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opinion was an ornament added by the newspaper reporters; but there seems to have been enough in the opinion without it to rouse the resentment of the City Council, which, at its next meeting, voted by a large majority to ask the Art Commission to explain the grounds upon which it rejected the statue.

AS the Commission is not responsible to the City Government, and is, besides, undoubtedly aware that it is impossible for a critic to explain satisfactorily to a layman the "grounds" upon which he objects to a work of art, it is unlikely that the request will be acceded to, and the City Council will then have a grievance of the first magnitude for use at election times, and on other occasions. On the contrary, if the Art Commission really undertakes to explain to the city fathers why Buyens's statue is commonplace, and those of Everett, Cass, Hamilton and various others, by which the town is now adorned, are something else, it might talk for years without any other result than to exasperate its audience, so that, unless some person should find means to soothe the wounded dignity of the City Council, it looks as if a serious quarrel might be the result. For ourselves, we have always been rather doubtful of the value of the Commission at this stage of the artistic development of a city like Boston, however it might be if the circumstances were different. Like all American cities, Boston is in the condition, as regards public art, of a savage, trying-on for the first time, let us say, the pantaloons of civilization. Undoubtedly, the first appearance of the untutored barbarian in his new garments will be somewhat awkward and ungainly, but, as he becomes accustomed to them, he will grow critical, and his taste will improve, until, if he has the proper mental capacity, he may vie in tailoring with the bipeds of any country. If, however, on his first appearance in his new clothes, some one, in whose judgment he had confidence should receive him with yells of derision, and tell him that he looked "commonplace," or something else of the sort, the chances are that he would throw aside the civilized garb altogether, and return definitively to the costume of Adam. So with those of our cities which are trying to adorn themselves, as public or private generosity may permit, with statues and other public monuments. If they are allowed to go on in their own way, they will, for a while, collect bad work with the good, for the obvious reason that the citizens, with the exception of a very small class, do not know the difference between the bad and the good. As time passes, however, the silent influence of the good work, which is of more use, in educating public taste, than all the lucubrations of a thousand critics, will make the demerits of the bad statues conspicuous without argument, and we shall see, most probably, good, and constantly improving, objects of a certain local school becoming more numerous, while the poor ones are neglected or removed. It is needless to say that this is the really healthy condition of an artistic community, and it is a condition which cannot be reached through dilettante criticism, however able that criticism may be. In the end, public opinion, in matters of art, is always the best test of merit. Having no ideals, the public judges of things as they are, without preconceived notions as to what they ought to be; and, if it has objects enough to choose from, it will soon learn to prefer the right ones. It is, however, essential that it should have the opportunity of choice. If it is told that it cannot have this, or that, or that it ought to have the other, for reasons which it cannot understand, it will care nothing about the whole matter, so long as it remains in tutelage; and, of a given number of communities of people so refined and sensitive as Americans, it is safe to say that by the end of the next fifty years, the one which has been allowed to pursue its artistic development with the least molestation will be farthest in advance.

WE find more, in some respects, about what is going to be seen at the Chicago Exhibition in the foreign journals than in our own. According to *La Semaine des Constructeurs*, the Union Syndicale des Architectes Français has decided to take part as a body in the Exhibition, and to send a series of photographs of designs and of executed works by members of the Union, grouped in such a way as to illustrate the development of the theories held by the Union in regard to architectural design. The Union Syndicale includes the

THE Art Commission, appointed by the Legislature of Massachusetts to look after the æsthetic welfare of the inhabitants of Boston, has come into collision with the City Government in a way which is rather amusing. The principal function of the Commission is to examine statues and similar works of art intended to be set up in the squares or other public places of the city, and decide whether they are worthy of the honor for which they are destined. If it decides that they are not, it has only to say so, and, under the law, they cannot be erected. It may be imagined that it would not be long before a conscientious commission of the kind would find itself at variance with some sculptor or architect, if not with the City Government itself; and history does not show that feuds of this sort are among the most easily appeased. In the case of a sculptor or architect, the aggrieved individual, being perfectly helpless, and knowing that a controversy with the Commission as to the merits of a rejected work would not do much for his professional reputation, is likely to keep his griefs within his own bosom; but the members of the City Government, whose position is in no way endangered by the opinions of a handful of art-critics, and who are not at all fond of having their authority over city affairs set aside, will probably prove less tractable. In the present instance, the dispute has arisen over Buyens's statue of Columbus. It seems that some one, finding that a duplicate of the statue could be obtained from the foundry at a moderate price, suggested that it would be a good thing to have it, to set up in one of the squares, or more properly, polygons, with which the system of street designing pursued in Boston has so liberally furnished the city. The idea was taken up by the City Council, which, like most bodies of the sort, unites a noble enthusiasm for the beautifying of the town with a laudable desire to avail itself of opportunities to do so at the least possible expense; and an order was passed to contract for a replica of the statue, and to set it up in Copley Square, an irregular area in the middle of the city. The matter, having arrived at this point, came within the jurisdiction of the Art Commission, and it was soon announced that this body considered Buyens's statue "commonplace," and would not allow it to be set up, either in Copley Square or elsewhere; and, according to the daily papers, that it considered Copley Square an unsuitable place for statues. As the members of the Commission are not men of the sort to volunteer gratuitous opinions as to matters about which their advice was not asked, it may be presumed that the last part of the

French architects of the rational school, who agree with Viollet-le-Duc in thinking that the design of a building ought to be the logical consequence of the requirements which it is called upon to fulfil. Viollet-le-Duc himself was not always very happy in carrying out his idea in original designs, but it does not follow from that that the idea was not a good one; and his friend and pupil M. de Baudot, until recently President of the Union Syndicale, with several other brilliant and able men, have won for the logical school a high place in French architecture. With the exception, however, of the bare facts that the members of this association have carried out a large part of the most important French public work, and that the great Trocadéro Museum was, to a considerable extent, founded through their influence for the purpose of promoting the dissemination of their ideas, little is known in our country about this conspicuous group of architects, and a well-arranged series of illustrations of their work will be extremely interesting. Besides this important exhibit in the French section, it is said that the German Government has decided to show a model of the new Reichstaghaus, or Parliament-House, now building in Berlin, and Professor Lessing has already been commissioned to prepare it. The model will be at one-twenty-fifth the actual size, and, as giving a clear idea of one of the most important and carefully-designed buildings of the century, it will be of great interest.

THE *Deutsche Bauzeitung* for August 27 prints an article on the "History of Disinfection" which is very timely.

After mentioning the nostrums with which our fathers sought to ward off infection, it says, most truly, that a complete revolution in the theory and practice of defence against infectious diseases has been brought about by the discovery, within the last decade, of the specific microscopic organisms by which infection is conveyed. Since that discovery, the science of prophylaxis against infectious diseases has resolved itself into the science of destroying the bacteria which are now known to be the means of infection, and whose development and growth in the body is the cause of the disease. It was soon discovered that the smelling-bottles which our grandmothers used to carry with them, and the pine-needle perfume which our fathers valued so highly, were powerless against the vitality of these active little organisms, and sharper weapons have since been employed. Sulphurous acid, in the form of fumes from burning sulphur, was at first greatly favored, and is still much used, but it has been found that its efficacy as a "germicide" is quite feeble. Of late years, an effort, which seems to be tolerably successful, has been made to apply the fumes of burning sulphur in such a way as to form the much more powerful corrosive, sulphuric acid, on the objects which it is intended to disinfect. This is done by first steaming or sprinkling the rooms or objects to be treated, and then burning sulphur in such a way as to saturate them with its fumes. The sulphurous acid vapors, condensing on the moistened surfaces, are supposed to be partially converted into sulphuric acid, and, in this form, destroy readily the minute organisms within their influence.

CHLORINE, as applied by means of chloride of lime, chloride of zinc, and chlorine-water is found not to be very fatal to the lower organisms, although it is highly injurious to the lungs of human beings. It is, however, cheap, and has been much employed. Bromine, while equally distressing to human lungs, is much more fatal to bacteria, but its cost prevents its extensive use. All these mineral disinfectants have, within the last two decades, however, gone nearly out of use, and have been replaced by carbolic acid, which, twenty years ago, was believed to be so efficacious in destroying germs that a two-per-cent, or even a one-per-cent solution was used with confidence as a protection against the most dangerous contagion. Now, however, Koch has proved that carbolic acid has hardly any effect upon the bacteria of infection; and scientific sanitarians are in a state of considerable perplexity as to what shall be used in its place. Bichloride of mercury, or corrosive sublimate, which is very poisonous to small insects, as well as to men, was for a time much employed, and is still highly recommended in newspaper paragraphs for use, in solution, for washing the walls and woodwork of infected rooms. In some parts of Germany such washing was once made compulsory for rooms in which there had been a case of contagious disease; but the corrosive sublimate is so intensely poisonous that serious effects followed its use in this way, and

the regulations requiring it were soon withdrawn; while it appears, from the investigations of the skilful biologists of the present day, that, destructive as the substance is to more highly organized creatures, it is not very fatal to the microscopic germs of infection. As usual in such cases, the announcement of the comparative uselessness of the germicides which had been so long relied upon was followed by the appearance of scores of mysterious disinfectants, of which some were patented, while others were sold under strange names, of course for the profit of the ingenious inventor and his friends. Most of us remember the flaming advertisements in which, for several months, the almost inert boracic acid, under the name of "Rex Magnus," was held up as a preventative of corruption and decay; and, in Germany, "baldrianic acid," "Oil of Provence," palmitic acid, sulphuretted hydrogen and sulphide of ammonium were for a time, heralded as infallible disinfectants, only to be soon cast aside by those capable of judging of their merits. Even to this day, so strong is the public love of mystery that, according to the *Deutsche Bauzeitung*, the streets, not only of some provincial towns, but of Berlin, are disinfected with a powder consisting simply of ground gypsum, which has been treated with carbolic acid solution, and mixed with some red pigment. Meanwhile, although the search for an available chemical disinfectant still goes on, the best sanitarians have fallen back on soap-and-water, and superheated steam, as the most effective agencies against contagion yet available. The room in which a case of infectious disease has occurred is no longer smoked with sulphur, still less provided with a saucer of chloride of lime and vinegar, and left to its fate, but is thoroughly cleaned. The floors and other woodwork are thoroughly scrubbed with soap-and-water while the walls and ceilings, which would be injured by water, are cleaned by rubbing with bread-crumbs. The furniture undergoes the same scrubbing process, and the bedding, the clothes worn by the patient, the carpets and other fabrics which may have received disease-germs are thoroughly steamed. It was once usual to heat in dry air only, but examination shows that heat alone often simply dries the covering of the fatal spores, leaving the germ unharmed inside, like a nut within its shell; while steam softens or dissolves the envelope of the spore, often allowing the germ to escape, and, in any case, exposing it to the unimpeded action of the hot vapor.

IT will be remembered that a system of underground railway has been proposed for Berlin, the principal peculiarity of which consists in the construction of the tunnels, which are composed of iron tubes, bolted together, with water-tight joints; the stations consisting of several tubes, set side by side, and communicating with each other. From a mere suggestion, this scheme has now become a well-digested plan, and it is said that it has already been adopted by the municipal authorities, and will soon be in part carried out. The plan, so far as the location of the roads is concerned, consists of three independent portions. The first portion is formed by two roads, crossing each other at right angles in the centre of the city. Around the point of intersection of these roads, as a centre, is traced a circular line, with a radius of about a mile; and another circle, with a radius of two miles, is laid out, concentric with the first. It is intended to leave this outer circle for future construction, but the first circle, and the intersecting straight lines, will probably be built within the next two or three years. One curious thing about the scheme is that all the tunnels contain a single track, and trains will circulate always in the same direction; while, although passengers change readily from one line to another, none of the roads cross at grade, and there is thus no possibility of trains meeting on the track. In the case of the straight roads, it is necessary to have movement in both directions, but this is secured by building two tunnels, parallel, but a short distance apart, and connecting them by a loop at each end, around which the trains can move easily. The stations are placed between the two tunnels, so that passengers can take a train going in either direction. The track is narrow-gauge, the rails being one metre from centre to centre. The trains are to be propelled by electricity, with an overhead wire and trolley, but, instead of providing each car with a motor, the trains, which are to consist of three cars each, are to be drawn by a locomotive. The tunnels will cross the River Spree in many places, but they will pass at some distance below its bed; and, although the soil of Berlin is sandy, it is expected that the tubes of the tunnels will be perfectly water-tight.

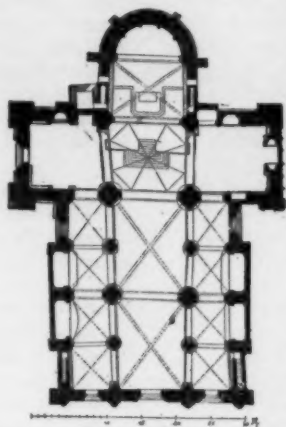
LOMBARD ARCHITECTURE.¹—III.

Fig. 10. Plan of San Michele, Pavia.

MORE boldness and originality is exhibited in the Lombard edifices of Pavia than in those of Milan. It is in the Pavian Church of San Michele, erected at the end of the tenth century, or, more probably, during the eleventh, that this style displays its characteristic features most completely. The body of the house is quite short (Fig. 10), and is divided and vaulted like that of San Ambrogio, with galleries over the side-aisles; it has a broad, prominently projecting transept and a spacious tribune, the pavement of which is raised to cover the crypt. The walls are thick, the pillars powerful, the buttresses massive. The whole construction is treated with marvellous vigor, and the decoration bears the same seal of rudeness and strength. These characteristics bespeak a finished type, marking in the evolution of the style the termination of its formative period.

The nave is not enclosed, as at San Ambrogio, between the two-storied side aisles. It is carried above the lateral roofs, so as to admit the light directly through windows opened under the formerets of the vaults (Fig. 11, 12). Such was at least the primitive disposition, remains of which still appear at the top of the walls, under the timber roof. But the largest vaults are no longer in existence; they overburdened the walls which they have pushed outward. They may have crumbled away, or they may have been demolished to save them from falling; in any event they were replaced by lighter ones, double in number, after the division of each of the original large bays into two oblong sections. The upper windows were then masked on the inside. This condition of things was not changed at the time of the restoration of the monument and is still preserved.

So the attempt to raise the large vaults in order to facilitate the lighting of the nave failed at San Michele. There is nothing surprising in this. Neither in Italy nor elsewhere did the architects of the Middle Ages solve this constructional problem wholly. On the other hand the entire *chevet* beyond the aisles is very well planned. At the point of intersection rises the culminating motive, the vaulted octagonal dome, supported by squinches *à gradins* in the angles of the bay beneath (Fig. 11). On two sides of the base are barrel-vaults extending out over the arms of the transept, while a groined vault covers the arm terminating in the apse. This last arm is, however, more often covered by barrel-vaulting. The disposition is, then, the same as that of the vaulted Byzantine church, where the central dome rests on barrel-vaults buttressing its thrust at the same time that they support its weight.

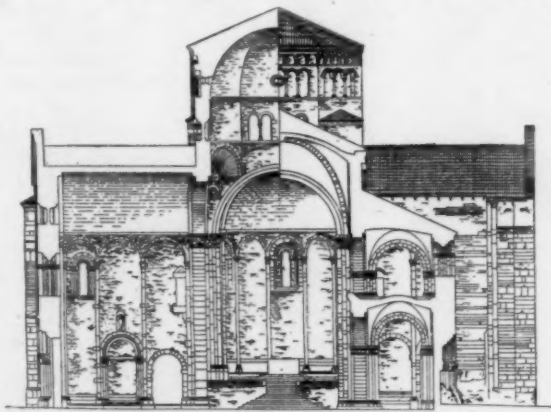


Fig. 11. Transverse Section of San Michele.

Lombard architects evidently drew inspiration from Byzantine monuments when they adopted this general arrangement,

¹ From the French of F. Dedartain, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 873, page 177.

which became a permanent one with them. And the association of such a *chevet* with the basilican type shows clearly that the Lombard style was derived from a mixture of Byzantine and Roman elements.

It was, moreover, much easier to secure stability for the *chevet* vaults than for those in the nave. The base of the

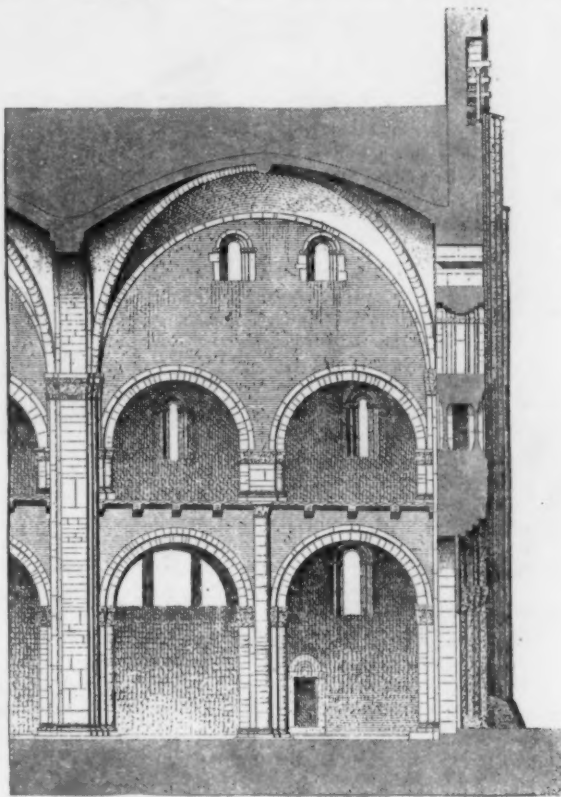


Fig. 12. Bay of the Nave of San Michele.

drum of the dome, buttressed by the arms, is perfectly firm; the drum is short; the upper octagonal vault, composed of eight sectors, exerts only a moderate thrust on each face of the drum; lastly, the external masses of masonry, above the squinches, complete the buttressing system which assumes the equilibrium of the dome. The latter is the most securely established and, in general, the best preserved of all Lombard domical construction. The barrel-vaults over the arms rest on solid walls running down to the ground, and which can, consequently, be made as thick as necessary. They are, moreover, supported at both extremities—at the intersection, by the walls of the other arms, and, at the opposite end, by buttresses placed very favorably for the purpose at the entrance to the apse and at the angles of the transept façades. It was easy, therefore, to make the posterior portions of the edifice perfectly



Fig. 13. Façade of San Michele.

solid as there was no call to consider the lighting question since the absence of any lateral constructions left the walls, from the ground to the vaults, available for window space.



Fig. 14. Doorway of the North Transept of San Michele, Pavia.

The conditions to be grappled with in the construction of the triple anterior part are very different. The use of the groined vault is demanded on account of the convenience of distributing the weight on isolated supports and also disengaging the lofty walls of the nave to admit of the piercing of windows. These groined vaults exercise a double action on their supports. They not only thrust the pillars, but also, owing to their being so much stilted, the lateral walls along the formerets. This lateral thrust which does not occur in cylindrical groined vaults with horizontal generatrices, becomes especially dangerous in the domical vaults of a broad nave with square bays, on account of the size of the bays and the consequently wide

barrel-vaults over the arms, so that the fact is established as far as the *chevet* is concerned, or, in other words, the Byzantine portion of the edifice. It was more difficult to apply this system to the naves and especially to the side-aisles where the rain-water must all be carried off on one side. However, the raising of the groined vaults was a help. All that was needed was to pile up on the haunches of the transverse arches and formerets, in the hollows between the vaults, enough earth to obtain the slope required for the flow of the rain-water. The upper part of the vaults emerged therefore and formed a succession of visible caps. Such, undoubtedly, was the appearance of San Michele at first. In 1865, when the side-aisles



Figs. 15, 16 and 17. Capitals from San Michele, Pavia.

space between the supporting buttresses. To secure the high walls of the nave against its action it would be necessary to have recourse to intermediate buttresses bearing on the small alternating pillars or, better still, to rampant walls on the transverse arches corresponding to these supports in the side aisles. In the same way, for buttressing the vaults at right angles to the great pillars, it would require other rampant walls, more robust than the first and capable of transmitting all the thrust exerted on these points to the external buttress. Lastly the exterior buttresses would have to be of sufficient thickness and strength to counteract all action against them. The Lombard architects felt all these requirements, but did not know how to meet them in a satisfactory way. There are rampant walls at San Michele over the transverse arches of the side-aisles; but they are too low and thin. The buttresses, although massive, leave much to be desired in their form; they are very broad but not sufficiently prominent. It took a long period of groping to assure stability through the correct and harmonious proportions of all the members of the edifice.

The problem was the more difficult for Lombard architects to solve because they built their vaults very heavy. The use



Fig. 18. Capital from San Michele, Pavia.

of a double system of roofing, the interior vaulted, the outer of timber, to protect the first, had not been adopted. They employed either the vault or the roof, as the Byzantines, the Romans and other more ancient peoples had done before them. When the vault was used the tile or slate covering rested on the extrados, either directly, or with earth between to regulate the slope with a view to carrying off the water over the top of the walls.

Therefore, the weight of the covering and of the earth was added to that of the vault; and the last was of itself considerable, because a vault, thus exposed to the infiltration of rain water, must of necessity be thick in order to be durable.

The fact that the Lombard vaults bore their covering directly, is of sufficient interest to justify its discussion here. It was true of the vaulting of the apses and domes, as numerous examples attest. It has also been proved to be true of the

were restored, their vaults were still covered with sloping earth on which the roofing-tiles were laid. There was no timber roof except over the nave.

The proof that the nave vaults also carried their covering directly rests on the position of the cornice with relation to the formerets. The top of these arches was on a level with the summit of the cornice. This disposition is general (see for example, Figure 32, which gives the section of San Teodoro at Pavia). It corresponds exactly to known cases of vaults bearing their covering directly. For a timber roof the walls have to be higher. In fact, they have been carried up everywhere by means of a small additional wall above the original cornice, and this proves that no timber roof existed at first, although one was certainly put on afterward.

Thus the vaults of the nave, which were already very difficult to support, owing to their breadth and elevation and the thrust which, on account of the stilted, they necessarily exert on the lateral walls, are in all the worse condition because the lack of any upper support necessitated their being made very thick, and also because their weight was still farther increased by the burden of the covering and the sloping earth. The large Roman groined vaults of the *Thermae* and the *Temple of Peace*, which those in question resemble, were constructed quite differently. They were monoliths exercising no thrust, or sufficiently supported by the adjacent robust masses

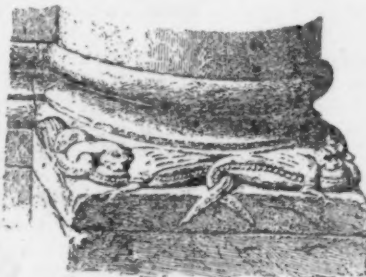


Fig. 19. Capital from San Michele, Pavia.

of masonry in case of any accidental giving way. In mediæval imitations of the disposition of these Roman halls as a whole, the rigid dome was replaced by a constructed vault and the massiveness of the work was much reduced. Such a change of system demanded more complicated and bolder combinations in the arrangement of the supports. And as the constructors were then very crude workmen they spent much time in experimenting to obtain these. The early part of the Middle Ages was passed in this way; and the problem was not solved in the following period except by an advance in two directions, namely, the introduction of light vaults covered by a timber roof and the perfecting of the organs of support, due especially to the use of flying-buttresses beyond the Alps and metal ties in Italy.

This simultaneous use of the vault and roof was a notable innovation in the art of building. The principal object in adopting the vault (in countries provided with timber) is to guard against fire. Its essential function then was overlooked when it was surmounted with a timber roof. It was necessary to come to that; it was necessary to lose sight of its primary service and assign it a chiefly decorative rôle, as was done at Ravenna, between the fourth and sixth centuries in a few edifices sumptuously adorned with mosaics. But such a disregard of true principles and of immemorial custom very naturally met with much opposition. To make it universal, it had to be forced on mediæval architects by an absolute necessity of reducing the weight and thrusts.

The typical disposition of a Lombard façade is perfectly realized in that of San Michele. It consists of a massive wall carried up to two inclined lines, which terminate it in the form of a gable. The projection of the main nave above the side-aisles is not indicated. The façade is a mask, not an enclosing wall modelled on the profile of the section behind it. All purely Lombard façades are disposed in the same way.

Buttresses, composed of bundles of cordons, divide the wall into three parts, corresponding to the interior division into aisles. The latter are reached through three doors, broadly splayed and with numerous archivolts. Several openings of various forms—geminate, elongated, circular and cruciform—arranged in three rows, admit light above the entrance into the central compartment. Evidently, an attempt was made to introduce as much light as possible to the body of the church from this direction, as it was but indifferently lighted lengthwise; but the means then at one's command for opening and closing the windows did not admit of their being made very large, especially on the west, where the effects of inclement weather were particularly felt. Consequently, the number was increased. These small openings, crowded together in the space available for them, unfortunately have a mean appearance, which contrasts with the amplex of the doors and the imposing simplicity of the façade.

The crowning consists of an arcaded gallery borne by colonnettes. This elegant motive is repeated at the top of the cupola and of the apse; it is also seen at the summit of a portion of the lofty wall of the nave, on the south side. Sculptures abound on the façade. Not only are they used to decorate the entrance recesses and the cordons of the buttresses, but they are distributed in horizontal bands nearly half-way up the wall. These chiselled courses, not uniform in height and irregularly divided, impart to the front of the edifice a striking appearance of sumptuous rudeness. The façades of the other churches of Pavia are yet or were once similar in their main features. The likeness was complete in the Church of San Giovanni in Borgo, now destroyed (except for the number of the doors), and in the very well preserved façade of San Pietro in Cielo d'Oro.

In addition to the three doors of the façade, San Michele has three broadly splayed side entrances, two on the north and one on the south. The most remarkable of the six is that in the north transept, represented in Figure 14. The elegance of the ornamentation, the happy effect of the bandeau with consoles and of the colonnettes framing in the bay, and also, shall we add, the purity of its sculptures, make it uncommonly interesting.

At the elevation of the first row of windows runs a corridor formed in the thickness of the façade wall, to which access is had by stairways, likewise in the wall (see plan, Fig. 10). The galleries over the side-aisles are reached in this way, and put in communication with each other. Wooden bridges across the transept give admittance from these galleries to other passages in the walls of the tribune, which lead to the arcaded galleries of the exterior crowning of the apse. Thus it was possible to circulate all over the edifice. Moreover, a winding staircase built in one of the buttresses of the façade communicates with the gable arcades and with the roofs, so the upper portions of the edifice, the proper care of which is of such importance for its preservation, can be watched and easily repaired. The stairways and passages are, however, scantily lighted, and are so narrow that two persons could barely meet on them. It seems hardly probable, then, that lofty galleries of such difficult approach were designed for the use of the public. Similar stairways and passages are found in most Lombard churches of any importance, but nowhere are the means of circulation so perfect as at San Michele.

We have already spoken of the considerable rôle which sculpture played in the decoration. Aside from the partially-preserved marble mosaic forming the floor of the tribune and the majolica plates and porringers imbedded in the façade—which may also be observed in several other monuments of the same character as San Michele—the ornamentation is exclusively sculptural. A multitude of figures of men and animals,



Fig. 20.



Fig. 21.

Fig. 22.

Exterior Bas-reliefs at San Michele.

foliage and carved decorations of all sorts cover the capitals (Figs. 15 to 18), and sometimes the bases (Fig. 19), the doorways (see Fig. 14) and the window casings; they occur, besides on the walls, in long bands or isolated bits (Figs. 20 to 22). The extreme diversity of the subjects and the wonderful variety in the ornaments testify to the activity and productiveness of the artist's imagination. The execution is not less remarkable. It has lost the thinness and flatness of the Longobard period, and it is also much in advance of that shown at San Ambrogio. The work is broad, easy and bold. The figures are often portrayed in life-like attitudes; though defective in form, they are full of movement and action. Owing to the prominence of the reliefs, the sculptor was able to model the ornaments and figures, give the surfaces a round or tapering effect, and heed sufficiently the elementary rules of perspective. San Michele exhibits Lombard sculpture, as well as architecture, in full flower.

[To be continued.]



would be unwilling to take any more if it were offered him,—for the capacity of the average architect's office, so far as new work is concerned, seems to be like that of the Boston street-car—always room for one more. Probably the largest and most important work in hand is the railroad work: both the Pennsylvania and Reading Companies have much to do in addition to their new stations at Broad Street and Twelfth and Market. There are, however, a number of important buildings underway, which, when finished, will add much to the credit and reputation of the city. Among these might be mentioned the Betz Building corner of Broad Street and South Penn Square by Mr. William Decker. This will be the highest office-building in Philadelphia, and is built upon a steel frame, after the latest examples in New York and Chicago.

Plans are being considered for a new theatre for William J. Gilmore on the site of the old Central Theatre, on Walnut Street above Eighth, — which burned down some months ago. Disastrous fires are sometimes beneficial to a city, as much handsomer buildings often replace the old ones. The Central Theatre will be no exception to the rule. The Times annex, which burned down at the same time, is already being rebuilt.

The new temple of the Reform Congregation Keneseth Israel on Broad Street above Columbia Avenue was dedicated a few nights ago with appropriate services. The exterior is of Indiana limestone, and is in the Italian Renaissance style. Its dimensions are 120 feet on Broadway and 150 feet in depth. At the corner there is a tower 150 feet high, and near the centre, and toward the southern end, stands a smaller tower, 70 feet in height. The interior is rectangular in form, with galleries around the sides giving a total seating-capacity of about 1,700. The Ark is at the eastern end, in which will be kept the Scrolls of the Law. The Perpetual Lamp is in front of the Ark. In the centre of the building is

a cut-glass dome, 112 feet high. The windows are of stained-glass, and the wood-work, of quartered-oak and mahogany. The building was designed by Mr. Louis C. Hickman, assisted by Oscar Frottscher.

The Bourse controversy is now over and the committee have selected one of the twelve designs submitted in the competition, viz, that of Mr. David Evans of this city, who is said to be both an architect and builder. All the readers of the *American Architect* are familiar with the history of this remarkable affair, and it is to be hoped that the action of the Philadelphia architects in refusing to submit to the obnoxious clauses in the prospectus governing the competition, will exert a most healthful influence on the profession throughout the country. The result appears to be a victory for the Bourse; but the very fact that there were only twelve competitors, when the Bourse had every reason to expect fifty or sixty, at least, shows that the latter did not by any means secure the variety of designs which they had anticipated when they offered sixteen prizes of \$500 each, for the best sixteen designs. And who were the twelve fortunate individuals who drew prizes? Why, for the most part, office-boys and obscure draughtsmen; scarcely an architect among them all!

And yet the Bourse Committee are reported as being entirely satisfied with the result. This brings to mind the story of the old Dutchman whose wife died, and the preacher came to offer him the consolation of religion. "Hans," said the preacher, "are you resigned to your loss?" "Resigned?" said Hans, "Resigned? Mein Gott, I had to be resigned!"

So it is with the Bourse; they either have to be satisfied with the result of the competition, or acknowledge themselves defeated—and that would never do. Far better it is, for the Bourse, to have an inferior building than that the committee should undergo the humiliation of acknowledging their course unsuccessful. And yet this very Bourse building is to be the turning point in the commercial and business interests of the city. It is to establish the era of a "New Philadelphia," and yet the enterprise is started by antagonizing and ignoring a profession without which there can be no hope of progress or improvement in the architecture of the future. Looking at the controversy from the standpoint of an unprejudiced observer, there can be but one opinion as to its relative effect upon those concerned; the loss was to the Bourse, the gain to the architects.

The fourth annual exhibition of the Art Club, limited to oil-paintings and sculptures, will be held early in November. It is expected that this exhibition will excel any previous one given by the club and no pains nor expense will be spared to make it compare favorably with those of any other city.

The art and mechanical schools of the city are now beginning to open their doors to students. The Drexel Institute reopens with nearly all of its proposed departments ready to receive pupils. This great institution will be a great addition to the educational resources of the city, especially when its night-schools are in working-order.

The Spring Garden Institute is to reorganize its mechanical day-schools and reopen its night-schools in drawing and mechanical handiwork, early in October. The School of Design for women, the Pennsylvania Museum, the School of Industrial Art, the Academy of Fine Arts and the Franklin Institute are all giving signs of fresh activity.

CONSTRUCTION.¹—XIV.

MATERIALS.



WHERE is one interesting observation to be made, which may have a certain bearing. The younger nations are, the more do the monuments that they erect take the character of durability; in growing old, on the contrary, they are content with transitory constructions, as if they were conscious of their approaching end. It is with nations as with single individuals; a young man will build more solidly than a septuagenarian, for the former has no presentiment of his end, and

he seems to believe that all about him can last only as long as himself.

Now, the Middle Ages are a singular compound of youth and decrepitude.

The old society still keeps a breath of life while the new is in its infancy. The edifices built in the Middle Ages experience these two contrary situations. In the midst of nations permeated by a youthful and strong vitality like the Normans and the Burgundians, for instance, the constructions are built much more solidly, and assume a stronger individuality than among the dwellers on the banks of the Seine, the Marne and the Loire, whose customs during the twelfth century, still bear the trace of Roman traditions.

The Burgundian even has a considerable advantage over the Norman in that he is endowed with an active imagination and that his temperament is to a degree southern.

During the Romanesque period his monuments have a character of strength that cannot be found in the other French provinces and when the Gothic system begins to be developed, he takes it up and applies it with singular energy.

Perhaps he has a less sure taste than his neighbor, the dweller on the banks of the Seine or the Marne; but he has certainly, more than the other, the feeling of his own strength, the consciousness of his own vitality and the means of displaying these youthful qualities. It seems as if the territory which he occupies had come to his aid, for it supplies him with excellent materials, of great resistance, of large dimensions, and lending themselves to all the bold ideas that his ardent imagination suggests to him. On the contrary, in the basins of the Seine, the Marne, the Oise and the middle Loire, in old France, the materials furnished by the soil are soft, light, and of little resistance; they ought, by their very nature, to banish the idea of temerity, and oblige the builder to supply by ingenious combinations what the soil refuses to him.

We must take account of the properties of these different materials, and of the influence exerted by their qualities over the methods employed by builders; but, independently of these particular qualities of the materials suitable for building, we repeat, the character of the people of these provinces presents great differences which influence the means adopted.

The transition is complete: of the Romanesque structure nothing remains; the principle of the equilibrium of forces has displaced the system of inert stability.

Every edifice at the end of the twelfth century, is composed of a framework rendered solid by the combination of oblique resistances, or of vertical weights opposed to thrusts and of an envelope, a garment which clothes that framework.

Every edifice has its skeleton, and its membranes; it is only a structure of stone, independent of the garment that covers it. This skeleton is rigid or flexible, according to the need and location; it yields or resists; it seems to possess life for it obeys contrary forces, and its immovability is obtained only by means of the equilibrium of these forces, not passive but acting.

Already we have been able to appreciate the properties of this system in the description that we have given of the construction of the choir in the church of Notre Dame at Chalons-sur-Marne (Figs. 41, 42, 43); but how clumsy and, at the same time, labored, mean and complicated that structure appears, if we contrast it with the beautiful Burgundian constructions of the first half of the thirteenth century.

There all is clear, frank, easy to understand; and what wise hardihood! the hardihood of people, who are sure of not failing, because they have prepared for everything, have left nothing to chance and know the limits which good sense forbids them to pass.

We have reached that period of construction in the Middle Ages, during which the nature of the materials used is to play an important part.

We cannot pass over in silence the remarks that ought to serve as an introduction to the methods of building used by the Gothic architects. They had built so great a number of public and private edifices during the twelfth century, that we are not surprised to find among these builders a profound knowledge of the materials suitable for building, and of the resources furnished by their use.

The men who cannot acquire a very broad education, for want of instruction completed by the successive observations of several centuries, are obliged to make up for that elementary poverty by the keenness of their intelligence; and being unable to rely upon documents which do not exist, they must make these observations for themselves, collect them, classify them and form a theory from them. Experience alone guides them; it is not until later that rules are established, and it must certainly be confessed that, however complete may be the theory, however numerous and good the rules, they never succeed in taking the place of the observation based on the experience of every day.

At the end of the twelfth century, the builders had quarried and cut so great a quantity of stone that they had attained to an exact knowledge of their properties and to the use of these materials, by reason of these properties, with a very rare intelligence. It was not then, as to-day, an easy matter to procure hewn stone; the means of preparing and transporting it were insufficient, and it was necessary to obtain it on the spot; it was impossible to procure stones from distant regions: therefore it was by means of local resources that the architects had to raise their edifices, and often these resources were feeble. People do not take sufficient account of these difficulties when they estimate the architecture of those times, and they often blame the architects and consider as a puerile desire to raise constructions surprising for their lightness, what was in reality only an extreme poverty of means. Building-stone was, in the twelfth and thirteenth centuries, comparatively what it is in our time, a material rare, and consequently dear; it was, therefore, necessary to manage and use it so as to make only the smallest amount possible enter into the construction. There is no need to refer to written documents to find out this truth; it is enough to examine public and private edifices with some attention, and it is soon recognized that the builders not only never used one stone more than was needed but that also they never put into the work other kinds than those

¹ From the "Dictionnaire raisonné de l'Architecture Française," by M. Viollet-le-Duc, Government Architect, Inspector-General of Diocesan Edifices, translated by George Martin Russ, Architect. Continued from No. 872, page 164.

suitable to each place, scrupulously economizing on the most expensive stone, that is to say, upon those of very great hardness or of large size. Hand-work, on the contrary, having then progressed very little, the builders did not commit the mistake of making a too

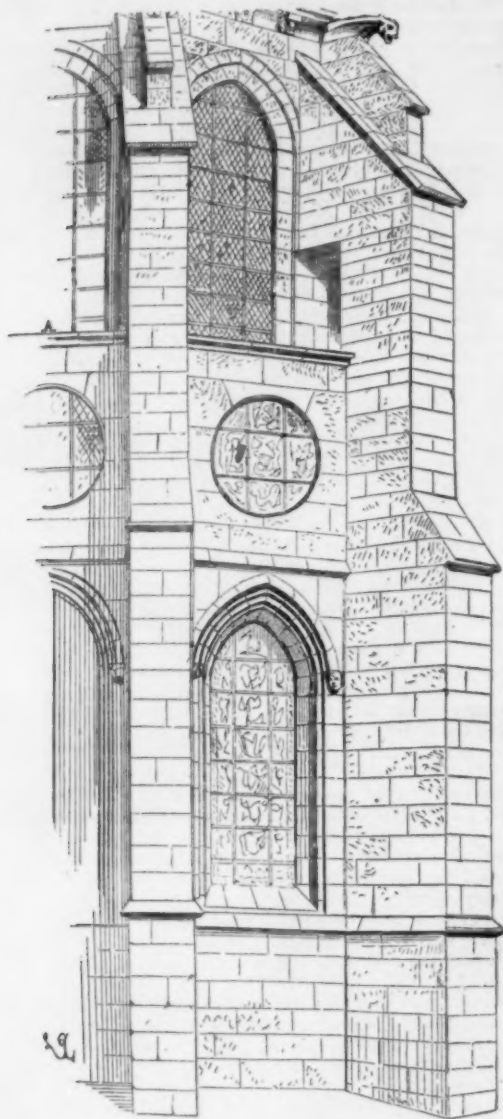


Fig. 75. Apse of Notre Dame, Dijon.

lavish use of it. Moreover, it is quite in the order of things that, when a material is costly in itself, one should seek to bring out its value by some extraordinary treatment. We recommend these observations to those persons who, not unreasonably, condemn the servile imitation of Gothic architecture. This is what one might say, but no one has yet thought of it: "If in the twelfth century, a cubic metre of stone was worth on an average two hundred francs, and the day's work of a stone-cutter one franc, it was reasonable to use as little stone as possible in an edifice, and it was natural to bring out the value of that precious material by workmanship costing so little. But to-day when stone averages in value one hundred francs per cubic metre, while the daily wages of a stone-cutter represents six or seven francs, there is no longer the same reasons for so far sparing the stone at the expense of the solidity, and for giving that substance, which costs so little, a workmanship which costs so dear."¹

A cubic metre of stone which will cost for transportation on a canal only five francs per forty kilometres, for example, will cost twenty or more francs if brought on wagons, supposing the distance traversed to be the same; while if the roads are bad, the difference will be very considerable. Now this is just what took place in the Middle Ages, without counting the tolls and the duties on quarrying, which were often enormous. Centralization is one of the surest means of obtaining raw materials at a low price. Formerly there

¹ Some one will perhaps ask how it can be that stone is so dear when hand work is so cheap since stone acquires value only by the quarrying. To this we reply, in the first place, that the quarrying may be done with more or less skill, and by means of more or less powerful machines; and that a very advanced state of industry always brings a diminution of price upon the raw material, because of the facility of preparation, of transportation, and the use of improved machines.

was not an abbot or a noble in the land who did not exact the payment of duties of passage, and, these duties being arbitrary, there resulted a considerable increase upon the cost of quarrying. In proof of this, we see, for instance, monastic institutions going great distances to obtain stone because it comes from quarries belonging to them, and because they have only to follow the roads free of duties, while they do not take the materials which are nearer to them, but which must cross lands belonging to proprietors not vassals of the abbey.

This argument would be more conclusive against the imitators of Gothic architecture than is, for example, the comparison of the nave of a Gothic church with the inverted hull of a ship; for the comparison is a eulogy rather than a criticism, as would be the comparison of the dome of the Pantheon with a bee-hive.

But let us leave these comparisons, which, as the proverb says are not reasons, and let us go on.

The builders in the Middle Ages were not acquainted with the sandstone saw, that long blade of wrought-iron, with the aid of which, by a horizontal movement back and forth, a workman can cut enormous blocks into slices as thin as occasion requires.

There are still seventy departments in France, where that very simple machine is not used, and these are generally the places where they build the best, for the advantages of the sandstone saw may be disputed.

France abounds in ledges of limestone of great variety and excellence, and easy to quarry. These ledges, as every one knows, are hard, or soft, thin or thick, usually thin when they are hard, and thick when they are soft. Now, there is always an advantage to be gained in building, from respecting the order of nature; this has often been observed by the ancients, and with still more scrupulous

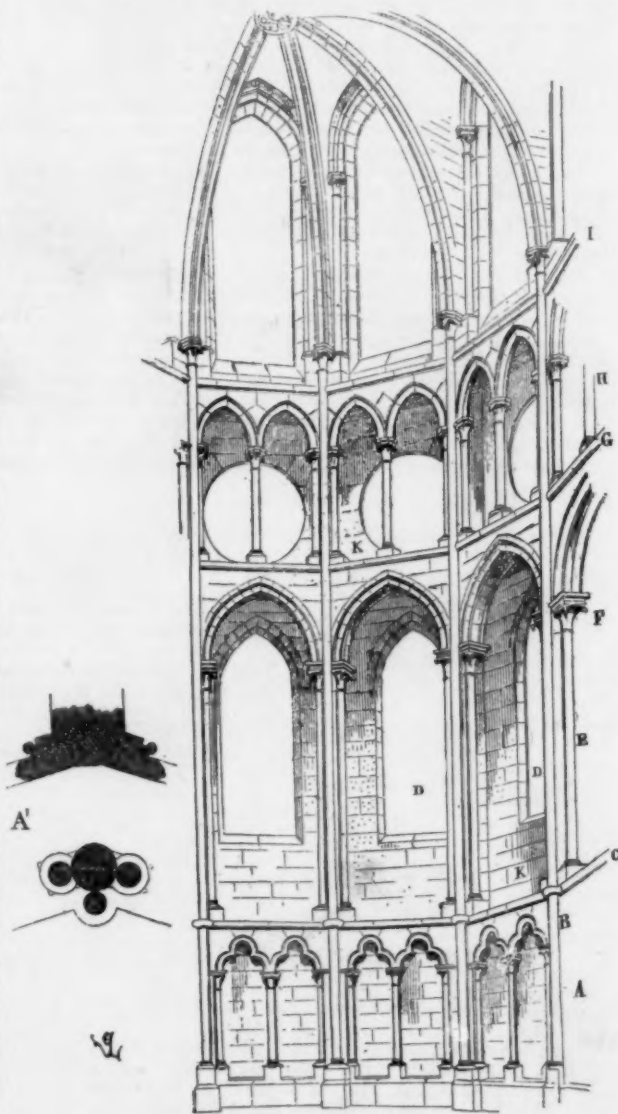


Fig. 76. Apse of Notre Dame, Dijon.

care by the Gothic builders. They have extracted and used the materials such as were furnished by the ledges of stone, even governing the members of the building by the height of these ledges. Never dividing a stone, as we do to-day in our work-yards, they set them up whole in their structures, that is to say, with the heart kept

in the middle, their beds below and above, contenting themselves with *chiselling*¹ them off.

This method is excellent, for it preserves in the stone all its natural force, all its means of resistance.

If the early Gothic builders used soft stones for their points of supports (as they were often forced to do, in default of finding others), they took care to leave them a great height of surface; for in this case soft stone is less liable to be crushed. As to hard stones, and among others the thinnest, which are generally the strongest, they used these as ties, as lintels prolonged to connect distant piers with one another; and they composed the supports which were to carry a very heavy burden, either by piling the stones one upon another, if these supports were very thick, or by setting them upright, against their stratum, if the supports were very slender. With regard to these stones set against the stratum, we recognize all the delicacy of observation shown by the builders. They were not

ignorant that stones set against the stratum are liable to split; wherefore, they chose them with particular care in shallow, very homogeneous and very compact ledges, in the building-stone at Paris, in the hard stones of Tonnerre² in Lower Burgundy and Champagne, in the small ledges of Upper Burgundy, hard as sandstone and without strata.³

Experience had shown them that certain stones that were hard and fine in grain like the Cliquant and the small hard ledge at Tonnerre, for instance, were composed of very thin layers of limestone set one upon another and united by a solid cement; that these stones through their very texture have, when set up against their strata, so to speak, an extraordinary strength; that they resist enormous pressure, and that when heavily loaded with a powerful weight, they split less readily than if set on their natural bed, for what makes these stones split is the moisture which they secrete between their thin layers, and which causes the particles of marl to swell; now, if set flat, they are more apt to preserve that moisture than if set upright. In this latter case the water runs along their sides and does not penetrate the courses resting one upon another. As a proof of our statement we might cite a number of

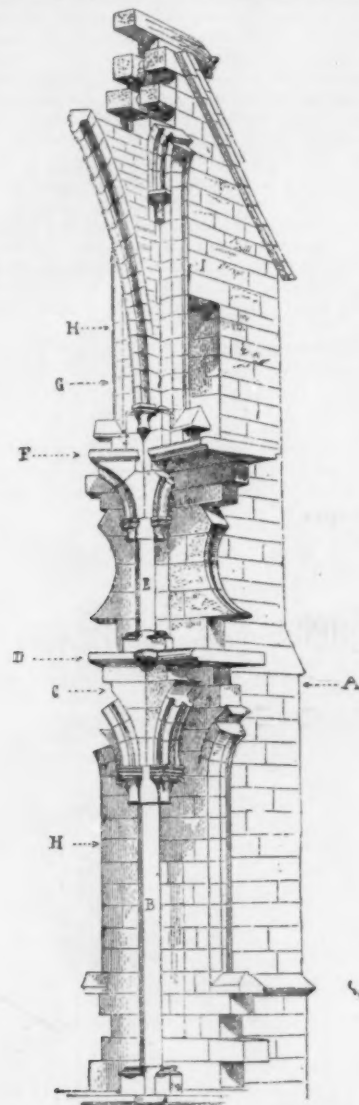


Fig. 77. Construction of the Apse, Notre Dame, Dijon.

copings made of slabs of Lias or Cliquant, set on their natural bed, in very old buildings, and frequently found to be split; while the same materials in the same structures when set upright against the stratum, are perfectly preserved and are injured only through accidents, like the oxidation of cramp-irons or gudgeons, or through some flaw.

We should not omit here one important fact in the constructions of the Middle Ages, that the beds are cut with the same perfection as the facings to be left in sight, and that the stones are always set in a thick bed of mortar and do not have the mortar put in with a trowel or poured in, which is worse.

In conclusion, and to end this digression about the materials suitable for buildings, we will add that the builders of the first Gothic

period have regulated their system of construction according to the materials at their disposal, and consequently the forms of their architecture.

A Burgundian architect in the twelfth century did not build at Dijon as at Tonnerre; for if we find in the same province the influence of the same school, in the execution of the masonry we remark considerable difference resulting from the nature of the stone employed. But as in each province there is one prevailing kind of material, the architects adopt a method of building in conformity with the nature of these materials: Burgundy, so rich in stone of a superior quality, furnishes us with the most evident proof of this fact.

DEVELOPMENTS. (THIRTEENTH CENTURY.)

At Dijon there exists a church of moderate size, under the name of Notre Dame; it was built about 1220, and it is a master-piece of reasoning, in which the science of the builder is hidden under an apparent simplicity. We shall begin by giving an idea of the structure of this edifice. The apse, without any aisle, opens upon the transept; it is flanked by two chapels or smaller apses facing the east like the chancel and opening into the transepts in the prolongation of the aisles of the nave.

The apse of Notre Dame at Dijon is composed, in the interior, only of a thick basement, not very high, carrying isolated piers connected in every direction, and having for the exterior enclosure only a sort of partition of stone pierced by windows. Naturally the piers are designed to support the vaults; as to the partitions, they support nothing, for they are only a means of enclosure. On the outside the building consists only of plain buttresses.

Figure 75 gives a perspective view of this apse; since it has no aisles, the buttresses support the vaults directly, without buttress-arches.⁴

The argument is forcible; but the Sainte Chapelle has no aisles, and at the start, the architect was not obliged to cross that space and transmit the thrusts of the great vaults outwards, beyond those aisles. It is thus, nevertheless, that people nearly always talk of an art that they do not understand, and the multitude applaud, for the professionals do not think it necessary to refute such arguments. They are wrong; for an error repeated an hundred times even by the most ignorant, but repeated with assurance ends by being admitted among the most undeniable truths; and we still see printed to-day, in perfect good faith, on the subjects of the arts and especially upon Gothic architecture, arguments long since refuted by the criticism of facts, by history, by monuments and by demonstrations based on geometry.

All this labor of truth which seeks to assert itself, passes unperceived before the eyes of certain critics, who probably boast that they forget nothing and learn nothing.

These supports are thick and solid, and in them alone, dwells the stability of the edifice. Nothing is simpler in appearance and in reality than this building. Thin walls pierced by windows, close all the space left between the supports. An exterior passage is left at A, to facilitate repairs on the large glass windows. All the facings are well protected from the rain by sloping roofs without offsets, and by cornices or copings.

Clearly, this is only a solid envelope, a screen.

Let us now enter the Church of Notre-Dame at Dijon. Just as the exterior is simple, solid, covered and screened, so the interior presents light and elegant arrangements. This edifice was built and still is situated in a populous quarter, surrounded by narrow streets, and the architect has felt it his duty to sacrifice everything to the interior effect. We recognize, moreover, that he must have been limited in expense, and must have avoided useless expenditure. He was chary of the materials, and did not use one stone too many. The apse, accordingly, on the inside (Fig. 76) is composed of a thick basement, A, built in courses and ornamented by an independent arcade inlaid in the wall. From this basement the pillars B start and rise to the extremities of the arches of the great vault. These pillars are set against the stratum from the base to the tablet C, which connects them in a moulding to the outer structure. Over this basement is a passage or gallery, designed to facilitate access to the glass windows D, and to enlarge the church, if necessary, on holy-days. The piers E are detached; they consist of four columns set against the cleavage from base to capitals, a large one (37 centimetres in diameter), and three slender ones (from 12 to 15 centimetres in diameter).

In A' we give the section of these piers. The large column and the two at its side are each in one piece as far as F, the course of the capitals, while the pillar starting from the ground is in one piece as far as the tablet G.

This tablet G forms a ceiling over the lower gallery, and connects the large arcade with the outer walls.

At the height of the gallery on the second story (the triforium) there is the same arrangement of the piers and the same section A',

⁴ We shall be permitted one remark upon this subject; while appreciating more or less the merit of Gothic religious edifices, some critics (who are not architects, it is true), have claimed that of all the churches of the Middle Ages in France the most perfect, that which shows on the part of the architect the highest amount of talent, is the Sainte Chapelle at Paris, for that church keeps a perfect stability without the aid of flying-buttresses; and, starting from this point, the same critics, happy without doubt at having made this discovery, have added: "The flying-buttress, a permanent stone support, exposing the weakness of the builders, is thus only a barbarous over-growth, a useless toy, since even during the Middle Ages skilful artists knew how to do without it."

¹ To chisel a stone is to take away from both of its beds the portions of lime which have preceded or followed the complete geological formation; in one word, to remove the parts liable to be decomposed by the action of the air or of dampness.

² These hard, shallow ledges of Tonnerre are no longer worked, although their qualities are excellent; they are called forest stones.

³ Stones of Manse, Dornoy, Ravieres, hard Coutarnoux, Anstrude, Thisy and Pouillenay.

only an intermediate pillar, *H*, bearing an arcade composed itself of large, thin pieces of stone, like slabs (flags) set upright.

Above the triforium, a second flagging, *I*, serves as a ceiling for this triforium, and attaches the arcade to the outer building; next comes the starting-point of the arches of the large vault, supported by the exterior buttresses.

The high windows then open above the archway of the triforium, and are no longer in a recess, as below, in order to give all the light possible, and to leave on the outside the passage of which we have spoken before.

Thus the thrust of the arches is transmitted obliquely to these exterior buttresses, which are built in courses, and the inner piers are only rigid points of support, incompressible because consisting of large stones set against the cleavage, but presenting, because of their small impost, only a frame capable of bending, at need, to one side or the other, without or within, should any settling occur.

As to the walls *K*, they are, as we have seen, only partitions 20 centimetres thick at the utmost. Now let us take away from this

only accessory supports which give firmness and stability to the principal columns, without being absolutely indispensable.

The weight of the vaults rests far more upon the buttresses, because of the action of the thrust, than upon the cylinders *B* and *E* (see Fig. 33).

As the interior clusters of pillars carry only a very slight weight, there was no need of giving them great resistance. But if we had an aisle, if the buttresses, instead of being immediately opposed to the action of the vaults, were removed by the whole width of this aisle, then the vertical piers should have a larger impost, for they really would carry the weight of the vaults.

The nave of this same Church of Notre-Dame at Dijon is vaulted according to the early Gothic method.

The pointed arches are on a square plan and are cut by a transverse arch.

The lower piers are cylindrical, built in drums and of equal diameter. Still, each pair of capitals differs somewhat, for they carry alternately either a transverse and two pointed arches or one transverse arch only. We give (Fig. 78) the view of an inner division of the nave of Notre-Dame at Dijon.

At *A'* we have drawn the section of the impost *A*, in *B'* the section of the impost *B*, with the horizontal projection of the abaci of the capitals. These capitals jut out farther on the side of the nave, to receive the pillars which rise to the beginning of the vaults, always in accordance with the principle which consists in moving back the vertical supports so as to draw off a part of the thrusts (see Fig. 34).

In *C'* we give the horizontal section of the piers *C*, and in *D'* that of the piers *D*, at the level of the triforium, at *E'* the horizontal section of the skew-backs *E*, and at *F'* that of the skew-backs *F*, on a level with the abaci receiving the great vaults.

This general sketch having been given, let us examine with care the structure of this nave.

[To be continued.]

OWNERSHIP OF DRAWINGS.



The Chatelet, Paris, France. From Planat's "Encyclopédie d'Architecture."

VARIOUS questions respecting the ownership of drawings prepared and used by architects in the erection of buildings entrusted to their design and superintendence have been treated by Mr. Wyatt Papworth in four separate articles published this Session in *The R. I. B. A. Journal*;¹ and in the second of the series [p. 194 ante] he gave extracts from an opinion obtained in 1871 by the Council of the Institute from Mr. Manisty, Q. C., and Mr. Bowen, Q. C. The case which was submitted to those learned gentlemen was drawn with some care by the late Mr. Ouvry, assisted by a small Committee of the Council; and as it has not been made public, nor the opinion it elicited ever appeared in its entirety, both are here given:

CASE SUBMITTED TO COUNSEL.

The question whether the architect of a building has a right, as against his client, to retain any or all of the plans and drawings of such buildings has been prominently brought before the public by the claim of Mr. Ayrton against the Government Architect, Mr. E. M. Barry, R. A., for the plans and drawings of the Houses of Parliament prepared by Sir Chas. Barry, R. A., and himself, from the commencement of the works, and said to be 6,000 to 7,000 in number; and similar cases of less magnitude are continually arising, and the advice of the Council of the Royal Institute of British Architects is frequently being sought by its members on this point.

¹ The first appeared in the *Journal*, p. 169; II, p. 188; III, p. 231; and IV, p. 254 ante.

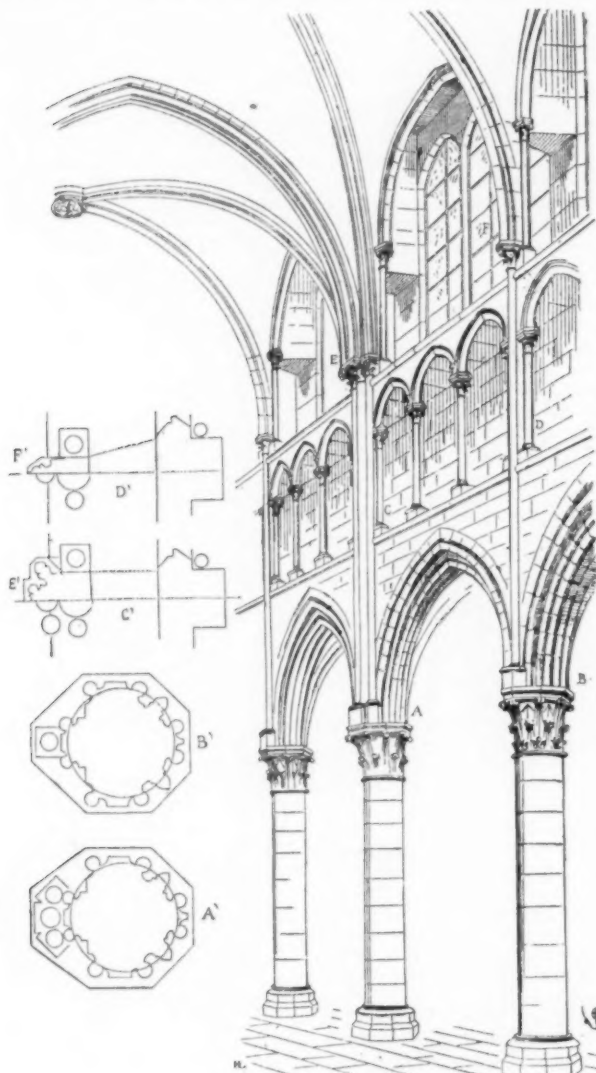


Fig. 78. The Nave of Notre Dame, Dijon.

structure everything not essential to it, let us take its skeleton, and this is what we shall find (Fig. 77): *A*, a buttress, built up and a passive mass; *B*, a column, slender but rigid, and resisting like cast-iron, thanks to the quality of limestone used; *C*, courses at the height of the arches, and, consequently, flexible at need; *D*, the connection between interior and exterior; *E*, a second column, but shorter than the one below, for, since it is higher up, any movement taking place there would have more weight; *F*, a second course joining interior and exterior; *G*, the skew-backs of the arches; *H*, simple walls that support nothing and serve only to close the building; *I*, the abutment placed only at the point where the thrust of the arch acts.

There is nothing too much, but everything that is necessary, for this construction has stood for more than six centuries, and does not yet seem near its fall.

It is not necessary to recall here what we have said about the function of the monolithic pillars that accompany the columns *B* and *E*, and which we have supposed removed in Figure 77. They are

Referring to the questions at the end of this paper, the following observations are suggested:—

It has always been the prevalent feeling in the profession that such plans and drawings remained the property of the architect; but the matter has not been till recently even partially discussed, nor has it been the subject, we believe, till the late case of *Eddy vs. McGowan* (not yet reported except in the newspapers), of any authoritative legal decision, and that case only raised the question as to the right to drawings where the building was not carried out, and the detail-drawings usually made during the progress of the works were not therefore required or made, though Baron Bramwell seems to have entertained a strong opinion that the principle would extend to the plans and drawings of completed works.

An architect is usually remunerated for his services by a commission, and the recognised scale of remuneration is:—

If works completed, 5 per cent on the total cost;

If designed complete with the plans, elevations and sections, and specifications ready for a builder's estimate, 2 1-2 per cent on the architect's estimate;

If designed as above described, and the estimate obtained from a builder, but the works be not executed, 3 per cent on estimate;

If a design only be made to obtain the judgment of a client, then a fee is charged according to the labor involved and the position professionally of the architect, in the nature of a payment for time.

One question is, whether these rates of commission include payment for any, and if any what, plans or drawings, so as to constitute them the property of the employer.

The other and more important question is, whether a custom can be established and sustained for the retention of the plans and drawings, or any of them, by the architect.

On the first point, architects contend that their professional services are engaged to design and superintend the erection of the buildings, that the plans and drawings are the instruments by which they work in designing the building, and that they might (as an extreme case) design a building and verbally instruct a builder to erect it without drawings of any sort. Before the contract system became so universal a building could be erected with but few drawings other than general ones, and when completed it was paid for by the measure-and-value system of the work as done.

An analogy is suggested to the case of a painter commissioned to paint a picture. The artist may, and frequently does, make sketches for such picture, but his contract is fulfilled by delivering the picture only to his employer, the artist retaining the sketches, and selling them and copies of them; and the same is the case with the sculptors in regard to models made for their statues, these models being kept by them.

There is also this distinction between these artists and the architect. The former have by statute a copyright in their works. The latter has apparently no copyright in his executed works, so that if the plans and drawings belong to the employer, he may use them in building twenty or a hundred like buildings without any remuneration to the architect; or he may give them away to a friend who is wishing to build; or, in the case of a design not carried out at the time, the employer may give them to a builder subsequently, to be executed without the supervision of the architect. It is supposed that the architect can register each drawing under the Copyright or other Act, but so doing affords him no protection if those drawings be given up, and would be endless labor and expense.

In opposition to the views asserted by the architect, it is contended that the plans and drawings are simply a lined or graphic embodiment of the design, which, irrespective of the plans and drawings, exists only in the mind of the architect, and therefore are necessary to the effective realization of that design, and paid for by the commission.

A difference also may arise as to the right to the plans and drawings in the case of works merely designed and not executed, and of works designed and executed. In the former case—that is, of works prepared for execution—the employer, if they be not carried out and he does not get the drawings, holds nothing in his hands in exchange for his 2 1-2 or 3 per cent, except in so far as he has had all the necessary advice and counsel requisite to enable him to act, whereas in the case of executed works he gets the building designed and superintended in exchange for his 5 per cent. It has been alleged that if the plans are paid for in one case, they are paid for also in the other case. Architects acknowledge that if they are asked to make a *design only*, as for a house, a school, a lodge, and so on, and agree to make it, that then such plans and drawings become the property of the employer, who pays only for the design, and can do as he pleases with it.

The different rates of commission charged seem to be founded on a division of the 5 per cent into three parts, viz.:—

For designing the building and making the specification.	2½ per cent.
For obtaining tenders from builders.	½ “ “
For superintending the erection of the building.	2 “ “
	—
	5

With reference to custom, there can be no doubt that for a very long period it has been the opinion of the profession in Great Britain and Ireland, Canada and the United States that they retained the right to all the plans and drawings, and that this claim has been generally conceded; but the custom cannot be said to be universal, as some architects give up the plans and drawings when asked for them by the employer, though in courtesy rather than as a right; and if an action be brought to trial, it may be assumed that, though a great majority of architects would uphold the custom, some evidence by eminent professional men to the contrary would be given, as indeed no custom can be cited on any point without some few exceptions being adduced.

Two questions would then arise—viz., 1st, whether the custom be so general as to be practically the universal custom of the profession: 2d, whether the custom be reasonable.

With regard to plans and drawings a distinction may possibly be drawn. There are some plans and drawings which are referred to in and

signed as part of the building contract. This contract, being between the builder and the person building the house, must be the property of the one or the other, or jointly of both, at any rate during the prosecution of the contract, though possibly not after that. The architect is no party to the contract, and cannot therefore be entitled to the possession of it, or of the plans which form part of it, but does generally hold it and them for the benefit of both parties during the execution of the works, and retains them afterwards. But, besides these contract-drawings, the architect makes detailed drawings of construction and of ornament and of decoration during the progress of the building, which, according to the magnitude of the work and of his professional status, may be numbered by hundreds or even thousands. A main question arises on these. The architect is not bound to make any specified drawings; he may make as few or as many as he pleases. Some architects make many drawings, others few. In fact, the architect makes these drawings in duplicate, one copy being for the use of the builder, the other being kept by the architect. Does the property in these drawings, as well as in the contract-drawings, pass to the client, or do neither so pass after they have served their purposes in the work?

This may depend, first, on the question whether the employer pays for them specifically, or only engages the professional services of the architect in the usual way. If the employer pays for them, he would, it is conceived, in the ordinary principles of law, be entitled to them. If he does not pay for them, by the same principles he would not be entitled to them.

The question would chiefly depend on the construction of the contract between the architect and his employer, but a specific contract is very seldom made. The architect considers he is engaged to provide a building containing the requisites demanded by the client or employer, and suitable to his position in society, and exhibiting the talents and skill of the designer according to the importance of the structure, and gives his professional services in exchange for his commission.

The general custom of the profession may be seen by a printed paper sent, embodying a great variety of opinions collected in a very limited time, and for a then pressing special purpose, by the Council of the Royal Institute of British Architects, and in which the arguments in support of the architect's claims are fully stated; and there is no doubt that the number of affirmatives might be indefinitely increased had more time been devoted to collecting them.

But, assuming the custom to be sufficiently general to be established on that ground, can it be maintained as a reasonable custom to any, and what, extent? and can any distinction be drawn in this respect between drawings made for executed works, and drawings for unexecuted works, on the ground that in the former case the employer gets the building, while in the latter case he only gets the professional advice and counsel, which in many cases may deter him from carrying out his building project.

You are requested to advise:

- 1 To whom do the plans and drawings belong when the projected building is not carried out?
- 2 The same question as to the contract-drawing where the building is carried out?
- 3 The same question as regards the supplementary detail-drawings?
- 4 The same question as to perspective drawings (not necessarily prepared for the execution of the building), both in cases of executed and unexecuted works—these perspective drawings being merely pictorial views, and having no bearing on the contract—when not specially charged for?
- 5 What course could an architect take in order to secure to himself a legal property in his drawings, or in as many of them as possible?

OPINION.

1 & 2 We are of opinion that, in the absence of express provision to the contrary, all plans and drawing which are prepared by an architect in the ordinary course of, and as incidental to, his employment as architect are paid for by and belong to the employer, both where the projected building is and where it is not carried out.

The alleged custom for architects to retain the plans and drawings seems to us to amount to no more than a very general practice to that effect; but the usage falls very far short of evidence sufficient to prove a custom binding upon all persons who employ an architect in the usual and ordinary way. We entertain a strong opinion that no such binding custom could be established.

3. Supplementary detail-drawings stand upon the same footing as other drawings. The architect may not be bound to make any particular drawings, but he is bound to make and he is paid for making, all such as are reasonably necessary and proper, and it cannot be supposed that he would make any which he did not deem necessary.

4. With regard to “perspective drawings,” which are merely “pictorial views” having no bearing upon the contract, and not necessarily prepared for the execution of the building, we are of opinion that the employer cannot be said to pay for them; consequently we think he is not entitled to have them delivered up to him.

5. The only course is for the architect to make a special contract, with his employer for the retention of such of the drawings as he desires to retain. In the case of pictorial drawings, if they are paid for by the employer, an agreement in writing would be necessary to vest the copyright in the architect. See 25 & 26 Vict. c. 68, s. 1.

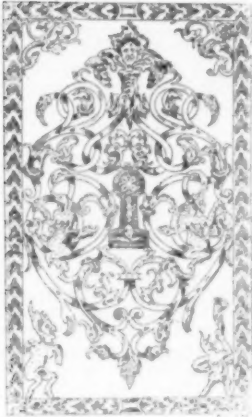
(Signed) H. MANISTY,
CHARLES BOWEN.

Temple: March 4, 1871.

The Opinion of these gentlemen, who afterwards became Mr. Justice Manisty and Lord Justice Bowen, was entered on the Minutes of a Meeting of the Council held on March 13, 1871. But little further appears to have been done in the matter, the reference to it in the Annual Report of May 1871, having been made in the following terms: “The broad professional question still remains to be settled, and until some decision shall have been arrived at in one of the Superior Courts, where evidence of custom may be produced, doubt on the legal aspect of the matter must prevail. Under these circumstances, the Council, having consulted the Honorary Solicitor and taken Counsel's opinion,

"can only recommend that the ownership of architects' drawings should be secured to them by a special agreement between themselves and their clients before any work is undertaken. The necessity of this course might be supported by many arguments, but it becomes doubly obvious while an impression exists on the part of the public that an architect, in parting with his drawings, gives up the copyright of his design."

FIRE-PROTECTION AT THE WORLD'S FAIR.



XVII-Century Lock-plate. From Havard's "Dictionnaire de l'Ameublement."

THE Chicago Fire-Underwriters' Association has issued to its members the following statement of the means provided for the protection of the exposition buildings against fire, a matter in which universal interest is taken:

As requested, herewith please find a summary of fire and water protection at the exposition grounds with other information pertinent to the execution of the plan of safety outlined and deemed expedient by your committee. Fire-stops in walls and columns of all exposition buildings are required to be of plank covered with cement mortar, composed of Portland cement and three parts of clean, sharp sand. Large stops require the addition of expanded-metal or wire-lath, plastered on both sides with cement mortar. The roofs of the various buildings are being cared for (as outlined in our report

to you of January 13, 1891) by means of ladders, with necessary scuttles, runways and cleated walks on roofs, so as to permit a complete fire-patrol of the entire roof-system, and to facilitate operations in fighting fire. The basement area of eight exposition buildings are being divided into compartments 150 x 250 feet, by two-inch plank fitted up tight, having connecting trap-doors from aisles to each compartment.

Water for the grounds and buildings will be furnished by the city from Hyde Park pumping-works, where the exposition company is placing pumps of 24,000,000 gallons capacity per day. In addition there will be a plant of four Worthington pumps on the exposition grounds, with a capacity of 40,000,000 gallons per day, which will take water from the lagoons for steam machinery and for the fountains. In case of fire or break-down of the city pumping-works these pumps are expected to furnish a full supply. Water will be brought into the grounds from the Hyde Park station through a 36-inch main to Machinery Hall, where it divides, and two 36-inch mains conduct the water throughout the grounds. Each exposition building is surrounded by a water-pipe not less than eight inches in diameter. This pipe will be crossed at a distance of 300 feet by a six-inch pipe; 300 feet apart are to be Mathews' double-nozzled frost-jacketed fire-hydrants; 169 of these hydrants are at this date set and in permanent locations, mainly surrounding the various buildings. There will be 400 or more. Within the walls of each building at intervals of 150 feet will be stand-pipes rising to the roof, with hose-connections on each floor, gallery and roof.

When complete there will be twenty miles of water-mains: sixteen miles are now laid and in position. The Liberal Arts and Manufactures Building will have a high-pressure independent pumping system for the roof. Until the completion of the permanent system, the present temporary water-supply is from the city mains; also a temporary power plant on the grounds, capacity 3,000,000 gallons per day, whereby water can be taken from the lagoons and 100 pounds fire-pressure maintained. This system was the only perfect and reliable one in Chicago during the two days in January when the city supply of water was stopped by anchor ice.

The temporary fire protective service consists of one steam fire-engine with four city fire-companies always on call, three chemical-engines, twenty-eight hose-carts, 14,500 feet of hose, 570 hand-extinguishers and 2,575 brine-pails. There are seventy-one barrels of water, of which fifty-five are on the roofs of such buildings as are finished to such a point. Of the 150 fire-alarm boxes to be located, sixty-four are in service, connecting all buildings with central station on the grounds, connecting with other fire-stations, with pump-house, police and headquarters. Complete "Joker" outfits for central station and engine-houses were ordered May 10.

The present police and patrol force numbers 225 men, which will be increased to about 1,800, under the command of Colonel Edmund Rice, U. S. A. The guard has a fire-drill three times a week, consisting of running off leads of hose, making connections, throwing water in the quickest possible time, climbing ladders and the use of all fire-appliances, under charge of experienced firemen. There will be a day and night patrol on the floors and roof of each building.

Ten stations have been located for the permanent fire-service, to contain six steamers, nine double-tank chemical-engines, three hook-and-ladder trucks, one water-tower and five patrol ambulance-wagons. — *Fire and Water.*

DONALD RAMSAY.



It is not a common thing, we feel sure, for lithographic transferers to take an interest in Emerson's Essays and so when, fifteen years or more ago, one of them begged that we would send word up stairs the next time Mr. Emerson chanced to visit his publisher so that he might come down and get a glimpse of a man to whom he owed much, we felt that this workman, intelligent and energetic as we knew him, was something vastly different from the men who form the majority of the slaves of the press. A little questioning brought out how when a slip of a lad tending sheep in Scotland he had at length been paid ninepence and, granted a holiday, had tramped to the distant town, how after debating long and anxiously how he should spend his treasure he had halted at a book-stall and there spent his day, at length selecting, in coverless pamphlet form, an essay by a "man named Emerson." Returning to his sheep again he read and reread his essay till he had it committed to memory and made the resolution that he would seek, buy and read all that the man Emerson had written, and he later did.

Between this barefooted, bareheaded gillie and the proprietor of the Heliotype Printing Company who, within a few hours' ride of his birthplace, died at Liverpool, September 6, there was a great difference socially and intellectually, and in the years that intervened the process of development advanced uninterruptedly, though the days brought with them the hard, unceasing labor which all self-made men have to undergo. Donald Ramsay was a self-made man and though he had unusually good reason to be proud of his handiwork no one could be more modest about it than he throughout his short life of forty-four years.

The sheep-tending period must have been a mere temporary episode in his career, for while still of very tender years his father, a weaving hosier earning but fifteen shillings a week, apprenticed him to a printer of valentines and his first work in what was to be his future calling was the coloring by hand of comic valentines. Teaching himself drawing he very shortly earned more — very little more — pay by designing valentines of a little higher grade and carried the character of the color work to a little higher level.

The failure of his employer brought about his transfer to a regular lithographer's shop and there he began to learn thoroughly this interesting craft in all its branches, and his success in after life was due to his thorough and minute knowledge of the practical operations of all kinds of printing processes, a knowledge which he took care to perfect and broaden by sedulous and earnest study all through his life.

It makes one shudder to know how boys are sometimes maltreated by their employers. Ramsay's may not have been harsher than others of that day, but the boy certainly underwent experiences we are unfeignedly glad never fell to our share. A lithographic stone of regulation size weighs about a hundredweight and is as much as a grown man cares to handle, but one day it was necessary that some one should bring from a neighboring engraver's, a quarter of a mile away, a stone of this kind which he had been working upon. The errand was entrusted to Ramsay, a willing boy of fourteen, whose daily food was but a simple bowl of oatmeal porridge. The only way a boy could carry such a weight was upon his bended back with hands clutching its upper edge. The engraver placed the stone on the plucky lad's back and watched him down the stairs and out of sight, perhaps, with misgivings as to the safe arrival of his own work; but Ramsay had no such misgivings, he was not wont to be beaten in anything he undertook, and he trudged on manfully, hoping his fingers would not slip, — for that would mean a broken stone and a thrashing, — and changing now and then the inclination of his bended back so as to obtain what slight relief he could. The job was too much for his strength and as he was crossing a street near the end of his journey his staggering steps betrayed his weakness to a tall, stout man who chanced to be passing and at once going to his relief lifted the stone to the ground; as the boy straightened up, the man discovered that his own son stood before him and for the first time learned how he was being mistreated. The parental anger can be imagined and also the brisk interview with the master-lithographer which at once ensued which put an end to all relations between boy and master.

After some years, finding at length that he had mastered his trade and that there was not a very promising outlook at home, Mr. Ramsay left Glasgow when twenty years of age and, in 1868, sailed for this country. After spending several years in Boston as a journeyman he went West and set up for himself in Minneapolis, but as matters did not prosper he returned to Boston and, about 1877, entered the employ of James R. Osgood & Co., and very shortly was made foreman in the lithographic branch of the Heliotype Department where he first attracted our attention, and that also of Mr. Osgood who, when his own failure in 1885 caused so great changes in our immediate surroundings, was very glad to entertain the propositions which Mr. Ramsay with the aid of friends was enabled to make for the plant and good-will of the Heliotype Printing Company.

At this point Ramsay the lithographer leaves the bench and takes his place in the office of what is now a large and flourishing business, built up very largely by his own sagacity and capacity, and it speaks volumes for the man that without exciting any ill-will on their part through an altered bearing on his and without any friction he was

at once able to take the place of employer of the men side by side with whom he had worked at the bench for years. The business obligations laid upon him by this venture necessitated untiring and excessive labor and care; but success rewarded his efforts and a few short months ago his title to the plant and business was at last clear, and feeling that the strain brought upon him by the fire last fall made a vacation desirable he, in seeming good health, set out to visit Scotland once more, but died two days after the steamer arrived.

For no man we have ever known have we entertained a more sincere respect than for Donald Ramsay, and, knowing the disadvantages under which the long hours of labor put every handicraftsman, we have often marvelled at the extent and accuracy of his information particularly in matters of letters pure and simple. His knowledge of English and Scotch literature was large and particularly was he familiar with the poetry of both languages, for to his other gifts nature had added no mean portion of the true poet's feeling and, by right of practising it, he held an acknowledged place among the minor Scotch poets of the present day, and was in consequence held in high repute by the Scot's Charitable Society and others of similar nature whose members cherish the words of Bobbie Burns, and regard highly those who can truly appreciate and interpret them. Membership in this leading Scottish society gave Mr. Ramsay opportunity to yield to his one failing — he was generous to a fault.

To the *American Architect* he was something more than a printer, he was a friend interested in its success and to his abiding faith in it, to his willingness because of this faith to do its work at a smaller profit to himself than would others in the same position, as well as to his sagacity and skill which again and again secured satisfactory results from seemingly impossible materials, our subscribers owe no small part of the satisfaction which the illustrations of the *American Architect* have given them in times past.

BOOKS AND PAPERS

IT is not often that we find the art of architecture, including its history and the science of building, expounded in one small book of less than a hundred and fifty pages; but Mr. Bates has found it desirable to make the attempt, in the interest of his classes at Clafin University, and, taking his book as a whole, his efforts have been tolerably successful.

It may be supposed that the students in the South Carolina college need practical information more than they do dissertations upon artistic forms which few of them will ever see, and the practical part of the little work, which occupies about two-thirds of its bulk, is very well done. That the æsthetic part is much less valuable is, perhaps, not a great misfortune, as every one who had any occasion to take up the subject seriously would soon find his way to Rosengarten, or Fergusson or other standard books.

As often happens with people who endeavor to abridge a subject without much thought, Mr. Bates has, insensibly, made up his concise account of architectural history and theory of a very small amount of information filled out with a good deal of commonplace padding. For example, we find, out of the twenty-four lines devoted to Egyptian architecture, nine occupied by these reflections: "They" (the Egyptians), "thought solidly, but always on a low plane, and were contented with low temples. They never thought high enough to build a cathedral with great arches, or a steeple, high or low. In contrast with these — and I use the illustration of the later people because it is striking — there is the light fantastical thinking of the Turks, as manifested by their architecture at Constantinople." It would be difficult, we should say, to find, in all the rubbish that has been written about architecture, nine more thoughtless lines than these.

From what authority Mr. Bates derives his notion that the ancient Egyptians were "on a low plane," as compared with those of the modern Turks, we cannot imagine; but to be told that the architects of the Pyramids "never thought high enough" to build a cathedral or a minaret is startling.

But it is in the chapter on "Architectural Design" that we find the most hasty and ill-considered observations for the benefit of students. With all due allowance for individual taste, it seems to us that a professor of architecture should hesitate to teach his pupils that after the "new lease of the old Greek classic work in London and Paris and America, which followed the publication of 'Stewart and Revett's' book in 1762, buildings public and private were built with Greek columns and entablatures" "in all our older large cities," "and about as good as any the Grecian ever saw"; and that, after the decline of the Greek "lease," "came a revival of Gothic, which has been at times much better than considerable of the old." It is hardly to be wondered at that, after this sort of indiscriminating talk, taken in connection with his sage remark that "It is best to have variety," Mr. Bates should be alarmed lest the student might think that a combination of two or three such excellent styles would be better than either separately, and should feel it necessary to warn him that "as regards the styles that people have invented and used,"

"he will give each its place, and not rashly intermingle them." "A hoop-skirt on a man, outside of his trousers," he graphically continues, "would be no more incongruous and reprehensible than a Gothic door or window would be if put in among Grecian or Roman columns and entablature."

We might add that, in the matter of literary as well as architectural composition, "a hoop-skirt on a man" is hardly more "reprehensible" than a crude, ungrammatical presentation of a subject not half learned, and obscured with ridiculous moral and æsthetic reflections, most of which have no basis whatever to rest upon. Mr. Bates has plenty of mind, and a remarkably quick feeling, and, if he knew his subject thoroughly, his comments on architecture as an art would be well worth listening to; and the attractiveness with which he could present them, if he took pains in doing so, may be judged from the few words in which he dedicates the book to President Dunton. Six more graceful lines we have seldom seen in English prose, and the man who could write them would have no difficulty in making the manner of his work attractive, if the matter were what it should be.



AMERICAN INSTITUTE OF ARCHITECTS.

THE next convention of the American Institute of Architects will take place on October 20 and 21, which are coincident with the inaugural exercises of the World's Columbian Exposition. Through the kind intervention of Mr. D. H. Burnham, the authorities in charge of the Exposition will place at the disposal of the Institute, for use as a meeting place for its convention, a hall well lighted and warmed, and properly equipped and furnished for the purpose. The only condition asked on behalf of the Exposition authorities by Mr. Burnham is that he be given by October 1, the name and address of every person who wishes to attend the convention. This is done because of the great numbers of those who wish to enter the Exposition grounds and participate in the opening exercises, so that the definite arrangements for the admission and care of all who will be, in a certain sense, the guests of the Exposition, may be made at an early date.

You are therefore requested to write me soon enough that I may receive the information on or before October 1, whether you will attend the convention, and to what address the necessary card of admission is to be sent.

Owing to the fact that the hotel accommodations at Chicago will be taxed to their utmost, you are advised to make your arrangements for rooms immediately. The members of the Chicago Chapter of the Institute will do all in their power for the entertainment, at their homes, for those who cannot secure quarters at hotels.

Further and more detailed information will be given in another circular.

DANKMAR ADLER, Secretary.



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

MAIN ENTRANCE, *Youth's Companion* BUILDING, BOSTON, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

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

THE *Youth's Companion* building is located upon Columbus Avenue at the corner of Berkeley Street with a frontage upon the former of 208 feet and on the latter 110 feet. Including the basement, which is fourteen feet high, airy and well-lighted, the building has six stories, all of which are occupied exclusively in the interests of the *Youth's Companion*, which paper has to-day a weekly circulation of between five and six hundred thousand copies.

One half of the basement is occupied by the presses: the other by boilers, engines, electrical and elevator machinery.

The large room at the right in the first story is the business office. Over this, in the fifth story, are the editors' rooms placed against the outer wall. In the centre of this section of the building, separated from the editorial rooms by a corridor, is the working-library, devoted wholly to the use of the large corps of editors. The rest of the building, in addition to spaces assigned to composition and electrotyping, is occupied by the subscription, mailing and premium departments.

CONSTRUCTIVE DETAIL OF THE *Youth's Companion* BUILDING, BOSTON, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

THE accompanying sketch shows the construction adopted to obtain for the press-room the greatest possible amount of space and light along the line of the front wall.

¹"The Elementary Principles of Architecture and Building," by Robert Charles Bates, Instructor in Architecture, etc., at Clafin University.

THE MEDICAL COLLEGE OF THE UNIVERSITY OF BUFFALO, BUFFALO, N. Y. MR. GEORGE CARY, ARCHITECT, BUFFALO, N. Y.

The style of architecture of the new building is that of the Italian Classical school and reminds one not a little of the Farnesina Villa in Rome. It is 155 feet long, 98 feet deep, in the west wing, 60 in the centre, and 75 in the east wing. The exterior is of Medina sandstone to a height of about 10 feet and thence, to the top story, so-called washed brick, having a rough, pebbled surface, and a brownish-red color. The top story is to be built of stock brick with an overhanging roof of 3½ feet, and without gutters, those being formed at the base of the building in a terrace. The names of the great physicians of the past ages appear in terra-cotta over the windows.

The drive-way and hall are wainscoted with a gray stone, the wall being faced from the stone up with yellow brick and vaulted with the yellow tile of the Guastavino Fireproof Company. There are practically three sets of stairs in the building—of stone, slate and iron. The pavements are granolithic and asphalt. There are no plastered walls in the building the side walls being entirely of brick. The finishing is to be of oak. The form of construction is what is known as "mill" construction. The building will be slow-burning to say the least, and will be very nearly fireproof. Every room is thoroughly ventilated according to the latest theories, the vitiated air being drawn off at the base and the hot air being brought in at the top.

The plumbing, too, is after the latest and best pattern.

The library is in the east wing of the ground floor. The dimensions are, in round numbers, 30 by 50 feet and 18 feet high, with a gallery surrounding the room. It is entirely fireproof and vaulted with the Guastavino tiles. It will be known as the Burwell library, in memory of the late Dr. George N. Burwell the most of whose valuable medical library was given to the college by Mrs. John Glenn.

The building contains three amphitheatres, the largest of which is on the ground floor of the west wing and will seat 450 students. The other amphitheatres seat respectively 250 and 150 students. All are between 25 and 30 feet high.

The museum runs along the front of the building some 80 feet on the first floor and has a gallery surrounding it. Adjoining it and occupying this whole floor of the western wing is the general laboratory which, like most of the rooms in the building, receives light from three sides. It is about 94 by 32 feet and will accommodate at desks about 140 students. Another department of interest is the dispensary waiting-room which runs up two stories high and has a dozen other dispensary rooms opening into it and to its gallery. Here patients may be treated and, when operations are necessary, may be wheeled into the adjoining amphitheatre and into view of the students. In this wing, too, is the dental dispensary. This dental dispensary is to be about 30 feet square.

HOUSE OF CHARLES SOOYSMITH, ESQ., GREEN'S FARM, CONN. MR. W. W. KENT, ARCHITECT, NEW YORK, N. Y.

INTERIOR DETAILS OF THE SAME.

HOUSE OF W. S. GUFFEY, ESQ., LIBERTY, PA. MR. GEORGE T. PEARSON, ARCHITECT, PHILADELPHIA, PA.

The walls above the stone base line are faced with mottled brick, with carved brick panelling, etc., and the roof is of green slate with copper dormers. It is to cost about \$25,000.

[Additional Illustrations in the International Edition.]

TOWER OF THE HÔTEL DES DRAPS, YPRES, BELGIUM.

[Gelatine Print.]

The building of which this is the central feature and oldest portion has a façade of 460 feet in length all designed in a uniform style and built between 1201 and 1304. At one end of the building was added, about 1575, a Renaissance structure used as a town-house. A view of this group may be found in the *American Architect* for April 25, 1885.

EXTERIOR DOOR OF THE MOSQUE AT OLGAY EL-YOUCOUFY.

[Copper-plate Engraving.]

STATUE OF BARTOLOMEO COLLEONI, VENICE, ITALY.

WHEN Lord Byron was writing his "Marino Faliero" he was in a state of ignorance about the equestrian figure that stands near the church of St. John and St. Paul in Venice, for he refers to it as the statue of a forgotten warrior. It is likely that many Venetian citizens in those days were not better informed. The fame of the soldier who, according to some authorities, was the first to make use of "mortal engines whose rude throats the immortal Jove's dread clamours counterfeit," and who was among the founders of the modern art of war, has not been more enduring than the fame of many other men of his class. Bartolomeo Colleoni was too much a man of the world not to understand that if he wished to be remembered he must make a provision for that purpose. He left money for the erection of a chapel in the Church of Santa Maria Maggiore in Bergamo,

where he is buried, and for a mausoleum, on which big painted and gilded figures of himself and his charger were to be set up. That commission was entrusted to Amadeo of Pavia. As Colleoni, like Othello, was the captain of the land forces of the Venetians, he was also desirous to have a memorial of his prowess in the city which he served, and accordingly he bequeathed a large sum to pay for the statue and pedestal which are shown in our illustration. The inscription, however, dissembles this origin, as it simply states that the statue was *ob militare imperium optime gestum*.

The pedestal of the Venetian monument is the work of Leopardi, and there are few examples which can be said to surpass it for elegance and refinement of the ornamentation. The figure of the condottiere is the work of Andrea del Verrocchio, the Florentine, one of the first artists of his time, a painter, sculptor and architect, who was the master of Perugino and of Leonardo da Vinci. The history of this statue as related by Vasari portrays the passion, jealousy and self-love, the independence and activity of the Renaissance artists. When Verrocchio had finished the horse he discovered that the execution of the figure of the captain was about to be conceded through favor to Vellano of Padua, who was patronized by some of the patricians. In his indignation at the perfidy he broke the head and legs of the horse, and fled to Florence, his native place. The Venetian senate immediately let him know that if he ever dared to show himself again in their city, it would be at the peril of his head. He replied that he would remember the warning, since the signory were unable to replace his head if once cut off as easily as he could repair that of the horse he had broken. The answer was favorably received. Verrocchio obtained permission to return, and he was promised double the remuneration agreed on. He recommenced his work with ardor. While superintending the casting he was seized with inflammation of the lungs, of which he died in the course of a few days in the year 1488. Leopardi was charged with the completion of the work, and it was erected in 1495.

It is supposed by Cicognara that the statue was recast by Leopardi, from which it might be inferred that the impressiveness of the work is owing to the Venetian sculptor. What seems to be not unlikely is that the remarkable effect which is produced on all who look upon the figure is to be credited to Da Vinci, rather than to his master or to Leopardi. Is there any reason to make the cooperation of Da Vinci improbable? When Verrocchio discovered that his apprentice could paint better angels than himself he may have suffered depression for a while, but there could be no rancour, for the Renaissance artists were accustomed to victories of that kind. There was no obstacle in the transaction to make it obligatory that the master should not afterwards invoke the aid of his conqueror. Now there is nothing, so far as we know, corresponding with the head of Colleoni in any of Verrocchio's figures in Florence. As a sculptor he was more esteemed by his contemporaries for his industry than for his genius. On the other hand, Leopardi's stands or sockets for the masts in the Piazza of St. Mark are so excellent, we are not much surprised at his capacity to design the pedestal in the Piazza of St. John and St. Paul. That he had sufficient power to design the equestrian statue is not, however, indicated by any of his works. In fact, the Colleoni memorial is very suggestive of the interposition of a "ghost."

It should be remembered that about the time when Verrocchio was occupied with the commission for the memorial of Colleoni, in Milan, Da Vinci was engaged on an equestrian statue of Francesco Sforza, who was one of Colleoni's rivals. Is it not probable that under such circumstances Verrocchio would have compared designs with Leonardo, and have availed himself of the aid of his pupil? The head of Colleoni is remarkable, but it is allied to some of those that are introduced in the "Last Supper" and to many that are seen in Da Vinci's sketches. The projecting brow which makes the eyes appear as sunk in a cavern; the aquiline nose which almost touches the upper lip, the capacious and merciless mouth, resemble details in the sketches which also show faces that are as truculent in expression as the old mercenary appears. It is now impossible to realize what sort of statue of Sforza was modelled by Da Vinci. The sketches which are supposed to relate to that work reveal the over-fastidiousness of the artist. The bronze statuette of a horse that is believed to be a copy of Da Vinci's does not express the strength which was necessary in an animal that was to bear the weight of a figure in heavy armor. Great as he was, Leonardo was often unable to put forth all his power. If we could, therefore, assume that Da Vinci helped in the realization of the Venetian work it would not be necessary to conclude that Verrocchio was a mere looker-on; it is likely that his strong common-sense and his devotion to realism may have translated Da Vinci's ideas into the impressive form which seems to command in Venice.

CATHEDRAL OF Tournai, BELGIUM.

It is considered that the naves and transepts of the Cathedral of Tournai form the noblest example of the Romanesque style that is to be seen in Belgium. The choir is no less remarkable although it is Gothic. The cathedral merits far more attention than it has obtained, for it shows how well the two styles could be assimilated. There was a Romanesque choir which was not completed until the beginning of the thirteenth century. It could not have long remained, for in the same century the works of the existing choir were commenced, although not completed before 1325. The change

is curious as exemplifying the influence of fashion in Mediaeval times. The Romanesque choir was no doubt impressive, but its severity was not as attractive as the style that had come into vogue, and therefore it was superseded. When the choir was completed it was even proposed to demolish the naves and transepts, but fortunately wiser counsels prevailed, or money was not forthcoming, and the reformers had to be satisfied with operations on the front of the cathedral. The belfry near the cathedral is an interesting example, although it has not acquired the popularity of one in Ghent.

KILLEEN CASTLE, COUNTY MEATH, IRELAND.

ONE of the misfortunes of Ireland arises from the almost superstitious belief of the people in the virtues of Acts of Parliament. It is supposed that it is only necessary to prepare a certain number of formal clauses in order to create prosperity in every province. There is no country in the world which has gained wealth and happiness by that sort of draughtsmanship. The ordinary arrangements of society which elsewhere have succeeded need not fail in Ireland. One of the essentials to success everywhere is the existence of land owners who will be wise enough to recognize that property entails duties just as it confers rights. Unhappily, the native owners rarely believed that they could become industrial leaders. When Mr. Froude was in Mayo he discovered that in an assembly of three hundred gentlemen there was not one among them who supposed he was created for any other purpose than following sports. The consequence is seen in the state of Ireland to-day.

While so many people in and out of Ireland are turning their eyes to Westminster as if there alone a remedy for social evils was to be discovered, Messrs. E. & H. Lumley, who believe that desperate remedies are not needed, are endeavoring to persuade gentlemen who are possessed of wealth to try what old-fashioned methods can do. Recognizing the shortcomings of the native proprietary, they are eager to demonstrate what can be accomplished when land is owned by those who are willing to assume responsibility, and to take part in the transformation of a country which possesses unequalled advantages. There is no great sacrifice necessary. Ireland has many dwellings which in any other country would be appreciated. Killeen Castle may be taken as an example. It is an historical building, and from time to time has been altered, so that at present it is adapted to modern requirements.



[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.]

OUR ILLUSTRATIONS.

BUFFALO, N. Y., September 10, 1892.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs:—Because I am interested in having American architecture improved and because I am desirous of seeing your journal take a foremost rank among architectural journals, I send you a dozen prints selected from the publications of the last two months, and I ask why were they published?

Very sincerely yours, GEORGE CARY.

[One of several possible answers to this question we find in a pigeon-hole labelled "curiosities of human nature." It is a letter from an architect in reply to our notification that while we accepted three out of four drawings offered we must decline the fourth, and is as follows: "When I forwarded the drawings for several buildings for publication in your journal, it was due to my having observed a conspicuous absence of any interesting American work in your recent publications. The reason you might give for your disinclination to publish the design of — Church would not interest me, but I would state that when these drawings were sent to you, you were not requested to make any selections but to accept or reject them as you thought best. You will do me a favor by returning them all unpublished at my expense." This was the result of two efforts (our correspondent's and our own) to raise the quality of illustrations in this journal.

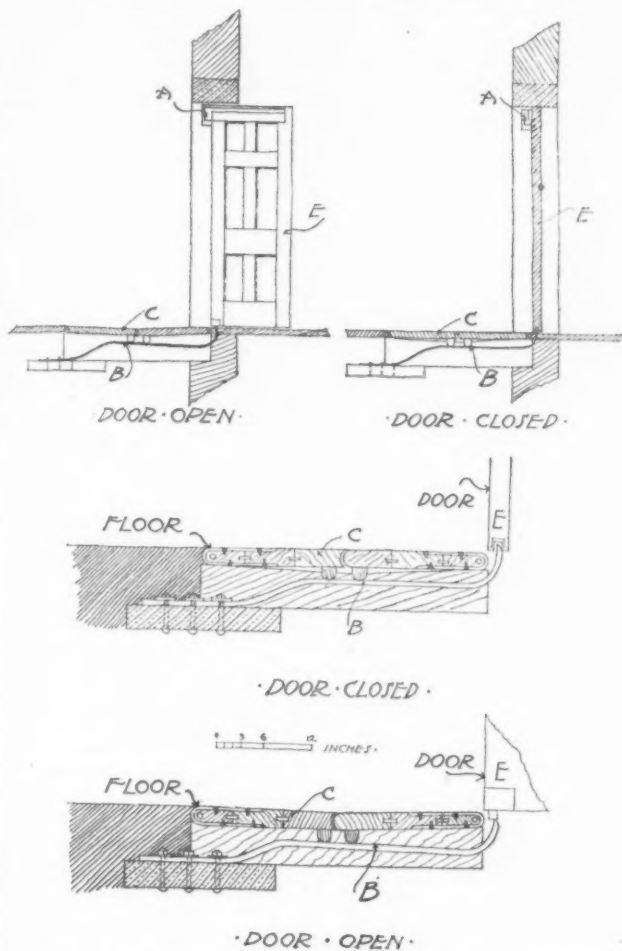
As good an answer as any would be to point out that the spring cannot rise higher than its source, while a third might be had by naming the designs to which our correspondent objects and asking their several designers to explain why they were not wise enough to keep them in permanent seclusion. — EDS. AMERICAN ARCHITECT.]

LANCASTER AND NIXON'S PATENT AUTOMATIC DOORS FOR THEATRES.

THE object of this patent is to automatically release and instantaneously push open outwards the doors *EE* by means of the springs *AA* fixed to the jambs at the top of the doors rolling or working on the doors themselves. By treading or pressing on the platform *CC*, which is on the level of the exit passage and situated over the springs *bb*, such springs *bb* will fall and immediately release the doors and cause them to fly open by pressure of the springs *AA*.

The platform *CC* is hung on centres with a stop under them to prevent the platform or floor falling more than one inch in the

centre. The minimum weight on the platform required to release the springs *EE* is forty pounds. The doors are hung in centres on either side of the doorway and are made so as not to recoil but



remain open at pleasure. They are divided vertically so as to form two doors, one portion slightly overlapping the other on the outer side, the portion overlapping being held by the spring (*b*) (*b*).

E. A. E. WOODROW.



THE BURNING OF GRINDELWALD, SWITZERLAND. — As at Meiringen last autumn, and as in almost every other case of fire in Swiss villages, Thursday's conflagration at Grindelwald undoubtedly originated with a visitation of the Foehn — that fiend of the air, who comes rushing over the Alps and down the valleys, hot and stifling as a sirocco, and too often carrying death and destruction on his wings. In the old days it was a recognized custom in all Swiss villages, where the houses were made for the most part of wood, that the moment the Foehn heralded himself at the top of the valley the tocsin should be sounded and every fire extinguished. But resorts like Grindelwald, growing more popular year by year, have no time to think of these ancient, though very wise, precautions nowadays; they are too busy attending to the wants of the stranger; especially at this period, the height of their summer season. On Thursday afternoon a spark from some stove or other was caught up and fanned by this rapid Foehn, and carried onto the roof of the west wing of the Bear Hotel, which for many years has been popular with the English visiting Grindelwald. The upper portions of the Bear were built of wood, and before its proprietor, Mr. Boss, could get near the spot with a hose-pipe, the fire had rushed along the roof and taken complete possession of it. To fight the flames with such primitive contrivances as exist in Grindelwald was useless. After the half-dozen days just past of almost tropical heat, the wooden walls were dry as matchwood. In ten minutes the upper floors were entirely consumed; ten minutes more and it was impossible to enter the lower stories. Some of the two hundred tourists succeeded in saving their baggage, though most of them were content to save themselves, though they lost everything they had with them. The fierce, hot wind carried the sparks down the valley, first to the English church, then to the Hotel Alpenruhe, to two cafés adjoining, then to chalet after chalet on each side of the road, and some of them high on the hillside, until between eighty and ninety structures were destroyed. In one hour they were reduced to piles of ashes. The poor peasants and guides who owned the smaller structures endeavored to save their worldly goods but even those which they succeeded in rescuing from the burning buildings were seized upon as they lay in the fields by the flames.

It was a pitiful picture this morning — these thrifty folk searching sorrowfully among the ashes and still-smoking remnants of their homes for any of their hard-earned savings that might have escaped the fire. But they were only adding to their misery. Not a solitary sou did they find. There was nothing worth carrying away. So also at the hotels. A few articles of furniture were brought out into the garden, but the heat from the burning buildings ruined them. The destruction was complete. From the Bear southwards for half-a-mile the Grindelwaldthal is a veritable valley of desolation. Even the trees have been robbed of their leaves and branches, and now stand bare and gaunt as telegraph poles, and the ripening corn and oats are burned down to their roots. The total loss cannot be less than £100,000, of which £40,000 falls upon the shoulders of the Brothers Boss. They had a fine cellar of wine in the Bear worth £2,000, and every bottle of it has gone. The building was of necessity insured, as were all the structures destroyed, for insurance is compulsory in the Canton of Berne, but the furniture and valuables are direct loss. The disaster showed very forcibly the utter inadequacy of the fire-extinguishing apparatus provided in Grindelwald, though it is an open question whether anything could have arrested the progress of the fire in the direction in which the Föhn carried it. Fortunately the wind did not change, or the upper portions of the village must have been destroyed also. About three hours after the outbreak the fire-brigades of Interlaken, Bönigen, and neighboring villages, together with a corps of pioneers from the military school of Thun, arrived by special train; but by that time the local brigade, aided by tourists, had succeeded in isolating the buildings to the north and east of the Bear, and thus prevented the spread of the fire in that direction. This was mainly due to the efforts of the English men and women who were staying in the village. The natives seemed helpless, until one of our countrymen organized a double chain of two hundred or three hundred people, with a large proportion of English and Americans, for the purpose of passing water from the brook to the engine. Many a delicate but courageous lady, who had lost everything in the fire except the clothes she wore, stood there for hours passing buckets back to the brook. The water-supply was, however, quite inadequate, and it barely sufficed to keep the walls of buildings to the north of the Bear from catching fire. In addition to the provision of more modern fire-extinguishing apparatus, it would be wise in reconstructing the hotels and dwellings to give them slate or tiled roofs. The existing system of thatching with small chips of wood is exceedingly dangerous. Under continuous heat, such as that prevailing in Switzerland during the past week, they become highly inflammable and, as has been proved once again, a stray spark is enough to set the whole village in flames. — *Interlaken Correspondence, London Times, August 21.*

STEAM OR HOT WATER FOR GREENHOUSE HEATING. — In order to determine whether steam or hot water were the best for heating greenhouses, a series of experiments have been made at the Agricultural Experiment Station in connection with the Cornell University in which the following conclusions were arrived at: (1) The temperature of steam pipes averaged higher than those of hot-water pipes throughout the entire circuit for the entire period of test; (2) The higher the inside temperature in steam pipes the less is the proportionate warming power of the pipes at a given point. The heat is distributed over a greater length of pipe, and as steam is ordinarily carried at a higher temperature than hot water, it has a distinct advantage for heating long runs; (3) When no pressure is indicated by the steam gauge, the difference between the temperatures of the riser and the return is greater with steam than with hot water; (4) Under pressure the difference is less with steam than with hot water; (5) There is less loss of heat in the steam risers than in the hot-water risers, and this means that more heat in the steam system is carried to the farther end of the house and more is spent in the returns as bottom heat; (6) This relation is more uniform in the steam risers than in the hot-water risers, giving much more even results with steam than with hot water; (7) When the fires are operative the fluctuation in the temperature of the risers at any given point is much greater with hot water than with steam; (8) An increase in steam pressure raises the temperature in the entire circuit, but the temperature does not rise uniformly with the pressure; (9) The first application of the pressure increases the temperature of the returns much more than that of the risers; (10) Steam is better than hot water for long and crooked circuits; (11) Pressure is of greater utility in increasing the rapidity of circulation of steam and in forcing it through long circuits and over obstacles; (12) Unfavorable conditions can be more readily overcome with steam than with hot water; (13) Hot water consumed more coal than steam and was at the same time less efficient — this result would probably be modified in a shorter and straighter circuit with greater fall; (14) Under the conditions here present steam is more economical than hot water and more satisfactory in every way, and this result is not modified to any extent by the style of heaters used. — *Invention.*

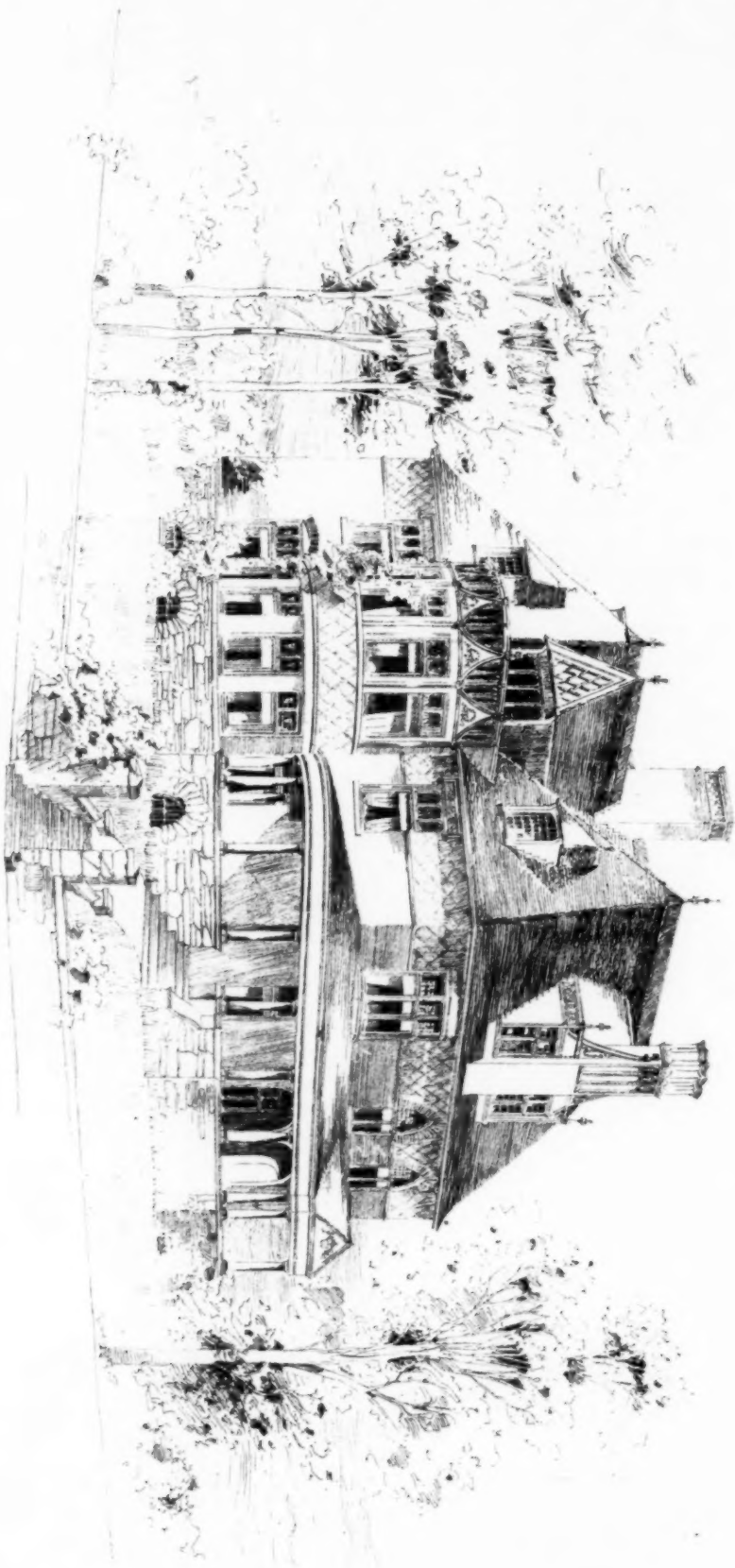
A GOOD SHOP FLOOR. — It is a hard matter to get a cheap, and at the same time serviceable floor for shops or buildings where heavy machinery or materials must be handled. Mr. E. A. Manchester, division master-mechanic of the Chicago, Milwaukee and St. Paul Railway, located at Dubuque, Iowa, has, says the *Railway Review*, of Chicago, overcome this difficulty in a very satisfactory manner. The good pieces of broken sills which are removed from cars are carefully saved and used for making the shop floors. In many places it is customary to burn this material, it being considered valueless. Most of the removals made are on account of a small break in one portion of the sill, usually an end broken off. This leaves a considerable length, sometimes as much as 25 or 30 feet of the sill, which is sound, but cut up by bolt-holes and mortises. The timber is of good quality, generally better than would be bought for such a purpose. In laying the floor longitudinal sleepers are first placed and the space between them filled-in with dry sand thoroughly tamped. On top of this are laid the timbers, and fastened by the use of boat spikes to the longitudinal

stringers, the sand being thoroughly tamped beneath each piece as it is laid. As far as possible hard-wood or hard-pine is used, but if it is necessary to put in soft-wood it is placed in a separate section and not mixed with the better material, and when it is worn out a complete section is removed and replaced with hard-wood if it is obtainable. This makes a remarkably substantial floor and one upon any part of which a jack can be placed with the assurance of an ample foundation for any reasonable load. The floor remains level, and consequently it is seldom if ever necessary to put shims under a jack, which is a particular advantage in a repair-shop where the end of a locomotive must be supported by the use of two jacks. Mr. Manchester has nearly all the shops in the car department supplied with this kind of floor, and is so well satisfied with it that he intends to put it in the locomotive department and roundhouse.

AN ADMIRABLE EXAMPLE. — The president of the Phenix of Brooklyn ordered double pay to be given for the term of absence to the employees of that company while doing duty with the militia regiments at Buffalo. There was quite a force of militiamen taken from other offices, but we have not been advised that any of the latter have followed the example of the Phenix. — *Spectator.*

TRADE SURVEYS

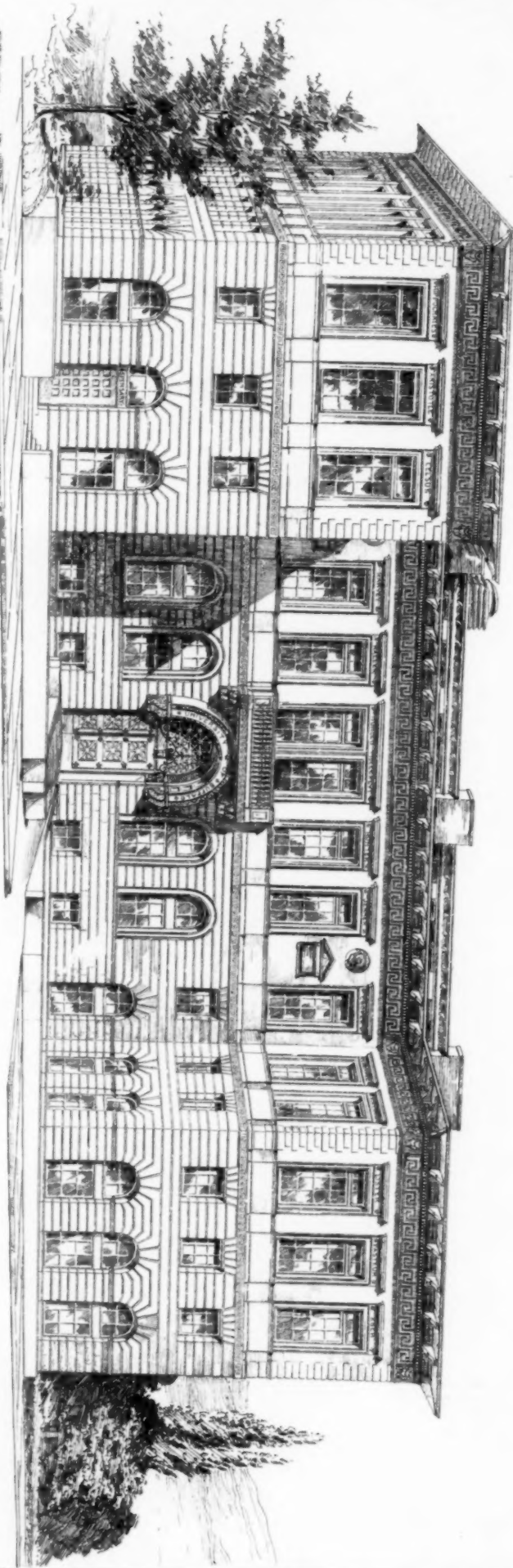
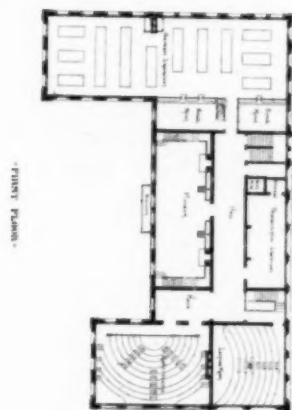
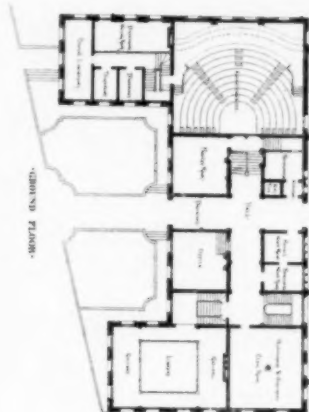
It is to be regretted that possibilities of stringency in the money markets should be referred to so often. It is impossible, by the most careful and intelligent study of the conditions on both sides of the water, to arrive at any reasonable conclusions as to the danger threatened. Reports and statements from high financial authorities are contradictory; to-day they may lean in one direction, to-morrow in another. Many of these statements are made for the purpose of influencing the public mind, especially the financial world. It is a matter of regret certainly that there is not some reliable method by which the actual undercurrent can be known. Perhaps this is impossible, as there are so many conflicting interests. The struggle for gold is the salient feature. What is involved in it ultimately no one can tell. Whether it is wise or foolish is a question. Whether opposition to silver is wise or foolish is open to question. The political economists in the world are, as a rule, opposed bitterly to silver, and perhaps wisely. That the struggle for gold will continue and become more intense is evident from recent events and movements. That we are facing new necessities and conditions in the financial world is also felt, and that these new necessities and conditions are really the causes of the struggle for gold by foreign financial institutions. The questions which many Americans are asking are: Will the struggle avail? May it not be fruitless? May it not be unnecessary? May not new conditions arise which will force the world to accept standards and measures of value at which it now rebels? The only point to be dwelt upon at present is that there are new conditions arising, but what these new conditions will bring to us is altogether beyond discussion. The trade centres of the world are changing. New avenues are being opened. India is becoming a more important factor. The United States is assuming a magnitude which is unsettling all previous calculations among the princes of finance and commerce abroad. South America, Australia and other parts of the world are opening up new and vast possibilities for capital and enterprise. New commercial and financial centres are springing up, which, in time, may threaten the supremacy and the theories and conclusions of old centres. In short, the world may be learning new lessons in the management of its book-keeping and in the handling of the products of industry. Careful-thinking financiers on this side of the water who have all along stubbornly but conscientiously clung to their convictions, are finding themselves less attached to them, and in a position where they may find it necessary to establish new standards and accept new conditions. Whether this breaking away is a genuine movement or not it is unnecessary to say, but it looks as though we were in a transition period, when new rules, new standards and new methods might possibly force themselves upon us for recognition and adoption. Regarding the volume of business throughout the United States, it can be once more said that it is increasing. As to prices, it can be no more safely said than at any time for months past that there is a firmness that is likely to continue. In short, the conditions of trade are such that higher or, at least, stronger prices are likely to prevail hereafter. It is, perhaps, this fact that has led to an increased buying in all of the leading channels within the past few days. The distribution of textile goods is progressing at an enormous rate. Hosiery goods are in extremely active demand. Imports of this product are also quite heavy. The production of the cheaper fabrics is also very good, both at Northern and Southern mills. The leading exponents of that industry all give a very good account of it, and say that there will be continuous activity for many months to come. Cotton and wool rule low, and are abundant. There is no disposition to speculation in either crude or finished material. Jobbers are acting in a conservative manner, distributing goods wisely and keeping credits within safer limits than usual. These observations apply to a number of other interests and industries. The volume of indebtedness, if it could be shown in figures, would appear to be under control. While it is increasing in volume, it is decreasing relatively to the ability to pay. The result is less bad debts at this time than, perhaps, for many years; at least, this is the opinion expressed by commercial authorities who have every opportunity for knowing. The iron industry continues to prosper. Production is heavy, and predictions have been made within a few days that the demand will expand and prices harden. While this view is, no doubt, conscientiously held by makers, it is open to question, because of the enormous producing capacity. Railroad building is still prosecuted indifferently. The production of coal is quietly increasing. The output of lumber is kept within safe limits. The planing and finishing mills all over the country are busy. All kinds of building material are under control, and stocks are light. A multitude of little industries are quietly scattering themselves throughout the richer sections of the United States. Mining operations in the Rocky Mountain regions are expanding steadily. Gold ore is being struck at many points, and capital is seizing opportunities quietly. A great deal of mining machinery is now being made, and those concerns giving special attention to such work are overworked. The low price of silver has caused many mines to temporarily shut down, but this shutting down is also influenced by the discovery of unusually large deposits of silver ore in Colorado.



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W. C. CARY, ARCHT.

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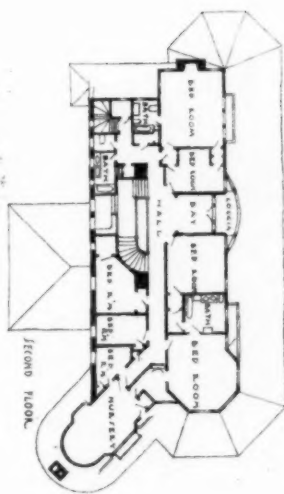
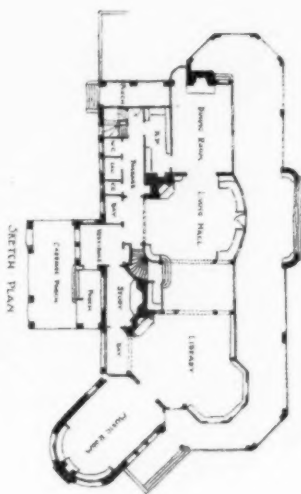


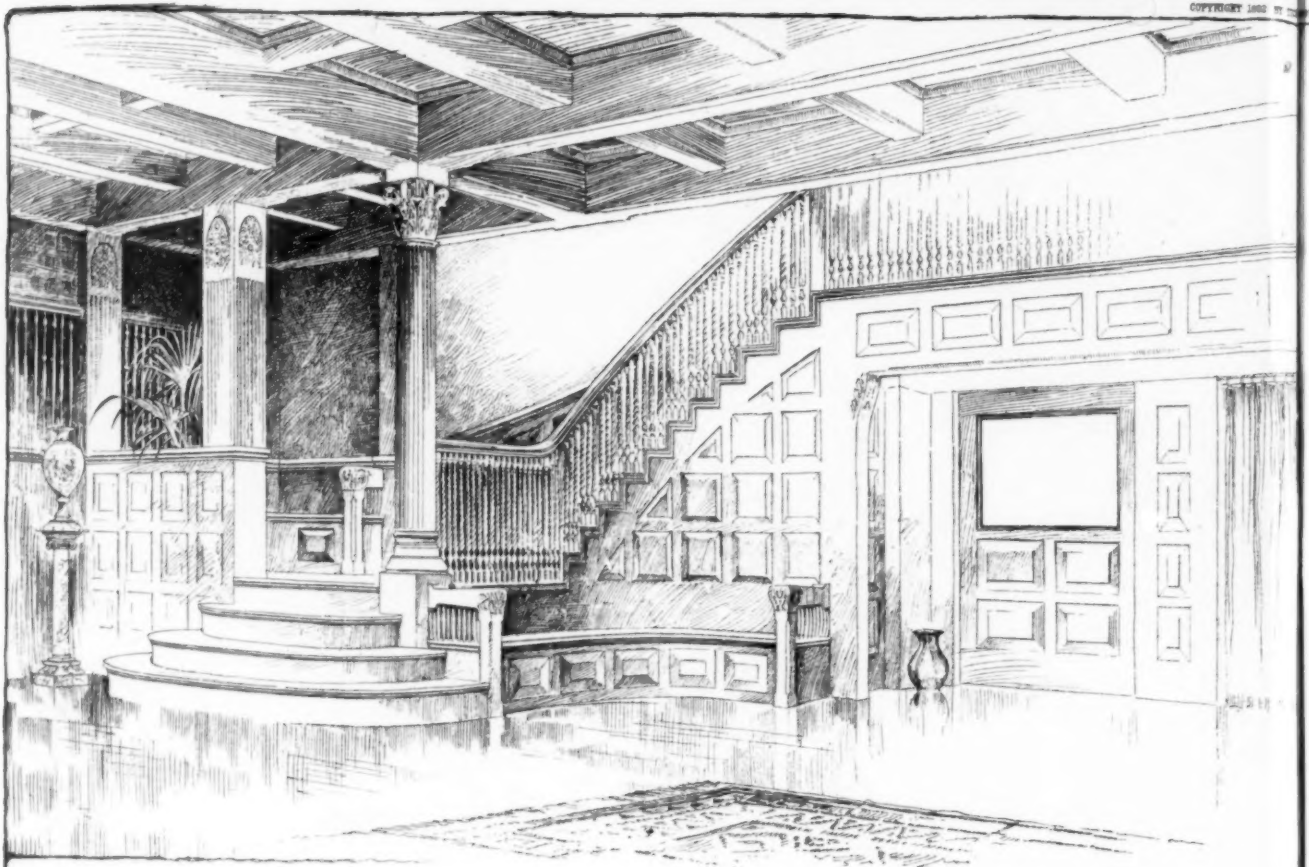
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LAND VIEW.

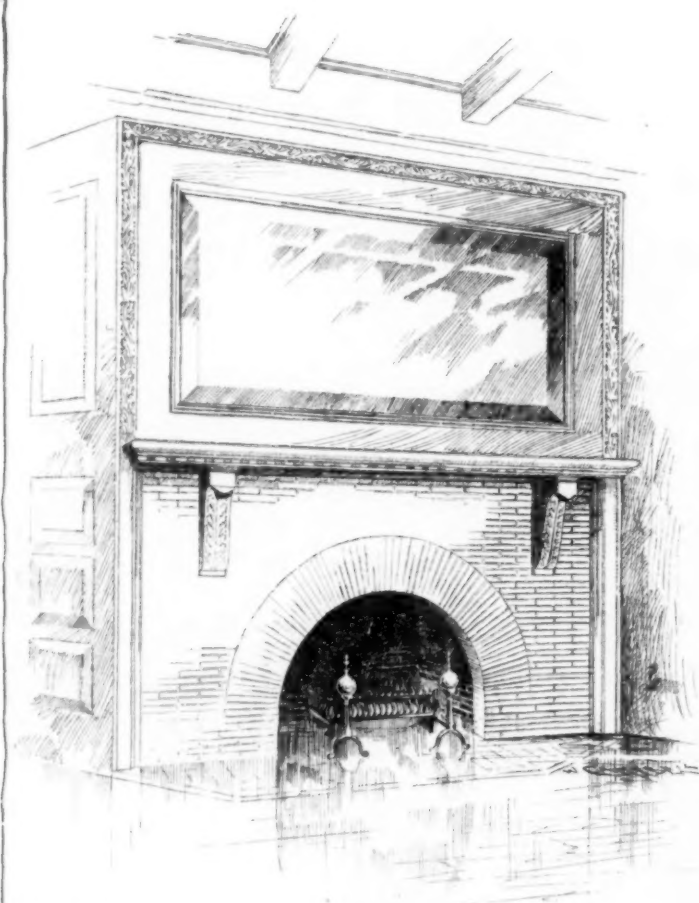
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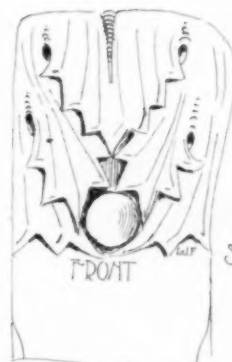


LIVING HALL

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LIBRARY MANTEL



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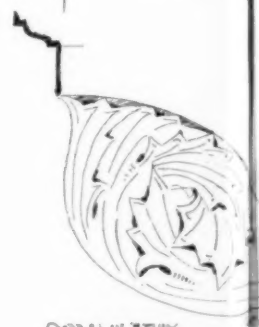
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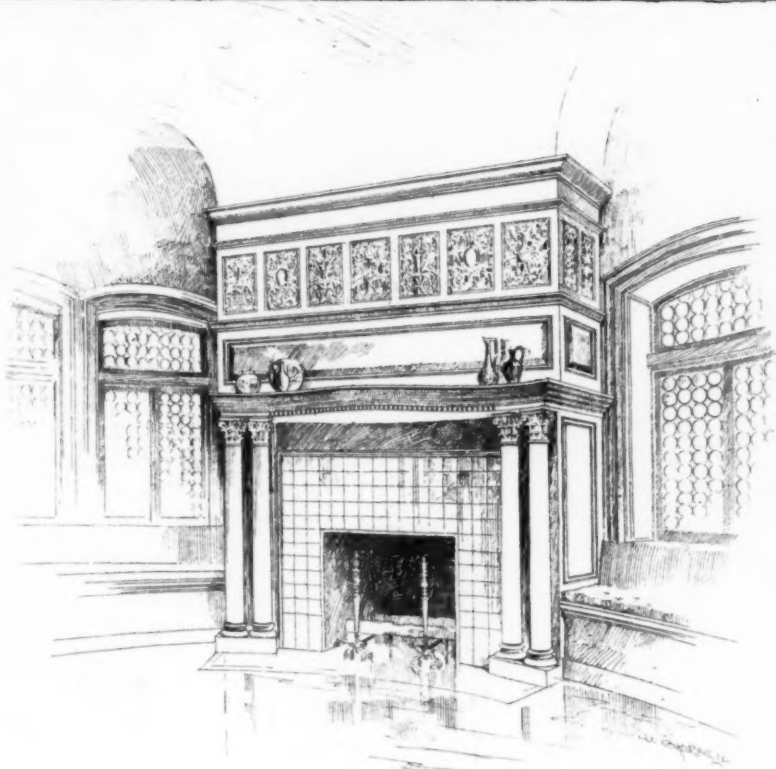
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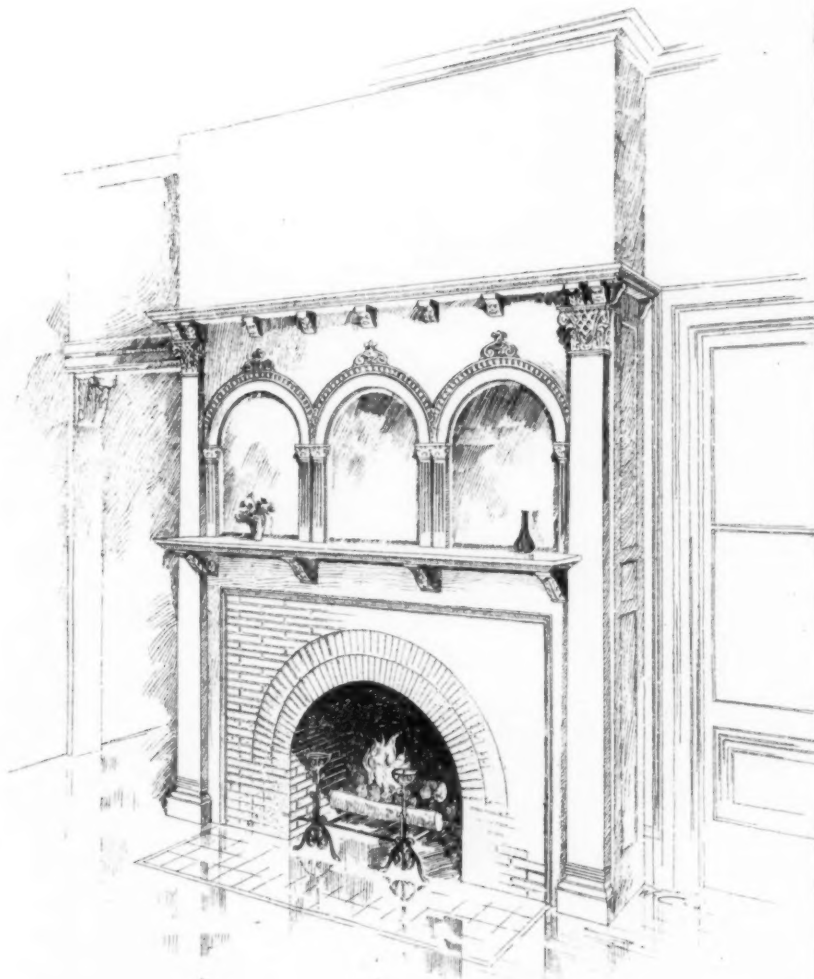
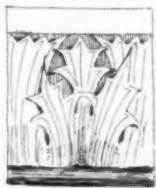
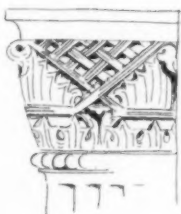
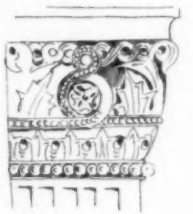


CAP IN STUDY (MANTEL)



MANTEL IN MUSIC ROOM

CHARLES SOOY SMITH,
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DINING ROOM MANTEL

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