince of the hostile army, furious at this miraculous protection, blasphemed horribly against the Divine guardian of the town. He was stricken stone-blind. Then he bowed beneath the hand that had chastened him, raised the siege and promised to present to the Church of the Virgin a crown of gold in which his horse could turn round.

His repentance found favor with the Mother of the Lord, his eyes were opened again, his sight was restored and he visited the Church of the Virgin with a yellow taper in his hand, to offer thanksgiving for his recovery. The prince, full of joy, declared that he would offer to the Church another gift as wonderful as the first was rich.

At these words a young shepherd from Rome came forth and said: "I will make it; give me a thousand golden crown-pieces and hire me for fourteen years and I will make you a clock of which the fame will go abroad, like the fame of the seven wonders of the world." He received the thousand crowns of gold and toiled day and night for fourteen years and completed the beautiful clock, modelled like a miniature church, with a golden angel on the spire.

"Now," said he to the bishop, "I must return home to my poor, good mother, whom I have not kissed for over fourteen years. I have shut within this stick the thousand pieces of gold which I have received in payment. God and the Blessed Virgin be praised! If they protect me on my way I shall be able to bring enough to my good mother to raise her beyond all fear of misery, to the end of her days."

But the bishop was one who feared not God, neither regarded man. He said to himself: "The shepherd will go away to other lands; he will make, perhaps, another clock, more wonderful than this; our clock will lose its renown, to say nothing of the pilgrims who will no longer come to this city to wonder at a unique work of art." He tried, therefore, to persuade the skilful shepherd to stay; but to each brilliant promise the young man replied, "All this is not worth my poor, good mother."

"But I shall send to bring her here," replied the bishop.

"Oh, no," said the youth; "she would die beneath your damp and chilly sky. My mother lives in the beautiful city of Rome; and even if she could bear the fatigue of such a journey, would she consent to leave the city of the Pope, the Pope whose mere passage through the streets is worth an indulgence to her?"

Then the bishop wished to arrest the shepherd as a sorcerer and a heretic, but feared to see the citizens rise in revolt against such an unworthy act. He had the shepherd waylaid just outside the town by ruffians without faith or mercy; the youth defended himself bravely, and they only succeeded in seizing his stick which contained the thousand pieces of gold.

"I have become poor again," he cried, after escaping from their ferocious hands, "but I still have my fingers and my eyes, and I shall be able to gain a thousand golden crowns once more."

The evil bishop, to whom this speech of the shepherd was reported, then made a resolve which must have been inspired by the devil in person. He had the shepherd's eyes put out with a red-hot iron and lopped off the fingers of both hands.

The poor young shepherd died many years after, wandering through the streets of the city, and begging his bread from door to door. He never saw the holy city of Rome, nor his poor, good mother.

Thus runs the legend. Here a mere broken relic of past days, a curious old clock, that can no more tick out the seconds and chime the hours, but has become mere gazing stock for idle passers-by, can still click out its cruel tale and chime out its testimony to the tragedy of mediæval life. — Charles Johnston, in the *Providence Journal*.

ST. GERMER-DE-FLY, OISE.

WE had driven out a dozen miles or so from Beauvais to see the old abbey church of St. Germer-de-Fly, and had found ourselves in a quiet country village, with one long street containing most of its houses, great and comfortable-looking buildings of brick and stucco. Many of the houses have delightful gardens around them, filled with roses in full bloom, and with fruit-trees carefully trained against the walls. In the middle of the village stands the old church, like a stranded bit of the Middle Ages, a noble and interesting building of the twelfth century, with a paved court-yard in front of it which one enters through an archway. We had spent an hour in examining the church, when the old French woman in charge opened the door of the chapel connected with it and ushered us in. It was a surprise to come into so beautiful a building in a small, quiet town, the very mate of the famous Sainte Chapelle in Paris, only not restored with vivid color as that is, but pure and pale in tone, and with wonderful blues and reds in the old glass glowing in some of the windows. And when our old woman opened a little door directly into a fine park, and invited us to walk in it, we became captives to the charms of the place. It was impossible to leave it after an hour, and a tiny hotel being pointed out to us, we decided to return in a few days to enjoy it at our leisure. And here we find ourselves living in so small an establishment that a party of four quite exhausts its resources, with a very sweet-tempered madame to cook and wait upon us, and monsieur in his blue blouse to drive us about the country with his strong white Percheron horse. There is a tradition of one American, and one only, who once came here, though Englishmen come from time to time.

The roofs of the cottages and other buildings are a study in themselves. In this part of France they are mostly covered with a deep purplish-red tile, though thatch is sometimes to be seen. Time has mellowed this color with shades of gray-brown, and an occasional dash of orange and moss and lichens have added to the variety of tint. The curves and deflections that settling has produced add another charm to the original fine form of the roofs, with their great variety of chimney and dormer. Their color is much more rich and harmonious than that of the somewhat crude orange-red tile that is seen in certain parts of England — in Lincolnshire, for example.

The great church stands in the centre of the village life, a fine building of more than seven hundred years old, a good deal white-washed inside, but retaining much interest apart from its associations with the monks who lived here for centuries. They disappeared long since, and their lands were bought and a fine château built on them. The long pond in the park is pointed out as having formerly belonged to the abbey, but only a few ruins remain of the monastic establishment. The grounds are laid out as a park, with

long walks bordered on either side by ivy-grown trees, high walls enclosing the whole place, to which the gates stand always hospitably open. The beautiful chapel has escaped much restoration, and its carvings and capitals, instead of being whitewashed, retain traces of their original colors, the leaves on the capitals being often a soft green. On the floor are some flat tombstones with incised figures of former abbots, beautiful examples of very early work, which have been carefully protected from the feet of passers-by.

The church and chapel are a delight to the eyes at all times, but most so, I think, in the long twilights of these summer days, when the light fades and the details of the buildings become less distinct. Sometimes a great owl comes out from his hiding-place and flies about, calling to his mate, who answers him from her hidden nest. Bats circle about and beautiful blue swallows fly low down, close to the ground. The golden color in the west makes a wonderful background to the old abbey, and the gargoyles and pinnacles turn into dark silhouettes against the glowing yellow. The peace and quiet of the place are great, for only a few voices, softened by the distance, come to our ears. — *Correspondence of the New York Evening Post.*



[Contributors are requested to send with their drawings, plans and a full and adequate description of the buildings, including a statement of cost.]

HOWARD MEMORIAL LIBRARY, NEW ORLEANS, LA. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.

[Gelatin Print, issued with the International and Imperial Editions only.]

This view, unfortunately, has a certain air of unreality since it is obtained by making use of a reversed negative.

CHRIST CHURCH CATHEDRAL, VICTORIA, B. C. MESSRS. EVERS & KEITH, ARCHITECTS, SEATTLE, WASH.

THIS competition, which was practically an English one, was decided last year. Several English architects competed and all the designs were placed in the hands of Sir Arthur Blomfield as expert, who selected the design by Evers & Keith, of Seattle, Wash. and Victoria, B. C.; the second and third places being awarded to London architects. The building is to be entirely of stone with stone spire, copper *flèche* and slate roof, and the principal dimensions are: total length, 236 feet; width, 125 feet; height to ceiling of nave, 72 feet; height to ridge, 90 feet, and height of tower and spire, 270 feet. When complete, the cathedral will have cost about \$250,000.

HOUSE OF A. J. PARKER, ESQ., TORONTO, CAN. MESSRS. DICK & WICKSON, ARCHITECTS, TORONTO, CAN.

OLD HOUSES AT ST. LO, NORMANDY, FRANCE.

[Additional Illustrations in the International Edition.]

STATUE OF THE REPUBLIC, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL., MR. DANIEL C. FRENCH, SCULPTOR. THE PERISTYLE, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL., MR. C. B. ATWOOD, ARCHITECT. THE AGRICULTURAL BUILDING FROM THE NORTHWEST, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL., MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS.

[Gelatin Print.]

NEUES THEATER, LEIPZIG, SAXONY. HERR C. F. LANGHAUS, ARCHITECT.

[Gelatin Print.]

ST. GILES' CHURCH, CAMBERWELL, ENG.: RESTORATION OF TOWER AND SPIRE.

THE views of the Church of St. Giles, Camberwell, which we publish this week, are from photographs taken before and after the restoration. It will be remembered that early last year the structure was found to be in a dangerous state, and was condemned by the London County Council. The churchwardens and overseers having consulted and received a report from Messrs. Newman & Newman, architects, of Tooley Street, London Bridge, instructions were given to them to prepare necessary drawings for the restoration, which is being carried out, and has been completed to the point shown. The works have consisted of the renewal of the whole of the decayed Caen stone dressings, and the substitution of the best Portland for the same. All the original mouldings and carvings

have been restored in the most careful and conservative manner, the upper thirty feet of the spire being taken down and rebuilt. The scaffolding which encircled the spire was 210 feet high, and was one of the finest pieces of scaffolding recently erected in London, and has formed a landmark in the district for the last twelve months. The works will have cost, when complete, £3,800.

YORK BUILDINGS, MANCHESTER, ENG. MESSRS. CHARLES CLEGG & SON, ARCHITECTS, MANCHESTER, ENG.

THE buildings shown in the illustration are situated in York Street and Mosley Street and were erected for the York Street Property Co. The premises are adapted for offices and chambers and warehouses on the upper floors, and for shops and offices on the ground-floor, whilst the basement was specially designed and arranged for the Mecca Café Company. The buildings are supplied with two passenger elevators and a goods hoist, with loading accommodation from back street, and are also fitted up with the electric light. The materials used in the elevation are Accrington plaster-bricks, with New Pillough stone dressings, the whole of the ground-floor elevation being of stone. The domes of turrets are of copper, and the roof is of the best Velinhelli slates. Among the advantages of the buildings are a subscription writing-room, with special postal and telephonic arrangements, as well as dressing-rooms. The building has been completed at a total cost of about £20,800.

STRASBOURG, AFTER A DRAWING BY SAMUEL PROUT.



[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE CHICAGO MANUAL TRAINING SCHOOL.

CHICAGO, ILL., August 22, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I don't know who your Chicago correspondent is, but whoever he may be he ought to inform himself a little more before he compares the work of the Pratt Institute and that of the Chicago Manual Training School in such round terms.

The facts are, that the Pratt Institute employs a special instructor in architectural drawing, while the Chicago school does not, but the work has to be done by the instructor in machine drawing and at the same time in a class of from twenty-four to fifty, from five to eight only of whom are taking architectural drawing, and not only this, but the drawing time is only one hour a day.

Now if your correspondent or your editor can tell me how I can do two things at the same time, and do either or both successfully, I should be everlastingly obliged. I have been trying to find out for eight or nine years, but have not yet, so have done the best I could with from one hundred and fifty to one hundred and eighty boys daily, with no assistant.

Yours respectfully,
The Perspective, Orthographic, Isometric, West Jean Design Machine, Architectural, etc., Instructor,
CHICAGO MANUAL TRAINING SCHOOL.

[While we hope that our correspondent receives a salary in proportion to his varied and numerous occupations, we cannot see why the work turned out by his scholars, which is evidently exhibited at Chicago on its own merits, may not properly be compared or contrasted with the work of the scholars of any similar institution. —EDS. AMERICAN ARCHITECT.]

OUR ILLUSTRATIONS OF THE WORLD'S FAIR.

CINCINNATI, O., August 23, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I have been a weekly purchaser of the Imperial Edition of the *American Architect* for two or three years, and looked forward this year to a feast of good gelatine plates of the World's Fair buildings and sculptures. Early in the spring you advertised a thoroughly comprehensive treatment of the matter in illustrations, but, beyond a half-dozen plates, so far I have not found the promises fulfilled. Now the same meagreness of really good photographs of the Fair has been noticeable in other publications, particularly *Harper's Weekly*, and I am led to believe it is the fault of the Exposition management in not affording facilities, since the complaint against the official photographer is loud and continuous. If this is the case, wouldn't it be a good thing to say so, and let the attack be made general enough to enable the people to purchase an abundance of pictures, satisfactory in artistic quality and exhaustive in subject, before it is too late.

Yours,

H. L. BRIDWELL.

[MR. BRIDWELL and others who have addressed us in similar vein are quite right in assuming that it is through no fault of ours that we have not kept our promises as to illustrating the World's Fair buildings. It is evident from the public complaint that has been made by publishers of all

kinds in every quarter of the country that one of the most annoying and probably one of the most prejudicial blunders made by the authorities of the Fair, in that it, in a manner, has excited the hostility of the press, has been the manner in which publishers have been denied reasonable courtesies in the matter of securing illustrations of the buildings. It seems to be all the more inexcusable since the making of negatives and prints has not been leased out as a "concession," but has been retained by the authorities in a department under an "official photographer." Without attempting to determine whether the delay and annoyance we and other editors and publishers have been put to have been caused by an inadequate organization of this department, by a demand upon it which no organization could satisfy, or by indifference or incompetency on the part of some or all of the employees, the result is that, up to this time, nine months of persistent efforts on our part have only secured four negatives. But at last the tide has changed, and temporarily is setting our way, though whether with enough strength to enable us to keep our promises remains to be seen. At all events, we have secured within a week a few more negatives, the first fruits from which are shown by the contents of this issue. Finally, if we do not succeed in keeping our promises, it must be understood that the blame cannot rest with us, for not only did we have full justification for making the promises, but we have neglected no effort to keep them. — EDS. AMERICAN ARCHITECT.]

GUIDE-BOOKS TO ROME.

NEW YORK, N. Y., August 26, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,— Please tell me of some book which gives useful information to an architectural student who wishes to go to Rome. Kindly give me the price and the place where sold. Kindly answer this through the columns of the *American Architect*.
Yours faithfully,
J. C. DUNN.

[FOR an ordinary sojourn, a copy of Baedeker's "Central Italy" is all in the nature of a guide-book that one needs; while A. J. C. Hare's "Walks in Rome," published by George Routledge & Sons, of New York, price \$3.50, affords enough information, both historic and artistic, to make even a longer visit intelligible. — EDS. AMERICAN ARCHITECT.]

TRAP-VENTILATION.

NEW YORK, N. Y., August 24, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,— In the paper entitled "A Review of Recent Plumbing Practice," read by Mr. Glenn Brown, F. A. I. A., at the World's Congress of Architects in Chicago, and reprinted in a recent issue of your journal, Mr. Brown asserts that I "practically avoid in my works the question of trap-ventilation."

This statement is erroneous and misleading, and shows that Mr. Glenn Brown has either not read my books carefully or else that he has not taken the trouble to understand correctly the opinions expressed by me regarding the "back airing" of traps.

It is, in my judgment, only a question of time when all plumbing regulations will be so changed as to leave it optional with the owner or architect of a building whether to "back air" his traps, or to adopt the much simpler and safer system of non-siphoning traps.

I have, as early as 1884, gone on record as being opposed to any useless and expensive system of trap-ventilation, and have since then repeatedly asserted my belief in, and preference for, non-siphoning traps and a simpler plumbing system. On page 123 and following, of my book "*Hints on the Drainage and Sewerage of Dwellings*," published in 1884, I expressed my opinion regarding trap-ventilation as follows:

"While admitting that such air-pipes render S-traps practically safe against most of the above-made objections, it cannot be denied on the other hand, that they largely increase the cost of plumbing in dwellings, especially so, where fixtures are much scattered throughout the house.

"First, they complicate the work and are difficult to run in old buildings, and must be largely increased, in the case of high buildings, towards the upper floors.

"Second, they increase the evaporation of water in traps, and therefore aggravate the danger from sewer-gas entering through fixtures in cases where these remain unused for a long time.

"Third, it is quite possible that vent-pipes stop up in time at the crown of the trap with splashes from soap-suds, when they will cease to furnish air to break the vacuum. Unluckily, such fact would not reveal itself, and is not easily detected, nor is much known at the present time about this point.

"The literature on this subject has been lately enriched by numerous careful and valuable experiments upon the siphonage of traps, made by Col. Geo. E. Waring, Jr., assisted by the writer, by Messrs. Edw. S. Philbrick, C. E., and Ernest W. Bowditch, C. E., of Boston, by Mr. S. Hellyer, of London, England, Dr. Lissauer, of Dantzig, Germany, Dr. Renk of Munich, Germany, and others.

"The results of the first mentioned experiments are greatly at variance, and seem to indicate, that while in some cases traps need a strong protection against siphonage, in other cases, especially where the soil and waste-pipes have ample ventilation, and branch wastes are very short, such protection is not required. At any rate, it is too early yet to establish rules which apply to all cases. It has always seemed to me as if it would be feasible to practice a wise discrimination.

"Where a fixture is located remote from a vertical pipe, and consequently discharges through a long run of waste-pipe, which would otherwise form a 'dead end,' it is positively necessary to run a vent-pipe from the crown of the trap upward to the outer air, which prevents in the first place a stagnation of air, and at the same time stops siphonage; and this is true of any kind of trap, not only of the class of traps known as S-traps. It should apply to mechanical traps as well.

"If, on the other hand, such fixture is located quite near to a vertical thoroughly ventilated soil-pipe, or a well ventilated horizontal run of pipe, I should not hesitate to place under the fixture a trap which is not easily siphoned, leaving out the air-pipe if there is no vent-pipe near by to connect

to. Such a course seems especially desirable in the case of high buildings for single fixtures in basements, or on lower floors. For instance, a one and one-half inch sink trap in the basement of a flat, such as is now being erected in New York City, 200 feet in height, would require an air-pipe at least three or four inches in diameter to prevent siphonage, the friction in a one and one-half or two-inch pipe two hundred feet long being too great to allow the air to enter quickly enough to break the suction. I would consider it foolish extravagance to use such long length of pipe of such large size for the trap of only a single sink. If a non-siphoning trap could not be made to answer the purpose, the only sensible course to pursue would be to abandon such fixture entirely.

"I must further say that it seems to me dangerous to use vented S-traps with the usual water-seal of only one and one-half or two inches under bowls or tubs in spare or guest rooms of large city residences, and for such dwellings generally that are occupied only a part of the year. This danger is generally disregarded or passed over lightly by enthusiasts for 'back-air' piping. My personal preference in such cases would always be for a non-siphoning trap, with a water-seal which does not so easily evaporate, or for a non-siphoning trap with a mechanical seal against gases from the soil-pipe, and where rules of local Boards of Health would demand such an air-pipe under such conditions, I should probably advise the use of a tight-shutting stop-valve on the waste-pipe,¹ and combined with it an arrangement for simultaneous shutting off the hot and cold water supply to the fixture, so as to render an overflow impossible. I am quite ready to admit that the latter arrangement would tend to complicate the plumbing work, but, I think, everybody must concede that, under the conditions mentioned, it would be safer than a vented S-trap with usual slight seal."

In my work "*House Drainage and Sanitary Plumbing*," second edition, revised, published in 1884, I expressed a similar opinion, as follows:

"It is always costly and often very inconvenient to run vent-pipes to the roof. The plumbing work is greatly complicated, and the number of joints which may leak sewer-air, greatly increased by trap-ventilation. There is also danger that the vent-pipes for traps under tubs, sinks and bowls may stop up with soap-suds or grease, in which case they would cease to act properly. The continuous current of air in the vent-pipe, in passing over the water in the trap, undoubtedly increases its evaporation. Finally it becomes necessary, in the case of high buildings, largely to increase the diameter of vent-pipes, in order to make up for the loss through friction necessarily occurring with long air-pipes. Therefore, while I consider vent-pipes for traps a necessary evil in many cases, especially for water-closet traps, I am inclined, in other cases, to prefer a good non-siphoning water-seal or mechanical trap, provided the soil and waste-pipe system has ample ventilation. Such a mechanical or anti-siphoning trap may be used under sinks, tubs and bowls, but for water-closets and sloop-hoppers (if without a strainer) the simple lead water-seal trap with vent attached is the only safe device."²

In an article published in the *Chicago Inland Architect*, in 1885, and subsequently reprinted in 1887 in my book "*Recent Practice in the Sanitary Drainage of Buildings*," I stated as follows:

"Experiments have established, with a sufficient degree of certainty, the fact that the self-cleansing siphon-pipe, or running traps, cannot be depended upon always to retain their water-seal against siphonage, unless air is admitted at the crown and sewer-side of the trap, either by some anti-siphoning trap attachment, or by a so-called 'back-air' pipe, of ample size. Consequently, I should not use such traps without providing such protection as the remedies mentioned afford. Later experiments have shown that an air-pipe is not a reliable protection against siphonage in all cases, especially where the course of the air-pipe is long and tortuous, and that where fixtures are not in constant use, it furthers the evaporation of the water in traps, and hence endangers the safety of plumbing work. That it increases the cost of plumbing, and hinders simplicity of arrangement, must be conceded by all. Thus while it offers certain advantages in some instances, there are other cases where the disadvantages predominate. It remains then, to be decided, only after a thorough and intelligent consideration of all conditions, whether a seal retaining water-seal trap safe against back pressure, siphonage or other influence, or an anti-siphoning trap attachment of some kind, may not be preferable."

In an article on "The Drainage of a House," published in Boston in 1888, and subsequently reprinted in 1890, in the second edition of the book "*Recent Practice, etc.*," I stated:

"From my best knowledge and belief, I cannot accept as universally necessary the requirement of 'back ventilation' of traps. . . . I do not fail to explain to my clients that the back airing of traps is done at the expense of simplicity; that in a properly laid out system, trap vent-pipes are not necessary to prevent dead ends in short lateral waste-pipes; and that prevention of siphonage can be accomplished, and the extra cost incurred by using back-air pipes be saved in all but rare instances, by adopting simpler and well-known devices.

"Where I am compelled to run back-air pipes, complicating the pipe system, it is always my endeavor to modify the arrangement so as not to expose the water in the trap too much to the air current; for there can be no question that the thereby increased free circulation of air in the vicinity of the sealing water of traps hastens the unsealing—by evaporation—of traps under fixtures which remain unused for some days in succession, and endangers the security of all traps during any period when a house is left unoccupied."

The above quotations must convince any unprejudiced person that I am not a blind believer in trap-ventilation. They will also suffice to refute the careless assertion of Mr. Brown, that I avoid the question of trap-ventilation.

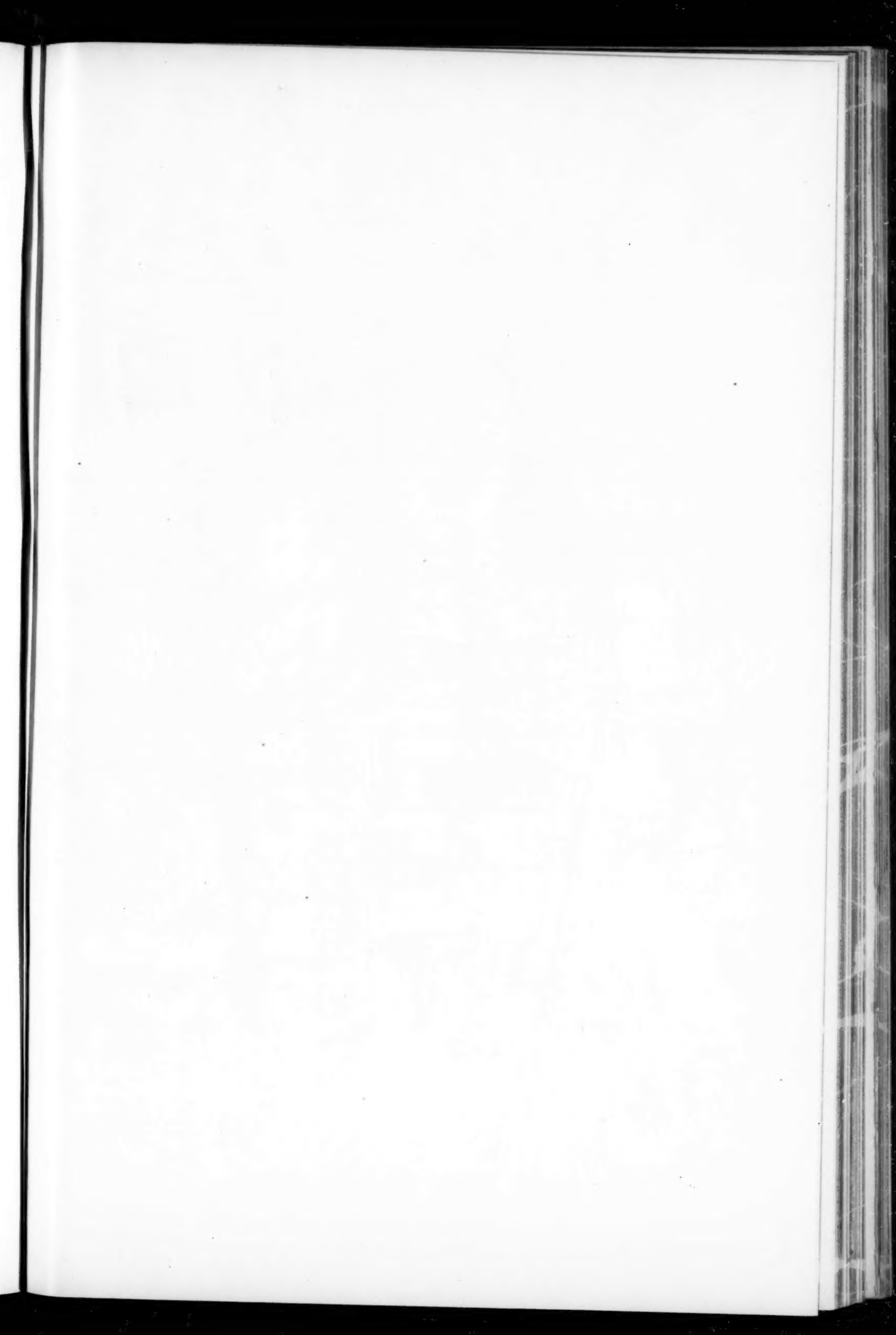
By kindly giving space to the above in the columns of your esteemed paper, you would oblige,

Yours respectfully,

WM. PAUL GERHARD,
Consulting Engineer for Sanitary Works.

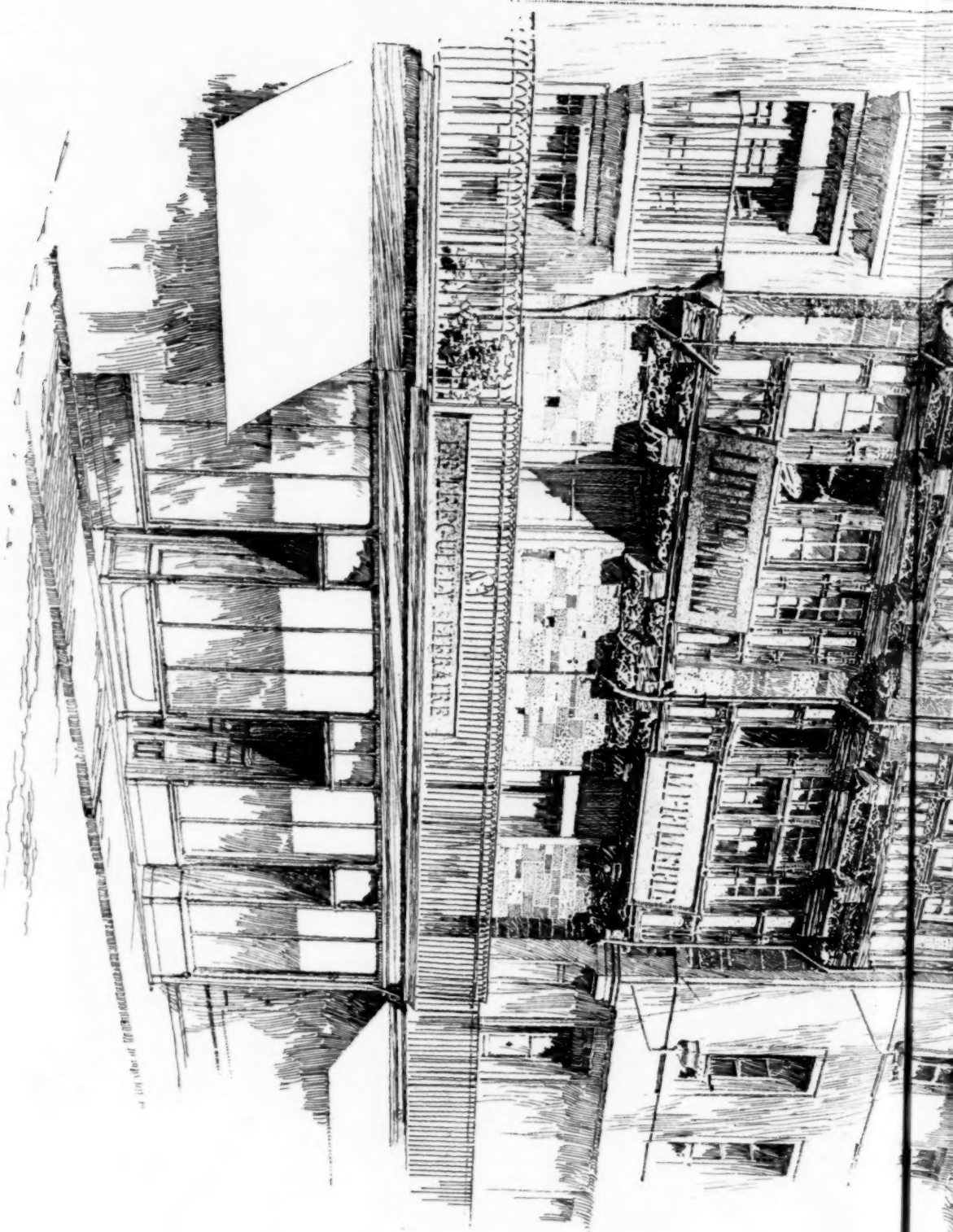
¹ Such a combined trap and shut-off valve is now obtainable in the market.

² The many forms of excellent siphon and siphon-jet closets now obtainable are constructed with a very deep and effective trap-seal, which does not require a vent-pipe where the piping is properly arranged.



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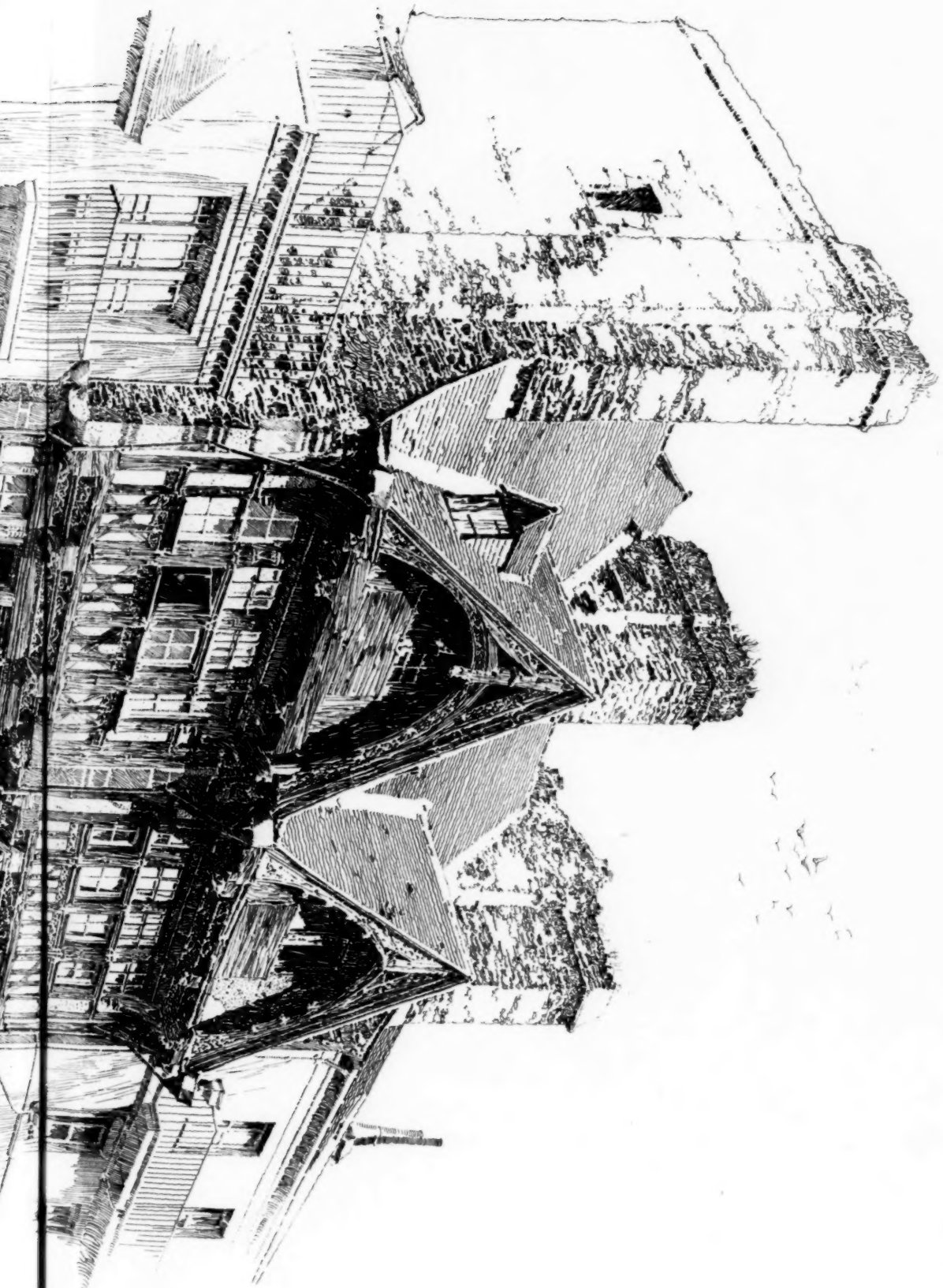
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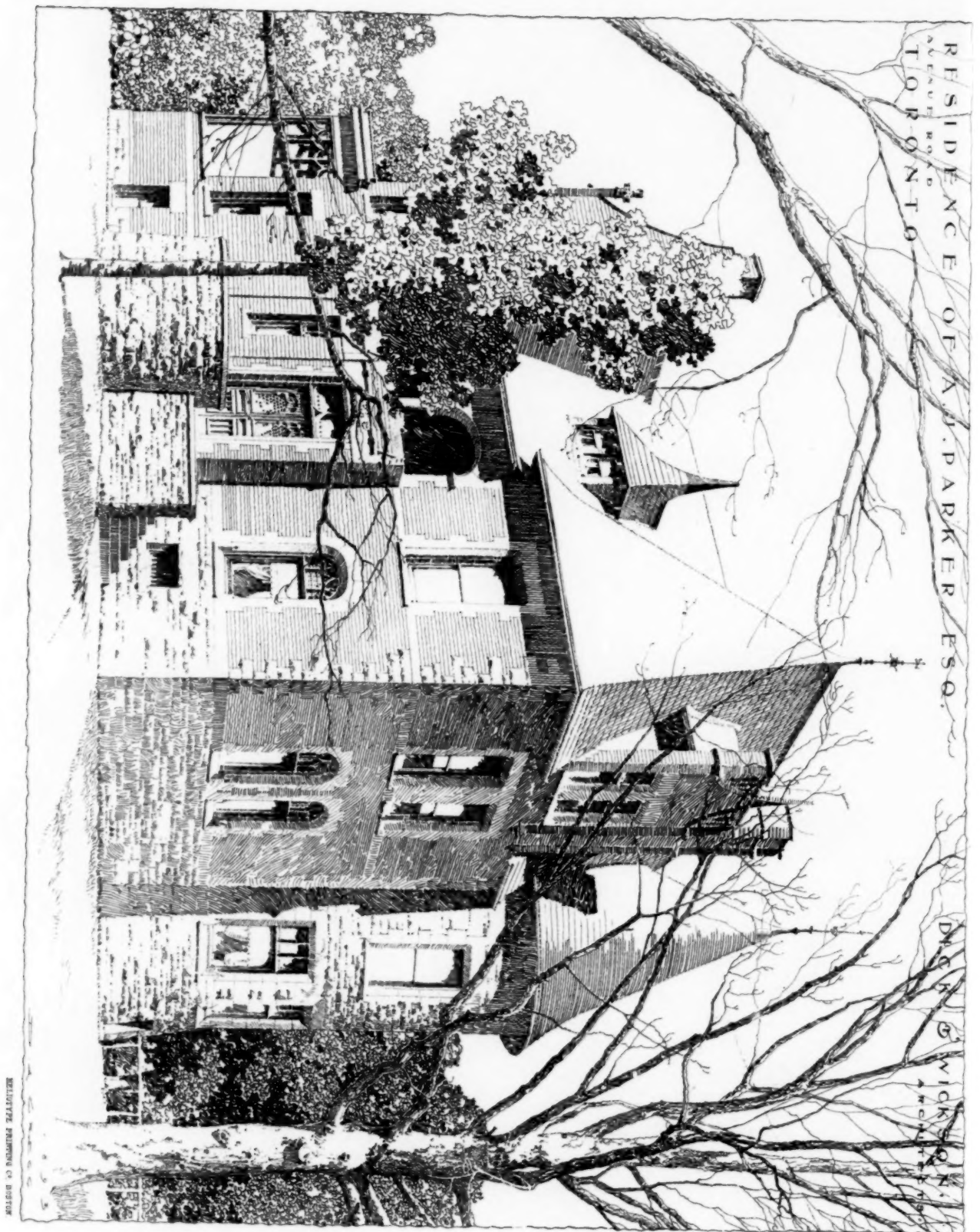


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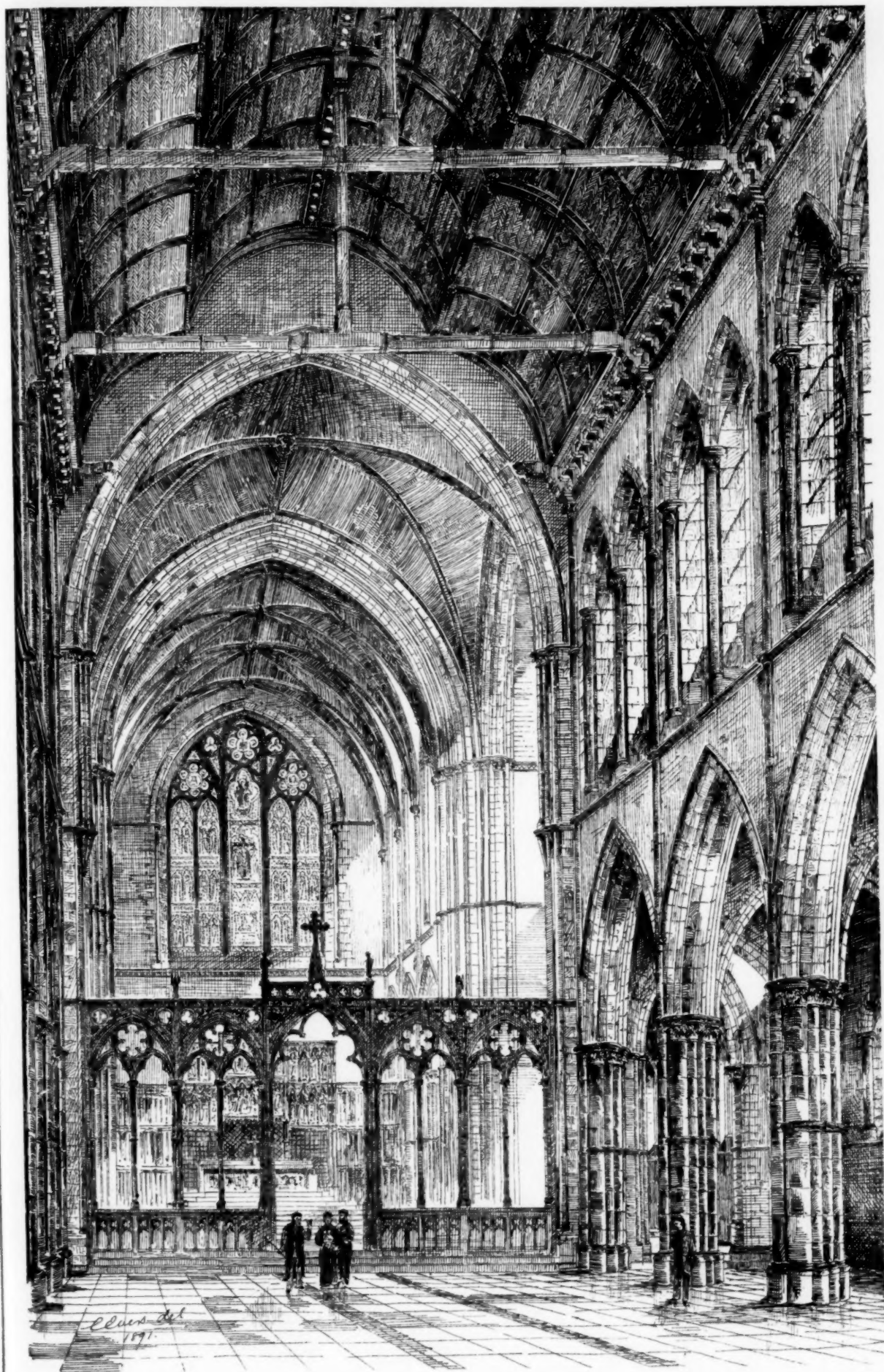




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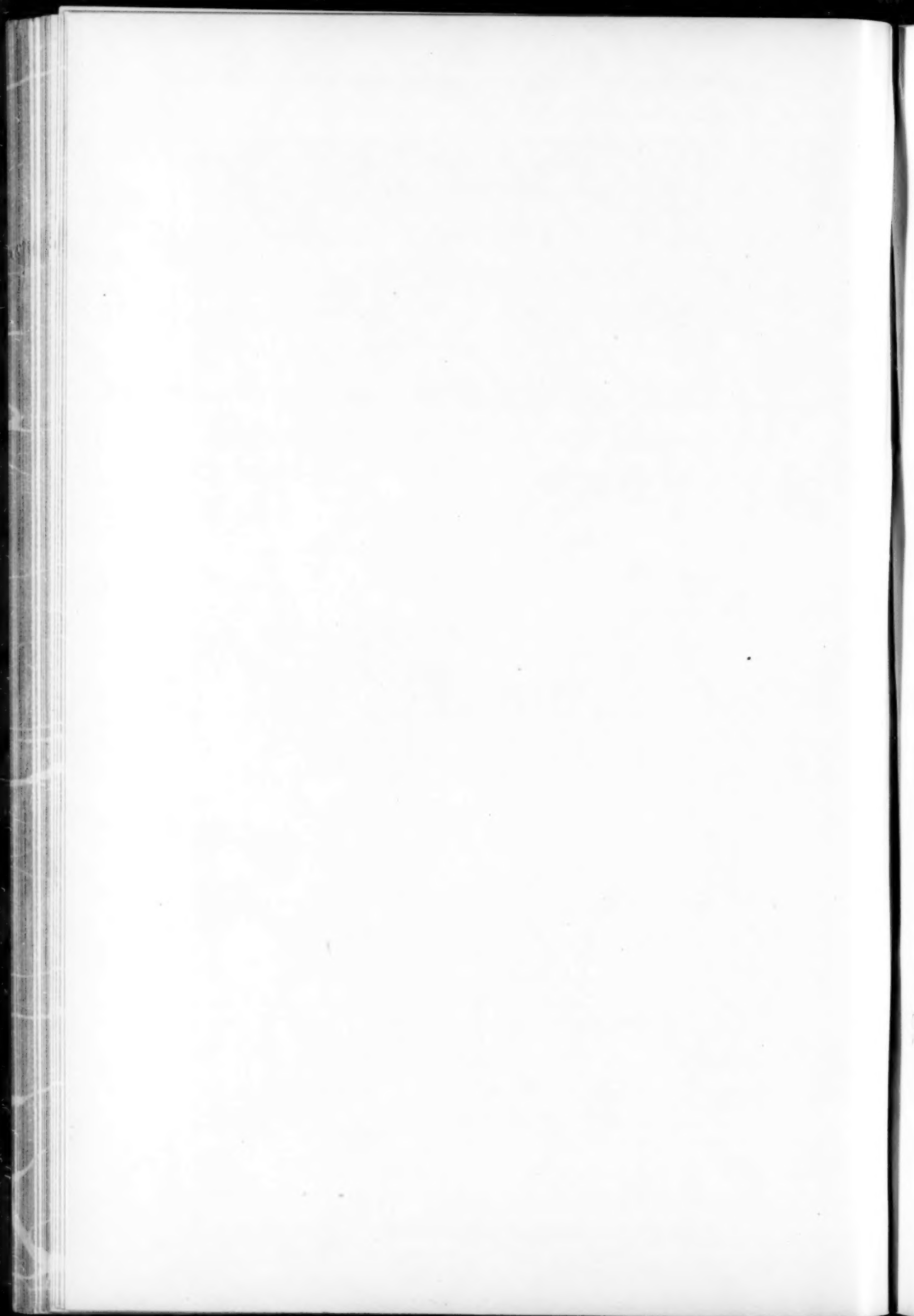
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