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A PECULIAR case, in which the architect of an important building is a party, is on the calendar of the Massachusetts Supreme Court. Most architects know something of the new Boston Court-house, which has been building for the last seven years; and the Boston architects, at least, know something of the unamiable relations which have existed for a part of that time between the architect, Mr. Clough, and the Commissioners who have had charge of the matter as representatives of the State and city. The building is now nearly finished, and Mr. Clough, whose work is practically over, has brought suit for fifty thousand dollars for compensation for extra plans, made by him, but not used, including the costs and expenses of the collection. It is understood that the actual bill for the work done was between twenty and twenty-five thousand dollars, but compound interest at six per cent would be added to the claim, and an allowance is usually made by the courts to a successful claimant, as compensation for the expense of collection, to which he has been unfairly put.

AS to the merits of the case, we know nothing, except what can be gathered from the Boston papers. A reporter for one of these lately talked with some of the Commissioners, one of whom very frankly explained that the extra drawings for which compensation was claimed were made in connection with a dome, or tower. The original design, which was submitted in competition, showed the building surmounted by a dome. When the matter had so far advanced that public attention was called to the intended appearance of the new building, a discussion arose, particularly among lawyers, as to whether the building should have a dome at all. According to our own recollection, the dome controversy raged for a long time, and at least one outside architect of eminence was called in to offer suggestions. Finally, the Commissioners called a meeting of the Suffolk Bar, which voted that it would be better not to have a dome. The dome was, accordingly, left out of the elevations and sections, but the plans were drawn in such a way as to furnish foundations for a dome, if it should subsequently be decided to put one on; and it appears that the architect drew designs for one or two modified domes, of less importance, and smaller expense. In the end, however, the Commissioners ruled out domes of any kind, and the plans were changed again, so as to provide no foundations for such a feature. It is for making and changing these plans and other drawings that the larger part of Mr. Clough's claim is made. According to the Boston *Daily Advertiser*, one of the Commissioners acknowledges that the original dome was shown in the competitive design accepted by the Commission, and that the plans for it were made by the architect before it was decided to leave it out, and thinks that "of course, he should get something, but not twenty thousand dollars"; but claims that the designs for a modified dome were made without the authority of the Commissioners. Rather unfortunately for this claim, another Commissioner, according to the *Advertiser*, says that "Clough . . . brought in a tower that would cost sixty thousand dollars, after two others had been rejected." "I told him," this Commissioner goes on, "we didn't want any cupola; if we had anything in that line, it should be a large flat dome." A more satisfactory admission that Mr. Clough made these drawings for the benefit of the Commissioners, who, after the abandonment of the original dome, did not themselves know what they wanted, and looked to him to devise something that they would like, it would be hard to imagine; and the picture of the relations between Mr. Clough and the Commission disclosed by the same speaker, who says that he "began resigning four years ago" because he was "tired of fighting that architect," does not indicate that a disposition to do him perfect justice has prevailed in their deliberations.

WE remember well the feeling of gentle satisfaction with which we welcomed perhaps a dozen years ago the first of the contributions of Mr. W. Watkiss Lloyd to this journal, for it seemed to be proof that the *American Architect* had at length achieved a respectable rank amongst journals dealing with art and architecture. Our knowledge of Mr. Lloyd was at that time limited to the fact that he was one of the most learned of English writers on architectural archæology and we have had to await the day of his death, which took place December 22, to learn that he was born at Newcastle eighty years ago and that he first made his reputation as an able critic by publishing in 1845 an essay on the "*Xanthian Marbles*." Since that time his pen was rarely idle, and he has produced a vast number of notable essays, papers and discussions and not a few books, some published, some remaining still in manuscript. His best known book is the "*Age of Pericles*," published in 1875. Amongst his unpublished works are translations of the "*Iliad*" and the "*Odyssey*," a "*History of Greece*," "*Michael Angelo and his Century*," etc. Personally he was a modest and amiable gentleman, a ripe scholar in spite of not being a "university man." The *Architect*, whose connection with Mr. Lloyd was much closer than ours, speaks of him as "a sixteenth-century scholar who was born out of date," a man of "immense erudition," "a living concordance to classic literature."

RAPID-TRANSIT in Boston has advanced a stage, by the decision of the City Government to build a subway, about a mile in length, under Tremont Street extending from Warrenton Street, at the junction of Tremont Street and Shawmut Avenue, to Scollay Square, or perhaps as far as Haymarket Square. Whether the subway shall be built in the form of a tunnel, or as an open cut, and subsequently roofed over, is undecided as yet, and the exact route is not entirely settled. There is much reason for thinking that the construction either of a tunnel, or a deep, open cut of the width intended, through the narrow part of Tremont Street, would either undermine dangerously the high buildings, or would necessitate very costly underpinning or sheet-piling; and the people interested in that large portion of the city which lies to the northwest of Tremont Street would like to see a branch of the subway extended to Park Square, for their benefit. The intention is to lay four tracks in the subway, and run the street cars through it, instead of on the surface of Tremont Street, which is now, in that part, very crowded. With four tracks, it ought to be possible to run express cars from Haymarket Square, where they would be within easy reach of the northern railway stations, to Warrenton Street, or Park Square, in five minutes, thus saving an immense amount of time, as the same trip, in the surface cars, takes now about half an hour, and, in the busy hours of the day, often much more.

WE have an idea that if the Boston people should really get a taste of rapid-transit, they would soon want a great deal more than a tunnel under Tremont Street can provide. For example, volunteered plans are already drawn, and the land purchased, for a new Music Hall, at the corner of Huntington Avenue and West Chester Park. In this hall will be given the Symphony concerts, as well as, probably, all of the best musical entertainments, public balls, fairs and so on; yet the region in which it is situated, though densely populated and fashionable, is one of the most inaccessible in the city for any except those who live in it. Even after the completion of the rapid-transit tunnels, the people from the northern suburbs, who form a large part of the public from which concerts in Boston draw their support, will be left nearly two miles from the hall, and will have to finish their journey to it either on foot, or by the slow and crowded surface cars. In either way, the time from the southern end of the tunnel, which must also be the terminus for all express trains, to the hall would be little less than an hour, and the suburban lovers of music will have to go without their dinners if they expect to hear the first chords of the Symphony concerts in the new hall. The contingent from the southern suburbs, which is at least equally mportant, will be little better off. The Boston and Albany railroad has, indeed, at present, a place within a little less than a mile of the hall, where incoming trains stop before crossing the tracks of the Providence railroad, and where a flight of steps is provided, by which passengers who have business in the neighborhood can climb up to the street; but the outward trains stop at a different place, about half a mile farther off, and it is reported that, by a system of interlocking switches, the necessity for both these stopping-places will be done away with, and passengers by the Boston and Albany road, as well as by the Old Colony, will have to go to the main station, and find their way thence, by surface cars, about two miles to the hall. The Providence road, alone, has made preparations for building a station about fifty rods from the hall, at the intersection of the Brookline, Cambridge and Dorchester surface lines, where an important business centre is likely to be developed. As, by means of this station, it would be perfectly easy for a hand-car to run there in a few minutes from either the Albany or Old Colony stations, or from South Boston, over a system of tracks already laid and connected, and as these tracks approach within a few rods of the main subway, at the Tremont-Street crossing, and of the proposed branch at Park Square, and are laid at a level which would permit of ready connection with the subway tracks, it hardly seems possible that these few rods will not, sooner or later, be broken through, and the three or four miles of subway already existing in the heart of the city be added to the system which the city is about to construct at so enormous an expense.

THE Metropolitan Traction Company, of New York, has written to the State Railroad Commissioners, offering a prize of fifty thousand dollars for the invention of a system of street-car propulsion, superior to the cable and the trolley. The Company says, in its letter to the Commissioners, that the cable-system is the most economical yet invented for streets where the lines are straight, and the business heavy, but is not available for crooked streets, or for general use in cities; while the trolley-system, which can be used for crooked routes, it thinks would not be acceptable to the public in New York. In this dilemma, it appeals to the inventors of the country for help, and promises fifty thousand dollars in cash, as a prize to any person who shall, before March 1 next, submit to the Commissioners an actual working-system of the sort required. The Company exacts no rights in the invention, in return for its prize, nor will it interfere with the award that the Comissioners may make, its object being simply to develop the science of street-car propulsion, primarily for the benefit of the public, and, later, for its own benefit, if a system should be brought out by this means which it could successfully adopt.

ONE of those extraordinary instances of carelessness which occur from time to time in New York, in relation to building-operations, forms the theme of various articles in the daily papers. It seems that a certain Mrs. Shanks undertook to build a house, on land belonging to her in Harlem. The house was built, but, after it was all done, it turned out to have been built, not on Mrs. Shanks's lot, but on the adjoining one, which belonged to a Mrs. Williams. Mrs. Williams's astonishment at finding that her land had been enriched, at some one else's expense, with a four-story house, was hardly less than that of Mrs. Shanks, at finding that she had bestowed her money on her neighbor; while three lawyers, who held as many mortgages, for money advanced to build the house, were by no means agreeably surprised to find that they had advanced ninety-five hundred dollars on a piece of real-estate which still remained vacant, and which would not sell for more than four thousand dollars. However, troubles of that kind are soon righted among honest people. Mrs. Williams told Mrs. Shanks that she would take no advantage of the mistake, but would sell her the lot on which the house stood at its value as vacant land; and in her turn, Mrs. Shanks informed her mortgagees that when the lot was transferred to her, she would transfer the mortgages from the unimproved to the improved property. This programme was carried out, and all parties are now, we hope, enjoying the contentment which only a clear conscience can give. It is singular that mistakes of this kind should be so common in New York, where the rectangular and uniform disposition of the streets makes it particularly easy to stake out lots correctly, but this is the third or fourth instance within a few years of a house having been built entirely on the wrong lot of land. So far as we know, a friendly and honorable arrangement has been made in each case; but, if some avaricious owner should try to retain the property thus wrongly bestowed upon him, it might turn out that the responsibility of the surveyor who staked out the lot would be unpleasantly called in question.

A FEW months ago, a workman in the cut-glass factory of Oullins, near Lyons, became obnoxious to the local glass-cutters' Union, and a strike was ordered, to continue until the man should be discharged. The manager of the factory held out for a time, but finally sent the man away, rather than have his business stopped. The discharged workman applied to the proper court, in this case the Civil Tribunal of Lyons, claiming from the glass-cutters' Union damages for the conspiracy against him. The Tribunal refused to entertain the action, on the ground that "The pressure exercised by workmen on their employer, even in pursuance of a concerted plan, to secure the discharge of one of their comrades, however regrettable it may be, does not constitute a misdemeanor." The Tribunal went on to say that "Strikes, and the incidents of strikes, cannot serve as the basis of an action for damages; a strike is a lawful means, employed by masters or workmen, to enforce upon each other their demands." Why it should be any less a misdemeanor for a gang of workmen to combine to deprive a comrade of his employment than to rob him of his money, the Lyons Tribunal does not explain; but the case gives a curious illustration of the extent to which trades-union tyranny has warped the minds of the community in the manufacturing parts of France. The reputable French newspapers comment severely on the decision, which would undoubtedly, on appeal, be reversed, the highest court in France having already unmistakably expressed itself on the subject. It is fortunate that in this country, where the Union tyrants are perhaps more reckless than elsewhere, the idea that any body of men, under any name whatever, can legally conspire to deprive another man of his living, has never found the smallest countenance in the courts; and, although the Unions constantly attempt such proceedings, the victims of them have rarely failed to find protection in the courts, where they have been appealed to.

THE regular annual competition for the American Prize in the Paris School of Fine-Arts was judged December 21, by a special Commission, whose President was M. Ginain. The subject assigned was "a Public Library, with Baths and Restaurant." Ten competitors entered, and the prize was awarded to M. Bigot, pupil of M. Laloux, with MM. Chifflot, Tronchet, Duquesne, Adone and Sirot as next in rank.

THE University of Illinois is to be enriched with a fine building for the engineering department, under the name of Engineering Hall, the corner-stone of which was laid a few weeks ago. The architect is Mr. George W. Bullard, a graduate of the University. It is a pleasure to think that the admirable work done by the Engineering and Architectural Departments of this University has received a recognition which will do so much toward facilitating and extending it.

OFFICE-HELP FOR ARCHITECTS.[1]—XXIII.

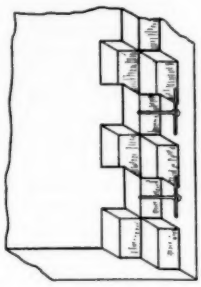


Fig. 111.

§ 306. Tying: — All masonry angles should be tied either by carrying the bond around the angles and consequently building the wall simultaneously, by building them with a tying slip-joint (Fig. 111), by metal anchors and block-toothing (Fig. 112), or by metal anchors and a slip-joint. Where the walls can be carried up simultaneously and are of the same height, it is best to carry the bond around continuously. Where the walls can be kept within one story of one another and are of the same height, the metal anchors and block-toothing are best. Where the walls are of stone, stone and brick, or contain large pieces of terra-cotta, a slip-joint should be used. In "skeleton construction," the section of the columns should be such that the filling-in will bond well around them; the wall of each story should be made entirely independent and be entirely carried by the framing; heavy brackets or corbels should be framed for; arches over openings should be self-supporting.

In Figure 113 is illustrated a typical section of a pier in skeleton construction with various ways of forming the column sections. If the building is relatively low, the ordinary Z-bar column carrying its supporting angle would be sufficient. The supporting angle would project at each end to within 4″ of the face of the wall, and at the side to within $2\frac{1}{2}$″, and would carry a specially moulded brick or specially cut stone to make the joint. In high buildings where all of the wind-bracing that can be obtained is desirable, Z-bars may be spread as shown by the dotted lines with a heavy web-plate and stiffening angles put in, which converts it into a vertical girder, and adds very largely to the stiffness of the column, or a box-girder of two channels with plates on each side as shown on the alternative, may be used. For very tall buildings, one or the other of these should be used, and in addition to these the wind-bracing shown in § 249. For the lower members it is probable that the form made of channels will prove to be more economical. For upper section where they can be made smaller, the Z-bars would probably be the best. This general detail is not only good from a constructive point of view, but affords excellent facilities for putting in the heating and lighting lines of the building. Walls should always either carry themselves and the legitimate floor-load coming on them or else should be simply curtain-walls, carried by the framing and fire-proofing it.

§ 307. Frames: — In all good work in masonry, the door and window frames should not be built-in, but should have the recesses provided for them; after the wall is up, the frame should be set in place with the bed-mould removed. The exterior joint between the frame and the masonry should be caulked with oakum in the same way that a ship's seams are caulked. The joint on the back should be filled with Portland cement put in with a caulking-iron in manner similar to the tucking of a joint; then the bed-mould should be put on, and any openings between it and the masonry caulked with Portland cement.

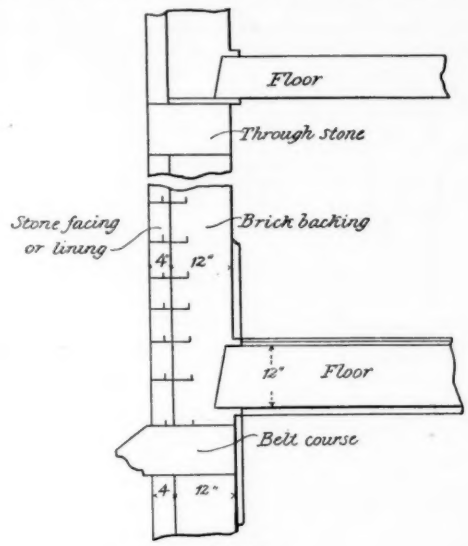


Fig. 112.

§ 308. Partitions: — Partitions may be made of a variety of materials, but should be made of porous terra-cotta or hollow fire-clay blocks 4″ thick. These partitions should never be loaded; when it is necessary to put a load on a partition, it should be made of common brick and proportioned as per § 302.

§ 309. Thin Partitions: — In office-buildings, and elsewhere where space is of great value, partitions $1\frac{3}{4}$″ thick can be made by spacing $1\frac{1}{4}$″ I-beams 2′ 0″ apart on centres and filling between them with hard plaster, using a scratch-coat mortar; then a brown coat is placed on over the whole in the usual manner, and finally finished off. The irons should be dropped into pockets made by boring $1\frac{3}{4}$″ holes through the upper and under flooring, down to the floor-arch and be held in position by means of two cast-iron wedges, wedging them fast at the top. They should be painted before being placed in position with the metal paint hereinafter noted, and then, when thoroughly dry, given a coat of strong alum-water so as to prevent staining through. The plaster-blocks are cast in moulds placed on each side of the small beams. The brown coat should be permitted to become thoroughly dry before the finishing coat is put on, as otherwise it will discolor the white plastering. A patent has been applied for on these partitions. Other thin partitions are made by using Cornell lath, Hayes

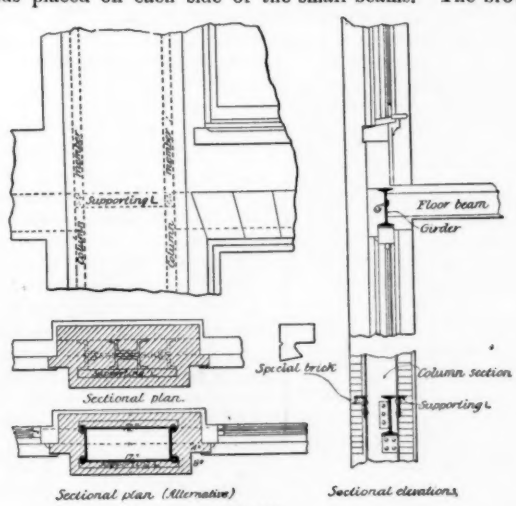


Fig. 113.

[1] By George Hill, Consulting Engineer. Continued from No. 941, page 6.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
∥ parallel to.	□′ square feet.
÷ divided by.	□″ square inches.
× multiplied by.	8# read 8 pounds per lineal foot.
+ added to.	[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.
$\frac{a}{b}$: — a divided by b.	⊥ 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.
L' = " " " " " per square foot 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 courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = 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_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

lath, Expanded-metal lath, etc., or jute bagging, held in position by means of iron bars, iron channels or small I-beams. They all, however, require a greater outlay for material, and a greater expense for labor, and are at the same time, necessarily weaker than that above described.

§ 310. Miscellaneous Points: — Wherever two walls that differ more than 12″ in thickness or more than 20% in height

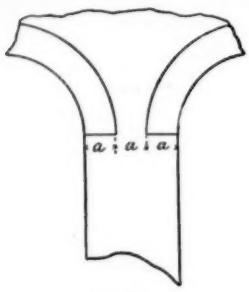


Fig. 114.

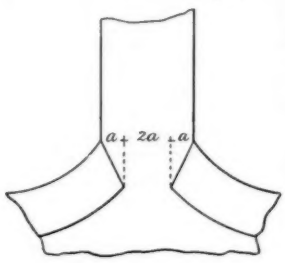


Fig. 115.

join, the joint should be made a slip-joint, and it should be carried through the foundations and footings. In skeleton construction, care should be taken to see that court-walls are separated from curtain-walls by a slip joint. Chimney-stacks should be kept separate from all other masonry walls. T-irons, channels or cast-iron plates for small spans, should be used as back lintels for all openings. In 4″ hollow-block partitions the top of the door-buck should be made with a 4″ channel-iron. Hollow brick, Haverstraw size, are worthless as furring. Experiments with new material only pay when some one else tries them. Overhanging cornices of stone, brick or terra-cotta should be thoroughly anchored with galvanized-iron anchors, carried well down into the work and with a sufficiently large plate at the bottom to hold all down. Stone sills should be supported only at the ends and the mortar should be carefully raked from under the centre until the works are nearly completed. Skew-backs for erect arches in walls should be designed so as to have ample area against crushing (Fig. 114). Skew-backs of inverted arches under piers and for the support of the footings should be made with an area equal to one-third of the pier's area, and in addition, the lines vertically up from the two ends of the skew-back should each take in one-fourth the area of the pier (Fig. 115). All arches have thrust and it must be absorbed by tie-rods, or transmitted to solid bearings by means of sloping abutments following the line of thrust, or be so decomposed by means of heavily loaded abutments as to fall within the line of the piers. Frost will destroy any mortar that is always saturated with water and alternately freezes and thaws; it is, therefore, particularly necessary that the back of all walls exposed to moisture should be coated with a damp-proof material and that ample drainage should be provided. Frost will not heave dry ground. Equalize the thickness of joints so as to secure as uniform a shrinkage as possible.

In common brickwork nine courses should lay 23″. If a wall goes out of plumb 1″ in 30′ 0″ it should be torn down at once. Cement-mortar may be mixed with salt-water without injury to the mortar. Chimney-stacks should be made with fire-clay flue-linings surrounded with an 8″, or thicker, shell above the roof and 4″ shell below. The linings should be laid in fire-clay and the shell built up independently of the linings. All walls exposed to the weather must be furred, either with 2″ furring-blocks or else with $1\frac{1}{4}'' \times 2''$ spruce lath with one course of brick brought out $1\frac{1}{4}''$ both above and below the beams (Fig. 116). Walls of ordinary brickwork shrink about $\frac{1}{16}''$ per 10′ 0″ of height. Crown all flat arches upward $\frac{1}{16}''$ per foot and see that all joints are on radial lines. If common brick is used, see that the tops are wedged off with slate chips. Avoid bond-stones in piers wherever possible; if required, then make them of the full sectional area of the pier with a thickness of one-sixth of the length and make the piers of a better quality of mortar than the rest of the work by 25%. Templates or stones to carry beams and girders should be proportioned to distribute the load over the wall, reducing the S_c to safe limits. They should be made of either 8″ or 12″ in depth, 4″ to 12″ in thickness, and either 12″, 16″ or 20″ in length. For girders carrying great loads the size will be found by dividing the total load by S_c. They should be set with full beds of cement-mortar and instrumentally levelled so as to be right to within one-eighth of an inch. Hollow walls are not a success and should be avoided: they cost more than furring. In planning for buildings, always make complete elevations of all walls and plans of all floors where there is any change either in window openings, thickness of walls or windows omitted.

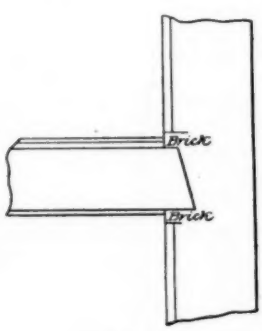


Fig. 116.

When corbels are necessary in brick walls, the corbel should not project more than one-third the thickness of the wall and the depth should equal the thickness as a minimum, each course projecting a uniform amount, and the bearing area should reduce the S_c to safe limits. If the corbel is of stone, it should be either slate, blue-stone or granite, of a thickness equal to twice the projection of the corbel. Wood should never be used in a masonry wall for any purpose; if nailings are needed they can be made with porous terra-cotta blocks. All brick and stone should be tested for porosity by being immersed in water for twenty-four hours. Hydraulic pressed-brick should gain not to exceed 1%, granite and trap 0.5%, common brick 2%, and sandstone 1%. Salty efflorescence may be helped by washing down with hydrochloric acid and painting, and then if the painting is done often enough it will cure it. All common brickwork exposed to the weather should be rendered with a Portland-cement grout, painted with oil-paint or some of the enamel paints on the market.

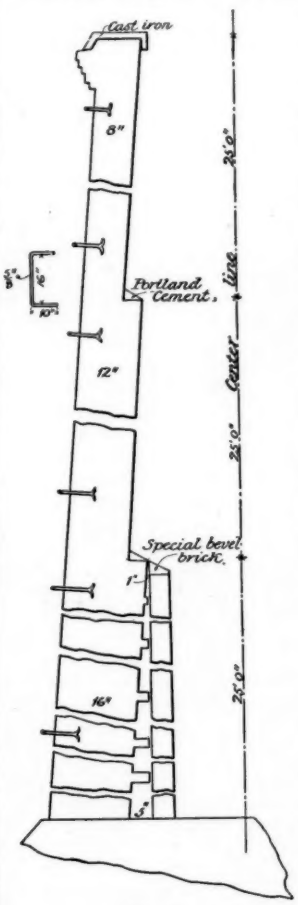


Fig. 117.

§ 311. Chimneys: — For all tall chimneys a trial section should be made, taking the walls at 8″ thick for the first 25′ 0″ from the top and increasing 4″ for each additional 25′ 0″ of height. The wall should batter 4″ per 25′ 0″ and should step off on the inside, thus making the line joining the inside edges of the steps a vertical one. Each step should be given a wash of cement.

Take wind-pressure at 50 pounds per square foot on the section of the stack, plot the pressure horizontally and the weight vertically, the weight counting from the point of intersection of a vertical line with a line of wind-pressure passing through the centre-of-gravity of the section. The resultant should pass so far from the outer edge of the chimney that the total pressure on an area equal to the area of a square whose side equals twice the distance from the resultant to the outer edge is within the limits of S_c. (Fig. 102.)

They should be built with Portland-cement mortar and sufficient time should be allowed for the mortar to set before the stack is exposed to wind-pressure, as otherwise it is likely to fall. Cap should be of cast-iron $1\frac{1}{4}''$ thick and made of as few pieces as possible. Hooks should be built in each 12′ 0″ of height, so as to permit of easy scaling should that be necessary. A lining of fire-brick 5″ thick and carried up vertically should be placed inside of the stack for a distance of 35% of the

length of the flue, this lining should be free of the chimney and free to expand and contract, but should be kept from buckling by bricks projecting from the shell rubbing against the lining (Fig. 117). The space between the lining and the walls should be entirely closed off at the top.

§ 312. Concrete: — The treatment of concrete for foundations in the usual building construction has already been sufficiently covered. For walls of buildings, it should only be used under circumstances forbidding the use of any other material, since very few masons possess more than a rudimentary knowledge of the use of hydraulic cements, and one imperfect barrel would result in a failure, either of the surface or of the strength of a wall that would cast discredit on all of the work. Under circumstances requiring the use of concrete, as for example, Carrère & Hastings's great hotels and other buildings at St. Augustine, Fla., the services of an expert engineer familiar with the uses of concrete should be obtained, and the use of the material constantly watched. Under these circumstances, the cost is only slightly in excess of that of common brickwork.

§ 313. Mortars: — See page 9, Section VII. When a mortar of considerable strength is required, Tables II and III should be compared, but the cost of the mortar should be determined by ascertaining the price of each of its ingredients at the locality considered and making the comparison. Generally, for all cases where building-operations are carried on under the control of a building-department, or where the services of a most competent clerk-of-the-works are not to be had, it will be found better to use Rosendale-cement mortar, than Portland-cement mortar.

[To be continued.]

THE NINTH LEAGUE EXHIBITION.[1] — II.

NEXT to the Vanderbilt drawings comes a drawing of Mr. Haight's American Theatre, in New York, splendidly rendered in color by Mr. J. King James. Taken altogether, this is the finest piece of architectural rendering in the exhibition. The surfaces of the stonework are as smooth, and free from brush-marks, as the stone itself, and, while fully colored, there is nothing in the picture to call away attention from the building which forms frankly the main object in it. Near by, Messrs. De Lemos & Cordes have a design for an office-building, which is rather disappointing after the graceful and elegant work which they have given us in other buildings; and Mr. W. C. Mellen shows a competitive design in Colonial style, for a library at Augusta, Maine, which has the unpleasant, though too common, fault of appearing to have been born symmetrical, but to have taken on an abnormal development at one end.

After a tall bank-building by Messrs. Cady, Berg & See, and a nicely studied house-front by Messrs. Sturgis & Cabot, of Boston, we come to a cluster of pretty water-color sketches, by Mr. E. M. Welch and Mr. E. K. Taylor; and then reach an extraordinary design for a thirteen-story apartment-house, which contains more architecture than any design within our recollection, except, perhaps, the eccentric creation which was devised by Mr. Moser as a habitation for the American Institute of Architects, and attempted, with considerable success, to include every known style or variety of architecture. In one elevation of the apartment-house in question we find the first story marked by a portico, with enormous intercolumniations. The next story is diversified by a balcony; and at the third story start polygonal bays, framed in pilasters. This motive continues through the next story; but at the fifth story the pilasters are dropped, and bays of a new sort, overhanging the first, and of different plan, are piled on top of them. This second order of bays also continues through two stories, and is terminated in the seventh story by huge arches, under which the upper part of the bays fits rather uncomfortably. In the eighth and ninth stories, we have plain windows; and, in the tenth story, more of the same, but with a string-course attached to them. This completes what we may call the plain portion of the façade. In the eleventh story we find the beginning of a vast dormer, with a recess in the middle, and windows curiously arranged in the recess; in the twelfth story a huge arch terminates the recess, with more windows under it; and, even in the thirteenth story, the dormer is not wholly lost, a window appearing in the peak, which evidently lights a room behind it. Not far from this labored composition is a fine drawing, in black and white, of Messrs. Heins & LaFarge's New York cathedral, which loses much of its effect by the badness of the framing. The drawing seems either not to have been stretched at all before framing, or to have been stretched on a board so thin that the contraction has drawn it all out of shape, causing the lines of the subject to wave violently in various directions, to its great injury. Near this is a pretty design, in pen-and-ink, for a small Congregational church, by Messrs. Berg & Clark; and then come more colored sketches, very good, like nearly all the work of the sort shown.

By this time we arrive at the stairway leading to the basement, where we find a colored drawing of a house in New York, by Mr. Mellen, of not extremely interesting exterior, further illustrated by a large model, showing the interior, which appears to be rich and stately. We hurry by this, and are stopped by a charming little water-color, by M. Van Pelt, called "Housetop Walks, Nantucket," but which is either a careful composition, or a very nicely chosen group of old Nantucket houses, in brick and wood, ranged along a street sloping to the sea, which occupies the distance. The perspective of the difficult subject shows a skilful hand, and the grouping and color are extremely pretty.

In the vicinity of this is a beautiful pen-and-ink perspective, by Mr. J. King James, of Mr. Haight's Vanderbilt Dormitory, at Yale College. The building is in the late Gothic, or rather Transition English style which Mr. Haight manages so well, and the drawing is in perfect sympathy with the sentiment of the design.

In the same group with the last are some pretty drawings of country houses, by Messrs. Rossiter & Wright, and several nice water-color sketches, by Mr. MacCafferty, Mr. J. W. Case, Mr. H. B. Herts, and Mr. E. K. Taylor. Of these, the most of a picture is, perhaps, one of Mont Saint-Michel, by Mr. E. K. Taylor, which, for poetry and artistic feeling, deserves to go with the Nantucket sketch, and we think that is saying a good deal.

We are getting so near the limit which our judgment places on the patience of our readers that we must content ourselves, for the rest of our space, with mentioning only a few of the works which have special comments attached to them in our annotated catalogue. Among these we find another very pretty design by Mr. Haight, this time for a country school-house; some nice brick and half-timber houses by Mr. MacCafferty, Mr. Robertson and Messrs. Renwick & Aspinwall; a charming eleven-story family hotel, by Mr. Hardenbergh; Messrs. Le Brun & Son's Home Insurance Company's building; a good Philadelphia apartment-house, by Mr. T. P. Chandler; Mr. Ernest Flagg's St. Luke's Hospital, quiet and refined in treatment, and with an admirable plan; a pretty house in Albany, by Mr. George Keister; a beautiful design for an addition to a church, by Mr. Faxon, and a very pretty school-house, by Mr. F. R. Comstock, of Hartford.

It will be remembered that this exhibition includes sculpture, decorative painting, and decorative designs of various sorts, to a greater extent than ever before, but we refrain from going out of one province to criticise these, further than to say that we find extraordinary interest in four models for figures intended for the angles of the new pulpit in Grace Church, New York, by Mr. W. W. Bosworth. Mr. Bosworth being an architect by profession, his models would be interesting in any case, but they are particularly so as examples of clever adaptation of sculpture for close connection with architecture. Every architect knows that modern figure sculpture rarely accords well with architectural lines, and that the mediæval sculpture, however deficient in other respects, possesses this property to a much greater degree than that of our age; but Mr. Bosworth, while retaining the long, straight folds of drapery, and tendency to general rigidity, of the mediæval work, has joined these qualities in a curiously successful manner with the greater correctness of modelling, and more classical dignity of modern sculpture.

We regret that our notice of a beautiful and brilliant exhibition should have to terminate with a rather harsh criticism, but it seems to us that the exhibitors deserve better treatment than they receive at the hands of the Catalogue proof-readers. We have said the same thing in previous years, but the need of it is more pressing this year than ever before. It would be possible to forgive such mistakes as referring to the "Cortosa in Paria," or the "Church of Santi Spirita," or the "École de Medicin," or "Stoaksay Castle," or "San Stephano," or "L'Eté de la Saint-Martin," or describing a bas-relief of Juliet and her Nurse as "Juliet and the Muse"; but it is not so easy to excuse carelessness by which the names of contributors are disguised beyond recognition. We find, for example, Mr. William G. Preston's design for the improvement of Copley Square, in Boston, attributed to "William Gibbons"; Miss Ruggles, now Mrs. Kitson, one of the most brilliant women sculptors of the time, appears as "Miss Ruggler"; while Miss Helen Reed, another sculptor, is furnished with a middle name, as "Miss Helen Reech Reed." What appears to have been originally a pretty and noble name is tangled up and inverted into "de Veniane Renee," and Mr. Tuthill appears in two forms, as "Wm. B. Tuthill," and "Wm. B. Tuttle," the address being given as the same in both cases. In the same way, Mr. Treadwell's name is spelt after various manners, none of them correct, and Miss Janet Scudder, the sculptor of a most beautiful portrait bust, figures as "Janel Scudder." It ought to be remembered that artist contributors send their works to such exhibitions in the hope of gaining reputation, and a serious injury may be done them by mangling their names and addresses in this way, to say nothing of the discredit which such mistakes cast upon a catalogue which otherwise comes very near perfection.

[1] Continued from No. 942, page 18.

COAL IN THE UNITED STATES. — The output of coal in the United States last year is officially returned at 179,000,000 tons in round figures. In this total Pennsylvania figured for 99,000,000 tons, or more than one-half. The value of the American coal raised last year is officially computed at $207,566,381. — *Engineering.*

THE BUILDING-OPERATIONS OF '93. — NEW OFFICE-BUILDINGS: THE MONADNOCK EXTENSION, THE COLUMBUS, THE ISABELLA, THE MARQUETTE, ETC. — THE ART INSTITUTE BUILDING. — VANDALISM AT THE WORLD'S FAIR GROUNDS.

ALTHOUGH this has been considered a dull year among architects and the work in the offices here has been very quiet, still the number of large down-town buildings which have been completed in 1893 almost seems to contradict what is, however, known to be an indisputable fact. These buildings, if not all actually begun in ninety-two, were, at least, conceived during that year. A tabulated list of the building-permits for thirteen years show that not since eighty-nine has the showing for the twelve months been so small as in this past one of ninety-three. In eighty-nine the amount of money used in building was $25,065,000. In ninety the year's expenditure summed up to $47,322,000; in ninety-one, $55,360,000; in ninety-two, $65,402,000, and in ninety-three, $31,000,000.

The new buildings down-town seem as one passes by them in daily rounds to be not so few in number; possibly, because of their mammoth proportions they force themselves upon the attention. On Dearborn Street, the centre for office-buildings, the Old Colony, Ellsworth and Boyce Buildings rise majestically, while the "Monadnock Extension," so-called, overtops them all in gigantic proportions, while in its ornamentation it stands out conspicuously from its companion the old Monadnock, which is absolutely free from any architectural effect. But little effect can be obtained in these large buildings from the street, no matter how they are treated, and it is only when viewed from some neighboring building that one can see their often picturesque arrangement of roof and upper stories. This is especially noticeable in the Woman's Temple, before described in these letters. The dignity of this building is never lost at any point, though the elaboration of detail is kept for the lower and upper stories, the intermediate ones being less pronounced. Buildings like the old Monadnock afford no possible object for admiration, and one in looking at them must always fall into the common habit of counting the stories. This building is doubtless well suited for the use for which it was intended, offices, and possibly it may be shown in the future that these mammoths, the production of the nineteenth century here in America, should be so treated to obtain the most fitting result. Certainly their main object is utility, but when utility in interior plan can be obtained in combination with some exterior architectural features, it must ever be a gain for the city in which the buildings are located. The Monadnock Extension, as well as, possibly, its neighbor the Old Colony, were the last buildings built under the old ordinance, they both being over a hundred and thirty feet in height, the limit to which buildings can now be raised. The old Monadnock is absolutely free of any band-courses, or, in fact, any division which can serve to break the monotony of its seventeen stories. Even a cornice seems to be tabooed, the only approach to one being a slight budding forth, as it were, of the outer walls at the point where they approach nearest to the sun. The Monadnock Extension is decidedly more ornate and seems to prove that an office-building may without loss of convenience or dignity be so designed. It is composed of red brick and terra-cotta, its color being an exception to the almost universal prevalence of buffs and grays, at present the colors of the materials used for large buildings. The entrances in the Monadnock Extension are very satisfactory, their chief feature being the two large, low arches, which throw deep, picturesque shadows and are, generally speaking, a fine feature. Series of bay-windows run from the third or fourth story upward, and these rest upon a well designed band-course with bracket supports. The windows are enclosed in long bays, the moulding of which is ornamented with Classical carving which is effectual without being heavy. The bays at the top of the building terminate in four arches resting on pillars, and over-topping them are windows flush with the wall.

Diagonally across from the Monadnock rises the Old Colony. In this building granite is used for the first three stories, while buff Roman brick and terra-cotta are the materials used above. The building is kept as near the Colonial style as was possible in this especial kind of structure and is very satisfactory. The main entrance leads between Doric columns, and the carvings not only around the entrance, but also in the lower stories, though not lavish are extremely refined in design and excellent in execution.

These four structures already mentioned, the Boyce, Ellsworth, Old Colony and Monadnock, were begun in ninety-two and finished last year, while in this same quarter several large office-buildings are even now in the process of construction, the new Marquette and the remodelled Equitable being chief among them. The Marquette is attracting especial notice as, to make room for it, the old Honorè Block was torn down, which not many years ago was considered one of the best business structures in the city, a substantial stone building with some little architectural pretentions. It has, however, been raised to make room for the more extensive structure, whose foundations are in part already in, the place having been roofed over and work having been carried-on on them in spite of snow and rain. It will not be long before the steel skeleton will be raised, a process which is always an object of interest to the average passer-by, because of the peculiar way in which the work is carried on — energetically on, say, the first and second stories, then three or four stories are passed by and finally we see the workmen gathering on the fifth and sixth or seventh and eighth.

Farther east, the Columbus, the Isabella and the Marshall Field buildings — some of those which were begun in ninety-two were ready for occupancy in ninety-three. The severe simplicity of the Monadnock type, it is easily to be imagined might become a relief after such riotous ornamentation as is found in the Columbus. Carvings and bronzes are introduced wherever possible and the sky-line is as far from anything reposeful as a summer sky in the midst of a cyclone. Of no defined style, turrets and domelettes gambol at will above the eaves-line, while in the chief corner construction the conventionalized meridians, in the form of an inverted hoop-skirt form, hold a gray glass globe, "a cloud by day and a pillar of fire by night," for in it is placed a strong electric-light. The globe has a map of the world on it which is dimly discernible from the street. The building named for the discoverer of America, completed in this anniversary season, was intended for a memorial building, and there are consequently many features which recall the past. On either side of the entrance bas-reliefs in bronze of their most Catholic Majesties, Ferdinand and Isabella, repose. Above the entrance a more than life-sized bronze figure of Columbus stands on a globe. The two lower stories of the building are of metal and glass, the metal loaded with ornamentation, while above buff terra-cotta is used. The arms of Spain and possibly of Columbus — they are difficult to distinguish at the height — enter into the decoration of the upper part of building, extreme at this point in its ornamentation. Though the exterior may be lacking in good taste there are unquestionably very many charming features in the central entrance-hall, rich in marbles, mosaics and onyx. The mosaics are of Italian manufacture and are very fine. The floor of the vestibule, as well as the rest of the hall, is of this admirable work, and exhibits of the three famous vessels, "*Nina*," "*Pinta*" and "*Santa Maria*," the "*Santa Maria*," naturally, having the most prominent place. Both ships and water are most artistically treated. Around the entire vestibule are bas-reliefs of scenes from the life of Columbus. They are not aggressively poor, neither are they extremely good. Probably had the author possessed twice the reputation which he did, he would have given the work three or very likely four times as much study as was actually put upon it. The greater the artist, the longer and more conscientious his work and study seems a foregone conclusion. Within the hall two memorial tablets in a marble arcade testify to the glory of Columbus. A charmingly decorative mosaic panel on the opposite wall bears the letters Y and F. At the back of the hall beyond the four or five elevators some most quaintly picturesque winding stairs of marble and onyx lead to the floors above. Opening out of this hall both by narrow doors and wide windows are two most decorative and decorated shops. These also are rich in mosaics and marbles, and may be mentioned in detail in some future letter.

The new Marshall Field Building, though a less difficult problem to solve in the matter of stories than some of the other higher structures, and though entirely and completely loaded with ornamentation, except in the lower story, is certainly a very attractive and successful building. In the high structures the ornamentation generally is reserved for the lower and upper stories, leaving a very long stretch of bare, unattractive surface. To avoid this in the Marshall Field Building the idea seems to have been to entirely cover the pieces of terra-cotta, as it would be possible to cover stone, with carving. Two different designs enter into this decoration, one alternating with the other. The lower stories are of granite, while the upper are of terra-cotta, there being two divisions in this part of the building formed by the use of material of two shades, the darker for the stories next to the granite, while the highest ones are of a still lighter shade. The band-courses, the window-frames and, as stated above, the very face of the terra-cotta are covered with ornamentation, but curiously enough, when every thing is so decorative the result is not so distracting as would be expected, for the ornamentation is so general that a decided effort of uniformity and repose is obtained. Whatever richness of color is put into it, has been wisely kept for the interior exclusively and has not been allowed to infringe on the exterior dignity by cropping out around the windows and entrances. However beautiful richness of color, decoration and mosaics may be in certain building in certain places, they most decidedly are not suitable for structures in our ever smoke-begrimed down-town district.

The Isabella Building is another one of the new structures which offers an amount of dignified picturesqueness in its general outline, which is very pleasing. A certain carelessness is noticeable in some of the details which in so satisfactory a structure is to be regretted. The ornamentation of the upper stories is quite in the feeling of the florid Gothic, with which the entrance, which is very charming, harmonizes, but certain capitals and band-courses in the intermediate

stories lose this character in a design not in keeping with the good work of the rest of the building.

The large structure on the corner of State and Madison, to be known as the Champaign, is strictly of this last year's construction. We are told by the papers it is to be one of the "handsomest steel structures" in the city, but the possibilities of such a result seem dubious. The lower stories are of brownish-red terra-cotta, while the remaining thirteen are of white. When we are told by the local press that "the windows will be large, and the cases and frames covered with gold-leaf," that "materials have been selected that can be easily washed," that "the intention is to make it a distinctly white and ornamental building," we tremble for the possibilities. When a thing so big is bad it becomes a serious matter. This, however, is mere speculation upon hearsay and the result may be the exact opposite from our fears, for as yet with scaffolding, etc., around the building, it is impossible to judge it. One of the remarkable features of this mammoth structure is the rapidity with which its seventeen stories have been erected. The old building was only torn down some time about the middle of last summer and now the place is entirely under roof.

The new Stock Exchange Building, now in process of construction, is one which promises to be successful. In its ornamental details it bears very distinctly the characteristics which ever mark the works of its architects, one of our best known firms. These details as usual are very charming and are at the same time very curious. When viewed from near at hand the designs seem so fine and small as to suggest that at a little distance they would become quite lost. But this is not the case, for when viewed from a block away, as in the case of the upper stories it is possible to do, they come out clear and distinct and sharp, having a much better carrying quality than design of apparently a bolder and much coarser kind. Evidently the architect appreciates the advantage of these almost purely geometrical forms treated as a design in which these qualities cannot be outdone. The work has all the mark of most careful study — no lazy open spaces are left in an indolent fashion or are filled-in with a few meaningless curves and lines which have no connection with anything else. The building is entirely of a buffish terra-cotta. A curious little episode connected with it has been the attempt to stop by injunction the placing of the lettering over the doorway. The name Stock Exchange is, of course, the name applied to the headquarters of the stock exchange and it was not considered advisable to take the chances of this possible confusion. The injunction was not, however, granted and the lettering went merrily on.

Near neighbors to this building are the New York Life (recently illustrated in the *American Architect*) and what is known as the Association Building. The New York Life is now under roof, while the Association Building, which is in part the home of the Young Men's Christian Association, was dedicated last New Year's Day. The lower stories of this building are extremely dignified and the structure generally very successful, though the upper stories lack the charm of the first ones of buff Bedford stone, while the composition of the roof is not entirely satisfactory. The Christian Association will occupy the two stories in front and two-thirds of the rear of the building. One of its chief attractions is a swimming-tank on the first floor, twenty-one by seventy-two feet, with tub, shower and spray baths and locker-rooms. There are bicycle storage-rooms with accommodations for three hundred bicycles. There is a good-sized reading-room on the second floor, a lecture-room with two hundred and fifty chairs and an auditorium with a seating-capacity of thirteen hundred.

One block west of these and a few squares south rises the huge Medina Temple. This is the home of some of the secret societies, and named for the famous Arabian town, its architecture taking on an Eastern character. How well this style is carried out is a matter that might be questioned. There is a lack of study in the design which pervades the whole and which does not yet give the most satisfactory results. The ornamentation is almost exclusively reserved for the upper stories, and the lower ones fail in dignity. Two buildings of a public character have been finished and thrown open to the public this month. These are the Art Institute and the Newberry Library. The Art Institute, as far as its exterior is concerned, was finished last spring, but has never been given over to the exclusive use of the association till now. The building is of buff Bedford stone, which unfortunately even now has lost all chance of taking on its time-growing richness of color, because of the coating of soot and smoke. The building is of the low Classic type, its outlines and proportions being excellent. A broad and most successfully laid-out flight of steps lead to a generous entrance through an arched portico. The building has somewhat the shape of the letter E, there being two long extensions running east from the western façade and enclosing between their arms a generous inner court, which gives ample light to all of the rooms opening upon it and which it is planned eventually to partially cover with the building, as the requirements of the Institute may demand that the entire design be worked out. The basement-rooms are reserved for the use of the school, and seem to be light and good, though it appeared rather a curious fact at first with all this large building, that for the actual working part of the Institute there was no accommodations, other than the basement. On the first floor proper are the rooms for the casts, the library and lecture-room, besides a central entrance-hall, from which connecting halls run north and south, from which open the other rooms. These rooms are all well-lighted by broad and generous windows, which pierce the façade on the first story. The lecture-hall had its first public trial as to its acoustics, in a lecture delivered a few days ago, and was not found wanting. On the second story over the main entrance-hall, having an open court in its centre, is a gallery reserved for some choice pieces of sculpture. Out of this, as in the first-floor arrangement, halls branch out, running north and south, from which open the galleries themselves directly connected with each other as are the down-stairs rooms. These galleries are well-lighted by sky-lights, which give curtained walls to the façade in the second story, whose possible monotony is relieved by a slightly recessed arcade. Below the frieze, where possible, a band of classic sculpture is introduced, and on the north and south ends the possible monotony of the walls is further broken by the introduction of galleries, the frieze continuing on the wall at the back of them. The decoration of the frieze itself consists of the names of painters and sculptors carved in excellent Roman lettering. The treasures of the Institute look doubly well, now they are installed in their new home, and Chicago seems to be filled with a justifiable pride over this new possession. The recent opening reception was attended with a good deal of enthusiasm and since the Fair, it does, indeed, seem as if we were on the eve of a true awakening to a better appreciation of art here than ever before. The mere fact, that in the lecture above alluded to, one on the impressionists, the lecture-room was taxed to its utmost capacity to hold the audience seems a hopeful sign. And the audience was not composed chiefly of students, but of all classes, evidently many of them gathered there with a desire to better understand "those queer blue and violet daubs" they saw last summer in so many art-rooms at the Fair.

The Institute has quite recently allied itself to the Chicago Society of Decorative Art, which now has its collection of many choice and interesting articles in some of the galleries of the Institute. These consist chiefly of rare textiles and curious embroideries, fans, jewel-work on cloth, etc. Zorn's picture of Mrs. Potter Palmer, which has been the subject for a good deal of discussion, both here and in New York, was at a recent reception of the Society exhibited here for the first time to a strictly Chicago gathering. That it is a very wonderful picture every one admits, that it is a wonderful portrait many are yet to be convinced. If the artist had no other claim than this, to be classed among the painters who are called illuminists, this one work would place him amongst the front ranks, so wonderful is the sheen on the satin gown, and the sunlight on the slightly upturned face. As a special attraction the Society exhibited a loan collection of fine portraits of women and a charming collection of miniatures.

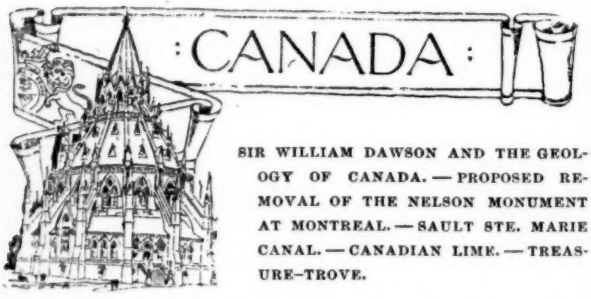
The only excitement at what was once the World's Fair, has been caused by the behavior of the public, now that the Park is once more given over to the Park Commissioners. Naturally no entrance-fee is now asked and this removal of the small twenty-five-cent charge, which for the last few months has been made, seemed to be the signal for the vandals for miles around to rush down to the scene of last summer's brilliant spectacle. The Northern Barbarians did not descend upon Rome with more determined thought of plunder, than did these sons of a free soil flock to appropriate what did not belong to them. Poles and matting from the Java village have been carried away by men on bicycles, men on foot and women in buggies. One man is reported as being caught in the act of detaching toes from some of the sculpture around the large buildings to add to a toe-collection which he said he was making, and one man was even said to have been found who was on hand with a wagon trying to boldly and bodily remove one of the statues from the north end of the Transportation Building. Why people should thus conduct themselves it is hard to understand, especially when they commit no depredations in any of the other parks. It is rumored that the Victoria House and the Convent of La Rabida, as both being substantially built, will be allowed to stand. Certainly no more picturesque object could be found for a park than this reproduction of the old monastery, as it stands out against the lake across the artificial strip of water.

A little matter concerning these Exposition photographs once again brings this much-discussed subject before the public. Messrs. Burnham and Millet are preparing an illustrated history of the Exposition, having already put a large sum of money into it. They wish to use gratuitously the photographic plates of Arnold & Higinbotham now in the photographic bureau of the Exposition. As is well known this firm, one member the son of President Higinbotham, were granted the exclusive right to take photographs of the grounds and buildings. Each has been paid at the rate of two thousand dollars per annum and ten per cent net of the receipts from the sale of pictures. As the Exposition furnished the building and all the photographic material, it is unnecessary to say the venture has proved a successful one for the concessionnaires. President Higinbotham maintained it would not be fair to the firm to use their plates, while others of the board support Mr. Burnham in his claim. So the matter rests. The work, it is expected, will be an elaborate one and deal almost exclusively with the work of construction and architectural features of the great Fair.

It is at least one comfort that the buildings now being in the hands of the Park Commissioners, all the photographers who are so inclined, from the small boy with the snap-shot to the earnest and skilful amateur are now able to photograph the buildings, as they should have been allowed to do all summer. If the chief aim of this great show was education as maintained, nothing could have better

served this purpose than a free distribution through all this broad land of ours of all the pictures that could have been taken of it. Two concessionnaires might have been poorer, but the public would have been far richer.

Considerable interest has been of late taken in a competition which has been going on in Milwaukee for plans for the new Public Library. Many of the Chicago architects have competed and the usual amount of grumbling customary to hear at such a time has been in the air. Insinuations of unfairness have also been abundant, though why, no one knew. Professor Ware of New York was called in to give expert advice on the jury, and this advice given has been followed. Of the five plans recommended by Professor Ware one, by a Milwaukee firm, was chosen. It is estimated that the building will cost five hundred thousand and on this the architect will receive five per cent, which is rather unusual in such public works. The four remaining architects of the five selected by Professor Ware receive five hundred dollars each, and he himself receives a similar amount for expert services, which looks as if the competition was much more wisely and fairly conducted than such affairs are usually.



SIR WILLIAM DAWSON AND THE GEOLOGY OF CANADA. — PROPOSED REMOVAL OF THE NELSON MONUMENT AT MONTREAL. — SAULT STE. MARIE CANAL. — CANADIAN LIME. — TREASURE-TROVE.

SIR WILLIAM DAWSON, who since 1855 has been President of the McGill University at Montreal and only recently resigned that important position, has published another work on the geology of Canada. Natural history and geology have been lifelong studies of the Professor and he has ever advocated powerfully the complete harmony between scientific research and revealed religion. This latest work on Canadian geology he has entitled "*The Ice Age in Canada.*" Canada presents particular advantages for the study not only of the Laurentian system which gives its name to our great river, but also of the Pleistocene period. Sir William Dawson gave the results of some fifteen years' study of the Laurentian period in his book "*Acadian Geology*" published in 1855. "At that time he went to live in Montreal and his attention was given to the Pleistocene period of Central Canada, and had the advantage of working with Sir W. Logan, who had charge of the geological survey at that time, and he proceeded to explore the stratigraphy and fossils of that period. He divided the strata into three groups, Boulder clay, Leda clay and Saxicava sand, and succeeded in raising the number of species of its known fossils to about two hundred. In 1872 Sir William Dawson corrected his '*Notes on the past Pliocene Geology of Canada*' and published a small volume, now out of print, although happily the substance is preserved in a early volume of the *Canadian Naturalist.* The book now published, consists of notes on the Pleistocene Geology of Canada with special reference to the life period and its climatical condition.

"Just below the surface soil we find post-glacial alluvia and peat, on the north shore of Lake Ontario, stratified sand and gravel and, in the Belly River region, prairie alluvium. The next underlying strata, are respectively, for the first region, surface boulders, Saxicava sand and gravel with boulders in and below the sand — for the second, boulders, sand, laminated clay and upper boulder deposits; for the third, upper boulder clay. Next in order, for the first region, upper and lower Leda clay with, in both cases, marine shells and plants — for the second, stratified sand and clay, with fresh-water shells and plants, and for the third, gray sand, with ironstone nodules, brownish sandy clay, carbonaceous layers of peat, and again grays and ironstone. . . . Lower boulder clay or tile with native travelled boulders, are for the three regions, the salient feature of the fourth layer. In the east and centre Paleozoic rocks, often striated, and in the northwest, cretaceous beds underlie the Pleistocene." Sir William Dawson classifies the zones of glaciation as Laurentian, Appalachian and Cordilleran, these three being the main sources of the land ice in the height of the glacial age. In the great Cordilleran range, the changes that overtook the eastern portion of the continent assume an exaggerated form, the nature and complexity of which is illustrated by a table correlating the phenomena of the high regions with those of the plains during the ice age.

"The tendency of recent observation has been to show that the Pliocene and older subdivisions of the tertiary, cover, each of them, a much larger time than the Pleistocene, and that the close of the latter approaches more nearly to the modern or recent time than had previously been supposed." Taking it for granted, therefore, that the newer Pliocene was a continental period of long duration in which the land was more elevated than at present, and that it was in this period that the valley of the Great Lakes was hollowed out (the most ancient St. Lawrence being marked by no lake system), Sir William Dawson has reached the conclusion that the oldest of the Pleistocene deposits (the hill boulder clay), was laid down during the time in which the northern land was slowly sinking under the sea, that the Leda clay and other interglacial deposits and those that correspond with them in the northwest, belong to the time when the subsidence had been complete, while districts of various elevations remained above the surface. To this mid-glacial period again followed a second era of boulder deposits with still further subsidence. It was at this stage that boulders were borne on floating ice to the mountains. It is recorded by Dr. G. M. Dawson that such boulders have been deposited at a height of no less than 5,289 feet, which is more than 1,000 feet higher than the highest known on the eastern side of the continent, and from this depression there was gradual elevation until the second continent was built up, more extensive than that of to-day, with the southern marine fauna penetrating far north and along our coasts and great mammals, now extinct, overspreading the land. Since then there have been cataclysmic oscillations of level, and a partial subsidence still apparently in progress.

"Sir William Dawson combats the extreme views as to influence of glacier action held by some distinguished scientists, such as Agassiz and Dana of the United States, Ramsey and Geikie in Great Britain, as well as the theories of Croll and Ball as to the close of the climatical changes. The cold climate of the glacial period was in Sir William Dawson's judgment, due to the peculiar geographical condition and distribution of ocean currents. It was characterized, not so much by prevalent low temperature, as by a local occurrence of an extreme degree of evaporation and condensation. As for the time of the ice age the cumulative evidence of the mass of various data, tends to show that its cause is of apparently recent date. As for the relations to it, of the human race, the strongest case for the existence of man in the tertiary period, whether at the close of the Pliocene or the beginning of the Pleistocene is that of Dr. Mourton of the geological survey of Belgium. The discovery of fruits and bones points to certain conclusions, so that it is hard to do otherwise than admit that man witnessed two great continental subsidences, the earlier and possibly the later of which was accomplished in the Northern Hemisphere with a great access of cold. Sir William Dawson is, however, inclined to think that in all likelihood the finds of Dr. Mourton may be susceptible of different explanation. This is the merest outline of a work which in subject and treatment is of deepest interest to the students of geology." — *Montreal Gazette.*

A very strange notion, for the carrying-out of which some of the citizens of Montreal have been agitating, is the removal of the Nelson Monument from that part of the city it now occupies, which is principally French in its inhabitants, to a part which is more distinctly English. The notion has arisen as an outcome of the recent attempt to injure the Monument, but for many reasons such an idea could never be permitted to be carried into effect. In the first place it would be tantamount to recognizing a division in the city between the French and English citizens which is already too much marked and has many inconvenient results. Montreal must ever be considered as an English city — a large portion of its inhabitants may be French or of any other nationality, but they must conform to English laws and stand as citizens of an English city, and could never be allowed to make two cities out of one on account of a difference in nationality. Then, again, the Monument was erected not only by the English people there, but by the French as well, and the idea of raising a monument to the naval hero was first mooted at the time the news of his death was received in the city, and the whole population, whatever nationalities they represented, did justice to his memory by contributing to the Monument.

The great Sault Ste. Marie Canal which has been for some years in course of construction is now nearly completed. The object of the Canal is to form a passage from the Lake Superior to the Lake Huron large enough for the grain boats of the lake service. The River Ste. Marie now connects these lakes, but the "Sault" or Rapids make it unsuitable for navigation. The importance of the grain-carrying trade can hardly be realized until one has seen how large are the vessels employed. Solid steel "whalebacks" of a total length of 290 feet are the largest used, and if a stranger will contemplate this fact for a moment it will give him some slight index to size of the inland seas of North America. Three hundred feet represents the length of many ocean-vessels used for export and import service, or in other words "merchantmen," and it rather astonishes fresh arrivals when they hear our lakes are large enough for them. The masonry of the canal is now finished. The walls are 1,000 feet long, 60 feet high and 30 feet wide at base, tapering to 15 feet at the top. Col. O. M. Poe, Chief of the Staff of Military Engineers of the United States, having seen the works, has pronounced the masonry as fine a piece of work of the kind as he ever examined. Everything is now ready for the hanging of the gates, and it is expected that the canal will be opened in July next.

Canadian lime seems to be much appreciated in the Eastern States of the United States, and now if there is a change in the tariff and the heavy duty put on by the McKinley Bill is removed, Canadian lime will, no doubt, again find its way into the States in immense quantities. The tariff used to be three cents a barrel, but the McKinley Act raised it to thirteen cents a barrel. At the present time with the duty lowered again to the three cents a barrel, the

price has fallen so much that it is selling cheaper than at any former time.

A certain farmer in the Province of Ontario decided to make some alterations to his homestead and employed some carpenters, superintending the work himself. While the men were tearing down a plaster partition they came upon two canvas bags, which were found to contain $7,000 in gold. The happy farmer was, fortunately for himself, at hand when the discovery was made. It is said in explanation of the find that years ago, an owner of the farm who had a son given to throwing away money took this means of preventing his son from getting hold of this sum; dying of apoplexy, the secret of the hidden treasure died with him.

USE OF "NEEDLES" IN TUNNELLING.

IN a tunnel recently opened just outside the great Northern Railroad terminus at King's Cross, London, the system known as "needling" was adopted in the excavation, this being the first instance of its employment in an operation of this class. The needles, which were designed and patented by a working miner named Jennings, since dead, are flat steel bars about ten feet long, six inches broad and two inches thick, and they were used instead of timber to support the roof of the tunnel while the arch was being bricked-in below. Although the tunnel at King's Cross is only 530 yards long, its construction was attended by serious practical engineering difficulties. It had to be carried under a canal without interfering with the navigation, under numerous lines of metals and turn-tables in constant use without stopping the traffic, and under goods sheds, a potato market and other heavy buildings, supported on iron pillars and then brick foundations, and some of them carrying very heavy iron girders. Moreover, the line of the tunnel was very near the surface, some portions having as little as five feet six inches of soil above them.

In such shallow soil to have made an open cutting right through, bricked-in the tunnel and then covered in the earth on the top, would have been the simplest method of procedure. But under the conditions above described this was quite impossible. The ordinary alternative was to drive the tunnel under support of timber, but this would have been both costly and dangerous, for it would have involved the use all through of timber not less than fifteen inches square, while the excavation must have bee extended beyond the dimensions of the tunnel to allow for the drop of the timber before the crown of the arch could be built-in.

By the use of the needles, however, timbering overhead was entirely dispensed with, and the tunnel-arch bricked and concreted close up to the undisturbed soil above. The way in which this was carried out is as follows: A shaft was sunk in the proposed line of the tunnel, and in the open cutting thus made a portion of the arch was built-in. Upon this arch two rows of needles were laid. The needles are grooved about an inch from each side, and are so shaped that they can overlap and lock into one another in such a way that no weight from above can displace them. Headings were next driven off in the front and rear of the open cutting, and as the miners advanced the excavation the needles were driven forward by a jack-screw to support the soil above. The headings were made in lengths of about six feet at a time, and thus the needles being ten feet long, could support the roof and at the same time have a firm stay on the brickwork behind. When each length of excavation was completed, the bricklayers came in and built-in the tunnel beneath the needles. Then the excavation re-commenced and the needles were driven forward once more. The shaft being, as we have said, double-faced, the work proceeded in two directions at once, the miners working in one section while the bricklayers worked in the other, and *vice versa*. For each section one set only of needles was used from beginning to end of the work, and as there is practically no wear or tear to them the same will probably be used again in other tunnels. The saving effected in timber for every inch of the work was very great. Moreover, nearly two feet less of excavation was needed and no costly mass of wood was left in the ground to rot away and cause serious subsidences in the future. The tunnel was driven from four shafts, the two central ones having two faces each. The time saved by this method is not a considerable item, but the tunnel has been driven in very shallow soil and under very heavy buildings without the least interruption to the traffic overhead or damage to any of the property undermined. C. H. G.

SOCIETIES

MINNESOTA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the last annual meeting of the Minnesota Chapter of the American Institute of Architects, the following officers were elected to hold office for the current year:

President, Cass Gilbert; *Vice-President*, Geo. E. Bertrand; *Secretary* and *Treasurer*, Clarence H. Johnston.

The election of directors and the appointment of committees for the various branches of Chapter work has been fully perfected with a large promise of fruitful results.

The Chapter numbers thirty members on its rolls, and being well organized and energetic, it is fair to presume that the various activities in which it is engaged will make an exceedingly creditable showing when the year book is made up.

Meetings are held monthly alternately in Saint Paul and Minneapolis, at which papers are read and discussed, interesting professional data compared, and reports of committees on legislative matters, current work, and draughtsmen's competitions received. The draughtsmen's competitions inaugurated last year have been so successful that they will be continued during the current year.

The field is ripe for harvesting much that is of benefit and value to the profession in Minnesota, and the Chapter, recognizing its opportunities, expects to accomplish correspondingly large results.

C. H. JOHNSTON, *Secretary*.

SOUTHERN CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the meeting of the Southern Chapter of the American Institute of Architects, held January 10, the following officers were elected:

President, M. J. Dimmock, Richmond, Va.; *Vice-President*, Thomas H. Morgan, Atlanta, Ga.; *Secretary* and *Treasurer*, W. P. Tinsley, Lynchburg, Va.; *Directors*, C. C. Burke, Memphis, Tenn.; L. F. Goodrich, Augusta, Ga.; F. T. Walker, Montgomery, Ala.; C. C. Wilson, Roanoke, Va.; Theo. M. Abrahams, Charleston, S. C. Memphis, Tenn., was selected as the next place of meeting. The Chapter was banqueted by prominent citizens of Augusta on the following night.

AMERICAN INSTITUTE OF ARCHITECTS. — MEETING OF THE BOARD OF DIRECTORS.

THE first meeting of the Board of Directors for the year, was held in New York on Monday and Tuesday, January 8 and 9. There were present, President D. H. Burnham, First Vice-President George B. Post, Second Vice-President Levi T. Scofield, Treasurer Samuel A. Treat, Secretary Alfred Stone, and Messrs. E. M. Kendall, R. M. Hunt, C. F. Schweinfurth, George A. Frederick, George W. Rapp, W. G. Preston, R. W. Gibson, W. W. Clay, J. F. Baumann, A. F. Rosenheim, Jas. W. McLaughlin, W. S. Rames, W. C. Smith, C. F. McKim and Thomas Hastings.

The result of the last letter-ballot was announced and W. P. Ginther of Akron, Ohio, and Clellen Waldo Fisher of Worcester, Mass., were declared elected, and the Secretary announced the deaths of James P. Johnson of Ogdensburgh, N. Y., and Alpheus C. Morse of Providence, R. I. The resignation of J. C. Plant of Minneapolis, because he was no longer engaged in the practice of architecture, was received and accepted and a communication was received from the Buffalo Chapter in regard to the relation of the Chapters to the Institute, which was very fully discussed and the whole matter was referred to a committee of five to report at a meeting of the Executive Committee to be held sixty days, at least, previous to the next annual meeting, and they were requested to communicate with as many members of the Institute as possible and to report such changes in the By-laws as they deemed expedient. The Chairman announced as members of this committee, E. H. Kendall, New York City; R. W. Gibson, New York City; E. A. Kent, Buffalo, N. Y.; J. W. McLaughlin, Cincinnati, Ohio; W. L. B. Jenney, Chicago, Ill.

A communication from the Buffalo Chapter was received containing a wood-cut purporting to be a representation of the "proposed Federal Building for Buffalo, from the Supervising Architect's drawing," three clippings from the Buffalo *Courier*, and a series of resolutions concerning the Federal Building Law.

After an examination of the drawing and a consideration of the resolution and the newspaper clippings, it was voted that the Secretary be authorized to draw a memorial and resolution in regard to the Buffalo building and that they be prepared to present the same to the Board at its next adjourned meeting for consideration.

At the adjourned meeting held on the next day, the Secretary presented a draft of a letter to be sent to the Secretary of the Treasury, Hon. John G. Carlisle, which was referred to a committee — Mr. George B. Post, Mr. C. F. McKim and the Secretary, who subsequently reported a modified letter which was unanimously adopted and signed by all of the general officers and by the members of the Board present, twenty in all, and forwarded to the Secretary of the Treasury by Messrs. Clay and Treat of Chicago. The Secretary was directed to send a copy of the communication to every Chapter of the Institute with a request that they take such immediate action thereon, as may seem to them best.

The Board received and acted upon eighteen applications and the Secretary was directed to issue a letter-ballot for the election of the following, as Fellows of the American Institute of Architects — William Schickel, Frederick W. Perkins, C. P. Baldwin, G. E.

Harding, J. W. Moulton, A. Page Brown, Joseph Wolf, J. H. Duncan, Jas. Brown Lord, J. O'Connor, R. W. Gilbert, W. Chamberlin, J. S. Barney, W. T. Gooch and J. G. Stearns.

Mr. P. B. Wight having resumed the practice of his profession, was transferred from Corresponding Member and was duly reinstated as a Fellow of the Institute. The following persons upon the nomination of the President, were elected to act with the President, D. H. Burnham, Treasurer S. A. Treat and Secretary Alfred Stone, as members of the Executive Committee, viz: E. H. Kendall, C. F. McKim and R. W. Gibson of New York, and W. W. Clay of Chicago. It was voted to present the name of W. P. P. Longfellow to the next annual convention as an Honorary Member.

The matter of proposing J. S. Walker of Samoa, as a Corresponding Member was referred to the Executive Committee.

A communication of D. W. Gibbs of Oklahoma, in reference to a change in the By-laws in regard to members incapacitated by ill-health from active professional practice, was referred to Committee on Constitution and By-laws.

By the vote of the last annual convention, New York was selected as the place for the next annual convention of the Institute, and the Board appointed October 15, as the date for opening the same.

The appointment of a Committee of Arrangements was referred to the Executive Committee.

Messrs. R. M. Hunt, Geo. B. Post and E. H. Kendall were appointed a committee to collect data with regard to the early organization of the Institute and its acts to the time of its consolidation with the Western Association of Architects, said committee to be empowered to supply a clerk if necessary for the purpose.

The Secretary was directed to print a form for Chapter reports.

Messrs. Post, Hastings and McLaughlin, were appointed a committee to prepare rules to govern competitions, and to report them to the Board of Directors before the next annual convention.

Messrs. Napoleon Le Brun, T. M. Clark and Alfred Stone, were appointed as members of a joint committee on better fire-protection.

Mr. Kendall read a communication from Baron von Geymuller on his proposed "*Thesaurus of Architecture*" and urged that the subject should enlist the interest of the Board, and through them subscribers be obtained from the public libraries and persons of wealth throughout the country. Adjourned.

Alfred Stone, *Secretary.*

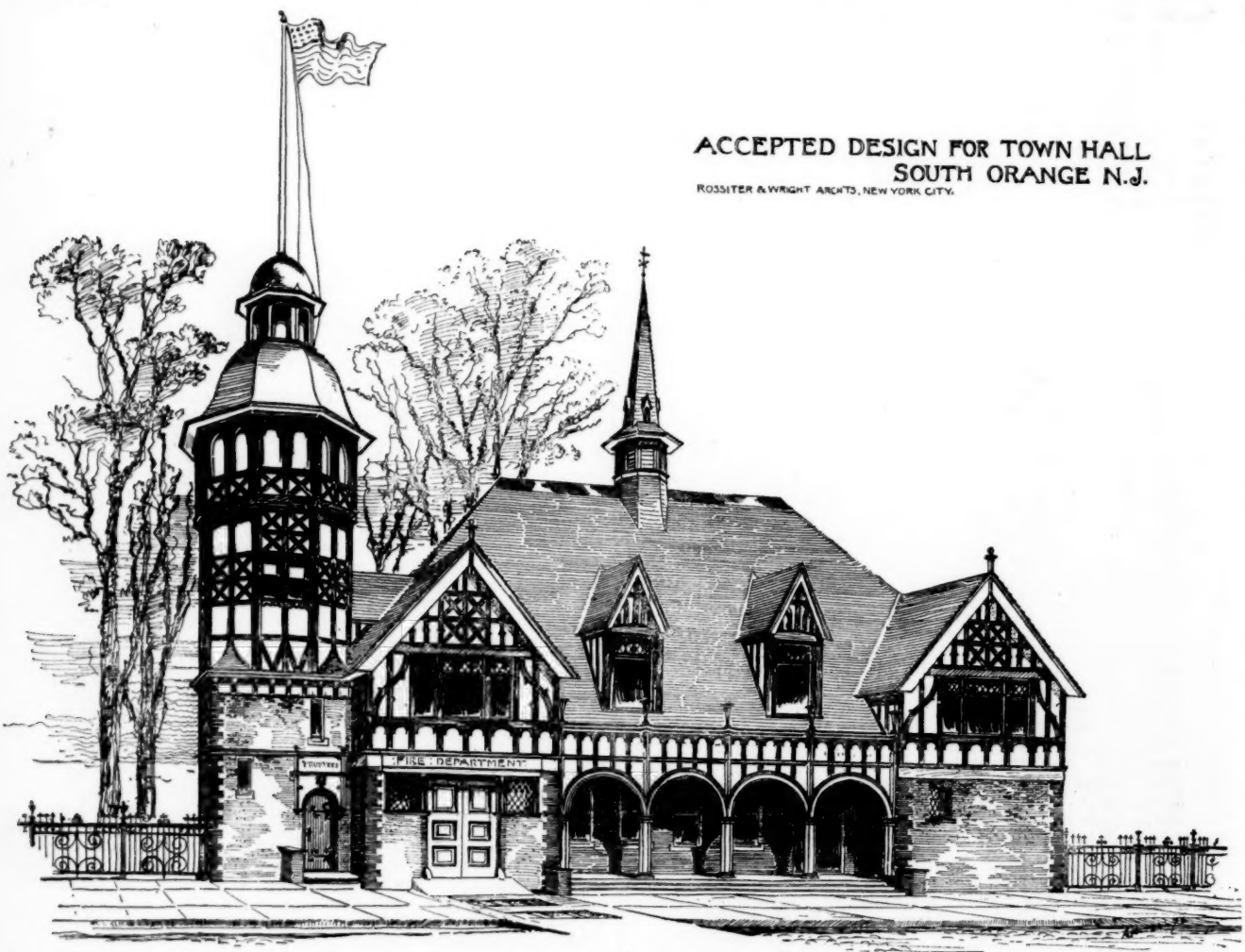
ILLUSTRATIONS

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

PEDIMENTAL GROUP FOR THE PENNSYLVANIA RAILROAD-STATION, PHILADELPHIA, PA. MR. CARL BITTER, SCULPTOR, NEW YORK, N. Y.

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

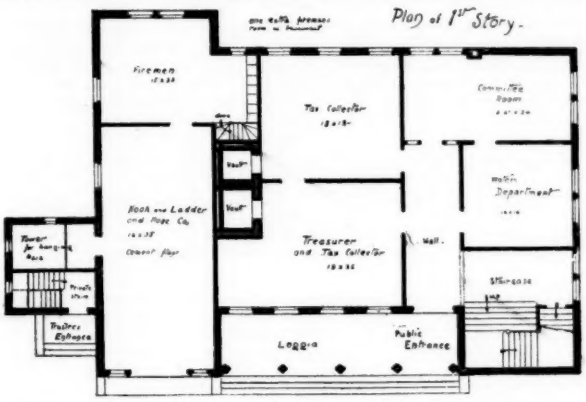
THIS half-scale model was shown at the late exhibition of the Architectural League where it held an important place in the large inner gallery. While the modelling is very effective and in parts the composition gracefully conceived and well carried out, we cannot entirely admire the composition as a whole, as it wilfully throws into confusion the architectural movement of the feature the sculptor was called on to decorate. The general movement of the groups of centaurs, forming as it does a species of inverted arch in violent opposition to the arc of the pediment-mouldings, suggests that the groups were really modelled in the first place, each to occupy the space filled by the other and at some later date were transposed without other reason than to attract attention. The statues of the "Dancing Boy and Girl" are by Mrs. Kitson.



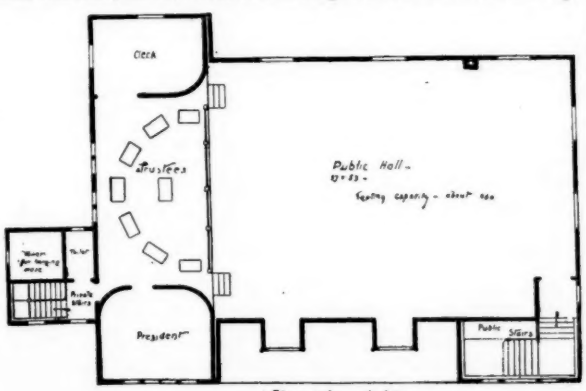
TOWN-HALL, SOUTH ORANGE, N. J. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

THE foundation will be stone and the walls of the first story will be of brick with pressed-brick corners. The balance of the exterior will be in half-timber work with Portland cement on wire-lath between the panels. The style of the building being suggested by the half-timber work of England and Germany of the Elizabethan period. On the south corner a tower will rise to the height of fifty feet, surmounted by a belfry, beneath which the fire-hose may be hung to dry. The basement will be almost entirely above ground, and will be lighted from the rear. One room in this will be finished for the firemen in addition to their meeting-room on the first story. Toilet-rooms are provided in the basement for the

first-story offices, and provision is made for coal storage, also two large fireproof vaults with iron doors for the storage of documents. The first story provides accommodation for the fire-department by a large room, sixteen by thirty-five feet, sufficient in size to accommodate the truck and the hose-carts. The firemen's room is directly in the rear of this, and communicates by private staircase with the second room below. The floor of the hose-room is filled-in solid up to the first story, finished with cement and provided with a drain so that water used in cleaning the apparatus can be easily carried away, without rotting the floor beams. The walls will be wainscoted about seven feet high; the firemen's quarters connect with the tower and



belfry. In the first story are provided offices for the village treasurer and water superintendent, a committee-room for the trustees, and one extra room is provided in case the township committee wishes to install the township collector in the town-hall. The entrance to this part of the building is under a loggia which will have a cement floor. This opens on a hallway, from which rises the main staircase, six feet wide and well-lighted at the bottom and top,



Plan of Second Story.

on the right as you enter the building. The second story contains the meeting-room of the Board of Trustees, which will be a large hall comfortably seating about 350 people. The stage is so arranged that it can be completely shut off by means of sliding-doors from the main floor. The auditorium will have an open-timber roof. The president and clerk will each have a room communicating with the trustees' room and to all this part of the building access may be gained by a private staircase in the tower which may be utilized with convenience when the main hall is rented. A toilet-room for the trustees is also provided on the second story. The entire building will be heated by steam, and lit by gas.

THE CASINO, WOODLAND ST., HARTFORD, CONN. MESSRS. HAPGOOD & HAPGOOD, ARCHITECTS, HARTFORD, CONN.

THIS is to be the social rendezvous for the families on Asylum Hill. It is arranged so that the assembly-hall can be rented without interfering with the people in the club-house proper, affording facilities for dancing-parties, theatricals, etc., with or without the use of the supper-room or banquet-hall. This does not interfere with the use of the whole floor for the casino assemblies when so desired. Billiard-tables for ladies and non-smoking gentlemen are provided on the second floor; and in the high and well-lighted basement are the tables for those who wish to smoke. Work on the building will be begun in the spring as soon as frost is out of the ground, and it is hoped to use the building and its courts for the annual tennis tournaments of the Hartford Lawn Club in August.

DESIGN FOR A SCHOOL-HOUSE AT AMITYVILLE, L. I. MESSRS. J. G. GLOVER AND H. C. CARREL, ASSISTANT ARCHITECTS, BROOKLYN, N. Y.

STORE FOR THE KAMPMAN ESTATE, SAN ANTONIO, TEX. MR. J. R. GORDON, ARCHITECT, SAN ANTONIO, TEX.

HOUSE FOR FRANCIS D. LEWIS, ESQ., WISSAHICKON, PHILADELPHIA, PA. MR. R. G. KENNEDY, ARCHITECT, PHILADELPHIA, PA.

PROPOSED COUNTRY HOUSE. MR. MANLY N. CUTTER, ARCHITECT, NEW YORK, N. Y.

PROPOSED DECORATION FOR DIRECTORS' ROOM, CORN EXCHANGE BANK, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

PORTION OF THE WEST FRONT OF THE MUSIC-HALL, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT, CHICAGO, ILL.

[Gelatine Print.]

FOUNTAIN OF VENUS, NEAR FLORENCE, ITALY.

[Copper-plate Etching.]

THIS fountain, the work of Tribolo with a crowning statue by John of Bologna, is in the garden of the Villa della Petraja.

HALTON, ENG.: GRAND STAIRCASE.

NEW BUSINESS PREMISES, LEGGE LANE, BIRMINGHAM, ENG. MESSRS. ESSEX, NICOL & GOODMAN, ARCHITECTS.

THESE premises have recently been erected. The elevation is carried out in red pressed-brick with terra-cotta dressings supplied by Mr. Edwards, of Ruabon.

ST. COLUMBA CHURCH, WANSTEAD SLIP, ENG. MR. E. PRIOLEAU WARREN, ARCHITECT.

THE illustrations show the exterior of the new church of St. Columba. A view of the interior appeared in *American Architect* of November 18, 1893.

TOWER, ST. GILES'S CHURCH, NEWCASTLE, ENG.

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 NEW YORK CITY-HALL COMPETITION.

NEW YORK, N. Y., January 16, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The six plans selected by the Advisory Committee for the consideration of the new Municipal Building Commission were described and commented upon, in the report, simply in numerical sequence and without regard to relative merit. The numbers put upon the portfolios as received were all changed later, and, so far as I know, no plan has yet been identified. Your editorial is misleading in these respects.

Yours very truly, EDW. H. KENDALL.

NOTES & CLIPPINGS

HELPING STREET-CARS UP-HILL. — A trolley line in Oil City, Penn., climbs a grade of nearly 14 per cent for almost 1,000 feet in one part of town. John B. Smithman, president of the company operating this line, has invented and patented a scheme for helping the cars up and down this slope. It consists of a counterpoise, lowered in a well, and connected by cable with the cars. A well is now being bored for this purpose, and is nearly finished. It is sunk from the top of the hill, and will go to a depth of 1,000 feet. The "balance," as it is called, will be a cylindrical iron bar, 4¾ inches in diameter and 40 feet long. A single car, Mr. Smithman estimates, weighs about seven tons, but, on a 14-per-cent grade, it would require only one ton of vertical pull in the well to counterbalance it; and that is the weight so employed. A cable, running over a big, stout pulley, will connect the counterpoise with the car; and only one car at a time will be helped either up or down the hill; and, obviously, after an up trip the next one must be a down trip. The cable is attached to a "grip" on the car, and will run in a conduit. Mr. Smithman has invented a "differential" drum, which should render a hole half as deep as the grade is long available, but he will not use it in this first experiment. He has also thought of having a series of holes and weights where a grade is very long. — *N. Y. Tribune.*

THE NEW YORK CITY-HALL. — Fortunately for its reputation our excellent contemporary, *Garden and Forest*, does not often indulge in such silly diatribes as this concerning the New York City-hall competition: — "The proposal to erect a new Municipal Building in City-hall Park offers another opportunity for the Municipal Art Society to step in to protect the people from the vandalism of the city government. In deference to public opinion, a committee of architects have been empowered to examine a hundred or more proposed plans, and they reported that not one of them all was worthy to be considered. His Honor the Mayor then inquired if the commission could not shuffle up the different sections of half-a-dozen of the best plans and patch them together so as to make an appropriate building, and, oddly enough, Mr. Le Brun, chairman of the commission, thought that this could very easily be done. Of course, it is absurd to suppose that any monumental building was ever put together in this way. Does any one imagine that St. Paul's Cathedral or the Capitol in Washington could have been designed after this fashion? Suppose Mr. Atwood, instead of developing the beautiful Art Building in Jackson Park, and directing its growth from one central and commanding thought, had dovetailed together pieces of the other buildings, and then put a roof over them — does any one imagine that the result would have been satisfactory? Of course, a municipal building constructed on the principle advocated by Mayor Gilroy would be a disgrace to an enlightened people; and yet, in order to perpetrate this outrage, it is proposed to tear down the one public building in the city of which every one is proud, and which is hallowed by the memories of a century. Besides this, the new monstrosity would cover up the only strip of grass on Broadway between Bowling Green and Union Square — that is, on two and a half miles of the most frequented part of the principal street of the principal city of the New World; and that, too, when the lofty buildings which are piling up about City-hall Park will make its immediate neighborhood the most densely populated spot in the world. No tenement district can compare with it in population during the daytime, and yet the city is tearing down blocks in other parts of the city in order to provide small parks for the people. In no spot on Manhattan Island, certainly, is there more need of open space and a glimpse of verdure than there is about the City-hall. Surely the Municipal Art Society, the Historical Society and every other organization of people who make any pretence to cultivation or refinement, and every man or woman who has the slightest regard for the history, the honor, the health or the beauty of the city ought to protest against this backward step toward barbarism."

THE DISINFECTING POWER OF SEA-WATER. — The most wonderful stories are told of the disinfecting power of sea-water, after electrical treatment, as exhibited at Havre, where experiments upon a large scale have been made under the direction of M. Hermite, the inventor of the system. The following is an extract from the special correspondence of the *London Standard*: "A central station for the proper electrolyzing of sea-water has been established at Havre, on Quai Lombardie, near the Angoulême Bridge, and pipes in connection with it had been laid through all the streets of the St. François quarter, inhabited by some twelve thousand people of the poorest classes, and formerly the hot-bed of every infectious disease. The electrolyzed sea-water forced through the pipes had, however, effected a marvellous change. The streets watered with the disinfecting liquid, by means of hose connected with the pipes, had lost that putrid oder which formerly made them not only repugnant, but an ever-present danger in the very centre of the town. In addition to this, two of the most insalubrious houses in the district had been chosen by M. David, the town architect, for the application of the Hermite system to dwellings. One of them was situated No. 24 Rue de la Fontaine, and the other 35 Rue d'Edreville. A large tank, connected with the electrolyzed sea-water mains, had been placed at the top of each of these six-story buildings, and pipes from the tank carried down to flush the closets and sinks on the various floors. In the case of the house No. 24 Rue de la Fontaine, the now odorless water from the syphons of the closets and sinks was conducted through pipes to the street gutter, down which it ran some distance before it ultimately fell into the sewer. The object of this arrangement was to offer the public a constant, visible, and olfactory proof of the purifying qualities of electrolyzed sea-water. The disinfecting liquid, so to say, consumed the sewage matter, as well as the microbes it contained; and in passing along the gutters and through the sewers, it contributed to the disinfection of both of them by the chlorine it still contained. With the Hermite system, all the sewage water could, without inconvenience, be allowed to flow into the sea, or even into rivers, for it purifies instead of contaminates them." — *New York Evening Post.*

SEA-WATER FOR FIRE-SERVICE AGAIN RECOMMENDED. — The fire-commissioners of Boston recommend a plan for using water from the harbor to extinguish fires in the business part of the city. It is proposed to lay mains through the district, and in case of fire to force water into them with the two fire-boats. These two boats, one of which has been built and an appropriation made for the second, have a combined capacity of 13,000 gallons of water a minute. This would equal twenty-four second-size land-engines, and would furnish sufficient pressure anywhere in the district for ten streams for each boat. A plan somewhat similar is already in use in Cleveland and Detroit. It would seem to recommend itself to all cities whose fresh-water supply is at times seriously impaired by droughts. — *Fire and Water.*

GALLO-ROMAN REMAINS IN THE DEPARTMENT OF SARTHE. — Excavations in Oiseau-le-Petit, Department of the Sarthe, France, have revealed a Gallo-Roman city which appears to have been destroyed by an earthquake. The city probably contained about 30,000 inhabitants, but its name is not known in French history. The ruins include a great temple, part of which is still standing; also a theatre and monuments. A number of medals have been found, which include one of the time of the Emperor Constantine. — *N. Y. Evening Post.*

ORIGINAL DRAWINGS OF THE ELDER ARCHITECTS. — It is probable that the unique collection of original drawings by Inigo Jones, Palladio, and others, lent by the Duke of Devonshire to the Royal Institute of British Architects, may be retained permanently by that body. — *New York Evening Post.*

A DESERTED WASHINGTON TOWN. — A gentleman who has just returned from Gray's Harbor City, Wash., states that there are upward of one hundred buildings there, but they are all deserted. A few fishermen dwell near the shore in their own rude shanties. Some of the deserted buildings are handsome structures, one business block having cost upward of $20,000. — *Exchange.*

BOSTON'S FIRE RECORD. — The fire record for the year just completed shows that the total number of fire-alarms during the twelve months has been 1,536, with an estimated gross loss of $5,706,000. There were 34 deaths and 111 persons injured by the fires. Out of the number of alarms given, 39 were false alarms, 19 seconds, 6 thirds and 1 fourth and 1 general alarm. — *N. Y. Evening Post.*

SETTLING OF THE CHICAGO BOARD OF TRADE BUILDING. — It has been decided to demolish the big tower of the Board of Trade Building in Chicago, as it has sunk eight inches, and is threatening the rest of the structure. New bonds will be issued to provide money for the proposed repairs. The tower is 325 feet high. It is possible that a tower of light material will replace it. — *New York Evening Post.*

THE LIGHTNING-ROD IN EGYPT. — It was said a little while ago, that an obscure Hungarian priest was the inventor of lightning-rods, and not Benjamin Franklin. Now a German Egyptologist, Herr Heinrich Brugsch, claims that he has ample proof that the ancient Egyptians used a form of lightning-rod for protecting their temples against discharges of atmospheric electricity, and that Franklin merely re-invented the same device. But, until he can also prove that Franklin was aware of what the ancient Egyptians had done in this direction, the American is just as much entitled to be regarded as an original inventor. — *Invention.*

AN OLD MEXICAN AQUEDUCT. — One of the oldest aqueducts in Mexico was built a century and a half ago to supply the City of Queretaro. This aqueduct, which bridges water five miles, has seventy-four impressive arches, through one of the highest of which the tracks of the Mexican Central Railroad pass. The Mexican aqueducts were not arranged to deliver water under any considerable pressure; they either supplied a series of gutters passing through the town, or discharged the water under light pressure at fountains, whence it was carried in vessels on the heads or backs of women, on the backs of burros, or on wheelbarrows or carts especially arranged for the purpose. There seems to be a considerable opening in the near future for hydraulic engineering in the republic of Mexico. Very few of the more important towns have water brought and distributed under pressure, and as advancements are made the number of those which provide for a water-supply will probably increase. The City of Mexico has lately contracted for additional water-supply, and an English contractor is now completing a gravity system under high pressure for the City of Pachuca. — *The City of Mexico Two Republics.*

FIVE YEARS UNDER THE ZONE RAILROAD SYSTEM. — It is five years ago since the Hungarian Government decided to apply the "zone" system to its railways. Taking Budapest as the central point, a circle with fifteen miles radius was drawn about it; beyond that another circle was described with twenty-four miles radius, and so on up to eleven circles. The twelfth and thirteenth circles each included a "zone" of fifteen miles, and all the rest of the country made the fourteenth "zone." At the same time, fares were reduced, on an average, 50 per cent. A person wishing to go anywhere within the first zone, fifteen miles from Budapest or less, pays twenty cents first-class, sixteen cents second, and ten cents third. This rate is doubled for the second zone, anywhere within twenty-four miles, tripled for the third, and so on to the end. The result is now published. It shows an increase of passengers, upon the whole, to the amount of 216 per cent, and of receipts to the amount of 40 per cent. These returns exceed the most sanguine expectations. Now that the experiment has turned out so profitably, the directors of private railway corporations in other countries may feel disposed to imitate it. In this instance, at least, it seems clear that both the public and the State treasury have been benefited greatly. — *N. Y. Evening Post.*

COMPARATIVE COST OF THEATRES PER SEAT. — The latest addition to the numerous playhouses of Vienna is the new Raimund Theatre, which has been erected in the Mariahilf district, and is intended for the representation of classical drama at popular prices. Its auditorium, which measures 22 metres by 20 metres, or 72 feet by 65 feet, holds an audience of about 1,800, half of which number have seats on the floor of the house. The cost of the building, for which Herr F. Roth acted as architect, was 450,000 florins or 37,500*l.* Only nine months were required for its erection. Referring to the financial aspect of this "people's theatre," our contemporary, the *Deutsche Bauzeitung*, publishes some interesting data on the cost per seat of the largest theatres of the Continent. A seat in the Paris Opera House cost 16,466 francs, or 658*l.*: in the Vienna Opera House, 2,000 florins, or 166*l.*; in the Budapest Opera House, 2,525 florins, or 210*l.*; and in the Frankfort Opera House, 2,356 marks, or 117*l.* The seats at the Schwerin Theatre cost 125*l.* each; at the Bruenn Theatre, 35 *l.*; at Rouen the figure was 40*l.*, and in Halle and Berlin 49*l.* and 60*l.* respectively. At the Worms People's Theatre the cost was, however, reduced to 25*l.* 15*s.* per seat, and at the new Raimund Theatre to about 21*l.* 5*s.* English figures are, unfortunately, difficult to obtain. — *The Builder.*

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