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A CALL has been issued, signed by Mr. D. H. Burnham, as chairman of a provisional committee, for a Congress of Architects, to be held next year in Chicago. It has been generally expected that such a congress would be held, in connection with the exhibition, and we are glad to see that the matter has not been forgotten. The Congress of Architects at Paris in 1889 was interesting and profitable to the profession, and an American one of the same sort should be at least equally so, particularly under the care of the accomplished and energetic architects of Chicago, who, we suppose, will have the local charge of the affair. As at Paris, an Advisory Committee is to be selected from among the most distinguished architects of all countries, including especially the presidents of professional associations. Mr. Robert C. McLean, Room 19, Tribune Building, Chicago, has been appointed Secretary of the Committee of Arrangements. No one could perform the duties of this laborious position more intelligently, and those who wish for information not to be found in the circulars of invitation, can be sure of a satisfactory response to inquiries addressed to him.

ACCORDING to the newspapers, some curious movements have been observed in the Washington Monument. It is well known that all high stone monuments follow the motion of the sun, through the expansion which its rays produce on the illuminated side; but in the Washington Monument it is found that, besides the diurnal movement, there is an annual one, the top of the monument describing, in the course of the year, a small circle. A strong wind is found to cause a slight inclination to leeward, showing that either the stone or the mortar in the joints is elastic within certain limits. These movements are detected by means of plumb lines of wire, to which are suspended heavy lead weights. The weights are immersed in oil, to diminish the effect of accidental vibrations, and the wires are enclosed in metal casings. It was recently rumored that the foundation of the monument had sunk, but the fact is that it has risen a few thousandths of an inch. This novel phenomenon is probably due to the expansion of the cement in the concrete of which, as it will be remembered, the foundation is now practically composed, and it will be interesting to watch its progress.

A CASE has just been decided by the General Term of the Supreme Court of New York, in accordance with a view of the law which appears to be invariably taken by courts, but which contractors, to their sorrow, find difficult

to comprehend. Messrs. O'Brien & Clark, the contractors for Section 6 of the new aqueduct which supplies the city of New York, sued the city for about eight hundred thousand dollars, for extra work. The extra work seems to have been mainly done upon the verbal order of the engineer in charge. The court in which the case was first tried gave judgment for the contractors for twenty thousand dollars. The representatives of the city conceded that this amount was due, and stood ready to pay it, so that the decision was really a rejection of the contractors' claim. The contractors appealed, and the General Term, by its present decision, unanimously affirms that of the court below.

THERE was no question that the work was done, and we are inclined to think that the courts would have found some way, under the circumstances, of making a private owner pay the bill; but contracts for public work are governed by a different principle. In delivering the opinion of the Court, Judge Van Brunt said that that claim of the contractors must be regarded as being for work either outside the contract, or under the contract. If it was regarded as outside the contract, recovery of payment for it was cut off by the statute under which the work was done, which expressly provided the manner in which it should be ordered and contracted for, and gave no authority to any one to create any liability against the city in any other way. If the claim was to be regarded as being for works done under the contract, it must be shown that it was done in accordance with the contract. This instrument gave no authority to the engineer to order work in excess of the plans and specifications. The contractors claimed that they followed the instructions of the engineer; but the Court said that it was apparent that no liability could arise out of talk. "As has been iterated and reiterated during this opinion," said the judge, "the foundation of all liability upon the part of the city must be found in the law and the contract, and unless it can be shown that the claimed liability has authority from the law commanding the contract, and from the contract, then clearly it does not exist." The Court continued, "It seems to us that the difficulty in the case arose from the fact that in entering into this contract, and in the early progress of the work, both the contractors and the engineer entirely misapprehended their relations to, and their rights and obligations under it, each assuming that equitable considerations might have their weight in determining questions in which the rigid terms of the contract seemed to work a hardship. In this both were entirely mistaken, as by the law liability could only be fastened upon the city in the manner by it prescribed." It is said that other contractors for the aqueduct have similar claims, amounting in the aggregate to millions of dollars, the fate of which is undoubtedly governed by this decision. It is still open to the plaintiffs to carry their case to the Court of Appeals, but the opinion of the General Term is so clear and convincing that it is doubtful whether the contest will be continued further.

MR. RENNER, an architect of New York, according to the *Sunday World*, was recently requested by the Super-vising Architect of the Treasury Department to make measurements and examinations of the White House, in Washington, with a view to the enlargement of the structure, which is much too small for the purposes to which it is put. Mr. Renner did so, and made a sketch plan for the enlargement, which is published in the *Sunday World*, of July 24. Mr. Renner's idea is to build on each side of the present house a large room, connected with the present building by a short corridor, so as to avoid shading the end windows of the present house, and to use the new rooms as picture and sculpture galleries, and also as reception-rooms. Instead of the single conservatory, which now forms one of the most noted attractions of the White House, he proposes to build two, one to be attached to each of the new wings. Mr. Renner's plan is, we are told, to be submitted to the proper committee of Congress at the next session, and it seems not unlikely that something may be done about carrying this, or some other plan for the same purpose, into execution.

A LAWYER writes to *La Semaine des Constructeurs*, saying that one of his clients has contracted to build an iron "marquise," or shelter, over a certain entrance door. There has previously been a marquise there, supported by iron hangers, which still remain leaved into the wall. The owner, to avoid more cutting of the stonework, wishes the contractor to use the old hangers to support the new marquise; but the contractor, knowing the treacherous disposition of iron that has been long set in masonry, is afraid to do so. The owner, to allay his fears, has appealed to the architect, who gives assurance that the hangers are strong enough for their work, and offers to give a written guaranty to hold the contractor harmless from all consequences of their weakness. Nevertheless, the contractor hesitates to do the work, and his lawyer wishes to know whether he would be safe in going on with it under the circumstances.

THE Jurisprudence Committee of *La Semaine* gives a reply which will probably surprise most contractors, saying that as the law stands in France at present, although the iron-worker might safely do the small work required of him, he could not carry out an important construction of the security of which he had reason to doubt, even at the positive order of the architect and owner, and with their guaranty to assume all the risk, without incurring at least a joint responsibility with them for the consequences of his action. It says that, in matters of this kind, the opinion of courts has changed materially within the last twenty years. Formerly, the theory was that the architect possessed the theoretical knowledge, and the builder the practical; that it was the architect's exclusive business to make the plans and specifications, for which he was solely responsible, and the builder's duty to carry them out faithfully, without criticising them. On this theory, if the builder carried out the plans and directions of the architect in a workmanlike manner, he did all that was required of him; and if the structure fell down, owing to faults in its design, he could not be required to pay damages.

NOW, however, as the Jurisprudence Committee says, the position of builders has changed. They are no longer ignorant persons, knowing nothing but what their master taught them during their apprenticeship, but men of more or less general education, to whom are open the same sources of information as to the stability of structures, and the resistance of materials, that the architect uses; and the law holds that they are no longer excusable if they fail to avail themselves of them. The old relation of the builder to the architect, as that of an ignorant tool, whose duty it was to obey the instructions given him, but not to presume to criticise those instructions, has given place to that of an intelligent co-worker with him in furthering the main object, that of completing the building in the most perfect manner possible. For carrying out this purpose it is necessary for the builder to study and understand the architect's plans, and to exercise his judgment about them, and, while the responsibility for imperfections in them rests primarily with the architect, the builder who saw defects in them, or might, with reasonable care and skill, have done so, will also be held culpable if he has carried them out without, at least, vigorous protest. The difference, in this respect, between small works and important constructions (*gros ouvrages*) is that the former concern only the owner, and if he chooses to have them carried out so that they will fall down, he may safely have the privilege of doing so; while the security of the "*gros ouvrages*" is a matter of public importance, and all those who have knowingly and wilfully concurred in endangering the public safety will be held responsible for doing so, without regard to their private arrangements among themselves for releasing each other from liability.

IT is curious that the development of anarchy seems to meet with much greater obstacles in republican countries than under monarchical government. Herr Most's ideal of this country as one in which he and his friends would be free to kill and maim other people at pleasure received a shock when some of those friends were strangled at the end of a rope for having tried to put their doctrines into practice, which is likely to be renewed even more forcibly if it should be found that the fraternity of anarchists incited the murderous riot at Homestead and the attempted assassination of Mr. Frick; and the cool determination with which, at his last trial, Ravachol was condemned and executed, shows that in France, also, the momentary panic inspired by the discovery of such inhuman

wickedness as that professed by the Anarchist leaders has been succeeded by a resolve to exterminate them at any sacrifice if necessary. This state of mind affords a refreshing contrast to that presented by Germany, or even England, which have so much to fear from the confusion which would follow the assassination of the chief of the State that they think it necessary to keep the assassins in good humor by concessions and liberties which would never be accorded them in a freer country.

HERR CARL MERKEL, in his letter to the *Deutsche Bauzeitung* on the subject of water-works engineering among the ancients, gives a very high idea of their enterprise and skill. It is well known that Rome was lavishly supplied with water, by means of magnificent aqueducts, some portions of which are still serviceable; but, until within a few years, it has not been understood that water-works on a splendid scale were constructed by the Greeks, centuries before anything of the kind was done by the Romans. It has long been observed that the ruins of Athens, Syracuse and many other places show remains of fine aqueducts, but these have been, as a matter of course, attributed to the period following the Roman conquest, which was undoubtedly characterized, in most of the conquered provinces, by the execution of many of the great engineering projects which the Romans liked so well. Now, however, closer investigation has made it certain that Athens, and many other Greek and Sicilian cities, and even Tyre, Antioch and other towns in Asia Minor, were plentifully supplied with water, by a well-arranged system of pipes, two or three hundred years before the first Roman aqueduct was thought of; and it is curious that the earliest Roman aqueduct, the Aqua Appia, built in the year 312 B. C., by the censor Appius Claudius Cæcus, who is known to have been a student and admirer of Greek civilization, imitates the Greek models, in being entirely subterranean, and therefore following pretty closely the sinuosities of the surface. The second of the Roman aqueducts, known as the Anjo vetus, finished in 272 B. C., was built in the same manner; and even the Aqua Marcia, built in 144 B. C., ran for nine-tenths of its length underground. Later, however, the characteristic Roman passion for directness and thoroughness asserted itself, and the great aqueducts of the imperial period run mostly above ground, as nearly as possible in a straight line from the source to the point of delivery in the city.

EVEN if the Greeks had wished to conduct water in straight lines, the broken and mountainous character of their country would hardly have permitted it, and the most economical policy for them was undoubtedly to excavate a trench, following nearly a contour line of the surface, and either lay earthenware pipes, which were extensively employed for small aqueducts, or build stone or brick conduits, filling the excavated material back around the conduit, whatever it might be. Even Hadrian's Roman engineers, in building, more than a hundred years after Christ, an aqueduct sixty miles long to supply the city of Corinth with water, found it best to adopt the ancient Greek mode of construction, and the whole of this aqueduct, celebrated in antiquity under the name of the Stymphalian aqueduct, was laid underground. Where, however, the Greeks thought it advisable to lead their conduits by the shortest route through a mountain, or over any other obstacle, they found means of doing so, and, in particular, they tunnelled unhesitatingly for long distances. One water-tunnel, described in ancient works, and recently discovered, is said to be nearly four miles long. By another piece of engineering, the details of which are unknown, the island of Ortygia, off the Sicilian coast, was supplied with water from Syracuse, through a submarine conduit. By what system of service and other pipes water was distributed from the street mains to the houses we hardly know. In the Greek cities, the dwelling-house was a poor affair, the people living mostly out of doors, or in the public resorts, so that we should not expect to find elaborate plumbing in Athens or Corinth; but it is certain that the Roman houses were plentifully supplied with water for washing and drinking, as well as with ornamental fountains. As several specimens of antique lead pipe have been discovered it seems probable that the house pipes, and perhaps the smaller street mains, were of lead. What the waste-pipes were made of, and whether traps were used, we do not know, but it appears that the plumber's art must at least have been tolerably well developed.

MODERN ARCHITECTURE.¹—VII.

WHERE is nothing surprising in the fact that French and German influences are found contending with each other in Switzerland, the one or the other preponderating according to locality or political circumstances. Switzerland played a considerable rôle in the creation and development of German

is in general favor in all countries, with a few more marked leanings toward the present French school; while the theatre of Zurich, by Herr Hermann Stadler (Fig. 43), is affected rather by that archaism to which we have already referred and which sprang into existence at Berlin.

The public school buildings at Basle (Fig. 44) show the effects of a German influence, which appears in an exaggerated

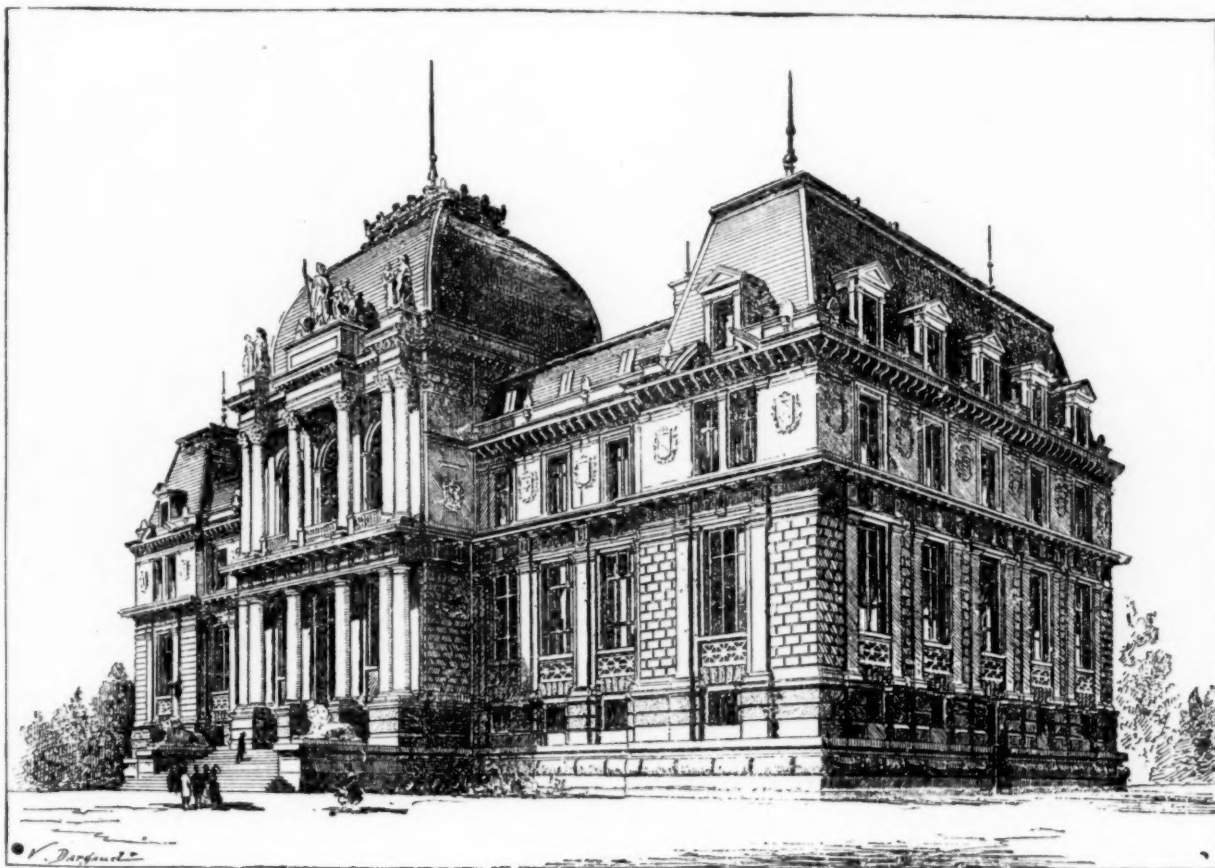


Fig. 41. Federal Law-Courts, Lausanne, Switzerland.

art; it is natural, therefore, that it should have preserved the memory and traditions of a period glorious for it; it has likewise one of the most honorable parts in the history of French letters and arts, an alliance which it has never disowned. A few examples will suffice for the purposes of this article and we shall not enter upon details that are properly reserved for a special discussion of Swiss architecture.

The Federal Law-Courts Building of Lausanne, designed by M. Recordon who was the successful competitor for furnishing

form in the private house at Zurich reproduced in Figure 45; the latter bears the character of the modernized German Renaissance which is so frequently met with in the recent constructions of Frankfort, Hanover and other cities that have made great progress lately industrially and commercially. It stands near the lake in the liveliest and most cosmopolitan section of the city. We may note in connection with this subject an original disposition which might be utilized elsewhere. The houses forming any one of the islets of new constructions in this district will be found built around a very large court laid out as a square; two broad roadways cross this square at



Fig. 42. Museum of Painting, Neuchâtel, Switzerland.

the plans, as well as the Museum of Painting at Neuchâtel (Figs. 41, 42), belong to the type of Classic architecture which

¹From the French of P. Planat, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 367, page 82.



Fig. 43. Theatre at Zurich, Switzerland.

right angles to each other. Inside the court the ground-floor of the houses is disposed as open galleries bordered with shops. Each house has thus two façades, one on the square, the other on the street, as well as two rows of shops. In bad weather,

or in case of extreme heat, the court side, which is protected by the covered galleries, is naturally the most frequented. By this arrangement the apartments are well aired and lighted and the number of shops is doubled, so that the increase in the

very serious qualities, and perhaps owing to the disposition of the grounds, the Academic façade of the Roman edifice is the least diversified and the one in which the architect was most



Fig. 44. School-house at Basle, Switzerland.

value of the houses easily makes up for the price paid for the land included in the square.

In our articles on Italian Architecture (see *American Architect* for November 14, 1891, *et seq.*) a section is devoted to modern times; we will go over the ground covered there only so far as to cite a few additional examples showing that Italy is so privileged that she has only to look to her own past for her models.

The Court-house at Rome (Fig. 46) is one of the largest edifices of the modern kingdom. Signor Calderini was the successful architect in the competition open for the plans, and work was begun at once; it was more fortunate in this respect than the Parliament Buildings were. We have selected this example because it is particularly interesting to compare it with the great edifices of Vienna referred to above. In both cases the source of inspiration is the same, but the choice and interpretation are nevertheless very different. It is no less interesting to compare the structure with the Palais de Justice at Brussels or with that of Paris. In all four instances, these

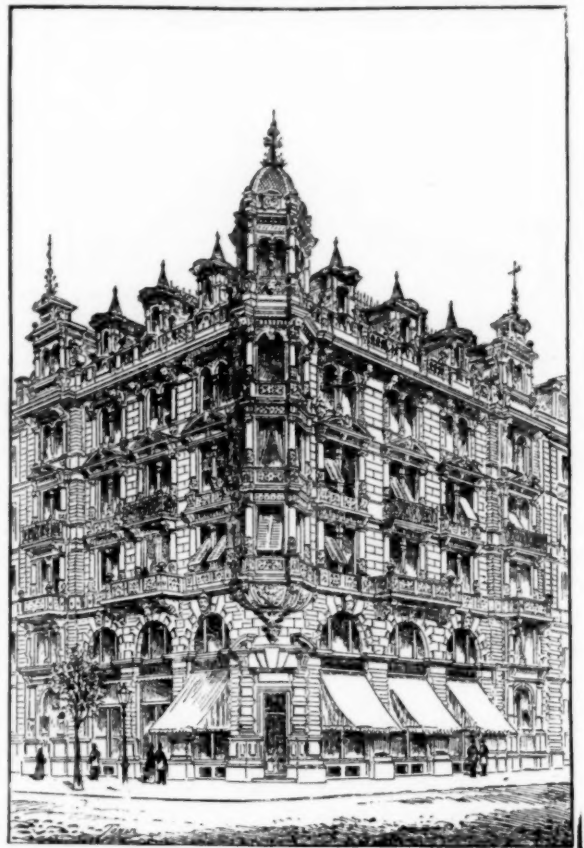


Fig. 45. House at Zurich, Switzerland.

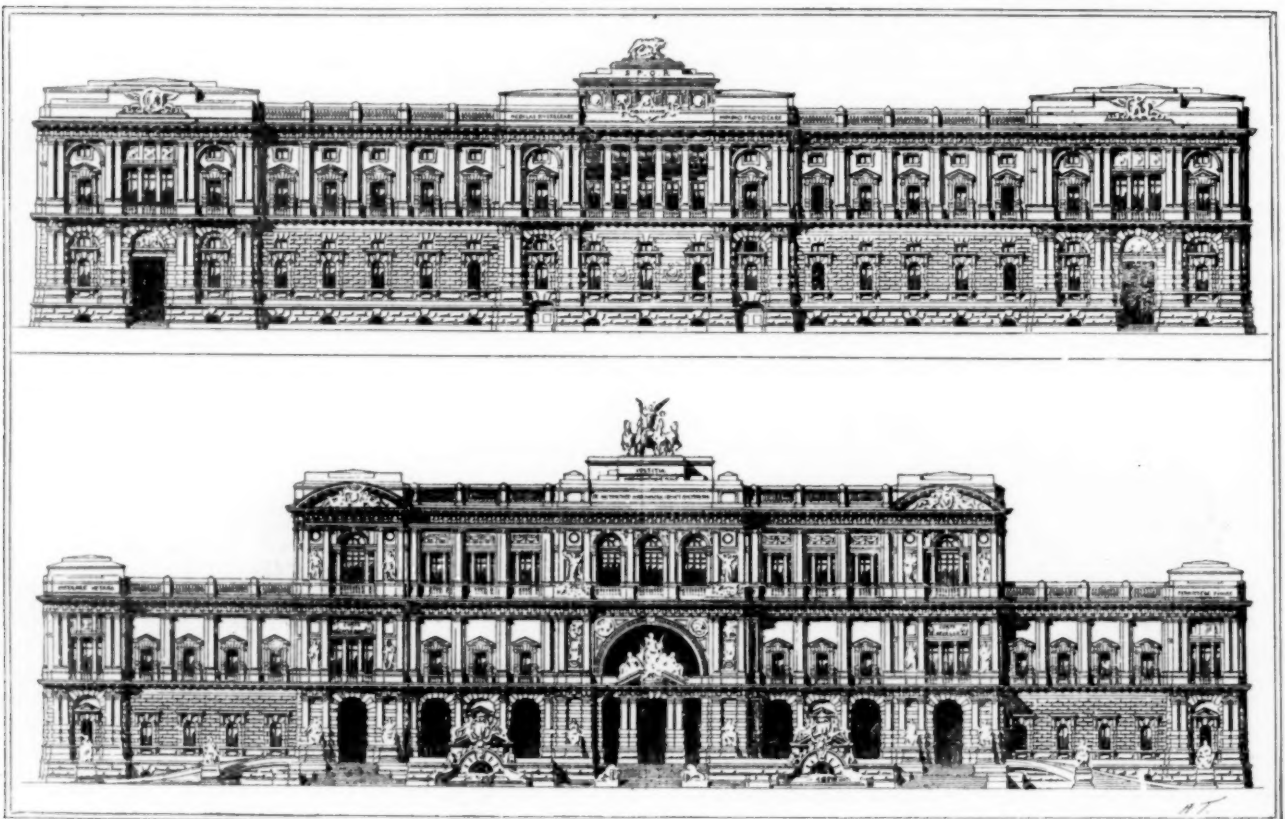


Fig. 46. Court-house, Rome, Italy.

are works of the first order in their respective countries. The results of the comparison we would state as follows: with content to conform to excellent traditions. At Vienna it is clear that, in a style which yet has nothing startling about it,

more attention has been paid to the silhouettes, to motives giving variety to the façade and to combinations of cupolas, roofs and campaniles which add life to the general aspect. At Brussels, the architect profiting by the commanding site and

its principles. This struggle between the purest and most refined archaism, seconded by a delicate taste, and the desire for novelty, cannot fail to be of the highest interest. Unquestionably the new façade of the Court of Assizes furnishes an



Fig. 47. Zoological Building, Naples, Italy.

skilfully endeavoring to obtain all the advantage possible from it, also sought inspirations in the past which were not exclusively those of antiquity or the Renaissance; in some cases he was fortunate in his efforts at adaptation, in others less so; from the very fact that he has essayed to open up paths



Fig. 48. Villa Raggio, Genoa, Italy.

branching off from the beaten track he will be the more readily discussed. At Paris finally, we must call attention to an attempt no less interesting, but in quite another line. It is certainly curious to note what results can be reached in a formal quest of new solutions by an artist of great talent and



Fig. 49. Chiesa Palace, Turin, Italy.

imbued wholly with the Hellenic spirit of careful research and of delicacy in the study of the minutest details; one who, by taste, by training and by temperament, sets Greek art above every other and cannot but find it difficult to accept other than



Fig. 50. Casino of St. Sebastian, Spain.

example of real success in this bold venture; but we must confess that the later addition of the monumental staircase leading to it, which masks it and does not harmonize with it, has somewhat detracted from its otherwise remarkable merit.

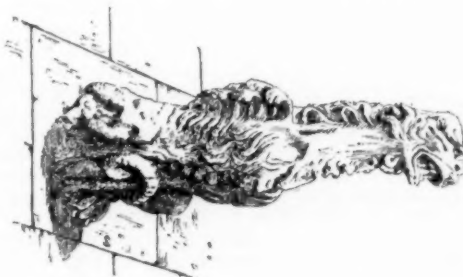
A few specimens of more modest architecture, presented in Figures 47, 48 and 49, are sufficient to illustrate the style adopted by the Italian architects of the present day, both in Northern and Southern Italy.

Spain has a glorious architectural past of most varied features. We shall not repeat here what has already been cleverly presented under Spanish Architecture (see *American Architect* for May 30, 1891, *et seq.*). We shall not touch on the peculiarly original Moorish period, the fine productions of Gothic times, the evolution effected in the sixteenth century as a result of frequent intercourse with Italy, the contrasts between the noble and severe architecture of the Escorial and the exuberance of the Plateresque school, nor on the transformations of the eighteenth century; our readers are familiar with all this now; we will merely ask attention to the very pretty Casino of Saint Sebastian (Fig. 50), the forms of which are so well adapted to a sunny climate and glowing sky; also to an immense hotel at Barcelona (Fig. 50), which is of interest on account of its Moorish suggestions, in a construction designed wholly to meet modern requirements. Here again, in order to be able to judge of effects, one must take into consideration coloring, the play of light and shade, and atmospheric influence.

[To be continued.]

THEATRE BUILDING REGULATIONS.¹—VI.

WATER-SUPPLY AND FIRE-PROTECTION.



Gargoyle, Chateau de St. Germain. From Havard's "Dictionnaire de l'Ameublement."

WHERE could be no more important subject in theatre regulation than the water-supply and the fire-protection. The London rules are not so full as those of the Continent or of America.

[London.] All theatres in London containing a superficial area for the accommodation of the public of 1,000 feet and upwards have to be provided with a sufficient number of hydrants, each of a diameter

¹ Continued from No. 867, page 88.

of not less than 2½ inches, to be connected by a 3-inch main with a Water Company's high-pressure street main.

Each of such hydrants must be provided with at least a 30-foot length of hose with fittings of the Metropolitan Fire-Brigade pattern.

Where there is no constant supply of water, there shall be provided on the top of the proscenium-wall, or at some other place to be approved by the Council, two cisterns, to be kept always filled with water.

Such cisterns must be each capable of containing at least 250 gallons of water for every 100 persons of the audience to be accommodated in the building and must be properly protected from all danger from frost.

Fire mains must be connected with the cisterns by hydrants to be fixed in such places and manner as may be approved by the Council.

Personally I do not approve of the reliance on cisterns at all, they are apt to be empty when most needed. I think the supply should at all times be from a high-pressure constant supply.

Every theatre must be connected with the nearest Fire-Brigade station by telephone.

Wet blankets or rugs, and buckets filled with water must always be kept on the stage or in the flies, scene-docks, or wings, and attention directed to them by placards legibly printed or painted, and fixed immediately above them.

Some person is to be held responsible by the management for keeping the wet blankets or rugs and buckets ready for immediate use.

Hatchets, hooks and other appliances, for taking down hanging scenery in case of fire must always be kept in readiness for immediate use.

The regulations as to fire must be always posted in some conspicuous place in such premises, so that all persons connected with such premises may be acquainted with such regulations.

[Austria.] The fire-regulations of Austria are somewhat lengthy. Some of the main points not observed by the London County Council are: that a fireproof retreat has to be arranged for the persons in charge of the fire-appliances. In the several tiers or galleries, as well as in the roof there must be coils of hose stowed away in recesses within glass doors, and accommodations must be afforded for the firemen in charge.

Special precautions have to be taken on the stage, tanks always full of water must be provided and each tank must have near it at least four fire-buckets, wet swabs and sponges affixed to poles, and at least one long fire-hook on each side of the stage and a sufficient number of knives with ferrule handles sealed up by the management. Extinguishers are to be kept in perfect working order on the stage.

An apartment must also be provided and kept for the Inspectors, and in case of accidents or sudden illness this room can be used by the patient, and it has to be fitted with all necessary appliances for this purpose.

The storage of fireworks is prohibited: when such are to be used they must not be brought in before the commencement of the play and they must then be placed in charge of a fireman.

When straw, hay or other easily inflammable materials are used for "properties," they have to be taken out of the theatre after each rehearsal or performance, and, for shots, the wads must be of cow's-hair.

Wax or oil colors are not allowed to be used by the scene-painter. All combustible parts of the machinery and fittings must be impregnated with fire-resisting solutions, and the materials used to construct the scenery and properties must also undergo a similar impregnation, and be subjected to examination and proof before they can be used, as well as twice a year.

The lighting or smoking of cigars or pipes is prohibited in the Austrian theatre, and the removal of all shavings and rubbish of all kinds from all workshops, etc., is insisted upon prior to the commencement of the performance. Cleanliness generally in all parts of the house is to be a special duty.

With regard to the firemen and persons in charge of the fire-hose, naturally they are to be thoroughly instructed and drilled in their duty. They are to wear uniform, and be distinguished by numbers. The number of men to be employed in each theatre is determined by the authorities. Further, all arrangements, the working of which is of importance as to time in critical cases, such, for instance, as the opening of doors or lowering of the proscenium fireproof curtain, or opening of ventilators, are to be placed under the care of specially appointed persons. The firemen, when on duty, are not to be employed in any duties except their own. The Austrian authorities are so strict with regard to the fire-protection that they insist upon supervising the instruction to the firemen as to the position and relief of their posts, their patrols and duties generally. The management is further bound to provide watchmen when the theatre is closed, who have to record their rounds by visits to tell-tale clocks. All parts of the house have to be thoroughly examined before each "show," and after the lights have been put out at the end of the performances.

Every theatre has to be provided with a special set of rules and regulations as to the daily examination of the house before and after each performance, the carrying about of naked fire or lights, and as to what is to be done in case of fire. These rules have to receive the sanction of the authorities, and the management is held responsible for the due, exact and conscientious performance of them, as well as the giving the alarm of fire to the audience at the right moment—a difficult time to define.

[Vienna.] In Vienna theatres, the firemen employed "must always be sober," and only trustworthy and courageous persons are chosen. If the firemen do not belong to the Vienna Fire-Brigade, they have to wear a distinctive uniform, and all the employés of a theatre are bound to obey them in matters relating to the extinction of fire.

The duties of the firemen are clearly defined:

To work the water-taps and buckets, and the blankets and sponges in moments of danger;

To work the iron curtain;

To see to the gas and gas-meters;

To patrol every part of the theatre which is in use.

A fireman has to be stationed at each hydrant one hour before the commencement of the performance, and there he has to stay till the show is over. In the same way officials are told off to remain by the iron curtain during the whole time the audience is in the theatre.

A special officer has to be appointed to take charge of the whole of the gas arrangement, and the superintendence of the "safety-lights" in all the passages used by the spectators is entrusted to the Imperial Royal Police authorities.

A curious rule exists in Vienna that all persons connected with the fire-service are bound to report to the Municipal Board of Works all information they may have received or deficiencies they may have noticed in the arrangement entrusted to their charge. It frequently depends on the calmness and coolness of the firemen to prevent the public being seized with a panic and being hurried into a violent flight from the theatre.

[Berlin.] The Berlin arrangements for the extinguishing of fires in theatres are determined and upheld in accordance with the rules of the fire-brigade, and copies of the rules are given to all officials, artists and servants of the theatre.

[St. Petersburg.] The fire-plugs in the theatres of St. Petersburg must be so arranged that wherever there is a possibility of an outbreak of fire, water can be played upon that point from at least two plugs or hydrants. The plugs must be placed in such positions as to ensure the escape of the firemen.

A guard-room is required with a number of alarm-bells connected with the various fire-watch posts, and from this guard-room telegraphic communication with the nearest municipal brigade station.

The rules as to the water-supply from the city water-supply or from reservoirs or tanks are similar to those of the London County Council.

The saturation with non-inflammable preparation of all scenes, properties and dress is also insisted upon and a list of articles to be so treated is given in the rules; the further regulations of fire protection in St. Petersburg theatres are like those already noted above for other countries.

[Brussels.] In Brussels there is a special rule that the upper part of the stage shall be provided with an apparatus for saturating it with water, regulated by a fire-cock fixed on the outside of the theatre.

[Italy.] The Italian rule for fire-appliances, etc., is very concise. "There shall be provided on the stage during the time of performance an efficient staff of firemen in proportion to the size of the theatre, and there shall also be a sufficient supply of water."

[Paris.] There are some fresh points to observe on this subject when looking over the Paris regulations. The water-supply to the fire-hydrants must be completely separated from the supply for general purposes, and there must be a fire-plug four inches in diameter on the outside of the theatre in front of each entrance. The water-supply must be taken off two of the city mains and the pipes must be furnished with a sufficient number of stop-cocks to obviate the danger which might result from their breaking.

If the theatre is separated from adjacent premises, or if it has internal areas suitable for escape in case of fire the side fronts and those abutting on the areas must be furnished with fixed iron ladders in a straight line with (*au droit*) the windows, or openings made for the purpose of escape. Similar ladders are required on the façades.

[New York.] In New York the theatre must be provided with a balcony, not less than four feet in width, in the open spaces at the sides of the theatre at each level or tier above the parquet on each side of the auditorium, of sufficient length to embrace two exits. From these balconies staircases must be provided extending to the ground-level.

The staircase from the upper balcony to the next below must be not less than thirty inches in width in the clear, and from the first balcony to the ground not less than four feet wide. All these balconies and staircases must be constructed entirely of iron including the floors of the balconies.

Where one side of the theatre borders on the street similar provision for escape must be provided.

In New York the number of hydrants is defined as follows:

One on each side of the auditorium in each tier.

One on each side of the stage in each tier.

One at least in the property-room.

One in the carpenter's-shop.

The stand-pipes have to be kept filled with water by means of an automatic steam-pump of sufficient capacity to fill all the lines of hose simultaneously when in operation.

Automatic-sprinklers over the stage are required in New York with fusible plugs, to be approved by the Commissioners of the Fire Department. These sprinklers must be placed up and around the proscenium-opening, and on the ceiling or roof over the stage at such

intervals as will protect every square foot of the stage surface, when they are in operation. The scenery, etc., must be rendered non-combustible; portable extinguishing apparatus is insisted upon.

In some conspicuous place on every gallery or tier of a New York theatre, there have to be posted the regulations for the protection of the public against fire or other accidents, together with a diagram or plan of the gallery or tier distinctly showing the exits therefrom. Every exit must have the word "exit" painted over it in legible letters not less than eight inches high.

This leads me to the London County Council's rule as to notices, which is that:

[London.] All exit and other doors used by the public shall be indicated by painted notices in three-inch white block letters upon a black ground.

Such notices shall be painted on the doors and walls at least six feet nine inches above the floor.

The words "no exit" shall be painted at least six feet nine inches above the floor, in three-inch white block letters upon a black ground, upon all doors, in sight of the audience, which do not lead to exits.

[Mons.] A curious rule has been framed by the Mons Board of Works: "On the walls and on the curtain should be painted in large text and bright color, this notice: 'In case of fire, to save your life and the lives of others, follow, but do not push. The theatre may thus be emptied in three minutes.'"

In Italian theatres notices are required in the bends of the corridors indicating by letters and signs the way out.

E. A. E. WOODROW.

[To be continued.]

BEAUTY, ORNAMENT AND ARCHITECTURE.



Portal, Hotel de Chateaubriand, Rue du Bac, Paris, France. From Havard's "Dictionnaire de l'Architecture."

GOING back into the past the most striking thing to be noted in architecture is the abundant use of ornament in all styles. In the Egyptian, Assyrian, Greek, Roman, Byzantine, Mediæval or Gothic, Renaissance and Mohammedan it is scarcely possible to consider the architecture apart from the decoration, so closely united were the two. Each employed it in its own way and the results were totally unlike in all cases, but the intimate relationship existing between the architecture and the decoration is present in all. Yet this very difference in their methods is the key to the successful manner in which these forms of art—for they are but different branches of the same art—obtained their full effects. The isolation in which architecture was first developed was not without its advantages. Each people had abundant opportunities to work out an art of its own without any direct reference to what was being done by other nations. Each style has many elements in common with other styles, and there are in all more or less traces of borrowings and foreign origin, but these borrowed forms soon

acquired features which, while they did not hide their source, rendered them an integral part of the art of those who adopted them.

In this formative period of human existence intellectual movements were slow. To those who participated in them they were doubtless swift enough, but judged by modern standards they were tedious and much drawn out. Whether or not this intellectual state is essential to artistic development need not be questioned, but it is certain that it was conducive to amazingly beautiful and satisfactory results. This is especially the case with borrowed forms: they are not thrust spontaneously into a new art, but are modified to suit existing forms and meet fresh requirements. They become part and parcel of new styles without intruding upon decorative features already adopted. In time they are so completely absorbed that those who used them forgot their origin, or that they were ever anything else but part of their own art. It has been among the proudest achievements of modern scholarship that these disconnected fragments have in some instances been traced to their fountain head.

Here, then, is one principle which makes ancient and mediæval decoration so completely satisfactory. It is the complete absorption of every foreign element into a homogeneous whole; the modification of foreign elements to conform with the style into which they are introduced; the gradual addition of art motives whereby one form is made richer without the intrusion of foreign ideas. Another fundamental fact in decoration, good decoration—there is none other—is its application in a rational manner. The best forms of architecture are those in which this idea is most closely followed. Of the historical styles it was most openly violated in the Roman and the Renaissance, and both of these are wanting in the purity, the strength, the expression which is true of those in which decorative elements, be they painting or sculpture, are employed as adjuncts to architecture. The architects of the Renaissance too frequently made their architecture the means of preparing elaborately designed surfaces: ornament was the chief thing; architecture, not an after consideration, for the building must be built before it can be decorated, but subordinate to the decoration. Quite the contrary obtained among the Egyptians, the Greeks and the builders of the Middle Ages. With them the quantity of the decoration is scarcely less than that used in the Renaissance, but being employed as adjuncts to the architecture it fills useful and necessary purposes. It is not brought before the spectator in such a way as to concentrate attention upon it to the exclusion of all else.

Beautiful, gorgeous and elaborate as many of the buildings of the Romans and of the Renaissance period were, they lack that exquisite finish and careful attention to detail which is characteristic of Greek and Gothic work. That masterpiece of Greek art, the Parthenon, is a most wonderful combination of architecture and decoration in which the latter strengthens and accentuates the former, while the architecture, in its turn, offers ample but not too abundant opportunity for the ornament. The Greeks were the first to practise the limitation of ornament, confining it to certain parts of the building. In Egyptian architecture ornament is used indiscriminately, though it was an integral part of the architecture, and consisted of painted or slightly incised designs spread over the surface of the structure like a huge piece of embroidery. The building blazed with color in all its parts, and presented a brilliant appearance which was thoroughly in keeping with Oriental feelings and ideas. The Assyrians adopted a somewhat similar idea, though their sculpture and brick produced results quite distinct from the Egyptian. All of this was reversed by the Greeks. Wherever they learned the lesson it matters not, but they early discovered the advantage of confining their ornament to certain parts and that much better effects could be had by using a small amount of good ornament than a large quantity of indifferent decoration. While they decreased the amount they increased the quality in an amazing proportion, and produced buildings of perfect architecture that excited the admiration of the spectator both for the architectural forms and the ornamental features. This was accomplished with much less materials than were used by the Egyptians, Assyrians or Romans, who were never satisfied until almost every inch of surface had received some sort of decorative finish.

The principles employed by the Gothic decorative artists were closely akin to those of the Greeks. Like them they confined their decoration to portions of the edifice, and by using the best possible quality gave an effect in marked contrast to the overloaded structure of the Gothic decadence. The builders of the great French cathedrals of the thirteenth century in which Gothic art reached its culmination, fully comprehended the value of capitals that were not too crowded with ornament to show their constructive form. They knew the merits of a well moulded base or cornice, of a delicate string-course, of richly carved bosses, covering the intersections of the vault ribs, of tracery, of finials, of gargoyles. Above all they realized the value of concentrated ornament, in lavishing the results of their chisel upon the elaborately carved doorways. Here hundreds of figures were frequently employed, and the imagination of the artist given full play. The doorway completed, the decoration was brought to an end. No attempt was made to cover the building with such extensive work. Not only was all appearance of overloading thus prevented, but the sculptures gained and added strength and importance from their isolation. A front such as at Paris or Reims contains more sculpture than that employed directly on the portals, but it is used with a full understanding of its capabilities,

A comparison of these fronts with one of later date in which there is no sparing of ornament and decoration shows how completely and thoroughly the earlier artists understood their work and how mistaken were the attempts to improve upon their methods.

Greek and Mediaeval were not only alike in the principles of decorating buildings, but they had further resemblance in the abundant use they made of every kind of decoration. The Greek architect not only prepared his lines and surfaces with the utmost nicety and discrimination as to purity of form and outline, but he colored them. He used sculpture in certain parts of his structure. He hung costly curtains of rare stuffs between his columns. The interior glistened with gold and precious metals. The resources of his civilization were exhausted in providing glories for his deities, and satisfaction for his own artistic instincts. No art was neglected, no means unemployed.

It was so with the Gothic builder. His lines and surfaces were not, perhaps, as delicately moulded as the Greek. He did not color his walls externally, because his art originated in a cold northern climate where it would have been unsuited to the environment. But he used wall-paintings within. He filled his windows with richly painted glass whose colors were of unsurpassed brilliancy. His capitals, his bases, his strings, his bosses, his tracery were carved in the most exquisite and artistic manner. He could not hang curtains in the open air, but he decorated his inner walls with tapestry or hung pieces between arches and from the clerestory on festival occasions. The altar was loaded with gold plate, and brazen and gilt sanctuaries contained sacred relics. As with the Greek, no art was missing, no effort spared to render the church as elaborately ornamented as the knowledge of the times permitted.

These facts are of importance as showing the people who were most careful and artistic in their use of ornament and most fully understood the value of concentrating it were also those who used the greatest variety of decoration, and in a way that produced results of unmatched richness. It seems almost paradoxical that such should be the case, but it is nevertheless true. To the modern builder this offers at once a lesson and a warning. It shows the fundamental principle under which ornament is best employed in architecture. It shows the necessity of developing borrowed forms to suit new conditions, of using ornament as an adjunct only, not as a chief end. It shows the value of concentrated or limited ornament, of decorating some central feature rather than spreading it over an entire structure. It further shows that it is possible to employ a great variety of decorative means and yet so subordinate them to the whole that, while the entire result may be extremely rich and varied, not one shall apparently be in excess or excite undue attention. The Greek or Gothic architects were master artists in the production of general effects, in the obtaining of final results from diverse sources, in the combining of varied elements in just proportions. All these are of the first importance in architecture. The necessity for adhering to them has never ceased to be felt.

The methods of Greek and Gothic architects have been referred to for the purpose of illustrating the principles on which the best results of architectural decoration have been obtained. It is not to be pretended that either Greek or Gothic designs are thoroughly adapted to modern needs and should be copied and used on all occasions. Admirable as most of them are, their truest value to us is not their forms alone, but the principles they express, the ideas they convey, the methods they illustrate. Greek decoration teaches us the truths which underlie the use of ornament in any architecture, be it Greek or other. It shows that in the purest art there is no direct copying or borrowing of forms, but a modification of whatever beautiful comes to hand. It teaches us also, and perhaps this is the most important of all, that the best results are not necessarily obtained from the extravagant use of ornament and the subsidiary arts.

Quite the contrary practices are in vogue in modern architecture, and much of the error of modern designs arises from an incorrect understanding of the proper way to employ ornament. History tells us that no general rules can be laid down. Each example calls for individual treatment. The reasons that lead to the use of decoration on one building would not require a similar amount on another. All that precedent does — and this is sufficient for modern needs — is to show us that a rational use of ornament and decoration is legitimate in the best architecture, and that those styles in which it is most freely used have best withstood the test of time and of comparison with other forms of art. It tells us further that it is possible to make use of many different kinds of ornament in the same structure — still employing it in a rational manner — without in the least detracting from the architectural qualities. On the contrary it adds to them and gives additional beauty to the building as well as enjoyment to all who behold it.

No apprehension need therefore be felt that a return to the elementary principles of architecture will be attended by plain unornamented, unornamental structures, which will have only their utility to excuse them. Utility is a prime essential in all good architecture, but it is not all of architecture. It is but a single part of a whole of which ornamentation and decoration are other parts, not as essential perhaps, but all having organic connection. The error in modern architecture is a lack of discrimination in the use of ornament. Some buildings have too much, others too little. Those with too much are not seldom unsatisfactory as buildings and a reaction ensues against the use of any ornament. It does not seem to be known or understood that it is a part of good architecture, and that

it is possible to have the latter while employing the former. Unfortunately there are many examples which discourage one from having much hope for the regeneration of ornament and its regulation to its proper sphere.

Ornament in modern architecture is apt to be used as an addition to the building, as an element apart from the architecture. Frequently it is prepared by another hand than that of the architect, and at other times he undertakes to guide, direct, prepare and plan more than he can properly attend to. In the former instance there is a lack of unity in the work that does much to mar the effect however good it may be. In the latter the ornament is apt to acquire a weakness and similarity that is far from pleasing, and even attempts at originality are often unsuccessful. Originality in modern ornament as in architecture is apt to take the form of the grotesque, without any of those quaint lifelike qualities which make Gothic grotesque so attractive. The bizarre and the odd, the strange and the unknown are more likely to meet with approval than good, quiet work which lacks the distinctive characteristics of the grotesque. This abnormal, it might almost be said diseased, form of art is to be attributed not alone to the architects, but to the taste of a community which is satisfied with such productions. They must be appreciated since money is forthcoming for their erection, but it is a matter of great regret that those who have money to spend in building should not be better informed. The man who uses bad grammar is tolerated because he is the chief sufferer and his ignorance is not necessarily inflicted upon the entire world. Such is not the case with those who are deficient in architectural knowledge. The man who erects a building in an unarchitectural manner commits an offence against the entire community, against strangers who may visit it and against posterity.

Rapid as are the movements of modern life, a building once erected is apt to maintain an existence of some years. During this period the errors and ignorance of those concerned in its erection stare the spectator in the face, a constant reminder of the faults into which one is led through not knowing what one is about. Unfortunately there is no escape from such ignorance. Once it has been given visible form in stone, brick, iron, wood or other material it is destined to remain until accident or a positive refusal to fulfil its functions brings it into disuse and decay.

Whatever may be the errors in modern application of decoration to architecture they should not discourage us in its use. The highest province of architectural art is to be ornamental. In the Middle Ages this was a task of comparative ease, since the monumental churches and the chief structures of the time, permitted ample opportunities for the use of ornament. Their vast size, the large sums of money at the disposal of their builders, the esteem in which they were held in the popular mind, all tended to render their ornamental qualities important. Modern life offers few such opportunities and the architect is ill-adapted to take advantage of them. We may have many other buildings of a different kind which should offer in their way as ample scope for ornamental architecture as were presented to the mediaeval architect. These advantages will never be availed of so long as ornament is looked upon as something that may be assigned to subordinate hands or borrowed from existing structures. Such a method is undoubtedly valuable in giving us illustrations of good work, but it is not the province of architecture to copy, to borrow, to steal. Its end and aim is to develop, to change existing methods and forms, to conform to newer ideas and necessities. The use of ornament calls for progressive ideas as does any constructive form. It needs to be absorbed into our architecture as part and parcel of it, not kept on the outside as something that may be employed but which has no functional connection with the structure.

It is difficult to hope for improvement while our architecture chiefly concerns itself with the reproduction of former forms. More homogeneous work than is possible under present conditions is requisite to an intelligent use of ornament. The application of the principles of common-sense to architecture, point the way for progress. This does not imply the omission of ornament from our buildings, but its employment in a rational manner which will add strength as well as beauty, truthfulness as well as solidity. It means a return to the elementary principles under which man first began his architectural creations, and which made them in time the fairest, grandest, mightiest of his works.

BARR FERRELL.

HOW THE GOVERNMENT LOST A GREAT MOSAIC. — A correspondent of the New York Times writes as follows under date of June 9. "Whether Pope Pius IX or the present Pope has ever sent an exhibit to a World's Fair in Europe I could not say; but I do know that Pius IX sent to the exhibition in this city, in 1853, a beautiful mosaic copy of Guercino's 'St. John the Baptist' an exquisite work of great value. It was the positive intention of the Holy Father to have afterward presented this artistic gem to the United States Government upon the occasion of the appearance at Washington of his first Nuncio Apostolic, Mgr. Gaetano Bedini. The presentation, however, was made discretionary with Mgr. Bedini, and dependent upon his reception. It was not, he thought, such as, in view of the correspondence between Minister Cass and the Pontifical Government, he was entitled to expect. He therefore withheld the intended presentation, and the beautiful mosaic, after the close of the exhibition, was sent back to Rome. In 1856 I met, in the mosaic manufactory of the Vatican, the artist who made the copy, and he told me that he had been six years at work on it."

COMPARATIVE MUNICIPAL BUILDING LAWS.—X.

[Note:—In these tables bracketed letters invariably refer to preceding passages in the same column.]

Hollow Walls.

Boston:—*a.* Vaulted walls of the same thickness, independent of withes, may be used instead of solid walls.
b. The walls on either side of air-space shall be not less than 8" thick.
c. Such walls to be tied together perpendicularly with continuous withes of hard burnt brick of good quality.
d. Or of other approved material, and which shall be not more than 3' apart.
e. The air-space shall be smoothly plastered.

Baltimore:—*f.* In all buildings when walls are built hollow the same amount of stone or brick shall be used in their construction as if they were solid.

g. No hollow wall shall be built unless the two walls forming it, shall be connected by continuous vertical ties of the same material as the walls, and not over 24" apart.

Charleston:—

Chicago:—*h.* Hollow walls, not bearing walls, may be used in all cases.
i. Hollow walls shall be tied together with incombustible anchors not more than 3' apart.

j. Used as bearing walls, the thickness shall be reckoned by the solid parts, unless either part is at least 8" thick and solid connections made in upright directions not less than 12" wide, and not more than 8' apart from centres.

k. In such case two-thirds of the hollow space shall be counted with the solid parts.

l. No woodwork allowed within 4" of the hollow space.

Cincinnati:—**Cleveland:**—

Denver:—(*a*); (*b*); (*c*); (*d*).

Detroit:—

District of Columbia:—

Kansas City:—**Louisville:**—**Memphis:**—

Milwaukee:—(*h*); (*i*); (*j*); (*k*); (*l*).

Minneapolis:—(*i*); (*j*); (*k*).

Nashville:—

Newark:—In hollow walls only the amount of material actually used shall be counted as thickness of wall. The two parts shall be tied together with brick or suitable iron anchors.

New Orleans:—

New York:—(*f*). No hollow wall shall be built unless the two walls are connected by proper ties of brick, stone or iron placed not over 24" apart.

The inside 4" of all walls may be built of hard burnt hollow tile blocks, properly tied and bonded into walls and of dimensions not less than ordinary bricks.

Omaha:—**Philadelphia:**—**Pittsburgh:**—

Providence:—(*i*); (*j*); (*k*); (*l*).

St. Louis:—(*h*); (*i*) Used as bearing walls the thickness shall be reckoned by their solid parts, unless either part is at least 9" thick, and solid connections are made in a vertical direction, not less than 12" wide nor more than 8' from centres, (*k*); (*l*).

San Francisco:—(*f*). No hollow wall shall be built unless the two walls are connected by proper ties either of brick or galvanized straps placed not over 20" apart and of proper stiffness.

Wilmington:—

Walls Built at Same Time and Braced.

Boston:—*a.* Every portion of every structure in process of construction, alteration, repair or renewal, and every neighboring structure or portion thereof affected by such process, or by any excavation, shall be properly constructed and sufficiently supported during such process.

Baltimore:—

Brooklyn:—*b.* In no case shall side, end or party wall be carried up more than two stories in advance of front and rear wall.

Charleston:—

Chicago:—*c.* In construction, no wall shall be carried to a greater height than two stories above any other wall.

d. Walls shall be securely braced during construction.

Cincinnati:—**Cleveland:**—

Denver:—*e.* Any building erected in an isolated position more than 10' in depth, without cross-walls, shall be securely braced during construction both inside and out, if practicable, or, if outside bracing is not practicable, it shall be properly braced from the inside, and the bracing shall be continued from the foundation upward to at least one-third of the height of the building from the sidewalk level.

Detroit:—

District of Columbia:—*f.* The enclosing walls of a building must be brought up as nearly simultaneously as possible, and in no case shall the work on the side walls be ahead of the work on the front wall more than the height of one story, unless a special permit be first obtained from Inspector, defining manner in which work shall proceed.

Kansas City:—*g.* No side wall of a brick building shall be carried up in advance of the rear wall.
h. Walls and roof of every building shall be strongly braced from the beams of every story until all the bearing parts of the construction are completed, unless omitted by consent of superintendent.

Louisville:—*t.* During construction, no wall shall be carried to a greater height than one story before the other floors are brought to its level.
j. Walls shall be braced during construction if deemed necessary by Inspector.

Memphis:—*k.* Front, rear and side walls shall be built at same time.

Milwaukee:—(*c*).

Minneapolis:—(*c*); (*d*).

Nashville:—

Newark:—(*d*).

New Orleans:—

New York:—(*e*). *i.* Walls of every building during erection or alteration shall be strongly braced from the beams of each story until the building is enclosed, and the roof tier or beams shall be strongly braced to the beams of story below until floors are laid.

Omaha:—(*g*); (*e*) without limitation for depth of building.

Philadelphia:—

Pittsburgh:—

Providence:—

St. Louis:—(*e*); (*l*).

San Francisco:—(*i*), and then shall be securely anchored to other portions at distances not to exceed 6' in height, and the work shall be racked back not less than 6' for the purpose of securely bonding the work.

Wilmington:—Enclosing walls of building must be built up as simultaneously as possible. In no case shall side walls be ahead of front wall more than height of one story.

Wall Anchors.

Boston:—*a.* All walls of first¹ and second² class buildings meeting at an angle shall be anchored to each other,

b. Every 10' in their height,

c. By tie anchors at least 1" by 2" wrought-iron,

d. Securely built into side or partition walls not less than 36",

e. And into front and rear walls at least one-half their thickness.

f. All floors in first and second class buildings shall have beams tied to each other and to walls so as to form continuous tie across building,

g. Not more than 10' apart,

h. With good wrought-iron anchors at least 3" by 1 1/2",

i. Walls running parallel or nearly parallel with floor beams shall be properly tied once in 10' to floor beams by straps or anchors, as specified above.

Baltimore:—

Brooklyn:—*k.* Front, rear, side and party walls shall be anchored to each other,

l. Every 6' in their height,

m. By tie anchors 3" x 1 1/2" wrought-iron, built into side or party walls not less than 16". (*e*).

n. Side, end or party walls shall be anchored to each tier of beams with good wrought-iron anchors 1" by 1", well built into side walls and fastened to each beam by two wrought-iron nails at least 1" diameter,

o. The anchors not more than 8' apart.

p. Beams supported by girders shall have ends of beams on girders, butted together and strapped by wrought-iron ties, at the same distance apart and in the same beams, as wall anchors, well fastened and of same size as wall anchors.

q. Plate iron shall be built into side or party wall and secured by wrought-iron anchors at least 1" by 2", built into walls and turned down at least 4".

Charleston:—

Chicago:—*r.* Walls shall be securely anchored to timbers and joists resting upon them.

Cincinnati:—*s.* Walls not carried up together must be anchored every 6' in height by good and sufficient wrought-iron anchors 36" long and turned up 24".

t. External and party walls above the ground-floor shall be securely anchored at least every 8' to each tier of joists wrought-iron hooked end anchors provided with proper T or other heads.

u. Joists supported by girders must have anchorage continuous by proper dog anchors or other approved system.

Anchors parallel to joists not less than 2' long, anchors at right angles to joists not less than 5' long.

Cleveland:—(*s*); (*t*); (*u*).

Denver:—*v.* All walls of brick buildings meeting at an angle shall be anchored to each other (*b*); by anchors of at least 3" x 1 1/2" wrought-iron, (*d*); (*e*).

w. All walls of brick building on which the ends of beams rest shall be anchored to each tier of beams at least every 8'. (*p*).

Detroit:—

District of Columbia:—(*n*). Anchors not more than 10' apart, and so as to form continuous tie across building at each floor.

Kansas City:—(*v*); (*b*). By anchors of at least 3" x 1 1/2" wrought-iron (*d*); (*e*). (*er*). With good strong wrought-iron anchors at least 1" by 1 1/2" well fastened to walls and beams. (*p*).

Louisville:—

Memphis:—External and party walls above the ground-floor shall be securely anchored at least every 12' to each tier of joists, with approved appliances which shall allow the joists to fall out without injuring the wall.

Joists supported by girders, shall have anchorage made continuous by approved anchors of proper proportions.

Milwaukee:—(*r*). Anchors 8' on centres.

Minneapolis:—Side, end or party walls shall be anchored at each tier of beams, not more than 10' apart, with strong wrought-iron anchors, at least 1" by 1", well built into walls and fastened to top of beams. (*p*).

All anchors shall run within 4" of the opposite side of wall, where they do not run through wall.

Nashville:—

Newark:—Front walls shall be securely anchored to side or party walls with iron anchors every 4' in height.

All walls shall be anchored to each tier of beams with iron anchors not more than 8' apart; anchors built in to within 4" of outside of wall.

If there are openings in wall there shall be at least one anchor in each pier. Beams supported on girders or partitions and not continuous across building, beams having anchors shall be tied together with iron straps.

New Orleans:—

New York:—Front, rear, side and party walls of every building shall be properly bonded together, or shall be anchored to each other every 6' in height by wrought-iron anchors not less than 1" by 1 1/2". Side anchors built into side or party walls not less than 16", and into front and rear walls so as to secure them to side, end or party walls, when not bonded together.

Side, front, rear or party walls and every pier shall be anchored to each tier of beams at intervals of not less than 6' apart, with strong wrought-iron anchors not less than 3" by 1 1/2" well fastened to side of beams by two wrought-iron nails not less than 1" diameter.

(*p*), and girders shall be anchored to walls and fastened together by suitable straps.

Every pier or wall, front or rear, well anchored to beams of each story, with same size anchors, are required for side walls, shall hook over second beam, and each tier of beams, front and rear opposite each pier, shall have hardwood or Georgia pine anchor strips dovetailed into beams diagonally, which strips shall cover at least four beams, and be 1" thick and 4" wide, but no such anchor-strips shall be let in within 4' of the centre line of beams, or wooden strips may be nailed on top of beams and kept in place until floors are laid.

Omaha:—All walls of brick buildings on which the ends of beams rest shall be anchored to each tier of beams not more than 6' apart with good wrought-iron anchors at least 1" by 1 1/2", well built into walls and fastened to beams. (*p*).

Philadelphia:—**Pittsburgh:**—

Providence:—Side, end and party walls shall be anchored at each tier of beams, not more than 10' apart, with good wrought-iron anchors at least 1" by 1 1/2", well built into walls and fastened to top of beams. (*p*).

St. Louis:—Side, end and party walls shall be anchored to each tier of floor beams, and, where piers receive girders, they shall be anchored thereto.

San Francisco:—All walls shall be securely anchored with iron anchors to each tier of beams.

Side, front, rear and party walls shall be anchored to each tier of beams at intervals of not more than 8', with good wrought-iron anchors 3" by 1 1/2", built in not less than two-thirds of thickness of side walls, the ends turned down into joists and securely spiked thereto. (*p*).

Front, rear, side, end and party walls, if not carried up together, shall be anchored to each other every 6' in height, with wrought-iron anchors 3" x 1 1/2", built into full thickness of front and rear walls, with flat heads not less than 3" in diameter on outside of said walls, so as to secure walls together.

All wall anchors shall be not less than 3" x 1 1/2", wrought-iron, not less than 3' 6" long, turned down into joist or back tie, with a flat head of wrought or cast iron not less than 6" square rivetted on.

Wilmington:—Side, end and party walls shall be anchored at each end of beams, not more than 10' apart, with strong wrought-iron anchors 3" by 1 1/2", well secured in walls and fastened to beams by two wrought-iron nails 1" diameter. Door-frames to be well anchored into walls. Compiled by H. A. PHILLIPS.

¹ "Building of the First Class" means fireproof construction throughout.

² "Building of the Second Class" means all buildings not of first class, the external and party walls of which are of brick, stone, iron or other

LICENSING ARCHITECTS IN NEW YORK.



XV Century Door, Rouen, France. From *La Semaine des Constructeurs*.

THE following is the protest of architects which appears to have inspired the Governor of the State of New York to decline approving of the Registration Bill, although it had passed the Assembly:

HON. ROSWELL P. FLOWER,
GOVERNOR OF THE STATE
OF NEW YORK:

Sir,—The undersigned architects in the city of New York respectfully submit the following objections to Assembly Bill No. 451, entitled "An Act to Regulate the Practice of Architecture":

1. It should not be a function of the State to regulate æsthetic matters. The "architecture" on a building could be scraped away, and the building would still remain. It is no concern of the State whether an architect mixes up Doric with Gothic, or otherwise

produces architectural monstrosities. The need of the times is good building-laws. It is the ignorance of construction, of building, that the State needs to guard itself against. Architects should be compelled, by suitable building-laws, to plan buildings safely, whether they know enough to do so or not, and the truth is that the overwhelming majority of architects do not know how to build safely and well, no matter how competent they may be to draw pretty pictures or answer correctly questions on the five orders of architecture.

2. No laws requiring the licensing of architects exist in any country in the world, while in every large city, abroad and at home, building-laws conserve the public interests.

3. The bill means the exclusion of architects in other States from doing business in the State, except to compete for some special building (Sec. 14, line 6), say when a prize is offered for plans for a public building. It means a restriction on trade, and is, therefore, against public policy. It is of the class of laws that the United States courts have brushed away, such as laws requiring commercial travellers to take out drummers' licenses in certain States.

4. Such a law would lead to reprisals by other States. If the law is good for New York State, it is good for all the other States. New York City architects have a clientage co-extensive with the boundaries of this country. When an expensive residence is to be erected at Newport, R. I., or Bar Harbor, Me., or at Long Branch, N. J., or a great hotel at St. Augustine or Tampa, Fla., a New York architect is employed. New York capitalists and the great moneyed corporations centered in this city send their home architects to put up buildings which they need, even in very distant points. A New York architect is now in Germany erecting a building for a New York insurance company. Shall architects in this State cut off their brethren in other States, and not expect to be cut off from practice in return? Similar laws adopted by other States would deprive New York City architects from a vast amount of work, and be more hurt to them than to the architects anywhere else. If licenses were a universal requirement among the States, some New York City architects would require to go through many distinct examinations, and run the risk of not getting a license at all in some cases, and paying for the privilege of applying in all cases.

5. Such a law would work an injury to country builders who carry on business both as builders and architects. Illustrated publications giving excellent designs for country houses reach the hands of every country builder, and it is not to the interest of residents in the small towns and agricultural portions of this State that builders should be prohibited from preparing plans and practising as architects as well as builders. It is folly to require that licenses should be taken out in these cases. New York City architects have nothing to fear from the competition of country builders, however much architects in small cities have to complain on this score. Many of the most capable architects are former carpenters or masons.

6. The bill makes no distinction between an architect who never has and perhaps never will draw plans for anything other than frame houses and barns, and architects with a general practice in large cities. All are put on the same plane, and must show themselves equally capable, as a licensee can practise anywhere in the State after he receives his parchment.

7. If the bill proposed to make an architect responsible to an owner for the safety of his building, it would have some merit, but it does nothing of the kind. In New York City, an architect's plans must first be approved by the Building-department and the Health-department, and the supposition is that the building will be safe and sanitary. It seems to be somewhat superfluous to examine the architect and his plans as well. A candidate might know much about "architecture" and very little about construction.

8. The bill has many bad features. A license may be revoked for gross negligence and recklessness (Sec. 11, line 3); not a word is said about gross ignorance. A license may be revoked for "dishonest practices." It does not say what this means. Perhaps taking a commission from a contractor would be deemed dishonest practice. But it may mean if an architect borrows from some person a sum of money which he is unable or unwilling to repay, that will be deemed a sufficient reason for the revocation of his license.

9. The bill puts a premium on a non-resident architect having an office in New York City. A Jerseyman will be entitled to a license in this State because he practises here. When his own State passes a similar law, he will be entitled to a license there as well, without fee or examination; while a New York resident, if he desires to do any business as an architect in New Jersey, will have to go through a formal examination and pay for a license.

10. The bill proposes to set up an architectural court, with power to issue subpoenas and to compel the attendance and testimony of witnesses (Sec. 13). And if a builder should designate himself an architect, unless he has a license therefor, he is to be deemed guilty of a misdemeanor. These propositions are ridiculous. Our country is too new, and the demand for ability in men as builders and architects too great, to restrict the action of individuals within proper lines of enterprise by any such law.

In conclusion, your petitioners beg to state that this is not a case of "sour grapes," as each signer hereof would be entitled to a license under the proposed law. They oppose the bill through a sense of public duty, as well as because their individual interests would be affected by such a law, and also to save from its ill-effects many architects who have signified their approval of licensing architects without understanding the real import of this bill. Only one side of the question was heard by the Assembly and the Senate. We respectfully ask you to veto the bill. Very respectfully,

WILLIAM J. FRYER, architect and engineer, 19 Broadway.

CORNELIUS O'REILLY, architect and builder, 121 East Forty-fourth St.

THOMAS GRAHAM, of C. Graham & Sons, architects and builders, corner Thirty-ninth Street and Madison Avenue.

J. A. WOOD, architect, 153 Broadway.

FRANCIS H. KIMBAL, architect, 40 Broadway.

The executive committee of the American Institute of Architects offered the following explanation:

HON. ROSWELL P. FLOWER,

GOVERNOR OF THE STATE OF NEW YORK:

Sir,—An argument made by sundry architects in opposition to your approval of Assembly Bill No. 451, entitled "An Act to Regulate the Practice of Architecture," was brought to the notice of a meeting of the Executive Committee of the American Institute of Architects held on April 30, at which were present Mr. Edward H. Kendall of New York, President of the Institute; Mr. Richard M. Hunt and Mr. C. F. McKim of New York; Mr. Alfred Stone of Providence, Rhode Island; Mr. George B. Ferry of Milwaukee, Wisconsin; and Messrs. Samuel A. Treat and Dankmar Adler of Chicago.

I have been instructed by the Executive Committee to submit the following to your notice. The committee regrets that any persons should maintain that architecture is merely the application of decorative features to buildings, and admits that were this assumption justified there would be no reason for invoking the authority of the State to determine whether or not any person is qualified to call himself an architect.

The constitution of the American Institute of Architects thus defines the status of an architect: "An architect is a professional person whose occupation consists in originating and supplying artistic and scientific data, preliminary to and in connection with the construction of buildings, their appurtenances and decorations; in supervising the operations of contractors therefor; and in preparing contracts between the proprietors and contractors thereof." This definition is accepted by architects and laymen throughout the civilized world, and in the discharge of the functions and duties thereby implied many millions of dollars are entrusted annually to the professional care of the architects of the State of New York, and the life and health and the safety of life and limb of many of its citizens are made dependent upon the greater or less degree of capacity, knowledge and skill possessed by these architects.

The executive committee takes the liberty in the following pages of traversing the arguments advanced against Assembly Bill No. 451, and craves your attention, not from the standpoint of the architect, who has no more claim for assistance or protection from the State than any other citizen, but because this bill is conceived for the service and benefit of the people and of the State at large.

Taking up the remonstrance referred to in the order of its paragraphs, the committee begs leave to state:

1. It is not intended that Assembly Bill No. 451 shall regulate æsthetic matters. The architecture of a building is not, in its true acceptance, something that can "be scraped away," but it is the

design of the building in its entirety, and embraces its construction, arrangement, equipment and adornment, all determined with regard and reference to each other, and in a well-designed structure so interdependent that neither can be tampered with without injury to the others and to the whole building. It is true that "it is no concern of the State whether an architect mixes up Doric with Gothic," and it is also true that it is "ignorance of construction of building that the State needs to guard itself against." If it is also true that an "overwhelming majority of architects do not know how to build safely and well," then it is time to protect the people of the State from the possible disastrous effects of this alleged ignorance on the part of architects of the most vital essentials of the professional equipment. It is the purpose of Assembly Bill No. 451 to prevent persons who "do not know how to build safely and well" from calling themselves architects, and to make the appellation "architect," when applied to the name of any one in the State of New York, a reasonable guaranty to the citizen employing him that its bearer knows "how to build safely and well."

2. While it is true that "no laws requiring the licensing of architects exist in any country in the world," yet in Germany and Austria no one may call himself an architect until after he has demonstrated in an examination by a Government board of examiners that he is possessed of the knowledge of "how to build safely and well," while in England such examinations as to skill as constructors are being resisted by the architects themselves, who appear to deem themselves above what they seem pleased to treat as a sordid and degrading consideration of their status as artists. In France the legislative requirements and current legal decisions have clearly defined the liabilities for malpractice of architects to their clients and to the public. Therefore, in that country only those who are possessed of a high degree of knowledge and skill dare to face the responsibilities incident to the assumption of the title "architect," and the discharge of the functions incident thereto.

3. If the passage of Assembly Bill No. 451 "means the exclusion of architects in other States from doing business in this State," this exclusion can only apply to those who cannot "build safely and well," for those who can do so will not experience difficulty in demonstrating to the examining board their possession of a degree of knowledge and skill sufficient to entitle them to a license. The passage of this bill does not "mean a restriction of trade," and is not "therefore against public policy." On the contrary, being intended to prevent the waste of public and of private funds in imperfect and unsafe buildings, it will encourage and increase the volume of trade in good and safe building, and will protect the public against the evils of buildings constructed in ignorance of the processes of safe and good construction.

4. If "such a law would lead to reprisals by other States," and "if the law is good for New York it is good for all the other States," it is to be hoped by every citizen that all other States will make such reprisals and will follow the example of the Empire State. But if other States do not follow our example, the architects of the State of New York will stand even higher than they do now, for they will then be the only ones in the United States who possess a higher claim to the title of "architect" than that of having chosen to adopt it for themselves. It is no hardship for one who knows "how to build safely and well" to demonstrate to dozens of State examining boards the possession of such knowledge, and such person would greatly prefer to do this if by his so doing those not possessed of that knowledge could be eliminated from the list of his competitors.

5. Such law would not "work an injury to country builders who carry on business both as builders and architects." They need only demonstrate to the examining board that they "know how to build safely and well" to obtain a license to call themselves architects. But if they cannot make such demonstration there is still nothing in the bill to prevent them from making and selling plans of buildings. The law would only prohibit them from writing the word "architect" after their names. While it would be folly, as these objectors state, to require that licenses be taken out to protect the architects of New York city or of any other place from the competition of country builders, it is not folly to protect the people of the State of New York in city and country from being imposed upon by butchers and bakers, by tailors and shoemakers, or even by draughtsmen and carpenters, who, unable to earn a living at their legitimate trades, endeavor to impose themselves upon the community as architects.

6. It will certainly work no harm to the people of the country districts of the State if, by the operation of the proposed law, they are not put on a plane inferior to that occupied by the inhabitants of cities. Nor will it harm the poor of this State if the law demands that the architects who build their houses shall be capable and well-informed men, and does not confine that privilege to the rich.

7. The good architects of this State would certainly not object to a definite statement in legal enactment of their responsibilities to their clients and to the public. Well-informed and competent architects would carry out far more intelligently and successfully the provisions of our existing building-laws than the kind of architect who is permitted so to call himself under present conditions.

8. As a license cannot be granted except to those who have proved that they are not ignorant, it is to be presumed that no provision for its revocation for "gross ignorance" is necessary. It

certainly cannot be objected to that the proposed law provides penalties upon architects for malfeasance of trust, for collusion with contractors, for bribe-taking, and for dishonest and corrupt practice generally.

9. The hypothetical case of the possible advantage which the stray Jerseyman might gain over the New Yorkers is too trivial for consideration.

10. It has been before stated that, under the proposed law, any one who can demonstrate that he is an architect, namely, that he "knows how to build safely and well," must be granted a license so to call himself. It is certainly conservative of the financial interests of the people as well as of safety of life and limb, if the law makes it a misdemeanor for one who knows nothing of construction to call himself an architect. Yes, "this country is too new, and the demand for ability in men as builders and architects too great" to permit ignorant and incompetent men to foist themselves upon the public and waste its treasure and imperil the lives of citizens under cover of a self-assumed title, implying the possession of a high degree of expert skill and knowledge. It is not an illegitimate restriction of individual enterprise to prohibit a person who does not know "how to build safely and well" from calling himself an architect.

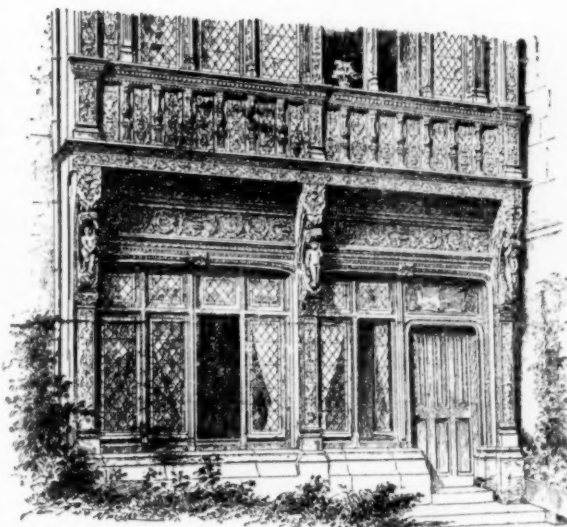
Finally, the executive committee wishes to express its sincere regret that persons practising as architects should entertain so low an opinion of their chosen profession and of themselves as to proclaim to as high an authority as the Governor of the Empire State of this union that architects are but picture-makers, and in a state of ignorance as to all matters relating to safe and good building.

All of which is most respectfully submitted in the hope that you will approve the proposed bill.

I remain, very respectfully yours, on behalf of the Executive Committee of the American Institute of Architects,

DANKMAR ADLER, Secretary, A. I. A.

FUEL-GAS.¹



From a XV Century House, Rouen, France. From *La Semaine des Constructeurs*.

WITH the advent of natural gas, bringing with it as it did, so many beneficent results in industrial pursuits and domestic life, naturally the mind of the entire gas fraternity was turned upon the problem of providing fuel-gas; that is, fuel-gas that would take the place of coal, not only in localities where natural gas could not be found, but also in localities where natural gas was found, in anticipation of its giving out at an early day.

This problem has not been solved, though we all cherish the hope that some day it may be.

In looking over the various processes for making fuel-gas, we see several methods of accomplishing the same end.

It is pretty generally conceded among fuel-gas men that a process which will allow of bituminous coal being charged into the top of the retort or generator, and pass down by gravity, until the several processes of distillation are completed, leaving nothing but the clinker and ash to be removed at the grate below, is the most desirable.

The value of the resultant gases for quantity and quality depends upon the quality of the coal introduced into the generator, as the heating agents are hydrogen, carbonic oxide, marsh gas and a small per cent of olefiant gas.

To produce a gas that is richest in heat units you must have a coal that produces a large quantity of good coke.

In order to decompose the steam, incandescent carbon is necessary.

¹ Read at the Detroit Meeting of the Western Gas Association, May, 1892, by K. M. Mitchell.

The composition of gases from bituminous coals is given as follows:

Hydrogen.....	54.5
Carbonic oxide.....	36.4
Carbonic acid.....	1.6
Marsh gas.....	7.5

It is also absolutely necessary in vending a fuel-gas, particularly a gas which contains over one-third of its volume of deadly poison, and which is to be used for domestic purposes, that it have a distinct and positive odor, an odor that will be lasting when mixed with air.

It will be seen by the above analysis that the only odor to the gas is from the small per cent of marsh gas.

In our regular illuminating-gas we get the well-known carbonaceous odor from over 42 per cent of its volume.

The slightest leak upon a fixture or burner accidentally turned on, or burner in gas-stove, which may be extinguished from boiling over of the contents of a kettle, is quickly detected and remedied. Not so with fuel water-gas. If a burner is accidentally turned on and not lighted the presence of the deadly fluid is not detected by the victim.

Symptoms of poisoning from carbonic oxide are as follows: burning feeling in the skin of the face, followed by giddiness and headache. Headache grows more intense and chief point is in temples. There is a strong pulsation in the temporal arteries. There is also nausea with peculiar noises in the ears, and as the poisoning advances, there is loss of consciousness. There may be also, according to Boehm, in "*Ziemesen Encyclopedia*," loss of mind or a pleasant, ecstatic feeling, a sense of fatigue both mentally and physically, eccentric pains in the limbs, and certain peculiar disorders of the skin.

In order to remedy this great objection to fuel water-gas, fuel-gas makers have introduced into the gas while being generated a few gallons of oil to each 1,000 feet manufactured.

Another plan is to allow the purified water-gas to pass over crude Lima oil, which is periodically injected upon the water in the gas-holder tank.

The latter plan gives to the gas a perceptible odor at the point of escape, but the odor is not enduring and clears away or separates from the gas quickly.

In previous discussions on fuel water-gas the relative values of coal-gas and water-gas by volume have been stated to be 666 and 292, respectively.

In the *American Gas Light Journal* for March 21, 1892, Dr. E. G. Love is quoted as saying that the common coal-gas of London, with an illuminating power of 16 to 17 candles, has a calorific power of about 668 units per foot, and that the product obtained by decomposing steam by incandescent carbon, as effected in the Motay process, consists of about 40 per cent of carbonic oxide and a little over 50 per cent of hydrogen. This mixture, he says, will have a heating value of about 300 units per foot. This is, in my judgment and experience, about the correct value.

Although it has been stated by the advocates of fuel water-gas that the air dilution, necessary for the complete combustion of illuminating-gas, detracts from its theoretical value 50 per cent, it is also said in favor of water fuel-gas that the heat is intense and concentrated. This is also true of the arc electric light; the heat is intense and local. Yet we want gas for the purpose of boiling water, heating our ovens, etc. The gas that will give us a uniform heat in our ovens, a general heat around our boiling vessels, is the one to be most desired.

The question to the consumer is not what is the theoretical value of the gas or air dilution to complete combustion of the gases, but how much monetary value can he get out of them, i. e., how many feet of gas will I consume a month doing my cooking or heating by gas when consumed in the best means at hand.

We have before us two cooking-stoves, for example. They are both of the best and latest patterns, made especially for the work for which they are intended. They have four holes or burners on the top and two burners for the broiling and baking ovens. One is a stove fitted to burn coal-gas, 16 candle-power; the other is fitted to burn fuel-gas with no illuminating power and of the composition as given in the before-mentioned table. We must gauge the stoves so that when in use the work can be done as expeditiously with one kind of gas as with the other. With the coal-gas cooking-stove we heat the oven in 15½ minutes from a temperature of 76°, ready for baking, consuming 6½' of gas. We place in the oven a 6-pound pan of bread, regulating the gas to properly bake the bread. When baking is done we note the time from the lighting of the burners to the completion of the operation. Total number of feet of gas burned, 17.5; pressure of gas, 14.10; total time, 1 hour, 33 minutes.

With a fuel water-gas stove of the same dimensions we heat the oven in 17 minutes from a temperature of 76°, ready for baking, consuming 20' of gas. We place in the oven a 6½ pound pan of bread, regulating the gas to properly bake the bread. When cooking is done, we note the time from the lighting of the burners to the completion of the operation. Total number of feet of gas consumed, 64; pressure of gas, 32.10; time 1 hour, 28 minutes.

In boiling water on the coal-gas stove, we place over one of the top burners a vessel containing two quarts of water, temperature 48°. We bring the water to a boiling point in 10 minutes' time, consuming 2.8' of gas.

In boiling water over a fuel water-gas stove we place over one of the top burners of the stove a vessel containing two quarts of water, temperature 48°. We bring the water to a boiling point in 11 minutes' time, consuming 5.5' of gas.

We light all the burners of the coal-gas stove; gas consumed 60' per hour; pressure, 16.10. All the burners of a fuel water-gas stove lighted consume 160' of gas per hour; pressure, 32.10.

I have in my mind a room heated by fuel water-gas. The arrangement of the heating apparatus is unique and the whole of the products of combustion pass into the room. The second register at the back of the store-room is connected to the front register; or, in other words, the registers 1 and 2, at the front and back of store, are connected together by means of a galvanized iron duct below the floor. The gas jets or burners are fitted in the vertical portion of air-duct in No. 1 register. The heated air and gases rise in the room. The heating of the air in No. 1 register causes a draft in No. 2 register and draws the air along the duct to No. 1 register to be heated. The air in the room is kept in constant circulation. The size of the room is 20' x 50' x 10'. From December 7th to March 29th (leaving out 17 Sundays), we have 96 days of heating. The average temperature for the month of November was 34.2°; December, 33°; January, 16.5°; February, 33°, and March, 33°. The amount of gas consumed in the 96 days was 90,800'. The store was open 10 hours per day. The temperature of the room was about 65° to 70° during the coldest of weather. The apparatus seemed to give satisfaction so far as heat is concerned. Nothing is said about the condition of the atmosphere with this volume of carbonic acid produced and pouring into the room. What the occupants of the room suffered during this time, I am not prepared to say.

In another instance we have a young ladies' institute, heated by water-gas, using gas-heating stoves as made by the Chicago Gas-Stove Company. They are sheet-iron stoves, open in the front, with horizontal burner. In each horizontal pipe there are inserted lava tips, the flames from which are directed against an inclined plate holding tufts of asbestos. The stoves are connected to a flue and the products of combustion in this instance pass up the chimney.

	Number of Stoves.	Size.	Hours Burned a Day.	Feet per Hour.
Sitting-room.....	1	10	16	62
Parlor.....	1	10	3	62
Reception-room.....	1	10	14	62
School-room.....	1	12	14	75
School-room.....	1	10	6	62
Repository.....	1	12	6	75
Bed-room.....	1	12	3	75
Bed-room.....	1	5	2	31
Bed-room.....	1	5	2	31
Bed-room.....	1	5	4	31
Bed-room.....	1	5	9	31
Bed-room.....	1	5	4	31
Elocution.....	1	5	1	31
Music.....	1	5	14	31
Music.....	1	5	14	31

AMOUNT OF GAS CONSUMED.

October.....	46,500' at 50 cents.....	\$23.25
November.....	121,900' at 50 cents.....	60.95
December.....	147,000' at 50 cents.....	73.50
January.....	188,000' at 50 cents.....	94.00
February.....	154,300' at 50 cents.....	77.15
March.....	157,600' at 50 cents.....	78.80
April.....	121,900' at 50 cents.....	60.95
		\$468.60

In addition to this, there was used in gas-range for cooking purposes, 169,200' of gas for the nine months. We will assume that 40,000' will be consumed in the remaining three months, making 209,200' cost \$104.60. There was used during the cold months, 19 cords of wood at \$4.50 per cord, making \$85.50. Total money paid for heating and cooking for the year, \$658.70. Cost for fuel for the same time—the year previous—50 cords of wood at \$4.50; 20 tons of coal at \$8.25 per ton; total, \$390.

In summing the matter up, the writer cannot see where there is anything done by fuel water-gas that cannot be done by the illuminating-gas now at hand.

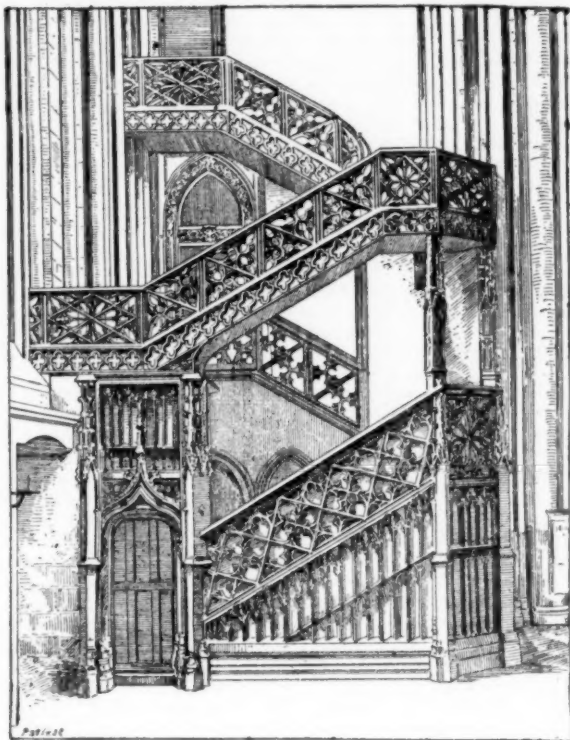
In cooking or heating stoves 1 foot of illuminating-gas will do more general work than 2 feet of the fuel water-gas. It takes less capacity of mains, metre, etc. For example, to convey a certain amount of fuel water-gas a 10" main is required. To convey the same equivalent in heat units of illuminating-gas a main of 7" diameter will do the work.

To measure the gas for a fuel water-gas cooking-stove a 10-light metre is required. To measure the illuminating-gas for cooking-stove of same size a 5-light metre is sufficient. Throughout the whole operation it is necessary to double the capacity of the works and distributing-plant in vending fuel water-gas as against a good illuminating-gas plant.

In my judgment the secret of gas for fuel purposes lies in the cheapening of the price of illuminating-gas used for this purpose, making the price of this article 80 cents, \$1 or \$1.25, according as you are more favorably located.

A gas-plant is now in operation in St. Joseph, which relies almost entirely for financial success upon the question whether its use as a fuel will displace solid fuel throughout the community. This gas is sold for 50 cents per 1,000' and does not carry over 300 heat units. The determination of the question will only be had after the artificial stimulants which are now offered the public to induce its adoption has ceased and opinion is allowed to pass strictly upon the merits of the gas.

THE BLOCK AND QUADRANGLE.



Staircase in the Cathedral, Rouen, France. From Havard's "Dictionnaire de l'Aménagement."

IN these days of densely-packed areas and concentrated building it becomes of great importance to make the most of the space at our disposal. How we ought to dispose our buildings for domestic and public purposes is one of those questions about which promoters, owners of property and architects are not very decided. The idea is that if we cover the land with buildings and increase the number of stories we utilize the space to the best advantage. Little argument is required to prove that this plan deprives the building of two great necessities, light and air, both of which must be derived over or through surrounding premises. The greater the space covered within the given boundaries, and the higher the building, the greater is the need of area for necessary light and ventilation, or, as it practically works out, the less habitable and healthy it becomes. In a deep, solid building, light can only be admitted through the four sides, therefore the inner rooms and corridors suffer from deprivation of light if sufficient interior light areas are not provided. Every architect who has designed a large solid block of dwellings or offices in flats is aware of this difficulty. See, for example, how many large blocks of offices and residences in Victoria Street, Broad Street, Chancery Lane and other city streets are spoilt by the darkness of the interior rooms, deriving their light and ventilation from small areas of considerable height which have the appearance of shafts. Even as offices these inner rooms are too dark and dismal to work in without gaslight, the requirement of which adds much to the rental paid for the flat or suites of rooms. The isolated block is of course less objectionable than the solid engaged block in a street. We mean one with an open space all round, but even the isolated building may lose its advantages by being carried several stories, as a hospital pavilion may suffer if it exceeds in height the space between it and the adjoining pavilions. The "block" system is seen in its full development in the lofty tenement-house of New York or Chicago, or in this country in the monster hotel or block of flats, and in these the system reaches its culminating point of mischief. The floors are ventilated from one to the other, the lifts and staircases serve to conduct the air and to render it impossible to preserve that hygienic condition of purity which is absolutely essential, besides implicating the whole block of floors in case of fire. A paper read at the late Health Congress went to show, from carefully prepared statistics, that the mortality of hotel servants was higher than that of any other class, owing mainly to the impure air breathed in the dormitories at the top of the hotel. What are we to think of such immense blocks as those of the Masonic Temple, the Manhattan, the Auditorium, and the Title and Trust Buildings of Chicago, with their numerous stories? Some may naturally ask whether these buildings are legitimate architecture, or are not merely *tours de force* of a very vulgar order. Many of them are huge blocks of offices packed on each floor with rooms lighted partly by side courts. Architecturally we are ready to admit that some of them exhibit considerable skill in the attempt to give expression to vertical masses of numerous windows, and in the bold treatment of the lower granite or rusticated basements; they overwhelm and

impress the eye by the great mass of superimposed stories, but we cannot affirm that their merits are equal to the effort and cost. As the solution of a hygienic problem, we certainly consider these buildings huge blunders, occupying space and blotting out sunlight, for which they give no compensation. In the event of any epidemic or fire breaking out, the consequence to those living on the various floors is simply disastrous. We might go on enumerating objections to the "block" system of building; one of the greatest is the crowding on a small area of a larger number of human beings than is desirable or safe. A well-known hygienist, Doctor Poore, of University College, lately said: "The fashion of piling people in heaps, and offering libraries and bagatelle-tables as a compensation for a garden, must come to an end." Another is the friction of so large a number of people in one block through the want of more entrances.

But the æsthetic reasons to urge against the "block" system are quite as strong as the hygienic, and it is almost needless here to say anything on this ground. Our great blocks of buildings in London are disfigurements. Northumberland Avenue has well been called a "draughty, gloomy gorge of bricks." The monster blocks and residential flats in the West End are painfully dismal, destroying that personal liberty which is more than ever necessary in residence in great cities. And as every architect is aware, all idea of proportion is destroyed by a huge façade, which cannot be properly viewed from any point within the confines of an ordinary street.

Let us now turn from the "block" to the quadrangular disposition of buildings, and let us see how it may give advantages most needed in town life. By the quadrangular system we mean building round a square or court-yard, or placing the blocks in such a manner that sunlight and air can penetrate the innermost rooms and infuse life and cheerfulness to the inmates. We cannot in our cities obtain large quadrangles or grass-plots such as we see in Oxford and Cambridge, and which impart such a picturesque charm to those University towns; but we may at least try to plan our large buildings for offices and residential purposes with more reference to the area at our disposal. For instance, it may sometimes be advisable to build two or more blocks instead of only one, separating them by courts. If the ground is wide enough we may put a longitudinal building down the centre, with one or two cross blocks, which would give four or six courts; the two front ones near the street could be planted, immensely enhancing the frontage, the remaining courts behind affording light and air to the inner blocks. These areas, by reducing the depth of each block, render it easy to light the several apartments and corridors, promote cross ventilation, and simplify the roofing. The narrow-fronted building to a street, with a considerable depth, is always a nut to crack, especially if it has to be built solid. Without a central area, the lighting of the middle rooms is impossible. Is it absolutely necessary to build it solid? May it not rather be planned to inclose an area on one side? An area in the centre would, of course, be impossible in a long narrow site. Suppose we make the front and the rear parts return the whole width, leaving a long building connecting them with a side area. The shape of block would be a long  (looking at the plan sideways); the area thus left would give light to all the rooms between the two return ends, and such a plan would admit of a side façade as well as a front.

Examples of buildings inclosing court-yards may be seen in the Bank of England and Royal Exchange, St. Bartholomew's Hospital, Courts of Justice, Gray's Inn, New Inn, Somerset House, Government Offices, Whitehall, Burlington House, Buckingham Palace and several other public buildings in London. The beauty and variety of those edifices are derived from this source of effect. Mr. Waterhouse, in the Manchester Town-Hall, has disposed his blocks round a triangular area, in which the central hall is placed. The main corridors surrounding the building internally receive their light from the area, and are made to contribute to internal picturesqueness. The Municipal Buildings at Bury and Sheffield are planned with open courts, the office blocks arranged round the triangular and irregular sites. The open court may sometimes become a central hall. The quadrangular courts and halls of the lately selected South Kensington Museum extension design exhibit this idea, and the design selected for the Glasgow Art Galleries, which we have lately illustrated by plan and elevation, is instructive as an example of a long rectangle having a large central hall placed transversely with a court on each side. As will be seen in these latter instances, a great public hall may sometimes take the place of an open quadrangle round which the solid blocks are grouped.

The quadrangles of Oxford impart to that city all its character, and distinguish it from the modern town of to-day. Who has not admired the quadrangles and surrounding buildings of Merton, Magdalen and Christ Church, the gateway and quadrangle of Brasenose, and the cloister and domestic charm of Magdalen? We cannot hope or expect to build now these beautiful retreats, removed from the noise and bustle of town life; even such secluded courts and inclosed gardens as those of Garden Court and Pump Court in the Temple, or the pleasant squares of Staple Inn and Gray's Inn, of Bloomsbury and the West End, are not likely to be repeated, owing to the increasing value of land in London; still there are opportunities offered by the demolition of large building areas, which would enable the owners of ground and the London County Council to avail themselves of planting squares and small inclosed gardens, instead of allowing them to be occupied by solid blocks. If an area

in the rear of houses can be obtained, it would be conferring a greater boon on the public to lay it out as a square or garden court, to which the surrounding houses can have access, than if such a space were divided amongst a number of houses in the shape of back-yards that can, and generally do, get built over or filled with rubbish. This mode of appropriating old garden ground or back areas is probably the most judicious that could be followed in towns where so much waste back space is obtainable. For example, would it not be better to purchase the back-yards of a score of houses that are now only used for lumber, and make a square or recreation ground of them, than to convert them into another roadway or sell the land for building? The larger sites of some of our new polytechnic institutions may well be utilized as squares or gardens. In these matters of laying-out towns our insular prejudices are much against us, and we may derive profitable suggestions from our Continental neighbors, who have always preferred to build round a square or a quadrangle than to pack solid blocks between parallel streets.—*Building News.*

ST. PETER'S AND ITS BUILDERS.¹—II.



One of the Quadrigas on Vienna Parliament-House. Pilz, Sculptor.

THE middle of the fifteenth century may be taken as the end of the Middle Ages, and people who like to mark a gradual change by a definite date have fixed upon the taking of Constantinople by the Turks in 1453 as the limit. Then at least ended the Eastern Empire, which had been in a way a symbol of mediæval civilization, as the Western Empire had been the symbol of Latin civilization. Byzantine art and the last Byzantine emperor died together. Gothic architecture in the north had, it is true, still a century of life before it, more or less; but the Renaissance had made its way in Italy, architecture following the steps of letters and of sculpture. In Florence, the cradle of the Renaissance, it had asserted itself with a decision and consistency that it was slow to attain in other cities. Brunelleschi had built the church of S. Lorenzo, the front of the Pitti Palace, had added his great dome to the cathedral, and had died. Michelozzo had built the Riccardi Palace for Cosmo de' Medici, and the church of S. Marco: Brunelleschi's great successor, Alberti, was at the top of his fame, and Bernardo Rossellino had made himself a name.

The pope at this time was Nicholas V. Raised from a humble position by mere value of character and acquirement, upright, generous, progressive, scholarly, a patron of learning and enamored of the arts, founder of the Vatican library, he came to the papal chair in 1447. The stormy pontificate of Eugene IV had ended; the schism which he had provoked died with him, and was buried two years later at the abdication of the antipope Felix V. For the first time in many years the Holy See was at peace. The Renaissance was in the air; but no building of importance had been undertaken in Rome for half a century, and the new style was represented there only in the restoration of some of the older churches, so far as we know. Nicholas was a great builder, and Rossellino was his favorite architect. He summoned Rossellino from Florence, and set himself seriously to embellish Rome. He undertook, says Vasari, the restoration of many churches and especially of the principal basilicas.

¹ Continued from No. 860, page 177.

But his great undertaking was the rebuilding of the suburb of the Vatican, commonly called Il Borgo Nuovo, where were his own church of St. Peter, and the (comparatively) new palace which the popes had occupied since the return from Avignon. For this Rossellino planned a great scheme, which apparently did not differ very much in its main lines from that which was afterwards carried out either by design or by natural growth. Three great streets, lined with arcades and shops, were to converge upon a great open square, beyond which was an advanced portico, next an atrium with a fountain, flanked by colonnades, then another portico, and then the church. The palace was to be rebuilt on an enormous scale, enclosing courts and gardens, and containing not only the pope's own residence and that of his cardinals, but sumptuous lodgings for visitors, churchly and royal, with chapels, library, loggie, and even a theatre for their amusement. The nucleus of the whole project, or at least the part that was first undertaken, was the design for the rebuilding of St. Peter's. For this Alberti was called into council. He had come to Rome and was employed by Nicholas to restore the aqueduct by which the Aqua Virgo had been brought into Rome by Augustus, and designed for it the Fountain of Trevi, afterwards altogether remodelled by Salvi in 1735.

The old basilica, we are told, which had stood through the storms and sieges, the conflagrations and plunderings, the pilgrimages and ceremonies of eleven hundred years, had survived the reigns and accumulated the gifts of two hundred popes and antipopes, and had become the most famous, the richest and the most venerated church in Christendom, had grown decrepit, and needed to be rebuilt. Whether it would have been thought so if there had not been the temptation of a new fashion we cannot know; at all events it had strength enough to last another half-century without accident, as its history shows. But the old conservatism of Rome was gone or disappearing; a series of pontiffs had begun who had no tenderness for the traditions or the relics of Christian art, who were men of their own day and generation, prepared to lead the way in throwing over the forms of mediævalism, and reverting to the classic in art, literature, and even in thought. Nicholas determined to build a new St. Peter's, which should be greater than Constantine's church, and more splendid than Solomon's temple. The year of Jubilee, 1450, arrived, and the work was begun. The new church was to follow the lines of the old, to preserve the same orientation, fronting the east, but to be longer at both ends. The sacred martyrdom, or confessor, over the grave of St. Peter was to be undisturbed, the old church remaining as long as possible while the new one was built up about it, and the foundation was laid for a great apse behind that of the basilica.

The tranquility in which Nicholas began his reign did not last. The fall of Constantinople followed in three years, and Nicholas, stimulated by the appeal of Æneas Sylvius, who afterwards became Pope Pius II, began enthusiastically to preach a new Crusade. The last years of his pontificate were disturbed by political conflicts like those which had made the reign of his predecessor turbulent, and which were to occupy the attention and revenues of his successors for the next fifty years. In 1455 he died; the building of St. Peter's was discontinued, and for the rest of the century the walls of its apse stood nakedly a few feet above the ground, while the old basilica maintained its place and rank.

Unfortunately the designs of the architects have not been preserved, nor is there anything to indicate what share Alberti had in them. Rossellino's name has always clung to the beginnings of the new St. Peter's. The charge of the building was put into his hands; yet it is difficult now to point to any important work of his designing. For there is serious question whether even the buildings at Pienza usually ascribed to him are his. He did an immense amount of work in restoring old churches both in and out of Rome, chiefly for Nicholas, but his great designs died with his patron. It would seem that he was an experienced builder, and that Alberti was joined with him as a consulting architect on account of his skill in design. Vasari, indeed, says more than once that Alberti would have succeeded better if he had had more practical knowledge of building. But Alberti was one of the brilliant figures of the Renaissance, a type of its leaders. He was a noble and a churchman, learned and courtly, an amateur of all the arts, a writer, an enthusiastic student of ancient art and literature, and of all the learning of his day. It is worth while to remember that the Renaissance, in architecture, was not a development but a fashion. It did not grow up among the men who practised building, as had every previous style; it was imposed upon them from without by the taste of the learned, and the practitioners of other arts. It was imported into architecture through literature and sculpture, and its leaders were practically amateurs, that is, they were painters or sculptors or dilettanti before they were architects. They deliberately assumed to substitute a new architecture for the old, and supported by the patronage of the nobility and the Church, with the prestige of the reviving worship of everything that was Classic, they were able to do it. With what reluctance and stumbling they were followed by the men who were bred to architecture as it was already practised, we see in the slow and amorphous transition of architecture in countries that were beyond the reach of their direct influence. At the same time we cannot fail to recognize the superior skill of the true builders in the early Renaissance as we see it in north Italy and in France. Their work, only slightly tinted by the spirit of a style which they did not comprehend, but were constrained by fashion to follow, is full of grace, fertility, unhesitating skill. The

leaders of the Renaissance, on the other hand, knew perfectly well what they were aiming at, but they lacked skill and training. Their progress was tentative, their first work feeble and undecided. In fact, if they had not taken up a style which they could reduce to rule and square by example, it is hard to see how they could have succeeded at all. We can see how they gained as they went on; and when they had mastered their style, and the classic spirit and form were fixed in practice, the new work began to show firmness in design and technical skill. However much we may regret the freedom, grace, and delicate picturesque quality of the early Renaissance as we see it, for instance, in Fra Giocondo's Loggia at Verona, it could not last. It was a transition, and its development into the fixity and formalism of the later Renaissance was inevitable. It was like the grace and color of the first foliage and the gray-blue skies of early spring, which Corot and his followers loved to paint, full of loveliness, but transitory and irrevocable.

Alberti, then, was a type of the Renaissance leaders. Like his great predecessor, Brunelleschi, who was bred a goldsmith and sculptor, he was an enthusiast who had come to architecture from without, flushed with a gospel which he was eager to embody in it. If he had not the genius of Brunelleschi, he had at least a rare talent, a keener sense, native or educated, of proportion in mass and detail, the same indefatigable diligence in studying and measuring all the remains of ancient architecture that he could get access to, and he had no habits of design acquired in other arts or other styles to cloud his susceptibility to the characteristics of the works he studied. So he became the most purely classic of the men of the early Renaissance. His great treatise "*de Re Aedificatoria*," published and presented to Nicholas while St. Peter's was going on, the first important book on architecture that we know of since Vitruvius, shows a remarkable insight into the spirit and method of classical design, which his work embodied more and more with experience. His earlier work, such as the Rucellai palace at Florence, the cage of pilasters with which he disfigured the interior of S. Francesco at Rimini, and the church of S. Sebastiano at Mantua, show the uncertainty of hand, the unaccented profiling, the looseness of proportion and half-classic taste that we are used to in the earliest Renaissance. But with experience his hand grew firmer, his sense for classic proportion and relation of parts was strengthened. For the lean entablatures and slack profiling of Brunelleschi he substituted a justness of proportion and outline that were in advance of his time. He missed, and probably could never have attained, the delightful naiveté and unconstrained elegance that we have recognized in the Renaissance of northern Italy. But he anticipated the stately consistency of style that belonged to the next century, and the detail of his façade of S. Francesco—surely designed later than the interior—is almost classic enough for Vignola or Serlio. At the time when the luxuriant façade of the Certosa was going up at Pavia, there was building at Mantua, Alberti's greatest work, the church of S. Andrea, which, however, Mr. Street was willing to describe as a "hideous classic edifice tacked on to a most beautiful brick campanile." It is a church that might have been designed by Palladio or Alessi a century later, and in which, as we may see hereafter, most of the characteristics of St. Peter's are prefigured, although the dome was not added till long after Alberti's day. It is interesting to watch in his work the growing idea of largeness of scale, of the predominance and sufficiency of a single order, which is certainly the underlying idea of classic architecture, coming down from the Greeks themselves, and which has risen to the top in every revival of it, although it opposes itself to the expression of use and to the necessary division of buildings into stories, so that it was set aside by the Romans in their theatres and amphitheatres, and by the first Renaissance architects in their palaces and churches. Brunelleschi and Alberti both recognized this idea, and Alberti embodied it in S. Andrea as fully as it was afterwards embodied in St. Peter's. The preference for the entablature and the subordination of the arch were natural conclusions from Alberti's study of the antique, and carried so far that he insists in his book that arches shall always be borne on pilasters and that nothing but an entablature shall rest on a column. Accordingly he, like Brunelleschi, followed the Roman habit of inserting under the arch, when it bears on a column, the shaky fragment of entablature which is so offensive to many modern critics, but which made its way among later architects until Milizia could say: "It would be ridiculous nowadays to urge the importance of this principle, which is known even to children"—a saying which we may safely leave to the tender mercies of Mr. Freeman.

How far the first design of St. Peter's was influenced by Alberti's knowledge, which was doubtless greater than Rossellino's, or by his principles, it is—as I have said—impossible to judge. Whatever might have been made of the church if it had gone on under their care, it was probably begun in the undecided style of the early Renaissance, for it was begun before Alberti's style had matured. The façade at Rimini, which first shows a mastery of his new style, was not begun till ten years later than St. Peter's; and S. Andrea, which alone shows his fully developed power, was ten years later still, and built after his death. Nevertheless, the fact remains that the great church of Rome engaged the service of three men who were, after Brunelleschi, if not the best architects, at least the greatest leaders of the Renaissance—Alberti, Bramante, and Michael Angelo—and if we compare it with S. Andrea we shall perhaps conclude that it embodies, however they may have got there, as many characteristic ideas of Alberti as of any other man

of its time excepting only Michael Angelo himself: but the popes who followed Nicholas had their hands full of political cares and expenses, and the church lay neglected for fifty years. W. P. P. L.

[To be continued.]



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE *Youth's Companion* BUILDING, COLUMBUS AVE., BOSTON, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

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

ALL SAINTS' CHURCH, DORCHESTER, MASS. MESSRS. CRAM, WENTWORTH & GOODHUE, ARCHITECTS, BOSTON, MASS.

This church is to stand on the corner of Ashmont and Bushwell Streets and is to be constructed of seam-faced granite with trimmings of Nova Scotia freestone; the stone of the interior will be red Portage sandstone; the wood, oak. The total cost of the buildings, exclusive of the rectory, will be about \$75,000.

OTHER VIEWS AND PLAN OF THE SAME.

CATHEDRAL OF S. CIRIACO, ANCONA, ITALY.

The façade of this church, which occupies the site of a temple of Venus, some of the columns of which are used in the interior of the present building, dates from the thirteenth century and is ascribed to Margaritone d'Arezzo. The octagonal dome is one of the oldest in Italy.

HOUSE AT BRIGHTWOOD, NEAR WASHINGTON, D. C. MR. W. J. MARSH, ARCHITECT, WASHINGTON, D. C.

GRAND WAITING-ROOM OF THE NEW UNION DEPOT, ST. LOUIS, MO. MR. T. C. LINK, ARCHITECT, ST. LOUIS, MO.

[Additional Illustrations in the International Edition.]

PORTION OF THE HOTEL DE VILLE, ALOST, BELGIUM.

[Gelatin Print.]

A GENERAL view of this building was published in the *American Architect* for November 22, 1890.

A LOUIS XIII CHIMNEYPIECE, RHEIMS, FRANCE.

[Steel Plate Engraving.]

SIDE AND SECTION OF THE SAME.

[Steel Plate Engraving.]

ANTWERP CATHEDRAL.

If judged by the severe standard which should be applied to all works of architecture, the tower of the cathedral of Antwerp must be considered as rather bizarre in its details. At the same time the majority of people, not excluding critics of a severe turn, would say that Napoleon was right when he proposed to preserve it against wind and weather by placing it under a glass case. Whether seen at a distance, from the deck of a steamer on the Scheldt or by a pedestrian across the flat country surrounding Antwerp, or when unexpectedly displayed to the eyes of a traveller in the bedroom of a hotel in the Place, the tower always gives pleasure, which foreigners enjoy as well as natives. We once saw an English merchant, who had lived for many years in one of the houses adjoining the building, gazing as intently at the delicate stonework as if he had been a student of architecture on a first excursion. He told us that the beauty of the tower kept him a resident in Antwerp, for although he had seen all similar structures in Europe it alone was able to fascinate him. One of Thackeray's last roundabout voyages included Antwerp, and *blasé* as he was with most things, he found a revival of old feelings as he saw the tower and heard the melodies which descend from it. Yet it is said that the tower is not so high as Salisbury spire, for although described as being from 400 to 455 feet to the top, the true height has been ascertained as only 366 English feet. According to a Belgian authority the height is 122 metres, 925 millimetres, or 430 feet of the old measures of Antwerp. The spire at Strasburg is 142½ metres, and the spire of the Freiburg Minster (Baden) which is not so well known as it merits, is 116 metres.

The Church of Notre Dame at Antwerp (it is only by custom described as a cathedral) was commenced in 1352, the choir being the first part undertaken. The tower was not begun until 1422. The design for it was prepared by Jean Amelius, an Italian, whose name was translated by the Flemings into Appelmans, as we can see by the inscription in the gallery on the first stage. He died in 1534, and a monument to him was erected, not in the cathedral but in the church of St. Walburg, of which no trace remains. The tower was completed, as it is seen, in 1518; but owing to the time taken in the

construction the people grew impatient, the final stage was omitted and the upper part differs from the architect's design.

We need not say much about the interior, with its central nave and six aisles. Owing to the absence of capitals and the continuity of the arch mouldings to the ground, the effect by day is somewhat disappointing. The painting and sculpture adopted for the side chapels are of a rude Renaissance character, and on the transept walls Rubens is dominant by his two pictures. The choir is not reserved, and in consequence the ceremonies are shorn of the splendor which should belong to them. The interior also gives rise to more or less dissatisfaction, especially as it is too apparent that the architecture is not supposed to have a title of the interest belonging to a single picture "The Taking Down from the Cross," which is not over-devotional in spirit. After many trials, we found that the cathedral is seen to most advantage when there is a procession in the evening, and especially when it does not take place on a great festival, and therefore display is avoided. The dim lights impart an impressiveness to the numerous bays that cannot be forgotten; the clergy and their assistants and the scattered groups are generally only sufficient to give scale to the building, and its extent is suggested; the organist does not appear to be anxious to overcome by the volume of sound which his instrument can emit; the Swiss for the time ceases to look out for surreptitious glances at his treasures, and the Americans have sought other places where they can become disturbing forces. On such an occasion details are forgotten, and one is amazed at the wonderful variety of scenes which are presented by every change in the point of view. Then we can appreciate the value of so many aisles.

Antwerp owed its greatness to commerce, and the old traders desired to keep as close as possible to the river. Hence we see in the streets between it and the cathedral, massive houses of the sort which Prout has drawn. They were the scenes of many stirring incidents which are related by Motley and other historians. The figures which are placed at the corners of the streets with lamps before them are often as old as the houses. They were all removed by order of Napoleon, but after his defeat they were restored.

INTERIOR OF A CHURCH, TOSCANELLA. MR. J. A. SLATER, ARCHITECT.

ST. CATHERINE, RAVELLO, ITALY. MR. J. A. SLATER, ARCHITECT.

OFFICES, UNION COURT, OLD BROAD STREET, LONDON, ENG.

LONDON AND MIDLAND BANK, HIGH STREET, SHOREDITCH, LONDON, ENG.



[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.]

ACCEPTING A DESIGN ABOVE STIPULATED COST.

WILKES-BARRE, PA., July 30, 1892.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—During the early part of the year a large dry-goods firm of this city invited three architects to submit designs for a new building, limiting the cost to \$50,000. Subsequently they invited a fourth man to enter the lists.

The three architects originally invited requested the dry-goods firm to pay each defeated architect \$250; this request was refused.

However all the gentlemen prepared and submitted designs. In each case, except that of the fourth man, the cost of executing the design was \$50,000 or under. The cost was guaranteed by reputable builders. These low-cost designs were all rejected (without thanks), and that of the fourth architect accepted and contracted for at a cost of more than \$100,000.

Will you kindly state whether or not the defeated architects are entitled to compensation because the firm failed to keep good faith in the matter of cost? And can you cite any similar cases that have been brought before the Courts and the decisions thereon?

Respectfully yours, COMPETITOR.

[We think that, if the facts, as stated, can be proved to the satisfaction of a jury, the three architects who sent competitive designs complying with the conditions, can recover whatever the jury may consider to be the value of their work, and the damage that they suffered by being thus dishonestly deprived of the employment which they had expected. The principal case of the sort, decided in this country, is that of Walsh vs. Music-Hall Association, 16 Missouri Appeals, 502, and 90 Missouri (Supreme Court) 459, but analogous cases of breach of contract in other branches of business, involving similar points, could readily be found.]

In our opinion, if the evidence is in good shape, so that the case can be brought before a court, without being confused with side issues, the American Institute of Architects, or the profession generally, could do nothing which would more advance professional interests, than to assist in the prosecution of the action to a conclusion which should serve as a permanent check upon the tricks by which honest architects are robbed of so large a part of their time and money.

As we have often said, our great professional organization has it in its power to save architects a considerable portion of their incomes, as well as most of the vexations and disappointments which shorten their lives, by

undertaking the prosecution to the decision of a court of record, of cases involving points of importance to the profession, which would otherwise be compromised for a pittance, or abandoned by private architects on account of the cost of going on with them.

A few decisions upon the most important points would establish precedents, so that the work would not have to be done again. — EDS. AMERICAN ARCHITECT.]

CORRECTION.

NEW YORK, N. Y., August 6, 1892.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Permit us to correct an error in the issue of the *American Architect* of August 6th. The architects of the addition to Christ Episcopal Church, 71st Street and Boulevard, are Renwick, Aspinwall & Renwick and Walter T. Owen.

Yours truly,

WALTER T. OWEN.

NOTES AND CLIPPINGS.

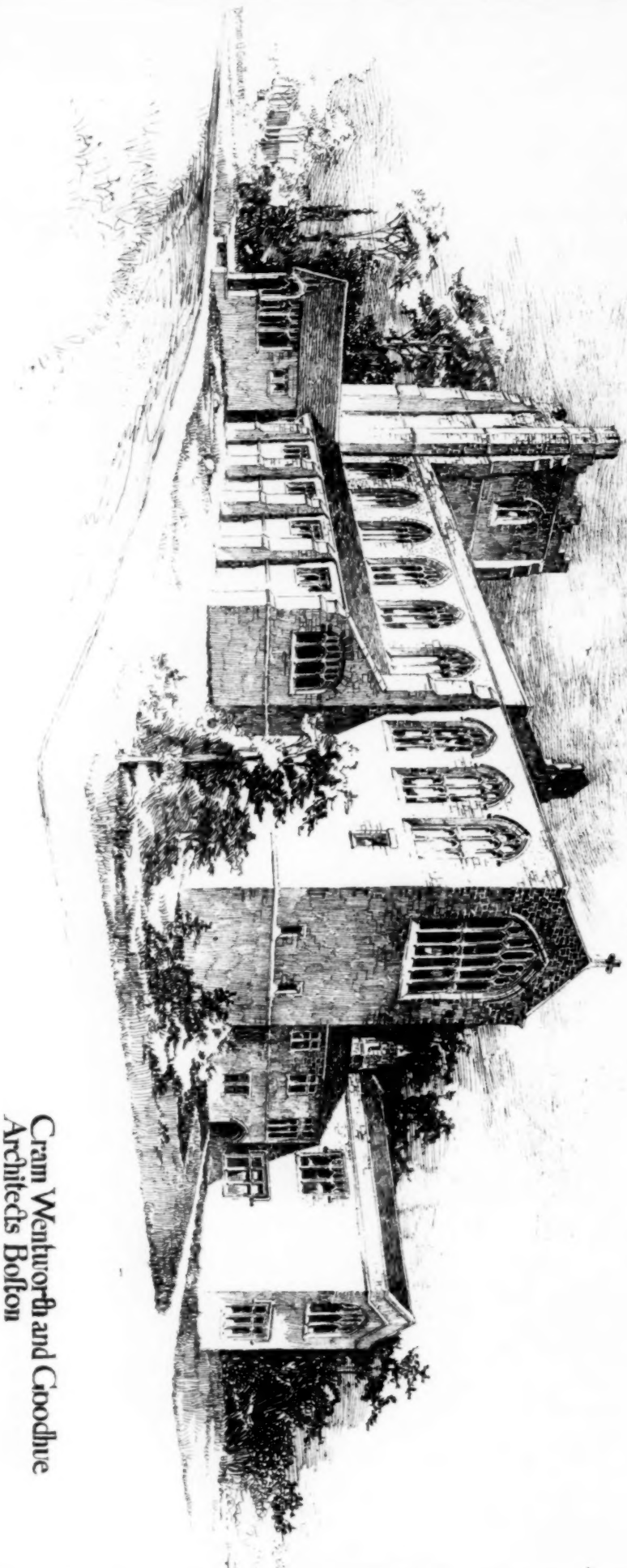
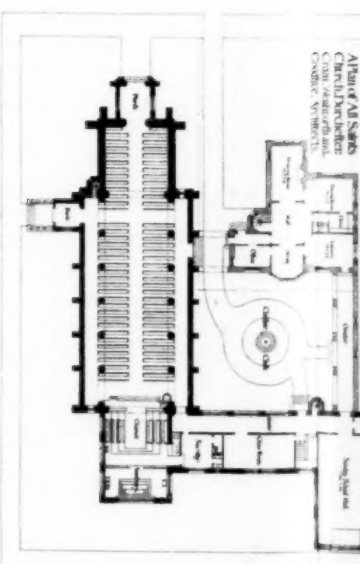
SANITARY CONDITION OF HOTELS. — Dr. G. V. Poore writes in the *Lancet*: "Can anything be worse, from the hygienic point of view, than the modern tenement-house or monster hotel, where each floor ventilates into the floor above and the floor below, while the lifts effectually drive the air from one floor to another without renewing it?"

A MIGHTY SAW. — A 110-ton saw is calculated to cut through almost anything, even through a nickel-steel armor-plate; and for just this use has the gigantic saw been made for the Homestead mill, Pittsburgh, at a cost of \$35,000. The blade of the saw is 7 1/2 feet in diameter, being geared from above and revolving horizontally. After one has gazed upon this huge steel carpenter's tool, he little wonders to see it slice off an angular slab of cold nickel-steel, weighing about a dozen tons, as easily as a carving-knife clips off a crisp turkey wing. — *Philadelphia Record*.



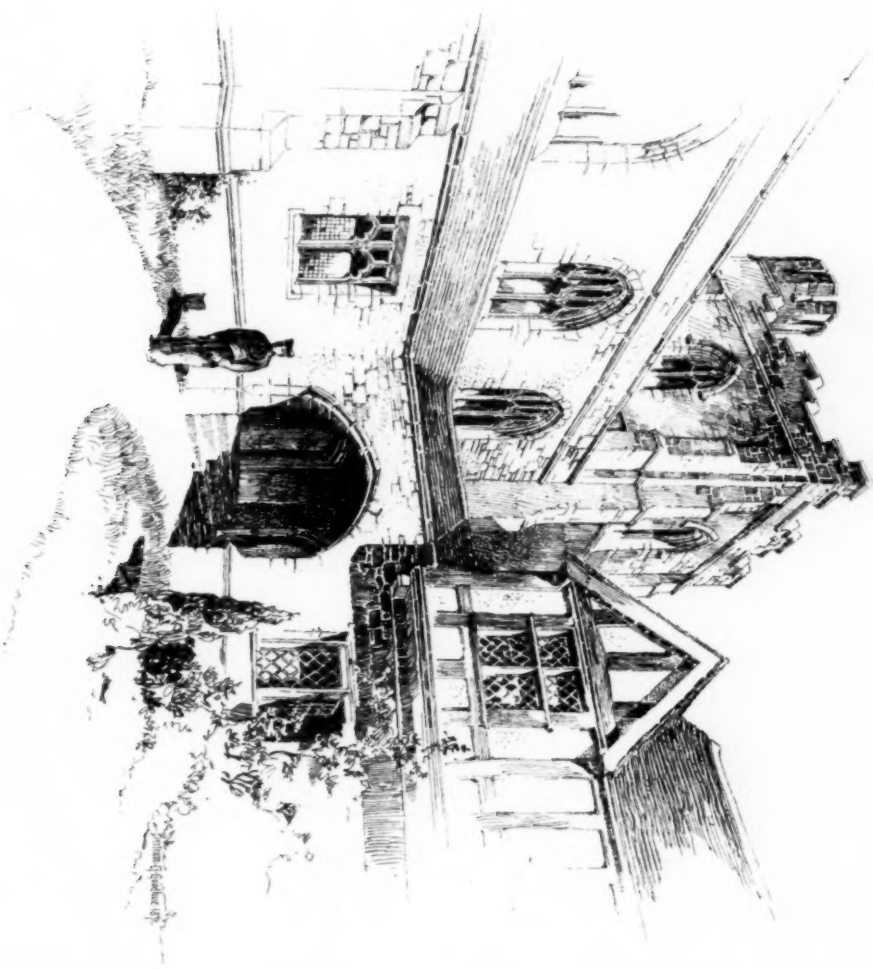
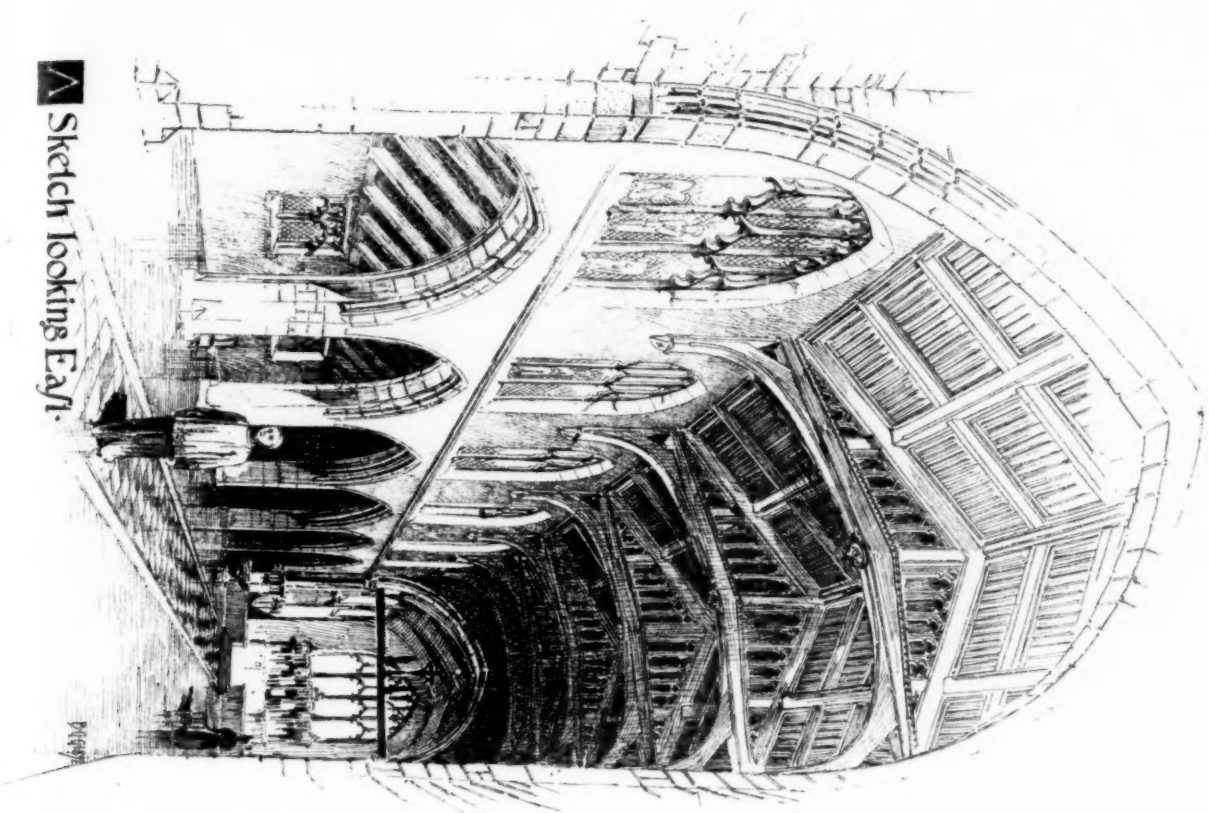
THE month of August has been so far a month of surprises to a great many business men because of the discovery of limited stocks of goods, merchandise and material in hands of distributors, storekeepers and users of material. If this information is correct, it will have a remarkable effect upon the fall trade. The reports to date are fragmentary, but are probably indicative of a general absence of over-supply. Trade conditions will improve if it should be found that the users of material generally are in need of increased stocks. Leading manufacturers and business men have already taken steps to ascertain whether the reports so far as received are generally correct. Salesmen for large jobbing textile houses, and hardware houses, and for staple manufacturing products have, for some months past, reported a sluggishness and indifference on the part of middle men and storekeepers generally in all parts of the country. They have reported this as matter for regret and disappointment. At the time, their reports were regarded as correct, but in the light of recent events it appears that the middle men generally throughout the country were only acting a prudent part, and getting rid of stocks before loading up with new supplies. This policy has been followed throughout the West and South, and to a considerable extent in the States east of the Mississippi River. It is probable that stocks of goods among distributors are lower than they have been for perhaps a year or two. It is also probable that the old policy of carrying the maximum limit will not be resorted to for reasons heretofore pointed out, namely, the promptness with which goods can be delivered, and the possibility of fluctuation in prices. It is therefore probable that the markets will show a hardening tendency throughout. The limited supply of merchandise in hand is the first reason for this statement; the ease in the money market is the second; the fact that bottom prices have been reached, is the third, and the evidence of an expanding demand on all sides, is the last. It is, of course, uncertain, to what extent this demand will grow, but it is reasonable to assume that the cautious policy which has been followed during the past two years, accompanied by the general increase in requirements, will be followed by slightly better prices, and an improved demand for some months to come. This is the opinion entertained by some of the most reputable and careful thinking manufacturers and merchants in the larger cities East. Going into detail, it may be mentioned that textile manufacturers have had a large influx of orders within a week or two; that hosiery manufacturers are meeting with a quick sale of their entire production; that imports, while very heavy, are not being held in bond and warehouses for a halting demand. In the iron trade the conditions are pretty well known; within a week a general improvement has set in for material intended for engineering operations, such as bridge building, elevated railroad work and all kinds of structural material requirements. The rolling-mills throughout the country are now crowded with orders, although about one hundred to one hundred and fifty are still idle; these may be at work within two weeks. Stove manufacturers are buying material for autumn and winter melting. Rail-mills are buying nothing at present, and selling very little. The manufacturers of equipments for gas, electric-light and electricity of all kinds report that they have more work on hand than in the history of this industry. The builders of engines, dynamos and all equipments intended for steam and electricity have a vast amount of work on hand, probably more than at any former period. This statement is made upon the authority of the managers of some of the largest works in the New England States, New York and Pennsylvania. There is a good and improving demand for all kinds of shop and store stocks throughout the West. Further favorable reports are received from mining interests, lumber interests and from railroad authorities who report a sharp increase in traffic within the past two weeks. This fact, if correct, denotes an early opening of the fall trade, and further corroborates the statement made at the outset regarding the low condition of stocks of all kinds among consumers and storekeepers. Brokers and bankers say that if the favorable monetary conditions continue that this coming autumn will be the most healthy and satisfactory from the trade and manufacturing standpoint that the country has seen for four or five years, notwithstanding the fact that it is a presidential year. Even if this be true the statement will be shorn of some of its pleasant features by the fact that prices are abnormally low.

All Saints Church.
from the South East.



Cram Wentworth and Goodhue
Architects Boston

A Sketch Looking East.



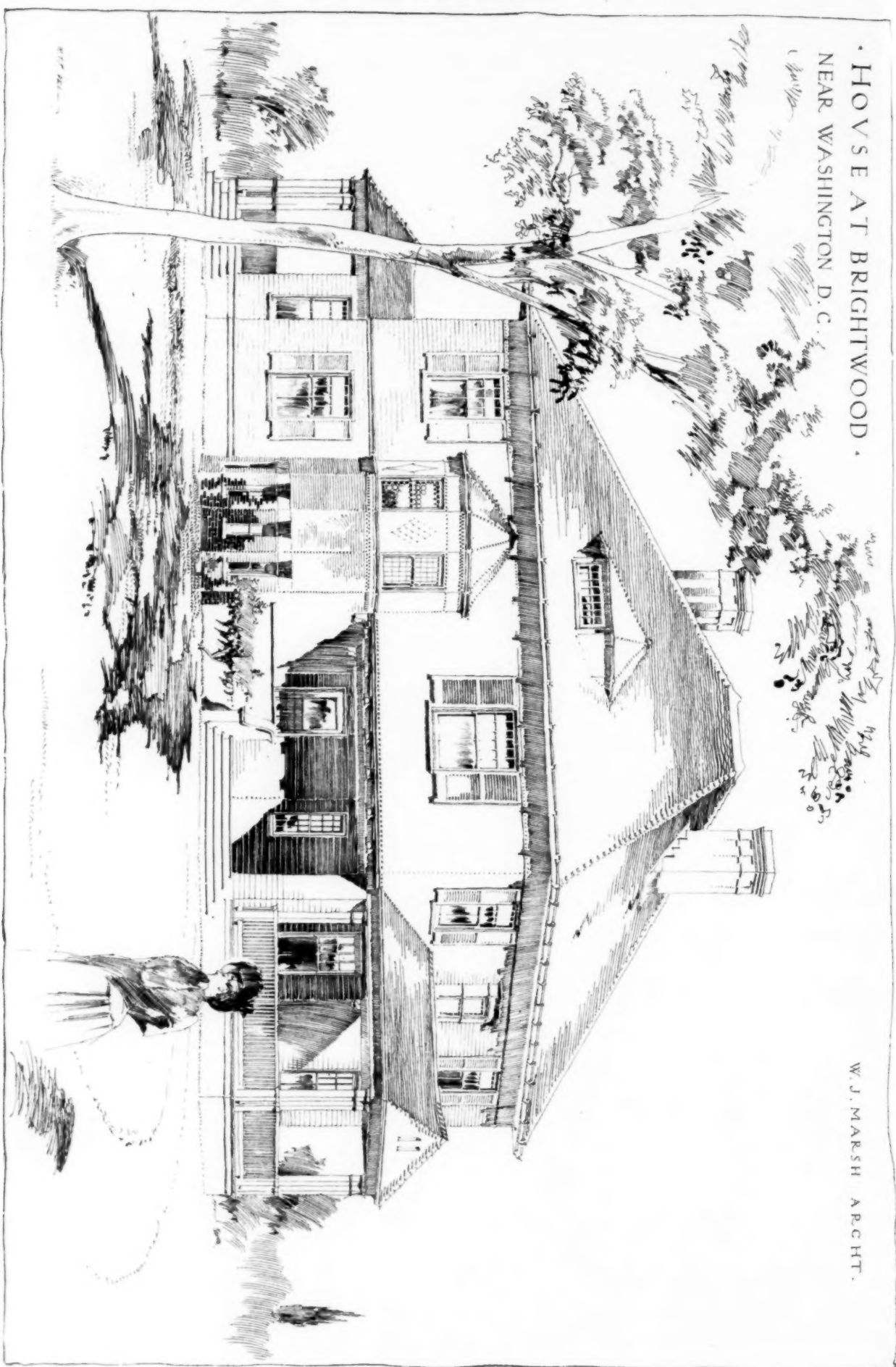
B In the Cloister-Cloze.

PLAN OF AL SABA

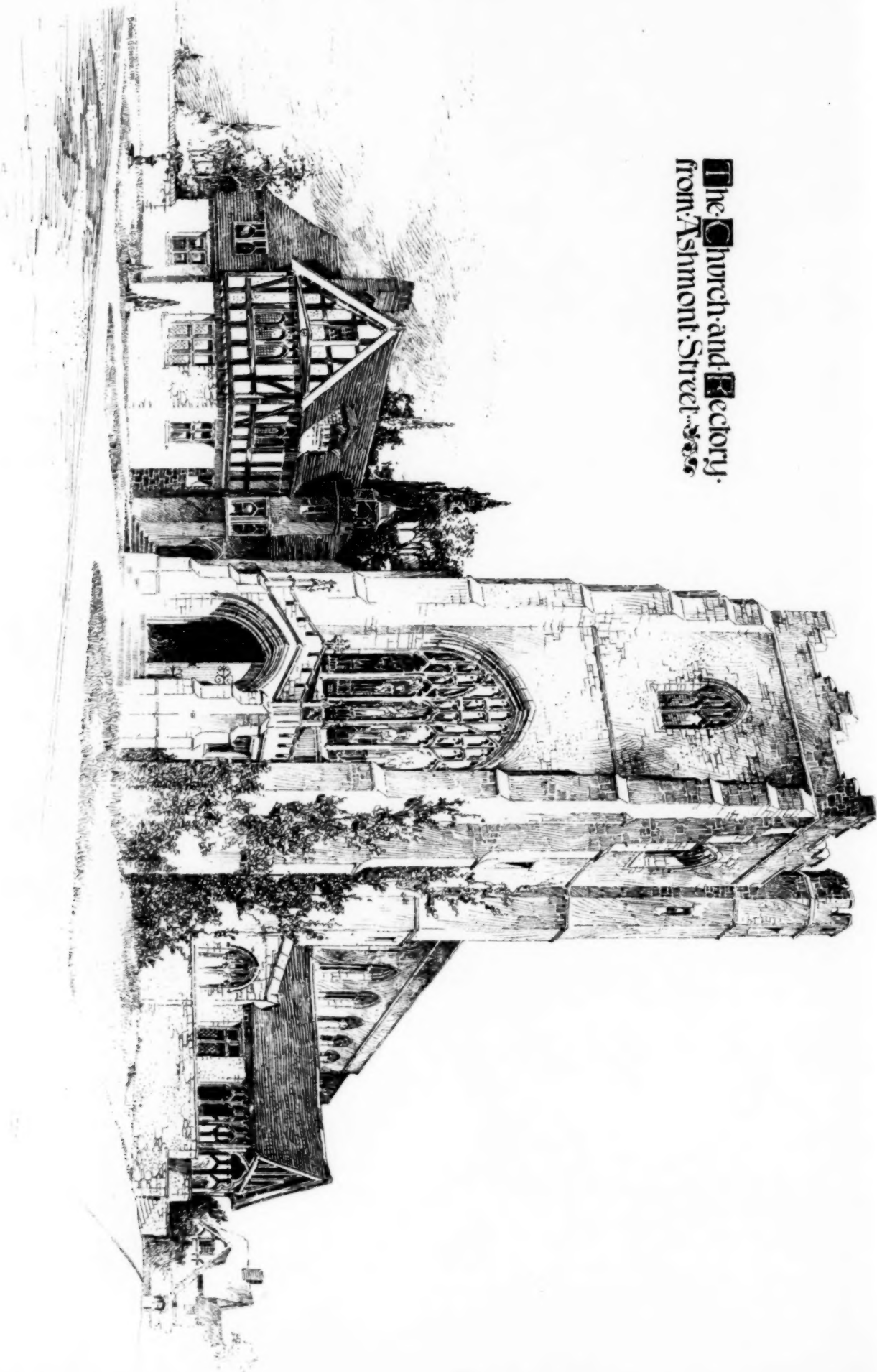


HOUSE AT BRIGHTWOOD.
NEAR WASHINGTON D.C.

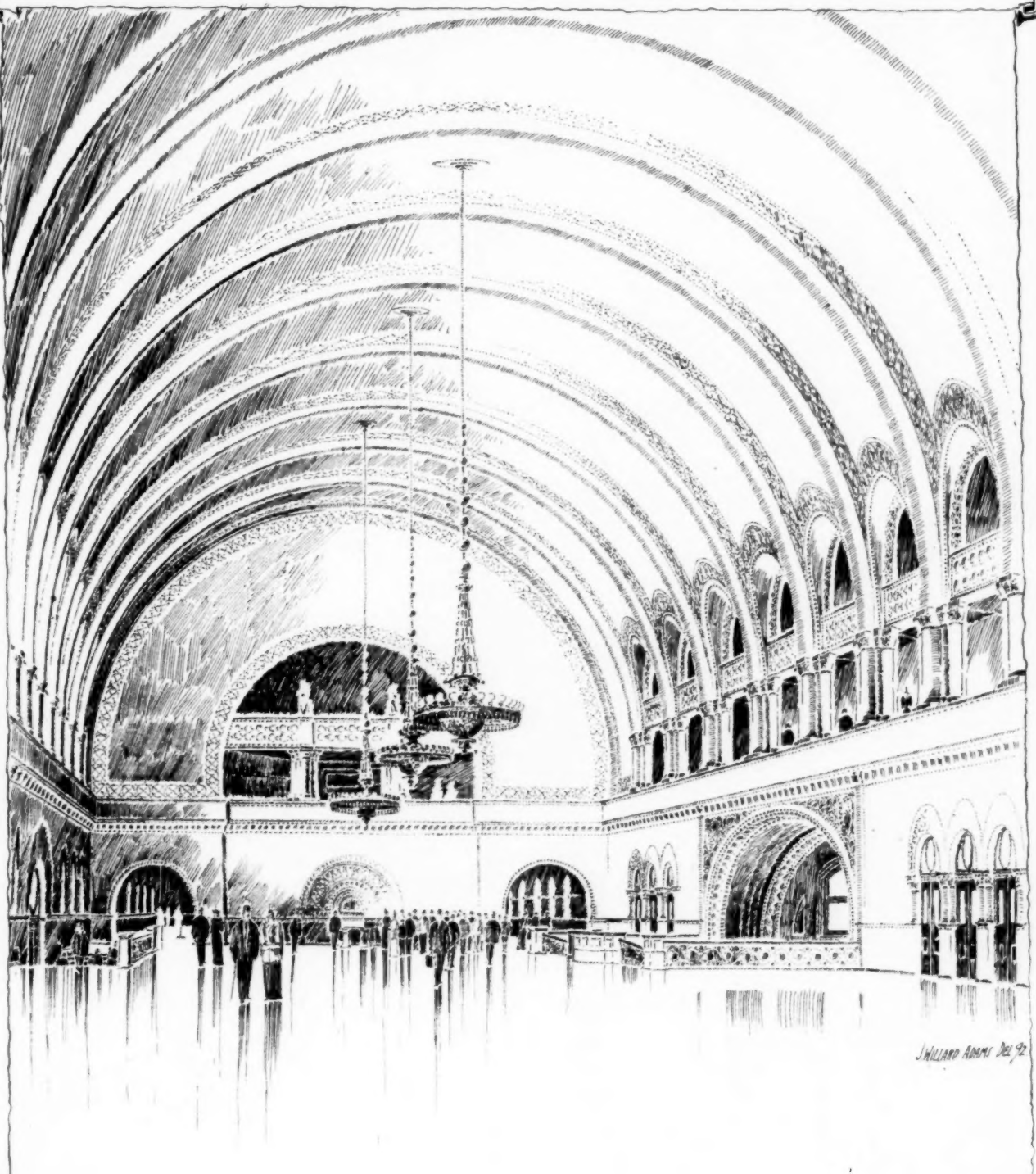
W. J. MARSH ARCHT.



The Church and Rectory.
from Ashmont Street.



GRAND WAITING ROOM - NEW UNION DEPOT - SAINT LOUIS MO.

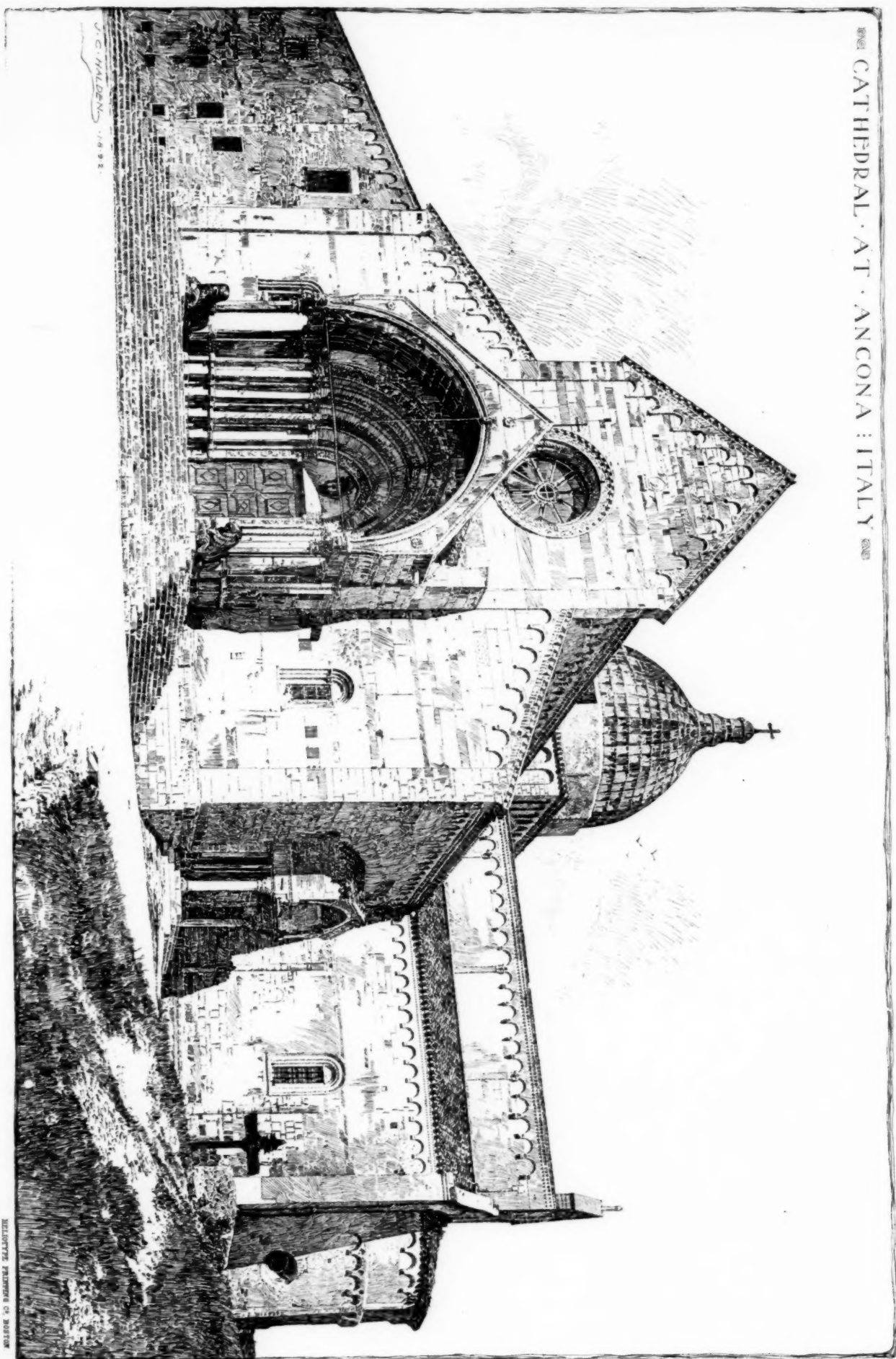


J. WILLARD ADAMS DEL. '92

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CATHEDRAL AT ANCONA: ITALY



J. C. HALLIDAY, 1892.

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