

PAGES

MISSING

CANADIAN ARCHITECT AND BUILDER.

VOL. VII.—No. 10.

OCTOBER, 1894

{ PRICE 20 CENTS
\$2.00 PER YEAR.

—THE— CANADIAN ARCHITECT AND BUILDER, *A Monthly Journal of Modern Constructive Methods.*

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD THURSDAY IN EACH MONTH IN THE INTEREST OF
ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS,
DECORATORS, BUILDERS, CONTRACTORS, AND MANU-
FACTURERS OF AND DEALERS IN BUILDING
MATERIALS AND APPLIANCES.

C. H. MORTIMER, Publisher,

Confederation Life Building, - TORONTO, CANADA.

Telephone 2362.

Branch Office: NEW YORK LIFE INSURANCE BUILDING, MONTREAL.

Bell Telephone 2299.

SUBSCRIPTIONS.

The CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States for \$2.00 per year. The price to subscribers in foreign countries, is \$2.50. Subscriptions are payable in advance. The paper will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrearages paid.

ADVERTISEMENTS.

Prices for advertisements sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th day of the month, and changes of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of technical value to the persons in whose interests this journal is published, are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publisher of any irregularity in delivery of paper.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1894.

PRESIDENT	-	EDMUND BURKE, Toronto.
1ST VICE-PRESIDENT	-	J. E. BELCHER, Peterboro'.
2ND VICE-PRESIDENT	-	W. A. EDWARDS, Hamilton.
TREASURER	-	H. B. GORDON, Toronto.

COUNCIL:

KING ARNOLDI	-	Ottawa.
FRANK DARLING	-	Toronto.
D. B. DICK	-	Toronto.
THOS. FULLER	-	Ottawa.
J. GEMMELL	-	Toronto.

REGISTRAR AND LIBRARIAN:

W. A. LANGTON - Canada Life Building, Toronto.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1895.

PRESIDENT	-	CHAS. BAILLAIRGE, Quebec.
1ST VICE-PRESIDENT	-	A. C. HUTCHISON, Montreal.
2ND VICE-PRESIDENT	-	A. T. TAYLOR, Montreal.
SECRETARY	-	J. VENNE, Montreal.
TREASURER	-	JOSEPH PERRAULT, Montreal.

COUNCIL:

A. F. DUNLOP	-	Montreal.
J. NELSON	-	Montreal.
A. RAZA	-	Montreal.
L. Z. GAUTHIER	-	Montreal.
F. X. BERLINQUET	-	Quebec.
J. B. BERTRAND	-	Quebec.

AUDITORS—L. Z. RESTHER, W. MCLEA WALBANK.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

WM. PEARS, President.	FRED. WAKEFIELD.
WM. PARK, 1st Vice-President.	WM. BOOTH.
GEO. OAKLEY, 2nd Vice-President.	JAS. ISAAC.
DAVID WILLIAMS, Treasurer.	H. LUCAS.
JOHN ALDRIDGE.	JAS. THOMSON.
JAS. CRANG.	H. MARTIN.

JOHN L. PHILLIPS, Secretary.

TO ADVERTISERS.

For the benefit of Advertisers, a copy of this journal is mailed each week to persons mentioned in the CONTRACT RECORD'S reports as intending to build, with a request to consult our advertisement pages and write advertisers for material, machinery, etc.

RECENT tests at the School of Practical Science, Toronto, of samples of porous terra cotta brick of ordinary red brick size, for use as interior linings of brick and stone walls, are said to have demonstrated the fact that these bricks have an average ultimate crushing strength of 12 tons per foot, and that a 6-inch arching is sufficiently heavy for ordinary office building construction.

IN the present number is printed the first of a series of articles which will appear regularly in succeeding issues of the ARCHITECT AND BUILDER, over the nom de plume of "The Bystander." These articles will be written in the form of notes by a member of the staff of this Journal, and will treat of architectural and kindred matters of current interest. The publisher will appreciate any information which friends of the ARCHITECT AND BUILDER may place at "Bystander's" disposal, and which would assist him to give interest and value to his department.

IN our illustration pages will be found portraits of all but two or three of the officers of the British Columbia Institute of Architects. We regret our inability to include in this group portraits of all the officers of the Institute, owing to the failure of some to respond to repeated requests for photographs. After delaying publication for several months in the hope of being able to complete the group, we have been obliged to present it in the somewhat unsatisfactory form in which it appears in this number. Friday, the 2nd of November, has been fixed as the date on which the annual meeting of the Institute will be held in the City of New Westminster. We hope to be able to print in our November number an account of the proceedings.

THE citizens of Montreal are considering whether or not they will hold an Ice Carnival during the coming winter. To those who favor such a project we would say, don't do it. No doubt the festivities of these Carnivals are pleasing to many and attract a large number of visitors to the city, but the advertising usually done for the occasion is of a kind calculated to do Canada more harm than good. It is unfortunately true, that outside of this country the opinion of the majority of people is that we are entitled by climate to the exclusive use of all emblems suggestive of cold weather. This is not more true of Canada than of many other countries. In proof of this statement we can point to the variety of crops that are produced here, including all fruits grown outside of the tropics. There is a habit, altogether too prevalent among our people, of representing life in Canada, or thoughtlessly allowing it to be represented, as if the distinguishing characteristic of the climate were extreme cold with almost perpetual snow and ice. We are all familiar with such representations in many Canadian pictures. We wish to protest against such a setting for Canadian works of art, whether in print, on canvas or in more enduring forms, and would like to see our people and artists in every line co-operating to correct the wrong impressions, which, as stated, are already too widespread. Our aim should be to show Canada to the best possible advantage at every opportunity.

THE voters of Chicago are to decide next month whether or not they will erect a new City Hall and Court House at a cost of about five millions of dollars. It is proposed to remove the present Municipal and County buildings which were completed eighteen years ago at a cost of three and a half million dollars or so, and rebuild on the same ground. All the world knows that Chicago has had a marvellous growth within the last eighteen years, but it is not for this reason alone that a new City Hall is wanted. The buildings to be removed have been undergoing repairs almost constantly since completion. The manner in which the Corporation is setting about the proposed new work is likely to result in another gigantic failure so far as securing the best possible design and economy in the expenditures are concerned. Advertisements are out for a farce competition which will probably secure one set of plans and one estimate, duplicates of plans which, it is understood, the committee in charge already have in their possession and intend to use. The great need in the erection of large public buildings here or anywhere else, is honest competition for architects and contractors, and no effort should be spared to bring about these conditions.

ONE of the principal features of the annual convention of the Province of Quebec Association of Architects this year, was the exhibition of architectural drawings in the galleries of the Montreal Art Association. We are pleased to notice that in addition to the large exhibit of the work of local architects, a considerable number of drawings were contributed by members of the Ontario Association of Architects. The exhibition was attended by a large number of leading citizens, and cannot fail to serve a useful purpose in arousing public interest in the work of the profession and in architectural matters generally. This is one of the objects which the O. A. A. at its last meeting proposed to attain by means of a series of public lectures. It might not be out of place for us to suggest to the O. A. A. the advisability of undertaking an enterprise similar to the one which has been so successfully carried out in Montreal. No doubt the authors of many of the drawings which were exhibited at Montreal, would consent to have them come to Toronto. It is several years since anything in the line of a public exhibition of architectural drawings was attempted here, and there consequently exists the better opportunity for a successful effort in this direction. Reverting to the Montreal meeting, it is to be regretted that there were not more papers, and that the opportunity for a profitable discussion on the two excellent papers presented by Messrs. Baillairgé and Taylor, was not taken advantage of.

A NEW organization was formed in New York last month to be known as "The Employers' and Builders' League." The purpose of its formation is that by careful, conservative action, the interests of owners, contractors and journeymen may be conserved; also that by arbitration and discussion all necessity for strikes, lock-outs, liens and disputes may be avoided. One provision in the constitution of the league in favor of workmen is as follows: "The (directors) may nominate, appoint and remove when expedient, four journeymen in each craft, who shall be representative conservative men, to be known as master stewards, and these men shall be the recognized medium of communication between the Board of Directors and the journeymen." The organization is purely defensive, with the object of securing fair play for employers and employees. Union or non-union men will all be treated alike. A strong provision in favor of employees is, that every man will have a guarantee from the organization that he will get his wages. The membership roll includes fifty eight employers and every branch of the building trades. We do not understand just why the objects sought for could not have been as well promoted by and through the New York Exchange of the National Builders' Association, but the fact that another organization was considered necessary by a large number of the most prominent New York builders convinces us that the field for its usefulness is plain and raises the question again, why should not Canadian contractors be more generally and thoroughly organized? It would be simply absurd to say that the conditions are so different with us that contractors do not need to work for each others' interests on the lines that are followed elsewhere. The conditions are not likely to be just the same in different large cities or in different parts of the country,

more or less remote from each other, but as between Canada and the United States the situation will average very much alike. We firmly believe as much good can be accomplished in Canada for contractors and builders through better organization, as in any other country. It is not our purpose in this connection to set out in detail our reasons for this opinion. We have had occasion to refer to some of them in former issues and will probably do so again in the future. We would be glad to assist by all possible means in promoting a greater interest in this question among contractors, and should they provide a suitable opportunity, will endeavor to point out some methods which could be adopted with benefit to all parties interested.

THE statue of Sir John Macdonald, which was unveiled in the Queen's Park on Saturday, 13th inst., before an assemblage, variously estimated at from 15,000 to 18,000 people, and with appropriate ceremonies and speech-making, is the work of Mr. Hamilton McCarthy, R. C. A., the well-known and talented Canadian sculptor. The site selected for the statue, directly opposite the Queen's ave., and in front of the Ontario Legislative Buildings, could hardly have been more prominent or favorable for a purpose of the kind. The criticism, indeed, has been made, that the position is so exceptional that it ought to have been held for a statue of Her Majesty. The work of the sculptor is spoken of in kindly and complimentary terms by those capable of judging of its artistic merits, and it is undoubtedly a marked advance on the statue of Egerton Ryerson, also from the hands of Mr. McCarthy. The statue itself, the work of a Canadian artist, so also is the pedestal entirely a Canadian production. The granite was quarried in the Province of Quebec and was shipped to this city in its rough state. The designing, cutting, polishing, and the whole of the work was done in this city by D. McIntosh & Sons. These unveiling ceremonies naturally suggest a reference to the excellent paper in another column, "Notes on Some Aspects of the City of the Future," by Mr. A. T. Taylor, and which was read before the Quebec Association of Architects at the meeting this month. The particular suggestion of this paper is that the time has arrived, when, in all our larger communities, there ought to be in existence a committee, which will constitute a special artistic authority or tribunal, who will decide in the matter of selection of our monuments, statues, and the embellishment generally of our streets, public squares, etc. Mr. Taylor pertinently remarks: "How intelligent men will consult lawyers on all legal questions, doctors on matters of health, engineers on matters of drainage, hydraulics and machinery, but on matters of art and taste think they are quite capable of judging for themselves". Such a committee, it is to be expected, would be composed of men who were experts in artistic pursuits. Were a committee of this character in existence in many cities of Canada, as well as elsewhere, future generations would not be called upon to ask for an explanation why this manner of designing some public building, locating a citizens' park, or placing some statue or monument, had been done with so little regard to esthetic and artistic thought and observation. In how many cities are large amounts of money wasted in undoing, in the line of public work, what had been improperly done in the first place. In this respect the question has an economic bearing that must touch the pocket, even though the artistic organs, to employ the language of the phrenologist, have been but poorly developed. The suggestion, as Mr. Taylor has pointed out, is not chimerical, as a scheme of the kind is in operation in Boston, and New York has also a municipal art society "established with the express object of providing adequate sculptural and pictorial decorations for public buildings and parks." The argument is sometimes used that in the newer cities public affairs are conducted on too utilitarian a basis to permit of thought in artistic directions. Those in the newer cities, profiting by the experience of older communities, might well avoid the mistakes made in this manner, and if no other influence will move the people there is abundance of force, as has already been suggested, in the purely economic and financial bearings of the question.

Sandpaper is at present made with powdered glass instead of sand. Glass is readily pulverized by heating it red hot and throwing it into water, and finishing the powdering in an iron mortar.

MR. CHARLES BAILLAIRGÉ.

WE have pleasure in presenting to the readers of the ARCHITECT AND BUILDER the accompanying portrait of Mr. Charles Baillaigé, the newly-elected President of the Province of Quebec Association of Architects. Mr. Baillaigé was born in the city of Quebec, on the 27th of Sept., 1826, and received his early education at the Quebec Seminary. Subsequently he engaged in the study of surveying, architecture and engineering. Many of the principal churches and other public buildings in the city and province of Quebec were erected from his designs. In 1866 Mr. Baillaigé was appointed City Engineer of Quebec, a position which he still holds. He has found time in the midst of a life of unusual activity to contribute to the technical societies and the technical press of this and other countries a number of valuable papers on a variety of subjects. He is likewise the author of several books.

We are pleased to observe that Mr. Baillaigé is keeping in view the important subject of the proper education of the rising generation of architects, and we hope to see some definite action taken during his term of office in the direction of providing the means of imparting to students the knowledge without which they cannot properly rank as architects.

MEASURING AIR.

SPEAKING of the work of the Massachusetts State inspectors of public buildings, the Boston Journal of Commerce says that, in inspecting the means of ventilation in a school house, great care is taken by the inspectors to secure all the data for an accurate and intelligent report. The barometric pressure, temperature, and relative humidity of the outside air are first taken, together with the force and direction of the wind. The location of the building as to points of the compass, the position and direction of the fresh-air ducts, and location of the inlets and outlets in the rooms, are also noted. Upon entering the room to be examined, thermometers are placed in various positions, on the inlets and outlets, at the teacher's desk, at the breathing line and floor among the pupils, and near the outer door.

Careful measurements are then made of the volume of air supplied to and removed from the room by the ventilating apparatus. These measurements are made by taking the velocity in feet per minute of the air at the inlet or outlet by a standard anemometer, and then multiplying this velocity by the average working area of the opening in square feet.

For example: The inlets and outlets are usually covered by wire gratings or by ordinary register facings, which obstruct, to some extent, the flow of air, and it is seldom the case that the air is found to be flowing alike through all parts of the opening.

Proper corrections being made for these variations, and for the running of the anemometer, a very close approximation to the actual volume of air passing through may be obtained.

After keeping the doors and windows of the room closed for one hour, a test is made to ascertain the amount of carbonic acid in the air, the amount of this gas present being considered as a fair index of the other and more dangerous impurities in the air of the school room.

This test, unless great accuracy is desired, is usually made with an instrument invented by Professor Wolpert, and called, for him, a Wolpert air-tester. This instrument is very simple, consisting only of a glass test tube, on the bottom of which is a black mark, an inner tube of glass, and a rubber bulb, all of a specified size, and a stand in which to hold the tube.

The test tube is filled to a certain height—marked on the tube—with lime water, and by means of the inner tube and bulb air

from the room is passed through the water until, by the formation in it of carbonate of lime, the water is rendered so opaque that the black mark or spot cannot be seen.

A table, furnished by the inventor, shows by the number of times the bulk has been filled how many parts of carbonic there are in 10,000 parts of air.

There are various sources of error, both in the measurement of the volume of air and in determining the amount of carbonic acid, which have to be carefully guarded against by the inspector.

This has been so well done in testing the air that in a large number of tests made with a Wolpert tester at the same time that samples of air were taken for chemical analysis, the average difference between the amount given by analysis and by the Wolpert test was only 67-100 of one part in 10,000.

Tests to show the circulation of the air through the room are also made, usually by means of gunpowder smoke.

The report of the inspector, when complete, gives, in addition to the outside conditions already noted, the volume and temperature of air supplied and removed, the temperature of the room, the relative humidity of the air, the amount of carbonic acid found in it, and the results of the tests for circulation.

For determining the barometric pressure, relative humidity, and temperature, and also for measuring the flow of air into and out of the room, the very best and most accurate instruments to be procured are furnished to the inspectors by the State.

These gentlemen by long practice and habits of close observation have become very expert in the use of the apparatus employed in testing air supplies to school houses and other buildings, and they are also equally expert in regard to methods and systems of heating and ventilation, their wide experience placing their knowledge and judgment in such matters far above those of men of limited experience in such matters, or mere theorists.

PERSONAL.

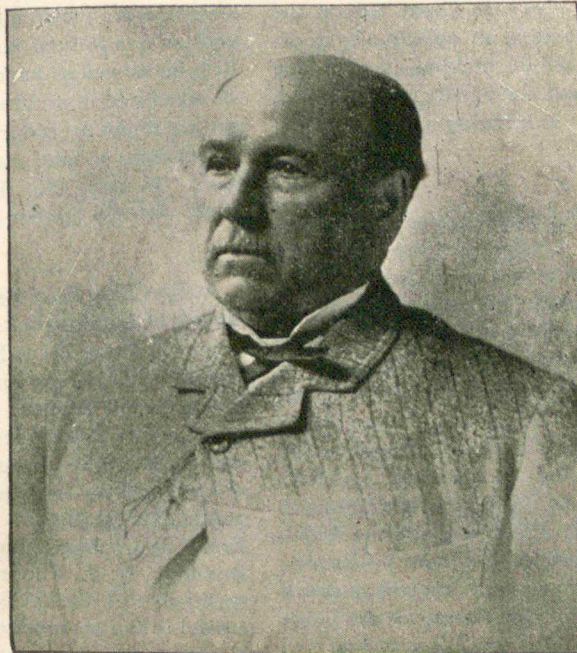
The death is announced of Mr. John E. Turnbull, Inspector of government Buildings, in the maritime provinces. Mr. Turnbull was a native of St. John, N. B., and lived in that locality the greater part of his life. He established the first planing mill in New Brunswick. He

had reached the advanced age of 76 years.

The marriage is announced on the 18th September, at Rusholme Congregational church, Manchester, England, of Mr. J. C. B. Horwood, architect, Toronto, Ont., to Mary Ethel, eldest daughter of Mr. John Jones, Manchester. The CANADIAN ARCHITECT AND BUILDER would express the hope that, to Mr. Horwood and his bride the perspective of life may never appear less pleasing than at present.

In connection with the mention made in the ARCHITECT AND BUILDER for September of the materials which are being employed in the erection of the new Union Depot at Toronto, it should have been stated that Don Valley pressed bricks and terra cotta manufactured by Messrs. Taylor Bros., of Toronto, are being used in the building.

The test of steam-pipe coverings, says Heating and Ventilating, leads to the conclusion that it costs \$15.48 to run one hundred of naked two-inch pipe at from 70 to 80 pounds pressure for one year of 3,000 working hours, with coal at \$2 per ton. With the least efficient of the coverings used in the test, this loss could be reduced to \$4, with the most efficient to \$2.64. Striking as are these figures they are probably below cost of actual practice, for steam pipe is under pressure usually more than ten hours a day, and \$2 per ton is below the average cost of coal. Prof. Charles B. Gibson, in some tests made for the Manufacturers' Mutual Insurance Company some years since, reached the conclusion that with coal at \$4 per ton and 3,000 working hours per year, the loss from a naked two-inch pipe was 64½ cents per linear foot, considerably more than Mr. Dickinson's test would show even with coal at \$4 per ton. However, the lowest of the estimates shows the importance of covering the pipes and it is a good thing to attend to before the present loss is increased by the coming cold weather.



MR. CHAS. BAILLAIRGÉ.
President Province of Quebec Association of Architects.

THE BYSTANDER.

THE interest manifested by Canadian architects in the suggestion to throw open to competition designs for our national buildings, shows that many among the profession have been thinking along the same lines as Mr. G. F. Stalker, of Ottawa, in his article in these columns last month. The Bystander has talked with a number of architects recently, and they have been, without exception, of one mind on this question. The only point on which any seemed desirous of being guarded in their expressions was in their references to the present government architect, of whom all spoke in the highest terms. On this point, it was clearly shown how the force of agitation for a desirable reform may sometimes be broken by the faithfulness and ability of a public official, just as agitation for some reforms have their inception in the incapacity of an officer, where, perhaps, the system itself may not be faulty. As President Burke, of the Ontario Association of Architects, said to the Bystander, "There is a wide difference between the gentleman at the head of this department of the public service in the Dominion, and Supervising Architect O'Rourke, of the Treasury Department of the United States." "But then," continued Mr. Burke, "the principle involved in the suggested change is the same, whether in Great Britain, the United States, or Canada. And loyalty to the most efficient public servant ought never to be allowed to stand in the way of attaining that which principle establishes as right, and experience has shown is wise. In Great Britain the practice of giving the profession generally an opportunity to exercise their talents in designing for public buildings has proven an undoubted gain to the mother land, financially, and also from a strictly professional point of view, in securing a better class of buildings in every respect."

× × × ×

Other architects with whom the Bystander talked were just as definite in their statements as the President of the Architects' Association. If the subject is to be discussed from a public standpoint, there can be little question that the change is imperatively needed, and no doubt this fact has had much to do in securing the passing of the United States bill, a very clear outline of which was given by Mr. Stalker in the article published in last month's ARCHITECT AND BUILDER. En passant, it may be remarked, that the estrangement of opinion between Secretary of The Treasury Carlisle and Supervising Architect O'Rourke has at last culminated in the head of the Treasury Department summarily removing Mr. O'Rourke, and the Architects' Bill, it may be generally conceded, has now, practically, become law. Mr. Glenn Brown, who entered into the question of architects' charges, exhaustively, in the American Architect and Building News of some few months since, comparing cost of construction of many buildings as under the supervision of the government architect, or when in private hands, has presented a case, which in point of financial cost, seems wholly unanswerable. The Bystander does not intend to burden his comments with any large quotation from Mr. Brown's article, but it is to be remarked, that when we find a building, erected under the supervision of a government architect, as was the case with the Custom House and Post Office at Albany, N. Y., costing \$811,204, or 102.8c. per cubic ft. to construct, and requiring 11 years for completion, and we place alongside of this a building erected at Kansas City for the New York Life Insurance Co., the work under the supervision of a private architect, and this costing \$950,265, or 38c. per cubic ft., and completed in two years, whatever may be the opinion among professional men, the conditions are of a character to set ordinary citizens thinking. This case is only one out of many cited by Mr. Brown in his carefully tabulated statement. Mr. Burke was asked, how so wide a difference in cost was to be explained. Was it a case of the government architect drawing a fat salary? "It is not here the trouble rests," said Mr. Burke. "In fact, compared with the responsibilities of the office and the class of work performed, Mr. O'Rourke was in receipt of a meagre salary. The trouble is in the amount of routine about the business—the curse too often of all public work. There is a whole regiment of employees, civil service officers, connected with the department, and they do their work in a perfunctory manner that is never known in business circles, but that is indigenous to officialdom. Here is where the cost comes in. Push and energy are unknown, and the work is allowed

to drag along without much regard to the time actually consumed."

× × × ×

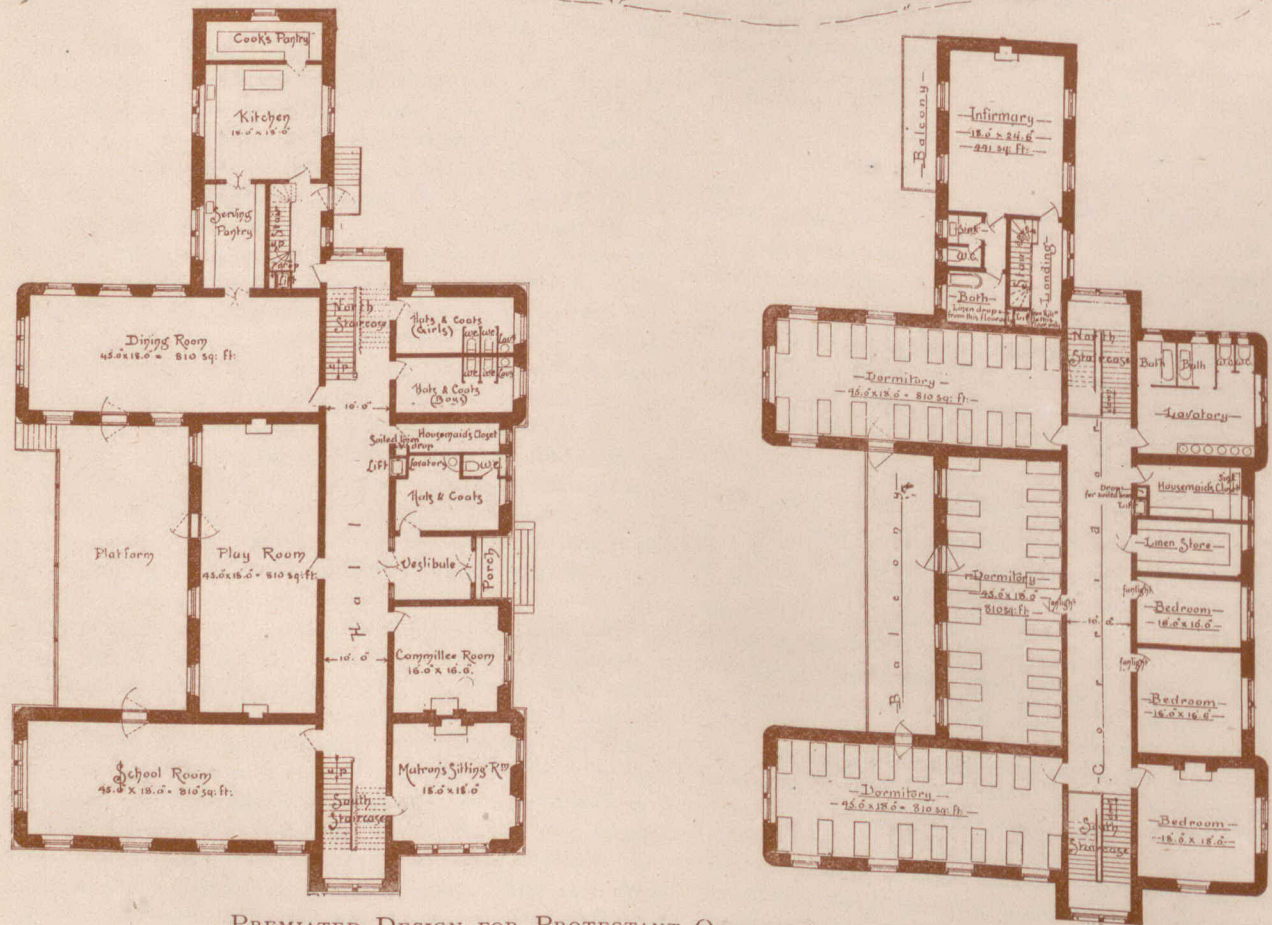
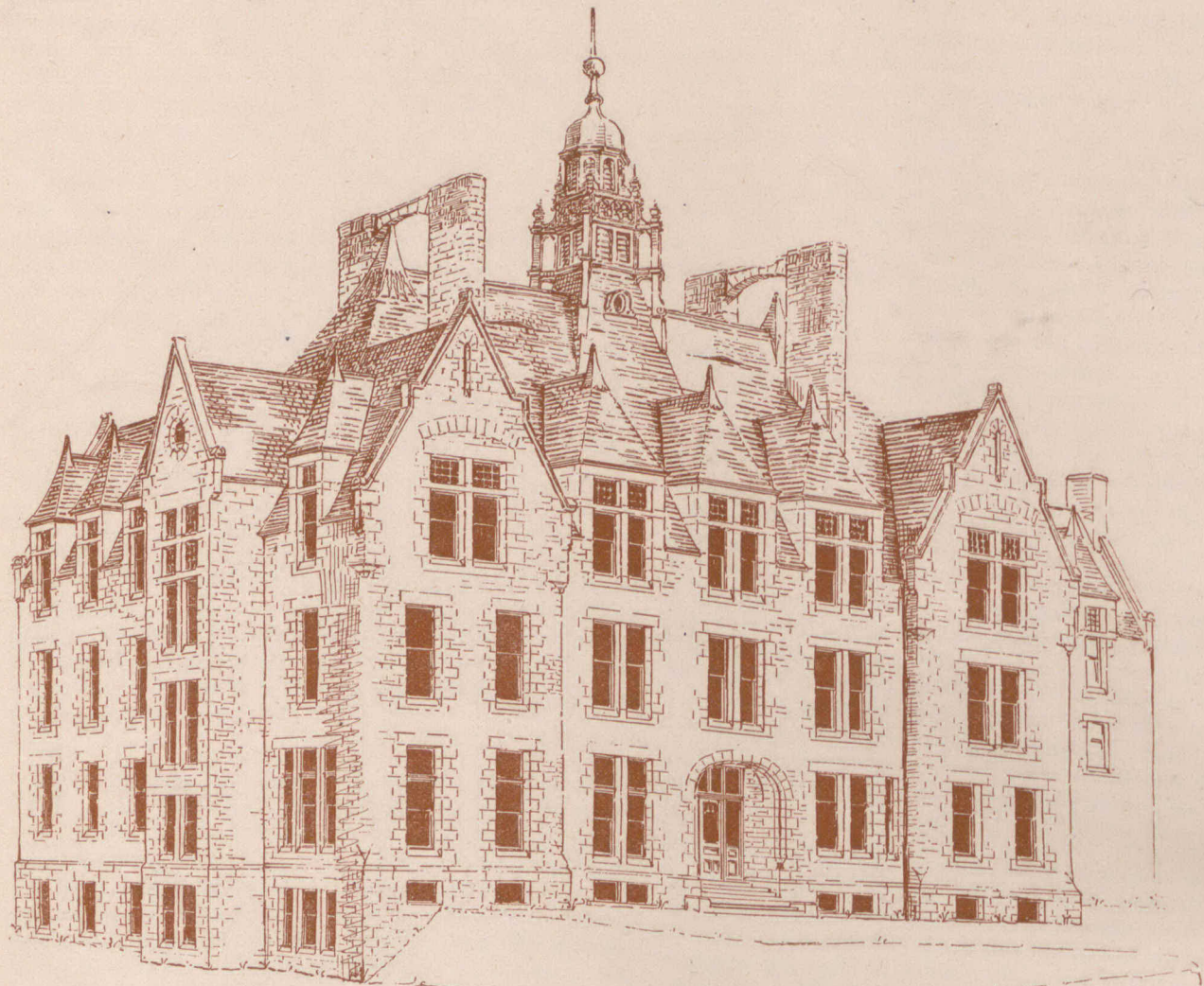
The strongest argument in favor of a change in system, as seen by architects, was the advantage to be gained in the character and style of the buildings to be erected, if thrown open to competition. "It matters little how competent may be the government architect," remarked Mr. Langley, "he is bound to get into a rut, when the work is left continuously in his hands from year to year." A similar thought was given expression to by Mr. Siddall, of Siddall & Baker. "No man," said he, "can give freshness to his work when he is burdened with all the details of management, as must be the case with anyone holding the position of government architect. There is a want of incentive for such an officer to keep in close touch with the advances that are being made in architectural and building lines. "The Bystander was reminded in this connection of a protest he had heard against uniformity in building in general, when this policy is pursued, as it sometimes has been pursued, by communities: "Never lapse into deadly dullness, the modern classic monotony of later Spain." Perhaps it is that arguments of some force can be advanced against any change in the present system, so far at least as Canada is concerned, but the Bystander has so far failed to learn of any of these as he has talked over the matter with those active in the profession. The strength of experience is always worth much, and the fact that the system of public competition has worked so admirably in the public interest in Great Britain, as well as having given strength and encouragement to all interested in architectural pursuits, is to many minds sufficient argument to influence the various Canadian architectural associations to take steps to secure legislation along the same lines. In doing this they would only be following in the circle, along with the mother land, and their neighbors to the south.

× × × ×

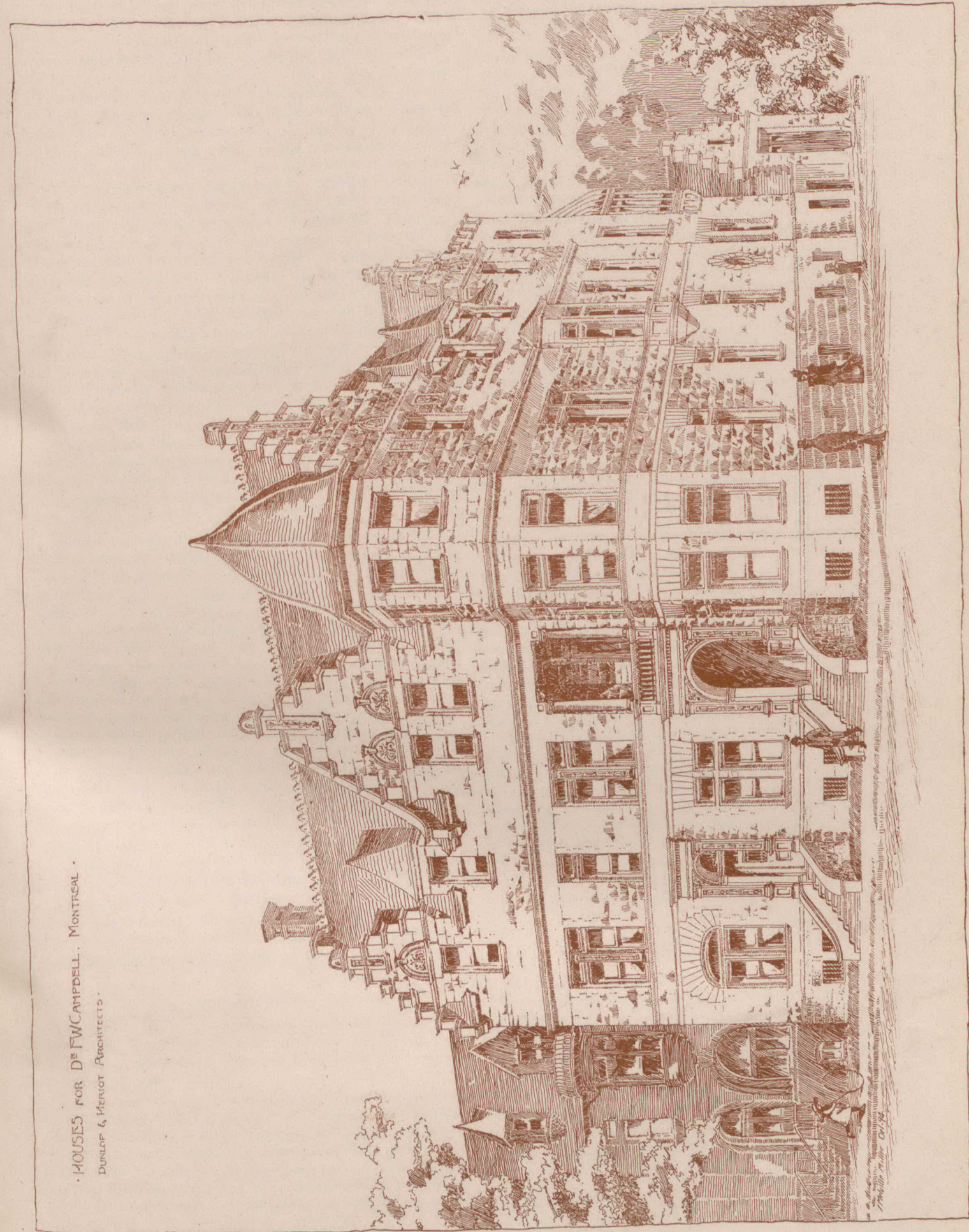
A short time since designs were asked for by the Free Library Board, of London, Ont., for the erection of a new building for library purposes in the Forest City. A statement of specifications and particulars was sent out to those architects who desired to compete, and about 20 architects, it is said, in different parts of the province, sent in designs. Within the past month the award was made and to the surprise of those who had adhered strictly, as they believed in honesty they ought to have done, to the requirements set forth in the specifications, they learned that the Free Library Board had accepted the plans of an architect in Brooklyn, N. Y., whose drawings, it is alleged, were not in accordance with the specifications. The party who has been successful in the competition was a former resident of London. It has been stated, now that his plans for the London building have been accepted, that he will return again to Canada. Just how far this is the case, however, the Bystander is not prepared to say, and whether any significance is to be attached to the fact that the award was given to an "Old London Boy" is a matter that the people will decide according to the various ways of measuring up a transaction of this character.

× × × ×

The interest of the Bystander was in ascertaining the feelings of the profession in a case of this kind. Messrs. Siddall & Baker, who were among the aggrieved parties, were seen, and both members of the firm were very indignant over the action of the London Board. They said a protest which they and others had signed, had been forwarded to the Board, but whether any good would come out of it time only would tell. In the opinion of Mr. Baker it ought to be the duty of every architect to protest against conduct of this kind. "What is the use," said he, "of asking for plans on certain lines, if others are to be permitted to deviate from these conditions and undertake to secure, perhaps a little more for their clients as a step to secure the award. A continuation of this practice must inevitably lead to corrupt and immoral methods in competing for work. We have enough of this kind of thing in other walks of life, and if the dignity and character of the architectural profession is to be maintained, we should act as one man, not alone, in denouncing conduct of the kind, but we should unanimously take steps to prevent, if possible, its recurrence in other ways." Mr. Beaumont Jarvis, who had also entered the competition, was spoken to about the matter. He had signed the protest that was being entered, and



PREMIATED DESIGN FOR PROTESTANT ORPHAN ASYLUM, MONTREAL.
 J. R. RHIND, ARCHITECT.



HOUSES FOR DR. F. W. CAMPBELL, MONTREAL.
 DUNLOP & MENZIES ARCHITECTS.

with Mr. Baker he agreed that the subject was one that might fairly enlist important consideration from the architects of the country.

× × × ×

The Bystander was amused by the rejoinder made to his enquiry by another well-known architect. This gentleman said: "I do not know anything about the London competition. Our firm certainly did not enter the competition, and have not been asked to sign any petition objecting to the award. But these people who have found themselves disappointed ought never to have entered the competition. They ought to have known better than to have expected anything like fair dealing in these competitions. We have long since refused to endeavor to secure business in this manner, having learned from our experience that the man who has the biggest pull on interested parties, or who has become an adept in wire pulling, is usually the one who 'gets there.' We are out of that kind of business." The argument was one, that seemed to give force to the contention of Mr. Siddall, that it was time for architects to unite in an effort to remedy so rank an evil. But when taking steps to remove the mote out of their neighbor's eye, what about the beam that may be in their own? The Bystander has had this question suggested to him through a remark made by a builder a few days ago: "I never think of tendering for work in the hands of Mr. So-and-So, naming a certain local architect, for my experience has been that his office is a close corporation, and tenders for buildings of which he has control never go outside of a certain favored circle." Surely it cannot be that the architects of Canada will allow themselves to be tainted in any way with the spirit, and indeed the practice, of corruption, that seems to float about the air these days as do the bacilli of so many diseases that attack the physical man.

× × × ×

The death on the 7th October, at his home, Beverley, Mass., of Oliver Wendell Holmes, the genial and clever author of the Autocrat of the Breakfast-Table, reminds one of a remark of the dead "Autocrat," when urging people who have information to impart of service to their fellowmen, "to set their thought-sprinklers to work." The Bystander in his journalistic experience has found it one of the hardest things possible to get men—ladies are excepted of course—to tell what they know to others. Every newspaper editor realizes how difficult it is to get men, well informed and with the ability to do the work, to put their pen to paper and to impart from out of their knowledge information of benefit to their fellowmen. It is sometimes almost as difficult to get some people to talk about what they know. They are as mum as an oyster, keeping their thoughts hermetically sealed. The Bystander has no brief from the editor of the CANADIAN ARCHITECT AND BUILDER to quietly probe this journal's readers and ask them to be a little more generous in their discussion of matters of interest to others in the same line of business, but he is quite sure, if the editor is like other editors, that he will appreciate the setting to work of the "thought-sprinklers" of his readers. The Bystander, as he meets with the architects and builders of the country from time to time, will be glad to have them turn the faucet on occasionally and keep him posted in what is uppermost in trade matters.

PUBLICATIONS.

The Rathbun Co., of Deseronto, are sending out a handsome catalogue relating to their porous terra cotta for fire-proofing purposes, with illustrations of the material and numerous public buildings in the erection of which it has been employed.

In the October number of the Engineering Magazine appears a new and very valuable feature in the form of a "Review of the Industrial Press," with an index to all the leading articles published currently in the technical Journals of the United States and Great Britain. The readers of the Magazine are not only made acquainted with the most important matter appearing each month in the technical Journals, but they can be supplied through the publishers with copies of any articles which they may desire to possess at a moderate cost.

It seems probable that a new City Hall for the City of Quebec will shortly be commenced. The Council has been authorized to issue debentures to the amount of \$150,000 for carrying out the project. The site which will probably be chosen is the Jesuit Barracks Square.

CORRESPONDENCE.

[Letters are invited for this department on subjects relating to the building interests. To secure insertion, all communications must be accompanied by the name and address of the author, not necessarily for publication. The publisher will not assume responsibility for the opinions of correspondents.]

A CORRECTION.

OWEN SOUND, 1st October, 1894.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—We noticed in your September number an item referring to the Owen Sound Portland Cement Co., whose works were destroyed by fire, stating that the company is being re-organized under a new name. We wish to correct this statement, as there is no re-organization, or change in the company's name. We will still continue our business under the name of the Owen Sound Portland Cement Co., Limited. The cement works, which are situated at Shallow Lake, about nine miles west of Owen Sound, are being rebuilt at a large expenditure, and we expect to have our factory in full operation again about the 1st of November. Some additions are being made to our machinery, and when completed we will be able to turn out even a better grade of cement than in the past, which was always considered equal to any imported cements. By making the above correction, you will much oblige.

Yours truly,

THE OWEN SOUND PORTLAND CEMENT CO.

A SUGGESTION FOR THE O. A. A.

TORONTO, October 6, 1894.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—Some months ago you mentioned in your paper that the Province of Quebec Association of Architects had opened a reading room and other offices, into which the members could come at any hour of the day or evening, and so on.

Now, what is to hinder the directors of the O. A. A. from doing the same thing. In Montreal the sister association has far more to contend with than we have here. They have not half the number of members, and they have a serious opposition to face which we have not. At our last convention it was considered advisable to do something "to keep ourselves before the public" and show them that we are an association with a definite aim and object, and not to let ourselves be forgotten or overlooked. Now what did we do? We gave a lecture—I will not comment upon it—but we gave a lecture in public, one and only one—and that poorly advertised and worse attended, in a neighborhood not usual for public entertainments. I believe that if we had a fair sized room and had it something like the Montreal arrangement, where we could meet, see each other, discuss common subjects, and have books of reference to study, and so on, and at least a brass plate at the door, the public would know something more about us, and we ourselves could have more interest in our Association. Our management follows a policy of "masterly inactivity." It professes to be doing a great work, but from one year to another, except for a sudden momentary ebullition, I maintain it does little if any good beyond educating—if it does that—the future architect.

Yours truly,

CITY MEMBER.

COMPETITIONS.

The Verein zur Beforderung des Gewerbefleisses, of Berlin, is offering a silver medal and a prize of \$750 for the best paper giving a chemical and physical analysis of the iron paints mostly employed. Very little definite information is known regarding the application, duration, effect, etc., of these paints, and the papers above invited should contain (1) a description and classification of the paints mostly used, based on a chemical analysis. (2) A statement of the materials and mixtures which form the most suitable paints for application to all kinds of iron. All papers are to be sent in by the 15th of November next.

According to the permit book in the office of the City Engineer, there have been erected in London, Ont., since the first of the present year, 117 dwellings. Of these 78 are cottages and 39 more pretentious residences. The brick houses erected in the city since New Year's cost upwards of \$118,550. In ten instances no figures are given with the permit. The cost of frame houses during the same period was \$22,475, with the prices of four not given. Preparations are under way for the erection of a free library building to cost \$12,000, while the Y. M. C. A. will erect a \$50,000 structure.

THE LONDON, ONT., PUBLIC LIBRARY COMPETITION.

Much dissatisfaction has been caused to the majority of the competitors in the above competition by the action of the Board in awarding first position to a design which in a most essential particular does not comply with the instructions issued to all the competitors. A copy of the specified requirements as forwarded to one of the competitors by the Secretary of the Library Board, is as follows :

[Copy.]

MESSRS. _____ Toronto. LONDON, June 27th, 1894.

Gentlemen :—In reply to yours of June 26th, would say, Competition is open. We require plan of Basement, showing Lavatory, etc.; plan of Ground Floor ; plan of First Floor ; Front and Side Elevations.

Size of Building, 50 x 80 feet, of local brick faced with No. 2 pressed bricks. Basement, size 20 x 50 feet, 8 feet in the clear of St. Mary's or Credit Valley stone, 8 feet to Ground Floor.

Ground Floor to have Librarian's Room, Reading and Ladies' Toilet Room, wood ceiling 14 feet high, pine floor and finished in clear pine.

First Story finished in grey plaster with 14-inch base, no partitions, wall to be at least 7 feet to plate, maple floor.

Roof to be of slate and at least 1/2 pitch.

Building to be heated with hot air, with gas piping and wiring.

The upper floor to be deafened.

Plan to be drawn to scale of 8 feet to inch.

Elevations to be in black and white.

In case the Building and Heating Apparatus cannot be erected for \$12,000 (twelve thousand dollars), the Committee will not pledge themselves to pay any commission.

The successful competitor to receive \$600. The man whose plans are accepted to furnish plans, specifications, and superintend the erection of the Building.

Plans to be in by July 3rd.

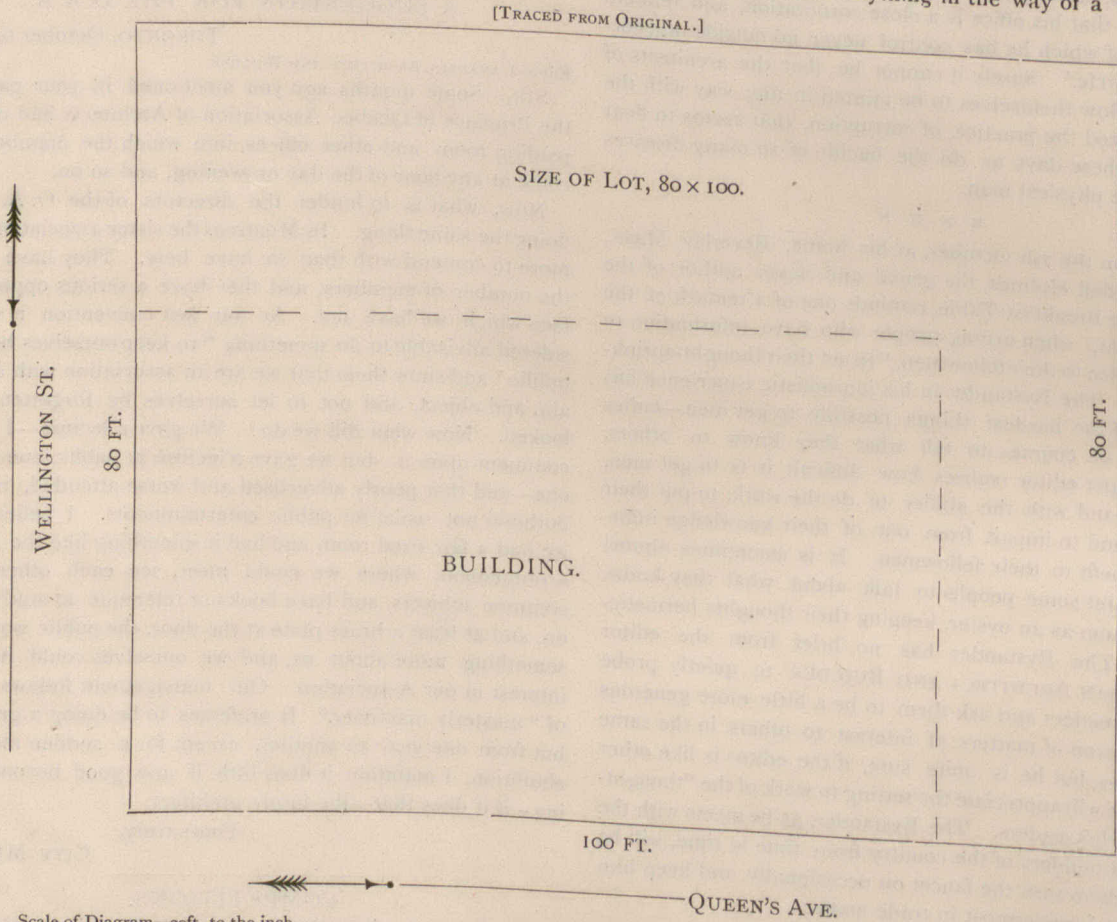
Yours truly, (Sgd.) C. E. KEENE, Sec.

The CANADIAN ARCHITECT AND BUILDER has also received from a well-known firm of architects the following letter on this subject :

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—The united protest from all the architects who entered the London, Ont., Free Library competition and were so meanly treated by the Library Board, forms but another link in the chain of circumstances adverse to the straightforward practice of the profession of architecture in Canada. It seems inconceivable that a Board occupying such a position of public trust, should have so little respect for justice and fairdealing as to permit the conditions of competition, formulated for the purpose of instructing competitors as to what was required in the proposed building, to be utterly disregarded in one of its most important clauses. Who would dare to assert that it is right to limit all the competitors to a certain clearly defined portion of the lot on which the building is to stand, and at the same time accept the only design which covers nearly the whole of the two sides of the lot—having frontages on each street vastly in excess of the stipulated site? There is something wrong when no steps are taken to rectify such an injustice, although the attention of the Board was at once called to the matter.

The competition was entered upon the district understanding that the design which best met the requirements of a free public library, would be adopted, providing it complied with the proper and reasonable conditions of the Board and of the site. Surely, no sane person would expect reputable architects to devote their time to the elaborate designing of a building, upon the loose understanding that the instructions given did not form part of the competition, or that anything in the way of a library plan



The following protest, in which the fairness of the award is called in question, has been presented to the Library Board :—

To the Chairman and Members of the Free Library Board, London, Ont.

Gentlemen :—We, the undersigned architects, having submitted designs for the proposed Public Free Library, to be erected in London, in accordance with your advertisement of June 1st, 1894, and the conditions furnished by your Board for our guidance in preparing the same, respectfully beg to protest against the acceptance of a design which is not in accordance with those conditions.

We were instructed to make the size of the building 50 feet by 80 feet, and all our designs were made to comply with that reasonable and feasible condition, whereas, the only design which totally ignored that portion of your instructions, has been awarded first place, notwithstanding the fact that it has frontages of one hundred feet by about sixty feet.

We, therefore respectfully beg to submit that we have all been led, by your advertisement, into the expenditure of much time and money, and that in justice to us, you should reconsider your decision, at the earliest possible date, and that the award should be made to the best design conforming to your conditions.

We have the honor to be, Gentlemen, Respectfully yours,

- | | |
|-----------------------------------|-------------------------|
| (Sgd.) T. A. MOORE. | (Sgd.) SIDDALL & BAKER. |
| (Sgd.) MCBRIDE & FARNCOMBE. | (Sgd.) BEAUMONT JARVIS. |
| (Sgd.) M. L. BUFFY. | (Sgd.) MOORE & HENRY. |
| (Sgd.) GEORGE R. HARPER, Toronto, | |

would do, if it did not exceed the specified cost, nor, if it did exceed the cost in this case, would it have mattered much? Probably not.

We believe there was an effort made to have the rules of the Ontario Association of Architects, for the deciding of competitions adopted, but without success. The Board did consider the advisability of appointing properly qualified persons to decide as to the best design, but this sensible idea was not adopted. The result is, the adoption of a design which any properly qualified person would have been in duty bound to reject. Probably the small expense of employing competent assistance was the cause of its not being done. It remains to be seen whether they have or have not lost more by the course adopted. The twentieth century is near, and it is high time that qualified architects should demand the discontinuance of this sort of thing. From the personnel of the Board in this case, one would expect considerations of justice to occupy a prominent place. But there has been a wrong done, unwittingly, no doubt, in the first place, but none the less a wrong, and common justice should suggest to them that the least they can do is to try to have it righted.

FAIR PLAY,

ILLUSTRATIONS.

COMPETITIVE DESIGN FOR THE PROTESTANT ORPHAN ASYLUM, COTE DES NEIGES ROAD, MONTREAL.—JAMES R. RHIND, ARCHITECT.

The sum allowed, viz., \$30,000 was small for the accommodation called for, the design therefore had to be made very plain and inexpensive. But an endeavor is made to give a good outline by the grouping of gables and chimneys and the central "fleche" for ventilation.

RESIDENCE FOR MRS. McNALLY, WESTON, ONT.—J. A. ELLIS, ARCHITECT, TORONTO.

The house is built of brown stone and red bricks, slate roof, with a complete system of plumbing, heated with hot water.

"MAPLEHURST," THE RESIDENCE OF DR. CHARLTON, WESTON, ONT.—J. A. ELLIS, ARCHITECT, TORONTO.

In the construction of this house, there has been employed Credit Valley brown stone, and Carlton brick, slate roof, modern plumbing, hot water heating. The house, which occupies a prominent site, contains a conveniently arranged suite of offices.

HOUSES FOR DR. CAMPBELL, MONTREAL.—DUNLOP & HERIOT, ARCHITECTS.

PORTRAITS OF OFFICERS OF THE BRITISH COLUMBIA INSTITUTE OF ARCHITECTS.

STAINING WOOD.

THIS is a subject few writers in the magazines have touched upon, writes James Marks in *Painting and Decorating*. It is not so well understood as priming or painting; it requires a knowledge of wood, its nature and the beauty that a stain is to bring out, or at least not mar or destroy. All woods have a transparent look, or what may be termed reflection; they change as light strikes them. Look at a varnished door of hard wood in one light, the cross stiles will look darker than the upright stiles. Change your position or change the light, and the reverse will appear. Examine a panel of bird's eye maple, or any curled wood, it will change as the light is reflected on it. This is the beauty of real wood, whether varnished or stained, and is a beauty that no grainer has ever been able to imitate.

To stain wood and keep this reflecting power or change of appearance, is or should be the object. It has been done, it can be done, but it very seldom is done. The conditions are against its being done on the ordinary work that is met with in our every-day experience. The first thing necessary is the wood itself; it must be clear, and free from sap, soft places and knots. Mill dressed lumber should be finished off with a sharp smoothing plane. No sandpaper should be used on the work; all ends of mortices should be carefully sized, before staining, so as not to appear dark, by the extra quantity of stain they absorb. No lime or plaster should touch the woodwork, or a dark stain will be the result.

Let us varnish a piece of woodwork of this description, say white pine, with three coats of light hard oil finish, or, better, a good No. 1 coach varnish, and all the beauty of the wood is to be seen. Nothing is marred, nothing hid. Next let us stain and varnish, and the chances are that the fine, satin-like reflection is gone. There is something in the stain that mars the fine transparent reflection which is the beauty of all natural wood finish. The grain may be left, and even be brought out more prominently by an inferior stain; but this is not or should not be the object sought for, for if the reflection which changes is destroyed with a filler or a stain, then it should not be used.

The average painter concludes that a coat of thin color that produces the desired tint is a stain, and will, and does, in a number of instances, meet the requirements of a stain best, but this is not a proper stain. No coating of any pigment, no matter how finely prepared, or how applied, in oil or distemper, can be applied to wood as a stain without destroying the real beauty of the wood, the reflection.

It is the natural tendency of all woods to darken under varnish or polish; how this is cannot be readily accounted for, except it be the action of light on the wood shining through the varnish or polish, either of which excludes air; but when they darken in this way it is always with a change of color natural to the color of the wood in its native or new state. This can be observed in old oak furniture or mahogany, both of which grow old with a beautiful transparent richness, the color of which should be imitated if possible.

Let me give an illustration: I have a strip of ash or light oak, the grain of which is as near to walnut as possible. This strip is to be stained the color of the walnut, and the reflection is not to be destroyed. The stain that will accomplish this is a proper stain and none other.

Staining has taken the place of graining, and while, on account of cheapness, it may be a substitute, so far as the average job is concerned, that is produced with a coat of stain and filler combined, or color stained, it has neither the beauty nor appearance of an average job of graining, and will not until woodwork is properly prepared and staining is properly done; then be assured it may compete with graining, but it will certainly cost more money. There must be a new idea formed, and a more correct one, of what is needed, and the makers of stains and fillers must be required to produce a stain that will do the work in a proper manner, under skillful workmen, and not advance claims for their goods that cannot be accomplished.

STUDENTS' DEPARTMENT.

ADVICE TO A YOUNG ARCHITECT.

THE following characteristic letter was prepared by the late Mr. William Burges, at the desire of a young architect, who consulted him about the worthiest course to follow in the study and practice of architecture:—

"My Dear Sir,—I venture to submit the following considerations to your notice:—

"You have passed your apprenticeship, done your Academy, and finished the usual Continental tour, and the question now arises as to what you are going to do?

"If you follow the usual course, you would take an office, hunt up work, and do the same according to your lights, consoling yourself that many architects would do it much worse.

"Of course, there are various sorts of practice, all of which are open to you, and you might become simply a house doctor, or a warehouse architect, or a light and air man, or an architectural policeman (i.e., district surveyor), or a general partitioner; and it is quite possible to make money by any of these, the amount depending on the extent of the practice, and that again upon the number of friends, besides the amount of the importunity and imprudence by which work may be solicited.

"But reflect; are any of these men artists? It is true that when they die they may have made money, but what else will they leave to the world besides that? Their names are simply written in water.

"Now, it is quite open to you to take to all or any of these lines of practice, to make money, to bring up a family, to become churchwarden and, above all, to be pronounced 'warm' when you leave this world.

"My object in writing these lines is to suggest to you that there is another course open by which you may perhaps be the means of leaving some beautiful things to posterity, and by which your name may possibly survive after you have quitted this life.

"The question arises, 'Why not try to be an artist, an accomplished man, a creator of works of art, and an ornament to your profession?'

"You have not the excuse that many have for not making the attempt, as I understand you are in a great measure independent of your profession.

"Why not use that advantage to be something more than an idler on the one hand or a money grubber on the other?

"Try at least for a couple of years. They will not be lost years, even should you eventually not take up the artistic branch of your profession; for you will to a certain degree have educated yourself in the attempt, and you will be so much the better.

"Supposing you decide to try, let us see where you are. You know something of modern construction, enough to enable you to practice without letting your buildings fall. You can draw well, and in an architectural and geometrical manner; but I know nothing of your perspectives, and your freehand drawing is woolly, and wants precision. Above all, you are very defective in the human figure. (You have, I presume, a fair knowledge of the history of architecture.)

"Now, I should recommend you to employ your next two years in three principal things:—

"1. The drawing of the human figure. This is easily the foundation of all good taste. I don't mean that you should spend weeks in frizzling up a figure in chalk, for you are not going to be a painter, but that you should learn to draw correctly and know the bones and muscles which go to make up the outline, and, in fact, to be able to account for everything you see.

"2. A serious course of reading of the best and well-known authors. This also will conduce to form your taste. Philosophy and science will not help you so much as works of the imagination. Bohn's Library furnishes fair translations of the best authors at 5s. per volume; but if the work is a translation, it is desirable to get two or more versions and to compare them together. In the Classics, I should recommend Homer, Aristophanes, Æschylus, Herodotus, Xenophon, Virgil, Horace, Apuleius. Of the moderns, Dante, Chaucer, Shakespeare, 'Faust,' 'Robinson Crusoe,' 'Undine,' and Lane's translation of the 'Arabian Nights.' Of course I could mention many more, but these are sufficient for the present.

"3. To carefully study and draw various beautiful things; and whether the said thing be a piece of jewellery or a piece of iron work or a building or portion of a building—to do it thoroughly, to find its construction, and why this and that is done, the basis of the ornamentation, the particular form of the curves, and never to leave it until you know all about it. The result will be that the next time you see a similar thing you will know all about it, and won't want to study it again. Do everything by common sense; don't make a drawing when you can make a rubbing, and regard all your drawing in the light of evidence which is worth next to nothing if it is not authentic.

"I consider you very lucky that you have such an opportunity of having your 'learning time' over again, and I am quite sure that if you make up your mind to be industrious, your two years spent in the way I have ventured to suggest will be very happy as well as very useful ones.

"Hoping you are not bored by the above.

I remain, yours truly, "W. BURGES."

ANNUAL MEETING OF THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The Province of Quebec Association of Architects met in annual session on Thursday, October the 4th, at 10.30 a.m., in their rooms in the New York Life Building, Montreal, the President, Mr. J. Nelson, in the chair. Among those present were: Messrs. J. Nelson, President; C. Baillaigé, Vice-President; A. C. Hutchison, 2nd Vice-President and Acting Secretary; J. Z. Resther, Treasurer; A. T. Taylor, E. Mann and J. Venne, Councillors; S. Lesage, A. F. Dunlop, Jos. Perrault, L. Z. Gauthier, H. C. Nelson, V. Roy, J. Z. Resther, F. X. Berlinguet, G. A. Monette, T. Daoust, M. Perrault, W. E. Doran, W. McLea Walbank, G. W. Wood, A. H. Lapierre, J. R. Gardiner, A. Boileau, etc.

The annual report of the Council, read by the Acting Secretary, stated that at the semi-annual examination in January four candidates presented themselves for admission to the study of architecture. Of these three passed. During last winter arrangements were made for the members of the Association resident in Montreal to meet once a month at dinner and subsequently to listen to papers and lectures. The Council regretted that these opportunities for social intercourse and instruction were not taken advantage of in the manner it was thought they would have been. Early last fall the Council endeavored to form classes for students engaged in architects' offices, in order to afford instruction in branches of study not usually obtained in an office, and so prepare them for passing their examinations. It was regretted that owing to the difficulty in obtaining teachers and to the lack of interest in the matter by members and students, these classes had to be abandoned. The Council strongly urged upon the Association the necessity of establishing classes for the systematic study of the several branches of architecture, either in direct connection with the Association or in connection with an university. During the year the number of books in the library has been slightly increased by purchase and donation.

The report submitted by the Treasurer, Mr. L. Z. Resther, was of a very satisfactory character.

The reports of the Council and the Treasurer having been adopted, the election of officers was proceeded with, and resulted as follows, the scrutineers being Messrs. E. Mann and A. H. Lapierre:—

President—Mr. Charles Baillaigé, Quebec.
1st Vice-President—Mr. A. C. Hutchison, Montreal.
2nd Vice-President—Mr. A. T. Taylor, Montreal.
Secretary—Mr. J. Venne, Montreal.
Treasurer—Mr. Joseph Perrault, Montreal.
Council—Messrs. A. F. Dunlop, J. Nelson, A. Raza, L. Z. Gauthier, Montreal; F. X. Berlinguet and J. B. Bertrand, Quebec.
Auditors—Messrs. L. Z. Resther and W. McLea Walbank, Montreal.

The most pleasing part of the morning session then took place. It was the presentation of a large photographic group of the Montreal members of the Association to their confreres in Quebec. The photograph, which is placed in an antique frame, is a really fine specimen of the photographer's art. Mr. Jas. Nelson having explained that he and Mr. Taylor had been charged by the Montreal members with the arrangements for the picture, called upon Mr. Taylor to make the presentation. That gentleman alluded to the fact that the Montreal members had already received a photograph group of their Quebec confreres, and the former felt that the least they could do was to reciprocate as soon as possible. It was hoped that the photograph would be received and kept by the brethren in Quebec as a pleasant memento, and that for many years to come their successors might look at it and see the gentlemen who started the Association and carried on the work for so long.

The newly-elected President returned thanks on behalf of the Quebec members, and spoke of the artistic merit of the picture, saying that although the idea of the Quebec and Montreal sections of the Association presenting photographic groups to each other had perhaps originated with the former, the latter had improved upon it in many ways. The photograph represents forty-three Montreal members of the Association assembled in a handsome room, the background being a reproduction of a view of the Senate Chamber in the Palace of the Doges in Venice.

Mr. F. X. Berlinguet also briefly returned thanks, after which the gathering adjourned for luncheon.

AFTERNOON SESSION.

The newly-elected President occupied the chair at the afternoon session, which opened at 2:30, and contributed the following paper:

FOUNDATIONS IN DEEP AND UNRELIABLE SOILS.

An article in the Engineering Record of New York, on "Foundations of High Buildings," by W. R. Hutton, M. Am. Soc. C. E., etc., has reminded me that in the Province of Quebec we have had several failures of an expensive nature to make good, due to faulty foundations, as at Joliette, St. Bazile, St. Casimir, Nicolet, etc., and in Upper Canada at Cornwall and elsewhere.

As it is more satisfactory to know exactly how the foundations of certain tall and heavy structures have been built, than to learn from any treatise on the subject how they should be laid down, I shall first summarize Mr. Hutton's article as extremely interesting and instructive to the profession,

and then allude to the Canadian cases mentioned. In New York the rock is at from 15 to 50 and 70 feet below the surface, and overlaid by yellow sand mixed with clay and containing pockets or beds of quicksand. Many buildings rest on piles driven to refusal, though not necessarily to, nor always to, the rock. Under the city building law, each pile may be loaded with 20 tons. The permanent wet level is about that of high tide in the harbor and piles, not to decay, should be cut off at or about this level—dry seasons and deep drains, which may lower it being taken into consideration. When a gap occurs in the rock and bottom can not be reached, an arch is thrown over (Field) Building on Battery Place.

The method of founding directly on the sand is gaining favor. The "Equitable Building" and the "Union Trust" are so built with wide footings loading the soil to 2 and 2½ tons to the square foot. The "World" and "Times" buildings have similar foundations. Older buildings at only a few feet below the surface have suffered, probably from the lateral flow of quick-sand into deeper neighbouring excavations. The newer buildings are at too great a depth to render such a result at all probable. When test pits are sunk and quick-sand makes its appearance, endangering adjoining structures, concrete should be at hand to promptly fill the pit and prevent the danger.

To save the cost of 15 to 20 feet of underpinning to the old walls of contiguous buildings, the foundations of the "Methodist Book Concern" were built in alternate piers surrounded with sheet piling; the intermediate piers were then put in; the whole arched over and the walls raised upon them. In the case of the "Manhattan Life Insurance Building" 353 feet high above street level, with foundations 55 feet deep to rock—a total of 408 feet—piles enough could not be driven to bear the great weight. The system adopted was that of pneumatic caissons. Fifteen of them, of which eleven are square, varying from 13 x 13 feet, to 21 x 26 feet, and four circular ones from 9 to 15 feet, in diameter, cover some 4,000 square feet, or about half the maximum pressure allowed by city regulations, namely, from 150 lbs. to the square inch (say eleven tons to the foot), the brick piers being somewhat smaller as they may be loaded to 200 lbs. to the inch, 14½ tons to the foot. The caisson roof is strengthened with I beams. The whole area is excavated to 20 feet in depth below the Broadway level, and the caissons are sunk by means of compressed air 35 feet further to the rock. They pass through 12 feet of fine micaceous sand, layers of mud with sand, of silt, of clay mixed with sand, and a very hard conglomerate over the usual gneiss rock. The caissons were sunk by excavating the soil beneath them from the inside, and by the weight of the brick piers simultaneously built upon them, and to avoid an inflow of quicksand which might occur when the air pressure was reduced by blowing out the semi-fluid material through pipes, it was decided in the beginning to remove all material in buckets through the air locks, but upon trial it was ascertained that the pressure could be maintained while blowing out by running the compression faster, and the soft earth was thus removed. It is to be noted that any flow of quicksand from outside the lines of the caisson might have caused settlements of the neighboring buildings. When the caissons reached the rock they were filled solidly with concrete. "At the date of writing," says Hutton (September, 1893), "nearly all the caissons had been sunk to place and no appreciable cracks had occurred in adjacent buildings, one of which rests on piles at the level of the general excavations (20 feet below street level as already stated), the other on the natural soil several feet above." The cost of these 55 feet foundations is said to have been ten per cent. of the entire cost of the building. A commendable feature in the "Manhattan Life Building" is the symmetrical distribution of the load upon each pier. Commonly foundation walls are built upon the outside edge of the property, with the footings almost entirely inside the thickness of the wall, concentrating upon the outer edge of the foundation pressures much above the average. In the "Manhattan Life," the supports are centrally or symmetrically placed upon the caissons, and strong steel girders extending from side to side of the building sustain the side walls in "cantilever," to borrow a form of expression from the French. The engineer-contractors of the building, Messrs. Soozsmith & Co., made an interesting application of the same method in founding the draw pier of diameter. Their experience having convinced them that there was great risk of cracks in the masonry from irregular movements of a very large caisson, this one was made annular in plan, 59 feet in outside diameter and 10 feet wide. When sunk upon the site, cemented to the rock and filled with concrete, it formed a cofferdam within which it was expected to build the masonry "in the dry" after the water was pumped out, but seams in the rock bottom of the central space admitted water faster than it could be removed by pumps, and it became necessary to cover the bottom with a layer of concrete put in place under water to close the seams and permit the completion of the pier.

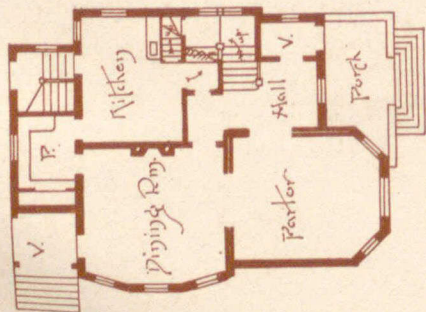
In Chicago, foundations are more difficult and costly, due to the fact that instead of only 30 feet to 50 feet, as in New York, there is from 60 to 100 feet of blue drift clay overlying the rock, a material having a greater avidity for water and containing beds of quick-sand, and yet upon this soil Chicago boasts some of the highest buildings yet erected. Formerly platforms of timber were imbedded in the clay, and piles rarely driven to the rock, but the great weight of recent structures requires that piles be driven to the rock, and the tops cut off below all future drainage that they may be always "in the wet", or detached foundations under each wall and pier, with footings carefully proportioned in area to the weight to come upon them and to the resistance of the soil. The best practice limits the weight to 3,000 lbs. per square foot, or say 1½ tons, but this is frequently exceeded. Some settlement is expected, and it is sought, by proportioning surfaces to weights as far as possible, to render the settling uniform.

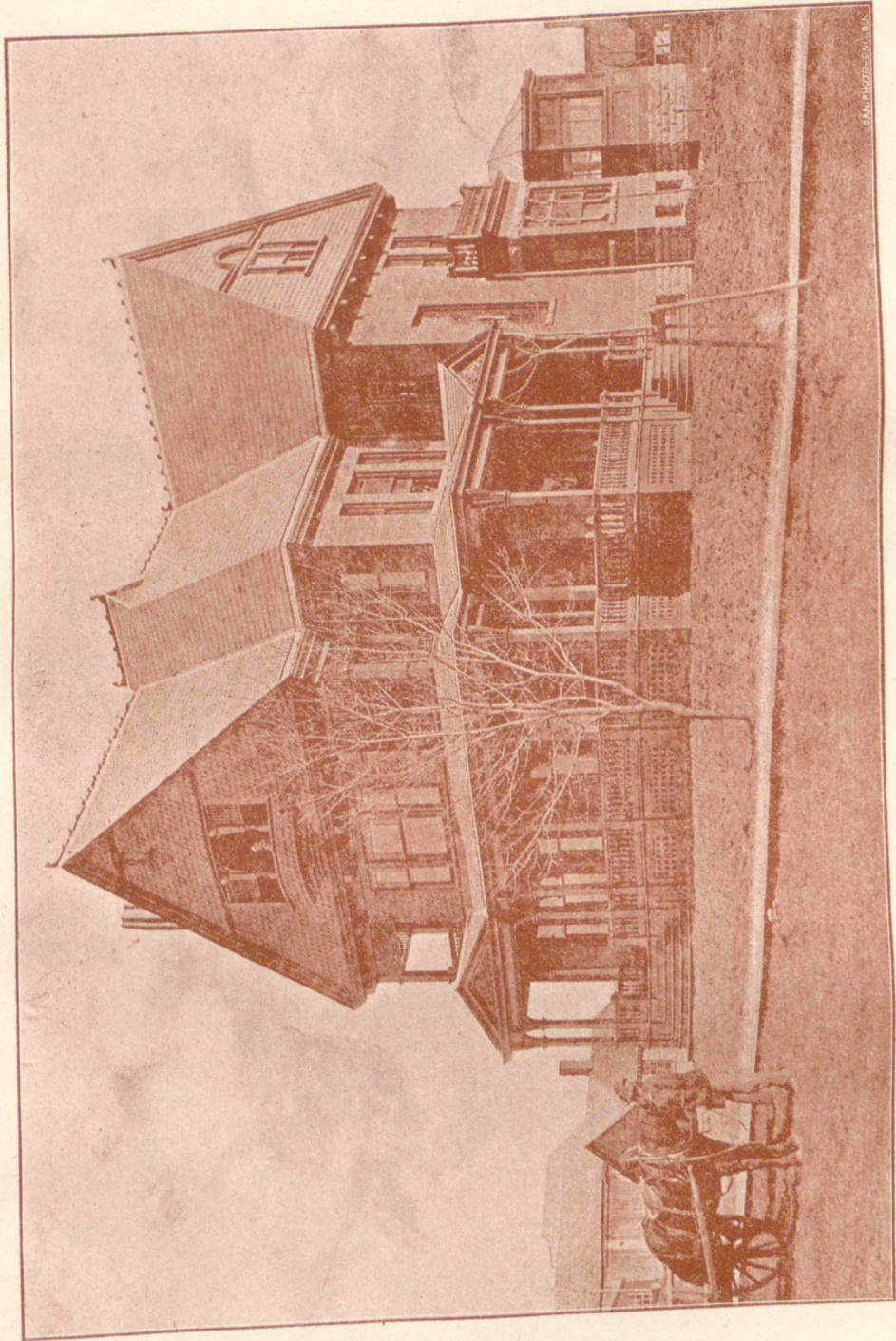
As the wide footings when of masonry must be built in high and narrow offsets, forming a truncated pyramid under each pier or wall, thus robbing basement floors of much of their height, the practice in Chicago and elsewhere, due to the comparative cheapness of iron or steel bars and beams, is to form the footings of tiers of these bars laid on a concrete foundation, each successive tier laying across or at right angles to the one below, or along and across the wall alternately, and as their greater transverse strength allows of a greater breadth of offset, the reduced thickness of the walls is reached more rapidly or in a lesser height, not exceeding from 18 to 30 inches, instead of from 7 to 8 feet in some cases where of masonry. The weight is said to be also thus reduced by about 4 per cent. of the load upon the pier. The bars or beams sometimes of second hand railroad iron, are first dipped in hot asphalt or tar, carefully bedded on and filled in, and covered with concrete to protect the metal from rust. Such a foundation is, of course, dependent on being at such a depth that the adjoining soil be undisturbed. As on account of the soft nature of the clay, the adjoining soil be it must flow laterally if not prevented from doing so, just as water supporting a vessel in a lock would do, or dry sand, any structure, if not laterally restrained by some solid surrounding. Some large buildings in Chicago have been erected upon a continuous platform of concrete, covering the whole area of the structure. The serious irregular settlement of the whole public building constructed in this way, accompanied by cracks in the walls and in the concrete platform, has brought the method into disfavor. It has

SKETCH OF MRS. MAGALY'S HOUSE.

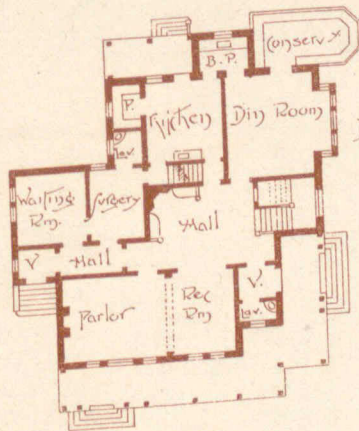
WESTON, ONT.

JAMES A. ELLIS, ARCHT.
TORONTO, J.V.





W. A. L. PHOTO - EN. V. B. B.



DR. CHARLTON'S HOUSE...
 WESTON, ONT.
 James A. Ellis - Architect
 Toronto Ont.

been applied with better results when the platform has been made with iron beams covered and protected with concrete.

It has been observed in Venice, a city founded on the marshy bottom of a lagoon, that many large buildings constructed in the 14th century and before, rest upon a platform of masonry broader than the building it supports. The masonry itself rests upon a bed of puddled clay which shows signs of a powerful artificial compression. These structures show no notable change, while many others of later date, built upon piles, show by numerous cracks the irregular settlements they have incurred. It is said that the tower of St. Mark's does not rest on piles.

A different method has been adopted for a part of the foundations of the new "Stock Exchange" in Chicago. The foundation is generally upon piles about 50 feet long driven into the hard clay which overlies the rock; next to the "Herald Building," however, which adjoins it, wells were substituted, lest the shock of the pile driven close to its walls should cause settlement and cracks. A short cylinder 5 feet in diameter, made of steel plates, was first sunk by hand, reaching below the footings of the Herald building. Then around and inside the base of the cylinder, sheet piles about 3½ feet long were driven, and held in place by a ring of steel inside their upper ends. The material inside the sheeting was excavated, and a similar steel ring was placed inside their lower ends; by means of wedges the lower ends of the sheeting were forced back into the soft clay, until another course could be driven outside the lower ring. This operation was repeated until the excavation had reached the hard clay about 40 feet below the cellar. In this material the excavation was continued without sheeting, in the form of a hollow truncated cone to a diameter of 7½ feet, and the entire excavation was filled with concrete. The wells are spaced about 12 feet, the loads upon them vary; some of them will carry about 200 tons—something less than 4 tons to the square foot. The material excavated was a soft putty-like clay to a depth of 40 feet, where a firm clay was reached, deemed capable of carrying the weight proposed. The rest of the foundation is upon piles spaced 3 feet between centres, to be loaded with about 30 tons per pile, similar piles having been tested to 50 tons at the Chicago Library foundation. They are driven with a Vasmyth steam hammer without brooming, are cut off below lake surface, capped and filled in with concrete. A series of short transverse I beams distribute the load transversely, and longitudinal beams prevent local settlements.

The foundations of the Washington monument at Washington have heretofore been well described, but having been commenced in 1848, now some 45 years ago, a description of the method employed may not be uninteresting or unconstructive to the younger members of the profession. This structure, when I visited Washington in 1856, had obtained a height of 156 feet. The monument was commenced on a national subscription then limited to \$1.00 per head, to afford every citizen the advantage of contributing his mite towards honoring the memory of the great man whose name it bore, and I myself have the honor of being one of the original subscribers, the receipt for which, of the size of an ordinary bank note, engraved on white paper of the consistency of a bank of England note, with a cut of the finished monument at one end of it, I probably still have in one of my souvenir albums. Almost every nation of the earth had contributed a souvenir in the shape of a block of its most precious stone or marble, bearing a fitting inscription, and which were so placed as to be seen and felt and read by every one ascending the inner stairway, reaching, at the time of my visit, to the then top of the structure, and intended to be continued upwards to the full height of 600 feet then proposed; while hundreds of similar blocks from all the crowned heads of Europe, not excepting His Holiness the Pope—blocks of solid copper and nearly solid gold and silver and the like, were either incased in the monument or lay strewn about the ground awaiting each its turn to do honor to the "Father of his Country," the hero of liberty and independence.

At the date of my visit the works had been for some time interrupted, owing to unequal settlement of the foundation. In 1878, says Hutton, the work which had been in the hands of the Washington Monument Association was turned over to the general Government and completed with money appropriated by Congress. The work as finally constructed is a plain shaft 500 feet high with a pyramidion on top of it 55 feet in height. The shaft is 55 feet square at the base, 30 feet at top, the interior being say 20 feet in diameter, and weight over 90,000 tons. The original foundation was of rubble masonry in lime mortar, 23½ feet thick and 80 feet square at the base, the footings thus projecting 12½ feet all around beyond the outer lines of the shaft. The soil upon which it rested was a sandy clay; 13 feet below this was a bed of gravel. The area of the base was too small, and the soil under it not sufficiently resisting to carry the final weight. A mass of concrete 13½ feet thick, extending 23 feet 6 inches outside of the old base, and 18 feet under it, increased the bearing surface and carried it down to the gravel. The concrete extended 5 feet under the walls of the shaft itself. The construction of this block of concrete under a shaft 156 feet high and weighing 36,000 tons, was a delicate operation, accomplished in this way:—On the east and west sides, near corners diagonally opposite, cuts or trenches 4 feet wide and 13½ feet deep were made from the outer lines of the foundation, and extended by tunnelling 18 feet under the base of the old foundation. When completed they were filled with concrete, and other cuts opposite to them were made in like manner, carried under the old base and filled with concrete. The removal of so much bearing surface in these two tunnels under the old foundation was sufficient to cause motion in the structure, and after this but one cut was made at one time. The work was continued and completed by this system of narrow cuts, which were filled with concrete until the entire sub-base was finished. After this, 10 feet in thickness of the outer part of the old foundation was removed in sections 10 feet wide and replaced with concrete extending 10 feet out on the new base.

Being under the impression that when I saw the monument, at that time 156 feet high as stated, it inclined somewhat out of the perpendicular, and as Mr. Hutton in describing the underpinning and strengthening of the foundation did not allude to the fact, I wrote him through the Engineering Record and my letter and his answer appeared in a recent issue of the journal, to the effect that it did incline slightly, but that its rectification was effected through the process of underpinning, though he does not say precisely how. I remember, however, that previously to strengthening the foundations in the manner described, it had been proposed to excavate beneath the monument, introduce a series of upper and under sills of heavy timber with uprights or posts between them, introducing some hundreds of jack-screws and letting down the monument gradually on one side to the level of the other. This process I applied myself in a modified form and on a smaller scale in bringing back to verticality a factory chimney some 80 feet in height at Hook's mills, in Grant street, Quebec. After cutting away a wedge shaped slice of the brick work from beneath the shaft, or between it and its foundation, by means of jack-screws it was let down by so much, the thickness of the wedge sawed out bearing the same proportion to the breadth of base as did the inclination over to the height of shaft, which inclined some two feet from the perpendicular.

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

insufficient the surface rises as the building sinks, precisely as water does around a vessel in a lock, with the additional weight of an in-going cargo.

I have said that from faulty foundations several Canadian structures have been wrecked to a considerable extent, but I shall only here allude to the new Joliette church, from having myself seen it now two years ago, and the blame ought to be fixed somewhere for a fault which it will probably cost all of \$10,000 to make good. The tower of this fine edifice, when I saw it, had actually sunk not less than eleven inches below the adjoining masonry of the sides, tearing itself away completely from the adjoining walls or remainder of the facade; and as lateral portions of the facade had also sunk, though to a less extent, and were bringing down the side or aisle walls of the edifice, the church wardens had the whole front of the facade cut away from the sides to allow of any future sinking of the tower without dragging the sides with it to destruction. The other churches I have mentioned as at Nicolet, St. Casimir and St. Bazile, have been affected I am told, exactly in the same manner, and due to a similar cause, to wit, the omission on the architect's or contractor's part to so proportion the breadth of footings as to cause every square foot thereof to bear an absolutely equal load on such a soil as at Joliette, where there are some eight feet thick of sandy clay overlying some 20 to 30 feet of mud or of clay of such a soft and semi-liquid nature that anyone can drive an iron rod into it to a depth of 20 feet or more. And this proportioning of the area of footings is such a simple thing to calculate that it is criminal to say the least, to neglect doing it. Again, in this case of the Joliette structure, the foundation I am told of the tower and remainder of the front elevation were sunk to a greater depth than those of the aisle walls, a very foolish thing to have done, as it left less of the comparatively solid upper stratum of sand between the wooden platform under the walls and the soft clay below, thus increasing the tendency of the heavier walls to penetrate into the soft substratum. Now the architect who planned the structure, it is said, disclaims all responsibility in the premises, as not having been employed to superintend the construction of the building; and the contractor says that neither is he responsible, as he executed the plans as prepared by the architect, and so between them both it appears that the parish will have to foot the bill of reconstructing the whole facade and tower at the parishioners' expense.

I had the honor at our last meeting in Quebec of reading you a paper on the "Necessity of a School of Architecture for the Province of Quebec," or I should more aptly have said, "for Canada as a whole," since similar failures have occurred in Ontario; and now I presume it will not be denied that such a school is of paramount necessity, where an aspiring architect may be taught the importance of sounding and boring the soil he plans to build on, and in any case where not on solid rock or an unyielding base, not fail to spread his footings in a way to make them truly proportional to the respective weights they will have to bear.

Errors so expensive to make good should not occur again as at St. Bazile, where the walls sank some two feet, and the masonry had to be almost entirely rebuilt at a cost of some \$12,000. At Cornwall, the settlement was not less than two feet ten inches, and occurred all at once, I am told, on or during a single night—the front wall tearing itself away from the remainder of the church and sinking bodily and equally, though, or in a way to allow of making good the levels of the door-ways without the necessity of demolishing and rebuilding the front and tower.

Foundations may be considered the engineering part of architecture, and it is strange and hard to see how, while an engineer will never attempt to drive a pile or sink a caisson or start the foundations of any structure without sounding the soil he has to build on, an architect can consider himself less liable to the danger of unequal settlement. The CANADIAN ARCHITECT AND BUILDER, in an article in its November issue of last year, insists on this engineering knowledge on the part of architects, and it is to be hoped, that the absolute necessity of the thing will now be seen and not forgotten in the future.

Not settlement is to be guarded against, but solely inequality of settlement in the different portions of a foundation. It is just as easy to erect a heavy structure on a mud foundation and insure its permanent verticality, as to cause a heavy iron-clad to ride at ease and upright on its bed of water. This can be done, as said, by thoroughly proportioning the area of base of each portion of the structure to the weight it has to bear, which will insure absolute equality of settlement in any homogeneous soil; but if one or two corners of a structure be on rock or any such unyielding foundation, then becomes it peremptory in the other portions to reach the rock or rest on it by the proxy of piles or pillars driven down to an equally unyielding bottom; or if not, to see by trial how much the soil can bear without sensible compression, and divide the weight, or spread it out over such a number of feet as will meet the requirements of the case. If a reliable bottom is to be reached by piling through a bed of stiff or compact and so to say incompressible sand, it must not be forgotten that material aid can be had by applying the loosening, disintegrating power of water. I had to do this myself when boring in 1876 for the tests as to the nature and impermeability of the soil or river bed to be built on. The sand was so compact that a two or three inch tube could not be driven into it to more than a few feet without the aid of a jet of water forced down through an inner and smaller pipe, and which loosened and disintegrated the sand beneath the outer pipe in a way to cause it to sink to a depth of 70 feet to rock bottom, while room was made for the advancing pipe or pile or borer by the water forced down, as said, through the inner tube, coming up or returning through the space between the tubes and bringing up the loosened sand with it. Ordinary wooden piles may be driven in the same way through stiff and otherwise unyielding soil, by the use of water under pressure forced down through a pipe or hose attached to the side of the pile and reaching to its shoe or point, and easily removable, and to be used again on each succeeding pile. This most effective mode of loosening the soil is much used, and has been for some years past, in pursuing excavations under water, and in fact, in all possible situations, and the material removed, it must be remembered, can now, instead of having to be so removed by cartage, be blown away to any distance by forcing it through pipes of adequate size or even rubber or canvas conduits under air pressure, or which is the same thing, by pumping out the air in front or ahead of the material to be discharged or removed, when the mere atmospheric pressure of over 2,000 pounds to the square foot, blows the stuff along to destination.

The most advanced practice in caisson foundation building, is perhaps that now being pursued in putting in the piers for the American Surety Company's building in course of erection opposite Trinity church, corner of Broadway and Pine street, New York, by Bruce Price, architect of the new Frontenac Hotel, Quebec. These foundations are 70 feet deep to bed rock, while the building of 22 stories, or 360 feet in height above road level, and therefore higher than Trinity church itself, will have a total height of not less than 430 feet, its cost being put down at some \$2,000,000. Messrs. Sooz-smith & Co. are the engineering firm of contractors. I say "engineering," because now-a-days, the responsibility for solidity and permanency of construction, devolves on the contractors equally with the designing architect. These firms of builders employ the highest engineering talent, for it must not be believed, as popularly thought, that all the engineering difficulties are in advance wrought out and solved by the designers, on the contrary, Sir Benjamin Baker, in the construction of the Firth bridge, where the twin

spans are each some 1,700 feet from pier to pier, gives the greatest credit to the contractor's engineers for their many ingenious devices in carrying out the work. In the case under consideration—the American Surety Company's building,—there are (13) thirteen brick piers on as many rectangular steel built caissons of $\frac{1}{2}$ " stuff, braced on the inside. The caisson is 7 feet high beneath the roof of heavy I beams, its sides carried up two feet all around above the roof, with a two feet filling of concrete on which the brick piers rest. The whole foundation was excavated bodily, and taken out down to 20 feet beneath the roadway, at which depth water was reached. The caissons were then put in place—not all of them together, but in alternate series, so as not to risk deranging the foundations of adjoining structures, sunk to a lesser depth than that to be arrived at. To each caisson is applied a tube of oval horizontal section, and of such size, some 3 x 5 feet inside drain, in the clear of jointing flanges, as to allow of the men passing up and down, to and from their work, and to give passage to the buckets, go and come, by which the excavated material is raised from within the caisson to the surface. The brickwork upon the caisson progresses as the caisson sinks gradually to destination with its increasing burden of advancing masonry. As the pier advances or is added to in weight, additional lengths of iron shaft, or well, or vertical tunnel-way, are added and bolted on, air-tight of course; and as the shaft gains height, the air lock rises with it. The construction and use of the air lock, though presumably well known to all, from having now so often and for so many years been used, as in the construction of piers of the Brooklyn Bridge and elsewhere, is a mere cylinder, a component portion of the shaft, high enough and of sufficient size for several men to stand in at a time. It has an under and an upper door or hatchway, through which the workers in the caisson pass up and down or to and from their work. If there were no water to contend with, the simple shaft way through the pier would be sufficient, the men working under ordinary atmospheric pressure, but the water has to be kept out to allow of excavating to the required depth to reach the rock. The pressure of the incoming water is counteracted, resisted by the pressure of the air from within the caisson outward. This pressure increases with the depth, and hence the necessity of the air back, wherein, while the ingoing and outgoing gang or band are in it, the pressure of the air, by opening a cock in the floor for the ingoers, one in the roof for the outgoers, is gradually increased or diminished in a way to accommodate the lungs and give no trouble to the individual—cause him no discomfort. This would seem to be slow work, but on the contrary, it is, under the trying and difficult circumstances, very rapid, when we consider that as much as 52 feet has thus been sunk in a single week, or nearly nine feet per diem, which would entail a delay of only 13 weeks or a little over three months if each pier had to be sunk separately to destination, whereas three to four of the piers can proceed simultaneously, and the work be done in a month or a little more.

In the manipulation of the caissons, great ingenuity is shown, to remove no more earth than that which is vertically under the caisson, to avoid disturbing adjacent buildings. In sinking caissons in river beds, no such precautions have to be observed, and the material excavated in semi-fluid state can be blown out instead of bucketed out, as was done in the case of the Brooklyn bridge foundations, where on one side of the river, after the caisson reaching bottom at 40 feet depth of water, there remained 40 feet of sand still to be removed to reach the rock foundation, and this immense mass of some 70 x 100 x 40 feet, say 10,000 cubic yards, was actually blown out by air pressure through the twelve four inch pipes provided for the purpose,—two to each of the six compartments into which each caisson was divided—the pipes running from the floor level of the caisson, through the roof thereof, and up through the masonry as it progressed, with an elbow at the top of each, throwing the stuff out into the river. A caisson for the foundations of a building has also sometimes to be moved laterally, and this is done and has been done effectively, with its load of brickwork on it, by thrusting it forward by struts and jack-screws from the off-side, while the on-side, or that to which the pier is to be moved, is caused to be gradually worn away by the disintegrating action of water already alluded to, the operation being performed by jets of water under pressure, some of them from above downward, while others as effectively do their work from beneath the lower edge of the caisson upward.

Mr. A. T. Taylor also contributed the following paper :

NOTES ON SOME ASPECTS OF THE CITY OF THE FUTURE.

MANY fanciful pictures have been drawn in literature of the condition of man in the future on this earth, most of them with more than a strong tinge of romance. There seems no doubt that in the near future the hygienic conditions of life will be greatly improved, and that the physical surroundings will more and more be laid under tribute to minister to the well-being, comfort and pleasure of mankind. It behooves our profession to be in the forefront of all such movements.

As a population aggregates at particular centres, and crowds together to make up our large towns and cities, problems of how best to house and minister to its physical, mental and higher nature, present themselves for solution to all earnest-minded men. The wise solution of such is not optional, for if neglected or ignored they bring their own Nemesis in misery, disease and death.

In a city's growth there are two elements which go to make the ideal in what we may call its externals, viz.: 1st, wise and comprehensive building by-laws; 2nd, wise and artistic guidance in the laying out and beautifying of its conformation, its buildings and their surroundings and general embellishments. These two aspects concern us very closely as architects, and I think need no apology for being brought before you to-day.

The necessity for the first of these has been more recognized than the second. Most towns of any importance have formulated some kind of building system to govern the erection of buildings, their general strength and healthiness.

In the case of our own city, the present by-laws have been amended from time to time, and are still somewhat inadequate, so that it is felt by many that the time has come when an entirely new building by-law should be prepared; and as you have heard from the Secretary's Report to-day, a Committee of our Association is working upon this at the present time. It is no easy work—nay, it is impossible, to frame such laws as to please everybody, or to cover every possible contingency; but it should be the desire of such a committee to frame them so that good building—both as regards materials and workmanship, may be the result, and bad building discouraged. It naturally, of course, follows that such laws require to be enforced, and they will need firm and judicious enforcement.

Many new materials are employed and many new modes of building adopted, so that building laws of to-day require to be more extensive and all-embracing than of old. It is proverbial that a skilful, and if there is such a thing, an unscrupulous lawyer, can drive a coach-and-six through any Act of Parliament, and it is difficult to make by-laws that unscrupulous jerry builders and dishonest contractors may not evade, or that ignorant and stupid men—architects in nothing but the name—may not stumble and blunder over. It is in checkmating the one and helping the other that these laws will be most useful, and with the plumbing by-laws recently enacted, incorporated, the result should be a reduction in the death rate, fewer fires, healthier homes, and greater peace and contentment. Only in a very general way can such

by-laws take cognizance of the design and appearance of the buildings. Were it possible to get a proper authority, thoroughly competent, to criticise and pass judgment upon all designs of buildings to be erected, it would no doubt be an advantage to the appearance of our streets, and such abortions would never see the light. But this authority would have to give the widest latitude in choice of style, and any special predilection on the part of such tendency of all such tribunals is to stereotyped forms, which would have to be avoided, but the careful selection by such a tribunal of men of undoubted check this. Personally I am in favor of such a tribunal, but such must be recognized artistic knowledge and ability.

In Europe certain restrictions as to the height of buildings have long been in vogue:—Thus, in Paris, no front wall on any street can be higher than 65 ft.; in Vienna the limit is about 77 ft., and in London, in new streets less than 50 ft. wide, the height of a building must not exceed its distance from the opposite side of the street. The wisdom of such rules is now being recognized by our neighbors across the border, where "sky scrapers" have so flourished as to utterly destroy the unity and symmetry of the streets; and enactments are being passed in some cities limiting the heights of buildings. It may be that in the near future some such enactment will be necessary in our own city.

In France, I understand, they go further than this, and the municipal authorities of the cities have supreme control over the treatment of the exterior of buildings—the style of architecture adopted, etc.

I referred to the danger of stereotyped forms in designs controlled by a tribunal of fixed predilections, and I would take the opportunity of referring in this connection to a similar and more imminent and grievous danger in connection with the designs of all government buildings emanating from a department of the government. A well-timed letter from one of our professional BUILDERS, which all would do well to read. The system has been felt to be unsupportable in the States, and, as you all know, a bill has recently been passed to throw open the designing of public buildings to the professional Provincial government architects, I think I will have the unanimous support of all, when I say that, in the nature of the case, better results would follow if wise selections of architects were made from the profession at large for such buildings.

We pass on to the second aspect, viz.: Wise and artistic guidance in the laying out, beautifying and embellishment of the streets, parks, buildings and surroundings of a city. This has been grievously neglected. Cities have been allowed to grow either at haphazard, like our own city, and then through dense population; or have been laid out in simple grid-iron plan, as prosaic and inartistic as it is possible to imagine. The relation of a building to its site and the relation of the site to the building, has been too often ignored by authorities and by architects. As an example of the first, I may cite the new Boston Public Library, which is, to my view, very unsatisfactory in relation to its environments; and as examples of the second, I may refer to nearly all of our public buildings, which are planted down without any regard to vistas, or of being made central features in our streets. Paris is a notable exception to this, and in the laying out of her squares, gardens and streets, and in the arrangement of her public buildings and monuments, she is an example to the world.

On this continent, Washington is perhaps the best laid out city for such effects as I have named. All cities of the future, which are not simply the development of the cowpath of the country and the lane of the village, will be laid out with some regard to numerous open spaces, radiating boulevards and noble buildings, placed in such positions as to afford beautiful vistas. There will be more gardens and parks, because men will have learnt that these are greater moral factors in the well-being of mankind, than crowded tenements and low saloons.

Charming effects in cities are often obtained by curved streets of large radii. Who has not delighted in the windings of the Strand and Fleet Street in London, or endorsed Wordsworth's ecomium on the beautiful High Street, of Oxford, when he describes it as "The stream-like windings of that glorious street?"

I have touched on the designing of public and government buildings. I would like to venture a word or two on the selection of our monuments, statues, and the embellishment generally of our streets, public squares, etc. Is it not the truth, that very few of these are satisfactory to a cultured taste? In nearly all large cities and towns, monuments, statues, &c., are often so inartistic, so unworthy of their position, that we are led to wonder what dreadful crime the unfortunate man committed that he should thus be held up to the ridicule and pity of future generations. We are not wholly innocent of examples of these ourselves—nay, in many respects we are very guilty. Under existing arrangements, is it surprising that this should be? It would be surprising if it were otherwise. The selection and arrangements for these memorials and adornments are generally in the hands of men—very worthy, no doubt, but not educated in art, and therefore not capable of deciding such matters. It is extraordinary how intelligent men will wisely consult lawyers on all legal questions, doctors on matters of health, engineers on matters of drainage, hydraulics and machinery, but on matters of art and taste, think they are quite capable of judging for themselves.

I have long cherished the dream, that in the city of the future, all such questions will be relegated to a special artistic authority or tribunal, who will decide such matters. Is it too much to hope that this may be realized in the near future in our own city? This is by no means a Utopian idea, have succeeded in getting an Art Committee appointed to supervise all such matters as I have spoken of. There the Committee is composed of five members, who serve without any remuneration and consist of the following: The Mayor of the city, the Chairman of the Trustees of the Public Library, the President of the Institute of Technology, the President of the Art Museum and the President of the Society of Architects. Would it be possible to have such a Committee appointed here? It seems to me that some of our worthy aldermen must be exceedingly perplexed, when they try honestly and conscientiously to decide matters of taste and art, and that they would gladly hail the assistance of such an Art Committee, who could give an "ipse dixit" on these things.

We have made marvellous progress in art matters in the last few years, but there is much still to be accomplished if we would not be outstripped by other cities.

The art attainment of a people is a measure of their civilization. I think it is quite within our province as an association of architects to take the first step in endeavoring to have such a tribunal appointed. The members might consist of say, the Mayor, the President of the Art Association, the President of the Royal Academy or some representative of the same, the President of the Association of Architects, and say a representative from the

Government Board of Manufactures or such other bodies as might be arranged. Had such a committee been in existence I feel sure some monuments which have recently been put up in our city would have been relegated to the limbo of Philistinish things, and we should have been spared many painful sights.

Both New York and Boston go further even than this, however, for in these two cities Municipal Art Societies have been established, with the express object of providing adequate sculptural and pictorial decorations for the public buildings and parks. I understand that the first work done in this way in New York was the decoration of a wall in the new Criminal Court Building, and other work of a similar kind is contemplated. All such efforts are entirely praiseworthy, and the liberality of generous-hearted men might well find an additional channel in the beautifying of our public buildings by pairing and sculpture.

Nature has done much for our city, rolling a magnificent river past our doors, and heaving up a beautiful verdure-clad eminence for our habitations to cluster round; let us do our part in making these habitations worthy of their natural surroundings, so that they may be healthy, comfortable and beautiful—worthy dwelling-places of a happy, virtuous and contented people.

These two papers were listened to very attentively and were much appreciated. On the proposition of Mr. W. E. Doran, seconded by Mr. J. Z. Resther, a hearty vote of thanks was accorded the contributors for the papers, after which the meeting adjourned.

THE CONVERSAZIONE.

A delightful conversazione was given in the evening in the galleries of the Art Association to inaugurate the opening of the Exhibition of Architectural Drawings under the auspices of the Province of Quebec Association of Architects. There was a large and fashionable assemblage of people.

Gruenwald's Band discoursed sweet music, and refreshments were served during the evening in the large class room adjoining the gallery. The evening was a thoroughly enjoyable one. This is the first Exhibition of the kind held in Montreal, and has proved more successful than the promoters had ventured to hope for, and may be taken as a favorable augury of what will be accomplished in the future.

The following is a list of the drawings exhibited:

Gordon & Helliwell, Toronto—Church of the Messiah, Toronto; residence of Captain S. Crangle, Toronto; Town Hall and Market, Orillia, Ont. Darling & Curry, Toronto—Church of St. Mary Magdalen, Toronto; Organ of St. James Cathedral, Toronto; Competitive Design for Ontario Legislative Buildings, one large perspective in pen and ink, and two elevations of the same. Frank Darling, Toronto—Head Master's House, Port Hope School, Ont.; house at Niagara; house on College ave., Toronto. W. A. Langton, Toronto—Sketch St. Hilda's College, Toronto. Siddall & Baker, Toronto—Nos. 12 and 14 Colborne street, Toronto (stores); railway station at Janesville; staircase to Music Room, Nordheimer's Building, Toronto; perspective of Competitive Design for Government Buildings, British Columbia. Thos. Fuller, R.C.A., Ottawa—Public Building, Brockville, Ont.; Public Building, Sorel, P. Q.; two views of Public Buildings at Galt, Ont.; design for Superintendent's residence, Experimental Farm, Ottawa; Public Building, Victoria, B.C.; Drill Hall, Toronto; Public Building, Charlottetown, P.E.I. R. Dawson, Toronto—Residence of A. T. Lytle. A. T. Taylor, F.R.I.B.A., Montreal—Interior sketches of house at Ottawa; street scene in Louvain; Hon. Geo. A. Drummond's residence, Montreal; Bank of Toronto, Montreal; Bank of Montreal, west end branch, Montreal; seconded premiated design for Glasgow Municipal Buildings, Scotland; the Engineering Building, McGill College; the Redpath Library, McGill College; interior view Bank of Montreal Head Office; Almshouses, Chiselhurst, England; scene in Perugia, Italy; the Cathedral, Malineo, Belgium; the Physics Building, McGill College; Bank of Montreal, Vancouver, B. C.; Siena Cathedral, Italy; view in Ghent, St. Antonio, Padua. A. C. Hutchison, R.C.A., Montreal—Residence of C. E. L. Porteous, Montreal; residence of W. W. Ogilvie, Rapids Farm; Cote St. Antoine Academy; Erskine Church, Montreal; Young Women's Christian Association Building, Montreal; design for a Bank; Montreal High School; Window, Front Gable Erskine Church, Montreal. Brown & McVicar, Montreal—Residence of F. G. Guadinger, Montreal; residence of George Hyde, Montreal; Taylor's Church, Montreal; Masonic Temple, Montreal. David R. Brown, Montreal—Westminster Church. D. Norman McVicar, Montreal—Tower of Eglise St. Jean, Amiens; Calle off Grand Canal Venice. Miss M. P. Taylor, Edinburgh—St. Giles Cathedral, Edinburgh; Norman Staircase, Canterbury; interior of St. Mark's, Venice. Edward Maxwell, Montreal—Study for residence of H. Vincent Meredith, Montreal; group of three sketches for country houses; view in hall of house for General Manager Bank of Montreal, also exterior view of same; business premises of R. Sharpley & Sons, Montreal; residence for Hugh A. Allan, Montreal; residence of D. McIntyre, Montreal; Competitive Design for Masonic Temple, Montreal. J. W. and E. C. Hopkins, Montreal—Merchants' Bank, Montreal; residence of R. B. Angus, Montreal; business premises of John Murphy & Co., Montreal; North British and Mercantile Insurance Co.'s Building, Montreal; Bank of Montreal, Ottawa; the J. C. Wilson Building, Montreal; Montreal Street Railway Co.'s new building, Montreal. E. C. Hopkins, Montreal—St. Patrick's Cathedral, Dublin. Dunlop & Heriot, Montreal—St. George's Church Tower; houses for Dr. F. W. Campbell, Montreal; proposed residence for Hugh Graham,

Montreal. A. F. Dunlop, R.C.A., Montreal—Residence, Edgehill avenue, Montreal; Ice Grotto, Victoria Rink, Montreal; "Dunlop of Dunlop," Ayrshire; St. James Methodist Church. J. C. A. Heriot—Design for a Country House; design for a Country Church; design for a Suburban Residence. Perrault, Mesnard & Venne, Montreal—Church for Pawtucket, U. S. A.; Church of the Sacred Heart; Laval University, Montreal; Banque du Peuple Building, Montreal; perspective of first scheme for Monument National, Montreal; elevation Monument National, Montreal; design for a church. A. Raza, Montreal—St. Bridget School, Montreal; residence for Ald. A. Dubuc, Montreal; residence for Ald. J. Brunet, Montreal. W. McLea Walbank, B.A.S., Montreal; residence for Dr. F. Buller, Montreal; competition design for Masonic Temple, Montreal; competition design for Montreal Board of Trade. R. Findlay, Montreal—Residence of Jas. Morgan, St. Anne de Bellevue; Sun Life Building, Montreal. Roy & Gauthier, Montreal—Competition design for Chicago Court House, U. S. A.; houses St. Louis Square, Montreal; Sacred Heart Church, Ottawa, Ont.; college at St. Thérèse, P. Q. J. R. Rhind, Montreal—Competition design for St. John the Divine Cathedral, New York; competition design for Masonic Temple, Montreal; premiated design for Protestant Orphans' Asylum, Montreal. A. Flockton, Montreal—Residence of L. H. Taylor, Montreal. J. and H. C. Nelson, Montreal—Design for an Educational Institution. J. Rawson Gardiner, Montreal—Design for Business Block; Choir Bolton Abbey; Old Houses, Sussex. Eric Mann, Montreal—Design for an Office Building. A. J. Cooke, St. Lamberts—The Founder's Tomb, St. Bartholemew, Smithfield; design for a Reredos; design for a Font. C. Dufort, Montreal—Design for a Chamber of Commerce. G. A. Monette, Montreal—Design for a Villa Residence. P. B. Williams, Montreal—Design for Memorial Front, St. Michael's Mission, Stepney, London, E. C. L. A. Venne—Design for a Country House; study for stained glass, Head of our Lord, a fragment of window, and design for stained glass and decoration exhibited by Messrs. Castle & Son and Messrs. Spence & Son; also a large cartoon for a window by Castle & Son, and five decorated plaster models of the Alhambra, which were kindly loaned by Mr. R. B. Angus for exhibition.

On each side of the two doors are beautiful examples of old Chinese wrought iron work, lent by the Hon. Geo. A. Drummond. They are all four floral studies of chrysanthemums and lillies, most interesting and perfect in their design and finish. In the entrance hall two vigorous plaster models are exhibited by Mr. Hall, and in the doorway is hung a beautiful eastern camp sent by Mr. D. A. Watt.

Mr. A. T. Taylor contributed some fine water color sketches of picturesque views and scenes in Italy. Amongst the many beautiful buildings erected in the Romanesque style by this author, the West End Branch of the Bank of Montreal, the Redpath Library and the Bank of Toronto may be mentioned. Another good bit of designing by the same author is his competitive design for the Glasgow Municipal Buildings, of a classical character, and rendered in pen and ink, which was awarded the second premium amongst a large number of competitors. Mr. Edward Maxwell has also some very effective water color sketches, and his study for Mr. H. Vincent Meredith's house is nicely rendered.

Mr. A. C. Hutchison has some good pen and ink drawings—for instance, Mr. C. E. L. Porteous' house—original in conception and good in rendering, as are also his drawings of Erskine Church, his St. Antoine Academy and his house for Mr. Ogilvie.

The design of Mr. J. C. A. Heriot for a suburban residence possesses some merit.

We are glad to see the design of Messrs. Darling & Curry, of Toronto, for the Ontario Legislative Buildings, which ought to have been erected, and would have been an ornament to Toronto, and their perspective of the magnificent Church of St. Mary Magdalene, Toronto.

Mr. J. R. Rhind has an ambitious design submitted in the competition for the St. John's Cathedral, New York, showing an immense deal of labor both in design and draughtsmanship.

Mr. A. F. Dunlop shows a view in pen and ink of St. James Methodist Church, which hardly does justice to the beauty of the original.

Siddall & Baker's design for the Government Buildings at Victoria, B. C., is well shown by a crisp pen and ink perspective.

Mr. Thos. Fuller has enriched the exhibition by a number of small but most daintily rendered water color perspectives of buildings he has designed.

Messrs. Perrault, Mesnard & Venne show a good sepia perspective of their Laval University, Montreal.

Mr. Findlay, amongst other things, shows a very picturesque country house at St. Anne's, and Mr. A. Raza two city residences in the Renaissance style and elaborately decorated.

For the first undertaking of the kind ever attempted in Montreal, the Exhibition is a marked success, and it ought to encourage the Province of Quebec Association of Architects to hold similar exhibitions at regular intervals in the future, which would do so much for the education of the public and the profession at large.

CANADIAN CEMENT, LIME, AND CLAY PRODUCTS.

UNDER the title "The Utility and Value of some Common Mineral." the following interesting particulars were presented in a paper by Mr. A. Blue, at a recent meeting of the Ontario Mining Institute:—

The two most abundant minerals in this country are clay and lime, and they are likewise among the most useful. They furnish the raw material too for mineral industries of the first importance, in which a large amount of capital and many laborers are employed. Yet in the vulgar opinion, clay and lime are not worthy of being called minerals, and the seekers after gold, silver, copper, nickel and iron would scorn to recognize the workers in clay and lime as fellow miners. I think it will not be hard to show, however, that these very common minerals possess a value not in any degree inferior to the metals, and that they are deserving of much greater attention than they have yet received in this country, at the hands of moneyed men, and men of the best technical training in the mineral industries. But let it be premised, that in this paper lime (using the term in its colloquial sense) will be dealt with only as material for the production of cements.

As to the extent and growth of the industries, information is afforded by the census reports of the Dominion Government. But for comparative records we can only go back to 1881; no account was taken of cements in the Censuses preceding the one for that year, and the earlier statistics of the brick industry are of no use in showing its growth.

The statistics of the two industries in Canada and the Province of Ontario respectively, are given in the following table for the years 1880 and 1890:—

	CANADA.		ONTARIO.	
	1880	1890	1880	1890
CEMENT:				
No. establishments.....	9	19	3	12
Hands employed.....	115	243	29	128
Wages paid.....	\$38,151	\$85,960	\$7,000	\$39,245
Value of product.....	91,658	251,175	29,200	153,400
BRICK AND TILE:				
No. establishments.....	560	697	400	463
Hands employed.....	4,129	6,737	2,768	3,791
Wages paid.....	\$608,690	\$1,428,489	\$405,311	\$797,257
Value of product.....	1,541,892	3,584,713	971,158	2,154,152

The noticeable feature in these statistics is the large share Ontario claims in the progress of the ten years. Ten new cement establishments were added, and all but one are credited to Ontario. The number of hands employed by the industry increased by 128, and all but 29 are returned for Ontario works. The amount paid for wages was greater in 1890 than in 1880, by \$47,809, and two-thirds of it was earned in Ontario. The increase in the value of product was \$159,517, and three-fourths of it belong to Ontario. The progress of our Province in the manufacture of brick and tile was less conspicuous in the decade, although in number of works, employees, wages and value of output, she exceeds all the other provinces combined. In the increase of works from 1880 to 1890, her share was 63 out of 137; of workmen employed it was 1,023 out of 2,608; of wages paid for labor it was \$391,946 out of \$819,799, and of value of articles produced it was \$1,182,994 out of \$2,042,821.

But assuming the absolute accuracy of these figures, there is one aspect of them that arrests attention, viz: the relativity of the cost of labor to the value of product in Ontario and the other provinces. For the whole Dominion, in 1880, the ratio of labor to product was 1:2.53, and in 1890 it was 1:2.50—a proportion which every one would be disposed to accept as likely. For Ontario, however, the ratios of labor to product were 1:2.40 and 1:2.70 for the former and latter years respectively, while for the other provinces they were 1:2.95 and 1:2.27. The use of improved machinery would account for this disparity to some extent, although not wholly. So also would fluctuations in the price or the efficiency of labor. The latter cause can be dismissed as improbable, in view of the proximity of the provinces; and while the former might flatter our vanity, it would, in view of all the circumstances, be fatuous to claim for it more than a very modest share of potency in the radical disturbance of ratios. The real cause will probably be found in the different scales of values adopted in different parts of the country, and it is to be regretted that in the Census enumerations account was not taken of quantity as well as of value.

In the statistics collected by the Bureau of Mines last year, the manufacturers of cement in Ontario, gave the value of their product as \$127,475, while the number of workmen they employed was 224, and the amount of wages paid for labor \$60,208. Their product included 74,353 barrels of natural rock and 31,924 barrels of Portland cement. In 1890 there was no Portland cement made in our province, but the value of cement manufactured that year according to the census was greater than last year by \$25,985, while the number of workmen employed was less by 96, and the wages paid for labor less by \$20,963. Had we the output for the Census year in quantity, the cause of the discrepancy would more clearly appear. The Bureau's returns of brick and tile for 1893 are also much lower in value than those of the census for 1890, but this is no doubt due to the fact that the financial stringency of last year caused many works to close down early in the season, while others were idle the whole year. The number of men employed was 2,874, the amount paid for wages \$531,686, and the value of product \$1,339,873—the ratio of labor to product being 1:2.52.

It has been shown that on the basis of values the manufacture of cement in Canada increased from \$91,658 in 1880 to \$251,175 in 1890. The whole of this product was consumed in the country, but it was far from supplying our needs. In the fiscal year 1880-1 we imported hydraulic, Roman and Portland cements to the value of \$53,765, and in 1890-1 to the value of \$313,690. But since the fiscal year 1886-7 the Trades Tables, give us the quantity as well as the value of cements imported, and they show that the demand has been largely on the increase.

The following table gives our imports of Portland and Roman cements for each of the seven fiscal years, 1886-93, the great bulk of which was the Portland variety:—

YEAR.	BARRELS.	\$
1886-7.....	102,750	148,054
1887-8.....	122,402	177,158
1888-9.....	122,273	179,406
1889-90.....	192,322	313,572
1890-1.....	183,728	304,648
1891-2.....	187,233	281,553
1892-3.....	229,492	316,179

The total importation in the seven years was 1,140,200 barrels, valued in the Trade Tables at \$1,720,570; but to this should be added the \$455,445 of customs dues paid to the Government, the costs of freight and insurance and the profits of importers, in reckoning the price paid by the consumers—an aggregate of not less than \$3,250,000. In these seven years the increase in quantity was 123 per cent., and in value 113 per cent. But a more striking evidence of the growing demand is afforded by a comparison of the imports of Portland and Roman cements for 1880-81 and 1892-93. In the former year their value was only \$45,646, and in the latter it was \$316,179, being an increase of nearly 600 per cent. in twelve years. This is a rate that perhaps has not been equalled in any other article of Canadian importation. What is the secret of it, and is the demand likely to be maintained?

The answer to these questions may be summed up in a very significant term of very modern usage on this continent, viz., good roads. The setting in of the era of good roads in this country, as well as in the United States, does not date back ten years, but in that short period much has been learned on the subject, and the street engineer is now as much of a specialist and quite as useful in his way as the military engineer or the mining engineer. The Roman roads of Europe, which have lasted out the traffic of two thousand years, have taught him the invaluable lesson that the only sure way to make a good road is to lay a good and strong foundation. But instead of using stone material, as the Romans did in constructing their great military roads, he has adopted the concrete used by them in the construction of temples and other public buildings, some of whose walls have been standing 2,400 years. The great dome built by Agrippa, the friend of Augustus, "the immortal monument of the Pantheon," as Gibbon described it—now the church of Santa Maria della Rotonda—is an edifice in concrete, and though ravaged by fire and assailed by the Huns and Goths, it is still intact after more than 1,900 years. Concrete is the street engineer's material for street building, and his chief reliance in the making of it is not Roman or any other kind of natural cement, but the stronger and more durable Portland. In Toronto during the last five years not less than 150,000 barrels of cement have been used in making concrete for street construction, and of this quantity Mr. Rust tells me that not more than 4,000 barrels have been the native hydraulic cement. "Up to the last year or two," he says, "it was all imported Portland cement from Europe." In other towns and cities of the Dominion cement is also being used in steadily increasing quantities in building sewers and streets, and the results are so uniformly good that the material promises to grow steadily in favor. It is almost certain then that for many years yet to come the demand for Portland cement will continue as experience proves the utility and permanency of the concrete roadbed.

But why should we remain dependent on foreign sources of supply for Portland cement? We have in Ontario abundance of raw material for producing it. In scores of localities beds of white shell marl of large extent and excellent quality are found, some of them at the bottom of lakes in which myriads of fresh water shells yet survive, to add to the thickness of the deposit as one generation follows another; others of them on the sites of lakes long ago filled up with peaty mould or drained by continual elevations. This marl, if unmixed with sand, clay, peat, or other matter of mineral or vegetable origin, is almost pure carbonate of lime, and furnishes the principal material for the manufacture of Portland cement. The necessary proportion of clay is a matter of experiment, but in all cases the purer and more uniform the quality of the marl, the easier it is to get a right mixture. Our manufacturers in Ontario have acquired their experience slowly and dearly.

Mr. Rathbun told me that it cost him five years of testing, with the aid of a chemist, before he was convinced that it would be safe to start his works. Mr. Butchart also told me that it cost his company several thousand dollars, a visit to some of the best Portland cement works in England—where he was admitted as a special favor—and the service of two experts in the construction of a suitable plant, before they could produce a commercial article. But the Rathbun Company and the Owen Sound Company have succeeded, and during the last two years they have been producing a Portland cement which satisfies every requirement.

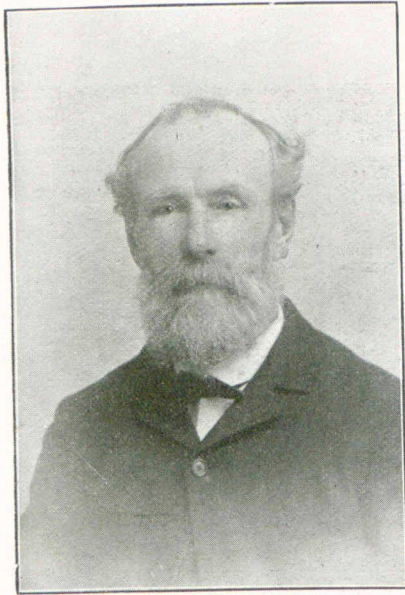
Mr. C. H. Rust, Deputy City Engineer of Toronto, makes this statement concerning it, in a letter which I have just received from him:

"Since 1892 we have used a quantity of Portland cement made by the Rathbun Co., at Napanee Mills, and by the Owen Sound Co., at Shallow Lake. Both these brands are quite equal to the majority of the imported cements, and no doubt, when their facilities for manufacturing are increased nearly all the cement used in this city will be of home manufacture."

The Owen Sound Co., has recently had the misfortune to lose its mill by fire, but it is understood that a new one is in course of erection. The company has a large supply of raw material alongside of the works, suitable clay for mixing being found immediately below the marl, and doubtless the capacity of the new mill will be made to meet the growing requirements of the trade.

The only other Portland cement works in the Province are at Marlbank in the County of Hastings. The site was chosen because of its nearness to a very large deposit of marl; but although English capital was put into the business, and presumably English experience also, the enterprise had to pass through the usual ordeal of disappointment and delay before a successful beginning was made.

The output of those three mills last year was 31,924 barrels, but one of them did not start until late in the season, and another only worked half the year. Had their capacity been six times as great they could hardly have supplied the quantity of Portland cement imported by



E. MALLANDAINE, Hon. Treas.



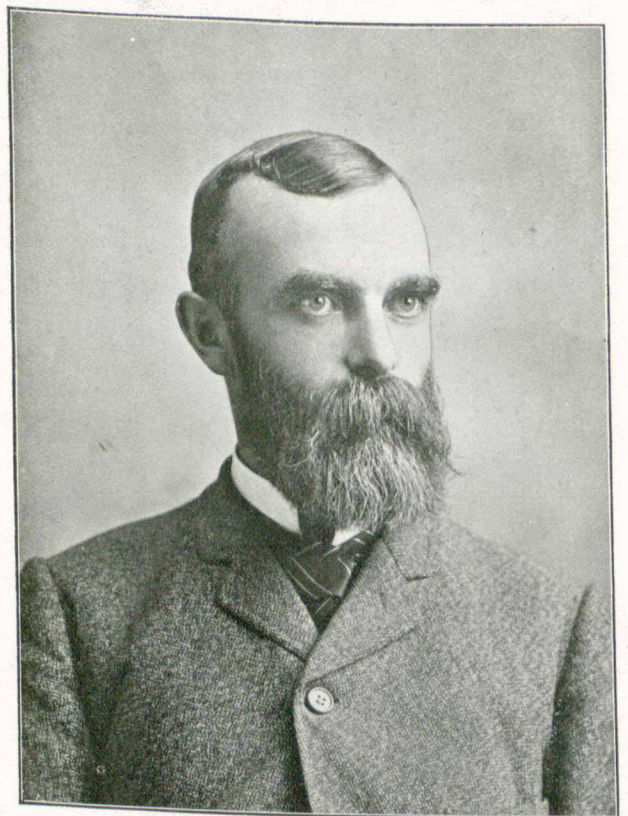
RICHARD P. SHARP, M.S.A., N. Westminster
Hon. Sec.



JOHN GERHARD TIARKS, Victoria, Member
of Council.



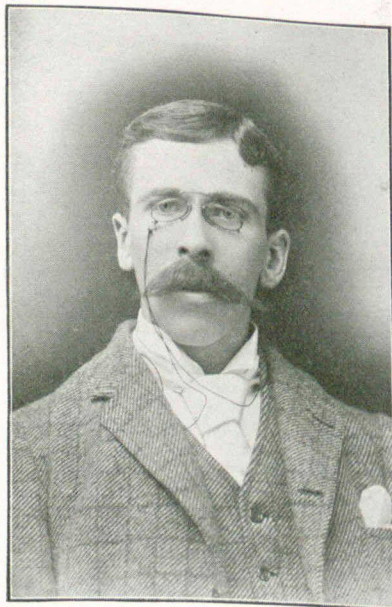
C. OSBORN WICKENDEN, Vancouver, President.



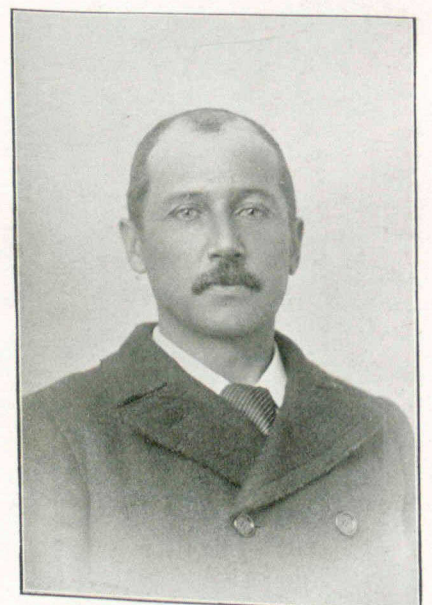
CORNELIUS T. SOULE, Victoria, Vice-President.



THOS. HOOPER, Victoria, Mem. of Council.



T. T. HONEYMAN, Nanaimo, Mem. of Council.



ALAN E. MCCARTNEY, Vancouver, Member
of Council.

OFFICERS OF THE BRITISH COLUMBIA INSTITUTE OF ARCHITECTS.

Canada during the fiscal year 1892-3, and obviously therefore there is ample room for home manufacture to grow. With raw material so abundant and accessible, and with capital seeking new channels of investment, and labor seeking employment, why should we not produce in the country all the Portland cement that our market requires. An article of uniform quality will always be in request by customers, and with care on the part of the manufacturer there is no reason why he should not be successful in supplying a distinct brand. But as long as we are dependent on foreign makers we cannot hope to be supplied with cement of uniform quality, for where larger orders have to be filled it is a common practice even of large mill owners to buy lots from other manufacturers and so make a prompt shipment. The result is that there are as many brands as makers, and with cements of different qualities, some quick setting and some slow setting, it is hardly possible to make a first-rate concrete. This is a risk which may easily be avoided if orders are placed at home, with the home manufacturer, and the good results obtained from our Ontario cements are no doubt due to the fact that orders are honestly made up, each manufacturer being jealous of his own reputation.

As regards the products of clay, it is not necessary that much should be said. Taking the various articles of common and pressed bricks, terra cotta, tile, sewer pipe, and pottery, the number of men employed in their manufacture in Ontario last year was 3,109, with earnings of \$601,686. The aggregate value of their products was \$1,684,873, or more than one-fourth of all the mineral products of the Province in the same year. This fact alone suffices to prove the importance of our clay industries; yet it is obvious that they are capable of greater development. The manufacture of pressed brick and terra cotta began here only five years ago, and last year, in spite of the collapse in the building trade, the value of the output of six works was \$217,373. It gave employment to 224 workmen, and paid them wages to the amount of \$80,686. The improvement already noticeable in the architecture of our cities as a consequence of the use of pressed brick and terra cotta is bringing this material fast into favor, and it may be said that the earth affords no better building material than a properly burnt brick, and none which so readily lends itself to the production of handsome architectural effects. In the strong and fine-textured shales of our Hudson river and Medina formations, conveniently situated and easily quarried, Ontario is favored above most Provinces and States in America.

The same shales are also found to be suitable for the manufacture of sewer pipe, with proper mixtures, and last year the output of two establishments employed in this industry was \$230,000.

Another clay industry is now on the eve of commencement, and if successfully established it promises to be a great boon to our towns and cities, viz: the manufacture of vitrified brick for street paving. In Ohio, Illinois, Iowa and other American States, this has grown to be a very important industry, and it is supplying a material for street construction which on all points of merit is not equalled by any other material hitherto employed for the purpose. Many mistakes were committed by the first makers of paving brick, and there is much yet to be learned as to the clays or clay mixtures which give the best results, as well as to the proper degree and duration of heat to produce a hard, tough and impervious brick. But much is already known, and with careful experiments and close observation many works are enabled to produce with regularity a high percentage of paving brick of uniform quality from every charge of a kiln. A number of experiments have recently been made in Toronto, Hamilton and elsewhere in this Province, and although each expert will assure you that he alone knows the secret, and that no one else has the clays for a right mixture but himself, you may rest assured that in a matter of this sort the key and the ward are not so hard to match as the tribe of experts would have you believe. In several instances encouraging progress has been made, especially with the Medina and Hudson River shales.

We may, therefore, I think, look with confidence to an early beginning of the production of paving brick in Ontario; and when that time comes we shall no longer be at the mercy of trust concerns like the owners of Pitch Lake asphalt, as illustrated the other day in the case of a contract for paving in the city of Hamilton. When we are producing Portland cement from our own shell marls and clays to the full extent in which it is required for street concrete, and paving brick from our own shales to cover the concrete, we shall be as independent as we ought to be in supplying ourselves with the materials of such everyday requirements as are called for in the building of good roads. In so doing also, we shall be utilizing our raw materials of clay and lime, otherwise of no value, finding profitable investments for capital lying idle in the banks, and giving employment to hundreds, if not thousands, of men who for lack of work to do are finding it hard to win their daily bread.

With one suggestion to the professors and instructors in the School of Practical Science, Toronto, and the School of Mining, Kingston, I close. Reference has been made to the experiments conducted by the manufacturers of brick and cement, preliminary to the building of works to commence production on a commercial scale. These experiments demand patience, exactness and scientific method, as well as the use of costly appliances. Why should they not be taken up in our technical schools, where there are professors having the necessary expert knowledge and training, and the appliances for making tests and ascertaining results with unerring accuracy? The importance of the clay industry has been so well recognized by the State Legislature of Ohio, that a course of practical and scientific instruction in the art of clay-making and ceramics has been added to the educational work of the state University, and the first term of the department opened yesterday. Work of that character is as much needed in Ontario as in Ohio, and the professors of our scientific schools cannot too soon prepare to enter upon it.

DISCUSSION.

Mr. R. W. Prittie said he had been for a number of years interested in the brick industry, particularly in the manufacture of paving brick. This article was coming largely into use in the States, and he had seen pavements which had been down for 16, 18 and 20 years, with but little repairs. It was giving the utmost satisfaction, and made a superior pavement in every respect, being smooth, lasting, easily cleaned, and affording a good foothold for horses. He was interested in a large vitrified brick factory which had been started at the Humber, near Toronto,

last year, and was got partially under way when the financial crash on the other side affected the enterprise and brought it temporarily to a stop. He hoped, however, that the operations would yet be begun. It was the company's intention to put up a plant capable of turning out 50 millions of brick per annum, and employing 400 men.

Dr. A. P. Coleman, in reference to a remark in Mr. Blue's paper, thought it only fair to say on behalf of the School of Practical Science, that they had begun the work of testing cement, brick and similar materials. If provided with proper appliances, the authorities of the School were perfectly willing to engage even more extensively in such work.

Mr. J. Latimer asked if there had been any development in fire clay, Mr. Blue—Not in Ontario.

Mr. Bell—There are good deposits of fire clay in Nova Scotia, but they are not made use of.

Mr. J. M. Clarke said it was well known that the manufacture of articles like vitrified brick in Ontario had engaged the attention of outsiders more than the people of the province. Outsiders were now investigating the subject with the view of beginning the manufacture of paving brick here.

BEARING POWER OF FOUNDATIONS.

From the valuable note-book of Mr. E. L. Corthell, of the Western Society of Engineers, we have been permitted to extract the following data respecting the bearing power of foundations.

Clay.—From 2 to 8 or 9 tons per square foot, without allowance for friction.

Sand.—The different kinds vary greatly in bearing power. Sand mixed with loam will not bear more than 5 tons per square foot. 9.3 tons per square foot were placed on fine gravel and sand at Urk viaduct; masonry piers on cylinders 4.8 inch diameter; friction neglected.

In India, on coarse sand in deep foundations, not over 9 tons are used.

In experiments 20 tons have been put on sand without measurable settlement.

Friction.—Side friction varies from 200 to 600 pounds per square foot.

All the above are in gross tons = 2,240 pounds.—B. Baker, April 17, 1888.

Clay.—Black Friars Bridge, 5 tons per square foot. Settled badly.—Randall Hunt, Engineering and Building Record, June 23, 1888.

New London Bridge, 5 tons per square foot on piles, = 80 tons per pile. Settled badly.

Newcastle-on-Tyne, 1½ tons per square foot; no settlement. Fargo, Dakota, four-story building, 2½ tons per square foot; failed. Then 1½ tons per square foot; no settlement.

Cleveland, new viaduct, 1 to 1.7 tons per square foot. Washington Monument, 9 tons per square foot, inside edge. Clay and sand, 3 tons per square foot, outside edge.

Sand.—Coney Island pier, 5 tons per square foot. New York Steam Company's chimney, 4 tons per square foot on fine sand settled.

Brooklyn Bridge anchorage, 4 tons per square foot.

Nantes Bridge, 6.8 tons per square foot; settled.

Berlin, considered safe, 2.3 tons per square foot.

Sometimes used to 4.1 tons per square foot.

Albany Capitol, 2 tons per square foot; settled.

Cairo Bridge, fatigue weight:

Channel piers, 3.34 tons per square foot.

River Piers, 33.08 tons per square foot.

Friction on sides taken at 4,000 pounds per square foot; fine sand.

Sioux City, Pier III; sand, 2.64 tons per square foot.

Soft Soil.—India, one ton per square foot used.—Journal of the Association of Engineering Societies.

TO TEST WHITE LEAD.—Those who desire to test in a practical way the merits of white lead will find some useful hints in the instructions issued by an American Association of Master Painters. Substantially it is as follows:—Coat a board primed in ochre with a mixture of one ounce of oil and two ounces of lead. Then put on a second coat over the entire face of board, excepting a small portion in the middle. When this is done, put a third coat over all, excepting another small space, with a mixture also of one ounce of oil and four ounces of lead. Allow one week to elapse between each coat, and paint the boards while in an upright position. The board will, when finished, have been painted as follows: In the middle there will be a narrow space showing ochre priming, and on the left of it another similar space of one coat of lead; on the right of the ochre priming space, as well as on the left of the one coat space, will be similar small spaces, each being covered with two coats, and on the right and left respectively of these will be a larger space, covered with three coats. After the last coat has been on three or four days, place the boards where they will get a southern exposure, and if put over a roof at least two feet above same. If the boards are dry to the touch, they should be placed out of doors for a day or two between coats. The brush should be used to finish the mixing, and the boards should not be sandpapered. The test being one of comparison a separate board must be painted with each of the leads about to be tested. It will not be necessary to use a separate brush for each board if there are so many of them. Benzine is chosen as being more volatile than turpentine to wash out the brushes. Keep the brushes in oil when not in use. The test is intended principally as one of durability, and as after long exposure the covering qualities of the different leads will not be easily determined, they should be noted at the outset.

PLUMBERS' EXAMINATION PAPERS.

THE following are the examination papers used in the Examinations in plumbing by the city and Guilds of London Institute:—

ORDINARY GRADE.

1. (a) How would you make a reliable joint between a lead branch and an iron soil-pipe? (b) How would you make reliable joints in a stack of iron pipes receiving wastes from baths, sinks and used lavatories, with hot-water supply? (c) Describe the cements used for ordinary jointing purposes and their composition.
2. (a) Give the composition of ordinary and fine solder, and the melting point of each. (b) If a pot of solder is "poisoned," i.e. rendered porous or unworkable by the introduction of some foreign substance, how would you remedy it? (c) What fluxes are used for jointing copper, brass, lead and iron to lead?
3. Describe the process of autogenous soldering: when should it be used, and what are its advantages?
4. How should sheet lead be set out and cut in order to line a sink 2 feet long by 1 foot wide inside, 12 inches deep at back and sides, and six inches deep in front, with 7lb. lead, turned over on top edges $1\frac{1}{2}$ inches all around? Describe or show by sketch. What would be the total weight of the lead? What would be the total weight of the solder you would use?
5. Show what you consider the best possible arrangement of waste-pipe from a sink, bath or lavatory, with its discharge to drain.
6. Sketch various forms of defective traps with which you are acquainted, and also improved kinds you would recommend in place of same.
7. The well supply to cistern in an old house having permanently failed, it has become necessary to lay on the supply from the town main: what alterations would have to be made in order to efficiently accomplish this?
8. The drain receiving large quantities of waste water from scullery sinks is frequently choked: what remedies would you suggest?
9. Enumerate the common defects found in waterclosets, which are bad in principle and construction, and show by sketch what kind of fittings you would suggest in place of same.
10. Show or describe what you consider the most complete arrangement of waste-pipes and services for a range of three urinal basins with automatic flushing tank over, and proper surface drainage from floors, with the sizes of the various pipes?
11. What precautions would you take in fixing the water pipe (a) from a refrigerator where food is stored, (b) from a sink or lavatory?
12. Sketch a lead bend, elbow and set-off, and enumerate the various tools required in the formation of same.

HONORS GRADE.

1. What cisterns and pipes would you recommend for the storage and distribution of (a) rain-water, (b) hard water, (c) sea-water? State your reasons for such selection.
2. Describe the process of manufacture of milled sheet lead and pipe.
3. Show in the accompanying sketch of sectional house, having a water-closet on each floor, bath on first floor, lavatory on ground floor, and sink in basement, the plumbers' work required and the positions you would suggest for the above-mentioned fittings. Describe the form of each fitting you would use, and the size and the arrangements of the various service, soil and waste pipes.
4. Show on the accompanying plan what arrangement you would adopt for a complete system of drainage for the house described above, and give the various sizes of pipes, &c.
5. A water-pipe running alongside a leaking drain receives an injury: describe the circumstances under which sewage can be sucked into the pipe at the point of injury while the pipe is charged with water. A cistern kept charged with water is situated in the roof of a house having three stories. A service pipe from this cistern supplies a bath on the first floor and a bath on the ground floor. Under what circumstances can water in the bath on the first floor be made to discharge through this pipe into the bath on the ground floor?
6. Describe the principles of a common syphon, and state what is the greatest height a syphon will draw water when once set in action.
7. It is impossible to obtain a good fall to a system of house drains: what precautions would you recommend to prevent stoppage? What do you consider the best and also the least fall to be allowed for a 6-inch main drain?
8. Describe or show by sketch what methods you would adopt for ventilating a water-closet apartment which is not placed next external wall, and give your reasons.
9. (a) Give some of the causes of "humming" noise in rising mains to cisterns. (b) What defects in a system of hot-water circulation will cause noises in the pipes, &c.? (c) Give causes of concussion in pipes and their remedies.
10. Describe or show by sketch the "cylinder" system of hot-water circulation and the "tank" system, and give the advantages and disadvantages of each: explain the reason of hot-water circulating in the pipes.
11. Show by plan and section how you would arrange a lead flat, 22 feet by 20 feet, giving size of bays and gutters and formation of approximate weight of the whole?

12. What precautions would you take for the protection of fittings and service-pipes from frost in a country house situated in a very exposed position?

A HOUSE HEATING GAS FURNACE.

At the recent Industrial Exhibition in Toronto, there was exhibited by Mr. A. H. Dixon, of Toronto, a house heating gas furnace, the construction and modus operandi of which are thus described: The furnace has a large fire chamber; the air is admitted to the burners on both sides, through a perforated shield in fine streams over the top of burners. The products of combustion pass from fire chamber into the radiating drum, which entirely surrounds the fire chamber. Between the outer and inner casing of this drum is placed a partition which forms a flue and causes the product of combustion to pass four times around drum before reaching the exit flue to chimney. Besides the large surface of the outer and inner casing or sides of the drum, a series of tubes are placed in the drum, which extend through both top and bottom heads of drum and through the partition forming the winding flue, forming another large heating surface, as the cold air enters into the bottom end of the flues, and comes out heated at the top and passes into the dome of the furnace. The evaporating pan is placed on the top of the fire chamber, connecting to an outside reservoir; in this way the moisture from the inner pan distributes evenly to all the different pipes leading from furnace. The dome of the furnace is provided with an opening and allowing ready access to the water pan.

ENAMELLING CAST IRON.

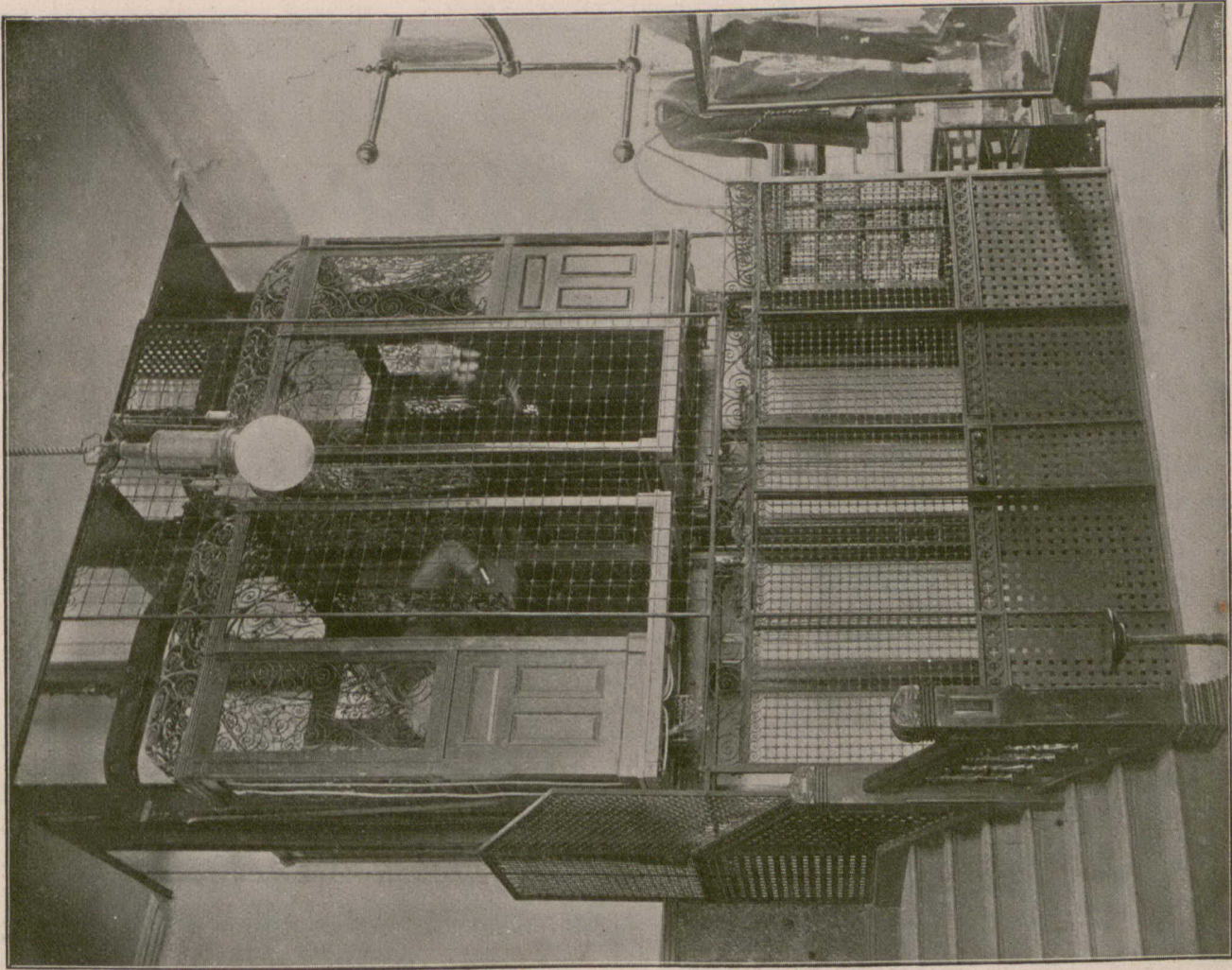
It is noted as a somewhat singular fact that there are not more than two processes for enamelling cast iron, notwithstanding the amount of ingenious effort put forth in this direction. One of these is the hot process, in which the iron, heated to a vivid heat, is powdered with a flux powder, borosilicate of lead, distributed with a sieve, then heated, and, when the flux fuses, it is powdered afresh with glass more soluble, forming the glaze of the enamel; but this operation is attended with danger, and is not adapted to large articles or for decoration. The second process, which meets the objections named, consists in dressing or coating the article first with magnetic oxide, then dipping it in borosilicate of lead, coloured by metallic oxides, to which is added a little pipeclay, in order to give rather more body. The article thus covered cold, by dipping or with brushes, is put into the furnace, the enamel adhering and vitrifying at the usual furnace temperature used by enamellers, and by putting a coating of coloured enamel with a brush on a first coat simply plain, it is possible to make any decorations desired.

CONCERNING CHIMNEYS.

AMERICANS do not make as much of chimneys as do most of the builders of European countries. The builder is not sufficiently honest about his chimneys. Either he gives them undue prominence, overloads them with decoated material, or he treats them as though he were afraid of them. The chimneys of Amsterdam are beautiful indeed and add greatly to the picturesque quality of that city. Likewise in Paris, while they are there treated in a way somewhat more decorative than is common to the rest of the world, they are handled in an honest way, no effort being made to conceal them, and their decorative works is that of artists. There is often the idea that the chimney should maintain a symmetrical relation to the rest of the building. However, in no section of the world do we find a high regard for symmetry in chimneys successful; on the contrary, we find the most beautiful chimneys in that part of the world where they are allowed to have largely their own way; coming out of a building in unexpected places and unexpected ways and decorated by the hand of an artist.—The Clay Worker.

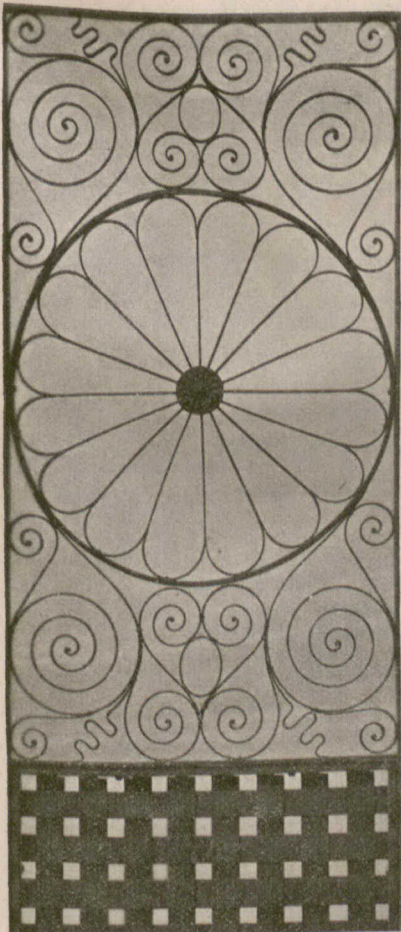
A very important conference on the practical setting and workmanship of artisans is likely to arise out of the Building Trades Conference that was held recently at the County Hall, Springgarden, London. It will perhaps be recollected that on the motion of Mr. Gay, chairman of the London Building Trades Federation, it was decided to appoint a committee to consider the whole question of apprenticeship. That committee has carefully considered the matter. A draft has been prepared of the preliminary report, which it is proposed should be discussed at a general conference of all the trade unions and industrial bodies that evince a desire to attend. Among the subjects are the following: To consider the existing opportunities for a boy to obtain a thorough training as a skilled artisan—viz., (a) apprenticeship—its gradual discontinuance and its possible restoration; (b) technical instruction—its proper direction, whether theoretical or practical, the character of the existing classes and their comparative utility, the local distribution of the classes with relation to the needs of the district, the character of the supervision of the existing classes, the restriction of the classes to men actually engaged in the various trades, and the question of assisting the various teaching bodies.

TRADE SUPPLEMENT.

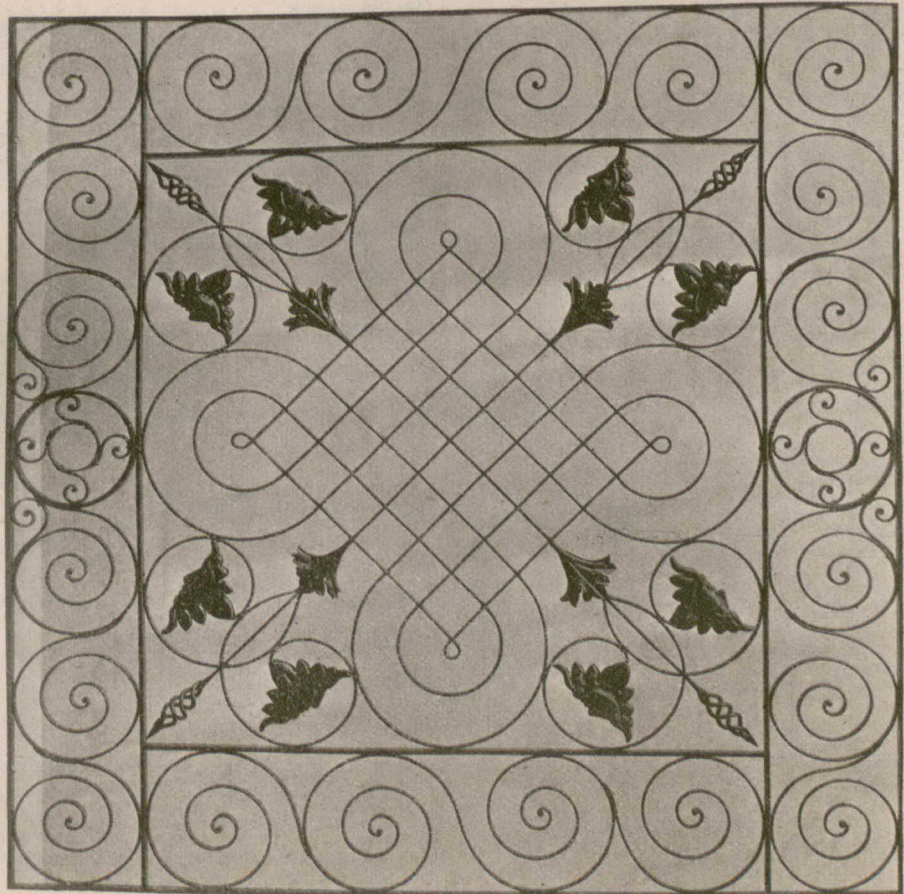


ELEVATOR CARS AND ENCLOSURES
 IN MESSRS. JOHN MURPHY & Co.'s NEW DRY GOODS STORE, MONTREAL.

DOMINION ORNAMENTAL IRON CO., MONTREAL.
 T. J. BALDON, Manager.



WROUGHT IRON PANEL, 16 HOSPITAL STREET.



PANEL IN ELEVATOR CAR, BANK OF TORONTO, MONTREAL.

A WILLING WITNESS

TO THE BENEFITS DERIVED
FROM ADVERTISING



Outside Venetian.



Rolling Steel Shutters.



English Venetian Blinds.



Rolling Venetian Blinds.

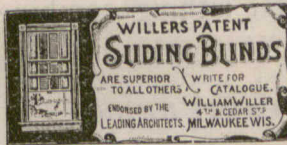


Rolling Partitions.



School Venetian.

GEORGE CLATWORTHY.



Telephone No. 1740.

GENERAL AGENT FOR . . .

Willer's Patent Sliding Blinds.

AND

Wilson's (of New York)

Patent Rolling Blinds
English Venetian Blinds
Rolling Steel Shutters

46 Richmond

STREET WEST

Toronto, July 6th 1894

L. H. Mortimer Esq
Canadian Architect & Builder
City

Dear Sir,

Being an advertiser in your paper of some years standing, I have much pleasure in testifying to the good results obtained therefrom.

About a year & half ago I ceased to advertise, & business at once declined.

In your issue for June (last month) my adv again appeared in the "Architect & Builder" & already as a direct result enquiries are coming in from all quarters & far distant points - from Nova Scotia in the east to British Columbia in the west.

This I think is a pretty good test of the value of your paper to Builders' Supply men, as an advertising medium.

Yours truly
Geo. Clatworthy

A NEW STONE ELEVATOR.

The Engineering and Mining Journal for August 4th describes the Jeffrey stone elevator for the handling of crushed stone, ore, broken coal, and similar materials. An illustration shows the elevator used in connection with a stone crusher, receiving the product directly from the delivery chute of the crusher and discharging it into a revolving screen at the top. The elevator is constructed of two strands of steel chain covered completely with a continuous line of buckets, which prevents the gritty material from coming in contact with the chain and the other principal wearing parts of the machinery, thus greatly increasing its life. The buckets are made of heavy steel with riveted seams, in sizes to suit the capacity. The peculiar shape of these buckets makes it possible to operate the elevator at a very slow speed, at the same time effecting a cleaner discharge than is produced by high-speed machines, to say nothing of the saving of wear and tear. At suitable intervals wrought-iron cross-bars are attached to the chain, carrying rollers at each end, extending outside of the buckets, which support the weight of the chain, bucket, and the material; this causes a roller friction, reducing the strain on the machinery to a minimum and requiring the least possible amount of power.

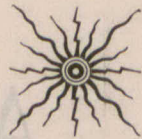
Here are a few facts about the Chicago Masonic Temple: The frame of the building is of steel bolted together, 4,700 tons of steel having been used. The walls are of stone and pressed brick with marble and bronze trimmings and terra cotta partitions, 2,200 tons of the latter entering into the work. There are eighty-eight miles of electric wiring, and the plate glass would, if laid flat on the ground, cover four acres. The pumping apparatus used in running the battery of fourteen elevators would easily supply water for a city of 60,000 souls. The elevators run at a rate of nine miles an hour and each elevator runs every year 123,136 miles. There are twenty-one stories and on the top floor is an observatory and roof garden.

ARCHITECTS and ENGINEERS
APPLY TO
THE NEW COLOR PROCESS CO.
214 ST. JAMES ST., MONTREAL,
for Instantaneous Reproductions in
Colors of Drawings and Plans

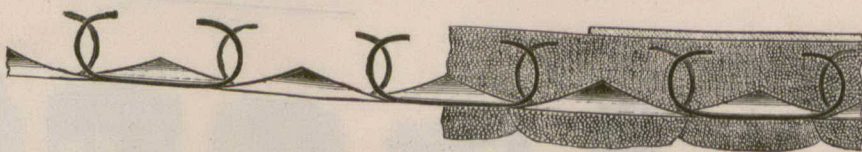
- WILL SAVE YOU
- MONEY** Copies on Manilla Paper 4c. per sq. f. ot.
 - LABOR** No recoloring by hand.
 - TIME** We print without the aid of the sun.
 - ERRORS** We give exact fac-sim les.
 - TRACING CLOTH** We print direct from originals on paper.
 - DISSATISFACTION**

We guarantee uniformly perfect work.
Originals sent from a distance returned with copies same day as received.

Hayes' Patent Steel Lath ..



HAS NO EQUAL IN ANY PARTICULAR



... Used in more important buildings ...

... THAN ...

all other styles of metal lathing combined.

SOLE MANUFACTURERS

THE METALLIC ROOFING CO.

OF CANADA, LIMITED.

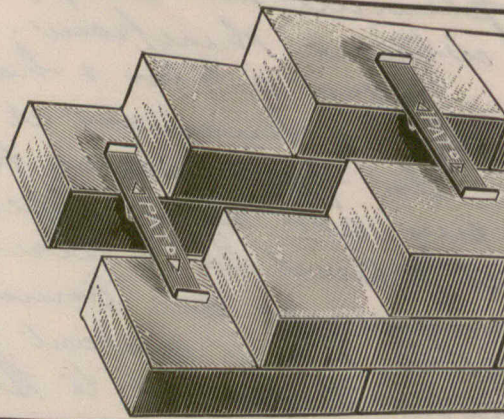
BRANCH OFFICE :

706 Craig Street
MONTREAL

HEAD OFFICE :

82 to 90 Yonge Street
TORONTO

Send for Samples and Prices



The Wall Tie

WEESE'S PATENT
WALL BRACE OR TIE

USED FOR BUILDING
Warm, Dry, Fireproof Buildings
ESPECIALLY ADAPTED FOR
Churches, Public Buildings, Hotels,
Dwellings, etc.

... MANUFACTURED BY ...
THE MAC MACHINE CO.
BELLEVILLE - CANADA

Write for particulars . .

Don Valley Pressed Bricks

TWO HIGHEST AWARDS AT CHICAGO
Gold Medal for Bricks -- **Gold Medal for Terra Cotta**

EXTRACT FROM THE REPORT OF JUDGES ON WHICH THE AWARDS WERE GIVEN :

"In our estimation there are no bricks on the Exhibition Grounds to be compared to those manufactured by the Don Valley Brick Works."

60 Adelaide Street East

OFFICE AND SHOW-ROOMS :

TORONTO

Please mention the CANADIAN ARCHITECT AND BUILDER when corresponding with Advertisers

PAGES

MISSING