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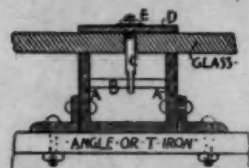
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JANUARY 19, 1895.



SUMMARY:—

The Massachusetts Institute of Technology forced to apply for State Aid.—The New York City-hall Competition.—The Status of the Boston City Architect Department.—A Sightless Architect.—An English Architect secures Justice.—Death of W. H. Gaylor, Builder and Architect.—The Originator of the Suez Canal.—Another Step in the making of Artificial Diamonds.—A Peculiar Railway Accident . . .	25
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THE Massachusetts Institute of Technology has applied again to the State Legislature for money, asking for an appropriation of twenty-five thousand dollars a year for six years, to help in paying current expenses, which now exceed, by about that amount, the annual income. As a place of higher scientific education, the Institute of Technology has been extremely successful, and is now at the height of its popularity and usefulness, but, as in most great schools, and especially in schools devoted to science, the increase in number of students brings with it increase in the number of instructors, multiplication of courses and departments, and increase in the number and cost of instruments and apparatus, collections, special libraries, and other necessary appliances for teaching. Although the Institute has been, of late years, generously endowed by bequests and other gifts, these endowments have usually been specially devoted to certain purposes, instead of serving to increase the available income of the Institute; and, unlike other colleges, the Institute, which was founded by private citizens, only about thirty years ago, has very little income from invested property. Considering the value of the Institute to the people of Massachusetts, and the credit which it brings to the State, the Legislature could hardly find a more worthy object of encouragement. While it was in what may be called the experimental stage, State assistance was several times, perhaps wisely, refused it. Now, by the zeal and enlightenment of its managers, and the ability of its instructors, it has risen to the highest rank among the schools of science in the world, receiving students from Europe and Asia, as well as from all parts of the United States; and it would be a national misfortune to have it compelled to reduce its teaching force, close some of its departments, turn away students, and sell its splendid apparatus, for want of money.

THE New York city authorities do not show much enthusiasm in regard to paying either the architects who submitted plans for the new City-hall, or those who acted as advisers in the matter. The Comptroller, when applied to by one of the latter for repayment of some of the expenses incurred by the Advisory Board in working over the plans, coolly replied that the statute repealing the act which authorized the construction of the new City-hall in the Park terminated also the existence of the City-hall Commission, and with it the existence of the Advisory Board; and he had therefore no authority to pay any money to the members of a Board which no longer existed. The idea that, by abolishing an office, a public corporation can extinguish all debts that it owes to pre-

vious incumbents of the office, as well as debts to private persons, contracted in its behalf by such officials, acting within their authority, during their term of office, is a novel one, and is certainly quite worthy to be the last expression of the régime of infamy and plunder which, we hope, has been brought to a close in New York. The contract between the city and the architects who competed for the City-hall was as definite and solemn as words could make it. The architects fulfilled their part of it to the letter, and they wait for the city to fulfil its part. To assert that the repeal of the statute authorizing the erection of the new City-hall in the Park released the city from this contract is, to put it plainly, a ridiculous subterfuge, as every school-boy knows that a statute having that intention, even if passed, would be void; and the attempts of the officials to dodge behind this pretence simply discredit the city. That they have no appropriation available for paying the debts they have incurred may be true, and it may be necessary to get judgment from a court before the necessary tax-levy can be made, but this is a very different thing from denying the obligation, or, what is almost as bad, neglecting to acknowledge it.

THE new Mayor of Boston, Mr. Curtis, took occasion, in his inaugural address, to advocate the abolition of the City Architect's office, and the committing of the city building work to private architects. Although he had no fault to find with the present administration of the office, he thought that the city would be better served by enlisting the efforts of a number of the best private architects than by putting all its work in the hands of one man, however able he might be. Whether the Mayor's recommendation will be carried out remains to be seen. The last Mayor held similar views, but the City Architect's office had, on his accession, been of such service to the politicians that it was useless to try to abolish it, and he contented himself with putting it into the hands of an architect of distinguished ability and integrity. Under the administration of this gentleman, Mr. Wheelwright, the office has, we imagine, been of very little service to the politicians; and as the new Mayor appears likely, if the office is retained, to continue the régime under which it is to be used for architecture, and not for politics, it may be that his wishes in regard to it will be no longer opposed.

MANY people will be interested to know that the architect who planned the library and natural history building of the Perkins Institution for the Blind, in Boston, besides several tenement-houses belonging to the Institution, is himself a pupil of the Institution, and is totally blind. This clever man works out his ideas, as he modestly says, in his head, and then sketches them in raised lines, not to scale, but with the principal dimensions marked, and the windows, doors, closets and projections of the plan clearly shown. These sketches are put into the hands of a draughtsman, who re-draws them to scale, under the direction of the designer. In this way the blind architect, Mr. Reardon, has gained a considerable professional experience. The Institution does a good deal of building, and he understands its needs thoroughly, and knows how to make sure that they will be satisfied, and he is probably the best architect that could be employed under the circumstances. It is curious that Mr. Campbell, the distinguished Director of the London College of Music for the Blind, who was for many years an officer of the Boston Institution, and has been totally blind from his youth, has also been able to be of much use to the establishment under his charge in its building work. We have heard him recount his experiences during the construction of the buildings of the College. The workmen, apparently, imagined that, as the occupants of the rooms would not see what was about them, it made no particular difference how it was done. They were soon undeceived. Mr. Campbell, as soon as any part of the buildings was in condition to be inspected, had step-ladders brought, and commenced a thorough inspection, with his fingers. All the plastering was gone over, and, where important defects were found, the work was rejected, and the plastering had to be pulled off, and done over again. The woodwork was criticised in the same way; and, in the end, the College buildings were finished with a minute care which would hardly have been shown if a skilled clerk-of-works, with the best and sharpest vision, had had the supervision of them.

A CASE was tried in England the other day, which throws some light on the way in which English courts regard the rights of architects. It appeared that Mr. F. Lovell Lee, an architect, found a lot of land for sale, which, as he thought, would make a good site for middle-class flats; and went to an acquaintance of his, who, as he believed, would be likely to make such an investment. His acquaintance told him that he had a client, who, as he thought, might be interested in the matter, but that, before he saw him about it, he would like to have Mr. Lee make some sketch-plans, showing what could be done with the property. Mr. Lee complied with this request, and, when his sketches were ready, went to a quantity-surveyor, Mr. Verity, and told him that he was likely to be architect of the new building, and wished him to measure the quantities and make an approximate estimate, with the understanding that he should charge nothing for his services if the matter fell through. Mr. Lee then took the plans and estimates to his friend, who intimated that he was satisfied with them, and that, unless his client made some objection, there would be none, and he asked Mr. Lee to go on with the plans. Mr. Lee told him that he had done all the work on speculation that he proposed to, and that if he went on with the working-drawings and specifications, he would require payment on the usual terms. The other assured him, that if the building went on, he should be the architect, but he did nothing more until he was told by the defendant that the contract for the sale of the land was signed, and that he was himself the purchaser; and he wished Mr. Lee to send out the party-wall notices. Mr. Lee did so, and began work at once on the detailed drawings and specifications, and engaged Mr. Verity to make a detailed bill of quantities, for which he paid him £74, this being two per cent on the estimated cost. A little later, the defendant told him that he had concluded to sell the land, instead of building, and wished him to find a purchaser for it, which he vainly endeavored to do. He then presented his bill for two and one-half per cent commission on the estimated cost, with £74 in addition, to reimburse him for his advance to Mr. Verity.

THE defendant brought forward the timeworn old denials and counter-claims. He said that he had never engaged Mr. Lee to do any work for him, and had never authorized him to employ any quantity-surveyor on his account; and the whole thing had been a mere speculation of Lee's, for which he was not in any way liable. Moreover, Lee's services were useless to him, as the work could not have been carried out for the sum mentioned in Verity's estimate; and, if it had been carried out, it would have contravened the Metropolitan Building Act. He brought forward several architects and builders, who said that the building could not have been erected for what Mr. Verity estimated it, and considered that it would cost, judging by the cubic contents, from twenty to thirty per cent more. In rebuttal, Mr. Verity testified that he had made his estimate from measurements of the actual quantities, not by cubing, and was sure that the building could have been erected for the sum named; and Mr. Lee testified, in regard to the contravention of the Building-Act, that his first sketches did contravene the provisions of the Act in regard to the size of light and air spaces, but that he corrected this in his later plans. There was no jury, and the judge, Mr. Justice Wills, in summing up the case, said that some of the evidence offered for the defendant was not reliable, and he was sorry to say that this remark might be applied as a general rule to that kind of evidence. Every one knew perfectly well that, when once litigation was embarked in, witnesses could be procured without difficulty, to differ, not only to the extent of twenty or twenty-five per cent from the witnesses of the opposite party, but, if necessary, by seventy-five, or two hundred per cent. It was very unfortunate that it should be so. He thought that the plaintiff had made out his case, and no reliable evidence had been offered for the defendant to show that the plaintiff's estimate was not a fair and reasonable one; and he therefore gave judgment for the plaintiff for the full amount of his claim, with costs.

MR. WILLIAM H. GAYLOR, formerly Building Commissioner of Brooklyn, died recently in that city, at the age of seventy-three. Mr. Gaylor was born in Stamford, Conn., and was brought up on a farm. At the age of fifteen, he was apprenticed to Edwin Bishop, a noted builder of that region. Three years later, he removed to Brooklyn, and after finishing his term of apprenticeship as a builder, he studied

architecture, and designed many fine buildings. Under Mayor Low, he was appointed Building Commissioner, retaining that office during the whole of Mr. Low's administration.

THE *Deutsche Bauzeitung* mentions an interesting fact in connection with the Suez Canal. After observing that, as all professional engineers know, de Lesseps was not an engineer, it says that the originator of the scheme upon which the canal was finally carried out was an Austrian engineer, Alois Negrelli von Moldelbe, who died in 1858, and whose plans and writings on the subject of the canal were bought, after his death, by de Lesseps. The son of this engineer, General Negrelli, has called attention to this matter in the Vienna papers, and the *Deutsche Bauzeitung* thinks that the fact that de Lesseps never mentioned the engineer Negrelli in his accounts of the canal "throws no very favorable light on de Lesseps's personal character." It is certainly a little strange, if de Lesseps really carried out Negrelli's scheme, that he should not have given him the credit which he always modestly disclaimed for himself; but it must be remembered that de Lesseps called councils at various times, of the most distinguished engineers in Europe; that he was for many years intensely interested in the subject, and probably bought everything that he could lay his hands on to help him in working out his pet scheme; and it is at least conceivable that the plan which he carried out appeared to him a combination of a large number of suggestions, among which he might have forgotten the relative importance of Negrelli's.

M. HENRI MOISSAN, in a note to the French Academy of Sciences, reported in the *Revue Industrielle*, gives an interesting description of his experiments in volatilizing carbon. Naturally, these experiments were carried on with an electric furnace, in which he succeeded easily in vaporizing considerable quantities of pure carbon, which condensed invariably in the form of a sort of dust of tiny crystals of graphite. Tests of the black coating which forms on the inner surface of the bulbs of incandescent lamps showed that this was also mainly graphite, condensed from the vapor given off by the heated carbon filament. After establishing these facts, M. Moissan endeavored to ascertain whether the carbon was melted in the electric arc, or whether, like a few other substances, it passed directly from the solid state into that of vapor. Repetition of the experiments, using always pure carbon, failed to show the slightest trace of fusion. A small crucible, with a tightly-fitting cover, was exposed to a current which partly volatilized the block of magnesia on which it stood, but the cover did not adhere to the crucible; and even where a current of twenty-two hundred amperes, at a pressure of seventy volts, was turned through an electrode of pure carbon, although the end of the electrode was converted into graphite, there was no sign of fusion. Nevertheless, M. Moissan thinks that carbon can be liquefied, but he believes that liquefaction will take place only under pressure. When, by the united action of heat and pressure, pure carbon is brought to the state of a liquid, he believes that, on cooling, it will crystallize into diamonds. Already, as he says, he has been able to obtain, in small retorts of chilled iron, small diamonds, having the shape of an elongated drop. Diamonds of this shape, he says, are found in nature, having no apparent trace of crystallization, but presenting rather the form that would be assumed by a drop of liquid, imprisoned in a pasty mass.

A PECULIAR railroad accident occurred, according to *Indian Engineering*, a little while ago in India. Eight men were sitting in a compartment of a third-class car, naturally with the windows open. Another train came up from the opposite direction, and, just as it passed, one of the men, who was sitting next the window, fell dead. On arriving at the next station, the dead man was carried out by his companions, who were quite unable to explain what had happened to him, except that they thought he had received a blow of some sort. Meanwhile, the other train had also arrived at a station, and there the fireman was engaged in lamenting the loss of his coal-rake, which had been laid on top of the tender, and seemed to have slipped off in some way. On comparing the two incidents, it appeared that the rake must have been gradually shaken down over the edge of the tender, until it projected just enough to enter the window of the approaching train, and deal the unfortunate traveller his death-blow.

THEATRES. — XI.

THE ROYAL ENGLISH OPERA-HOUSE, LONDON. — I.

TO the energy and enterprise of Richard D'Oyly Carte, London owes this magnificent play-house, built for the performance of English opera, and now converted into one of those fashionable theatres of variety with which this capital abounds.

In this article we have only to deal with the original conception and the original purposes of the building. The name of Mr. D'Oyly Carte is as well known in the American theatrical world as in England, and whatever he attempts, he carries out with signal completeness. It is this energy of purpose which has been the means of providing this addition to our play-houses.

The foundation stone was laid on the 15th of December, 1888, by Mrs. Helen D'Oyly Carte, in the presence of only some four or five persons whose names are famous all over the world. I refer to Sir Arthur Sullivan, Mr. W. S. Gilbert, the composer and author of the wonderful series of comic operas produced by Mr. Carte, Mr. Colcutt, the architect from whose designs the exterior of the building and the interior decoration were carried out, and who is so well known as the architect of the Imperial Institute, Mr. Holloway, who superintended the actual building work, and Mr. Carte himself.

Although Mr. Colcutt acted as architect for the building, it is understood that Mr. D'Oyly Carte, in conjunction with Mr. Holloway, prepared the constructional plans and sections before Mr. Colcutt was called in to undertake the architectural and decorative portions of the work, with a result that two and a half years after the first blow of the pickaxe, one of the most beautiful theatres of London arose upon one of her most unpleasant sites.

Having to battle with an enemy so familiar to London architects, Mr. Colcutt was compelled to choose materials wherewith to erect his building which would withstand the effects of the smoke which in time begrimes the buildings of London.

For the façades of the building in Cambridge Circus, red Ellistown brick and Doulton terra-cotta were used. The employment of terra-cotta by such architects as Mr. Waterhouse, Mr. Ernest George and Mr. Colcutt has done much to advance the architectural revival of the Victorian age.

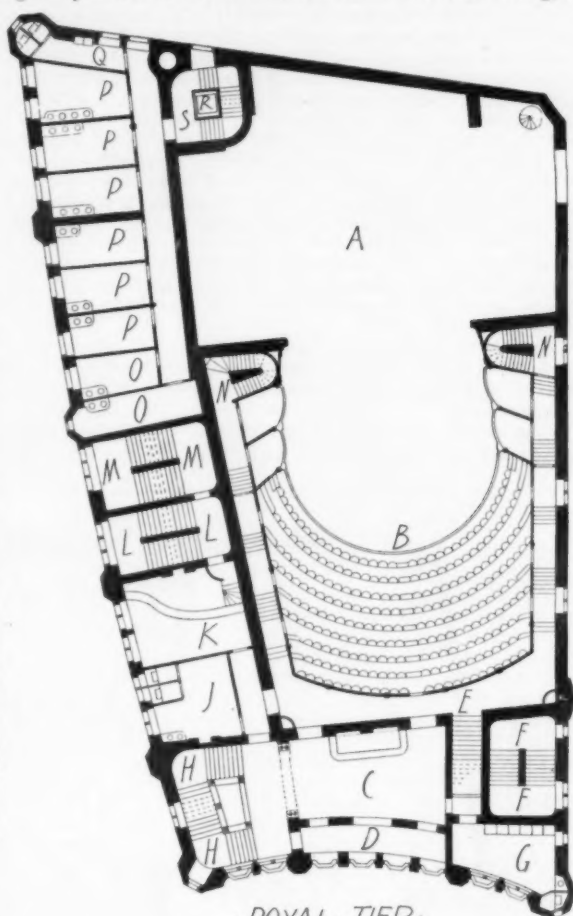
The site is one of peculiar shape and, following the line of Cambridge Circus, the principal façade takes a concave form, the return façades, that is the north and south walls, striking off at an oblique angle.

The problem was how to impart the appearance of strength at the weak angles formed by the side walls and front walls. The complete and striking success with which the architect overcame this difficulty is shown in the accompanying sketches.

Each angle of this principal façade has been filled-in with an octagonal turret, starting at about twelve feet from the ground, and ending beyond the top level of the building in an octagonal dome. The space between these angle-turrets—in other words, the whole elevation—is divided into three vertical sections by two small turrets, or *tournelles*, each ending in a pinnacle surmounted by a figure holding an electric-light. The horizontal sections of the façade correspond to the internal distribution into circles and gallery. With its grouping of arched windows, its deep balconies—or *loggias*—designed to be thrown open in summer, and its frieze and cornice surmounting the second tier of windows, this front elevation of the Royal English Opera-house will, doubtless, be acknowledged one of the most attractive examples of balance and composition.

Over the entrance doorways Mr. Walter Smith has modelled in terra-cotta the emblematic figures of Music and Literature.

The vestibule walls are lined with white veined Italian marble. The dado is of the beautiful marble known as *vert-vert*, with its capping and plinth in a marble of darker hue. The rich ceiling, sup-

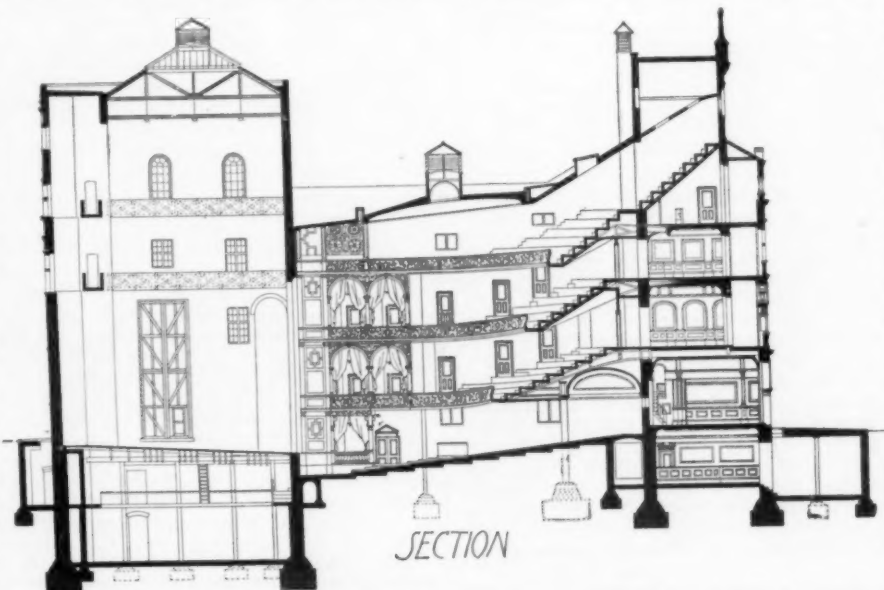


ROYAL TIER

- | | | |
|-----------------------|-----------------------------|----------------------------|
| A. Stage. | G. Lavatories. | N. Private Box Staircases. |
| B. Royal Tier. | H. Grand Staircase. | O. Wardrobe Stores. |
| C. Saloon. | J. Ladies. | P. Dressing-room. |
| D. Loggia. | K. Office. | Q. Lavatories. |
| E. Extra Exit. | L. Second Circle Staircase. | R. Lift. |
| F. Gallery Staircase. | M. Gallery Exit Staircase. | S. Stage Staircase. |

ported by plain columns of *rouge jaspe*, with bases and capitals solidly gilded, is carried out in a color scheme of pale cream upon a gold ground, and divided into panels filled with ornamental work in high relief. Mr. Fairfax Murray's painting, "The Concert," was secured by Mr. Carte for the express purpose of beautifying one end of this vestibule.

The whole of the structure of the staircase is supported by a series of columned arches—the columns being of rich green marble, with capitals and bases gilded like the columns in the vestibule. The hand-rail and plinth are in *grand antique*, the balusters in alabaster, and the step, in veined marble, while the walls are lined with Derbyshire alabaster, and the doorways, together with the casing of the elaborately-decorated windows, are of the



SECTION

same material as the rail and plinth. The richness afforded by the natural colors of these marbles, together with the lightness, strength and graceful simplicity of the design is admirable.

The grand staircase leads down to the orchestra stalls, stage-boxes

and smoking-rooms, and up to the Royal tier or balcony stalls, first circle and ampitheatre.

The grand saloon, by which the staircase passes, is one of the most attractive portions of the interior. This is described as a triumph of pure rich coloring, not merely of the painter's art, but of nature's execution in her own marbles. Pavonazza, that splendid product of the quarries of Italy, supplies the wall linings, a marble which is also largely used in the chief parts of the theatre, and may be seen in the building in its varieties from gold-tinted to almost pure white with its strong interlacing of black veins. The dado of the saloon is of *rouge jaspe*, and the shafts and pilasters of pink *Algerien*. The blocks of marble from which these shafts were cut is said to be "a derelict that for several years adorned the quay of a French seaport until, discovered a blackened mass of stone," it was brought to adorn this theatre.

From the grand saloon, on the one side is entered the dress-circle, on the other the balcony or *loggia*, which has already been mentioned and which is used as a cool retreat in summer for smoking and resting between the acts.

The saloons on the first circle and ampitheatre are each worthy of description; sufficient now, however, to say, they follow the lines of those below and are each provided with retiring-rooms, lavatories and cloak-rooms.

The walls of the chief passages and corridors are of deep red below, lined above with light cream and gold. The drapery to the

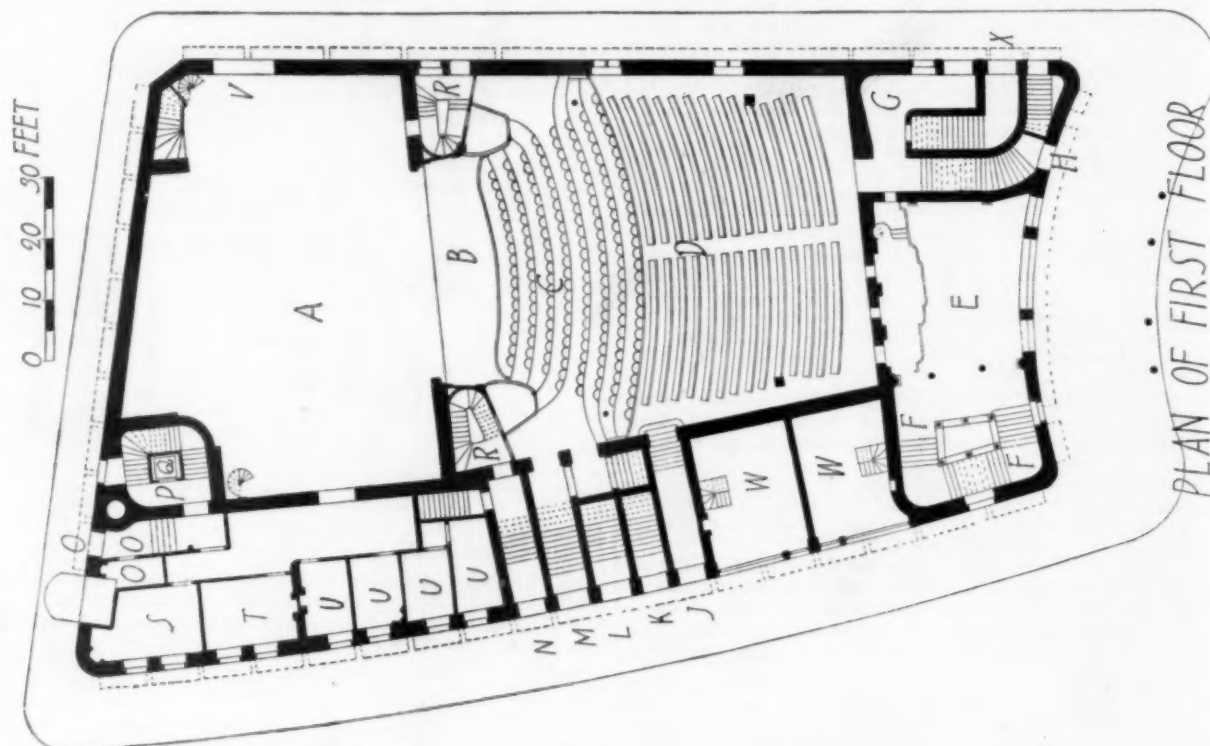
of the auditorium are fourteen feet nearer each other at the back of the pit than they are at the proscenium, the dimensions being respectively fifty-one feet and sixty-five feet.

A third structural change is to be seen in the form of the circle and gallery seats. These, from the section, will be seen not to be, as usually is the case, on a level line, but that the middle seat is considerably lower than the seat at either end. Technically speaking, the rows are "dished" up from the centres. The reason for this arrangement is to lift up those at the ends of the rows, so as to enable them to see the stage the better, over the heads of the people in front, the angle of vision being sharper at the sides than in the centre of the circles. Mr. James George Buckle, an authority upon theatre construction, was called in to design the "sighting" lines of the auditorium, a task he fulfilled with credit to himself and Mr. Carte.

The seating capacity of the house as designed and first opened to the public was as follows:

Orchestra stalls.....	270 seats.
Pit.....	500 "
Royal tier stalls.....	242 "
First circle.....	222 "
Ampitheatre.....	230 "
Gallery.....	400 "
Private boxes.....	40 "
Making a total of nearly 2,000 seats.	

On examining the plans, it will be seen that each part of the house



A. Stage	E. Vestibule	J. Pit Exit.	N. Royal Entrance.	R. Private Box Staircase.	V. Scenery Door.
B. Orchestra	F. Grand Staircase.	K. Second Circle Exit.	O. Stage Entrance.	S. Green Room.	W. Shops (now converted into a Second Vestibule.)
C. Stalls.	G. Pit Exit.	L. Gallery Entrance.	P. Stage Staircase.	T. Chorus Room.	X. Gallery Entrance.
D. Pit.	H. Royal Tier Exit.	M. Stalls Exit.	Q. Artists' Lift.	U. Administrative (now Scene Dock.)	

private boxes and the richly-embroidered stage-curtain are of yellow satin, the chairs and rests to the front of the circles being of green plush velvet. The columns of the private boxes are elaborately painted by hand, and the design to the circle fronts consists of cupids holding incandescent electric lamps. The dominating colors of the auditorium are a pale green, pale cream and gold.

In comparison with the elaborate decoration of the auditorium, the proscenium-arch is severely simple—being all the more appropriate as the framework for the stage picture displayed behind it. This frame is composed of *grand antique cippolino* marble and Italian *pavonazza*, with small panels of Mexican onyx. The size of the opening to the stage measures thirty-four feet three inches in height by thirty-four feet in width.

On examining the section of the building, it will be seen that there is a rise of the ceiling, instead of being, as is almost always the case, on the flat. This rise inclines upwards from the stage to the back of the gallery. In the details of the ironwork, which accompany this article, will be found some of the constructional drawings of the steel and iron work of which this ceiling is composed.

The line of inclination taken is almost parallel with the pit floor and the innovation has been made with a view of propagating the sound from the stage to the remotest corners of the house. The peculiarity of the site is also said to have been utilized for the advancement of the acoustic properties of the house, as the side walls

has a separate entrance and a separate extra exit, making two "ways out" for each division of the audience.

Some of the chief dimensions of the building are as follows:

Width between walls of auditorium, average.....	58 feet, 0 inches.
Width between walls of stage.....	67 " 0 "
Depth from curtain line to back of pit.....	72 " 6 "
Depth from curtain line to back of stage.....	47 " 0 "
Distance from curtain line to grand tier box front.....	41 " 6 "
Distance from curtain line to first tier box front.....	49 " 0 "
Distance from curtain line to gallery front.....	54 " 6 "
Height from pit-floor to ceiling.....	52 " 0 "
Height from stage-floor to gridiron.....	66 " 6 "
Height from cellar to gridiron.....	98 " 0 "

E. A. E. WOODROW.

[To be continued.]

CANADIAN DUTIES ON SHINGLES REMOVED.—Hereafter, shingles and pulp wood from the United States will enter Canada free of customs duty, the Dominion Government having received assurances that the United States is admitting Canadian-made shingles free of duty. The Governor-General's proclamation appeared January 12, reciprocating in this respect with the United States.—*Exchange*.

THOMAS JEFFERSON, ARCHITECT.



JEFFERSON, in his well-known epitaph, prepared by himself, did not see fit to add "Architect of its Buildings" to the title, "Father of the University of Virginia." Perhaps he did not regard his architectural work as an achievement, or expected future generations to take the word Father in its broad, general sense as Originator — Originator of the University of Virginia, not only of its scholastic plan, but also of its architecture. However that may be, while he has received just measure of praise for his educational system, his architectural ideas, in which he was as far ahead of his time as in his educational theories, have passed comparatively unnoticed.

An inquiry into Mr. Jefferson's career as an architect, is met at the outset with serious difficulty, for there are few data. We find that he entered William and Mary College in the year 1760; was a student in the Academic Department for three years, and afterwards in the Law for five, and began the practice of law in 1767, at the age of twenty-five.

We first hear of him in an architectural capacity in 1770, when the house at Shadwell (the old homestead) was destroyed by fire. He moved thence to Monticello, where his preparations for a residence were sufficiently advanced to make it his permanent abode.

In June, 1779, he writes: "I was appointed Governor of the Commonwealth, and retired from the Legislature. Being elected also one of the visitors of William and Mary College, I effected during my residence in Williamsburg that year a change in the organization of the Institution. We added the law of nature and nations and the fine arts to the duties of the moral professor."

There are no exact data as to what it was intended to include under the term "fine arts," but the fact that at the very first opportunity Mr. Jefferson introduced the fine arts into the curriculum of William and Mary is of far-reaching significance, for it shows that even at this time he was thoroughly impressed with the importance of art as a study, and refused to regard it merely as a pastime.

In 1784, he was appointed Minister to France, where his artistic insight was generally well recognized, for we find him authorized to employ a suitable sculptor to make the statue of General Washington, and this is the now celebrated Houdon Statue in the Capitol at Richmond. Soon after this, his old colleagues in the Legislature requested him to furnish a plan for the new State-house. We are told just here of Mr. Jefferson: "In his notes he had been somewhat of a critic of architecture," and had declared that "the genius of the art seemed to have shed its maledictions over the land of his birth." He undertook the State-house project with more than usual ardor, and applied to M. Clarissault, an architect of reputation, and under the influence of Jefferson's partiality for the Grecian architecture, they selected as a model the Maison Carrée of Nîmes, pronounced by Mr. Jefferson "one of the most beautiful, if not the most beautiful and precious morsel of architecture left by antiquity." It is interesting to note that Jefferson and his architect were subjected to the same worries as fall to the lot of their more recent brethren: "As the building was originally a temple, and contained but a single room, it took some time to make the plan of the interior convenient for the three branches of government." In the meanwhile, he learns that the committee was about to proceed upon a plan of its own. He immediately writes to Mr. Madison and Mr. Randolph to prevail on them to arrest the progress of the work; he writes that his plan is not only more beautiful than the other, but more convenient. "Besides," he asks, "how is a taste in this beautiful art to be formed in our countrymen, unless we avail ourselves of every occasion when public buildings are to be erected, of presenting to them models for their study and imitation?" To Mr. Madison he says: "You see I am an enthusiast on the subject of the arts. But it is an enthusiasm of which I am not ashamed, as its object is to improve the taste of my countrymen, to increase their reputation, to reconcile to them the respect of the world, and procure them its praise." The appeal was successful, his plan was adopted, and from it the present capitol was erected. The building, however, fails to satisfy one of the most important canons of architectural design in that its exterior belies its interior. The main entrances are on the sides, while the porticoes, bespeaking those entrances, are at the ends. We can easily pardon such a fault, however, in the measure of praise which should be given to him for carrying through his own ideas, and giving us a building modelled on historic lines, rather than allowing the committee to proceed on their own plan.

As a resident of the Continent, Mr. Jefferson made good use of the opportunities to cultivate his artistic tastes. On the 20th of March, 1787, we find him at Nîmes writing to the Comtesse de Tessee: "Here I am, madam, gazing whole hours at the Maison Carrée, like a lover at his mistress. The stocking-weavers and silk-spinners around it consider me as a hypochondriac Englishman, about to write with a pistol the last chapter of his history. This is the second time I have been in love since I left Paris. The first was with a Diana at the Château de Laye-Epinay, in Beaujolais, a delicious morsel of sculpture by M. A. Soldt. This, you will say, was in rule, to fall in love with a female beauty — but with a house! It is out of all precedent! No, madam, it is not without a precedent in my own history. While in Paris, I was violently smitten with

the Hôtel de Salm, and used to go to the Tuileries almost daily to look at it."

December 23, 1787, Jefferson returned to America. He retired to private life, and to Monticello, in 1794, at the age of fifty, and it was then that he began to complete his home. The Duc de la Rochefoucauld-Liancourt writes in 1796: "Mr. Jefferson had commenced its construction before the American Revolution. Since that epoch, his life has been constantly engaged in public affairs, and he has not been able to complete the execution of the whole extent of the project which it seems he had at first conceived. That part of the building which was finished has suffered from the suspension of the work, and Mr. Jefferson, who two years since resumed the habits and leisure of private life, is now employed in repairing the damage occasioned by this interruption, and still more by his absence. He continues his original plan, and even improves on it by giving to his buildings more elevation and extent. He intends that they shall consist of only one story crowned with balustrades; a dome is to be constructed in the centre of the structure. The apartments will be large and convenient; the decorations, both outside and inside, simple, yet regular and elegant. Monticello, according to its first plan, was infinitely superior to all the other houses in America in point of taste and convenience; but at that time Mr. Jefferson had studied taste and the fine arts in books only. His travels in Europe have supplied him with models; he has appropriated them to his design, and his new plan, the execution of which is already much advanced, will be accomplished before the end of next year, and then his house will certainly deserve to be ranked with the most pleasant mansions in France and England."

In 1782 (fourteen years before), the Marquis de Chastellux had written: "This house, of which Mr. Jefferson was the architect, and often one of the workmen, is rather elegant in the Italian taste, though not without fault. It consists of one large square pavilion, the entrance of which is by two porticoes, ornamented with pillars. The ground-floor consists of a very large lofty saloon, which is to be decorated entirely in the antique style; above it is a library of the same form; two small wings, with only a ground-floor and attic-story, are joined to this pavilion, and communicate with the kitchen offices, etc., which will form a kind of basement-story, over which runs a terrace. My object in this short description is only to show the difference between this and the other houses of the country, for we may safely aver that Mr. Jefferson is the first American who has consulted the fine arts to know how he should shelter himself from the weather."

It is easy, therefore, to see the influence which Mr. Jefferson's residence in France had exerted on his artistic taste, but it is also clearly proved that this taste and talent were well developed before he left this country. Exactly where Jefferson obtained the data essential to design even the original structure, it is hard to say. We are inclined to believe that his friend, Dr. Small, the Professor of Mathematics at William and Mary, must have had works of art of more or less value, and that he assisted in developing Mr. Jefferson's artistic taste. It is a fact beyond dispute that no amount of uncultured artistic instinct would enable a man to develop such a design as that of Monticello. No data are available as to the tastes or habits of Dr. Small, so we are left entirely to conjecture as to where and how Mr. Jefferson obtained that artistic cultivation which enabled him to outline the original plan of Monticello.

We next hear of Mr. Jefferson in an architectural capacity in connection with the buildings of the University of Virginia. It is not our purpose to incorporate in this article any history of that long effort by Jefferson and his distinguished associate, Joseph C. Cabell, which finally resulted in the establishment of the University of Virginia. Suffice it to say, that after a protracted struggle and many preliminary moves the Legislature, in 1818, established the University and located it at Central College, which had been partly completed, and it is the plan of "An Academical Village" devised for Central College by Mr. Jefferson on which the University buildings were carried to completion. We quote from the proceedings of a meeting of the Visitors of Central College, held in Charlottesville May 5, 1817: "On view a plan presented for erecting a distinct pavilion or building for each separate professorship, and arranging these around a square, each pavilion containing a school-room and two apartments for the accommodation of the professor, with other reasonable conveniences; the Board determines that one of these pavilions shall now be erected. And it is further resolved, that so far as the funds may admit, the Proctor be requested to proceed to the erection of dormitories for the students adjacent to said pavilion, not exceeding ten on each side, of brick, and of regular architecture, according to the same plan proposed." It is interesting to note that the Visitors present at this meeting were James Monroe, James Madison, John H. Cocke and Thomas Jefferson. We quote further from the report of the Commissioners appointed to "fix the site of the University of Virginia, etc.," dated August 14, 1818: "The Board having thus agreed on a proper site for the University, to be reported to the Legislature, proceed to the second of the duties assigned to them (that of proposing a plan for its buildings), and they are of the opinion that it should consist of distinct houses or pavilions arranged at proper distances on each side of a lawn of a proper breadth, and of indefinite extent in one direction at least; in each of which should be a lecturing-room, with from two to four apartments, for the accommodation of a professor and his family; that these pavilions should be united by a range of dormitories sufficient each for the

accommodation of two students only, this provision being deemed advantageous to morals, to order, and to uninterrupted study; and that a passage of some kind, under cover from the weather, should give communication along the whole range." . . . "It is supposed probable that a building of somewhat more size in the middle of the grounds may be called for in time, in which may be rooms for religious worship, under such impartial regulations as the Visitors shall prescribe, for public examinations, for a library, for the schools of music, drawing, and other associated purposes."

This report was signed by Mr. Jefferson first, and was most probably written in full by him. It will be noted that it is simply the building-plan of Central College with the addition of "the building in the middle ground." It may be well to note here that this same report includes the scholastic plan, and that not only in this plan, but in the others made by Mr. Jefferson, a Department of Architecture is included; and there is no doubt that Mr. Jefferson still remained true to the precedent he had established at William and Mary, and was still thoroughly impressed with the importance of Architecture and the Fine Arts as a study of practical utility. In the act passed by the Legislature, establishing the University and defining the courses of study, Mr. Jefferson's pets are excluded. It may be that this was done from motives of economy, for only ten professors were to be appointed, and they had multitudinous duties. However, when the Visitors met just before the opening of the Institution, 1824, and arranged in detail the work of the Schools, we find Mr. Jefferson asserting himself with his noted persistence, for in the School of Mathematics is included "Architecture, Civil and Military." Mr. Jefferson was the directing and shaping power in the building of the University until his death. "He drew plans, made estimates and contracts, busied himself about bricks and mortar and superintended the whole business of building." When he began the task of converting Central College into the University, he found two pavilions and sixteen dormitories complete. Before the Institution was opened the following buildings were finished, viz: ten pavilions, six hotels, one hundred and ten dormitories and "The Rotunda," or in other words the Lawns, the Ranges and the Rotunda. The key-note to the whole building-scheme is found in his determination to make the buildings a monumental group, which should impress the beholder for all time, and incidentally to cater to that Virginian characteristic "which would never be pleased with anything small." "The great object of our aim from the beginning has been to make an establishment the most eminent in the United States, in order to draw to it the youth of every State, but especially of the South and West. We have proposed, therefore, to call to it the characters of the first order of science from Europe, as well as our own country, and not only by the salaries and the comforts of their situation, but by the distinguished scale of its structure and preparation, and the promise of future eminence which these would hold up, to induce them to commit their reputation to its future fortunes. Had we built a barn for a college and log huts for accommodations, should we ever have had the assurance to propose to an European Professor of that character to come to it?"

In order, therefore, to carry out these ideas, it was decided to have recourse to that most monumental of all architectural styles, the Classic; and it is interesting to know that in 1890 the associated architects of the World's Fair buildings, having this same end to attain, sought it successfully through the same channel—the Classic style.

The various drawings required for the University buildings were made by Mr. Jefferson, assisted by his granddaughter, Cornelia J. Randolph. Contrary to the commonly-received idea, there has been no attempt to make reproductions, except in case of the rotunda. The proportions and the details of the order used were taken from some structure, but no attempt was made to reproduce that structure, with the one exception noted. For example: the pavilions now occupied by Professors Garnett and Peters are credited to the "Ionic of the Temple of Fortuna Virilis." A glance at a cut of the temple will show that use was made only of the order, not of the design of the temple. And so also in regard to the "Doric and Ionic of the Theatre of the Marcellus," which we find in two other pavilions.

In the Rotunda, however, an entirely different phase of the question presents itself. The drawing made by Mr. Jefferson for this building contains the following: "Rotunda reduced to the proportions of the Pantheon, and accommodated to the purposes of a library for the University, with rooms for drawing, music, examinations and other accessory purposes—the diameter of the building (77 feet) being one-half that of the Pantheon, consequently one-fourth its area and one-eighth its volume." It will be noted, however, that the Rotunda differs from the Pantheon in the following respects: The portico of the Rotunda is hexa-style; that of the Pantheon octa-style; the side belfries are omitted; the main cornice of the Rotunda is continued around the building. Again, in the Rotunda, a circle drawn with its centre in the centre of the structure, is tangent to the ground-line, and to the outside lines of the side-walls, as well as to the dome. This is not exactly the case in the Pantheon, for here the diameter of the dome and the distance from the floor-line to the highest point of the dome are the same.

Whatever differences there may be in points of detail, there is no doubt that the effect of the buildings as a whole is singularly inspiring and grand. "The shadows of remote antiquity are cast upon those beautiful grassy lawns which form the Campus, or, shall we say, the Campo-Santo of the University of Virginia. There, in the

Theatre of Marcellus, dwells the household of Professor Minor. Yonder are reminders of the baths of Caracalla, of the baths of Diocletian, and of the Temple of Fortuna Virilis. And there, at the upper or northern end of the quadrangle, stands the Roman Pantheon, the temple of all the gods, reduced to one-half its original scale, but still majestic and imposing. This building, with its rotunda, upon which Jefferson spent as much pains as Michael Angelo did upon the dome of St Peter's, is used for the library and for various lecture-halls. Young people dance merrily under that stately dome at the end of the academic year. The young monks thus escape from their cells into the modern social world. How charmingly old Rome, Medieval Europe and modern America blend together before the very eyes of young Virginia."

And we may well pause here and ask why it is that, while Jefferson's scholastic plan has been watched with such pious solicitude, his architectural scheme has been so desecrated? It is a fact that, with one exception, all the additions to the original buildings violate Mr. Jefferson's scheme most flagrantly. Yet, when we examine the matter, it is easy to see how this has happened. We will pass, if you please, the addition to the long rectangular annex to the Rotunda, in which it was vainly hoped by repeating the porch at the new end, to preserve the harmony. The principal additions of the University in more recent time have been the Medical Hall, the Chemical Laboratory, the Brooks Museum, the Chapel and the Gymnasium. The Medical Hall and the Chemical Laboratory are purely utilitarian buildings, which do not assert themselves, yet carefully-detailed Classic entrances would have done much more to secure harmony. The first building to make an irreparable break in the plan was the Brooks Museum. This building (equipment and plans) was a gift to the Institution. The Visitors were only concerned with it to the extent of accepting it. The architects who planned it, either failed to visit the University before doing so, or were possessed of a greater share of iconoclasm than falls to most mortals. The Chapel is of stone, in the Gothic style, and has been the subject of much severe criticism, notably, from Mrs. Amélie Rives-Chanler.

There can be no doubt that it would have been better to have built it of brick in the Classic style, but whether any one is to be criticised for it is a doubtful question. This building was erected by the long continued and most earnest effort of the ladies of the University, and we incline to believe that when the end came in view, the style of design was completely lost sight of in the joy that the building was really to be built—that the Institution was to have a suitable edifice for religious worship at last.

As we have said, the Chapel was built by subscription, the Museum was a gift, and it was only in the Fayerweather Gymnasium that the Visitors exercised a controlling voice. While no copy of any Classic structure, yet the building follows the lines laid down by Jefferson, being Classic in feeling and in detail.

May we not hope that in ALL future additions to the University, no matter how unimportant the structure may appear, the Visitors will bear in mind the following memorable words of Jefferson, words as true and perhaps more needful to-day than when first written, words which it would be well to have upon the walls of all rooms in which committees having charge of public buildings deliberate: "Besides, how is a taste in this beautiful art to be formed in our countrymen unless we avail ourselves of every occasion, when public buildings are to be erected, of presenting to them models for their study and imitation?"—John Kevan Peebles in the *Alumni Bulletin*.

NORFOLK, VA., May 15, 1894.

STRAINS IN COMPOUND FRAMED STRUCTURES.¹—III.

FRUSTUM OF AN OCTAGONAL PYRAMID.

IN conclusion, an example is given of the strains resulting from transverse and vertical forces in a frustum of a pyramid, obtained by Graphical Statics.

It will be noticed that in this as well as in the preceding examples, the strains are the results of the transverse force, wind, being fixed as to direction, hence only one system of diagonals are shown; as the wind rotates from all points, diagonals must be provided for either direction of the force, the maximum strains obtained being used for the other dimensions.

The great reduction of labor, in favor of the graphical method over the analytical, becomes apparent upon comparison between the two methods.

The results from the diagrams are tabulated below.

EXAMPLE.

Height = 40 feet. Diam. of inscribed cir. at base = 24.142 ft.
Load at top = 80 tons. " " " " " top = 12.071 "

Zone.	Load.	Transverse force.
I.	10 tons.	5 tons.
II.	12 "	6 "
III.	14 "	7 "
IV.	16 "	8 "

¹ By Francis Schumann, Engineer. Theory of strains in compound framed structures: Applicable to towers or piers, prismatic or pyramidal or both combined, polygonal in plan, subject to transverse and vertical forces. Continued from No. 994, page 21.

RATIOS OF TRANSVERSE FORCES.			
Zone.	Side A.	Side B.	Side C.
I.	.375	.5	.125
II.	.355	.5	.145
III.	.340	.5	.160
IV.	.329	.5	.171

FORCE f.			
Zone.	Side A.	Side B.	Side C.
I.	$\frac{5}{2} \times .375 \times 1.4142 = 1.33$	$2.5 \times .5 = 1.25$	$2.5 \times 1.25 \times 1.4142 = 0.44$
II.	$\frac{6}{2} \times .355 \times 1.4142 = 1.51$	$3.0 \times .5 = 1.50$	$3.0 \times 1.45 \times 1.4142 = 0.62$
III.	$\frac{7}{2} \times .340 \times 1.4142 = 1.68$	$3.5 \times .5 = 1.75$	$3.5 \times 1.60 \times 1.4142 = 0.79$
IV.	$\frac{8}{2} \times .329 \times 1.4142 = 1.87$	$4.0 \times .5 = 2.00$	$4.0 \times 1.71 \times 1.4142 = 0.96$

VERTICAL FORCE ON EACH CHORD, FROM
Load = 10.00. Zone I = 1.25. Zone II = 1.50. Zone III = 1.75.

HORIZONTAL COMPONENTS OF VERTICAL LOADS, FROM
Load = 1.63. Zone I = 0.20. Zone II = 0.25. Zone III = 0.29.

STRAINS FROM TRANSVERSE FORCES IN SECONDARY TRUSSES.				
Member.	Mark.	Side A.	Side B.	Side C.
Chord.....	a			
Strut.....	a-n	+ 1.33	+ 1.25	+ 0.44
Tie.....	a-e	- 2.45	- 2.31	- 0.82
Chord.....	e-n	+ 2.15	+ 2.03	+ 0.72
Chord.....	b-f	- 2.15	- 2.03	- 0.72
Strut.....	e-f	+ 2.57	+ 2.50	+ 0.97
Tie.....	f-g	- 4.18	- 4.07	- 1.58
Chord.....	g-n	+ 5.62	+ 5.40	+ 2.03
Chord.....	c-h	- 5.62	- 5.40	- 2.03
Strut.....	g-h	+ 3.82	+ 3.84	+ 1.60
Tie.....	h-j	- 5.65	- 5.67	- 2.37
Chord.....	j-n	+ 10.04	+ 9.84	+ 3.88
Chord.....	d-k	- 10.04	- 9.84	- 3.88
Strut.....	j-k	+ 5.15	+ 5.29	+ 2.33
Tie.....	k-l	- 7.09	- 7.29	- 3.22
Chord.....	l-n	+ 15.25	+ 15.20	+ 6.24

REACTIONS. (IN VERTICAL DIRECTION.)				
Windward....	d-m	- 15.05	- 15.00	- 6.16
Leeward.....	m-n	+ 15.05	+ 15.00	+ 6.16

SUMMATION OF STRAINS IN PRIMARY STRUCTURE. — RING STRUTS.
— (COMPRESSION.)

Side A.				
Zone.	From transverse force.	From vertical force.	From force P.	Total strains.
I.	1.33	2.13	2.61	6.07
II.	2.57	0.27	3.14	5.98
III.	3.82	0.32	3.66	7.80
IV.	5.15	0.37	4.18	9.70
Side B.				
I.	1.25	2.13	2.61	5.99
II.	2.50	0.27	3.14	5.91
III.	3.84	0.32	3.66	7.82
IV.	5.29	0.37	4.18	9.84
Side C.				
I.	0.44	2.13	2.61	5.18
II.	0.97	0.27	3.14	4.38
III.	1.60	0.32	3.66	5.58
IV.	2.33	0.37	4.18	6.88
RING TIES. (TENSION.)				
Zone.	I.	II.	III.	IV.
Strain....	2.41	2.90	3.38	3.86

CHORDS.			
Zone I.	From transverse force.	From vertical force.	Total strain.
C ₁		+ 10.13	+ 10.13
C ₂	+ 2.15	+ 10.13	+ 12.28
C ₃	+ 2.03	+ 10.13	+ 12.16
C ₄	+ 0.72	+ 10.13	+ 10.85
Zone II.			
C ₁	- 2.15	+ 11.40	+ 9.25
C ₂	+ 3.59	+ 11.40	+ 14.99
C ₃	+ 4.68	+ 11.40	+ 16.08
C ₄	+ 2.03	+ 11.40	+ 13.43
Zone III.			
C ₁	- 5.62	+ 12.92	+ 7.30
C ₂	+ 4.64	+ 12.92	+ 17.56
C ₃	+ 7.81	+ 12.92	+ 20.73
C ₄	+ 3.88	+ 12.92	+ 16.80
Zone IV.			
C ₁	- 10.04	+ 14.69	+ 4.65
C ₂	+ 5.41	+ 14.69	+ 20.10
C ₃	+ 11.32	+ 14.69	+ 26.01
C ₄	+ 6.24	+ 14.69	+ 20.93

FINAL REACTIONS.				
	R ₁	R ₂	R ₃	R ₄
From transverse forces.	- 15.05	+ 0.05	+ 8.84	+ 6.16
From vertical forces...	+ 16.50	+ 16.50	+ 16.50	+ 16.50
Total.....	+ 1.45	+ 16.55	+ 25.44	+ 22.66

FINAL REMARKS.

What at first appears a complicated and indeterminate problem in compound structures, can be solved strictly in accordance with the laws of statics, by a proper subdivision into secondary parts and a proper allotment of the external force to each.

The strains obtained will be found to conform to the deformation in the respective panels, that is, the stresses will be in proportion to the strains when the members are dimensioned to be within the limits of elasticity of the materials of which they are composed.

The effect from variations in temperature are ignored, because structures, of the kind treated, are free to change form in all directions, from the base up, without altering the proportions.

Serious alterations would occur, causing indeterminate secondary strains, from changes in the levels of the foundations, or from differences in the expansion or contraction, from temperature, between the points of support, bearing on masonry, and the lower tiers of ring struts. No amount of calculation could provide for such contingencies, which must be met by a proper form of construction, the metal portion being so designed as to move freely upon the foundations, which themselves must be ample to maintain their respective levels, when the strains come upon them.

The adjustment of the diagonals by means of sleeve nuts, or swivels, must be carefully attended to, so that no excessive initial strains result.

The methods outlined for polygonal towers are applicable for analogous forms of structures, such as hemispherical domes or conical roofs, no matter what shape in plan.

DE LESSEPS.

ENGINEERING for December 28, '94, closes a long, interesting and detailed account of the great work done by Ferdinand de Lesseps in the following remarkably — for an English writer — sympathetic language :

Would that we could close our narrative at this point, adding nothing except that *le grand Français* died full of years and honors! Surely the gods must have loved this man, who resembled the heroes of Olympus so closely in his magnificent courage, his unbounded faith in himself, his reckless expenditure, his unconquerable resolution, and his never-failing resource. Yet, so far from snapping the thread of his life when he was young, they allowed it to run on far beyond the allotted length for humanity, giving him unnecessary years in which to blemish his fair fame, and carry loss and misery into thousands of homes. One would be glad to avoid saying anything about the Panama scheme, but unfortunately it cannot be passed over without comment. Further, it is useful in illustrating the character of De Lesseps, showing the weakness of his qualities just as the Suez scheme displayed their strength. It was as grand to see one man defying the Governments of Great Britain, France, and Turkey, and carrying out his projects in spite of them, as it was pitiful to see him assuming the same attitude regarding the forces of nature, and being broken by their invincible power. Yet it was the same mental characteristics that controlled him on each occasion. His boundless self-confidence and his magnetic personality beat down the obstacles raised by politicians and financiers, but were powerless

against material obstacles. The vanity of his middle age had been swollen by the plaudits of the world, until, in his advanced years, it overflowed whatever trace of caution there may ever have been in his constitution, and led him to believe that mountains could still be removed by faith. "I will be solely responsible; no one shall have any responsibility but myself," said the splendid old man, and the adventurers who were tempting him into the project smiled as they saw the load shifted from their shoulders to his. Whatever may have been the standing of the original promoters, the Panama Canal seemed to gather round it the most avaricious and corrupt crowd that ever fastened themselves on any undertaking. Out of 53 millions sterling raised, only about 31 millions were spent on the works, the remaining 22 millions being frittered away in France. This was done under the nominal management of a man who, whatever his faults, was absolutely clear of any participation in the plundering that went on, who not only embarked his own fortune in the enterprise, but that also of his wife and children. The hand that had foiled Lord Stratford de Redcliffe and Lord Palmerston must have lost its cunning when it could not manage a board of directors.

There is no necessity to re-tell the history of the works at Panama. It is within the memory of most of our readers, and can be found written in our columns, so that a brief account of the part taken by M. de Lesseps will suffice. In 1879, an attempt was made to float 800,000 shares. These were only partially taken up, and then De Lesseps set himself to the part he was so well fitted to perform—to create an enthusiasm among the small bourgeoisie, the peasants, and the shop-keepers. "Those are the men who made Suez," said he; "they shall make Panama." He made a tour through the chief towns of America, England, France, Holland, and Belgium, and when, on December 7, 1880, 25 millions sterling were asked from the public, double that amount was offered. Immense sums were spent, for which there was little to show, and in 1886, powers were sought to issue lottery bonds. The matter was, however, adjourned by the Parliamentary Committee to which it was referred. To save delay, De Lesseps offered the shareholders 24 millions sterling in *obligations nouvelles*, at 55 per cent discount, of which a part only were taken up. Other attempts were made to raise money, each on more onerous terms than the last, until in 1888 a lottery loan of 1,000,000 obligations fell flat on the market. On December 18, of that year, the Panama Company suspended payment, and the greatest excitement prevailed. A Cabinet Council was held, and M. de Lesseps and his colleagues resigned their authority into the hands of three judicial liquidators. Various attempts were made to form a new company, to cheapen the scheme by the adoption of locks to enable vessels to get over the Culebra summit, and in other ways to resuscitate the enterprise. But all to no purpose; the true facts were now known, and all intelligent people saw the project to be impossible.

De Lesseps's great courage and his marvellous power of impressing his countrymen shone out vividly in the hour of trial. When the company suspended payment, the news ran over Paris like wildfire, and in a short time an immense and angry crowd of investors had gathered in the large hall at the offices. They were mostly poor men who had embarked in the canal the savings which were to provide dowries for their daughters and to support their declining years, and it was no wonder that their feelings ran high, and that they took no care to conceal their desire for vengeance on the man who had led them to ruin. Yet, in spite of the urgent danger of the situation, De Lesseps went into the room to address them. He told them there was still hope if they remained united and firm, and that it was yet possible to retrieve the past. He threw the blame of the catastrophe on his unscrupulous adversaries, whom he described as vultures watching for their prey. In a short time he had recovered the confidence of his audience, and rapidly he converted their hostility into enthusiasm. Instead of putting their threats of violence into execution, they shouted "*Vive Lesseps!*" "*Vive le Grand Français!*" until the roof rang again, and the cry was taken up by the hundreds outside who had been unable to gain admission. The small minority that remained unconvinced ran a great risk of being lynched, so complete was the revulsion of feeling.

Unfortunately, the enthusiasm evoked could not undo the past, nor was it fervent enough to provide sufficient funds for the future. Every attempt at re-construction unearthed more and more of the infamous practices of those who had preyed on the company, until the Public Prosecutor was obliged, by the force of the general indignation, to institute an official inquiry into the action of M. de Lesseps and his colleagues. The inquiry was concluded on November 15, 1892, and was followed by a prosecution for breach of trust against M. de Lesseps, M. Charles de Lesseps, Baron Cottu, and two others. The charge against them was that they "employed fraudulent manoeuvres to induce belief in unreal schemes, and to raise imaginary hopes of the realization of a chimerical event, with the object of obtaining from various persons subscriptions, followed by the payment of money on the occasion of the issue of bonds made on June 26, 1888, and by those means having embezzled a portion or all of the fortune of third parties."

M. de Lesseps was too ill to attend the trial, and was immediately condemned by default. Both father and son were sentenced to five years' imprisonment. In the former case, there was no attempt to carry out the judgment, for the old man had dropped into dotage, and it is uncertain whether he even understood that he had been accused. He lingered on, very nearly two years, cared for with the

greatest solicitude by his wife and numerous children, passing most of his time asleep, and when awake, so forgetful that he never discovered the kindly imposition which furnished him with papers and magazines a year or two old, in order that he should not obtain cognizance of his disgrace. At the last, his only pecuniary resource was a pension bestowed on him and his wife by the Suez Canal Company.

Although condemned by the court, De Lesseps was acquitted by public opinion of dishonesty, both in intention and deed. As we have stated, he put his own and his wife's fortune into the Panama scheme, and he received no part of the illicit gains which seem to have been shared by so large a proportion of the public men of Paris. It is difficult to decide whether he was cognizant of the immense sums paid as hush-money to the vultures of the press and of the Bourse. He ought to have been, and it is by no means certain that he would have interfered to stop the pillage had the matter been within his cognizance. To have done so would have been to add a large number of influential persons to the ranks of those that were attacking the scheme, and to have lost all chance of raising additional funds. He had been through a similar experience before, with the entire weight of the educated and governing classes against him, and had come out victorious. To his experience was added his unflinching belief in the possibility of the canal being made, and in the certainty of its bringing in handsome returns. He was like a man sinking a shaft into a lode which he knew to be of solid gold. Economy was not of the slightest importance; the one thing that was transcendently necessary was, that the work should be finished and got into operation. Then mistakes, waste, and speculation could all be wiped out in a few years. To falter was to fail; and so, on he went, led by the most astounding confidence, and pushed by the direst necessity, till he fell, surrounded by broken reputations and ruined hopes.

The best testimonial to De Lesseps is found in the fact that, although it is possible to draw up a long catalogue of weaknesses and failings, the man stands out as a hero at the end. As in a statue by the old masters, you may break off a limb here, chip out a fragment there, and stain the entire surface with dirt, and yet the remains reveal at a glance the mind that conceived and the hand that executed them, so, after we have convicted De Lesseps of vanity, of recklessness, and of wilful ignorance, almost amounting to deceit, he is still one of the great men of the nineteenth century. He was an idealist who was not content to sit in his study seeing solitary visions. He went into the world and inspired others with the same beliefs that he held himself, and by their aid he converted dreams into realities. He addressed himself to the *petits gens* of France, a class among whom thrift is engrained and is apt to degenerate into sordid avarice, and out of their hoards he drew the millions that made the Suez Canal, and the treasure that was lost at Panama. When he was successful, they worshipped him, and in spite of the fact that with such people love of money is a paramount passion, he was forgiven when he failed. The sentence of the court was virtually annulled by public opinion, and for two years the broken old man lived a peaceful life, regarded only with pity by those that had most cause for rancor. In the future, it will be Suez that will be remembered, and not Panama, when the world is taking account of the great men of our times.

BOOKS AND PAPERS

"SO, only the man who has made and carefully studied pen-drawings should have the right to speak authoritatively of them." Indeed and indeed! Then by the same title no one may speak of architecture authoritatively except he be an architect—and we won't say that an architect's lot would not be a happier one, if this were really true; no lady may speak about taste and fashion, be she not a milliner or a dressmaker; no man save a horse-trainer can profess to "talk horse," and no one except the *chef* may dare to say whether a dinner be properly cooked or no.

What a simplified world it would be, and what a replacing of silver speech by golden silence would be effected if Mr. Pennell's high-and-mighty dictum could only be carried into effect.

In the present case, since we hardly believe Mr. Pennell could bring himself to believe that we had either made or carefully studied pen-drawings, we are rather tempted to remember that "the proper study of mankind is man," and instead of examining Mr. Pennell's work, turn our attention to the study of the man who prepared the book.¹ It would be a very easy, but an ill-natured and malicious task to construct from his own words the portrait of a personage of inconceivably unpleasant characteristics, though such portrait would probably be quite untrue to nature. It is enough to say that rarely has a man offered such a chance for caustic personalities. The writer's serene self-confidence in himself and his opinions is quite genuine, and the *naïveté* with which he treats nearly every one *de haut en bas* is as delicious to the onlooker as it is childish in itself. Egotism and egoism are to be found everywhere—no, not everywhere: Mr. Pennell has sedulously avoided introducing any of his

¹ "*Pen Drawing and Pen Draughtsmen*," their work and their methods of study of the art to-day, with technical suggestions. By Joseph Pennell, Lecturer on Illustration at the Slade School, University College. Macmillan & Co., London and New York, 1894. Price, \$15.

own pen-drawings into his book, and we believe that, apart from the title and preface, the only place where his surname is found is where his wife is referred to. But what a multitude of I's the compositors had to set!

If one were to treat Mr. Pennell's opinions seriously, and could, from the mass of conflicting opinions he expresses, make up one's mind as to what these opinions really were, perhaps a good deal might be learned, but he has buried his wheat in such a quantity of chaff that it is not easy to make out what he really does mean or whether he really means anything.

Opening the book at random, the eye falls on this: "You feel, as in this one, that you are in the presence of a vast multitude, you really hear the sound of their footfalls. Nothing more impressive has been done in art." Now, a man who assumes to write on one branch of art, even if it be only of pen-drawing, in virtue of the fact that he has "made and carefully studied pen-drawing," and so is a more competent critic than other less-gifted creatures, certainly must mean to have such words as these — truly awesome words — instantly and implicitly believed. But being of a possibly hypercritical turn of mind, instead of accepting this dictum as pure gospel, we venture to raise our eyes to the illustration above the text to discover what all this rapturous eulogy is about. We find that the subject is a silhouette, by Henri Rivière, at the "Chat Noir," in Paris, which represents the "vast multitude" of exactly eighteen nude figures who



are not, to our eyes, stamping the ground with a deafening fervor, but, rather, are strolling somewhat daintily and leisurely along as one would expect that eighteen persons would move when they were burdened with the weight of a long May-pole, upon the butt of which one of their number was being carried in triumph. Yet this, we are told, is "amazing," "the reproduction even seems the size of life." The writer must have been sincerely happy when he discovered this treasure, for he says of it, also, "I have never seen such a feeling of movement given in any form of art." These are big words and, if words mean anything, there is to be found in the famous Parisian restaurant the tenth wonder of the world — that is, if we can accept our author as a competent critic; but, alas, we fear that here and there a few may be found who will dispute his competency.

We fear, too, that this "nothing more impressive has been done in art," which we have stumbled on, will somewhat stand in the way of our attempting to play the unprejudiced critic. But, as far as the author, compiler, collator of the book is concerned, this would have no weight, as he has already kindly advised us that we have no standing.

Out of regard for the fact that Mr. Pennell has ignorantly sinned against good taste, and because, somewhat ostrich-like, he has evidently believed that he was evincing a rare modesty by refraining from including any drawings of his own in the book, we will not go on much further in this vein. If Mr. Pennell had the ability to write as pleasingly as he can draw — for we admit that in several directions he has a very pretty talent for drawing — the book, in spite of its "scrappy" character, might have been extremely entertaining as well as instructive. Instructive it is, because it is a compendium, an omnium gatherum, of black-and-white illustration, but you must cull your own instruction from the plates, and not allow yourself to be disturbed by the compiler's prejudices, fads and unwarranted and unwarrantable misuse of superlatives. It is proper to have respect for one's own opinions if they are to be expressed, but it is usually possible to express them with firmness, decision and emphasis, while yet leaving to the rest of the world a modest chance of arriving at its own conclusion — the same, or a different one. We fancy that an efficient and sufficient commendation of Robert Blum's work could have been devised without going to the length of saying of his well-known St. Augustine drawings, "There is not an architectural draughtsman in the world who could equal, or even come anywhere near them"! But this is enough of the ungracious part of the reviewer's work.

The book itself could hardly have been made coherent and homogeneous in appearance by any known art of the book-maker's. Its very essence is incongruity, dissimilarity, contrast, so far as the character, style and method shown by the multitudinous illustrations are concerned, and the result is a book which is, as a mere book, offensive to the eye, unpalatable to the taste. At the same time, while it repels the book-lover, it has an uncanny attraction for the would-be illustrator with pen and ink. Artists and illustrators who have already "arrived" will, we fancy, dismiss the greater part of the author's remarks with a pish! and a pshaw! but amateurs and tyros will be attracted to it, if not by it, and will be grateful that the publishers have issued a second edition of the work at a price reasonably within their means. But as a text-book it is of somewhat

doubtful value; there is in its more than four hundred pages so large an amount of material, so individual in most cases and so dissimilar, that it gives the impression of an ill digested mess rather than the result of an orderly attempt at a classified exposition of black-and-white work. Pen-drawing is to so large a degree a modern revival of artistic expression, that it might have been held hopeless to expect that an arrangement that grouped together the work of artists of a given nationality would result in the revealing of anything like national "schools" of pen-drawing. It was a reasonable programme to adopt, this grouping together of artists of the same nationality; it certainly makes the information accessible, and lends to the book a usefully encyclopædic character, but it has destroyed or impaired its usefulness as a book of instruction and has only increased the disagreeable inharmoniousness of its general appearance. If the work of men, whatever their place of birth, who worked in fairly similar way had been grouped together, we believe that the existence of certain schools would have been determined; that is, if workers in the same vein and by the same method may be held to belong to the same school. In these days of the rapid dissemination of intelligence in all its forms, Art is less than ever given to paying heed to geographical or ethnical limitations. It is clearly possible that a hint dropped in some sketch in a page of the *Century* may be seized on at the same time by artists in every country on the globe and developed in fairly identical manner contemporaneously. But, this having happened, to take a specimen of each of these men's work and insinuate it amongst the work of fellow-countrymen working on wholly different lines, would be to produce in any publication where ethnical grouping was adopted a very curious and unpleasant see-saw effect.

To our minds, it seems clear that the ethnical grouping adopted is not as useful for purposes of study as an arbitrary grouping by styles, schools and methods.

In spite of the rather obvious defects we have pointed out, the book is a very useful one, one worth buying, worth keeping, worth studying, if you are willing to do the studying yourself; and pen-artists of all grades have reason to be grateful to the publishers and to the author who have spent much time and taken great pains to make the book one of real value, as it certainly is. It is not given to every artist who can do good work and can appreciate good work done by others to be able to analyze results so as to state causes clearly, any more than it is given to a writer to vent his spleen in sarcastic language, and hope to meet with the indulgence that is accorded to the audacious, but generally clever and amusing, diatribes with which Whistler favors the public now and then.

ONE of the most interesting personages in history is the Emperor Justinian, in whom may be said to have been united the austerity, cunning and intellectual greatness of the three races, the German, the Greek and the Roman, which had divided the world in his time pretty equally between them; and his most interesting work, to most people, is the immense church which he built to the Divine Wisdom. Independent of its architectural qualities, the church which Justinian and Theodora built, on ground consecrated by Constantine, and which is still, we presume, regarded by half Christendom as the principal Christian church, would always be an object worthy of study; but, in addition to this, St. Sophia is one of the most curious architectural works in the world. Not only is it, as a work of art, as our authors say, "one of the four great pinnacles of architecture," but, unlike Karnak, or the Athenian Parthenon, or Amiens Cathedral, which they cite as the other three pinnacles, it is, to a certain extent, a spontaneous growth. While they were developed, by steps easily traced, from a less perfect beginning, St. Sophia, taking its principle of construction from the small, rudely-domed buildings of the East, carries this out, for once, with Roman boldness and greatness of conception, decorating it, at the same time, with Greek refinement. As our authors happily express it, the condition which produced St. Sophia was "the re-orientalization of Classic art," — the linking of simple, massive Roman building to a new decoration, vividly alive and inventive, frank, bright and full of color, and yet as rational in its choice and application as the architecture."

The details of the development of such a building, and such an architecture, cannot but be of the greatest interest to architects, and Messrs. Lethaby and Swainson have presented them in a very interesting manner. Convinced, as they are, that good architecture must be the natural growth of the circumstances and conditions under which it is carried out, they have studied the circumstances under which St. Sophia was built, and compared them with the result, in a most convincing manner, and, naturally, very much to the edification of the practising architect, to whom the analysis of the construction, and the accounts, derived from a multitude of sources, contemporary and otherwise, of the materials and methods employed, are full of suggestions; while the sketches of ornamental detail, in which the application and construction are considered with a true architect's instinct, are not less valuable. Altogether, without the pretensions of Fossati's great "*Aya Sophia*," this book¹ seems to us the best work on the greatest of Byzantine buildings, and one of the best monographs on any building, that we know; and architects and students who are already familiar with the forms of Byzantine

¹"The Church of Sancta Sophia, Constantinople": A study of Byzantine Building; By W. R. Lethaby and Harold Swainson. Published by Macmillan & Co., 66 Fifth Avenue, New York. Price, \$6.50.

architecture will find their knowledge vivified, so to speak, and rendered much more practically available, by studying this excellent account of their development.

EVERYONE has noticed the shape of the long and narrow sheepskin covered note-book¹ which is especially affected by builders, and there seems no better way of characterizing the reprint of the Boston Building-laws just issued by the Master Builders' Association of the City of Boston, than to say that it is put out in the same convenient shape, the object being to prepare a portable and pocketable copy that may always be at hand on the job.



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

THE PROGRESS CLUB-HOUSE, NEW YORK, N. Y.: A CORNER OF THE BALL-ROOM. MR. ALFRED ZUCKER, ARCHITECT, NEW YORK, N. Y.

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

THE PROGRESS CLUB-HOUSE, FIFTH AVENUE AND 63D STREET, NEW YORK, N. Y.: PLANS AND ELEVATION. MR. ALFRED ZUCKER, ARCHITECT, NEW YORK, N. Y.

A GELATINE plate published in the *American Architect* for December 6, 1890, shortly after the club-house was finished, makes it unnecessary to repeat to-day a view of the exterior.

This building, which measures 92' x 100', occupies four lots on the northeast corner of 5th Avenue and 93d Street. The structure rises 80 feet above the sidewalk and is 27 feet below it, necessitating elaborate arrangements for sewerage. The materials used in construction are red brick, red terra-cotta and a light-brown stone, and the choice of color and the use to which the materials have been put is excellent.

The entrance to the club is on 63d Street, through the great arch which is the central feature of the façade. The ceiling of the ample vestibule is decorated in high relief, in an elaborate manner in the Italian Renaissance, and the walls are of costly marbles, worked in panels above a marble wainscot. The vestibule is shut off by heavy doors of antique oak and wrought-iron from the main hall which is an effective feature of the building. It extends through the edifice from north to south, and is 20 feet wide, terminating in a broad anti-oak flight of stairs, which is lit by a window, under a depressed elliptic arch. This window is 22 x 12 feet and represents a colonnade, the arches of which are of ivory yellow, the spaces between being filled with masses of opalescent clouds reflecting the iridescent tints of the sunset.

To the left, upon entering from the vestibule, are the reading and two drawing rooms forming a connected suite of apartments overlooking the Park, 100 feet long by 38 wide and 18 feet high. The decoration of these rooms is very rich. The reading-room is finished in oak; the walls are hung in leather, with gold figuring, and the chandeliers are of peculiar design, wrought in brass, with cut-glass electric globes. The central room of the suite is sumptuously decorated and furnished in the style of the First Empire, the prevailing tone of color being a pale yellow, which is relieved with a delicate tint of light green in the furniture, the onyx columns with gold capitals and the onyx chandeliers. Beyond this apartment is a ladies' parlor in light oak and pale blue. These three rooms make a very effective suite, and have been very skilfully treated by the architect, so that the rich ornamentation is not anywhere obtrusive, and the effect is general and not one of details.

To the right, on the other side of the main hall, is a pretty reception-room, in oak and decorated in blue; the steward's office, with coat-room and a dining-room furnished in autumn browns, with elaborate oak carvings.

Ascending the grand staircase, the second floor is entered upon a large open space, on two sides surrounded by balconies above, which are flanked with carved oak arcades; on one side by the entrance to the banquetting-hall, and on the other side by the continuation of the staircase, which at this point is illuminated by a stained-glass window, 30 feet high and 22 feet wide, which contains an allegorical figure of "Progress" ascending amid clouds. Time lies stretched below with alambics and other instruments typical of the past, and above all is a representation of Guido's "Dawn."

The banquetting-hall which occupies the entire south half of this story, is one of the noblest apartments in the city. It is 90 feet long, 55 feet wide and 25 feet high. It is lit by large mullioned windows on three sides, the upper parts of which are filled with richly-colored glass. The ceiling is supported by four graceful columns, on high pedestals of serpentine and malachite, the capitals being of gold and the shafts of onyx, and is decorated in the Renaissance style, each

of the nine large panels into which it is divided holding a silver chandelier of very elaborate workmanship. The brackets on the walls are also of silver. There is a musicians' gallery on the north side of the room, which is entered from the balconies already spoken of in the hall, and the railings of this gallery are of ormolu gilt, and the heavy mouldings which surround it are also gilt. The seating capacity of this banquetting-room is 700.

The remainder of this floor is occupied by numerous chess and card rooms, which can all be thrown into one large apartment by removing the partitions, which were especially constructed for this purpose. On this floor, too, opening into the banquetting-hall, is a large "serving-room." Great care has been given to the furnishing of this room. It contains the most perfect appliances known to modern caterers for serving large dinners. The culinary arrangements include steam-heating tables, hot-dish cabinets, carving-tables, ice-boxes, etc. In addition, on this floor are toilet-rooms and other offices.

Ascending again the main staircase, and on the way passing by the stained-glass window already spoken of, the visitor enters the large foyer which, as it is almost a part of the ball-room, may be treated as belonging to it. This ball-room is without doubt a success. Its appearance, especially when illuminated, is rich and brilliant in the extreme. The dimensions of the room are noteworthy in these days of little apartments. It is 90 feet long, 65 feet wide and 35 feet high. The decoration is a luxurious work of art. The prevailing color is old ivory — the walls being enamelled and the enrichments, as befits the character of the room, are lavish. The ceiling, which is supported by the walls only, so that the area of the room is unbroken and the full effect of its size obtained, is covered several feet in depth and divided by means of heavy ornamental groins into six recessed panels, the centre of each panel being formed into a dome, in each of which is a cluster of electric lamps representing the descending stars of a rocket. This idea is ingenious, and the result excellent — with electric-light, illumination is at last becoming a part of decoration. The bend of the ceiling at the sides is decorated with festoons of flowers in high relief and with garlanded Renaissance figures of nymphs, in the tiaras of which, as well as in the flowers, electric-lights sparkle like diamonds. Long tendrils of flowers trail down the blank spaces of the wall, which is further decorated by female figures and cherubs of papier-mâché, onyx and ormolu bearing golden candelabra. The drapery of the large windows of the room is maintained in position by ornamented chains which are supported from above by nymphs. At the south end of the room is a long gallery capable of seating 100 persons, and it is reached from the ball-room floor by means of an ornamental spiral staircase. The ball-room will seat at least 1,000 persons.

Entrance to the ball-room is given through four large arches. Three of these lead onto the foyer, which is a special feature of this floor, being over 40 feet long and very richly decorated, and one into a dainty ladies' drawing-room. This last is decorated in white enamel and gold in the ornate style known as "Rococo." The ceiling is covered with an oil-painting on canvas, representing a work of Thuman, "Amor and Psyche." This room opens into the foyer, as does a gentlemen's room at the other end, so that on grand occasions the entire floor can be made practically one immense apartment.

The other features of the building on the floor are not striking, though they add very materially to the comfort and completeness of the club. These consist of the kitchen, which has received special attention from the architect, the laundry-rooms and steward's and servants' quarters. Indeed, the completeness of the domestic appointments of the club are one of its most noticeable and praiseworthy features.

Descending, the grand staircase ends in the basement in a large well-lighted hall, handsomely panelled in oak and ornamented with wrought ebonized-iron chandeliers. The width of this hall is 20 and the height 15 feet; on one side, opening onto it by heavy doors with stained-glass panels, are the billiard-room and the café. The former contains six tables, and though richly furnished is of the usual character, with a slightly raised platform at one end for spectators. The café, however, is one of the pleasantest and most charming rooms in the building. It is in the Flemish style of architecture, and possesses a quaintness and old-time charm that is most delightful. At one end is a large brick fireplace, under a massive arch of great span, where hangs, on heavy forged-iron chains, an old-fashioned pot grate. At the other end, behind a semicircular carved-oak screen enriched with stained glass, is a buffet. The ceiling is high and vaulted and supported upon massive piers. The furniture is all in antique oak, heavy and richly carved in agreement with the architecture of the room. On the other side of the hall on this floor is a circulating-library room furnished in black-walnut, steward's offices, toilet-rooms, hat-and-coat room, barber's shop and shoe-blackening room.

Below this floor is the sub-basement, which is remarkably well lighted by means of areas. Its chief feature is the extensive bowling-alleys, five in number, with platforms for spectators, bar and other conveniences. The columns supporting the ceiling of this room have been quaintly designed in the shape of ten-pins and all the electric and gas fixtures are similarly shaped. On the other side of this floor are the boiler-rooms, dynamo and engine-rooms — a very extensive and complete department, modern in the extreme, — as well as storage-rooms, ice-houses, coal-cellars and other offices. It

¹ "The Building-Law of the City of Boston." Boston: Press of Samuel Usher, Price, 25 cents.

may be noted here that the temperature of the building, summer and winter, is automatically maintained, and an extensive system of mechanical ventilation changes the entire atmosphere of the building about every five minutes.

In conclusion, it may be said that from top to bottom the building is most carefully and artistically planned, the construction is everywhere of the most substantial and excellent kind, and reflects great credit upon the members of the Club and the architect. — *Record and Guide.*

THE SAME: THE VESTIBULE.

THE SAME: MOSAIC-WORK IN THE VESTIBULE; THE BILLIARD-ROOM; CEILING OF THE BALL-ROOM; THE MAIN HALL.

PROPOSED HOUSE FOR H. GRAHAM, ESQ., MONTREAL, P. Q.
MESSRS. DUNLOP & HERIOT, ARCHITECTS, MONTREAL, P. Q.

[Additional Illustrations in the International Edition.]

THE PROGRESS CLUB-HOUSE, NEW YORK, N. Y.: LADIES' PARLOR.
MR. ALFRED ZUCKER, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

THE SAME: THE DINING-ROOM.

[Gelatine Print.]

THE SAME: DRAWING-ROOM AND LADIES' BOUDOIR.

[Gelatine Print.]

THE SAME: DETAILS OF THE BALL-ROOM.



SOCIETY OF BEAUX-ARTS ARCHITECTS.

THE annual meeting of the Society was held at the Hotel St. Denis, on the evening of January 10. The following officers were elected for the coming year: John M. Carrère, *President*; John Galen Howard, *Vice-President*; Edgar A. Josselyn, *Secretary*; Walter Cook, *Treasurer*; W. A. Boring, *Corresponding Secretary*; Thomas Hastings, John Edward Howe, and Whitney Warren, *Committee on Education* (one-half for two years). The meeting passed a vote expressing its sympathy with the effort to obtain a legislative bill licensing architects in the State, and arranged for a delegation to attend a conference of the different artistic societies in the city, with a view to an affiliation.

EDGAR A. JOSSELYN, *Secretary.*

THE ADHESION OF CEMENT MORTARS TO BRICK-WORK.

IN a communication to the *Union des Ingénieurs de Louvain*, M. Felix de Walque gives the results of a large number of experiments made to determine the adhesion between various cement mortars and different makes of brick. The bricks tested were of five varieties, viz: (1) Hard, well-burnt, machine-made, and re-pressed bricks, having well-finished surfaces and arrises; (2) a soft machine-made brick used for facing work in houses, etc., where appearance is considered of more importance than durability; (3) good, hard, clamp-burnt, hand-made bricks; (4) hand-made facing bricks, softer and weaker, but of good appearance; (5) overburnt bricks, such as are commonly used in foundation work.

Five kinds of cement were used in the experiments, viz: (1) A slow-setting Portland; (2) a quick-setting Portland; (3) a slow-setting slag cement; (4) a moderately slow-setting slag cement; (5) another make of slow-setting Portland cement.

Three mortars were made with each of these cements, gauged as follows: (a) one part cement to one-half part sand; (b) one part cement to one part sand; (c) one part cement to two parts sand. The bricks before being cemented together, which, it should be stated, was very carefully done, were thoroughly soaked in water, and after setting, their adherence to each other was tested at dates of two days, four days, eight and one-half days, fifteen days, and forty-four days. The two earlier dates gave irregular results, the best result when the joint was two days old being an adherence of 14.5 pounds per square inch, and at four days one of 38 pounds per square inch, both of these figures being obtained with the hard

machine-made bricks; but some of the other bricks showed an adherence at these dates of less than one-tenth these amounts. Each experiment was repeated four times, and from the mean of these results the figures in the Table below were obtained. The most

MORTAR.		BRICKS.	
Cement.	Sand.	Hand-made clamp-burnt bricks.	Hand-made clamp-burnt bricks.
Slow-setting Portland, 1 part.	Part. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	Adherence in pounds per square inch at	Adherence in pounds per square inch at
1	1	8 1/2	8 1/2
2	2	15	15
3	3	44	44
4	4	8 1/2	8 1/2
5	5	15	15
6	6	44	44
7	7	8 1/2	8 1/2
8	8	15	15
9	9	44	44
10	10	8 1/2	8 1/2
11	11	15	15
12	12	44	44
13	13	8 1/2	8 1/2
14	14	15	15
15	15	44	44
16	16	8 1/2	8 1/2
17	17	15	15
18	18	44	44
19	19	8 1/2	8 1/2
20	20	15	15
21	21	44	44
22	22	8 1/2	8 1/2
23	23	15	15
24	24	44	44
25	25	8 1/2	8 1/2
26	26	15	15
27	27	44	44
28	28	8 1/2	8 1/2
29	29	15	15
30	30	44	44
31	31	8 1/2	8 1/2
32	32	15	15
33	33	44	44
34	34	8 1/2	8 1/2
35	35	15	15
36	36	44	44
37	37	8 1/2	8 1/2
38	38	15	15
39	39	44	44
40	40	8 1/2	8 1/2
41	41	15	15
42	42	44	44
43	43	8 1/2	8 1/2
44	44	15	15
45	45	44	44
46	46	8 1/2	8 1/2
47	47	15	15
48	48	44	44
49	49	8 1/2	8 1/2
50	50	15	15
51	51	44	44
52	52	8 1/2	8 1/2
53	53	15	15
54	54	44	44
55	55	8 1/2	8 1/2
56	56	15	15
57	57	44	44
58	58	8 1/2	8 1/2
59	59	15	15
60	60	44	44
61	61	8 1/2	8 1/2
62	62	15	15
63	63	44	44
64	64	8 1/2	8 1/2
65	65	15	15
66	66	44	44
67	67	8 1/2	8 1/2
68	68	15	15
69	69	44	44
70	70	8 1/2	8 1/2
71	71	15	15
72	72	44	44
73	73	8 1/2	8 1/2
74	74	15	15
75	75	44	44
76	76	8 1/2	8 1/2
77	77	15	15
78	78	44	44
79	79	8 1/2	8 1/2
80	80	15	15
81	81	44	44
82	82	8 1/2	8 1/2
83	83	15	15
84	84	44	44
85	85	8 1/2	8 1/2
86	86	15	15
87	87	44	44
88	88	8 1/2	8 1/2
89	89	15	15
90	90	44	44
91	91	8 1/2	8 1/2
92	92	15	15
93	93	44	44
94	94	8 1/2	8 1/2
95	95	15	15
96	96	44	44
97	97	8 1/2	8 1/2
98	98	15	15
99	99	44	44
100	100	8 1/2	8 1/2

remarkable feature about the experiments is the fact that the smooth-pressed bricks gave a far better hold to the mortar than the rougher varieties, which is entirely opposed to usual ideas. — *Engineering.*



BOSTON, MASS. — *Winter Exhibition, including Pictures loaned by Quincy A. Shaw; Paintings by Paris de Chavannes; Ancient Chinese Buddhist Paintings; Line Engravings, Mezzotints, and Etchings by Rembrandt; at the Museum of Fine Arts.*

Exhibition of Pictures of New England Life by New England Painters; at Jordan, Marsh & Co.'s, opened November 27.

Fifty-first Exhibition, Oil Paintings and Sculpture: at the Boston Art Club, January 18 to February 16.

Paintings by Theodore Wendel: at the St. Botolph Club, January 7 to 23.

Fourth Annual Exhibition of Oil-paintings and Sculptures: at the Unity Art Club, 711 Boylston St., January 22 to February 12.

CHICAGO, ILL. — *Water-color Exhibition: at F. Keppel & Co.'s, 1 Van Buren Street.*

Loan Exhibition of Portraits: at the Art Institute, January 2 to 16.

CINCINNATI, O. — *Studies by Anton Mauve: at the Art Museum, January 9 to 28.*

CLEVELAND, O. — *First Annual Exhibition of the Cleveland Art Association: January 21 to February 22.*

NEW YORK, N. Y. — *Loan Exhibition: at the Metropolitan Museum of Art, New North Wing, opened November 5.*

Zachille Collection of Arms and Armor: at Tiffany & Co.'s, Union Square.

George Inness Memorial Exhibition: at the Galleries of the American Fine Arts Society, 215 West 57th Street, opened December 27.

Water-colors of Holland and Venice by F. Hopkinson Smith: at the Avery Galleries, 308 Fifth Ave., January 7 to 19.

Works by Claude Monet: at the Durand-Ruel Galleries, 389 Fifth Ave., January 12 to 27.

Etchings by D. Y. Cameron: at F. Keppel & Co.'s, 20 East 16th St.

Paintings of Japanese Subjects by Theodore Wores: at the Avery Art Galleries, 368 Fifth Ave., January 21 to February 2.

PHILADELPHIA, PA. — *Sixty-fourth Annual Exhibition of the Pennsylvania Academy of Fine Arts:* opens December 17, closes February 23. The special exhibition of Architectural Drawings closes February 5.

PROVIDENCE, R. I. — *Architectural Drawings by Members of the R. I. Chapter, A. I. A.:* at the Art Club, January 23 to 30.

NOTES AND CLIPPINGS

PAWNEE HOUSE. — Roofless, but with the stone walls strong and firm, the building which was once used as the capitol of Kansas still stands on a slope overlooking the Kansas River near Fort Riley. It is called the Pawnee House, after a town which had a short-lived boom, and which was designated as the capital in the Territorial days of Kansas, by a governor who had property interests in more than one of the mushroom prairie towns that sprang up in the Kaw or Kansas Valley. The governor's political enemies applied to the Washington authorities to have Shawnee Mission, a rival metropolis, fixed upon as the capital, charging that the governor was influenced by his speculative interests in honoring Pawnee. He was sustained, however, and the capitol was rapidly put up with stone which was quarried from the Geary County hills. It was a crude affair, 50 by 80 feet, and pierced with just enough windows to give the representatives light at their rough-hewn desks. "The coming of the Legislature," says a chronicler, "was more like the invasion of a desert than the gathering of the representatives of a new Commonwealth. They came in white-topped prairie schooners, whose bulging sides told of ample camp supplies hidden away therein to withstand a protracted absence from the necessities of life. The boarding-houses were ignored; the dwellers of Pawnee were scorned, and the legislators set them down in tents around their own camp-fires and ate their own bacon and cornbread. One who tells the story incidentally remarks that many of the delegates 'came with similar camp equipage to that of their pro-slavery Missouri constituents who had come in to elect them a few weeks before. They had no more idea of remaining in the enemy's country than had the amateur settlers who elected them. It was too far from the base of supplies, and an early adjournment to a spot nearer the Missouri line was inevitable.'" For two years, from 1853 to 1855, Pawnee was able to claim the capital honors, and at the end of that time the Legislature voted to remove the seat of Government to Shawnee Mission, passing a resolution over the veto of the speculator-governor. Pawnee struggled for a while against its fate, but in August, 1855, cholera broke out in neighboring Fort Riley, and there was a stampede from Pawnee which left it a huddled group of shanties and boarding-houses, with the prison-like capitol in the midst of them. The wind now has free sweep through the former hall of legislation, prairie animals stray in and out at will, and grass grows rankly about its foundations. — *New York Evening Post.*

A TUNNEL UNDER THE CITY OF BALTIMORE. — The Baltimore & Ohio Railroad is preparing a gigantic coup that will draw Washington and New York nearer together by forty minutes. This is the new \$8,000,000 tunnel under the City of Baltimore, by which the transportation of cars across the river at Baltimore will be obviated. For many years the Pennsylvania Road subtlet a part of its road, including an entrance to the largest Baltimore station, for a handsome sum, to the Baltimore & Ohio. But the rival road began to cut so deeply into the Pennsylvania's business, that it came down hard on the Baltimore & Ohio and refused to renew the lease. Shut out of Baltimore, and cut off as far as the Susquehanna River, it looked as if the Pennsylvania had forever disposed of the Baltimore & Ohio as a rival for its New York line. But the Baltimore & Ohio pluckily built its own tracks from Baltimore to the Susquehanna, across which it threw a splendid iron bridge. It was enabled to take a more direct route than the Pennsylvania road, and so cut off sixteen miles of distance, which the Pennsylvania has made no effort to discount, as it would cost millions. The Baltimore & Ohio trains had then to be taken across the river at Baltimore, but even with that disadvantage it landed passengers at the foot of Liberty Street in New York exactly five hours from the moment of starting from Washington. Meanwhile, the \$8,000,000 tunnel was begun under the City of Baltimore, and within a few months it will be open for traffic, when the Baltimore & Ohio will leave its competitor exactly forty minutes behind in the race to New York, with no prospects of shortening the difference between them. There has been a good deal of secrecy maintained about this tunnel, the Baltimore & Ohio people having determined on a great stroke when it is opened. Nobody is allowed to write it up, and all inquiries are met with polite evasions, which tell nothing except that they are building a tunnel which will some time or other be finished. It is, however, declared by the *Boston Transcript* that it is considerably nearer completion than the officials will let on — and it is certain that four hours and twenty minutes will take a train through from Washington to New York, with a strong probability of the lopping off of the odd twenty minutes. — *Philadelphia Press.*

PENSIONERS LEAVING THE INVALIDES. — Before very long it is expected that the Hôtel des Invalides — the gilt dome of which forms such a conspicuous landmark in Paris — will have ceased to exist, at all events as what may be called the home of the French Chelsea pen-

sioners. By degrees the number of pensioners lodged there has diminished until they are a mere handful. It seems that old soldiers do not care to continue to live in barracks after their retirement, but that they prefer a pension outside, be it ever so small. Owing to the decrease in the number of pensioners, a public sale has been held at the place, of furniture and other superfluous articles. Some old clothing belonging to dead and gone pensioners was also disposed of. Among the kitchen utensils brought to the hammer was a copper saucepan no longer needed, which was so large that it took six men to carry it to the cart on which it was taken away. A facetious bidder, who asked the auctioneer whether he would put up the pensioner's "wooden head," of which French legend speaks, was informed that unfortunately that interesting object was not included in the catalogue. — *London Standard.*

STRANGE LOGGING DEVICE. — There is a wood-pile in Lead City, S. D., widely known throughout the Black Hills mining region. It belongs to the Homestake Gold Mining Company, and is composed of timbers about the size of railroad ties, which are used in supporting the walls and roofs of the drifts and tunnels of the mines. A narrow gauge railway brings the logs, which have been sawed flat on two sides, to a point on the mountain slope about 600 feet above the valley, and they are then thrown into a wooden chute about 4 feet wide and 2 feet deep. The inside surface is kept smooth and slippery by a small stream of water. If the logs were allowed to run directly to the ground, they would speedily excavate an enormous hole besides damaging themselves, so the lower end of the chute is curved upward and the logs leave it at an angle of about 60 degrees with the horizontal and rise from 150 to 200 feet in the air, turning over and over, and finally landing on the enormous pile already there. A useful fact in connection with this method is, that the logs sort themselves in the pile according to their size; the heavier ones having a greater momentum are all found at the side farthest away from the chute. — *Exchange.*

THE BREAKING OF A FLY-WHEEL. — While going at a terrific speed a fly-wheel, 20 feet in diameter, broke in 1,000 pieces at the Edgar Thomson Steel Works the other afternoon and made a wreck which cost \$20,000. The engine to which the wheel was attached was one of the largest and best ever constructed for blast-furnace purposes. It was built after a special design at a cost of over \$10,000 and was considered a model piece of machinery. About four o'clock a large ball connected with the governor in some way became detached and flew off. This permitted the engine to "run off," as engineers say, and with nothing to regulate the pressure of steam the big wheel was sent spinning. The speed kept increasing, and it became evident to the engineer that the wheel could not hold together. He attempted to stop the engine, but failed, and soon the wheel with a terrific crash went to pieces, threshing the big engine into a thousand fragments and hurling tons of iron through the walls of the building like cannon-balls. The entire end of the building and part of the roof were demolished. Fortunately, no person was injured. — *Pittsburgh Dispatch.*

PROGRESS ON THE CHURCH OF THE SACRE COEUR, PARIS. — It is useless to tell Parisians, as they are informed to-day, after a long spell of silence, that the works at the Basilica are being pushed forward with activity, and that 500 men are engaged in putting the big dome in position. It was supposed that the dome in question would be ready last week, but now it is stated that it will require many months to complete it. The belfry will not be ready until the year 1896. The committee, down to July of this year, had received 27,594,000fr., or £1,103,790 sterling. The subscription-list was opened in July, 1873, but, in spite of the large sum collected since that year, further appeals will have to be made to the faithful, before they can hope to see the church even near completion. — *Exchange.*

THE NEW YORK STATE-HOUSE. — The old State Capitol cost about \$100,000, less than one-half of what is paid out annually to take care of the present unfinished structure. The annual outlay for maintenance during the last four years has been as follows: 1891, \$106,850.29; 1892, \$254,613.64; 1893, \$256,470.20; 1894, \$232,098.25. In the four years that Senator Murphy's father-in-law has been superintendent, the expenses of sweeping, scrubbing, elevator-running and snow-shovelling have increased over \$58,000. The Capitol has been the headquarters of the Democratic machine. The party-healers who could not be provided for elsewhere were taken care of there. Mr. Murphy used to send down his henchmen by the carload, imposing one injunction upon them that they "should not go up Capitol Hill in a body." — *N. Y. Tribune.*

"LOOKING BACKWARD," VOL. 2. — Some one ought to write a second volume of "Looking Backward," in which Mr. Bellamy's colorless officials should take the background, and the political organs of the industrial army should appear, with Mr. Debs as commander-in-chief. The opening chapter should deal with the last Anglo-Saxon struggle for liberty, against the restless patronage of the socialistic party which held in its hands all the railroads, telegraph lines, and mines in the country. It should describe the immensely preponderating foreign element in this new party; the loss of confidence on the part of the Anglo-Saxon minority; the resulting anarchy and bloodshed; the final seizure of the government by trades-unions, under the leadership of some crafty "boss." It should go on to describe the political structure of the new nation: how, in the new paternalism, an ignorant foreign majority took the place of the papacy, dictating to men's consciences when they should be generous; how it soon became necessary that religion and education should come under the paternal system, since the power which controls altruism must likewise control the social forces that lead to it; how one step towards tyranny led to another; how tyranny inevitably tended towards autocracy; and how at last that same single, forcible, shrewd head of the Cæsar once more appeared on the throne of the temporal and spiritual world, and so the "look backward" was complete. — *John H. Denison, in the January Atlantic.*

1897. State of New York, County of Albany.

Albany

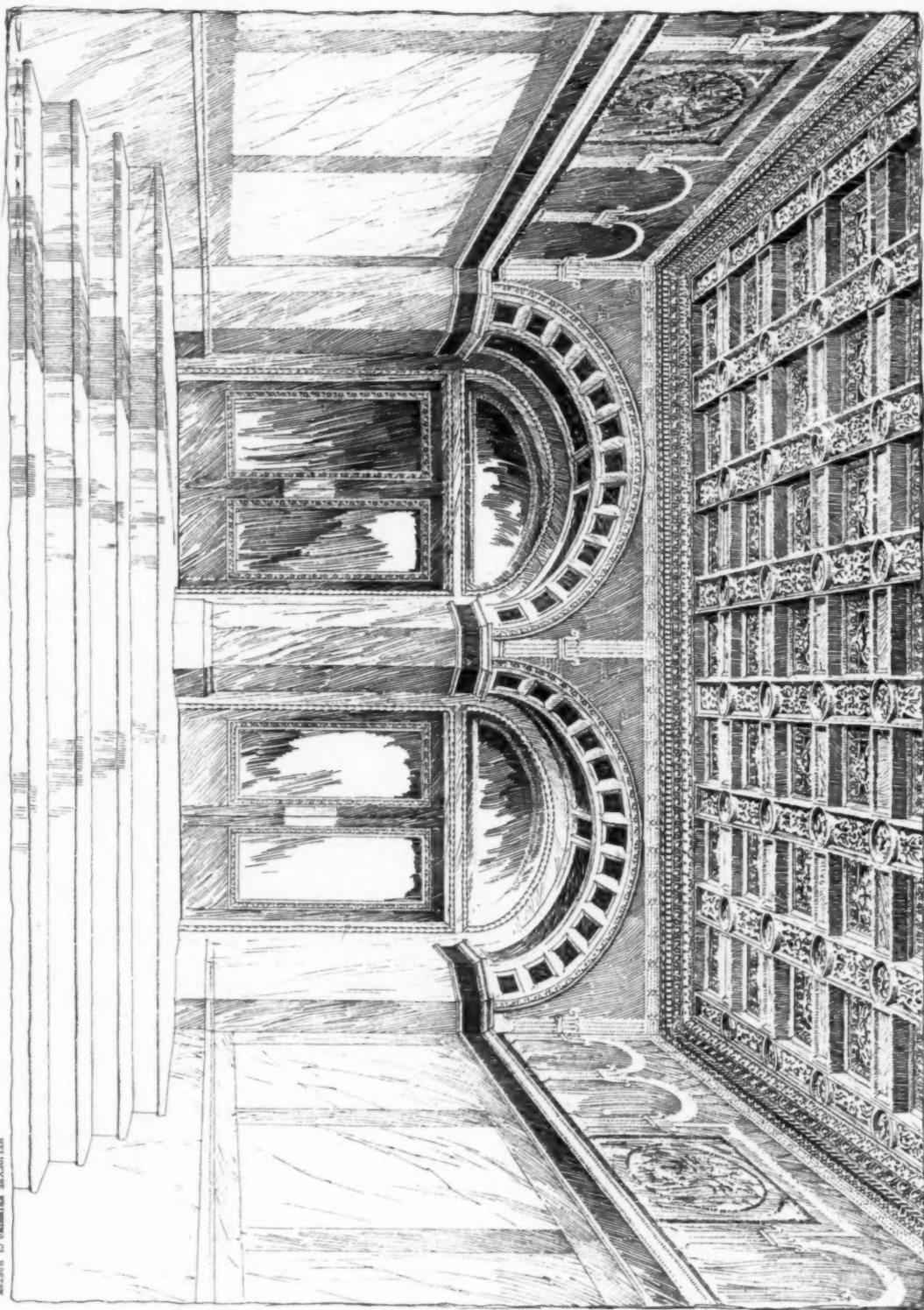
PROPOSED RESIDENCE FOR H. GRANTAN, Esq.
 CAR. SHERBROOK & STANLEY STS.
 MONTREAL, PQ.

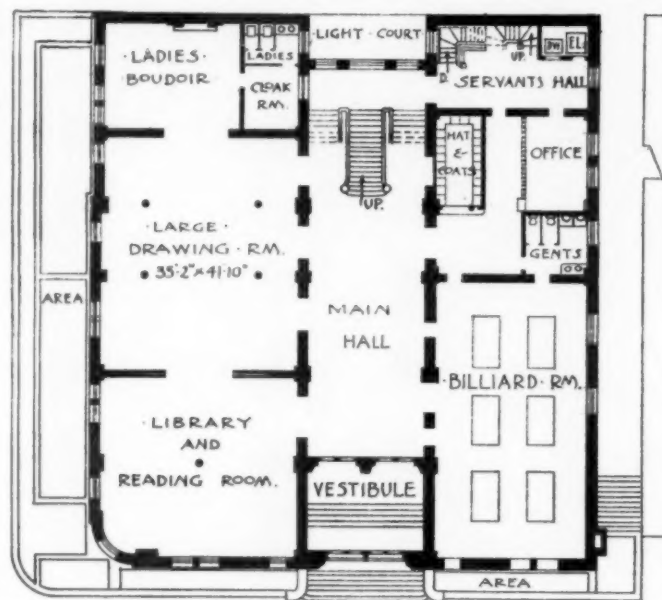
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 ARCHITECTS, MONTREAL.



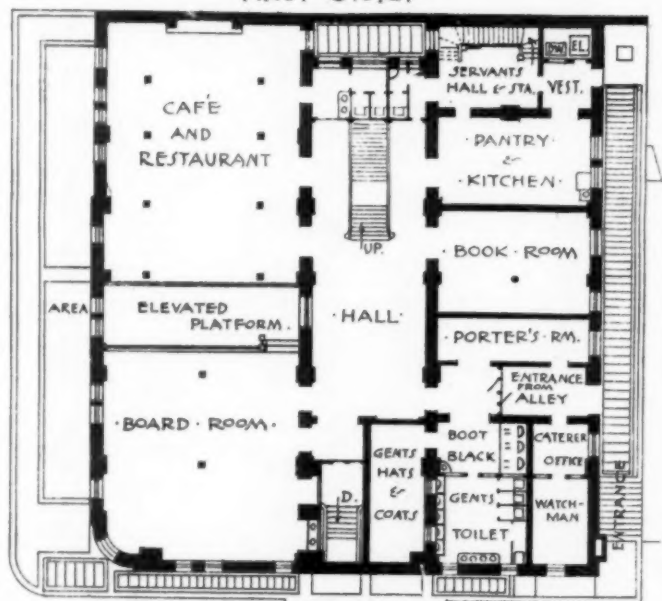
THE PROGRESS CLUB, NEW YORK, THE VESTIBULE.
ALFRED ZUCKER, ARCHITECT.

ILLUSTRATION BY H. H. HARRIS

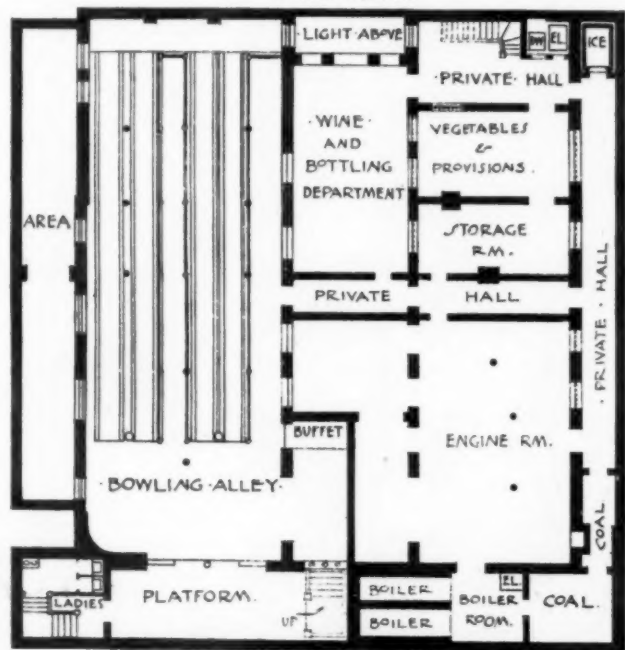




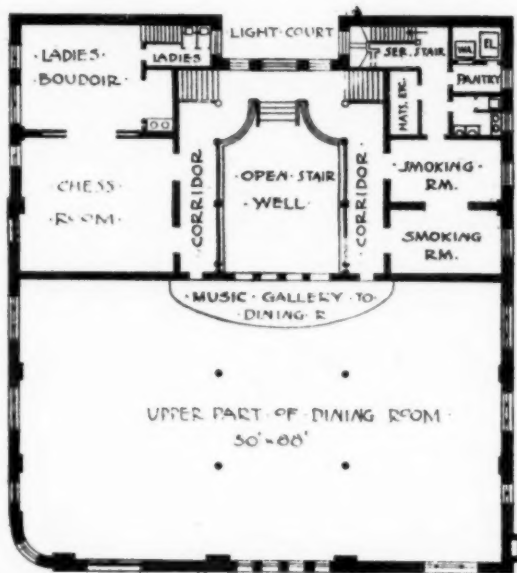
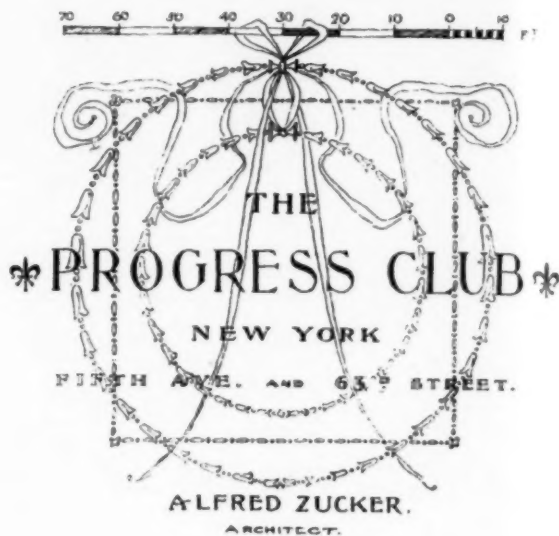
FIRST STORY.



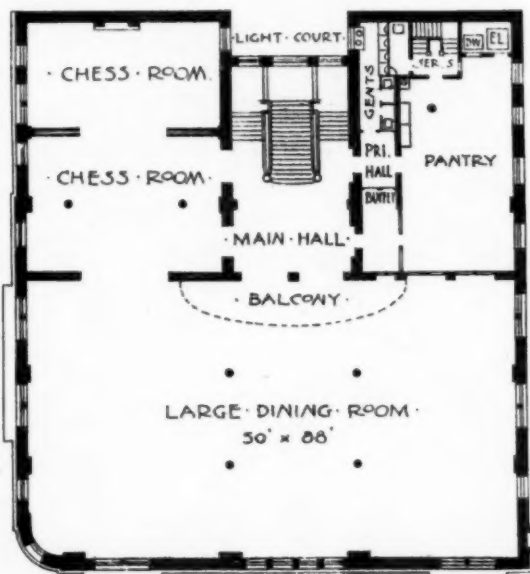
BASEMENT.



CELLAR.



MEZZANINE STORY.

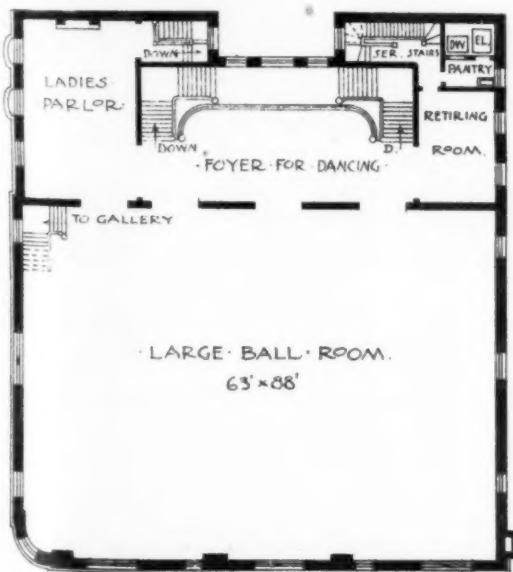


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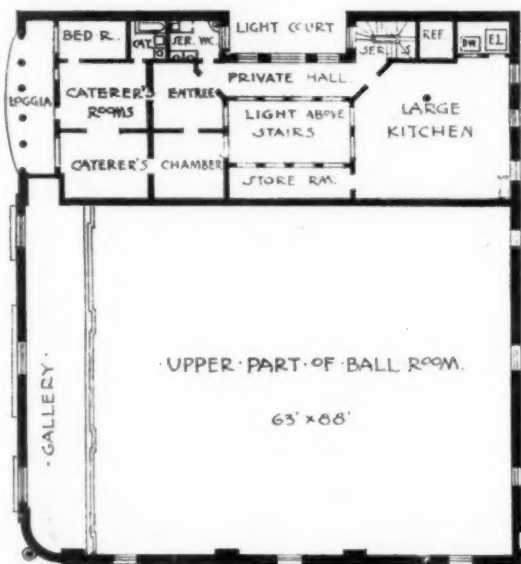


SCALE 1/4 INCH = ONE FOOT

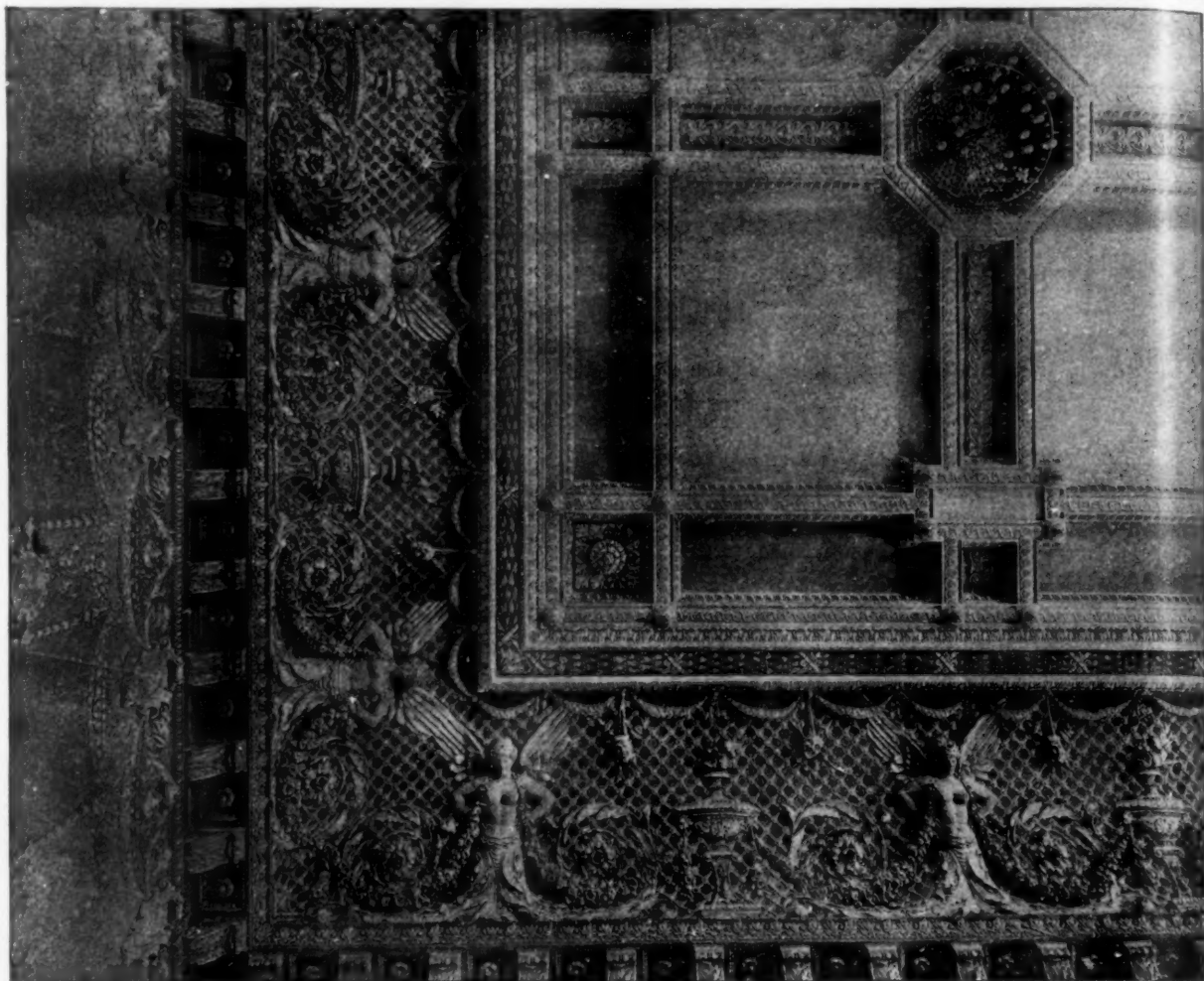
ELEVATION ON WEST



THIRD STORY



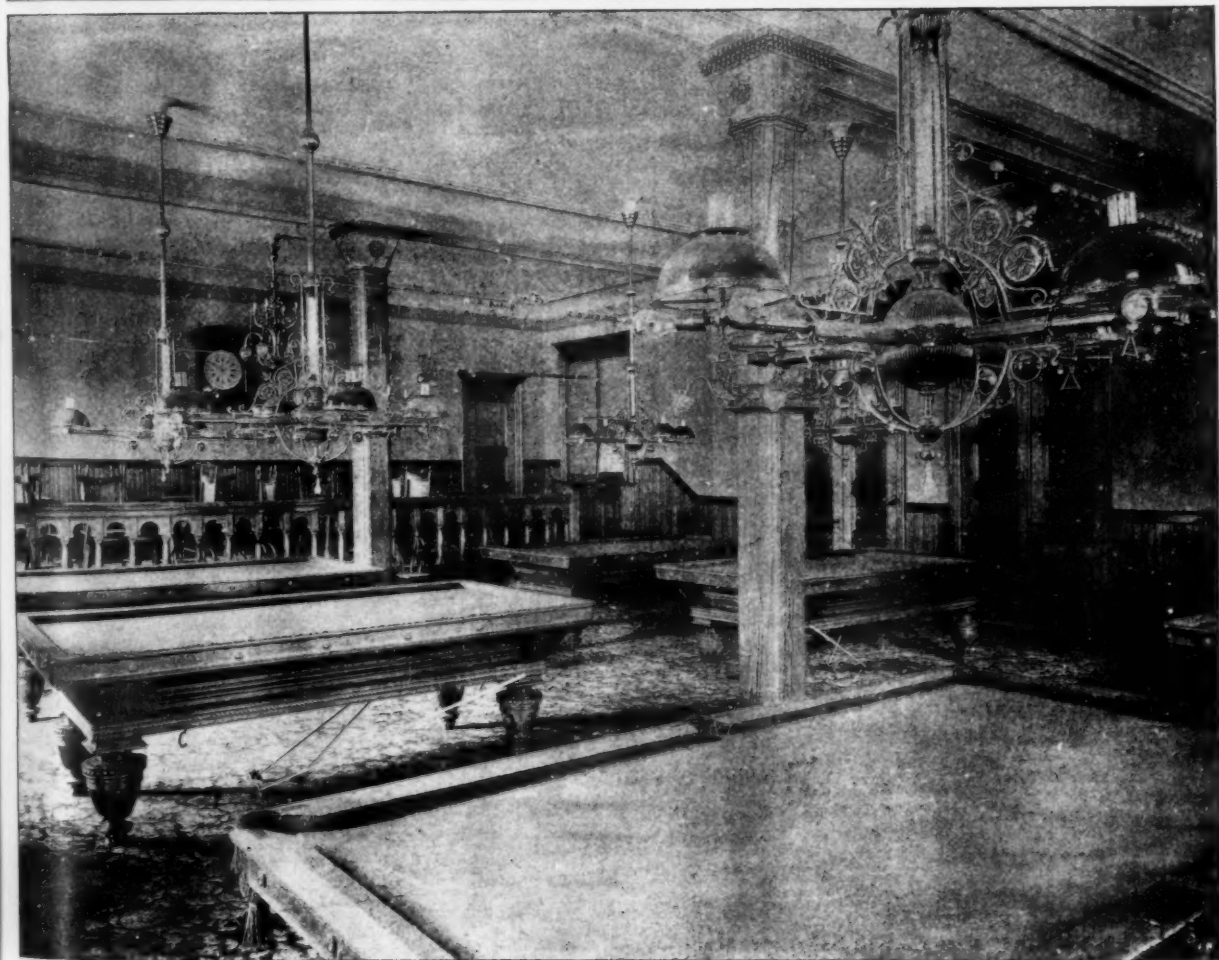
FOURTH STORY



CEILING OF THE BALL-ROOM.
THE MAIN HALL.

THE PROGRESS CLUB HOUSE,

ALFRED B. WOOD, Archt.



HELIOTYPE PRINTING CO. PHOTO

CASINO CLUB HOUSE, NEW YORK, N. Y.
ALFRED D. WELLS, Architect.

MOSAIC WORK IN THE VESTIBULE.
THE BILLIARD-ROOM.