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THE *Record and Guide* points out the great advantages which present conditions offer for building, particularly in New York. Not only is land cheap there, as compared with its ordinary value, but materials of nearly all kinds can be bought at prices ranging from five to twenty-five per cent lower than those current last year, which were then considered very low. Structural iron is officially quoted at prices lower than ever before, and it is currently understood that contracts can be made for it at prices under the market quotations. Bricks cost, in New York, only about two-thirds as much as they did last year, and spruce lumber about three-quarters. The only element in the cost of building which nominally maintains its price is labor, but, although the walking-delegates fiercely resent the idea that any reduction of wages is probable, this does not prevent such men as can find employment from working with unaccustomed diligence and care, in order to keep their places, so that the result is practically the same as that of a substantial reduction of wages. With all these advantages on his side, the *Record and Guide* thinks that the investor or real-estate speculator will not for many years be able to use his money to such advantage as now, and we take pleasure in finding the opinion which we expressed some weeks ago confirmed by so eminent an authority.

THE current number of *Architecture and Building* contains an editorial, headed "Allies in New York's Dishonor," and devoted to matters connected with the competition for the new City-hall, which we cannot approve, and representing, we hope, some portion of the profession, we would like to disclaim, for that portion, any participation in the sentiments expressed in it. The editorial in question accuses the Mayor of making "efforts to prostitute the city's honor in making a fiasco of the competition for the new City-hall, with the probable after-result of throwing the whole thing into politics"; and it denounces the *New York Times*, *Tribune*, *Herald*, *Mail and Express*, the *Record and Guide*, and various persons and associations, for "supporting" the Mayor in his "effort to squash the competition." So far as we know, there is not the slightest reason for supposing that Mayor Gilroy desires, or ever has desired, to act otherwise than fairly in the matter; and the idea that he or his friends could be benefited politically, either by throwing away the chance of securing for the city one of the most splendid buildings in the world, or by alienating a great body of architects, artists and fair-minded citizens by any underhanded rascality, seems to us too absurd for con-

sideration. In the same way, the accusation that the people who think that the old City-hall, and the Park, ought to remain as they are, express that opinion simply for the purpose of "playing into the Mayor's hands," is unworthy of serious attention. In point of fact, the only rumors of unfair and dishonorable action in the matter that have come to our ears, which seemed either well-sustained or plausible, have related to the architects themselves. It is a matter of history that some of these, who were not personally concerned in the competition, have interfered in the affair in a way which, as they must have known, may seriously affect the interests of those of their brethren who were participants; and stories are in circulation which indicate that one or two, at least, of the competitors have endeavored to push their own cause by very questionable means. It cannot be too often repeated that architects must not expect to be treated by persons outside the profession better than they treat each other; and if architects choose to take the lead in discrediting or defrauding their brethren, they need not complain if the public follows their example.

LE *GENIE CIVIL* gives an interesting account of the seashore hospitals of Europe, particularly of France, written by M. Henri Mamy. It has long been a part of popular medical knowledge that scrofula, by which is generally meant a constitutional derangement, showing itself sometimes by eruptions on the skin and sometimes by the feebleness and deformity known as "rickets," although not itself very fatal, conduces strongly to fatal tuberculous diseases. In fact, M. Mamy says that French medical statistics show that out of the annual average of 800,000 deaths, 172,000 are due to tuberculous diseases; and that about forty-one per cent of those who die from tuberculosis have previously had scrofula. According to these figures, seventy-three thousand people die every year, and many thousand more are crippled or made helpless, from scrofula; yet scrofula is not only curable, but easily curable, as the French physicians think, by a regimen in which the breathing of pure air forms much the largest part. For the purpose of applying this regimen to those who need it most,—the children of poor families, who cannot afford fresh air or healthful surroundings,—nearly all European countries have established seashore hospitals, devoted to this class of patients. Italy, with a population of only about twelve millions, supports twenty-six of these hospitals; England has five or six; and France has fifteen. The latter country possesses the great advantage of extreme diversity of climate, and the manner in which the patients of different classes are assigned to establishments suited to their condition is interesting. It is hardly necessary to say that patients in whom tuberculosis, either pulmonary or visceral, is actually developed, are not sent to seashore hospitals; but the damp atmosphere, which would generally be injurious to them, is found to be extremely beneficial to those in whom the diseased condition has not progressed beyond the scrofulous or rickety stage. Among the French hospitals, those on the north coast are found to suit feeble and anæmic children, who, if taken there at the age of a year or a year and a half, when rickets usually makes its first appearance, gain strength with marvellous rapidity, and, if allowed to stay long enough, are almost always permanently cured. The hospitals on the west coast, where the air is warmer, but extremely moist, are found to suit nearly all scrofulous patients, but particularly nervous and impressible children. As a rule, patients with any trace of pulmonary tuberculosis are not sent there, but there is an establishment at Arcachon, which is buried in pine forests, and so sheltered that even consumptives may do well. The third class of hospitals is situated on the Mediterranean shore, and these are found particularly favorable for nervous and excitable subjects, and for those the condition of whose lungs is in doubt. M. Mamy says that an essential element of success is that the treatment should be prolonged. One or two years is necessary for complete cure; and it is found that a continuous sojourn is much more effective than short, repeated visits. It certainly seems as if this admirable example might be followed here. We have a range of seacoast climate quite equal to that of France; our mortality from tuberculosis is, proportionally, about the same, and we have just as much affection for our children, and more money with which to show that affection. Nearly all the seashore

hospitals in France have been built, and are maintained, by private generosity, and among the names of their benefactors those of women are most conspicuous.

A RECENT decision shows that the French courts take a curious view of an architect's contracts with his employer.

An architect, named Avezard, was engaged by one Bosquet to carry out certain work. Whether Bosquet and Avezard had any preliminary discussion as to the fees to be paid to the latter does not appear, but, in the contract between Bosquet and the builder for the erection of the structure in question, a clause was inserted, which said that it was "mutually agreed" between Bosquet and Avezard that the latter should be paid five per cent on the total cost of the building, as estimated by Avezard, without deducting the contractor's discounts; and that a similar commission should be paid on extra work, reckoned in the same way. This contract was signed by Bosquet and the builder, but not by Avezard. It will be remembered that, in France, the preliminary estimates are always made in accordance with an official price-list, covering all the details of building work, valued at maximum rates, and contractors, instead of offering to do the work at a lump sum, often make their tenders in the form of a discount, which they propose to make from the official price-list, and which, in practice, often reaches twenty-five or thirty per cent where the conditions are favorable for building cheaply. It is obvious that, under these circumstances, to calculate the architect's commission on the gross estimate, without deducting the discount, or "rabais," is equivalent to adding one-third or one-half to his fees; and if the architect is allowed to make the rough estimate on which his fee is based, the addition may be still larger.

BOSQUET died while the work was going on, and, after its completion, Avezard sued his heirs for a balance of commission which he alleged to be due him, amounting to 3,510 francs. He had been paid 7,000 francs, and it was proved that the total cost of the building was 128,320 francs. The Bosquet heirs maintained that Avezard had been overpaid, and they alleged, moreover, that he had not delivered to them the plans and papers relating to the building, as it was his duty to do, so that he had not fulfilled his contract with them, and, being himself in default, could not require payment, even if anything were due him. Avezard rested his claim on the contract, signed by Bosquet, and said that he was ready to give up the papers relating to the building when his bill was paid. The Tribunal of the Seine made several interesting rulings. In regard to the clause in the contract, fixing the fees to be paid, it said that, as it was signed, in connection with the other portions of the building-agreement, by Bosquet, but not by Avezard, it was not binding between Bosquet and Avezard. "But," continued the Court, "even if the said clause, . . . inserted in the strangest fashion in the building contract, in the place where should be found a clause relative to the mode of payment to the contractors . . . had nothing suspicious about it, and had been regularly signed, as a clear and definite agreement, both by Bosquet and Avezard, it could not form an obstacle to the sovereign right of the Tribunal to regulate and fix the fees of Avezard, who is only a salaried agent." The Court explained that the law, in giving to the tribunals the right to fix the compensation of an agent, keeping in view his care and trouble, and the importance of the service rendered by him, even though the agent might have stipulated in advance for a fixed compensation, and received promise of payment in accordance with his stipulation, intended to protect the interests of those who, finding themselves engaged with agents disposed to exaggerate their personal merit, and the importance of their services, had been unable to resist successfully the demands made upon them. This principle, the Court thought, was applicable to the case of Avezard. According to his own statement, he had based his claim for commission on an estimate nearly double the actual cost of the building, and the Court said that it was evident that an architect could not be permitted to calculate his fees by a system which would authorize him to fix them arbitrarily, since he would only need to make estimates much too large to arrive at the most exaggerated standard of compensation. Taking into consideration, therefore, the actual cost of the building, on which the Court thought that five per cent commission should be allowed, and adding something for expenses and extra time spent, the total sum properly payable to Avezard was found to

amount to 7,252 fr. 92 c. which, as the Court said, was enough to pay him honorably. Of this, 7,000 francs had been paid, leaving a balance of 252 fr. 92 c., which the Bosquet heirs were ordered to pay, with the costs of the suit, and interest from the date of the writ; and Avezard was directed, when this payment was made, to deliver to the Bosquet heirs the papers relating to their building, but was instructed that he need not do so until the money was paid.

AT a recent meeting of the American Chemical Society, in Baltimore, a paper was read on the subject of expert testimony by chemists in criminal cases, which strikingly confirms the views which we have long maintained in regard to such testimony in building cases, and which Mr. Tidd lately presented, in a very forcible manner, as applied to the expert testimony of engineers. According to the writer of the paper before the Chemical Society, who has had experience in such matters, it is very desirable that, in murder trials, the expert witness or witnesses, upon whose testimony the case frequently turns, should be summoned by the court, and should make their report to the judge, instead of being engaged by the lawyers on either side. The writer says, just as we said recently in regard to building or engineering cases, that criminal lawyers consider that the expert belongs to the side that employs him, and that his testimony must be made to fit their theory of prosecution or defence; and we need not add that if they can contrive to make it do so by misleading him a little as to facts outside of his own knowledge, they will sometimes take advantage of his want of caution. More than this, however, the writer of the paper says that experts, in his experience, are only allowed to answer the questions put to them, and, unless it can be brought out in reply to a direct question, they may be unable to give information which would materially modify the impression produced by their testimony. We have called attention to the fact that lawyers, by skilfully worded questions, generally contrive to get from an expert, even against his will, answers which will confirm the impression that they desire to make; but, in most courts, experts are privileged witnesses, and would be allowed to qualify, even without a direct question, testimony which without such qualification would be misleading. Our writer, however, gives an instance where, in a murder trial, an expert chemist, who had analyzed the contents of the stomach of the victim, and had found therein zinc and arsenic, was called upon to testify to having found the arsenic, but was not allowed to mention that zinc had been found with it. The body had been embalmed after death, and, to a chemist, there was no doubt that the zinc, and, very probably, the arsenic, had been injected into the body after death, as components of the preservative fluid used by the embalmers. To have testified to the presence of zinc and arsenic together would probably have led to inquiries, on cross-examination, the result of which would have been favorable to the person accused of the murder; but the expert was engaged for the prosecution, not the defence, and he was only allowed to say just enough to give the jury the impression, which he probably did not himself share, that the arsenic had been feloniously administered to the victim, in order to cause his death. Decent people will probably think that a prosecuting attorney who would deliberately suppress and distort the truth in this manner, in order to secure the conviction of a person who, if all the truth were allowed to be told, might be acquitted, was little less than a murderer himself; but prosecuting attorneys like to gain their case as well as the attorneys for the defence, and honorable scruples about the means to be used for accomplishing this result are not generally more noticeable on one side than the other. Our chemical writer, speaking from his observation, says that "A reliable chemist, brought into a murder trial by the court, for the express purpose of finding out the truth, whoever might be affected, would serve to bring about a new state of affairs in ordinary criminal trials." The same thing might be said of trials involving building and engineering matters, and it seems to us that all the professions interested ought to combine their efforts without delay to bring about a better system. If the State or National organizations of chemists, physicians, engineers and architects could this year appoint committees to work together in drawing up proper measures for submission to the Legislative authorities, seconding their efforts, perhaps, by addresses to the public, another winter ought to see the reform practically begun, and experience of its benefits should insure its rapid spread.

PUBLIC SQUARES.¹—III. THE BUILT UPON SQUARE.



Fig. 43. Lessing Theater, Berlin, Prussia.

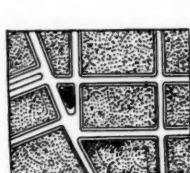


Fig. 44. Trinity Place, Berlin, Prussia.

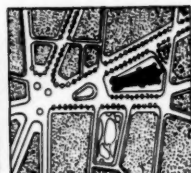


Fig. 45. Eglise de St. Augustin, Paris, France.

IN the arrangement of a mere fore-square, the sides are not considered when the building stands between others, or they are of secondary consideration when the building is surrounded by mere side streets or alleys.

The building that is located so as to be open or free on several or all sides, so that the architecture may be treated with dignity, stands upon what we have above designated as the "built upon square." The requirement of a suitable distance for viewing the structure applies to all the sides, while that of good distant perspective effect can be restricted to the main view.

It is a duty in the laying-out of a city to create suitable positions for the public buildings and their open squares. The necessity of having an open space around a public building is the only excuse for the arrangement shown in Figure 43.

It is not sufficient in laying-out a city to be content with accidental open places that have no axial or artistic relation to the streets, (Fig. 44). An illustration of the use of a similar square as the site for a monumental building is given in Figure 45. In this instance, the shape and arrangement of the square are not left wholly to chance, for by giving the continuation of the Boulevard Malesherbes a



Fig. 46. Place de l'Opera, Paris, France.

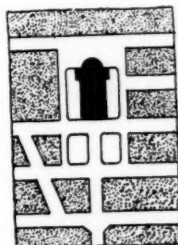


Fig. 48. St. Paul's, Copenhagen, Denmark.

slight inclination in its direction as it enters the square an axial position is thus obtained for the church which can be seen from both near and far.

The arrangement of the Place de l'Opera at Paris (Fig. 46) is equally effective.

The City-hall Square at Philadelphia (Fig. 47) and the Kirchplatz at Vienna are not so successful as the above cases, because they disturb the traffic. Even the Piazza di Castello at Turin is to be criticised in this respect in spite of its great size, as the building imposes too much restraint upon the traffic.

This defect is avoided in Figure 48, in which the axial position of the church is effected without hindering the traffic, and a view of the architecture from the neighborhood is possible.

Less to be praised is the Zionskirchplatz at Berlin (Fig. 49) and still less the spaces about St. Paul's, London, St. Stephen's, Vienna and others which, although offering a good view from a distance, are still so restricted in size that it is impossible, comfortably to view the building near to.

Examples of squares that are too extensive are not scarce, but the effect of emptiness in such squares may be removed or diminished by furnishing it with plantations and smaller decorative buildings. Such a remodelling of the Belle-Alliance Platz at Berlin has made less apparent the disproportion between the thin column and the immense square. The church in Figure 50 probably suffers in comparison with the large extent of water.



Fig. 47. City-hall, Philadelphia, Pa.

It is evidently difficult in laying-out a city plan to prevent errors of proportion between the square and the buildings that are to be placed upon or around it, as the designer does not know anything of their probable size. Many mistakes, however, will be avoided, if he proportions the square to some suitable buildings as he imagines them. The rest must be entrusted to the common-sense of futurity.

¹A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 946, page 67.

Examples of beautiful "built upon squares" are those on which about the Madeleine at Paris, the Cathedral at Orleans and the Cathedral at Rheims, all axially located, with extensive open surroundings; in a less degree, the Münsterplatz at Ulm (Fig. 51) and the Münsterplatz at Freiburg (Fig. 52) are noteworthy.

The arrangement of three rectangular blocks shown in Figure 53 is not generally advisable and can be adopted only in large cities when enforced by necessity and when the proportions between the

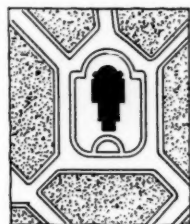


Fig. 49. Zionskirchplatz, Berlin, Prussia.

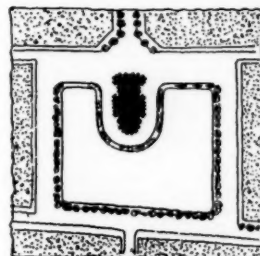


Fig. 50. Johanneskirchplatz, Stuttgart, Wurttemberg.

square and the buildings are as good as in this example. If the garden part of the square were not too much cut-up by the diagonal crossings, and garden plantations were arranged around the churches, the ever-effective contrast between architecture and nature would make this square one of the most beautiful in Berlin.

The "built upon squares" are of the greatest decorative value to the city, for they are, more than the others, useful in determining the position of the streets and in forming the terminal points of long lines of sight. In this respect Paris is far in advance of all other large cities.

The Arc de Triomphe, the Opéra, St. Augustin, La Trinité, Notre-Dame-de-Lorette, St. Vincent-de-Paul, the Madeleine, the Strasbourg Station, the Halles Centrales, the Trocadéro, the Church of the Invalides, the Luxembourg Palace, the Odéon, the Panthéon, the Belvedere-des-Buttes-Chaumont and many other well-known buildings form the points of interest, larger or smaller, of one or more street perspectives.

Many of the streets are so picturesquely arranged that the terminal feature is seen only over intervening groups of houses. Beautiful examples of this are the Boulevard St. Michel, which, seen from south to north, leads the eye across the Seine to the Palais de Justice, over which rises the *flèche* of the St. Chapelle; and the Avenue Friedland which has in its axis prolonged the cupola of the Church of St. Augustin.

Paris is particularly rich in architectural compositions, frequently made more effective by placing the buildings on elevations and often in relation to plantations lying lower. Examples of this last are the Madeleine, La Trinité, St. Vincent-de-Paul, St. Sulpice, St. Clotilde, the Trocadéro, the Sacré Cœur and others.

Another instance of beautiful indirect street perspective is the view of the Houses of Parliament from Whitehall Street, London.

In street perspective, proportions must be carefully considered. Long and broad traffic streets cannot be directed towards small decorative buildings or statues without weakening the effectiveness of the latter.

Mediæval buildings especially do not require extensive open places around them—in this respect both the Cathedral at Milan and Notre Dame at Paris suffer.

The "Built around Square."—These squares do not require long street views leading from them. They are in themselves artistically



Fig. 51. Münsterplatz, Ulm, Wurttemberg.

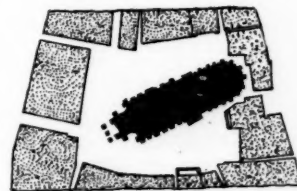


Fig. 52. Münsterplatz, Freiburg.

effective where there has been provided a comprehensive view, good sky-lines and an enclosing frame of pleasingly-grouped and correctly-proportioned buildings.

Regularity of shape is not a necessity, as shown by many monumental squares, but the irregularity must be a growth founded in the nature of things and neither arbitrary nor designed. Then an irregular square may be even remarkably beautiful and picturesque. The relation of heights is of great importance. A square that has

a decided slope or is very warped does not adapt itself to being built around by monumental structures. It is possible to use the higher side for a monumental building, the sloping square being treated as a terraced and planted fore-square to it; but the three remaining sides are not proper sites for monumental structures.

Slight inclinations, like the designed sinking of the centre of the oval in front of St. Peter's, Rome, are not objectionable, but the artificial raising of the centre should not be attempted.

An architectural square needs a frame: a place which is open on all sides to radiating streets, or which is enclosed merely by fence-walls or plantations, does not give

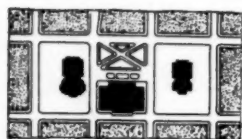


Fig. 53. Gendarmen-markt, Berlin, Prussia.

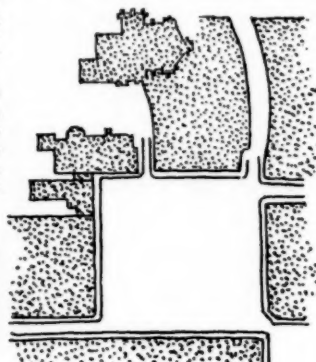


Fig. 54. Groote Plaats, Veurne, Belgium.

the impression of an architectural character, but only that of an unrestful street-crossing or street-enlargement. The square must be surrounded by buildings in such groupings as to give a balance to the masses, and at the same time variety and unity. The entering streets are features of secondary importance to the buildings and when necessary their entrance to the square should be concealed by a grille or portico. The idea of an architectural frame for a square is derived from the old palace courts.

The square must permit a view of all the surrounding buildings from a desirable distance. The proper proportions of size between the buildings and the squares we shall treat of later. In squares that are too large, the buildings lose in importance and effectiveness, and in those that are too small the distances for properly viewing the buildings are too restricted.

A series of "built around" squares are given in Figures 3, 5, 6, 8, 10, 11, 54, 55, 56, 57, 58.

In the Groote Plaats at Veurne, Belgium (Fig. 54), the City-hall and Court of Justice are situated in the corner without axial position. The cathedral rises beyond the square over the low houses which form its framework. It is remarkably picturesque and certainly a growth which cannot be created new in our times.

Figure 3 is closely allied to Figure 5: one corner contains the city-hall with the bourse, through which a passage connects with the outer street; on the long side across the square stands the post-office building, and above the small market-houses looms up the Church of Mary. The well in the centre, a feature lacking in Figure 5, adds much to the beauty of the square.

Similar arrangements are to be found in the Mediæval market-places of many other cities as, at Paris, the Church of St. Gervais and

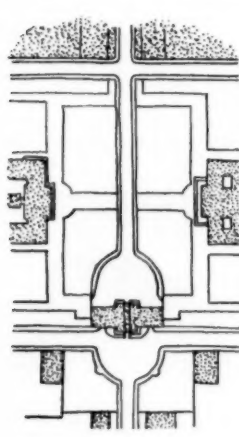


Fig. 55. Königsplatz, Munich, Bavaria. 120m. x 185m.

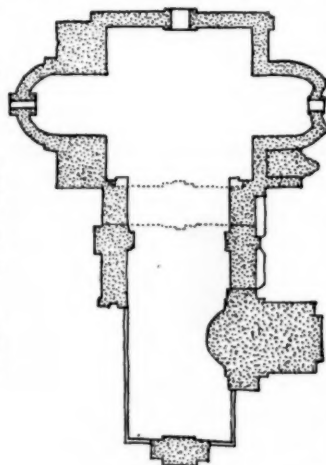


Fig. 56. The Zwinger, Dresden, Saxony.

the Hôtel de Ville; at Rheims, the Cathedral and Palace of Justice; at Orleans, the Cathedral and the City-hall.

One of the best-known and most celebrated of the "built around squares" is that of St. Mark's at Venice (Fig. 6), 175 m. long and a width varying from 58 m. to 90 m. It is enclosed by the two council

buildings, St. Mark's Church and a part of the Doge's Palace. The main view is directed towards the church which does not stand in the axis. Its unsymmetrical position is not apparent, however, on account of the erection of the Campanile and the celebrated three flag-staffs on the larger of the cross dimensions.

The Piazzetta, sharply cut off from the Piazza by the Campanile, is in reality only a street of approach from the lagoon to the Piazza, but by virtue of the surrounding buildings and the two decorative columns, it is considered as an independent square. Of great beauty and of modest dimensions is the Piazza dell' Annunziata, Florence (Fig. 8). It is surrounded on three sides by arcades. The equestrian statue of Ferdinand I and two beautiful fountain-bowls constitute the decoration. In Verona the small Piazza dei Signori and the roomy Piazza Brà furnish two beautiful examples of the "built around square."

The Piazza del Campidoglio (Fig. 10), Rome, by Michael Angelo, is probably the most noble of all. It is trapezoidal in shape, increasing in breadth from the head of the ramp to the Palazzo del Senatore. A steep ramp in the long axis leads up to the square from the Via di Araceli. At the foot of this ramp are the two Egyptian lions, and at the summit, on the angles of the balustrades, are two colossal statues, in marble, of Castor and Pollux standing by the sides of their horses. Near these, on the balustrade, are the celebrated sculptures called the "Trophies of Marius," and in the centre of the square stands the famous bronze equestrian statue of Marcus Aurelius. On the three sides of the Piazza are the buildings designed by Michael Angelo. The central one is the Palazzo del Senatore, that on the west side is the Palazzo del Conservatore and that on the east contains the Museo Capitolino. The upper balustrades of these buildings are crowned with thirty-two ancient statues. On the right of the ramp a winding roadway leads up to the square,

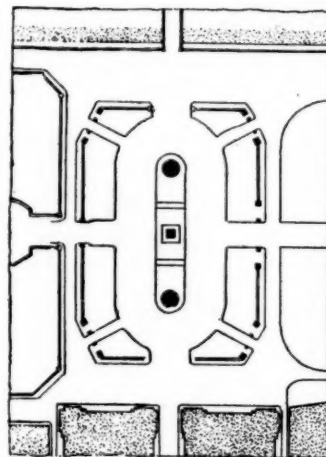


Fig. 57. Place de la Concorde, Paris, France.

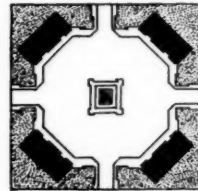


Fig. 58. Amalieborg-platz, Copenhagen, Denmark.

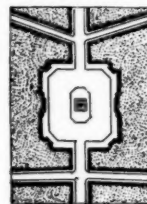


Fig. 59. Place Vendôme, Paris, France.

and on the left, the imposing stairway, to the Church of S. Maria in Araceli.

The Place Stanislaus at Nancy (Fig. 11) is one of the most beautiful in Europe. The city-hall is on the main side, the adjacent sides being enclosed by similar high palace façades, and the fourth side by two low-standing cafés, which serve as a foreground to the Porte Royal outside. The four corners and the one street, Rue Catharine, are closed off by gilded iron grilles. Two of the grilles decorate corner fountains, the remaining three serving as gates. The Rue Stanislaus is the only one that enters the square unobstructed. The Place Vendôme, Paris, (Fig. 59) is not as successful as the Place Stanislaus, although surrounded by high palaces and containing the celebrated column. The corners of the square are chamfered and the centres of the long sides emphasized by projections.

The Amalieborg-Platz at Copenhagen (Fig. 58) is unique by virtue of the arrangement of the four civic buildings in the four corners. In the centre stands an equestrian statue, and at the main entrance, a triumphal gate. The proportions of the square are very good. It is not valuable, however, as an example for imitation, as four similarly grouped monumental buildings and two intersecting streets with but little traffic are difficult to obtain. A disadvantage with this, as well as with the Stanislaus and Vendôme squares, is that they must be crossed by the general traffic.

The dimensions of the Königsplatz at Munich are excessive, and if reduced one-third, the three buildings, the Glyptothek, the Art Building and the Propylea would appear more impressive (Fig. 55).

The City-hall Square, Vienna, is to be criticised in this respect, for although the City-hall, the University, the Parliament House and the Burg Theater are immense, they do not effectively enclose a square 200 x 400 metres. Another defect is its division by the parks and plantations which permit a comprehensive view of the whole square only from the upper stories of the surrounding buildings. By far

more beautiful in these respects is the Lust Garten, Berlin, hardly half as large and on which the buildings appear to advantage.

The Schlossplatz at Stuttgart (Fig. 31) is remarkably fine as a garden square, but as an architectural square it is too large.

Occasionally found within palace buildings is the so-called "inside square," which may be classed between the architectural "built around square" and the court of the German and Italian palaces. As examples of these "inside squares" are to be mentioned the Franzensplatz in the Hofburg, Vienna, the Zwinger, Dresden (Fig. 56), the Court of the Doge's Palace, Venice, the Place du Carrousel in the Tuileries and the Palais Royal, surrounded by shops, Paris. Monotonous palace façades surrounding the public square are found in Italy, particularly as in the Piazza S. Croce and Piazza Cavour, Florence (Fig. 18), and the Piazza Vittorio Emanuele at Rome; in this respect, all the above-mentioned "inside squares" are to be criticised.

In general, the architectural square should be attempted only when monumental buildings will surround it, in which case the balance of different styles of architecture is to be preferred to uniformity.

(To be continued.)

ELECTRICAL SCIENCE FOR ARCHITECTS.¹—II.

THE PROPORTIONING OF WIRES.



Tower at Loches, France.

A MATTER of great importance in electrical work, with regard to both safety and satisfactory service, is the correct proportioning of wires to the currents they have to carry. Conductors always offer a resistance to the passage of the current, and this not only causes heating of the wire and waste of energy, but it diminishes the pressure at the lamp, motor or other device operated.

A current of electricity, however small, will heat in some degree a wire of any size, and if the current be large and the wire small this heat may become of great intensity. The effect is not different from that in any case where resistance is overcome by force. When a nail is driven into lead it is very plain that the energy is transformed into heat. Meteors falling through the atmosphere are heated to incandescence, and even when water is forced through a pipe, a part of the energy is transformed into heat because of the resistance of friction. We may not know exactly how a current of electricity sets the molecules of a conductor into motion and thus produces heat, but we do know that it requires a certain force to make a current flow in a wire, and that if we make the wire smaller it takes more force to send the same current through it. We know, too, that if the heat generated is measured it is found to be equal to the energy expended. By making the wire smaller, the resistance is increased and more force must be applied so that this resistance may be overcome.

If a pump is to deliver 100 gallons of water per minute through a pipe, it will take a certain amount of force even if the pipe be a foot in diameter, but if it be reduced to one-tenth the size, it will take enormously more force and the additional amount will all be used simply in overcoming friction—in heating the pipe and water. In this case the heat is carried away so fast by the water itself that it is of course only the waste of power that is serious. In forcing electric-currents through wires, however, not only is energy wasted, but the heat is left in the wire to dissipate as best it can. The wire

goes on heating until the generation of heat is balanced by the dissipation, and if the current is much too large the wire, in the meantime, may become of such a temperature that it will set fire to inflammable material near it. It is obviously not the total amount of heat that is generated nor simply the rate that determines the temperature. It is the rate per foot of wire. Thus while the whole of the resistance in an electric circuit is what determines the total heat generated by a given current, it is the amount of resistance per foot that, with a certain volume of current, determines the temperature to which the wire will be raised. On the other hand, since all heat generated means lost power, it is the total heat and not the temperature that affects the available force at the lamp or motor.

It is partly because of this that wires of inadequate size are so often used. The total resistance may not be sufficient to absorb an appreciable part of the force and so affect the lamps or motor, but the resistance for a given length of wire may be sufficient to cause more heat than can be dissipated by that length without great rise in temperature.

The Boards of Fire Underwriters have, accordingly, determined upon proper "carrying capacities" for the different sizes of copper wire, and wiremen generally now follow the tables provided. As inflammable material is often brought near electric-wires it has been thought wise to allow but little rise in temperature. The tables have consequently been made up with an allowable rise of about 15° Fahrenheit when the maximum current is flowing.

The following of the Underwriters' rules in this regard has done a great deal to make incandescent-lighting service satisfactory. Whatever energy is lost in heating the wire is, of course, unavailable for heating the filament in the lamp. The effect of the rules is to limit the loss or heat per foot. There might be a very small loss per foot and yet a serious total loss, but for short distances the minimum sizes of wire allowed by the Underwriters are often larger than would be absolutely necessary if consideration were given only to the effect upon the lights. In places where a small number of lights are used and where, ordinarily, guesswork would be resorted to, the rules thus do much toward securing good service.

As soon as the wiremen get away from compulsion, however, it is very likely that the wires will be too small for good results if the maximum total loss is not specified. Since every foot of wire has its definite amount of resistance depending upon its size, a definite amount of force depending upon the volume of current is spent in overcoming the resistance in each foot. The amount of force or pressure in incandescent-lighting is ordinarily kept constant, and if all the lights in a building are to burn with equal brilliancy, the loss of force in the wires must be made negligible. To this end the wire must be chosen with regard to both the distance and the number of lamps, for it is the distance that determines the total resistance and the number of lamps or "load" that determines the volume of current.

Again, the distribution of electrical energy is analogous to the distribution of water or gas. In the holiday season when the volume of gas drawn off is very great, the lights are often noticeably poor. The pipes offer so much resistance that the usual pressure at the gas-works is not sufficient to force along the great volume of gas and still give the ordinary pressure in the buildings. The same effect is seen in long lengths of water-pipe. If water is being drawn from cocks near the supply, much less will come from one farther off, although the pressure at the pump may remain the same. The pressure at the gas-jet or water-cock cannot be kept up and in the same way the electrical pressure falls before it reaches the lamp terminals, if too small wires are used. Each incandescent lamp requires its own small but definite amount of current. Turning-on the current is like turning-on water or gas, but the filament of the lamp offers so much resistance that the force at the terminals can send only a very fine stream, so to speak, through it.

The lamp itself is a good illustration of the heating effects of the current. There is a great resistance per foot in the filament. Even the small current passing through generates heat so fast that it can be dissipated at an equal rate only when the whole is incandescent. The construction of the lamp gives a conductor of considerable resistance in small space and it gives the filament "long life," but any conductor will be heated to incandescence provided sufficient current be passed through it.

A lamp is made to be used at a certain electrical pressure, and it is only at this pressure that the proper amount of current will go through it and thus cause the proper amount of light. It is for this reason that it is so important to calculate the sizes of the wires and thus give every lamp as nearly as possible the same pressure. Every branch of a line requires a separate calculation, for there are different volumes of current in each and the lamps are at different distances. It is at this point that rule-of-thumb methods fail and some degree of engineering ability becomes necessary to prevent undue loss in the wires and at the same time to prevent unnecessary expenditure for copper in the conductors. In buildings improperly wired it will frequently be noticed that lamps in one part will be much brighter than those in other parts, or it will be found that when all lamps are on, the light is poor and that it improves as some of the lamps are switched-off. In these cases it will almost invariably be found that some of the wires are too small, usually the longer ones.

There is no excuse for this sort of work except the saving it effects in the cost of material. It is not a matter of judgment nor of experience, but simply of calculation. It is known how much

¹ Continued from No. 942, page 19.

current each lamp requires, and exactly how much the pressure will drop when the necessary current is forced over a given length of wire of a certain size. With no other force that we use can results be so easily and so exactly predicated.

Of course, with wires of reasonable size there must always be some difference in the lighting effect of any two lamps, but it is not a difficult matter to make it so small that the eye cannot detect it. It is now ordinarily specified that the electrical pressure at any two lamps in a building shall not differ by more than two per cent under any conditions of use. This difference is within reasonable limits and is sufficiently small to prevent noticeable change in lights when others are turned on or off.

RUSSELL ROBB.

(To be continued.)



where at the invitation of the Hon. J. W. Ross the members met in rooms prepared for them in the School of Practical Science in the Queen's Park.

The President, Mr. David B. Dick, read an address of remarkable ability, that was voted by the members generally as the finest they had ever listened to, and at the termination of the proceedings a special vote of thanks was recorded with reference to the address. The President spoke at length on the advantages of professional associations and reviewed entire the work of the season. No effort was made during the past year, since the bill for the amendment of the Act of Incorporation was withdrawn, towards pursuing the matter, it being felt that for various reasons it was advisable to let the matter rest for a time. At the time the bill was to be brought up for amendment of the charter by the erasure of the word "registered" (often commented upon in previous letters), it happened that three distinct trades were seeking incorporation for the purpose of excluding all but particular firms from pursuing these callings, or, in other words, desired to be made "close corporations." The Press, with its usual intelligence, was inclined to class the architects with these trades, and either purposely or through gross ignorance chose to misinterpret the objects of the amendment to the Association's Act. The "temper of the House" was such that the tradesmen's bills were promptly thrown out, but the House had no opportunity of discussing the architects' bill, for the Committee on Legislation very wisely decided to withdraw it and let it stand till a more propitious occasion. The principal architectural event of the year was, of course, the "World's Fair," and the President related the history of its conception and the means employed for its execution — the meetings of the appointed architects to decide on style, proportion and grouping of the buildings and their methods of procedure towards the desired end — the results of which procured such an effect, architecturally, as the world had never before witnessed. Speaking of the training of students, Mr. Dick alluded as an example of success to Mr. R. M. Hunt of New York, who last year was the recipient of the Gold Medal of the Royal Institute of British Architects, giving an account of his professional training and studies and of his connection with the present state of architectural ability as displayed in work in the United States of to-day.

Reference was made to the work of the sister society, the Association of the Province of Quebec, and to the Mechanics' Lien Act and the amendments or other changes that have recently been made to it. The ground covered by the President in his address was very general and complete, and the excellent advice he tendered with reference to the conducting of the Association's natural programme and other matters will certainly not be thrown away.

In the discussion that followed the reading of the reports of the treasurer and registrar, which were the next items on the programme of the convention, the suggestion to form chapters of the Association in various towns in the Province, brought up last year, was again proposed. This was the means of eliciting from a member who lived in one of the towns in question an amusing account of the difficulties in the way of having local associations. He believed that in his town there was an association now, as there used to be some years ago and he did not recall any movement towards winding it up, and probably the secretary elected five years ago was still in office, as no successor had been appointed. But the then president was chosen to that office because he had, it was supposed, the largest practice — but that very fact made him the most unpopular man among them. Such was the *esprit-de-corps* in his town, that if any architect "got a job" it made every other architect so angry that it was impossible to get along as an association or chapter. He did not believe, therefore, that a chapter would be very successful in advancing the interests of the profession where he lived.

Mr. W. R. Gregg, of Toronto, read a paper on "Estimating the Cost of Buildings from Calculation of their Cubical Contents" and this closed the first afternoon's proceedings. In the evening Mr. C. H. C. Wright, Lecturer on Architecture at the School of Practical Science, gave a magic-lantern exhibition of architectural views to members of the Association and friends, which proved very interesting, even to the uninitiated of the audience. "Magic-lantern" seems hardly a sufficiently dignified name for an instrument such as that in use at the School of Practical Science: it is a magnificent instrument, one of very recent make, by the best maker in Europe, fitted with all the latest improvements and could hardly have cost less than one thousand dollars, and very probably cost more. This instrument played a considerable part in the proceedings of the Convention, as Mr. Wright had very kindly undertaken to prepare slides for the illustration of some of the papers to be read, and this greatly added to the value of the papers. The morning of the next day was occupied by reading of a short paper on "Construction of Shop-fronts during the next Decade" by Mr. Gambier-Bousfield and a discussion thereon, and a very interesting description of the "World's Fair Architecture" by Mr. W. A. Langton, the Registrar of the Association, illustrated by magic-lantern views. This paper was followed by short papers read by Messrs. Burke, Townsend, Gemmell and Gouinlock on various particulars in connection with the "Fair" from the architects' points-of-view. Lunch was served in the building, so that little time was lost from the business of the convention and the afternoon was taken up by the reading of papers.

Mr. Coleman, Lecturer on Geology at the Schools of Practical Science, exhibited specimens of the geology of the Province and gave a very interesting lecture upon them. Mr. Power, of Kingston, read a paper on "Construction," followed by one on "The Architect" by Mr. Simpson of Toronto. After which Mr. Helliwell (Toronto) read a paper on "Current Styles," illustrated by the magic-lantern. A paper on the "Scientific Insurance of Buildings," to be read by Mr. Langley, was omitted owing to the absence of the author, which was a matter of considerable regret. The convention closed with the election of members of the Council to fill the place of three retiring members. The results were not obtained without a considerable amount of voting, four ballots being found necessary.

Mr. Thomas Fuller, Government Architect, Ottawa, Mr. H. B. Gordon and Mr. J. Gemmell, of Toronto, were the successful candidates. The president for the new year was elected by the Council at their meeting on the following morning, Mr. E. Burke (Toronto) being chosen to that office.

Another charming story of history has received its death-blow by the knife of truth. We are told that "*Evangeline*," immortalized by Longfellow, has been proved beyond doubt to be fiction. The peaceful settlers are now known not to have been peaceful at all, nor were they the harmless neighbors we have hitherto believed them to be. They would never have been removed had they been so: they really made themselves thorns in the side of the English, till at last the Governor of Halifax hit upon the plan of deporting them wholesale as the simplest and least bloody way of securing peace. The Acadians were under the thumb of a priest, the Abbé Le Loutre, their spiritual guide. These primitive people were persuaded to harass the English settlers and under the disguise of Indians struck terror into the hearts of their neighbors. The Governor put them to the test by ordering them to come in and take the oath of allegiance, but Le Loutre urged them against the proposition and they refused. The colonists must be protected against them, however, and precedent for the Governor's expedient was not wanting. Dr. J. Bowman Stephenson has given us the details of the deportation, which was carried out by Lieutenant-Colonel Winslow of Massachusetts. He summoned the heads of the various families into the log church at Grand Pré, from which place they were conducted to the vessel. From the vessel the men were permitted to go in small numbers to pack up their belongings and fetch their families, and hard as the plan seems, they were well-treated and had only themselves to blame for the step. There was no scattering of families and when landed they settled down together. In after years many found their way back again and now in New Brunswick we have a large Acadian population. One Acadian is a senator, another is a judge and several others are members of the legislature of New Brunswick or Prince Edward Island. It is stated that a book is being prepared by Sheriff Richard of Winnipeg — himself an Acadian — with another version of the sad history, in which it appears that Governor Lawrence ordered the expulsion and that England had nothing to do with it, but that Lawrence had greedy eyes for their possessions, such, at least, as they could not carry away. A statue is to be erected by the wealthy Acadians to "*Evangeline*," as a memorial of the deportation, on the shores of the Bay of Fundy near the site of the old French village. The statue is to be heroic, an Acadian girl is to be represented bearing in her hands a medallion of the poet Longfellow, so that the memorial will have a twofold significance. The American flag is to top the whole, as it was New England that had so much to do with the event.

ELECTRIC-LIGHT FOR ST. PAUL'S. — The authorities of St. Paul's Cathedral have definitely decided to introduce the electric-light, and a meeting of experts and others has been held in reference to the matter. In Easter week an appeal will be made to the citizens to defray the expense, and at the same time to find funds for the completion of the decorations. — *The Westminster Budget*.



FIRES AT THE WORLD'S FAIR GROUNDS.—
THE COURT OF HONOR AT LONDON.—
THE EXHIBITIONS, LECTURES AND
SCHOOLS OF THE ART INSTITUTE.—THE PALETTE CLUB'S EXHIBITION.—BRONZE LIONS FOR THE ART INSTITUTE.—THE CHICAGO MASSACRE GROUP.—THE SETTLING OF THE CHAMBER OF COMMERCE BUILDING.—THE RE-REMOVAL OF JOHN BROWN'S FORT.

ABOUT the time that our last month's letter went to print, Chicago was surprised and pained to find that flames had broken out in the Court of Honor at what had once been the World's Fair, and that what might have been the most beautiful feature to preserve in the Park, for at least a certain space of time, had been destroyed. Of course all the cities in the Union knew of it almost as soon as Chicago did herself, and every one regretted, with her, that any foreign exhibits should have been injured in the Liberal Arts Building. That this great building did not also entirely go was a marvel. It is much to be deplored that if the always-to-be-fearful tramp with a match, or other viciously inclined person had to do his fell work in the building that he could not have contented himself with some of the more isolated structures, and not have attacked the one feature which of all others was most appropriate to be retained in Jackson Park. And now again, fire has broken out in the Agricultural Building and the southwest corner has been entirely destroyed before the flames could be stopped. It is purely the work of incendiaries, for tramps were seen skulking around the place previous to the breaking-out of the fire, and in fact one incipient fire was found and extinguished by a guard only a short time before the larger fire broke out. Fire, it seems, was also discovered in the Terminal Station a few days ago. There appears absolutely no reason for this incendiarism except a love of pure deviltry. The fate of the buildings seems to be still as unsettled as it was last fall, though if these fires continue there will be few buildings left to have any fate to settle. It seems, indeed, rather a hopeless problem and if fire could do more work in different directions it might not be looked upon as a catastrophe. One reason for the rapid spread of the fire through the Casino, across the Peristyle and to the Music-hall, was that in none of these constructions were any fire-stops used. In all the large buildings such precautions were taken in porticos, recesses, etc., but the urgent need of economy, and the small danger in these three structures from fire that could menace any of the exhibits induced the directors to abandon a precaution which was much more necessary in other places. It, indeed, seems as if the time had come when the Fair was to be made completely a thing of the past, as an order has been issued by the officials compelling all exhibits to be removed by February 15. The owners failing to comply with such ruling, the Exposition people will put their employees to work to remove the "remains." Foreign exhibits will go to the bonded warehouses at the south end of the grounds, while the domestic goods will be removed to down-town warehouses. As each building becomes empty it will be turned over to the Park Commissioners, and the guards on duty dropped from the pay-roll. Many feel that it is better that the Peristyle should fall as it did, rather than that it should crumble and decay, bit by bit.

Imre Kiralfy has now a scheme to reproduce, on a reduced scale, the Court of Honor in the West End of London, having been in consultation with Mr. Atwood on the subject. It is planned to show the main lagoon, the north and south canals, with the Colonnade and obelisk and the bridges, terraces and Peristyle. The façades of the Casino, Music-hall, Manufactures, Electricity, Administration, Machinery and Agriculture Buildings will be erected, while there will also be suggestions of the electrical and MacMonnies fountains and French's colossal figure. Behind the façades, the idea is to have small shops and restaurants. It is purposed to reproduce the illumination of the Court of Honor with search-lights and electric-fountains.

Following out the broad scheme of making the Art Institute really the centre of all art movements and interest, there is this month displayed there a most artistic and interesting collection of metal-work, which last summer was displayed in the German village. This display not only consists of raw metal-work itself, but iron and wood carvings, with which such work is often combined in old and curious knives, forks, spoons, etc. The whole attitude of the Institute seemed to be one of extreme liberality and breadth: To foster all artistic tastes, in whatever direction they may lead, to interest the public in all the branches of art, and to place to a certain extent an art education within its reach. Three days in the week the galleries are open to all, and the record made of the number of entrances on those days shows it to be a privilege that is appreciated. The last Sunday in January the list made a showing of twenty-six hundred admittances. It has always been the policy of the Institute to offer interesting courses of lectures to its members, but this

winter in addition to these, though no notices are sent to this effect, it is generally understood that the members may have the privilege of attending any of the excellent and attractive courses of student lectures, the lecture-rooms at present offering ample accommodations for all who may care to come.

It very likely would be a surprise to even many Chicago people to know that the number of students at the Institute in all branches now approaches a thousand. Last year there were over nine hundred. This year, though the architectural department has had an increase over preceding years, the other departments are not quite so full as heretofore, owing probably to the prevalence of hard times. Should the increase next year in the architectural department be as great over this year, as this year is over the preceding ones, it would bring up this department to the rank of second largest school in the country. The Institute enjoys at present the distinction of being the only institution of its kind in the United States in which the different arts of painting, sculpture, design and architecture have each a special corps of teachers, and in fact are carried on as separate and independent departments under one general supervision, as at the École des Beaux-Arts. Astonishing as it may seem, the Institute is already becoming cramped for room. The beautiful Trocadéro casts, before spoken of in these letters, which are now the property of the Institute, have been, up to this time, housed in their last summer's home, in what was the Art Building of the World's Fair. This structure, which has now been transformed into the Columbian Museum, is now filling up so fast that the room which is used by the casts is needed. Consequently they have been turned over to the Institute and a temporary sheet-iron structure is being put up for their accommodation in the interior court of the Institute.

In connection with some of the casts from Asia Minor an amusing little incident occurred the other day. A rather curious-looking individual appeared at the office of the Director and introduced himself with the remark, "Why, you've got a cast in there with my name on it!" Being a little surprised, Mr. French asked the man to show him the curiosity, which proved to be one of the Hittite monuments of Asia Minor. The man himself was one of our famed globe-trotters, with the usual desire to have his unknown name cut wherever it was possible to place it. He succeeded in "writing it forever" on one of the originals in far-distant Asia Minor, and consequently, when the cast was taken, the work of the name-carver being deep and clear, "Jeremiah Perkins" or "Jonathan Smith," whichever it might be, came proudly back to his native clime with the Hittite relics, there to be gratefully recognized by himself.

At present the Palette Club is holding its Twelfth Annual Exhibition on the walls of one of the galleries of the Institute. This is the club of women artists and amateurs before alluded to in these letters as having through its fourteen years of existence made itself noticeable as having combined with the minimum amount of by-laws and parliamentary ruling the least possible amount of friction, jealousies and ill feelings. This, however, is not its only claim to distinction, for if it is not already the strongest art organization in the city, it is fast taking that place. The exhibition is smaller than some in previous years and the work is generally of an unassuming character, not many large pictures being among those on the walls, but the grade of excellence is high and a good deal of strong and clever work is shown, all marked with a good deal of individual character.

Last month in speaking of the building of the Art Institute no mention was made of what, by next summer, will be a striking feature at its entrance. This will be the two colossal bronze lions which will stand at either side of the doorways. For the future of these beasts there is little to fear, for they come from the hands of Edward Kemeys. They are reported to be of heroic size, as standing in an attitude of expectancy, the neck arched, and one paw forward, as if ready to spring, the tail lashing the flank, and the whole form full of life and power. The height is nearly nine feet and from tip of tail to muzzle is eighteen. They are being cast at the American Bronze Company's works at Grand Crossing and the French superintendent of the foundry, Jules Bercham, is sparing neither time, money nor skill to make the casting as successful as possible. An amusing little fact connected with this part of the work is that the tails have been made nearly twice as thick as the bodies, for the tails of such lions, as every one knows, are a favorite perch for the terrible and omnipresent small boy, and as his habits cannot be cured, preparations are thus made to make them as harmless as possible.

It is a great gain when we really get any work in sculpture that is entirely successful. It is so lasting, so ever-present, there seems to be so little possibility of a hole being punched through a bad sculptured figure, that one feels that those who give such work to a city take upon themselves a grave responsibility, and that the selection of an artist should be made discreetly, advisedly and in the fear that the donor's name may be associated with scorn and ridicule rather than with admiration by his grateful fellow-citizens.

Apropos of this, last summer there was unveiled at Eighteenth Street the work which is known as the "Memorial Group of the Chicago Massacre." It may be ungracious to criticise a gift, and such feelings doubtless seal the mouths of many in the community, who know enough of art to see that they must either give false commendation or else keep silence, if good manners and truthfulness are to be combined. The attitude of the local press is often the same, and if they have men on their staff who could honestly criticise the work, they are kept in the background, and in the place of such criticism there are introduced interviews with the donor of the gift,

or an enthusiastic description of the work by the artist. Such things, however, should be differently treated and a lesson ought to be learned even at the expense of some one's feelings. This group stands on the spot where the little handful of fugitives in trying to escape from Fort Dearborn, to either Fort Wayne or Detroit before the advancing forces of the English in the War of 1812, were attacked by hostile Indians, the Pottawatomies, nearly all of the little band being slaughtered, though a certain chief, Black Partridge, friendly to the whites, performed many gallant deeds of rescue. Bas-reliefs—scenes from the life of the early settlers—surround the base of the statue, while the group itself has for its subject the rescue of Mrs. Helm (the wife of the young commander of the fort) by Black Partridge from the hands of a hostile savage. Historically, the whole work is not without interest, but artistically it is not far removed above the commonplace. The positions of the figures are strained and angular, the action is weak, the drawing far from strong and the composition not all that could be desired. One of the most pleasing features of the whole thing is the little child sitting on the ground with outstretched arms. The site of the work is exceptionally fine and it is a pity that it could not have had in it the spark of genius which distinguishes the really fine group of Indians at Lincoln Park. The Massacre Group was a present from Mr. George Pullman to the Chicago Historical Society. If the carving lately executed over the doorway of the new home of this society, now nearing completion, is anything by which the average taste of its members can be judged in matters artistic, disrespectful comments will not be made by them on the work of Mr. Carl Roll-Smith. If anything could be worse than this bas-relief over the entrance—a scene from the life of some of the early Catholic missionaries—it is to be hoped it will be executed in perishable wax, or possibly butter, rather than enduring granite, as this has been. The scene has, no doubt, some historical points of interest, but it is too bad to invite inspection prolonged enough to study them out.

One of the West Side Parks is to have an equestrian statue of Gen. Philip Sheridan, and again we hold our breath, though names like Lorado Taft and Prof. W. H. Goodyear on the committee to award the prize of six hundred dollars for the best model, make the future look less fearsome. The prize money was given to George Wagner, a Paris educated sculptor, whose model was selected from among forty others.

In art matters Chicago has a future ahead of her which is full of dangerous shoals and reefs, on which the fair fame she acquired last summer may become a sad and dismal wreck. The local Directory of the Fair, many of them with absolutely no art education, knew enough to entrust the work of general plans to two firms of men, whose ability was well known. Those men called in the best talent of the country to help them in the work that turned out such a wonderfully inspiring success. Somehow, now, Chicago has way down in her inner consciousness a settled belief that she herself blossomed out with all this wonderful artistic ability, and many are her rich men whose views are now given in matters artistic by the newspapers as being something worth reading. Already some of these rich men have indulged in little artistic flights of their own, one of the residents on the Lake Shore Drive, revelling in a little matter of wrought-iron gateway and fence, large and heavy enough to surround with dignity a forty-acre country-place, but rather overpowering the nondescript stone mansion, which is to be seen behind the bars only a few feet away. The entire wire structure is elevated on a stone wall, two or three feet high, and in places towers to the height of thirty or thirty-five feet. The design of the chief gates, upon which the owner prides himself as being partly his own conception, is rococo, Renaissance, most anything—garlands of roses, urns, cherubs' heads, Classic features, a large and pronounced letter 'T', all mingling in the scheme of decoration. The actual execution of the iron-work is excellent and it is pleasant to know such work can be done in Chicago; but the hopeless vulgarity of the whole thing is simply appalling.

One improvement on the North Side, which has really been an improvement, aside from being an interesting architectural gymnastic display, has been the repairs and changes made in the Holy Name Cathedral. The clerestory of this fourteenth-century Gothic church was at the time of the construction, for economical reasons, put in of either wood or iron. The roof has been held up by screws, the material of the clerestory removed, and the wood or iron replaced with stone like the rest of the church. The Gothic columns of the interior, between the nave and the side-aisles, were also for economical reasons put in of iron or wood. Screws have here been inserted, these columns have been removed and iron ones encased in marble have taken their place. The whole scheme of color of the interior decoration is a combination of browns and oak shades. The marble used for the column just mentioned is brown, while the wainscoting is of the same color and material. The roof, though not in keeping with the usual Gothic treatment, is very successful. It is of oak, rather a combination of open-timber and vault construction. The oak is kept in the natural color, which is made brilliant by the liberal introduction of gilt used directly on the wood. Some very satisfactory bronze-work is used in the gates at the chancel-rail. The design is Gothic and treated with great simplicity. Of all the Roman Catholic churches in the city, it is by far the most striking.

There has been considerable interest of late evinced in the fate of the Board of Trade tower, which, with its ship headed to the wind, has been for many years a conspicuous object on fair days. Nearly

ever since the completion of the building there has been talk of its settling. It was one of the first steps taken in the developing of the system of foundations which in our clayey, spongy soil has been a great problem in the construction of our large buildings. No piles were driven on which to rest the foundations. The architect reports that they rest on a bed of concrete, prepared as for the foundations for more modern buildings, except that wooden beams are imbedded in the concrete rather than the iron I-beams of the present form. All this settlement, however, is apparently principally due to the fact that the building-committee very enormously increased the weight by ordering a change of construction and material after the building was fully under way, when it was practically impossible to do any strengthening or to increase the footings. Naturally these extenuating circumstances which should have thrown the blame, at least partly, on the Board of Directors, are never mentioned, either by them or the daily papers, but the entire blame is thrust upon the unfortunate architect. General Sooy Smith has for several years been taking measurements and making estimates, and the results of those investigations are about as follows: Levels taken for five years show that the building has settled at the rate of one-sixteenth of an inch a month, the settlement amounting in the whole to eight inches, and the settlement continuing at the same rate at present. The north-west corner has settled most and is now almost entirely separate from the rest of the structure, there being a crack ten inches wide between it and the partition wall. Uneven sinking has resulted in two large cracks in the south wall running the entire length of the building. The heavy weight of the tower has caused another depression, greater still than that of the north wall. The clay substrata on which the foundations rest are full of water and very spongy. The main trading-hall measures one hundred and eighty-one by one hundred and twenty-six feet; the ceiling is very high, and the whole area of the room is unbroken. It is at present decided to strengthen the roof by placing steel trusses across the hall, ten feet below the roof-line, and that the heavy tower shall be torn down. No definite plans have as yet been made as to how the tower shall be replaced by a lighter structure, or, if the building should still continue to settle, what other measures should be resorted to. Engineers say that to underpile the structure and sink the foundations down to bed-rock would cost one hundred and fifty thousand dollars.

It may be remembered, that over a year ago note was made in these letters of an inappropriate transfer, which was to be made of John Brown's old fort from Harper's Ferry to our western metropolis. At the time it seemed a most irrational scheme, and on general principles one to be condemned most thoroughly. Subsequent events also proved that the idea was not a wise one, for, financially, it was a total failure. It is reported that the exhibition for ten days dragged on a weary existence, during that time collecting eleven paid admissions, and after an expenditure of sixty thousand dollars closed its gates. The old relic, however, was as much missed from Harper's Ferry as it was unwelcome in Chicago. Hearing of its sad fate here, a mass meeting was called in its former home, a subscription was raised for it, an option was obtained on the old building, and soon the relic will stand once more on its site overlooking the Potomac. It is to be hoped that a plain enough lesson has been taught for the future use of those who dig up by the roots and transplant venerated objects, beautiful or curious in their original place, but something to be despised with their old memories hanging at loose ends around them, or neatly salted down for transportation. An element of the ridiculous will now be connected with the old Fort, never before suggested by anything in its past history, when its fruitless journey to Chicago is mentioned.

Of interest to marine architects will be the large dry-dock to be built at South Chicago, the largest dry-dock ever built away from the Atlantic. It is expected that all will be completed to receive vessels by the first of next August. Heretofore there has been no place where repairs could be made on the big steel steamers that ply the lakes, and the ship-building company at South Chicago has often felt the want of just such a dock. It is reported that the size of the dock will be as follows: Length, four hundred and twenty-five feet, with an extension of fifty feet for the future; width at the top, one hundred feet, while at the bottom it measures eighty. The width of the gate will be seventy feet and there will be seventy feet of water over the water-sill.

THE NATIONAL SAFE DEPOSIT, LONDON.



National Safe Deposit Company was established with a capital of £500,000 for the express purpose of erecting, without regard to cost, a structure for safe-guarding valuable property which should be impregnable against every conceivable form of attack, either covert or open. To this end a site was chosen in the very heart of the city, within a stone's throw of the Bank of England, where the building should be isolated from all surrounding structures and, as a first measure, the ground was excavated to a depth of about 60 feet below the normal surface. During the course of this excavation, the ancient Roman pavement was come upon, and a large quantity of antique relics thrown up, a number of which now compose a part of the Guildhall Museum. After the foundation had been cut out to this depth, 20 feet of solid concrete were laid down, and on this, in turn, the outer walls were erected. These are of a

strength and massiveness that recall those of mediæval ages. They are composed of an aggregate thickness of 6 feet of the hardest cemented bricks, which is backed by a wall of concrete two yards in diameter, forming altogether 18 feet of solid material. Within this outer wall, however, and separated from it by a narrow passage, is another wall composed of blue Staffordshire bricks. This is lined inside with armor-plate of fully 4½-inch thickness, dovetailed in sections and strengthened by wrought-iron framing. This forms the true Safe Deposit Building, situated within an outer wall, or shell, of 18 feet of brick and concrete, and within this interior, in turn, are placed the safes, or "integers," as the small safes are technically called, and the various strong-rooms.

Under the lower floor of the Safe Deposit is an enormous subterranean cistern, supplied by an adjacent well, 20 feet by 30 feet in area and 10 feet deep. Above, the roof of the Safe Deposit is formed of bomb-proof, semicircular arches, with 5 feet to 8 feet of hardest bricks and solid concrete lined with 4½-inch armor-plates and plates of iron. Over all, at the top of the external building, there is a tank, kept constantly full, containing 50,000 gallons of water. Hydrants are fixed to each floor, and each floor is isolated from the other by arches of brick and concrete. The whole Safe Deposit Building, however, might be filled with combustibles, set on fire and suffered to burn out, without occasioning any material damage. The entire building, with the safes contained in it, is totally incombustible, and the existing fire-extinguishing appliances can hardly be considered as other than superfluous. Several patents, it is stated, are represented in constructional details. The enormous supporting pillars, for instance, are cast of special fire-proof composition with a metal core, and before erection were fully tested, one of them being subjected to a furnace-heat of 36 hours before being erected in its place, having suffered no material injury. The armor-plating, too, is said to be undrillable, and is of a more massive character than that of any other safe deposit in the world. The entrance doors to the vaults are 12 inches thick, of solid metal, weighing each about 4 tons. They are opened and shut in sections, and simultaneously, by a unique application of hydraulic power. And when closed each vault is hermetically sealed, fire, air and water proof. Every qualified authority who has examined the building has pronounced it to be, at all points, the strongest and most secure structure in existence.

Mr. Wilkes was good enough to conduct the writer over the Safe Deposit, which is composed of four separate floors with eight vaults on each floor, or thirty-two vaults in all. The whole premises are lit by electricity, gas being ready in reserve, and the body of the Safe Deposit is so contrived that a clear view can be obtained, from the galleries which surround one side of each of its four stories, from the ceiling of the Safe Deposit Building to its lower floor.

"The protective armor-plate casing," said Mr. Wilkes, the manager, "is stronger than that of any other Safe Deposit in the world. The one which approaches us most nearly in this respect is that of the Nassau Bank in New York, but their metal is 2 inches less in diameter than ours. When we take into consideration what can now be accomplished by the blow-pipe, it is impossible to assert that any real security can be conferred by an armor with only 1 inch or 1½ inch body. An ordinarily skilful burglar, using an apparatus that may be carried in a small hand-bag, can, within twenty-five minutes, without noise or trouble, cut a slot in an inch-plate, and make a hole big enough for a man to go through.

"The doors to the vaults are in themselves unique, and the arrangement for closing them has no parallel. The opening, as well as closing, requires the presence of four officers of the Company, holding different positions, and once closed there is no power on earth that can move them, until the proper machinery is brought into action. To drill through these doors is a practical impossibility. They are made of a metal harder even than spiegeleisen, and are the invention and patent of Mr. John Whiechord, F. S. A., the original architect to the Company. Everything relating to the working and management of the establishment is in duplicate. The steam-engine which works the lift, the electric-light and hydraulic apparatus, is in duplicate; so are the boiler, dynamo, hydraulic plant and water-supply. There is no conceivable point for which every provision has not been made."—*Invention.*

BOOKS AND PAPERS

INIGO JONES and Christopher Wren¹ are great names to the Englishman, for they represent pretty much all there was of native architectural art in Great Britain from the extinction of the Gothic and Elizabethan architecture down to the beginning of our own day. This is, to be sure, not saying much, but it is, perhaps, not surprising that since it is all that can be said the patriotic Englishman should take care that it is not forgotten.

Mr. Loftie has done his best, no doubt, to restate and confirm the claim of Jones and Wren to a place among the great masters. If

he has failed, it is only because the claim is in both cases impossible to maintain. Neither Jones nor Wren was a great architect. The first fell upon a time when the art, never really at home in England, was extinct through the length and breadth of the island. He had sense enough to feel that fact, and taste enough to appreciate the quality of the work of the great Italians which he saw during his residence in Italy. But he was forty-two years old when he returned to England and was made surveyor-general, and it was only at this mature age that he began the serious practice of an art which he had until then only dabbled in as an amateur. The work which he did was respectable, marked by good taste and a just sense of the proper relation of parts to each other and to the whole design; but it was for the most part dull, formal and quite without distinction. No better instance of this can be cited than the Banqueting House, so called, at Whitehall, the one building by which he is generally known, and of which it is safe to say that in no other European capital save London would it be thought worthy of any special attention whatever. The great palace which was projected by the Stuarts, and of which the Banqueting House was a fragment, was the object of long-continued study on Jones's part, and the result of that study was the two sets of drawings made, the one for James I and the other for Charles I, which are declared by Mr. Loftie to be "the great work of his life." Judged by this standard the fame of Jones should be eclipsed by dozens of clever students in the architectural schools who are turning out every month *projets* of this sort with more invention and style than are to be found in the drawings for the palace at Whitehall. If we judge him, as we must, by the work which he executed, the result is not very much otherwise. His great houses, as Ashburnham House, Coleshill and the central block of Cobham, seem to be absolutely without merit. The façades of his city buildings, as Covent Garden and Lincoln's Inn Fields are little better, and of his few churches the only one which is dwelt upon by Mr. Loftie, St. Paul's, Covent Garden, which excited the "deepest admiration" of one British architect, which another declared to be "the most perfect piece of architecture which the art of man can produce," and which Jones himself so much admired that he desired in his will that a view of it in relief should be put on his tombstone, is neither better nor worse than a hundred wooden "meeting-houses" in a hundred New England towns, built by unpretending village-carpenters unknown to fame, in accordance with the rules laid down in Shaw's "*Carpentry for the use of the Classic Orders.*" If, as is generally supposed, Jones built the garden-front of St. John's College, at Oxford, we may regret that his way of life led him among the snares of official position when he toiled in the prison-house and served the rich and great at the rate of 8s. 4d. per day. "Slow rises worth by poverty oppressed."

What we have said of Jones may, for the most part, with equal force be said of Wren, except that, as Wren's opportunity was the greater, — such indeed as few men have ever enjoyed — so was his merit the less. This is no place for a criticism of St. Paul's, a conscientious work, not without touches of greatness, but feeble in composition and detail, and showing everywhere the lack of that easy command of great effects which so impresses one in the nobler monuments of Italy. Wren's fame rests on St. Paul's and on the minor churches which rose under his hand from the ashes of the great fire. In a few of these, notably in St. Bride's and Bow Church, the grace of the many-storied steeple redeems the poverty of the rest of the design; but the greater number are without this extenuation, and are stamped in every line and feature with that quality which must, alas, be confessed to be characteristic of Anglo-Saxon art — the commonplace — "*was hat alle bündigt, das Gemeine.*"

Mr. Loftie assures us in his preface that "this book is not written for architects nor is it by an architect." Perhaps in this view it is unfair to criticise with severity his judgments or his comparisons. Yet it is difficult to read with patience such statements as that the Italian architecture which he calls Palladian, "because the word is easy to pronounce," found in England a second home "where it flourished even better than in its birthplace," or that "in Wren's city-churches England possesses a treasure only comparable to the works of art at Florence and Rome, a treasure such as no other city could show;" or that "when convenience could be combined with architectural beauty, as in St. Stephen's, Walbrook, the result was absolute perfection." Has, then, this critic never seen the buildings of the Italian Renaissance? But photographs are abundant. Has he never held in his hand a photograph of, let us say, the two palaces by Michael Angelo which flank the square of the Capitol at Rome? Or the communal palaces at Verona and Brescia, or the Basilica at Vicenza, or any one of a dozen palaces at Florence or Venice, or the church of La Salute at Venice, or the Capella Pazzi at Florence; and then considered with a judicial and undazzled eye the Banqueting-House, or Greenwich Hospital, or St. Stephen's, Walbrook? Really one would suppose that even an English mind might be brought to feel the pathetic absurdity of such a comparison.

And surely, even a person who is not an architect and does not write for architects might be expected to avoid certain forms of speech which are calculated to make the irreverent laugh, but the judicious grieve, as where Mr. Loftie, in criticising Mr. Waterhouse's town-hall at Manchester, says the hall is forty feet high but "is so cleverly designed that it does not look seven," or where, in speaking of the staircase at Christ Church, he quotes Peshall as saying it was designed by a London architect named Smith; and

¹"*Inigo Jones and Wren*"; or the Rise and Decline of Modern Architecture in England. By W. J. Loftie, author of a History of London. New York, Macmillan & Co., 1893.

continues, "I can't help hazarding the guess that by Smith he must have meant Jones." Or again, when in praising the virtues of harmony and proportion, he quotes the pretty song

"My love is like a red, red rose, that sweetly blooms in June,
My love is like a melody that's softly played in tune."

and remarks "He might well have gone further and taken a third simile from architecture. He might have added that she resembled a Gothic spire, or a tapering marble column."

Mr. Loftie has added to his account of the two worthies who form the subject of his book, a chapter or two on the Elizabethan architecture which preceded them, and the Palladian architecture of their successors. But his liveliest chapter is the introduction which he devotes to a review of the ill-fated Gothic revival of a generation ago, for which he has no single good word. *De mortuis nil nisi bonum* is no motto for him. He pours scorn and contempt without measure on the grave of that well-meant but pathetically unsuccessful movement, and declares that it did not produce one really good or beautiful building. For the "eclectic" style which has taken its place in England he has little more respect, and objugates Scott, Waterhouse, Colcutt and their coadjutors in good set terms. We are not sure that the mantle of Sir Edmund Becket, so long a thorn in the flesh of the architects of England, has not descended upon Mr. Loftie. It is certain that they have not been treated with such contumely since that lively but not very discriminating critic subsided into silence upon assuming the dignity of a peer.

ONE of the most beautiful and useful architectural books¹ that we have ever seen owes its being to circumstances which, in themselves, furnish an interesting piece of professional history. A few years ago, the Society of Berlin Architects, one of the most influential professional bodies in Europe, was reorganized, and the brilliant leaders who had effected the reorganization set about concerting plans by which the Society should be enabled to gain its true place in the life of the country, as the universally accepted guide and authority in matters within its province. With this view, they undertook to select a series of subjects, which would be interesting to a large portion of the public, as well as to the profession, and discuss them in such a way as to enlist the attention and participation of persons outside the profession. This method of proceeding would, as they believed, be advantageous, not only to the public, who would profit by the information that architects could furnish on subjects of interest to both, but to the architects themselves, who, through the discussion, would be brought into more intimate relations with public opinion and feeling.

The first matter that seemed to them suitable for treatment in this way was that of the design and arrangement of Protestant Churches. In Protestant Germany, as in this country, church-building has within the last few years received a new impulse, and there is probably no professional subject which would excite the interest of more people; while in Germany the subject has an ecclesiastical importance which it does not possess here, on account of the close connection between Church and State, and the semi-official supervision which is given to the details of public worship; so that any propositions looking to modifications in the accepted practice of church-building would arouse the clergy, as well as the laity. Moreover, there is, beyond doubt, at the present time a widespread feeling that Protestant worship, particularly in Germany, while it satisfies the reasoning faculty, does not appeal, as it might, to that inner life of the spirit which takes pleasure in symbolism and association of ideas, and there is, both for architects and the clergy, a great field open for the inculcation of Protestant religious sentiment, by means analogous to those which helped to spread Christianity throughout the civilized world, and which still hold the hearts of millions of ignorant and unreasoning people firmly to the Roman Church. In studying the means by which Protestant æstheticism in church-building may be developed, as well as those by which the convenience of congregations may be better secured, it is evident that, while architects are best qualified to examine the ground, and make preliminary suggestions, they could not go far without the coöperation of the clergy; and the Berlin Society of Architects, therefore, decided that it would be desirable, first to study thoroughly the history and present condition of Protestant church-design, and then, with this complete view of the present state of the subject as an aid, to call a convention of architects, divines and friends of art, in which future improvements could be discussed.

In order that the Society might be equipped with the necessary basis of facts, it was decided to appoint a committee to collect the different types of design in Protestant churches, ancient and modern, and to Mr. K. E. O. Fritsch, the senior editor of the *Deutsche Bauzeitung*, who was an active member of the Society and of the committee, fell, subsequently, the greater part of the work of preparing the information so gathered. It soon became evident that almost nothing of value could be gained from existing books on Protestant church-architecture, most of which in Germany, as, to a less extent, in England, have been written in support of one or the other of the æsthetic and rational, or, as we should say, of High Church and Low Church, factions; and it was found necessary to

appeal to German architects generally, to collect plans and information for the work. To this appeal a hearty response was given, and, although the book in which this information is presented, and which is the book before us, grew to unexpected dimensions, demanding long and continuous labor in its preparation, Mr. Fritsch modestly reminds us that the credit for it must not be given entirely to him and his Society, but that it must be considered as, in a certain measure, the work of the whole profession.

Apart from its origin and authorship, the book is a model of its kind. Containing, as it does, plans of five hundred and fifty different churches, with elevations and sections, or perspective drawings, interior and exterior, of most of them, in a volume of five hundred and sixty pages, resembling Fergusson's History more than any other familiar architectural book, the drawings are necessarily small; but they are beautifully clear and well-drawn, and lettered to perfection, while the plans have the inestimable advantage of being at a uniform scale, of one to one thousand. We would like to give an idea of the interesting way in which Mr. Fritsch traces the peculiarities of Protestant church-planning, not, as is usually done, to the requirements of an audience-room, as distinguished from a place for visible ritual service only, but to the practice, which was introduced by the Protestants, of furnishing their churches with permanent seats, allotted to the different members of the congregation; but we may find opportunity for commenting on this and other points later. Meanwhile, we need not say that the illustrations, particularly the plans, with the infinity of suggestions that they contain, are scarcely less valuable to the practising architect who does not read German than to those who do, and there is hardly a possible arrangement of auditorium, chancel, pews, galleries, pulpit, font or baptistery, or any style of exterior or interior treatment, which is not to be found among these examples, which cover, not only Germany, but Denmark, Norway, Sweden, Russia, Holland, France, Switzerland, England and the United States, and range, in time, from the Reformation, or rather, the period just preceding the Reformation, to the present day.



WORCESTER COUNTY SOCIETY OF CIVIL ENGINEERS.

THE Worcester County Society of Civil Engineers held their annual banquet at the Commonwealth Hotel last week, Tuesday evening. President Wm. H. Coughlin presided. Speeches were made by Mayor Marsh, Architect Elbridge Boyden, Professor Kimball, of the Worcester Polytechnic Institute, Representative Eben T. Thompson, H. L. Norton of the Hawkins Bridge Company, Springfield, Architect Clemence, M. A. Boyden, Architect A. A. Barker, President Jewett of the Board of Aldermen, City Solicitor W. S. B. Hopkins and W. E. Mills. The banquet was well attended.



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

ENTRANCE TO HOUSE OF DR. H. M. JERNEGAN, COMMONWEALTH AVE., BOSTON, MASS. MR. GEORGE A. AVERY, ARCHITECT, BOSTON, MASS.

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

NEW LUTHERAN THEOLOGICAL SEMINARY AT GETTYSBURG, PA. MR. J. A. DEMPFWOLF, ARCHITECT, YORK, PA.

THIS edifice now in course of erection, contiguous to the old "Seminary Building" of historic fame, will be built in local common brick and Hummelstown-stone trimmings, with Peach-bottom slate roof; including steam-heating, gymnasium, baths and other modern conveniences and appliances. The total cost will be about \$40,000.

UNION CONGREGATIONAL CHURCH, NORTH BROOKFIELD, MASS. MESSRS. EARLE & FISHER, ARCHITECTS, WORCESTER, MASS.

DESIGN FOR A COUNTRY HOUSE. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

COLONIAL HOUSE, ST. LOUIS, MO. MESSRS. BARNETT, HAYNES & BARNETT, ARCHITECTS, ST. LOUIS, MO.

THE LOTOS CLUB-HOUSE, ST. LOUIS, MO. MESSRS. STEWART, MCCLURE & MULLGARDY, ARCHITECTS, ST. LOUIS, MO.

¹ "Der Kirchenbau des Protestantismus, von der Reformation bis zur Gegenwart." 1041 Illustrations. Published by the Society of Berlin Architects, 1893, and for sale by Ernst Toeche, Berlin. Price 32 marks, (\$5).

[Additional Illustrations in the International Edition.]

THE AITRE-SAINT-MACLOU, ROUEN, FRANCE.

This plate, which is reproduced after *L'Art*, represents a portion of the building which once enclosed the cemetery. The structure in modern times has been used for school purposes. The wooden columns are sculptured with a *danse macabre*.

TOMB AT VILLEDAGNE, FRANCE. M. EMILE BERTRAND, ARCHITECT.

This plate is copied from *Architektonische Rundschau*.

MONUMENTS TO M. THIERS, AT NANCY; TO GENERAL DE CHANSY, AT LE MANS; TO RAFFET, AT PARIS AND TO THE SOLDIERS OF THE AUBE, AT TROYES, FRANCE.

THESE illustrations are copied from *La Construction Moderne*.

RENDEZ-VOUS DE CHASSE, LANGASSE, FRANCE. M. P. GION, ARCHITECT.

This plate is copied from *La Semaine des Constructeurs*.

SKETCH FOR A MONUMENT TO WILLIAM TELL, ALTDORF, SWITZERLAND. RICHARD KISSLING, SCULPTOR, ZURICH, SWITZERLAND.

This model, to which was awarded a first prize about a year ago, is reproduced after *Schweizerische Bauzeitung*.

VICTORIA TECHNICAL INSTITUTE, MADRAS, INDIA. MR. H. IRWIN, ARCHITECT.

THE Victoria Technical Institute, here copied from *Indian Engineering*, is situated within the premises and in front of the Government Central Museum, Madras.

The library is 195½ feet long and 25 feet wide, with wings running the whole length 15 feet wide. At both ends there are semicircular reading-rooms. In the wings are placed book-shelves to the height of the roof, with a gallery midway, supported on carved brackets (representing mostly Indian subjects), protected by a very handsome railing. In the whole length of the library there are six bay-windows, on either side; the upper portions of these and all other windows are fitted with stained cathedral glass in ornamental floral designs.

The roof of the central hall of the library is of Mangalore tiles with three rows of glass tiles of the same pattern, in order to throw light onto the carved cathedral-glass ceilings, the central portion of which is of planks decorated with geometrical patterns.

The roofs over the wings are terraced, with an ornamental ceiling below.

The roofs of the reading-rooms are supported by wrought-iron trusses covered over with zinc sheets, with a ceiling of galvanized-iron. Arrangements have also been made in this roof for ingress and egress of air between the ceilings and the roofs.

The walls inside are to be plastered with Madras fine plaster, relieved by panels. The cornice and pillar heads will be neatly carved and finished off. The outside walls are of brick in mortar pointed black, with terra-cotta panels over and around the doors and windows and terra-cotta pillar heads relieved by a heavy cut-stone cornice. To add to the outside appearance of the building, four turrets are constructed at the four corners, in which special staircases lead to the book-shelf gallery and to the roofs of the wings.

The tower is between the library and the lecture theatre and is 28 feet square at the base, and is to rise 175 feet above ground-level and will contain seven stories, but it is not quite decided yet if the uppermost two stories will be the same as that shown in the accompanying elevation.

The lecture-theatre is semicircular with a radius of 74 feet. The class-rooms are two stories high.

THE GLASGOW ATHENÆUM. MESSRS. J. BURNET, SON, & CAMPBELL, ARCHITECTS, GLASGOW, SCOTLAND.

THE illustration, from a drawing which was hung in the Royal Academy Exhibition of this year, shows the front to Buchanan Street of the new portion of the Glasgow Athenæum, which, as indicated in the plan, is an addition to a block previously built, and with which it is connected by a bridge on one of the upper floors. The back portion of the new block consists to some extent of old premises, which were acquired and then rearranged and refitted internally.

The front of the new portion towards Buchanan Street, which forms the main architectural interest of the building, is treated in a very bold and original manner, both in main composition and in detail, especially in regard to the tower-like portion which marks and emphasizes the position of the staircase.

The concert-hall and theatre is intended partly for performances by the students of the school of music connected with the Athenæum (which we gather is an educational establishment and not a club in the ordinary sense). It holds about a thousand persons, and, like the rest of the building, is lighted by electricity. On the floor above is a billiard-room and class-rooms.

The system of heating and ventilation forms a special feature in the internal arrangements. The air, before being introduced into the building, is passed through a filtering-screen and purified from all dust particles, fog, or other extraneous matter. It is then passed through steam-heated coils of piping, where it is raised to the required temperature, relieved from all superfluous moisture, and passed on to rotary fans, by which it is propelled into ducts or channels leading to the several apartments of the building, and discharged through ornamental gratings, so placed as to secure an equal distribution throughout the apartment. The areas of the inlet gratings have been so determined that the current of air may be reduced to a velocity which is almost imperceptible, while the gratings are fitted with regulating louvres, by which the currents may be diverted in any direction found to be most comfortable to the occupants of the apartment. While the primary object of the steam-heated coils of piping is to raise the temperature of a cold external atmosphere, provision has been made so that the same coils of piping may be utilized for the circulation of cold water in order to reduce the temperature of a warm or sultry external atmosphere when necessary. Two distinct plants of machinery and main ducts have been put down, one being specially reserved for the requirements of the concert-hall. Flues for the extraction of vitiated air are placed in the most effective positions. In the concert-hall provision has been made for the introduction, by the aid of one fan only, of a volume of purified fresh-heated air equivalent to 1,200 cubic feet of air for each person per hour, or otherwise equal to a volume of air 15.80 times the cubical contents of the hall per hour.

Entrance to the hall can be gained, not only from Buchanan Street, but from the St. George's-place portion of the Athenæum, where there is crush-room and cloak-room accommodation; there are also cloak-rooms and lavatories adjoining the area and gallery entrances to the hall. The platform is so arranged that it can be adapted either for concert or theatrical purposes.

This print is copied from *The Builder*.

PUBLIC BUILDINGS, FARNWORTH, ENG. MESSRS. BRADSHAW & CASS, ARCHITECTS.

FARNWORTH is a growing and prosperous manufacturing town, one of the many Lancashire centres which are rapidly increasing in size and importance. The site of the proposed public buildings occupies one end of a large space used as an open market-place, and it fronts the highway between Bolton and Manchester. The design emphasizes the main façade, and is governed by a three-fold purpose—to provide public offices and hall, to arrange a dignified entrance to the market-ground, and erect buildings for a new post-office. The walls have red-brick facings, with a liberal amount of light, warm-toned terra-cotta and stonework, the roofs being red tiled. On the first floor is the public hall, with suites of rooms adjoining; it has a fine wagon-headed roof, and ample window-spaces. The drawing was exhibited at the Royal Academy this year and is here copied from *Building News*.

WEST FRONT OF PETTON HALL, NEAR BASCHURCH, SHROPSHIRE, ENG. MR. THOMAS BOWER, ARCHITECT, NAUTWICH, ENG.

SOUTHEAST FRONT OF THE SAME.

INTERIOR OF MORNING AND DRAWING ROOMS OF THE SAME.

INTERIOR OF THE HALL OF THE SAME.



A COLOSSAL CHIMNEY AND ELECTRIC-RAILWAY PLANT IN BROOKLYN.—The chimney-shaft of the Brooklyn City Railroad Company is said by the engineers to be the largest chimney in cubic-capacity yet built, the inner core or flue-area having 65,800 cubic feet of air-space. It is 293 feet high, the sides of the base measure 38 feet 3 inches, and taper-in to a height of 85 feet, where the circular form is assumed. The structure rests upon a foundation of 14 feet of stone and 9 feet of concrete, supported by 1,201 piles, and contains over 2,000,000 bricks, with a total weight of about 3,000 tons. The iron cap surmounting this big stack weighs about five tons and is 27 feet in diameter. Up to the middle of the flue rises a "baffle-plate" of fire-brick to a height of 60 feet. This is to give each of the two flues a separate draught. The chimney is designed to carry away the smoke and gases from thirty-six 500-horse-power boilers using forced draught. Under natural draught the stack would have required an additional 70 feet in height to accomplish the same result. The inner case, or chimney proper, is entirely distinct from the outer wall, and is 282 feet high, with walls 24 inches thick at the base, tapering to 8 inches at the top and 17 feet in diameter. This is in order to allow for the expansion due to the enormous volume of hot air which it is designed to carry off. The outside wall is built with twelve buttresses projecting inward, and reaching to within half an inch of the core. Lateral expansion being thus provided-for, the perpendicular gain, which is reckoned at one-sixteenth of an inch to a foot, is provided-for by building from the outward wall inward, above the top of the core, a curved apron, or "toothing" of brick, leaving an aperture 17 feet across, or just the

diameter of the core. The new power-house was designed by F. S. Pearson, of Boston. To celebrate the completion of the chimney, a dinner, to which about sixty guests were invited, has been given in its interior. The first of the six big multipolar dynamos requires two Corliss engines to keep it running, and steadiness of motion is secured by a fly-wheel 25 feet in diameter and weighing 90 tons. These dynamos are said to be the largest railway power-generators ever built. — *Invention.*

CALICHE CEMENT. — Caliche, the name given by the old Spanish settlers of Arizona to a sort of half-rock, half-clay material, proves on analysis to be a valuable geological formation, and bids fair to enter the commercial arena ere long as a new cement. The caliche lies upon the surface, or very near it. It is often found from 6 feet to 25 feet in thickness, and covers many thousand acres of surface. Whenever found it was until recently considered a decided detriment — it interfered with the cultivation of the soil, was useless for grazing purposes, and produced no precious metal. In these three items were found almost the limit of Arizona's supposed resources. But not long since, samples of this peculiar, "worthless," clayey rock were sent to competent chemists for analysis, with the result that this much-abused caliche was declared by them to contain the proper constituents in the proportions to make the very best Portland cement. In fact, the analysis indicated the same constituents in almost the same proportion as in the best English Portland cement. Some of the samples contained about twenty per cent of sand, but it is claimed that much of the material contains no sand and also that the sand can be readily eliminated. Should the claims, as at present made, prove practically true, the discovery is one of large importance, as the use of Portland cement is constantly and rapidly increasing and forms a large item in our imports. And if the caliche, which is so plentiful and is easily and cheaply obtained, will furnish a product approximately equal to English Portland cement, it will prove a mine of wealth to Arizona, to the owners of the caliche beds, and to all interested in new construction in the line of buildings, bridges, aqueducts, or dams and street improvements. It would soon result in cheapening the article and also — an item of no less importance — diminish our imports of it from foreign countries, adding that much to the country's independence and the nation's wealth. — *Waverly Magazine.*

SIR EDWARD BURNE-JONES. — The official recognition of the merit of Mr. Burne-Jones's art, involved in the bestowal upon him of a baronetcy, will come as an agreeable surprise upon the extremely wide circle of his friends and admirers. All the same there will remain a sense of incongruity in the acceptance of a hereditary distinction by one whose note hitherto has been that of detachment from the applause of the world, or, at all events, from the approval of his contemporaries. Mr. Burne-Jones found even the yoke of the Royal Academy too heavy to be borne, and withdrew a year or two ago from the ranks of its associates, which he should never have entered. If the honor, however, be congenial to him and his family, there is no more to be said beyond a word of congratulation that British art is thus honored in the person of one of its foremost representatives. Sir Edward Burne-Jones paints in a curious old house between Kensington and Hammersmith, formerly the residence of Samuel Richardson, the novelist. His son, Mr. Philip Burne-Jones has made some mark as a painter, though not in the same direction as his distinguished father. — *Edmund Yates in the New York Tribune.*

GOLDEN IMAGES UNEARTHED FROM THE RUINS OF TLAXIACO. — A discovery of great scientific interest has been made in excavations being carried on in the district of Tlaxiaco, State of Oaxaca. A number of small images, formed in metal, were uncovered by the workmen in one of the oldest ruins a few days ago. The images represent people of Oriental appearance and dress, as well as priests in their robes of sacrifice. They bear hieroglyphics of unknown characters and are elaborately wrought, with fine art lines shown in every curve. The images found thus far are of gold, either wholly or in part, and are coated with some unknown enamel, which has preserved them from all harm in the many years they have been buried in the soil. They will probably be shipped to the National Museum in the City of Mexico, where they will be placed at the disposal of the scientific world for further study and discussion. The find is the most important of the year in the domain of antiquities, and preparations are now being made to conduct a complete exploration of the Tlaxiaco ruins for further evidence of the ancient civilization which is known to have flourished in Southern Mexico. — *N. Y. Times.*

WASHINGTON TREED BY A LION. — Whoever has seen the Washington Monument in Baltimore, with the crouching bronze lion of Barye near its base, will appreciate the story they tell about the rustic huntsman on his first visit to town. He was shown all the objects of interest in Baltimore, one by one, but gave each only a passing glance and not even so much as a word of comment. When he came in sight of the Washington Monument, however, a new light shot from his eye. At last it was obvious that something had been found to interest him. He scanned the shaft for some minutes, running his eye from the base to the point on which the statue stood and back again, then fastened his gaze on the crouching lion as if fascinated. His lips parted, and his city friends drew near to hear his criticisms of the sculptor's art. At last, out came the words: "He's got the old man treed, ain't he?" — *Kate Field's Washington.*

WHY STREET REBUILT CREWE. — When Crewe Hall was burned down, some years ago, Lord Crewe exhibited coolness equal to that displayed on a similar occasion by Sheridan. He ordered a table to be placed on the lawn, and, calling for ink and a telegraph-form, wrote the following message to Mr. Street, R. A.: "Dear Street: Crewe is burning. Come and build it up again." In accordance with his instructions, the minutest details of the hall, a fine old Elizabethan structure, were carefully reproduced. — *N. Y. Tribune.*

GLASS FLOOR IN DYNAMO ROOM. — The Continental Insurance Co. is erecting a new building at 44, 46 and 48 Cedar Street, New York, and has contracted to have the floor in the dynamo and engine-room made of 3-4 inch deck glass. This arrangement, of course, insulates the men working about the dynamos and gives a flooring that it is very easy to keep clean. It is likely that this scheme, which was suggested by the president of the company, is one that will be generally adopted.

TOWN OWNERSHIP OF RICH CLAY BEDS. — The theories of certain social reformers are to be seen in actual working in the little community of Klingenberg-on-the-Main, in Germany. In the neighborhood of this town are valuable pits of fire-proof clay, which the authorities in days gone by were far-sighted enough to retain as public property, instead of allowing them to be owned by individuals. They are worked by the municipality for the public benefit. The result is that Klingenberg is one of the happiest places in Europe. Not only do the profits on the clay suffice to cover all local and imperial taxation, but there is a considerable surplus, the bulk of which is divided among the inhabitants. In addition, a present of 15 marks is made this year to every young man who is beginning his military service. — *London Daily News.*

DETERMINING THE AGE OF A TREE. — "I have been called upon in court frequently to pass upon the age of a tree, in order to decide as to the date of a land survey," said Dr. J. T. Rothrock, the State Forester, the other day. "I cannot say that the rings of a tree are a certain indication of its age, although the common belief is that a tree makes a ring every year. I remember a very important case in New Jersey where a great deal depended on determining the exact year of a survey. Our side based its case upon the fact that a section of a tree that had been chipped at the time of the survey showed it had afterwards grown a certain number of rings. To show the fallacy of such an argument, I produced a section of another tree chipped during the same survey which, when cut in half, had more rings upon one side than upon the other. I asked why one-half should be taken any more than the other to determine the age of the tree. It had either only made a half-ring or a ring and a half some one year. Trees may make no rings some years while in others they may make two. I have known of cases in the tropics where they have made three or four rings annually." — *Pittsburgh Dispatch.*

THE DESERTED CAPITAL OF ALABAMA. — Years ago, when our grandfathers were babies, the capital of Alabama was the beautiful little city of St. Stephens. It was the first capital of the State, and each year there assembled there the men who started the ship of State on her journey. But not alone did these old worthies go there to make laws. Like the statemen of this day and time, they mixed considerable frolic with their labors. Most of them were rich and lived in opulence in their lovely country homes. When they went to the capital, therefore, they proceeded to get out of town life all there was in it. In consequence, old St. Stephens was a fast and godless place. The biggest gamblers in the State collected there and fleeced the rich and unsophisticated planters and lawmakers. It is related that it was an unwritten law that no preacher should invade the precincts of St. Stephens. One day a Baptist minister reached there and proposed to preach. He was unceremoniously seized, put in a skiff and rowed across the river, where he was left with the injunction that if he returned he would be tarred and feathered. Tradition says the good man uplifted his hands in honest indignation and prophesied the decay and ultimate abandonment of St. Stephens. His prophecy was fulfilled, for nothing now remains of old St. Stephens except some rock foundations and some memories. Fifty years ago the town was abandoned, the capital was moved to Tuscaloosa, the centre of the State, and the present St. Stephens, the seat of Washington County, was built upon the river. A visit to the site of the first capital of Alabama is full of interest. As you approach it you discover the ruins of once handsome dwellings. The stone foundations show that they were massive and indicate that they were built with no regard for economy. Coming to the town proper, one can easily trace the streets and thoroughfares. They were carefully surveyed and laid off, and many of them were paved with stone. Near the centre of the old capital city are found the remains of the old State Bank and those of the leading hotels. About all that remains of the former institution is the stone vault, in which was kept the money of the State and of the rich legislators. The cellar is about all that remains of the principal hostelry, and from the bottom of this massive oaks are now growing. The cellar is laid in solid stone masonry, but some fifty years ago acorns, buried beneath the floor, shot little sprigs up between the blocks of stone, and, as the twigs grew and strengthened into trees, the rocks were pushed aside to let them spread. Probably the place of most interest, however, is the foundation of the first Capitol. That it was a handsome building for those times is evident from the masonry of the foundation. The building was small, not, if the foundation is not misleading, exceeding forty-five feet square. Just in front of it is one of the grandest old oaks in the world, under whose shade did our old great-grandfathers most probably sit, discuss affairs of State, swap negroes and play poker. The boundaries of old St. Stephens would indicate a city of some 6,000 people, but the population was never more than half that large. One of the most interesting things about the ruins of old St. Stephens is the cemetery. Probably not a spade nor hoe nor rake has touched its soil for more than half a century, and yet the choicest flowers and vines and trees grow there in rank profusion. Cape myrtle, ivy and evergreen, honey-suckle, grapevine and wild rose mix up and embrace each other as no florist on earth could make them do. Handsome marble shafts shoot high up in the air, but each is covered with a matting of ivy. The names on the shafts are unknown to this generation, although many men of history are buried there in unmarked graves. — *St. Stephens' Atlanta Constitution.*