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AN interesting case, concerning the rights of the lowest bidder, was tried in New York the other day. Bids had been invited for the paving of Kingsbridge Road, and the plaintiffs, Pennell & O'Hern, complied with all the necessary formalities, and submitted a tender which was proved to be the lowest one received. Nevertheless, the Commissioner of Public Works refused to accept it, and awarded the contract to some one else. Pennell & O'Hern, in consequence, sued the city for damages, claiming thirty thousand dollars. The case was tried with a jury in the Trial Term of the Supreme Court, and a verdict in favor of the plaintiffs was brought in, with damages to the amount of five thousand dollars. Lest any one should suppose, however, that this favorable result was due to the discovery, by the jury or the Court, of any inherent right of the lowest bidder to employment, it may be well to say that the case could only turn on the terms of the statute under which bids were invited, or, possibly, on those of the invitation. It cannot be too strongly impressed upon the minds of contractors that, unless some statute, ordinance, resolution or other official act prescribes that the contract, in a given case, shall be awarded to the lowest bidder, the law presumes that the persons whose duty it is to make the award are entitled to use their discretion in the matter, and to award the contract to such persons, and in such manner, as they may deem for the best interest of the community for which they act.

A STRIKING illustration, not only of the usefulness of the New York Building Department, but of the importance of providing adequate means for securing its care to all parts of the city, is to be found in a recent occurrence. One of the inspectors of the Department, passing a seven-story building in process of erection in the lower part of the town, noticed that one of the walls leaned slightly. He took mental note of the building, and, some time later, he arranged his regular round so as to pass it again. It seemed to him that it leaned more, and he notified Superintendent Constable, who came promptly to the spot. A few measurements showed that the wall was already twelve inches out of plumb, and still moving. The Superintendent is a man of resource and decision, and, instead of going through the formal routine of notice to the owners, which would probably have cost the lives of several people, he sent for wire ropes, and soon had them passed around the walls, and tied back to neighboring buildings, in such a way as to keep the new structure from falling outward into the street. Meanwhile, the contractor was summoned, and required to take down the defective walls forthwith. Thanks to Mr. Constable's effective staying, this work was accomplished without accident, and what might have been a lamentable catastrophe was averted.

MR. JAMES H. GREATHEAD, an engineer known throughout the world for his invention of the system of tunnelling called by his name, died recently, at a comparatively early age. His experience in submarine tunnelling dated from a very early period. As a draughtsman in the office of Sir Marc Isambard Brunel, he was engaged in the designing and supervision of the first Thames Tunnel, and became thoroughly familiar with the difficulties to be encountered in such work. The first result of his observations was the invention of the water-shovel, by means of which the water itself, driven under pressure against the solid earth in front of the tunnel heading, is made to disintegrate it, so that it can be removed in a half-liquid condition by means of pumps, the workmen being guarded meanwhile by a shield. This method has been in use ever since for such works, and has recently been successfully extended to excavation for foundations of buildings. His health being delicate, he was obliged to leave England for a time, and lived for about ten years in India and Australia, actively engaged as consulting engineer for railway and bridge construction. Returning then to London he became interested in the City and South London Underground Railway, which was built by his system under the Thames from London Bridge to Southwark. The success of this line, which, unlike most of the other London underground roads, pays dividends, led to the construction of another on the same system, which is now nearly completed. Mr. Greathead was employed on this, as on the South London road, and, in the course of his studies, invented and patented several improvements on the shields used in the work. Naturally enough, the projectors of the Hudson River Tunnel, the most important submarine tunnel in this country, sought his advice, and he was associated with Sir Benjamin Baker as consulting engineer for the work.

THE Supreme Court of Massachusetts rendered recently a decision, on appeal, in a case of intimidation, which is interesting, not only for the opinion of the majority of the Court, on which the decision was based, but for the dissenting opinion of two of the judges. The facts of the case were, briefly, that the employés of a certain furniture-maker in Boston struck, and the International Furniture-Workers' Union, in order to prevent him from hiring men in their places, maintained a patrol in front of his premises, to intercept and threaten, or expostulate with, persons who might intend to apply for work. The plaintiff applied for an injunction to prevent this patrolling, and after repeated appeals, the full bench of the Supreme Court holds that he is entitled to such injunction. The Court does not consider that it would be unlawful for an organized body of workingmen to establish a patrol of men charged simply with the task of arguing rationally with applicants for work; but the evidence showed that the patrol actually threatened "personal injury and unlawful harm" to persons seeking employment in the plaintiff's establishment. Such conduct, the Court says, is in contravention of the right, secured by the Constitution to every employer, of engaging able persons who are willing to work for him at such prices as may be mutually agreed upon, and of persons employed, or seeking employment, to enter or remain in the employment of any person or corporation willing to employ them, and the person suffering from it is entitled to an injunction. A rather queer argument was put forward by the counsel for the defendants, that, as the conduct complained of, if unlawful at all, was, under the statutes of Massachusetts, criminal, and therefore punishable by the usual processes of criminal law, an injunction could not be issued to prevent it; but the Court replied to this that, while a Court of equity will not ordinarily issue an injunction to restrain the commission of crime, a continuing injury to property or business may be enjoined, although it may also be criminally punishable.

TWO judges, Field and Holmes, dissented from the opinion of the majority of the Court. Chief Justice Field could, apparently, see in the conduct of the patrol, as described in the evidence, only "a peaceful mode of finding out the

persons who intend to enter the plaintiff's premises to apply for work, and of informing them of the actual facts of the case in order to induce them not to enter the plaintiff's employment," and the illegality of such conduct seemed to him too doubtful to justify an injunction. Judge Holmes, who also dissented from the opinion of the majority, took much more radical ground. Passing over some objections which he found to the language of the injunction, his opinion says that "In numberless instances the law warrants the intentional infliction of temporal damage, because it regards it as justified." As an illustration of this, he says that "It has been the law for centuries that a man may set up a business in a small country town, too small to support more than one, although thereby he expects and intends to ruin some one already there," and he explains that the doctrine under which such things are permitted is that "free competition is worth more to society than it costs." As he draws important inferences from this principle, it may not, perhaps, be amiss to observe that "free competition," and "the intentional infliction of temporal damage," are two quite different things. Free competition may involve the unintentional infliction of temporal damage, but in law, as in morals, the intention is everything, and even Judge Holmes, further on, seems to get into some trouble with his theory. In the illustration which he gives, although he says of the person who sets up a competing business in a place only large enough to support one business of the kind, that he "expects and intends to ruin some one already there," he cannot mean to say that an effort of a man who has to make a living for himself and his family to get custom or employment, even though the custom or employment that he gets may be taken from that which some one else has previously enjoyed, is the same thing as an intentional attempt to "ruin" his rival, or that the law makes no distinction between them. While the law, in general, considers that all men are equally entitled to try to earn a living by such honest profession as they may choose, it frowns upon perfidious attempts to steal away another's customers, and certainly, no jurisprudence at this day would sanction malicious injury under the pretext of competition.

ALTHOUGH Judge Holmes, in his next sentence, seems to retreat a little from his position, by saying that "the infliction of intentional damage is justifiable only when it is done not for its own sake, but as an instrumentality in reaching the end of victory in the battle of trade," it seems to us that he obscures the point of this explanation, which is assuredly a most important one, by the loose way in which the expressions, "victory," and the "battle of trade," are used. Further on, in a similar manner, he speaks of "free competition" as a narrower expression for "free struggle for life," and explains this idea by saying that "One of the eternal conflicts out of which life is made up is that between the effort of every man to get the most he can for his services, and that of society, disguised under the name of capital, to get his services for the least possible return." It would be interesting to know what evidence a judge, as distinguished from the Socialistic phrasemongers, finds to support the notion that life is made up of "eternal conflicts," or that one of these conflicts consists in a struggle about wages between "Society," or "Capital," and the rest of the world. It is hardly necessary to say that the law, in Massachusetts, has hitherto known nothing of "Society," or "Capital," or "struggles for life," or "eternal conflicts," but has uniformly looked upon the citizens of the State, whether rich or poor, whether employers or employed, as persons of exactly equal rights and responsibilities, presumably engaged, not in "struggles," or "eternal conflicts," but in pursuing mutually useful callings in an honorable and considerate manner. The exchange of this ideal for that which contemplates mankind as a drove of biped swine, each bent on securing for himself, at the expense of his weaker brethren, the largest morsels of garbage, is something for which the community, outside of the Socialists and Anarchists, is hardly yet prepared, but it is difficult to see how anything else could be meant by the acceptance, as a basis for legal decisions, of the notion that the relations of any two citizens, or bodies of citizens, can be those of an "eternal conflict," or warfare of any kind. Judge Holmes says that citizens, in their controversies, cannot "be permitted to usurp the State's prerogative of force"; but if "the intentional infliction of temporal damage" is allowable as a manœuvre in the "eternal conflict," it is hard to see on what principle jurisprudence could define the limits of the kind or degree of injury to be inflicted. The law says that in "struggles for life" between individuals, either party is justified in killing the other, and if anything of the kind really exists between classes or bodies of individuals, the Anarchist view, that the extermination of one class by the other is justifiable and praiseworthy, is the only logical one. The difficulty with this deduction is not in the reasoning, but in the premises. If a state of "conflict," eternal or otherwise, legally exists between two men, or sets of men, the individuals on either side are entitled to the privilege of combatants, that is, the "intentional infliction of temporal damage," within the rules of warfare, which include the killing or maiming of the enemy. If no state of conflict exists, it is not easy to see how any intentional injury to another person can be justified. Judge Holmes says that free competition involves occasional injury to others, which is true, but it is incidental, not intentional injury, that is involved, and the limit of incidental injury should be simply the equalizing of opportunities between two persons with equal rights. It is the attempt by one party to inflict an intentional injury upon his competitor, as he would upon an enemy, which converts competition into warfare; and, however Socialist sophistry may confuse the two things, civilization and liberty rest on the distinction between them.

THE story of the discovery in the mountains of Mexico of a buried city, "larger than New York," is repeated in the newspapers, with more circumstance than before, and we are informed that the ruins cover an area of "about one thousand square miles"; that they include the remains of twenty temples, besides two pyramids, and that the objects already dug up "prove" that the town "was at some time one of the great centers of wealth and power of the American hemisphere." It is naturally interesting to know what may be the character of the objects which "prove" such an important truth, and we are informed that the "subterranean chambers" of "the largest buildings" are "filled with broken pieces of plaster, painted bright red and white," and, on the floors, are found "beads, axes, idols and broken pottery"; while, in another place, "under the altar," at a depth of nine feet from the surface, was found an earthen pot, which was "filled with dirt," and mixed among it were seventy-two objects of mother-of-pearl, all perforated, and five of them were heads of Kings, with crowns nicely carved. The inhabitants of this Aztec metropolis showed rather unusual taste in packing away the effigies of their kings in bean-pots "filled with dirt," and it is to be regretted, in the interest of history, that they had not devoted their "nice" carving to the countenances of these royal personages, rather than to their crowns; but the inhabitants of a city of a thousand square miles in area can hardly be judged by ordinary standards. Besides the contents of the bean-pot, and the "beads, axes, idols and broken pottery," with the broken pieces of red and white plaster, the finds hitherto secured appear to include only some "bones of strange animals," a portion of which, it is pleasant to find, have been "carefully packed" for expert examination. For the benefit of science, it is made known that the ruins are situated in the State of Guerrero, not far from its capital, Chilpancingo, and are locally known under the name of Quechomitlipan.

THE new Prefect of the Seine, M. de Selves, in imitation, perhaps, of Mayor Quincy, of Boston, has created a Technical Committee, whose duty it is to advise him in regard to all projects relating to architecture or fine-art prepared for the Department of the Seine. This Committee, which is composed of painters, sculptors, engineers and architects, and includes a contractor, is to hold regular meetings, under the presidency of the Prefect himself. The Parisian architects do not look with much favor on this innovation, and inquire what the Committee will find to do; but it is altogether likely that M. de Selves understands what he is about, and that his advisers will be able to render the service for which they are appointed. In the case of the Mayor of Boston, the establishment of a "Cabinet of Experts" seems to have amply justified itself, by the importance and value of the counsel which its members have already given in regard to the building-matters of the city, and in Paris, where many schemes of improvement are under consideration, the responsible executive head of the municipal government may quite naturally feel it desirable to have the guidance of experienced advisers in technical matters, instead of depending for his decisions on his own fancies.

THE THIRTIETH ANNUAL CONVENTION, A. I. A.[1]—II.

NATIONAL ARCHITECTURE: CERTAIN CONSIDERATIONS WHICH MIGHT POSSIBLY AFFECT THE DESIGN AND CONSTRUCTION OF OUR BUILDINGS.[2]

THE purpose of this paper is not to revive the time-honored discussion of the evolution of a style of architecture for these United States of America — and then with a "*whereas*" and a "*be it resolved*" to move that the matter be referred to a committee, with the recommendation that this American Institute of Architects do hereafter recognize only such-and-such proportions, or combinations of mouldings or of materials, as rightly constituting a national style of architecture.

I have no doubt that there are members present to-day who have listened to, or perhaps themselves have read, carefully-prepared papers on "An American Style of Architecture" before some of the earlier conventions of the Institute: certain it is that the contributors to periodicals, professional and otherwise, have agitated the subject for the past twenty-five or thirty years, with the apparent hope that the mooted question could be settled within a very few years. Nor is it my intention, as the guardian of the Government's interests in matters architectural, to predicate, or even to recommend, that the future court houses, custom-houses or post-offices throughout this broad land of ours should be designed in any one school, or that they should all be constructed from any one specific material, but I beg leave to offer the following memoranda of principles, tending to the begetting of logical architecture, and which, having been proven in past ages, cannot fail to be of most lasting benefit to us in our efforts towards the realization of a National architecture.

The influences most potent in the evolution and development of architecture may be classified in three groups, namely:

(1) Geographical, Geological and Climatic.
(2) Religious and Social.
(3) Historical, Political and Commercial.

As we trace the history of mankind we find that the Geographical, Geological and Climatic conditions have been of prime importance everywhere; in Egypt, Chaldæa and Assyria; India, Greece and Italy; Spain, France and Holland; Germany, Norway and England.

Lower Egypt (which Herodotus calls "the gift of the Nile") Chaldæa (a second Holland) and Assyria, (a more undulating country) were built virtually of sun-dried mud and fire-burned clay. Syene and kindred quarries of upper Egypt supplied the granitic rock for temples, tombs, pyramids and obelisks.

In India we are familiar with the Taj Mahal, the temples and water approaches of Benares, the rock-cut temples of Ellora and Elephantiné. We have all studied the orders from the marble temples of Greece and her colonies.

In Southern Italy we find frequent use of marble, in Central Italy of peperino, tufa, travertine and concrete, and in Northern Italy of brick and terra-cotta.

Spain suggests the use of tiles for roof-covering and for the ornamentation of interior wall-surfaces, with granites, sandstones and limestones for the construction of walls, piers, vaults and bridges.

In France the local material of Auvergne is volcanic rock; of Brittany, gray granite; of Normandy, the beautiful Caen stone, and, farther to the north, brick and half-timber, or "*pan de-bois*."

Dutch tiles would never be mistaken for Spanish, nor Dutch brickwork for that of Northern Italy, and yet the architecture of Holland is essentially ceramic. The various portions of Germany show the use of limestones, sandstone, brick and half-timber respectively.

The log châlets of Norway, Sweden and Switzerland certainly give a clue to the geography, geology and climate of those countries.

English architecture, perhaps more than any other, has been affected by influences beyond these three primary causes, but it has been because of England's geographical position more than for any other single reason that these influences have affected her in a greater or lesser degree, and the paradox of the spirit of ardent investigation, coupled with that of the utmost conservatism, is surely as admirable an instance of "*les défauts de ses qualités*," or *vice versa*, "*les qualités de ses défauts*" as can well be imagined. It is very interesting to note next how the architecture of various nations has been affected on the one hand by Religious and Social influence, and on the other by the Historical, Political and Commercial. The Egyptians built their residences of mud and clay, and reeds and sticks in a most temporary fashion, but their tombs, which they accounted their true homes, were of the most enduring stone obtainable. There is a difference between not only the residences of Egyptians and Greeks, but — even more so — between their temples, for, whereas the former constructed a multitude of columns and surrounded them by blank walls, the latter placed the edifice proper within and the columns without. The erection of theatres by the Greeks, primarily for the celebration of religious rites, was the beginning of the Social influence upon architecture, and when the baths of Caracalla and Diocletian, the palaces of Augustus and Nero, the villas of the Emperor Hadrian near Rome and of many wealthy private citizens at Pompeii, Baiae and other resorts were built, then the social side of life was most prominently expressed.

The religious wars or Crusades of the Middle Ages undoubtedly produced marked results upon the buildings of Western Europe by the gradual importation of Eastern architects, mechanics and materials.

The feudal system was powerfully expressed not only in the fortified castles on the hill-tops, but, as in Florence and elsewhere, within the very cities themselves.

It is a singular fact that generally in countries where stone was plentiful and to be had of large dimensions, the interiors of buildings were gloomy, though the general impression may have been one of awe; whereas no interior has ever before or since equalled in joyous grandeur and cheerful dignity the dome of Santa Sophia, which Anthemius built of brick for the Emperor Justinian.

From the tenth to the fourteenth century was the great church-building age of Europe. At first the early Christians began by remodelling and adapting the Roman basilicas, then by using materials of Pagan temples for the construction of their churches, and finally, after passing through the transition of the Romanesque and Norman (when the principles of the Gothic vault and pier and buttress were fully known), were evolved those magnificent productions of master minds, the cathedrals of Paris and Amiens and Bourges and Chartres.

Next came the age of the villa in Italy and the château in France; in the former they were grouped about the cities and always preserved certain formalities in their details and urban traits in their composition, and in the latter they were especially picturesque and suggestive of the country.

As civilization has advanced, we notice that the Religious impress has grown less, and then the Historical, and afterwards the Political, have each in turn lost somewhat of their former importance, while Social and Commercial influences have grown with rapid strides. Even in the time of the Crusades, Venice, while furnishing ships and men for these holy wars was not slow to seize the opportunity for enriching herself, not only in ducats, but precious materials of all sorts for the construction and decoration of her palaces and churches, not disdaining an occasional sacred relic.

Later on, François I imported Italian architects and artificers into France; while the commercial spirit which has always existed in England developed the tendency to adopt (and sometimes to get) the best of her neighbors.

With us in America, especially in our larger cities, this commercial spirit clamors most continuously for recognition, and the high prices of land, the phenomenal growth of cities and the use of elevators, of iron and steel and fireproofing materials and of electricity have forced upon us the solution of entirely new and untried problems.

In connection with these reflections upon the evolution of a national architecture in foreign lands, it is well for us to contrast the relative area of these countries with portions of our own United States, and to consider also the isothermal lines of the Old and New Worlds. Compare, for instance, the size of Old and New England; the republic of France with the Lone Star State; the Kingdom of Italy with California; and at the same time remember how, in the Old World the style changes with very few degrees of temperature, each geological deposit, and under all geographical conditions; and that the peristyle and pediment, the deeply overhanging cornice and the *cortile* are indigenous to Southern climates, while the dormered roof and peaked gables belong to sections of rain and snow.

As a result of the exhibition at Philadelphia of 1876, interior decoration and ornament certainly underwent a change in this country, and with the exposition at Chicago in 1893, a greater simplicity and refinement has appeared in the design of exteriors. In 1876 it was Japan and India that produced the effect upon us. In 1893 it was Greece and Rome — through the medium of the École des Beaux-Arts at Paris. The greatest triumph of France at the Exposition of 1893 was not that achieved within the walls of the many buildings where she was represented, but in the influence of the École des Beaux-Arts, on the general arrangement, proportions and details of the chaste and beautiful Art Building and of those magnificent structures forming the Court of Honor. Where in all the history of Rome, of Greece, of London, of Paris herself, is there anything comparable?

Therefore, bearing constantly in mind the manifold requirements and many-sided conditions which contribute to the healthy growth of our profession, let this success of 1893, where architects worked together with unexampled *esprit de corps*, be an incentive for even more admirable results in a logical architecture and, without question, the problem of our National architecture will solve itself in due time.

[1] Continued from No. 1088, page 39.

[2] A paper read at the Thirtieth Annual Convention, A. I. A. by Wm. Martin Aiken, Supervising Architect of the Treasury Department.

REPORT OF THE COMMITTEE ON BUILDING LAWS.

YOUR committee has no service to the public to report this year. Although it has reason to suppose counsel would have been valuable in several instances, where new codes of building regulations were under consideration, it received no request for its advice, and did not consider it desirable to intrude its services without invitation. At the same time, your committee believes that if suitable means could be taken to inform the public of the fact that the Institute maintains a standing committee for the purpose of furnishing, gratuitously, to communities or persons who are considering matters of building legislation, such information and suggestion,

as the principal professional body of the country can supply, and some evidence should be given of the qualifications of this committee to advise in such matters, its services would be sought, not only by communities desiring to avail themselves of its special knowledge, but by legislative committees, which, by referring technical questions to such an authority, could avoid the importunities of selfish interests, which are too often able to pervert building legislation for their own profits. As more rational and uniform building-laws would considerably lighten the labor and anxiety of architects, your committee suggests that the Institute might with advantage undertake the preparation of a tract on building-laws, comparing the practice of different localities and different countries, and endeavoring to make it comprehensible and useful to the general public. The library of the Institute already contains the most important work on the subject ever issued, the "*Manuel des Lois du Batiment*," of the Société Centrale of France, and it would be a matter of small expense to collect the building codes of all the principal cities in the world, most of which could be obtained gratuitously by the Institute. With this material, your present committee, or such other committee as the Convention might appoint, should be able to prepare a treatise of permanent value, which might first be published as a part of the Convention *Proceedings*, and separately printed in pamphlet form as a tract for distribution. On application from a Fellow of the Institute, copies of this tract might be properly sent to city officials, or members of legislative committees, and could hardly fail to be of benefit. It seems to your committee that in some such way as this the Institute can not only perform without intrusion a public service, which it is better qualified to render than any other part of the community, but may, in a dignified manner, call attention to its position at the head of the building interests in America. After the committee in charge of this tract had finished its work, the documents which had served in its preparation should be kept together, as a record of the condition of the art of building throughout the world at the close of the nineteenth century. This record would grow every year more valuable, and your committee hopes that the time may not be long until the Institute is established in permanent quarters, where such records may be consulted and continued, and from which its publications of general interest may be issued.

T. M. Clark, *Chairman.*
N. LeBrun.
Alfred Stone.

THE INFLUENCE OF STEEL CONSTRUCTION AND PLATE-GLASS UPON MODERN STYLE.[1]

I MUST confess to a little doubt as to the intention of this inquiry. I shall, however, proceed upon the supposition that what is meant is to discover in how much and in what way the use of steel construction and plate-glass has affected the forms of masonry design? It is evident, I think, that unless the employment of these agencies has caused some modification in the design of buildings where they are *not* employed, that their influence terminates in their own development, in which case they must be regarded rather as additions to the resources of modern design than as modifying factors in it.

An illustration will make this clear.

When the Gothic builders found a method of lightening their vaults by concentrating the weight on the ribs, and incidentally discovered the practical value of the pointed arch, a change in architectural style followed. The round arch soon disappeared even from walls unconnected with vaulting, and the new forms, introduced as engineering expedients, made their influence felt even in matters of pure decoration.

Now what we have to consider is, whether the introduction of steel-skeleton construction is going to produce a revolution in style at all comparable in nature to the one just instanced?

I think not. My first reason for thinking so is the direct one, that I can see as yet no evidence of any change in masonry design which can, with justice, be attributed to the influence of steel-framed buildings. The second reason is the theoretical one that the use of steel has introduced no new constructive principle. The way in which steel does its work is in no essential respect different from the way in which wood does its work. No different principle is involved. Steel has greater strength than wood, and it will not ignite, but that is practically the extent of the difference between them as constructive elements. Each requires some sort of protection from moisture and fire.

There is, however, one feature of steel-framed buildings — I mean always those in which all masonry is carried on the framing — that might at some time become an agent in modifying the design of pure masonry façades, although it has not yet done so. I refer to the envelope which covers the steel framing. I have never particularly admired the panelling treatment of parti-colored marbles given by Giotto to the Campanile at Florence, because its composition of lines fails to *accuse* the idea of solid masonry behind. It is too purely decorative, suggesting wainscoting, and is akin to the false treatment given many Italian church façades of the frontispiece type. In a word, it is not *expressive* in its suggestion.

Now the same reason which would lead one to condemn this veneer treatment for a good wall of masonry, leads one to condemn a masonry treatment for what is really a veneer. The treatment that is wrong in the Campanile would be right in the steel-framed façade.

This being so, it is possible that a time may come when the beauty of such a treatment of the envelope of steel buildings will so possess our minds that its influence will be felt in the design of masonry buildings. This possibility, however, is too remote to be reckoned as a present influence upon modern style.

Nor do I think plate-glass can be counted as such an influence. It should be considered, like steel construction, rather an addition to our resources of design than as a factor modifying them. There is nothing in plate-glass which compels our invariable use of it in large sheets, and so drives out before it the employment of mullions, muntins and leads. With steel construction we should have had the same great shop-windows we have to-day, even if the casting of glass in plates had not been invented.

It must be conceded, however, that by reason of its mechanical perfection, its freedom from flaws, and its admirable polish, plate-glass exerts what influence it has to procure for it a setting in harmony with these characteristics.

Architecture has always been swinging back and forth between two extremes, which are marked respectively by indifference to mechanical finish and by delight in it. Your brilliant painter amazes his Philistine client by his unconcern about the finish of his brush-work. The client sets smoothness of finish above the qualities the painter regards, because he is not a craftsman like the painter. The unevenness which the client finds a blemish, may be to the painter the mark of his freest and truest touch. So there are certain types of architecture to which the individuality and touch of the craftsman lend a large part of their charm, whose very virtues are based on the happy use of the accidental, and whose effect is the opposite of formalism. These are the picturesque types. On the other hand are the formal types, where charm resides in the submission of all parts of the work to a central authority, and where the individual note in any part is a defect, rather than a heightening of the general effect.

It is to this latter class of architectural styles that plate-glass is naturally allied, by reason of having the same kind of virtues. It may be said, therefore, to be always silently exerting what influence it has in behalf of classical architecture. Yet I think this influence will not be considered great enough to modify our previous conclusion that modern style has been left unaffected by steel construction and plate-glass.

[1] A paper by Mr. Robert D. Andrews read at the Thirtieth Annual Convention, A. I. A.

REPORT OF THE COMMITTEE ON EDUCATION FOR THE YEAR 1896.

AT the Twenty-eighth Convention of the Institute, held in 1894, this Committee in its annual report ventured the proposition, whether the methods of instruction in our schools, especially the study of the historical styles, might not be so directed as ultimately to lead to a higher comprehension of our professional responsibilities in relation to the development of a system of architectural forms which should be more accurately adjusted to the expression of modern American civilization than those which at present prevail; whether, in short, we should continue to allow ourselves to drift towards some unknown result, or endeavor to control the current, keeping it within reasonable bounds.

In accordance with the request of the Institute, the Committee, with the above object in view, opened a correspondence with the Directors of the schools, partly to show our general interest in their work, but more especially to ascertain to what extent and in what way a knowledge of the spirit underlying the development of the historical styles was inculcated. Some of the replies received were printed with the Committee's report of last year. They conveyed to the Institute, on the whole, an agreeable impression of the intelligence and thoroughness with which this branch of architectural study was pursued in the schools.

But the Committee, in its report of last year, after reciting these facts, ventured to suggest what might prove a practical method of bringing about the results aimed at in the report of the previous year. They proposed to refer to the post-graduates of the schools, now become active practitioners in the profession, and to the members of the Institute in general, the consideration of these larger subjects, which the limitations of the schools prevent them from properly treating.

With this in view, the Committee has been encouraged to propose for open discussion in the present Convention, a subject which seemed to them of sufficient interest to awaken active discussion, and of sufficient importance to call into play the best intelligence of the profession. Several members of the Institute have been good enough, at the request of the Committee, to prepare essays on the theme chosen, viz., "The Influence of Steel Construction and of Plate-Glass on the Development of Modern Style." These essays will be read at this Convention, in order to open the way for a discussion which, it is the hope of the Committee, may become general, the subject having been duly published to the members of the Institute to this end.

If this discussion should prove to be a distinctive and satisfactory feature of the present Convention, it is hoped that it may form an inspiring precedent for those which are to follow, and that thus the proceedings of future conventions may have, at least, one element of

permanent value to the cause of good architecture, and one which in attracting the attention of the thoughtful men outside our profession, may cause our work and our aims to be regarded with increased respect and a more intelligent sympathy.

HENRY VAN BRUNT, *Chairman.*

INFLUENCE OF STEEL CONSTRUCTION, AND OF PLATE-GLASS UPON THE DEVELOPMENT OF MODERN STYLE.[1]

THE human race finds itself endowed with two distinct classes of desire — one to perpetuate, the other to enjoy its existence. What necessity requires seldom performs its office without administering to the desire for pleasure. Utility makes her demands to perpetuate life, art to provide enjoyment. While the capacity of the race to provide was exhausted in supplying its necessities, art was impossible. It was only when he had so far conquered the forces of nature as to leave some time and some energy unexpended, after his needs were supplied, that man could, or did, turn his mind to the contemplation, and his hand to the realization of that which was ornamental. It is only out of the surplus strength of hand and brain that works of art proceed.

That branch of art, to which, as architects, we are devoted, had its origin in an attempt to beautify the buildings which primitive man found necessary for his shelter while alive, for his tomb after death and for a place where he might pay respect to the supernatural.

Architecture is purely an art of space, as music is of time — an art of light, as music is of sound — an art which appeals to the eye, as music does to the ear — an art which produces its effect by composition of line, form and color, as music does by composition of rhythm, melody and elocution — an art which is removed from an aggregation of heterogeneous forms and inharmonious colors, as far as music is removed from a mingling of discordant and conflicting noises.

Buildings which only pay respect to necessity, might be called the noise of architecture. Those which consider quality as well as quantity introduce an organization of elements through which an artistic result may be produced. The varying ratio of energy devoted to the needful in a material sense, and to the desirable in a spiritual sense, measures the progress from the absence of architectural art to its highest development.

Architecture being an art of precedence, forms and motives when once accepted tend to perpetuate themselves in use, even for long periods after their original meaning is forgotten — possibly in materials for which they were not intended, and in which they never would have been produced. It was many a century from the early timber buildings of Egypt to the mastabas of the fifth dynasty, and yet we have the crystallization of wood construction in these later productions in granite and limestone. It was two thousand years from the wooden sun shelters of Chaldæa to the palaces of Essarhaddon, but some of the details familiar to the eye of the early ages, when both civilization and architecture were in a formative condition, were retained in the best materials the later Mesopotamian empires could furnish. Some of the details in palaces of Assyria, which were built two hundred years before the time of Pericles, not only were transported twelve hundred miles to the new civilization on the Mediterranean, but were carried from their origin in sun-dried brick to the marble of Classic times. The guilloche from the palace of Assurbanipal, and which was older than Hellenic civilization, is still retained among us as one of our most effective ornaments.

But not greater was the conservatism which resisted any change in form and decoration, in the empires of antiquity, than is the conservatism of more modern times — even in our own country, in the nineteenth century. While we claim to be free to adopt any detail we please, we are, nevertheless, copying the detail of past ages — not only using it in the material where it reached its perfection, but in any other material that we have at hand, and without reference to whether the material is suitable for the detail or not, and without much thinking of the place and manner in which it was formerly employed.

The cause of this tenacity of historic forms rests, probably, in the fact that the most fertile mind — much less the average designer — is not able to produce, from the use of the material and the purposes in the structure, an entirely original supply of forms, especially within the limit of the time allowed for the purpose. This demand for more than can be wrought out for the occasion, causes continuance in the habit of copying — copying even thoughtlessly — from existing buildings and familiar designs. Again, through the sense of sight, forms fix themselves in the mind, and when the designer is called upon to use *some* form, he naturally turns first to those which "hang on memory's wall."

But while this tenacity of old forms must be recognized in the consideration of our subject, it is equally true that no material has ever become the chief, in a class of buildings, without lending the influence of its qualities to the design of the structures where it was used. Very soon a new requirement has arisen that could not be met by the old materials, and for which the new would answer — and the new was forced into prominence — lending a new quality, in proportion or detail, to the design.

But what is new must begin with the old as a basis, so that the style of our times will be influenced not only by new materials brought into use, but also by those which have been in use, and which have already lent their impression to the work of the past; because architecture is a record of the past, as well as a statement of present conditions.

Our subject is undoubtedly intended to include not only past, but future influence as well, upon the development of style. The past will be historic, the future prophetic. There is not as much to disagree about in that which has passed, as in that which is to come, and yet no two persons will make quite the same selection of facts from which to form an opinion, even of what now exists — hence, opinions must differ. But when it comes to that which is to occur in the future, the field for difference of opinion widens. It may be that opinions printed now will be read with much mirth — if they are read at all — after what is to happen has happened. But with all the past as a foundation — as a base upon which to support predictions of the future — it may be that some little part of the future can be estimated.

The materials of which buildings are erected always affect the design to a greater or less extent. All historic styles of architecture possess certain peculiarities of form and detail induced by the character of the material, in the use of which the style was developed. Any style will have a definable relation to the materials available when it is undergoing formation. History presents some interesting proofs of the influence of material on style. The great buildings of the Nile Valley, which have lived to carry the story of Egyptian civilization across a silence of so many centuries, bear unmistakeable evidence of the abundance of stone at the beginning of Egyptian greatness, while the ancient Mesopotamian cities could rise from their earth-bound sleep of two thousand years and exhibit their buildings to prove the scarcity of stone in that country, when Ourkam bid his nation of thinkers erect temples for the worship of Istar. Even the Greek, who crystallized the toys of his youth in the monuments of his manhood, never forgot the timber which built the shelter for his ancestry, although he petrified his houses of wood into temples of marble.

The wonderful difference between the proportions of modern buildings since steel construction has come into use, and those which were the prevailing custom prior to that date, is noticeable upon all hands, particularly in this country. The most remarkable of these changes is the extraordinary height to which buildings are now carried in some American cities. Another noticeable change, is the great unbroken window surface closed-in by plate-glass, which prior to the present age was impossible. Not only the exterior, but the interior of buildings, has been greatly changed by reason of steel construction. Vast floor-spaces are now opened up, with but a few small supports for what is above, and the same is repeated story after story. To whatever extent plate-glass has made it easier to furnish light, its use has resulted in great benefit to humanity, whether it has overturned former architectural notions or not. To whatever extent steel construction has made it possible to have lighter, better and safer buildings, more ample and better arranged floor-space, more comfortable and safer offices, it has been a benefit to mankind, even though it may have entirely overreached our ability to govern it, as an architectural element. No more need be said of the possibility of extending floor-space without being broken by roof supports, than to call attention to the main hall of the Liberal Arts Building at the Columbian Exposition at Chicago, a room some 400 feet wide, 1,200 feet long and 200 feet high, without a post or pier anywhere to break the well-nigh boundless continuity of floor-space. In this direction it may be said that steel construction opens up a possibility of greatness hitherto unknown. This is one decided influence already realized. If you say it is more a feat of engineering than of architecture, I say, in reply, that this is only because architecture has not been able, as yet, to measure up to its privilege, under the reign of glass and steel. While these possibilities have had an extensive influence upon the height of buildings, the extension of rooms and the question of light, considered in a practical sense, it is, perhaps, not the direction in which we are supposed to discuss this question.

Let us turn to the influence that steel and plate-glass have exerted upon the exterior of these buildings. Here their influence is written in legible lines by the numerous *attempts* which have been made to vary the proportions of historic styles of architecture to fit the requirements which have come with the use of these two hitherto unknown materials. These *attempts* are mostly failures, as viewed from an artistic or architectural standpoint — no, they are not failures, they are only unsuccessful efforts. They are not failures, for they prove to us what *not* to do, and that we must know. Their influence is negative, but it is wholesome. They prove to us that our ideas must be reformed and expressed in a different architectural language. Up to date we have witnessed the building of walls — or what seemed to be walls — 200 feet high, supported only on small piers, scarcely able, if they *were* piers, to sustain their own weight. We have tried hard to admire the result, but have failed. The untruthfulness of the expression was too evident. Then, we have built walls very plain and simple, and that seemed to have a negative kind of merit, but we were not satisfied with it. Next, we have tried to decorate the façades — supposed to be walls — with forms from one style of architecture or another, and, like the man with the roads in Arkansas, whichever style we have tried, we wished we had tried some other one. Then we have lost our patience and decided

[1] Paper by Mr. J. W. Yost read at the Annual Convention, A. I. A., Nashville, Tenn., October 21, 1896.

that steel, as a building material, was a destroyer of our peace, and we have tried to get city councils to pass ordinances, saying that steel construction should not be allowed. We have tried to drive it out of town, by limiting the height to which buildings might go. Then, when we find these efforts a failure, we go back and try some other style of architecture, and perhaps we plaster the details of a Greek temple or Venetian palace all over a sixteen-story front, and try to comfort ourselves with the fact that we have done as well as anybody else. We place columns one, two and three stories high, upon the top of one another, or by interspersing them with a few tiers of impossible arches produce a sort of architectural grille, which looks as if it ought to be built lying down, as it apparently has no ability to stand up. And we feel "real mad" at some newspaper critic for saying that "it looks as though the builder had got hold of the elevation with the wrong end up." After this, we meet our brethren of the profession, afflicted with similar tribulations, and we solemnly resolve that tall buildings are an architectural monstrosity. This seems to be the history of the past. It is largely a record of our failure to accommodate our architectural notions, and the details of historic styles to the new conditions induced by the use of steel and plate-glass. But what of the future?

It so occurs that plate-glass and steel construction are directly opposite in character, and yet both work toward the same end. The steel may be said to be the positive quantity, and the glass the negative quantity. The steel is the solid — the glass the void. The glass can fill the space which the more positive material does not care to occupy. The great strength of steel posts tends to reduce the width of piers, the glass stands ready to fill the increased space between. The strength of steel girders tends to widen the space between posts, and the glass is ready at hand for the greater duty of closing the larger opening. It may be said therefore, that if steel construction is the master, plate-glass is the faithful servant. The great strength of steel has a tendency to reduce the solids and increase the voids, to reduce the thickness of walls, and decrease the depth of shadows. The character of posts and lintels is such as to induce the use of straight lines, and the same influence is exerted by the difficulty of using curves in the windows filled with plate-glass. The influence of these characteristics would be in the direction of angularity of style.

Being a material quickly affected by fire and weather, steel must be enclosed by some shield for protection. Instead of its brick or terra-cotta covering attempting to preserve the appearance of a wall, when it has lost the substance of a wall, it will, by-and-by, fall into its true position as a covering for the steel, and begin to take the form of, and exhibit, probably in conventionalized form, the detail natural to the steel construction itself. Already it is seen that to attempt to make a building, the frame of which is steel, look like a stone building or a brick building is a caricature on all decent building art. It is not less an architectural fraud — an artistic monstrosity — to imitate a brick building by the forms used, when steel constitutes the chief building material, and when the brick, if left alone as it appears, would not stand for a moment. But as the steel will give certain suggestions to the form of the covering, which are natural to the steel construction and not to the covering material, the material used for the covering, on the other hand, will tend to give to the design certain of its own peculiarities. Hitherto the covering has practically given all, and the steel nothing, to the detail. The constructive forms of the past have been continued in use, as well as the decorative motives, whether they have been suited to the material in which they are wrought or not.

Sixteen-story buildings have sought to avoid the appearance of height by adopting some manner of design by which their real altitude could be partially concealed. Breadth and comparative lowness have become such desirable qualities, in our minds, that we have been willing to make that seem low which was not low, and solidity and repose have been so desirable, that we have sought to supply the appearance of these qualities to buildings where the whole purpose was in the opposite direction. But, it has become evident to the intelligent designer that we must stop trying to make a twelve-story building look like a distorted Greek temple, and must stop trying to use forms which must be distorted in their proportions in order to fit requirements at variance with any which such forms can properly answer. The fact is that the problem of a design in steel and plate-glass for a tall building is a new one, and it cannot be solved by the old rules. There is no use trying to convince ourselves, or anybody else, that the little piers laid up with brick are the real piers; we see at a glance they are not. They would be crushed instantly if they were. There is no use trying to lead anybody into the idea that a brick or stone wall can be laid across a twenty-foot void, with nothing to support it. There is no use trying to conceal the fact that what we see is only a covering of the real building material, on whose efficiency the structure depends. There is no use trying to hold longer to the antiquated notion that only comparatively low buildings are architecturally creditable. There is no use, either, of our entertaining the idea that because steel cannot be successfully used in proportions suitable to stone, that, therefore, steel is not a good material for architectural purposes.

The fact is that the wall and pier and buttress, hitherto the strength and support of the building, have no reason for an existence under the new conditions. It is, therefore, possible to conventionalize them as the Greeks did the wooden cornice when they built in marble, or it is possible to omit them altogether as features of the design, as the builders of the Middle Ages did with the entablature, when they had no further use for it.

There seem to be four parts to be disposed of in the design for a modern steel building: First, the continuous posts; second, the lintels between stories; third, the panel of brick or other material which fills the space between posts and lintels; and fourth, the windows. It seems to me that while the steel must be concealed from the elements, it should not be concealed in the design, and that the surface of the building should take the form of a covering of continuous posts, and a covering of horizontal members between posts, and the filling-in of the panels which intervene. It would seem, also, that neither of these three should be so designed as to make believe that it is the support of the structure, but the covering of posts and lintels should show that it is a covering, and a covering only, of that which is the support of all. It would seem, furthermore, that this screen and covering should take on its true character, and appear to be what it really is, and not pretend to be a wall.

The reflex influence of this change from the old ideas in the design of buildings where steel is really used, will be a tendency to harmonize the design of other buildings to express an architectural relationship with them.

Thus, we have the influence of steel construction and plate-glass: first, the tendency to greatness, especially in the direction of greater altitude and greater dimensions for interiors; second, a tendency toward angularity of style; third, a tendency to better illumination; fourth, a tendency to decrease ponderosity of structure; fifth, a tendency to entire reformation in the use of forms and motives of ornaments.

In accepting — as I think we must accept — radically new ideas of architectural propriety and fitness, we do not — must not — lose sight of the principles upon which all architectural art is founded, without reference to the style in which the expression is made.

In architectural design the elements are few — the combination infinite. Line, volume, texture, light, color — these are the notes which compose all the wonderful harmonies in the world's architecture, by variation, combination and organization. Each element has its own language, — its own influence in the picture, — its own way of affecting the sensibilities, according to its own unvarying law. The aggregated sensation is an emotional resource which we call feeling. The designer may play upon these notes like one who sings a song by air, knowing nothing of the science of music. He may not even think why any element of his design produces a given effect. He may not even know that it does, but a master of design must be a master of its elements, as a great artist must know the nature and effect of each pigment he uses, and a musician must understand the scales which are the basis of all musical composition.

If in a building we desire an effect of dignity or of frivolity, of severity or grace, of boldness or delicacy, of rudeness or refinement, we must make use of those combinations of elements which will produce the desired result. A design with equal lines — be they ever so long, equal volumes — be they ever so large, colors in equal key — be they ever so rich, is only confusion and weakness. It has the evenness of death, no expression, and is devoid of feeling. In the ideal design, the longest lines must be assisted by shorter lines grading down to the shortest that will distinctly reach the eye. The great volumes must be judiciously contrasted with volumes less and still smaller in size, until they reach the minimum that the eye can readily distinguish. The cube must vary to the line in one direction and to the sphere in the other. The color must vary in key to produce a balance between extreme intensity and the lowest key definable to the eye. These elements, properly marshalled and proportioned, are nature's contribution to the design. But all these when carefully balanced, until the sharpest criticism fails to find a point of attack, only produce a result like a beautiful organism ready for action, but awaiting the breath of life. That which must make this image of beauty a living reality, that which must animate and vitalize it, is the human element in the picture — the spirit of the designer who speaks life into the dead clay, or steel, or stone, and gives it a voice to join in the song that through the greatest of the arts creation sings for man.

SOCIETIES

THE SOCIETY OF BEAUX-ARTS ARCHITECTS: COMPETITION NO. 7.

THE Committee on Education has to report that the judgment of the last exhibition of drawings entered in competition was held on October 27th. The Jury was composed as follows: Mr. E. L. Masqueray, Mr. John G. Howard, Mr. E. P. Casey, Mr. A. A. Stoughton, Mr. E. A. Josselyn, Mr. Ernest Flagg and Mr. John M. Carrère.

The awards were as follows:

CLASS A, PROGRAMME. — A PUBLIC MORTUARY CHAPEL IN A LARGE CEMETERY.

First Mention. — Will C. Haskel, pupil of Mr. E. L. Masqueray. Herbert Van Vlack, San Francisco. Robert D. Graham, pupil of Mr. Ernest Flagg.

Second Mention. — Unanimously voted to A. H. Wright, Boston. Arthur L. Nicholson, E. A. Isles, Adolph Mertin and Jas. Hopkins, pupils of Mr. E. L. Masqueray. T. R. Johnson, pupil of Mr. Ernest Flagg. S. P. Hobart, pupil of Howard & Caldwell.

Third Mention. — J. W. Clich, Jr., John A. Robb, John R. Jordan, Chas. H. Darsh and S. S. McGrath, pupils of Mr. E. L. Masqueray. C. L. Brinsmade and G. Edward Escher, pupils of Mr. Ernest Flagg.

CLASS B, PROGRAMME. — A FERRY-HOUSE IN NEW YORK CITY.

Medal was awarded to E. R. Bossange, pupil of Mr. E. L. Masqueray.

First Mention. — Wm. T. L. Armstrong, pupil of Mr. Masqueray.

ILLUSTRATIONS

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

ENTRANCE TO NEW YORK LIFE INSURANCE COMPANY'S BUILDING, MINNEAPOLIS, MINN. MESSRS. BABB, COOK & WILLARD, ARCHITECTS, NEW YORK, N. Y.

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

ENGINE-HOUSE AND BATTALION HEADQUARTERS, ELM AND WHITE STREETS, NEW YORK, N. Y. MESSRS. N. LE BRUN & SONS, ARCHITECTS, NEW YORK, N. Y.

THIS building, of which the fronts are of limestone and cream-colored brick, contains two engines and a water-tower; it is, besides, the fuel depot for the district and contains the Battalion headquarters. Realizing how important a thoroughfare Elm Street is to become after the projected widening has taken place, the authorities and their architects have acted wisely in erecting a building which will give so high a tone to the new buildings that are to postdate it.

DETAILS OF THE SAME.

THE SAYER HOUSE, NEWPORT, R. I. MEASURED AND DRAWN BY MR. P. G. GULBRANSON, BOSTON, MASS.

OTHER details of this house may be found amongst the advertising pages.

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

PALAZZO FARNESE, CAPRAROLA, ITALY: PAINTINGS BY TEMPESTI, IN THE LOGGIA OF THE MAIN STORY.

THE SAYER HOUSE, NEWPORT, R. I.: TWO PLATES. MEASURED AND DRAWN BY MR. P. G. GULBRANSON, BOSTON, MASS.

NO. 27 CHURCH STREET, NEWPORT, R. I. MEASURED AND DRAWN BY MR. P. G. GULBRANSON, BOSTON, MASS.

A GROUP OF DOORWAYS.

[Additional Illustrations in the International Edition.]

NATIONAL SHOE AND LEATHER BANK BUILDING, BROADWAY AND CHAMBERS STREET, NEW YORK, N. Y. MESSRS. J. C. CADY & CO., ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

DESIGN FOR A HÔTEL DE VILLE. MM. E. DUPONT & GUILBERT, ARCHITECTS.

[Copper-plate Engraving.]

THE CHURCH HOUSE, WESTMINSTER, LONDON, ENG. SIR A. W. BLOMFIELD, ARCHITECT.

INTERIOR OF THE SAME.

COMMUNICATIONS

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

"CAST-IRON *VS.* STEEL COLUMNS."

NEW YORK, N. Y., October 31, 1896.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Replying to your correspondent "*X*" in current issue of your valuable journal, I wish to state that the best practice with reference to high buildings seems to favor the use of steel columns in preference to cast-iron, and for these reasons: —

First. — Cast-iron has been known to be in a state of unequal tension due to many causes, thus favoring sudden collapse. Cast-iron column connections are generally *bolted;* instances are known where the story of a building has passed inspection and to save time in going for other bolts, the ones in place have been removed to be used in the advanced construction. Steel column connections are made with rivets.

Secondly. — A cast column is bulky, and from its mere bulk may conceal radical defects undiscovered by the hammer. A steel column is assembled from small and easily inspected and tested members, which are riveted together and become a solid integer; this can not be done with cast-iron.

A building twelve stories high must be fireproof or, at least, consist of fire-resisting construction.

"An essential feature in fire-resisting construction" (and therefore of strong and *safe* buildings) "is an iron or steel frame with such well-designed joints and connections that they will not part with nor lose the larger portion of their sustaining power, even though much softened and twisted."

No buildings in which *cast-iron* columns or *bolt* connections are employed can have this characteristic of good iron or steel construction.

Most of the buildings constructed of considerable height are, or should be, planned like a bridge, with one end fixed. Bridge engineers now make but little use of cast-iron.

The one argument advanced against the use of wrought metal as compared with cast is that the former rusts more. I believe that skilled constructors can and do protect wrought metal so that it will last as long as, if not longer than, cast-iron. I should strongly urge "*X*" to use wrought metal in his twelve-story building.

GEORGE MARTIN HUSS.

PHILADELPHIA, November 3, 1896.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In reply to "*X's*" question, in your issue of October 31, 1896: "In the skeleton construction of a twelve-story building, which is best to use, cast-iron or steel columns?" I am minded to express my own thoughts upon this question.

"*X's*" query is such a broad one that it is difficult to answer it intelligibly.

It is presumed that, by "steel" he means rolled steel containing a small percentage of carbon.

Those who have followed the course of building construction for the last fifteen years are amazed, when they reflect upon the great and rapid changes in methods which have taken place during that period.

When, in former times, the outer walls of masonry were expected to support not only themselves, but also a part, at least, of the floor and roof loads, and when the heights of buildings were small as compared with their areas upon the ground, there was scarcely a question as to what was the best material to use for interior columns; the use of cast-iron was almost universal, except perhaps in mills and factories, where the question of cost decided in favor of wood.

When, however, it became necessary to erect high buildings upon relatively small areas of very expensive ground, and ground that was soft and treacherous at that, then, the constructive method to be pursued became a matter of the utmost importance. The static weights must be reduced to the utmost, because of the inability of the ground to sustain great weights without undue settlement; at the same time the walls must be thin, and the piers and columns small in area, so that the rentable space should be as large as possible.

To fulfil these conditions the skeleton system of construction was devised. Such interest was manifested by architects and engineers in the new method of construction, that it has been rapidly developed to a high degree of efficiency, and has resulted in the development of a distinct branch of the engineering profession at the present time.

Almost all the rolling-mills of importance are now organized for the production of structural work for buildings, so that rolled and riveted work can be erected very cheaply: this fact alone is often an important one in deciding the character of the construction.

With the foregoing remarks in mind, the following observations

may be useful to "*X*" in determining the kind of column best suited for his building:

I have purposely omitted the question of fireproofing, as it can be applied to cast or rolled columns with equal facility.

In the abstract, it may be said in favor of rolled columns that they can usually be made so as to occupy less floor-space than cast ones, because of the smaller factor-of-safety used.

They offer superior facilities for girder and beam connections.

They are less liable to contain dangerous defects.

They are much lighter in weight, thus keeping down the first cost, as well as the cost of transportation, handling and erection.

They can be made in greater lengths than cast columns with less liability of being crooked.

In a similar manner, it may be said in favor of cast columns, that they can be procured at almost any foundry, a comparatively small and inexpensive plant being required for their manufacture.

If they are carefully designed, with all their parts of the same thickness, and without abrupt change of shape, and are cooled in the sand slowly and evenly, they will behave well in service, as the great number of them in successful use will testify.

They are less liable to dangerous corrosion or rust than rolled columns.

Small columns or struts, shoes, etc., are more easily and cheaply made of cast-iron, and may be of more pleasing shape.

If "*X's*" twelve-story building has a large area in proportion to its height, and the ground upon which it stands is capable of sustaining a pressure of 8,000 pounds per square foot without undue settlement, then there is little to say against the use of cast-iron columns.

On the other hand, if the building in question is of small area, or, if the ground is treacherous, so that he must keep his building as light in weight as possible, he will be obliged to use a full skeleton of rolled metal, with outer or "curtain-walls" of terra-cotta or hollow bricks.

If this latter supposition is the case, then the columns should be as long as possible, extending through several stories without a joint, and all column joints should be spliced sufficiently strong to transmit the full column loads: all connections should be riveted.

It may be necessary to take special precautions against the effect of the wind, depending upon how much of the structure is exposed above adjoining buildings, its shape and area upon the ground, and its weight, as opposed to the force of the wind; which may tend, (*a*) to unduly load the leeward columns, (*b*) change the shape of the frame, which will produce cracks and rifts in the plaster, (*c*) produce overturning.

I realize clearly that, while good practice at the present time favors the rolled column, yet, it is not unlikely that the calamitous failure of a rolled frame would produce a revulsion of sentiment toward cast metal. Little has been heard of the possibilities of cast-steel for columns.

Very respectfully,

Charles L. Hillman.

THE ARCHITECT'S PAYMENTS.

Brooklyn, N. Y., November 4, 1896.

To the Editors of the American Architect: —

Dear Sirs, — A society in this city, building a hospital, elects a building-committee, of which I am chairman. A competition among architects takes place; among the many stipulations is this, "*the successful architect shall be the architect of the building and receive a compensation for his services of 5% of the cost of the building.*" After contracts with builders were made, a verbal contract was entered with the architect that he be paid 2½% of the cost at the signing of contract with the builders, and 2½% of each of the successive payments made to the builders.

The Committee is blamed for having made such a contract, *as it was common practice to pay architects at the completion of the work.*

Is not the architect entitled to a further payment of 1%, he having completed all the details required?

I know of no better authority than you, and will thank you for an early reply.

Yours truly, Carl F. Eisenach.

[The "verbal contract" made with the architect conforms to the usual practice of the profession. To be sure, the schedule of charges of the A. I. A. declares the "architect's payments are successively due as the work is completed in the order of the above classifications." From this it would follow that on completion and delivery of "general drawings, specifications and details" the architect could collect 3 1-2 per cent. But it is so seldom that *all* detail drawings are finished at the time of signing a contract, that it has become the custom to collect the last half of the commission as successive percentages on payments to the builder. — Eds. American Architect.]

NOTES AND CLIPPINGS

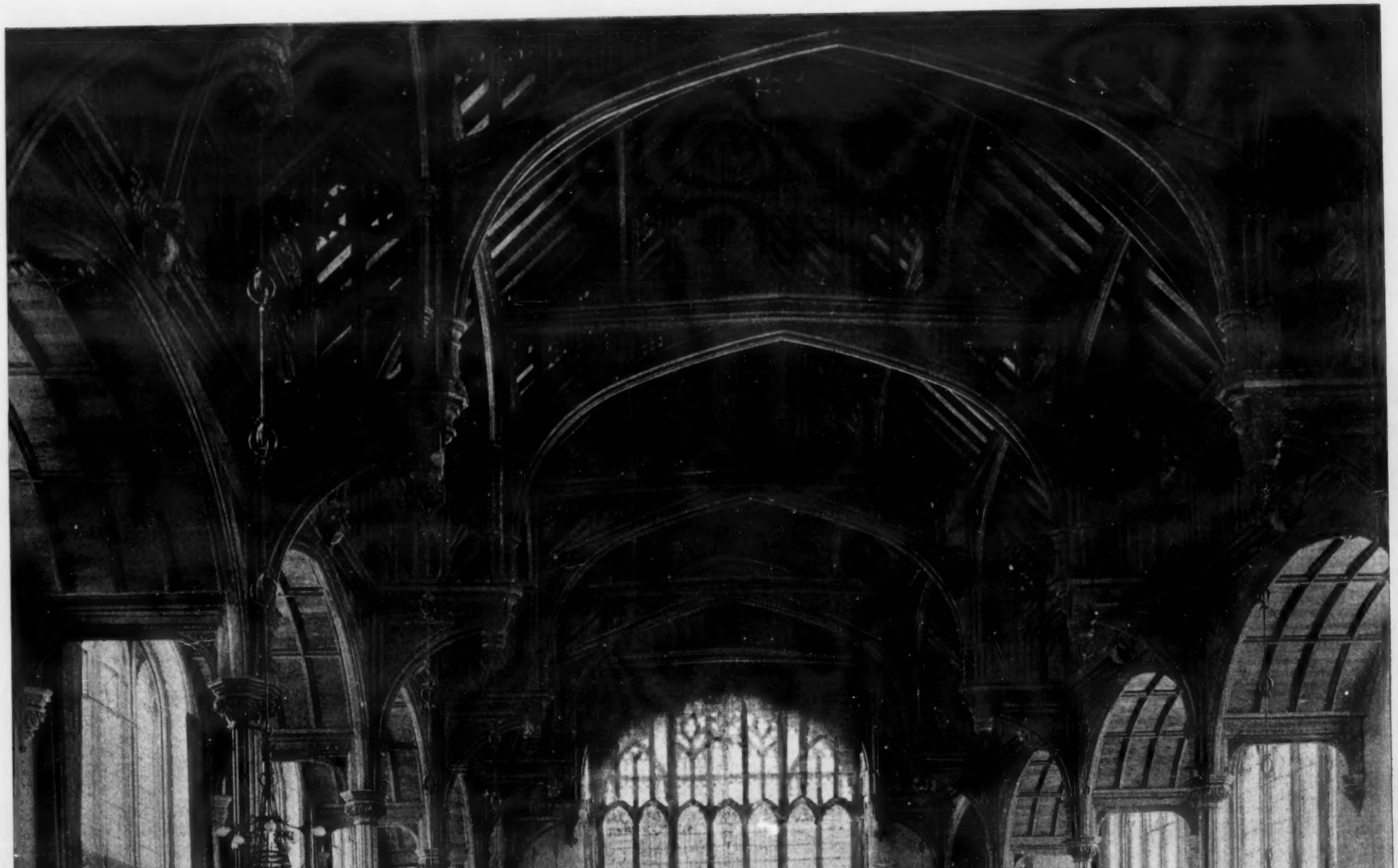
Democratic Slaps at Royalty. — Talking about Brussels reminds me that the King of Belgium has just been subjected to a very unpleasant mark of dislike and hostility on the part of one of the wealthiest and most influential of his subjects, a millionaire of the name of M. Van Der Driesche. Some time ago this gentleman bought a plot of ground in front of Leopold's villa in the Avenue de la Reine, at Ostend, and built thereupon an elegant residence, which much interfered with his Majesty's view. The King caused this fact to be intimated to M. Van Der Driesche. The latter at once pulled down his villa, but has since erected on the site a monster hotel, twelve stories high, a regular sky-scraper in fact, which entirely closes off his Majesty's view and renders the royal villa to all intents and purposes uninhabitable. Curiously enough, the action of the millionaire is meeting with universal approval in Belgium, and even at Ostend, a fact which goes to show the extent to which King Leopold has managed to forfeit the good will of his subjects.

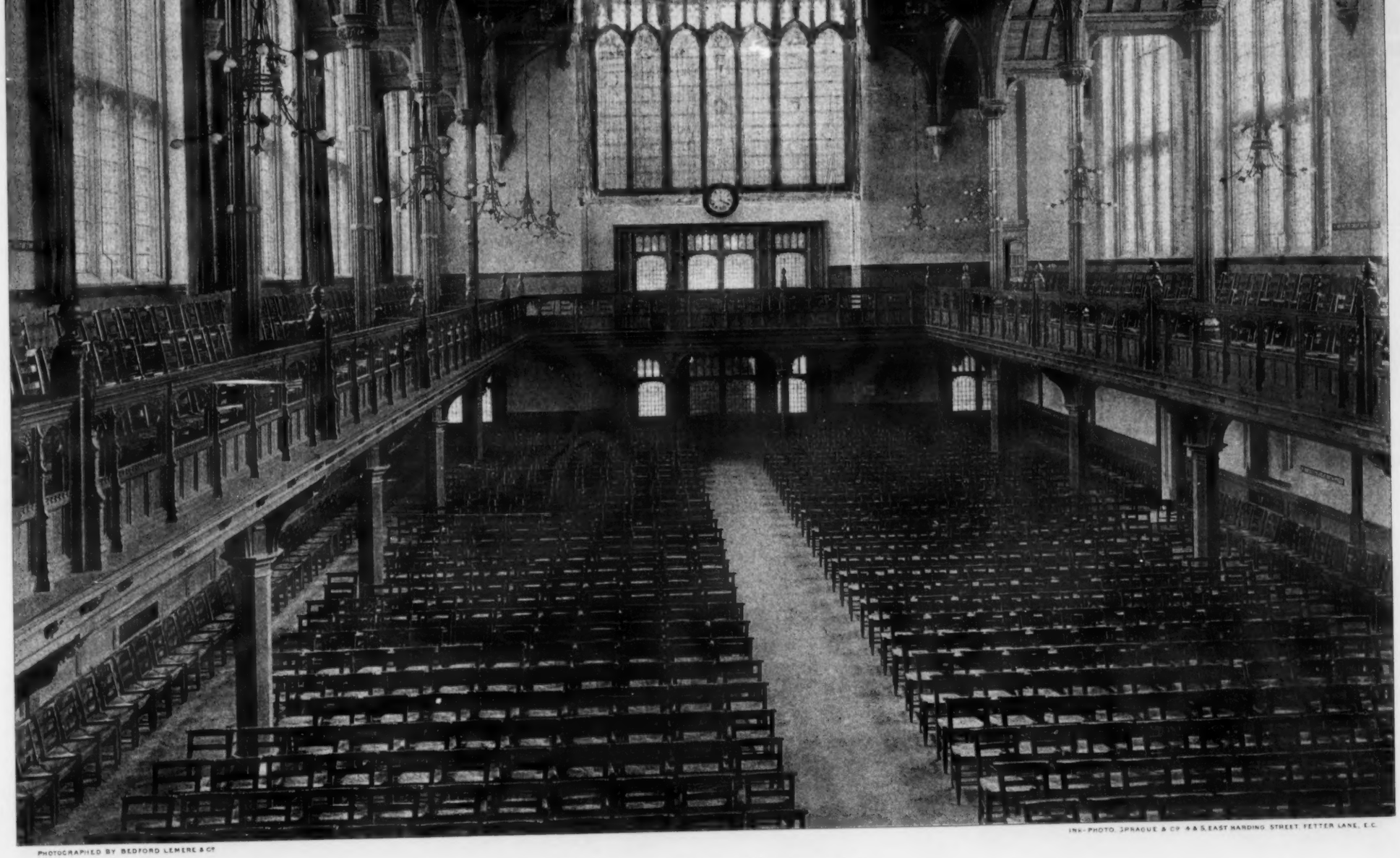
The Emperor of Austria has been driven by the force of public opinion to confer the grand cross of the Order of Francis Joseph upon Baron Nathaniel Rothschild. In the patent conceding the order it is stated that it is by way of recognition of the Baron's munificence in giving his castle and park of Reichenau for use as a home and asylum for invalid and discharged soldiers. But if the Emperor had had his way he would never have granted the honor, seeing that the Baron's abandonment of his château to charitable purposes was merely dictated by spite against members of the imperial family. Some fifteen or twenty years ago the Emperor's brother, Archduke Charles Louis, enchanted with the beauty of the scenery of Reichenau, purchased a large tract of land, built a château for himself and made it his summer home. Forever vaunting the beauties of the place, a number of his imperial relatives, as well as a large contingent of the oldest Austrian aristocracy, were induced thereby to build villas and châteaux in the neighborhood, until at length Reichenau became known as the most exclusive and select of summer resorts. His breast filled with social aspirations, Baron Nathaniel Rothschild came to the conclusion that he might further his ambitions in this direction by buying a property in the neighborhood. This he succeeded in doing by dint of strategy, and before long aristocratic and imperial residents at Reichenau were horrified to perceive that the turrets and battlements of an exceedingly pretentious and by no means picturesque or artistic modern mediæval castle were rising above the trees, vulgarizing one of the most beautiful and conspicuous spots in the valley. As soon as the castle was completed, the Baron established himself there and proceeded to call upon all his titled neighbors, who, acting in deference to the suggestion of Archduke Charles Louis, declined to take any notice of him whatsoever. In fact, the Baron was slighted in every possible way, being even refused tickets to local charitable entertainments to which the very peasants were asked. Moreover, the rights of way accorded to the other residents of the place were denied to him. After a bitter struggle he at length was compelled to abandon the attempt to force his way into Reichenau society and to confess that he had been frozen out. Determined, however, to have the last say and to get even with his enemies, he announced his intention of presenting his château and his estate for the use as an annex of the great cancer hospital at Vienna. Fortunately for the residents, the Archduke's influence was successful in having the gift declined by the managers of the hospital in question, and finding that owing to their dependence upon imperial and aristocratic patronage most of the metropolitan hospitals would show a similar reluctance to take advantage of any offer that he might make, the Baron finally announced he would give the place to the Government for use as an asylum for old soldiers. This time the offer had to be accepted, the Baron having happened to make it just at the moment when the authorities were confessing their inability to provide in a satisfactory manner for military veterans. Reichenau is now thronged with old soldiers, much to the annoyance of the residents, who, however, reflect that it might have been worse and that after all, the veterans are infinitely more picturesque to gaze upon than the inmates of the great Viennese cancer hospital. — *Marquise de Fontenoy.*

Vehement Criticism. — There is a rude force shown by these Englishmen that often compels admiration. Take architecture, for instance. If an old Bostonian objects to some general design or feature of detail, he writes a letter to a newspaper, and in filing and polishing sentences works off his anger. Or he and other estimable gentlemen descend from their family trees for the purpose of draughting resolutions of protest which they sign with the awful dignity of names in full. But in Frognal the other day, an Englishman of very ancient family, one Adam Parent — somehow the name seems tautological — discovered in a walk abroad suburban houses that displeased him mightily. Mr. Parent is fond of architecture. Men say he can recite with only a few immaterial omissions the whole of the first and famous chapter of Vitruvius, and the greater part of Claude Parrault's preface to the translation dedicated to the Grand Monarch. How did Mr. Parent show his artistic horror and contempt? By spluttering in a letter to the *Times*? By going to the nearest "pub"? The enthusiast bethought him of Samson's last professional appearance, and then he walked up Frognal pushing at the brick-and-plaster capitals of the entrance piers of the houses; and these miserable objects either fell out and were broken, or else shifted out of position. As a commentator remarks, "No more impressive rebuke could have been administered to the taste which selected and the workmanship which inserted these curious parodies of Classical style." — *Boston Herald.*

Do Telephone Wires mitigate Lightning Strokes? — It has long been held from practical experience that the network of wires now found in many towns protects those places from the effects of lightning, and probably also prevents many thunderstorms from breaking over them. An official inquiry has been recently made in Germany as to the influence exerted by telephone wires on atmospheric electricity, with a view to set at rest the question whether danger from lightning stroke is increased or diminished by a close network of wires. The inquiry has shown that the wires tend to weaken the violence and diminish the danger of lightning stroke. Returns obtained from three hundred and forty towns provided, and from five hundred and sixty not provided, with a telephone system, show that the danger varies in the proportion of 1 to 4.6 between the two cases. — *Invention.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.





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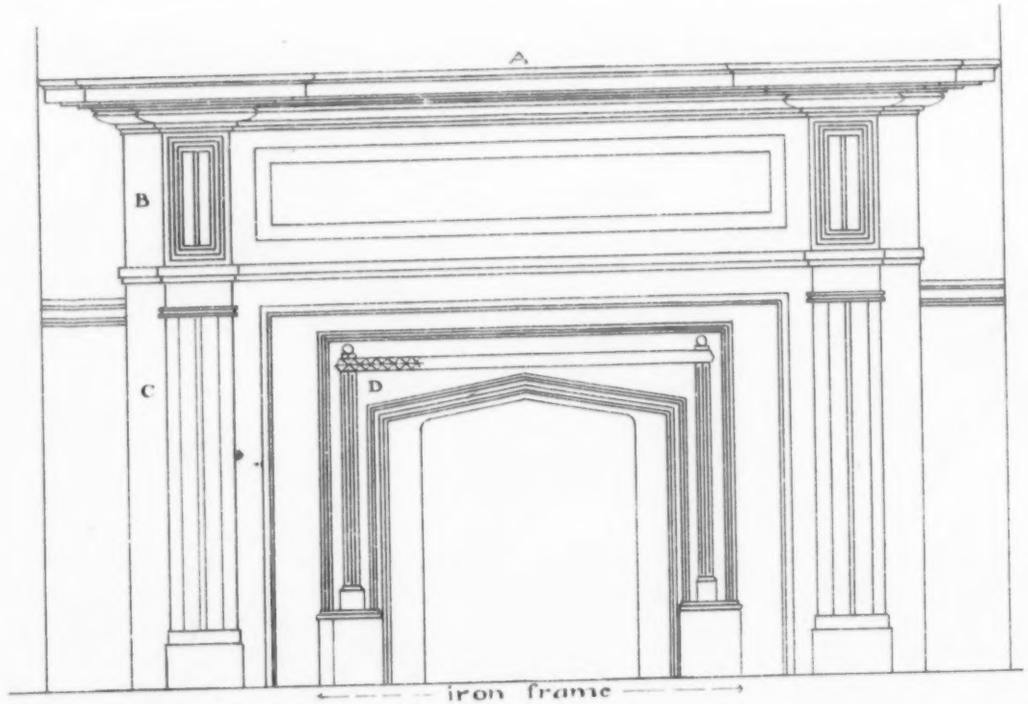
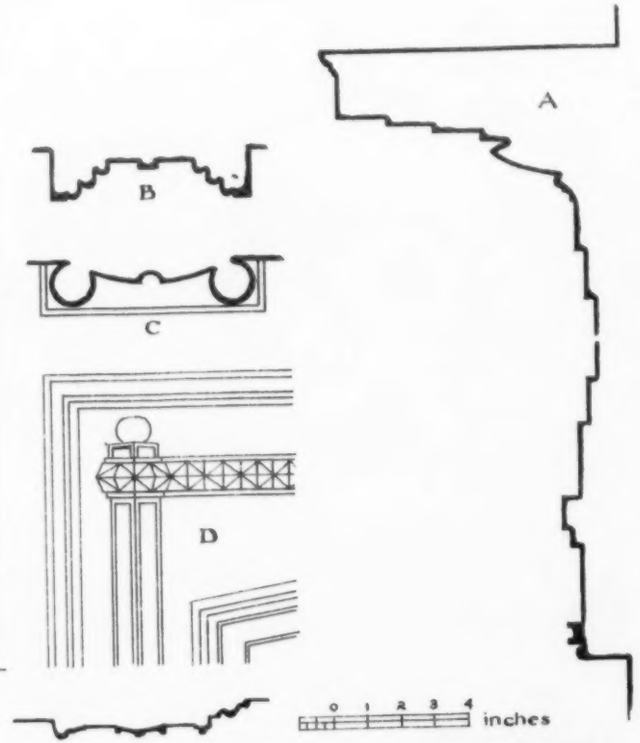
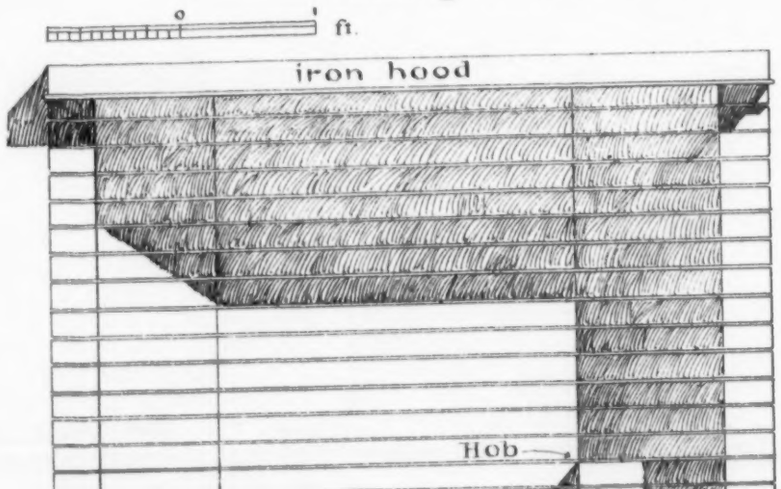
THE CHURCH HOUSE, WESTMINSTER.

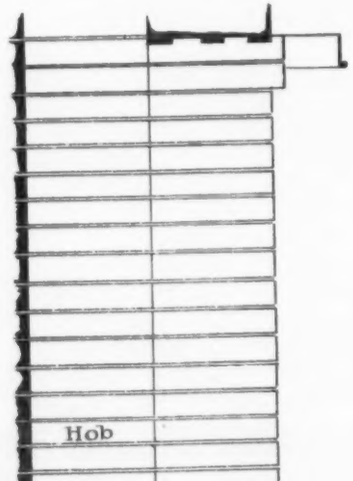
SIR A. W. BLOMFIELD, A.R.A., Architect.

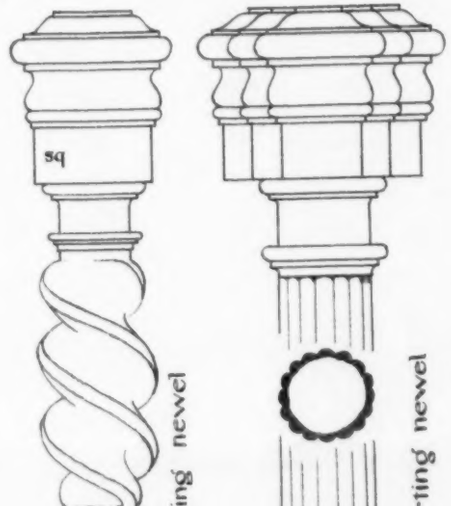


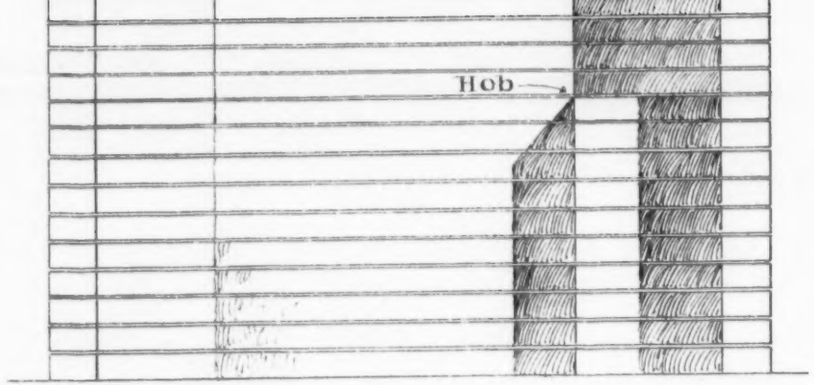


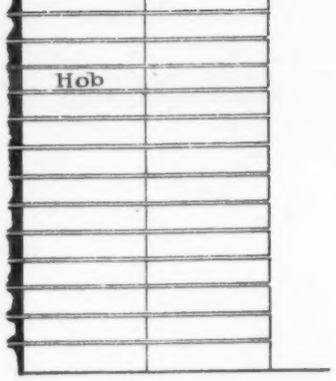
Dining Room Mantel

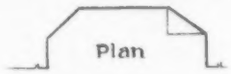






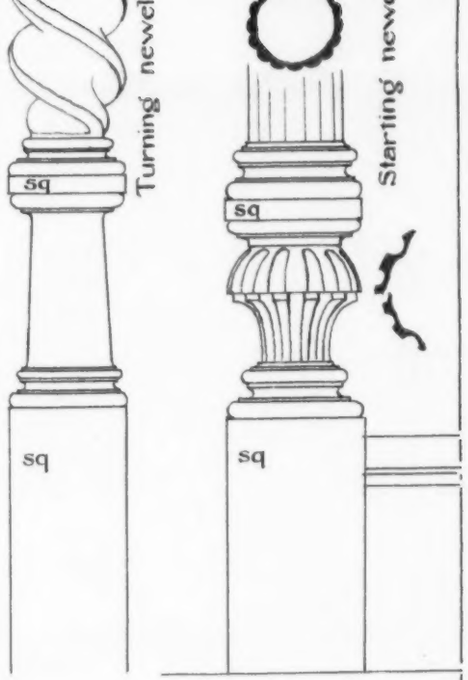






Kitchen Fireplace

Section



Sayer House, Newport, R.I.

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Measured and drawn by P.G. Gulbranson 1894

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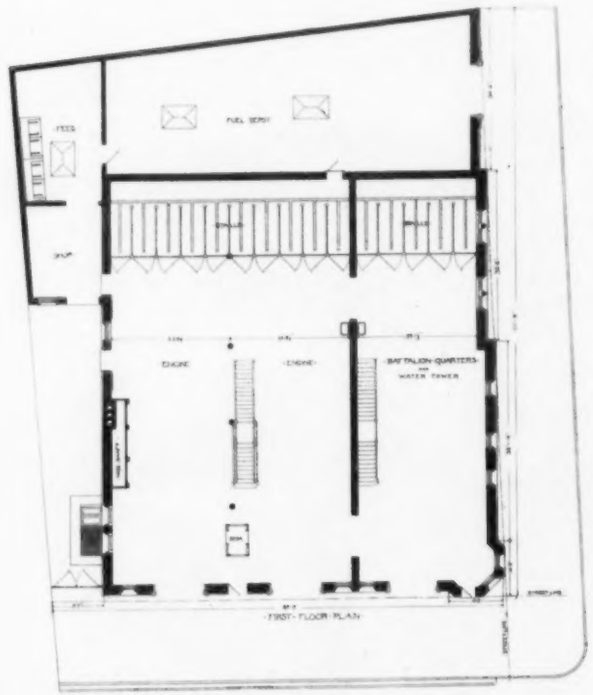
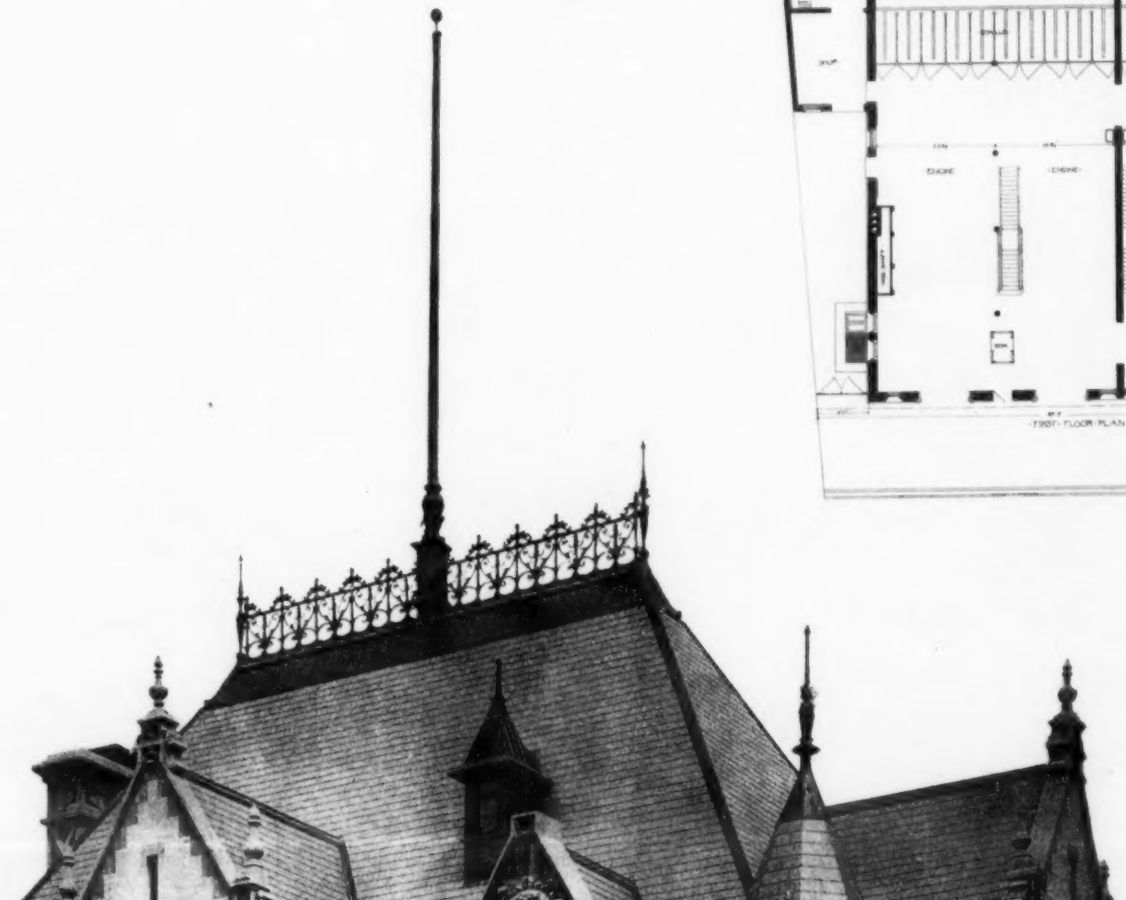

FUEL BINS
ENGINE
ENGINE
BATTALION-QUARTERS
OVER
WATER TOWER
FIRST-FLOOR PLAN



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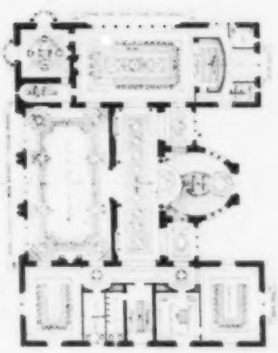
UN HÔTEL DE VILLE.



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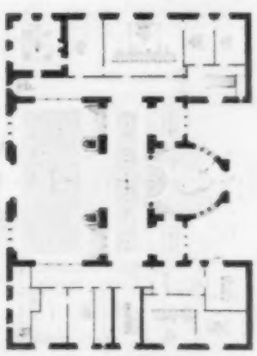

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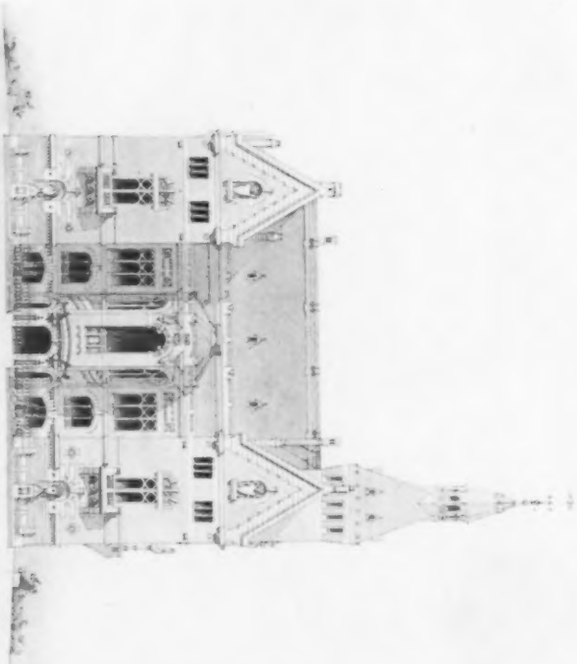

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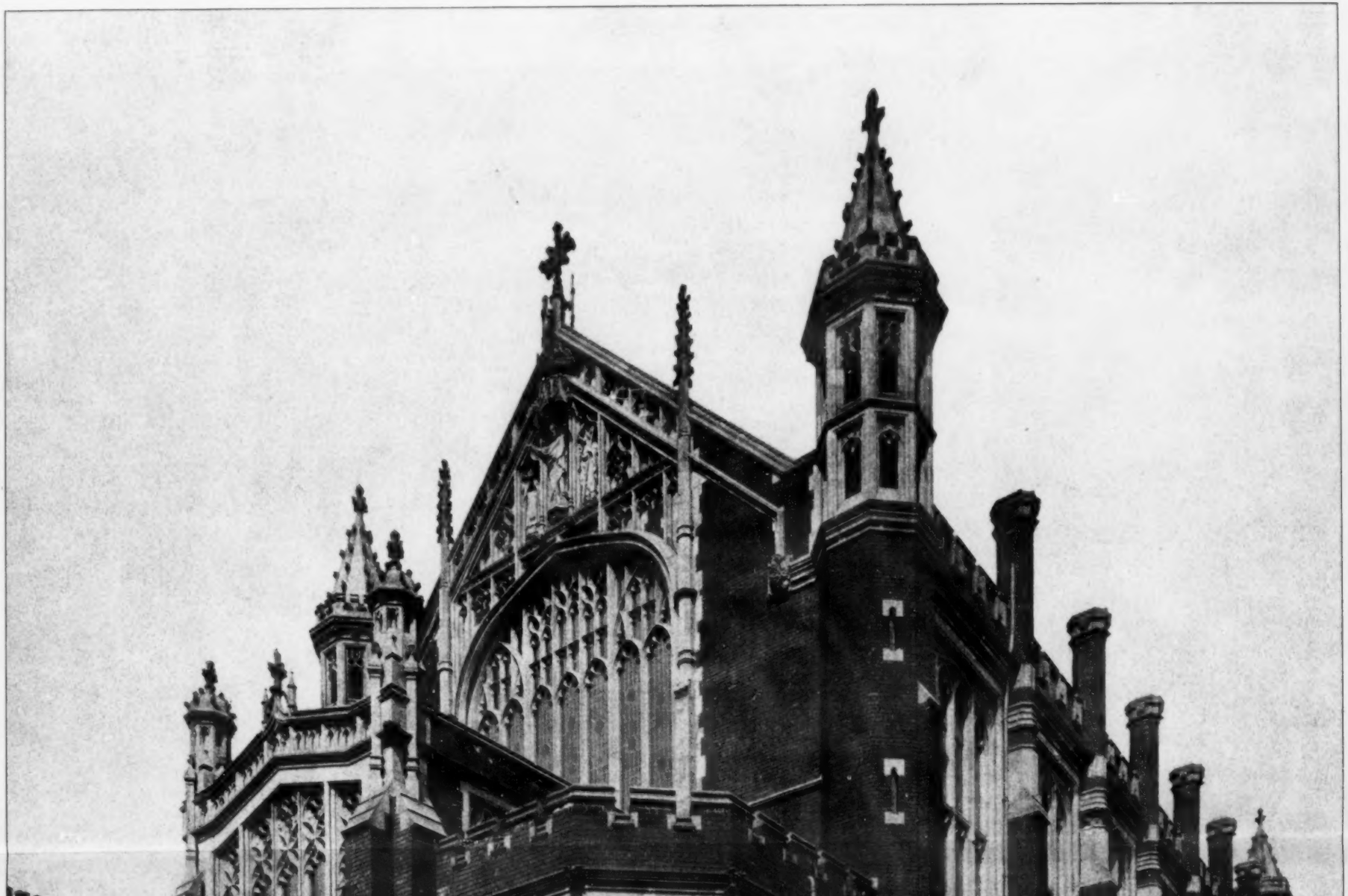

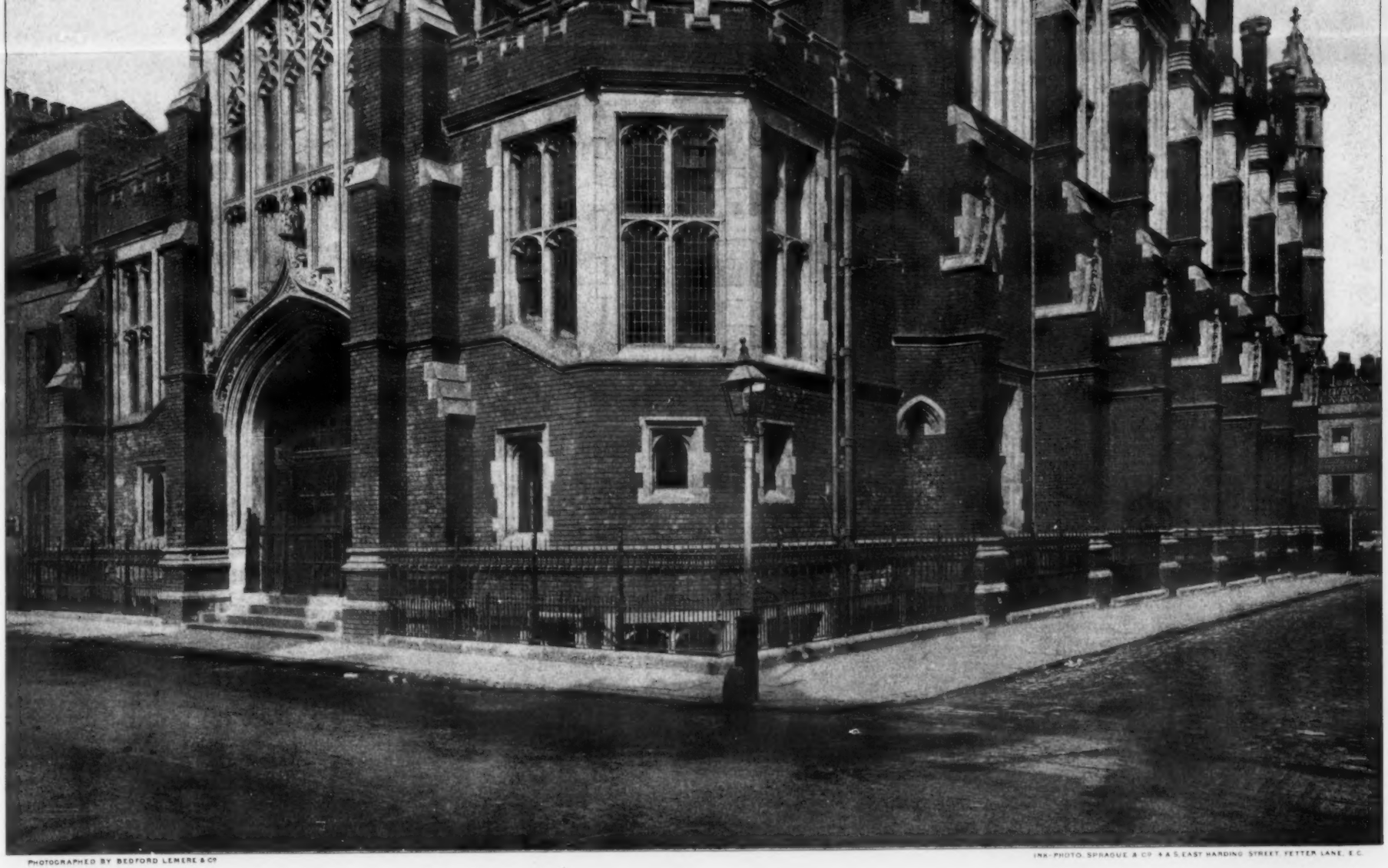

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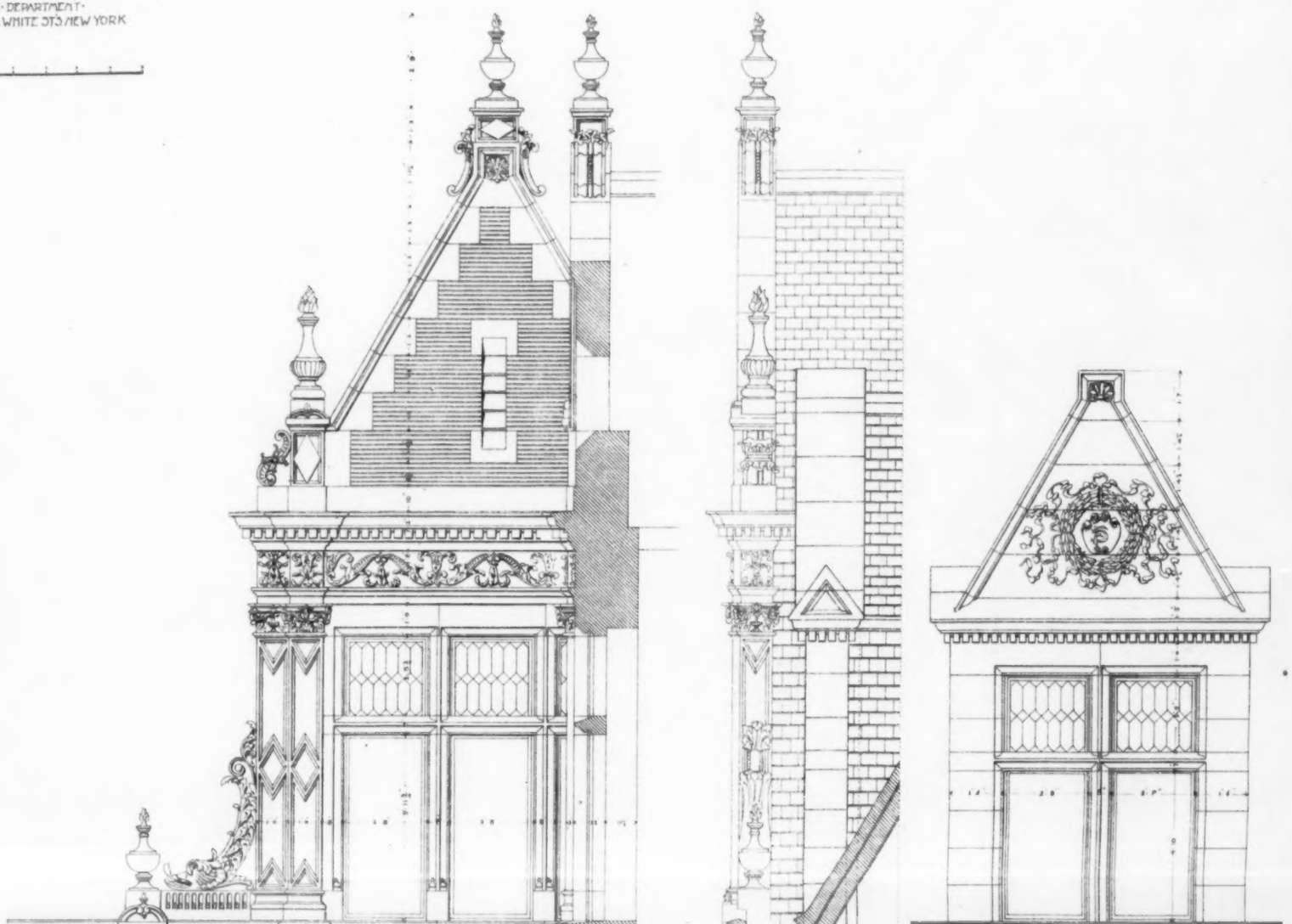


SIDE ELEVATION OF DORMERS
ELEVATION & PLAN OF SIDE DORMERS
31ST ENGINE
2ND BATTALION