THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. LVIII. No. 1140.

Entered at the Post-Office at Boston as second-class matter.

OCTOBER 30, 1897.

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MR. JAMES K. TAYLOR, once a member of the firm Gilbert & Taylor, of St. Paul, and latterly head-draughtsman in the office of the Supervising Architect, has, as the result of the recent civil service examination, been appointed Supervising Architect of the Treasury Department.

THE Chicago Architects' Business Association, which includes a large number of the prominent members of the profession, has adopted a code of rules of practice, which we take pleasure in repoducing in another column, on account of its valuable suggestions to young architects everywhere. It will be observed that the Association rejects definitely the principle of the Uniform Contract, that work is only to be executed which is both shown on the drawings and described in the specifications, and maintains the principle, which has been held by architects all over the world for a hundred years, that the drawings and specifications are not to be considered as repetitions of one another, but as complementary, so that, as the Chicago Association says, "work called for by the plans, and not referred to in the specifications, and *vice versa*, shall be included, the same as if mentioned by both plans and specifications, provided such work comes clearly within the branch or branches covered by the contract." Another provision, which gives authority to a tacit rule in architects' offices, is that contractors who wish to be considered as acceptable bidders must furnish the architect from whom they desire employment with satisfactory references, and are liable to be dropped from the list for unfaithfulness or misconduct.

THE Pennsylvania Capitol Commissioners have selected Mr. Henry Ives Cobb, of Chicago, as architect of the new building. Whether the courts will allow him to carry out his design is not yet settled; but, according to the newspapers, he has been instructed to prepare working drawings at once. The design shows a dome, but, as this cannot be included for the sum specified as the limit of cost, it will be omitted for the present. How far this proceeding agrees with the promises and stipulations made in the agreement with competing architects we will not here consider, as the matter is now before the courts; but it is only fair to Mr. Cobb to observe, in the meantime, that he does not appear to have made any attempt to deceive the Commissioners, plainly informing them that his design could not be carried out for the sum proposed; and that their action in adopting a plan, the cost of which will far exceed the limit, after using, as a pretext for annulling the first competition, the fact that none of the designs recommended by the experts could be carried out within the sum specified, is a matter for which they are therefore wholly responsible. It will be thought, undoubtedly, that Mr. Cobb might with propriety have withdrawn his design from the second competition; but if, as is very likely, he had received a hint that it would be viewed with favor, if submitted a second time, it is asking a good deal of human nature to expect him to withhold it.

MR. JOHN SARTAIN, of Philadelphia, died a few days ago, at an advanced age. Although the art of engraving has almost died out all over the world, and the mezzotint, with which his name is particularly connected, has long been disused, Mr. Sartain had done a good work in the artistic development of the country. Although he was born in England, he came to the United States when hardly more than a boy, and soon distinguished himself by his engravings in what was then a new style. For magazine work the mezzotint, which was quickly executed, and was capable of fine effects, was well adapted, and every magazine that went out with the name of John Sartain appended to its pictures brought him an increase of reputation which was well deserved. Unfortunately, the ease with which the process was worked commended it to persons less capable, and a crop of mezzotints was scattered abroad which brought the very name into discredit. Sartain, however, was too accomplished an artist to be dependent upon one method of expressing himself, and his work always found appreciation. For many years he was Director of the Philadelphia Academy of Fine-Arts, and several times represented this country abroad in matters of art.

THE Council of the National Academy of Design proposes, very sensibly, to carry out its new building project in a leisurely manner, spending such money as it has, or may receive, but not incurring debts, which always form a serious embarrassment to an institution with no fixed source of income beyond what is needed for its current expenses. The Academy has now on hand enough to pay for the building to be devoted to the schools, which will cost about two hundred thousand dollars, and hopes that private lovers of the fine-arts will help to continue the work. The cost of the whole building will be about five hundred thousand dollars, and it has been suggested that the various galleries, which will occupy most of the space not needed for the schools, should be named after such benefactors as may give money enough to pay for them. The Fine-Arts Society set an example of this in naming its beautiful Vanderbilt Gallery after the generous and thoughtful donor, and nothing could be more pleasant or appropriate than such a method of recalling, for all time, the names of those who may assist in such a work in time of need.

THE statistics of the estimated cost of buildings for which permits were issued from the Inspectors' offices of the larger towns during September are interesting, as compared with those of the corresponding month last year. In Pittsburgh and Chicago, the aggregate cost this year is nearly one-half greater than last year, and the same is the case in Philadelphia; while in Brooklyn and Cincinnati it is almost doubled. In Denver, Duluth and New Orleans there is no material change, and Omaha, Kansas City, St. Louis, Detroit and Minneapolis show a falling off. New York, Boston and Washington returns are not at hand. On the whole, the exhibit is favorable, but it is probable that the revival in building operations will not be greatly felt until next year, when the anxieties of capitalists as to what Congress may do this winter have been partly dissipated, and business in general has more fully accommodated itself to its new conditions.

A "LABOR" case, which has been in the New York Courts for several years, was decided on appeal, by the Supreme Court, last week. A man named Davis, a hod-hoisting engineer, had tried to gain admission to the Portable Hoisting Engineers' Union, but was rejected. He endeavored to get employment in his trade, but was pursued by the walking-delegate of the Union, and, whenever he found a situation, the

walking-delegate appeared, and, by threatening his employer with a strike, obtained his discharge. After this had gone on for some time, it occurred to him that the law might help him, and he applied to the courts to enjoin the delegate and the Union from persecuting him further, and sued at the same time for damages, for the loss of the wages that he would have earned if he had been allowed to work. The Union did not pretend that he was not a competent workman, but defended the case on general principles, claiming the right to proceed in such a manner under the circumstances. The Supreme Court, like, we believe, the inferior courts before which the case was tried, holds a very different view. The opinion delivered says without hesitation that "should such proceedings be tolerated, workmen, though competent and willing, would be unable to earn a living"; and as it was proved that Davis would have had continuous employment, at seventy-five dollars a month, if the walking-delegate had not interfered, the Court awarded him five hundred dollars damages. Of course, it is unlikely that either the Union or the walking-delegate will have five hundred dollars with which to satisfy the judgment, but it is something to have the principle established that, if they had the money, they would be compelled to make good the plaintiff's loss, and there may possibly be some way, if the Union expenses are paid by assessments, of enforcing an assessment for the sake of paying the judgment, in the same manner that judgments against towns are sometimes collected from the taxpayers.

M. R. DE BATZ sends to *Le Génie Civil* a curious account of the gold-mining camps in Northern China. It will be remembered that gold-hunting has been, until very recently, forbidden by law in China, and all gold-mining has been contraband; but in one instance the miners have been strong enough to defy the Chinese Government until now, and in another they were able to resist the law successfully for several years. In both these cases the mining community, after a period of lawlessness, established, by its own efforts, a strict system of discipline, just as the Vigilantes did in California in 1849, and the proceedings of the Chinese outlaws, and escaped convicts from Siberia, resemble most curiously those of the Anglo-Saxon miners of the Pacific Coast. More than thirty years ago, a missionary, travelling through the mountains of Manchuria, came upon a little republic of gold-diggers, occupying the placer district of the province of Ghirine. At that time, the population of the district was about ten thousand, and it has not, apparently, varied much since, while its system of government and administration still remains unchanged. Under this system, all the miners are enrolled in *artels*, or squads, of ten men each, who work in common, the gold taken out by the whole squad being equally divided among all the members at fixed intervals, under the supervision of the republican government, which retains one-fiftieth of all the gold, to pay the expenses of administration and military defence, and the cost of maintaining the poor and helpless members of the community. Originally, the direction of these matters was put in the hands of an elected chief, assisted by two subordinates, who were separately elected; but, many years ago, a young Chinese, flying from the consequences of some misdemeanor, found his way to the camp, and, by his force of character, rose to the place of chief. Once installed, he managed to secure the election of associates favorable to him, and thus made himself practically the king of the district; and so well has he used his authority that he still, at the age of seventy-five, sits as firmly as ever on his simple throne, and his son will undoubtedly succeed him. This remarkable man has extended his power over the neighboring valleys, in each of which exists an independent community, the head of which, only, is appointed by the "Khan." Besides the miners, there are many farmers and merchants in the district, who pay taxes to the Khan; and he divides these with the Chinese Governor of the province, who has long since given up the idea of enforcing his authority over the valley, and submits to receive at his court a resident ambassador of the Khan.

ANOTHER mining republic, less fortunate in its career, existed a few years ago on a tributary of the Amoor River, on the Chinese side of the river. Since 1860, the placers of the valley had been worked occasionally by fugitives from Siberia; but, in 1883, a native found a huge nugget of gold, which he brought for sale to a merchant in Siberia. The fame of this spread through Eastern Siberia, and, before the end of the year, nearly seven thousand men were encamped in the valley, while, two years later, the number had increased to nearly fifteen thousand. As in the case of the older community, the miners were divided into independent *artels* of nine or ten men each. Membership in an *artel* could only be obtained by election, and the gold obtained by each was divided equally among all the members. Each *artel* elected a head man from among its own members, and the *artels* together chose a governor, to maintain order in the entire camp. Unfortunately, the community, which comprised merchants, jugglers, gamblers, inn-keepers and thieves, besides the miners, and was recruited mainly from the worst class of escaped Chinese and Russian criminals, was too unruly to be governed by a single elected chief, and murders and misdemeanors of all sorts were common. At last, the more honest part of the community succeeded in carrying through, by a majority of votes, a plan for electing, in general assembly, a "syndic," charged with the duty of maintaining order throughout the district. The first syndic elected prepared a code of regulations, which were put in operation forthwith. Under these regulations, theft, falsification of gold-dust, the carrying of arms while intoxicated, or their unnecessary use, and some other misdemeanors, were punished with five hundred blows of the knout. This was substantially condemnation to death, as no one could survive five hundred strokes of the whip, with its lashes garnished with sharp bits of metal. For simple intoxication, the penalty was one hundred blows of the knout; disorder at night brought two hundred; and the loan, at excessive rates of interest, of tools or apparatus was punished with three hundred. The syndic was assisted in his duties by ten bailiffs, all elected by the community; two bailiffs were assigned to each of the five districts into which the camp was divided, and all the Chinese were gathered into a district by themselves. For ordinary cases, the bailiffs were the judges, but there was an appeal to the council of bailiffs, over which the syndic presided. Extraordinary cases were decided by a general assembly of the community, summoned by firing cannon in the public square. For some time after the adoption of the new code the officials were kept busy. Thirty murderers were hung in one day, and the worst criminals fled in alarm, to be replaced by more honest people, who heard with satisfaction of the reform. The finances of the community were provided for by a tax on merchandise; a police patrol of more than a hundred men was established; a church was built, and near it a hospital, for the maintenance of which more than fifteen thousand dollars a year was spent; a regular system of registration of mining-claims was enforced, and strict rules were adopted for the conduct of the *artels*. Apparently, this little mining town was in a fair way to become a model of democratic government, when the Russian administration, undoubtedly in coöperation with that of China, took unfavorable notice of it, and commenced operations against it. First, all emigration of Russian subjects to the Chinese side of the Amoor was forbidden. A cordon of troops was established along the river, and all persons coming from the mines were searched, their gold taken from them, and compensation made at a rate far below its value; while public notice was given of the penalties attached by Chinese law to gold-mining in Manchuria. The Chinese Government seconded these proceedings, by sending troops to disperse the miners. The latter were well armed, and the Chinese did not dare to attack them openly, but a column, by making a *détour* through the mountains, took them by surprise, and captured the outposts. The Chinese commander then gave the people of the town six days to evacuate the place. The floating population soon disappeared; next went the Chinese miners, who knew that they could expect no mercy from their countrymen; and, last, the Russian miners retired in good order, and carrying their arms with them. They were not molested, but the wretched Chinese were pursued by irregular cavalry, speared, mutilated, and thrown into swamps, or upon burning piles of wood, to the number of more than three hundred. The town was burned, and a strong guard was set over it, which has effectually prevented the return of the Russian miners. Lately, however, a Chinese company, organized by Li Hung Chang, has recommenced the working of the mines in the valley. From fifteen hundred to two thousand Chinese laborers are said to be employed, and the net profits, according to the official reports, are more than a million dollars a year, or about six hundred per cent on the company's capital, which is only two hundred thousand dollars.

STATICS OF STRUCTURES. — THEORETICAL AND APPLIED.[1]—VIII.

THE TRUSS; PRACTICAL APPLICATION OF VI AND VII.

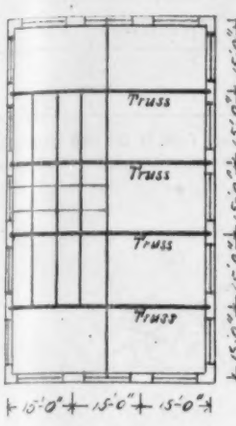


Fig. 69.

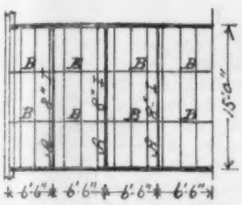


Fig. 70.

147. The example to which we shall now apply the principles set forth in the last two chapters is to consist of the roof of a hall 48′ wide by 78′ long, as shown in Figure 69. This roof, having a slope of 30°, is to be framed entirely of steel, and covered with 3″ porous terra-cotta blocks and slate. The hall is divided lengthwise into five bays of 15′ each, which subdivision results in four trusses.

148. We find the Fink type (§ 136) to be the most suitable form of truss under the circumstances, and adopt it accordingly. In preparing to draw the stress-diagram for it, we must ascertain the load to be supported, which can only be done by first designing the framing for carrying the roof-blocks and slate over the space between the trusses. This framing is to consist of tees, spaced 25″ on centres — the blocks being 24″ wide. To estimate the load per square foot which it must be capable of sustaining, we proceed as follows:—

From the manufacturers' catalogues, or from Table IV[2] we find that 3″ porous terra-cotta blocks weigh 15 pounds per square foot; the average weight of slate, when laid on a roof in the usual manner, we find to be, after consulting one or two hand-books, 10 pounds per square foot; the framing (exclusive of trusses, *i. e.*, the tees) we shall, for the present, guess to weigh about 8 pounds per square foot. This is quite a high figure, but we are justified in adopting it, as tees placed closely together weigh a good deal. However, as soon as we have determined upon the framing we shall calculate the weight of the iron in it, and thus ascertain whether or not 8 pounds per square foot was more than necessary. If required, we can then revise our calculations.

We now have the total dead weight, namely:—

Blocks: 15 pounds.
Slate: 10 "
Iron: 8 "

Total Static Load: 33 pounds.

To this must be added a certain amount of live-load — made up of wind and snow. We shall take that specified by the New York Building Law: 50 pounds per square foot of superficial area. Later on, in making the stress-diagrams, we shall omit this figure and substitute for it the true amount for our angle of inclination, as found by calculation.

149. We now have a total dead and live load of 83 pounds, for which the tees are to be calculated. In making a plan of them it is preferable to have them running horizontally, that is, from truss to truss, parallel with the ridge, after the manner of purlins, instead of with the slope, like rafters. This is done to counteract any sliding tendency of the blocks. But the trusses are 15′ on centres, which is too great a span for tees. To overcome this difficulty we place three heavier purlins (*A*, *A*, *A in* Fig. 70) from truss to truss, between which, again, are framed light girders or rafters (*B*, *B*, Fig. 70), giving, for the tees, three equal spans of 5′ each. Under these circumstances the load-area of each tee will be 5′ × 2′, and its required moment-of-resistance (§ 46).

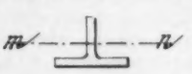


Fig. 71a.

Fig. 71b.

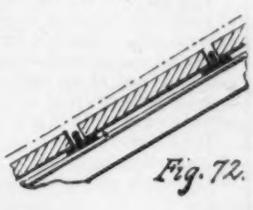


Fig. 72.

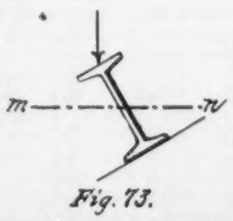


Fig. 73.

$$\frac{5 \times 2 \times 83 \text{ lbs.} \times 5 \times 12}{8 \times 16{,}000} = 0.39''$$

150. Now, taking our "Carnegie" (§ 44), we turn to the table entitled: "Properties of Carnegie T Shapes," and find, by consulting the seventh column, that the one best suited to our purpose is a 4″ (flange) × 2¼″ (stem) × 5.8 pounds T, with a moment-of-resistance or "section-modulus" of 0.42″. This is the least moment of the section, the neutral axis being taken through the centre of gravity parallel to the flange, as indicated in Figure 71*a*. If the neutral axis were taken through the centre of gravity coincident with the stem, as in Figure 71*b*, the moment-of-resistance would be greater, namely, 0.71″. That means that a tee when placed as in Figure 71*b* will offer a greater resistance to cross-bending than when placed as in Figure 71*a* (§ 11, 12). Since, in our case, the tees will have to be placed as in Figure 71*a*, we must of course take the smaller moment-of-resistance.

An important consideration which causes us to select the above section is the great width of its flange, 4″, which will afford an excellent bearing for the blocks, as indicated in Figure 72.

151. We have next to calculate the small cross-girders *B*, *B*. Their span is 6.5′, and distance on centres 5′. We calculate again

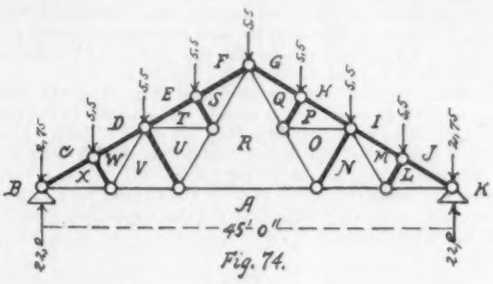


Fig. 74.

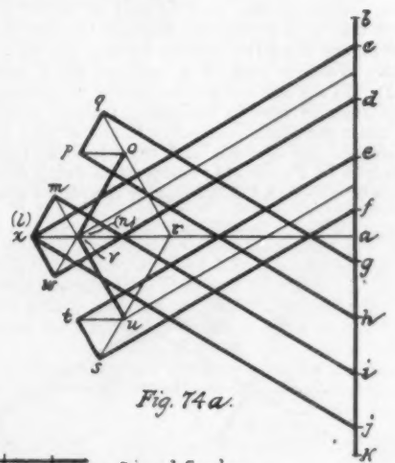
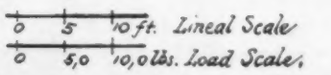


Fig. 74a.



for a uniform load of 83 pounds per square foot, and find the required moment-of-resistance to be

$$\frac{(6.5)^2 \times 5 \times 83 \text{ lbs.} \times 12}{8 \times 16{,}000} = 1.65''$$

We adopt 4″ channels, 5.25 pounds per foot, having an *R* of 1.9″.

The long purlins *A*, *A*, Figure 70, are next calculated for two concentrated loads, according to Equation 16, § 72. We find their *R* to be 10.1″. Since these beams will be inclined 30°, when in place, as shown in Figure 73, they will not be quite as strong as if set vertically; we shall therefore adopt an 8″ — 18 lbs. I, with an *R* of 14.2″, which is about one-third more than found above.

Let us now check up the weight of the framing per square foot of area, to see whether our original estimate of 8 pounds was too high or not. We find that the 8″ I's weigh 2.77 pounds per square foot; the 4″ I's, 1.05 pounds; and the T's, 2.9 pounds; a total of 6.72 pounds. Consequently, our estimate was too high, but not enough so to make a great difference.

152. Now, to proceed with the stress-diagrams of the truss. There are three of them to be drawn, the first for static and snow load, the second for left wind-load, and the third for right wind-load.

The static-load is made up of the following: (*a*) weight of blocks; (*b*) weight of slate; (*c*) framing exclusive of truss; (*d*) weight of truss. The first three we know; the fourth, of course, we cannot ascertain accurately until the truss is designed; for the present, therefore, we must rest content to assume a certain amount, based upon our knowledge of the weight of similar trusses already built.

153. The writer has found that for trusses up to a span of 100′,

[1] Continued from No. 1125, page 25.
[2] See No. 1115, Page 43.

the weight of the truss in pounds per square foot of area supported will closely approximate one-tenth of the span in feet. Thus a truss of 30′ span would weigh 3 pounds per square foot; one of 50′ span, 5 pounds; and our truss of 45′ span, 4.5 pounds. This will bring the total static-load to: —

Blocks:	15	pounds.
Slate:	10	"
Framing:	6.7	"
Truss:	4.5	"
Total:	36.2	pounds.

As we intend to combine the static and snow load in the first diagram, we must add the proper allowance for snow to the above. This varies for different localities, ranging from 30 pounds per square foot for the extreme northern parts of our country down to 5 pounds per square foot for localities having the latitude of Washington. We shall make an allowance of 20 pounds (New York latitude), which will increase our load to 56.2 pounds, or, say, 56 pounds per square foot.

154. Since the trusses are spaced 15′ on centres, and the length of the upper chord for one side is 26′, the load to be carried by one-half of the truss will be $15' \times 26' \times 56$ lbs. $= 21{,}800$ pounds. The upper chord being divided into four panels, the load on each will be equal to one-fourth of the above amount, which makes 5,450 pounds; or, say, 5,5 pounds. The load on each intermediate panel point will therefore be 5,5 pounds, and for the end points, 2,75 pounds; while each reaction will equal 22,0 pounds (Fig. 74.)

The stress-diagram can now be drawn (Fig. 74*a*). In this figure a load scale of $\frac{1}{8}''$ equal to 2,0 pounds was adopted as the most convenient, resulting in a load line (*bk*) not quite 3″ long. Let us say here, that the reader will find it best to choose his scale so that it will result in a diagram of average size. For, while a very large diagram will make it possible to scale the stresses very closely, it is, on the other hand, very difficult to get the stress-lines exactly parallel to the truss-members. The opposite is true of a very small diagram.

The diagram in Figure 74*a* being exactly like that of Figure 61*a*, § 136, nothing further need be said in regard to its construction, except that it is a complete diagram for both sides of the truss, while Figure 61*a* is the diagram for only one-half.

155. We now prepare a table of eight columns (see below, § 162). In the first column are placed the letters of every member of the truss, arranged in four groups: Upper chord members, struts, ties, and lower chord members. In the second column are written the stresses due to static and snow load, as found by scaling the stress-lines in Figure 74*a*; compression being denoted by a —, and tension by a + sign. After having completed this column our next

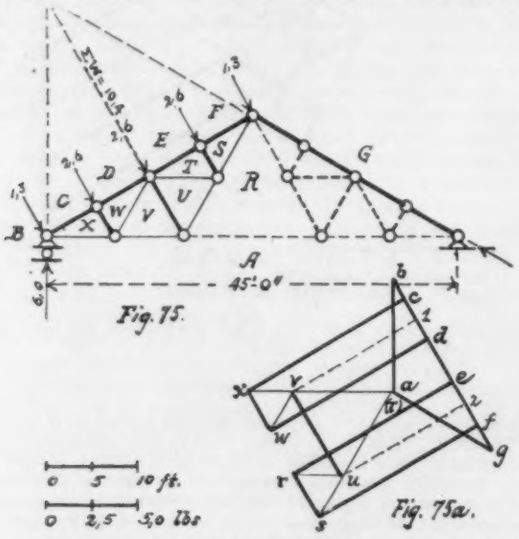


Fig. 75. Fig. 75a.

step would be the construction of the wind-diagrams. Before drawing these, however, let us say a few words regarding wind-pressure in general.

156. The pressure exerted by the wind upon a plane normal to its direction is directly proportional to the square of its velocity and the area of the plane.

Smeaton found experimentally that a current of air moving at a velocity of 35 miles an hour produced a pressure of 6 pounds per square foot upon a plane normal to its direction. According to this we can say that any pressure will be to the square of the velocity producing it, as 6 is to the square of 35, or

$$P : V^2 :: 6 : (35)^2,$$

from which we get

$$P = \frac{V^2}{204}, \qquad (24)$$

which is known as Smeaton's formula.

The following table of pressures for different velocities has been calculated by means of it: —

TABLE V. — WIND-PRESSURE FOR VARIOUS VELOCITIES.

Miles Per Hour V.	Character of Wind.	Pounds Per Square Foot P.
20	Fresh Breeze.	1.96
40	Strong Breeze.	7.84
60	Storm.	17.64
90	Hurricane.	40.00

The last pressure, 40 pounds per square foot, is the one generally assumed in building construction. Some authorities, however, assume

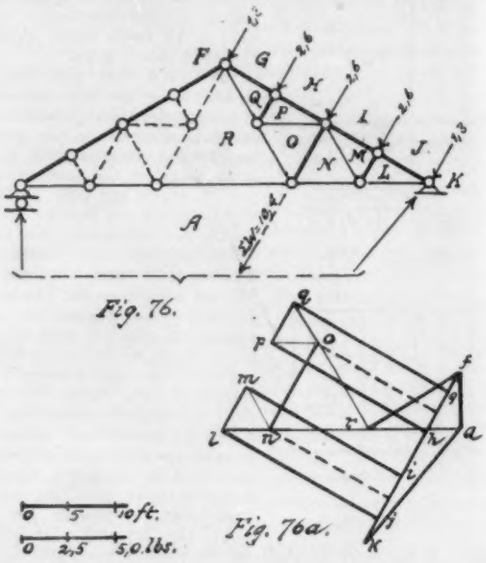


Fig. 76. Fig. 76a.

as much as 50 pounds per square foot for constructions in exposed locations.

157. Having found the direct pressure, we must next find a means for reducing it to a direction normal to an inclined plane, as presented by the surface of a roof. There are a number of formulæ for doing this, some of which have been deduced mathematically, while others are based on the results of experiments. None of them has as yet been definitely accepted. The one most used by American and English engineers is that of Hutton: —

$$P_1 = P\,(\sin x)^{1.84 \cos x - 1}. \qquad (25)$$

in which P is the initial pressure on a plane normal to the direction, P_1 the derived pressure normal to the inclined plane, and x the angle of inclination.

Another, mainly used by German engineers, is as follows: —

$$P_1 = P \sin^2 x; \qquad (26)$$

and still another

$$P_1 = P \sin x. \qquad (27)$$

in all of which the symbols are identical with those in Equation 25.

The last two are entirely theoretical, and the first of them (26), at least, does not seem to conform very well with results obtained by experiments. Hutton's formula, on the other hand, conflicts with the principles of mechanics, since, according to it, the pressure on a plane inclined at an angle of 60° or over is identical with that on a plane perpendicular to the direction of the wind. However, this error is on the side of safety.

The following table gives the different pressures for various angles of inclination, as found by the three formulas for an initial pressure of 40 pounds per square foot: —

TABLE VI. — WIND-PRESSURES FOR VARIOUS ANGLES OF INCLINATION; INITIAL PRESSURE 40 POUNDS PER SQUARE FOOT.

Angle of Inclination.	Equation 25.	Equation 26.	Equation 27.
15°	14.2	2.6	10.3
20°	18.4	4.7	13.7
25°	22.6	7.2	16.9
30°	26.5	10.0	20.0
35°	30.1	13.2	23.0
40°	33.3	16.5	25.7
45°	36 0	20.0	28.3
50°	38.1	23.4	30.6
55°	39 4	26.8	32.8
60°	40.0	30.0	34.6
65°	40.0	32.9	36.3
70°	40.0	35.4	37.6
75°	40.0	37.2	38.6
80°	40.0	38.8	39.4
85°	40.0	39.6	39.9
90°	40.0	40 0	40.0

158. We shall use Hutton's formula, which gives a pressure normal to the surface of our roof of 26.5 pounds per square foot. This results in a total wind-load on one-half of the truss of $15 \times 26 \times$

26.5, or 10,350 pounds; and on one panel, one-fourth of this amount, or 2,58 pounds, which we shall call 2,6 pounds.

This, then, is the load on the intermediate panel-points; on the end points it will be 1,3 pounds. We can now draw the left wind-diagram, Figure 74*a*; being exactly like Figure 62*a* in construction,

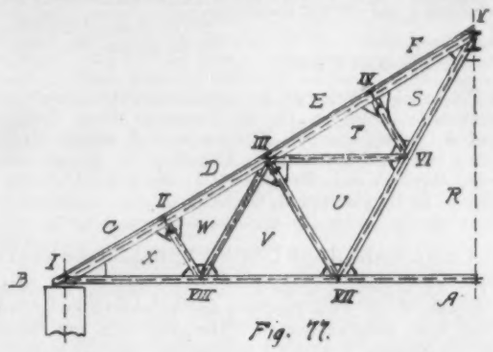


Fig. 77.

it requires no further explanation. The load scale is $\frac{1}{8}'' = 1{,}0$ pounds. After completing the diagram the stresses are scaled and entered in the third column of our table. All the dotted members of the right-hand side are stressless, while the stress in each member of the right-hand upper chord is equal to $r\,g$, or 6,0 pounds.

Following this, the right-hand wind-diagram is drawn in a similar manner (*Fig.* 76*a*) and the stresses scaled and entered into Column 4.

159. The maximum stress for each member is next to be ascertained. This is found in every case by adding to the static stress the larger of the two wind-stresses. Thus, for CX it is equal to — 40.5 (static) and — 10.0 (wind-left) or — 50.5; for GQ, — 32.0 (static) and — 10.0 (wind-right) or — 42.0; and so on. These maximum stresses are entered in the fifth column. By dividing them by the safe stress to be allowed — compressive or tensile as the case may be — the required cross-sectional area of each member is found. As the safe tensile stress we shall assume 16,000 per square inch (Table II). The safe compressive stress will be somewhat less, for, while the strength of a member in tension varies simply with its cross-sectional area, a long member being just as strong as a short one of the same size, the resistance of a compression member, on the other hand, varies not only with its cross-sectional area, but also with its unbraced length. The safe compression on very short struts thoroughly secured against sideward bending or buckling would, similarly to the tension, be 16,000 pounds per square inch; but the limit established for the ratio of the diameter to the unbraced length reduces this to about 10,000 pounds. This limit, according to the N. Y. Building Law, is 1 : 30 for steel, and 1 : 20 for cast-iron. That is, a steel strut, having an unbraced length of, say, 6′ or 72″, must be at least $72 \div 30$, or 2.4″ wide, or in diameter. Similarly, a cast-iron column 8′, or 96″ long, would have to be $96 \div 20$, or 4.8″ in diameter. There are several column and strut formulas taking all these things into account, which shall be given later on. For the present we shall content ourselves with calculating compression members on a basis of 10,000 pounds per square inch, being careful, at the same time, not to exceed the ratio of 1 : 30 as regards unbraced length.

160. It will be found of great advantage to make the larger members, as, for instance, those of the upper and lower chords, of double angles, so that plates may be placed between them at the panel-points, to which the smaller web-members can then be riveted. Let us begin with the upper chord. It is customary to make this of uniform cross-sectional area throughout. Its size will therefore be determined by the members CX and JL, they being subjected to the greatest strain. We find that two $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ angles are the best suited, although their actual area is somewhat in excess of that required. This will, however, compensate, in the first place, for the small bending-moment due to the practically uniform load of those tees resting directly on the upper chord, which must be taken care of independently of the compressive stress (§ 141); and secondly, for the rivet holes, which must always be deducted to get the effective cross-sectional area. They diminish the area of a member to the extent of their diameter multiplied by the thickness of the member. Since we shall use $\frac{3}{4}''$ rivets throughout, and the angles in question are $\frac{3}{8}''$ thick, the amount to be deducted for rivets would in this case be $\frac{3}{4} \times \frac{3}{8} = \frac{9}{32}$, or 0.28 of a square inch.

161. In deciding upon the sizes of the smaller struts, it must be borne in mind not to take the angles too small, for the reason that it might be impossible to rivet them up. Therefore nothing under a $2\frac{1}{2}''$ angle was adopted, although the actual amount required was nearly always very much less, as will be seen by comparing Columns 6 and 8. It is further specified by the Building Law that no material shall be less than $\frac{1}{4}''$ thick, so that it may not become dangerously weak through rusting. This requirement also was fulfilled in selecting the different sizes. The ties XA and VA were made of two continuous angles; likewise UR and SR. WV and TU were made of flat bars. In all cases proper allowance for the rivet holes was made. Two $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L's were adopted for the middle lower-chord tie RA.

162. TABLE OF STRESSES, SIZES OF MEMBERS, ETC., FOR TRUSS (FIG. 74-77):—

1	2	3	4	5	6	7	8
Member.	Static and Snow.	Wind Left.	Wind Right.	Maximum.	Required Area.	Adopted Cross-section.	Actual Area.
CX	— 40.5	— 10.0	— 6.0	— 50.5	5.1	Two $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ L's	6.1
DW	— 38.0	— 10.0	— 6.0	— 48.0	4.8	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
ET	— 34.5	— 10.0	— 6.0	— 44.5	4.5	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
PS	— 32.0	— 10.0	— 6.0	— 42.0	4.2	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
GQ	— 32.0	— 6.0	— 10.0	— 42.0	4.2	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
HP	— 34.5	— 6.0	— 10.0	— 44.5	4.5	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
IM	— 38.0	— 6.0	— 10.0	— 48.0	4.8	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
JL	— 40.5	— 6.0	— 10.0	— 50.5	5.1	" $5'' \times 3\frac{1}{2}'' \times \frac{3}{8}''$ "	6.1
XW	— 5.0	— 2.6	—	— 7.6	0.7	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ "	1.06
VU	— 10.0	— 5.2	—	— 15.2	1.5	$3'' \times 3'' \times 5\text{-}16''$ L	1.78
TS	— 5.0	— 2.6	—	— 7.6	0.7	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L	1.06
QP	— 5.0	—	— 2.6	— 7.6	0.7	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ "	1.06
ON	— 10.0	—	— 5.2	— 15.2	1.5	$3'' \times 3'' \times 5\text{-}16''$ L	1.78
ML	— 5.0	—	— 2.6	— 7.6	0.7	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L	1.06
WV	+ 5.0	+ 2.6	—	+ 7.6	0.5	$2\frac{1}{2}'' \times \frac{3}{8}''$ Flat Bar.	0.84
VR	+ 10.0	+ 5.6	—	+ 15.2	0.9	Two $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L's	2.12
TV	+ 5.0	+ 2.6	—	+ 7.6	0.5	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L	1.06
SR	+ 15.0	+ 7.8	—	+ 22.8	1.4	Two $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L's	2.12
QR	+ 15.0	—	+ 7.8	+ 22.8	1.4	" $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ "	2.12
PO	+ 5.0	—	+ 2.6	+ 7.6	0.5	$2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L	1.06
OR	+ 10.0	—	+ 5.2	+ 15.2	0.9	Two $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L's	2.12
NM	+ 5.0	—	+ 2.6	+ 7.6	0.5	$2\frac{1}{2}'' \times \frac{3}{8}''$ Flat Bar.	0.84
XA	+ 35.0	+ 7.8	+ 5.0	+ 42.8	2.7	Two $3'' \times 3'' \times 5\text{-}16''$ L's	3.56
VA	+ 30.0	+ 5.2	+ 5.0	+ 35.2	2.2	" $3'' \times 3'' \times 5\text{-}16''$ "	3.56
RA	+ 20.0	—	+ 5.0	+ 25.0	1.6	" $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ L's	2.12
NA	+ 30.0	—	+ 11.0	+ 41.0	2.6	" $3'' \times 3'' \times 5\text{-}16''$ L's	3.56
LA	+ 35.0	—	+ 13.0	+ 48.0	3.0	" $3'' \times 3'' \times 5\text{-}16''$ "	3.56

163. In designing the truss, after the sizes of the various members have all been determined upon, a single-line diagram of all the centre lines is first made (shown dotted in Fig. 77), about which the several members are then drawn. After this is done, all the joints and connections are studied in detail.

Let us begin with Joint I (Fig. 78). The plates to be used are to be $\frac{1}{2}''$ thick throughout, and the rivets all $\frac{3}{4}''$ in diameter. Since the rule for the *pitch* or *distance on centres* of rivets is "not less than three times the diameter," our rivets will be spaced $2\frac{1}{4}''$ on centres. Now, to find the number of rivets required to fasten the end of the upper chord CX to the plate: The amount of compression to be transmitted by the rivets from the angles to the plate is equal to 50,5 pounds. The rivets will be in double shear. The value of a $\frac{3}{4}''$ rivet in double shear, at 10,0 pounds per square inch, is equal to 0.4418 (area of rivet) $\times$ 10,0 $\times$ 2, or 8,840 pounds. The number required to safely resist the shearing would, therefore, be equal to $50{,}5 \div 8{,}84$, which is 5.7, or, say, six rivets. But will six rivets give a sufficient bearing (§ 110) against the $\frac{1}{2}''$ plate? No; for the bearing value of a $\frac{3}{4}''$ rivet against a plate of that thickness is, at 20,000 pounds per square inch, only equal to $\frac{3}{4}'' \times \frac{1}{2}'' \times 20{,}000$, or 7,500 pounds, which is less than the shearing value. Dividing 50,5 by 7,5, we get 6.75, or, say, 7 rivets required for bearing. This, then, is the number required for CX.

We next find that in the case of XA it is likewise the bearing which determines the number of rivets; it being $42.8 \div 7{,}5 = 5{,}7$, or 6.

164. The bearing required by the truss upon the wall is found as follows: The load to be transmitted is equal to 22,0 pounds

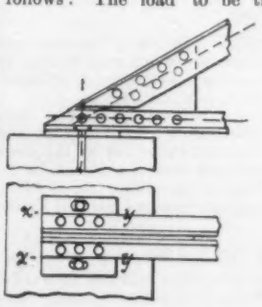


Fig. 78.

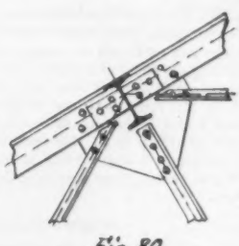


Fig. 80.

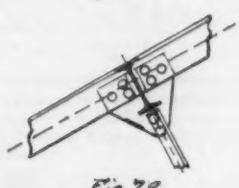


Fig. 79.

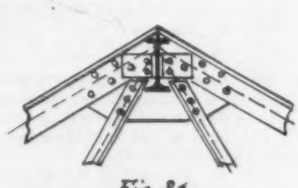


Fig. 81.

(static reaction) plus 6,0 pounds (left wind), or 28,0 pounds. The safe compressive stress on brickwork being 200 pounds per square inch, the area required would be $28{,}0 \div 200$, or 140 square inches. We adopt a cast-iron plate 12″ square, which we rivet to the lower chord members and fasten to the wall with two anchor bolts, as indicated. The holes in the plate through which these bolts pass

must be made elliptical, to afford the truss an opportunity of expanding and contracting when subjected to changes in temperature. This precaution need be taken at only one end. This expansion varies from $\frac{1}{750}$ to $\frac{1}{1000}$ of the span. If the truss had been of much greater span a roller bearing would have been required.

We shall make the plate 1″ thick; the shear along the line $x - y$ is equal to $2.75 \times 12 \times 200$ lbs. $= 6{,}600$ pounds, or $\frac{1}{12}$ of this, 550 pounds per square inch, which is far below the limit (Table II).

At the next point, No. II, Figure 79, we find that the number of rivets required in the strut $X - W$ is two, as determined by the bearing against the $\frac{1}{4}$″ metal of the angle, which is 3,750 pounds per rivet.

At Joint III (Fig. 80), the same is true of $W V$ and $T U$; the rivets for $V U$, being in single shear, have a value of 4,420 pounds each, which results in $15{,}2 \div 4{,}42 = 3{,}4$ or four rivets for that member.

Joint IV is the same as No. II.

Joint V (Fig. 81): $F S$, for bearing, requires $42{,}0 \div 7{,}5 = 5.6$, or six rivets. In the same manner $S R$ requires three.

165. The remaining joints do not differ in any way from the foregoing, so that the reader will have no difficulty in solving them himself.

The 8″ I purlins are riveted into the upper chord, as indicated in Figure 77. They serve to stiffen the trusses laterally; otherwise a system of lateral wind bracing would be required. This usually consists of a series of diagonal rods tying together the panel-points of the two outside sets of trusses, and sometimes also those of the intermediate sets.

O. F. Semsch.

(To be continued.)

CHICAGO ARCHITECTS' BUSINESS ASSOCIATION.

The Chicago Architects' Business Association has adopted the following rules of practice: —

DRAWINGS.

Section 1. All drawings forming a basis for contracts shall be drawn to a scale of not less than one-eighth of an inch to the foot, in ink or by some other process that will not obliterate. General dimensions shall be accurately figured and the drawings made explicit and complete.

SCALE DRAWINGS.

Section 1. All portions of the work that require a larger scale to illustrate the same shall be drawn full size or to a scale large enough to make them fully set forth what is required by the architect. No architect shall ask for bids on any work until all general drawings are complete and sufficient details made, which, in connection with the specifications, will settle all questions affecting the cost of work.

SUPERVISION OF WORK.

Section 1. The supervision of an architect shall be such as shall require the faithful execution of the work according to the true meaning and intent of the plans and specifications, but such supervision does not cover the duties of a clerk-of-the-works. In case there is no clerk-of-the-works provided by the owner, contractors must refer any question about which there can be any doubt to the architect for decision before proceeding to execute the work.

SPECIFICATIONS.

Section 1. Specifications must be prepared in ink or by some permanent process, and shall clearly explain the kind and quality of materials and methods of construction, and give such further information as may be needed to definitely supplement the drawings.

Sec. 2. Everything that will be required in the work must be mentioned in the specifications as far as practicable, being classified and grouped under appropriate headings, and work called for by the plans and not referred to in the specifications, and *vice versa*, shall be included same as if mentioned by both plans and specifications, provided such work comes clearly within the branch or branches covered by the contract.

RULES FOR LETTING CONTRACTS.

Section 1. Written invitations for proposals will be forwarded contractors for work to be let, stating when bids will be opened. This does not apply to public work requiring advertisement for proposals.

Sec. 2. Contractors desiring place upon the roster of an architect's office shall furnish reference as to mechanical ability and fidelity and be prepared to furnish a good and sufficient bond.

Sec. 3. Proposals shall be presented on the day set for opening same and will be opened in the presence of a representative of the bidders.

Proposals shall be opened, read and posted at the time specified before such bidders as are present. Contracts shall be awarded by owners or architects within a reasonable time thereafter.

Bidders shall not be held on proposals retained longer than ten days after date of opening.

Sec. 4. The lowest bidder will not be permitted to change the amount of his bid, but must sign contract or withdraw. The right is reserved to reject any or all proposals.

Sec. 5. If, after the opening of bids, changes are made in the plans and specifications amounting to not more than 10 per cent, the lowest invited bidder shall tender a detailed proposition for said changes, subject to the approval of the architect and owner, and, if found fairly detailed, the contract shall be awarded to him upon his bid so changed.

Sec. 6. Lack of ability to carry out the work in a proper manner, want of fidelity, or disposition to render less than is due the owner in strict conformity with the terms of contract, shall lay the contractor liable to be dropped from the roster of the architect temporarily or permanently, as in the judgment of the architect is just and right, and in the interests of his clients.

Sec. 7. Final certificates of payment on a contract shall not be issued by the architect until the contractor has returned all plans and specifications to the office of the architect.

H. B. Wheelock, *President.*
C. R. Adams, *Secretary.*

Adopted September 9, 1887.

At the annual meeting of the Association the following officers were elected: *President*, H. B. Wheelock; *First Vice-president*, Samuel A. Treat; *Second Vice-president*, Normand S. Patton; *Secretary*, Charles R. Adams; *Treasurer*, L. Gustav Hallberg; *Board of Directors*, J. C Morrison, C. L. Stiles, O. H. Postle, F. W. Handy, W. G. Barfield and R. C. Berlin.

THE VILLA BORGHESE UNDER PRESENT CONDITIONS.

A FINAL settlement of the much-mooted question concerning the disposal of the Villa Borghese and its magnificent art treasures has lately been announced. The great villa and the park in which the museum is situated become the property of the City of Rome, the price paid being 3,000,000f., while the pictures and other works of art contained in the museum have been acquired by the Italian Government for double the sum paid for the villa.

Lovers of art, the world over, are rejoicing over this settlement and feel greatly relieved at the thought that the collections will be kept together in their proper places and that the finest of the old Roman villas built by the Popes will be preserved from destruction. The Villa Ludovisi, left by Gregory XV for his nephew to build with means bequeathed for that especial purpose, is now divided into building lots, disfigured with large apartment-houses and overrun with a network of surface railroads. Little of it remains beyond the Casino of the Aurora, now being used by the American School. The Doria-Pamfili, which was built by Olympia Maldacchini, is preserved in all its beauties on the other side of Rome and is thrown open at stated intervals to the public by the Genoese Dorias, who inherited the Pamfili property through marriage.

Ever since 1892, when the Borghese family became hopelessly bankrupt, the owners of the villa, the Government, and the creditors have been at odds over the settlement of the estate. The misfortunes of that ancient house have not been caused, as is generally supposd, by a change of government and altered conditions in Italy, but simply by reckless speculation. The present generation was amply endowed with wealth, but desired, and, in fact, required, a great deal more. Heavy speculation failed to bring about the anticipated results, and the impoverished members of the family were preparing to dispose of their lands and valuable paintings. Fortunately, the Government had a claim on both, and as soon as it perceived the intention of the Borgheses it set about asserting its prerogatives, with the result that the entire property will remain intact and Italian.

The park, which consists of a large tract of rolling meadow and woodland, has frequently been called a masterpiece and the veritable perfection of Italian landscape art. It resembles in many respects a large English estate, where Nature is left much to herself. Added to this beautiful natural expanse of meadow, stone pine, ilex trees, and occasional avenues of cypress are mossgrown fountains and marble columns and arches, which, by virtue of their very age, seem to be part of the earth itself.

The meadows lie just along the city wall adjoining Pincian Gardens, the parade ground of fashionable Rome. The Porta del Popolo leads to the villa entrance just beyond, and here the great collection just purchased by the Government is preserved. The building was erected by Vasanzio for Scipio Borghese, and was rebuilt by Marco Antonio Borghese at the end of the last century.

The nucleus for the Borghese collections was made before 1800, by Marco Antonio Borghese. His son, Prince Camillo Borghese, a brother-in-law of Emperor Napoleon, in 1806 sold the most valuable part of the collection to the French war lord, and it is now contained in the Louvre. Afterward he gathered the new collection.

It is in the work of the seventeenth century that the gallery excels and is believed to be the most valuable private collection in the world, notwithstanding its lack of many specimens of the early Renaissance period. — *New York Times.*

THE WINDSOR OF AGRA.

THE magnificent tomb known as the tomb Taj Mahal completely obscures the many other interesting historical places connected with the old Mogul capital. But the deserted city of Futtah-pure-Sikri, the summer residence of the Emperor Akbar, claims a visit from every traveller to the land of the Moguls. And in a late number of *Belgravia* Mrs. Emily A. Richings closes her pen picture of Imperial Agra with a short sketch of her visit to the old palace of the great Mogul Emperor. She says: "We started at daybreak for the twenty mile drive to the 'Windsor of Agra,' which crowns a sandstone crag, from whence the materials of mosques and palaces were hewn. The idea of ruin is incompatible with the city abandoned at the command of a fakir, disturbed in

his lonely hermitage by the arrival of the brilliant court. Our entrance disturbs a flock of peacocks in their promenade on the red terrace of Akbar's palace, where his huge red sandstone bed is yet to be seen. Squirrels frolic in the vast quadrangles once filled with the gorgeous retinue of royalty, but the massive buildings appear in perfect preservation, as though the inhabitants had fled but yesterday from the silent halls. The houses of the queens, who enjoyed comparative freedom in this summer retreat, were decorated according to the taste of the fair owners. The palace of the Hindu queen is encrusted with elaborate carving in the debased and soulless Indian style. The Persian palace, wreathed with delicate inscriptions from the Zend-Avesta in the very poetry of caligraphy, shows that the creed of Zoroaster was professed by the royal inmate. The mansion of the Mohammedan begum displays the chastened beauty and perfect proportion of a severe architectural style; and the lowly dwelling of the Christian wife, with the flat roof and plain white walls of the Portuguese houses in Western India, would recall the tender associations of her childhood's home, from whence she was torn to be transplanted to the glittering splendors of the imperial court.

"A pathetic significance belongs to the sole trace of decoration remaining in the simple habitation of the Christian captive who retained the faith of her girlhood amid the uncongenial environment of the Mohammedan court. A faded fresco of the 'Annunciation' may still be traced on the peeling plaster of the white façade, and, amid the blurred outlines of the dim picture, the lily in the hand of the angel is the only clear detail in the confusion of color — a fitting emblem of one who 'bore the white flower of a blameless life' through the heated atmosphere and unbridled luxury of the imperial zenana.

"Through the splendid halls of public and private audience we reached the paved quadrangle known as 'the pachesi board,' where this favorite game was played by living pieces dressed in blue, red, yellow and white, and dexterously moved on the black and white squares of marble by two State officials. Sixteen dusky maidens in gala robes were the prize of the winner, and from a central throne Akbar watched the game. In the 'Luka-luki,' or Hide-and-Seek Palace, another time-honored diversion shared the popularity of pachesi, and the great Mogul, in the comparative leisure of Futtah-pure-Sikri, entered with zest into the sport, chasing his bevy of ladies through the labyrinths of 'Luka-luki' until the vaulted roofs rang with shouts of mirth. The silence of the deserted city broods with oppressive weight over the quarter once devoted to fun and merriment. In the great mosque, birds build their nests in marble niche and fluted dome, and a solitary dervish prostrates himself at the alabaster tomb of the hermit of Sikri. The Elephant Tower, covered with jutting tusks of polished chunam and encircled by tombs of royal elephants, gives a touch of barbaric grandeur to the scene. In a building near the gate, and known as Akbar's office, the Great Mogul spent the early hours of the day receiving and dispatching envoys to and fro on the complicated business of the empire. As the red palaces glow in the sunset light, the *coup d'œil* requires but slight aid from imagination to reproduce the glory of the past."

SOCIETIES

PHILADELPHIA T-SQUARE CLUB.

A REGULAR monthly meeting of the "T-Square Club" held on Wednesday evening, October 20th, was the first meeting held by the Club in its new house. For some time past the Club has been without a home, holding its meetings in the offices of the various architects, who have kindly extended their hospitality to their fellow-members. This, however, was always considered a merely temporary arrangement, and the Executive and House Committees have been active in their search for suitable quarters, and now feel that a place has been secured as nearly ideal as is possible under existing conditions, having rented on a five-years' lease an old stable, the ground-floor of which has been sub-let as a carpenter shop, the Club retaining the two upper floors for its own use. The upper floor has been converted into one large room, 30′ x 35′, where the Club will hold its meetings. Five casement windows extend all across the front and three at the back. A generous brick fireplace has been built at one side and the walls and ceiling are lined with wood of a dark color. Very little was necessary to be done to this place, with its sloping ceiling and general Bohemian air, to make it a cozy home, and just what all the members have wanted so long.

At the meeting on Wednesday evening the walls were well covered with the sketches made by the members during the past summer, and which constituted the subject for competition at this meeting. Charles Z. Klauder, with a large collection of water-color and pencil sketches showing much freedom and breadth of treatment, was awarded First Mention. Second Mention was awarded to Nicola D'Ascenzo, who displayed a number of admirable sketches and decorative compositions, mostly done in oil colors, and Third Mention to Frank A. Hays, who submitted some charming pencil sketches and water-colors, of an excellence we have grown to expect in his work. The sketches of Bissegger, Mann and Pearson are also deserving of special mention, notably the pencil sketches of Bissegger.

The meeting was enthusiastic, there being over sixty members present, and a number of invited guests.

ILLUSTRATIONS

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

HOUSE OF MR. PARKER, DETROIT, MICH. MESSRS. ROGERS & MACFARLANE, ARCHITECTS, DETROIT, MICH.

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

SYNAGOGUE SHEARITH ISRAEL, 70TH STREET AND CENTRAL PARK, WEST, NEW YORK, N. Y. MESSRS. BRUNNER & TRYON, ARCHITECTS, NEW YORK, N. Y.

INTERIOR OF THE SAME.

ÉCOLE DES ARTS ET MÉTIERS, LILLE, FRANCE. M. J. BATIGNY, ARCHITECT.

SCHOOL-HOUSE, NORMANDY, MO. MR. E. A. MANNY, ARCHITECT, ST. LOUIS, MO.

[The following named illustrations may be found by reference to our advertising pages.]

DOORS AND DOORWAYS, NO. 12: DOORS IN THE MAIN FACADE OF THE CHÂTEAU, AZAY-LE-RIDEAU, FRANCE.

FIREPLACE DECORATED IN COLORED GESSO-DURO, STAINED ALABASTER AND GILDED BRONZE. H. DYMOKE WILKINSON, ARCHITECT.

THIS plate is copied from *Building News*.

HORS D'ŒUVRES.

[Additional Illustrations in the International Edition.]

PORCH OF THE MARIENKIRCHE, PIRNA, SAXONY.

[Gelatine Print.]

THE old Marienkirche at Pirna, Saxony, dating from the early part of the sixteenth century, has recently been subjected to a thorough renovation, when new galleries were constructed and an entrance-porch added, on the north side of the church, after the designs of Herr Theodor Quentin, architect. This porch is shown in our plate. The material is yellowish Saxony sandstone.

The sculptured high-relief in the tympanum over the doorway and the statues of Luther and Melanchthon, flanking the portal, are the work of Herr Werner Stein, of Leipsic.

ALL SAINTS' EPISCOPAL CHURCH, MESSRS. CRAM, WENTWORTH & GOODHUE, ARCHITECTS, AND THE "PEABODY" APARTMENT-HOUSE, ASHMONT, DORCHESTER, MASS. MR. E. J. LEWIS, JR., ARCHITECT, BOSTON, MASS.

[Gelatine Print.]

"ALVERSTOKE," CLAPHAM COMMON, LONDON, ENG.

STANLEY PALACE, CHESTER, ENG.

THE PROSCENIUM OF HER MAJESTY'S THEATRE, HAYMARKET, LONDON, ENG. CHARLES J. PHIPPS, ARCHITECT.

COMMUNICATIONS

[*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 ARTS AND CRAFTS SOCIETY: A CORRECTION.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I notice that in the last number of the *American Architect* in your comment on the "Arts and Crafts" you inadvertently omitted the names of John Evans and Mr. Kirkmeyer from the list of councilors. These two men of course represent the "Crafts" side of the Society, and it seems to me it might be well if

you could publish their names, as this will serve to show that the Society is not made up entirely of architects, artists and amateurs.

Yours very truly, R. A. Cram.

[Our correspondent uses exactly the proper adverb, and we are obliged to him for drawing attention to the oversight. — Eds. American Architect.]

NOTES & CLIPPINGS

Absurd Trade Discounts. — The ridiculous complex system of single, double, triple, quadruple, quintuple, and even in some cases sextuple discounts from printed price-lists now prevailing in some trades where competition is keen has reached a height of absurdity which it is hard to believe can actually exist in any business conducted by sane persons. In the gas-pipe trade, for example, "57 per cent off the price-list" may seem to the uninitiated quite a liberal discount; but there are "trailers" added to this, like knots on a kite's tail, increasing in number according to the size of the order and the standing of the customer. "Fifty-seven per cent and six tens off" is a familiar quotation in this trade; and as we presume that the majority of our readers will not understand the meaning of this technical phraseology, we will do the arithmetrical sum for their benefit. Thus an article is listed perhaps at one dollar; 57 per cent off leaves 43 cents net; 10 per cent off of 43 leaves 38.7 cents; 10 per cent off of 38.7 leaves 34.83 cents; 10 per cent off of 34.83 leaves 31.35 cents; 10 per cent off of 31.35 leaves 28.22 cents; 10 per cent off of 28.22 leaves 25.40; 10 per cent off of 25.40 leaves 22.86 — the net price of the article! The *Oil, Paint and Drug Reporter*, in its latest issue, in discussing the condition of the plate-glass trade, says: "It is not believed that there is much profit in selling at the present low price of 90 per cent off the list." Further on we read. "It is thought by some people interested in the business that the end is not yet, and that 90 and 10 per cent will be reached before the war is over." Discounts of "80 and 20 and 10" per cent are allowed by manufacturers of steel screws; and were it not for fear of confusing our readers, we might penetrate still deeper into this maze of discounts. What is the explanation of such seemingly puerile, or rather imbecile, proceedings? There appears to be a magic charm in discounts. The customer is supposed to believe, and often does, that for some occult reason the seller is giving him peculiar favors. No matter how transparent the trick may be, the purchaser seems to be incapable of penetrating it; he is hypnotized by the mystic charm of the sextuple discount. This is the more remarkable when we reflect that the purchaser is, perhaps, also a manufacturer engaged in playing the same game himself. One obvious result of this method of transacting business is to wipe out the small retail traders, who cannot obtain the sextuple discounts which large dealers insist upon. The discount system has penetrated almost every trade, from the selling of ponderous power punches to little pills; and the only advantage of a printed price-list is to beguile the uninitiated retail purchaser into the belief that he is securing a bargain when he buys an article at a cost less than the printed price-list. A few years ago, before the department-stores embraced so wide a range of sales, the book publishers sold books at retail often at the full list price, and the catalogue with prices attached was conspicuously displayed and consulted for the purchaser's benefit. If the purchaser, however, "knew the ropes" he could always obtain at least 10 per cent discount, and often a great deal more than this. Now the purchaser is relieved of the necessity of this counter-play by purchasing the book at a fixed price at a department-store. When the department-stores first began to sell books the retail purchasers could actually obtain new books cheaper at their counters than by buying directly from the publishers. Book publishers do not now seem to be able to meet the competition of rival retail sellers of their own products, and are giving up the attempt. It is evident that trade discounts have attained such a height of absurdity that the whole system has become top-heavy, and is liable to fall at any moment. — *Philadelphia Record.*

Surface Burial. — Sir Seymour Haden has communicated to the *Times* the results of his experiments in surface burial carried out with animals. He also gives some important and interesting information with respect to the interment of human bodies under similar conditions, and with results which confirm in a most unmistakable manner the views advanced by him. First, as regards the practical experiences of human burial near the surface. It appears that while Sir Seymour was previously writing on this part of the subject the Prussian Government was issuing a secret commission to inquire into the condition of the dead in the battlefields of the Vosges. About a year and nine months had elapsed since the battles had been fought, and, as many dead bodies were known to have been only very superficially buried, it was feared that epidemic disease might result. The condition of matters as found by the commissioners, however, put an end to any such fears. In cases in which as many as 800 dead bodies, in the hurry incident to rapid military movement, had been thrust into one shallow excavation, it was found that the bodies had already disappeared, their bones and accoutrements alone being left. But to this unexpected disappearance there was a remarkable exception. In some instances the bodies of officers which had been buried in mackintoshes had not disappeared, the conditions of interment having been somewhat analogous to those of burial in coffins. These facts confirm, although they may not add anything material to, the knowledge which Sir Seymour Haden had already acquired by experiments conducted on a small scale in his own garden, and on a larger scale during the removal of the Holborn Burial Ground. In the latter case it was found that the only bodies which had wholly disappeared were those which had been thrown without covering into the plague-pit. Following up Sir Seymour's experiences the interest deepens. He tells us that for eleven years — since 1886, in fact — he has been burying in the grounds attached to his house animals of every kind and size — calves, swine, cats, dogs, geese, etc. — with the object of ascertaining not only the depth at which interment may be safely made, but the time at which complete resolution of the buried body may be looked for. Beginning with a depth of 4 feet 6 inches — the depth prescribed by the Local Government Board — for instance, he has found that a period of something more than four years (depending mainly on the size of the animal buried) was necessary for complete resolution, and, speaking roundly, that for every foot of depth below the surface a year or thereabouts was necessary to insure this end; that at a depth of 3 feet three years were necessary; of 2 feet two years; and of 1 foot one year; in a word, that resolution was rapid in proportion as the grave was shallow and the soil porous. Nor is this all. For the last two years he has not been burying the body at all, but by simply laying it on the ground and covering it in every direction with a single foot of earth at the end of a year every trace of animal tissue has disappeared, the bones alone being left. Moreover, the whole process is effected without the slightest appreciable effect either on the small portion of soil employed, or on the purity of the earth beneath, or on the sweetness and freshness of the air around. — *Invention.*

Architectural Ruins in South Africa. — The London correspondent of the *Birmingham Post* says that the formation of an Ancient Ruins Prospecting Company in Rhodesia, which encountered some criticism from archæologists, has had one result which will be heard of with interest by those who regarded the scheme as the work of commercial vandals, for the travellers employed by the company have discovered a number of hitherto unknown ruins. Messrs. Neale and Johnson, who knew of no fewer than 200 separate ruins altogether, have on a recent expedition located 85. One is particularly interesting, as, though it resembles Zimbabye in shape, its walls, about 15 inches thick and 15 feet high, are made in a novel manner. They do not consist of bricks or tiles, but seem to be in one solid piece of glazed material, which looks as if it had been burnt after being placed in position. This strange style of architecture suggests, Messrs. Neale and Johnson think, a different race of people from the ordinary ancient workers. It is clear from the character of the ruins that they had attained a high standard of excellence in building. Even more remarkable than the news of this find is the report of Messrs. Neale and Johnson that they have verified the story which has been always current among the natives as to the existence of an ancient building, which possesses massive stone doors, still in position and unopened. The explorers state that this extraordinary ruin is in an unhealthy district, and that lack of water made it necessary for them to postpone visiting it. There will be no difficulty in returning, so far as the natives are concerned, for they are perfectly submissive. The region visited by Messrs. Neale and Johnson embraced the Lower Shanghani, the Lower Umvumgue, the Lower Sebakgue, the Lower Gwelo, and the Lower Inyati.

Typhoid-fever Death-rate. — Statistics as to the typhoid-fever death-rate in different cities in its relation to the character of their water-supplies, given in a recent report on water in Philadelphia, show the importance of sand-filtered water even in cases where the supposed purity of the water offers no apparent reason for filtration. It is shown that the cities of Europe using sand-filtered water have a lower death-rate from typhoid fever than any American city. The city most nearly free from typhoid is The Hague, in Holland, which uses water filtered from sand dunes. The average annual death-rate there from typhoid fever in the five years 1890-'94, inclusive, is 4.9 per one hundred thousand of population. Rotterdam, with a death-rate of 5.2, is second on the list. Other important cities rank in comparative immunity from typhoid as follows: Dresden, 4; Berlin, 8; Amsterdam, 10; London, 13; Edinburgh, 14; Brooklyn (N. Y.), 16; New York, 17; New Orleans, 19; Hamburg, 21; Paris, 25; Milwaukee, 28; Boston, 30; Detroit, 31; Buffalo, 35; Providence, 36; San Francisco, 38; Minneapolis, 40; Baltimore, 41; Newark, 42; St. Louis, 43; Philadelphia, 45. In the five years covered by these statistics Philadelphia had 243 typhoid deaths to each 100,000 of its population, while The Hague in the same period had but 24 and Rotterdam 26, and all the other cities using filtered water a rate nearly as low. The Philadelphia typhoid death-rate means about 2,430 deaths from typhoid, and as only 5 per cent on the average of typhoid cases are fatal, it is estimated that there must have been between 40,000 and 50,000 typhoid cases in that city in 1890-'94, inclusive. — *N. Y. Evening Post.*

Bogus Antiques made by Prison Labor. — The royal British antiquarian and archæological societies have lodged a petition with Lord Salisbury protesting against the peculiar form of prison labor in Egypt since the Khedive's penitentiaries and jails have been under English management. It seems that the convicts, of whom there are twelve hundred in the Jourah Prison alone, are employed in manufacturing bogus antiques, for which there is reported to be a large market, especially in America. The petitioners declare that the forgeries are so clever as to be scarcely distinguishable from the real article. As yet only antiques of relatively small dimensions have been produced, but the prison authorities express the hope of being able in course of time to turn out full-fledged mummies and sarcophagi. The scientific societies in England point out with some degree of justice that while this form of prison labor may have commercial advantages it practically renders the British Government a party to fraud. — *N. Y. Tribune.*

How Vienna treats the Rear-Tenement Question. — The Board of Health of New York, which seems to have got itself into trouble through a too impulsive tearing down of condemned rear-tenement houses, might find it profitable in future to follow the course adopted in Vienna nowadays when the removal of insanitary buildings is sought. There are in Vienna 1,263 old buildings whose owners are guaranteed eighteen years' freedom from taxation if they will tear them down and put new structures in their place. Last year 242 owners made use of this privilege.

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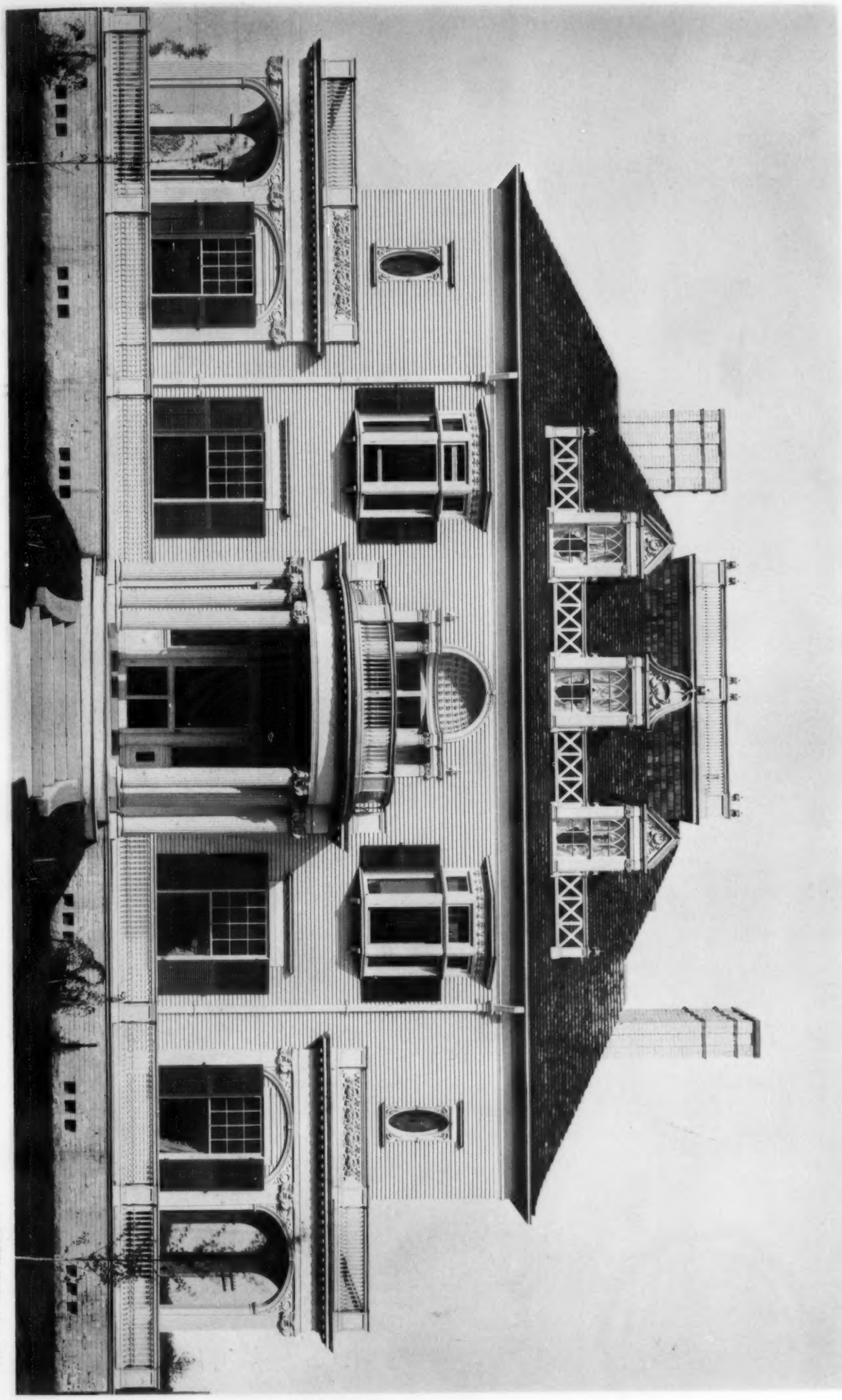

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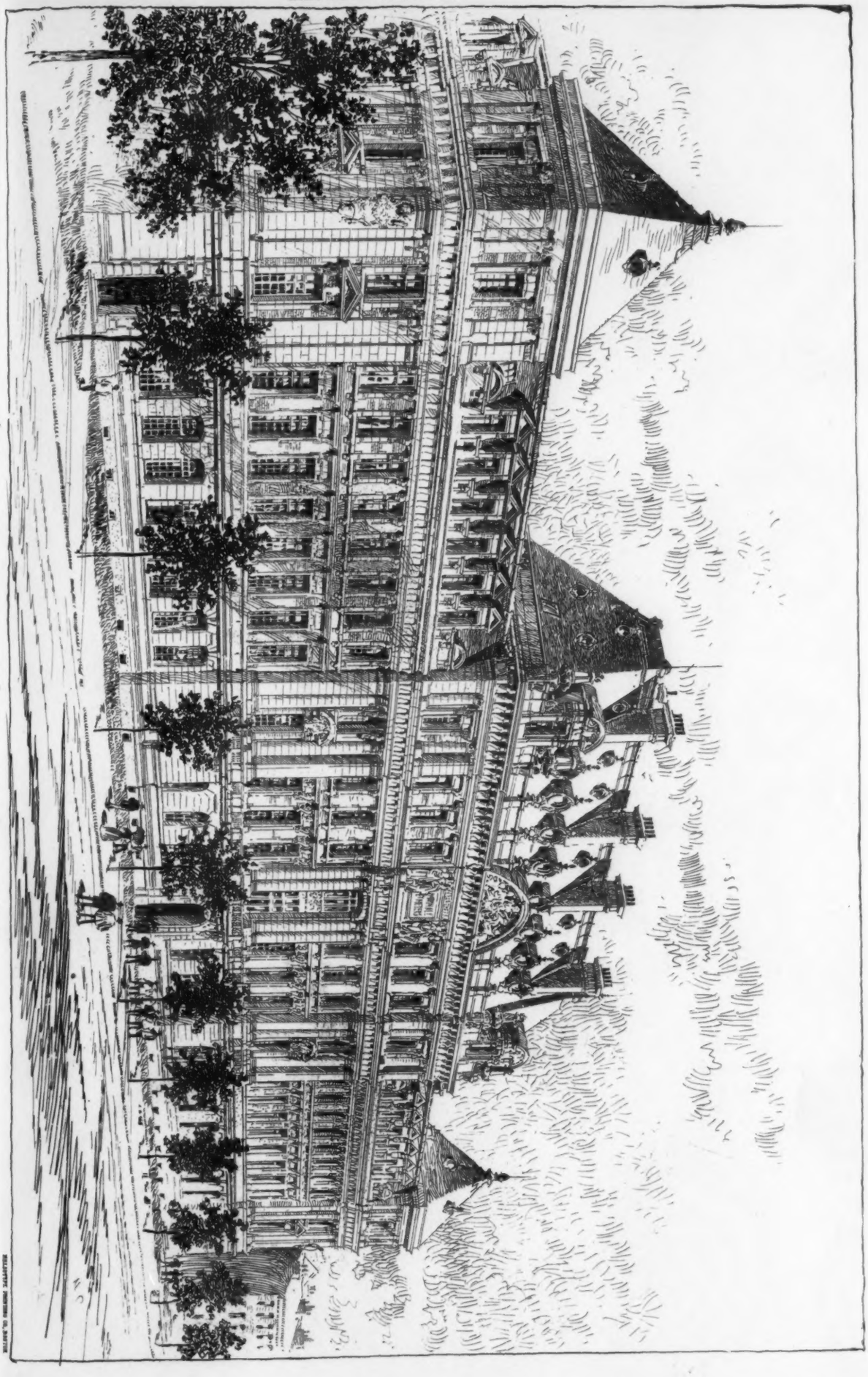

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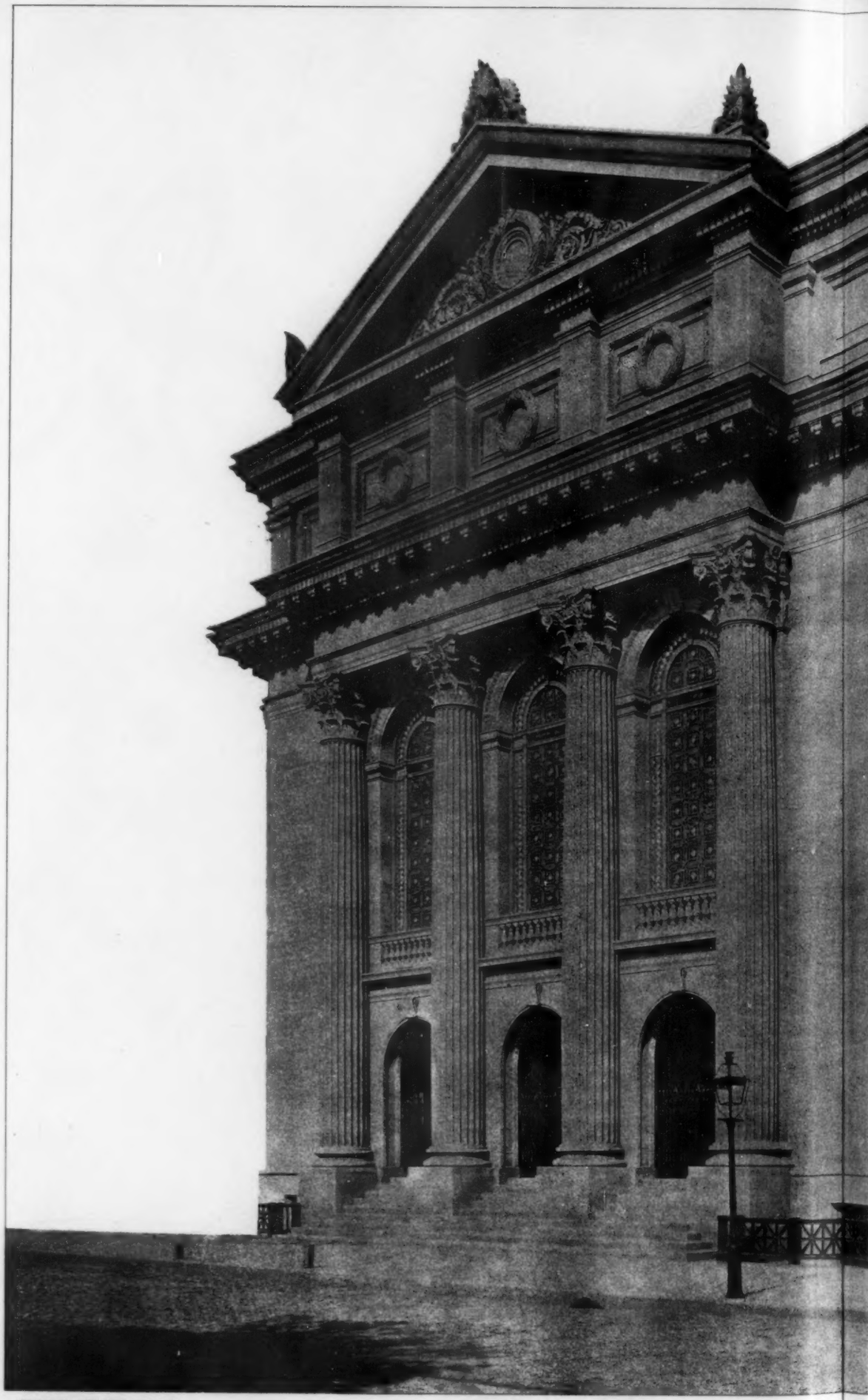

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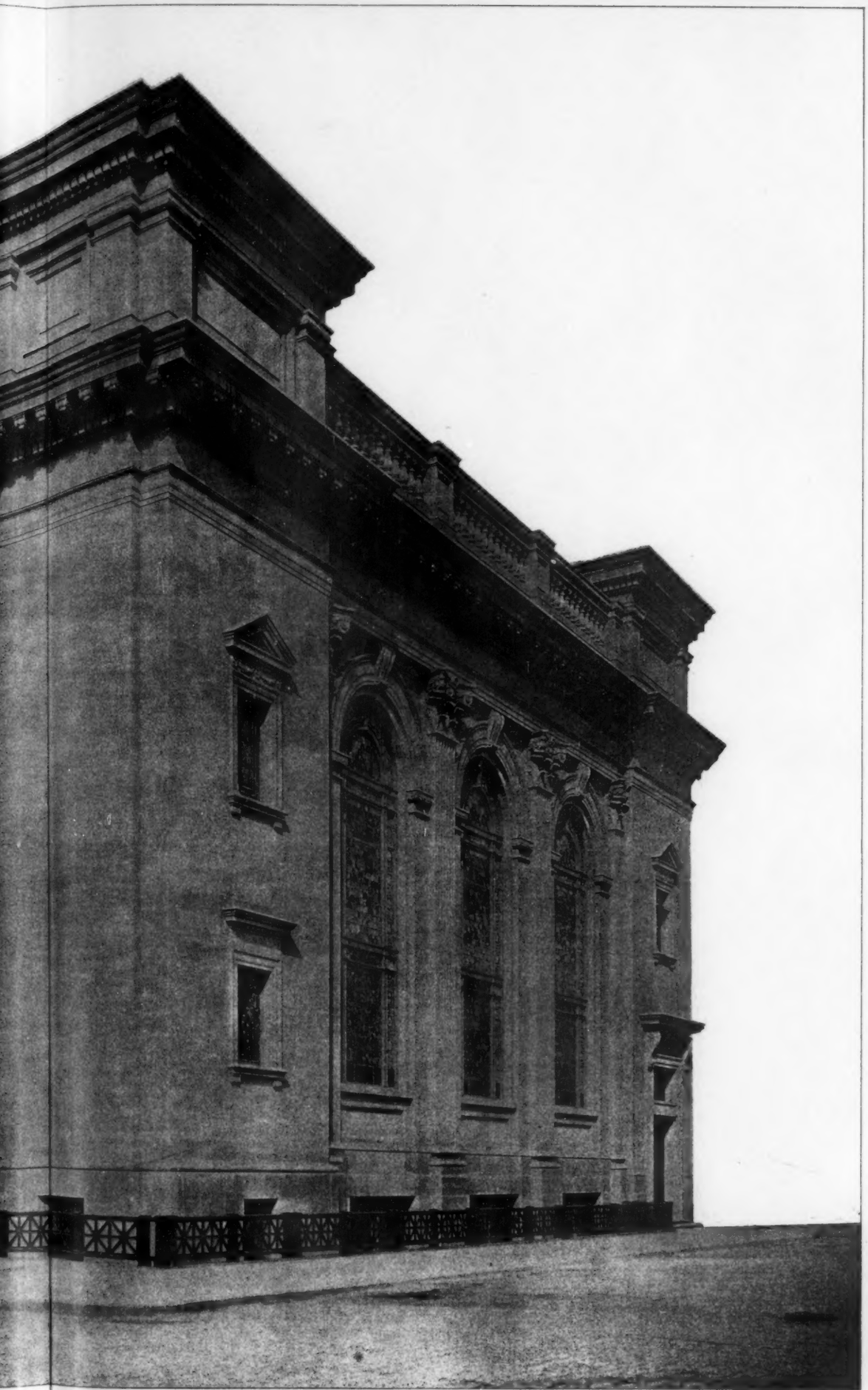

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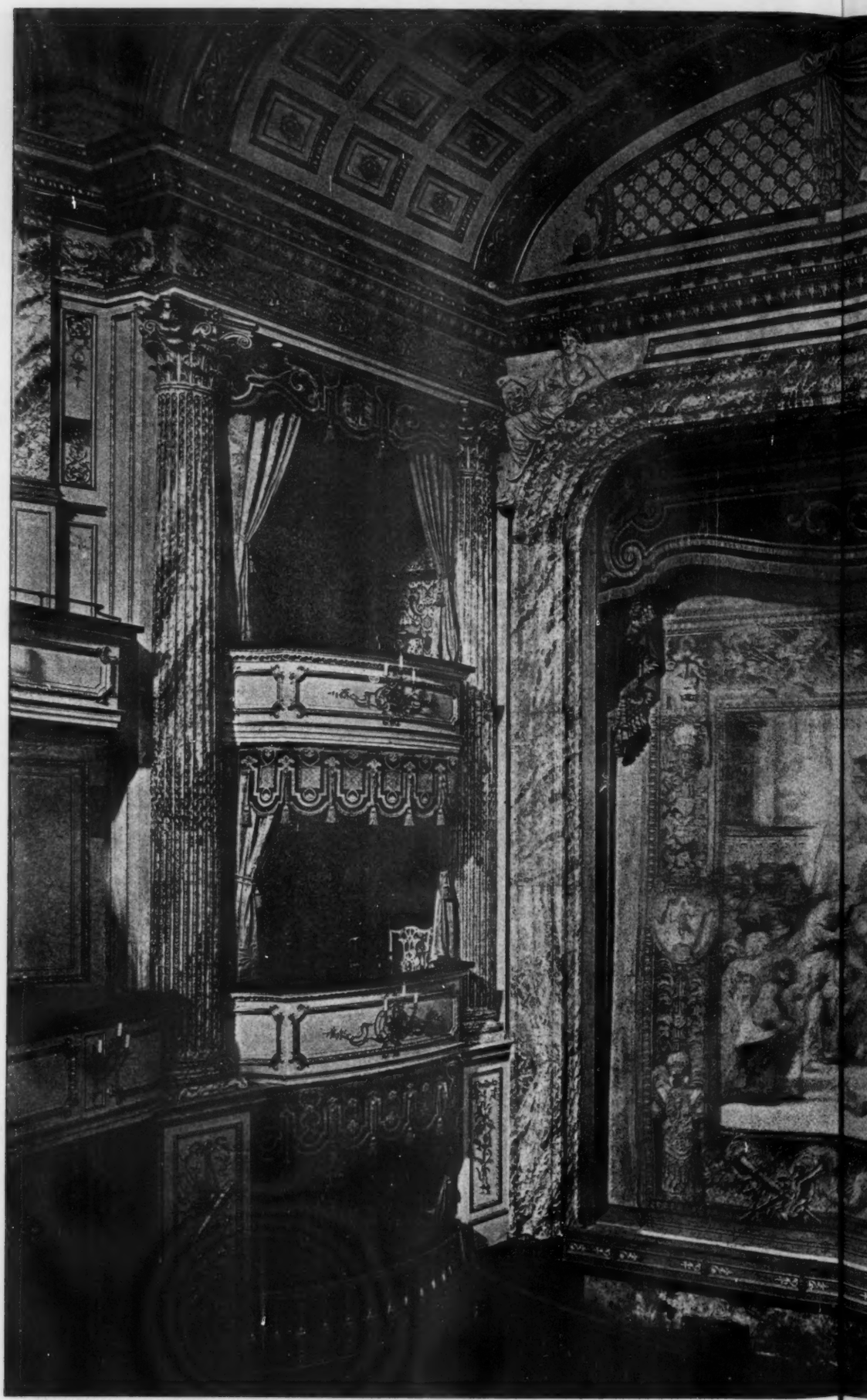

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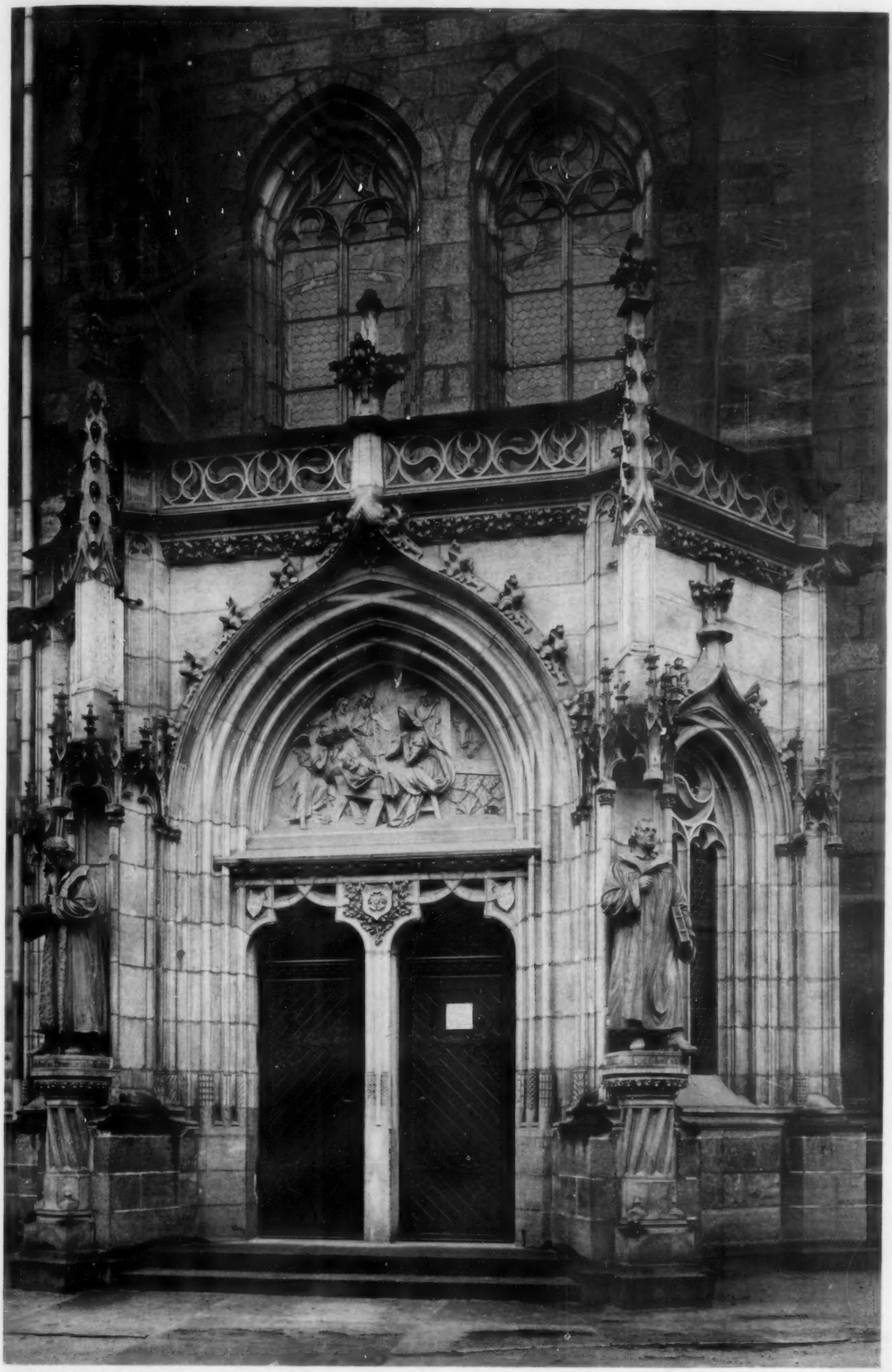
PROSCENIUM: HER MAJESTY'S

The Late CHARLES J. PHIPP

MAJESTY'S THEATRE, HAYMARKET.

ARLES J. PHIPPS, F.S.A., Architect.



Blätter für Architektur Neumann & Co., Berlin.

North Porch of the Marienkirche, Pirna, Saxony.

Theodor Quentin, Architect.