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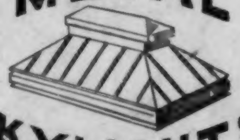

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CONTENTS

NOTWITHSTANDING the general condition of depression and distrust under which the business of the country seems to labor, and the great number of people out of employment in the cities and manufacturing towns, there are signs that the next season will be a good one for building, unless the walking-delegates should see fit, for purposes of their own, to prolong the distress of their constituents by the mischievous tricks which have so often served to turn capital away from building investments. Among the favorable signs, the most conspicuous is, perhaps, the firmness with which the value of land in the principal cities has been maintained throughout the season of depression in other property, and, of late, the unusual number of transfers which have been made, at good prices. It is tolerably obvious that a man who buys vacant land, at about the same price that he would have had to pay for it a year ago, in preference to stocks that would cost him only two-thirds what they would have been worth a year ago, thinks that the land will be the better investment of the two, and the numerous instances of subdivision, at a profit, of large lots bought in this way by the richer operators, indicates, both that an increased number of investors is coming to the same way of thinking, and that the buyers of the small lots intend to improve their holdings. Another favorable circumstance is that building in most of the large cities has been quiet for several years, so that, in normal times, there would, before this, have been a considerable demand for new houses and stores. Already, although the wish to economize, and the dulness of business, have driven many families from the city to the cheaper accommodations of the suburbs, the city houses of a moderately expensive class are well taken up, and more must be provided for before long, and with them the new stores and other semi-public buildings which the growth of population makes necessary. Again, every architect must have observed that an unusual number of churches have been projected recently. For about ten years, very few new churches have been built, but the tide has certainly set in again, and as the most contagious among architectural fashions is that of church-building, we are likely to see within the year, a great many rickety, ugly and inconvenient wooden churches exchanged for structures more in accordance with modern taste. It is notorious that the erection of a new church in a town usually gives the signal for a good deal of other building, and remodelling of old work, so that in the country, as well as the cities, the prospect seems encouraging. It is, however, well to recollect that the anticipations which now seem justified may easily be brought to nothing by the ill-judged interference of trade combinations with natural laws. Unquestionably, the people who have money to put into building next year have a right to expect that they can build cheaply. Every one knows that iron and steel, which will be used in increasing quantities in city building, are cheaper than they have been for years, but that, even at present prices, they pay a reasonable profit to the manufacturers. It is also probable that tariff changes will result in a reduction in the cost of spruce and some other woods, and in that of lime, cement, and perhaps other materials, which will amount to a substantial sum in the total cost of an ordinary building; while labor, notwithstanding the bravado of the foreign demagogue, is not likely to advance in price while the cost of the necessaries of life is being reduced, and while the almshouses and city soup-kitchens are thronged with good mechanics and their families, whom the blustering and haranguing of the walking-delegates has not saved from being thrown out of work. Those who are obliged to calculate closely the interest on their expenditure must take into consideration all these things. If they think that they can build at a cost which will probably give them six per cent net income from their investment, they seem likely, for the next two or three years, to prefer this sort of investment to any other, much to the advantage of the building world; but if they are met, as soon as the building season begins, by arrogant combinations of material-dealers or workmen, with demands which, if granted, would increase their investment so that it would not pay more than four or five per cent, and, if not granted, would subject them to months of controversy, delay, annoyance and loss, they are not only likely, but certain, to abandon their projects, and employ their capital in some other way.

IT will be remembered that the parents of the late Henry O. Avery presented to Columbia College, in memory of their son, a fine architectural library, which now comprises more than ten thousand volumes, and is known as the Avery Library. The collection is kept in a special alcove, which it is intended to mark by a memorial tablet. The tablet itself has already arrived at the College, and, although its permanent place is not yet ready, it has been set up temporarily in the great hall of the College Library, where it will undoubtedly attract much attention. The tablet is by the French sculptor, Chaplain, and is very prettily composed — a rectangular panel, or rather plate, surmounted by a simple pediment, something after the fashion of a Greek stele, presenting in the upper left-hand corner a medallion-portrait of the regretted young architect, while a seated figure of Architecture, with its eyes raised toward the portrait, occupies nearly all the space between the lower right-hand corner and a diagonal, the intervening portion giving room for an appropriate inscription. The figure is seated on a stone, carved in the shape of a Corinthian capital, and beyond it, near the edge of the panel, rises the straight trunk of a laurel tree, which extends toward the medallion a leafy branch, from which a spray runs over into the pediment. The whole affair is not much more than three feet high, but the delicate simplicity, — one might almost say naïveté — of the idea, together with the beautiful design and execution, make it charming.

A NEW sort of street pavement is under trial in Rochester, N. Y. The City Surveyor of this pretty town, Mr. J. V. McClintock, conceived the idea that if a macadam pavement could be made water-proof, so as to prevent the soaking and softening of the ground under it, a great improvement might be made in it, at a small expense. As an experiment, therefore, he macadamized a street in the central part of the city with broken trap-rock from the Hudson River Palisades. The stone used was rather small; the largest pieces would go through a one-and-one-half inch ring, and everything was used but the dust. This material was laid over an old macadam pavement, which was previously picked up, and the dirty stones removed. After rolling the pavement thoroughly with a steam-roller, it was grouted with a mixture of one part American Portland cement to one part sand, with water enough to bring it to the consistency of thick cream. The pavement was first thoroughly wet, and the grout then poured gently over it from pails. One barrel of cement, costing two dollars and fifteen cents, was sufficient for eight and seven-tenths square yards of pavement. After the grout had been allowed to set for twenty-four hours, sand was thrown on the surface, and water sprinkled over it. Traffic was kept off for nine days. Although it is impossible to tell as yet how the pavement will wear, Mr. McClintock, in a letter to the *Engineering Record*, says that it is smooth and neat, and easily cleaned, and is popular with drivers. The principle of this pavement is not altogether new. For some years the Boston streets, in accordance, it is said, with a plan devised by the Superintendent of Streets, have been paved with granite blocks, the interstices of which have been filled, after laying, with hot gravel and tar, making the surface quite water-proof. This improvement has added greatly to the cleanliness and durability of the Boston pavements, at a small expense. Whether Mr. McClintock's Portland-cement grouting will do for macadam what the coal-tar concrete does for granite blocks is still a question. From our experience of Portland-cement grout, we should be strongly inclined to leave out the sand, and use the cement neat, and to keep traffic off it, if possible, for a month, wetting the pavement occasionally in the meantime. Sand in Portland-cement grout is disposed to separate from the cement, and we should think that it might hinder the cement from penetrating the smaller interstices. However, the idea seems a promising one, and, if it answers tolerably well in Rochester, no doubt improvements can be made later. Possibly the broken stone itself, instead of being laid dry and grouted, might as cheaply be laid already mixed with cement and sand, in the form of concrete, and immediately rolled. Such concrete would bear a large proportion of sand, which would reduce the expense.

A GOOD deal is being said in the newspapers just now about propelling boats on the Erie Canal by means of electric currents, transmitted by wires and trolleys, and it may be interesting to say that, according to *Le Génie Civil*, this system has already been in operation for about a month on the Canal de Bourgogne, in France. Most people know that one can travel almost all over France, as well as Belgium and Holland, by canal, and canal navigation is one of the most important subjects of study among French engineers. The Canal de Bourgogne crosses the ancient Province of Burgundy, connecting the Seine with the Saône, and thus affording inland navigation between Paris and Lyons, and between the Channel and the Mediterranean. There is a high ridge of land between the valleys of the Seine and the Saône, and the Canal crosses this by means of a series of locks on each slope, connected, at the summit, by a piece of level canal, about four miles long, half of which runs in a deep cutting, while the middle half forms a tunnel, about two miles long. To save a part of the enormous expense of cutting through the ridge, the tunnel is made only just large enough to admit the passage of a boat, without affording room for a tow-path at the side, and it is necessary to provide means for propelling the boats without using horses. When the Canal was first built, the passage of the tunnel was made with the help of a chain, secured to the rock overhead. The boatmen laid hold of this chain, and tugged until they brought the boat through. In 1867, this primitive arrangement had become inadequate to the demands of the traffic, and, instead of it, a chain, four miles long, was laid in the bed of the Canal, in such a way that it could be taken up and passed over rollers fixed in the bow and stern of a boat. A tug-boat was then built, provided with a steam engine, and gearing, by which the chain was clutched, and the boat pulled along, drawing after it a string of ordinary boats. This answered well, but the cost of coal for the service is about a thousand dollars a year, while the wear on the chain is considerable. For these reasons, in connection with the fact that a waterfall is available near each end of the line, it was decided to substitute electric currents, generated by the waterfalls, for steam in the tug-boat, and the installation, planned by M. Galliot, of Dijon, accomplishes this result very successfully. The current is generated by dynamos driven by turbine wheels, and conveyed by bronze wires to the canal. Two wires are used, one positive and the other negative, and two trolleys close the circuit through the motor on the boat, which drives the machinery pulling upon the chain. The movement is said to be gentler and more regular than that derived from the steam-engine, and, as the water-power costs nothing, all the expense of coal is saved, while the spare current from the dynamos serves to light the tunnel.

AN extraordinary exhibition was held a few weeks ago in Boston, and, later, in New York. It seems that one of the expeditions now engaged in exploring Egypt, while at work near the Fayoum, discovered a collection of tombs, in which were deposited vast numbers of mummies, dating from the Ptolemaic and Roman period, between 200 B. C. and 200 A. D. It will be remembered that, from the earliest times, the Egyptians endeavored to recall, in the form which they gave to the cases or wrappings which enclosed the bodies of their dead, the features of the deceased persons, and, when the family could afford it, portrait statues were usually placed in the tomb with the mummy, in order that the "appearance," or external form, of the deceased might not be lost before his soul returned, after its five thousand years of wandering, to be reunited to the body. In the later times, when Greek ingenuity had to a certain extent taken the place of tradition, the dead person's "appearance" was preserved by simpler, and, in a certain way, more effective means. Instead of the conventional carved mask on the mummy case, explained by a beautifully executed portrait statue near by, or a picture on the walls of the tomb, a piece of realistic portrait painting was attached to the mummy itself. It will be remembered that, a year or two ago, a quantity of plaster masks were found in an oasis in Upper Egypt, painted in the most realistic manner, and evidently portraits, once attached to mummied bodies. In Lower Egypt, instead of plaster masks, flat portraits, painted on panels, were enclosed among the wrappings of the head of the mummy, in such a way as to look out from among their folds, as if the real person were still there. The Fayoum excavations brought to light a great quantity of these Græco-Roman-Egyptian portrait panels, and Herr Graf, who was attached to the expedition, conceived the idea of collecting some of the best of them, and sending them to the Chicago Exhibition. They arrived there rather late, and, for want of a better place, are said to have been displayed in one of the Old Vienna buildings, in the Midway Plaisance, where few people seem to have discovered them. After the close of the Fair, they were sent to Europe, and were shown in Boston and New York only on the way.

AS paintings, the panels were of very unequal merit. All of them were coarsely executed, and most had a rather unpleasant effect, the skin being pallid, and the eyes "*cernés*," with dark rings around them, but it is quite probable that these peculiarities were intended to heighten the lifelike effect of a face nearly hidden by drapery, and seen by the light of a torch, so that they should not be regarded as the result of lack of skill, but the contrary. In fact, although the proportions of the faces were not well kept, many having absurdly low foreheads, there was a vigor of portrait effect about them which showed a practised hand, as if the artists who painted them turned them out by the dozen, as it is quite probable that they did, and warranted a staring likeness into the bargain, as is, also, not improbable. Anything like delicate, artistic feeling could hardly be looked for in such works, and it was certainly not to be found, although some of the faces, particularly of young girls, were refined and pleasing. Perhaps the most striking characteristic of the faces, or rather, of the persons whom they represented, was the want of any striking characteristic. Except for the large proportion of negro faces, and the peculiarities of costume and of treatment, the pictures would pass for a collection of cheaply-daubed portraits of the inhabitants of New York. Naturally, at the time of the Christian era, Lower Egypt was filled with a motley population of Greeks, Romans, Jews, Egyptians of the old stock, and Negroes, so that the variety of complexion and feature in the portraits corresponded closely with that to be found in a modern civilized city, and certainly gave an unusual interest to the collection. Another interesting point was the excellent preservation of the colors, which were put on with a wax medium, and were, apparently, as fresh as on the day they were laid in place. Even the brush-marks were perfectly distinct, and the gold-leaf which indicated coronets or other ornaments in many of the portraits was nearly intact. It would be useful to our decorative painters to have some of the colors analyzed, but the most important fact, that, with a wide range of pigments, painting in wax medium remains unchanged in a dry climate for two thousand years, is, by these remarkable pictures, well established.

MUSEUM OF NATURAL HISTORY.[1]—I.

A NATURAL HISTORY MUSEUM, while an exhibition building, differs materially from a museum of painting or sculpture. The latter, designed to preserve the works of the past for the purpose of perpetuating the history of art, also receives articles that are of secondary importance and not absolutely indispensable to the main object of the collection, stray bits from various monuments that have disappeared. These minor works, forming the archives of the history of art, do not always require to be exposed in the best light. In a museum of Natural History the demands are quite different. For scientific study the smallest object is important and sometimes it is of cardinal importance; nothing can be sacrificed. Hence, in a museum of this kind it is necessary to have a simple disposition of the rooms, and they must be easily accessible and abundantly lighted. Then, with the specimens arranged with the essential degree of order, the visitor will be able to search through a vast collection with the same facility that he would consult a dictionary.

Simplicity of disposition and easy means of access are moreover requisite in case of crowds. The galleries are intended for the public, and every individual must be able to get instruction in them. Clearly, a wide difference must exist between an institution of this kind and a laboratory for the sole use of scientists or experimenters. A laboratory is a place for work; the rooms may be small, for they are designed for a few persons only. The conditions are just the reverse in an exhibition gallery.

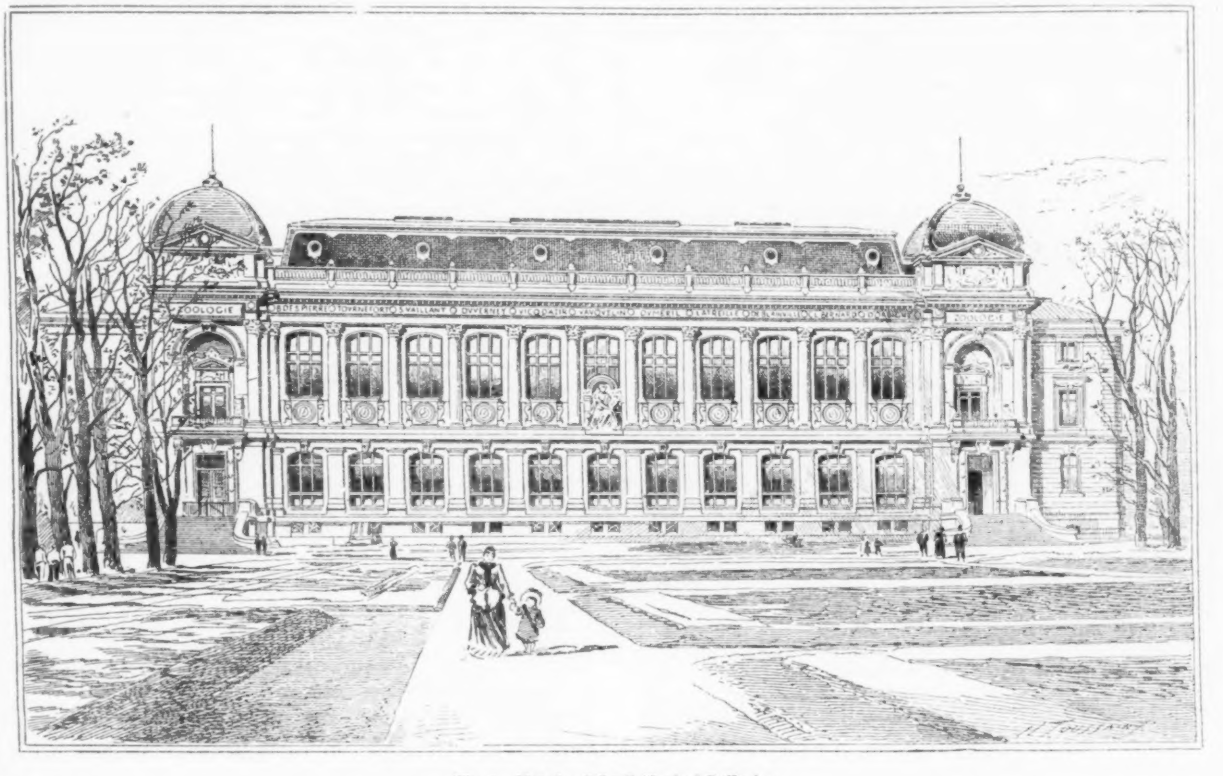

Fig. 1. Façade of the Zoölogical Galleries.

First, therefore, the general arrangement of a Natural History Museum must be such as to admit of ready circulation. The apartments must then be disposed lengthwise; a single door, even if central, being inadequate, each room must be provided with a separate entrance and exit; besides, from an architectural standpoint, it is always better to give one entering an apartment as great a perspective as possible, rather than to present it from the middle of one side. As for small square rooms, they are not very convenient for circulation and the corners, which are necessarily poorly lighted, always offer some difficulties in the arranging of the specimens.

It is also essential that the collections of specimens, which are often very delicate, should be enclosed in glass-cases, and these must, of course, be well-lighted; the supports and sashes must be as light as possible in order not to obstruct the light: iron is the best material for them.

The stairways communicating with the different stories must be commodious and convenient for every one, for children and for the aged; they cannot be steep and must be so located as to give easy access to the various galleries of the edifice. Lastly, as it is pleasant for the visitor to get a general view of the collections, tribunes should be introduced at different favorable points, to enable him to enjoy glimpses of the whole and also to aid him readily to reach any desired spot.

The Jardin des Plantes at Paris occupies a vast site, the buildings on which have been put up at different periods and set somewhat at hazard. They serve very diverse purposes, it is true, and require very unequal areas. The menagerie proper is on the northwest, while on the southeast, on the grounds beyond the Rue de Buffon, are the laboratories, especially all those constructed in recent years.

The main entrance to the garden, Place Walhubert, is in front of the Pont d'Austerlitz, though not on its axis; it gives immediate access to a very long parterre bordered on either side by two beautiful rows of trees and reserved more especially for botanical researches; it is between the menagerie and the laboratories. Near the farther extremity are found, on the left, on the Rue de Buffon, a long building constructed by M. Rohault de Fleury, containing geological and mineralogical galleries, and, on the right, backed by the two labyrinths, the conservatories. Previous to 1877, the end of the parterre, along the Rue Geoffroy-Saint-Hilaire, was occupied by an isolated building dating from the time of Louis XVI, possessing no architectural value and standing at an angle to the general direction of the parterre, of the conservatories and of the geological galleries. This edifice, called the Cabinet of Natural History, contained in poorly-lighted apartments the zoölogical collections.

It was in the latter part of 1871, that, on the complaints of the professors of the Museum, who were unable to expose the constantly increasing collections in the already over-crowded rooms, the Government requested the architect of the Jardin des Plantes, M. Jules-André, to submit two plans of enlargement for consideration. In 1872, these were ready. One simply provided for the additions to the galleries of Comparative Anatomy near the Rue Cuvier; the other included designs for a new building to be erected in front of the old Cabinet of Natural History, a spacious building capable of accommodating all the existing collections and with ample room for any new

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[1] From the French of Pierre André, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

acquisitions that the Museum would be apt to make. That year (1872), M. Thiers, then the President of the Republic, made a visit to the Jardin des Plantes. The second plan pleased him; it was presented for consideration, and the designs were approved at a meeting of the professors of the Museum and by the general board of overseers of civil constructions. The sum of seven million francs was voted by the Chambers for the erection of the new galleries and a first instalment of 400,000 francs made it possible to begin work on them in 1877. They were twelve years in process of construction; the zoölogical galleries were formerly opened July 25, 1889. The site was happily chosen. Before their erection, one was in doubt as to where was the central point of the Museum and what was the main object of interest, where, in short was the monumental embodiment of the scientific power of such an establishment. At present, the new edifice marks the centre; it forms a successful connection between the conservatories and the geological galleries.

The visitor has before him at once the three kingdoms of nature. Two covered and monumental passageways, joining the buildings, enable him to start with the series at one extremity and follow it through to the other. All these galleries constitute a whole, although containing widely diverse collections. And as our art treasures are massed in the palace of the Louvre, so here and in other proportions the Museum presents the *ensemble* of our Natural History collections.

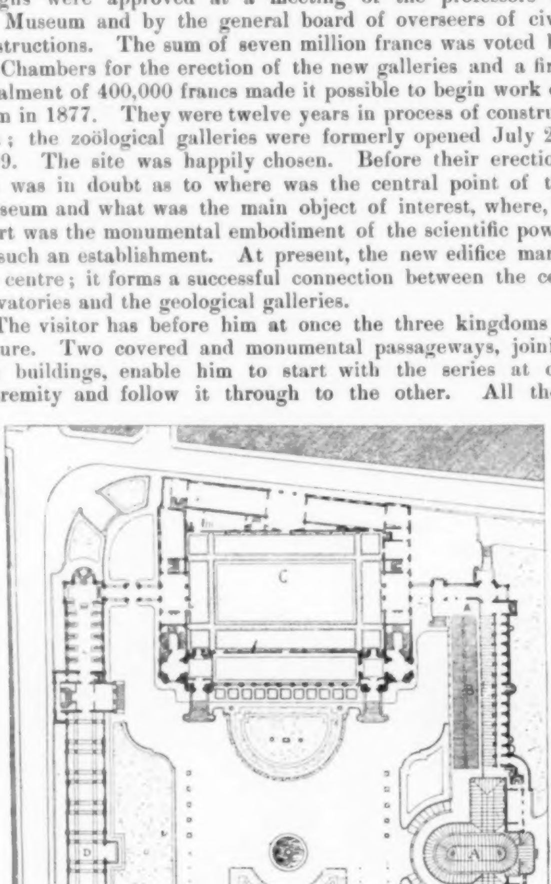


Fig. 2. Plan of the Museum of Natural History, Paris.
A. New Conservatories. *B.* Old Conservatories. *C.* New Building. *D.* Mineralogy.

Before entering upon a description of the edifice, it has seemed best to call attention to the considerations that determined the choice of site and also to the general demands to be satisfied in a construction of this kind. It remains to be seen how successfully the programme has been filled.

The architect conceived the idea of a vast exhibition-hall with an area of 3,000 square metres, with light entering through the entire ceiling and the axis of the apartment on the passage connecting the old buildings. In front, and facing the parterre, three stories of galleries furnish space for special exhibits. On the sides, are the supplementary services: lecture-room, professors' offices, etc. In the rear, on the Rue Geoffroy-Saint-Hilaire and occupying the site of the former Cabinet of Natural History, the plan was to construct a series of galleries for the department of Comparative Anatomy; but his work has not been begun.

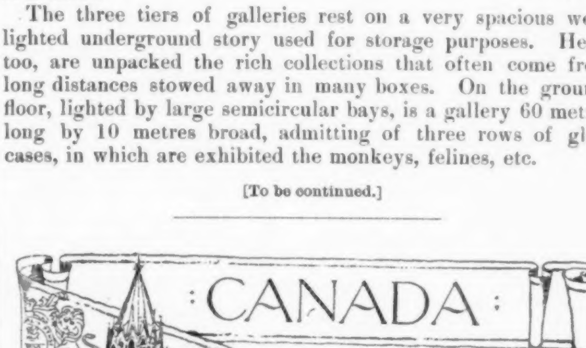
The main façade of the new zoölogical galleries is 100 metres long. This length is due to the character of the site itself; the architect insisted upon making the structure harmonize with the surroundings. The rows of trees mentioned above now lead up to the two entrances, and the latter are rendered still more prominent by two monumental pavilions. A central entrance, useless, as we have seen in an edifice of this kind, would, moreover, have had no *raison d'être* in the axis of the grand parterre, which does not constitute a public path. The conservatories on the right, on a slope, and the geological galleries on the left, the architecture of which is somewhat cold, bring the eye to the centre. The more important new structure supplies the central motive which had been lacking.

The lines of the façade are simple and majestic, as befits a temple of Science, and indicate clearly the three different stories of galleries. The grand order is reserved for the principal story, which contains the largest hall; it is supported on the the ground-floor by a row of broad pilasters, forming buttresses and giving color to the basement story. The fact must not be overlooked that this façade has a northern exposure, that it is not lighted by the sun and that, as the character of the edifice precluded the lavish use of ornamentation, the architect was obliged to adopt a simple decoration, introducing strong projections to avoid coldness and monotony and relying upon the massiveness of the construction to convey an adequate impression of the wealth accumulated in it.

Lastly, this façade indicates to the most casual observer the general composition of the vast establishment. On the right, is the menagerie with its widely diverse constructions; on the left, the numerous laboratories. Midway, at the end of the parterres designed for the study of botany, are the exhibition galleries for the three kingdoms of nature. At the centre of the whole and uniting all is the Museum, the zoölogical building, containing the great hall in which the finest specimens are gathered together and which has become the heart of one of the largest scientific establishments in France.

The three tiers of galleries rest on a very spacious well-lighted underground story used for storage purposes. Here, too, are unpacked the rich collections that often come from long distances stowed away in many boxes. On the ground-floor, lighted by large semicircular bays, is a gallery 60 metres long by 10 metres broad, admitting of three rows of glass cases, in which are exhibited the monkeys, felines, etc.

[To be continued.]



:CANADA:

THE MC'GREEVY-CONNOLLY TRIAL.—GOLD-MINING.—TRUTH ABOUT THE ATTEMPT TO BLOW UP THE NELSON MONUMENT.—A NEW DRILL-HALL.—TORONTO'S WATER-SUPPLY.

THE celebrated McGreevy-Connolly case, postponed so many times, has at last come to trial. It may be remembered that the origin of the case arose during the summer of 1891 before a Parliamentary Commission of the Canadian Dominion House of Commons. Something like three millions of dollars, grants of public money, were involved in the case in connection with Government construction works at the Harbor of Quebec. At the same time it was found that the government works at the Esquimault graving-dock in British Columbia and certain other works involving immense outlays had given opportunities for the squandering of public moneys. The firm engaged on these works was known as Larkin, Connolly & Co., but it was shown that Major Larkin was in no way connected with the transaction in question, and he was allowed to withdraw. Robert McGreevy was a partner in the firm and held that position solely because of his influential brother, Thomas McGreevy, a member of the Dominion Parliament and also a member of the Quebec Harbor Board and a personal friend of Sir Hector Langevin, then Minister of Public Works. This friendship between Langevin and McGreevy made the latter an important member of the Harbor Commission and he did not scruple to use his influence with the minister to obtain large sums of money on account of the government contracts which were spent, not on the works for which they were drawn nor upon himself, but upon his party for electioneering purposes. The result of the Parliamentary inquiry was primarily the disgrace of Sir Hector Langevin, who resigned his office, and the dismissal of Thomas McGreevy from the House of Commons. This suit is the final outcome wherein McGreevy and Connolly were charged by the Crown with conspiracy to take money out of the public treasury. The original case was recounted in these letters at the time. It charged that Thomas McGreevy was an agent for the firm was of Larkin, Connolly & Co., whereby he secured contracts and alterations in these contracts, while at the same time he was a member of Parliament. When the case was called on November 14 at Ottawa, before Mr. Justice Rose, a great array of legal talent was present on behalf of both prosecutors and prosecuted. It took nearly three-quarters of an hour before the jury was finally empanelled, owing to the number of men challenged by both Crown and defendants. B. B. Osler, Q. C., one of the council representing the Attorney-General of Ontario, who prosecuted together with the Dominion Government, laid the case before the Court. The charge was certainly a serious one. The McGreevys made a "good thing" out of their relationship, the one, with his hand on the government purse, and the other with his in the affairs of the great contractors Larkin, Connolly & Co. Robert McGreevy obtained thirty per cent as his share of the profits of the firm and divided it with his brother Thomas, M. P. While the firm paid to the latter separate commissions for securing to it the contracts for government work, in one case amounting to the handsome sum of twenty-five thousand dollars. As an example I may refer to what is known as the "Cross Wall" contract. "By a device of McGreevy, when tenders were opened the lower tenderers withdrew and the third highest tender, that of Larkin, Connolly & Co. was consequently accepted. The lowest tender was $552,000 and that of Larkin, Connolly & Co. $634,000, while the work actually cost the government $830,000." All this was done by private information provided through Thomas McGreevy, and it was for this that Robert McGreevy got 30 per cent and divided it with his brother. The case was concluded on November 22, when McGreevy and Connolly were both found guilty of conspiracy and sentenced to one year each in the County of Carlton jail without hard labor.

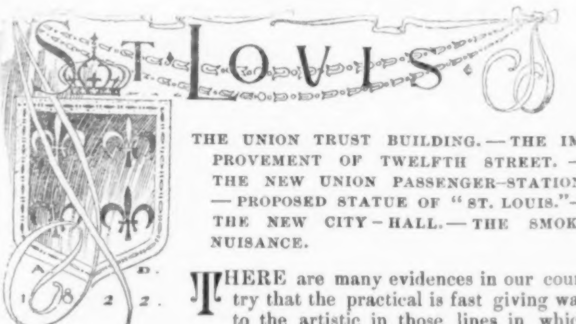
Some time ago a company was organized for the purpose of mining gold at Galbraith, District of Algoma, Ontario, at what is now known as the Ophir Mine. A vein was discovered here and is now worked at a depth of 150 feet and is said to be a true fissure between syentic rocks, and from 20 to 40 feet wide of gold-bearing quartz. A brick of solid gold was forwarded a few days ago from the mine to the Canadian Bank of Commerce, Toronto, weighing 220 ounces and valued at $4,000. The brick is of interest as it is one of four that were the result of the first week's crushing done at the mine works. The four bricks are said to be worth together at least $12,000. There is no mint in Canada, so that this gold has to be sent to the United States mint at Philadelphia for coinage.

It is not a little amusing to see how easily alarmed people become nowadays and what mountains they make out of mole-hills upon the slightest occasion. The importance attached by the press at a distance to the intended attempts to blow up the Nelson monument at Montreal by a triplet of young scamps was somewhat premature, and it would have been wiser to have obtained particulars of the affair in detail before attempting to ascribe it to revolutionary principles. Some damage no doubt would have resulted to the monument if the plot had not been discovered, and exactly what was the object of the miscreants, beyond mischief, has not yet been discovered. One of them was the son of Mercier, the ex-premier of the provincial government of Quebec, who was dismissed from his office for malpractice and found the English of Canada too strong for him, and his notion of reforming Quebec in the interests of France and of the Pope, whom he serves in the capacity of Papal Zouave, distasteful to the majority of Canadians, including many of the French-speaking people themselves. Young Mercier may have wished to take such a step by way of revenge for what his father suffered on account of his misdeeds, but it has not transpired whether Mercier, Junior, was the ring-leader or not. At present the three are in jail awaiting their trial. The monument in question stands at the head of Jacques Cartier Square, which slopes down from the base of the monument to the river. The monument consists of a column surmounted by a statue of Lord Nelson, and at the base are two Russian guns, trophies from Sebastopol, presented to the city by the Imperial Government. The column was erected in 1808 by the merchants of the city, many of whom had a personal recollection of the hero, who was on the Quebec station in command of the "*Albemarle*" in 1782.

The new drill-hall being erected by the Dominion Government in Toronto, is approaching its completion. It is, I believe, the largest hall for the purpose on the continent. Montreal has a fine drill-hall, completed about six years ago which is a little longer than this one, but this is wider, and contains in addition a large number of armories and other accessories which greatly exceed those of the Montreal hall. The Toronto drill-hall covers an area of 300 feet by 189 feet six inches, of which the space of 280 feet by 125 feet forms the main hall for drilling. The height of the interior of this hall is 36 feet to the wall-plates and the great roof of one span rises to its apex another 36 feet. Half of the area under the drill-hall has been excavated and fitted-up for bowling-alleys and for rifle-practice with the Morris tube. The cost will be in the neighborhood of two hundred and seventy-five thousand dollars, and when finished will be an excellent example of completeness and convenience as regards drill-halls, and it should stand an object of study to students. The construction is very massive, the design "military," and the details bold; but a building of this kind can never be actually beautiful, architectually, because immediately you get it in perspective the immense area of roof dwarfs its proportions and it becomes squat and ugly. Some relief has been obtained from this effect in this case by the erection of towers in the centre of the long sides which break the continuity of the roof slope, and on the whole the effect is very good.

There are few public buildings just now in course of construction, and in these inland cities we do not get the chance of seeing any great engineering works.

We have often alluded in these letters to the water-works system of the City of Toronto, and it will be remembered how this month last year witnessed the sudden ruin of the then recently completed steel conduit under the Toronto Bay (which, with the island, forms an enclosed harbor for shipping) by means of which lake-water was pumped to the city reservoir; something stopped up the inlet out in the lake and the pumps drew out all the water in the conduit, whereupon it rose to the surface and lay like a sea-serpent stuck in the ice. The conduit was repaired, but is considered as totally unreliable, and that which was to have given a permanent pure-water supply to the city and was laid at an immense cost, was, through mismanagement, a complete wreck in six months after its completion. It has now been decided to tunnel under the bay and across the island and away out into the lake; a very costly alternative and a work that will take two years at least to finish, supposing the work proceeds without the usual quarrels between the city and the contractors and the consequent interposition of injunctions and counter-injunctions, but until that is all done the citizens remain in imminent danger of a repetition of last year's pure-water famine and at any time we may be told that it is necessary to boil every drop of water for drinking. The great canal scheme, which was mentioned some time ago and which was for the purpose of supplying Toronto with an aqueduct from Lake Huron and a ship-canal, giving water-power sufficient for all the city's factories and everything else that man could possibly want, after being forced before the public by the most determined of promoters, has fallen through. Never before did promoter obtain so much indulgence or was allowed to pester the public with an impracticable scheme as was the man who developed the idea, but despite the contrary and adverse opinions of engineers, financiers, and a host of practical scientists, he still found a party in the City Council to prop up his plan, which on the face of it was simply to discard the beautiful water of the Lake Ontario and bring water from another lake a hundred miles away, because through fraud and mismanagement and general incapacity of those in charge, the works provided for supplying the city with pure water had hitherto failed. The company he declared himself as representing, but whose identity he would never disclose, has at last been proved to be non-existent. There was a time when some American capitalists thought of taking it up, but it was recently found that all had withdrawn from it, although the wily promoter carefully kept this secret as long as he could. Now there seems to be an end of bubble schemes and the citizens look forward to be able to get a *permanent* supply of pure water in *about* two years time.



ST. LOUIS.

THE UNION TRUST BUILDING. — THE IMPROVEMENT OF TWELFTH STREET. — THE NEW UNION PASSENGER-STATION. — PROPOSED STATUE OF "ST. LOUIS." — THE NEW CITY-HALL. — THE SMOKE NUISANCE.

THERE are many evidences in our country that the practical is fast giving way to the artistic in those lines in which the latter should have long ago asserted itself. We are a nation of tradesmen, and all our ideas have heretofore seemed to follow the one standard dictated by business, selling and buying. A new era seems to be setting in throughout this vast continent which bears the imprint of a rapidly-advancing civilization and the fortunate state of things for some of us that we have time to devote to things artistic. That this is bound to have its influence on the country's future existence cannot be gainsaid, because at any rate, this influence would come about in the natural course of civilization. Architecture being one of the fine arts, and appealing more to the people in general than either painting or sculpture, that is to their artistic appreciation — if there be such in the souls of some of them — is and will be the most influential guide of the nation's refinement and culture or of its artistic taste. We have hinted at the starting of an era in architecture which partakes of the artistic. Chicago people and others would like us to say that this is the result of the magnificent effort and genius displayed in the Columbian Exposition buildings. Several years before 1893, however, saw the beginning of this happy era, and the present time sees it flourishing.

Most of us will acknowledge that the greater number of the utilitarian sky-scrapers in Chicago do not excel in architectural beauty, and when it was announced that the Union Trust Building was to be the finest office structure in St. Louis, we naturally looked forward to a feast of architectural good taste. But we are very much disappointed. Truly enough the Union Trust Building will yield a large revenue, but to the architect of refined tastes and classical ideas, the fourteen-story structure means nothing from an artistic point-of-view. The design is doubtless well known, having been exhibited by the architects in the Art Building at the World's Fair. The building fronts on Olive Street, the square court facing south in the direction of the thoroughfare mentioned, and runs along Seventh Street to the alley, half-way to Locust Street. The first two stories are built of yellow terra-cotta, and the remainder of the building to the thirteenth floor with yellow pressed-brick. The thirteenth and fourteenth floors are slightly recessed, and the windows divided by terra-cotta on a level with them and isolated pillars to support the roof and cornice. It is the intention to provide a roof-garden. The entrance on Olive Street is of the well-known "golden-gate" type in yellow terra-cotta, with an egg-and-dart moulding so large in proportion that it is a wonder that the ancients do not rise out of their graves, and protest against it. The vestibule, passageways and corridors are laid in mosaic and wainscoted in brown Tennessee marble. The five elevators are encased in ornamental oxidized brass-work.

In strong contrasts, with this from an artistic point-of-view, is the laudable idea which the city government is at present entertaining regarding the improvement of Twelfth Street. This is virtually an open square, extending five blocks from St. Charles Street to Market Street, and for this distance it is 200 feet wide. The city proposes, at the instigation of the property-owners, to widen the thoroughfare from St. Charles Street to Washington Avenue, and from Market Street to Spruce Street, to 200 feet, thus making the width uniform for eight squares. Also to construct a walk in the centre of the thoroughfare 35 feet wide, and at suitable intervals in the centre of the same to erect very high ornamental steel poles for electric-lighting purposes. As a new viaduct is to be built at Twelfth Street beginning at Spruce Street, where the wide portion of the former terminates, it is proposed to build a triumphal arch at its entrance. The new city-hall is located on Twelfth Street rather far back from the building-line. This fact alone shows that the city has long cherished the apparently new scheme. It is proposed to build the new court-house on the street, occupying the half-square from Chestnut Street to Market Street. A large market-house has been considered as quite appropriate and feasible for such an important retail thoroughfare as it is fast becoming. Three substantial structures have lately been erected, two of them seven and the third eight stories in height. They are retail in character, and will doubtless be quickly followed by a large number of handsome structures as soon as the city decides in favor of the project, which will, unquestionably, be the case. The part of the proposed improvements devolving upon the city will cost several millions of dollars, to which the property-owners have willingly signified their intention to submit in the shape of the assessments as at present estimated.

A Sketch in the Court of Honor of the World's Fair.

Among the most prominent structures being reared in St. Louis at the present writing is the new Union Passenger Station. The train-shed, station-building, terminals, etc., have attracted the attention of architects and engineers throughout the world for some time past, on account of their great size, costliness and beauty. The station is, without doubt, the largest in the world, as the appended figures in square feet will show: St. Louis Union Station, 420,700 square feet in extent; Frankfort (Germany), 336.340 square feet; Cologne (Germany), 238.970 square feet; Philadelphia and Reading, at Philadelphia, 208,000 square feet. The site is 601 feet in width, extending from Eighteenth Street to Twentieth Street and 700 feet long, extending from Market Street to Clark Avenue. The entire site is occupied by the train-shed and station-building. The former, although under one and the same roof, is divided into three parts by the roof supports, it having been found impossible to do without these on account of the great width to be spanned. There are thirty-two lines of rails, a larger number than in any other railway-station, even exceeding that of the Gare St. Lazare, in Paris. The station-building is very substantial and appropriate. It is French Renaissance in style with many modifications to suit the case, and is built of rough-cut Bedford stone. A very handsome Norman clock-tower, 287 feet high, is to be built at the Eighteenth and Market Streets corner. The structure is entirely fireproof, and the appointments and furnishings will be the handsomest that money can buy. The cost of the entire undertaking will be over $2,000,000, exclusive of the cost of the site, and it is the intention to open the station in April or May, 1894.

The main entrances to the station are on Market Street, a very narrow and much crowded thoroughfare. In view of this fact, the City Government proposes to buy the two squares of property opposite and convert them into an open square. Otherwise the congested condition of Market and surrounding streets would be unbearable. The new square will be graced with the statue of some noted personage, such as Queen Isabella, in commemoration of the great events of the last two years and 1492, or St. Louis, King of France, after whom the city was named. The republic of France, by the way, has several times hinted that she would like to present us with a statue of St. Louis, and the people have never signified a desire for such a gift. That we would readily accept it, goes without saying, and it seems to us that the present is an excellent opportunity to make this known to the French Government through their consul at St. Louis.

The architects of the new city-hall, now in course of erection, are to be more and more congratulated on the entire success of their efforts, as this handsome structure approaches completion. The design is well-known, we presume, but for the sake of those who are not acquainted with it we will describe it as French Renaissance. That this style is eminently adapted to the purpose is established by the entire success attending its application in the Hôtel de Ville, at Paris. In fact, the St. Louis City-hall though not as handsome as the Hôtel de Ville, is imbued with the same feeling and partakes of the same plan and scheme as the French structure. Unfortunately, the city did not feel able to stand the expense of employing only cut-stone, and the result is that yellow Pompeiian brick with Bedford-stone trimmings is used. The effect is rather pleasing, as the dull gray stone matches very well with the brick. It was maintained by many members of the Board of Public Improvements that only materials found in the State should be used in the building, but the architect protested that to carry out his ideas he would have to use gray sandstone, and that the Bedford (Ind.) deposits of that kind were the best and most convenient. Some Missouri red granite is used, and the rough finish given to it imparts an air of strength and stability, which is not followed out in the rest of the building. In fact, if the whole building were of the latter material it would not cost much more than at present and would defy the ravages of time. We have not much faith in Bedford or any other sandstone, as our observations have caused us to believe that it will not stand the rigors of our climate. In ornamental work especially it disintegrates very rapidly. The architect of the city-hall has a weakness for niches, two of which he has placed on the main façade of the building over the chief entrances. We say he has a weakness for such, for he has placed several on another building recently put up by him. In the case of the City-hall, many people have wondered whose statues were to be placed in the niches, and brilliant wits have suggested our virtuous mayor and incorruptible president of the City Council. The tower will be exactly similar to that of the Hôtel de Ville, and its pinnacle will be the highest point in St. Louis.

As is well-known, the building is located on what was once Washington Square, and needless to say it does not occupy all the site. This fact demonstrates that there are great possibilities in connection with beautifying the surrounding grounds and laying them out with walks, trees, and flowers. It is rather fortunate that the building is not hemmed-in by four noisy granite-paved thoroughfares. The noise in the old hall and the present Court-house is something fearful, especially during the warm months. The streets surrounding the latter building have lately been paved with Nicholson wooden blocks, which greatly alleviates the suffering of judges and witnesses. However, the clanging gongs of the cable and electric cars still "disturb the peace."

One of the most disagreeable and unfortunate features that exists in cities west of Pittsburgh is the necessity for using bituminous coal. To be sure, Pennsylvania anthracite coal must be used in a great many cases, such as in furnaces for heating houses. But St. Louis, Cincinnati, Chicago and other western cities more or less prominent, are almost entirely dependent on bituminous coal. The results of its use are well-known, and naturally the abatement of the smoke nuisance has become the question of the hour in those cities. The smoke and soot are so troublesome in St. Louis that where in many cases cream-colored brick and other light materials could and would be used in the construction of handsome buildings, they have to be abandoned. Yellow brick is used to some extent but its use is not general in the down-town districts. Marble and white limestones and sandstones are used in the far-out residence-sections because they are beyond the smoke line. The district within the latter covers an area of about forty out of the sixty-two and one-half square miles constituting the city proper. Any one who has ever been to St. Louis has undoubtedly noticed, twenty-five or thirty miles distant from it, the huge overhanging pall of black smoke. That the smoke nuisance is very hurtful to St. Louis as well as other cities cannot be denied, and one of the greatest eyesores to Continental Europeans visiting the World's Fair was the smoky, and, consequently dirty condition of Chicago. Such a state of affairs hurts the business interests of a place, prevents the preservation of works of art, besmears one's countenance and linen, and covers the finest buildings with a grimy deposit which rains and winds will not erase.

Judging from present events the city of St. Louis has taken vigorous action in the matter and will make of the Mound City "the fairest of the flock." A law was passed about one year ago by the Municipal Assembly compelling all manufactories of whatsoever kind using steam-power, including stations for lighting and power purposes and heating-plants, to equip their furnaces with smoke-consumers. Little or no attention was paid to the law at first, and in fact it met with opposition, but when private individuals took the law in their own hands and reported its trangressors, the latter began to appreciate its importance. However, nothing could be done in this wise, because not a single smoke-consumer worthy of the name had yet been invented. The city knew this and did not appoint salaried smoke-inspectors until later on. A number of enterprising and conscientious business-firms have tried several devices, and by experimenting have succeeded in producing an excellent device which is a smoke-abater in the full sense of the word. It can be applied in any steam-plant by simply leading steam through a pipe from the dome of the boiler to the furnace. A nozzle on the end of the pipe shoots the steam all through the smoke as it rises from the fire, and as the particles of steam drop they carry the soot with them. The latter is consequently consumed by the fire. An improvement on this device consists in the steam forcing the soot into a far corner of the furnace where it is dropped in the manner aforementioned and consumed by the flames. Experiments made with the improved consumer demonstrated that when in use the smoke is absolutely prevented from going out of the stack, and the latter is of no use, whatever, except for affording draught to the furnaces.

The city appointed smoke-inspectors several months ago, who are paid a fixed salary. They note troublesome chimneys in their respective districts and report them, at the same time warning the owners that they are transgressing the law which requires them to put in a smoke-consumer within thirty days after notice has been given. Failure to comply with the law entails a fine of five hundred dollars and costs. Many consumers are now in use, and the good effects of the law are already most apparent.

HOSPITAL CONSTRUCTION.[1]

IN return for the honor done me in being asked to read a paper on "Hospital Construction" before this intellectual gathering, I shall try to give in as concise a form as possible, first, my own ideas as to the constitution of a first-class Australian hospital, and secondly, a modification of the same where sufficient funds are not available to build a first-class institution. I will, with your permission, glance for a few moments at the history of hospital constitution. I believe it to be correct to say that there was an institution in Ireland 300 years B. C., founded by the Princess Macha for nursing the sick and those wounded in battle. In the same century the great Guzerat king, Asoka, built several hospitals in India. Later on, at Cæsarea, was built a great hospital and leper-house. Alexandria had its hospital. Rome had a hospital in 380 A. D., founded by Fabiola, a pious Roman lady. The Emperor Justinian built the hospital of St. John at Jerusalem. This hospital afterwards came under the control of the Knights Hospitallers, afterwards the Knights of Malta; the original Order is now represented, I think, by the Christian Masonic Order of Knights Templars. The ancient Mexicans had hospitals and skilled surgeons. Again, in Spain there was the hospital founded by the Moors in Cordova, in the eighth or ninth century. In Paris the Hôtel Dieu, known as the Hospital of St. Christopher, was founded later on. In England St. Thomas's and St. Bartholomew's were established in the sixteenth century, though the monasteries from early periods acted as outdoor dispensaries, and in very many instances had special rooms or wards set apart for the treatment of the sick; in fact, the practice of the art of healing and surgery was principally in the hands of the monks in England and the Christian countries, and of the Jews in Spain. The eighteenth century saw the establishment of the present system of hospitals in England under the direction of laymen, York, in 1710, being the first of a number which shortly followed.

I will now briefly sketch my conception of the requirements of a first-class Australian hospital. First, and of the utmost importance, a good breezy site, if possible on a limestone plateau, with open surroundings and in a salubrious district. Second, carefully-studied construction based on hygiene. Many have supposed that architectural considerations should be allowed to predominate in the construction, but the true basis of hospital construction should combine the science of hygiene with the results of the experience of the best surgeons and medical practitioners; in short, such construction as will advantage the life and health of man rather than satisfy æsthetic tastes; and while the constructor should not be unmindful of the latter he must absolutely pay primarily the strictest attention to the proven results of medical experience, using his knowledge of construction to achieve the requirements demanded by the most advanced healing sciences; and always aiming to, so far as possible, deprive the causes which vitiate the air of a hospital of the power to create mischief. Only by striving to guarantee the maximum attainable purity of the essentials to good health and life can he hope to gain success as a constructor. Were money no object, and were I consulted as to the best method of designing a hospital, I would recommend a series of small one-story, isolated pavilion-wards, grouped round a large central administrative block, and equidistant from a main operating-theatre, with special wards attached. Each isolated pavilion-ward to contain, say, from twelve to sixteen beds, with two small single-bed separation-wards, small ward operating-room, nurses'-room, ward store-room, convalescents' day-room, bath-rooms and hot and cold water, separated patients' water-closets, with fæcal trough and fæcal cupboard, nurses' water-closets, and the whole surrounded with broad verandas, connected directly on each side with ward, so that patients' beds could be wheeled right out into the fresh air. The administrative block should have in near proximity the kitchens, laundry, servants' house with housekeeper in

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[1] A paper read before the Australasian Association for the Advancement of Science, at the meeting held in Adelaide, by Mr. C. E. Owen-Smith, superintendent of public buildings, Adelaide, and published in the *Australasian Builder*.

charge, nurses' house with superintendent in charge, and in rear the mortuary-house, dissecting-house and steam disinfecting-house. Wards to be grouped separately for medical and surgical cases — contagious diseases or noisy cases or delirium-tremens house to be set well apart; while for epidemics, in the extreme rear could be temporary buildings for use when required. Each isolated ward to have a broad zone of aeration, and to be connected by tram-line with the central operating-theatre and the main administrative block. The small tram-lines would carry the patients in an enclosed litter to the operating-theatre, and food, coals and materials generally for distribution around the wards. All walls should be of brick and hollow, allowing free ventilation from ground-line to underside of roof between walls, the sun-heated air being carried off thence by dormers. Walls at least, including hollow, 20½ inches thick. Internally all walls of wards and theatre to be sheathed in glazed tiles. Ceilings of panelled wood, painted and highly varnished, and covered on top with a heavy coating of sea-weed. Floors of Minton tiles covered, in winter, with pieces of soft felting, frequently changed and disinfected. Ventilation, etc., as will be hereafter described. Such wards as described with proper inlet and exhaust natural ventilation. 2,000 cubic feet of air per bed; 16 superficial feet of light per bed; perfect sanitary appliances; good nursing and the professional care of a hospital staff should be almost perfect. The operating-theatre block should contain waiting-room and instrument-fitter's shop combined; anæsthetic-room leading into theatre, and a corresponding room on the other side for surgeons; and, connected by corridor with theatre, two four-to-six-bed wards and two single-bed wards, with nurses'-room between. In the operating-theatre I consider it absolutely essential to have a zone of warm air surrounding the table in winter-time; this can be provided with the aid of a gas-heated coil. I strongly recommend the cleverly-designed table used in our theatre which can be inspected by visiting surgeons; the designer is Mr. Woods, the hospital instrument-fitter. The kitchen-block should contain large kitchen proper, with roasters, cupboards, tables, etc.; steam-cooking kitchen, scullery and main boiler-house, from which all the steam required in the institution can be supplied, viz, cooking-steam, steam for hot-water generators for distribution by gravitation from special tower in administrative block to all wards and buildings, steam for washing-machines in laundry and for drying-room, also for the super-heated steam-disinfecting machine. And here I may say I know of nothing better for hospitals than the Washington Lyon machine; the super-heated steam-process of disinfecting has by results rendered the use of the dry hot-air process absolutely out of date. To go back for a moment to the kitchen, large well-ventilated cellarage is an absolute necessity, the whole, including ventilation-shafts, rendered fly-proof. The kitchen should also, by use of wire-doors, wire window-screens and ventilation-openings, be fly-proof. By using jacketted copper-boilers and ordinary direct-steam copper-boilers, the cooking of potatoes, vegetables, boiled meats, soups, etc., for large numbers is rendered comparatively easy. Colonial-made ranges can do the rest in roasting, baking puddings, etc. Kitchens should have iron and Seyssel-asphalt floors with central drainage for frequent hosing. Walls can be unplastered, with struck flush-joints for whitewashing, which should be done periodically. Laundry-block should have walls and floors as for kitchen, and contain steeping and disinfecting tank and steam-boiling troughs and automatic washing-machines, drying-room for bad weather worked by steam-pipes, or, if too great a strain on the supply of steam by furnace, with circulating smoke-flue. Mangling and ironing room should be attached. Separate troughs should be provided for the clothes of staff, nurses, servants, etc. The mortuary-house should contain a large post-mortem room, with smooth Seyssel-asphalt floor, plentiful supply of hot and cold water, extra light and semi-open roofs, carefully-graded drainage of floor, with cemented or tiled walls; also inspection-room, where bodies are coffined and await the undertaker. The whole of the mortuary should be absolutely fly-proof and allow a free circulation of air. I should not forget to add that a special fire-service is an absolute essential in designing a large hospital as also a swimming-bath, tennis-courts, dancing-room, etc.

As "the money no object" basis of the ideal hospital just described is not compatible at present in Australia with bank reconstruction and curtailed estimates, I shall proceed to describe what I trust may be termed a good serviceable hospital, taking, in terms of the request made by the committee of Section I, the southern portion of the east wing of the new Adelaide Pavilion Hospital as an exemplification of a portion of this class of institution. The Adelaide Hospital, being a clinical institution, must of necessity be in close proximity to the School of Medicine in the city; consequently the area of site is limited, in fact too much so, and while a good zone of aeration is obtainable in the north, east and west, and to a certain extent on the south, within the area available for the future hospital, the space is too limited for such results as a conscientious constructor would desire to attain. A little extra money expended to insure dependable foundations in a hospital, as in other buildings, is always true economy. Should the ground be bad or unequal, a false bottom or cushion of fine sugar-sand from 12 inches to 18 inches deep, according to circumstances, has proved itself a perfect cure, and by the introduction of two rows of railway irons into the centre of the concrete a further bond of security is established. Either clinker-bricks or hard, flat stone of extra-large size can be used for foundation-walls between concrete and floor-line, and to prevent the possibility of damp rising, two courses of damp-proofing are desirable, either ordinary gas-tar and sand or Seyssel asphalt being used where obtainable of good quality. I prefer bricks for construction of superstructure. Brickwork is cheaper than stone, and makes sounder work. Hollow walls are very desirable in this hot continent, but they have their disadvantages in two or three storied buildings as lacking in stability, though this can be overcome by increasing the thickness and consequently the cost. The operating-theatre block has hollow walls, being a single-storied building. As mentioned before, a Minton-tiled floor is suggested as being the best from a hygienic point-of-view; this, however, means money, and the next best floor is hardwood. Personally, I prefer jarrah to any other wood, but again cost interferes, as to insure a sound, close-jointed floor, the timber ought to be specially selected, milled and seasoned for at least three years before use; and even then probably 25 per cent of the boards may have to be rejected before securing a first-class floor. But when a good jarrah floor is obtained but little is left to be desired. The proper treatment for such a floor, after being cleaned up and papered, is a thorough saturation with raw linseed oil, then varnish, and finally hot beeswax and turpentine, rubbed up to a smooth, shining surface. After jarrah, our choice of available timber is limited to pitch-pine or New Zealand kauri; either gives a splendid floor but care must be exercised with each. The former should be high-colored and have two or three years' seasoning; the latter should be light-colored in contradistinction to red, and used bone-dry, care being taken to exclude all damp air from the underside for a season. Both floors should be waxed. A room 100 feet long by 26 feet and 18 feet high, giving nearly 18,000 cubic feet of air each to twenty-six beds, is an economic ward. The corners should be rounded to do away with internal angles, and so prevent dead air. As little woodwork as possible should be used, a coarse Keene's cement for architraves, window lining and skirting being preferable to wood, and as little moulding as possible. When ready the walls should have five coats of paints and two coats of the very best elastic varnish. The ceiling can be of plaster, wood, or 28-gauge small fluted, corrugated, galvanized-iron; the latter makes a splendid ceiling and leaves little to be desired, and is considered an improvement on lath and plaster, not being subject to crack or fall down. In any case, whether plaster, wood or iron be used, the ceiling must be painted and varnished, and in the case of a two-storied building, sound deadening must be filled-in above the ceiling and under the floor of the ward above. A central fireplace is considered an improvement on the old system of fireplaces in the walls, and the main shaft can be used for decorative purposes to brighten the ward. In Australia, natural ventilation has, I believe, been found to answer all purposes in hospital construction when judiciously applied. Fresh air should be introduced through the external walls delivering under each bed, and again at, say, 7 feet 6 inches or 8 feet above floor-level, with a special terminal to prevent the cold air falling directly onto the patient below; while by a system of extracting pipes from ceiling and pipes carried up in centre of chimney-shafts, aided by the fires in winter and the difference of temperature between internal and external atmosphere in summer, helped again by the wind acting on the specially constructed terminal cowls on roof, the experience of several years has proved that hospital smells can be conquered, more especially if the attendants will judiciously use the fanlights placed over each window as an additional aid at night and the windows themselves in the daytime. Free currents of air should also pass from end to end of the whole block and from side to side. Wards should have large arched openings with screens within, uncovered, thus allowing free passage of air without direct draught. Each large ward should be provided with a dirty-linen shoot, delivering from ward to outer air direct and thence into laundry truck *en route* to steeping and disinfecting trough. In connection with such a ward as described should be a day-room for convalescents — the day-room combining the useful with the helpful, as it allows patients, sufficiently recovered to leave their beds, to sit there and have their meals; it also helps the wards by removing so many patients out for a certain time each day, giving more air to those remaining. In conjunction with the day-room should be separated water-closets, specially designed so as to be cut off by a fresh-air space from the building proper; the lavatory and baths, with hot and cold water, store-room and ward-scullery, all connected with deep drainage and almost perfect sanitary appliances. I may say our South Australian system is as nearly perfect as obtained in any part of the world at present, as inspection will illustrate better than words. A well-flushed glazed fæcal trough, and a cupboard for excreta requiring inspection by medical officers should be contained in the closet arrangements. Access direct, either from wards or day-rooms, should obtain from ambulatory verandas and balconies, etc.; these should be on all sides, to allow patients to have the benefit of sun or shade, according to the season of the year or time of day. On the opposite end of a large ward to day-room, etc., should be the room of the sister in charge or head-nurse, with glass door giving full view over ward, also a small ward operating and casualty room, store-room and a separation-ward of three beds for special cases. This room should have double doors and be equally as well ventilated as main ward. Repeat the ground-floor plan on first floor, with the balconies, etc., and the accommodation is at once doubled. External fire-escape stairs should be provided from balcony. In our hospital we have provided an Otis hydraulic-lift for patients and to send up dinners, etc., to first floor. A staircase travels round the elevator-case for ordinary traffic; a special water-service is provided for use of the lift. As space is limited with us, a second floor or third story has been built on central portion of wing for the ward-nurses, etc., accommodation for sixteen being provided, the floor being 39 feet above the ground. Nurses have bath-rooms with hot and cold water and water-closets, etc., on their flat, also connection with a large platform on roof overlooking city for taking the air on fine nights. Ward furniture requires a few words. Bedsteads should be very strong, with woven-wire mattresses, carrying the horsehair mattress. The latter need not be more than twenty-five pounds weight. These bedsteads are made in the colony. Each bed should have bracket on wall at head for medicines, name of patient, and his ailment, etc. A small table on solid pedestal is provided for each bed. Electric-lighting is the proper thing for hospitals, as the gas consumes so much oxygen. Electric call-bells. One word and I close. No constructor should ever forget the claims of the nurses to generous treatment in the shape of comfortable accommodation.

GEOMETRICAL AND FLOWING TRACERY.

THE different varieties of tracery, both the great classes and their more minute subdivision, seem to have been so many unconscious principles of formation, distinct and independent from each other, at work in the minds of the ancient architects; so that while they are perfectly distinguishable in idea, they are altogether mingled together in the existing instances. Every conceivable stage of transition from earlier to later forms, and more than this, every conceivable mode of combining — often confusing — contemporary ones, is to be found among the countless shapes afforded by our ancient windows. In fact, a window constructed consistently on one principle is actually less frequently met with than one which combines two or three. It is the manner in which these combinations are effected which for the most part decides the degrees of merit in the composition of tracery. Sometimes two principles of formation, though perfectly distinct, are still in harmony with each other, so that their commingling may combine the beauties of both, and consequently originate forms of greater elegance than either can possess in a pure state. In other cases they are actually repugnant to one another, and the separate beauty of each is lost by the incongruous combination; and in others again, even when there is no such inconsistency in the forms themselves, want of skilful arrangement on the part of the designer may effect mere physical juxtaposition of what seem to be detached fragments of separate windows instead of a gentle fusing together into an harmonious whole. Sometimes two windows occur which must, in a formal arrangement, be set down under one class, while their real spirit and character belong to another.

I. *Geometrical tracery* in its widest sense may be defined as that in which the figures in the head above the lights have no connection with the lights below, but are simply put in independently to fill up the vacant space. It is usually composed of geometrical figures, the circle especially, both in its actual form and as an element in foliation; the cusps in the most pure and appropriate form of foliation are distinct arcs of circles, forming an additional order of tracery, which, if omitted, renders the design plain but not incomplete. Geometrical tracery contains two principal subdivisions.

1. *Pure geometrical*, in which the whole tracery is composed of actual geometrical figures, chiefly in England circles, but also spherical triangles and spherical squares. The east end of Lincoln Cathedral is the finest example of this style.

2. *Foil tracery*, in which the tracery is composed not of figures plain or foliated, but where the foils are themselves the figures — that is, trefoils, quartrefoils, etc., are inserted without any containing figure. This style is not found in any very large windows; it occurs comparatively rarely in small ones, but is a very important element in combination. Pure geometrical tracery requires two lights to support a figure; thus a two-light window has one figure in the head, a three-light two. Windows above three lights are usually formed by subordination of design; thus the eight-light east window at Lincoln consists of two large divisions, each of which is again subdivided; the rule just given of course applies to the subdivisions. This rule is commonly observed in England; not so abroad, to the great prejudice of foreign windows. In foil tracery a figure may rest on one light only. Contemporary with geometrical tracery, and indeed with Flowing and Perpendicular, is "arch tracery," in which the tracery is formed by mere arched lines; this assumes the mouldings of and enters into combination with all styles, but seems to have an especial affinity with Geometrical. It does not enter into its definition, and its lines are actually continuous, but its hard curved lines give it an analogy with that style, and its combinations with it are very numerous. Its two-light examples have merely the figure of the Greek Υ; those of greater size form two classes, viz: — (*a*) *Pure Arch Tracery*, where the lights rise to the architrave, increasing in height toward the centre. (*b*) *Intersecting Tracery* where the lights cross in the head. From the union and combination of these forms result the varieties of Early Decorated tracery; for instance, a pure geometrical skeleton will have the large circle in the head filled-in with a composition of foils, or an intersecting window will be interrupted by the insertion of a circle. But to enumerate every kind of combination would be almost to enumerate every Geometrical window. There is one remarkable form in which a skeleton of arch tracery is more or less completely filled-in with distinct foils; the east window at Trumpington is a fine example. From arch tracery also is derived the practice of subarcuation, or marking off one or more lights on each side to form a distinct composition by an arch stretching into the architrave. This will be found at all periods.

II. *Flowing Tracery* seems to have little more than an ideal existence, so comparatively few specimens remain which can be considered as being worked completely free from geometrical ideas, and yet have manifestly no signs of the approaching Flamboyant and Perpendicular. Flowing tracery differs at once from geometrical, as having its figures not inserted above the lights, but growing out of them; in arch tracery the lines forming the arched heads of the lights are simply prolonged in their previous direction; here they branch out freely and form patterns of almost endless diversity. To draw a line between even ideal Flowing and Flamboyant tracery is more difficult, and in practice most Flowing windows are more or less affected by the Flamboyant influence. But compared with the best Flamboyant as distinguished from the many unsightly vagaries perpetrated under that name, we shall find that the flowing Decorated piercings retain more of the character of individual figures allowing room for occasional unoccupied spaces, and are not of the same long narrow shape, but somewhat more squat, and having a foliation affecting the whole piercing, and not merely one end. This latter form is an idea essentially Flamboyant, though continually obtruding itself through the whole duration of Flowing tracery. In short, the Flamboyant is simply the continuation of the mullions in a particular form, leaving spaces between the lines; the Flowing, the fusing the mullions and the figures in the head together. Its outline is rather pyramidal than directly vertical. The transition from Geometrical to Flowing tracery is exceedingly curious; both actually intermediate forms and combinations occur. With regard to the former, we shall find a figure which may be called the ogee vesica occupying an analogous position in the Flowing style to that which the circle holds in Geometrical; and as the two figures have a great connection, the ogee vesica being the figure which would result from an attempt to fuse together several circles placed in juxtaposition, we shall find every stage of this process, both in the general design of large windows and in their smaller portion. Subarcuation is retained throughout the style, and all through the Perpendicular also. And the circle in the head of a large window exercises a very great influence; the figure itself in its purity maintained its position for a very long time, and the attempts to fuse it into the other lines are very numerous and remarkable, as at St. Mary Magdalene in Oxford and Hawkhurst, Kent. And when the actual circle or other figure has disappeared, traces may be found in the tracery of the centre-piece, which is continually found adapted to such a containing figure and often retains strong vestiges of the wheel in lines diverging from a common centre. Combinations are either when one part of a window is Geometrical, another Flowing, or when a skeleton of one form is filled up with details of the other; a skeleton of arch tracery filled-up with Flowing patterns in a manner just analogous to the formation of arch and foil tracery, is neither uncommon nor ungraceful. Flowing tracery seems divisible into the following classes, the first three of which seem to have their origin in the tracery of the wheel mentioned just above.

1. *Divergent Tracery.* — In this a point is assumed as a centre, and branches are thrown off from it; it hardly exists in a pure form in windows of more than two lights, where three piercings commonly diverge from the top of the central mullion, one to the top, two to each side, which is necessarily continued in a perpendicular line for some distance, which is, of course, prolonged when more than two pair of piercings are thrown off and the wheel motion proportionably lost. This is a most elegant form and more vegetable than any other; it is very important in combination with others, but is not adapted to large windows, though the western one of York Minster is constructed on its general principle.

2. *Convergent Tracery.* — This is the converse of the latter; the side piercings seem not to be thrown off from the centre, but to converge to it from the sides; like divergent, its pure form is confined to small windows but it is important in combination.

3. *Reversed Tracery*, in which the piercings seem to hang down from the top towards the centre. This is hardly found but in combination, and is often intermingled with the latter. These three, though having a Geometrical origin, exhibit a Flamboyant tendency in their foliation earlier and to a greater extent than any other forms of Flowing tracery. It is manifest that the direction which any piercings appears to take is very much affected by foliation at one end, and this form gives a great opportunity for long narrow openings.

4. *Reticulated Tracery*, in which the tracery is wholly composed of ogee vesicas. It thus answers to the pure geometrical composed of circles, both from the analogous position occupied by the figures in the two systems and the connection between the figures themselves manifested in many examples of actual transition between the two forms. This class, though by no means the most elegant, is at once the most common and the most typical form of Flowing tracery. It is, however, decidedly monotonous when spread over a large window. It is further open to the objection made with much less weight against Perpendicular, that it is not self-contained, but merely cut at an arbitrary point out of an infinite series of panels. In

many instances this fault is certainly remedied, but only by forsaking the principle of formation. This form also occurs to a great extent in combination: very pretty three-light windows are formed by a mixture of this and the divergent in the tracery, and a still better form by a reticulated skeleton, each of whose vesicas is filled with a divergent pattern. The figures are commonly quartrefoiled; when trefoiled at the upper end, as in Jersey, a Flamboyant tinge is introduced. They occur of many proportions, and by straightening the sides glide gradually and imperceptibly into Perpendicular.

5. *Ogee Tracery.* — This is in flowing tracery analogous to the arch form, being in fact arch tracery, employing for the simple arch the ogee as being more adapted to the flowing line. It admits of two varieties corresponding to those of the analogous form: — (*a*) Where the ogee arches intersect and the apex of one coincides with that of the window arch. This variety is very rare and very unsightly. (*b*) Where the ogee arches are left imperfect and no apex coincides with that of the window, so as to leave in three-light windows (the most common form) a large vesica in the head and large spandrels. This form is also much used in combination. The splendid windows at Heckington, Sleaford and Newark have chiefly skeletons of this form, with fillings-up of various kinds. By flattening the sides of the vesica in the head it sinks into Perpendicular even more easily than any other; the chancel of Kislingbury Church, near Northampton, is a fine example of this transition in an advanced stage. These classes in their different combinations will be found to exhaust nearly all the forms of Decorated windows with the exception of a few vagaries of all dates scattered up and down, which neither agree among themselves nor can be reduced to any class. — *The Architect.*

HAUNTED PALACES.

THERE is such a distinctly holiday flavor about the following collection of legends published a short time ago in the New York *Tribune*, that it seems quite proper to republish them at this time:

It is difficult to realize that here, at the close of the nineteenth century, there should still be educated people who believe in the existence of ghosts. One might have thought that the scepticism which constitutes so characteristic a feature of the present age, as well as the growing taste for psychical research and materialism, would be sufficient to counteract any such superstitions of mediæval times. But such is not the case. The belief in the supernatural seems not to diminish in Europe, but to increase with the growth of logic, science and enlightenment, and it is noteworthy that it is not among the relatively ignorant masses of the people that superstition is most strongly developed, but among those who have received instruction of the highest order and who, either by popular will or what is euphoniously described as "Divine Right," have been set up to direct, guide and govern their fellow-creatures.

It has frequently occurred to me that the belief in the supernatural might be assumed by these great ones of the earth for the purpose of endowing themselves and their surroundings with a respectability otherwise lacking. There is something so eminently respectable in owning a haunted house or palace. It partakes of the nature of ancestry and blue blood, in that it cannot be acquired by purchase, but must be inherited, evidence of this peculiarity being furnished by the significant fact that none of the English purchasers of the castles and country-seats of the old country families of Ireland has ever to my knowledge been honored with any visitation by the family banshee of the original proprietor. But the scepticism which this circumstance created in my mind with regard to the existence of spooks has once more been disturbed by the apparently authentic evidence afforded during the last few months of the presence of spectres in the royal English palace of Hampton Court and at the Royal Palace of Stockholm.

That Hampton Court Palace is supposed to be haunted is nothing new. It has long enjoyed that reputation. Indeed, the Corporation of the City of London is on record as having ordered 12,000 masses to be said for the repose of the soul of Queen Jane Seymour, one of the many wives of King Henry VIII, with the object of "laying" her ghost, which, even in the reign of King James II, was wont, according to popular belief, to wander about the corridor near the room where Queen Anne Boleyn caught her sitting on the King's knee. Unfortunately these masses do not seem to have been efficacious; for Queen Jane's spectre continues, so we are assured, to haunt the palace to this day. Fifteen years ago the inhabitants of the palace were alarmed by the sound of the whirring of a spinning-wheel at night, and, in deference to their urgent entreaties, the Government Office of Works instituted an investigation which resulted in the discovery of a bricked-up, and until then unsuspected, chamber, containing an ancient spinning-wheel showing marks of recent use. Reference to the old records of the palace showed this room to have formed one of the private apartments of Queen Jane. Both the late Lady Eastlake and Mrs. Cavendish Boyle, residents in the palace, have vouched for the appearance a few years ago of a white apparition, believed to have been that of Queen Catharine Howard, near the Queen's great staircase, and have graphically described the ghastly look of despair on her face and the blood-curdling sounds of her screams. And now we hear not only of a wholesale exodus of the servants employed at the palace, but even of its desertion by widowed ladies of rank, who, in recognition of services rendered by their husbands, have been accorded by the Queen free apartments there for life, owing to the antics of yet a third ghost who is, for some reason or other, believed to be that of Queen Anne Boleyn. It is all very well to laugh at this. But servants do not give up good places, nor do titled ladies of limited means relinquish so great and highly prized a privilege as free apartments in a royal palace for the sake of mere fancy or imagination.

Windsor Castle constitutes an exception to the general rule of royal and imperial abodes, in that it is absolutely free from ghostly occupants. The spectre of Herne the Hunter is, however, believed by superstitious people to roam under the oaks of the Home Park at certain times of the year. Buckingham Palace is far too modern a building to have a banshee of its own, while if Marlborough House were possessed of any spectral inhabitant it could only be the spirit of that imperious spouse of the first Duke of Marlborough, who is on record as having bullied to tears and into utter submission the good Queen Anne of glorious and pious memory. I have never heard of any supernatural apparition at either Kensington Palace or at St. James's, although the tragedies which have occurred within the walls of the latter royal abode, notably the mysterious murder of the Duke of Cumberland's confidential valet, Senlis, in the early part of this century, ought to be sufficient to people it from cellar to garret with spectres. At Holyrood the ghost of the murdered Rizzio, the troubadour admirer of Mary, Queen of Scots, is supposed to promenade the gloomy old galleries after dark, and it is noteworthy that whenever any member of the Queen's family is forced to spend a night in the capital of Scotland, a hotel is preferred to the royal palace.

The Little Red Man, who used to haunt the Tuileries before it was destroyed by fire at the time of the Commune, and his twin brother, who still appears from time to time as a precursor of death at the Grand Ducal Palace of Darmstadt, are too well known to need more than passing reference here, and the same may be said of the White Lady of the imperial Burg or palace at Vienna, and of her similarly-attired sister, who makes periodical visits to the old royal palace at Berlin. Much has been written about this White Lady of the Hohenzollerns, concerning the authenticity of whose appearances the late Emperor Frederick collected a wonderful array of records of the most convincing nature. There is in particular a sworn statement in the imperial archives, both at St. Petersburg and at Berlin, with regard to the apparition of the White Lady to Prince Frederick of Prussia and to a party of officers on the eve of his death at the Battle of Saalfield, in 1806. I have seen a number of stories about this White Lady of the Hohenzollerns, but none as yet which give any indication as to her identity. It seems that she was originally the Countess Agnes von Orlamunde, who murdered her first husband as well as her two children in order to be enabled to marry the Burgrave of Nuremberg, the ancestor of the Electors of Brandenburg and of the house of Hohenzollern. The triple murder is asserted to have taken place within the precincts of this palace, which was built 450 years ago, contains a thousand windows, and as many rooms as the number of years of existence.

The royal palaces of Lisbon, of Madrid, of Munich, Stuttgart and Moscow, have each a familiar banshee to announce the impending demise of a member of the reigning family. But perhaps the most uncanny of all of them is the royal palace at Stockholm, which has been haunted to such an extent since the assassination within its precincts of King Gustavus III, that it has been twice entirely razed to the ground and reconstructed, with the object of dislodging the supposed ghosts. If the royal princes and princesses of Sweden and Denmark and their respective suites are to be believed, these endeavors have been of no avail, as may be gathered from the description which they all unite in giving of certain apparently supernatural occurrences which took place during the visit of the Crown Prince and Crown Princess of Denmark and their children to the Court of Sweden last winter. It is said that on the night following the arrival of the Danish royalties at Stockholm, their chamberlain, Count Moltke, suddenly found himself thrown from his bed upon the floor with considerable force, and without being able in any way to account for the occurrence. On the following morning Prince Charles of Denmark, a big, burly and stolid young man, complained of having been awakened during the night by the noise of a scuffle at his bedside, for which he was likewise unable to account. A couple of evenings later Princess Louise of Denmark, the beautiful eighteen-year-old daughter of the Crown Prince, was writing letters in her *salon*, which was illuminated by lamps and a number of wax candles, when, suddenly raising her eyes from the paper, she caught sight of what she believed to be a spectre, standing at the other side of the table and gazing fixedly at her. The Princess gave a loud shriek and rushed from the room, the spectre, according to her story, darting ahead of her. In the corridor she swooned, and was found there unconscious by the attendants, who had been alarmed by her outcry. Nor did the twenty-three-year-old Prince Christian, eldest son of the Crown Prince, a stalwart young fellow of most manly character, escape an experience of this kind. For, happening to enter a room for the purpose of getting some article which he had forgotten there earlier in the day, he backed out of it, pale and trembling, declaring that the room was full of armed men who had forced him to retire. The last apparition was seen on the eve of the departure of the Danish royalties, when the Crown Prince and the Crown Princess of Denmark were playing whist with King Oscar and the Crown Prince of Sweden. The expression of the latter's face attracted the attention of his partner. He had become as pale as death. His cards dropped from his hand, and his eyes protruded even more than usual as he gazed into vacancy. King Oscar, thinking that his son had become ill, seized him by the shoulder with the object of rousing him, whereupon the Crown Prince exclaimed that he had caught sight of the bood-stained apparition of some unknown person standing at the other side of the table, and that it had afterward glided out through the wall.

Of course, all this may sound ridiculous and childish to ordinary people who do not believe in the supernatural. But even they would experience an uncanny feeling if forced by circumstances to reside in houses which had been the scene of a suicide or of a murder. What wonder, then, that royal and imperial personages should entertain the same kind of superstitions and sentiments with regard to their blood-stained palaces, especially when it is borne in mind that the blood has in almost every case belonged to their more or less remote ancestors. EX-ATTACHE.

RONDA, SPAIN.

THE traveller in Andalusia — whether he comes leisurely from the north, or whether he merely spends the two weeks between the arrival at Gibraltar of New York steamers — is very apt to pass, on the newly-opened railroad between Algeciras and Granada, without taking much notice of it, a little station called Ronda. If his desire be to see rural Spanish town-life, pure and untouched by the stream of foreign travel, he makes a great mistake in being content with a mere glimpse of the neat, attractive station. And if his wish be to see interesting Moorish buildings and beautiful landscape, the tourist will do well to leave the train and spend a day or so in rambling about this quaint little town.

It is not easy to find out much about the past history of Ronda from the guide-books, for Finck and Hare have passed it by, and O'Shea gives but the briefest sketch. Certain it is that this was the dwelling-place of one of the Moorish kings, and a stronghold, until the fall of Granada drove the Moors out of Spain. Since then there has grown up a new town of Ronda side by side with the old, which has gained a reputation throughout Spain, not because of the beauty of its situation, nor because of its being the centre of a fertile, fruit-bearing region, nor for its Moorish heirlooms, but on account of its bull-fights (said to be the best in Spain), and also for its annual fair in May. It is situated upon a high rock divided in halves by a great chasm which marks the line between the old town and the new; and on the valley side the curious volcanic cliffs go straight down for over 300 feet so suddenly as almost to take away the breath of the unsuspecting visitor, who, strolling leisurely through the Alameda, steps out upon the terrace and looks over the railing.

The streets of Ronda are, for a Spanish city, quite clean, and so the sightseer can move briskly along, free to observe the typical Spanish caballeros, with their broad-brimmed sombreros and their long cloaks, one side of which is picturesquely thrown over the left shoulder so as both to protect the mouth and to show a bit of gay-colored lining. You rarely see one alone. The caballeros are always either in a group on the street corner, whispering as though imparting to a chosen few the secrets of the nation, or else walking silently two by two over the rough pavements, until you expect them to face about, form a half circle, and tell the audience their latest plot, conveyed in a Gilbert and Sullivan chorus. There is less air of mystery about the Spanish women, with their black-lace head-covering, but, when you see them in Ronda at their bay-windows, you cannot help wondering why it is they conceal their fine complexion under layers of powder until they have a fairly ghastly look. These windows project over the sidewalk, and here the women chat and gossip and sew and watch all passers-by, with whose faces their own are generally on a level. Every window, high or low, is heavily ironed and barred, and there are often two doors to a house, both of solid timber held together by great iron nails, so that each home is a little fortress. This appearance harmonizes with the fact that Ronda is avowedly the home of past and present smugglers, of ex-bandits and high-handed horse-dealers and bull-fighters, who trust not and are not trusted. Who knows but that it may have known a revolution or two in its time?

The bull-ring is a circular stone affair with a special box for royalty and seats for at least 3,000 persons. With certain claims to architectural beauty, it is nevertheless pretentious, and the whole has a shabby and neglected appearance. Interesting are the dark boxes or stalls in which the bulls are kept, until they are suddenly driven out into the glare of the arena to face the toreadores and their attendants. The doors are pulled up and let down, and the guide calls your attention to this simple arrangement in a way which shows how wonderful he considers it.

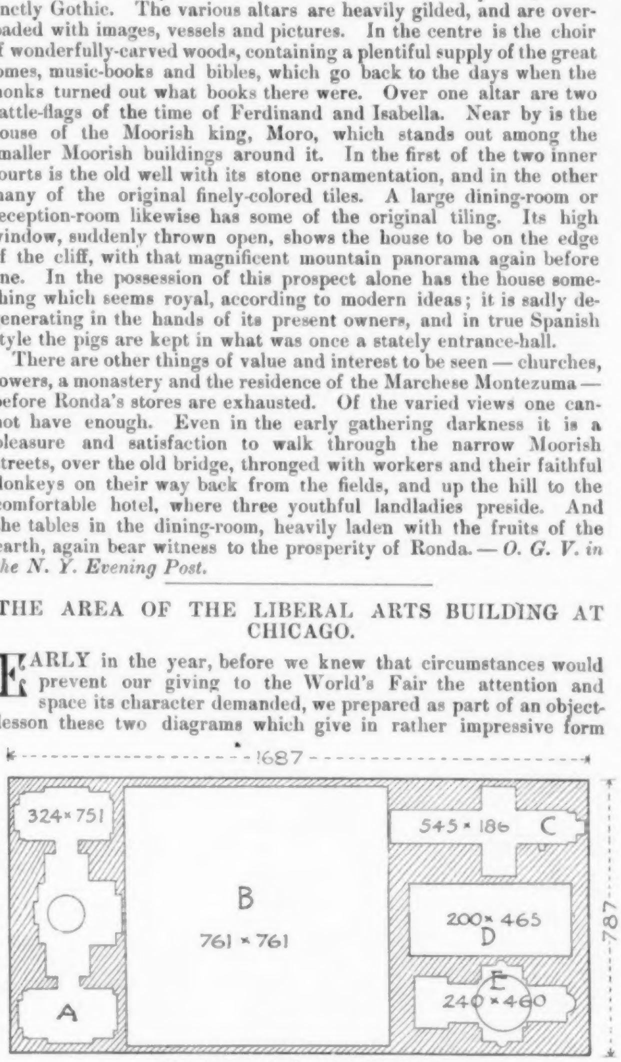
From the Plaza de Toros it is but a short walk to the great beauty of Ronda, the chasm between the towns, which is crossed at a height of 276 feet by the new bridge. Standing on this bridge of one span and looking down to the river below, it is impossible to imagine a more picturesque scene than that offered by the green-coated rocks which tower up on either side, bearing on their summits like white crowns the little houses, old and new. The narrow river pours itself in boiling cascades through the chasm out into the valley beyond, but on the way its waters are made to turn the wheels of various mills and of Ronda's only modern improvement, a tiny electric-light plant, and so attractively are these housed that the picture loses none of its beauty. On the contrary, the little white buildings, with their tile roofs, add greatly to the general effect as they nestle against the moss-covered rocks.

Beyond the bridge there comes into view the busy little market, with its quantities of fruit piled high upon the dirty cobblestones, and then the Larger Church, as it is called, towers up. This church, a relic of the Moors, is intensely interesting, for, originally a mosque, it still has at one end the great stone columns rising to the roof; the other half, evidently added after the Christian reoccupation, is distinctly Gothic. The various altars are heavily gilded, and are overloaded with images, vessels and pictures. In the centre is the choir of wonderfully-carved woods, containing a plentiful supply of the great tomes, music-books and bibles, which go back to the days when the monks turned out what books there were. Over one altar are two battle-flags of the time of Ferdinand and Isabella. Near by is the house of the Moorish king, Moro, which stands out among the smaller Moorish buildings around it. In the first of the two inner courts is the old well with its stone ornamentation, and in the other many of the original finely-colored tiles. A large dining-room or reception-room likewise has some of the original tiling. Its high window, suddenly thrown open, shows the house to be on the edge of the cliff, with that magnificent mountain panorama again before one. In the possession of this prospect alone has the house something which seems royal, according to modern ideas; it is sadly degenerating in the hands of its present owners, and in true Spanish style the pigs are kept in what was once a stately entrance-hall.

There are other things of value and interest to be seen — churches, towers, a monastery and the residence of the Marchese Montezuma — before Ronda's stores are exhausted. Of the varied views one cannot have enough. Even in the early gathering darkness it is a pleasure and satisfaction to walk through the narrow Moorish streets, over the old bridge, thronged with workers and their faithful donkeys on their way back from the fields, and up the hill to the comfortable hotel, where three youthful landladies preside. And the tables in the dining-room, heavily laden with the fruits of the earth, again bear witness to the prosperity of Ronda. — *O. G. V. in the N. Y. Evening Post.*

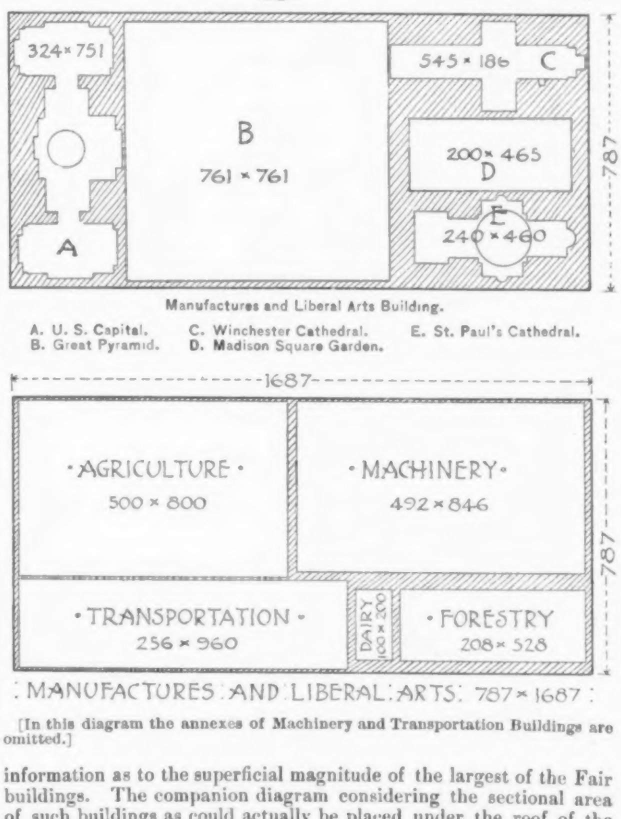
THE AREA OF THE LIBERAL ARTS BUILDING AT CHICAGO.

EARLY in the year, before we knew that circumstances would prevent our giving to the World's Fair the attention and space its character demanded, we prepared as part of an object-lesson these two diagrams which give in rather impressive form information as to the superficial magnitude of the largest of the Fair buildings. The companion diagram considering the sectional area of such buildings as could actually be placed under the roof of the big building never was finished.



Manufactures and Liberal Arts Building.

A. U. S. Capital. C. Winchester Cathedral. E. St. Paul's Cathedral.
B. Great Pyramid. D. Madison Square Garden.



[In this diagram the annexes of Machinery and Transportation Buildings are omitted.]

STONE ROOF OF A CHAPEL IN COURPIER FALLS. —The arched stone roof of St. Pierre chapel, recently erected in Courpier, near Clermont-Ferrand, Puy-de-Dome, fell November 22, while many Sisters of Mercy were at prayers. Several sisters were killed, and others were injured severely. — *Exchange.*

THE ILLUSTRATIONS

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

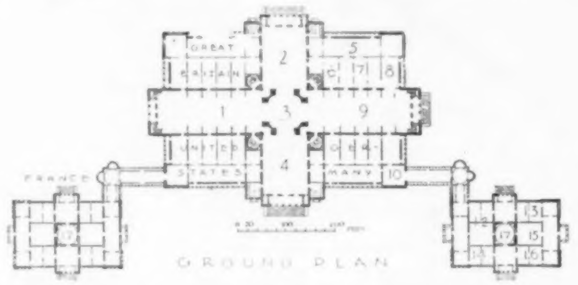
DECORATION OF THE CHANCEL OF THE CONGREGATIONAL CHURCH, PROVIDENCE, R. I. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

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

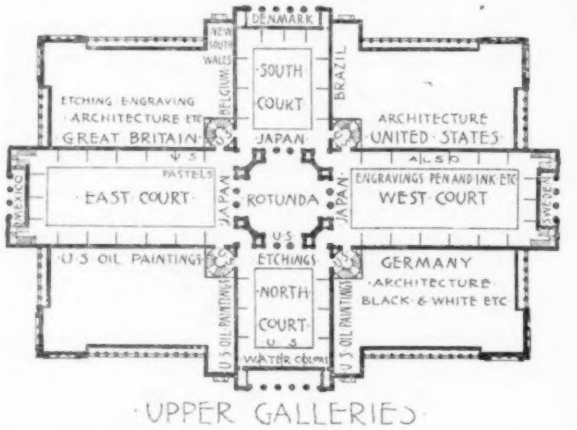
INTERIOR DETAILS FOR THE HOUSE OF THOMAS A. McINTYRE, ESQ., W. 75TH ST., NEW YORK, N. Y.: THREE PLATES. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

[Issued with the International and Imperial Editions only.]

THE FINE ARTS BUILDING, FROM THE NORTH, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.



1 East Court: France, Architecture and Historic Sculpture.
2. South Court: France and England, Sculpture.
3. International Rotunda: Sculpture.
4. North Court: Germany and United States, Sculpture.
5. Russia.
6. Spain.
7. Japan.
8. Holland.
9. West Court: Germany, Spain, Italy, Sweden and United States, Architecture and Sculpture.
10. Austria.
12. Italy.
13. Denmark.
14. Belgium.
15. Norway.
16. Sweden.
17. Sculpture.



CLOISTER IN THE CEMETERY AT MONTIVILLERS (SEINE INFERIEURE), FRANCE.

WEST FRONT OF THE CATHEDRAL, BAYONNE, FRANCE.

"MADONNA AND CHILD," BY NICCOLO DELL' ARCA ON THE PALAZZO PUBLICO, BOLOGNA, ITALY.

[Additional Illustrations in the International Edition.]

CENTRAL EASTERN PORTICO OF THE MACHINERY BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

[Gelatine Print.]

JAVANESE THEATRE, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatine Print.]

"WORK-HORSE AND NEGRO," STATUE IN THE COURT OF HONOR, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. D. C. FRENCH AND E. C. POTTER, SCULPTORS.

[Gelatine Print.]

COURTS OF JUSTICE, YORK, ENG. MR. HUON A. MATEAR, F. R. I. B. A., ARCHITECT.

OUR illustration is of the principal entrance to the new Courts of Justice, York. The foundation-stone was laid by H. R. H., the late Duke of Clarence and Avondale, July 16, 1890, and the building was opened by the Lord Mayor, Alderman Close, in July, 1892.

HALTON, HERTS, ENG.: LOBBY TO WINTER GARDEN.

DRESDEN, AFTER A DRAWING BY SAMUEL PROUT.

NOTES AND CLIPPINGS

INROADS ON THE MAINE FORESTS.—That person who believes the Maine forests are holding their own against the inroads of the lumbermen is likely to be disappointed when the next report of Forest Commissioner Oak is made public. The collection of facts which are essential to a comprehensive understanding of the wild lands and forests of this State has been one of the features which Mr. Oak has taken up and persistently carried forward since coming to his present office. Last spring he employed an expert to make measurements of lumber in different parts of the State for the purpose of establishing beyond doubt the rates of growth in different localities and an average rate of growth. These facts being known, also the valuation of the timber lands and the amount annually cut off, the rate of depletion of the forests can be ascertained with a great degree of accuracy. The facts which he has already collected indicate, it is believed, a much more rapid decrease of the forests than would at first be supposed. The Commissioner would not attempt to say now what the rate would be, but told the reporter, "You may say that the statistics thus far obtained indicate that the decrease in the amount of lumber in the State will be a matter of surprise." Of course events are likely to occur to modify in the future these percentages. This coming winter, for instance, will see much less lumber taken from the forests than usual.—*Augusta (Me.) Journal.*

WHY WINDMILLS USED TO BURN DOWN.—Of the production of fire by the friction of wood against wood, windmills of the old construction gave, on a large scale, some disastrous examples. When the force of wind increased, the miller was obliged to bring each of the sails in succession to the ground, in order to "unclothe" it; but when sudden squalls came on this was impracticable, and the mill, in extreme cases, ran away, *i. e.*, could not be stopped. Everything was now done to increase the grip of the wooden brake round the great wheel on the driving shaft, and water was poured copiously over them, but in spite of all this, flames would sometimes burst out from the intense friction, and the mill be probably burned down as the result.—*N. Y. Times.*

THE PROPOSED RUSSIAN BELL FOR PARIS.—Careful examination of the towers of Notre Dame at Paris have revealed the fact that the offer of the Russians to present to the cathedral an immense bell to be called the "Bell of Peace" and weighing 100 tons cannot be accepted. The bell in question could neither be got into the tower nor would the latter have the strength to support it, for one of the towers already shakes ominously when the fourteen-ton bell presented by King Louis XIV is tolled. Its mate in the other tower was captured in Sebastopol during the Crimean war, and it is to be restored to that city, the new Russian bell being destined to take its place.—*N. Y. Tribune.*

A LAWYERS' STRIKE SUCCESSFUL.—The famous strike of the Lawyers' Corporation of the City of Riom, in Auvergne, France, is ended. One of these lawyers, or advocates, having been improperly treated by a judge, his colleagues sided with him, and for five months they have refused to plead before the court, which was practically closed. At last due satisfaction has been given to the Lawyers' Corporation by M. Oudoul, the president of the Court District of Riom, and the advocates have resolved, in a meeting, to resume again their avocation and pleadings in that court.—*N. Y. Tribune.*

ASSESSING THE EXPENSE OF FIRES IN GERMANY.—There is an equitable and sanitary rule prevailing in Leipzig, Saxony, that whenever there is occasion to call out the fire-department the expense is assessed upon the owner of the house where the fire started. This expense, as may be readily understood, is no trifle, and householders take every possible care to avoid incurring it. It is considered that this carefulness to a very great extent accounts for the infrequency of fires in that city.—*Invention.*

THE WORLD'S FAIR FINANCES.—The final report of Treasurer Seeberger on the World's Fair finances, was received and adopted by the Exhibition directors last week. By this report it was shown that the total disbursements of the Exhibition Company have been $31,679,045, while the total receipts are $33,594,147. Thus a balance of $1,915,102 is left to the credit of the company. On this amount, $158,356 is represented in souvenir coins at face value.

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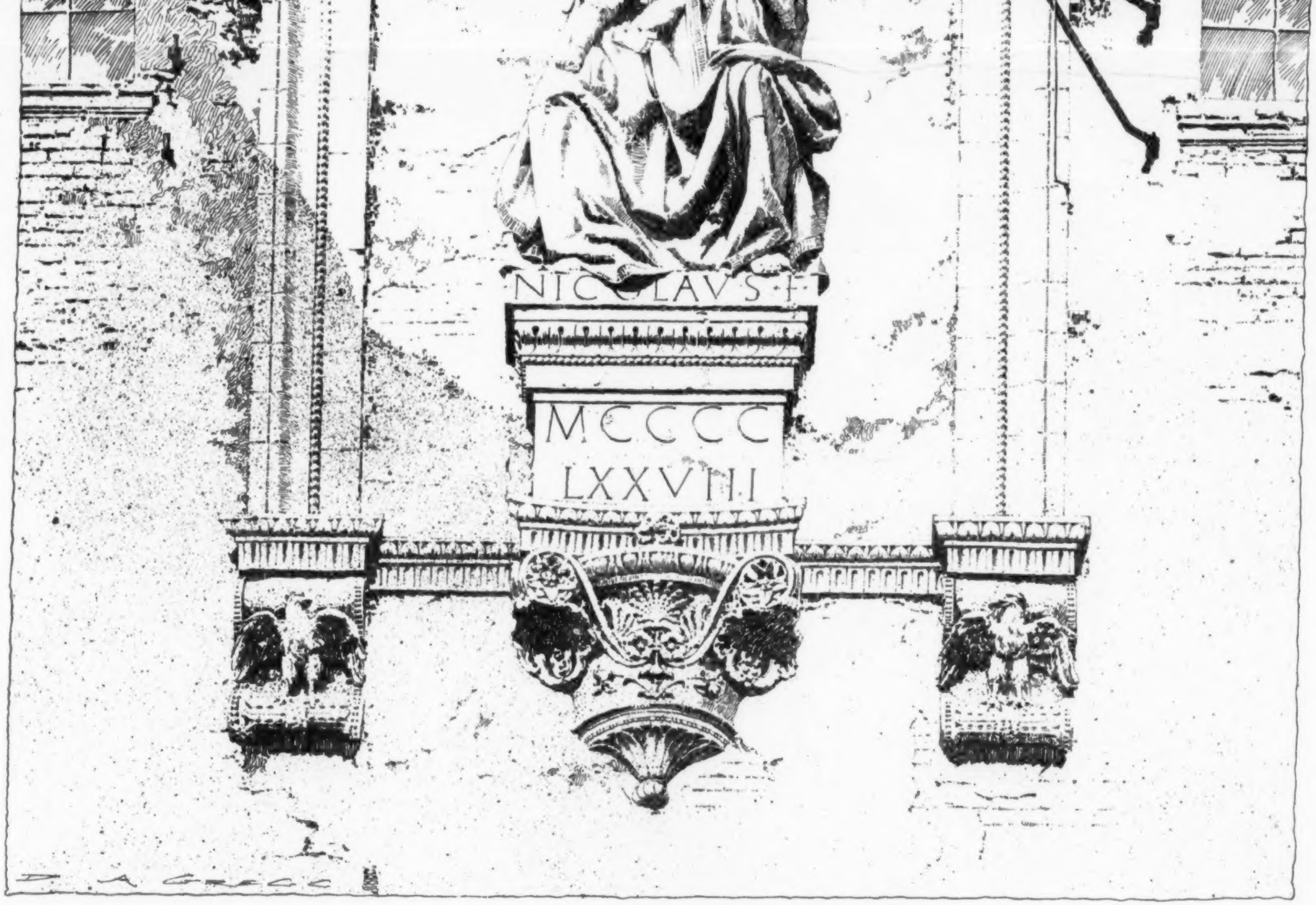

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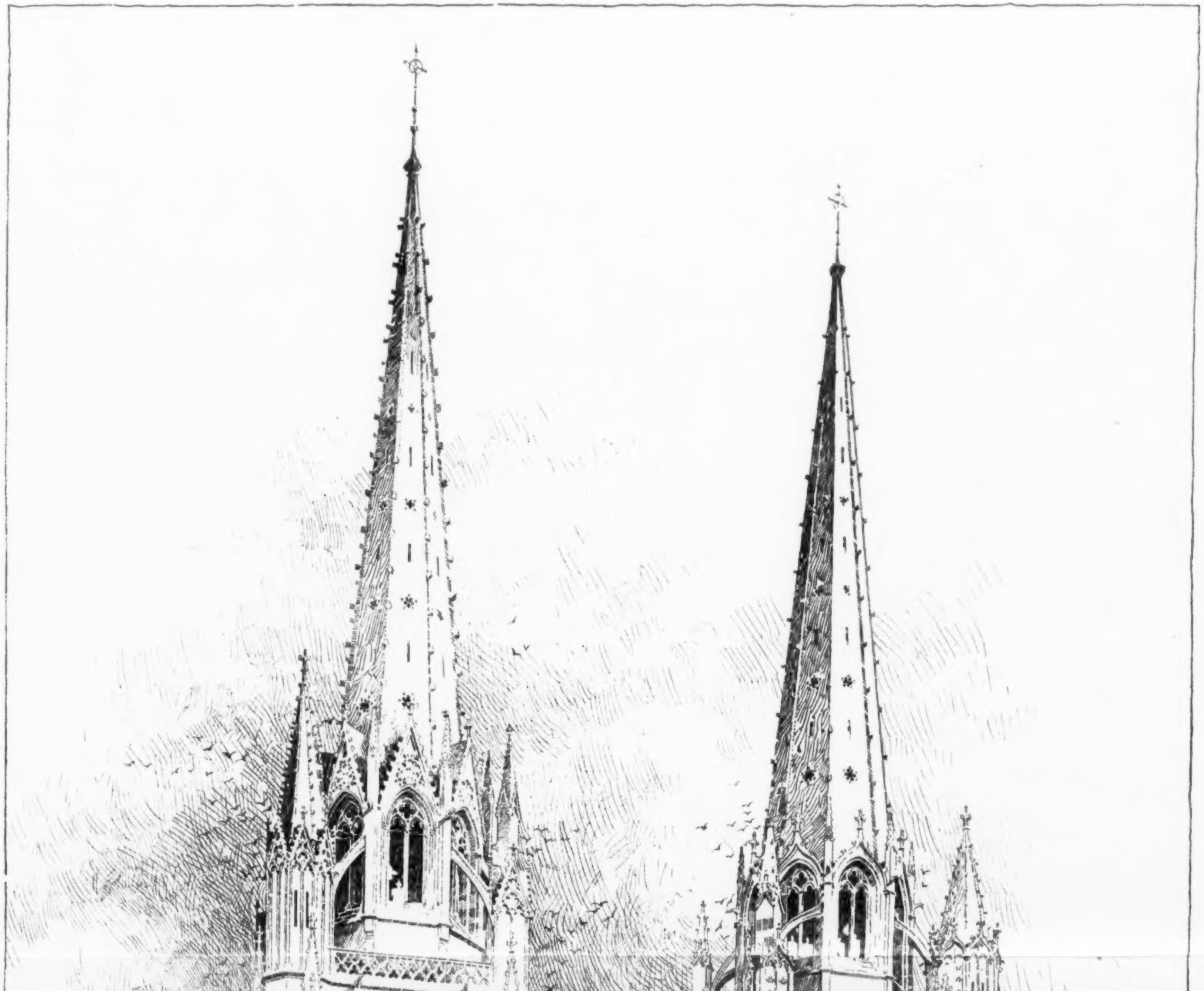

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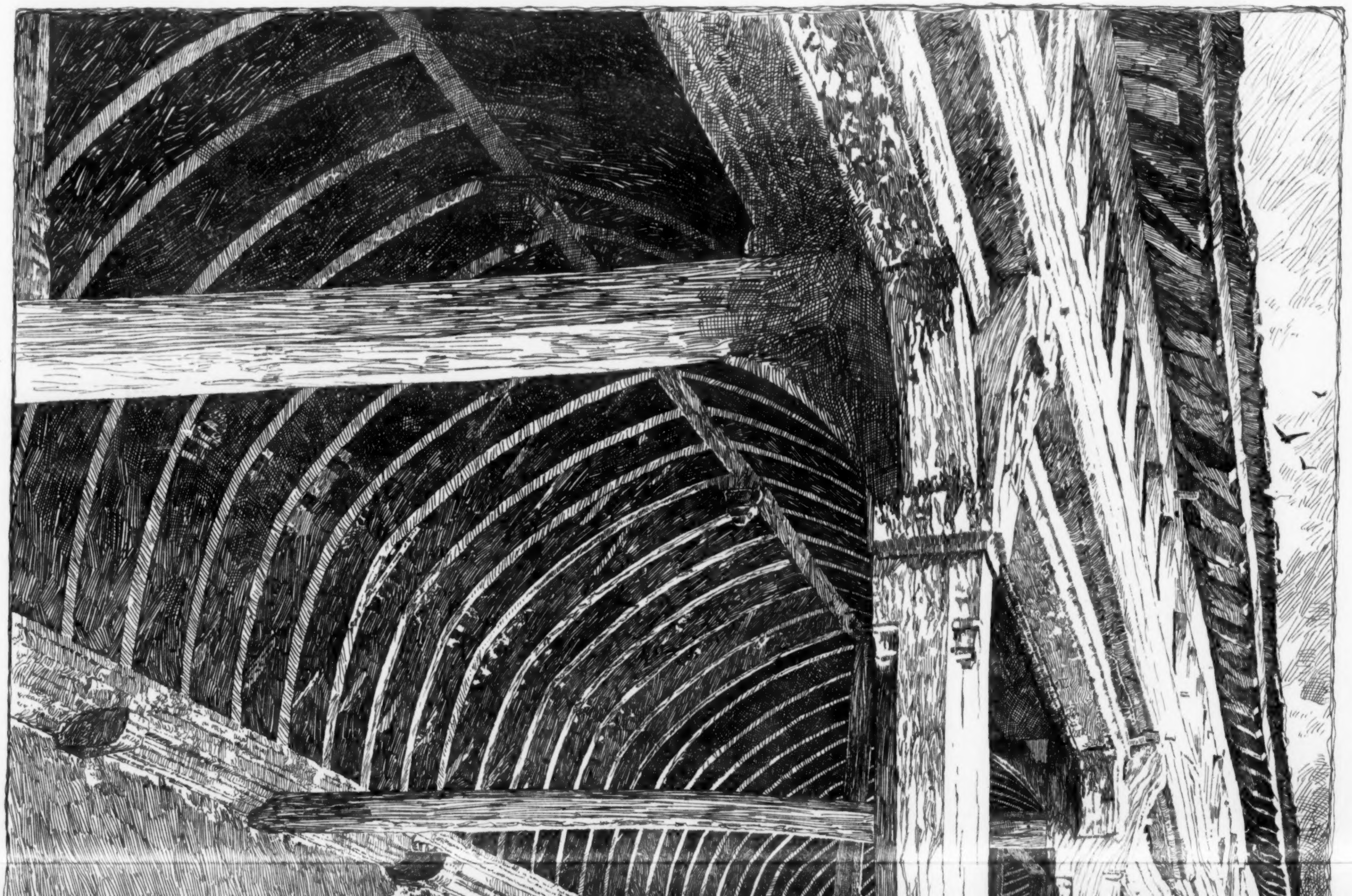

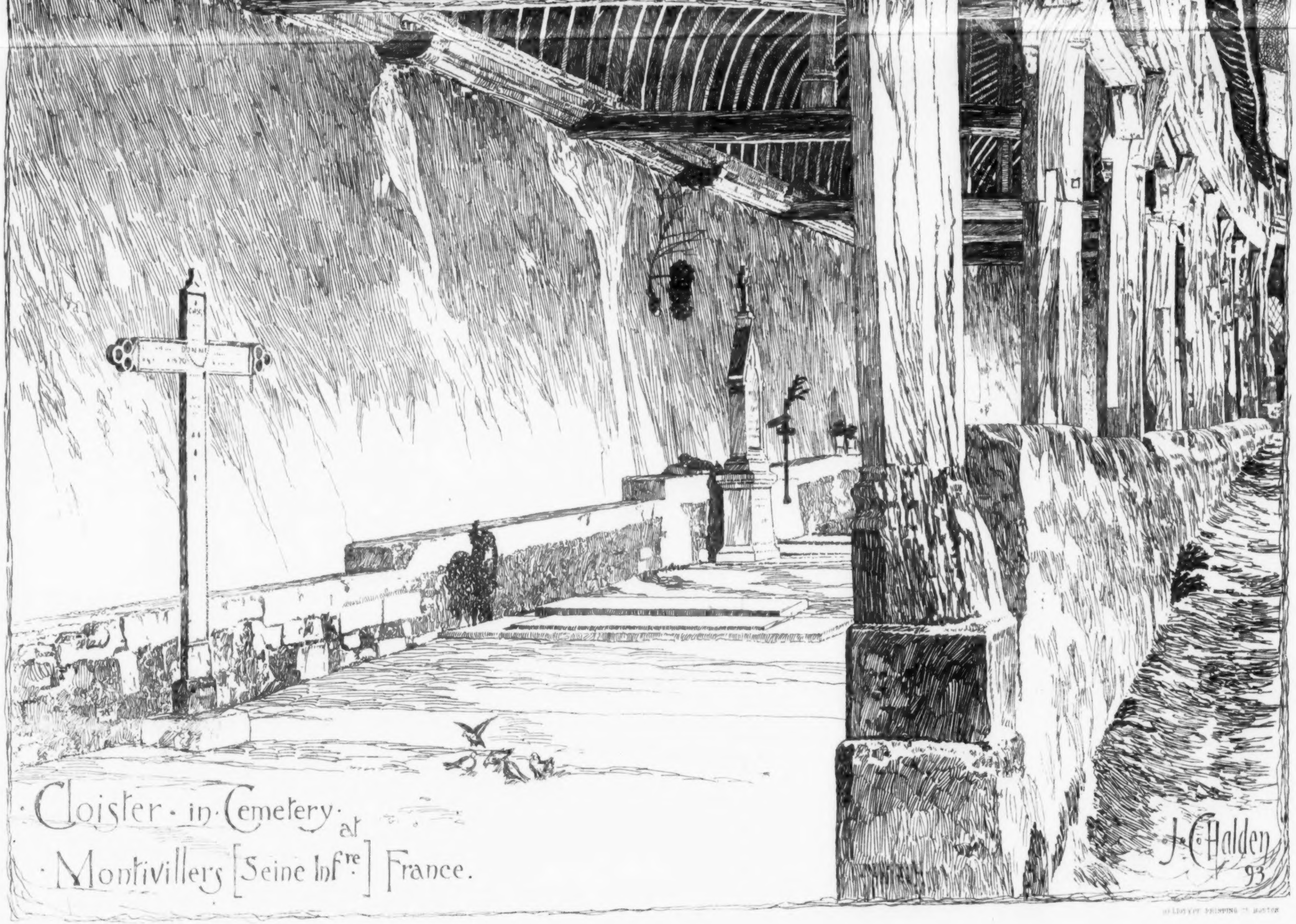

·Cloister · in · Cemetery · at
· Montivillers [Seine Inf^re.] France.

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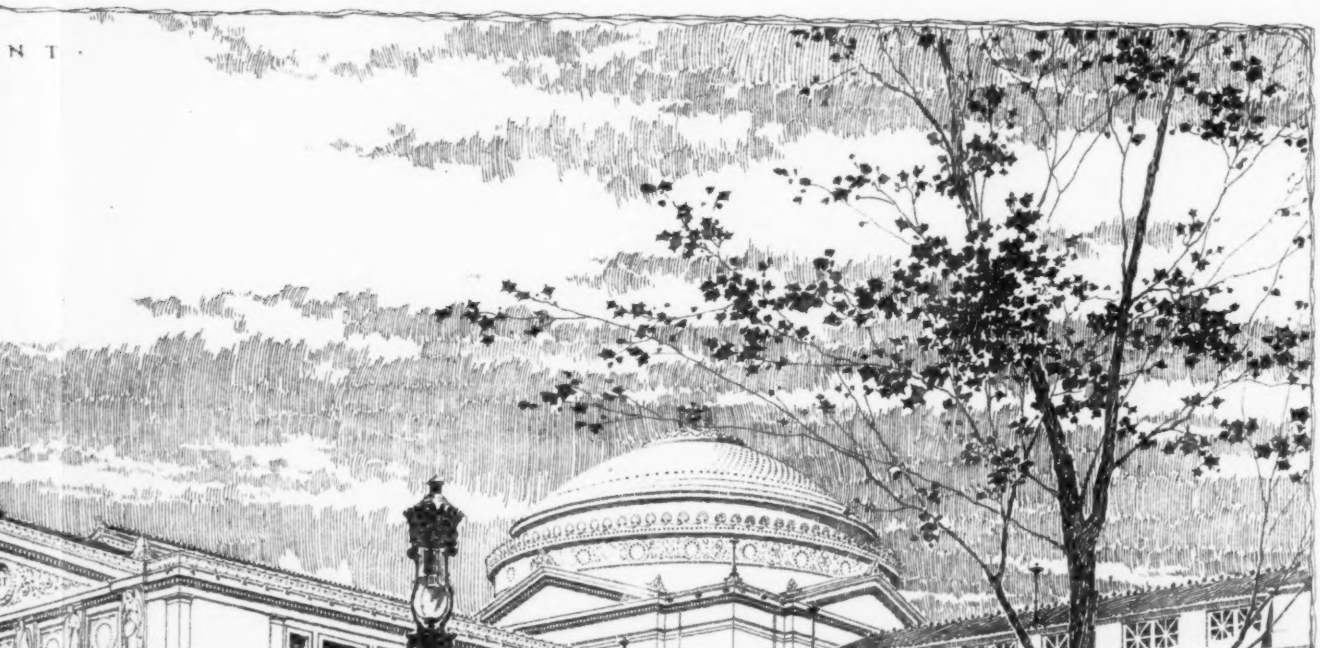
(WORLDS COLUMBIAN EXPOSITION):
CHARLES B·ATWOOD:
ARCHITECT

ND BUILDING NEWS. DEC. 23. 1893.



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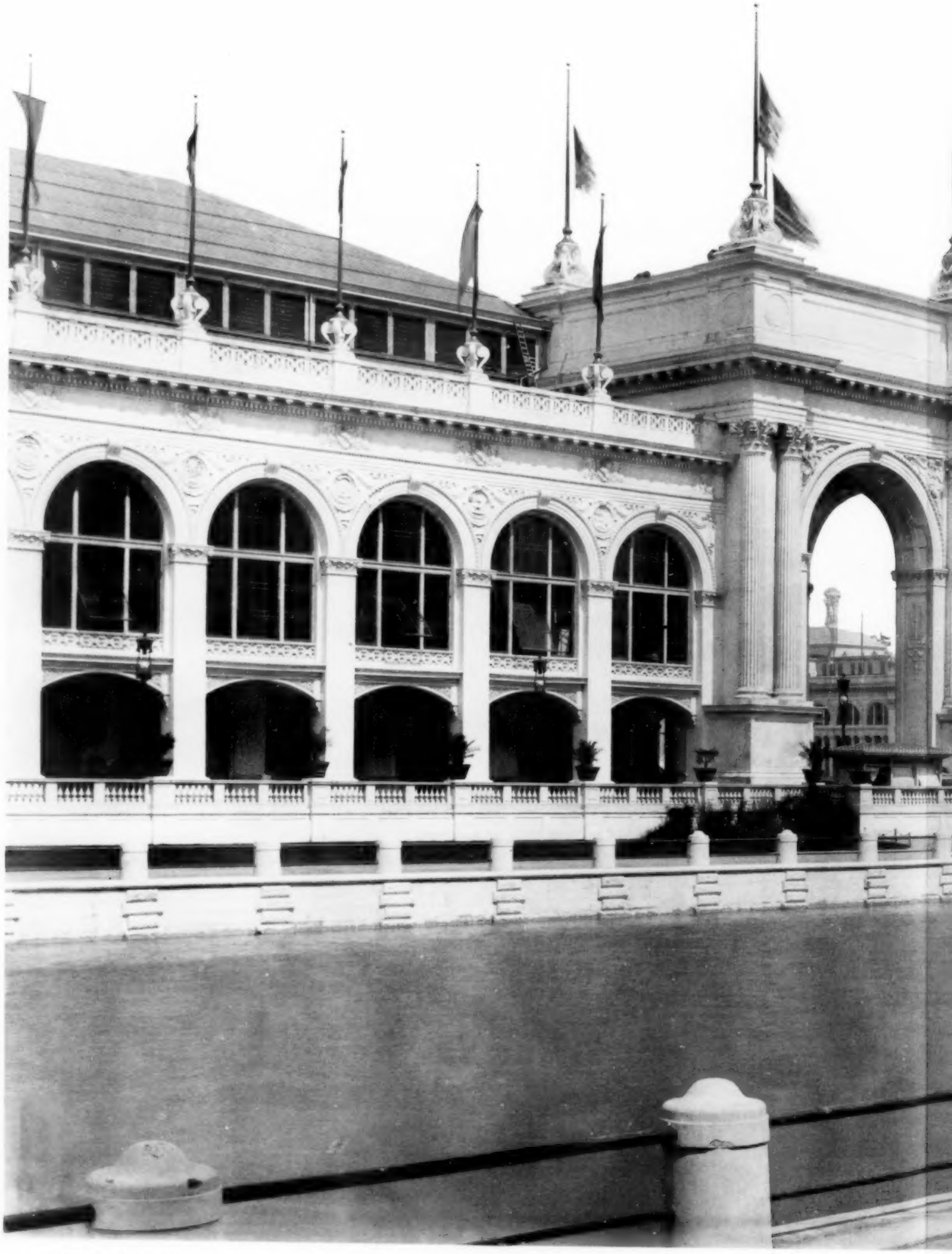

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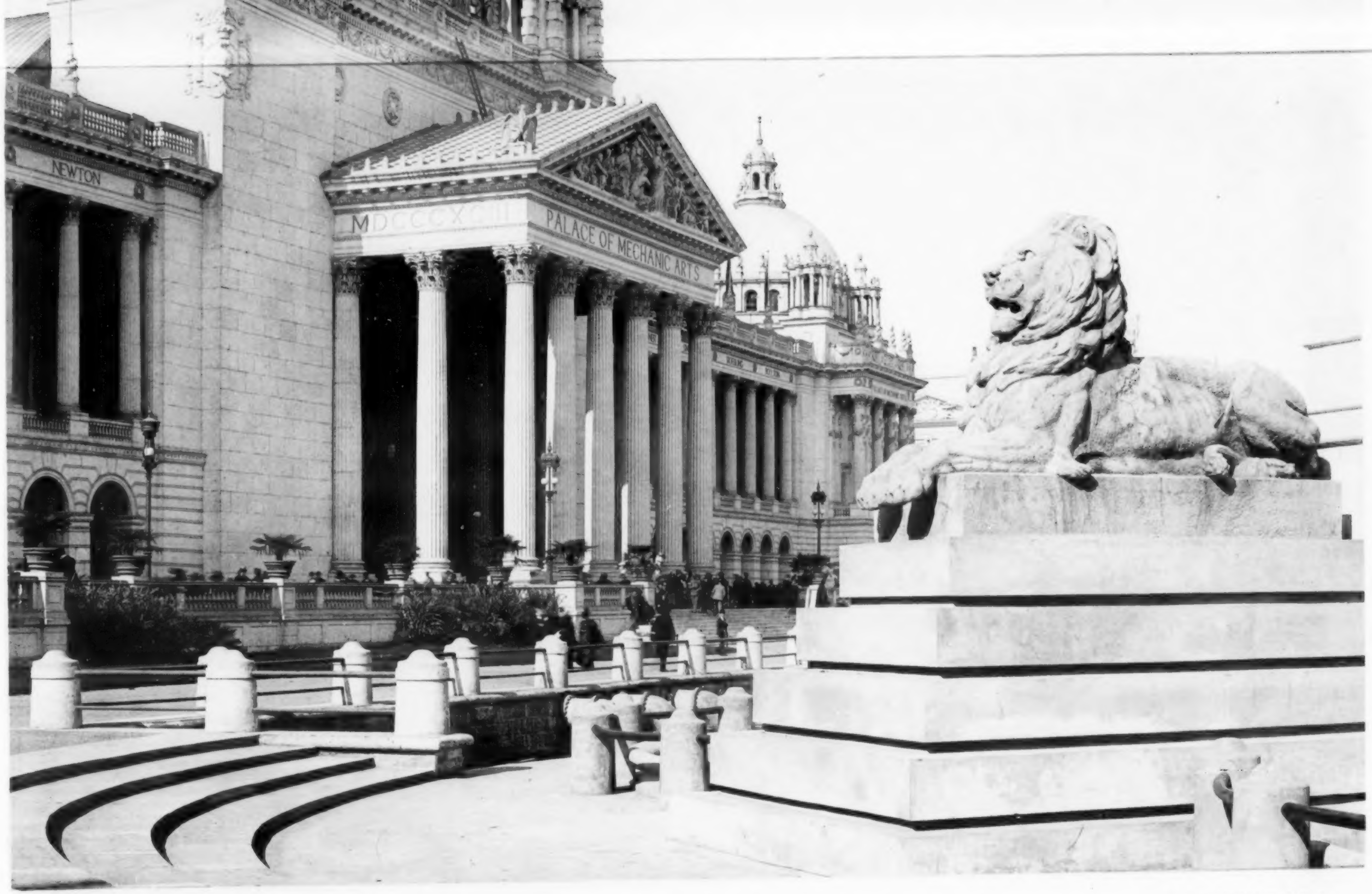

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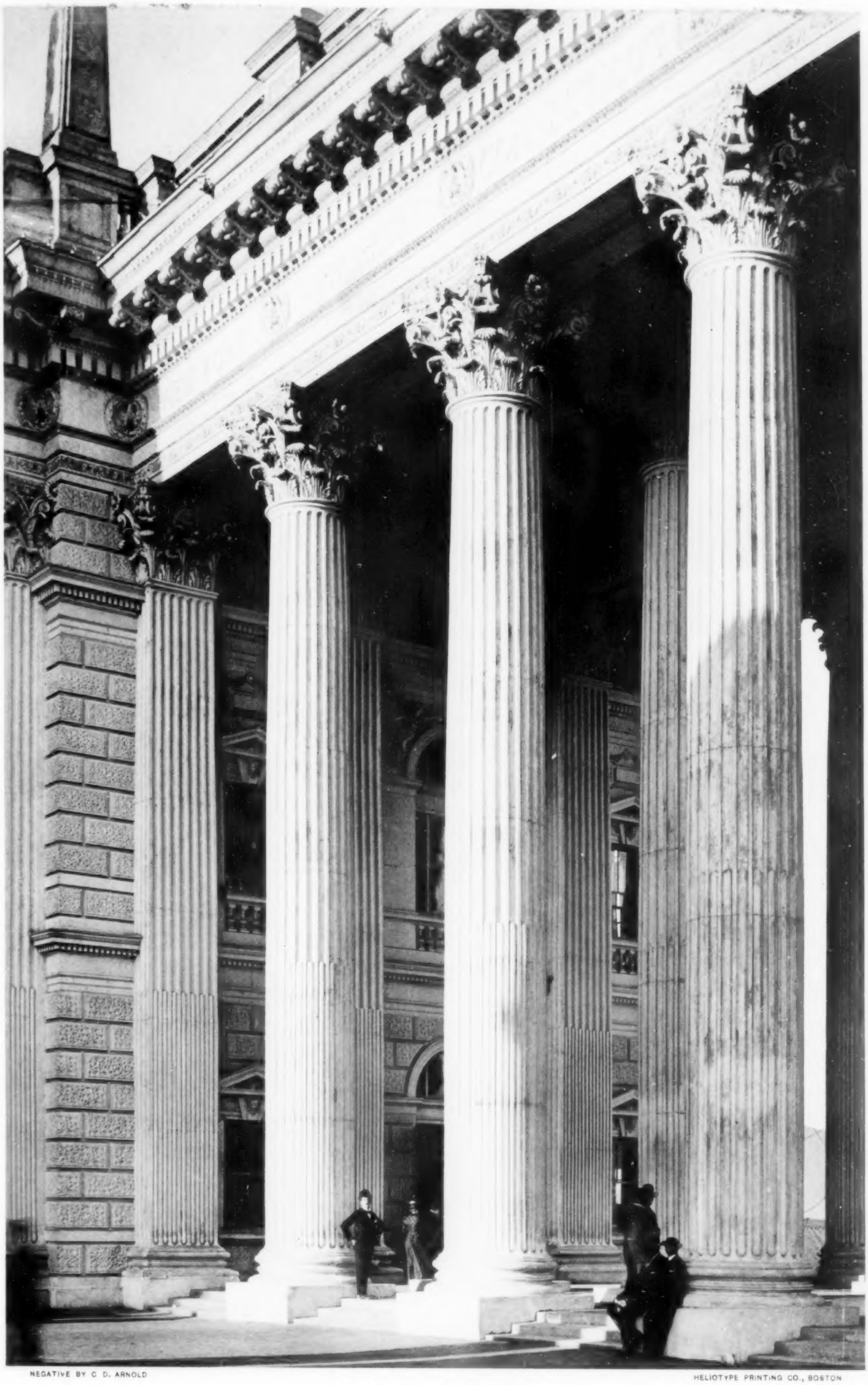

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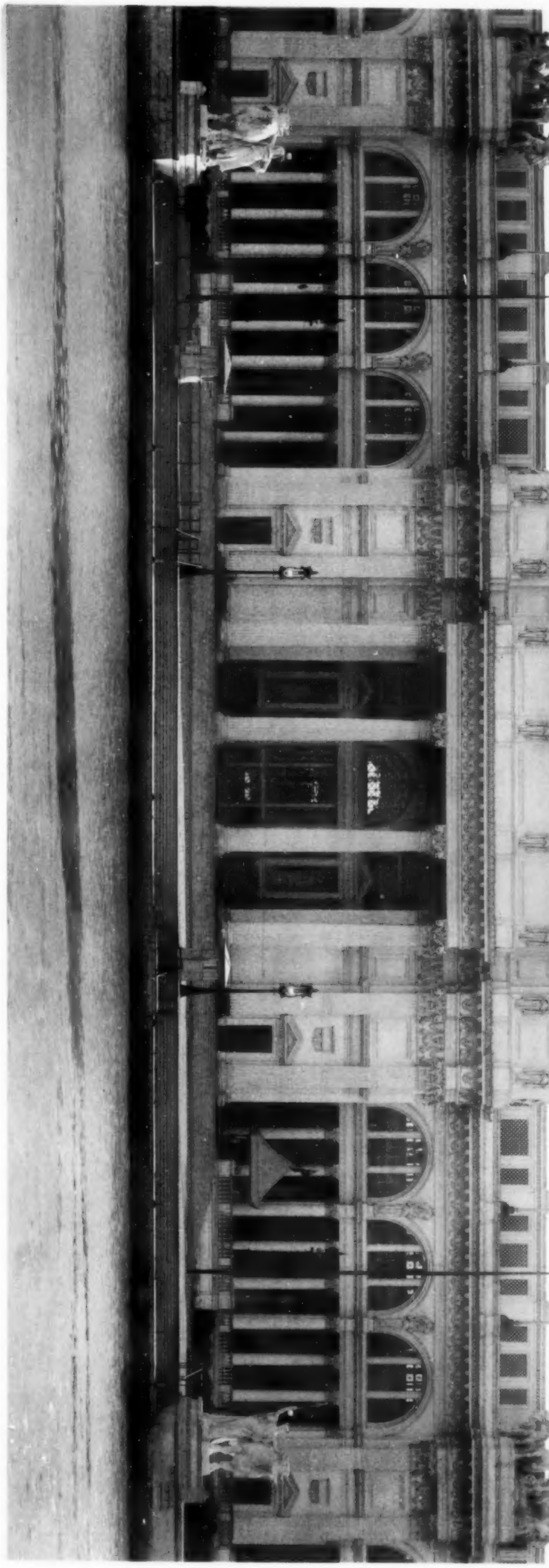

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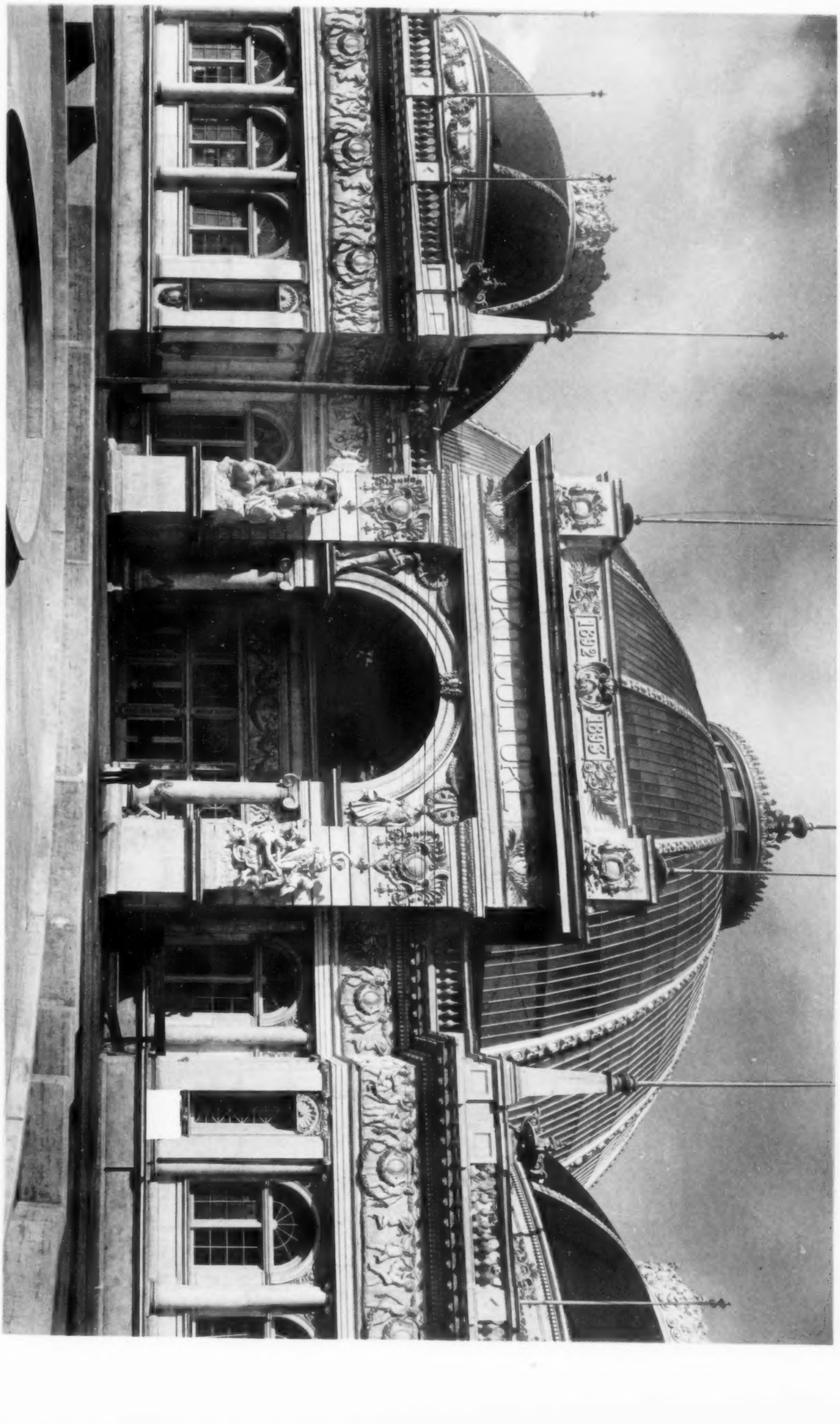

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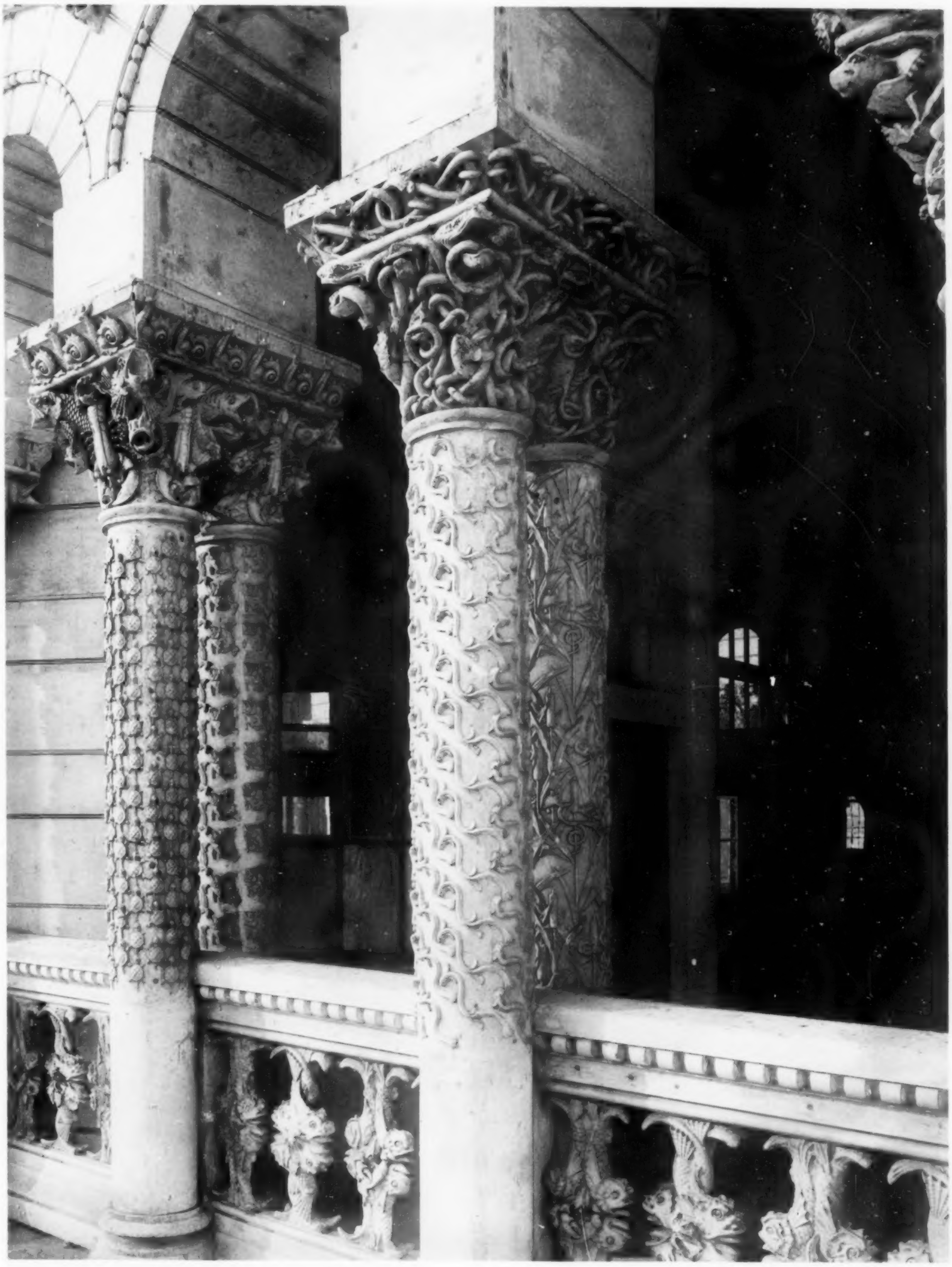

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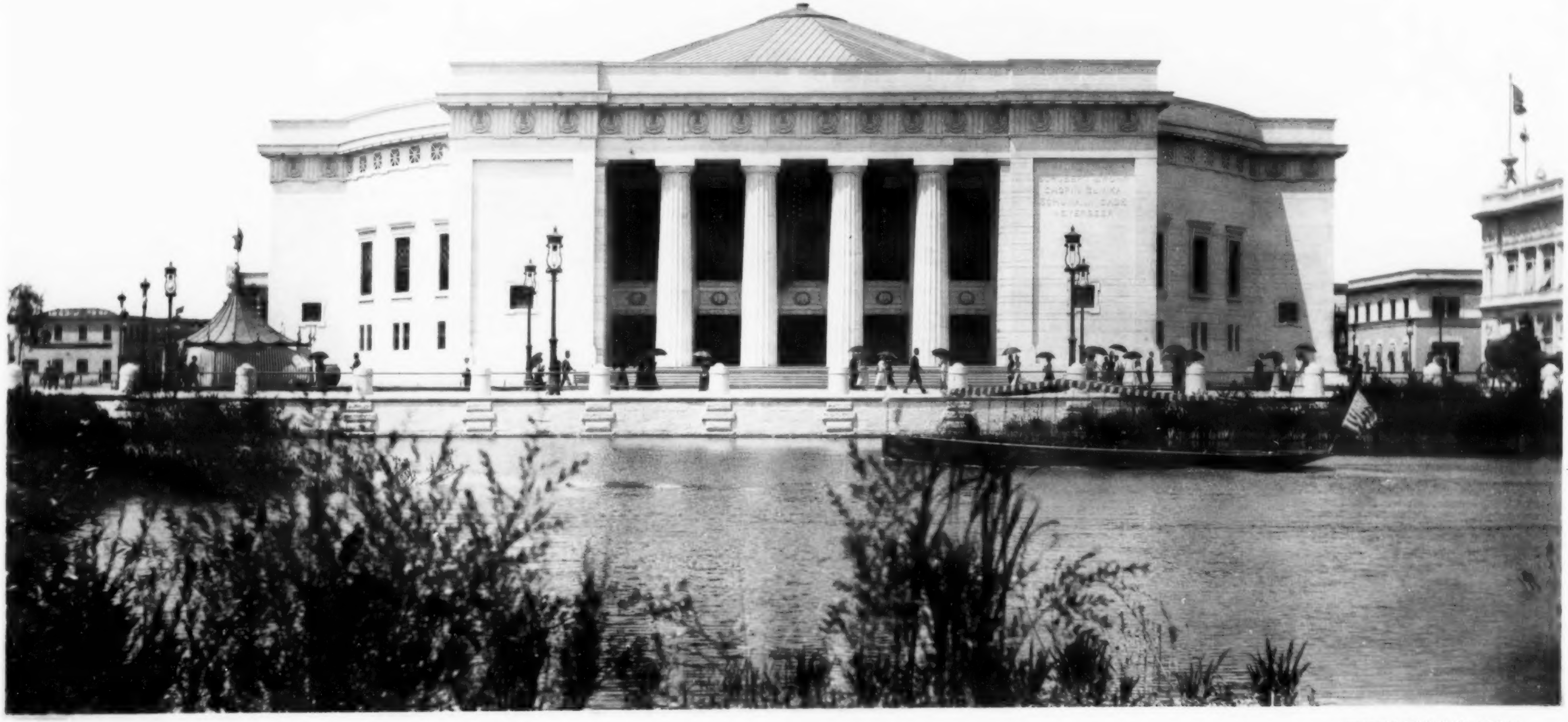

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