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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS

THE law authorizing the Secretary of the Treasury to employ professional architects to design and superintend Government buildings has not yet been put into practical operation. It is well known that the present Secretary of the Treasury, like many people brought up north as well as south of Mason and Dixon's line, has rather a dim idea of what architects are good for, and, in the present condition of the Treasury, probably feels safer in leaving the designing of his buildings to the Government plan-factory, whose operations he can, at least, count upon with certainty, than in committing the expenditure of the public money to new men, of whom he has never been in a position to know much. He can, as a prudent man, hardly be blamed for not wishing to undertake now any new ventures, but it will do no harm for those who have the matter at heart to keep the Secretary and the public in mind of the fact that it has been shown by ample statistics that Government building work, under the present system, costs more than similar work done under the care of private architects; and that, even if the cost were the same, the advantage of having Government buildings represent the very best and most artistic designing of a number of the best architects in the country, instead of a few stock patterns, devised by clerks in the Government office, would, in the end, be incalculable.

THE New York *Press* has undertaken this year the periodical description of the houses owned by Trinity Church, calling attention, with more fairness and moderation than has been usual, to the miserable character of some of the tenements, and the high rents extorted from the tenants. It will be remembered that a few years ago, the managers of the church property had a controversy with the Board of Health over an order, passed by the Board, requiring landlords to supply running water on every floor of tenement-houses, and there is a current idea that the church rather neglects the cheap and squalid tenements which occupy much of its land. In point of fact, we imagine that the church corporation is an unusually good and careful landlord. Some years ago, when attention was called in the newspapers to the bad character of the occupants of some of the Trinity houses, the church people immediately turned out the objectionable persons, who were probably sub-tenants, and thus not brought into immediate contact with the landlord. In the same way, the high rents which are mentioned are paid, as the *Press* acknowledges, by sub-tenants, to a principal tenant, who probably pays a low rent. Whether the church ought to feel bound to improve and modernize its property is a difficult question. If its houses were improved, its tenants ought fairly to pay more rent, to meet the interest on the additional investment, and there is something to be said in favor of the idea that a tolerably decent place, where the very poorest people can afford to live, is as suitable a piece of property for a church to hold as a neater and handsomer one, with rents so high that only the better class of persons could pay them; but on the whole, we are inclined to agree with the *Press* in thinking that Trinity Church could advantageously reinforce the spiritual edification which it is so earnest in disseminating by showing itself a little more zealous in its care of those individual members of Christ's church whose physical and moral health it is in a position to promote.

TEN or fifteen years ago, it was the common belief of writers on school hygiene that a school-room should only be lighted from one side. Experiment on themselves had convinced oculists that the most comfortable light for reading or writing was a "unilateral" illumination, coming from the left, and, on their representations, the rule of unilateral lighting was imposed by the school authorities upon the designers of the best schools of the period, who were told that "cross-lights" were at all hazards to be avoided. It seemed to us then that, in applying the experience of a single writer or student to a room full of pupils, the theorists had forgotten that, in a school-room of ordinary width, either the pupils in the portion of the room farthest from the window side would get far too little light for proper or comfortable vision, or those nearest the windows would get too much. Moreover, in summer, currents of air across the room are necessary, to keep the air at an endurable temperature, and the French school designers, recognizing this fact, but not venturing to give up their "unilateral" lighting, met the difficulty by planning windows on one side of their rooms, and, on the other, openings, filled with blind-slats, so that air, but not light, would pass through.

FOR these reasons, we thought then, and said so, that the preponderance of advantages, at least for our climate, lay in "bilateral lighting," by means of windows in opposite sides of the room, and that the "cross-lights" from the two sets of windows, although annoying, were less injurious to the eyes than deficient light, while the advantages presented by this system for the ventilation, or rather, the aëration, of the room were too important not to be taken into consideration. The investigations which had led to the adoption of unilateral lighting were first undertaken in Germany, and the system was not only, at that time, rigidly enforced in new buildings, but thoroughly tested, by comparisons made between the sight of the pupils in them, and those of the pupils in the older school-houses, lighted on what may be called the miscellaneous principle. After a few years of experience, it was shown beyond question that more cases of nearsightedness originated in rooms with unilateral illumination than in rooms of the old sort, with windows on different sides. When this was once established, the Germans, with the anxiety to do the best possible for the good of the children that has always distinguished them in matters of education, changed their rules, and, instead of demanding unilateral lighting, the official instructions on the subject now require that every new school-house shall have its rooms lighted from two sides. The German rules, unless they have been changed recently, prefer that the windows shall be in two adjacent sides, but the objections to this are obvious, the ventilation so obtained being inferior, while, supposing one row of windows to be on the left of the pupils, the others must be either behind them, where they cause an annoying shadow to be projected from the children's heads on their books or papers, or in the wall in front of them, causing a glare in their eyes which is acknowledged by all oculists to be extremely injurious. The Council of Public Hygiene for the Department of the Seine has just adopted a code of rules for school construction, under which, although unilateral lighting is permitted, bilateral lighting is favored, but without specifying whether the windows shall be in adjacent or opposite walls. As school-houses are now planned, with four rooms on each floor, it is certainly cheaper to give

the rooms windows in adjacent sides, but the French code introduces a curious complication into the matter by prescribing that the axis of rooms with bilateral lighting shall run north-north-east and south-south-west, or, at least, shall not vary more than forty degrees from a north and south direction. As, in the usual school-house with four rooms on a floor, the sun would enter each room for at least half the day, whatever the orientation, it is difficult to see why a rule should have been adopted which would be so difficult to comply with on most school-house lots; and, if it was intended to apply to rooms with windows on opposite sides, the orientation is of very doubtful propriety, as a room of this sort, with axis north and south, would have no sun at noon, and full sun only early in the morning and late in the afternoon, when it would strike far into the room, and cause so much annoyance as to require shutting-out by curtains, while an east and west axis would give sunshine all through school-hours, at such an angle that it would not generally be annoying, and need not be shut out by curtains.

THE Marquis Mario Brigaldi, a distinguished designer and decorative painter, died in New York a few days ago, after a long and busy life. He was a native of Milan, where he was born in 1806, but came to this country in 1832, with an artistic reputation already established. After sixteen years' practice in New York, he was summoned to Brazil by the Emperor, Dom Pedro, to design the imperial palace at Rio Janeiro. He met with a distinguished reception in Brazil, and was honored, later, by being chosen godfather to one of the imperial children. On leaving Brazil, he went to Spain, where he built two theatres, one in Madrid and the other in Barcelona, and found his way next to London, where he arranged the Royal Marionette Theatre, and is said to have designed houses for the Duke of Hamilton, and other distinguished persons. Returning to New York, he was for a long time engaged in decorating the Stewart mansion, now the Manhattan Club, on the corner of Fifth Avenue and Thirty-fourth Street.

FIRE AND WATER has observed that the fancy which has seized English ladies for working in wrought-iron is spreading to this country, and that sets of tools, for ladies' use, can already be obtained here, at prices varying from three dollars and a half to six dollars. A small forge is requisite, and with this, and some pieces of iron, added, we may say, to an artistic sense, a quick eye and considerable experience, very pretty little articles can be made by women, which will either serve for the adornment of their own houses, or those of their friends, or can be readily sold. Among these qualifications, we must humbly say, the artistic sense is the most necessary, and the least likely to be found. It takes a bold man to assert that women are not generally gifted by nature with a perfect eye for color, and an instinctive feeling for graceful line and modelling which no instruction can improve, but, in our opinion, it is precisely this conceit which, more than anything else, makes women slow to learn the arts of design, and hinders the development of the public taste by filling our houses with hideous frills and trash executed by women, not after their own imaginings, of which, in their innermost hearts, they feel a well-grounded distrust, but in accordance with what serves women in place of imagination — the directions of some fashion magazine. We suppose that most of our readers have mourned secretly over the prodigalities of misplaced labor which characterized a school of carving once famous among the fairer sex, and, while women well taught can compete with the best male designers in all the decorative arts, as the beautiful work shown annually in New York abundantly proves, no person of either sex can excel in those arts without familiarity with the best that has already been done in them, in addition to the general knowledge of line and composition which comes from the practice of drawing or modelling from nature under good guidance.

SO far as iron-work is concerned, a considerable degree of technical skill in handling hot iron is necessary to success, as the most fertile imagination struggles in vain against a hand which pounds away in scales the metal which it is endeavoring to lead into graceful curves. Moreover, as the iron is comparatively intractable, the forms into which it is wrought must be highly conventionalized, and the idea of such forms must, at first, be obtained from objects already executed. The best modern small objects of the kind are probably made in Munich, where they are manufactured on an extensive scale. The pretty candlesticks and other things brought by tourists from Nuremberg, under the delusion that they were made by the descendants of the blacksmiths who executed the splendid grille-work of the doors and windows in the old houses, are of Munich fabrication, and many specimens of the same sort find their way into our metal-work stores. These are generally good in design, and wrought with great skill, and one or two of them will supply the amateur with examples of nearly all the ornamental devices proper to wrought-iron. Some beautiful modern iron-work is also done in Paris, and the foreign junk-shops and bric-à-brac stores will supply ancient pieces, often of surpassing delicacy, such as escutcheons, keys, locks, hinges and other small articles.

LA SEMAINE DES CONSTRUCTEURS discusses a very important question, in answer to a letter from a correspondent, who is the contractor for the building of a factory. According to the letter, the walls of the factory were up, ready to receive the roof, when a destructive cyclone passed through the town, and struck the building, completely demolishing it, with the scaffolding around it. The contractor says that, to avoid delay, he has cleaned the bricks, and repaired the tools, ready to recommence the work, but he wishes to know whether the loss should fall on him, or on the owner. *La Semaine* replies by giving two views of the subject. According to the first view, which is that of Masselin, Dalloz and Laurent, the loss in such a case falls on the contractor. These authorities base their opinion on Article 1,788 of the Code Civil, which says, "If, in cases where the workman furnishes the material, the thing perishes, in any manner whatever, before being delivered, the loss of it is for the workman, unless it has actually or virtually been accepted by the master"; and on a decision of the Court of Cassation, which says that "if a contractor is charged with constructing an edifice, with his own materials, for the account of a third party, and this edifice perishes before being finished, the loss must be borne by the contractor, and not by the third party."

THESE citations seem sufficiently explicit, but the Jurisprudence Committee of *La Semaine* is unable to agree with the other commentators as to the real state of the law. Dalloz, in his remarks on the subject, rather goes out of his way to explain that "the workman who furnishes the material remains proprietor of the thing ordered until it is finished, and delivered to the person to whom he has agreed to deliver it"; and farther on, "The loss of the thing falls on the workman, because, until its delivery, it is to him that the thing belongs; it is, therefore, not necessary to inquire whether there has or has not been fault on his part." It seems to us that this is opening up quite another question, and that it would be much more sensible to say that the loss falls on the contractor because he has agreed to deliver a certain thing, and cannot do so, if it blows down while in process of construction, without rebuilding it, than to rest the matter on the very uncertain ground of the technical proprietorship of the building; and the Jurisprudence Committee see this at once. Accepting, with M. Dalloz, the view that it is the technical proprietor of the building who must bear the loss, under the general legal principle of *res perit domino*, they claim that the owner, not the contractor, is the proprietor, even of an unfinished building, for the reason that the owner of the soil always becomes the owner of everything attached to the soil, whether consisting of a complete structure, or of unfinished walls. There is no doubt that if a contractor builds a wall on another man's land, the wall becomes annexed to the real-estate, so that the contractor cannot pull the wall down, and carry off the materials, even though he may not have been paid for them; and this fact seems to the Jurisprudence Committee sufficient to fix the owner of the land as the proprietor, or *dominus*, of even the unfinished building, within the meaning of the Latin maxim. As a mere piece of reasoning, the argument of the Jurisprudence Committee seems to have an advantage over that of M. Dalloz, but, as we suggested above, we doubt very much whether a court would forsake, in its consideration of such a case, the firm ground of the interpretation of the contract, to wander among the bogs and quicksands of the technical proprietorship of real-estate, and, certainly, no decision showing any such tendency has yet come to our notice.

TOWN-HALLS.[1] — III.

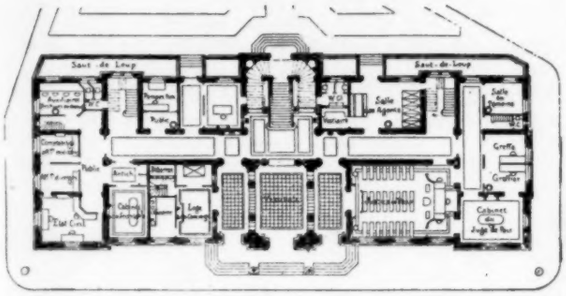


Fig. 20. Mairie at Valence, France.

OF large *mairies*, or moderate sized town-halls, those of Valence and Suresnes may be cited. As the programme of such constructions is nearly always the same, we will take the town-hall of Valence (Figs. 20, 21) as a type and give somewhat in detail the conditions imposed upon the competitors for furnishing the plans.

The building was to be erected within the limits of a rectangle having a maximum area of 846 square metres, 45 square decimetres. The sum of 400,000 francs, fixed upon for the outlay, was to cover all expenditures on the foundations and superstructure, exclusive of all movables. This sum must likewise include the cost of the ordinary interior decorations and

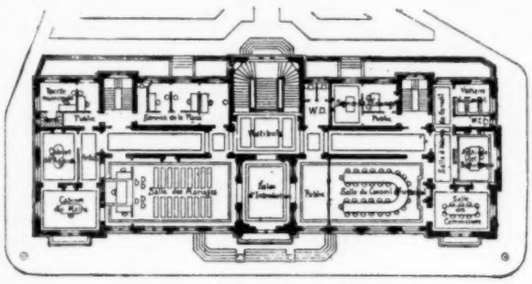


Fig. 21. Mairie at Valence, France.

the permanent work required for putting-in one or several furnaces at a later date.

The introduction of gas and water had also to be provided for in the plans, the expense of which was to be included in the 400,000 francs mentioned above, excepting, however, that of the lighting apparatus properly so-called. The basements of the building were to be in hard limestone from the quarries of Chomérac or Ruoms (Ardèche); the steps of the stairways in stone from Sauzet or Montceau (Drôme). The façades, angles and cornices were to be of white freestone from the

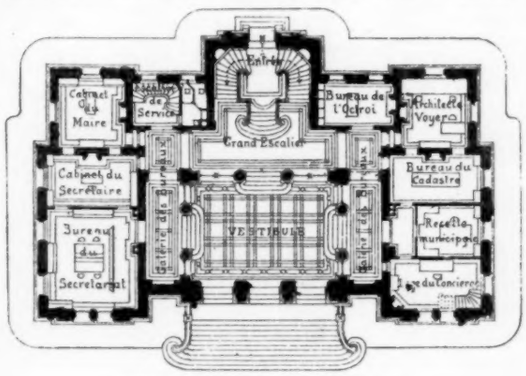


Fig. 22. Town-hall, Suresnes, France.

quarries of Saint-Restitut and Saint-Paul-Trois-Châteaux (Drôme).

The town-hall, planned to accommodate a city of 50,000 inhabitants, must comprise all the municipal services and be disposed as follows:

[1] From the French of E. Rümler, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 933, page 68.

UNDERGROUND FLOOR.

Cellars: storage-space for wood and coal; store-rooms for tools and instruments; hall for the old archives and place for one or several furnaces.

IN THE DIFFERENT STORIES.

Apartment for the concierge; constructional department, street and water service; public-lighting service; police;

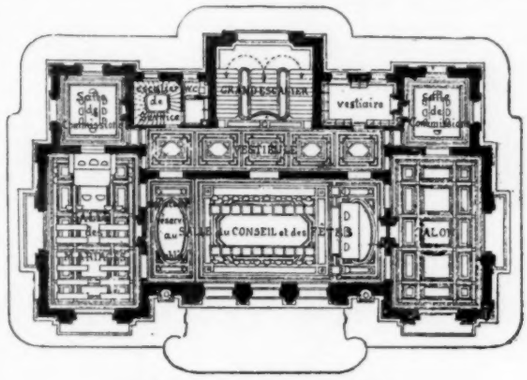


Fig. 23. Town-hall, Suresnes, France.

exchange offices; *mairie;* justice of the peace; town collector's office; store-rooms for small materials used at public fêtes, such as flags, escutcheons, etc. These might also be placed in the attic.

Each of the municipal apartments was to be made up as follows and include the various rooms hereafter designated:

1. *Apartment of the concierge:* Kitchen, store-room, two other rooms.

2. *Constructional department, street and water service:* Office of the street-surveyor; office of the employés; public waiting-

Fig. 24. Suresnes.

room; store-room for instruments, samples, etc. (in the underground story if necessary).

3. *Public-lighting:* Office of the director; employés' office; store-room for small articles (in the underground story, if necessary).

4. *Police:* Office of the central commissary; public waiting-room; hall for policemen; cloak-room for policemen; two strong-rooms (in the underground story, if necessary).

5. *Exchange:* Three rooms.

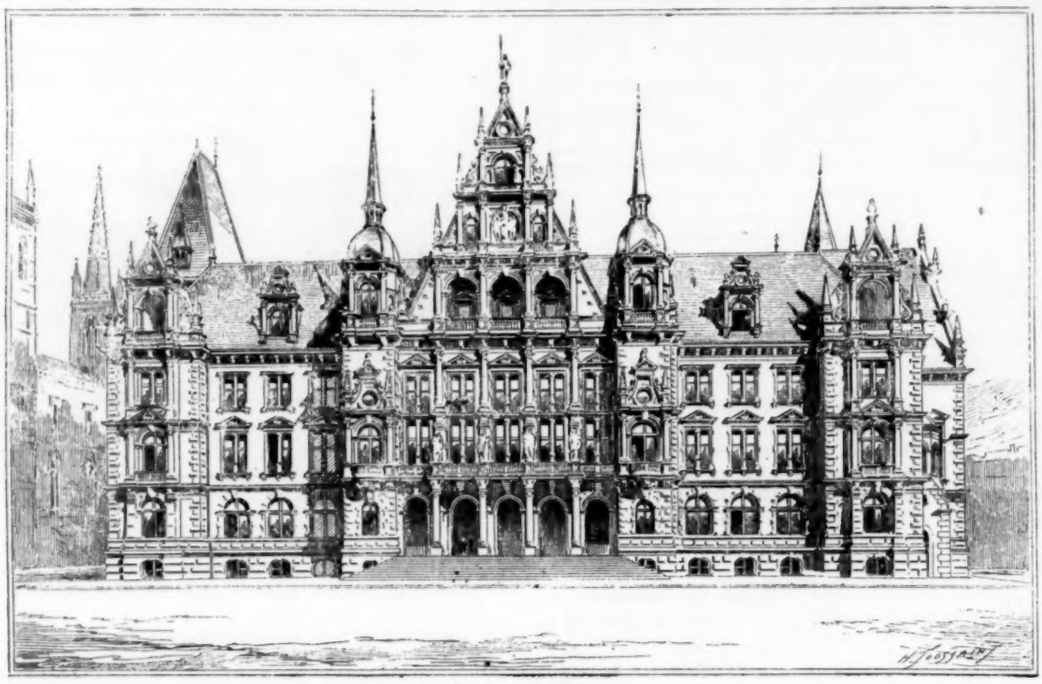


Fig. 25. Wiesbaden.

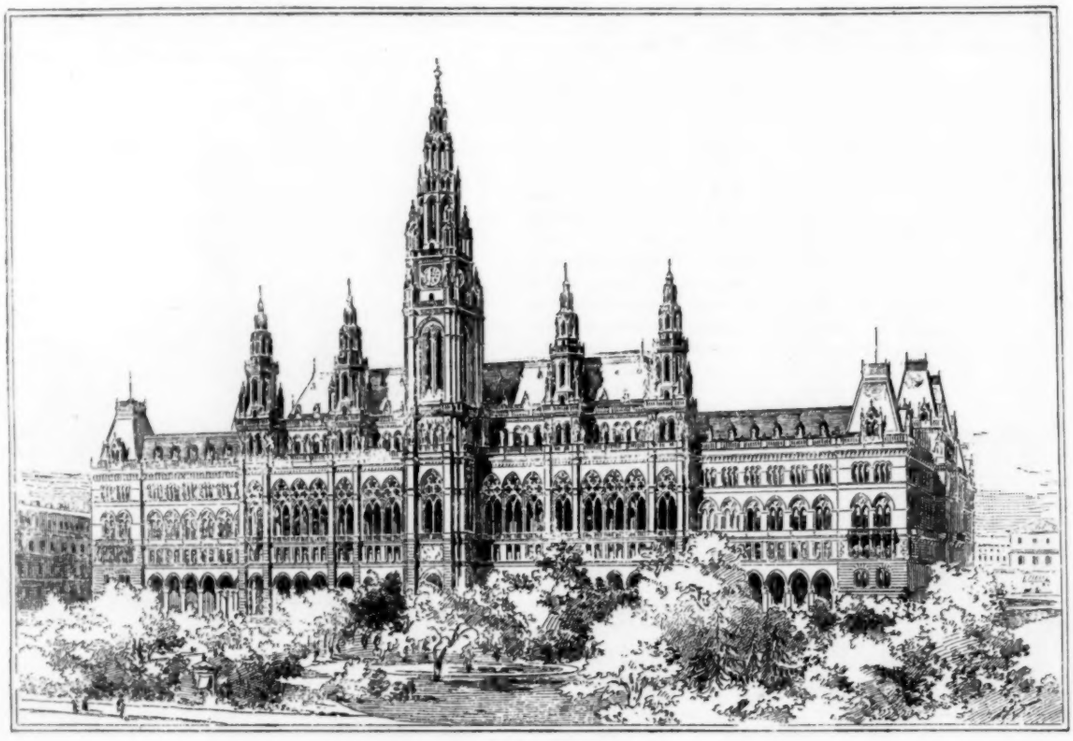


Fig. 27. Vienna.

6. *Mairie:* Mayor's office and deputies' office, with ante-chamber; council-chamber, with a section reserved for the public; hall for committee-meetings; hall for marriages and receptions; office of the general secretary; five offices: *civil state, miscellaneous business, accounts and military affairs, funeral ceremonies, auxiliary employés;* hall for the archives, ancient and modern; public waiting-room adjoining the offices and separated from them by gratings.

7. *Collector's office:* Counting-room with public waiting-room; collector's apartments, connecting with the office and consisting of kitchen, store-room, dining-room, parlor and three other rooms.

8. *Justice of the Peace:* Audience-hall; clerk; justice's office, with public waiting-room; room for the witnesses; storage of archives, etc.

9. Necessary cloak-rooms and water-closets.

The important divisions of the city service and the municipal apartments of honor were to be, so far as possible, on the principal façades; the offices were, moreover, to be so disposed as to receive as much light as possible. Architects were obliged to bind themselves to place the offices of the same division in proximity to the chief's office and in easy communication with it; the offices of the heads of the various boards must also be very easily accessible to the public.

Although the city proposed in the end to put in one or several furnaces, the plan had, nevertheless, to provide, as to

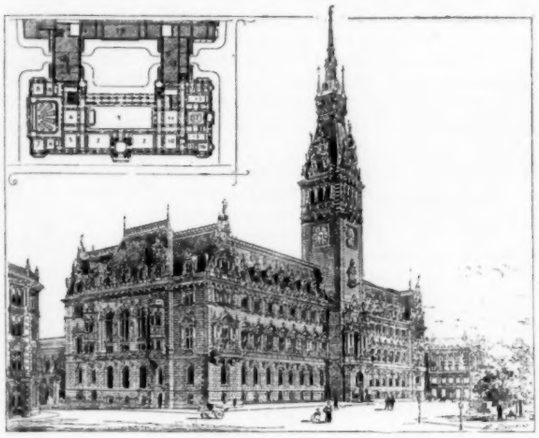


Fig. 26. Hamburg.

disposition and expense, for the introduction of the ordinary and decorated fireplaces wherever it should be deemed expedient in order to assure the heating of the apartments by the usual means.

The town-hall of Suresnes (Figs. 22, 23, 24) is also considered a good example, both as to the plan and also from an

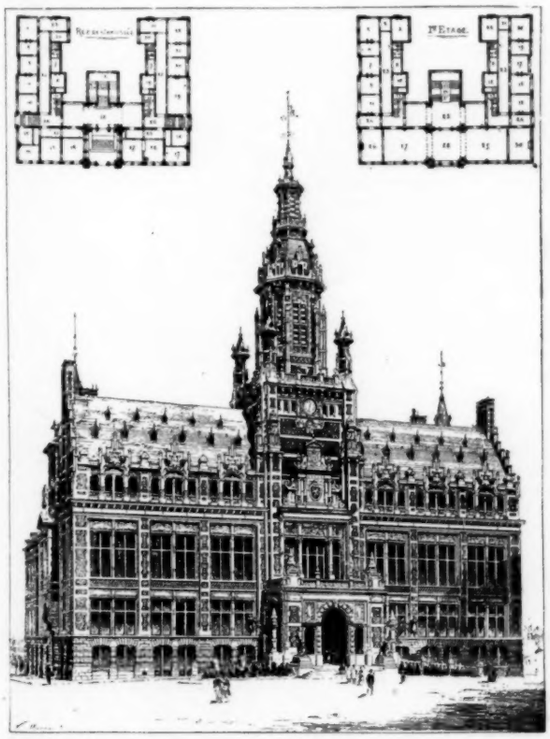


Fig. 28. Schaerbeck (Belgium).[1]

architectural standpoint. It occupies an area of 460 square metres and comprises an underground story, a ground-floor, a first story and a second story in a part of the building.

The underground story is occupied by the offices of the charitable board, a fire-engine room, a room for the storage of fête materials, two apartments for the use of the *concierge* and the cellars necessary for the furnace.

On the ground-floor in the axis of the principal façade, and below the level of the offices, is a vestibule surrounded on three sides by galleries on which open directly: on the left, the offices connected with the secretary's department; on the right, the office of the *octroi*, the city surveyor's office, the hall of records, the town collector's office and the *concierge's* apartment, which communicates by a special small stairway with the two rooms reserved for him on the floor below.

In the axis of this vestibule is the principal stairway leading to the first story, and admitting of a secondary entrance in the rear façade. The first story is occupied by the council-chamber, the hall for marriages, a parlor, two committee-rooms

Fig. 29. Birmingham.

and a cloak-room. A service stairway, starting from the ground-floor, gives access to the second story (secretary's apartments), as well as to the roof and the bell-tower.

The Germans and Austrians show a fondness in their municipal edifices for mediæval and Renaissance styles. The town-hall of Wiesbaden, one of the most recently constructed, possesses all the characteristics of the German Renaissance; especially noticeable is the gable in different stories (Fig. 25). The plan, although rectangular, is very symmetrical and the services are conveniently disposed. At Hamburg, the inevitable belfry reappears, crowning a vast edifice, with simple lines, and on a rectangular and well-arranged plan. The following legend indicates the interior distribution (Fig. 26).

1. Council-chamber; 2. Waiting-room; 3. Lecture-room; 4. Foyer; 5. Room for meetings; 6. Cloak-room; 7, 8. Lecture-rooms; 9. Working-office; 10. Lecture-room; 11. Vestibule; 12. Senate; 13. Committee-room; 14. Cloak-rooms; 15. Parlor; 16, 27. Working-offices; 18. Offices and working-rooms; 19. Stock-exchange.

It was from the Gothic style that the architect of the new town-hall of Vienna (Fig. 27) drew his inspiration. We find

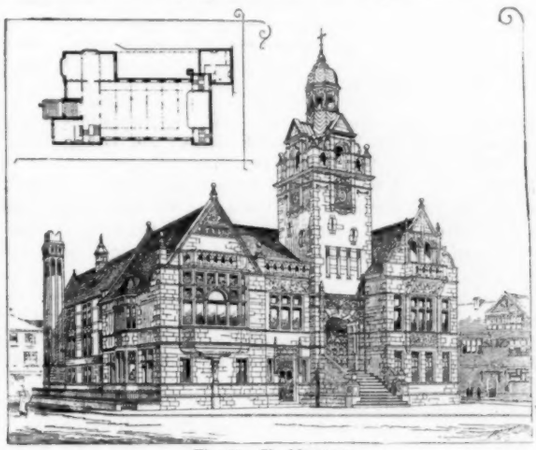


Fig. 30. Cleckheaton.

here, it is true, a rather complicated mixture of German, Italian and French Gothic forms, and even certain Renaissance motives. The plan is square and quite geometrical in distribution: it has been given in the *American Architect* for January 31, 1891.

Like Germany, Belgium and the Flemish countries have remained faithful to the traditions of their noble architectural period. Here the Renaissance still furnishes the type for municipal buildings. In justice to the architects of the present day, it must be said that they handle these skilfully and know just how to modernize them. A good example is the town-hall of Schaerbeck, a view and plans of which are given in Figure 28; the distribution is indicated by the following legend:

Ground plan: 1. Educational collections; 2. Clerk of instruction; 3. Director of instruction; 4. Deputy of instruction; 5. Stairway; 6. Water-closet; 7. Public; 8. Waiting-room; 9. Lift; 10. Deputy of finance; 11. Stairway; 12. Controller; 13. Stairway of honor; 14. Treasurer; 15. Collector; 16. Accounts; 17. Head-clerk; 18. Marriages; 19. Burials; 20. Engineer; 21. Deputy head-clerk; 22. Clerk of the Street Board.

First-floor plan: 1. Army affairs; 2, Public; 3. Charity; 4. Enquiry-office; 5. Service stairway; 6. Water-closet; 7. Head-clerk; 8. Public waiting-room; 9. Secretary; 19. Deputy; 11. Burgomaster; 12. Lift; 13. Stairway; 14. Stairway of honor; 15. Deputy, civil state; 16. Deputy, public works; 17. Architect; 18. Overseer; 19. Clerk; 20. Draughtsman; 21. Various plans; 22. Health board.

In England, all the different styles are adopted; nevertheless, the English Renaissance is more in favor than other types; and the belfry is, of course, found on all town-halls; this is true even of that at Birmingham, which is in the Classic style (Fig. 29).

The plans, as well as the architecture, vary infinitely in this country. No principle is followed. The lack of symmetry, so dear to an Englishman, prevails in the municipal building as in the cottage; but here it shocks our notions of logical disposition and regularity of plan.

However, in small places, town-halls of moderate size sometimes present a simple and convenient distribution, as at Cleckheaton (Fig. 30). But this is not always true of the large cities; it requires but a glance at the plans of the municipal buildings of Sheffield (Fig. 31) to convince one of this fact. The legend given below explains the distribution of the various services.

Ground plan: 1. Building inspectors; 2. District surveyors; 3. Borough Surveyor; 4. Sample-room; 5. Lavatory; 6. Borough-surveyor's clerks; 7. Borough-surveyor's drawing-office; 8, 9, 10. Plan-rooms; 11. Enquiry-office; 12, 13. Mortgages; 14, 15. Accountants; 16. Strong-room; 17. Courts; 18, 19, 20. Water-inspection service; 21. Superintendent; 22. Show-room; 23, 24. Collector's office; 25. Office; 26. Porter; 27. Strong-room; 28, 29, 30. General and assistant managers; 31. Accountant; 32. Telephone; 33. Chief clerk; 34. Auditor; 35. Water-works, public office; 36. Vestibule; 37. Borough-accountants, Public office; 38. Book-keeper; 39. Auditors.

First-floor plan: 1. Sub-committee; 2. Strong-room; 3 Lavatory; 4. Town-clerk's general office; 5. Waiting-room; 6, 7. Town-clerk; 8. Mayor's business-room; 9. Committee-rooms; 10. Serving-rooms; 11. Balcony; 12, 13. Conveyancies, deputy town-clerk; 14. Strong-room; 15, 16. Engineer's drawing-office, plan-room; 17, 18, 19. Council-chamber; 20. Cloak-room; 21. Ante-room; 22. Principal stairs; 23. Ladies' cloak-room; 24. Dining-room; 25. Reception-room; 26. Mayor's parlor; 27. Court.

It appears from this brief sketch and from the accompanying illustrations, that great diversity necessarily exists in the plans of municipal buildings, which must be constructed according to the services to be accommodated. No principle can, therefore, be laid down; but the examples which we have given may guide architects in many cases. E. Rumler.

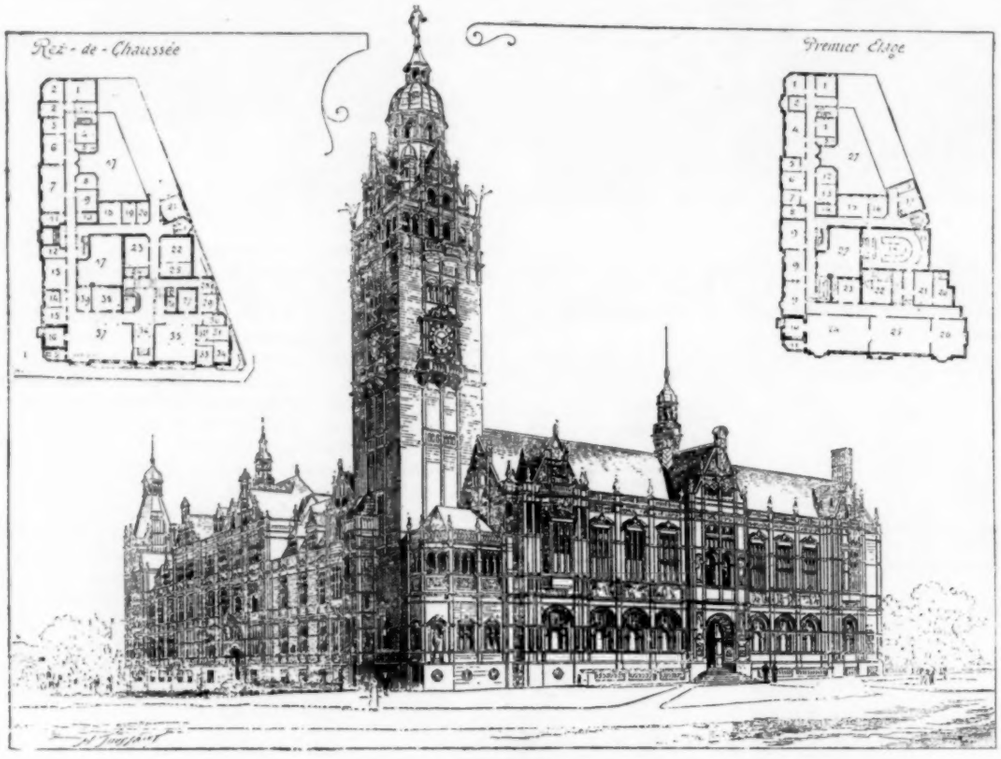


Fig. 31. Sheffield.

THE GREAT EXHIBITION REVIEWED.[1]—VI.

THE ARTS AND ART MANUFACTURES OF JAPAN AT THE GREAT EXHIBITION.

IT is certain that no contributing nation has made a greater effort than Japan to display, in expected competition with the other countries of the world, its progress in all arts, sciences, manufactures, agriculture, horticulture, mining and other industries. This is evident in every place where such effort was possible. Standing alone in her production of works of Fine Art, and not even approached in this respect by neighboring countries; being the only country on earth having consecutive art traditions which have marked a consecutive development for two thousand years; and preserving and practising up to those traditions, almost intact, down to the present time, uninfluenced by surroundings and modern innovations, it was expected that she would make an exhibit most unique in its character and

[1] Continued from No. 932, page 59.

varied in its extent. In this she has not disappointed us except in a few particulars. The works of her individual artists are above criticism. There is no one with the technical knowledge requisite to criticise them. It is only when they step out of their proper sphere that we can do so; and we must look for illustrations, if we would, among things for which we have a profound admiration.

Since the three great vases of Shippo ware, exhibited by Shirozayemon Suzuki, of Yokohama, have been moved from the Manufactures Building to the most prominent place in the Fine Arts Palace, they may be a proper text for some reflections upon the present condition of the Fine Arts of Japan and the proper relation of art to art manufactures in that country. Time was — and not many years ago — when such relation was unknown; for, twenty years ago there were no manufactures, properly speaking, in existence there.

Every man who made anything was his own designer and his own artisan. His work was generally done at his home, and whatever assistance he received was from members of his own family or his apprentices, who worked, not so much for wages, but with the hope that they might become his successors. He was doing the work that he learned from his father or one to whom he had been apprenticed. Possessed of all the traditions that his father or teacher had inherited from a line of ancestors doing similar work, his great ambition was to add his experience to that of his predecessors, and his art to their art, so that in his hands ti would be of greater beauty and bring greater renown. After the revolution that deposed the Tokugawa Shoguns, who for nearly three hundred years, while they may have been great tyrants, had been the greatest conservators of art that Japan had ever known, the study of everything foreign became a fad. And while the introduction and development of all the scientific and mechanical appliances that other nations possessed has been the greatest blessing that this country has ever received; the attempt to import foreign art, however good, and to imitate it, was a most laughable failure. It was ridiculed by foreign critics and soon came to an end.

The highest expression of artistic feeling in Japan was always, up to that time, given to objects of common use and for domestic adornment. A picture or statue was rated no higher as such than a vase or plaque. In fact, the latter were generally carried to higher degrees of artistic excellence, and embroidery was a medium of artistic expression of more importance than painting on silk or paper. Japan was probably the only country on the face of the earth during its long period of isolation wherein art was indigenous and universal.

As a consequence it possessed all the *material* for artistic development in any direction in which it chose to be led. If its art is to become only a manufacture there are plenty of employés to be had who have the preliminary education for the work to be done under patronage and direction, however bad the latter may be. The resulting pieces will have enough of the old Japanese spirit in them to, at first, mislead all but those who make the crucial test. The combination of labor on a single piece will enable manufacturers to turn out large things in a short time, and get quick returns on an investment of capital, which is a necessary concomitant of this kind of business. In this is the dangerous tendency of modern Japanese art that may lead to its degradation, and extinguish the individual artist with all his inherited traditions forever. Having escaped from the Scylla of imported art he is in equal danger from the Charybdis of the art manufacturer. The latter has already been established, as these exhibits testify. But he is still a rarity and if the individual artists hold aloof from him their art may still be saved. In looking at these vases, so pretentious and dazzling, we have wondered what Tsunikichi, the inventor of Shippo (cloissonné) ware, who died in 1883, honored by his appreciative sovereign, would have thought of them.

Of all the countries that have exhibited at the Great Exhibition, there is none whose art works are so far above criticism as Japan. The effort put forth by that Government is the most patriotic, the most fraternal and altogether laudable of those made by any foreign country. We are ready to praise almost every art work that they have sent, but we are not willing to put all their art manufactures in the same category. Much praise is due to Mr. Suzuki for the thousand smaller objects that he has sent, the work of individual artists in which each one commenced and finished the same article. But by moving his largest exhibits to the Fine Arts Building he has taken a responsibility which must be shared as well by those who are his superiors as by the authorities of the Fine Arts Department. These articles are set up in the most prominent part of the Exhibition by the highest authority, after having been exhibited where they belonged. It is not only their great size, their pretentions and the value put upon them, but the official recognition that has put them where they are which is responsible for misleading the host of uneducated people who cluster about them and betray by their expressions of admiration the extent to which they have been misled. If it were not for this they would not be worthy of such extended comment.

These vases are to be classed with works designed to astonish the beholder rather than to have any elevating tendencies. To the Japanese themselves they are denationalizing. The general shapes are contrary to all their traditions. The two outside ones are decidedly the best, being circular in plan, while the central one is oval, a form never before used in Japan. It is short and fat, the deficiency in its height being made up by putting on it a dome-shaped cover surmounted with an eagle.

They were made especially for the Exhibition in the factory of Mr. S. Suzuki at Yokohama, with the coöperation of Mr. S. Tsunekawa of Nagoya, and credit for the design and execution is given as follows: The general design by S. Shiwoda, the painted design by K. Araki of Tokyo and the drawing in ink on copper by K. Oda of Nagoya. The men who executed the mechanical and artistic work are G. Tsukamoto and K. Y. Hayashi of Toshima. The design for the wood-carving on the bases was by S. Nishiyama of Nagoya and the execution by K. Yeguchi of Nagoya. The bronze eagle on top of the central vase was made by Y. Sugiura of Tokyo. The greatest height of the vases with their wooden pedestals is eight feet eight inches, and they are undoubtedly the largest pieces of cloissonné in existence. It is this size alone that gives them importance, and it only shows that a mechanical feat has been accomplished.

The octagonal bases of Keyaki wood are decidedly European in design and finished black, but the deeply-cut panels carved from the same wood, with polished brass backgrounds show the natural buff color. It is asserted that seventy different kinds of wood are shown on these thirty-two panels. They are certainly magnificent work in the old Japanese manner, not tinctured in the least by outside associations. On these bases rest the vases proper, the framework or base material being copper. The general effect of the outside ones is better than that in the middle but the general outline suggests European rather than Japanese models. Each of them is surmounted by a metal corona of a decidedly Moresco-Gothic design, forming a leaf-work cresting, the separate leaves being inlaid with enamelled panels. Above the corona of the central one rises an enamelled dome forming a censer, surmounted with an American eagle in bronze, of very mechanical workmanship. Each vase has two badly proportioned handles very remotely suggesting the shape of a chrysanthemum blossom and the same is repeated on top of the censer forming a perch for the eagle. The worst attempt at decoration is seen in the draperies that hang from all of these handles, which are stiff and ungraceful, much resembling print-cloths in their decorations of enamel. There is considerable ornamentation in those parts which are not pictorially treated that is foreign to Japan. The ornament around the bottom moulding is common in thirteenth-century decoration and similar to the fleur-de-lis as treated in old French frescoes. The third member of the base being a broad cove, is decorated with buff on a red ground and copied from designs on European fourteenth-century encaustic tiles.

The coved necks are treated with alternate red-and-white stripes intended to suggest the American flag, and each of the stripes is covered with flower-patterns which make them look like pieces of print-goods. The field thus formed is studded with metallic five-pointed stars, each with a flowered enamel panel in the centre. The dome is decorated in the same manner as the necks.

All this is a most unfortunate setting for the really meritorious and unsurpassed enamel paintings on the body of the vases. Of these there are six pictorial subjects. These were suggested by Mr. Shin Shiwoda, councillor for arts to the Japanese Imperial Commission, and have been carried out in the most spirited manner by the artists to whom they were assigned. On the fronts the three seasons, Spring, Summer and Autumn, are typified by a group of two cocks and two hens on the middle one, a mythological dragon sporting in the sea on the left, and an eagle and mate on the right. The backs though not so striking or brilliant in color are still more beautiful. The back of the Spring vase is covered by a magnificent cherry-tree in full blossom. The back of the Summer vase is intended to typify both Summer and Autumn: a flock of gulls is flying over a foaming sea by the light of the moon; and it is the most beautiful of all the pictures. The Autumn vase is, curiously, backed by a Winter scene: a waterfall plunges through a rocky gorge, which is overhung by the branches of a fir-tree covered with clots of snow. In the middle of the gorge is a snow-covered rock, while a large and brilliantly-colored bird is flying downward surrounded by several smaller ones. In this decoration the artists who executed it have stood out supreme and given all the character to the work that it has. The rest, as has been said, is mere manufacture and fully demonstrates the futility of the factory system in executing such things.

There are more excusable evidences of factory-work in the Japanese exhibits of the Art Palace. These may be seen in the embroidery and tapestry work, of which pieces of such magnitude are exhibited that a lifetime would not have sufficed for one person to execute them. Of these are the exhibits of Sozayemon Nishimura, of Kyoto, whose card states that he is appointed Manufacturer in Art Fabrics to the Imperial Household. His exhibits are embroideries of which there are examples, both in Gallery 24 and in the rotunda on the second floor, which in size and beauty have never before been rivalled. Among many are No. 57, the Waterfall at the Source of the Hotygawa; No. 61, a six-panel screen in the gallery; No. 146, a six-panel screen and No. 155, peacocks on a pine-tree in the rotunda. But for artistic and historical value they are surpassed by the tapestries of Jimbei Kawashima, who advertises that he has a main factory at Kyoto and branch establishments. His exhibits in Gallery 24 are Nos. 11 and 68. The former is of great size and contains hundreds of figures, representing a festival in the olden time at the ancient and now unused temple at Nikko, which is regarded by the Japanese as the best of their architectural remains and is now a famous resort for artists and connoisseurs.

There are other evidences that factory-work has invaded the realms of art in a country which once had prospered and nurtured the arts without it. But these will suffice to illustrate our text. The arts of embroidery and tapestry are not yet losers by it, but are on dangerous ground. The individual artist is still everywhere found, and wherever seen in the Exhibition is practically above criticism. His works in the various departments of sculpture, painting, embroidery, bronze, porcelain and pottery only vary in degree of excellence. They are here seen grouped as never before and the memory of them alone will be a blessing to all who have had the privilege to behold them.

P. B. Wight.

[To be continued.]

FOUNDATIONS OF HIGH BUILDINGS.[1]

In treating of Foundations before a Congress of Architects, many things must and will be said that are trite and commonplace to numbers of them, and the subject, so interesting in its general aspect, becomes difficult of treatment under such exceptional conditions. It has been thought that the description of a few special cases and the more novel methods in local use would interest many of the members, more especially our visitors from foreign lands.

The high office-buildings of New York are principally on the lower part of the Island, below the City-hall. The surface is from 15 to 35 feet above tide level and the very irregular underlying rock is from 15 to 50 feet below. The soil is yellow sand more or less mixed with clay and containing pockets or beds of quicksand. Many of these buildings rest on piles 25 to 30 feet long, driven to refusal though not always to the rock. Each pile, under the city building-law, may be loaded with twenty tons and advantage is often taken of this permission. Generally the heads of the piles are covered with a bed of concrete upon which the walls and piers are built. Sometimes they are capped with blocks of stone dressed to fair beds that they may bear evenly upon the piles. It is feared that care is not always taken to get the tops of the piles well below permanent water-level; dry seasons and deep drains which may hereafter lower it, must be taken into consideration. In the lower part of New York the permanent water-level is generally not much higher than high tide in the harbor.

The Washington (Field) Building on Battery Place is founded on the rock, except at one point where the bottom of a cleft could not be reached. The gap was spanned by an arch of brick 15 feet in width which carries the walls above it.

The method of founding directly upon the sand is coming more in favor. The Equitable Building and more recently the handsome Union Trust are built directly upon the sand with wide footings, loading the soil to 2 and 2½ tons to the square foot. The *World* and the *Times* buildings have similar foundations.

Many of the older structures, which were often built upon the natural soil a few feet below the surface, have suffered, probably from the lateral flow of quicksand into neighboring excavations. The newer buildings are carried to too great a depth to render such results at all probable.

Under the Mills Building, however, in Broad Street, a test-pit was sunk within sheet-piling. Upon reaching a certain depth, quicksand flowed in so rapidly that fears were entertained for all the buildings near. Fortunately a quantity of concrete was on hand, with which the pit was promptly filled.

The foundations of the Methodist Book Concern were to be carried down to rock, fifteen or twenty feet lower than the foundations of contiguous buildings. To save the expense of underpinning these walls to so great a depth, the new walls were built on piers. Alternate piers were surrounded with sheet-piling, excavated to the rock and filled with solid concrete. When these were completed, the intermediate piers were treated in like manner. Arches were turned from pier to pier and the walls were raised upon them. The adjoining buildings were uninjured. The length of old wall exposed at any one point was too short to cause any dislocation, and the distance between the alternate piers localized the effect of each.

In this connection, some fear was felt lest the unequal shrinkage of the concrete foundation should cause cracks in the walls above. Concrete does shrink, but the experience of the New York Dock Department indicates a shrinkage of not more than of three-eighths an inch to the 100 feet of its long concrete walls.

In the foundation of the new Manhattan Life Insurance Building, is a new application of a method long applied in engineering works. The building itself will exceed in height all commercial buildings up to the present time. The cupola is 353 feet above the street, the foundation on rock 55 feet below, a total from rock to cupola of 408 feet. The great weight of the building compelled that its foundations should be carried to the rock; piles enough to carry it could not have been driven on the site and therefore the system of pneumatic caissons was adopted.

About 4,000 square feet — nearly half the area of site — are occupied by fifteen pneumatic caissons. Eleven of them are rectangular, varying from 1 x 1 feet to 21 x 26 feet and four are circular from 9 to 15 feet in diameter. They are built of steel plates stiffened with large brackets made of steel angles, and the roof is strengthened with I-beams. Area is excavated to 20 feet in depth below the Broadway level, and the caissons are sunk by means of compressed air 35 feet farther to the rock. They pass through 12 feet of fine micaceous sand, layers of mud with sand, or silt, or clay mixed with sand, and a very hard conglomerate over the usual gneiss rock.

The caissons were sunk by excavating the soil beneath them from the inside, and by the weight of the brick piers simultaneously built upon them. To avoid an inflow of quicksand which might occur when the air-pressure was reduced by blowing out the semi-fluid material through pipes, it was decided in the beginning to remove all material in buckets through the air-locks, but upon trial it was ascertained that the pressure could be maintained while blowing out by running the compressor faster, and the soft earth was thus removed. It is to be noted that any flow of quicksand from outside the lines of the caisson might have caused settlements of neighboring buildings. When the caissons reached the rock they were filled solidly with concrete. They are proportioned to the maximum pressure allowed by the city regulations upon concrete, 150 pounds to the square inch. The brick piers are somewhat smaller, as they may be loaded to 200 pounds.

Nearly all the caissons have been sunk to place, and no appreciable cracks have occurred in adjacent buildings, one of which rests upon piles at the level of the general excavations the other on the natural soil several feet above.

The cost is said to be about 10 per cent of the entire cost of the building.

An interesting application of this method has been made by the same engineer-contractors, Sooysmith & Co., in founding the draw-pier of Seventh Avenue Bridge, New York. This is a circular pier 59 feet in diameter. Mr. Sooysmith's experience having convinced him that there was great risk of cracks in the masonry from irregular movements of a very large caisson, this one was made annular in plan, 59 feet in outside diameter, and 10 feet wide. When sunk upon the site, cemented to the rock and filled with concrete, it formed a coffer-dam within which it was expected to build the masonry "in the dry" after the water was pumped out. The sequence must be told. Seams in the rock bottom of the central space admitted water faster than it could be removed by pumps, and it became necessary to cover the bottom with a layer of concrete put in place under water to close the seams and permit the completion of the pier.

A commendable feature in the Manhattan Life Building is the symmetrical distribution of the loads upon each pier. Commonly the walls are built upon the outside edge of the property with footings entirely inside the thickness of the wall, concentrating upon the outer edge of the foundations pressures much above the average. In the Manhattan Life the supports are centrally or symmetrically placed upon the caissons, and strong steel girders extending from side to side of the building sustain the side-walls "in cantilever," if we may borrow a form of expression from the French.

The soil of Chicago is blue drift clay (a material having a great avidity for water), containing beds of quicksand and overlying solid rock at depths of 60 to 100 feet. The original surface of the soil was about 5 feet above the lake; the street grades are now about 10 feet higher. The upper portion is harder and more resisting than that immediately below, but it is probable that as the depths increase the soil is more compact, consolidated by the superincumbent weight. Nevertheless, upon this soil Chicago boasts some of the highest buildings yet erected. The methods of foundation vary. Formerly platforms of timber were used, bedded in the clay, and piles, rarely driven to the rock, but the great weight imposed by recent structures has caused more careful study, and while there is no consensus of opinion practice follows three general lines:

First, piles are driven to the rock and cut off below all future drainage that they may be always in the wet.

Second, detached foundations under each wall or pier with footings carefully proportioned in area to the weights to come upon them and to the resistance of the soil.

The best practice limits the weight to 3,000 pounds on the square foot, but this is frequently exceeded. Some settlement is expected and it is sought by proportioning of weights to surfaces as far as possible, to render the settling uniform. But the large masonry footings reduced by small gradations, form a pyramid of masonry and occupy much room. To redeem this space and make it available for use, advantage has been taken of the resistance of steel beams to transverse strains, and foundations upon beams and rails are now in common use.

The footings as before are proportioned to the weights. A bed of concrete is first laid down and upon this a course of beams. These, by reason of their lower price, are often railway bars. Upon them transversely, a narrower course is laid and then another until the bedplate of the pier is reached. The projection of each course beyond the one above it, carefully computed, is just what the transverse strength of the rail or beam will enable it to carry of the pressure on the foundation course.

This use of steel permits low and wide offsets to be made and reduces greatly the height of the foundation and in consequence the space it occupies. Four or five courses of rails and beams will not exceed a height of 18 to 30 inches, replacing 7 or 8 feet of masonry and giving so much more basement height.

The weight of the foundation is also less than if of masonry alone. In a specific case, the weight of the steel foundations was two-thirds

[1] A paper read by W. R. Hutton, M. Am. Soc. C. E., M. Inst. C. E.; M. Soc. des Ingrs. Civils, before the Congress of Architects of the World's Congress Auxiliary of the World's Columbian Exposition, Friday, August 4th, 1893, by courtesy of the American Institute of Architects.

that of the masonry and the saving in weight about 4 per cent of the load upon the pier. Each course of beams or rails is carefully bedded, filled-in and covered with concrete to protect the metal from rust.

To this method it is objected that some deflection however slight will take place in the beams when the total load comes on them, which will crack and break the concrete and destroy its efficiency as a protection to the iron. This, only a long experience can decide. From a computation of the deflections in a particular case the settlement of the central portion would appear to be about one inch more than at the corners, the diagonal length being 26 feet. Our knowledge of the elasticity of cement will not permit us to say absolutely what would be the effect upon it of this flexure. A more certain protection would be to inject the cement under pressure after the weights are on and the final deflection of the rails has taken place. In either case the rails and beams should be dipped in hot asphalt before being placed in the work, this having proved an excellent protection.

The stability of these constructions has been questioned. The material excavated from the wells hereafter described is as soft as glazier's putty, and will doubtless flow under pressure. While confined laterally it is, nevertheless, compressible and is compressed by the weight of the building and to a certain depth solidified. So long as the adjacent soil is undisturbed, no question but that the foundations will be safe. Experience, however, seems to show that the clay will flow, if not when the lateral resistance is removed, certainly when to this is added shock, as the jar from driving piles.

Some large buildings in Chicago have been erected upon a continuous platform of concrete covering the whole area of the structure. The serious irregular settlement of a prominent public building constructed in this way, accompanied by cracks in the walls and in the concrete platform, has brought the method into disfavor. It has been applied with better results when the platform has been made with iron beams, covered and protected with concrete.

It has been observed in Venice, a city founded on the marshy bottom of a lagoon, that many large buildings constructed in the fourteenth century and before, rest upon a platform of masonry, broader than the building it supports. The masonry itself rests upon a bed of puddled clay, which shows signs of a powerful artificial compression. These structures show no notable change, while many others of later date, built upon piles, show by numerous cracks the irregular settlements they have incurred. It is said that the tower of Saint Mark's does not rest on piles.

A different method has been adopted for a part of the foundations of the new Stock Exchange in Chicago. The foundation is generally upon piles about 50 feet long, driven into the hard clay which overlies the rock. Next to the *Herald* Building, however, which adjoins it, wells were substituted, lest the shock of the pile-driver close to its walls, should cause settlements and cracks. A short cylinder 5 feet in diameter, made of steel plate was first sunk by hand, reaching below the footings of the *Herald* Building. Then around and inside the base of the cylinder, sheet-piles, about 3½ feet long were driven and held in place by a ring of steel inside their upper ends.

The material inside the sheeting was excavated and a similar steel ring was placed inside their lower ends. By means of wedges, the lower ends of the sheeting were forced back into the soft clay until another course could be driven outside the lower ring. This operation was repeated until the excavation had reached the hard clay about 40 feet below the cellar. In this material the excavation was continued without sheeting, in the form of a hollow truncated cone to a diameter of 7½ feet and the entire excavation was filled with concrete. The wells are spaced about 12 feet. The loads upon them vary; some of them will carry about 200 tons.

The materal excavated was a soft putty-like clay to a depth of 40 feet, where a firm clay was reached deemed capable of carrying the weight proposed. The rest of the foundation is upon piles spaced 3 feet between centres, to be loaded with about 30 tons per pile, similar piles having been tested to 50 tons, at the Chicago Library foundation. They are driven with a Nasmyth steam-hammer without brooming, are cut off below lake surface, capped and filled-in with concrete. A series of short transverse I-beams distribute the load transversely and longitudinal beams prevent local settlements.

The interesting foundations of the Washington Monument at Washington, have heretofore been well described. The method adopted is indicated here in the belief that it is not very widely known.

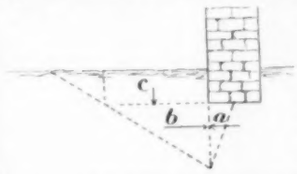
The National Washington Monument was commenced in 1848; in 1854 it had reached the height of 150 feet; in 1856, six feet additional were built. In 1878 the work which had been in the hands of the Washington Monument Association was turned over to the General Government and completed with money appropriated by Congress. The work as finally constructed is a plain shaft 500 feet high, with a pyramidion on top of 55 feet in height. It is 55 feet square at the base, about 30 feet at top and weighs over 90,000 tons.

The original foundation was of rubble masonry in lime mortar 23 feet 5 inches thick and 80 feet square at the base. The soil upon which it rested was a sandy clay. Thirteen feet below was a bed of gravel. The area of the base was too small and the soil under it was not sufficiently resisting to carry the final weight. A mass of concrete 13½ feet thick extending 23 feet 6 inches outside of the old base and 18 feet under it, increased the bearing-surface and carried it down to the gravel. The concrete extended 5 feet under the walls of the shaft itself. The construction of this block of concrete under a shaft 156 feet high and weighing 36,000 tons, was a delicate operation accomplished in this way: On the east and west sides, near corners diagonally opposite, cuts or trenches 4 feet wide and 13½ feet deep were made from the outer lines of the foundation and extended by tunnelling 18 feet under the base of the old foundation. When completed they were filled with concrete and other cuts opposite to them were made in like manner, carried under the old base and filled with concrete. The removal of so much bearing-surface in these two tunnels under the old foundation was sufficient to cause motion in the structure and after this but one cut was made at one time. The work was continued and completed by this system of narrow cuts, which were filled with concrete, until the entire subbase was finished. After this 10 feet in thickness of the outer part of the old foundation was removed in sections 10 feet wide and replaced with concrete extending 10 feet out on the new base.

Gravel and sand are counted among the incompressible materials for foundations when prevented from spreading sidewise. The resistance to lateral spreading is usually furnished by the adjacent sand, and when this is insufficient, the surface rises as the building sinks.

Very interesting experiments upon this subject have recently been published by M. Yankowsky, a Russian engineer. The memoir of Rankine, upon "*The Stability of Loose Earth*" was published in 1856, and is the only attempt that has been made to apply the mathematical theory of the equilibrium of granular masses to the resistance of sandy soils under vertical pressure. It is but an approximation and of uncertain value, although when applied to the thrust of earth against retaining-walls, his theory gives results which agree fairly well with experience.

About the same time (1857) Professor Pauker, colonel of Russian engineers, about to construct a battery at Cronstadt, upon an artificial foundation of sand, first applied the theory of Coulomb and Poncelet to the problem of the resistance of sand to a vertical load. He considered the reaction between the prism-of-pressure *a* supporting any part of the load, and the prism-of-resistance *b* held in place by the superimposed earth *c*. He assumed that this pressure and reaction acted on horizontal lines.



His analysis based upon these considerations, led him to a formula identical with that of Rankine, although reached independently and by an entirely different method. The formula of Pauker has been in general use in Russia for thirty years to determine the depth of foundation of large works, chiefly of bridge piers, upon sandy, clayey and even silty soils.

From 1857 to the present time there have been no attempts, either theoretical or experimental, to increase our knowledge of the resistance of natural soils to *vertical* pressure, although the analogous questions of the thrusts of earth and the resistance of retaining-walls has during this period received a very considerable development.

Mr. Yankowsky's experiments were made by sinking prisms of wood, 8 inches wide and 1 inch, 2 inches, 3 inches and 4 inches thick into a mass of dry sand, the weight and angle of repose of which were carefully determined, and noting the pressures and the displacements of the sand, the results of over a hundred observations are given in the diagram annexed. His first discovery was that the formulas of Rankine and Pauker do not at all correspond with the results of experiment, while the general character of the diagram showed that the discrepancies were not due to any inaccuracy in the experiments, but to faults in the theory. Seeking the cause of this large disagreement, he naturally concluded that some loss of work took place during the phenomenon of the flow of sand, which had not been introduced into the formulas. Examining the triangular prisms of pressure and resistance (method of Coulomb) he was convinced that the lost work was in the friction between these prisms, for while the prism-of-pressure tends to sink, that of resistance tends to rise along its inclined base.

He then discusses the question analytically and finally represents his conclusions by the following approximate formula:

$$H = 2\,h.\,\frac{\left(\text{tangent}\,(45^\circ + \frac{\phi}{2})\right)^2}{\left(\text{tangent}\,(45^\circ - \frac{\phi}{2})\right)}$$

H = height of a column of earth representing the vertical pressure.
h = depth of base below the surface.
ϕ = angle of repose of the material.

The curve of the diagram herewith represents the exact analytical expression, the formula above is a simplification and an approximation and is represented by the straight line of the diagram, tangent to the curve.

The diagram shows that the results of analysis agree fairly well with those of experiment, but while this justifies the use of the formula to determine the resistance of a sandy soil, it does not prove the correctness of the theory of Coulomb and Poncelet upon which it is founded.

In fact the hypothesis of prisms of pressure and resistance bounded

by straight lines do not admit the introduction into the analysis of the equation of moments. For this reason, the theory does not conform to the actual facts, which are much more complicated, of the flow of sand under vertical loads. The observations established this in the most conclusive manner. The width of the prism-of-resistance never exceeded half the theoretical width. This circumstance together with theoretical considerations, led to the suspicion that the flow takes place along curved surfaces; which was fully verified by Professor Kourdemoff, who by means of a glass plate in the side of the vessel containing the sand was able not only to observe, but to photograph its movement.

The limiting curve between the particles which were undisturbed and those which were displaced showed that the prisms of pressure and resistance have for profile a continuous curve. The analytical determination of these curves is not at present practicable; and we are compelled to fall back upon the approximate theories, and experimental data. The theory here given is nearer to the real phenomena of flow, and the results agree with the observations better than any other theory up to the present time.

THE TRAIN-SHED OF THE MAIN PASSENGER-STATION, NEAR THE CATHEDRAL AT COLOGNE.[1]

THE train-shed has a length of 255 m. (837 ft.) and a breadth of 92 m. (292 ft.), covering an area in round numbers of 22,200 sq. m. (238,970 sq. ft.). The following table gives a comparison with the other large train-sheds of Europe:

Train-shed of Station.	Length. Feet.	Breadth. Feet.	Height. Feet.	Area covered. Square feet.
Frankfort-on-the-Main (3 train-sheds)	600	184	93	336,340
Cologne	837	292	79	238,970
Bremen	440	194	89	83,620
Anhalt in Berlin	550	199	112	109,630
Midland, Manchester	563	210	....	118,210
Union, Glasgow	520	198	90	103,080
St. Pancras, London	705	243	100	171,260
Cannon Street, London	656	190	108	124,870

The cross-section of the train-shed is formed by three spans, a middle span of 63.9 m. (209 ft.) and two side spans of 13.4 m. (44 ft.). The height of the middle part is 24 m. (79 ft.); this was made especially low on account of the proximity of the cathedral. The trusses of the central span are formed by arched girders in pairs, the two in each pair being 0.8 m. (2.5 ft.) apart, and united by both horizontal and diagonal braces. The ends of the arches are hinged on pins, and are supported on a narrow horizontal bed-plate which is restrained from moving in a horizontal direction.

The single trusses are for the greatest part of their length built as lattice-girders, but from the ends to a height of 2 m. (6.5 ft.) they have solid webs. The flanges have a T section, and to these the double diagonals are directly riveted. Upper and lower flanges are symmetrical. The distance apart of the trusses is 8.5 m. (27 ft.) from centre to centre. The roof-covering is supported by iron purlins of a I or Z section, which rest on the upper flanges of the trusses. The connecting joints are so arranged that they transmit only vertical forces, the purlins being able to change in length under changes of temperature. This is effected by having at every other panel where the wind-bracing is connected a continuous purlin with projecting ends to which the intermediate shorter purlins are joined by rivets in oval holes.

The wind-bracing consists of round steel rods which carry the wind-pressure on any truss to the masonry abutments.

The trusses support a spandrel structure on each side, the walls of which, 7 m. above the side spans, are glazed throughout their entire extent. To light the train-shed more completely an upper construction 35 m. (115 ft.) wide extends over the whole length with the exception of the two end panels. This upper construction is formed by single small saddle roofs which extend at right angles to the length of the shed, and by a serious of longitudinal window lights along the ridge. The side surfaces formed in raising these above the ridge form a ventilating louvre. For the same reason the covering above the trusses is slightly raised above the rest of the roof, so that side openings are formed where smoke and dust may have exit. In total, the openings for ventilation have an area of 1,600 sq. m. (17,200 ft.).

The ends of the train-shed are enclosed by framing attached to the end trusses and have ornamented windows. The wind-pressure acting upon these ends is transferred downward to a special girder.

The end trusses have a breadth of 4.1 m. (13.4 ft.), the others being only 0.8 m. (2.5 ft.). The end truss and the two trusses next to it are, at both ends of the train-shed, connected together by continuous purlins and by diagonal members, thus forming a rigid system, which is firmly connected for a length of 21 m. (68.8 ft.) to the end abutments, but which is allowed motion on the other four abutments under expansion from temperature.

The trusses of the side spans consist of arched girders, the lower chord of which is so elevated that the pressure line in the upper chord under uniformly distributed load has the same circular form as the chord itself. Against unsymmetrical loads these arches have a moment of resistance amply sufficient.

The roof-covering is supported by Z-beams. On the crown of each side span there is a longitudinal louvre which serves both for lighting and for ventilation. All the roof-covering is of corrugated-iron.

The glass of the roof-lights has a thickness of 6 mm. (0.24 in.). The glass plates extend the entire width of the opening, the edges lying upon galvanized-iron gutter-plates, and are connected by screws passing through —⌒— springs between them. In order to avoid stresses in the glass, pieces of felt are placed between it and the springs, and the felt is protected from dampness by being wrapped in tinfoil.

At each end of these upper windows in the direction of the length of the train-shed is placed a ladder which, on one side of the building, is connected with steps leading downward.

The erection of the train-shed was done under difficulties, since the work had to be carried on without disturbing the movement of trains and passengers on the tracks and platforms below. For an erection-staging an iron structure 38.85 m. (127 ft.) in span was provided which had three trusses 5.5 m. (18 ft.) apart; these were firmly united by diagonal and lateral bracing. This staging was supported by 11 pair of wheels on a track on each side, so that it could easily be moved in the direction of the length of the building as the work advanced. The staging was so managed that it did not in any way hinder the temporary structures or the erection of the waiting-room building.

The movement of the staging, whose weight was about 140 tons, was effected very simply by 16 laborers with crowbars on each side, the time required to move it from one truss to the next, a distance of 8.5 m. (27 ft.), being from 45 to 60 minutes.

The total weight of the ironwork of the train-shed, exclusive of corrugated-iron, is about 3,130 tons (6,900,500 lbs.). This amounts to 160 kg. per square metre (32.8 lbs. per square foot) of floor-area for the large span, and 90 kg. per square metre (18.40 lbs. per square foot) for the side spans, the latter including the ironwork of the side wall on Maximinen Street.

[1] Extract from a paper by F. Lohse, read at the International Engineering Congress of the Columbian Exposition, Chicago, 1893.

BOOKS AND PAPERS.

ENTHUSIASM is always contagious, and when a writer like Mrs. Van Rensselaer, who is so facile with her pen and so perfectly competent to discuss matters of art in general and architecture in particular, undertakes to write about landscape-gardening, the enthusiasm which she throws into her descriptions and criticisms is so contagious that no one who is at all moved by art-impulses can read, even casually, her recent book on the subject[2] without being convinced that we, as a nation, are wofully deficient in a just conception of the natural beauties which can be harnessed to the service of architecture, and that the proper course for each of us who has the slightest regard for Art — with a capital A — is to immediately proceed to plant shrubs and flowers about our individual domains, and to take a hand in the elevation of the country to a proper appreciation of nature's glories as applied to human habitations. The author has written upon many artistic subjects, though never more entertainingly than in this volume, nor with a more comprehensive treatment of the theme, which she has evidently mastered in its fullest details, without losing any of the freshness of conception which can render such a topic so delightful, and the enthusiasm for the subject is so apparent that it is more than forgiven even when carried to the length of naïvely citing a contemporary artist as not only standing at the head of his profession in this country, but as being absolutely the best the world has ever produced. We have a great respect for Mr. Olmsted's great genius, and appreciate the services he has rendered not only to his own profession, but to architecture as well, while his crowning work at Chicago this year has certainly demonstrated the range of his capabilities; but though he may actually be what Mrs. Van Rensselaer assumes, the greatest landscape-gardener the world has ever produced, it seems to flavor just a trifle of the self-esteem which our English cousins are so fond of quoting as a peculiarly American trait, for any one to assert so much for a living compatriot.

A few quotations will, perhaps, best illustrate the bright, effective manner in which the subject has been treated. In regard to what landscape-gardening is popularly assumed to represent in the minds of a great many people: "Nowhere better than at Newport can we understand what a French artist meant when he said that most people's idea of gardening is the clearing-up of spontaneous vegetation, followed by the accumulation of strange and dissimilar objects. Most people, in truth, go to work in their gardens as they would in their houses if they should bring in a bric-à-brac dealer's stock and arrange it after the method which prevailed in his shop. Such a house would not be fit to live in, and the majority of our small gardens are not fit to look at." This is so manifestly true that it must appeal to every one who thinks for a moment. Mrs. Van Rensselaer is wholesale in her condemnation of the style of gardening which finds expression in the Boston Public Garden, or, still worse, in the South Park in Chicago, where admiration is compelled for the

[2] "*Art Out-of-Doors*," Hints on Good Taste in Gardening. By Mrs. Schuyler Van Rensselaer. New York: Charles Scribner's Sons.

ingenuity of the gardener in fashioning all manner of curious shapes, terrestrial and celestial, in bulbs and growing flowers, though the utter lack of art-feeling throughout the whole is painfully manifest. The book should be read carefully by every architect, especially taking to heart the portion which considers specifically the interdependence of architecture and landscape-gardening. "A professed landscape-gardener — I cannot say it too often — will almost invariably be needed when a naturalistic scheme of any extent is desired; but every architect ought to be able to design a small, formal garden, and every gardener ought to be able to develop it. Neither the average American architect nor the average American gardener has this power to-day, but that is merely because neither of them has learned his own trade properly. Every architect ought to know something about the requirements of the surroundings of a home, but few of ours even know how to choose its site reasonably well."

The book is not written for any class; it is not a professional work, but it is a plain, straightforward appeal from one who has studied the subject, and who appreciates the possibilities as well as the difficulties, addressed to every one who has a house or a garden plot, and wants to unite the two in a proper manner. It is in no sense technical, and if one contemplates only a bed of rose-geraniums against a terrace-wall, or a single cluster of nasturtiums against the side of a piazza, the planting would be done to a better effect, more intelligently, and with a great deal more satisfaction after having read this book, while, for the larger treatment of public parks and driveways, the book is almost unique. In fact, a perusal of the final chapter in regard to the books on gardening-art emphasizes the scarcity of literature on this subject either in English or foreign tongues. It is to be hoped that Mrs. Van Rensselaer's book will have all the influence on our country and suburban landscape and architecture which the subject merits.

MISS BEALE is so well-known to the readers of the *American Architect* that her book on "*The Churches of Paris*,"[1] seems quite familiar, especially as a considerable portion of it has already appeared at intervals in the columns of this journal, though the scope of the book is very much enlarged and extended. The work is in no sense an architectural guide, but is rather an historical and archæological description of the Paris churches, the architectural descriptions entering as mere incidents rather than as principal features. The first perusal reveals one or two rather unexpected facts. The list of edifices omits all of the more recent churches, such as St. Augustine, the Trinity, or St. Pierre de Montrouge, but in addition to these there are in Paris more than fifty churches all of which are described, seven of them bearing the name of Notre Dame. This seems like a good many religious edifices even for so large a city, but when it is remembered that previous to the Revolution, when Paris had less than one-third the number of its present population, there were three hundred and eleven religious foundations in the French capital, the present number does not seem so numerous. The book is quite freely but rather unfortunately illustrated. In these days of clean, sharp drawings, and excellent photographic reproductions, there seems no excuse for such poor work as abounds in this book, very little of which is in any sense worthy of the subjects. But aside from the illustrations the subject-matter is admirably treated and without being architectural is very readable, so that one is tempted involuntarily to read about church after church in spite of one's self. The author has evidently written *con amore* and the delightful legends, the half-forgotten lore and the quaint miracle stories are brought out so delightfully that a perusal of the book is almost equivalent to a visit to the structures themselves. One can hardly agree with some of the statements regarding the architecture, indeed, it is questionable whether the work would not have been more interesting to architects if architecture had been entirely left out of it, for one's antagonism is aroused by such a left-handed assertion as that the interior of the Panthéon, for instance, is "*no doubt* good"; nor would many architectural students admit that the abbey-church of St. Denis is "the finest in or near the metropolis and one of the grandest examples of French thirteenth-century architecture," nor that the only thing needed to make it perfectly beautiful is new stained-glass in the windows of the clerestory. And in describing the Cathedral of Notre Dame we are told that "the original design of the church did not comprise the chapels which connect the nave and somewhat spoil the effect of the exterior." There is room for considerable divergence of opinion on that subject. Some even go so far as to maintain that the most interesting architectural effect of the cathedral is obtained from the rear, and that the cleverest arrangement of plan is manifested in the disposition of the *chevet*. The writer evidently has a preference for the Mediæval work, and the Renaissance, of which there are certainly some excellent examples in the city, receives but scant justice at her hands. She dismisses almost the entire architectural effect of the Madeleine with the faint-hearted remark that "what the interior lacks in beauty as regards sculpture and painting, it possesses in its marble walls and its carved woodwork." On the other hand, the decorative paintings in the Panthéon are very fairly criticised both for themselves and for their effect in relation to the church, and a very clever appreciation of the work of Puvis de Chavannes is manifest when his paintings are characterized as pagan Renaissance. Altogether, the book is an excellent aid to a proper appreciation of the archæological and artistic treasures of the French churches and an admirable descriptive guide-book, tinctured with a slight architectural flavor.

[1] "*The Churches of Paris*," from Clovis to Charles X, by S. Sophia Beale, W. H. Allen & Co., limited, 13 Waterloo Place, London.

SOCIETIES

ENGINEERS' CLUB OF PHILADELPHIA.

AT the business meeting, held October 7, 1893, President John Birkinbine in the chair, sixty-two members and visitors were present.

The Committee on Visitors presented their report upon the recent visit of members of La Société des Ingénieurs Civils de France. About forty-seven members of that society reached the city on the afternoon of September 26th, under the escort of the sub-committee, and they concluded their visit and left for New York on the evening of the 28th. There was every reason to believe that their stay in this city was thoroughly enjoyed and that they carried with them many pleasant remembrances.

Mr. John Birkinbine gave a description of the exhibit of Fried. Krupp, of Essen on the Rhur, Prussia, at the World's Fair:

In a separate pavilion on the lake shore, constructed of iron and ornamented with sculpture and stucco, also provided with all necessary machinery, boilers, draught stack, etc., is displayed a large collection of guns, gun-carriages, projectiles, armor-plate, forgings, moulded steel castings, pressed and forged steel articles, etc., made at the Krupp Works.

In addition to these exhibits in the pavilion is a coast gun 16.54 inches bore, length 49.93 feet, mounted on a Pennsylvania Railroad truck, to which it was handled from the vessel by the new crane of the Maryland Steel Co. This gun, with breech closure, weighs 120.46 tons, and carries a charged projectile weighing about 2,500 pounds and driven by 900 pounds of brown powder. It is claimed to be able to penetrate at 2,200 yards a wrought-iron plate 3 feet thick, placed at right angles to it.

Among the cannon in the pavilion are a 12-inch gun, with barrel 35 feet long, mounted on a hydraulic ship carriage, and weighing, with shield, 126.5 tons; a coast gun 9.5 inches in diameter and 29 feet long, mounted on a centre-pivot carriage, and arranged so as to be elevated 45 degrees. This has the longest range of any gun with the same conditions. A shot was fired from it in 1892, in the presence of the Emperor of Germany, and the measured range was found to have covered over 12 miles. The path of this shot has been graphically shown in its relation to Mount Blanc, and the statement is made that if fired at Pre St. Didier in the Alps, at an elevation of 3,280 feet above the sea, it would cross 9,000 feet above the 16,000 feet summit of Mt. Blanc, and land over 12 miles away, near Chamounix.

Among the examples of rolled-plate metal exhibited is a plate of ingot-iron for an hydraulic bending-press, which is 27 feet long, 10.25 feet wide, and 1 foot thick, weighing 61.5 tons; a boiler-plate 65.5 feet long, 10.83 feet wide and 1.25 inches thick, weighing 16 tons; and a boiler-head 12.75 feet in diameter and 1.5 inches thick, weighing 3.33 tons.

Among the forgings may be mentioned a hollow shaft, forged by hydraulic power from a block of crucible steel, 49 inches in diameter and 8.8 feet long. This shaft is 12 inches in diameter and has a length of 82 feet, and is bored out longitudinally to a diameter of 4.33 inches on a lathe with a bed 111.5 feet long. The weight is nearly 12 tons.

Some castings worthy of mention are a moulded steel stern-post for an armored vessel, weighing 12.6 tons, and the companion rudder-frame, weighing 11.125 tons. The large size of these two articles, the latter of which requires a space of 26 by 17.5 feet, made transport by rail impossible, and they were therefore carried to the Rhine by teams, and thence by water to Chicago. There is also a propeller screw having a total weight of 26 tons.

The chimney belonging to the pavilion is 88.5 feet high, with an interior diameter of 3 feet, built of shaped brick with vertical perforations, the bricks being capable of bearing a pressure of over 5,000 pounds per square inch. It is claimed that these perforations increase the adhesion to 61.5 pounds to the square inch as against but 34.75 pounds in solid brick, thus insuring stability.

The pavilion is also equipped with machinery to furnish power for handling the large guns.

Mr. Birkinbine's remarks were illustrated by photographic slides, projected by the lantern, and by sketches on the blackboard.

At the business meeting, October 21, 1893, President John Birkinbine in the chair, forty-six members and visitors were present.

Mr. John C. Trautwine, Jr., described some lantern-slides, illustrating the exhibit of the Pennsylvania Railroad at the World's Fair. These included the general appearance and construction of the building, the system of track-laying, pneumatic signaling from block-stations, illustrations of the mileage of this road, which in a single track would more than encircle the earth, and of the relative value and speed of passenger and freight cars and rolling-stock.

There were also interesting models showing, by comparison, the

cubical contents of the ballast now in use on the road, and the length of track which the capital stock of the company would cover if laid out in tangent silver dollars; a reproduction of the bill of lading for the "John Bull" engine and boiler, dated Liverpool, July 14, 1831, and of a bill for T-rails shipped to the Camden & Amboy Railroad during the same year. Pictures of this old locomotive and of the type of passenger-cars used on that road were also shown and described.

Mr. John Birkinbine described the movable sidewalk on the pier at the World's Columbian Exposition, with the assistance of lantern views showing its general appearance and details of the construction and method of operation. He also showed and explained a photograph of the pyramid exhibited in the Mines and Mining Building, composed of cubes of the different minerals in the relative volumes produced in the United States in one second. He also commented upon a number of slides showing the column of Edison incandescent lights in the Electricity Building, and some of the most important engines and dynamos in that and in the Machinery Building.

The Secretary exhibited a large suite of slides showing the exterior of the Exposition Buildings that were not included in those shown at the last meeting, many of the more important exhibits in the buildings, and scenes in the grounds and Midway Plaisance, with descriptions of the various points of interest connected therewith.

L. F. Rondinella, *Secretary.*

The Illustrations

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

EDISON ELECTRIC ILLUMINATING COMPANY'S BUILDING, 26TH STREET, NEW YORK, N. Y. MESSRS. BUCHMAN & DEISLER, ARCHITECTS, NEW YORK, N. Y.

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

HOUSE FOR —— ESQ., NEW YORK, N. Y. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

HOUSE FOR MR. YOUNG, ST. LOUIS, MO. MESSRS. EAMES & YOUNG, ARCHITECTS, ST. LOUIS, MO.

HOUSE FOR L. FRANK OTTOFY, ESQ., ST. LOUIS, MO. MR. A. BLAIR RIDINGTON, ARCHITECT, ST. LOUIS, MO.

DOORWAY OF THE "LONGFELLOW," CAMBRIDGE, MASS. MR. C. HERBERT MCCLARE, ARCHITECT, CAMBRIDGE, MASS.

THE MERCHANTS' BANK BUILDING, BALTIMORE, MD. MESSRS. BALDWIN & PENNINGTON, ARCHITECTS, BALTIMORE, MD.

[Additional Illustrations in the International Edition.]

VIEW FROM THE COLONNADE LOOKING NORTH, WORLD'S COLUMBIAN EXHIBITION, JACKSON PARK, CHICAGO, ILL.

[Gelatine Print.]

STATUE OF COLUMBUS, IN FRONT OF THE ADMINISTRATION BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. AUGUSTUS ST. GAUDENS AND MISS M. T. LAWRENCE, SCULPTORS.

[Gelatine Print.]

HEWELL GRANGE, BROMSGROVE, ENG.

CHURCH OF ST. COLUMBA, WANSTEAD, ENG. MR. E. P. WARREN, ARCHITECT, WESTMINSTER, ENG.

The church at St. Columba, now in course of building at Wanstead Slip (Stratford, E.), is calculated to seat eight hundred people. It is a plain building faced externally with red brick, and having an internal arcade of the same material. A large contribution has been made from the Bishop of St. Albans fund towards the cost, which will be about £6,000.

TWO HOUSES AT MIDDLETON, ENG. MR. EDGAR WOOD, ARCHITECT.

The houses shown in the illustration are faced with Ruabon work in brick, bands, sills, etc., the stone being concentrated round the front entrance. The roof is covered with five colors of slates, small size, laid random, and blue-ridging. The whole of the interior woodwork including mantels, is yellow-pine treated with transparent paint, which allows the grain of the wood to be still seen, and at the same time takes away the rawness of the wood. The upper portions of many of the windows are filled with stained-glass, the designs of which have been taken from local growth.

ST. NICHOLAS CHURCH, PRAGUE, AFTER A DRAWING BY SAMUEL PROUT.

Notes & Clippings

Taking Down the Spectatorium at Chicago. — The work of removing the immense Spectatorium Building is being done by the Chicago Wrecking Company. "There are 400 tons of steel beams in the building," said President Harris this morning, "but the amount of building-material in the pile is very hard to estimate. If it requires good engineering skill to erect such a building as the Spectatorium, I am quite sure it is an equal feat of engineering to take it all down again. Special machinery is requisite to get the big girders down from their present position. The work is of a very dangerous character. Some of the men we employ are experts in their line. A good house-wrecker, as we call him, earns from $6 to $8 a day. We have a man on every job of importance constantly patrolling the building and repairing every spot which shows signs of weakness. If there is any place which he cannot repair, he instantly reports to headquarters. Work is then at once stopped and the building made safe before our men are allowed to again work on it." Mr. Harris was asked what time it would take his company to remove the Spectatorium, and replied: "It will take at least three months, but these things are as uncertain as the sale of the salvage. I shall try and dispose of the steel on the ground, and I have offered it all at $20 a ton, which is cheap considering the character of the material put into the building. If I can't get this sold that way, it will have to be all broken up for scrap. So you see I may stand to lose considerable there which I shall have to make up in other ways." — *Chicago Journal, October* 12.

The Ownership of the Gold Deposits in Maryland. — An article on the presence of gold in the Appalachian region of Maryland which was recently printed in a Baltimore paper recalled to a lawyer of that city the fact that the United States Supreme Court has decided that all deposits of gold and silver in Maryland belong to the State and not to the owner of the land in which they lie. He cites as authority the case of Shoemaker *vs.* the United States, in the last published volume of Supreme Court reports (147). The plaintiff had been the owner of land in the District of Columbia which was condemned for park purposes. He alleged that there was a deposit of gold on it, which he contended did not pass to the Government by the condemnation proceedings. The land in question was formerly in Maryland and was included in the grant by Charles I to Lord Baltimore. This grant specifically conveyed to Lord Baltimore all the mines, minerals and ores in the land covered by the grant, he paying the crown a royalty of one-fifth of the minerals, gold, silver, etc., that might be mined and utilized. Lord Baltimore made many conveyances, and the one of the tract held by Shoemaker among them, reserving to himself all the minerals that might be in the lands conveyed. The Supreme Court (opinion by Mr. Justice Shiras) held that no right to the gold and silver and minerals passed to the purchasers of these tracts, but that they remained in Lord Baltimore and his successors, subject to the royalty to the crown, and that such proprietary right passed to the State of Maryland when Lord Baltimore's grant was confiscated, and subsequently to the United States when Maryland ceded to them the land of which Shoemaker's tract was a part. — *N. Y. Evening Post.*

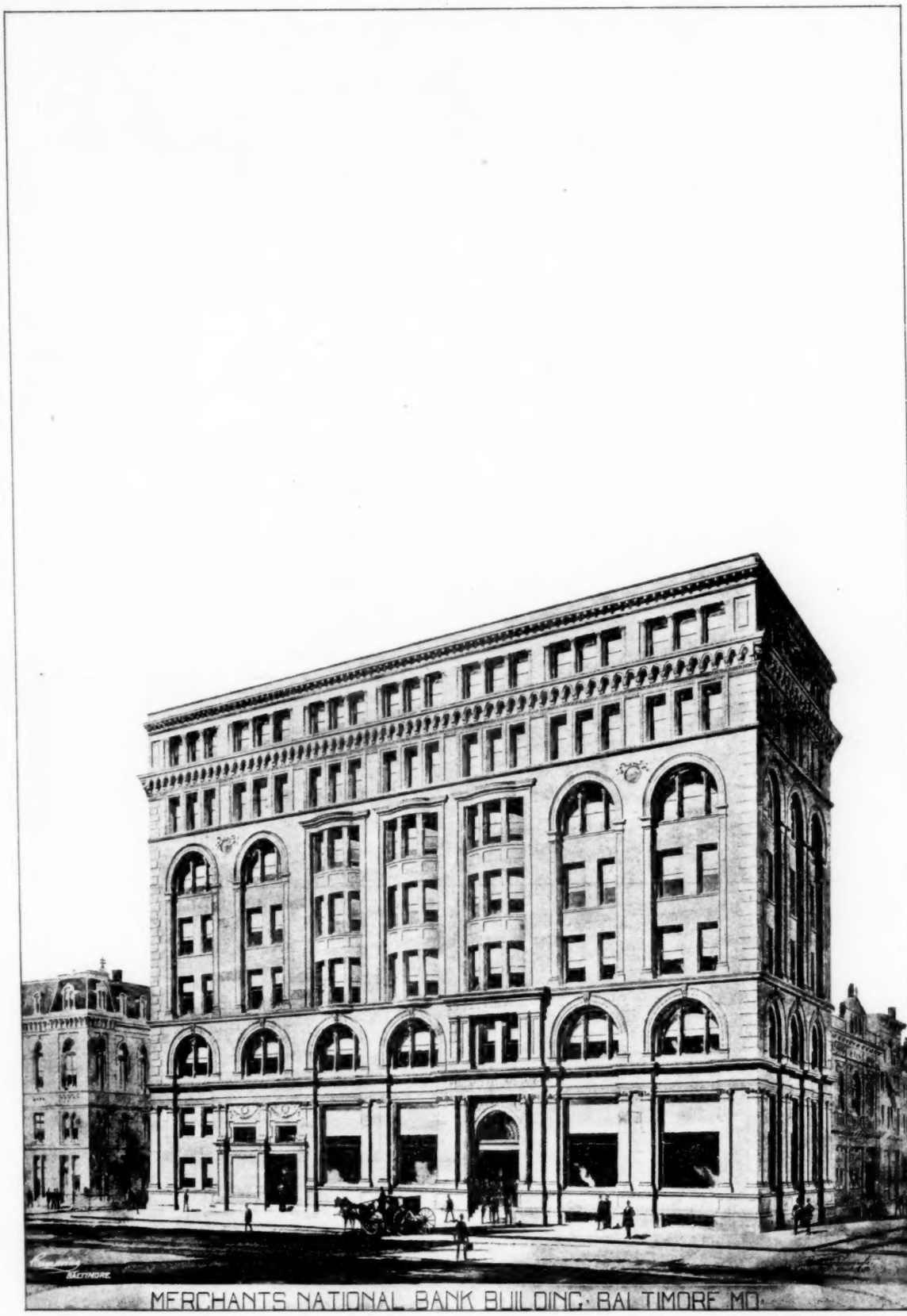
The Story of a Bacchus. — The venerable but still fascinating *raconteur*, M. Auderbrand, relates a little history in the last number of *L'Art* which explains the cause which has deprived the world of many a valuable example of ancient art. It appears that the late Prosper Merimée, who was the soul of the French department for the restoration of buildings, once went on an official visit to Bourges. In the neighborhood he heard about a place called "Cæsar's Camp," from which many strange objects were derived. As in duty bound he went there, and arrived at a moment when a fine statue of "Bacchus" was exhumed. He could not well explain his official position to the rustics, so he appealed to their greed by telling them that the figure, if brought to Bourges, would reach a good price. He proposed to go in search of a conveyance. Visions of the excitement that would be caused by his discovery floated through Merimée's mind — for he considered the "Bacchus" as a rival to the "Venus of Melos," with the additional attraction of being to some extent a French work — and lightened his toilsome journey on foot. After some hours' delay he returned with a carriage to Cæsar's Camp, but his chagrin can be imagined when he found that the statue no longer existed. A peddler arrived soon after the departure of Merimée, who also displayed an interest in the figure, not on account of its beauty or antiquity, but solely for its value as old metal. He at once struck a bargain, paid fifteen francs, ordered the laborers to smash the figure, improvised a furnace, and had nearly completed the melting of the "Bacchus" into materials for spoons and ladles before Merimée returned. The moral to be drawn is that archæologists should lose no time to secure possession of anything precious whenever they have the chance. — *The Architect.*

A Costly Mosque in Damascus Burned. — The principal mosque of Damascus was burned to the ground, late in October, causing a loss of $2,500,000. — *Exchange.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

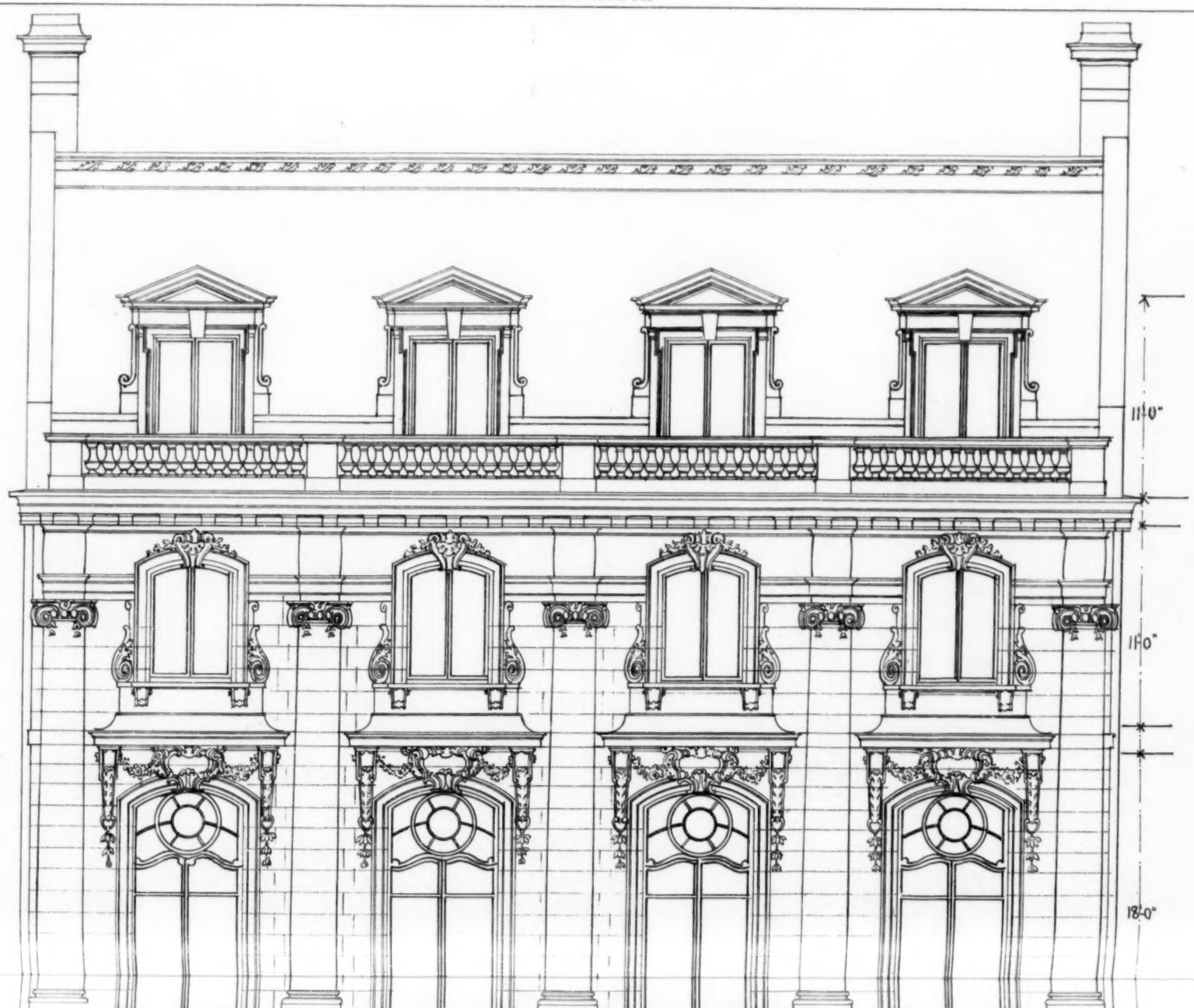
ENTRANCE TO THE "LONGFELLOW"
APARTMENT HOUSE
FOR DR. GEO. R. SOUTHWICK, CAMBRIDGE, MASS.
C. HERBERT McCLARE, ARCH'T. CAMBRIDGE.

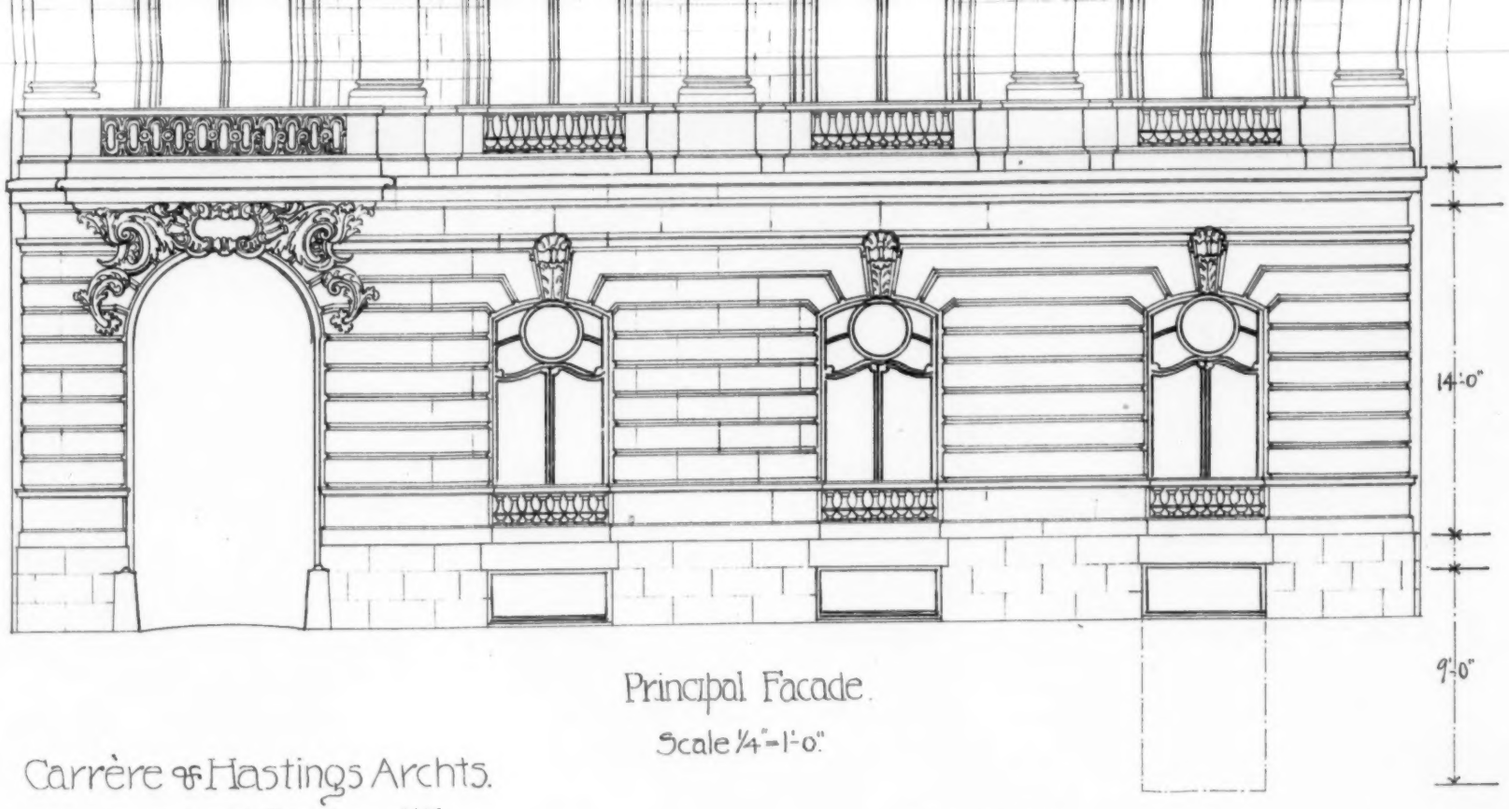
HELIOTYPE PRINTING CO. BOSTON



MERCHANTS NATIONAL BANK BUILDING: BALTIMORE MD.

HELIOTYPE PRINTING CO. BOSTON





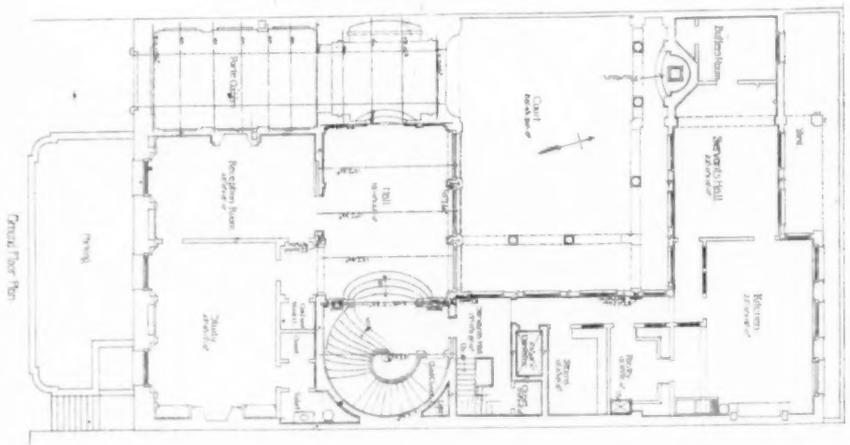
Principal Facade.

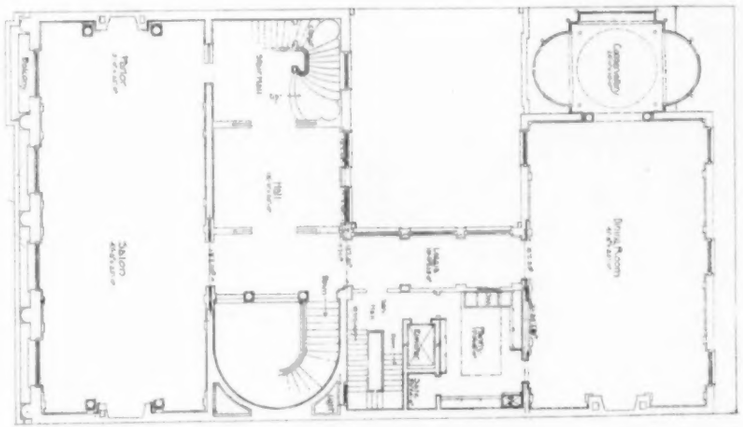
Scale 1/4"=1'-0"

Carrère & Hastings Archts.

44&46 Broadway. N.Y.

House for

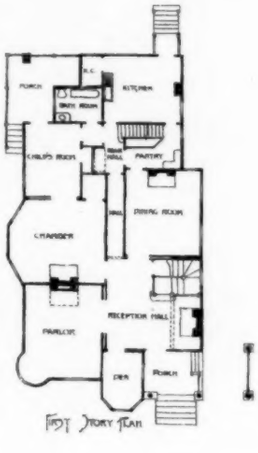




HOUSE FOR Mr YOUNG NEAR ST LOUIS
EAMES AND YOUNG ARCHITECTS

HELIOTYPE PRINTING Co. BOSTON

RESIDENCE FOR L. FRANK OTTOFY
A. BLAIR RIDINGTON ARCHITECT
904 OLIVE ST. ¦ ST. LOUIS MO. ¦



FIRST STORY PLAN

HELIOTYPE PRINTING CO. BOSTON