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ARCHITECTURE

ENGINEERING

DECORATION

TICKNOR & COMPANY

CONSTRUCTION

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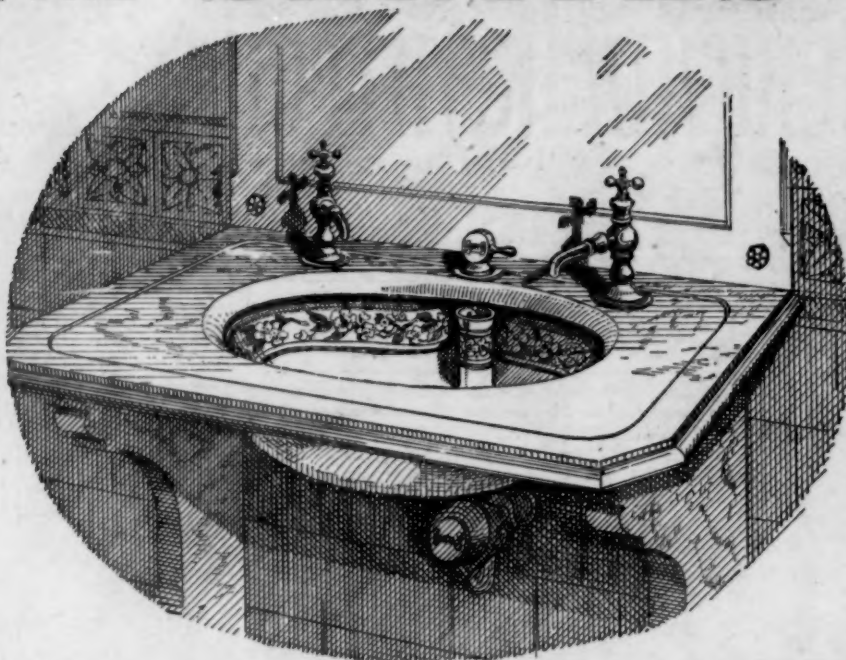
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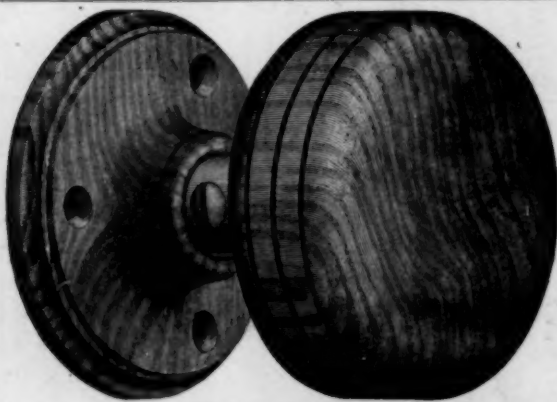
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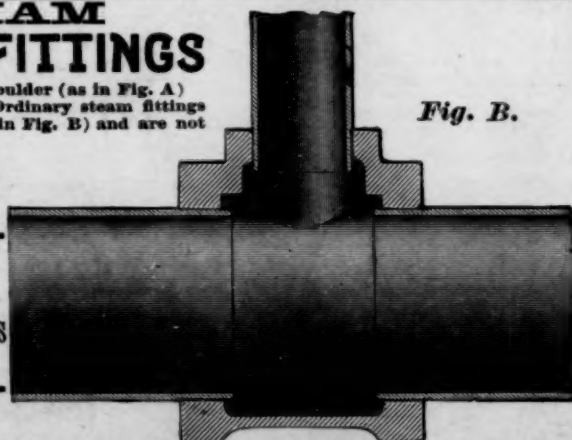
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Fig. A.



Fig. B.



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VOL. XXIX.

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AUGUST 16, 1890.



SUMMARY:—

The Boycott against the Brickmakers on the Hudson.—The Late Sir Edwin Chadwick.—The <i>Spectator</i> on the respective Duties of Architects and Underwriters.—Heraldic Architectural Decorations.—Perrot and Chipiez's latest Book on Art.—The Sardinian Nuraghe.—Modern German Architecture.	93
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THE boycott against brick manufactured at Verplanck's Point, New York, which we mentioned some time ago, has been carried out by the Union leaders of New York and Brooklyn, and, besides the manufacturers at Verplanck's Point, war has been declared against the Haverstraw brick-makers. The reasons given for the attack are that men are employed who do not belong to the Brick-Moulders' Union, and that wages are paid irregularly. The first, we need not say, ought not to be accepted for a moment as justifying a conspiracy against the manufacturers, but it is probably the only real reason. As the Verplanck's Point and Haverstraw manufacturers make about two-thirds of the brick used in New York, it occurred to them, after the boycott had lasted two or three weeks, that they might do a little boycotting on their own account, and, after conferring with the other brick-makers who supply the New York market, they came to an agreement that unless the New York Union leaders withdrew, within a week, the order, under which no Union man is allowed to touch a boycotted brick, the combined manufacturers would send no more brick to New York or Brooklyn until the offensive order was cancelled. As it would be impossible, at short notice, to set up independent brick factories, and to bring brick from Philadelphia or Connecticut would be expensive and inconvenient, this adoption by the brick manufacturers of the same tactics that have been constantly used against them by the Unions for some years past would result in the total abandonment of building operations in the two great cities, and in throwing out of work, for a period which the brick-makers would determine, nearly every member of the affiliated Unions whose leaders play so recklessly with their interests. We trust, for the sake of the mechanics and their families, that the matter will not be allowed to go so far, but the unexpected turn which the controversy has taken should serve as a warning that in this country the people who make bricks are just as free to combine for their own protection as those that use them, and that if those who control the immense power of the workmen's associations chose to use without regard to decency or common-sense, they must not be surprised if an opposing combination should administer to them an occasional dose of their own medicine.

ARCHITECTS have a good deal of reason for gratitude to the memory of the great sanitary reformer, Sir Edwin Chadwick, who died in England a few weeks ago, at an advanced age. The immense reputation which he had enjoyed

during the last twenty years was the legitimate fruit of enthusiastic work which began nearly sixty years ago. In 1835 he was already noted throughout England for his efforts to improve the sanitary condition of the poorer class of dwellings; and the *Builder* reminds us of the reference to him in Charles Kingsley's almost forgotten novel, "*Yeast*," in which one of the characters, who thinks that the present century needs an epic poem, is told that he had better write one himself, and call it the "*Chadwickiad*," and begin it with an adaptation of the first line of the *Aeneid*, "Smells and the man I sing." Curiously enough, Chadwick seems to have been led into sanitary science through the study of the problems of life-insurance, and what would now be called accident insurance. In 1828 he contributed to the *Westminster Review* an essay on "The Means of Insurance against the Casualties of Sickness, Decrepitude and Mortality," in which he argued that the causes which shorten and impair life are for the most part removable or preventible; and that a great deal of good might be done by a systematic investigation, such as the Government could best make, into "the circumstances under which sickness arises." What an enormous advance has been made since that time in our knowledge of these circumstances, we need not say; but the idea was then a new one, and Chadwick's enthusiasm and energy were admirably calculated to impress it upon a public which does not assimilate new ideas very readily.

THE *Spectator*, to which we owe a great deal of valuable information about insurance matters, and occasionally a little amiable criticism of our own opinions, compliments us by reprinting what we had to say a few weeks ago about the control of underwriters over building methods, and the excellent effect it would have if, instead of libelling and insulting architects on all possible occasions, they would see whether they could not more effectually improve building by fixing premium rates in something like a fair proportion to the risk; but continues to imagine that its own opinion about the matter differs from ours, and we find, for the first time, the explanation of this idea in its assertion that the *American Architect* had "previously assumed that it was the business of underwriters to see that buildings were properly constructed." Now, we cannot remember ever having entertained or expressed such a notion, which is quite different from our belief that underwriters should not make the owner of a conscientiously constructed building pay the same premium rates as those charged the owner of a cheap fire-trap; and we hope that, after all, the *Spectator* and ourselves are not so far apart as we thought. The *Spectator* says, indeed, that "there is no reason why they" (the underwriters) "should specially interest themselves in building construction," as "they are not the owners of the property insured"; to which the obvious answer is that, as they have to pay for the property, if the building containing it is burned, there would naturally be a very important reason why they should care to know whether the building was likely to burn or not; but it makes ample amends by saying that "There is no doubt that it would be in the power of underwriters to compel the erection of a better class of buildings, provided they could be induced to combine for that end"; and, in another place, "It should be their business" (that of the insurance companies) "to charge adequately for all hazards as they find them, and to discriminate largely in favor of the non-hazardous risks in the matter of rates"; and "If a building is of slow-burning construction, as nearly fire-proof as it is possible to make it, the rate for insurance should be extremely low, while a building that is full of hazards of all kinds should be charged for proportionately." We need hardly say that this exactly expresses what we have always maintained, and we have never reproached the underwriters for anything except the violations of this principle, which even the *Spectator* acknowledges to be very common among insurance companies.

THE *Deutsche Bauzeitung* gives architects, who fancy employing coats-of-arms, or other heraldic objects, for decoration, a hint that it is advisable to use them, so far as possible, correctly. In this country there is, perhaps, no great necessity for observing heraldic propriety, but it is a good thing for any one who undertakes to speak a language to do so correctly, and heraldic grammar is understood even by many Americans. In Germany, however, where coats-of-arms are

important pieces of property, and where the serene highnesses who own them are by no means amiable under ridicule, mistakes are, apparently, often made. To say nothing of shields painted, according to the decorator's fancy, with pink, brown and gray, in place of the gules, vert, azure and sable of heraldry, the devices upon them are frequently transposed and perverted in the most ignorant manner. The writer of the note in the *Deutsche Bauzeitung*, Herr Schönermark, after observing, with justice, that those who cannot use the heraldic language with propriety had better leave it alone, mentions an example of the embarrassments into which decorators sometimes fall, through ignorance of the meaning of the devices which they suppose to be merely ornamental. In a certain town, a grand reception was to be given to a very exalted personage, and extraordinary exertions were made to signalize the occasion. The streets were hung with laurel-wreaths and banners, and triumphal arches, obelisks and so on were erected at various points. In the opinion of the decorators, shields and coats-of-arms formed a suitable ornament for these monuments, and they were accordingly lavished in all convenient places. Where no particular pains was taken with them, they bore most unheraldic symbols, in all sorts of colors, but in the great reception-hall an effort was made to show the relationship of the great families of the neighborhood, by displaying their arms about the room. The intention of this was excellent, but the technical effect was injured by showing, in some cases, where allied families bore wild animals on their shields, the animals with their backs turned to each other; while, worst of all, the intended lodging of the illustrious visitor was, as a special compliment to him, ornamented with a huge shield, bearing his own arms, to which the artist, to increase the decorative effect, had added a symbol corresponding to the English bar-sinister. Fortunately, an amateur of heraldry happened by, and had the shield removed before the noble guest, who was known to be an expert in the science, arrived.

THE *Builder* publishes an interesting notice of the recent book of MM. Perrot and Chipiez upon the "History of Art in Sardinia, Judæa, Syria and Asia Minor." As it remarks, it is rather startling to find the arts of Sardinia and Judæa treated together, but it must be remembered that the ancient theory of the close relationship between the Jews and Phœnicians, and the Carthaginians and other early inhabitants of the territory on the Mediterranean coast, has been revived of late by several archaeologists, and seems to be accepted by MM. Perrot and Chipiez. However, that may be, Sardinia offers some very curious problems for the antiquary. Among other architectural objects, there are in the island an immense number of stone structures, built in the most solid manner, varying from twenty to two hundred feet or more in diameter, and containing one or more domed rooms, often arranged in two stories. According to La Mannora, who first studied these buildings intelligently, there are about three thousand of them in the island. Melani considers this an over-estimate, but Perrot and Chipiez think that the actual number is probably much greater. In Sardinia they are known under the name of "Nuraghe," but buildings of a similar character are found in lower Italy, where they are called "truddhi." Various theories have been put forward as to the use for which the nuraghe were intended, but it seems most probable that they were fortified dwellings, built for the same purpose, and under the same circumstances, as the little stone castles which, for many centuries, the inhabitants of the Mediterranean coast have had to provide for themselves as a refuge from sudden attack. In the Middle Ages, the refuge towers of the French and Italian coasts had their doors about twenty feet from the ground, and their owners got into them by means of ladders, which they drew up behind them; but the builders of the nuraghe, apparently with a similar purpose, of making it difficult for an enemy to get in, but with less ingenuity in devising means for carrying out the purpose, put the entrances at the level of the ground, but made them so low that they could only be entered by crawling on all-fours, and an enemy who got through them would be for the moment defenseless against the weapons of the occupants.

IN some cases, the nuraghe were evidently intended to shelter a family, or a small garrison, as they are divided into numerous rooms, and comprise an outer enclosure, with flanking projections, as well as the dwelling in the middle. There is no evidence of a fireplace in any of them, and the top may have had an opening to the sky, or their builders may,

indeed, have eaten their provisions raw, and so, in that mild climate, have been enabled to dispense with fires altogether. As to the date of the erections, nothing whatever is known, or can be even guessed. It is tolerably certain that in Roman times a tribe of aborigines still existed in the Sardinian mountains, something as remnants of the Aztecs are said to be still found in Mexico; but of what race the aborigines were, or when they most flourished, or whether it was they who built the nuraghe towers, no one can say. The only structure in other portions of the world, known to archaeology, which resembles in the least the Sardinian buildings, are the so-called "treasuries" in Greece, which pass for Pelasgic monuments; but the Grecian treasuries are underground, and are well settled to have been built for tombs, and generally contain objects of a highly refined art; while the nuraghe are always on the surface, instead of below ground, and could hardly have been tombs, since real tombs, of a very different construction, are often found near them; and of works of art nothing has ever been found in or about them except some barbarous caricatures of human figures, in bronze.

EVERY one does not realize how great a work has been accomplished by the German architects of the present generation, in raising the architecture of their native country from almost the lowest depths of falseness and insipidity to something like an equality with the best architecture in Europe. Their success in restoring an artistic character to their work is the more surprising, as all German architects are educated to a certain extent as engineers, and throughout their professional lives maintain a very close relation with the engineers, who are always members with them of a single professional body, as if the two classes of practitioners pursued simply divergent branches of one calling. It is rather the fashion here for architects, particularly the younger ones, to look with horror upon any mixture of engineering and architectural studies, and to maintain that a knowledge of the integral calculus and the capacity for making a clever perspective sketch are incompatible; but the judgment of the Japanese commissioners who could hardly have been without some artistic perception, and who decided that the most beautiful modern buildings in Europe were those designed by the engineer-architects of Germany, goes to indicate that the study of mathematics does not necessarily destroy the sense of picturesqueness and proportion, and the success with which they have created, out of almost nothing, a new architecture as varied and interesting as any in Europe, shows that at least they do not lack originality. The *Wiener Bauindustrie-Zeitung*, which is not likely to be unduly prejudiced in favor of the North Germans, calls attention in a recent article to the extraordinary improvement which has been made within a few years in the architecture of Berlin. Not long ago, Berlin was distinguished by the meanest architecture in the world. Its buildings, large, but ill-proportioned, were universally constructed of brick, plastered on the outside with stucco, and diversified with belts, or cornices, of great projection, made of wooden furrings, feebly secured to the brickwork, and covered either with zinc or plaster-of-Paris. Occasionally, ornaments, cast in stucco, or modelled by hand, were used to decorate a window or a frieze, but the use of real stone was alleged to be out of the question, on account of the distance from which it must be brought, while the rational use of brick was never, apparently, thought of at all. With the advent of the present generation of architects it began to be found out that the use of stone was not wholly impracticable, even in Berlin, and that in the end it was quite as economical as the perishable stucco. The first stone employed, as might have been expected, was worked by the native stone-cutters in anything but an artistic style. Not having any idea how cut stone ought to look, they rubbed and scraped it into as close an imitation as possible of the stucco to which they were accustomed; but it was at least solid, and, from the necessity of the case, they were obliged to retrench the projection of their stone string-courses and cornices. By degrees, through the exertions of the architects, the practice of stone-cutting was improved, and tooled faces and rustic joints began to give character to the exterior surfaces, while real sculpture, well designed and well executed, came into use. Not content with this, the architects undertook to use brickwork frankly. They hunted up mediæval examples, of which there were plenty to be found, and imitated them, adding such modifications as their taste suggested, and now the North German brickwork is perhaps the most interesting, from its variety and ingenuity, of all the manifestations of German architectural skill.

RELIGIOUS ARCHITECTURE.¹—XIX.

GOTHIC PERIOD.

FOURTEENTH Century.

—The fourteenth century opened with nothing more to invent; the principles of construction had been discovered, the general forms were fixed, and even the decorative elements had all been indicated in the thirteenth century. Nothing remained for the architects of the following centuries but the enrichment and complication of these fundamental essentials.

Until the fourteenth century the square abacus had been retained and the adornment of the capitals had consisted of a single band of foliage—rarely a double band for the heaviest pillar—merely forming crockets in the upper part so as not to mask the elegant curve of the capitals. Now, a polygonal shape was adopted for the abacus, and the curve of the capitals was hidden under a mass of ornamental foliage.

The shafts were reduced in size, and their number was increased in proportion as the network of vaulting-ribs became more complex; they were separated at their bases.

The mullions of the windows were multiplied. In the preceding century the windows comprised a pair of bays joined under the same pointed arch; now, this motive was repeated and the four bays were surmounted by a single pointed arch. As these

The position of the towers began to vary greatly. Pack-saddle-roofs were still in use; but the octagonal pyramid, with turrets at the angles, was of more frequent occurrence. The imbricated modillions and curved tiles, which formed the sole embellishment of the stone sides of these pyramids, were superseded by openwork carvings in the shape of trefoils and roses; the ridges were decorated with crockets.

In the general plan, we must note the addition of side-chapels, as well as the enlargement of the central apse which nearly always contained the chapel of the Virgin. In St. Ouen at Rouen (Figures 20, 21), for example, this chapel is boldly delineated, while the lateral chapels extend along the sides of the choir, and not along the aisles proper.

In quite a large number of churches belonging to the fourteenth century and the latter part of the thirteenth, the axis of the nave deviates towards the northeast. In explanation of this, it is said that their architects wished to recall the fact that Christ's head inclined to the right at the moment of his death.

The finest examples of the religious architecture of this period are encountered in the regions where the flowering of Gothic art began. Except at Clermont and Narbonne, the pointed system had not yet been fully adopted in the south of France. Germany was beginning to adopt it, gathering inspiration, not from the early edifices of the thirteenth century, but from contemporary structures. This can be seen in the Cathedral of Frankfort, built in 1315, and also in Strasbourg Cathedral. The windows assumed a remarkable air of lightness in that section of the country.

Italy continued to employ the semicircular and the pointed arch simultaneously. The churches were in general low and without a triforium. On the whole, the new style of architecture seems to have been as little suited to Italian tendencies as to Italian traditions; the architecture of Italy combined forms of widely different periods and widely varying characteristics; the influence of Byzantium appears to have withstood Gothic innovations there far longer than elsewhere in the West; evidence of this is seen in Milan Cathedral (Figures 24, 25), as well as in the more ancient Cathedral of Siena (Figures 16,

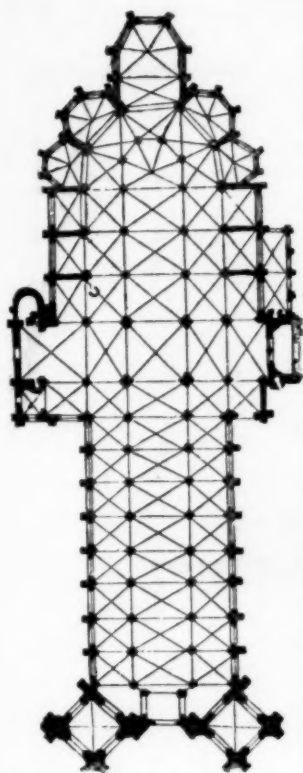


Fig. 20. Plan of St. Ouen, Rouen [14th Century].

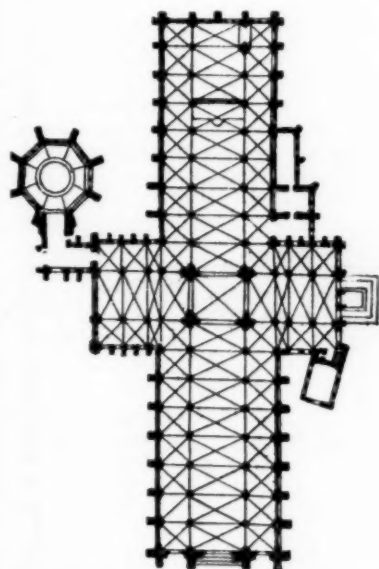


Fig. 22. Plan of York Cathedral [14th Century].

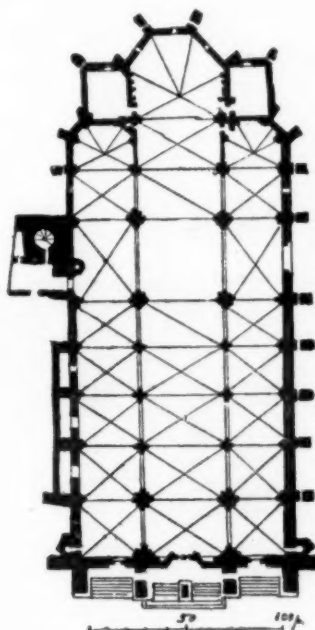


Fig. 23. Plan of Ratisbon Cathedral [14th Century].

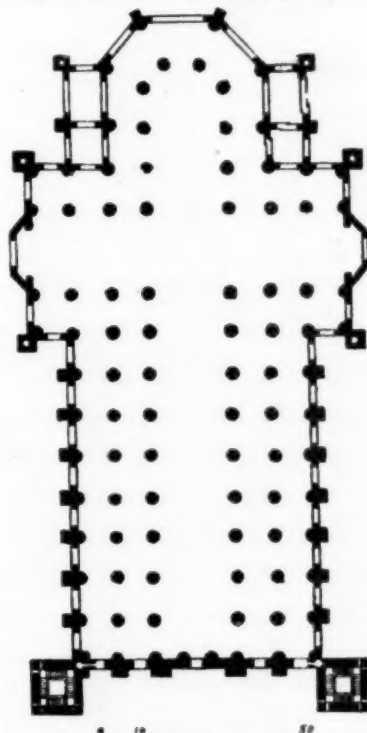


Fig. 24. Plan of Milan Cathedral [14th Century].

repetitions could go on indefinitely, from the second half of the fourteenth century, windows are found with eight bays united under one arch.

The triforia, which up to that time had been lighted entirely from the nave, were thenceforth illuminated through special openings at the right of the gallery arches.

¹ From the French of P. Planat, in Planat's "Encyclopédie de l'Architecture et de la Construction." Continued from page 81, No. 763.

17), although the Gothic elements of the former are more sharply defined.

Fifteenth Century.—In the fifteenth century there was no modification of the plan other than the continual enlargement of the side-chapels; the Chapel of the Virgin, however, retained its dominant place, as in the church of Mt. Saint-Michel (Figure 30), the choir of which was reconstructed in the fifteenth century.

We have already cited examples of a similar development in the churches of France; Antwerp Cathedral (Figures 27, 28) furnishes another and a remarkable example. The choir was begun in 1380, under the direction of Apelmans; the edifice was remodelled in the fifteenth century; the plan already in-

Barcelona (Figure 26) presents a very pure and finished type of those churches which, from the fourteenth century, were entirely surrounded with chapels, lateral and apsidal; the atrium, which is of very beautiful proportions, completed the circuit.

Fig. 21. View of St. Ouen, Rouen [14th Century].

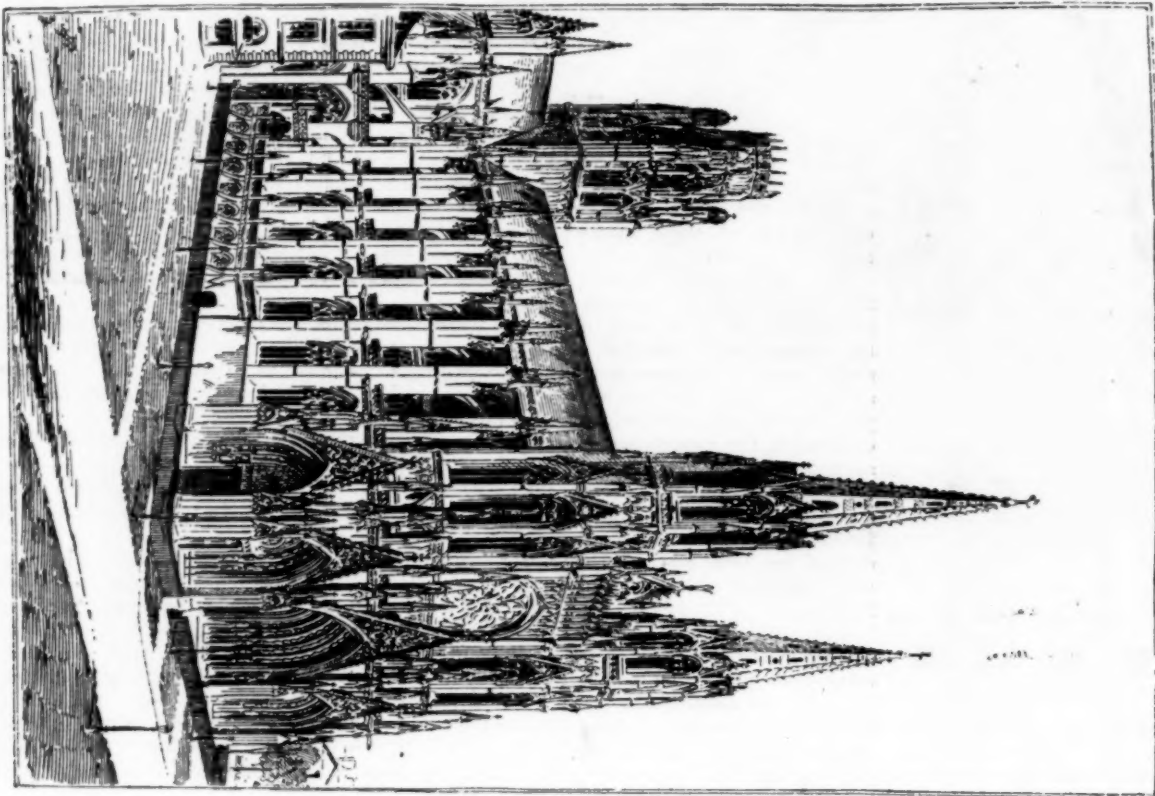
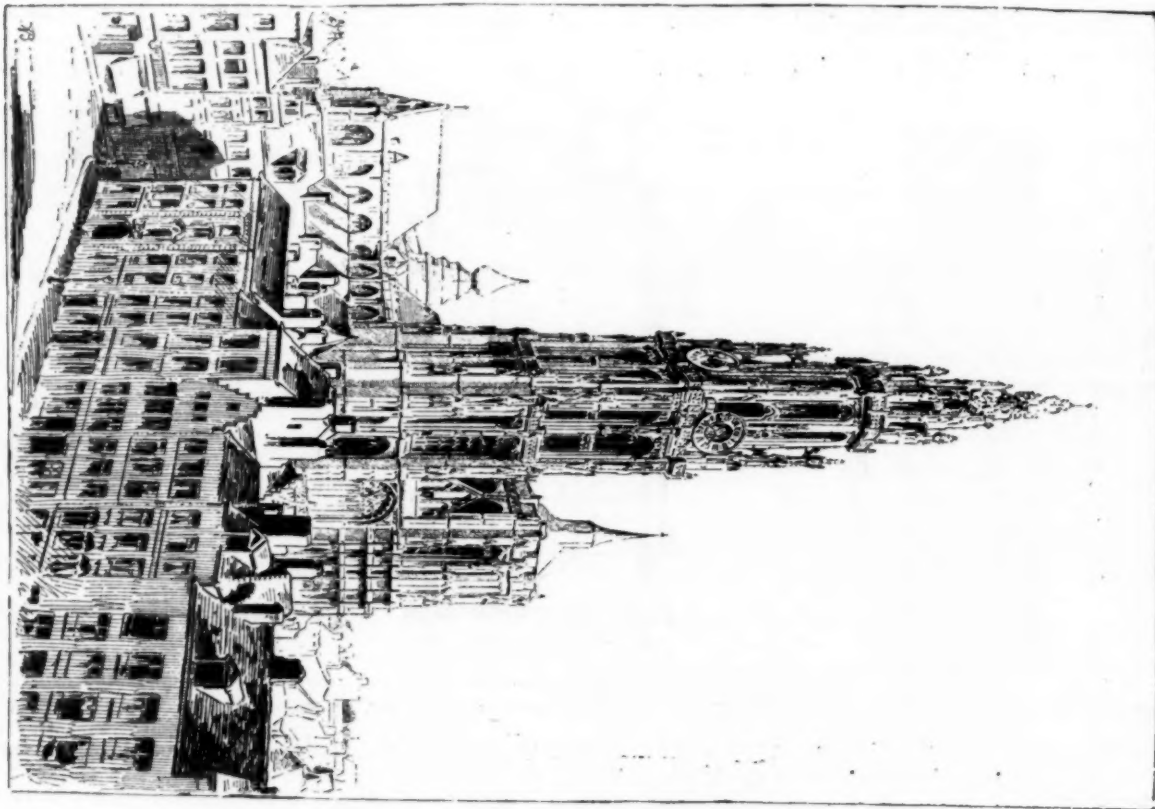


Fig. 28. View of the Cathedral at Antwerp [14th Century].



cluded five aisles, but the number was then increased to seven, a disposition of which very few other examples exist. The choir must originally have had a second row of aisles, but these were replaced by apsidal chapels.

A great many French churches, which, viewed as a whole, belong to the fifteenth century, are built on plans derived from another period. For example, St. Séverin at Paris (Figure 29) was evidently inspired from Nôtre Dame.

Though the tierce-point ogival form, either stilted or depressed, was maintained in the principal constructive and decorative lines, it was wholly modified in all secondary parts, where it was superseded by waving, flame-like forms and elongated heart-shapes; hence the designation "*flamboyant*."

The trefoils and quatrefoils of the rose-windows underwent a similar change. In Brittany, however, and in provinces

Every break in the buttresses was crowned with pinnacles and finished with genuine octagonal spires, with roofing, turrets, etc.

The columns were of extreme delicacy with sharp arrises; they were prolonged at the base, at the same time that their number was increased. As architects strove to heighten as much as possible the soaring effect of the composition, the in-



Fig. 25. View of Milan Cathedral.

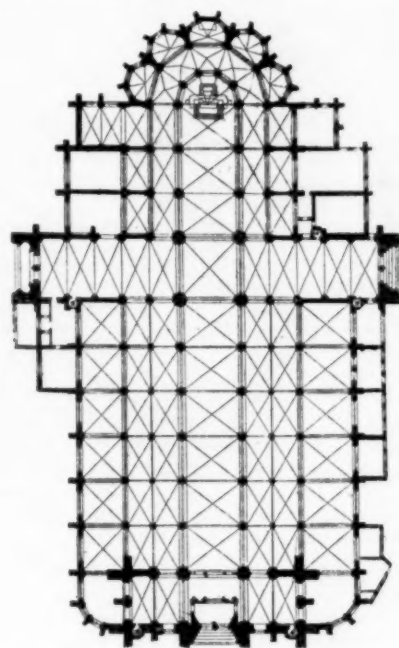


Fig. 27. Plan of the Cathedral at Antwerp [14th Century].

where granite was used for building, the hardness of the material proved an obstacle to such a wealth of embellishment, and somewhat of the primitive simplicity of decoration was preserved there. In England, also, the bays were frequently adorned with mullions reaching their entire height, and confined by a crosspiece.

The sculptural ornamentations were enriched and assumed greater importance. To emphasize this importance, the leaf-

intermediate capitals were often omitted in the clusters of columns, and they rose uninterrupted from foundation to vault.

The doors were profusely ornamented with crockets. At the top, the upper moulding was often raised in the shape of a pedicle for the support of a statuette.

Depressed forms began to appear during the fifteenth century. These were evidently due to a reaction against the abuse of the slender pointed forms. The so-called Tudor arches, which were common in England during the reigns of Henry VII and Henry VIII, were also of frequent occurrence in France at this period.

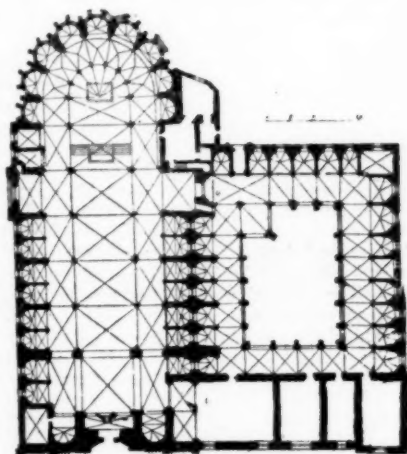


Fig. 26. Plan of Barcelona Cathedral [14th Century].

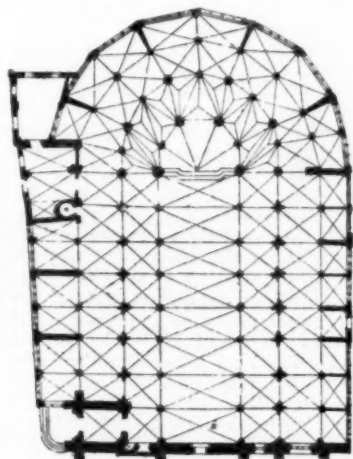


Fig. 29. Plan of St. Séverin, Paris [13th-14th-15th Centuries].

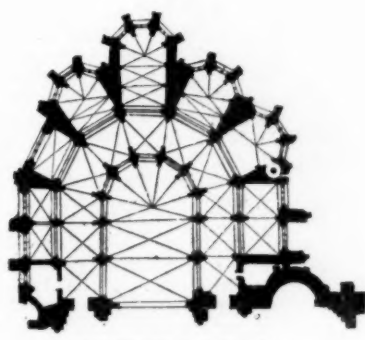


Fig. 30. Choir of the Church of Mt. Saint-Michel [15th Century].

forms, figures and accessories were boldly undercut, so as to appear almost as though detached from their stone background. The result of this tendency was that the foliage, which had been carved flat originally, was made to curve and curl in what has been termed the "*chou frisé*" fashion. Almost independent festoons were suspended from the covings of the doors and windows.

Rows of arcades, panels, tracery, intertwining figures, arabesque ornaments, festoons, different kinds of foliage, especially openwork vine patterns, as well as niches and canopies were employed in greater profusion.

The towers, which were decorated in a style corresponding to the rest of the structure, were sometimes built on an octagonal plan. In many instances, as at St. Riquier (Somme), in St. John's at Caen, St. James at Antwerp, St. Bavon at Ghent, and the Cathedral of Berne, the single tower occupied the centre of the western gable. Again, during this century, more frequently than at any other period, the towers consisted of a succession of openwork arcades, with two bells lodged within.

[To be continued.]

ARCHITECTURE UNDER NATIONALISM.¹ — III.

Part of a Greek Temple. From Viollet-le-Duc's "Discourses on Architecture."

WHAT are the special conditions—the social and intellectual peculiarities—which developed the great styles of architecture, and to what extent will nationalism reproduce these conditions and characteristics?

Beginning with the art of ancient Greece, we find a republic in which all the citizens participated in public affairs and took a deep interest in them as members of the same society. This spirit of association and equal political and social power and responsibility encouraged a spirit of criticism, emulation, ambition and intellectual progress. All the citizens were cultivated art critics and more or less of philosophers. The architect both valued and feared their judgment on his work, and exerted himself correspondingly to render his creations worthy of himself and his country. Every part shows the result of careful reasoning in virtue of which the design was precisely suited to the requirements of the structure and to the nature of the materials obtainable. The Athenians were slaveholders, but the slaves formed no part of the Republic proper, and corresponded simply to our machinery. They did the work of machines, giving the Greek citizens the opportunity for performing the higher intellectual work. Sparta alone of all the Greek cities developed an exclusive and inhospitable aristocracy, and never cultivated the arts.

With the Athenians the artist worked, not for a chief, nor for an aristocracy, nor a plutocracy, but for the whole people who were free, cultivated, fastidious, critical and disputatious. "If such a task is difficult, the recompense is precious when obtained; for success, won from such a public opinion, is the only reward which can really flatter the artist. . . . The Athenians were inclined to make art rule over all things, or rather to convert everything into a work of art. Among them an event, a fact, a phenomenon, good, evil, all that exists in the material or immaterial world, was translated into this language, with a delicacy of observation, a logical truthfulness, a simplicity and energy of expression which seems almost superhuman. But faculties so precious could only be developed in the midst of a perfectly homogeneous society, all of whose members, moved by the same intelligence, understood each other and were equally sensitive to the different expressions of art."²

Precisely these conditions will be reproduced under Nationalism. The great wealth of the Nation will give every citizen something of the leisure so fruitfully applied by the ancient Greeks to the study of art. With short working days of perhaps from four to six hours, and frequent and liberal vacations absolutely free from business cares, ample opportunity will be given for physical and intellectual development. Relieved from the all-absorbing occupation of money-making and money-losing, with its long train of consequent evils,

and equipped with the complete education received in early life consisting partly of manual and partly of mental training (the one or the other predominating in accordance with the natural aptitude of the individual), all the useless pursuits, legal, military and criminal, necessitated by the competitive system, being abolished, the entire energy of the whole people will be directed to the cultivation of the arts and sciences including manufacture, agriculture and transportation.

All the desirable features of the Greek Republic at the time of Pericles will be reproduced and magnified.

The first feature of vital importance, after that of the general cultivation of the masses and social equality, influencing Greek architecture, was that the architect was both artist and engineer; or, in other words, the professions of the architect and engineer were one and the same. This is an essential condition, and the impossibility of its realization under the present form of competitive industry, is one of several reasons why we cannot expect to see the development of another great style of architecture so long as this system lasts. It is not sufficient that the architect should employ an engineer or associate himself with one. He must be one. Already far too much is exacted of the architect to-day to enable him greatly to extend his sphere in this direction. He must first be relieved of two-thirds of the cares and responsibilities he now sustains, and this can only be done, as already indicated, by the Nation.

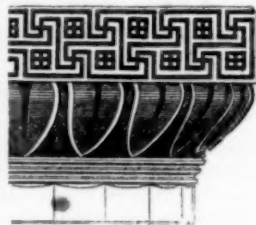
The result of the union of these two qualities in the architect is most forcibly shown in the magnificence and boldness of the early Gothic architecture, but it is also clearly evident in the logical refinement of the ancient Greek; while its absence is the cause of the failure from an artistic standpoint of the Roman architecture.

These facts are too well recognized to-day by the architect to require argument, but for the non-professional reader a few illustrations may be necessary, and even to the professional useful, as presenting the subject in a new light.

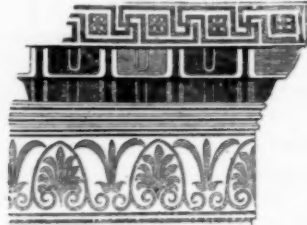
The initial cut shows the construction of part of a Greek temple.

The simple problem before the architect was to build an enclosed room surrounded with porticos to protect and shade it, in the most suitable and beautiful manner with the materials and machinery at command. His material consisted in the marbles of the neighboring mountains; his machinery in the arms of his slaves. Accordingly, where large blocks of material are not absolutely necessary for grandeur of effect, as in the walls of the cella, small stones are used, which can easily be transported in square blocks by these slaves. Where large pieces are required, as in the columns of the porticos, the blocks are cut at the quarry in the cylindrical form necessary to facilitate transportation by rolling. The lintel stones above the columns are smaller and composed of two long pieces, one showing a face on the exterior, and the other on the interior of the portico. This division is for two purposes, both considerations of engineering, the first being to diminish weight in transportation, and the second to avoid danger of fracture under the pressure of the superstructure on account of chance flaws or natural lines of breakage, invisible at the time of quarrying, to which all calcareous stones are liable. We see everywhere the science and skill of the engineer united with the delicate feeling of the artist. The lintels are raised to their places by ingeniously formed channels cut in their ends, since the modern crowbar and wedges cannot be used to adjust these finely cut and finished blocks. The capitals of the columns are formed with strong projections all round, the lateral projections being needed to assist in the support of the lintels, either actually or for the satisfaction of the eye, and the front and rear to serve as scaffolding for the erection of the lintels and superstructure. Above the lintels only small stones are used, since large ones are not needed for the artistic effect of the structure. The corner columns where greater strength is needed are spaced nearer together than the rest, and these columns are slightly thicker than the interior ones and lean slightly inward to increase the stability of the building. The strength and proportions of every part are calculated with the utmost refinement.

The same constructive skill is displayed in the treatment of every detail, and the same hand and mind are apparent in their artistic decoration. Thus the columns and triglyphs are fluted to increase



Doric Column Capital.



Doric Pilaster Capital.

the effect of vertical strength, and give decision and character to the lines of light. The columns are diminished in size toward the top to correct the optical effect of the reverse which an equal diameter at the top would produce; and all the apparently straight lines of the building, both horizontal and vertical, are really most delicate hyperbolic curves designed with the most subtle feeling to

¹ Continued from No. 760, page 42.

² Viollet-le-Duc's "Discourses on Architecture."

counteract optical effects produced by their combinations which would offend the trained eye of the Greek.

Every moulding has its meaning, explanatory of the functions of the member it adorns, and every piece of sculpture tells a story appropriate to the purpose of the structure. Thus the moulding under the abacus of the Doric column indicates by its design the massive weight these sturdy members support. The story is told by the form of the leafage inscribed upon its surface. The leaves are doubled entirely over upon themselves until their pointed ends touch their bases, as shown in the accompanying sketches. The leaves on the antæ or pilasters are somewhat less bent indicating thereby truthfully that less weight is borne by them than by the columns. With the Corinthian order, on the contrary, where, as compared with the Doric, grace and lightness are the distinguishing features, the leaves below the abacus are but lightly curved, and thus express the comparative lightness of the entablature. The Romans, incapable of understanding any such refinement of art expression as this interpreted the Doric tracery above described as indicating eggs-and-darts, and so named it. Could any more unfortunate symbols possibly be devised to express resistance to colossal weight than eggs-and-arrows!

Finally, the whole structure is richly decorated with strong, pure colors, for the purpose of setting forth the various members of the structure in bold relief and of adding brilliancy to the design. "This application of color," says Viollet-le-Duc, "to the exterior of monuments is so necessary in a country like Greece, where the air has a marvellous transparency, that to-day, for example, he who from a certain distance looks at the Temple of Theseus at Athens, now deprived of its colors, when in full sunlight, finds it impossible to distinguish the lights on the columns from those on the wall of the cella behind them, these lights, though on different planes, being confounded and appearing to be projected on the same surface."

When the travelling public view the ruins of these temples to-day, they see nothing of their real beauty, the color, the sculpture and refinement of the forms are gone; yet the average traveller imagines himself transported with admiration when he beholds them, and he describes their glory to his friends at home with as much enthusiasm as if he had actually seen the reality. Thereupon ghostly imitations are erected all over the country, without the color, sculpture, refinement, life or meaning of the original creations, and our public has not the cultivation to realize the absurdity of the thing. They are, in fact, as a whole, too much hurried and worried to care anything about the refinements of the art of architecture, and could not afford to pay for them if they did.

The next desideratum for the development of a true style of architecture, evidently unattainable under our present competitive system, is that the architect should be permitted in every case to personally superintend the execution of his design; in order that the architectural forms may exactly conform to the conditions of the site. "It is not rare," says Viollet-le-Duc, "to meet persons, considered competent judges, or even artists, who believe that a project conceived by an architect can, without losing any of its merit, be put into execution by outside subalterns without any direct supervision of the architect. Now a work of architecture, like every other work of art, is the most intimate association and agreement between the conception of it, and the manner and means of executing it; and to suppose that an architect can make a design, which another can execute without his superintendence, is the same as admitting that a musician may be two men, one who composes and one who arranges the score of the orchestra. The skilful architect, in designing, always has in view the materials he is to employ, their forms and dimensions; he must appreciate their qualities and nature, and dispose of them accordingly; he builds up in one day in his mind what it will take years to erect actually; and the sheet of paper before him already becomes, as it were, a vast constructor's yard, where masons, stone-cutters, carpenters, iron-workers, slaters, joiners, glaziers, sculptors and painters, are plying their vocations to produce an harmonious whole, just as the musician, in composing an opera, hears the various instruments of the orchestra, the choruses and the voices of the singers. But in order that the public may recognize in the score of the musician as in the monument of the architect, an original work of art, bearing the impress of personal talent, the musician must have himself written and arranged all parts of his composition, as the architect must have himself apportioned among all his workmen the various details which compose his monument; and it is essential that the musician himself should direct the rehearsals, so that he may modify his work where experiment may render it necessary, as the architect should superintend his mechanics and arrange, according to the spirit of his design, the innumerable unforeseen emergencies of execution as they daily arise under the hands of the workmen." The direction and power of the sun's rays, and the forms of the shadow in particular localities always determined the forms of the mouldings used in the Classic styles. The architect should not only supervise the erection of the building, but to a certain extent also, the preparation of the materials, since his design must be influenced by the size, form and constitution of the materials he uses. If, for instance, his stonework must come from quarries which are capable of furnishing only small blocks, the design must be governed by this condition. If, on the other hand, enormous blocks are obtainable, the design must be made to take advantage of this as an element of grandeur. It was in strictly conforming to these principles that the Greeks and mediæval architects produced the essential characteristics of their styles."

It is not so with us, nor can it be in the pressure and hurry of the modern architect's work. Our design must be made to suit the style arbitrarily selected, and be prepared in time to enable the building to be completed in accordance with the close financial calculations of the owner, and if the stones come from the quarry in pieces too large to conform to the design, they must be cut up into little pieces or else grooved in courses shamming little pieces as the only alternative.

Mr. Henry Van Brunt, in the introduction to his scholarly translation of Viollet-le-Duc's "*Discourses*,"¹ refers to this evil in the following telling words: "The atmosphere of haste in which we live is another element distinctly detrimental to the development of good style. But the Greek democracy, says our author, 'had the inestimable advantage of leisure.' The Greek temple, therefore, is an expression of utter tranquility. The very essence of that great art was deliberation. The architect was never hurried; his inspiration proceeded, not from impulse, but from conviction. He built slowly. But with us he is pressed to the completion of his work amidst bustle and confusion. The public is impatient of delay; it must have promptness and despatch at all hazards. The modern Ictinus must supply the design for the new Parthenon, 'ready for estimates,' in three weeks at farthest; and the unfinished study is perpetuated in a workmanlike manner and with all its sins of omission and commission made permanent and monumental. Indeed, all the conditions of life in this country encourage the architect to habits rather of rapid composition than of study and reflection, and tend to make of his occupation rather a business than a fine art. The 'strenuous liberty' which we have inherited involves a constant and often harassing struggle for existence. Therefore, the aim of the architect is to multiply his opportunities of professional work to the utmost extent, having in view, first, his pecuniary emoluments, of course, and second, his art. Under these circumstances he has no time to review his studies; he cannot afford, after his first sketches are made and his work is in progress of routine development in his office, to distrust and chasten his favorite *motifs*, with the solicitude and patience of an artist aiming at perfection like the Greek; much less, having discovered on reflection a new condition in his problem which would enable him perhaps to raise to a higher plane of artistic excellence or fitness the whole sentiment of his work, to throw aside his old studies and begin anew. This costs too much. If the products of routine and conventionality will satisfy his impatient public, he has the strongest impulse under the circumstances to content himself with the superficial appearance, and let the substances of art go for those who can afford it. Art is a mistress who is won by no such partial service."

Now so long as "time is money," and the struggle for money is the first aim and only condition of existence with the people, or in other words, so long as the competitive system exists, so long will that mistress refuse to be won by them.

J. P. PUTNAM.

(To be continued.)

EQUESTRIAN MONUMENTS.²—XXVI.

THE PARTITION OF POLAND.



Carthaginian Warriors: a Bronze Statuette found near Grumentum in Lucania. After "*La Vie Privée*."

PERSONAL pique deprived Louis XIV of the future services of the skilful Eugene of Savoy, and the same very human passion threw into the ranks of the enemies of Frederick the Great, a young Russian lieutenant, who about 1740, sought to enter the military service of the Prussian king; but Frederick on seeing him was inspired with an aversion which he did not try to conceal from its unconscious cause, and declined to enrol the would-be recruit. The result was that Gideon Ernst von Laudon humiliated and offended, went straightway to Vienna and offered his sword and skill to Maria Theresa. In the next fifteen years he saw much service in the field and at the opening of the Seven Years' War he was a lieutenant-colonel, within the year a general and in 1760, twenty years after Frederick refused to receive him, a field-marshal. Like Louis XIV, Frederick realized too late the mistake he had made, for Laudon was for years his most able opponent, but he did not repine at his own error of judgment and had the magnanimity to send to Laudon with a complimentary letter the latter's commission as general which had by the chance of war fallen into his hands. Laudon, who, as Frederick said, knew how to retreat so as to give the impression that he was leaving the field a conqueror, often had for

¹ Published by Ticknor & Company, Boston.

² Continued from page 72, No. 762.

an opponent Prince Henry of Prussia who, as his brother Frederick the Great said, was the only general who never made a mistake, and the presence of equestrian statues of these two great generals in very



Joseph II, Vienna, Austria. Zauner, Sculptor.

similar positions about the base of any two monuments would be reason enough for considering together such monuments.

But history does not make it needful to employ any such device as this to make proper a consideration of the monument to the German Empress at Vienna, after that of the Prussian King at Berlin. Of the man's right to be called Great, there is no doubt, but the woman's right is even greater. Her position was more difficult than his, the conditions that surrounded her more complex and as her own intelligence and skilful diplomacy contributed as largely to her own extrication from the difficulties that hedged her about as Frederick's did to his advancement, her right to be considered even greater than Frederick has its justification in history.

The present empress of Austria is a devoted horse-woman and an equestrian statue to her memory will some day be a very appropriate monument. Doubtless, too, Maria Theresa on horseback was a familiar figure to her Hungarian subjects, at least, but it is a piece of good fortune that Professor Zumbusch did not elect to make the crowning figure of the new monument at Vienna an equestrian statue of the empress. A woman on horseback in real life may or may not be an attractive spectacle but, at the best, she hardly makes an artistic combination with the horse, and as for making any woman in the saddle impressively regal in appearance, it is so difficult as to verge on the impossible—the crowned, robed and sceptred figure of Queen Victoria, at Glasgow, to the contrary notwithstanding. The mind more readily associates an empress with a throne than with a horse and Zumbusch, perhaps, felt that his composition could not dispense with some ordinary qualifying adjuncts. Taken by itself, from any point-of-view, save the rear, as upon that side the legs of the throne chair are oppressively conspicuous, the seated figure of the great empress and noble woman is a well-conceived and finely executed

composition: taken in connection with the rest of the monument the seated figure is out of scale with the other parts and there is nothing that suggests the artistic propriety of associating the seated figure of a woman, arrayed in indoor costume, even if they be imperial robes, with four male equestrian figures clad in the full-dress of officers on active duty. The idea is a misconception and one is tempted to believe that the same material could be arranged in a more satisfying way: the pedestal, for example, might be amplified to form a canopied resting-place for the bareheaded empress and the mounted figures raised to the top of the pavilion thus formed so that distance might somewhat veil their commonplaceness. The human portions of these four groups are much better than the equestrian members, for the men are well modelled and as portrait statues are interesting, but the horses have the air of being contract work, turned out by the master-founder as matters having a commercial value only.

On the whole the monument, which is adequately shown by the gelatine print in the *American Architect* for October 6, 1888, is a great disappointment in itself and the feeling is only heightened by its position. It stands on the outer side of the Burg-ring, opposite to the entrance to the Hofburg, in a square which is enclosed on the sides by the new Natural History Museum and the new Museum of Art and Industry while the rear is closed by the long, low and uninteresting buildings which compose the imperial stables. The square is too large for these buildings to give the monument any supporting background, and yet they are so near to it that it loses whatever effect it might gain from a really isolated and secluded position.

The best portions of the monument are the comparatively small but life-size figures of the Statesmen Kaunitz, Lichtenstein, Van Swieten and Haugwitz, which grouped close against the pedestal help to "amuse" the space between the widely separated equestrian figures: the figure of Kaunitz, the great chancellor, is particularly good. The equestrian groups, on the other hand, are the least good, for while the figures of Laudon, Daun, Traun and Kevenhuller are well modelled and have the appearance of being good portrait statues,

the horses on which they are mounted are very tame and conventional animals whose best point really is that being so tame they are not particularly demonstrative, and hence are not so objectionable as if figures of the same intrinsic merit had been cast in more rampant pose. Zumbusch was awarded the commission as the result of a competition held in 1873 and he worked up his composition architecturally in conformity with the advice of Gottfried Semper and later of Hasenauer, though how far these architects are responsible for either its merits or its defects is not determinable.

Both actually and in the scale of its parts this monument is larger than the one to Frederick the Great at Berlin, while as a composition it is less pleasing. It is about twenty metres high and in casting the figures, 44,000 kilograms of bronze were consumed, while the cost of the monument which was unveiled early in 1888, was 850,000 florins [over \$350,000]. A year and a half were required for the casting and finishing of the

figures over which the sculptor had labored twelve years.

Vienna is fairly well off in the matter of equestrian sculpture, for besides the examples already mentioned, the bas-reliefs of the Emperor Francis Joseph on the Rathhaus and the quadrigas with which the adjacent Parliament building fairly bristles, there is just behind the imperial palace, with its back turned to the Imperial Library, a bronze equestrian statue by Zauner of Joseph II, the capable but philanthropic and somewhat visionary son of Maria Theresa.

At the death of his father in 1765, Joseph was elected Emperor of Germany, but as by that step he only became joint ruler with his



The Margrave Christian Ernest, Baireuth, Bavaria.

mother of Austria and Hungary — the most important portion of the empire of those days — and as his mother preferred to keep the control mainly in her own hand, Joseph had opportunity to spend much of his time in travelling, not only within the confines of his own empire, but also through most of the other countries of Europe. Being of an observant and studious nature his ideas were widened and he perceived many opportunities of improving the moral and social condition of his subjects. The result was that when he came into sole power at the death of his mother in 1780, he spent most of his time in his short reign of ten years in trying to give effect to his many philanthropic edicts and laws which, although very excellently intentioned, were so ill-advised from the practical standpoint that the social and mercantile life of the empire was thrown into inextricable confusion, the result of which was that discontent and even armed rebellion were excited, and almost on his death-bed Joseph found that the wisest thing he could do was to abrogate all his edicts and put an end to all the reforms he had hoped to carry into effect. One reform alone was exempted from his sweeping revocation, the edict of toleration which placed Protestants upon the same footing as Catholics was allowed to stand.

It was a very natural conception to feel that the statue of such a man as Joseph II could not be patterned after any better model than the wise and philanthropic Marcus Aurelius at Rome, and even if the Classic revival had not been in progress at the time Zauner modelled the group, it is not unlikely that the Roman emperor might have served as the model, for the similarity of intention if not of actual character is obvious enough, and Rome is near enough to Vienna for the artists of the latter city to be familiar with the things the former contains. But though Marcus Aurelius was taken for the model, the sculptor seemingly did not approve of the robustness and virility of the original statue and accordingly in his own work pared and scraped in every direction till his horse and rider became but the shadows of their Roman prototype. Meagre and attenuated to the last degree in actual mass the group was also deprived of the spirit and movement which imbues the work in the piazza of the capitol at Rome. It is a tame and inartistic record of a man who meant to deserve well of his time but yet hardly succeeded. If the sculptor had conceived his subject as the man who devised with Frederick the Great the first partition of Poland, it seems as if he must have succeeded in creating something better than a mere nonentity.

The history of these times is made confusing to the student by the number of petty States and the frequency with which they made and annulled alliances with one another. Each little section had a full-fledged court with its king, or elector, or duke, and full corps of court officers, soldiers and distinguished men who were bound in duty to the history of their country to make themselves and her famous, and having become thus famous it became the reciprocal duty of the country whose glory they had enhanced to immortalize their memories by erecting in their honor statues, monuments and memorials; and so the cities and towns of central Germany are thickly sprinkled with creations of indifferent artistic merit and

of no great value as historical records, for though names were made they did not often fill the trump of fame so full that an inquirer in these days finds it easy to discover who the gentlemen were and what they did that these memorials should inflict themselves on posterity.

Fortunately, not many of these memorials are equestrian, but there is one which is associated with a somewhat earlier period which, for extravagant oddity, cannot be matched elsewhere. In Baireuth, the capital of Upper Franconia, still stands in front of the palace a monumental fountain which was erected in 1700 to the glory of Christian Ernest, Margrave of Brandenburg-Culmbach, who seems to have played enough of a part in the military life of those times to be made a marshal in the Imperial service. Just what his career was the records at hand do not show, but the fallen Turk beneath his caracolling palfrey — it can hardly be styled a war-horse — is proof that some of his exploits were accomplished at the cost of the hated and dreaded Moslem. It is so usual a thing for sculptors to be

obliged to support their stone or marble horses with the bodies of fallen enemies that it seems safe to believe that the crowning figure, as well as the figures of the so-called river-gods below it, is of sandstone.

The statue of the Margrave being a contemporary work of art, erected on a birthday of that noble being, is an interesting evidence of the pomp and state which enshrouded the petty German courts of the time. This Margrave is evidently made of the same pith as that first George, his contemporary, whom Thackeray found so fit a butt for his polite satire. The presence of the court-dwarf is another mark of the manner of the day, but whether he is introduced merely as a symbol of rank, or whether the little gentleman ever did his master some signal service which called for this enduring expression of gratitude, can only be guessed.

One cannot but be grateful that such a piece of work exists: it marks a phase of art, it records a stage of social customs, it embalms the fashion of the day in the things that concern the tailor and the

perruquier, and so long as it exists, it must afford to all who see it no little amusement.

There is the same uncertainty as to the details of another potentate of this epoch who is immortalized, none the less, by the sculptor Grupello in an equestrian statue at Dusseldorf. Johann Wilhelm, Elector Palatine, did much to restore the lost prosperity of that town, wherein he lived until Heidelberg was restored and again made habitable; but as he is most noted for this, and for the fact that he began the collection of the famous Dusseldorf gallery of paintings which the King of Bavaria, Max Joseph, later moved to Munich, it is likely that the rôle that fell to him was administrative rather than warlike.

The statue is remarkable for two things: the horse, although seemingly sufficiently supported on three legs is upheld in no small measure by his mighty tail, which the sculptor in a very unusual manner has brought down to the ground. Besides this, the statue is an exceptional one, since the Elector wears a crown and thus affords an example of a very small class of statues where this symbol is worn by an equestrian: even Louis XIV himself was content to wear a laurel wreath, and most others, when not humble-minded



The Elector Johann Wilhelm, Dusseldorf, Prussia. Grupello, Sculptor.

enough to ride with uncovered head, were satisfied with a head-covering better suited to the occasion.

Speaking of the tail of the Elector's horse brings to mind that there is at Dresden another horse with an even more voluminous tail which, however, this time serves a real end since the horse ridden by Augustus the Strong is there shown in the act of rearing, and, after the accepted usage of the time, the tail was called into play to preserve the figure's equilibrium. In this case the support was more than ordinarily needed since the statue is not made of bronze, but of beaten copper, gilded, and hence has less rigidity than if the alloy had been used. The figure of Augustus is conceived in the Classic vein by the sculptor Wiedemann, who respected the character of his subject enough to clothe him with the armor of the Roman warrior and not with the flowing toga of the civilian; for, though Augustus was a voluptuary of the most pronounced type and more famed for his amours than for aught else, he was something of a soldier and so much of an athlete, and so given to exhibiting his enormous physical strength—to which he owed his nickname—that civilian attire for the statue would have been quite out of keeping with his character.

Augustus contracted his love of pleasure during the travels which in his youth he made through western Europe, and the pomp and gaieties in which he took part at the court of Louis XIV inspired him with a desire to emulate them if ever he might have the chance. This fell to him through the death of his elder brother, and, having thus succeeded to the electorate of Saxony, he shortly nominated



Augustus the Strong, Dresden, Saxony. Wiedemann, Sculptor.

himself—as we should now say—for the position of King of Poland, which had for many years selected its ruler by the votes of the nobility. It was an unfortunate thing for the turbulent and always conspiring kingdom that Augustus was elected in 1696, for he at once set about recovering from the Swedes a portion of the country they had held for some time, since to effect his purpose he entered into an alliance with Peter the Great, and began the struggle with Charles XII of Sweden. For several years Poland was distressed with this conflict, which resulted in the victory of Charles and the deposition of Augustus in 1702. But when Charles was defeated at Pultowa, in 1709, Augustus, still with the help of the Russians, recovered his throne and continued his reign till his death in 1733. The first portion of his reign was bad enough for Poland, but the last part was worse, for, once he was firmly settled in power, he gave himself up to his pleasures, and to the frivolities and pomps of a luxurious court which spread its enervating influence throughout the country, and while they enjoyed themselves the Poles did not observe how gradually but surely the intriguing Russians were gaining that ascendancy in the affairs of the country, which a few years later would make the first partition of Poland [Aug. 5, 1772], between Catherine II, Frederick the Great and Maria Theresa, the most natural event in the world.

But, though his reign was a misfortune for the country, it was a good thing for art, and particularly for architecture, for many of the great nobles followed the King's example and adopted a style of luxurious living which could only be comfortably maintained in new dwellings, so that during this time a great number of magnificent châteaux and fortified dwellings were built.

During his early travels Augustus had acquired amongst other things a taste for paintings, and one of his most praiseworthy acts was the getting together the nucleus of the now famous gallery of

paintings at Dresden, which, in itself, would be reason enough for the sister art's honoring him with a statue erected in his natal city, in 1736, three years after the King's death.

MARIA THERESA.—Maria Theresa, daughter of Charles VI, Emperor of Germany, was born in 1717, and married in 1736 to Francis, Duke of Lorraine. Her father having died in 1740, she succeeded to the throne of Germany, in accordance with the act called the Pragmatic Sanction, but her title was soon disputed by the Electors of Saxony and Bavaria and the Kings of Prussia, Spain and Sardinia. These each claimed a portion of Germany by right of the Austrian princesses with whom they were connected. Maria Theresa received the homage of her Austrian States at Vienna, and was crowned Queen of Hungary at Presburg in 1741. Rejecting the offers of assistance of Frederick the Great, on condition of her giving up Lower Silesia to him, and her capital being menaced with a siege by the Bavarian Elector and his French allies, she convoked the Hungarian Diet at Presburg, and, appearing before the nobles with her infant children, appealed to their loyalty for aid and protection. The Diet responded with enthusiasm, the French and Bavarians were soon driven out by the Imperial forces, and in 1742 a treaty of peace was made between the Empress and Frederick, the latter obtaining Silesia. The Elector of Bavaria, who had been previously chosen Emperor of Germany, under the name of Charles VII, died in 1745, and Francis, the husband of Maria Theresa, was elected in his place. In 1746, the Imperialists gained important victories in Italy. The peace of Aix-la-Chapelle, in 1748, ended the war of the Austrian Succession, and Maria Theresa remained in possession of all her hereditary estates except Silesia. The Seven Years' War, carried on by Prussia against France, Russia and Austria, terminated in 1763 without changing the boundaries of Austria and Prussia, and, the Emperor Francis having died in 1765, his son Joseph succeeded to the Imperial crown, but Maria Theresa still held the reins of government. She is said to have declined to join in the partition of Poland until persuaded to do so by the representations of Joseph II and Prince Kaunitz. Among the important reforms of her reign was the abolition of torture and of feudal service. She also abolished the Inquisition at Milan and suppressed the order of Jesuits. She died in 1780, and was succeeded by her son, Joseph II.

ZUMBUSCH.—Kaspar Zumbusch was born in Herzbroek, Westphalia, in 1830. He went to Munich in 1848 and worked in the studio of the sculptor Haibig. In 1853 he was allowed to copy for a personal patron Canova's statue of Flora and also to make a bust of this gentleman, who generously paid the artist's expenses to Italy in 1858. In 1864 Zumbusch made busts of Ludwig II and of Wagner, and in 1867 he went again to Italy and made for Ludwig statues of the principal characters in Wagner's operas—Siegfried, Lohengrin and Brunhild. Zumbusch's other works include the monument to King Maximilian II of Bavaria, at Munich; the Victory Monument at Augsburg; the statue of Count Rumford at Munich; the tomb of Prince August of Prussia in the Bellevue Park at Berlin; and the Beethoven monument at Vienna. He was made professor of sculpture at the Academy of Fine Arts in Vienna in 1872.

LAUDON.—Baron Gideon Ernst von Laudon (written also Loudon), a famous general of the Austrians, was born in Livonia in 1716. He entered the service of Maria Theresa in 1743, and for his exploits in several campaigns, was made a general in 1757. He was appointed lieutenant-general the following year and contributed largely to the defeat of the Prussians at Hochkirchen. He gained a complete victory in 1759 at Kunersdorf, where Frederick the Great commanded in person. He was rewarded with the rank of field-marshal in 1778, gained several victories over the Turks in 1788, and was chosen generalissimo in 1789. He died in 1790.

DAUN.—Leopold Joseph Maria, Count von Daun, an able Austrian general, was born at Vienna in 1705. He made his first campaign against the Turks. About 1743, he obtained the rank of field-marshal. He commanded at the battle of Kolin, in 1757, where he signally defeated Frederick the Great, and in the same year, with Charles of Lorraine, sustained a severe defeat at Leuthen. He gained a victory at Hochkirchen in 1758 and was rewarded with 300,000 florins, a sword from the Pope and many honors. He was, however, again defeated by Frederick at Torgau in 1761. After the peace of 1763, he became president of the Aulic Council, and enjoyed great favor at court until his death in 1766.

TRAUN.—Otto Ferdinand, Count von Traun, an Austrian general, was born in 1677. He was made a field-marshal in 1740, and commanded the army which under Charles of Lorraine opposed Frederick the Great in 1745. He forced the Prussians to evacuate Bohemia. He died in 1748. He was highly complimented by Frederick the Great, who compared him to Sertorius.

KEVENHULLER.—Francis Joseph, Prince de Kevenhuller, an Austrian statesman, was born in 1706. After having been ambassador at Copenhagen, Dresden and Hanover, he returned to Vienna and filled many high positions at court, enjoying the favor of Maria Theresa and of Francis I. He was created a Prince of the Empire in 1763 and died in 1776.

JOSEPH II.—Joseph II, son of Maria Theresa, was born at Vienna in 1741, and became Emperor in 1765. He divided Poland with Prussia and Russia; united with Catherine II in a war against Turkey; introduced many civil and ecclesiastical reforms, often prematurely; abolished feudal serfdom, allowed liberty of conscience, limited the authority of the Pope and clergy, suppressed convents, and encouraged peaceful arts, but encountered insurrections in Belgium and Hungary. He died in 1790.

ZAUNER.—Franz Zauner, Edler von Felpatan, was born at Kauns in the Upper Inn Valley in 1746. He received his first regular instruction as a sculptor under Schletterer at Vienna, whither he had gone in 1766. Later on he was employed by the Court-sculptor Bayer to work on sculpture for the gardens at Schönbrunn, where he attracted the attention of Prince Kaunitz by the model for a fountain, which he completed in fifteen days. The result was that he was sent to Rome in 1776, where he continued his studies, until he was called to Vienna in 1781 as professor of sculpture. His principal works are a "Clio," made for Prince Kaunitz; the monument of the Emperor Leopold II, in the Court Church of the Augustines; two female caryatids in the palace of Count von Frees; and the colossal equestrian statue of Joseph II in Vienna, which was unveiled in 1807, at which time the sculptor was ennobled. Zauner died in 1822 at Vienna.

CHRISTIAN ERNEST.—Took part in the relief of Vienna, 1683. Died 1712.

JOHANN WILHELM.—Elector Palatine, born 1690; died 1716.

GRUPELLO.—Gabriel de Grupello, a Belgian sculptor, was born at Grammont in 1644. He was descended from an ancient Milanese family, one branch of which had emigrated to the Low Countries in search of better fortunes. He studied at Antwerp and Paris. In 1695 he was named court-sculptor by the Elector Palatine, Johann Wilhelm, and on his return to his native land in 1706, he obtained the same title from the Emperor Charles VI. In addition to the equestrian statue of the Elector, he executed a marble (pedestrian) one of that prince; a "Diana" and a "Narcissus" for the Park at Brussels; a group for the decoration of a fountain, made in 1675, and now in the Museum at Brussels; an "Expiring Magdalen" in marble, and numerous other works. Grupello died at Ehrenstein in 1730.

AUGUSTUS THE STRONG.—Augustus I (or II) (Frederick), King of Poland, was born at Dresden in 1670, the second son of John George III, Elector of Saxony. He served with distinction in 1690 and 1691 in the Imperial army against the French, succeeded his brother John George IV as Elector of Saxony in 1694 and made an alliance with the emperor, who gave him the chief command in the war against the Turks, who defeated him in Hungary in 1697. Augustus was elected King of Poland in 1697 after abjuring the Protestant religion for the sake of this prize. On obtaining possession of the throne he joined Peter the Great against Charles XII of Sweden, invading Livonia in 1700. He was, however, defeated on the Duna in 1701 and at Klissow in 1702, and expelled from Poland. Charles placed Stanislas Leszczinski on the Polish throne in 1704, and Augustus, to save his Saxon dominions from the conquering Swede, signed a treaty renouncing the crown of Poland in 1706. But the defeat of Charles XII at Pultowa enabled him to recover his kingdom in 1709, Stanislas retiring without a contest. The latter part of Augustus reign was comparatively quiet. He died in 1733, leaving among his children a natural son, Maurice of Saxony, the famous

general. Augustus was noted for his great personal beauty and extraordinary strength of body, and he was endowed with talents of a superior kind. But he was licentious and prodigal, and became the most dissolute and luxurious prince in Europe, his court being more splendid than that of any other monarch, save Louis XIV.

WIEDEMANN.—Ludwig Wiedemann was born at Nordlingen in 1699. In 1738 he was invited to London by the Duke of Cumberland to take charge of a foundry. He made an improvement in the manufacture of muskets, and afterwards went to Vienna, in 1750, where he was made a colonel of artillery. His principal work was the equestrian statue of Augustus the Strong, at Dresden. His last work in sculpture was the statue of the King of Denmark, executed at Copenhagen. He died in 1754.

[To be continued.]

TRINITY CHURCH, BERMUDA.



"All the Modern Improvements."—No. 14.

Paradise by any other entrance. But, after all, Trinity was only a chapel, according to Episcopal usage; for the Church-of-England mind is not able to grasp the idea of more than one church in a parish, which is distinctively the parish church, and all the others, no matter how large or grand, are merely chapels. Above all, Trinity was a chapel of ease; but his lordship the Bishop of Newfoundland and Bermuda is in Newfoundland for the summer, and I cannot reach him to ask him what that means.

Before daylight on a Sunday morning in 1884 an incendiary set fire to several of the Bermuda churches, and when the time for service came Trinity was a heap of ruins. All the other fires were extinguished, but Trinity was lost. The incendiary is supposed to have been a lunatic, but that is mere supposition, for he has never been caught. It was not an old building, nor a particularly handsome one, but it was the best in Bermuda, and its destruction sent a thrill of holy horror from one end of the islands to the other. If the incendiary had been caught he would have been dealt with without benefit of clergy. The building was first used in 1855, but it was not completed and consecrated until 1872. It was built of native stone, which was found to be too weak to support a spire, and in a few years the foundations had to be strengthened with brick arches and ironwork. The old building and the organ were insured for \$15,000, and with that capital the people began at once to build a new church that the architects estimated should cost \$50,000.

Then began a truly Bermudian performance—building a larger and heavier structure of the same native stone that had proved too weak before. Not only that, but they left the stone exposed to the weather instead of cementing it on the outside to preserve it. It must be a stone building and show the face of the stone to make it correspond with some of the old English cathedrals, and to give it a thoroughly Britannic, God-save-the-Queen air, architects were imported from Scotland to design it and superintend it. But to bring the stone for it, good solid stone, from some other country would have been "to put so much money in the hands of outsiders," as one of the members of the Assembly expressed it the other day; so the soft native stone must be used. They would not even put a coating of cement on the outside to keep the water out of the stones, though it is well-known in Bermuda that this is absolutely necessary. A cubic foot of that porous stone will absorb a pailful of water, and the new Governor's house, built in the same uncemented way two or three years ago, is washing to pieces already.

The new Trinity, so far as completed, has much the appearance of a cream-colored tenement-house with a pointed roof, but they say that this is because the partly-completed part is only a small wing. When, in the course of time, the whole building is finished, it will be

more symmetrical. It is to have, like most churches of the kind, a nave and a transept, aisles, a choir, a tower, and an apex [sic] on the nave. These things must make a fine church, if properly blended, and, judging from the published figures, it will be large. These figures are published by Thomas S. Reid, Esq., Secretary of the Trinity Building-committee and religious editor of the *Royal Gazette*, and they are entirely trustworthy. Mr. Reid, in Bermuda religious affairs is second only to the "Holy Father in God, Llewellyn, †, Bishop of Newfoundland and Bermuda," if I may judge by what he says of himself in the newspaper and the almanac he edits. It is unusual, of course, to see a great editor filling his newspaper and his almanac with news, even if it be ancient news, about a church; but this example that Editor Reid sets is a good one, and I hope soon to see it followed in New York. When we have the Bermuda cable in operation his good example may take root in New York, and we may have all our chief editors devoting themselves exclusively to church matters. The tower of the new Trinity is to be 32 feet square and the top of the spire is to be 185 feet above the ground. I am particular to mention the height of the proposed spire, because there is no one now living who will be likely to see that spire finished.

The dimensions of the new church would be of little interest to American readers; but if they should hear some day that a new fifty-thousand-dollar church had washed to pieces and fallen down, they would wonder at it. I should be sorry to think that such a thing might happen, for with a Governor's house just built and going to decay Bermuda would be in a "state of mind" if anything should happen to the new church. It is a fact, however, that a visitor to the island cannot help noting as a curious thing, that in the face of the decay, of the Governor's house almost before the walls are finished, they should go on and build this large new church under precisely the same conditions and take the risk—and that is putting the case in its very best light, to call it a risk. What makes it still more curious (and this is what I began to write about, but my fervor in church affairs has carried me to another branch of the subject) is that they could have imported almost any kind of stone except the fancy Italian marbles, from almost any other country for the same amount of money that it costs them merely to quarry the native Bermuda stone and draw it to the church. This is the greatest commentary on "cheap" and bad labor that I have ever met with. Here is the rock right under their feet, to be had for the cutting, and it costs them as much to saw out those blocks as it would have cost them to send to New England and buy blocks of granite.

Here is the way they get out the native blocks with native labor: There are fifteen or twenty darkies in the quarry, at a dollar a day for the best of them down to fifty cents or less for the poorest. A big block has been sawed out, and a little truck is waiting to load it on and draw it to the church. Half the darkies are standing looking at the stone, the other half are examining the truck and holding the poor little horses that are only too glad to stand still.

"Heah, you dar, git hold ob dis rope; don' be stand' dar restin' yourselves; you heah?"

"We's can't hist dat big stone on dat truck, jes' us few. T'ink we's hosses, you man?"

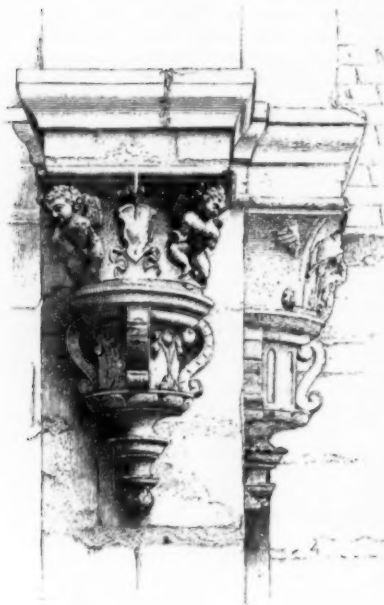
"Git hol' dat rope!" "Lef go dat pulley!" "Heah, you Geawge, hol' dis yeah bar!" Gabble, gabble, gabble like a party of monkeys up a cocoanut tree, every man telling the others what to do and no man lifting a pound. Ten minutes of this, then a long discussion whether the stone shall be lifted sideways or flat, till at length three or four of the best of the men get hold of the stone and put it on the track, sometimes only to let it fall back and break. That is what makes the Bermuda stone expensive.

All the stone for the body of the church is taken out of what is known as the "Par le Ville" quarry, which furnishes the hardest stone to be found in the islands. The committee and the builders examined the rock from a great number of quarries, but none would answer but this. The owner of this quarry, only too glad to have one of his hills turned into a church, contributed the stone, and the church people had nothing to do but cut it out. This went very well and easily enough at the beginning, while they were near the surface; but as they burrowed deeper and deeper into the hill it became troublesome and expensive. Then the architects, not too well pleased at best with the stone, positively refused to use it for facing the Gothic arches of doors and windows. It was not strong enough to stand the strain, nor hard enough to be handsomely cut. The "all-native-stone" principle had to be abandoned and stone was brought from various countries for the more important parts. A very handsome French stone was imported from Caen for the door and window arches; the inside pillars are of red Peterhead granite, polished, and the piers and arches of the tower are of Nova Scotia freestone. This hard stone was a novelty in Bermuda, and even the clippings were carefully saved to fill-in part of the piers. Thus the building became largely foreign in its construction, but the walls, being of native stone, first catch the eye, of course, and give the whole structure the appearance of being a native of the Bermudas.

The Par la Ville quarry, fortunately for the builders, is near the church; if it had been far away, the cost of cartage would have been almost prohibitory. Hamilton is about in the middle of the islands, twelve miles from St. George's, and nearly the same distance by land from the dock-yard. It is another curious commentary upon cheap labor that to haul stone from any interior point near St. George's over to Hamilton would cost more than to import it from

Maine or Nova Scotia, and nearly as much as to bring it over from France. To take it from one island to another by water would be cheap enough, but the hauling at both ends would make that impossible. Those Bermuda work horses are in no more hurry than the darky drivers, and "de sun am hot, boss, an' dere ain't no sort of hurry noways." There is no telling how many naps by the roadside a driver would have to take between St. George's and Hamilton, and as Bass's ale and Jamaica rum are to be had cheap in nearly all the little shops that nestle in shady spots on the principal roads, the trip would take very much the character of a picnic. — *W. Drysdale, in New York Times.*

NATIONALISM AT DES MOINES, IOWA.



EDWARD BELLAMY'S dream begins to assume tangible proportions to some of the citizens of Iowa. During last winter there was an organization known as "The Investigating Club," at University Place. The body met once a week and discussed the economic and social topics of the day. Not a little interest was manifested. Among those who participated in the meeting were some earnest, thoughtful men who had become opposed to our present competitive system of industry.

When the summer months began the club closed its meetings, but the investigation along this line of thought was pushed with more vigor. About a month ago a

small circle of men, Ernest B. Gaston, of the *Suburban Advocate*; C. H. Mershon, E. D. Smith, W. P. Macy, D. Harrod and J. P. Meredith, with a few others, all prominent citizens of that suburb, met to see if they could not devise a plan to escape what they deemed the serious evils of the present system and put into successful operation the better principles which had crystallized in their minds as the result of their investigations. The result has been the organization of a colony company with the object of founding in some favored part of the country (probably near Lake Charles, Louisiana), a community which shall be, so far as possible, complete within itself, and where what they term the savage, foolish and wasteful system of competitive industry shall give place to the kindly, rational and more economic system of coöperation.

Among the basic principles of the colony are these: "Man alone is nothing but a savage; he can support existence and that is all. It is only in and through society that he can obtain wealth and culture. Wealth is the product of man's labor expended upon the earth, which is God's gift to the race. No man should be allowed to monopolize the natural resources and levy a tribute on his fellow-man for the opportunity to labor. Every man is entitled to just so much liberty, as well as allow equal liberty to every other man. Each man should receive the full product of his labor, except an amount sufficient to discharge his debt to society through whose aid he can do effective labor."

By the constitution and by-laws it is determined that the general nature of the business to be transacted is the "production and distribution of wealth; the collection and extraction of raw material; its fashioning, by handcraft and machine-craft, into commodities; the culture of both animal and vegetable products; the production of food, clothing, shelter, machinery and all articles of necessary convenience or of luxury; the establishment of proper methods of distribution, transportation and storage; the establishment of just and correct systems of credit, account and exchange; the building of houses for ourselves and families; the arbitration and just settlement of disputes between ourselves and the practice among ourselves of just systems of social organization; the education of ourselves and our children in proper physical, mental, moral, intellectual and artistic lines; to improve the health, secure the happiness and perfect the well-being of every member; and as well to propagate and extend in the world at large the idea of universal and just coöperation.

Each stockholder contributes to the common stock \$500, and upon his death, resignation or expulsion, the value of his capitalization, or so much as he has paid in, shall be apportioned out of the common stock and paid over to himself, his heirs and executors; and each stockholder will waive all claim to or right for any increase,

interest or earned profits of any kind accruing or due thereon, both for himself and his heirs, executors and assigns, it being distinctly understood that upon death, and equally so in case of withdrawal or expulsion, the estate or himself shall withdraw only the amount with which he has assisted the capitalization; all rents, profits, interests, instalments and all reality and personalty — except private chattels reduced to personal possession and private hereditaments — earned and paid as dividends and wages to the stockholders during his disbursement, being distinctly granted in bulk and for the common use and benefit of the surviving and remaining stockholders; it being distinctly understood and agreed that the estate that each shareholder takes or holds in the increase or improvements and acquisition of the company is for life or years and not an estate in fee, and that the remainder lies always to the successor only when he shall be accepted as a member, such remainder to him being a remainder of the same class and character as the original member, and, therefore, it is well understood and agreed that no member has the right to sell, assign or transfer his interest herein to any one whatever without the consent of the company. It is definitely understood and agreed that any stockholder may be expelled from the company by a two-thirds vote of the other members.

Among general provisions is one that thirty cents per hour shall be the established basis of exchange for labor engaged by the colony to the members, until otherwise ordered by the colony. At least twenty-five per cent of all surplus in the hands of the treasurer each year is to be invested under the direction of the colony by the board of trustees in a plan of some kind that will tend to promulgate these coöperative views and to benefit humanity in general. Eight hours will constitute a day's work in the colony. For the amendment of by-laws a vote of the membership is required. The colony will keep a store or stores for the convenience of members and for the purpose of general commerce. Colonists may purchase from the stores such articles as are kept for sale therein with the labor-time checks provided by the colony.

The persons who have inaugurated this movement at University Place do not exactly indorse Bellamy's ideas. There is a distinct difference between them. Instead of Bellamy's principle, "From each one according to his ability, to each one according to his need," their principle is, "All will have equal opportunity and each will be rewarded according to his deeds." — *Des Moines Special to the N. Y. Commercial Advertiser.*

WOODEN POSTS IN A FIRE.



—PULPIT PANEL—DESIGNED BY THE REV. E. GELANDT

THE London Architect gives the following account of the fire-resisting qualities of wooden posts:

A fire occurred in a warehouse of enormous proportions, and raged with great fury for five hours, at the end of which time it was

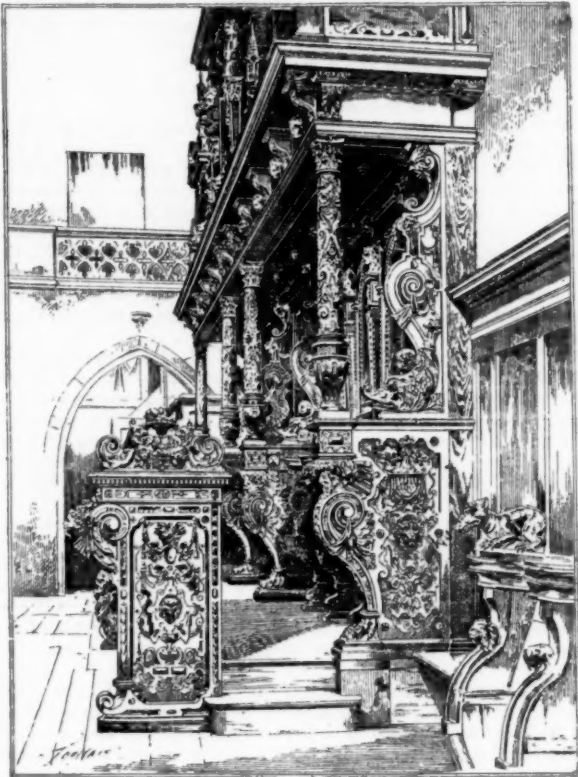
extinguished. The warehouse was constructed of brick walls; it had wooden floors, supported on wooden beams, which, in their turn, were carried on wooden story posts, about twelve inches thick, and although serious damage was done, not one portion of the woodwork was destroyed. After the fire, the proprietors allowed the chief of the fire-brigade to remove one of the story posts, with a section of the beams and other parts surrounding it above and below. This post had been subjected to the full action of the fire during the whole of its duration, as already mentioned, or, making full allowance for everything, including the delay of the fire attacking the particular spot on which it stood, and the time at which the cooling process commenced, certainly not less than four and a half hours.

As large quantities of water had been used, and it was probable that everything had been saturated, the wood was carefully dried before a strong fire, until not a trace of moisture remained in it. It was then set on end in an open yard, exactly as it had stood in the warehouse, with the pedestal underneath, the cap above, and the beam across the cap. More than a ton of shavings, light wood and heavy wood were placed around it, and after the whole heap was saturated with petroleum a light was applied to it, and after this large quantities of petroleum and turpentine were pumped on it. At the end of two and one-half hours the post, beam, and other parts were withdrawn from the fire, and within a few minutes of the time they were withdrawn they ceased to burn.

A few feet were then sawn off horizontally at that part which had suffered most from the flames, and afterwards the same piece was split longitudinally with steel wedges, in order to examine its condition. The post was of pitch-pine — about the most inflammable wood known — and yet, after exposure for seven hours to fire, the fury of which could not be exceeded except in blast-furnaces, it contained within a quantity of perfectly uninjured and apparently fresh

wood, probably capable of supporting the whole weight which the original post was designed to carry. Immediately after the saw cut, and again after the cleaving with steel wedges, the centre was carefully examined, and found to be just perceptibly warm to the touch, but nothing more, thus proving that the fibre, in which the strength lay, was quite uninjured.

THE PHILADELPHIA SCHOOL OF ARCHITECTURE.



IN the fall of the present year a School of Architecture will be opened at the University of Pennsylvania, Philadelphia, under auspices that promise a brilliant future. For some years past a Course of Architecture has been maintained at the University, but it has heretofore been part of the Towne Scientific School, and as such it has not been more than one of the regular undergraduate courses. The new School is organized on a broader basis and will, in a large measure, be independent of the strict requirements of college studies and give special instruction in the technical branches needful for the securing of a good foundation for practical work.

The School will be under the immediate supervision of Mr. Theophilus P. Chandler, Jr., the well-known architect of Philadelphia, who will be the Director. Associated with him are Dr. William Pepper, Provost of the University, who is *ex-officio* President of the Faculty; Dr. Horace Jayne, the Dean of the college; Professor Thomas W. Richards, Professor of Architecture; and Dr. Charles E. Dana, Professor of Art. In addition to the stated members of the faculty, the School will have the advice and assistance of a number of architects of Philadelphia, who will lecture on special subjects. These lecturers include Mr. Frank Furness, Mr. Wilson Eyre, Jr., Mr. Frank Miles Day, Mr. Joseph M. Wilson, Mr. Addison Hutton and Mr. John Stewardson and several others. The co-operation of practical architects in the work of the School is a peculiar feature and is one that will undoubtedly prove of great benefit, not only to the University as strengthening the interest of the community in its work, but also to the students as they will thus have the advice of many of the abler men in the profession, who, while not undertaking to personally supervise their work, will give them the advantages of their own experience. This plan will also enable the University to offer a wide variety of special lectures from authoritative sources, a result which could not be secured in any other way. In addition to the architectural lecturers, arrangements have been made for lectures by well-known builders and contractors. Additional professorships will be established from time to time as the growth of the School may require.

The work will be eminently practical, a fact which may be learned from the space occupied by men of personal experience in the organization. The course as at present outlined will cover four years and will give thorough practical, theoretical and artistic instruction. The degree of Bachelor of Architecture will be given to those taking the full course, and certificates of proficiency to those taking partial courses. While the greatest attention will be given to the strictly

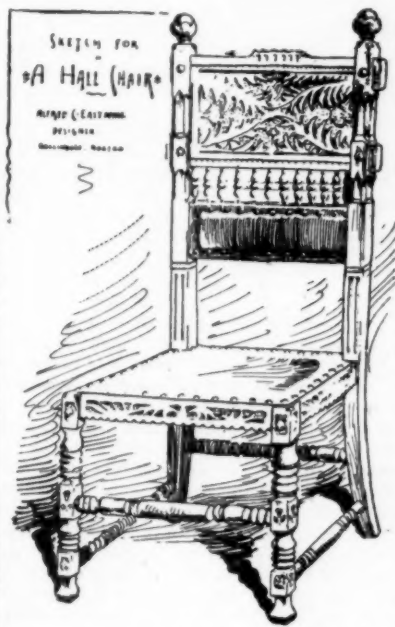
architectural studies, means will be afforded for instruction in English, French, mathematics, civil and sanitary engineering, physics, chemistry, hygiene and social science as provided by the large corps of professors and lecturers in the faculty of the University. The architectural work will comprise drawing from the cast and flat, free-hand and sketching, tracing, lettering, mechanical drawing and descriptive geometry, exercises in water-colors, modelling, designing, planning, the solution of architectural problems, landscape gardening and practical work in building construction, material and tools being provided for work in carpentry, brick-laying, plastering, etc.

Ample space has been secured in the University buildings for the School, and the rooms have been provided with all the requisites for study and practical work. A large collection of photographs and slides have been procured, and the nucleus formed for a special collection of architectural prints and books. In addition to the apparatus of the architectural school students will have the privileges of the University and the advantage of a widely-chosen course of lectures, and also the use of the general University Library.

The School of Architecture is the latest department to be added to the already large group of special schools that have been added to the University of Pennsylvania in recent years, and which have made it one of the most progressive of American colleges. A school of architecture founded by architects and conducted by men actually engaged in the exercise of their profession cannot but make for itself a place peculiarly its own. The organization of the new school has been long in contemplation, and its doors have not been opened without a full consideration of the best methods in vogue in similar schools already in existence. It will be the aim of those having it in charge to provide their students with the best and most approved forms of theoretical and practical instruction. They will endeavor not to produce architects whose knowledge of the subject is limited to books and drawings, but those who have not only handled but worked with the materials of which buildings are constructed. At the same time its near relationship to the college will not be forgotten, and its students will obtain, with their technical studies, that foundation of a liberal education which is a necessity to every active man. Possibly this school will give greater prominence to practical work than others of its class, but the names of those who are interested in it is sufficient guaranty that the theoretical and scholastic side will not be forgotten.

BARR FERREE.

ADHESIVE STRENGTH OF SULPHUR, LEAD AND PORTLAND CEMENT FOR ANCHORING BOLTS.



DURING a recent experience of the writer in constructing foundations for an elevated railway, solid rock was encountered so near the surface as to necessitate anchoring the foundation-bolts in it. Some more durable and economic means of accomplishing this than by the use of sulphur or lead was desired, and Portland cement was suggested as being suitable.

A careful investigation failed to find any record showing the adhesive strength of cement in pounds per square inch when used in this way, hence it was decided to make such experimental tests as would give reasonably positive information on this point. For this

purpose fourteen holes were drilled in a ledge of solid limestone, seven of them being 1½ inches in diameter and seven of them 1¼ inches in diameter, all being 3½ feet deep. Seven ¾-inch and seven 1-inch bolts were prepared with thread and nut on one end and plain at the other end but ragged for a length of 3½ feet from the blank end.

Four were anchored with sulphur, four with lead and six with cement, mixed neat. Half of each were ¾-inch and half 1-inch bolts, and all of them were allowed to stand till the cement was two weeks old. At the expiration of this time a lever of sufficient power was rigged and all the bolts were pulled with the following result:

Sulphur: three bolts out of four developed their full strength, 16,000 and 31,000 pounds. One 1-inch bolt failed by drawing out under 12,000 pounds.

Lead: three bolts out of four developed their full strength, as above; one 1-inch bolt pulled out under 13,000 pounds.

Cement: five of the bolts out of six broke without pulling out; one 1-inch bolt began to yield in the cement at 26,000 pounds, but sustained the load a few seconds before it broke.

While this experiment demonstrated the superiority of cement both as to strength and ease of application, yet it did not give the strength per square inch of area. To determine this, four specimens of limestone were prepared, each 10 inches wide, 18 inches long and 12 inches thick, two of them having 1½-inch holes and two of them 2½-inch holes drilled in them. Into the small holes 1-inch bolts were cemented, one of them being perfectly plain round iron and the other having a thread cut on the portion which was imbedded in the cement. Into the 2½-inch holes were cemented 2-inch bolts similarly treated, and the four specimens were allowed to stand thirteen days before completing the experiment. At the end of this time they were put into a standard testing-machine and pulled. The plain 1-inch bolt began to yield at 20,000 pounds, and the threaded one at 21,000 pounds. The 2-inch plain bolt began to yield at 34,000 pounds and the threaded one at 32,000 pounds, the strain in all cases being very slowly applied. The pump was then run at a greater speed and the stones holding the 2-inch bolts split at sixty-seven pounds in the case of the smooth one and at 50,000 pounds in the case of the threaded one.

It is thus seen that cement is more reliable, stronger and easier of application than either lead or sulphur, and that its resistance is from 400 to 500 pounds per square inch of surface exposed. It is also a well ascertained fact that it preserves iron rather than corrodes it. The cement used throughout the experiment was an English Portland cement. — A. A. S., in the *Polytechnic* (Troy).

THE VENUS DE MILO.



"All the Modern Improvements."—No. 15.

French consul at Milo. M. Dessault met M. Brest at Athens in 1847 and took down the story from his own lips. Here it is:

"One day, in 1820, a peasant of Milo, named George, while working in his field on the slope of the ancient citadel where he had already found many fragments of antique marbles, tore up a cluster of lentisk bushes, and saw, with astonishment, sand and stones roll down into the cavity made by the displacement of the roots. He looked into the hole and beheld what seemed to him to be a cavern inhabited by great white forms. Terrified, he ran to find me, told me his adventure, and said he had just seen some white ghosts in a cave. Thinking that some curious discovery had been made, I ran to the spot with him and verified the existence of several statues in a kind of subterranean crypt. I encouraged George to go on with the excavation, and placed my gardener's services at his disposal to hurry on the work. We were not long before we laid bare the substructure of a small rectangular building. I immediately proceeded to dig it out. The soil of the citadel slope, against the rock of which the temple or crypt was set, had fallen into it; but the arch had resisted the pressure and was almost intact, thus miraculously protecting the immortal masterpiece of Greek art. I then advised George to put in a safe place all the fragments of sculpture which could easily be carried. I observed that the Venus consisted of two portions, which could be easily separated, and that same evening the upper part was safely lodged in the house of its new owner. The Venus at the moment of her discovery, was standing on a square base, plain and without mouldings, about 80 centimetres (31 inches) high. The two arms lay on the ground at the

foot of the statue; one of them bent, held an apple, and upon this apple there were traces of color."

"What color?" asked M. Dussault, eagerly.

"Dame! Why, apple color, to be sure," replied the consul.

"M. Brest went on to say that he had seen the arms separate from the body, but entire, and he had tried to fit them. 'We tried to adjust the arms to the tenons still visible on the statue, and we arrived at the conviction that the bent left arm held the apple, while the other held up the drapery. The terminal Hermes were intact upon their pedestals. The ground was strewn with statuettes and heads, arms and legs and other fragments were still hanging to nails driven into the red stucco of the arched niche, after the fashion of the ex-votos of our madonnas. I have heard the opinion expressed that the Venus had, perhaps, been the object of worship as the Virgin in the first centuries of our era.'"

"And what became of the numerous fragments of which you speak?" asked M. Dussault.

"Well," replied M. Brest, 'I believe they were either stolen or lost. I had them carefully packed, and the seventeen cases which contained them were deposited by me on board of a French ship of war, which was on its way to Toulon. Their receipt was never acknowledged, and I have never heard them spoken of since.' M. Brest went on to speak of the violent objection raised by the Greek priest and the leading inhabitants of the island to the shipment of the statue, but M. Dussault's most urgent inquiries were as to the lost arms.

"The result of his close questioning of M. Brest was to establish (1) that at the moment of discovery the statue was armless; (2) that it is probable that the Greeks who obtained possession of the statue temporarily adjusted the arms to it in a clumsy manner for the purpose of increasing the commercial value of their property; and (3) that the arms, thus badly fixed on, dropped off during the fight which took place when the French sailors gained possession of the statue.

"Some years later, when M. Dussault returned to France, he asked M. Adrien de Longpérier, of the Musée des Antiques, what had become of the seventeen cases sent to Toulon by M. Brest. He replied: 'The terminal busts are in the Louvre.' 'And the arms, why have they not been restored to the statue?' 'We possess only two fragments of the left arm; all the forearm is missing, and it has not been thought advisable to restore so beautiful a statue.'

"The name of M. Longpérier," says M. Dussault, 'bears so great authority, that I said no more, but accepted his reply as conclusive. If it should be objected that the fragments of the arm are only a later restoration after some disaster to the original work, still it is reasonable to suppose that the sculptor who undertook the restoration had authority for his work, or at least was guided by tradition as to the original position of the arms. However this may be,' concludes M. Dussault, 'in view of the positive assertion of M. Brest, there can be no doubt as to the matter; the question is settled. And as to the existence of a second figure grouped with the Venus, the smallness of the original base and plinth of the statue absolutely disposes of the notion.'

"Finally, as a striking proof of the certainty which M. Brest felt in the matter of the position of the arms, M. Dussault states that M. Piscatory, the French minister at Athens, told him that he had had many conversations with M. Brest upon the subject, and that the consul was so anxious to impress upon the minister what the position of the arms really was that he insisted upon throwing himself continually into the attitude of the Venus of Milo.

"M. Brest is dead and gone long ago, but he speaks again through his friend, M. Dussault, with no uncertain voice; and his testimony as the man who, with the poor peasant, first saw the immortal work of the unknown master when the sun streamed into the dim hiding-place where it had stood for ages, must surely be paramount. There is, and can be, no doubt as to the arms of the Venus of Milo."



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

HOUSES ON MARLBOROUGH ST., BOSTON, MASS. FOR C. H. TILTON, ESQ., MR. J. A. FOX, ARCHITECT AND FOR W. SIMES, ESQ., MESSRS. CABOT & CHANDLER, ARCHITECTS.

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

THE CROCKER BUILDING, SAN FRANCISCO, CAL. MR. A. PAGE BROWN, ARCHITECT, NEW YORK, N. Y.

THE Crocker Building which is now being erected by the Crocker Estate Company, at San Francisco, Cal., is designed for banking rooms and stores on first floor, and offices above — and is entirely fireproof in construction. Steel beams and columns are used throughout. The façades are constructed of light granite for the lower stories and light buff brick and terra-cotta of same color,

above. The main corridor shown in one of the drawings is finished in light pink Knoxville marble—with marble mosaic floors. The banking-room of the Crocker Woolworth National Bank of San Francisco, occupying the corner of the first floor, is shown by two views—one taken from above the entrance doors looking toward the vaults: the other from the arcades at either side of, and above, the vaults, looking toward the entrance. This room is entirely finished in yellow Eschallon and black and gold marble—with elaborate marble mosaic floor in low quiet tones of color. The ceiling is richly coffered in decorated panels in stucco. The marble work is to be executed by R. C. Fisher & Co., of New York City. The entire cost of the structure will be about \$1,250,000.

STATUE OF THE MARGRAVE CHRISTIAN ERNEST, BAIREUTH, BAVARIA.

SEE article on "Equestrian Monuments," elsewhere in this issue.

STATUE OF AUGUSTUS THE STRONG, DRESDEN, SAXONY.

SEE article on "Equestrian Monuments," elsewhere in this issue.

[Additional Illustrations in the International Edition.]

MONUMENT TO ADMIRAL TEGETTHOFF, VIENNA, AUSTRIA. CARL KUNDMANN, SCULPTOR.

[Gelatine Print.]

COURT-YARD OF THE PALAIS DE JUSTICE, LEIGE, BELGIUM.

[Gelatine Print.]

ONE who approaches this building from the Place St. Lambert would hardly imagine that the sterile and uninteresting Classic front upon that square concealed behind it a court enclosed within architectural surroundings which are as far removed from classic formality as the poles. The façade on the Place St. Lambert, was rebuilt in 1740, while the façades upon the court remain as built in 1508-40, though restored within the present century. The arcading of the lower story is the chief feature of interest, and illustrates in a measure the Flemish understanding of Renaissance work at that epoch. Each of the fifty-two columns of this arcade is different from all the others in its sculptured detail, though the general form and treatment are alike in all, and all are due to the fertile ingenuity of a local sculptor, François Boret. The same treatment is continued about two sides of a smaller court-yard at the east end of the building which is less easy of access than the large one, which is really a common thoroughfare. In the smaller one, which is made charmingly picturesque with vines, shrubs and trees, are a variety of architectural fragments, evidently the overflow from the Archaeological Museum, which has its habitat in that end of the building. The whole structure is built of granite, or a coarse gray limestone.

ARCADE UPON THE SAME COURT-YARD.

[Gelatine Print.]

THE effect of these corridors is peculiarly good as the vaults are made, seemingly, with a large salmon-colored brick while the ribs are of the same material as the rest of the structure. The same vaulting treatment was employed for the extremely imposing vault of the nave of St. Bavon, at Ghent.

SAN MINIATO AL MONTE, FLORENCE: WEST FRONT. R. W. SCHULTZ, ARCHITECT.

COMPETITIVE DESIGN FOR FLORENCE CATHEDRAL: WEST FRONT. MR. W. BURGESS, ARCHITECT.

GIOTTO'S TOWER AND CATHEDRAL, FLORENCE.

HOLY TRINITY CHURCH, OXFORD ROAD, READING, ENG. MR. G. W. WEBB, F. R. I. B. A., ARCHITECT, READING, ENG.

In 1888, the trustees organized a limited competition for designs for the restoration of the above church, and this design was accepted. Owing to want of funds a portion only of the restoration could be completed, viz, removing galleries, reseating, heating, flooring and various other structural alterations found absolutely necessary for the safety of the building, which was in a very dangerous condition. A design was also prepared by Mr. Webb for a new chancel, the drawing being exhibited in this year's Royal Academy. The external view given this week will be carried into execution as soon as funds admit.

RESIDENCE, ALUMHURST ROAD, BOURNEMOUTH, ENG. MESSRS. ESSEX & NICOL, ARCHITECTS, BIRMINGHAM, ENG.

This is one of a series of houses now being erected in the Alum

Chine, being close to the edge of the cliffs, and commanding one of the finest views of the English Channel. The whole of the front is occupied with windows, the entrance door being placed at the side. It is built with Bridgewater bricks and Corsham Down stone dressings. The veranda is of stone, and carried on granite columns, the roofs being covered with Welsh slates.

BOOKS PAPERS

IN the same series as the little History of Italian Architecture, which we mentioned a few weeks ago, is a pair of volumes on Furniture and Decoration,¹ written like the History of Italian Architecture, by Professor Melani, of Milan, and, in their province, quite as useful. The books are small, the two volumes together containing, with the full-page illustrations, only about five hundred pages, but they are very cheap, two francs each, or eighty cents for the whole work, buying two substantial little volumes, neatly bound in cloth, and offering, besides a learned, but popular text, one hundred and eighteen excellent illustrations of various kinds of painted, carved and inlaid decorative work. These illustrations have the advantage of being somewhat less familiar to us than those in the architectural manual, and are admirably chosen. Those showing classical ornament, particularly, are of the most elegant antique design, and very well drawn, and there is some interesting Romanesque decoration; while the second volume gives, besides architectural ornament, a clear account of the della Robbia manufacture, and the Italian majolica of the sixteenth century. This is followed by a description of the intarsia work of the fifteenth and sixteenth centuries; and the remainder of the book is devoted to furniture, book-binding and similar matters, as practised within the last two hundred years. We are quite sure that many of our readers would find this little work useful in the office, as a help in designing furniture and decorative detail, and some of them may not know what a simple matter it is to procure foreign books of the kind. Of course, any bookseller would import them to order, but importation through a bookseller, according to our experience, is an expensive process, and a very slow one, as the bookseller waits until he has accumulated a stock of orders, so as to have them all filled at once by his correspondent abroad, before he sends over any of them; so it is quicker and cheaper to send a postal money-order for, say five francs, to cover postage, to Ulrico Hoepli, Milan, Italy, with a request that he send by mail the two volumes desired. Nothing more need be done until the books arrive at the purchaser's post-office, where he will receive a notification by mail, directed to the same address as that found on the package of books, to the effect that a package awaits him at the post-office, which he can have by calling and paying the duty, about twenty cents in the present case. This done, the purchaser can carry off his goods.

COMMUNICATIONS

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

WATER FOUNTAINS.

LEXINGTON, KY., August 9, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Would you be kind enough to give me the names of some art foundries which might have fountains in stock.

Respectfully, H. W. ALDENBURG.

[THE National Fine Art Foundry, 218 East Twenty-fifth Street, New York, and the Henry-Bouard Bronze Company, 430 West Sixteenth Street, New York, are as likely as any one to keep such things in stock. The J. L. Mott Iron Works, 84-90 Beckman Street, New York, we believe, keep in stock some simple forms of water-fountains.—EDS. AMERICAN ARCHITECT.]

BOOKS FOR STUDENTS.

August 12, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Would you kindly inform me in the *American Architect's* columns of some of the best books on architecture for instruction and self-study. I have been in an architect's office only a little over a year and wish to study up.

Yours respectfully, FRANK G. PIERSON.

[CLARK'S "Building Superintendence," published by Ticknor & Company; "Notes on Building Construction," to be obtained from J. B. Lippincott Company; Berg's "Safe Building," published by Ticknor & Company; Kidder's *Architect's Pocket-book*, published by John Wiley & Sons; Ferguson's "History of Architecture," "Gwilt's Encyclopædic of Architecture"—EDS. AMERICAN ARCHITECT.]

¹ "Decorazione e Industrie Artistiche," by Alfredo Melani. Milan: Ulrico Hoepli, 1889. Two volumes, price two francs each.

WILLIS ON VAULTS.

DETROIT, MICH., August 7, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Can you tell me where I can find a copy of Professor Willis's book or paper "On the Construction of the Vaults of the Middle Ages?" It may be a book on Gothic in general, or merely vault construction. An early answer to the above, stating price, will greatly oblige me. Respectfully, GEO. W. NETTLETON.

[We cannot find it in any catalogue at hand.—EDS. AMERICAN ARCHITECT.]



A SUBMERGED CITY IN INDIA.—In the eastern part of the district of Kattiawar, to the northwest of Bhownugger, lies the jungle of Peloo, the vegetation of which is composed almost entirely of the *Salvadora Persica*. The surface is a complete level, and the soil a deep alluvial, through which several brackish water-courses slowly run. This jungle now occupies the site of what was once a very large city—Vamila-pura—the surface being in many places strewn with the debris of burnt bricks, resembling those brought from the Euphrates. In the middle there is a circular enclosure of bricks, about 15 feet in diameter, much resembling the Druid-like religious enclosures of the Gonds. The floor is paved with brick, and in the east face of the wall there is a niche containing the remains of an obliterated image. This structure, however, appears to be a modern one, erected from ancient materials. Near this circle, extensive excavations were in progress for the purpose of obtaining the large burnt bricks, quantities of which are dug up from 10 to 18 feet below the surface and sold for building. The neighboring town of Wullay is almost entirely built of them. The floors of several houses paved with large yellow bricks were observed in their primitive level, showing that the city had not been overturned by an earthquake. To the west of the circular enclosure there is a full size granite figure of Nandi, the Bull of Siva, and farther on a large granite lingam mounted upon a pedestal of burnt bricks. If these images are coeval with the ruined city, they would show it to be one of great antiquity; but the inference derived from the enormous size of the slow-growing *Salvadora Persica*, which is found in many places over the ruins, tells against any such supposition. On the verge of the jungle there is a pile of granite slabs, about 10 feet long, 3 feet broad and 1 foot thick, which have evidently formed part of a large building. Some of them have been set up, carved and used as *Palgads*, being dates about 200 years ago. Copper household utensils are said to have been discovered and taken away by the laborers. To the south of the ruins at Cheemarwarra, whence Vamila-pura is said to have derived its supply of granite, immense peaks of this rock are seen rising abruptly from the plain, like islands from the sea, the ground between them being perfectly plain, and to all appearance levelled by the action of water. I have supposed that the present surface had been formed by an overflow of water consequent on some upheaving of the Gulf of Cambay—the fact of such an upheaving being attested by the existence and strata of the island of Perim. From the appearance of the country there can be no doubt that it was once overflowed, and that the waters gradually subsided, leaving the peaks of the hills alone uncovered; and to this deluge, from whatever cause arising, must be attributed the ruin of Vamila-pura.—H. M. Nicholson, in the Architect.

POLISHING WOOD WITH CHARCOAL.—The method of polishing wood with charcoal, now much used by French cabinet-makers, is thus described in a Paris technical journal: All the world now knows of those articles of furniture of a beautiful dead black color, with sharp, clear-cut edges, and a smooth surface, the wood of which seems to have the density of ebony. Viewing them side by side with furniture, rendered black by paint and varnish, the difference is so sensible that the considerable margin of price separating the two kinds explains itself. The operations are much longer and more minute in this mode of charcoal polishing, which respects every detail in carving, while paint and varnish will clog up the holes and widen the ridges. In the first process they employ only carefully selected woods of a close and compact grain, then cover them with a coat of camphor dissolved in water, and almost immediately afterward with another coat, composed chiefly of sulphate of iron and nutgall. The two compositions, in blending, penetrate the wood and give it an indelible tinge, and, at the same time, render it impervious to the attacks of insects. When these two coats are dry, they rub the surface of the wood first with a very hard brush of conch grass (*chien dent*), and then with charcoal of substances as light and friable as possible, because if a single hard grain remained in the charcoal, this alone would scratch the surface, which they wish, on the contrary, to render perfectly smooth. The flat parts are rubbed with natural stick charcoal; the indented portions and crevices with charcoal powder. Alternately with the charcoal the workman also rubs his piece of furniture with flannel soaked in linseed oil and the essence of turpentine. These pouncings repeated several times, cause the charcoal powder and the oil to penetrate into the wood, giving the article of furniture a beautiful color, also a perfect polish which has none of the flaws of ordinary varnish.

A BIG CALIFORNIAN FLUME.—According to the *United States Miller*, a flume of exceptional dimensions has just been completed for supplying water to the city of San Diego, California, and also for irrigation purposes. The whole flume, 45 miles in length, has been constructed on a uniform grade of .75 feet per mile, the water being carried over 315 trestles of varying heights and through many tunnels and numerous

cuts. No fills have been allowed, as with embankments there is always a risk of landslips, trestles being used in every case where these would have been necessary. The whole length is lined with redwood, which is said to be everlasting. The water is drawn from an artificial lake of 900 acres formed by the Cuyamaca dam, which is 720 feet long and 35 feet high. From here it is led along a natural flume to a diverting dam, where another lake is formed. This dam is 400 feet long by 35 feet high, and from this point the flume proper begins. Some of the longest trestles are: the Sweetwater Pass, 1,264 feet long and 81 feet high; Sweetwater Pass No. 2, 720 feet long and 25 feet high; Sycamore Creek, 720 feet long and 35 feet high; Connor Creek, 688 feet long and 34 feet high; Knob Creek, 600 feet long and 55 feet high; Cut-off, 640 feet long and 48 feet high; Los Coches, 1,064 feet long and 70 feet high; Sand Creek, 600 feet long and 58 feet high; South Fork, 420 feet long and 86 feet high; Quail Canyon, 500 feet long and 68 feet high; Monte Tunnel, 438 feet long and 60 feet high; Chocolate, 450 feet long and 63 feet high; and over 300 smaller ones. The most important tunnels are: Lankersheim, 1,900 feet in length; Los Coches, 313 feet; El Monte, 290 feet; Cape Horn, 700 feet; South Fork, 200 feet; Anderton, 270 feet; and Sand Creek, 430 feet. These are through solid rock of granite or slate 6 feet square, cemented and arched overhead, supports being placed wherever the rock is soft or has any indications of falling. The flume is 6 feet wide and 4 feet deep, and its capacity when flowing full is said to be 65,000,000 gallons daily.

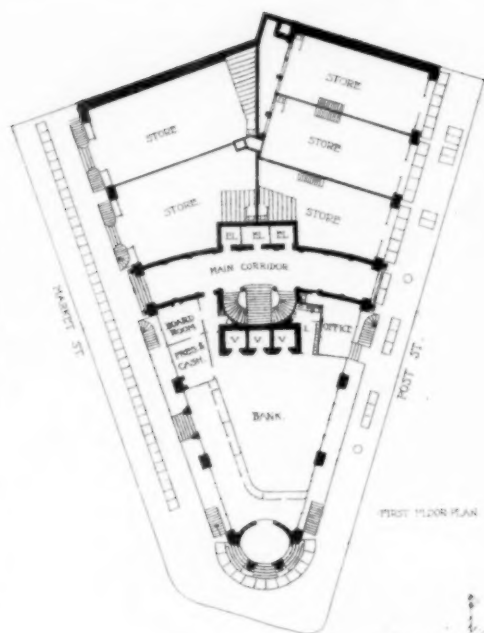
FIRE ON MT. ATHOS.—Advices from Athens announce a most disastrous fire upon the celebrated Mt. Athos, the holy mountain of the Greek church. The fire has destroyed the largest part of its wonderful forests. Of the 20 Greek monasteries which have been located upon the mountain for centuries most have been completely destroyed. The damage is estimated at 5,000,000 f. Twenty monks and hermits perished in the flames.—*Boston Herald*.



ENGINEERS, contractors and builders of large works are anticipating and preparing for an immense amount of work during the coming twelve months—this work covering every kind of construction, from railroads, tunnels, bridges, elevated roads, down to ordinary warehouse building. From reliable sources it is learned that the leading railroad companies will expend a great deal of money upon improvements—their expenditures in many cases running into the millions. American railroad managers are ambitious to put their properties in the best possible condition, and are profiting by the example of British railway management. False economy will no longer be practised by our trunk-lines, and engineers are now at work upon a variety of improvements and additions which will put many of our roads into better condition than ever before. A great deal of additional mileage is to be constructed next year, in the way of feeders, extra tracks and the like. A close study is being made of the requirements of the trunk-lines doing business between New York, Chicago and the far West. A recent estimate of the total railway mileage of the world gives the figures for 1888 at 571,771 miles, as against 548,035 for 1887 and 470,197 in 1884, while the figures for 1880 are 372,077 miles. Railroad construction is increasing faster than any other instrument of progress. Leading engineers consider railway building yet in its infancy, and assert that during the coming five years countries now almost without mileage will be more or less abundantly supplied. Rail-making, and the manufacture of all kinds of railway equipments and supplies, will be one of the leading industries of the next few years, and the United States will not fall behind other countries in the efforts to secure a fair share of the new business. We are, of course, debarred from several of the valuable markets of the world by distance and lack of transportation facilities; but there are agencies now at work which may possibly result in the opening up of some of these foreign markets to American capital and enterprise. The rail-makers recently held a meeting, and now state that business is in excellent condition and prices about to advance. This is scarcely probable, however. Tables of railway earnings and dividends show a prosperous condition of business. The money markets continue active, but the rates of interest among the smaller borrowers, especially in the West, are advancing. According to reliable reports there is an urgent need for funds in many Western cities, and it is probable that lenders will take advantage of this necessity. Fall business is opening up favorably, and it is quite certain that the business of the last four months of this year will exceed that of the same time last year, to the extent of at least 10 per cent. Activity prevails in all of the little industries, and the newer States are being overrun with business men and capitalists hunting out favorable opportunities for work. The tardy course of Congress is causing a great deal of concern in some of the industries which will be most directly affected by the contemplated legislation. The textile workers are busy, but there is a feeling of anxiety and reserve which interferes with the plans and purposes of the more enterprising. The smaller industries throughout New England are prosperous. Business in the South Atlantic and Gulf States is good, and the crop of new enterprises is unusually large. Returns show good management and favorable trade conditions. There is more confidence in business, commercial and financial circles than has been noticed for years, and for a variety of reasons, among which may be mentioned the fact that railway changes are more under control of established authorities, and there is less disposition than formerly to unsettle rates. Then, again, there is scarcely any symptom of a speculative movement: the extraordinary activity in the buying and selling of land is unattended with any speculative fluctuations in value. The rapid decentralization of industries now in progress is creating new markets in the West and South. There is a general feeling of confidence that the volume of currency will be sufficient for business requirements. The courts show a determination and ability to hold trusts and monopolistic combinations to a strict account. The politicians show a desire to honestly represent the wishes of the people, so far as they understand them. There are no dangerous or alarming questions to be discussed—no troublesome issues likely to arise. All these facts have their weight with the business interests and help to strengthen confidence.

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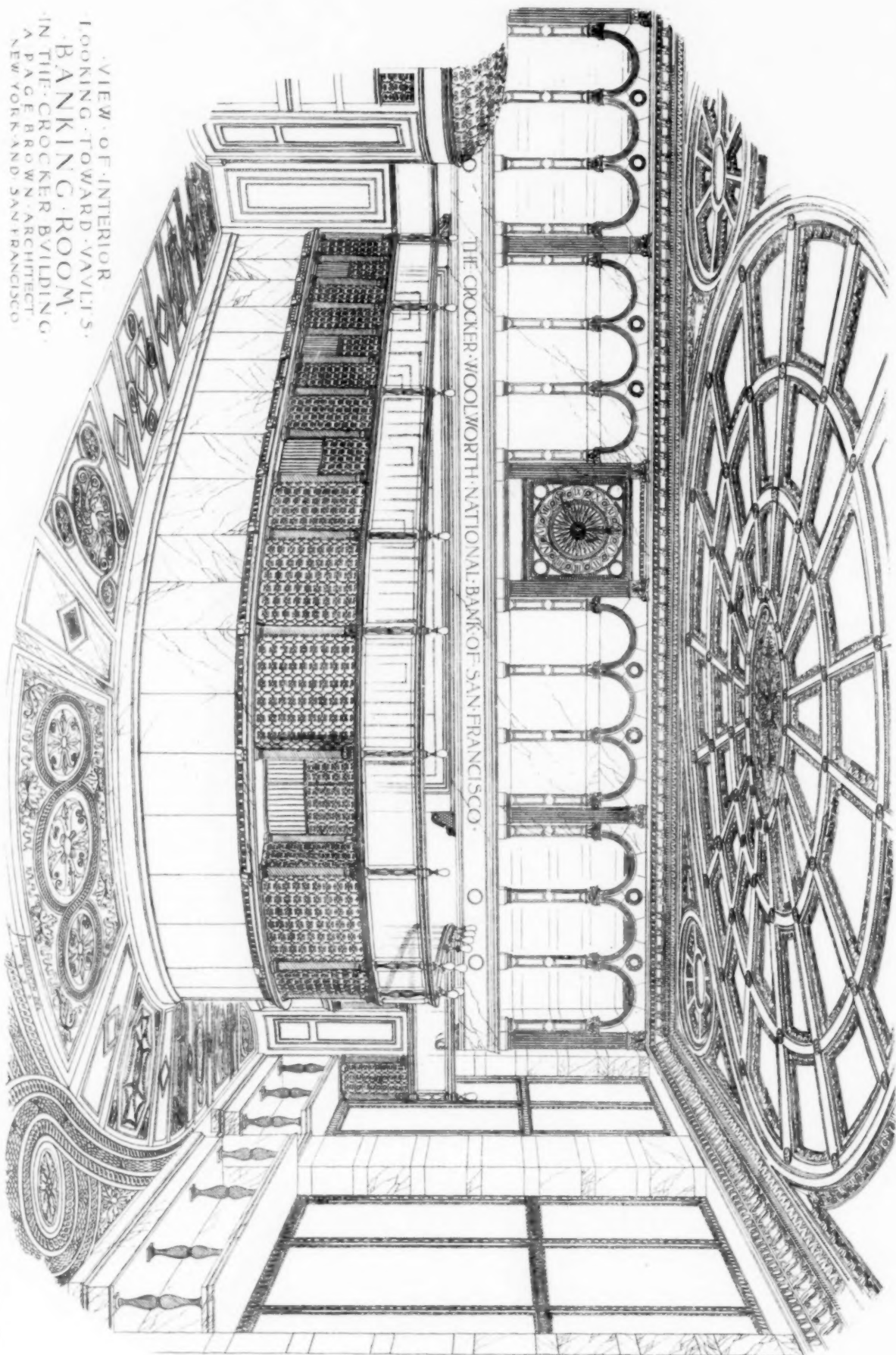
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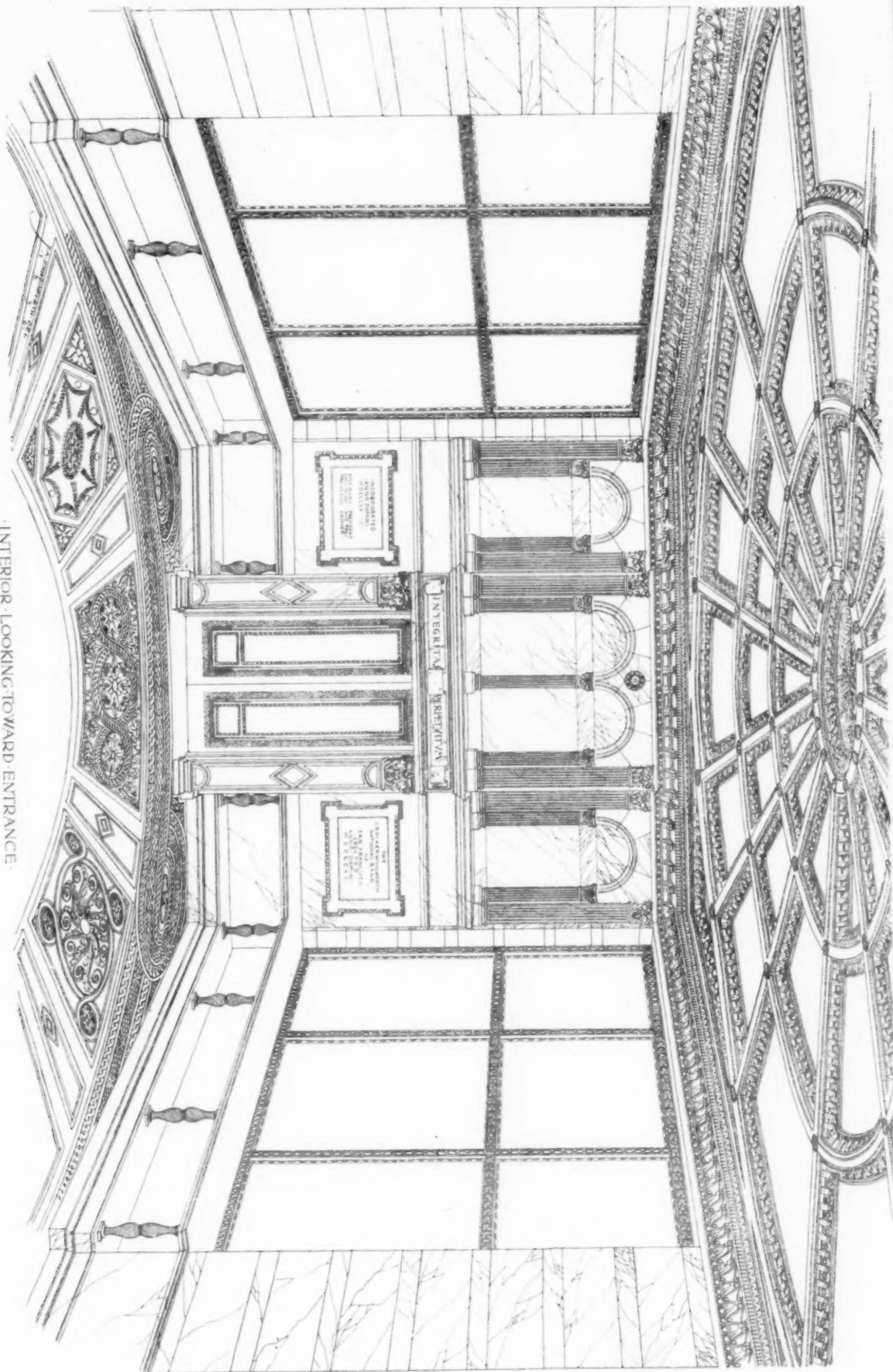
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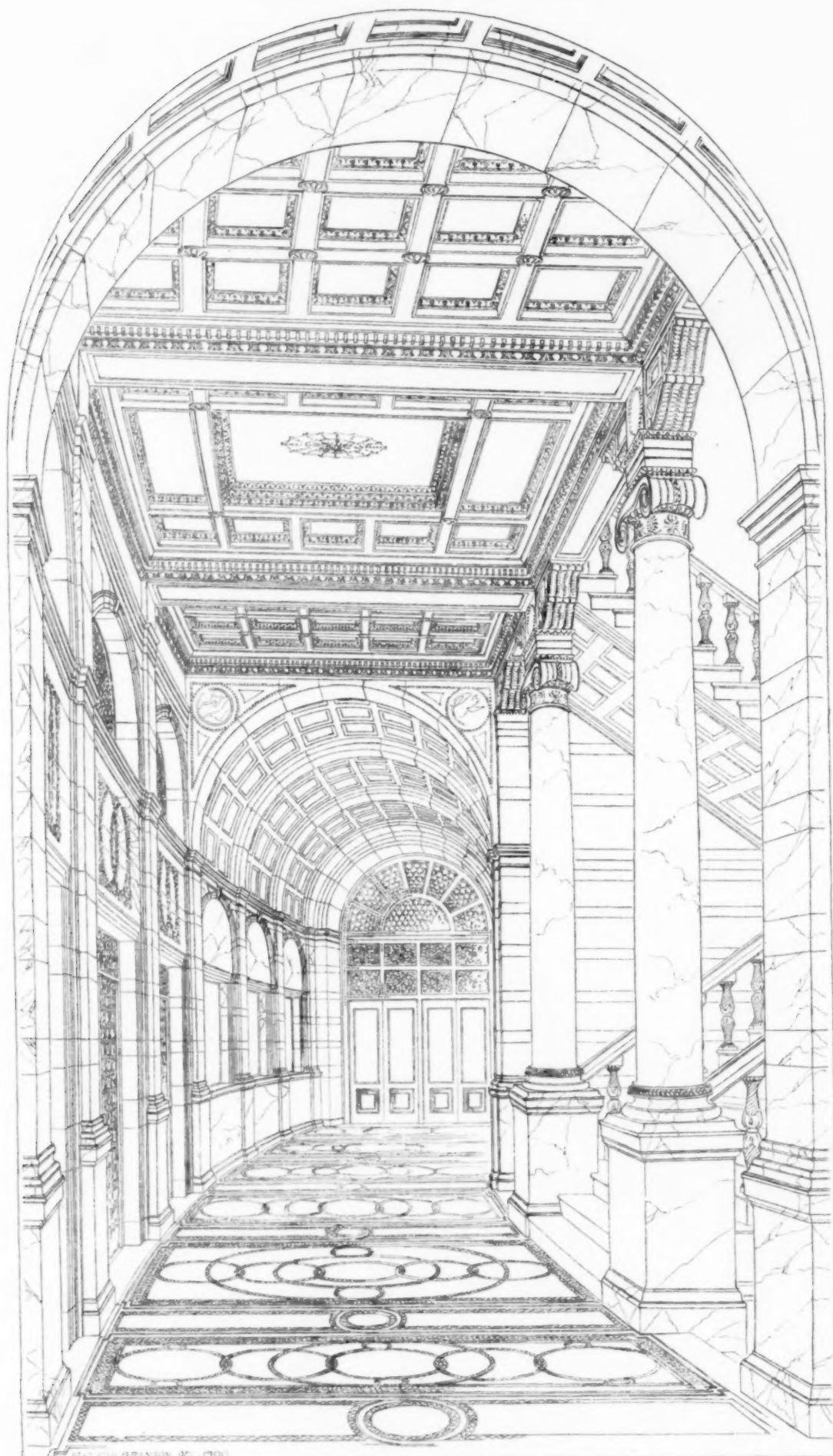
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LOOKING TOWARD VAULTS
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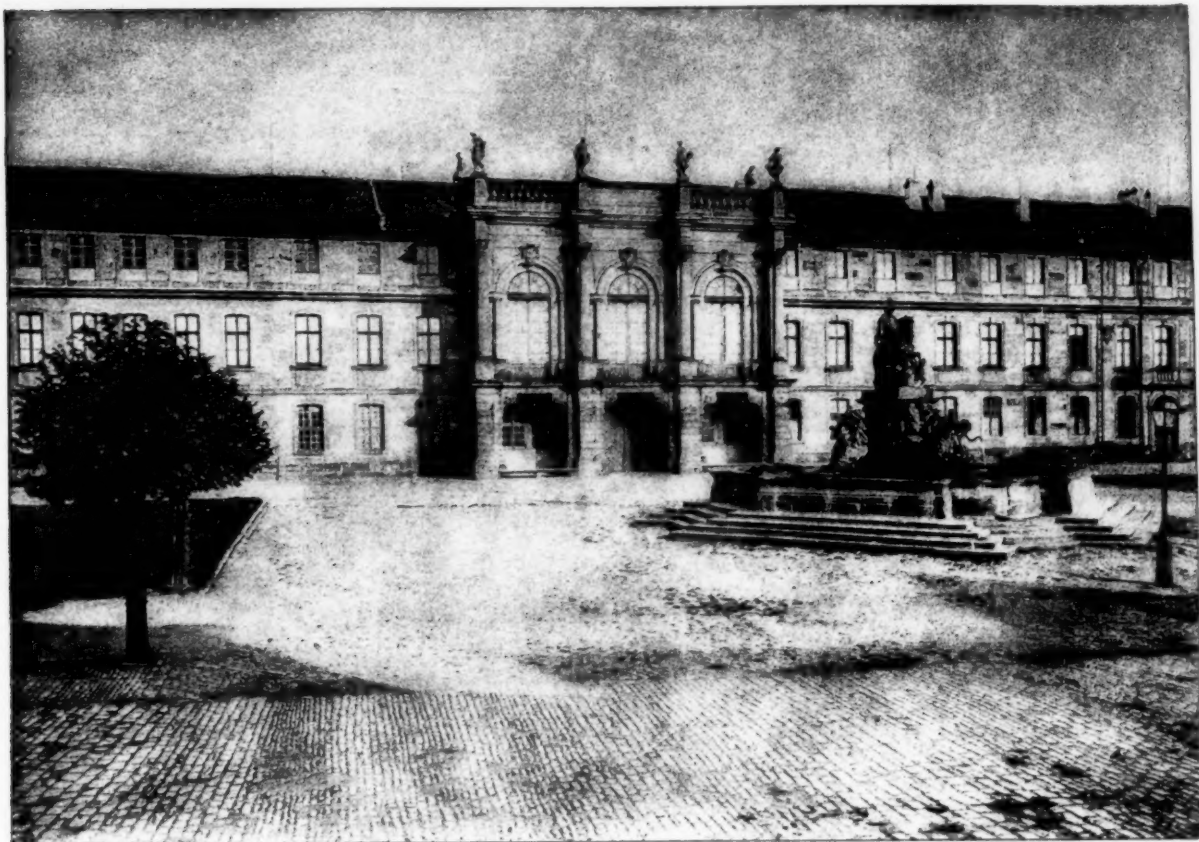
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