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IT is not very many years since it was a matter of course that the men who held public office in Massachusetts should be found simply and absolutely honest. Now, if we understand the present trend of things, this common virtue has become so rare that there is some chance that the State of Massachusetts is to use of the taxpayers' money at least one million dollars merely to create a monument to the integrity, the mere, common, vulgar honesty of three of its servants. If the Bulfinch portion of the State-house is to be destroyed—to the needless waste of public money and with the annihilation of sentimental and historical values—the structure that is to replace it must be held merely a monument to the commonplace integrity of the Commissioners, whose advice threatens to outweigh with the Legislature the arguments of historians, antiquarians and liberally educated men, the deliberate statements of the great majority of the architects of Boston, the protests of men and women who have devoted days to dancing attendance on legislative hearings for three or four years and the attested proposals of builders of unblemished reputation. No one has dreamed of calling into question the integrity of the architect, and still less has the honesty of any of the Commissioners been impeached, and yet these Commissioners, and particularly one of them, seem to take the attitude that to oppose their recommendations is to cast a stain on their reputations. It can hardly be that it has become so rare a thing in Massachusetts to have a public servant approve himself an honest man that it is necessary to erect to these three men's honor a building of doubtful architectural value, in place of one of which the attested value in this particular is enforced by a century's accumulation of historical associations. The Commissioners, seemingly, are urging the demolition of the Bulfinch front as a "vindication" of their conduct of the trust imposed in them. Can Massachusetts find it worth while to exalt the probity of three of her servants at so great an expense, so grave a cost? The overwhelming weight of testimony has shown that the Bulfinch front can be preserved at an outlay of one-third of the money required to build a vindication for the Commissioners, and the Commissioners' own witnesses have been forced to admit that this is so. It seems like a rather costly compliment to pay three men for possessing what used to be a homely, every-day virtue.

WE print elsewhere a letter written by the Chief of the Forestry Division of the Department of Agriculture to the Principal Assistant Engineer of the Lehigh Valley Railroad, in relation to the timber tests which have been made by the Forestry Division. We have before spoken of the great value of these tests, which were made with a thoroughness, and on a scale, which has given them the highest authority, as furnishing accurate constants in computations for which such constants have hitherto been unattainable; and, incidentally, they have answered beyond doubt the vexed question, whether the tapping of the Southern pines for turpentine injures the strength of the timber. As we mentioned some time ago, in referring to the more recent of these experiments, the members of Congress seem much less alive to the importance and the practical value of these investigations than the engineers, architects and builders who make daily use of the materials which Professor Fernow's tests have, for the first time, enabled us to use both safely and economically, and no appropriation has been made this year for carrying on the work, although a great deal remains to be done, especially in the way of testing the Northern-grown timbers. So far, the investigations, as Professor Fernow says, have cost about forty thousand dollars. It is not too much to say that the general use as constants of their tabulated results by the people who use the Southern timber, to which they mainly relate, will save the community at least forty thousand dollars a day; and equal, if not greater benefits would come from similar elucidation of the properties of the Northern timbers. Speaking for the people whom engineers, architects and builders serve, and who spend six hundred million dollars a year for timber, it cannot be too often or too earnestly repeated, that the collection and dissemination of information in regard to the proper use of timber is of hardly less importance than the effort towards the preservation of our forests, which has now become an urgent necessity. To protect and increase our forest wealth, by scientific management, and to lessen the needless waste of timber by instructing the people how to use it judiciously and economically, are but two branches of a single subject, and that subject is one of the important ones with which Congress has now to deal. It is hard for people to realize that the value of the average annual production of lumber in the United States is just about double that of the average production of wheat; yet the prosperity of the whole country, if we are to believe the newspaper economists, hangs upon the wheat crop, which is followed from day to day, with anxious eyes, by public and private statisticians; while the timber product, a crop of far slower growth, and far greater value, is passed over in silence, and the fast diminishing acres of timber-producing land are annually ravaged by vast conflagrations, and their value destroyed for half a century, without attracting so much attention as would be given to an attack of a "hot wind" on a Kansas village. It is time that the timber interests had their turn, and the people who represent them should unite in trying to secure their just rights.

A REMARKABLE paper was read a few weeks ago, before the American Institute of Mining Engineers, in session at Pittsburgh, Pa., by Mr. Alexander E. Outerbridge, Jr., Chemist to the William Sellers Company, of Philadelphia, on the change in the constitution of cast-iron induced by repeated shocks, or blows. The common notion in regard to cast-iron has been that it shared the reputed property of wrought-iron, of becoming "crystallized," or brittle, under the influence of repeated shocks. Mr. Outerbridge, however, when employed, some years ago, in metallurgical work in a manufactory of car-wheels, noticed that chilled cast-iron wheels, if they passed through their first few months of service without cracking, rarely cracked afterwards, almost always lasting until worn out. As chilled car-wheels are always annealed, the possibility that use might have a further toughening effect on them was not thought of, and the fact that the cracked car-wheels returned were generally new ones was attributed to some imperfection in annealing. Quite recently, however, Mr. Outerbridge had occasion to examine for the Sellers Company a large number of standard cast-iron "test-bars," one inch square and fifteen inches long, trying them for transverse strength. In order to hasten the process of cleaning the sand from them, to prepare them for the test, they were put into a

"tumbling-barrel," such as is generally used for cleaning castings, and rolled about for several hours. On breaking the bars in the testing-machine, after this treatment, they were found to show a considerably greater resistance than is usually displayed by test-bars of ordinary foundry iron. The difference was so marked that Mr. Outerbridge determined to investigate the matter further. After making sure that the testing-machine was accurately adjusted, he had a pattern made, with which twelve bars were cast at once, side by side in the same mould. Six of these were put into the tumbling-barrel, while the other six were cleaned from sand with a wire brush. The twelve were then broken in the testing-machine; and in every case the bars which had been subjected to the concussions incident to shaking in the tumbling-barrel showed more resistance than the others, the difference being from ten to fifteen per cent. This experiment was many times repeated, using various kinds of iron, from the softest to the hardest, with mixtures in various proportions of the two, but always with the same result. Many theories were put forward to account for the phenomenon. One of the most plausible explained it by saying that the tumbling rounded the corners of the bars, so that a crack would not start as easily as it would on a sharp arris. To test the application of this idea, Mr. Outerbridge had some bars tumbled, while others, of the same iron, had the corners rounded with a file; but the same difference in strength was found as before. Then several cylindrical test-bars were made together in the same mould, some of which were cleaned in the tumbling-barrel, and others with the brush; but, as before, the bars that had been tumbled proved much stronger. Mr. Outerbridge then concluded that molecular movements, under the repeated shocks, must have something to do with the matter, and he arranged a new test. Six bars were taken, out of a number of similar ones, and subjected to three thousand blows, on one end of each, with a hand-hammer. These bars, when broken, exhibited a gain in strength similar to that acquired in the tumbling-barrel. Many additional tests, under varying conditions, showed uniformly that a gain was secured in castings of any size, but that large pieces, such as two-inch bars, gained relatively more than small ones. A comparatively small number of shocks seem to be sufficient to bring about the increase of strength, which is undoubtedly due to the releasing of molecular strains due to unequal cooling; but the number necessary for different sorts of iron, as well as many other matters connected with the problem, will form the subject of further investigation.

WE sometimes have inquiries in regard to the laws regulating the height of buildings in the City of Paris; and as, judging by the newspaper accounts of hearings before legislative committees, they are often quoted inaccurately, it may be interesting to give a brief abstract of them, according to the revised code, which was adopted in 1884. Article I of the decree says, "The height of buildings bordering the public ways in the City of Paris is determined by the legal width of these public ways for buildings abutting on them, and by the effective width for buildings set back from the street line. This height, measured from the sidewalk or paved space at the foot of the façade of the building, taken at the most elevated point of the ground, and including entablatures, attics and all other constructions in the plane of the front wall, must not exceed the following dimensions, namely: Twelve metres for public ways less than seven and eight-tenths metres wide; fifteen metres for public ways from seven and eight-tenths to nine metres and seventy-four one-hundredths wide; eighteen metres for public ways from nine metres and seventy-four one-hundredths to twenty metres in width; twenty metres for public ways, (squares, streets, boulevards, quais, etc.) twenty metres or more in width." The decree goes on to say that the measurement for height shall be taken at the highest point of the ground only when the width of the building does not exceed thirty metres. Buildings of greater frontage than this, on sloping ground, must be of varying height, following the declivity of the ground; and when several houses are constructed by one builder, each house must follow the rule separately. Where a building is partly on the street line, and partly back, the whole must be within the limit of height of the portions on the street line. A building on the corner of two streets of unequal widths may be carried to the height fixed for the wider street; but the length of the façade at this height on the narrower street must not exceed two and one-half times the

legal width of the narrow street. Where a building fronts on two streets at different levels, the point from which the height of the building shall be reckoned is to be the mean between the highest points on each street; but this is only on condition that the actual height of the façade shall not at any point exceed by more than two metres the legal height at that point. Where buildings, not on a corner, front on two streets, of unequal widths, or at different levels, the height of such façade shall be calculated separately according to the street on which it fronts; but if the greatest distance between the two façades does not extend fifteen metres, the height of the façade on the narrower street, or the one at the lower level may be carried to the height fixed for the wider street, from the highest level.

THE second section provides that where the whole front of a building is set back from the street line, the open space thus left may be counted as part of the width of the street in determining the height of the front; but no buildings are to exceed twenty metres in height, to the top of the walls. It must be understood that all these heights apply only to the vertical walls, and that the roofs come above these limits, subject to the following rules. In general, the profile of the roof, which, in a Parisian building, is almost always of the "Mansard" pattern, must be included within an arc of a circle, having for its radius half the width of the street on which the building faces, but not more in any case than eight metres and a half, and its centre at the level of the top of the vertical wall, as fixed by the preceding rules, and at a point as far back from the ashlar line as the length of the radius; so that the line of the front of the wall is tangent to the arc of a circle within which the profile of the roof must be inscribed. If the street in front of the building is very narrow, the builder is to have the right in any case to a minimum radius for his roof of five metres. All projections must be comprised within the circle, except that staircase enclosures on court-yards may be carried through it, in order to afford means for reaching the upper stories of the building, and chimneys may be built through it to a distance of not more than two metres; and dormers may be placed with their fronts in the plane of the front walls of the building, provided that no part of them extends more than half a metre outside the arc, and that their united width is not more than two-thirds the width of the building. Obviously, a building with walls twenty metres high, and a roof eight and one-half metres high in addition, is tolerably lofty, the sum of these measures amounting to nearly ninety-three feet; but the law provides that under no circumstances shall a building have more than seven stories above the first story, eight stories in all.

AFTER many years of agitation, the Committee of the United States House of Representatives on Coinage, Weights and Measures, has reported in favor of a bill for the adoption of the metric system of weights and measures. Mr. Stone of Pennsylvania, in his report in favor of the bill, states some curious facts in regard to the present standards in use in this country. For example, in Maine, a legal bushel of apples weighs forty-four pounds, while a Wisconsin bushel of the same fruit must weigh fifty-seven pounds. A legal bushel of salt weighs fifty pounds in Virginia, seventy pounds in Massachusetts, and eighty in Colorado; and a bushel of oats varies in weight from twenty-six pounds in Maryland to thirty-six pounds in Oregon. How the wholesale dealers in these and similar products, which are sold by the bushel and pass from State to State, keep their accounts straight, is a mystery, but the embarrassments of merchants are trifling compared with those which chemists and scientific men would suffer, if they had not long ago abandoned the chaos of Troy and Avoirdupois and Apothecaries' weights for the metric system. So far as we know, the principal objection brought against the metric system, when its adoption was under consideration in Congress some years ago, came from the machinists, who pleaded that their gauges and denominations would have to be changed, at very great expense. Since that time, the machinists themselves, driven to despair by the increasing confusion of Birmingham wire-gauge, Whitworth gauge, Stubs's gauge, Brown & Sharpe's gauge, United States gauge, and others, have, in many cases, adopted the metric measurements; and, after the first outlay of remodelling standards was over, the change would probably be felt as a relief, even by them.

A PAPER ON CONTRACTS.¹

A CONTRACT, in the abstract, may be regarded as a condensed expression of civilization. In it are contained forethought, clearness of conception, and mutual confidence, that is, the qualities which distinguish civilized men and civilized communities from barbarians. Ever since history began, the people who have become great and prosperous have been distinguished by the precision with which contracts were made among them, and the strictness with which they were fulfilled, and the perfidious disregard of obligations has always been the mark of barbarism or decadence. The Romans, we might almost say, gained the mastery of the world, against their will, because they were known to keep their promises to each other and to other people, and the corrupt communities of the ancient world, tired of mutual treachery, threw themselves under their protection; and they lost it when Satan had taught them the perfidies which had brought the rest of the world under their feet. It would be too much to say that the rigor with which contracts were observed by the Romans was always beneficent in its operation; the repeated struggles of the debtors against the ruin in which they were involved by the enforcement of their agreements with their creditors show that oppression could sometimes take on the mask of justice; but it was generally some inequality of position or influence between the contracting parties which made such oppression possible, and it was, in principle, as true then as it is now, that the best development of character in the community, as well as in the individual, is to be found in guarding against all kinds of coercion or fraud in the making of contracts, and enforcing strictly those which are fairly entered into.

The great principle which underlies the making of contracts, and which should never be lost sight of by those who wish to have them enforced, is that they must have a consideration; that is, that something must be promised in return for something else. "A promise without a consideration is void," says the law; and a mere promise to do, or give, or lend anything of value, without the offer of something in return, cannot be legally enforced, even though it may be in writing, and signed by the parties. So strictly is this rule observed by the courts that the defence set up by counsel in actions upon a contract is, quite commonly, that the promise made in the contract was without a consideration—that is, was a promise to do or give something for which nothing was to be received in return, and was therefore void; and unless it appears that there was a real consideration, not a fictitious or pretended one, the court will set the contract aside. What the consideration is, so long as it is a real one, is not of much importance. A promise is a valid consideration for a promise, as, for example, in a contract of marriage, where both parties are bound by the promises that they make in consideration of reciprocal promises; and any promise, payment or service, so long as it does not involve anything contrary to morality, or the statute law, or public welfare, is a good consideration for any other promise, payment or service. It is not even necessary that the consideration shall be equal in value to the thing given or promised. There is no law to prevent a man from selling his house for one dollar, if he wishes, but the purchaser on those terms, if he tries to enforce his bargain, will have his conduct sharply scrutinized, to see whether he has practised any deception, or coercion, or misrepresentation on the seller. If not, and if the latter is of age, and of sound mind, the contract will be sustained. If it were discovered that fraud, or coercion, or misrepresentation had been used, the contract would, on the application of the party injured, be set aside, whatever the consideration might have been, on the legal principle that "Fraud vitiates all contracts"; and a bargain with a minor, or a person of unsound mind, cannot be enforced, except where the transaction concerns the purchase of the necessities of life.

An apparent exception to this rule is found in contracts under seal, but these papers are, in strict legal language, not contracts, but deeds, and stand on a plane very different from that occupied by mere contracts. In all ages, it has been customary to make certain formalities necessary for the accomplishment of so grave an act as the alienation of real estate, and, to this day, land, in civilized countries, cannot be transferred without the preparation of a formal document, which must be signed, generally in the presence of witnesses, by the party making the transfer, and sealed with what purports to be the impression of his signet ring. This document is known as a deed, and the signer, at the time of executing it, often goes through the form of saying, "This is my free act and deed," sometimes accompanying the words by placing his finger on the seal. An instrument executed with so much formality would, presumably, have been the subject of mature deliberation, and, therefore, may be considered as expressing the fixed and well-considered determination of the party who has signed and sealed it. Of this mature consideration and decision, the sealing, which is an act of much greater formality than a signature, is the sign, and it is for this reason that all documents, making conveyances or promises, which are solemnized, so to speak, by the seal of the party making the conveyance or promise, are classed together as deeds, and are given certain legal privileges over those which are simply signed. Among these privileges is the exemption of a sealed promise from any mention of a consideration. An ordinary contract is so easily and lightly made that there is always danger of misunderstanding, and the requirement that a consideration must be shown for every promise is simply a wise provision of the law for ascertaining that the person making the agreement really meant to exchange definite benefits. A promise made by a sealed document is different. Here the solemnity of affixing the seal shows that the signer was not indulging in mere idle talk in making the promise to which he attaches his name and seal, and it is not necessary, in order to ascertain whether he made it in good faith, to inquire into the matter of a consideration, which he may have had his reasons for not mentioning. Hence, the law holds that the seal itself "imports a consideration," and it is not necessary to show any consideration to enforce any promise made in a document properly sealed and delivered. In England, a curious illustration is to be found of the peculiar solemnity imparted to a contract by the seal, in the ruling, which is made

by some judges, that a contract under seal cannot be revoked or modified by another contract, not under seal. Where a contractor had agreed, under seal, to have a building completed by a certain day, and the owner had requested him to postpone the undertaking, and he had consented to do so, he was held not to have been excused from his contract; and another contractor, who had promised under seal to build two houses, and have them done by a certain day, and who had agreed in writing with the owner on an extension of time, was unable to recover the agreed price, in an action on the contract, because he had not finished the houses within the time originally contracted for, the court holding that the sealed contract had not been performed, and that the subsequent agreement, not being under seal, could not modify the previous one.

With us, the seal is not of such virtue; and, although a seal attached to each signature in a contract imports a consideration for all the promises in it, and makes it unnecessary to prove the consideration, it does not permit the parties from making verbal modifications of their agreement. Where the intention of the parties is not attested by the formality of the seal, the law only requires, after ascertaining that some consideration was to be given for each promise, to know what the agreement really was, in order to enforce it; and it makes, in ordinary cases, no distinction whatever between written and oral agreements, holding that a man's word is just as sacred as a written and signed paper. Although, however, this is the theory of the law, which will be applied whenever a court can ascertain without doubt what the agreement was, there is, with oral contracts, often difficulty in ascertaining their precise terms; if the parties to them



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¹ Read before the students of the Architectural Department of the University of Pennsylvania, March 26, 1896, by Mr. T. M. Clark, of Boston.

should happen subsequently to differ in their recollection of what was said. Perhaps the majority of law suits spring from the forgetfulness of parties to oral contracts about what they said in making their agreement; and the law recognizes this human weakness by the provisions known as the Statutes of Frauds and Limitations, which expressly say that promises of certain important classes, such as those relating to the purchase or sale of real estate, to services not to be performed within a year, and some other matters, shall not be binding unless made in writing, and signed by the "party to be charged." As in all other matters, the courts lean, in interpreting these statutes, toward the maintenance of the sacredness of contracts, however made, and any signed memorandum of an agreement, from which it can be ascertained what it was, is sufficient to satisfy the law; and it is not usually necessary to have the consideration mentioned in the memorandum, if there really was a consideration, which can be proved otherwise.

Apart from forgetfulness as to what was said in making an agreement, disputes often arise in connection with both oral and written contracts, from other causes. The most serious of these is usually the circumstance that the parties did not understand each other when they made the contract; so that one thought he was agreeing to do a certain thing, while the other supposed he was promising to do something else; the next in importance is the failure of the parties to think of, and provide for, all the matters incidental to the performance of their agreement; and the last is the intentional misleading of one of the parties by the other.

It is, perhaps, a peculiarity of human nature, that the less fitted a man is, by intelligence and training, to understand the agreements that he enters into, the more hasty and reckless he is in binding himself to them. Hundreds of signatures are put every day to contracts which the signers have not even read, much less understood; and it is not until the enforcement of the contract begins to be disagreeable to them that they awake to the consciousness of their folly. Many people, under such circumstances, imagine that they ought to be released from the consequences of their own act, and it is well to know that the law will afford them no relief. Where the parties honestly tried to make their intentions clear to each other, and supposed that they had done so, and, on carrying out the contract, find that they have misunderstood each other, the law, in the person of a judge, will decide what should be the true reading of the agreement; but where one party has expressed fully and fairly the terms to which he meant to agree, without dishonest reservation, and the other has had an opportunity to read them, but has signed the agreement without doing so, he is bound by it just as much as if he had read it. A case of this sort was once tried in Illinois, and, although the contract was written in a foreign language, the court held that if the signer was of mature age, and able to read and write, and capable of understanding the language of the contract, although it might not have been very familiar to him, and if he had had an opportunity to read it, and no artifice was used to induce him to sign it, he was bound by his signature, whether he had read it or not.

At the same time, a man who has signed a contract is not always bound by the other party's interpretation of it, if it differs from his own. In theory, to make a valid contract, the parties must agree upon the same thing. Their minds must meet, as the lawyers say; and, while each party is presumed to have agreed to what the words of the agreement plainly say, cases of doubt or obscurity are, as a rule, interpreted, where there is dispute, unfavorably to the party who prepared the document. This is fair enough, for a man who wishes to bind another to an agreement should see that he expresses plainly what he wants the other to agree to; and the theory of the law is that no one can entrap another, or take advantage of an obscurity due to his own fault. But if a man who has in good faith expressed carelessly the agreement on which he relies is compelled to suffer the consequences of the misapprehension into which his carelessness may have led the other party, much worse will be his position if the misleading has been intentional. There is an ancient story, which bears internal evidence of a Greek origin, about a certain general, who bargained with the inhabitants of a besieged city, that, if they would surrender, "no blood should be shed." They accepted his terms, and evacuated the city, whereupon he buried them all alive. Whatever may be the intellectual merit of this story, it has no legal standing whatever, and the general was as much a violator of his contract as if he had beheaded the people. The law says, that a contract shall be interpreted in the way that the party making the proposition understood at the time that the other party understood it. Evidently, the besieged citizens understood, by the expression that "no blood should be shed," that they would escape without bodily harm, and every judge in the civilized world would rule that this was the true and only legal interpretation of the contract. So in regard to another celebrated case, that of *Shylock vs. Antonio*. Beautiful as the counsel of the defendant may have been, she or the court knew very little law. Certainly, the defendant did not suppose, when he agreed to pay a pound of his flesh, under certain contingencies, that this could be removed from him without shedding blood. A reasonable effusion of this Christian fluid was therefore a necessary and proper incident to the fulfilment of his contract, and he was wrongfully and unjustly released from his own agreement by a subterfuge which an honorable man ought to be ashamed to take advantage of, and which could not stand a moment in any real court. As architects are very

frequently required to judge between the parties to contracts, either as formal referees, or as the persons who must, under the contract, decide whether it has been complied with, it is well for them to bear this in mind, and to try in all cases to ascertain what the parties would reasonably have supposed, when they made their agreement, that it was intended to mean. If they can make up their minds on this point, they will have determined the true interpretation of the contract, and, in nearly all cases, that which a court would put upon it, and will save themselves endless perplexities about the meaning of words, and precedents, and local customs, which the parties never thought of, and which, therefore, never really entered into the agreement.

To take an actual example, a man once contracted with a builder to build a house. The builder made his own specifications, which mentioned most of the work about the building, but said nothing about the floor-boards. When the house was nearly done, the builder sent the owner a note, saying that the flooring was ready, but, as it was not mentioned in the specification, there would be an extra charge for it, and requesting an immediate answer as to whether he should go on with it at the extra price mentioned, as otherwise the house would be delayed. The owner refused to pay any extra price, declared the contract forfeited, took possession of the floor-boards, and had them laid, deducting the cost of doing so from the contract price; and the English courts held that he was right. One of the judges said, "No person can entertain any reasonable doubt that it was intended that the plaintiff should provide the flooring, as well as the other material requisite for the building, and that it was merely by inadvertence that no mention of the flooring was made in the specification"; and the other said "The plaintiff contracted to do the entire work . . . and it is not the less a contract to do the whole, because it is specified that certain parts of the building shall be constructed in a particular way."

Where the parties have really forgotten to mention some important circumstance, necessary to the carrying-out of the agreement, the law must sometimes be called in to supply the deficiency, and it is desirable to have a general idea of the way in which it will do so. As a rule, the law will take the same view of the contract that a reasonable layman would. If, for example, a builder contracted to build a house at such a season that it would be necessary to keep up fires to prevent the plastering from freezing, and nothing was said in the contract or specifications about who should furnish stoves and fuel for that purpose, the law would hold that the builder, having agreed to construct the house in a proper manner, and knowing that the plastering would come at a time when fires would be necessary to protect it, should reasonably be considered as having included the cost of such protection in his price; and, on the other hand, if the contract would naturally bring the plastering in the warm season, and the owner, by changing the plans, or in some other way, should delay the work so as to bring it in cold weather, he would be bound, in the absence of any special stipulation, to pay the cost of keeping it from freezing.

In such cases as this, common-sense will show how the contract should be interpreted; but there are certain circumstances where legal usage is concerned. For instance, it is usually held that the statute law, or the public ordinances of the place in which a building is to be erected, or other work done, form a part of the contract; so that the builder, no matter what his contract or specifications may say, is not obliged to violate the law for the benefit of the other party to the contract; while, on the other hand, he is bound to comply with the local laws, whether his contract mentions them or not. When the laws which the builder must observe are those relating to corporations, his duties may become somewhat serious, for the proceedings of the officers of corporations, particularly of public corporations, like States, towns and counties, are regulated by very strict laws, which take precedence of any contract that they may make; and the builder, or the architect, who relies upon a contract made with county or municipal officials, or officers of corporations of any kind, without ascertaining whether the contract is duly authorized, and has been made with the prescribed formalities, may discover, too late, that no one is bound by their action.

Where questions occur in the interpretation of a contract, which neither common-sense nor the statute law can answer, the courts usually decide them in accordance with such customs or precedents as they find to be applicable to the circumstances. A recognized custom, which would naturally be known to both parties, has almost the force of law, for the reason that, being known to both parties, they must, unless they have expressly disclaimed their intention of being bound by it, be presumed to have had it in mind when they made their agreement, and to have intended to be bound by it in regard to the points to which it might be applicable. A case involving this was very recently decided in Massachusetts. A real-estate broker was consulted in regard to the sale of a certain tract of land. He brought the matter to the attention of a well-known speculator, making suggestions for the improvement of the territory. These were considered with favor, but satisfactory terms for the sale were not made, and the matter was dropped. Some time afterwards, another real-estate broker made propositions to the same speculator about the same tract, and effected a sale. The owner paid the second broker his commission, amounting to some twenty-five hundred dollars, and the first broker then demanded an equal commission for himself, claiming that he first brought the tract to the attention of the person who finally purchased it, and that the

custom among real-estate dealers and brokers was that, in such cases, the regular commission should be paid to both brokers. The jury found that this custom existed, as was claimed, and awarded the first broker the twenty-five hundred dollars that he demanded.

In this case, the jury probably concluded that the owner of the land knew of the custom, or, by familiarity with real-estate transactions, would presumably have known of it; for a custom known only to one party does not bind the other, unless it is so generally accepted in the community that a little inquiry, such as a man would reasonably be expected to make in regard to a subject on which he had no other information, would be sufficient to ascertain it. Amongst such may be classed the custom of paying a five-per-cent fee to architects. A man who had never employed an architect might know nothing of this custom; but if he should employ one for the first time, and nothing should be said between them about compensation, it is reasonable to suppose that he would ask other architects, or persons who had employed architects, what was the usual fee, and, as he could readily obtain the information that he wished, he would be held by most courts to have been sufficiently acquainted with the custom to be bound by it, in the absence of any bargain as to compensation made directly between the parties. In the same way, the local customs of mechanics, which could easily be ascertained by inquiry, are usually held to form a part of contracts with them.

In regard to the last of the three principal obstacles to the satisfactory fulfilment of contracts, the intentional misleading of one of the parties by the other, there will not be much to say. The architect who may have to do with a contract which he suspects to be tainted by fraud should endeavor to have the doubtful points cleared up at the earliest possible moment. If he assists the fraud, by concealing it, he becomes a party to it, and liable in damages to the person injured by it. In general, he should remember that a contract involving a fraud is no contract, and that the person deceived by it may, on discovering the deception, repudiate it, and, if he is a builder, may recover the reasonable value of work and materials furnished under it; or may repudiate that part of it by which he is injured and maintain the rest, if he prefers to do so. To the class of fraudulent contracts belong those based on plans or specifications to which surreptitious additions have been made after the signing of the agreement, or in which some material circumstance, known to one party, has been concealed.

It will be seen that a contract is, in its essence, a very simple thing, and it is well, in the midst of the complexities in which fear of fraud, and necessary provision for collateral circumstances, have involved building contracts, to keep in mind the real simplicity of the substance of the agreement. A man wants a house of a certain size and style; a builder agrees to build it for him for a certain price; this is the essential substance of a building contract. Such a contract may be very simple in form, without impairing its validity. In some States these contracts must be recorded in the office of the town or city clerk, but this is exceptional. In most places, a verbal proposition to build a certain house, or do a certain piece of work, for a given price, with its acceptance, either orally or by writing, is a perfectly good and binding contract. In an actual case, nothing passed between the parties but a memorandum, by which one agreed to build a house, measuring 35' x 40', and three stories high, with a two-story ell, 15' x 20', for a certain price. This memorandum was only signed by one party, but the other looked on without objection while materials were being brought and the work was going on, and he could not have repudiated the agreement if he had wished. It is true that the contract was lacking in the fulness of detail which would have made the design of the house more satisfactory, and the settlement of accounts between the parties easier, and it is simply in order to facilitate such settlement, and insure the conformity of the structure with the owner's ideas, as well as to provide for such matters as the time of completion, the times and manner of making payments on account, the method of ordering extras and changes, insurance against fire, and protection against loss by mechanics' liens, that modern building contracts are extended to such length.

For the very reason that architects know better than any one else the troubles which arise from lack of provision for these collateral matters, they are, except in the case of corporations, whose statute or charter limitations make it desirable to have the assistance of counsel, generally the ones upon whom devolves the duty of drawing up building contracts, and they will do well to keep in mind certain principles, remembering always that simplicity and clearness are the very cardinal virtues of such documents. The worst of all building-contracts, perhaps, are those productions, bristling with "Whereas"es and "Be it known"es, which are sold in the stationery stores. These compacts generally provide that payment shall be made in "lawful money of the United States," just as if a court is likely to rule that the parties, if they said nothing on the subject, meant Confederate or Canadian currency to be the basis of their agreement; while they often forget entirely to mention the matters of insurance, or extras, or the time of completion, or the other things to which the real difficulties of building contracts relate. As a rule, the less legal phraseology there is about a building contract, the better. Legal phrases often have a technical significance, which, if they are used by laymen, tend to obscure the instrument in which they are used, very much in the same way that a specification for building, written by an amateur, would be obscured by the use of technical terms of which he did not clearly know the meaning. It is usual to

divide a building contract into two parts. The first part contains a condensed recital of what is called the essence of the contract, and this is followed by a series of stipulations in regard to extras, times of payment, and so on, with the signatures at the end. Although everything above the signatures is included in the agreement, the courts will recognize, where the parties themselves seem to have so intended, degrees in the emphasis with which they have desired to insist upon certain of its provisions, speaking of these as being of the essence of the contract, and scrutinizing more closely any evidence purporting to show a waiver or abandonment of these provisions, than they would if it related to stipulations not selected by the parties themselves as specially important. For this reason, the first portion should contain some mention of any stipulation in regard to which a claim of waiver may be feared, and which is not a natural accompaniment of an agreement to build. For example, if it is very necessary to have a building done at a given time, and it is desirable to preclude the inferences of waiver of the provisions for completion, which a jury is so ready to draw from unimportant circumstances, the builder should promise in the first, or essential part of the contract, to have it done by a given day, leaving to a subsequent clause the details of the penalties by which completion is to be enforced.

Except for such special stipulation, the first part of the contract should be as brief as may be. The shorter it is, the more authority it will have, as the product of the most careful selection among the stipulations of the agreement; and it should be absolutely clear. It is a useful practice to write it without any punctuation, except the periods at the end of the sentences. When its meaning in this state is unmistakable, the commas may be added. In all cases, the first part of the contract should stipulate for the building of the house, or other structure, according to the plans and specifications, not for doing the work shown on the plans and specifications. We have seen that the English courts hold that a contract to build a house includes all the work necessary for that purpose, whether every item is shown on the plans and specifications or not, unless there is reason to suppose that any part was intentionally omitted; and the law in this country is the same; while a contract merely to carry out certain plans and specifications simply opens the door to a long wrangle over the meaning of every mark on these documents, without affording the owner any assurance that he will, in the end, get the house that he wants, or, indeed, any house at all. It is the fashion just now among builders to claim that a contract to build a house according to certain plans and specifications exposes them to loss, through having to supply things not mentioned in these papers, which turn out afterwards to be necessary to the completion of the building; but the builder certainly ought to know better than the owner what will be necessary to the full completion of the structure, and if the owner is willing to pay the builder for any risks that he may incur in this respect, there is no reason why the latter should not assume them.

When the contract has recited that one party agrees for a certain consideration, or one to be subsequently described, to build for the other party a house, according to certain plans and specification, and to have it done on a certain day, it has said all that is strictly necessary; and the stipulations in the succeeding clauses hardly do more than promote the convenience of the parties, particularly of the builder, in making settlement. Where nothing is said in a building contract about the times of payment, the law assumes that the contract price was intended to be paid in one lump, within a reasonable time after the completion of the building; and the provisions for payments on account are made for the convenience of the builder, just as those requiring the architect's certificate are for the security of the owner. In the same way, the stipulations in regard to the ordering of extras are intended simply to assure the builder payment for extra work, while they secure the owner against misunderstandings, or extortion on the part of the builder. Architects, who know from experience how such misunderstandings arise, should be able to provide against them, and nothing more is necessary than a clear and simple statement of the method by which the parties will agree to regulate these matters. In the same way, the special matters which many contracts involve should be provided for simply and sensibly, in such a way that the parties cannot possibly misunderstand what each is to do.

With these matters cared for, and an understanding arrived at as to who shall insure the respective interests of the builder and owner against fire, the contract is complete. It is usual, and desirable, in the interest of both parties, to fix a certain penalty for each day's delay in the completion of the building beyond the contract time; but the builder is just as much bound to pay damages for delay without such a clause as with it. The only difference is that, if completion is delayed, without any provision for a stated forfeiture, the owner, who is unquestionably entitled to collect or retain compensation for whatever damage he suffers from delay, is likely to put a different estimate on the injury that he has suffered from that which the builder thinks suitable to the circumstances; and the result is controversy, expense and general unhappiness; while the establishment beforehand of an agreed forfeiture simply substitutes approximate certainty for uncertainty, and shows each party what he has to count upon.

At the end of the contract come the signatures, with or without seals, and here, again, great formality is unnecessary. It is not necessary that both parties should sign, if one signs, and the other acquiesces, tacitly or otherwise, in the carrying-out of the operations

contemplated by the contract; nor is it necessary to execute two copies, one copy, if deposited where both parties can see it, being sufficient. The witnessing of the signatures is, in most States, also unnecessary. Its only advantage is to furnish a means of proving that the parties really signed the contract, in case they should deny it; and, in some cases, it is inconvenient, as the witnesses may have to be brought long distances to identify signatures which no one thinks of denying. In regard to the seals, as has been said, they serve to "import a consideration" for stipulations, such, for example, as some of those relating to insurance, for which there is no obvious consideration in the contract, and it is desirable to have them attached, mentioning that the signers set to the documents their "hands and seals," and, of course, specifying the date. It is also very desirable to have one complete set of the drawings and specifications signed, in order to identify them beyond question, in case of need, and the architect should naturally be very careful not to allow any alterations or additions to such signed documents. It is not necessary even to deliver the contracts, so long as they are kept where both parties can see them, if they wish, as, for example, in the custody of the architect; and signed plans and specifications should, as a rule, remain in the architect's care, as he alone is in a position to make a fair and intelligent use of them. With such a set of plans and specifications, well thought out, well made, and signed by both parties, and a clear and sensible contract, providing for all reasonable contingencies, the interests of the owner and builder will be tolerably secure, and the architect's anxieties will be so much relieved that he will find it worth while to devote a good deal of care to the proper direction of this, the first and most important step in the carrying-out of a building operation.

A SYLLABUS OF EARLY CHRISTIAN, ROMANESQUE AND GOTHIC ARCHITECTURE.¹—VII.

GOthic ARCHITECTURE.—HISTORICAL INTRODUCTION.

THE Evolution of Gothic.—The Gothic style does not depend upon the use of the pointed arch alone and the advantages this offers. A well-defined system of forces wherein everything unnecessary is cut away and the essential alone remains, is its chief characteristic. It is thus in the best sense of the word a rational style, and in its precise and well-defined decision as to what is necessary consists both its beauty and its constructive value.

The evolution of the new style began from above. It started from the vaulting and penetrated downwards and outwards to the whole edifice. Such, indeed, would naturally be the case. In all the structures of the vaulted type, the vault is the ultimate result of a long course of preceding preparations made with this object in view. If the vault falls short of what it is intended to be, the previous efforts substantially come to naught. The Romanesque style had done all it could to produce the most satisfactory vaulting; the system of support had been brought up to the height and perfection that the style was able to produce. But much was yet to be done. The style was still in the process of experiment, working its way slowly upwards, and what remained as the matter of most serious consideration was the improvement of the vault, its decrease in bulk and increase in stability, and, in addition, the proper adjustment of it to spaces of irregular shape. There is no doubt that this problem, æsthetic no less than constructive, was the one that more severely taxed the inventiveness of the mediæval architects. Romanesque art as yet knew nothing of the independent ribs; the groins of the cross-vault and the ribs of the compartment, as a whole, formed an integral part of the general masonry. And as for the use of the pointed arch, this had not yet been seen as a serious competitor of the semicircular.

The beginnings of Gothic are rather obscure, but as far as we know, the first and very halting step towards a change was taken in applying the pointed arch to those trapezoidal compartments where the greater height of the outer and the smaller height of the inner bay make the semicircular arch particularly inadequate. The apsidal chapels of the Abbey Church at Morienval in Northern France present this case, and it seems that under the pressure of alternatives equally unpleasant the mind of the architect lighted upon another plan. Instead of the semicircular arch for the lower bay, he resorted to the pointed and stilted arch. The result was not altogether so happy as it might have been, had the use of the arch been less an expedient forced upon a despairing architect and more the fruit of premeditation. But even so, it was certainly a new feature fraught with great consequences for the future. The adjustable quality of the pointed arch, which can be applied to spaces of any size without interfering with the height, was thus brought to the mind of the builder; he could not but see it and take advantage of it.

The history of the beginnings and growth of a system of sustaining ribs is as yet unknown, this important device in vaulting being found fully developed in another of the early monuments of Gothic, the Abbey Church of St. Denis (Paris), to which it has hitherto been customary to trace the origin of the style. The rib skeleton, with a shell of masonry to cover the cells of the vault, as well as the intimate connection between the ribs and the pointed arch, are already clearly and irrevocably established in the choir of this building. It is an interesting fact that both these churches and many others,

wherein are features indicative of the beginning of a new style, belonged to the Benedictine order. Whether we are to consider that the Gothic style was originated by the Benedictine order in Northern France (as by the Cistercian order in Burgundy), and afterwards developed and brought to its highest growth under the auspices of the guilds, is as yet uncertain.

From the reconstruction of the vault the system proceeded steadily to the transformation of the whole building. In Gothic the ribs completely direct the number, disposition and form of the supports. The column, the pier, the semicircular shafts are only the prolongation of the ribs. The vault is to such an extent the starting-point of the system that the architects of the epoch established the plan of the building by means of it. In fact, the case could not be otherwise, inasmuch as theoretically the Gothic construction is composed only of vaults and supports. All the rest is external and decorative.

In regard to the interior memberment it must be said that the whole system of support is utilized in another more surely logical way, each rib having a shaft, the shafts forming a group instead of the single band. Below, the alternation of piers is abandoned; the piers remain usually uniform even in the case of sexpartite vaults, an indication of the more complete system which was to follow, wherein the composite pier and the quadripartite vault are characteristic of the fully-developed Gothic. During the early period a certain horizontalism was maintained, much to the gain of an harmonious appearance, but soon verticalism prevailed and exceeded the idea of fit proportion, the nave became narrow, the piers huddled together, the framework rose higher, the intermediate space was absorbed by apertures, either windows or arches. The wall was substantially no more. The placid interaction of active and passive forces seemed exchanged for exclusive striving, vigor absorbed in intensity.

Hand in hand with the stupendous development of the interior goes that of the exterior. The secret of the efficacy of a style like Gothic is found in the increase in bulk and power of the exterior support. It is the ribs extended and terminated in gigantic erections of masonry, having all the strength and weight the wall was bereft of, that steady the whole composition. These mural fortifications are the final stronghold without which the interior subtleties could not exist.

The buttress, in one form or another, has been a constructive feature of much importance ever since the beginning of architecture. The Romans, experts as they were, used it extensively, but took good care to conceal it beneath some ornament. The Romanesque builders showed a more realistic spirit, and adjusted the buttress freely to the wall; nevertheless, in this style it remains in a rather unfinished state and performs no really effective service in resisting the thrust of the vault. The wall is the chief mainstay. To a certain degree the buttress covers the line of vertical and lateral thrust, but it acts only in portions and with great breaches between the points of mutual adjustment, nor are the portions very strong members in themselves. With Gothic it had to be otherwise.

The increasing verticalism within had to have its counterpart without. The immediate aim was to bring the upper (clerestory) wall in direct connection with the outer or standing buttress. At first this was done very hesitatingly; a whole series of monuments illustrate this grappling with a new idea. In the earlier structures of Gothic type the galleries are still maintained. In these buildings the outer buttress rises beyond the aisle and receives the thrust in the shape of a sloping arch, the so-called flying-buttress, that springs from the clerestory walls. As constructive members, the galleries have no longer any function, the service formerly rendered by their vaults or sloping roof is superseded by the flying-buttresses. The outer buttress, however, is not yet an independent structure, leaning as yet half its bulk on the wall; nor is the exact placing of the intermediate member, the arch, adequately found. It still comes below the mark on the mural band. The Romanesque idea of the sufficiency of the wall and its æsthetic function is still somewhat prominent. Only by degrees does the true Gothic principle reveal itself. The outer buttress must support, rather than lean, on the wall, and it must undergo certain changes that place it in its right position. Instead of retiring, it must stand boldly forward as a huge mass of independent matter. Instead of sloping by degrees towards the foundation, it has to be almost vertical and rise considerably above the point where the arch sets, in order to steady the underlying courses and possess weight enough to bear the thrust. These top pieces take the form of pyramids, or pinnacles, combining a pleasing appearance with an important function. Further, the arches, the flying-buttresses, are brought to bear upon a certain line of thrust on the clerestory wall, beginning below the edge of the roof, parallel with the apex of the vault or slightly below it. They broaden as they spring or set, so as to offer the greatest possible resistance and distribute the thrust upon the greatest possible volume of the buttress. Their slender shape and broad sweep give the outer structure a most pleasing appearance. The upper buttress, the mural pier, also partakes in the general development. It is no longer a shallow band of masonry, but protrudes vigorously, and can bear openings cut through its bulk for passages below the windows. It is fortified by means of slender shafts or short columns, which at the same time increase its decorative value. In buildings with very high naves, the single flying-buttress is usually doubled, one above the other, and in cases of double aisles, as is common in the choirs of most cathedrals of the later type, two rows of double

¹ Continued from No. 1047, page 23.

arches are introduced, an intermediate buttress, in the shape of a square pier receiving and abutting the double rows. Other parts of the building that do not directly serve a constructive purpose, yet to some extent partake in it, conform also to the principle of cutting away all unnecessary bulk, a satisfactory framework being the main object. Thus, in the windows the smallest space is occupied by the stone bars or slender masonry, the remainder being filled with the colored glass. The tower and the façades consist mainly of huge buttresses, the wall being pierced by big windows or tall doorways, and hidden behind a veil of tracery and arcades, so as to disguise its bulk. Even the towers become a series of slender shafts and open galleries in the upper story till the spire, if a spire there be, slopes gently upwards.

In regard to the development of the main features of Gothic, comparatively few monuments will suffice to illustrate the gradual improvement and evolution of the style. The order of these improvements is often somewhat inverted, since none of the structures of early Gothic is homogeneous, but owing to the size of the monument, is generally composed of parts of different date. Some parts of the same building are, therefore, more advanced in style than other parts, or are preceded in style by parts of other buildings. The following list offers in connection with the preceding statement only the general line of progress without affording any account of details, and is succeeded by a survey of the monuments of Gothic order based upon a general consideration of their interior arrangement.

A. GROUND-PLAN.

I. Development in general :

St. Denis, Noyon, Soissons, (Amiens).

II. Development of Choir :

a. Peculiar type (Cistercian) :

Laon.

b. Gothic chevet, ecclesiastical influence :

Senlis, Noyon, Chartres, Le Mans.

c. Gothic chevet, communal influence :

Paris, Bourges.

B. ELEVATION.

I. Beginnings :

Morienvall, St. Denis.

II. Intermediate stages :

1. Development of vaulting :

Noyon, Paris, St. Leu d'Esserent, Chartres, (Amiens).

2. Development of memberment :

a. Interior :

Senlis, Noyon, Laon, Paris, (Amiens).

b. Exterior :

St. Leu d'Esserent, Noyon, Soissons, Chartres, (Amiens).

3. Apertures :

a. Windows :

Paris, St. Leu d'Esserent, Chartres, (Amiens).

b. Roses :

Chartres, Laon, Paris. [South transept.]

c. Triforium : (The change from gallery into triforium goes along with the change from sexpartite to quadripartite vaults.)

Laon, St. Leu d'Esserent, Chartres, (Amiens).

d. Doorways :

Senlis, Paris, Chartres, [Northern transept], Rheims.

C. GENERAL TYPE OF EXTERIOR.

1. Longitudinal View :

St. Leu d'Esserent, Paris, Chartres, Rheims.

2. Façade :

Senlis, Chartres, Laon, Paris, Rheims.

D. THE TYPE IN ITS PERFECTION.

Amiens.

In its utmost refinement and exaggerated :

St. Denis, Beauvais.

General Value of Gothic Style.—In the principle of the independent ribs carrying a vault reduced to its lightest weight, lies not only a new element of architecture in general, but also a new element of building that leaves no restriction upon the creative desire of the builder beyond what static and æsthetic laws may prescribe—to these an architect is generally supposed to submit. This principle permits him to shape his structure in extent as well as in height, as circumstances may call for. In the perfect freedom of production, therefore, based upon perfect constructive knowledge, lies—however strange it may seem—the direct connection between Gothic and Modern architecture, the difference consisting in material rather than in principle.

MONUMENTS.

Chronology :

Early Gothic, 1150-1180.

The Great Cathedrals, 1180-1223.

The highest refinement, 1226-1270.

The final development (Flamboyant style, fifteenth century), and decline 1270—beginning of sixteenth century.

According to French authorities, the Gothic style may be said to have originated in the diocese of Senlis during the Romanesque period. First evidence :

Choir-passage in the Abbey Church at Morienvall, end of eleventh century.

The different monuments of this primitive class are all of minor size and offer no special interest. Other edifices from the period of transition, when Gothic elements were introduced without reforming the character of the building, see above, under "Romanesque style."

The final and decisive step towards a complete interior system is taken in the

Choir of the Abbey Church of St. Denis, near Paris, reconstructed under the auspices of Abbey Suger, 1140-1144. [Points of previous history : founded by King Dagobert I. rebuilt by Pepin and consecrated by Charlemagne, 775 ; destroyed by the Normans, end of eleventh century ; restored during eleventh and beginning of twelfth century ; façade, 1137-1140. Of the original structure remain only the lower part of the choir, the choir-passage, the radial chapels and the main façade.]

St. Denis must be considered the model and originator of the later perfect Gothic edifice. Its peculiarities offered suggestions and virtually started a whole succession of monuments or parts of monuments. The architectural movement was so strong and rapid in its current, that the principles of the new style seem almost simultaneously to have spread everywhere within the boundaries or in the immediate neighborhood of the Royal Domain.

The following groups of Gothic churches and cathedrals, according to the character and the relation of their interior system, may in the main be considered representative of the development of Gothic style in France.

Group I.—Edifices, or parts of such, of four stories, (i. e., gallery and blind arcade). Sexpartite vaults.

Cathedral Notre Dame at Noyon (Royal Domain). [The form of the choir borrowed from St. Denis. The transept with rounded arms. History : old cathedral burned 1131 ; the new one erected 1149. The choir was begun first, as was the rule in this epoch in case resources did not permit the total rebuilding. Finished 1153 (?).]

St. Remy at Rheims (Domain Royal). [Choir rebuilt 1162-1183.]

Notre Dame at Chalons-sur-Marne (Champagne). [The only thing of interest is the choir, 1157-1183.]

Semicircular (Southern) arm of transept in Cathedral Notre Dame at Soissons, erected 1176. [Similarity between it and the arms of transept at Noyon. History : rebuilding of Romanesque basilica began with this southern arm of transept ; the other parts rebuilt later.]

Cathedral Notre Dame at Laon (Domain Royal). [The only one of French cathedrals with square ending of choir. History : old cathedral burned 1112 ; reconstruction begun immediately afterwards ; choir and transept rebuilt between 1155-1174 ; choir semicircular ; changed afterwards ; nave, etc., 1191-1220.]

Group II.—Structures of three stories with triforium. Sexpartite vaults.

Cathedral St. Etienne at Sens (Domain Royal), begun 1140. [In its lower parts related to the Collegiate Church at Poissy. In the upper parts and façade the influence of St. Denis is visible. Peculiar form of choir. Transept lacking in original structure. (The present one added during fifteenth century.)]

Collegiate Church of St. Quiriace at Provins (Champagne). [Choir begun 1160.]

Group III.—Structures of three stories with gallery or triforium. Sexpartite vaults.

Cathedral Notre Dame at Senlis (Domain Royal). [1145 (?)-1183 with the exception of transept and bell-towers. Vaults (sexpartite) in nave no longer exist. Present vaults of much later date. Imitation of St. Denis, especially the choir. Originally no transept. Alternation of piers (round and composite). Structure changed during thirteenth, fourteenth and sixteenth centuries.]

Collegiate Church Notre Dame at Mantes (Normandy) c. 1160-1170. [Peculiar vaulting of triforium. Alternation of piers. Relation between the façade of Notre Dame at Mantes and Notre Dame at Paris.]

Cathedral Notre Dame at Paris, begun 1163-1235. [Five aisles that are continued around the apse. Originally no apsidal chapels. History : Notre Dame composed of two churches, St. Etienne existing since sixth century and St. Mary built by Childbert. Both basilicas. St. Mary repaired 1135 ; the idea originated with Bishop Maurice de Sully to unite both churches under a common title, 1160-1196. The choir and part of the transept finished and the foundation laid for the nave ; the work continued till 1208. The lower parts of the façade, 1208-1219. The portals completed to the height of the great gallery, 1223. The vaults and the upper story renewed after a fire, 1240.]

Church St. Leu d'Esserent (Order of Cluny) (Domain Royal). [Choir 1170 (?)-1180. Church completed during last part of twelfth century.]

Cathedral at Lisieux (Normandy) begun 1136. [The sexpartite vaults superseded by quadripartite after a fire, 1226.]

Choir of Cathedral Notre Dame at Bayeux (Normandy).

Cathedral St. Etienne at Bourges (Domain Royal) begun 1199. [Related to Notre Dame at Paris. No transept. Triforium in inner and outer aisle. Composite piers.]

Choir of Cathedral St. Julien at Le Mans (Maine), 1145-1158 (?). [Related to Bourges. Five aisles with adjoining chapels. No triforium in central aisle. Nave and transept Romanesque.]

Choir of Cathedral at Beauvais, 1225-1272. [Vaults renewed 1337.]

Group IV.—Structures of three stories. The system finally fixed. Quadripartite vaults.

Choir at St. Germain des Pres in Paris. [Finished 1163. Ground-plan similar to that of Noyon.]

Cathedral Notre Dame at Chartres, 1194-1260. [History: Old Cathedral destroyed by fire 1194, except principal façade, bell-towers and crypt. Immediate reconstruction. Nave and choir finished about 1230. Porches of the transept erected 1230-1240 (?). Cathedral burned second time 1836.]

Choir and northern transept of Cathedral at Soissons. [Choir finished 1212; transept, middle of thirteenth century. The nave, etc., 1479.]

Cathedral Notre Dame at Rheims (Royal Domain), 1212-1428 (?). [History: basilica where St. Remy baptized Clovis replaced in ninth century by a church that burnt down 1211. New choir dedicated 1215. Building completed for use 1241. Work was interrupted by the Hundred Years' War. Façade, as it stands, not begun till fourteenth century, but after plans traced during preceding century, 1260 (?) first erection of façade. Towers finished 1428. Reason for the late completion of the façade being an order from the king to enlarge the nave by three bays.]

Cathedral Notre Dame at Amiens. [Most perfect and most clearly planned of all the cathedrals, 1220-1288. History: Carolingian edifice destroyed by fire, 1218. Erection of the new building began with the nave. Choir commenced between 1235-1240. Destroyed afterwards by fire. The façade, 1230-1240 (?).]

Cathedral at Rouen (Normandy). [Reconstructed 1202.]

Cathedral at Sees (Normandy). [Begun 1210.]

Cathedral at Coutances (Normandy). [Reconstructed 1220 (?) - 1274.]

The rebuilding of St. Denis. [1231 — beginning of fourteenth century. Here exclusively composite piers and triforium lighted by windows.]

Chapels:

Ste. Chapelle at Chateau de St. Germain-en-Laye, 1235-1240.

Ste. Chapelle at Paris, 1245-1248.

Ste. Chapelle at Abbey of St. Germer. [Begun 1259.]

VARIOUS TYPES OF GOTHIC OUTSIDE ISLE DE FRANCE: SOUTH-ERN FRANCE.

Burgundy:

Cathedral St. Etienne at Auxerre. [1215-1234 (?).]

Notre Dame at Dijon. [Completed 1234.]

Auvergne:

Cathedral Notre Dame at Clermont-Ferrand. [Begun 1248.]

Choir finished 1285.]

Aquitaine:

Cathedral St. Etienne at Limoges. [Choir begun 1273.]

Languedoc:

Choir of Cathedral St. Just at Narbonne. [Begun end of thirteenth century.]

NORTHERN FRANCE.

Lotharingia:

St. Gengoul at Toul. [Middle of thirteenth century. No triforium. Composite piers.]

Champagne:

St. Urbain at Troyes. [Begun 1264 (?).]

Normandy:

St. Ouen at Rouen. [Begun 1318 — second half of fifteenth century.]

St. Vulfran at Abbeville. [Begun 1488. Flamboyant. Horizontal memberment absolutely abandoned.]

Ile de France:

St. Eustache at Paris. [Begun 1532. The final excesses of the style. The Renaissance at the doorstep of French architecture.]

M. WERGELAND.



PARIS:

THE MAIRIE OF THE Xth ARRONDISSEMENT.

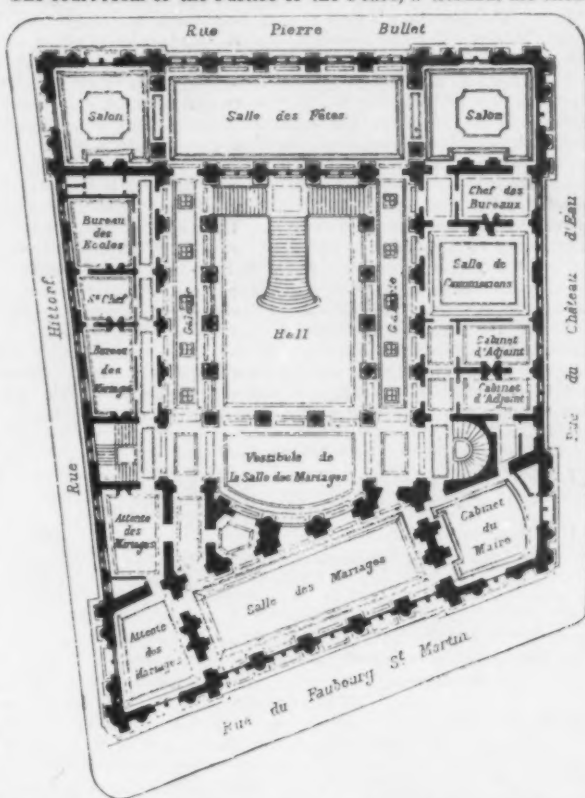
PARIS, which already contains a fair number of remarkable monuments, has lately been enriched with a new one which is to form not the least notable of its architectural possessions. The Mairie of the Xth Arrondissement, just inaugurated, deserves, next to the Hôtel de Ville, the inspection of those who are interested in French architecture. It is a very marvel of the Renaissance style, modernized by the restudy of certain ornamental and constructional details, and does great honor to M. Rouyer, the conscientious artist who has created it.

Born in 1827, M. J. E. Rouyer has won many successes, not only at the École des Beaux-Arts, but in the public competitions in which he took part. In the competition for the Paris Hôtel de Ville, in 1873, he won the second prize, 15,000 francs, and it is rumored that some of the arrangements of the plan of the actual building were borrowed from his design. He also built the Hôtel de Ville at La Neuville, Marne, his native town, the Hôtel Dieu at Château Thierry, and in competition won the commission for the hospital at Boulogne-sur-Mer, in 1877. Finally, it was in consequence of a competition held in 1889 that he was entrusted with the erection of the Mairie of the Xth Arrondissement, at Paris.

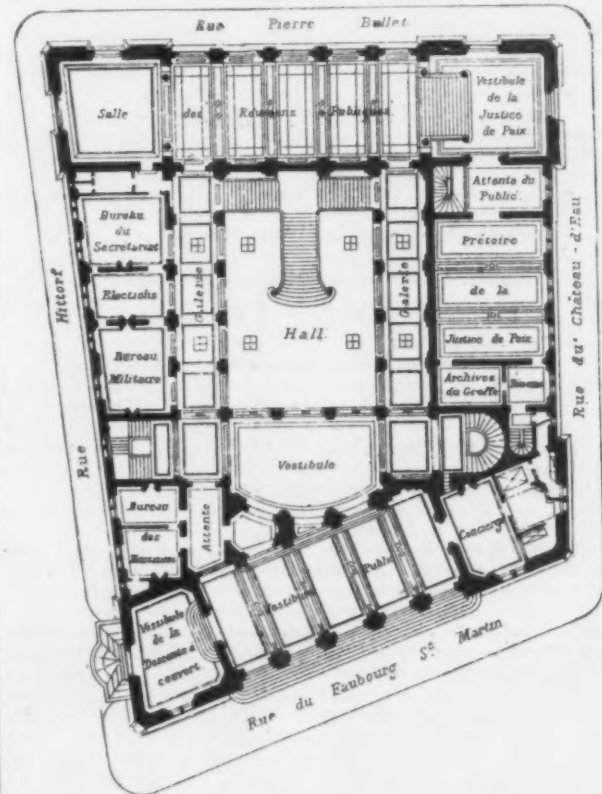
Built on the site of the old Mairie, the new building is wholly isolated, its principal façade giving on the Rue du Faubourg St. Martin. The entrance is boldly declared by five great archways with their glazed doors, protected by wrought-iron grilles, which give access to the public vestibule, raised ten steps above the level of the street. At the back of the vestibule three archways, approached by six steps, give entrance to the great hall which extends the full

height of the building and about which are arranged the various offices. These are, so far as practicable, made independent of one another, and their purposes are so clearly indicated that the public easily finds its way about.

The court-room of the Justice of the Peace, a tribunal the clients



of which are neither the quietest nor the cleanest, is provided with a private entrance from the Rue du Château d'Eau, upon which street faces the most important of the lateral façades. This entrance is made sufficiently decorative to satisfy the feelings of the magistrates.



The court-room occupies an important portion of the ground-floor space. The office of the registrar and the private room of the judge are in the entresol above, in easy communication with the court-room and other parts of the building.

Sharing the same vestibule with the justice court, and thus having

the advantage of a special entrance, is the great public assembly-hall which occupies the full width of the building at the rear. This arrangement is very happily adapted to the fashions of the time, for public meetings are only too apt to be noisy and an irruption of an excited body of men into the Mairie itself might be attended by disagreeable consequences.

To the left of the central hall, on the ground floor, are the offices of the secretary, the registrar of births, the recorder of elections and the bureau of military affairs. In the entresol above are placed the registrar of deaths, the treasurer and the staff of mutual aid officials.

Before turning from the ground floor, it should be noted that the architect has provided a covered *porte cochère* at the left-hand front corner, so that carriages can discharge their occupants without hindering the free approach of those afoot.

Upon the first floor are arranged all the rooms of state: the Salle des Mariages, above the vestibule, is connected at either end with a waiting-room and with the Mairie's private office, and is connected with the great Salle des Fêtes at the other end of the building by long galleries which overlook the hall below. Various subsidiary offices are provided upon this floor as well as in the half-story above, while in the basement is the police-station with its cells, and the heating and lighting apparatus.

The general aspect of the building is quite monumental, the geometrical elevation [See Illustrations] giving but an imperfect idea of the perspective effect of the actual result, the heaviness of the basement treatment and the great height of the roof largely disappearing. The highest floor of the turret is 46 metres above the level of the street, while the apex of its little dome is 5 metres higher.

The exterior decoration, with the exception of the statues which are to be placed in the niches, is quite finished. In the interior the rough work is finished and some of the smaller rooms. The hall, the centre of which is occupied by the staircase of honor, repeats the *parti* of the main façade: in the lower story, full-centred arcades; at the level of the first story a great Corinthian order, with balustrades between the columns, while above the cornice of this order rises a Corinthian attic which supports a glazed ceiling 22 metres above the floor; above all is the roof, glazed in part.

This building, which covers about 2,200 square metres, will cost, exclusive of furniture and electric lighting, about 2,200,000 francs, which brings the cost to about 1,000 francs per square metre, a very modest sum when it is remembered that many unpretentious houses built for leasing cost as much.

At first sight, considering the apparent richness of the building, one cannot understand how the architect has met the modern requirement: to produce a rich effect at a little cost.

The explanation is that, after the manner of a conscientious artist, M. Rouyer, who was unwilling to sacrifice the decorative and architectural qualities of his work, set himself to devise for the interior an economical method of construction. The exterior walls alone are of stone. All the interior walls are of brick covered with stucco to the level of the first story; the columns and cornices are of stucco also, fixed to steel shapes, and the same method was used in building the carriages and hand-rails of the staircase, the steps and balustrades only being of stone. Time alone will show how lasting this method of construction is, although it evidently has its economical side. The question is, Will this jewel of modern art be able to endure for years and centuries? Will all these coatings of stucco resist vibration, and the expansion and contraction of the metal work upon which they are applied?

In the great Salle des Fêtes, not yet finished so far as its decoration goes, in the *salon* of the right wing, is a fine mantelpiece decorated with a great piece of sculpture which won for its author, Dalou, the Grand Medal of Honor at the Salon of 1883. The subject represented is the "Fraternité des Peuples."

The first stone of the new building was laid January 10, 1892, while the official inauguration took place on February 28, 1896, and at that time the President of the Republic, who officiated, bestowed upon the architect the cross of a chevalier of the Legion of Honor. M. Rouyer had long been worthy of this honor because of the architectural merit of his many works and for his ability as an author, as shown in the two volumes of "La Renaissance en France," "Les Appartements de l'Impératrice," and most of all in the two volumes of "L'Art Architectural en France," a work which has become classic and is to be found everywhere in the libraries of architects. This Mairie of the Xth Arrondissement comes, then, as the crowning of an honorable and brilliant career.



PROVIDENCE ARCHITECTURAL CLUB.

AN Architectural Club which bids fair to become permanent has at last been formed in Providence.

For past years there have been endeavors to form something of this kind, but the efforts made have been weak and have lacked support.

But from the large attendance and the enthusiasm manifested at the initial meeting, which was held on Monday evening, March 23d, the Club certainly gives promise of great success, and it now seems

as though Providence is, in this respect, more nearly on a footing with other cities.

At this meeting a Constitution was drawn up and adopted. Norman Morrison Isham, A. M., Instructor in Architecture at Brown University, was elected President and Mr. Harry A. Slocomb, Secretary and Treasurer.

The Club will be called the Providence Architectural Club, the object being to promote architectural study, and any person interested in architecture is eligible to membership by vote of the Club.

After the business part of the meeting a social time was in order. There was a comfortable fire, and the room was blue with smoke—not from the fire. Very desirable quarters have been obtained in the Franklin Building. The room has been fitted very pleasantly with antique furniture in harmony with the building. A number of excellent photographs was exhibited by Mr. Wallis Eastburn Howe, who has travelled extensively through Southern Europe and the Levant.

The meetings are to be held bi-weekly on Tuesdays, but the rooms will be open to members at all times. It is the purpose of the Club in the near future to conduct classes in water-color and pen-and-ink rendering, also lectures of various kinds with lantern-slide illustrations.

Any member of a similar organization will be heartily welcomed by the Club at all times. Address

HARRY A. SLOCOMB, Secretary.

48 Benefit Street, Providence, R. I.



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

HOUSE OF MR. H. J. ESSER, ARCHITECT, MILWAUKEE, WIS.

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



FIRST FLOOR PLAN

SCALE 0 5 10 15 20

THIS house is built on 18th St., near Grand Ave. The size of house is 48' x 78', stone foundation. The first story to cornice is faced with red pressed brick and brownstone trimmings. The building is arranged for three separate dwellings, the north half in

two flats, one each on first and second floors. The floors between flats are prepared with deafening, making the same sound-proof. The south half of building is one separate dwelling, occupying first and second floors, with rooms finished in attic. The centre of building is divided by a solid brick wall extending from basement



SECOND FLOOR PLAN

to underside of roof. Each flat and house has separate front and rear entrances, with separate laundries and cellars. All principal living-rooms are finished in hardwood; the balance in hard-pine, oil finished. The bedrooms and bath-rooms of flats are lighted and ventilated.

THE OTTO STORE BUILDING, BUFFALO, N. Y. MR. E. A. KENT, ARCHITECT, BUFFALO, N. Y.

The stores for John Otto, No. 640 Main St., Buffalo, N. Y., are fireproof, constructed for heavy warehouse loads, with iron and slate stairs, 4 elevators, electric-lights, etc. The front is white marble from Adams, Mass.; from grade to second-story window-sills and thence to roof, cream-white terra-cotta. It has asphalt roof, vitreous fireproof work, the Grey steel column construction and 50,000 feet of maple floors, and is designed for retail or wholesale shops. The cost, about 9 cents a cubic foot, is considerably less than fireproof work of similar character has been let for previously in Buffalo. The building will be begun May 1st and finished in September.

TRINITY COURT, FOR THE EBEN D. JORDAN ESTATE, BOSTON, MASS.: TWO FLATS. MESSRS. BALL & DABNEY, ARCHITECTS, BOSTON, MASS.

The site for the new building is on the corner of Dartmouth Street and Trinity Place, and a new street, the total land area being about 27,663 square feet. The new street runs parallel with the Art Museum and the Boston & Providence Railroad tracks. It is designed to meet the demand for small apartments containing from two to three and four rooms and bath each, in a desirable and central locality for a reasonable rental, and particularly for the students of the Institute of Technology, the art and medical schools.

The plan of the building is a complete quadrangle, with an interior court-yard about 56 feet wide at Dartmouth Street, 184 feet long and 38 feet wide at Trinity Place end, thus having an area of about 7,500 square feet. All the entrances to the building are from the court-

yard. Along the northerly side of the court are three entrances to the stair halls, and on the southerly side four. These stairways continue to the top story and give access to the apartments at each floor. This plan avoids the necessity of corridors and waste of area, and virtually gives a series of separate houses with but two suites on each floor, thus giving privacy to the occupants not otherwise to be obtained.

One of the most important features of Trinity Court is the private school. This school will be equipped with a chemical and physical laboratory, second to none in the country, beside a large play-room, six large class-rooms and one school-room, lighted on both sides, with perfect ventilation, and capable of seating 125 pupils.

On the first floor at the left of the main entrance is the public restaurant, and beyond, on the northerly side of the court-yard, are two large dining-rooms for occupants of the building. Beyond, on this side, is a space to be used for apartments or club-rooms at Trinity Place end, and a private school, and on the southerly side a number of club or society meeting rooms.

The second, third and fourth floors contain 24 apartments each, these being of two, three and four rooms and bath, each, with large closets and open fireplaces in the parlors.

There are no light-shafts or wells in the building, every room and bath-room being an outside room.

On the top floor are apartments at both Dartmouth and Trinity Place ends, while the sides of the court between are arranged for studios, all being accessible from the elevators by corridors carried around to the southerly sides, with studios at the north with skylights in the roof. These studios are arranged the same as single studios, with an alcove and toilet-room, and others with living-room, bed and bath-room.

The material of construction will be rough red brick of carefully selected color, laid in white mortar, with trimmings of Ohio buff sandstone. The roof will be covered with a light-green slate, while the roofs of the dormers will be of copper.

The court-yard will be asphalted, with sidewalks of yellow tile, and will be finished as carefully as the exterior parts of the building. The total cost of the new structure above the land will be over \$350,000.

THE MAIRIE OF THE Xth ARRONDISSEMENT, PARIS, FRANCE. M. J. E. ROUYER, ARCHITECT.

For description, see the letter of our Paris correspondent elsewhere in this issue.

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A GROUP OF FOUNTAINS.

[Additional Illustrations in the International Edition.]

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[Copper-plate Photogravure.]

PAVILION FOR THE SEVRES PORCELAIN MANUFACTORY, EXPOSITION OF 1900, PARIS, FRANCE. MM. SELMERSHEIN & VENTRE, ARCHITECTS.

[Copper-plate Photogravure.]

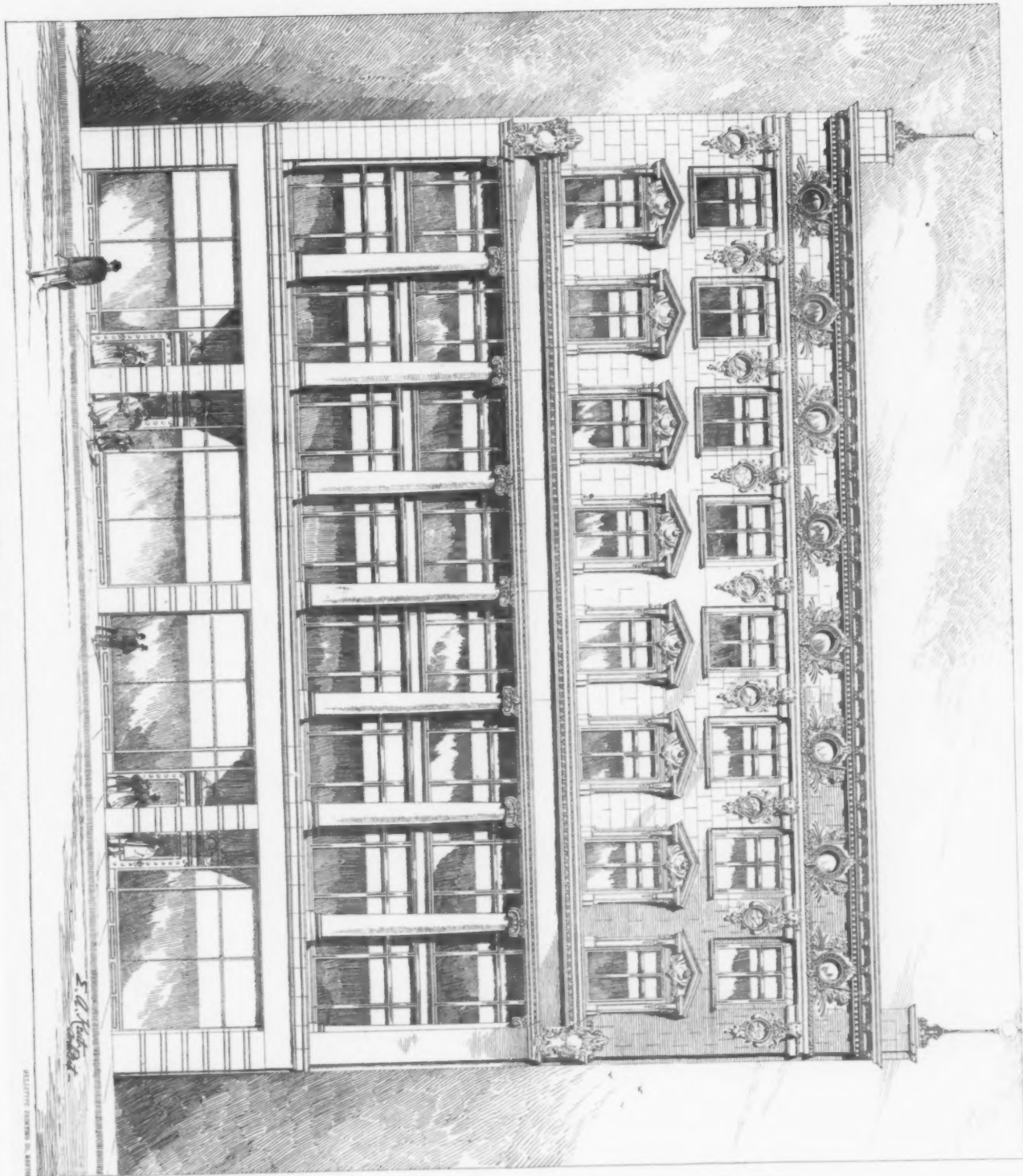
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S. A. HENRY, ARCHT.

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ILLUSTRATION BY H. H. HARRIS

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DESIGN FOR A PUBLIC LIBRARY. MR. PERCY K. NEWTON, ARCHITECT.

The design here copied from the *Builder* is that for which the English Travelling Studentship of the Royal Academy was awarded last year; and the view of the façade was exhibited at the Royal Academy of the present year.

The conditions of the competition merely stated that the site was supposed to be surrounded by buildings on three sides, and was 190 feet long by 60 feet wide. An area of 20 feet was to be left above the level of the first floor, and the building was not to exceed 80 feet in height.

PUBLIC LIBRARY, SOUTH AUDLEY ST., LONDON, ENG. MR. A. J. BOLTON, ARCHITECT.

THE ARGYLL MONUMENT, CATHEDRAL OF ST. GILES, EDINBURGH, SCOTLAND. MESSRS. MITCHELL & WILSON, ARCHITECTS.



[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.]

TIMBER TESTS.

JERSEY CITY, N. J., March 9, 1896.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I enclose copy of a letter I received recently from Dr. Fernow, Chief of the United States Forestry Division, which gives some important information relative to the tests of timber that have been conducted by that Department, and especially illustrates the necessity for professional men and the technical press to urge on our representatives in Congress and the Secretary of Agriculture the need for suitable appropriations, not only to enable this work to be continued, but especially to allow the large mass of unpublished test results to be published.

About 40,000 tests have been made, of which only about 2,150 have been published, which were the tests made on Alabama long-leaf Yellow Pine published in *Bulletin* No. 8, in 1893.

The letter was presented by me at a recent meeting of the American Society of Civil Engineers, and I have the permission of the Secretary of the Society to allow it to be made public.

I send to you, thinking that you might like to make use of certain facts in the letter to follow up the matter farther.

Yours respectfully, WALTER G. BERG.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF FORESTRY,
WASHINGTON, D. C., March 2, 1896.
[COPY.]

WALTER G. BERG, Esq., Principal Assistant Engineer, Lehigh Valley R. R., Jersey City, N. J.:

Dear Sir,—Replying to your request for information regarding the status of the timber-test work, especially as regards the kinds tested, number of tests and the data worked up, which I understand you desire in order to keep the American Society of Civil Engineers informed as to the progress of this work most interesting to them, I may make the following brief statement:

The total number of tests made at the mechanical laboratory to January 31 was 39,437, which during February will be brought up to about 41,500, when all the material collected will be tested and the work for the present abandoned under the orders of the Secretary of Agriculture.

In the above number the moisture determinations which accompany the tests are included, reducing the actual number of mechanical tests to probably 35,000.

The material for these tests was especially collected in the woods, comprising 356 trees representing 32 species, mainly of Southern growth. The distribution of tests by species stands as follows:

Southern pines (5 species).....	20,341
Northern pines (2 species).....	1,097
Bald cypress.....	4,126
White cedar.....	243
Oregon fir (10 pieces).....	276
Conifers.....	26,083
Gum (red).....	867
Oaks, white (4 species).....	4,052
" black (5 ").....	4,301
Hickory (8 ").....	3,011
Ash (2 ").....	714
Elm (2 ").....	409
Total.....	39,437

You will note, that of Northern timbers only the white and Norway pines have been tested in a small way, and of Oregon fir only a few random sticks sent in by an interested party; all others are Southern.

Of these sticks, only a portion on long-leaf pine was compiled and worked up in *Bulletin* 6. There are, however, now the entire data on Southern pine worked up in manuscript. The average results will presently be stated in an eight-page circular, the status of the printing fund of the Department preventing for the present the issue of a full bulletin. There will then still remain nearly as many data referring to other species undigested.

You will, however, understand that this test work differs from other testing done hitherto, in that it places reliance only on large numbers. Hence, for instance, the 276 tests on Oregon fir would hardly warrant us in drawing any conclusions. They are not better than any other tests, except that their moisture condition is noted, which is, to be sure, one important advantage.

On the other hand, for the Southern pines we may claim to have such a series of data as to make it unnecessary for anybody else to test these timbers again; they cover such a large number under all sorts of conditions, that absolute confidence in the reliability of the data for the range of strength in the species should be accorded to them.

At the same time the confusion existing in engineers' tables with regard to the kind of pine (names or species) should not be permitted any longer, especially since the various species promiscuously referred to as southern pine, yellow pine, pitch pine, etc., differ up to 20% in average strength values.

But the mere establishment of the strength values does not exhaust the usefulness of these data; they were to be used, and will be used, if we are permitted, to establish such relationships as will lead to the formulation of rules of inspection—the most important object of these investigations—as a result of which the engineer or other consumer will be enabled to judge of the comparative value of the piece in hand.

For such purposes the existing data may sometimes not even prove sufficient and would have to be supplemented by new data, obtained under special conditions.

One of the investigations of this nature directly interesting to the engineer is that on the relation of tests on large and small sizes. Here, too, our number of tests is still too small for safe generalization, although not less than 340 large columns and beams have been tested, with the interesting and readily explained result that for symmetrically cut beams (heart in centre), the values are as large and sometimes larger than for the average of the small pieces cut from the same beams; while the columns give mostly, but not always, lower values, yet the results are so variable, that no trustworthy numerical data have been attained, the range in individual cases being as much as 50%.

At present the work will be abandoned for the fiscal year, the allotment of funds having been exhausted, about \$40,000 in all having been spent so far. An attempt to work up the test results, at least for data of strength, will be made.

In the reading of the appropriations for this Division for the next year, the reference to this line of work has been left out and a discontinuance is probably contemplated. A bill making special appropriation for its continuance has been introduced in the Senate (S. 1214), but its passage is exceedingly questionable.

Regretting, then, that I cannot report to you a more hopeful outlook, yours very truly,

(Signed) B. E. FERNOW, Chief.



BALTIMORE, MD.—The Walters Art Gallery will be open to the public on all Wednesdays and Saturdays in April.

BOSTON, MASS.—Paintings recently purchased; the Martin Brimmer and R. Hall McCormick Pictures; Japanese Paintings; Etchings by Seymour Haden: at the Museum of Fine Arts.

Paintings by New England Artists: at the Jordan Art Gallery, 450 Washington St., until June 1.

Pictures and Sketches by Edward W. Emerson: at Chase's Gallery, 346 Boylston St., March 30 to April 11.

Paintings by Frank Wilbert Stokes: at the St. Botolph Club, March 30 to April 18.

Fifty-fourth Exhibition, Water-colors, Pastels, Works in Black and White, and Sculpture: at the Boston Art Club, April 10 to May 2.

Eighth Annual Exhibition of Photographs: at the Boston Camera Club, 50 Bromfield St., April 8 to 25.

BUFFALO, N. Y.—Fifth Annual Exhibition of the Buffalo Society of Artists: March 23 to April 11.

CHICAGO, ILL.—Ninth Annual Exhibition of the Chicago Architectural Club: at the Art Institute, March 31 to April 11.

Annual Exhibition of Chicago Society of Artists: at the Art Institute, April 7 to 26.

NEW YORK, N. Y.—Twenty-ninth Semi-annual Exhibition, including Loan Exhibition of Early American Paintings, Old English Paintings, and the Cullum Collection of Classic Sculptures: at the Metropolitan Museum of Art.

Seventy-first Annual Exhibition of the National Academy of Design: March 30 to May 16.

Eighteenth Annual Exhibition of the Society of American Artists: at the Fine-Arts Building, 215 West 57th St., March 27 to May 2.

De Maurier's Studies for the "Trilby" Drawings: at the Avery Gallery, 368 Fifth Ave., March 30 to April 15.

Exhibition of Competitive Drawings of the Society of Beaux-Arts Architects: at the Fine-Arts Building, April 16 to 18.

PHILADELPHIA, PA.—Sixth Annual Exhibition of Water-colors and Pastels: at the Art Club, March 23 to April 19.

PROVIDENCE, R. I.—Exhibition of the Providence Water-Color Club: at the Art Club, opened April 1.

WASHINGTON, D. C.—The Art Gallery of Thomas E. Waggaman will be open to the public on Thursdays during April.

NOTES AND CLIPPINGS

AUDUBON'S OLD HOME.—The home of Audubon stands on the south bank of the Perkiomen, about three miles east of Phoenixville, Pa. The house once occupied by the naturalist was built a hundred and thirty-six years ago. It is renowned in the region as the "Mill Grove House." It stands on a knoll overlooking the country. The old house is of stone, and the walls are remarkably thick and substantial, and look as if they would stand another one hundred and thirty-six years. They are covered with a growth of ivy. There are several ancient pine trees standing around the house. In the shade of these tall pines the world-famed naturalist did some of the best work of his life. The old house itself has been changed somewhat, but the changes have mostly been wrought within to add comfort and convenience. There is still to be seen the old chimney-corner, where Audubon sat by his tallow candle on winter nights and wrote or read. — *Philadelphia Record*.

THE DUCAL PALACE AT GUBBIO.—Signor Calzini draws attention to the ducal palace at Gubbio, now dilapidated—its best carvings carried off to South Kensington—totering, like the splendid town it once commanded, to a squalid ruin, but originally built, with scarcely less splendor than its more fortunate rival at Urbino, for the same Duke Frederic and by the same architect, Luciano Laurano. An even more sumptuous structure, built some sixty years later, the castle at Trent, still remains intact, with its exquisitely carved columns of Verona marble, its gorgeous ceilings, and its brilliant frescos by Dosso, Romanino and Girolamo da Treviso, cared for by the Austrian authorities, who now use it as a barracks, in a way that should be a lesson to the fussy and slovenly art commissioners of Italy. Signor H. Semper publishes a number of documents furnishing the names of most of the artists employed on this structure, and the precise date of their employment. — *The Nation*.

DUSTING THE WORKSHOP.—It is a rule of many, if not all, insurance companies, in taking a risk upon a wood-working shop, that the fine dust which accumulates in great quantities upon the beams and joists overhead and elsewhere shall be periodically removed. They must be kept clean. It has been shown by experience that this dust develops explosive qualities to almost as great an extent as that of flour mills. By ordinary methods the removal is attended with considerable labor, and in proportion to the amount of labor is apt to be the degree of neglect. At the Atchison, Topeka & Santa Fe Railroad shops at Fort Madison, Iowa, compressed air is made to perform the task with but little work. Air-pipes, says the *Railway Age*, are run through the building overhead, and at intervals they are provided with fittings for the attachment of hose. Once a week a man is detailed who goes aloft and blows the air into every crevice and over every exposed surface. As a result, the timbers become as clean and free from dust as if the building had been but just completed. The improvement in appearance alone ought to be worth the trifling expenditure. The practice affords another, and a very neat, illustration of the many possibilities of compressed-air service.

A PINK MARBLE BRIDGE.—A new bridge to be erected over the Tennessee River at Knoxville, while not to be of unusual size, will be, the engineer in charge says, a wonder in the engineering and architectural world. It is to be built entirely of pink marble, quarried in Knox County and within a few miles of the site. It will be 1,600 feet long from "out to out" of abutments, and will be 240 feet long in the main spans of arch, which, it is claimed, is 20 feet longer than the longest arch in the world. It will rise at the crown of the channel spans 105 feet above the water, making it a decidedly imposing structure. It is to be a solid marble bridge from side to side, with a 50-foot roadway over 100 feet above water, with the four largest spans in the world. The immense arches will be 8 feet deep at the keystone, 15 feet at the skewbacks, or spring lines, and will spring from piers 30 feet high and 40 feet wide. The piers go to solid rock, the substructure limestone, 12 feet below the water surface at the bridge site. The arches and spandrel filling will be constructed of concrete. The parapet walls will be constructed of sawed marble slabs, with heavy blocks on pilasters every 15 feet, projecting above the wall proper and giving what might be called a semi-castellated effect. — *New York Evening Post*.

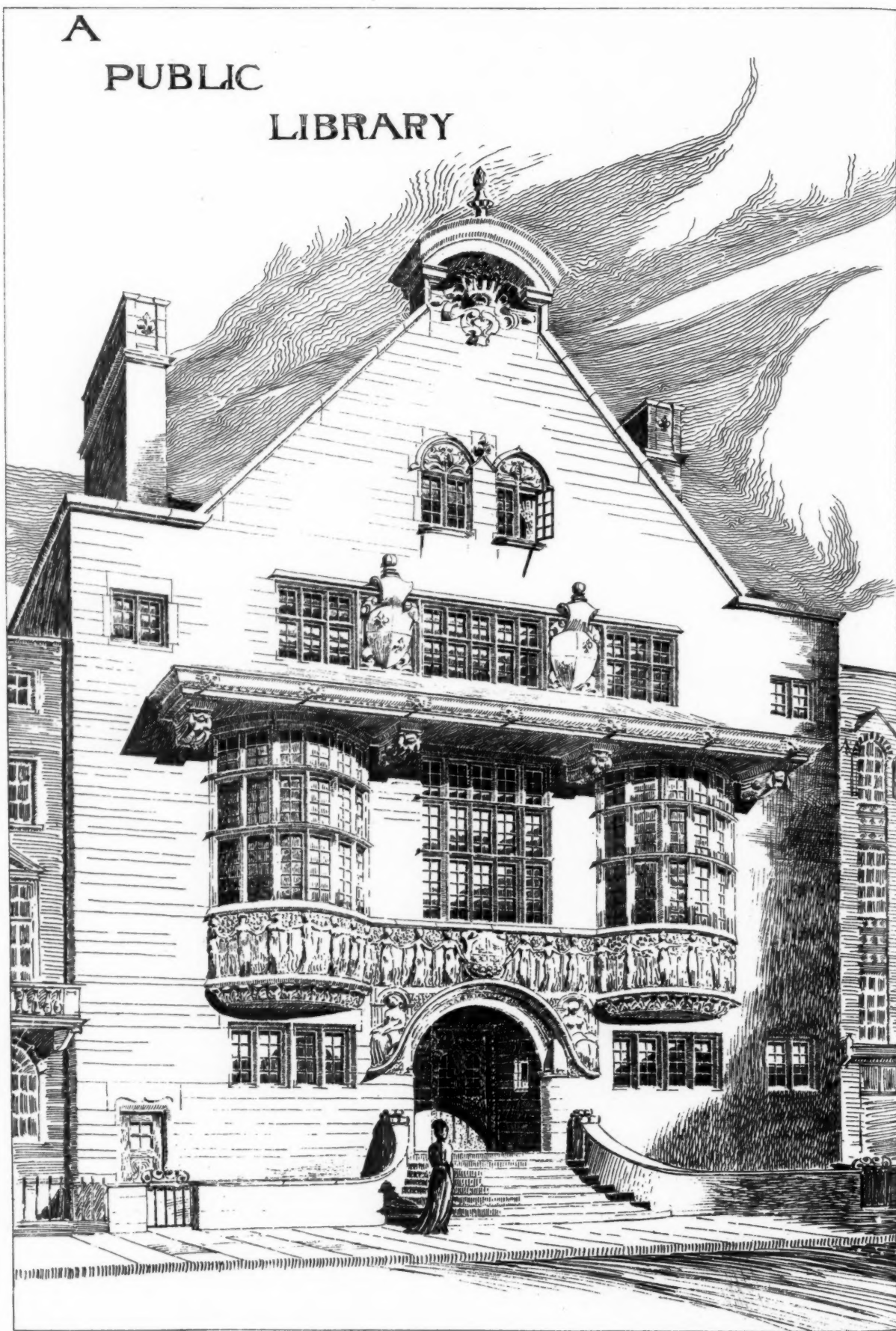
PAINTS FOR IRONWORK.—An account of some interesting researches on the value of paints for ironwork, made by Prof. J. Spennrath, has recently been published in the *Deutsche Bauzeitung*. As one result of these, Professor Spennrath concludes that none of the metallic oxides commonly used combine chemically with linseed oil. The drying process depends exclusively on an absorption of oxygen by the oil, which is facilitated by the presence of the pigment in a purely mechanical way. The value of the different pigments used varies. Thus zinc white, when used for outside work, rapidly swells to double its previous volume, owing to the absorption of carbonic-acid gas and water. Sulphuretted hydrogen will cause red or white lead to act in a similar way, but, when pure, Professor Spennrath considers these two latter pigments satisfactory. Carbon paints are very stable, as is heavy spar, but the covering power of the latter is small. In order to test the relative durability of various paints, sheets of zinc were coated with a number of different kinds. The zinc was then dissolved away by acid, leaving a film of paint. All these films, it was found, could be destroyed by the action of dilute nitric or hydrochloric acids, whilst the vapors of sulphuric and acetic acids acted similarly. Alkaline fluids and gases also destroyed the paints rapidly. Pure water was found to be more injurious than salt water, and hence the destructive action of sea-water is to be attributed mainly to the mechanical effects of wash. Hot water was found to act more rapidly than cold. The most important discovery made was, however, the great influence of temperature. Films similar to those already described completely lost their elasticity and became brittle when exposed to a temperature of 203 degrees Fahr. There was at the same time a large contraction. Similar effects are produced by prolonged exposure to considerably lower temperatures. Blistering he finds to be due to the inner coat of paint being so thick that it has not hardened thoroughly before the second coat is applied. — *Engineering*.

THE ADVENT OF ROMANTICISM.—The first note of sincere dissent was struck by Géricault, when he sent his "Raft of the Medusa" to the Salon of 1819. Gros, indeed, had in some of his Napoleonic pictures shown an inclination to express natural passion, but not pursued it far so this picture of Géricault's really marks a turning-point in French art. The intense feeling embodied in it forms a wonderful foil to the impassiveness of David's "Sabine Women" which hangs in the same room in the Louvre. There also reappears in it the emotional element of chiaroscuro, which had been almost banished by the Classic school, and the color strikes a chord in complete sympathy with the tragedy of the situation. The whole incident is well conceived; the elements of nature the wild heaving of the sea, the lowering sky, with its bright rifts, are attuned to the mingled despair and hope of the forlorn creatures on the raft. A few years later Delacroix exhibited his first picture, and the battle between romanticism and those in authority began in grim earnest. One can easily imagine the consternation, the angry wrangling, the wordy war, which the appearance of this picture stirred. The passion of the color and the drama of the light and shade, the vigorous and suggestive drawing, and the full yet fluent impasto, were new and startling to painters trained in a school where a convention of form and a certain restricted range of emotion and subject were enforced. The Classic movement inaugurated by David and continued by Ingres purged French art of the rapid trivialities in which it had sunk, and set up a higher ideal; but it was at the expense of liberty, in whose sacred name it claimed the right to reign. It was against the cold formalism of this school that the men of 1830 had to contend. — *Blackwood's Magazine*.

PROPOSED DECORATION FOR THE PHILADELPHIA PUBLIC BUILDING.—The competition for the decoration of the Council Chamber of the new Philadelphia City-hall has brought out many attractive designs from a large number of artists. There are prizes offered for the best three works, of \$3,000, \$1,000 and \$750. Among the contributors are Carl Marr, Munich; W. D. Streeter, George Bridgeman, Edward Ertz, H. O. Tanner, Newton Wells, Henry McCarter, L. H. Richardson, Fred Waugh, H. C. Foss, Max Bohm, Humphreys Johnstone, Edward Grenet, Guy Maynard, all in Paris; in England, Edwin A. Abbey, Robert Sewell, S. H. Vedder, W. E. F. Britten, Anna Lea Merritt, Mary S. Florence, Sarah Ball Dodson; in Florence, Italy, Francis W. Loring, Bryson Burroughs. On this side of the Atlantic, plans were sent to Chicago, Boston, New York, and other places, to Walter McEwen, William Sartain, Marcy Pendleton, Frank W. Benson, Will Low, Kenyon Cox, Gabrielle Clements, Charles S. Reinhart, Louis J. Rhead, Will H. Bradley, Kenneth Frazier, Alice Archer Sewell, Maria à Becket, William Sergeant Kendall, H. A. Ogden, Adelaide Wordsworth, Joseph Lindon Smith, S. W. Van Schaick, Thomas Shields Clark, and Henry G. Thuder. The Philadelphia artists who contemplate sending sketches are Henry Thouron, L. Hart Darragh, F. W. Stokes, I. Liberty Tadd, Maxfield Parrish, Maria Kirk and Ida Waugh. The sketches will be judged by a jury of seven persons, four of whom will be artists of recognized standing, and no one of whom will be a competitor. The work will all be in before April 15. — *New York Times*.

THE SURMOUNTING ANGEL OF THE SAN FRANCISCO CITY-HALL.—One of the principal decorative features of the new City-hall in San Francisco was to have been a great white-metal angel, with outspread wings, poised on top of the big dome. This angel has been the subject of much crabbed controversy between the gruff Mayor, Mr. Sutro, and the commissioners. The Mayor criticised the angel severely and rather ridiculed the whole thing. But last week the big angel was finished and ready for hoisting to its place on the dome. Then it was discovered that its wings offered too much sail space, and that they would undoubtedly, in the first high wind, pull the angel down from its perch. The shoulder-blades were too narrow for the wings to be properly braced. So the wings were sawed off and a wingless angel will surmount the dome. And Mayor Sutro is chuckling. — *Philadelphia Telegraph*.

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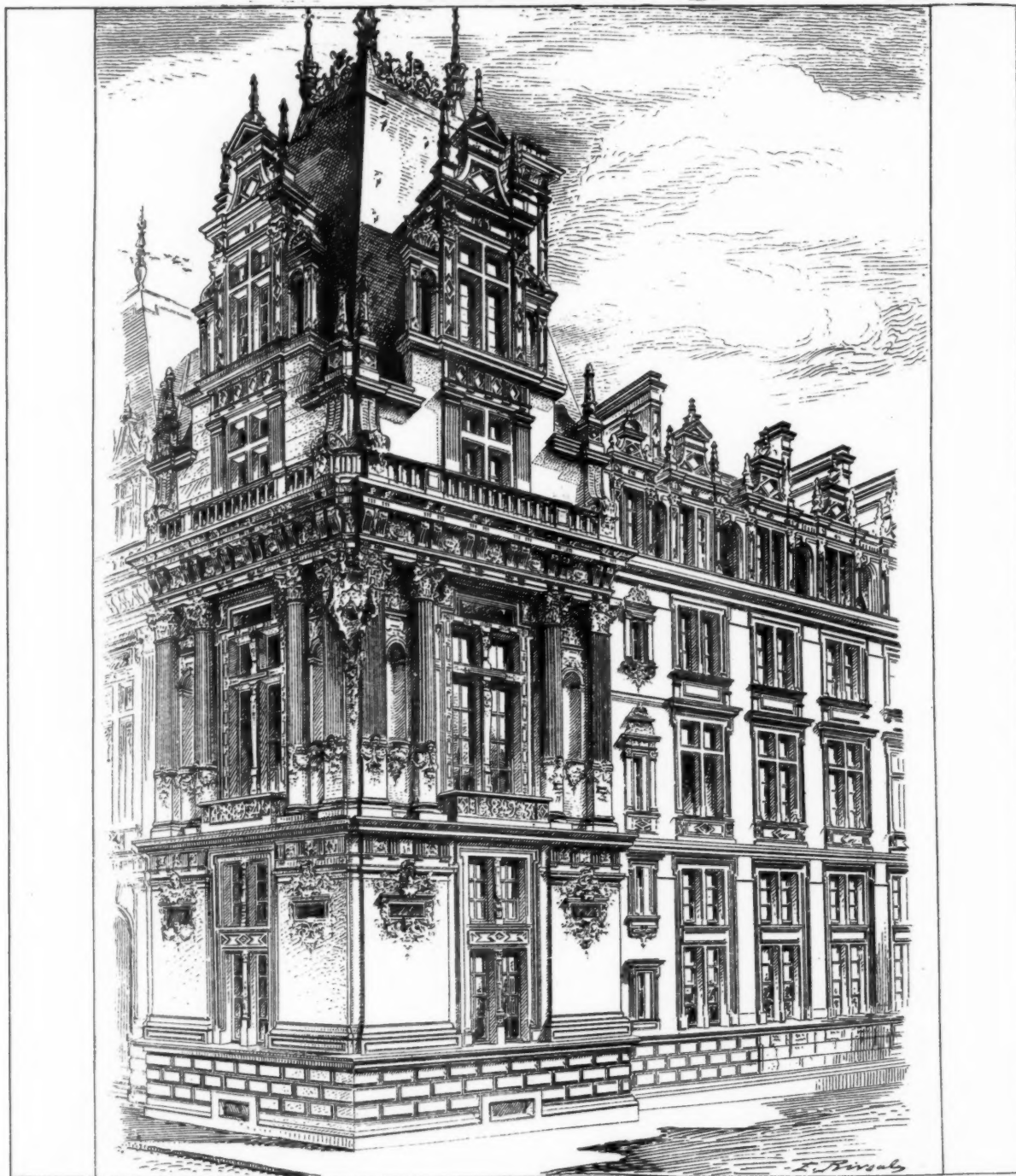
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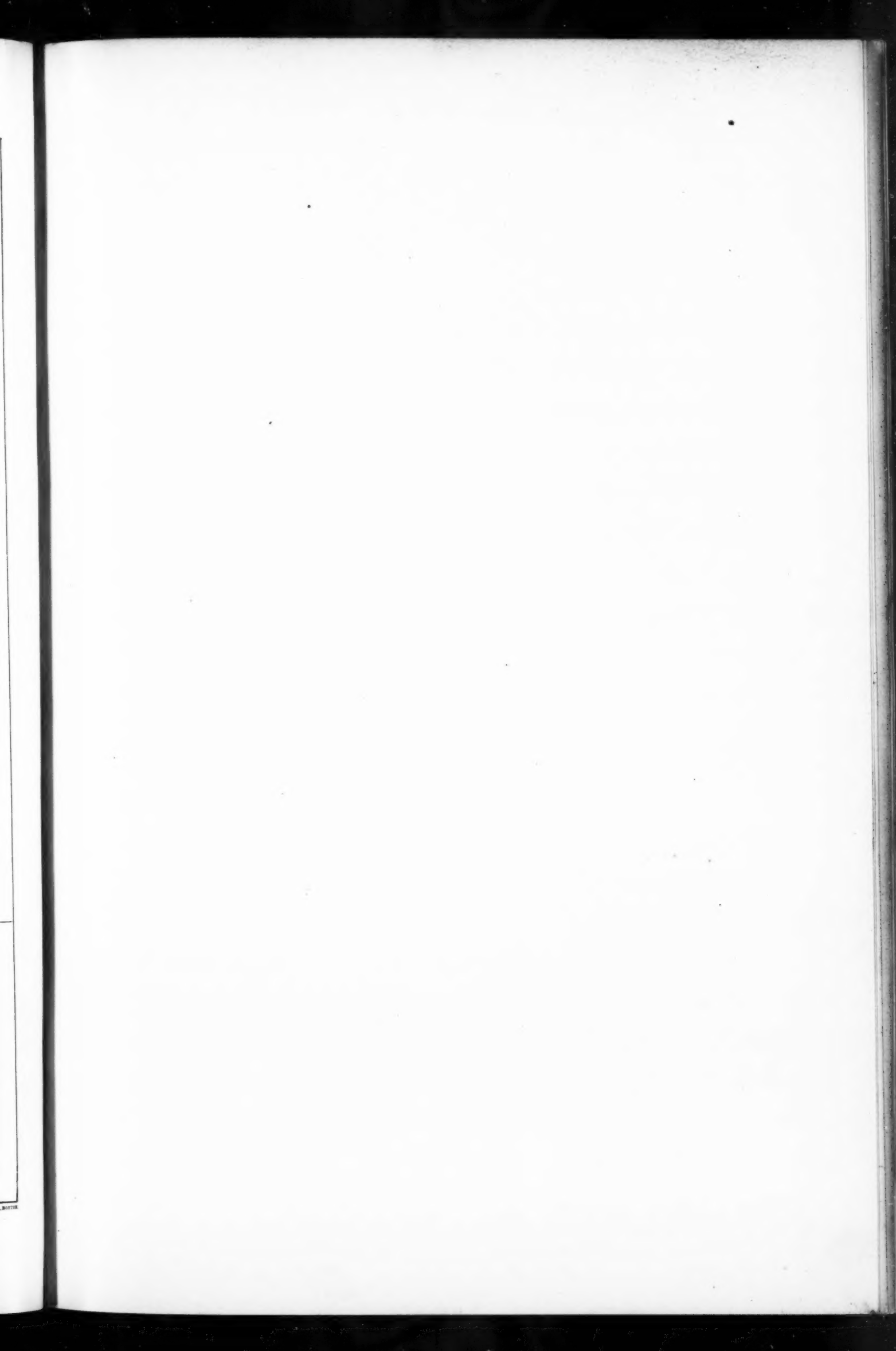


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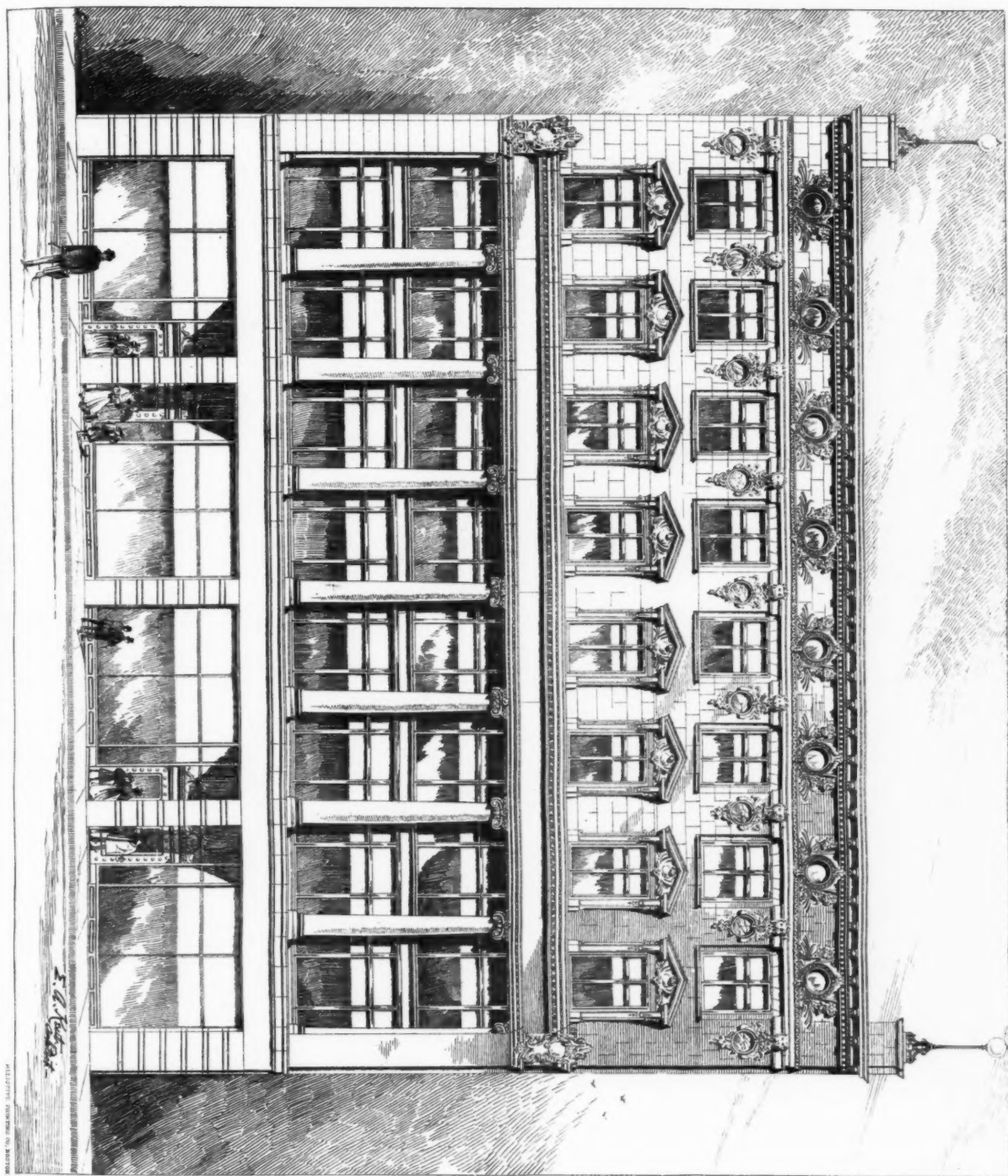


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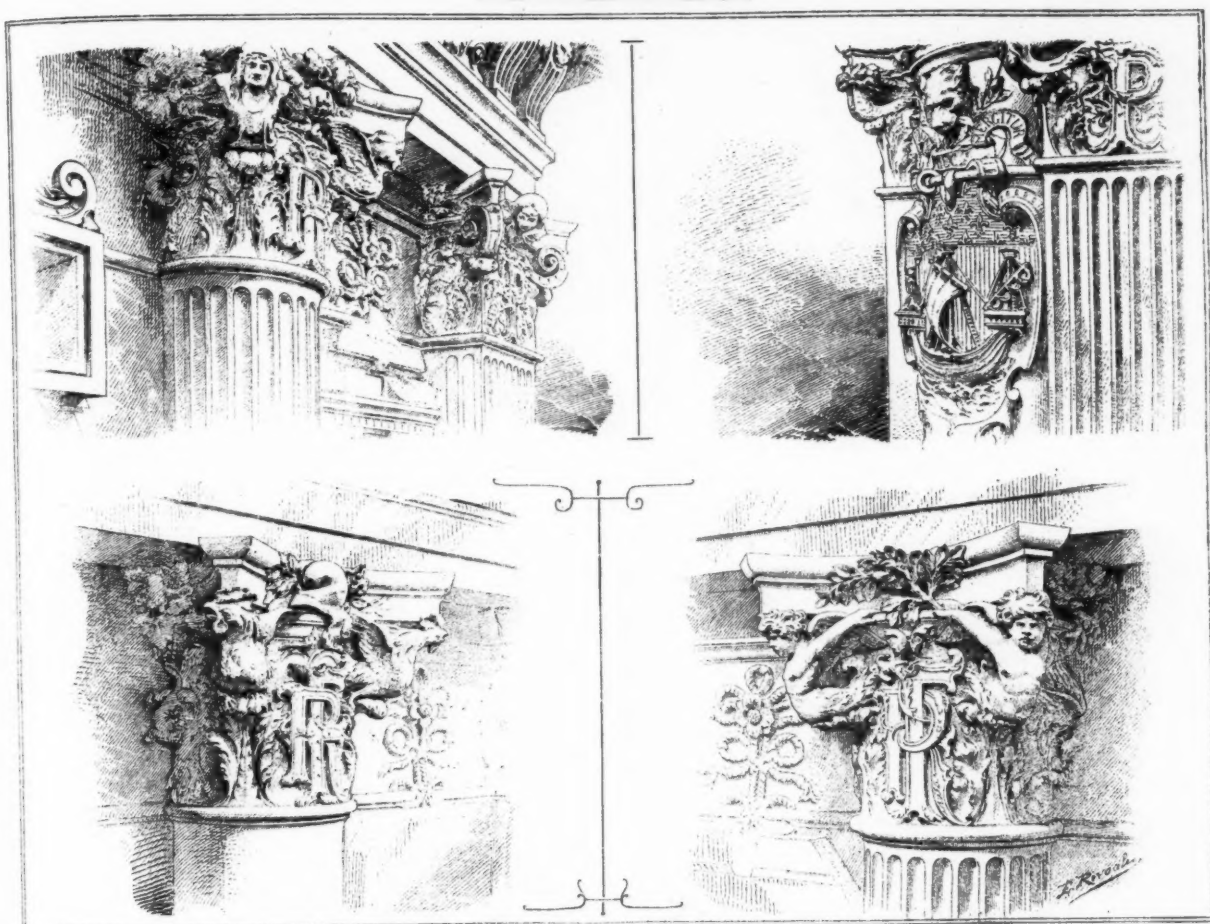




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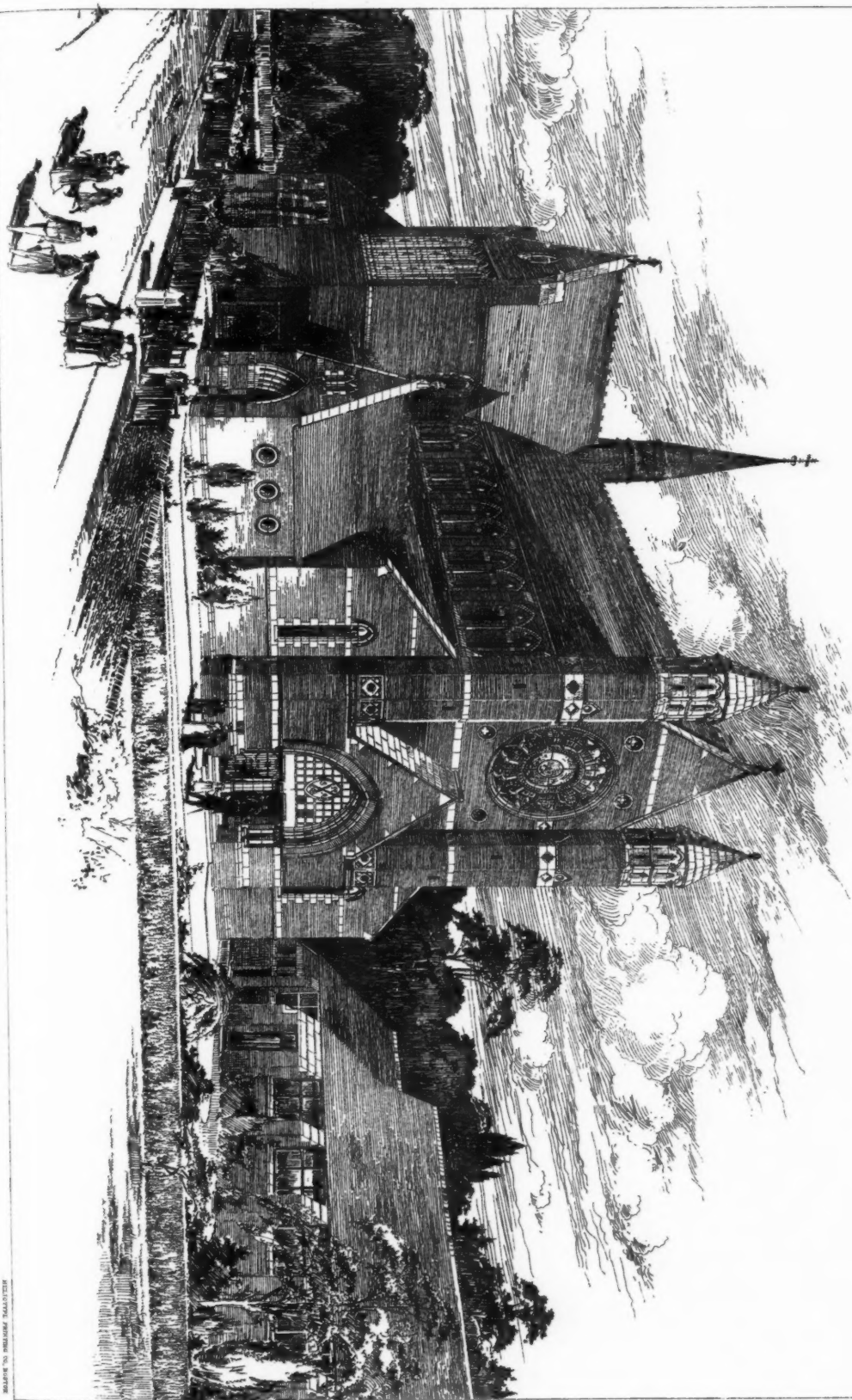


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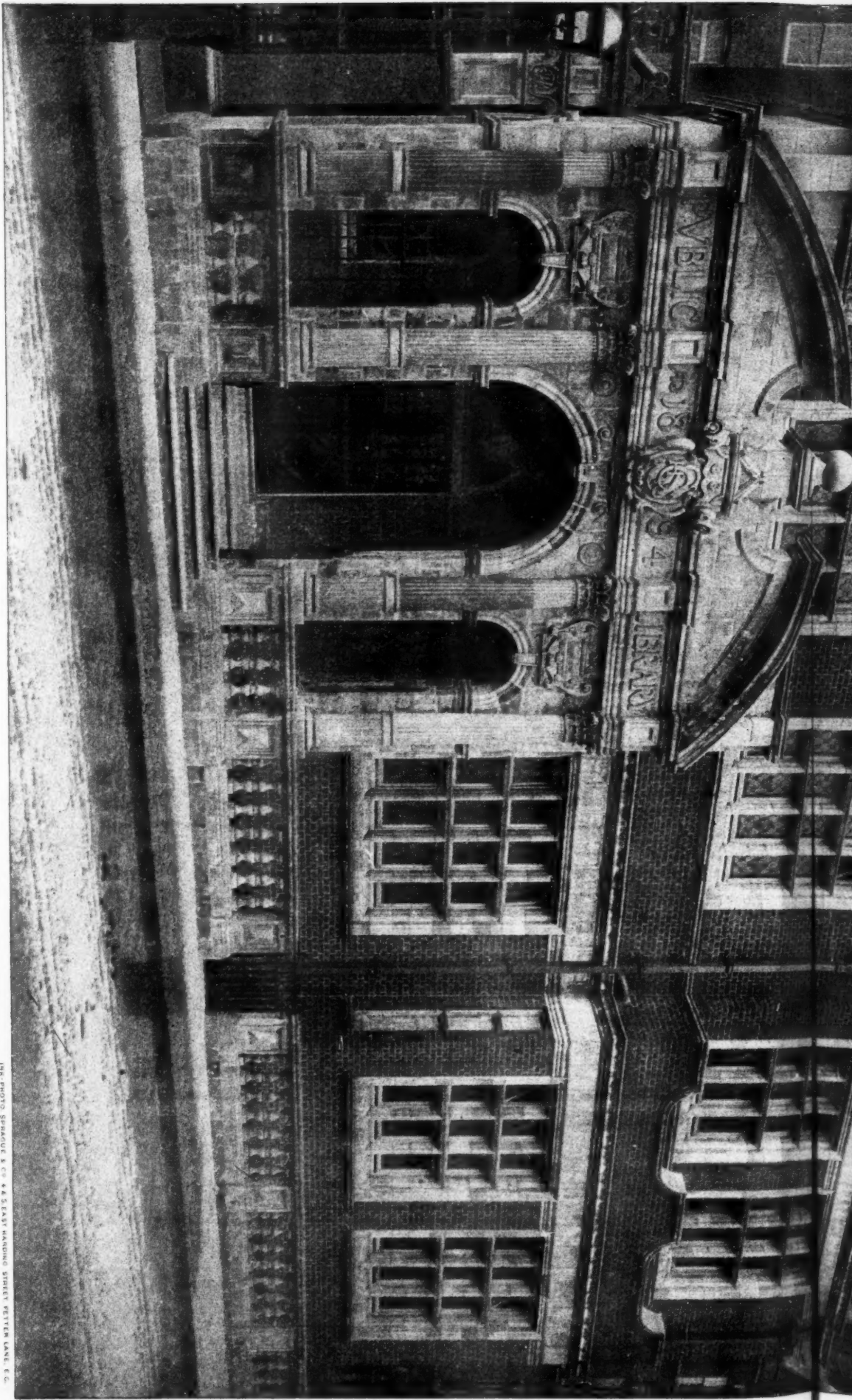
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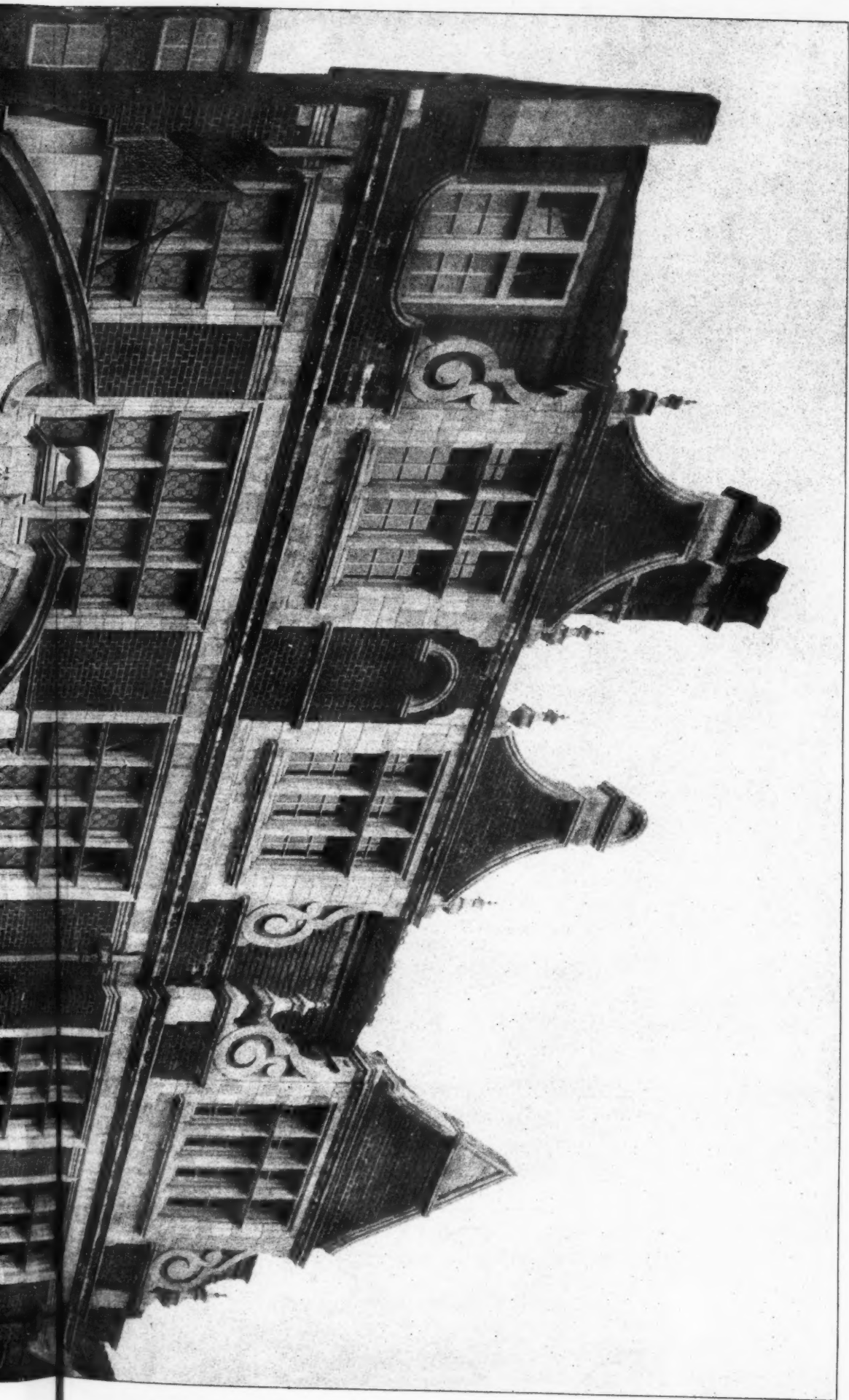
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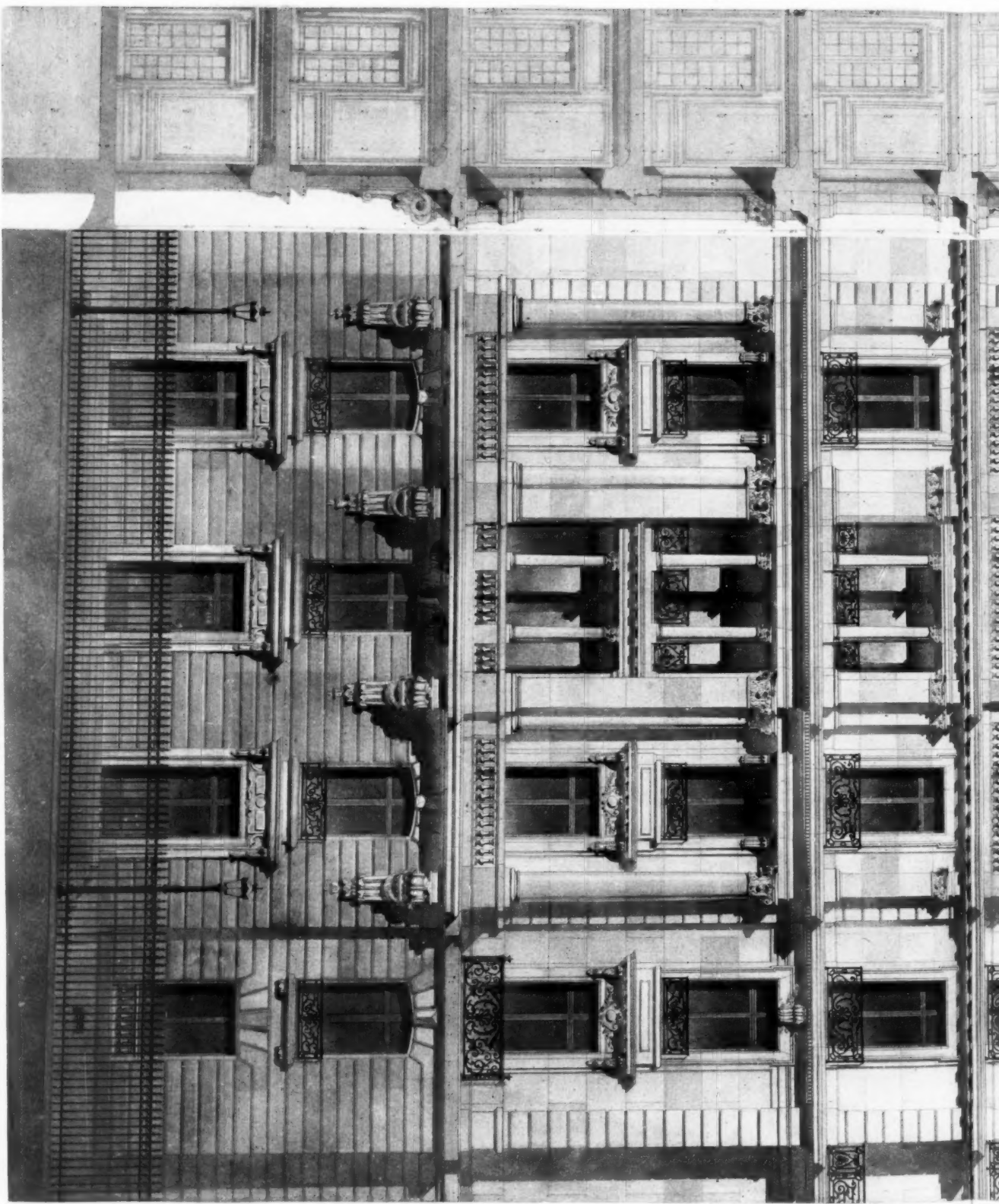
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THE ARGYLL MONUMENT, S. GILES' CATHEDRAL, EDINBURGH.

Messrs. SYDNEY MITCHELL & WILSON, Architects.

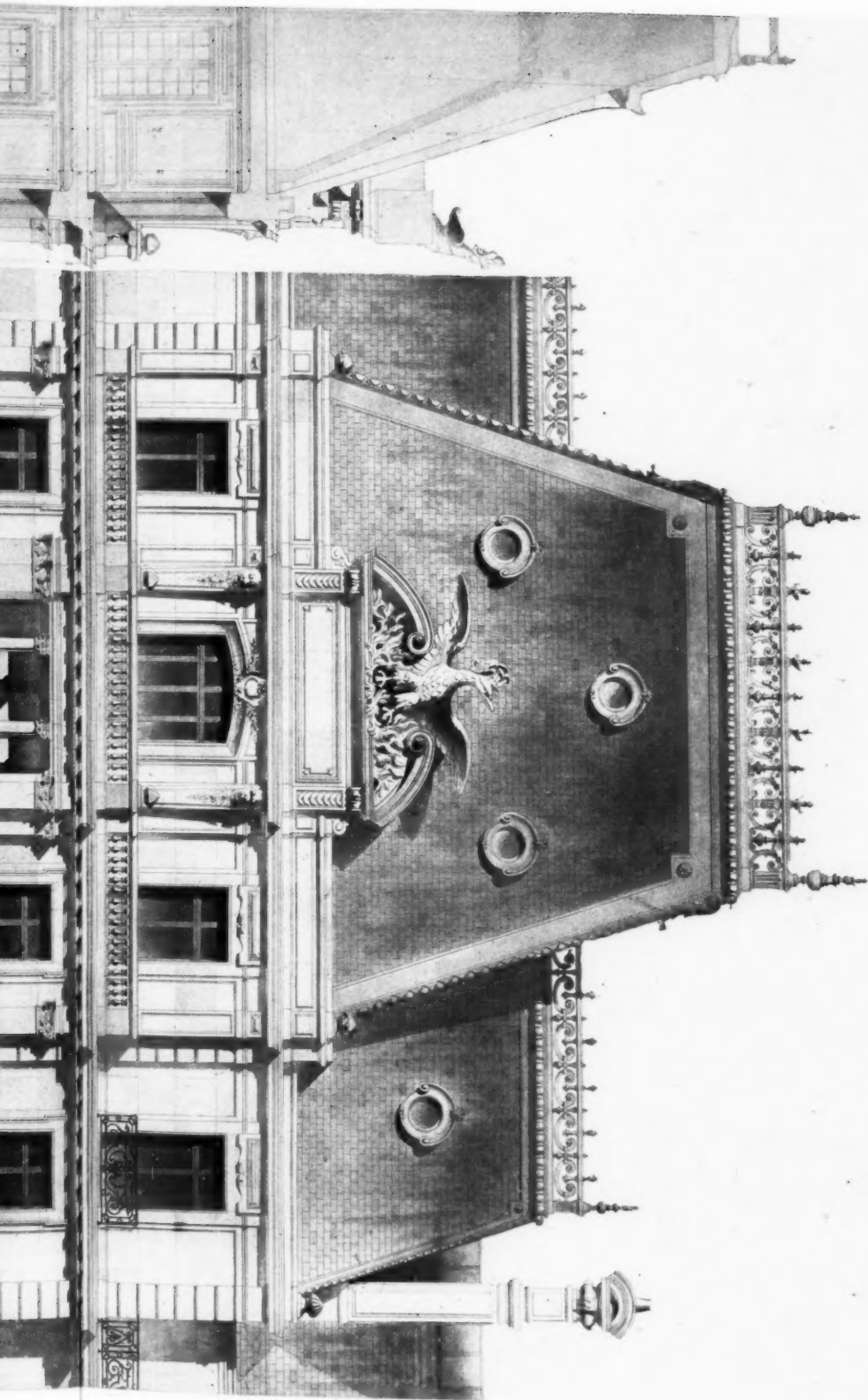
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MAISONS À LOYER AVENUE DU BOIS DE BOULOGNE 48 & 50.

Détail du pavillon central.



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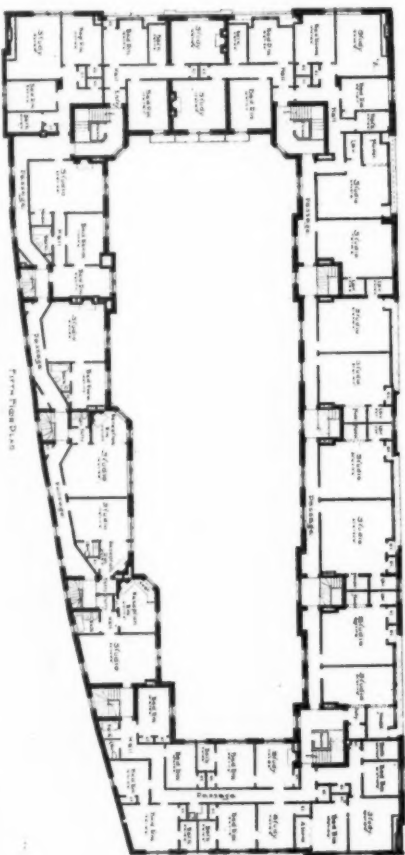
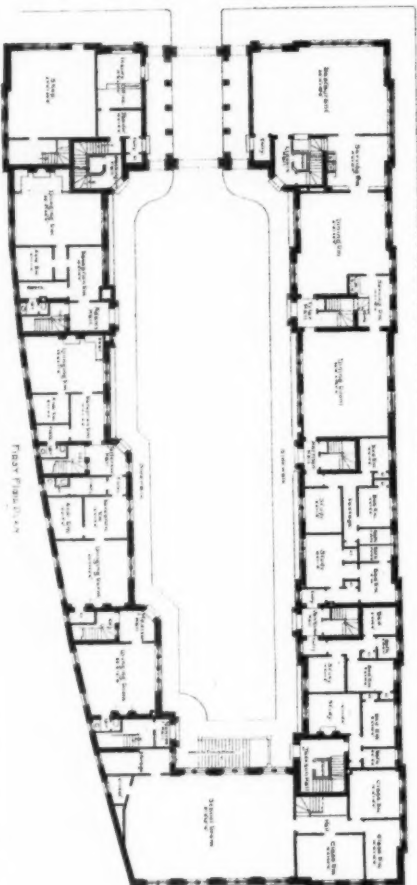
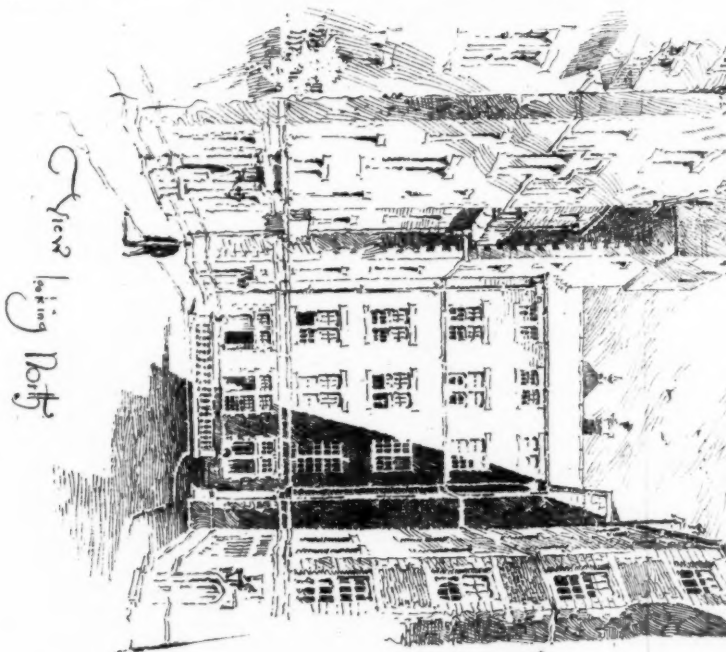
for
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EBEN D. JORDAN ESQ

BALL & DABNEY ARCHTS.



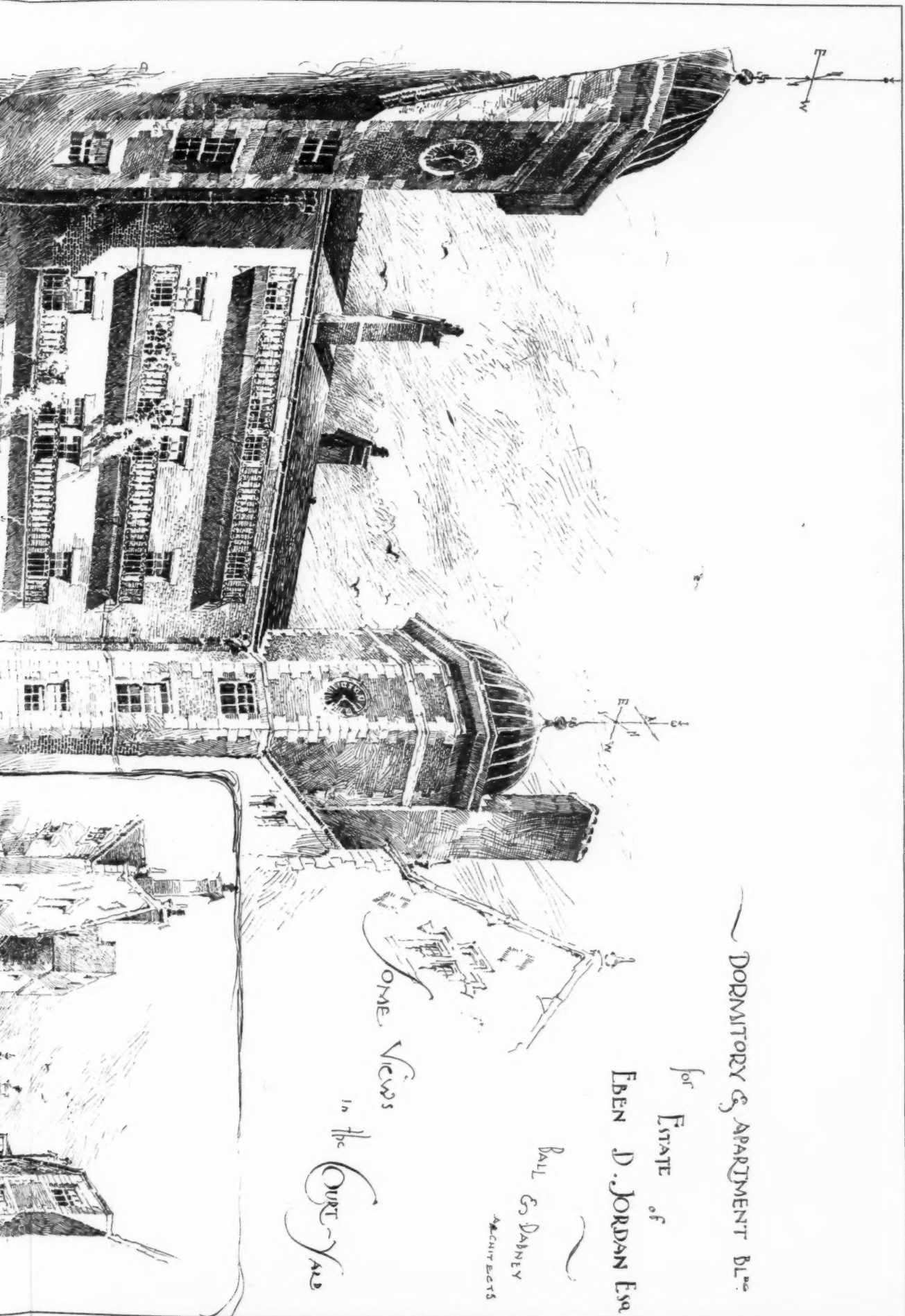




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AMERICAN ARCHITECT AND BUILDING NEWS, APR. 11, 1896.

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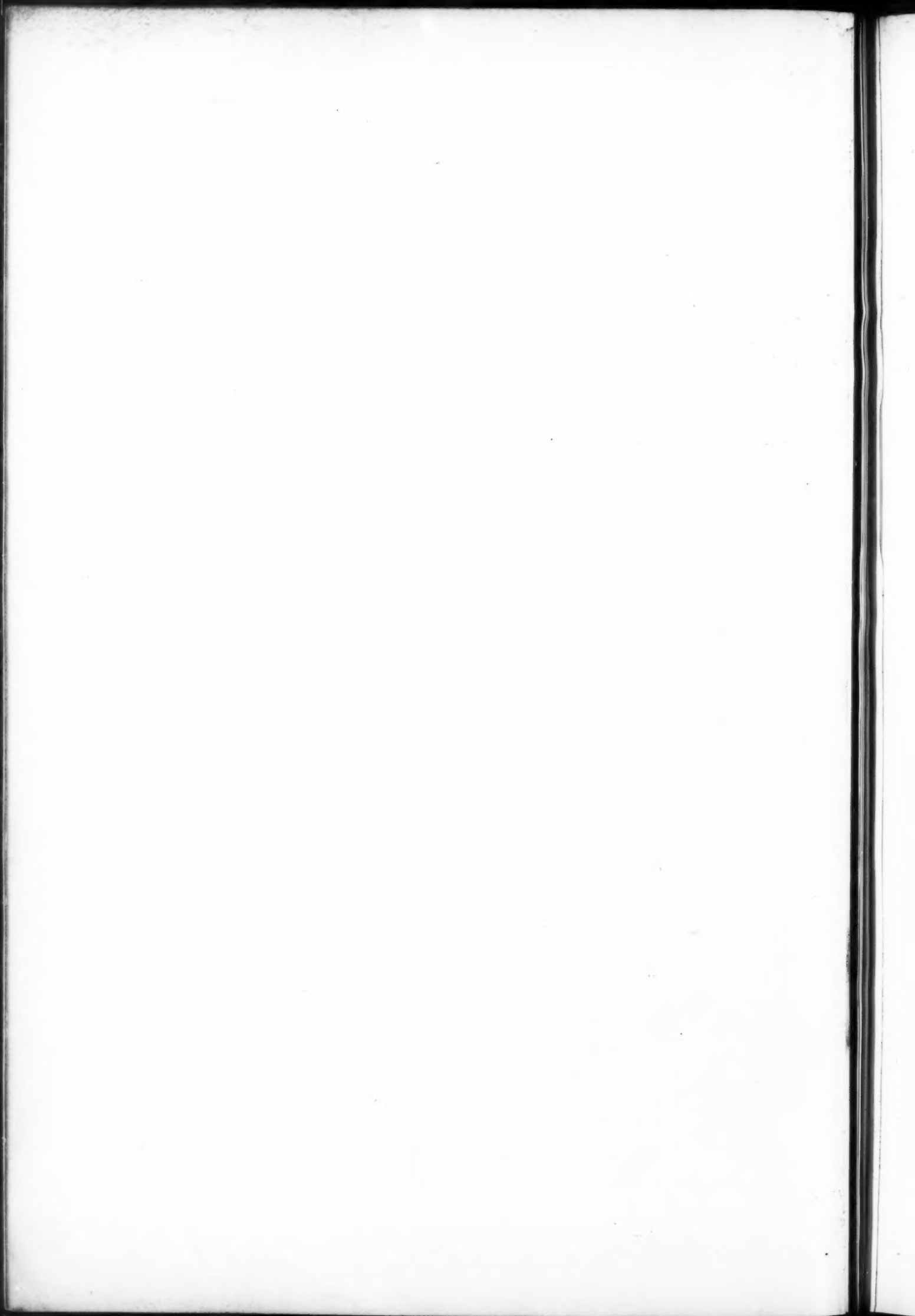


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Courtyard





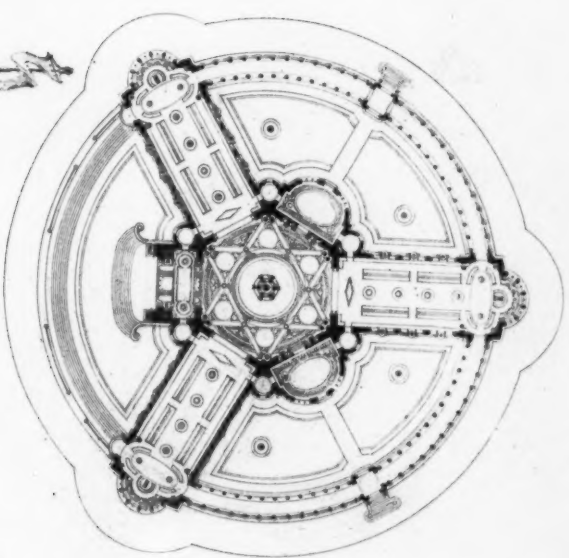
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PAVILLON POUR L'EXPOSITION DES PRODUITS DE LA MANUFACTURE DE SÈVRES EN 1900

(PROJET)
M. H. Pons, Architecte et Ingénieur des Arts et Manufactures

