

CANADIAN

# ARCHITECT AND BUILDER

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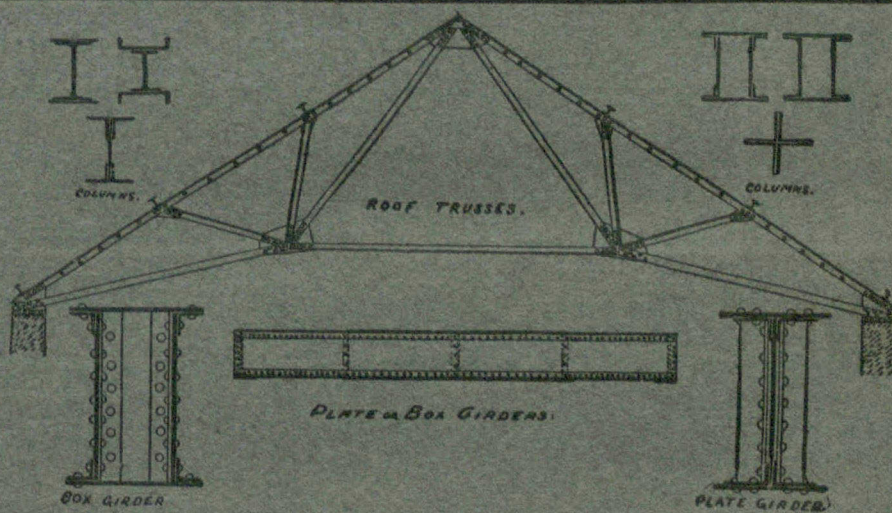
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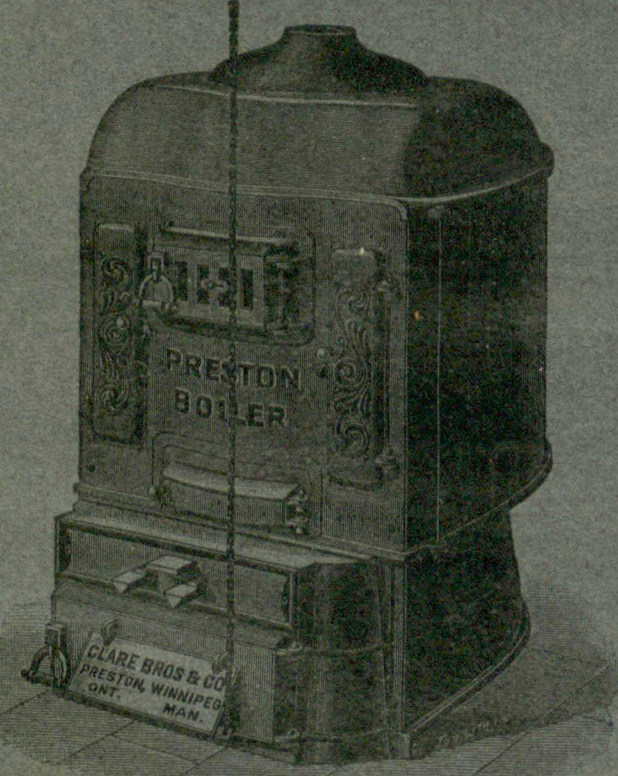
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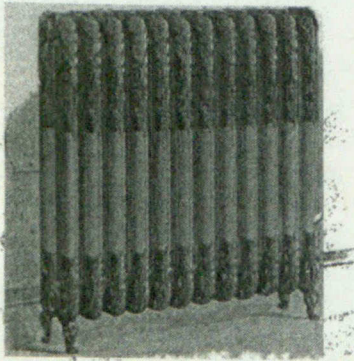
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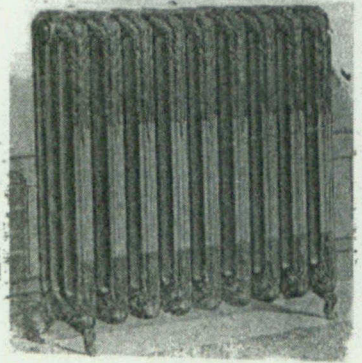
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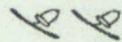
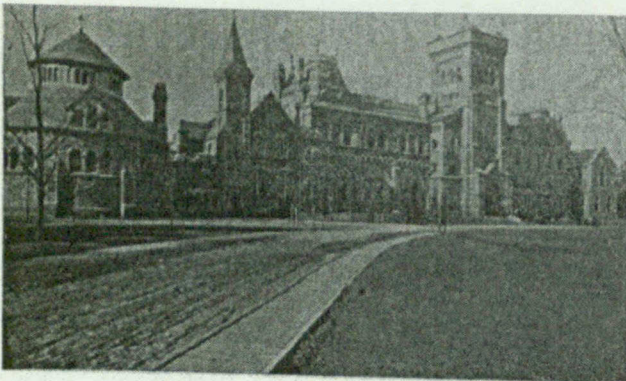
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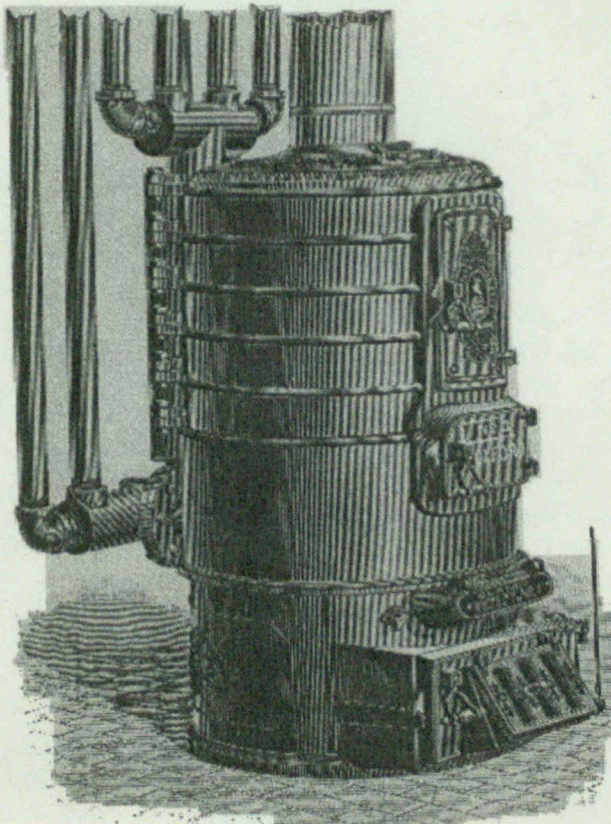
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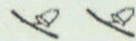


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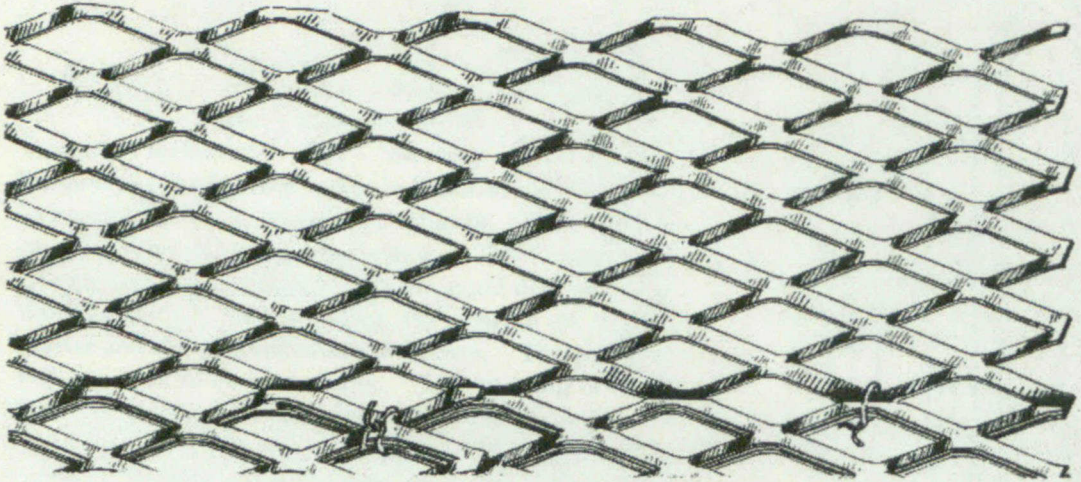
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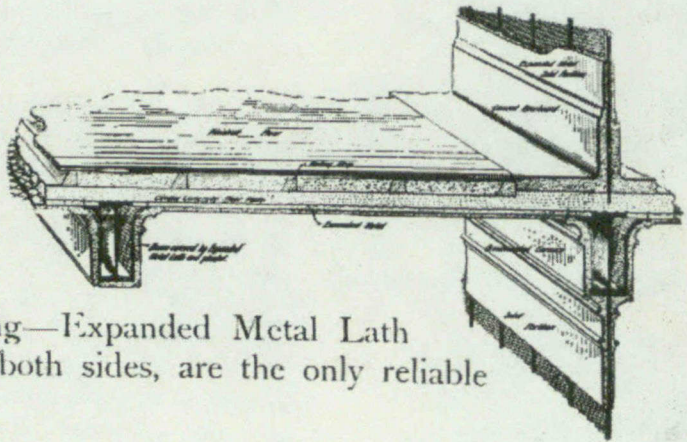


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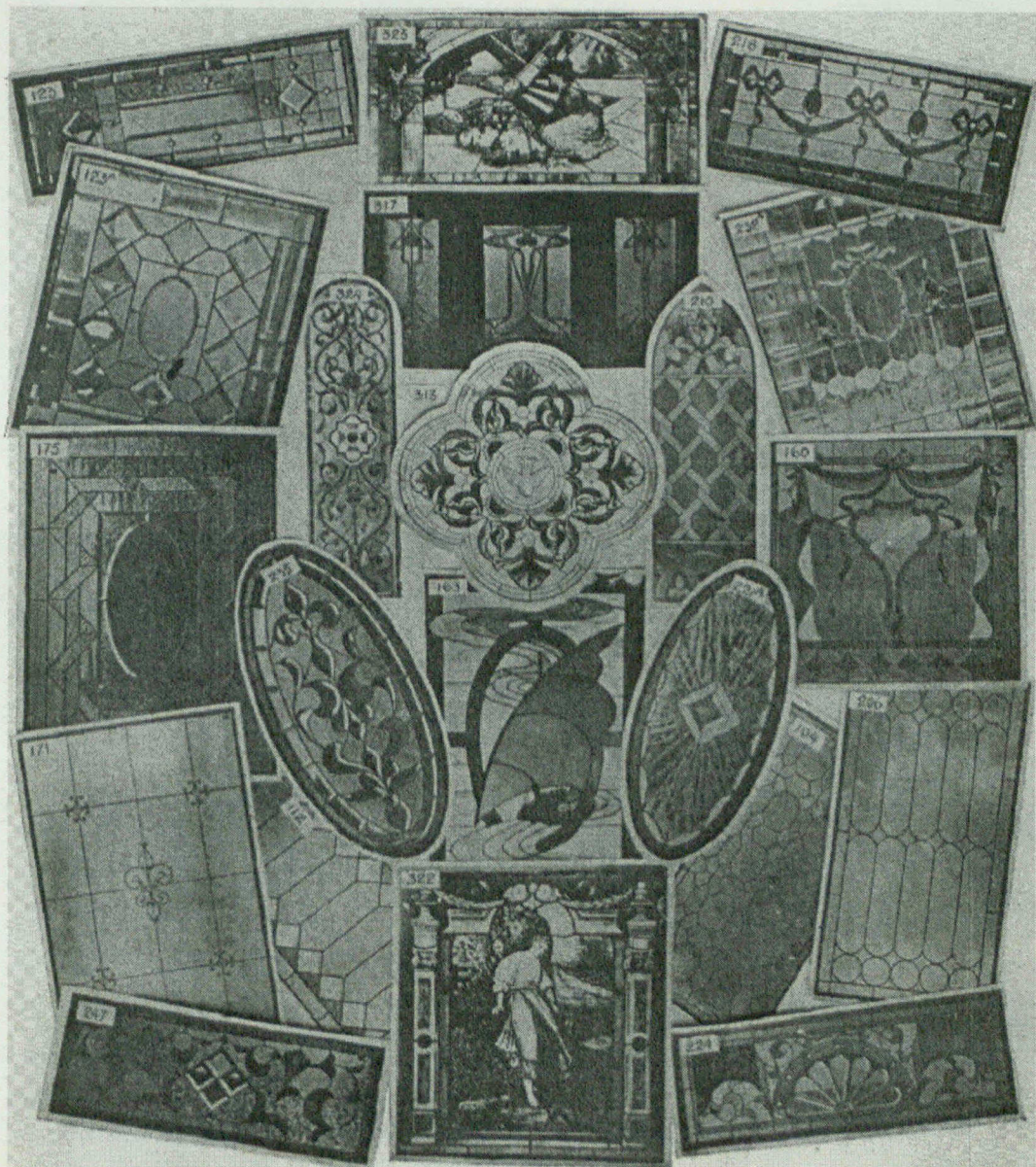
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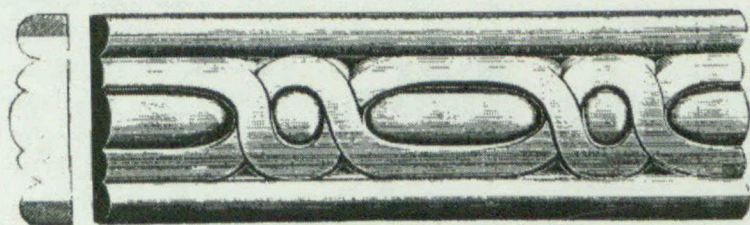
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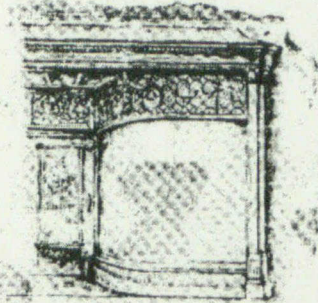
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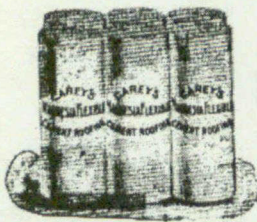
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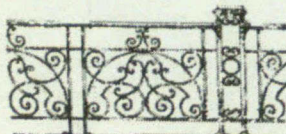


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# The Canadian Architect and Builder

VOL. XV.—No. 169.

JANUARY, 1902.

## ILLUSTRATIONS ON SHEETS.

St. John's Church (Exterior and Interior) East Toronto—R. J. Edwards, architect.

## ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Entrance to West Transept, St. James' Cathedral, Toronto—Cumberland & Storm, architects.  
 Photogravure Plate—Fontana di Trevi, Rome—Designed by Niccola Salvi  
 House on St. George Street, Toronto—Symons & Rae, architects.  
 House in East Toronto—R. J. Edwards, architect.

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 " A. F. DUNLOP, R.C.A., Architect, Montreal

### Toronto Building Department

There are signs of an approaching change in the City Commissioner's office in Toronto, and it would be well to consider the question of changing in a fundamental manner the whole administration of building inspection. At the present stage of the city's growth, and even more in consideration of the growth that is coming on, it is important that the Department should be a Department of Architecture, and that the head of it should be an architect highly trained in modern methods of construction, and able to keep up with new ideas. A permanent official of this character, to amend and keep amended the building by-law, and to carry it out intelligently, would be worth a good salary for he would represent great possibilities for the city. It is essential to have a man who is big enough to be at ease under his responsibilities, or the authority given to him will degenerate into a wretched administration of red tape. But if he is big enough he will do much to foster a good class of building in the city.

### The Toronto Exhibition

The Exhibition by-law of Toronto having become law, brings into the region of realities the problem of improving the Fair grounds. The argument for the by-law was that a successful Fair is an advantage to the city, and for this purpose new buildings were required. The main building was not rain proof, and

the first consideration, which outweighs all others, is therefore plain and practical—to protect the exhibits; and if the building is made fairly presentable, as the plainest and most practical member of the Exhibition Association will desire it to be, so much will have been accomplished, as compared with the present state of affairs, that the Association may reasonably rest from its labors and say that, as the Exhibition did well before, now, with new and improved buildings, it is safe. But the attractiveness of a Fair from the point of view of beauty, which is already accepted as essential to success, does not depend only upon its buildings. Good buildings and large buildings are essential to give adequate motive for the scene, and an imposing background; but the beauty and the real attractiveness of the Fair lies in the way the buildings are placed and the treatment of the spaces between them. Here is a field for the sort of charm that makes the Fair a sort of recreation ground for visitors, who care little about the exhibits. The possibilities are great and varied, and cost, in comparison with the buildings, little but thought. What can be done to improve the grounds as well as the buildings? To hold its own the Fair must meet the taste that has grown up for this sort of thing. It is not really in a safe position if only the buildings are improved. The difficulty is in the number of fixed conditions that exist. But the alterations that are to be made, and in particular the



condemnation of the main building, open up chances that a good landscape designer might turn to good account; and before the ground plan of the Fair is fixed for another period, by the erection of the new buildings, the block plan should be carefully considered by the architects, if necessary with expert assistance. In all important undertakings in which the treatment of grounds is involved, the best results appear to proceed from a joint committee of architects and a landscape architect.

The O. A. A.  
Convention

The annual meeting of the Ontario Association of Architects was attended, with three exceptions, entirely by Toronto members. The meeting was entirely harmonious and there were indications of increased sympathy with the educational objects, which were a principal theme of the Convention. The Council and Committees have evidently done a good deal of work during the year in arranging the scheme of subject matter and classes, and in actual tuition. The principal lack appears to be in students. The wedding is ready but they that are bidden appear to be not worthy. It seems a pity that there is no power to compel them to come in. If the special committee of the Legislature, which threw out the bill to make membership of the Association the only way to practise architecture had attended the meeting on Tuesday afternoon, they would perhaps think that an Association which has kept on its educational work without the powers it asked for might well have been entrusted with those powers.

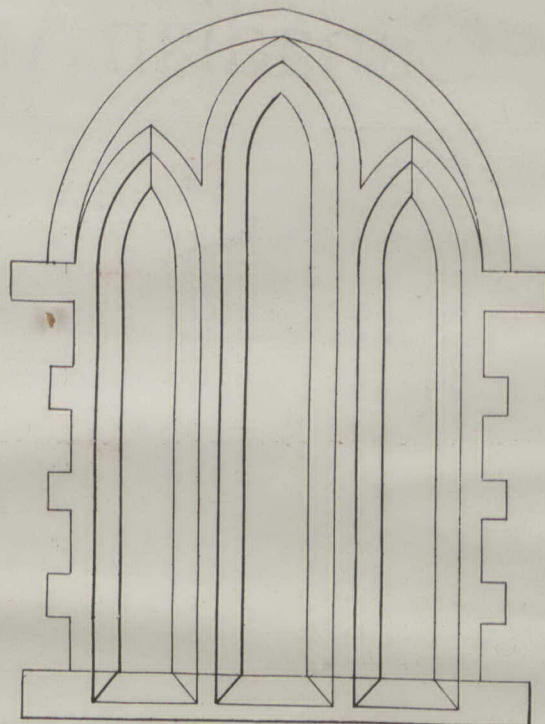
There was no doubt nothing altogether new in the papers of Prof. Capper and Prof. Laird. If there had been we should perhaps have had less cause to praise them. They represented the standard ideas of the present time in their subjects; speaking with authority, as men in a position to know, and in a position which requires them to know, what are not only high but practical aims in these matters. They helped Toronto efforts in the way of confirmation and encouragement from without, and the Association did well in inviting others than members of the Association to come and hear them.

AMERICAN STAINED GLASS.

Is American stained glass an improvement to a church? A window has recently been inserted in St. James' Cathedral in Toronto, which raises the question acutely. The disagreeable wall-eyed appearance the opalescent glass gives on the outside is a general objection to the use of American glass, but in the case of St. James' there are particular reasons why, for considerations of inside effect, it should not be used. One of the beauties of this church is the abundant light coming from the aisle windows, which light indeed is a necessity, for the nave seats are dependent upon it.

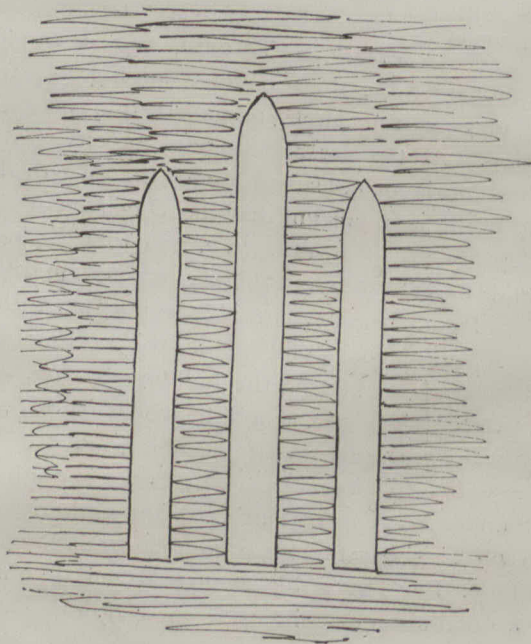
If the scheme, of which the new north east aisle window is a beginning, is carried out, this characteristic of St. James' will be gone, and we shall have instead an area of gloom provided apparently for the display of a series of illuminated pictures along the sides of the church. The practical discomfort will be intolerable, but it is the artistic loss that is to be most deplored. Any one looking at the church with a seeing eye can even now note the difference between the present effect

and a future in the gloom of American glass. The shafting of the columns and the lines of the woodwork are now touched with light from the aisle windows so as to delight the eye. The carving of the cedar organ cases was beautiful under the side light that each received. Now only one is touched with light; the other under the immediate influence of the new window has



lost that charm; indeed the carving is not strong enough to stand the test of dull and diffused lighting.

One can but look forward with regret to the gradual extinction throughout the church of its principal source of beauty. The windows themselves will be among the features which suffer. The glass alone is not the measure of the window. The arch, inside of which the



lancets are grouped, gives the real size of the window, as intended by the designers; and it is essential to the design that there should be light enough to let the relieving arch and its quoined jambs be seen. All this will be upset if American glass is introduced, by the submergence of these details in the general gloom. The windows which it is intended to beautify will



appear unpleasantly narrow, and, the reason for the subordination of the side lancets to that in the centre not being apparent, the grouping will appear to be without reason.

The case is one of conflict between the windows and the church—which is to receive first consideration. The church ought certainly to be the object of consideration, and the first consideration in choosing glass for St. James' Cathedral is that it shall let in light. The only glass that is likely to satisfy the requirement is toned white antique English glass. Figure subjects depending chiefly upon the leading and tones of white, with colour only for emphasis and adornment, would not only shine like jewels in the church and exactly suit its architectural requirements but are eminently suited for sacred subjects. There is something in the pure tints of antique glass, and the necessity for direct purpose in their application, more suited to a religious purpose than the soft and sensuous colours of opalescent glass, and the accidental effects which are a principal object to the makers of American coloured windows. Abundance of colour is in itself no hindrance to religious feeling. The mosaics of St. Mark's are as splendid in colour as they could be made, the robes of Perugino's angels are not only brightly coloured but are lined with another bright colour, and the edges are turned over to show the lining. But in these examples the work is carefully and delicately done to beautify the object to which it is applied. The more pains it receives at their hands the more we receive an impression of serious purpose in its presentation, and the more the subject is exalted. In American work, on the other hand, the subject appears to be but a peg upon which to hang ingenious experiments in accidental effects of colour, procured by manipulating the surface of the glass. The resulting effects—mechanical and accidental—exalt the manufacture but not the subject. The technique is hampering rather than helpful to strong purpose in subject, and, in the American school of glass workers, purpose in subject is not the strong point. The new window of St. James', which represents the descent of the Holy Spirit on the day of Pentecost, seems to be better than usual in this respect, yet it is impossible to avoid feeling that it does not convey the essence of the scene it depicts. There is commotion among the Apostles, but it is at something external to themselves. There is not a sign of that possession that required from St. Peter, a little later, the defence that they could not be drunk at that hour of the day. The Apostles have an air of gentle piety, devoutly regarding an apparition of The Dove, which suggests the source of the tongues of fire that are seated upon them. One of them looks round at his neighbor, which it is impossible to conceive of him doing at that moment.

Mr. Harry Simpson, architect, was a candidate for a seat at the Public School Board at the recent municipal elections in Toronto. Although failing of election, his popularity is attested by the fact that he secured upwards of 1700 votes.

The Central League of School Art of Toronto has decided to purchase five large pictures representative of different styles of architecture, together with a collection of other pictures which will be circulated among the public schools of the city.



Branch Office of the CANADIAN ARCHITECT AND BUILDER,  
Imperial Building.

MONTREAL, January 17th, 1902.

The building trades in general were perhaps less actively employed than usual last year. Since the great boom of '89 Montreal has not witnessed feverish activity in building. We must take for granted I presume, that a city which has acquired a certain development and has passed the formative period, must count on extraordinary events to create unusual activity. Something like the great Expositions at Chicago or Paris would probably be necessary. As a matter of fact Montreal has but met the wants of the normal expansion of a city of its size since the street widening craze passed, and has not responded to any demands for wild and unnatural expansion.

The year 1901 stands lower in the volume of building operations than many previous years, much lower indeed than the following figures show. In 1889 eighteen hundred permits were granted. Since 1890 a notable decline has been noticeable, 1893 recording one thousand and 1894 five hundred with an aggregate value of \$2,750,000; while in 1901 we have 752 permits with an aggregate value of about \$2,800,000, being less than any previous year by about 25 per cent. if we remember the weakness of the former reign in the Building Department.

A great many buildings were erected then with total disregard to by-laws add without a permit being taken out, while to-day one has to be taken for a ridiculously small alteration of \$30.00 as we have seen this week.

As two or even three inspectors could hardly control all buildings in course of erection in a city of the size of Montreal the new building inspectors upon entering into office established the following system which proved most effective. Every applicant on submitting his plans receives a placard or poster which he is expected to post up in a conspicuous position, together with his permit from the City Surveyor for depositing materials on the street. All policemen on duty report to the head of the district police station any work in progress without the official posters in evidence, which in turn is reported officially by the last named to the building inspector in chief.

We can further explain the steady decrease of building operations on the ground that the city is gradually filling up within its comparatively limited area. People are forced so to speak to seek accommodations in the



suburbs, such as Westmount, St. Henri, Verdun, Notre Dame de Graces, Outremont, Maisonneuve, De-lorimer, etc. The proof of this is in the St. Cunegoude, where we could not find to-day three building lots within the limits of that town proper. This state of affairs has existed for four or five years, with the result that as the last census shows that municipality has hardly increased in population for the last decade.

What should be done at the earliest moment possible is the annexation to the city of Montreal of all those municipalities from Longue Point to Cote Saint Paul, which form an uninterrupted agglomeration of buildings and the whole of which is practically one city to us as well as the foreigner who sees no demarcation whatever between these several towns grouped in one of three hundred and forty thousand inhabitants.

The bulk of last year's work was certainly furnished by last winter's big fire in the business district. It is a great satisfaction to find that in most of the buildings rebuilt an effort has been made to render them less inflammable, the Constine Building for instance, immediately behind the ruins of the Board of Trade, being thoroughly fireproof. A Montrealer returning after a two years' absence would certainly not recognize old historic Saint Peter's street; the two sides having been entirely transformed or rebuilt in the lower part.

Several important buildings were erected which deserve more than a passing glance, such as the new addition to the Royal Insurance Company's building, Place D'Armes Square, seven stories high and costing in the neighborhood of \$175,000. In connection with this I am glad of this opportunity to give credit to the architects, Hutchison & Wood, for the respect they paid to the architecture of the past (an occurrence so seldom met with nowadays). The individuality of the old building has been preserved by continuing the new portion on exactly the same lines. In a few years the line of junction will disappear altogether by the change of color of the new stone and make the whole an imposing unity.

The Grand Trunk Railway offices on McGill street, by R. A. Waite, of Buffalo, N. Y., costing \$500,000; Carsley's new store on St. James street, by A. F. Dunlop; St. John Baptist church and a \$250,000 R. C. structure on Rachel street, by J. E. Vauier; the Merchants' Bank building, additional stories, by Edward Maxwell; the Wilson residence, corner of Sherbrooke and Drummond streets, also by R. A. Waite; and the two princely residences on Drummond street, one in the style of an English manor house, for Mr. R. Reford, of the well-known steamship agency, and the other in the fashionable New York roccoco style, for Mr. Chas. R. Hosmer, of the C. P. R. Telegraph Co., by the Messrs. Maxwell, are among the most important works of the year.

But, unquestionably, the building which has attracted the most interest, is the extension to the Bank of Montreal, now being built on Craig street, at a cost of nearly a million dollars. The structure, which is about 150 feet long, faces also on its long side on Fortification Lane, its axis being exactly in the center of the the present building, extending from St. James street to Fortification Lane. As the slope of the ground is quite considerable from front to rear, (the ground floor on St. James street a few steps higher than the sidewalk), it will necessitate the construction of a bridge over Fortification Lane, uniting the two buildings, the

older of which will serve as a vestibule; and a monumental one it will be, with its magnificent facade, unrivalled by any other financial institution.

The slope is such that between the main floor level on St. James street and the level of the sidewalk on Craig street, two stories are gained, which will be devoted to public safety-vaults, the main floor being entirely reserved for the banking room, 40 feet high, with no windows, the light coming from the top. To give an idea of the richness of this structure it will suffice to say that no plastered walls will be in evidence, every inch of wall space being marble, and that the 32 columns of 34 feet in height, supporting the lantern, will each cost the sum of two thousand eight hundred and some odd dollars. The shaft will be in exotic marble and the capital in cast bronze, as in the antique pagan temple of old Rome.

This again is a lost opportunity for our architects, as it has been thought fit, as in the case of many of our prominent modern buildings, to call upon foreign architects to design the structure, Messrs. McKim, Mead & White, of New York, being in this instance the fortunate firm.

The erection of the Foley apartment-houses, on Dominion Square, Metcalfe and St. Catherine streets, by Messrs. Saxe & Archibald, acculuates a new departure in our mode of living started by the Sherbrooke apartment-house. This structure, which is pleasing in appearance, will cost in the neighborhood of \$400,000.

What this year may have in reserve is hard to foretell, but from present appearances, notwithstanding what real estate agents may say, we do not anticipate a season of great activity.

It is true, there are a few other mammoth structures to be commenced in the spring, such as the Liverpool, London & Globe Insurance Co. building, corner St. James and Place D'Armes Square. The building, which will comprise seven or eight stories, was thrown open to competition among a few city architects. Afterwards, it is reported, these architects were advised not to complete their designs, as the work had been given to the makers of the conditions of competition, Messrs. Peabody & Stearns, of Boston.

The Birks Jewelry Store, on Phillips Square, will be enlarged by a considerable addition, Messrs. Hutchison & Wood being the architects.

The Guardian Assurance Company has bought the remainder of the Barron Block ground, adjoining the Lancashire Insurance Company's building, designed by Edward Maxwell, and will build an advertising structure, which, it is hoped, for the profession's sake, will not go out of a Montreal architect's office, in order to give the public an occasion once more to compare results with the American building to be commenced at the same date on Place D'Armes and St. James street.

#### MONTREAL BUILDERS' EXCHANGE.

The Montreal Builders' Exchange have decided to adopt the system which has prevailed among American Exchanges, of renting desk room to supply firms and allow them to display samples of their materials in cases, the object being to make a permanent exhibit of building materials within the Exchange, and at the same time to increase the revenue.

#### MONTREAL MASTER PLUMBERS' ASSOCIATION.

The Association held its annual meeting a fortnight ago, when the following officers were elected: Hon. president, John Date; president, Thomas Moll; first vice-president, Thomas O'Connell; second vice-president, Joseph Thibault; third vice-president, W. G. Graham; secretary, J. A. Gordon; financial secretary, J. C. Brunet; treasurer, Captain Giroux; English corresponding secretary, J. W. Hughes; French corresponding secretary, Ald. Jos. Lamarche; chairmen of committees: Sanitary, P. C. Ogilvie; Audit, J. A. Watson; Apprenticeship, P. J. Carroll.



## ONTARIO ASSOCIATION OF ARCHITECTS

PROCEEDINGS OF THE ANNUAL CONVENTION HELD IN THE ROOMS OF THE ASSOCIATION, 94 KING STREET WEST, TORONTO, JANUARY 14TH AND 15TH, 1902

THE proceedings were opened at 2 p.m., Tuesday, January 14th, 1902.

The following members signed the register of attendance:

Grant Helliwell, H. E. Moore, Edmund Burke, Geo. R. Harper, W. L. Symons, A. R. Denison, J. Wilson Gray, A. H. Gregg, M. B. Aylsworth, W. R. Strickland, F. F. Saunders, W. Percy Over, C. H. C. Wright, John Gemmell, A. Frank Wickson, Wm. R. Gregg, C. J. Gibson, John A. Pearson, Almond E. Paull, R. J. Edwards, S. H. Townsend, Geo. W. Gouinlock, John Kay, Paris, M. Hall, H. C. McBride, London, Andrew Bell, Almonte, C. H. Bishop, W. A. Langton, and the following visitors: G. S. Lemasnie, Eng., C. H. Mortimer, A. H. Harkness, Alfred Baker, H. F. Duck.

The minutes of the last annual meeting were read and confirmed.

The President, Mr. Helliwell, then read his address:

## PRESIDENT'S ADDRESS.

To the Ontario Association of Architects in Convention Assembled.

GENTLEMEN,—The Council having elected me to the office of President I have the very great honor and privilege of addressing you in that capacity on this, the 14th annual meeting of the Association.

The year just closed has been a most prosperous one. Throughout the Province of Ontario and indeed the whole Dominion much commercial activity has prevailed. The national resources of our country have been developed as never before, all branches of trade have been busily employed, art and science have kept pace with the general progress, and our own profession has naturally shared in the widespread prosperity.

Under these happy conditions I can greet you with most hearty congratulations. The convention in which you are now assembled promises to be one of special interest and benefit. The committee who have had the task of providing and arranging the programme for this gathering have, as you will see by a glance at the Agenda, accomplished their work with signal success. Those gentlemen who, in response to the committee's invitation, have so kindly consented to come here and address this convention, deserve and will receive, I am sure, a cordial welcome. The names are those of old friends and new and are all deservedly distinguished in their special spheres. Dr. Bryce and Professor Wright have on former occasions read papers of great value and interest, and we can therefore anticipate with much pleasure the addresses they are to favor us with. The accomplished professor of architecture in McGill University, Montreal, is well known to the profession throughout Canada. On a former occasion Professor Capper was expected to address the architects of Ontario, but through some unavoidable cause was prevented. This is consequently the first time we have been favored with the presence of Mr. Capper (who is also an ex-president of the Quebec Association of Architects at our convention).

But this is not all, the Ontario Association of Architects appreciates very highly the honor of having with us at this annual gathering a distinguished representative of the architectural profession in the great republic of the United States. I refer to Professor Warren P. Laird of the University of Pennsylvania, Philadelphia, who has charge of the School of Architecture in that University.

The Agenda informs you of the subjects on which these gentlemen will address the Convention. They are all topics of the utmost interest and value and will, I am sure, be listened to with the greatest pleasure and profit.

In addition to these papers the reports of the treasurer and registrar and of the various committees will be presented. A forestalment of these reports is uncalled for. They will speak for themselves and will, I venture to say, be entirely satisfactory. I cannot, however, refrain from testifying to the faithful and arduous year's work of the committees, and especially, if one might make any distinction, to the work of the Committee on Education.

The curriculums of studies, as prepared by the committees have been printed and sent out to the members of the Association. Two courses have been arranged, a pass course by which students may qualify for registration as members of the Association and an honor course necessitating attendance at the lectures of the School of Practical Science, Toronto.

The honor course is designed to carry the student much farther in technical, scientific and æsthetic training than the pass course. It aims to equip him in the best possible manner for the practice of architecture.

An important feature of the course is that a student may take it concurrently with service in the office of an architect. The

committee, after careful study of the schedule of the class work of the School of Practical Science, and by the kind co-operation of the staff there, have so arranged the curriculum that an office student can go through the course by attending the school an average of seven hours during its sessions.

In both Pass and Honor Courses special provision has been made for that most important branch of study, "Design". In this department the student will be trained by means of Studio Classes, conducted on those methods now almost universally adopted in the architectural schools of Europe and America.

A beginning has already been made in this line and Studio Classes are now being conducted on two nights each week in these rooms. The report of the committee having this work in hand will be presented to this Convention and render it unnecessary for further comment on my part.

While dealing with the subject of Architectural Education reference should be made to the work being done in Central Ontario School of Art, in connection with which is a class in Architectural Design, attended by a number of the students of Toronto architects.

Outside of the schools, the profession and the public at large, or at least that portion of it interested in architecture, are receiving valuable education by means of the numerous exhibitions conducted by various architectural organizations in all progressive countries. It augurs well for the future of architecture that wide and increasing interest in such exhibitions is manifested on the part of the public.

The exhibition held in Toronto last winter, under the auspices of the Eighteen Club, enabled the profession and the citizens who attended to form a very comprehensive idea of the progress of architectural design on this continent, and incidentally could not fail to elevate the standard of public taste in matters architectural.

A lecture delivered in Toronto under the same auspices, by an eminent architect of Philadelphia, on the subject of, "The Architectural Adornment of Cities," was also a factor in local architectural education. The keen interest shown in this lecture by our non-professional townspeople was another gratifying proof of the progress of public opinion in these matters.

Looking at the question from a different aspect, the higher standard of architectural taste can be unmistakably seen in the more general recognition of architects as professional men. The progress of legislation with respect to the practice of architecture might be mentioned as one phase of this recognition. The public are rapidly coming to appreciate the necessity for scientific and scholastic acquirements on the part of those who have in their hands the construction of buildings. The restriction of architectural practice to those who have demonstrated their fitness for such responsibility is becoming more general.

Nowhere is this to be seen more than in the neighboring republic, where architectural progress has undoubtedly been more marked and rapid than in any other country in modern times. Some three or four years ago the state of Illinois passed laws for the registration of architects duly qualified. These laws having worked well, several other states have followed the example of Illinois and it is doubtless only a matter of a short time before this action will become general. Even in conservative England, sure, if slow, progress is making in the same direction.

On an occasion like this it is not out of place to take a brief survey of some of the more important examples of recent architectural work. On this side of the Atlantic the buildings of the Pan-American Exposition at Buffalo must first be mentioned. So much, however, has been said and written about these beautiful buildings that it is unnecessary to comment further on their general architectural style. There were those who, in the early stages of the buildings, prophesied that the Exposition would mark an epoch in American architecture, particularly in the external application of color to buildings. In this respect, however, it is now generally conceded that the result was disappointing, not in the application of color but in the lack of it. The brilliant, rich coloring we were led to expect was wanting, the general impression of color being that of quiet neutrality. A few of the domes were conspicuously painted and other parts of some of the buildings were strongly colored, but these were not numerous enough to seriously affect the general architectural scheme.

In England a spirit of eclecticism seems more prevalent, each architect choosing for himself that style or line towards which he feels most drawn, and along which he pursues his course alone. There are, at the present time, in Great Britain, many architects of high culture and great ability, whose work, chiefly domestic, is delightfully charming. The published illustrations of some of the more important houses, recently erected, show work full of character, inclining to plainness and simplicity of treatment, yet in many respects more satisfactory and pleasing than the immense, magnificent palaces which are building in such numbers in America.

English Architecture fails to show, as yet, any common movement in a specific direction, and it is difficult, not to say impossible, to predict even its near future. The recent discussion as to the style of Architecture to be adopted for the proposed new Liverpool cathedral serves but to confirm this view.

Glancing at recent work in the United States, in general, the influence of the French school is strongly marked, and must have the effect of retarding the growth of a national spirit in American Architecture. At the same time excellent work is being done, better work than any which has preceded it, and the future certainly looks most promising. American architects, if indeed imbued with the spirit of a foreign school, are for the most part working unitedly along the same line, and if the history







made in a sincere and active manner to bring new members into the Association, and stated that if it would meet with the approval of the meeting he would like to move that a committee be appointed with this object in view.

Mr. Helliwell: The qualifying examinations which are required by our Act of Incorporation, may be a difficulty in the way of some persons becoming members.

Mr. Wickson pointed out that the Association had made an effort to get in new members at one time, and that a certain number were brought in; also that another effort had been made last year to get in some young men, which was unsuccessful.

Mr. W. R. Gregg: Mr. President, I would second Mr. Denison's motion. It covers a great many men throughout the Province, outside those Mr. Wickson speaks of. There are a great many men outside of the Association who should come into it, and I think a committee should be appointed by the Council to get them into the Association. There are probably 30 or 40 architects practising in the Province who should be members. I have much pleasure in seconding Mr. Denison's motion.

Mr. Helliwell: Mr. Denison's motion is that a committee be appointed to devise means to increase the membership.

Mr. Langton suggested that a committee be appointed composed of Mr. Denison, Mr. Burke, Mr. Pearson and the Registrar, to think over what proceedings they would suggest, to report to the Convention to-morrow, and that then if their report was adopted, the committee should be appointed as a permanent committee, to carry out the proposals of their report.

Mr. W. R. Gregg stated that he had embodied Mr. Langton's motion in Mr. Denison's motion, viz.,—Moved by Mr. Denison, seconded by Mr. Langton that a committee be appointed consisting of Mr. Denison, Mr. Burke, Mr. Pearson and the Registrar to devise means to increase the membership, and to report on Wednesday.

Mr. W. R. Gregg then read the Registrar's report.

#### REGISTRAR'S REPORT.

**COUNCIL MEETINGS**—The Council has met eight times since the last annual meeting, and the average attendance has been  $5\frac{1}{2}$ .

**NEW MEMBER OF COUNCIL**—Mr. Geo. W. Gouinlock was elected a member by the Council early in the year to fill the vacancy caused by the resignation of Mr. Eden Smith.

**MEMBERSHIP**—The present membership of the Association is, Honorary members, 3; Resident members, 37; Non-resident members, 26; Total, 66 members.

**STUDENTS**—The new Pass Course Curriculum for students was issued in April, and copies were sent to all members of the Association.

The Honor Course Curriculum has been printed this month, and is now being sent to members.

Probably on account of the fact that changes were being made in the courses of study, no students presented themselves for examination last March.

Members are reminded that students must serve under indenture such time as is required in the by-laws, and that forms of Articles prepared by the Association, may be obtained from the Registrar, and that a copy of these Articles is required in each case to be sent to the Registrar and filed by him. Also that students are required to give the Registrar one month's notice of presenting themselves for examination.

The by-laws provide that examination shall be held in March of each year.

**MONTHLY MEETINGS**—On Tuesday evening, January 29th, on the occasion of the last Annual Convention, members of the Association and a number of invited guests assembled to hear a lecture by Mr. G. A. Reid, R. C. A., upon "The Summer Cottage," illustrated by lantern slides, and a description of the Paris Exposition, by Mr. F. S. Baker, F.R.I.B.A., also illustrated by slides.

Monthly meetings were held on the evenings of Feb. 12th, March 12th and April 9th.

Post cards announcing these meetings were sent to each member of the Association. The average attendance was 12.

At these meetings the following matters were considered:—The improvement of the water front of Toronto, the grouping of the Toronto Exposition Buildings, the improvement and better equipment of the School of Practical Science, and the importance of the Government's obtaining the best possible design for the proposed School of Science Building in connection with Toronto

University. In connection with these matters correspondence was carried on or interviews were obtained with the Mayor of Toronto, the Exhibition Board, and the members of the Ontario Government, respectively, and the views of the Association were fully expressed and were received, and considered.

The Monthly Meetings Committee takes in hand the securing of papers to be read and other arrangements for the annual meeting, which occurs upon the date set down for January Monthly Meeting.

**PROCEEDINGS**—The first annual volume of Proceedings of the Association was prepared in February, and four hundred copies were printed. Copies were sent to members and to a number of Canadian, American and English Architects, and others interested in architecture: also to Canadian, British and Foreign Clubs and Societies.

A number of interesting exchanges have been received in return, and these are kept on file in the Library for the use of members, where they may now be seen.

**STUDENTS' MEETINGS**—The use of the hall on Saturday evenings was granted in April by the Council to the Toronto Architectural Students' Club for meetings of an educational character, and a few of these meetings were held last winter, but the Club has as yet taken no advantage of this privilege during the present winter.

**COMMITTEES AND CHAPTER**—Important work of the Association has been carried on during the year by the following committees, which have reported progress from time to time to the Council, and have now reports to be presented to this meeting of the Association: Rooms Committee, Mr. John Gemmell, Chairman; Patrons of Studio Work, Mr. Frank Darling, Chairman; Educational Committee, Mr. A. Frank Wickson, Chairman; Revision of By-law Committee, Mr. W. R. Gregg, chairman. The Toronto Chapter, of which Mr. E. Burke is President and Mr. H. E. Moore is Secretary, will also present a report.

The report was adopted.

Mr. Gemmell read the report of the Rooms Committee.

#### REPORT OF ROOMS COMMITTEE.

Your committee formed to look after the furnishing of these rooms have thought that the evidence of their faithfulness to duty or the reverse is in the nature of things so tangible that a report was hardly required of them. But our Registrar thinks otherwise and has now at the beginning of the third year of our occupation, insisted on a formal report being laid before you.

This we will endeavour to do with the preface that being from private notes, it must not be allowed in its financial aspect to conflict with accounts of the Association duly checked and paid, but is sufficiently correct to give you the value of the personal property of the Association.

The first item although a most necessary one has cost us nothing—your committee noticing changes in plans as carried out from sketch accepted by Association, by correspondence and interview, persuaded Mr. Horn to install the library cases in lieu of separate entrance and vaults shown on that sketch, and he also stained and varnished floors. Your committee then started house-keeping, Mr. Townsend and myself made repeated visits to the great stores, the only result of which was securing the Japanese rug, an easy chair and curtains for windows and arriving at the conclusion that the stock furniture within our means would give the rooms a hopelessly commonplace effect. We therefore got Mr. Rawlinson to make from sketches, the black oak table and arm chairs in our sitting room which we trust have a more distinctive character.

The fine photo of "Michael Angelo's Moses," was bought at a timely auction sale. The reading desk is a capital given us by Mr. Colbrook, to which we added the desk and shaft.

The dog irons were put in by Rice Lewis & Son. The plaster statuary was a donation from W. J. Hynes except the Diana given to us by Mr. Baker as New York's idea of that chaste goddess.

The photograph of the bronze gates of Baptistery at Pisa is a gift from Mr. Langton.

The rooms we would report have been a great convenience for the meetings of Council and committees, and from their central position give us a standing in the community by which we can further the interests we have at heart.

The Toronto Guild of Civic Art asked and were allowed to hold their annual meetings in lecture room, your committee judging their aims are kindred with our own.

Mr. Langton and Mr. Darling have given much time and study to students' classes in design, two evenings in the week.

A class in water colour painting has been taught by C. M. Manly on Saturday afternoons and has been appreciated by some members of the Association and students.

We would also report some revenue derived from other societies for use of rooms on dates not required by either engineers or architects. The Society of Junior Accountants are allowed to hold evening meetings two Mondays in the months of December, January, February and March for which they are to pay \$20. \$10 was received from Ontario Land Surveyors who held their annual meeting here.

In closing our report we would ask that members be urged individually to make use of the rooms on all possible occasions. If books and periodicals are of value in the pursuit and study of architecture, we have by the kindness of the Public Library and individuals had some of the very best on our table and it is the intention to ask for increase of our periodical fund.

A weekly noon day lunch has been set out every Tuesday by our steward with increasing success and for these we would bespeak a larger patronage—regarding the discussions around the board and after as being valuable in promoting good fellowship among our members, and acquiring a room-frequenting habit, and these meetings have



many times been a means of keeping pace with public affairs that affect architectural progress.

Your obedient servants,  
S. H. TOWNSEND  
J. A. PEARSON  
JOHN GEMMELL } Committee.

## STATEMENT OF PERSONALTY, O. A. A.

1/2	Assembly room chairs.....	\$ 16 50
	Morris chair.....	7 55
	Electric fixtures.....	30 00
	Large table.....	12 00
	Fixed seat.....	10 00
	Japanese Rug.....	15 00
	Black oak arm chairs.....	32 00
	Window blinds.....	4 75
	Curtains.....	12 00
1/2	Reading Stand.....	2 50
1/2	Hall Table.....	5 00
1/2	Cuspidors.....	1 00
1/2	Lantern Curtain.....	5 00
	Velour Cushion for Seat.....	9 50
	Michael Angelo's Moses.....	1 80
	Regilding Frame.....	2 00
1/2	Large table.....	1 25
1/2	Hall oak chairs.....	12 50
12	Picture frames.....	10 00
	Glass for same.....	1 06
	Cardboard mats.....	2 40
	Mounting and framing lantern photo.....	5 60
		<hr/>
		\$199 41
	Goldie & McCulloch safe.....	30 00
	Table linen, cutlery and delf.....	25 00
		<hr/>
		\$254 41

The report was adopted.

Mr. Denison: Mr. Chairman, I don't see why the City Council should not be waited upon by this Association and asked for help. They make grants to other Associations of like character, and I do not see why they should not make us a grant. They help all kinds of educational institutions, Art schools, etc., and I don't see why they should not help our educational efforts.

Mr. Helliwell: The committee will no doubt take this into consideration.

The report of the Committee on Studio Work was adopted as follows.

## REPORT OF THE STUDIO COMMITTEE.

The studio committee consisted of Messrs. Darling, Gemmell, Symons, Langton, Over and Moore. Last winter the studio worked two nights a week for three months. Messrs. Darling, Langton and Over took one night and Messrs. Gemmell, Symons and Moore the other. We gave themes for design presented to the students in various ways and criticised their work with a view to giving them an idea of the fundamental principles of composition. We came to the conclusion that the students are not sufficiently instructed to make this exercise profitable and are devoting ourselves this year to systematic study of the principles of design as exemplified in the historical styles. We are holding classes on only one night in the week as being more convenient for both students and instructors and are proposing to continue them through the whole winter season. Up to the present, Mr. Langton and Mr. Over have been teaching the principles of the composition of the Roman Orders. These lectures are nearly completed and will be followed by instruction by Mr. Symons and Mr. Over in the principles of gothic and of the renaissance by Mr. Gemmell and Mr. Over.

(Signed) FRANK DARLING, Convenor.

Mr. Wickson then read the report of the Education Committee, the adoption of which was moved and carried.

## REPORT OF EDUCATIONAL COMMITTEE.

Your committee on Education beg to report that they have arranged two courses of study called respectively "Honor Course" and "Pass Course," each having a curriculum of study and examinations.

The Pass Course has mainly been adopted to suit the requirements of those who are absolutely unable to attend the School of Science, but on the curriculum it is emphatically stated that students are strongly recommended to take the Honor Course.

It is also intended to cover the case of a number, who having already started on their studentship could not well abandon their present position and begin again.

In this course the student is required to serve not less than five years with a principal.

The subjects to be studied and in which examinations will be held, are: Knowledge of Building Trades, Mathematics, History of Architecture, Statics, Strength of Materials, Structural Iron Work, Mouldings, Features and Ornaments, Design, Architectural Jurisprudence, Heating and Ventilation, Sanitary Science, Steel and Iron Construction, and Protection in Buildings.

Students living in any section where studio classes are being conducted are required to attend and graduate from such classes, but all others are required to pass examinations in Design in the final year.

The students are advised to take the Mathematics in Technical

Schools where such schools are already, or in the future may be established, the balance of the work having to be taken up individually, but from a complete list of the most carefully selected text-books.

**HONOR COURSE.**—The Honor Course calls for a higher educational standing on the part of the student before entering.

These students are also required to serve five years with a principal, though graduates from the Ontario School of Practical Science will require to serve three years only, one of which may be served during vacations.

To conform to the opinion held by many architects that a course of scientific training is more beneficial when taken concurrently with office practice, the Honor Course has been arranged to permit the student to take his office and University training at the same time and includes three branches.

"A" Science.

"B" Business.

"C" Design.

The subjects in branch "A" are taught at the S. P. S., the student being required to attend the school about seven hours a week during the school session, and in connection with this a timetable quite feasible in its working has been drawn up showing the hours at which attendance would be required during the five years.

Branch "C" (viz. Design) would be taken up in the Studio work (a separate report of which will be presented) and while no stated examination is held a progression by mentions is necessary for passing in it.

Copies of the Curricula as attached to this report may be obtained from the Registrar.

Your committee feel the members of the Association cannot be too urgently requested to refuse to take pupils except under the conditions that they agree to take in its entirety one of these courses, and if in Toronto it shall be the Honor Course, any other method of service being manifestly unfair to an applicant even if he, in his ignorance of the consequences, be willing to accept a studentship under other terms, and on the other hand equally unfair and damaging to the entire profession.

In addition to the Studio work this season, there has been a water color class conducted by Mr. C. M. Manly, A.R.C.A., which is being attended by some eight members.

A. FRANK WICKSON,  
Chairman.

Mr. W. R. Gregg was then called on for the report of the Committee on the Revision of By-Laws. He pointed out several changes in the By-Laws such as the requirement of 5 years practice to qualify for membership of the Council instead of 10 years as formerly; the addition of a Chapter By-law. He said that it was understood that the monthly meetings were not supposed to take powers on themselves that would not be fair to members outside the city who could not attend, but that every member should attend the annual meeting. He referred to the change made in that certain classes of members who formerly paid only \$2 a year pay \$3 now; so that there are now only two classes of members. Another change relating to fees is, that students coming up for the final examination are expected to pay only one fee covering examination and admission to membership of the Association.

Mr. Burke moved that the balance of business be postponed till after Professor Capper had delivered his address.

Mr. Helliwell: Gentlemen, in introducing to you this afternoon Professor S. H. Capper, of McGill University, Montreal, I bring before you the name of a gentleman well known to you all. The architects of Ontario have for a long time wished to listen to a lecture from Professor Capper, and I can assure him that he will be listened to with the very greatest possible pleasure.

Professor Capper then read his address which was received with hearty applause. (See page 13).

Mr. Helliwell: In presenting a vote of thanks to Professor Capper said he would like to express his personal appreciation of the paper.

Mr. Capper expressed his thanks to the Association and the Chairman for the expression of their appreciation of his address, and regretted that he would not be able to stay over the following day.

The business of the convention was then resumed.

Mr. W. R. Gregg, Chairman of Committee for the Revision of By-laws said that the adoption of the report as far as the convention was concerned was the adoption of clauses 13 and 14. He moved that the by-laws as they had been revised be adopted, seconded by Mr. Moore and carried.

Mr. Moore then read the report of the Toronto Chapter.



## REPORT OF THE TORONTO CHAPTER.

The Chapter has at present on the roll of membership 37 resident members.

In submitting this report to the Association it is perhaps necessary to explain that early in the year the Chapter instituted weekly luncheons which have been continued throughout the year with great success. This luncheon is held every Tuesday in the Association rooms and has proved of great benefit, both from a social and professional standpoint, as it has accomplished the desired effect of bringing the members continually into touch with one another.

Discussions have been engaged in on matters of interest to the profession generally. Public questions have been taken up and discussed, with the result that the Chapter has acted directly and indirectly in connection with other organizations on all matters where the public interest is concerned.

Some of the most important subjects taken up by the Chapter during the year are given below.

**RE THE ERECTION OF NEW GOVERNMENT BUILDINGS.**—After discussion a deputation consisting of Messrs. Helliwell and Langton, was appointed to interview the Government regarding the work to private architects. Mr. Helliwell reported the interview with Messrs. Latchford and Harcourt, and stated there was a strong inclination to employ the Government architect, and that Messrs. Heakes, Wright and Galbraith would be the delegation to visit other cities in the United States for information. It was possible, that a competition would be restricted to Canadian architects, but the work was finally placed in the hands of the Government architect; the Government offering to let the Association look over the plans.

**GENERAL IMPROVEMENT OF CITY RE LAYING OUT OF SQUARES, DRIVES, ETC.**—The delegation from the Association, Messrs. Burke and Gregg, which attended the meeting of the Guild of Civic Art, reported that a large committee had been appointed to wait on the City Council, urging on them the desirability of employing some competent person to prepare plans for the general improvement of the city. Mr. Langton gave a synopsis of the work of the Guild of Civic Art.

**BUILDING BY-LAWS.**—Mr. Wickson was appointed to take Mr. Gordon's place on the City By-Law Committee, the latter having to resign, on account of his trip to Corea.

A letter was written to the city urging a conference with the O. A. A., before finally adopting new building by-laws.

**TECHNICAL SCHOOL.**—A letter was sent to the Technical School board, suggesting that a properly qualified principal be appointed, with special reference to industrial design.

**EXHIBITION IMPROVEMENT.**—This matter was taken up and discussed by the Chapter, and is fully dealt with in the Association report.

Other matters discussed at the various meetings are as follows:

**Harbour Square Improvements, Decoration of City for Duke of York's Visit, Dominion Museum.** It was announced that Mr. Tarte was in favor of putting the plans for proposed new building out to competition. "Building Permits—What is the Practice of the Architect with regard to giving the Cost of a Building when taking out a Permit?" "The Designation of the Different Floors of Buildings;" after discussion this matter was left for decision at the next convention. "The Yearly depreciation in Value of Buildings."

At the last two meetings, business in connection with the coming convention was discussed.

A very successful innovation at the weekly luncheons, was the exhibition of architectural works and books loaned from different sources for the purpose of inspection by the members.

The average attendance during the year has been, total 407, and it is to be hoped that during the coming year, every member will take advantage of these luncheons, and increase the interest by his attendance.

Mr. Burke: One item of this report was never carried out—the promise of the Minister of Public Works. He promised that we should have the opportunity of criticising the plan of the new building for the School of Practical Science before it was carried out by the Department. We have never had the opportunity of criticising the plans.

Mr. Moore explained that he thought the plans were not far enough advanced yet to criticise them.

Mr. Gemmell: I think this is a privilege the Association should avail themselves of. I think it worth while to remind the Minister of Public Works of this promise.

Mr. A. H. Gregg then read the report of the Library Committee.

## REPORT OF THE LIBRARY COMMITTEE.

The library has been well used during the past year, the number of lendings showing a considerable increase over those of 1900.

The Association has subscribed to the regular editions of the Architectural Review, London, the Studio, London, and THE CANADIAN ARCHITECT AND BUILDER, and the current numbers of these periodicals are kept in the rooms for the use of members.

In addition to these magazines the Association receives in exchange for its annual proceedings various weekly, monthly and yearly publications of architectural and engineering societies in Great Britain, France, Italy and United States.

The following new books have been added to the library:—Brigg's "Modern American School Buildings," Carpenter's "Heating and Ventilation of Buildings," Robinson's "Principles of Architectural Composition," and Freitag's "Architectural Engineering."

Members outside the city are reminded that the books of the library will be sent by mail, the postage for delivering the books being paid by the Association. Magazines will also be sent in the same way.

A catalogue of the library is to be found in the Annual Proceedings.

Mr. Gemmell referred to an appropriation which was proposed for getting periodicals.

Mr. Helliwell thought this had better be left to the Committee of Finances.

Mr. Aylsworth read the report of the committee for publishing the proceedings.

## REPORT OF PUBLISHING COMMITTEE.

Your committee being still of the opinion that the annual publication of the Proceedings is desirable and in the interests of the Association, recommend that it be continued.

With this probability in view a form and style was adopted that should require no change from year to year except in illustrations and number of pages.

Its distribution in the proper channels by the Registrar has been the means of attracting in return a large number of similar reports from sister associations and other valuable publications always welcomed by the members who avail themselves of the use of the reading room.

The cost of paper and printing was unwittingly borne by Mr. C. H. Mortimer, of THE CANADIAN ARCHITECT AND BUILDER, in accordance with his offer made before learning that the number of copies would be insufficient for an advertising medium, and that so large a proportion of the work had to be set up specially.

As considerable of the matter may be used as set up for THE CANADIAN ARCHITECT AND BUILDER after each convention, thus reducing the cost, and feeling under obligation to Mr. Mortimer, we recommend that for producing Vol. No. 2 his offer at \$50 be accepted.

To partly meet this it is hoped that at least one appropriate advertisement may be secured.

With Vol. No. 1 before the convention the committee invite criticism and suggestions for improvement.

Arrangements have been made for reporting this convention in the same manner as that of last year.

M. B. AYLSWORTH,  
Chairman.

Mr. Burke: Before that report is adopted it would be well for the Association to notice that it involves the expenditure of \$50.00 for the publication. I have had word from Mr. Mortimer, and he states that it is impossible for him to cut that expenditure down, that he cannot get advertisements to remunerate himself, and it cannot possibly be done for less than \$50.00.

Mr. Langton said he thought the report could be adopted recommending the publication of Proceedings without adopting the means.

Mr. Aylsworth said that in adopting the report the expenditure of \$50.00 would certainly be approved.

Mr. Denison suggested that the report be adopted with the revival that the Proceedings be published if the Council saw their way to do it.

Mr. Kay was of the opinion that the expense could be met by advertisements in the Proceedings.

Mr. Helliwell pointed out that on account of the smallness of the circulation it was hard to get advertisements.

Mr. Gemmell stated that 400 was the edition, and he thought that a very good circulation.

Mr. W. R. Gregg stated that about 300 had been sent out.

Mr. Gemmell was of the opinion that the Proceedings should be published. He thought it unwise to publish them one year and drop them the next year. He considered that the idea of advertisements was made too little of, that two or three advertisements would meet the whole expense.

Mr. Wright said he thought it most desirable that this year at all events the publication be continued. He considered the money was well spent. While the circulation was very limited, it reached a very desirable class, and he could not see why there should not be in the Proceedings, advertisements of building material, as it reached the very class the manufacturer wished to reach and in the best form. He did not see why there should not be advertisements that would easily cover the expense of \$50.00, and he thought it would be a great mistake if the publication was not pushed for another year even at a loss of \$50.00.

Mr. Aylsworth said he saw no reason why the report should not be accepted.

Mr. Gemmell thought the motion that should be added to the report was the privilege of allowing advertisements on the cover of the Proceedings.

Mr. Helliwell said that was acceded to, and the report was finally carried.

Business was then adjourned till Wednesday.



## SECOND DAY.

Business was resumed on Wednesday, 15th, at 11.55 a. m.

Mr. Denison read the report of the Special Committee appointed on Tuesday:

## REPORT OF COMMITTEE ON INCREASING THE MEMBERSHIP.

Your committee recommend that the Council appoint an active committee to see the city members who have allowed their membership to lapse through nonpayment of dues, and architects who have qualified for membership, but who have not yet identified themselves with the Association, to explain to them the advantages and present object of the Association and to request them to renew their membership or enter membership, as the case may be, in accordance with the terms of the by-laws.

Also that a committee of the same purport be sent to out of town members who have permitted their membership to lapse.

Your committee do not see any other practical method of reducing the annual deficit, other than raising the annual dues, or making a special assessment.

Your committee think that each member of the Association could do valuable missionary work in endeavoring to enlarge the membership, and that a sense of individual responsibility regarding the progress and welfare of the Association should be pressed upon every member.

Your committee also recommend that the committee be requested to ask the City Council to make a grant towards the support of the educational work of the Association.

Mr. Pearson: With regard to this question of inducing the other architects in the city to join the Association, I think that we should each one of us make an earnest effort in this direction. It is no good sitting still and listening to this recommendation that the committee should go out and see certain men, but I think that each one of us should make an effort in this way, as we would have a great deal more influence with certain of these than the committee. Each one of us before we leave this room should think of someone he can go and get to join this Association. The outside men should be made aware of the good work that is being done in the Association, of the good papers that are being read at our meetings, of the studio work, etc.

Mr. Kay: Mr. Chairman, if Mr. Denison has moved the adoption of his own report, I would second it. I never see very much good come out of this forming ourselves into a committee of resolvers. It is the individual effort that counts and much more will come out of it. As my friend Mr. Pearson suggests, I think if we would all go out and make an effort much more would be accomplished.

Mr. Denison: I move the adoption of the report. I believe in this missionary work. There is no reason why the members in past years should not have been making this effort, but this is a step in that direction, and I certainly will do my part in connection with it. We have gone through a very difficult stage in our life's history. The Association and Eighteen Club have got apart, but I believe that this thing will come right yet, that we will come together again. There is really good feeling between the Eighteen Club and the Association, but there is some peculiar little feeling between us which I think will die out. I think if we were to unite together we could do wonders in the interests of the young members and of the students, but so long as we are divided, so long as there are two parties, we are divided one against another. If we were together our students would not be divided. It is a common thing for our students to come to us and say, "Where ought I to go: to the Eighteen Club or to the Association?" There is nothing in the way of the Eighteen Club carrying on their own Club, but we should be together; we should be on one plane.

Mr. W. R. Gregg, as a member of the committee, supported the report, and said that he wished to amend his report of yesterday before it was printed. He wished to say that there were 67 members. The Association was not falling behind; it was at least keeping up.

Mr. Gibson: Mr. Chairman, at one time every architect in the province was a member of the Association, now there are not much more than one-third members. There must be some reason why these men dropped out. I think there ought to be some effort to find out the reason of this.

Mr. W. R. Gregg pointed out that the best way to

find this out was to go and see these men personally as suggested in the report, as they would be sure to state what they had against the Association.

Mr. A. H. Gregg: Mr. Chairman, Mr. Denison has referred to methods by which the membership might be increased in Toronto, and of missionary work that might be done here. Outside of the city there is also much missionary work that might be done. Mr. Gibson has referred to the reasons why architects have not joined, or have allowed their membership to lapse. I think the reason is often indifference, or is found in the remark, "what good is the Association doing anyway?" Now take "What is the Association doing?" This year the Association has performed a tremendous amount of work in preparing two curriculums of study, the pass course and the honor course, and these two sheets are worth the membership fee to any member. The pass course is arranged so that any student throughout the province who wishes to take up a thorough course of Architecture is enabled to do so by home study. The Association suggests the proper books to read, and is prepared to examine the students. For more ambitious students who wish to take a special course at the School of Science we have the honor course, by which the students can take a course at the School of Science and then go back to their offices to complete their studies, or if Toronto students, they can, by a special arrangement with the government, attend the School of Science and at the same time put in their time in an office. Provision is made throughout the province for a student to take a course that is of advantage to him, and just that one item is worth far more than the fees themselves to every architect who is up-to-date, I should say. And there are other advantages, such as recognition in the law courts, which can be brought before lapsed members, and if it is through indifference that they have allowed their membership to lapse I do not see why they should not be brought back into the fold.

Mr. Helliwell: Along the lines of Mr. A. H. Gregg's remarks, I would like to say that not very long ago I had occasion to advertise for a student, and I was very much surprised to find a large number of young men all over the country who were taking up the course of the Scranton School of Correspondence. But anyone who has looked into the matter will see that the course we have arranged is a considerably better course than can possibly be afforded by this Scranton school, but they do not know it. If there could be any way by which they could know this, and that this course could be carried on at their homes, I think it would in the long run be of great benefit to the Association. We cannot expect to have such influence with the older men to bring them into the Association, but in the younger men is where our help lies. In the meantime I think we may present this report, it is moved by Mr. Denison, seconded by Mr. Kay.

The report was carried.

Dr. P. H. Bryce was then called on for a paper on "The Disposal of Sewage of Houses, Hotels and other Institutions in Towns and Country Places where there is no Sewage System." The paper which was illustrated by charts and figures on the board, was received with hearty applause, and will be printed in a subsequent issue.

Mr. Denison: I would like to ask Dr. Bryce the name of the maker of this valve.

Dr. Bryce: Mr. Quinn, the maker of this valve is here.

Mr. Quinn brought forward a valve of the regular size and in a very explicit manner explained the working of same. The name under which the patent was registered, was the "Quinn Automatic Flushing Valve" and it was manufactured by the James Robertson Co., the cost price being \$20.00. He also stated that some of these valves were in use and he had heard of no complaint as yet.

Mr. Burke enquired if this method of sewage disposal included in any form the bacterial disposal of sewage.



Dr. Bryce stated that it included the disposal of the whole of it.

Mr. Burke asked the question if the apparatus described would do away with the grease that would go into it?

Dr. Bryce stated that he had used one in his suburban residence, and the grease was practically all carbonated and done away with.

Mr. Wickson enquired as to the danger of frost affecting the tank, but was assured that if the tank was banked with earth or some leaves thrown over it the frost did not seem to affect it.

Mr. Curry in moving a vote of thanks to Dr. Bryce, mentioned the difficulty of getting enough earth in Muskoka in which to dispose of sewage.

Mr. Wickson: I have much pleasure in seconding Alderman Curry's motion. This subject on which Dr. Bryce has spoken to us to-day is one of considerable interest to us, and we are indebted not only to him, but to this gentleman who has brought this valve down and shown it to us.

The vote of thanks was carried with much applause.

Dr. Bryce in replying to the vote of thanks referred to Mr. Curry's remark about the scarcity of soil in Muskoka. He pointed out that the tank could be built on the rock, and for the final disposal of the sewage an artificial bed of sand could be made to these outlet tanks.

#### AFTERNOON SESSION.

After lunch Professor C. H. C. Wright read a paper on "The Behavior of Steel under Stress" (see page 16) which was illustrated by charts, scientific apparatus, diagrams and samples, the latter being passed around among the audience for their inspection.

Mr. Helliwell: We have listened to the papers that have been presented, with the greatest pleasure and profit. We have had especial pleasure in listening to professor Capper who came as a visitor to speak to us from Montreal. But it is with peculiar pleasure that I speak of the pleasure we have before us of listening to the gentleman who has come from the neighboring Republic to speak to us. I will not take up time further, but will call upon Professor Laird, and can assure him that coming to Toronto as he does now for the first time he will receive a hearty British welcome. (Clapping.)

Prof. Laird, in taking the platform, stated that he felt not only that he had received a hearty British welcome, but dozens of them since he arrived in Toronto. He then read his address which was heartily received, and which will be printed in a subsequent issue.

Mr. Langton: Mr. Chairman, I may as well take it upon myself at once to move a vote of thanks to Professor Laird for this admirable paper. I hope that it will not close the discussion, but I cannot speak without first speaking of thanks. It is a very full paper, a very complete view of architecture, and one which I am sure we shall be glad to keep in our minutes and look at again when we want to get in our minds the right spirit for carrying out our work. The soundness of Professor Laird's point of view may, I think, be measured by the frequency with which the word "plan" occurs in the earlier part of his paper. In the present welter of styles we can hold to that as the one sure thing. Plan is the basis of excellence, of real excellence, in all styles. It is the touchstone by which to test the quality of our work and to test the permanent value of new ideas. Mr. Langton went on to say that Prof. Laird, in pointing out that the architect of the present day is an organizer and leader of specialists, seemed to indicate that he could not be an inventor in detail. As to the question of style, he had great sympathy with persons who deliberately adopt a style, but he thought the way of true progress depends on the fact that the architect is an artist who does work for somebody else, and the problem presented to him must be at the bottom of his

design. As to the handling, one may take an illustration from literature to show that connection between theme and style is natural to a cultivated workman. In the biography of Macaulay, who was par excellence the literary man, at home in literature, we find examples of styles as suitable to their purpose as his historical style, but quite different from it. His drily instructive minutes from India to the home government, his gay letters to his sisters, and impromptu verses, are very different in manner, but all suitable to the occasion—all in fact endowed with style. An artist is essentially a man of his time. His times are reflected in his work. From this we may infer that an architect, so far from abhorring the peculiarities of current local Architecture, ought to find in the reasons for their peculiarity a key to characteristic in his own work. In other words, if a designer is true to his problem he is bound to have Architecture, and if he studies native usage he is bound to have something that can be called style.

Mr. Burke: I have much pleasure in seconding the resolution of thanks to Professor Laird. We had some words of comfort for ourselves in that paper when we were told that costliness was not essential to good style, that sincerity was the best essential of design. We have not the means of putting up costly buildings in Toronto, but we can study with sincerity those that we do put up.

Mr. W. R. Gregg: Mr. President, I wish to support this vote of thanks to Professor Laird, and I wish to say that we regret very much that Professor Laird was unable to be with us yesterday. We had a paper yesterday on "University Training in Architecture." Professor Laird comes from a university that was founded in 1740, Benj. Franklin being one of the founders. The latest addition to that university was the architectural college, and since the year 1890 Professor Laird has been the leading spirit in that college. Central Ontario in the matter of architectural education is just about at the point where he began his work, and I hope Professor Laird will favor us with some words on university education in architecture before he leaves.

The vote of thanks to Professor Laird was then carried by the meeting with much applause.

Professor Laird: Mr. Chairman, during the preparation of my paper I was seized with qualms in the fear that the result of such labors as I put on it would be nothing, and I am not sure now that the paper itself has any distinct virtue or any great value, and it seems to me that the thanks that has been showered on me has outweighed what my paper has deserved. The particular form of architectural education which lies nearest my heart, and nearest Prof. Wright's, has been referred to, and of course I am very glad to speak about that, and I want to speak to you as a colleague of Prof. Wright's, as understanding (while not having had retailed to me) his difficulties, because I know by my own what these must be. Prof. Laird went on to say that the Architectural College of Pennsylvania was one of the latest children of Pennsylvania University, the great distinction of this University of course being having had in its founding the spirit of Benjamin Franklin. He thought perhaps there might have been a similarity of conditions attending the organization of the Architectural School in Philadelphia as compared with that here. There had been no School of Architecture before—a course of architecture had been offered at the University which consisted, however, of scarcely more than the shreds of what might be called an architectural education. Means had not been provided, nor had the Professor of Architecture been given an opportunity of submitting a thorough course of architecture. He then went on to tell how the architects of Philadelphia had conceived the need of an Architectural School in that very great centre of business enterprise and architectural activity, and that the formation and progress of this school was due largely to their efforts. Prof. Laird pointed out that since the thorough establishment of the school the principle that had been



followed was that an architect requires to be a man of a good general education. An architect must be a man with a technical education, but at the same time a man with a liberal education, so that he can take his place among other educated men and give his art the place that it requires. The aim of the University had not been to make the young men merely good draughtsmen so that they could go out and make fine drawings, or to educate them only in any one branch, but had been to give them a thorough training in all the branches of architecture. In conclusion Prof. Laird said that here in the Dominion we probably had not as promising an opportunity for founding an architectural school, but we certainly had the opportunity of securing to our young men the essentials of a good training in architecture. It would require, of course, that Prof. Wright should be aided; he should not be expected, as no one man could possibly do it, to teach all branches of architecture. At Pennsylvania the plan of having the principal branches taught by specialists had been followed up. He also pointed out that the man who is carrying on an architectural school must have the support of all the architects.

#### ELECTION OF MEMBERS TO COUNCIL.

The names of Messrs. Alexander, Ottawa; Denison, Gemmell, Gray, Siddall, Symons, Wickson, Wright were written on the board, from which three members of Council were to be chosen.

Mr. Helliwell: Gentlemen, our business is to appoint three members of Council. The printed list of nominations you have received has been reduced in number by some of the gentlemen who have declined to stand for the election, and the names of those upon whom you have to vote are on the blackboard.

Mr. Wickson asked to have his name removed from the list.

Mr. W. R. Gregg protested against Mr. Wickson's name being taken off, stating that Mr. Wickson had had a year's rest, had proved himself a very efficient President when he was in, and that the Council needed his presence because he was interested in the work. Continuing he said, "I want to say a little for the unfortunate men, whose names come at the end of the alphabet, and I would like to ask the members to start at the end of the list and select their members." (Laughter). Mr. Wickson thanked Mr. Gregg for what he had said, but stated he did not feel able to fulfill the obligations required of a member of Council, and that was why he wished his name taken off.

Mr. Burke pointed out that one out-of-town member had retired, and wished this borne in mind when selecting new members.

Mr. W. R. Gregg drew attention to the fact that it was necessary to have six men in attendance to carry on the business, that some of the city men were almost sure to be absent, that Mr. Munro, of Hamilton, was on the Council already, and that it would be well to have enough men from the city so that the Council meetings might not be delayed by having to telephone around trying to hunt up enough members to make the required six.

Mr. Saunders and Mr. Kay were then appointed as scrutineers.

Mr. Wright: Mr. President and gentlemen, if I am in order, we have met with a great deal of pleasure during this convention, and I think that we should recognize the fact that it is due very largely to the efforts of our retiring Council, and to our President, Mr. Helliwell, that they have thrown a great deal of personal influence into the preparation for this Convention, and that this is the culmination of a faithful year's work. I think that our retiring Council and our President have certainly fulfilled all the requirements. I think they have, during the year, devoted very successfully a considerable amount of time as well as of energy in promoting and developing that feature of our work which is bound to lead to a successful issue, the

educational influence, the educational policy of this Association. And personally I feel greatly indebted to the members of this Council for the personal assistance and inspiration I have received directly through their efforts in bringing to this Association Prof. Capper of McGill University, and Prof. Laird of Pennsylvania University.

It is therefore with a great deal of pleasure that I move that a hearty vote of thanks from this Association be tendered to President Helliwell and to the past year's Council. (Loud clapping.)

Mr. Denison seconded the vote of thanks, which was carried with applause.

Mr. Wickson: I move that a vote of thanks be tendered to the Registrar. As you all know the honorarium which he receives for his work is merely an honorarium for the time and labor that he has put into it.

Mr. Burke: I have great pleasure Mr. Chairman, in seconding that motion. Mr. Gregg has performed an enormous amount of work for the Association.

Mr. Helliwell: The hearty thanks of the Association are due and are hereby tendered to the Registrar. (Applause.)

Mr. Gregg in replying suggested that Mr. Helliwell in presenting the vote of thanks to him was getting out of making a speech himself.

Mr. Helliwell: As far as the efforts of the Council are concerned, I can say the committees have done their work. The committees deserve recognition of the work, and a great deal of work has been done this year. I would just like to say in retiring, that I cannot find words to express my appreciation of the honor which the Association has given me in placing me in this position, and I hope that the Association may go on and prosper more and more as time goes by.

The scrutineers having counted the ballots; Messrs. Wright, Symons, and Denison were found to have the majority of votes.

Messrs. Bishop and Gemmell were reappointed auditors, and the meeting closed.

#### ELECTION OF OFFICERS.

At a meeting of the Council, held at the close of the convention, the following officers and committees for 1902 were chosen:

President, W. A. Langton, Toronto; First Vice-President, John A. Pearson; Second Vice-President, Geo. W. Gouinlock; Treasurer, W. L. Symons; Registrar, Wm. R. Gregg.

Council—Lawrence Monro, A. H. Gregg, Edmund Burke, C. H. C. Wright and A. R. Denison.

Board of Examiners—Prof. Galbraith, Chairman; C. H. C. Wright, S. G. Curry, R. J. Edwards, W. R. Gregg, Grant Helliwell, Edmund Burke, J. Wilson Gray and S. H. Townsend.

Monthly Meetings Committee—E. Burke, Chairman; John A. Pearson, F. S. Baker and S. H. Townsend.

Rooms Committee—John Gemmell, Chairman; S. H. Townsend.

Library Committee—A. H. Gregg, Chairman; W. A. Langton.

Editing Committee—W. A. Langton, Chairman; F. S. Baker, M. B. Aylsworth, C. H. C. Wright.

Patrons of Studio Work—W. P. Over, Chairman; F. Darling, John Gemmell, W. A. Langton and W. L. Symons.

Educational Committee—Prof. C. H. C. Wright, Chairman; A. H. Gregg, W. L. Symons, S. H. Townsend, A. F. Wickson and A. R. Denison.

City Building Laws Committee—Geo. W. Gouinlock, Chairman; Edmund Burke, A. R. Denison, J. Wilson Gray and J. A. Pearson.

Legislative Committee—W. A. Langton, Chairman; J. A. Pearson, Geo. W. Gouinlock and C. J. Gibson.

R. I. B. A. Examiners—S. H. Townsend and W. A. Langton.



## UNIVERSITY TRAINING IN ARCHITECTURE.\*

By PROF. S. H. CAPPER, McGill University, Montreal.

There are various architectural topics that are the subject of perennial discussion, according as one's view leans, with natural bias, to one side or another in matters essentially many-sided.

"Whether architecture is a profession or an art?" is such a topic; upon its discussion—nay, controversy, both bitter and prolonged, has raged interminably; and, in England at any rate, even serious division of council has resulted, with somewhat dissipated energy and hampered action for a time as a natural consequence.

Closely allied is the question of the proper training for an architect during his period of preliminary studentship;—what course will best fit him to do his best? It is a question, I venture to think, of somewhat vital concern to us in Canada. At present, as a people, we are neither very wealthy nor very powerful; we have not yet worked out our scheme of national education at all completely; it is not yet established, as it should be, broad and harmonious, on really national lines; on the contrary, to one coming but newly from Europe, it seems in too many ways seriously provincial in spirit and narrow in result. On the other hand we have across the border-line a great nation for our neighbour, both powerful and wealthy, eager and resolute, and bent, it seems to me, on solving the problem of how to place the maximum of education and special training within reach of all. Those visitors to our meeting who have honoured us by coming from across the border, and whom we all most cordially and gladly welcome here to-day, will not, I am sure, misunderstand me, when I urge the need for our doing our uttermost, in honourable, friendly rivalry, to maintain our own position worthily alongside our greater neighbour and to strengthen our determination not to be out-distanced in that race, the goal of which is national life lived worthily, and the highest development of the intellectual life of all.

In Toronto and in Montreal we have now in Canada two schools for the training of architects. Of the former I naturally do not venture to speak in detail, standing in the presence of many who know it well and can speak with an authority in regard to it that I cannot claim. But I do not doubt that I am right at any rate in this, that in both we are still at the stage of "missionary effort" in our endeavour to promote the thorough training of young architects in the Dominion. Too often our voices are but as those of one crying in the wilderness, where there are none that listen and whence architects do not come forth. In Toronto I do not know exactly how the matter stands at present, but in Montreal, during the five years that I have been at McGill University, encouragement and discouragement have been fairly evenly commingled. Personally, however, I have had the deeply interesting experience of organizing from the beginning and planning out the lines of development for what will, I trust, prove a sound and stimulating school of training in architecture on broad university lines of education.

In so many-sided a field as architecture, which is, it seems to me, an art and a profession, both, and (perhaps) something more besides, there is room for many kinds of activity and many types of mind. To one the solution of problems of construction, with the extraordinary wealth of mechanical resource at the disposal of the modern constructor, is the side of architecture that appeals most strongly; to another, it may be rather the problems of social interest, the housing of the poor, the proper provision for the care of the sick in hospitals, or even the progress of sanitation and the realization of its laws and their requirements; to some it is the nice adjustment of plan and interior arrangement; to others it is the wider field of the composition and design of buildings as a whole and the joy of seeing thoughts take concrete form, as they are realized in actual execution.

It is significant, this many-sidedness of architecture, and justifies in a measure its claim to be at once the broadest of the arts and the foundation of the rest. It brings the architect into touch directly with almost all the other arts, professions and handicrafts, from sculpture and painting to law and medicine and to industries of very many sorts.

And the training for the architect must be broad to correspond, if he is to be adequately fitted for his work. It cannot, of course, prepare him to the extent of endowing him with all the knowledge in all the branches that he may, in the course of his practice, require to master and make use of; that is out of the question; but it should lay the foundation for such acquirement by training the mind to grasp readily the dominant factors in the problems that ask for their solution in well-balanced and harmonious architectural design.

Of the many and varied qualifications that go to make the successful architect in practice, some are of the distinctly practical type, such as business aptitude, faculty of organization and attention to practical detail, while others are as distinctly of the theoretical and academic type; most notably is this true of power in design. Between the two comes construction and engineering, leaning now to the more practical, now to the more academic side, according as it is the more ordinary, rough-and-ready, customary building, or the altogether higher work in calculation and design of the scientific constructional engineer. That this last requires mathematical and scientific training, and is a fitting subject for university instruction, surely needs no argument or proof. The enormous advances made in but recent years in modern steel-construction especially are, I suppose, for the most part the direct result of such scientific study and research. But, if we accept this main rough division into the two

sides, the practical and the academic, for the former class let it be at once conceded that the best preparation is the actual stress of daily work at the office desk and the experience that is only to be gained by study at first hand in closest touch with buildings in course of actual execution. Nothing can ever take the place of such practical training, which must always remain an absolutely essential part of the preliminary equipment of an architect. No plea for academic education is ever intended to lose sight of this; nor is it the case that for this practical training academic education is either specially adapted or required. But, while those who urge so strongly that your architect must be "a practical man" are not at all beside the mark, that contention by no means covers the whole of the ground of an architect's education; it does not touch what is after all, if I may be allowed the phrase, the truly architectural side of architecture.

It is doubtless in the ordinary relations of life—though I am not quite sure that I ought to qualify the relations of architect and client as always "ordinary"—a matter of great personal convenience to be on this eminently practical footing, obviating friction and promoting smoothness that may almost be prosaic. Heaven forbid that I should not fully endorse the eminent desirability of being "a practical man."

Even the staunchest advocates of practicality, however, will admit that a great monument of architecture is not to be measured ultimately by the business capacity of its designer, but by some other and higher quality altogether. Jacopo Sansovino is said to have miscalculated the roof for the famous library of St. Mark's at Venice, and to have spent a time in jail as the result. While languishing there he doubtless came to hold a very exalted appreciation of the practical advantages to an architect of being practical; but we, and the many thousand travellers who know nothing, perhaps, of Sansovino's piteous time of incarceration, for whom the library of St. Mark's is one of the buildings that make the Renaissance architecture of Venice so fruitful and delightful a study, are apt to think less of the "practical man" than of the brilliant artist and designer, who has left us so impressive a monument of his genius and skill.

The pre-eminent quality of architecture is in truth design, and this power of design is the vital touchstone of the greatness of an architect. It is in virtue of design and composition that the great buildings of the past, differing utterly, it may be, in point of architectural style, yet, one and all, appeal to us in varying degree. Historical associations may, of course, affect us greatly; other considerations, too, may have to be allowed for in our appreciation; yet architecturally appraised all buildings owe their fame, in chiefest measure, to this power of composition and design. The same is true of our modern work. It stands to reason, therefore, that anything that will foster and quicken power of design must tend to the best equipment of an architect for his life's work.

For design, I venture to claim that academic training is the surest road for most, at any rate, to the achievement of success; that in no other way can the student readily obtain the grasp of the subject, the breadth of view, necessary to attain to the best use of the power that may be his. Design is the expression given to a building; if consistent, convincing and harmonious, the building will have dignity and the incomparable quality of Style. Slipshod designing will mar any building and make it commonplace and lacking in distinction. With design, then, the architectural student's preparation should begin, and with design it should continue to the end, not (of course) to the exclusion of other necessary studies, but in conjunction with them. Design, it seems to me, should form the basis, the backbone (so to speak), of his course of study from the earliest moment possible, and around it the rest of his subjects should, so far as possible, be grouped. And I base my plea for university training for architects precisely on the ground of the pre-eminent importance of training in design and upon the special facilities a university course affords for carrying out such training consistently in fullest measure.

Nay, I do not hesitate to go still further and to argue that the chief objection usually urged against academic preparation for professional life, the objection, namely, that it is "unpractical," is not in itself a disadvantage in this particular connection. In studying out an architectural design, in developing his ideas so as to bring out of them the best result he can, the student must, at the outset, at any rate, be left as little hampered as possible by fettering limitations, such as economy of cost, restrictions and inconveniences of site, etc. The object of his study is to teach him to think architecturally and to express his thoughts suitably and with grace of diction in the language of his art; to mould them into forms that shall be purposeful and fitting as well as beautiful and gracious.

It is by no means an easy alphabet to learn; like any other language, if I may pursue the metaphor, it takes long to master; it means no short apprenticeship in grammar and expression; for the artistic faculties are slow of development sometimes and always require careful, even toilsome, training. My contention is that for such training no preparation, as a general rule, is more apt or better than that provided by an university course of education. It can offer a well-arranged and systematic scheme of education, such as cannot readily be equalled by any other training. Moreover, it can and does most especially develop the study of design, that being precisely the side of architecture that most lends itself to academic teaching; it thus lays special stress on what, in my view, is the central subject, the foundation of the whole, while it is precisely the subject most difficult of adequate and serious study under ordinary conditions, apart from such a systematic course. It cannot be acquired in ordinary office

\* Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902.



training, where a student, be he never so willing, can at best but "pick up" desultory fragments of the subject. In a busy office each assistant is bound to have his special work allotted to him, without reference to his own requirements as a student; or, if he be a beginner, all around him are too anxious to have him show that he can be of some use to them, to think of his own immediate studies as the matter of first importance to himself. Travel and study are an alternative, but I do not think they are of the most effective service till a student has both learned what to see and how to see it; and both these require the previous training which systematic study of design can best give.

As against this academic instruction, it has been urged that such a course of training will stifle genius—a charge which need not, I think, be very seriously refuted; no sincere education can so fail of its primary object, namely, to "draw out" the faculties and develop them, as to succeed in stifling the superior powers that we call genius—and, secondly, that it will tend to create a dead level of correct mediocrity, dull and wholly lacking the freshness of untrained spontaneity. This, too, appears to me hardly to need refuting. The efforts of untrained spontaneity are not generally, I fear, much more successful in design than in painting or in sculpture; in architecture they too often lead to a wholly unregenerate straining after originality, that appeals successfully neither to reason nor to good taste. And academic training fully justifies itself, if it succeeds in making mediocrity less wayward, controlling its vagaries, and sparing us those frantic abortions in design that remain a lasting instrument—potent for evil—in vitiating public taste.

I would not be thought for a moment to speak slightly of originality; no gift can be more precious. But originality in architecture is not to be attained through the medium of blatant disregard of accepted forms of architectural expression. It is rather, it seems to me, to be attained more modestly, by absolute sincerity in design, coupled with, or rather dominated by, that rare gift, the imaginative power that naturally expresses itself in form or composition that is beautiful, not ugly. The French use the phrase "voir en beau" or "en laid," to express this faculty, or its opposite. One man will "see," or realize to himself, a design under a form that naturally lends itself to beauty of line or mass or composition; in the hands of another, on the contrary, the same idea will be embodied under forms that are less pleasing, artistically not satisfying. But I cannot think that the former will risk any loss to this admirable faculty, if he seek to educate his powers along the lines I have endeavored to suggest; while the latter may at least have the asperities of diction modified by familiarity with established and well accepted forms.

Perhaps few great architects have shown more striking originality in design than Sir Christopher Wren, in the wonderful series of churches with which he enriched London during nearly half a century after the great fire of 1666. Of them all the great cathedral of St. Paul's is assuredly his master-piece, I suppose the most beautiful and imposing church that the Protestant faith has raised. Yet, in its final form, it is a triumph of academic discipline over daring, but not successful, amateurish spontaneity. Those of you who are familiar with the design as originally approved—in King Charles I's warrant, it is declared to be "very artificial, proper, and useful"—will recall the really grotesque design for the central dome. "A nightmare conception," it has been called, "of two domes and a telescope steeple". It is even surpassed in grotesque extravagance by an earlier scheme of Wren's for the reconstruction of Old St. Paul's, in which a dome was to be "surmounted by a huge open-work pine-apple, 68 feet high, of monstrous and horrible design". Yet the dome of St. Paul's, as actually erected, is one of the most beautiful in existence, its most conspicuous characteristic being, as has well been said, "its magnificent sanity."

The reason for this astounding aberration of England's greatest architect is, probably, simply the lack of academic training. Wren entered upon the practice of architecture as an amateur, and, genius though he was, he never wholly overcame this lack of preparation for his great career; in St. Paul's itself, for which the long series of London churches was Wren's very wonderful preliminary study-ground, there are still minor blemishes in spite of years of patient study—it is idle to deny them—that seem only the result of this want of training in classical design.

Originality does not then, I take it, imply departure from traditional forms in architecture so much as honest, unaffected and gracious use of them in sincere application to the requirements of modern building. Hence it is said that I do not give my adhesion to those who would try to cut themselves adrift from the architecture of past times in order to be "modern." Not from ignorance, but from full and critical knowledge of the past can we create a tradition for the present.

It is idle to seek to evoke a "modern style" in the sense in which "Gothic" or "French Renaissance" were styles at different periods of French architectural history, when builders—both designers and workmen—were all familiar with certain current forms and methods and were restricted to these alone. With our immensely fuller knowledge, we cannot be so restricted, if we would. We can express ourselves in many ways in solution of the same problem, whereas in earlier times one, current, way only of expression was known and, therefore, consistently practiced. And modern architecture gains in this immensely fuller vocabulary, so to speak, if wisely, not extravagantly, used.

The historical study of architecture consequently forms the natural basis for architectural design. Only by knowing the best that has been done can we do the best that can be done to-day. Study of architecture in the past should not, if rightly guided, lead to mere archæological copying or repetition in our work to-

day; but it should, if its lessons are properly learned and its teaching taken truly as our inspiration, bring home to us the best that the past has done and set before us an ideal that will serve us as both a standard and stimulus to solve our modern problems as honestly and well. Only out of full and loyal knowledge of past tradition can we to-day hope to achieve in our work results that will be as true and as expressive of our modern life.

In the course in architecture which I have had the privilege of planning out and developing at McGill University, I have sought to give effect to this conception. The full curriculum embraces four years, of which the first is preliminary, devoted chiefly to Mathematics, Physical Science and Drawing, with the very useful addition of practical instruction in the workshops, designed to impart some knowledge of the nature of materials of construction, to familiarize the student with the more important tools, and to give him some manual skill in their use. Only in the second year is the more special work in the different departments of architecture and engineering begun with us.

I need not dwell upon all of the work in detail; I apologize for intruding myself upon you in this direct way. I desire only to emphasize the main conception that has guided me in the organization of the architectural course.

In the first of the three remaining years the teaching is chiefly devoted to a rapid survey of architectural history from ancient Egyptian to modern times, touching successively upon the great eras of European civilization and tracing the evolution of architectural styles in their constructional forms and methods.

The student is thus placed in touch, so far as may be, with the broad lines of his subject, and the present is linked with the past in continuous development. This, it seems to me, should have an important influence on the student's attitude; for, fascinating though the archæological side of architecture may be, it is not as archæology but as architecture that the modern student should regard it.

In conjunction with these historical lectures, a course on the elements of effect in architecture and the main principles underlying the two great divisions of architectural style, the classic and the gothic, naturally, I think, arises; for want of a better name I have called it Elements of Architecture. And from the first, so soon as the student has acquired a little familiarity with the more obvious means of architectural expression, such as the Classical Orders, (which remain, I think, the best primer, so to speak, the most reasonable and effective introduction to architectural form), he is set to express himself in elementary design of plan and building.

In the next year the historical course is devoted to a study in detail of the architecture of the Renaissance down to modern times, in amplification of the earlier general course, while both third and fourth year students take together the more special courses. These comprise detailed study of ecclesiastical, domestic and public architecture, the lectures still dealing with the historic evolution of architectural styles and with the problems and requirements of modern work. A course is also given upon general art history, so as to place the architectural student in touch not only with the decorative details of the different styles of architecture, but also with contemporary forms in other branches of art, especially the decorative arts employed in building.

I have only mentioned the subjects bearing on design, as the central theme round which, in my opinion, architectural study can best be developed in an university course. I have perhaps spoken at too great length already of the work of my own department at McGill University; if so, I again apologize. But I have said scarcely anything of that other side of architecture, construction, for which the scientific training of an university course offers very direct and effective preparation. For modern construction in its more recent progress touches engineering in its completeness of calculation and in its accuracy of design. And again let me guard against the charge of disregarding the practical training needed.

In an university course it is not possible, nor is it attempted, to supersede that side of training for professional practice which is only fully to be gained by practical employment in office and on works. This, the more business side of professional work, must always be learned in actual employment under the conditions obtaining in everyday life. And such practical knowledge of the work before him should, whenever possible, be acquired by the student concurrently with the higher training the university offers, by seeking, during his free months, employment in connection with works in operation or in progress of execution.

This training is manifestly of the greatest importance for the complete equipment of the student. But, necessary as this practical training is, an university course can and does provide for something more, for a thorough grounding in the principles upon which professional practice is ultimately based, an education which can hardly ever be otherwise at all adequately acquired but which, though too often lacking, is essential for attaining the best and highest work in architecture. In design and composition—the key note of the art of architecture—success depends for the most part on the due training of the critical aesthetic faculties; and for such training the education offered in an university course is very directly and specially adapted; for most, the surest; for many, the only road.

I have limited this paper to the consideration of but one side of academic education; I have had but time to mention the other, the training on the mathematical and engineering side which is so important a factor in the modern very wonderful development of constructional engineering; the consideration of



this, of course, should have, to do it justice, separate treatment at hands more competent than mine; nor have I ventured into the wider domain of the consideration of general university education, and its power to develop and broaden on harmonious lines the intellectual gifts and sympathies, and to quicken the mental life and strengthen its fibre. All that is beyond the scope of such a paper as mine to-day, which has already detained you, perhaps, too long.

Let me conclude, having thus in a sentence suggested these wider bearings of my subject, with a quotation from one of Oxford's greatest sons which sums this up in words far more eloquent than mine: "A university training is the great but ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power and refining the intercourse of private life." Is there any one of these great ends that should not be also the goal of our profession, the aspiration of us all as architects?

Mr. Gouinlock: I am sure we have all listened with a great deal of pleasure to the instructive paper given us by Professor Capper of McGill University. I heartily approve of the wisdom of the Association in inviting Professor Capper to give us a paper, which I am sure will stimulate the student and the profession at large. I have much pleasure in moving a vote of thanks to Professor Capper for his very able paper.

The motion was seconded by Mr. Denison and carried.

Principal Hutton, of the University of Toronto, who was in the audience, after expressing the pleasure of the outsiders who had come to listen to Professor Capper's address said: Professor Capper said that he would not refer to the advantages that Toronto University offers for the study of architecture because we all knew them so well, but I should like to tell Professor Capper that one of the advantages for the study of architecture is unique. As Mr. Blake said many years ago "the government put up the University Building to show the public how to build, and in case the public would not then know to build, they later put up the School of Practical Science to show the public how not to build. (Laughter.) Speaking as an outsider again, I cannot help feeling that the practical side of architecture occasionally needs some little consideration. I have heard my friends tell of an architect who requiring to put a register into a bed room could not find any place where it could be put but under the bed. (Laughter.) I have also heard it said that the Society of Architects would not be perfect until they had thrown their doors open to women. I am really a little surprised not to see any here to-day, (cries of "O no," laughter.) I know there are a large number of ladies who are very anxious to show how they can build, and I am sure that women would see that plenty of pantries were put in a house, and that a window would not be put in where it would be impossible to get at it.

Professor Capper: Had the architect who built a house with a bed room in it in which you could not place a bed, an academic training?

Principal Hutton: I believe this particular architect had not an academic training. Those who suffered from his ministrations would probably be strong supporters of Professor Capper's views; but I am inclined to think that the part of Professor Capper's paper which would interest them most would be the account of Sansovino's misadventure. They would look back with regret to a time when, if an architect proved incapable, the municipal authorities were able and willing—to clap him into jail. (Laughter.)

Mr. Wright: Mr. chairman and gentlemen, I for one would like to add the expression of my appreciation of the paper which we have just heard from Professor Capper. He has covered the ground very completely, classifying the work of the student under satisfactory heads. The paper deals principally with the questions of design and scientific construction as they should be taught in our universities, while leaving the practical application to be studied by work in an office. If Professor Capper will glance

through the course as laid out by this Association, he will see that we have taken very much the same view of the subject as he has. Our Association during the past year has done a good work in organizing this course, and it will do a much better work if it succeeds in carrying it out. The difficulty which we have had in forwarding the purpose of this Association throughout the province is that in the matter of the study of professional work the young men have been beginning in the wrong way. The mistake I think is in the admission of students to professional work; they have in the past been admitted too early in life and at too low a stage in their education. It has been the effort of the Association to raise that standard and it is to be hoped that their efforts will meet with success. The difficulty as far as the younger member is concerned is not so apparent to him at the time of registration, but it becomes more apparent when he comes to practice, and in the matter of guidance in this respect we have in the past not done our duty—if we have failed to require from our applicants a rigid fulfilment of the conditions necessary to qualify as students of the Association.

Mr. Hynes: (visiting member of 18 Club). It seems a unanimous opinion that a university education is desirable for an architectural student, and the question is, how are we to get the students to take advantage of this course. I think perhaps in Mr. Wickson's report there is something that is antagonizing the idea of the University course. That is the apprenticeship system. It is very hard to tie a man to two things. I think that persons who have a little money they wish to dispose of might establish two or three scholarships for the students to strive for in the University, which I think might induce students to take this course.

Mr. Symons: I should like to say a few words with reference to our educational committee. I think Professor Capper said that after all it was the design that gained distinction for an architect, and we give comparatively little credit to the man who has constructed the building in comparison to that given the man who has designed it. I think that we all agree that the men who have reached the highest stage in architecture have reached their height by their distinction in design. My own feeling has been for years that efficiency in design can only be obtained by academic training, by being thoroughly trained for that work, learning the A, B, C of the Orders and so on till we learn to design truly and well. Some people have asked me, what would you recommend to a young man as a course of training in architecture? Now-a-days we certainly make the answer that we can recommend a university training. And though it is sometimes hard for some of us to say whether it is the best, yet the longer I live I am the more ready to say it is the best, and I do not think we are dealing fairly with those who come asking admission to our offices in taking them in. We must be very careful that we are not sacrificing their interests simply to gratify our own pockets, to get them to do our work. Those of us who have gone through what we have, and in whose younger days there was not the chance of these days, must confess that our lacking is wholly I might say on account of our not having had the chances of academic training. (Applause).

Mr. Burke: Mr. President, I have great pleasure in adding my word of testimony as to our appreciation of the paper we have had from Professor Capper. Mr. Symons has touched on the difficult point with reference to architectural education, in Ontario at any rate—the tendency of students to enter an office without or before taking a proper architectural course in the School of Science. That tendency or custom can only be remedied by the architects refusing to take students who have not taken this course. The portion of our work to which Mr. Hynes referred in Mr. Wickson's report, is simply a method of getting over the difficulty with men who are now students; we feel that they should have some advantages, and it is for their benefit that arrangements have been made whereby they may have about seven hours per week at the School for lectures



on the scientific courses in connection with the Association curriculum.

Mr. Langton: Professor Capper's paper has the evangelistic quality which is most valuable in a lecture or paper. One cannot, in the short time that can be occupied by a paper, do much definite teaching, but one can stir up a spirit that will forward the end in view in delivering the paper; and this I think Professor Capper has done. There few of us I fancy who have reached, or are approaching middle age, who do not at this moment regret that the present advantages for students did not exist in our time and that we must be content with being—architects like Wren. (Laughter). The first necessity for architecture now-a-days is training. In the old days architecture was a craft. The architectural conception was common property; and to carry it out in individual cases, all the designer required was to know the grammar of its detail. The case is different now. The number of different works comprised requires a scientific training and the architectural problem is an open one, to be solved only by a mind cultivated to flexibility by exercise in the fields of thought of all generations of architects. Nothing can accomplish this training but long, continuous and practical study. That is the reason for the stand the Association takes. That is the reason for the apprenticeship system. One learns to play the flute by playing the flute. Students don't know that so much education is necessary and that so long a practical training is necessary. They see people set up as architects without it and they think they can do the same. But we know it, and it is our duty to students to lead them, not perhaps as they want to go, but as they ought to go. We have improved our curriculum and our methods. We have taken in good part all the advice the Eighteen Club, as representing youth and modern thought, gave us. We have rooms and facilities. We only want students. We have not got the students we ought to have and I am afraid in some cases they are being kept from us. I think this ought not to be the case. The architect, of whom Professor Hutton spoke, who put a bed over a register and windows in out-of-the-way places, was not an architect in the true sense of the term—in so far as he did these things. I think also that the case of Sansovino's roof is exceptional. It is a commonplace among architects that the architect who is an artist is also a good constructor. An architect is not a mere designer of exterior appearance. In my own mind I separate the word designer from the word architect. Architect is an inclusive term. The architect conceives the building as a whole. The plan is at the bottom of everything and a plan is not a plan that is not conceived of as a thing to be built. The best architect is the best builder.

#### THE BEHAVIOUR OF STEEL UNDER STRESS.\*

By PROF. C. H. C. WRIGHT, School of Practical Science, Toronto.

While discussing with one of the members of the Council of this Association the results of certain experimental work of the post-graduate year at the School of Practical Science I was induced to promise a paper on the behavior of steel under stress and in its preparation I have kept in view the younger members and students of the Association.

Inasmuch as the use of steel has completely revolutionized methods of construction and plan, its effect should be and is apparent in the design, not however, to the extent the material deserves. It has been the custom for years to use rolled shapes, rivets, and joints of an engineering type partly because this branch of the work has been generally relegated to the engineer, and partly because most of the steel work is hidden. Is not much of it hidden because it is considered unsightly? Why should not the parts exposed to view be æsthetically treated and the shapes receive architectural attention.

It has always been considered necessary to study carefully the properties of other building materials. The successful treatment of granite shows boldness or vigor; marble, delicacy or refinement; sandstone, elaboration; terra-cotta, repetition, etc.

While steel has been used very largely during the last decade it will be used much more extensively in the immediate future. It becomes desirable that the members of our profession should, and imperative that the younger members shall, observe closely

\*Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902.

the peculiar properties and behavior of this important material in order that it may be treated satisfactorily in design as well as in construction. It ought not and cannot be left to the engineer.

Another difficulty that might be mentioned is the action of fire on steel. Serious as this difficulty is from the point of view of design, it must be met frankly and not forgotten that this very same property enables it to be rolled and worked into shapes economically.

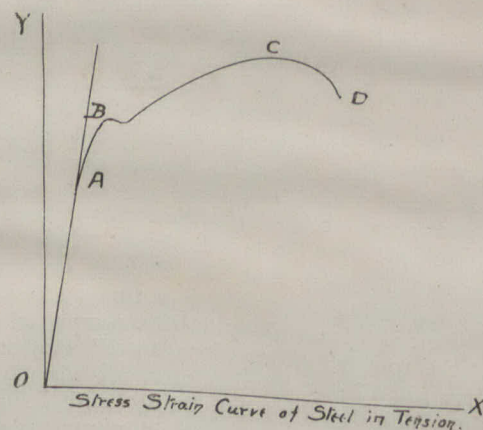
Interesting as this line of thought is, we must turn our attention to the more elementary stages and consider a few of the properties of steel.

Suppose a steel rod (usually 24" long) is placed in a testing machine and a load applied so as to produce tension in the rod. Now if measurements of the lengths of a part of the rod (usually 8") are made it will be found that for every load applied or stress there is a corresponding change in length, a deformation or strain. Further, that when the load is removed the rod will regain its original length.

There is a point however beyond which this is not true, or where the deformation or strain is not constant for equal increments of load or stress. Below this point steel is elastic, while beyond it is plastic. The point at which this change occurs is called the elastic limit. If however a piece of steel be stretched (strained) beyond the elastic limit, and the load removed, it will contract more or less but will not regain its original length.

The measurements of deformation or strain, which must be accurate to the nearest 1-10,000 of an inch, are made with an extensometer of which this Riehle Yale represents a very satisfactory type. As will readily be seen, the points of the screws which fasten it to the specimen are held rigidly 8" apart. After fastening it to the specimen, the bar connecting the two heads is removed, and the two micrometers read or set at zero (the contact being determined by the ringing of an electric bell on the closing of the circuit by the contact). A load is next applied to the specimen, and the micrometers again read, the difference between the two sets of readings, giving the deformation or strain corresponding to the load or stress. If the stress be doubled the micrometers will show that the strain has been doubled. As the stress is increased it will be found that equal increments of load will produce equal strains so long as the steel remains elastic, or in other words within the elastic limit.

If these measurements were continued and the resultant stress strain curve drawn, plotting the loads as vertical ordinates, and the strains as horizontal abscissa, it would resemble O A B C of the accompanying figure.



In the complete curve there are four significant points, viz., the true elastic limit, A; the apparent elastic limit, B; the ultimate strength, C; and the breaking point, D. From O to A the ratio of stress or strain or load to deformation is constant and the curve becomes a straight line. Between A and B the ratio of strain to stress increases slightly, while at B a very marked change takes place, hence the term "apparent elastic limit." Micrometer measurements of the length are not necessary to determine this point, and consequently it is widely used in commerce, and is often spoken of as "the commercial elastic limit," or often merely "elastic limit." Beyond the elastic limit the material continues to increase in length as additional loads are added until it reaches its ultimate strength, when it begins to fail. It no longer continues to support the load, but stretches under a decreasing load and finally separates under a greatly reduced one such as is indicated in our diagram by the point D.

Specimen No. 1 is a mild steel made by the open hearth process and gave the following results when tested in tension. The length of the specimen was 24 inches and its diameter 1".015. Punch marks one inch apart were made along the rod. The specimen was then placed in the testing machine and subjected to tension. The load was gradually applied and the material elongated uniformly for a time until it reached a point where it stretched under a constant load of 21,000 pounds, i. e. the commercial elastic limit of  $21,000 \div (1.015 \times 3.14159)$  i. e. 21,000 divided by the cross section of the rod or 27,200 pounds per square inch. The rod finally broke under a load of 37,700 pounds or of  $37,700 \div (1.015 \times 3.14159)$  or 47,200 pounds per square inch of its original cross-sectional area. On measuring the distance between two of the punch marks originally 8" apart (4 on each side of the break), it was found to be 11.08" long, i. e. the



steel had an elongation in 8" of 38.5%. Collecting we have :—

Commercial elastic limit . . . . . 27,200 lbs. per sq. in.  
 Ultimate strength . . . . . 47,200 " "  
 Elongation in 8 inches . . . . . 38.5%

The following measurements made on this specimen will show perhaps more clearly the elasticity of the material.

Load in Pds.	Stress in Pounds per sq. inch.	Extensometer readings.	Deformation of Strain.
1,000	1237	8.0005	0.0005
2,000	2474	8.0009	.0004
3,000	3711	8.00125	.00035
4,000	4948	8.00160	.00035
5,000	6185	8.00195	.00035
6,000	7422	8.00225	.0003
7,000	8659	8.0026	.00035
8,000	9896	8.00295	.00035
9,000	11133	8.00325	.0003
10,000	12370	8.00355	.0003
11,000	13607	8.0039	.00035
12,000	14844	8.00425	.00035
13,000	16081	8.00455	.0003
14,000	17318	8.0049	.0003
15,000	18555	8.0052	.00035
16,000	19792	8.00555	.0003

On drawing this stress strain curve, plotting the stresses as vertical ordinates and the strains or deformations as horizontal abscissae we get the following diagram.

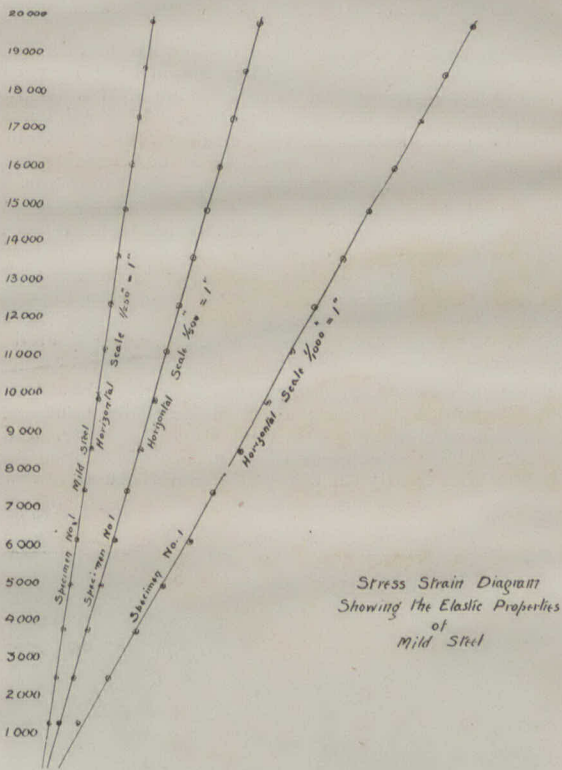


FIG. 1.

The complete stress strain curve is given in Fig. 2. Specimen No. 2 of Milo Steel, made by the open hearth process, gave the following results in tension:—

Length of specimen, . . . . . 24 inches.  
 Diameter of specimen, . . . . . 1.015 inches.  
 Apparent Elastic Limit, . . . . . 27,000 pounds per square inch.  
 Ultimate strength, . . . . . 47,500 pounds per square inch.  
 Elongation in 8 inches, . . . . . 38.0 %

Load.	Stress in Pounds per Square Inch.	Extensometer Readings	Elongation.
0	0	.27135	
1000	1237	.27185	.0005
2000	2474	.27235	.0010
3000	3711	.27265	.0013
4000	4948	.27290	.00155
5000	6185	.27325	.0019
6000	7422	.27355	.0022
7000	8659	.27395	.0026
8000	9896	.27430	.00295
9000	11133	.2746	.00325
10000	12370	.2749	.00355
11000	13607	.2753	.0039
12000	14844	.2756	.0043
13000	16081	.27585	.00455
14000	17318	.27655	.0049
15000	18555	.27655	.0052
16000	19792	.2769	.00555

Specimen No. 3 mild steel made by the Bessemer process gave the following results in tension :

Length of specimen . . . . . 24"  
 Diameter of " . . . . . 1.0155  
 Apparent elastic limit . . . . . 29,500 lbs. per sq. in.  
 Ultimate strength . . . . . 46,400 " "  
 Elongation in 8" . . . . . 40%

Load.	Stress in lbs. per sq. in.	Micrometer Readings.	Elongation.
		.5578	
1000	1229	.5581	.0003
2000	2457	.5586	.0008
3000	3685	.5591	.0013
4000	4914	.5595	.0017
5000	6145	.5599	.0021
6000	7371	.5602	.0024
7000	8600	.5606	.0028
8000	9828	.5609	.0031
9000	11050	.5612	.0034
10000	12290	.5616	.0038
11000	13510	.5620	.0042
12000	14740	.5624	.0046
13000	15970	.5627	.0049
14000	17200	.5629	.0051
15000	18430	.5632	.0054

Specimen No. 4 of machine steel gave the following results in tension :

Length of specimen . . . . . 24 inches  
 Diameter of specimen . . . . . 1.014  
 Apparent elastic limit . . . . .  
 Ultimate strength . . . . . 100,600  
 Elongation in 8 inches . . . . . 16 5/8%

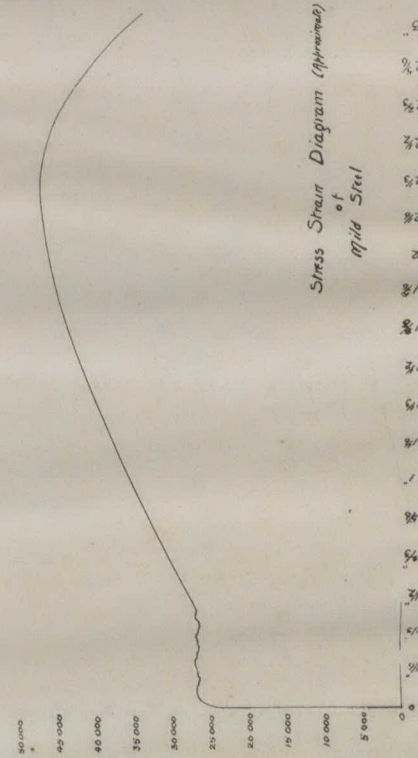


FIG. 2.

Load.	Stress in Pounds per Square Inch.	Extensometer Readings.	Elongation.
1,000	1273	.3837	.
2,000	2547	.3840	.0003
3,000	3820	.3844	.0007
4,000	5093	.3848	.0011
5,000	6366	.3852	.0015
6,000	7640	.3856	.0019
7,000	8913	.3860	.0023
8,000	10190	.3864	.0027
9,000	11460	.3868	.0031
10,000	12730	.3872	.0035
11,000	14010	.3876	.0039
12,000	15280	.3879	.0042
13,000	16550	.3883	.0046
14,000	17830	.3887	.0050
15,000	19100	.3890	.0053
16,000	20370	.3894	.0057
17,000	21640	.3897	.0060
18,000	22920	.3901	.0064
19,000	24190	.3904	.0067
20,000	25470	.3908	.0071

Figure 3 is the stress strain diagram of specimens Nos. 2, 3 and 4 within the elastic limit. Allowing for reasonable errors of observation the line joining the plotted points is a straight line showing conclusively that steel is within these limits perfectly elastic.

Before looking at the classification of steel let us examine very briefly its composition and process of manufacture. Cast iron as you will remember is a combination of from 2 to 6



per cent. of carbon with iron. The large amount of carbon determines its characteristic features or behavior. Wrought iron is the product resulting from the removal of carbon from cast iron. This leaves with the wrought iron such impurities as sulphur and phosphorous. When these are present in too large quantities they render the iron red short or cold short respectively.

Steel is a combination of iron with a percentage of carbon varying from minute quantities to as high as 2%. It is manufactured in the three following ways. viz.—1. By adding carbon to wrought iron—the product of such process being known as crucible steel. 2. By removing carbon from cast iron—the product of this process being known as Bessemer steel. 3. By melting together cast and wrought iron—the product of this process being known as open hearth steel.

Cast iron is hard and brittle and can be moulded, while wrought iron is soft and ductile and can be welded. Steel is unlike wrought iron in that it is fusible, and unlike cast iron it can be forged, and with the exception of high grades it can be welded. In addition to these advantages the higher grades can be hardened and tempered.

The term steel is applied to a class of materials which cover a very wide range of properties. One particular grade may be soft and ductile while another is quite hard and brittle. In ten-

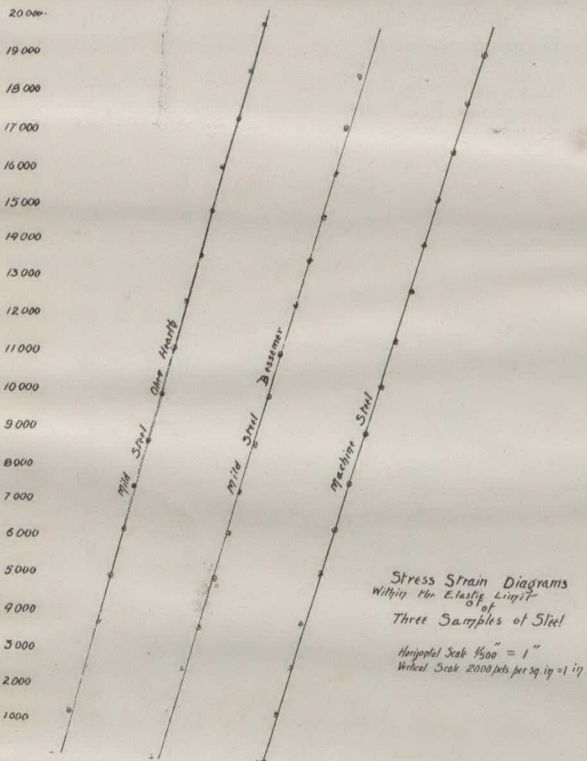


FIG. 3.

sile strength they may vary from 40,000 to 200,000 pounds per square inch.

It is now customary commercially to classify steels either according to their properties or uses. In the one group there is mild, medium or hard steel, while the other classification includes rivet steel, boiler plate, structural, machine, tool and spring steel, etc.

The following table gives a few of the characteristic physical properties of these different classes:—

Rivet steel should be ductile rather than strong and should have an ultimate strength of 40,000 to 55,000 pounds per square inch; elastic limit, 30,000 to 45,000 pounds per square inch; elongation in 8" = 25 to 35%.

Boiler plate—Ultimate strength 50,000 to 65,000 pounds per square inch; elastic limit, 30,000 to 45,000 pounds per square inch; elongation in 8" = 25 to 30%.

Structural steel—Mild, ultimate strength 40,000 to 55,000 pounds per square inch; elastic limit, 25,000 to 35,000 pounds per square inch; elongation in 8" = 25 to 35%.

Medium—Ultimate strength, 55,000 to 70,000 pounds per square inch; elastic limit, 35,000 to 45,000 pounds per square inch, elongation in 8" = 20 to 25%.

Machine steel—Ultimate strength, 80,000 to 110,000 pounds per square inch; elastic limit, 55,000 to 70,000 pounds per square inch; elongation in 8" = 20 to 25%.

Tool steel and spring steel—Ultimate strength, 120,000 to 200,000 pounds per square inch.

The standard specifications for structural steel proposed by a committee of the American Society of Civil Engineers in 1896 is as follows:

	Lbs. per sq. in.
" Tensile strength low steel	60,000 + 4,000
" " medium	65,000 + 4,000
" " high	70,000 + 4,000

Elastic limit 55% of the ultimate strength of the specimen.

$$\text{Per cent elongation in 8 in.} = \frac{1,500,000}{\text{Ultimate}}$$

$$\text{Per cent reduction of area} = \frac{2,800,000}{\text{Ultimate}}$$

Rivet steel when heated to a low cherry-red and quenched in water at 82° Fahr., must bend to close contact without sign of fracture. Specimens of low steel when treated and tested in the same manner must stand bending 180° to a curve whose inner radius is equal to the thickness of the specimen, without sign of fracture. Specimens of medium steel as cut from the bars or plates and without quenching must stand bending 180° to an inner radius of 1½ times the thickness of the specimen, without sign of fracture. While those of high steel also without quenching must stand bending 180° to a radius of twice the thickness of the specimen without sign of fracture."

In connection with the latter part of this specification the following test may be interesting and instructive.

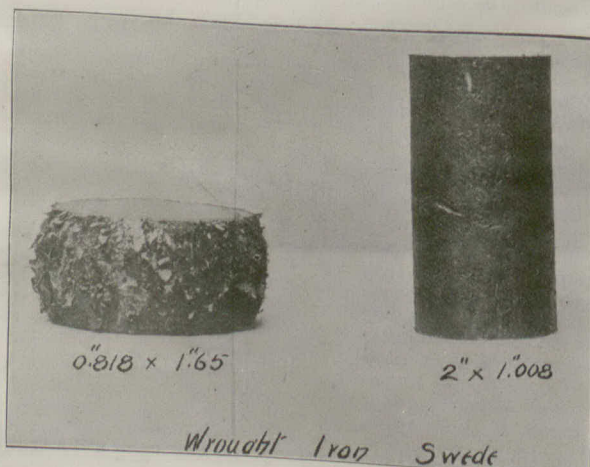
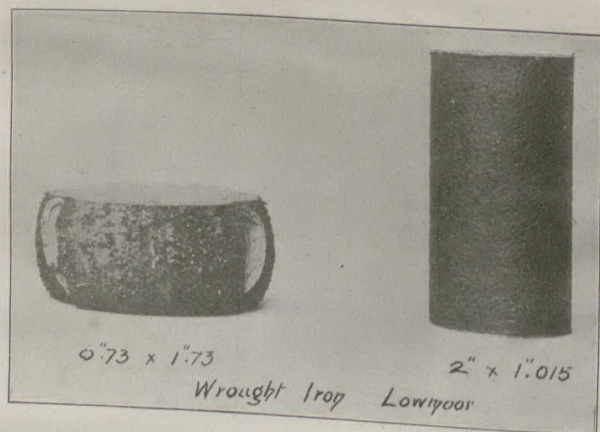
Two specimens, one of mild open hearth and the other of machine steel were heated to a cherry-red, quenched with water and tested with the following results:

	Ultimate strength pds. per sq. in.	Elastic limit pds. per sq. in.	Elongation in. 8"
Mild steel.....	17,200	27,200	38.5%
Mild steel hardened....	62,200	43,000	broke in strips
Machine steel.....	83,900	55,600	21%
do hardened.....	106,000	60,500	2%

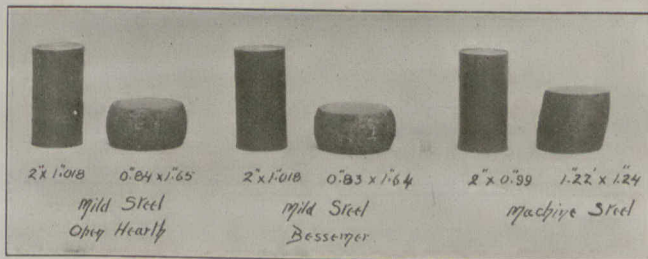
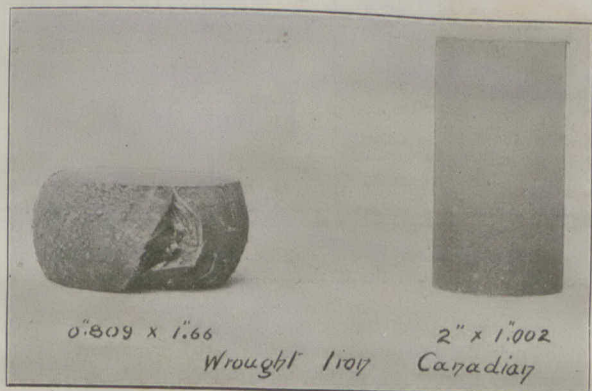
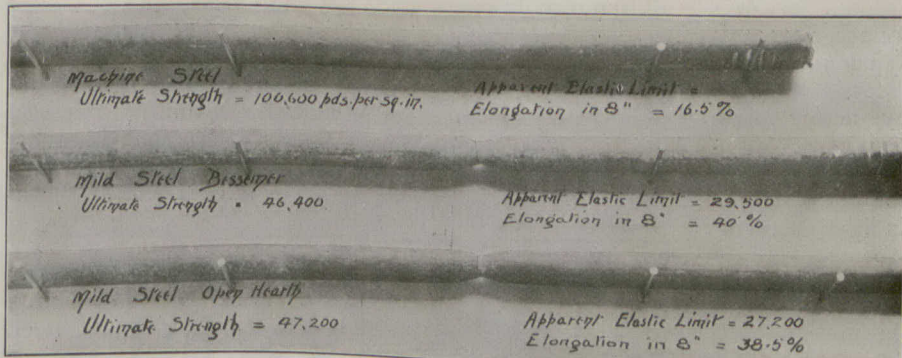
While almost every specification mentions maximum and minimum tensile strengths it is very seldom that mention is ever made of the compressive strength, although the material is used quite as frequently in compression as in tension. This is because the ultimate strength, elastic limit and deformation or strain are more readily determined in tension than in compression, and because the results in tension are the same as those in compression.

Under a uniformly increasing load steel in compression contracts uniformly within the elastic limit, which fortunately is the same as that for tension. When the load increases beyond the elastic limit the material simply spreads and increases the area of its cross-section indefinitely, so that in compression steel has no ultimate strength. This is well illustrated in the following specimens, originally 2 inches long, which were subjected to a load of 170,000 pounds each.

Specimens number 1, 2, and 3, are wrought iron, made in Sweden, England and Ontario respectively; while numbers 4, 5 and 6 are mild steel open hearth, mild steel Bessemer, and machine steel. Those specimens which are cracked open or are etched show very clearly the flow of the material under the stress.







The stress strain diagram for steel in compression when the stress is determined by dividing the load by the original cross-sectional area is as indicated in the annexed diagram, FIG. 4.

These compressive tests were made on a Riehle 200,000 pounds machine, and as the screws were kept running at a uniform rate, a set of readings of the times required to produce the stresses were registered on a chronograph simultaneously with the measurements of the deformation or strain. On plotting from these results the stress strain curve and the stress time curve, it is found that they were identical when the scales correspond.

Mr. Pearson: Whilst listening to Mr. Wright's very able paper, I have been brought to look upon the action of stress upon the elements that compose iron and steel in a different light from what I have hitherto regarded it. When such building materials as stone and wood are subjected to stress one can readily understand the action that takes place. In the first instance, when stone is subjected to pressure, the small molecules are disrupted from their setting in the basic cement and the material begins to fracture and crum-

ble away. In the case of wood, the fibres begin to slip past or tear apart from each other. Now, in the case of steel, if I understand Mr. Wright, this action is altogether different. When stress is applied the substance begins to flow. Perhaps I should not say altogether different, but the nature of the substance, as we conceive it is so very different from that of stone or wood, in that it is a more unified or compact mass, that the strain, the resultant of the stress, travels

through it, or is transmitted, or flows through it, more in unison with the inherent conditions that are generated by the stress. There is a something in the nature of steel, its elasticity, its plasticity, its resilience, its resistance, its recuperative powers, in that up to a certain point it will again assert itself, or assume

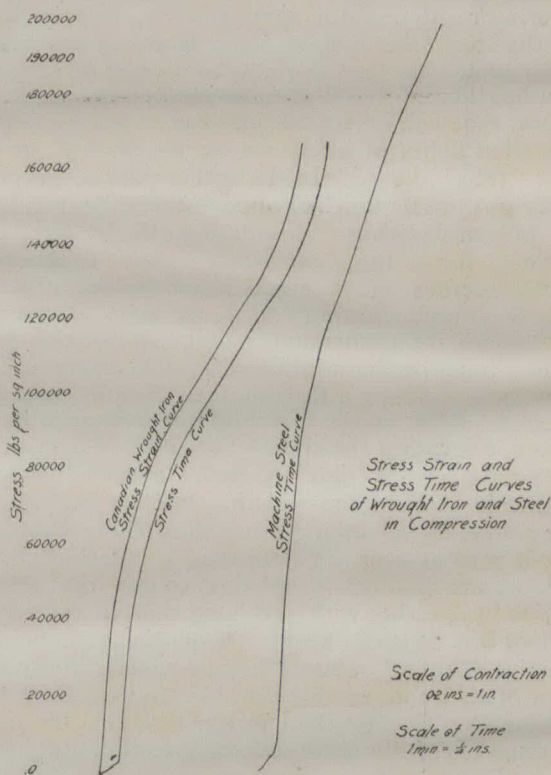


FIG. 4.

its normal condition—that, of all the materials we employ, places it in a class by itself. Now it is because of these integral qualities, that there is a greater unison, a closer affinity between the elements that compose steel and the conditions that arise when strain is present. What is this substance, what is—steel? We seem to know very little about it. We understand it to be composed of innumerable crystals, and these crystals, I suppose, are composed of atoms. Now, imagine a

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piece of steel under compression; the atoms or crystals that compose it begin to flow. Are these crystals of such hardness and density that they cannot assume another form and therefore must necessarily move around or upon each other, or do they adapt themselves to the conditions and elongate and compress inherently? What is this adhesive property that binds them together under stress, as the substance itself becomes more compact or elongated? Is it a cement? Is it the attraction of the atoms themselves? It seems to me we want to know more about the composition of steel, its simple elements and their properties, before we can understand the action of strain in the substance. It may be the association of ideas, but when Mr. Wright used the word flow, I immediately thought of liquids, (Laughter), and I think it would enable us to understand more clearly the action of stress on steel if we could conceive it as a rigid fluid. I would qualify the adjective to the extent of the action of stress upon steel; or, take a bar of soap and we can more readily understand this action of compression or elongation. Mr. Wright has shown us a number of tests with widely differing results, and in some cases by merely hardening the steel, the results vary from twenty-five to fifty per cent. He has carefully led us step by step into such a bewildering maze of tests and figures, and left us there, that I think we feel justified in asking him to tell us what factor of safety we are to employ in the future. (Hear, hear.) In the earlier part of his paper Mr. Wright briefly touched upon the architectural aspect of engineering, wondering if it were not possible for the architect to evolve an aesthetic section of a steel beam or column, exposing them and treating them as part of the design. There are tremendous possibilities in this proposition. Imagine the section of a steel beam in the Queen Anne style, or a Romanesque channel, and then think of it—think of the midnight oil consumed by the engineer in locating the elusive "moment of inertia" or the "radius of gyration" of such fantastic shapes! (Laughter). Until a fire-resisting steel is manufactured, or a steel of something more than the nondescript colour it is at present, a colour that is pleasing and integral, we are justified in painting to get the desired effect, or in covering with such materials as will protect it against fire. (Hear, hear). From the standpoint of economics, in that the shapes that are rolled are universal and are of such contour that they lend themselves readily for assembling, in that the effort is to obtain the greatest strength with the least area of cross-section, or un-

til that day dawneth when we shall view with a sense of exquisite pleasure the lines of a Z bar column, let us "rather bear the ills we have than fly to others we know not of." It is beyond question that the science of engineering has kept pace with the times, manfully meeting and solving the problems that the advancement of civilization unearthed, whilst its kindred profession has been content with the laurels gained in An-



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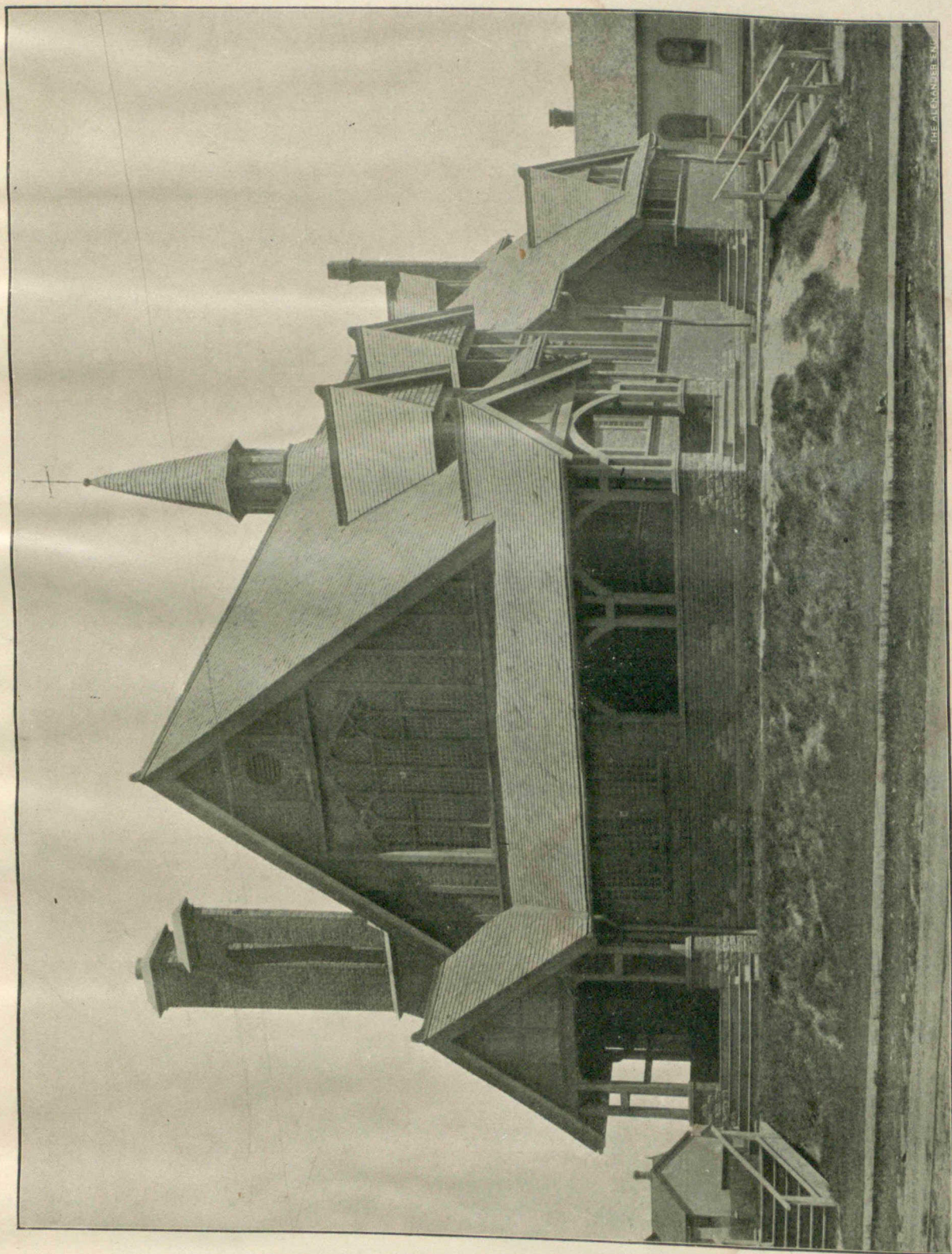
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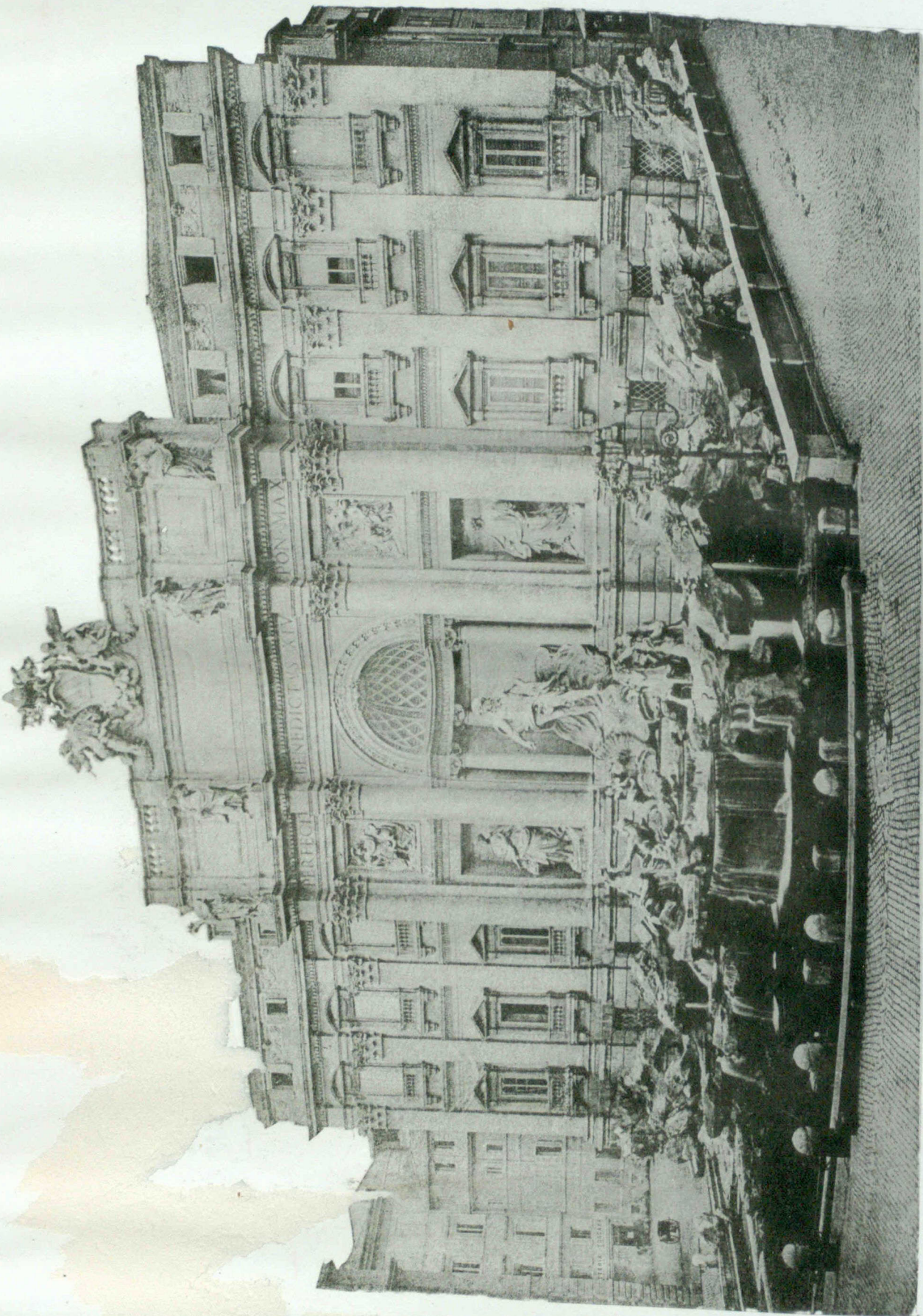
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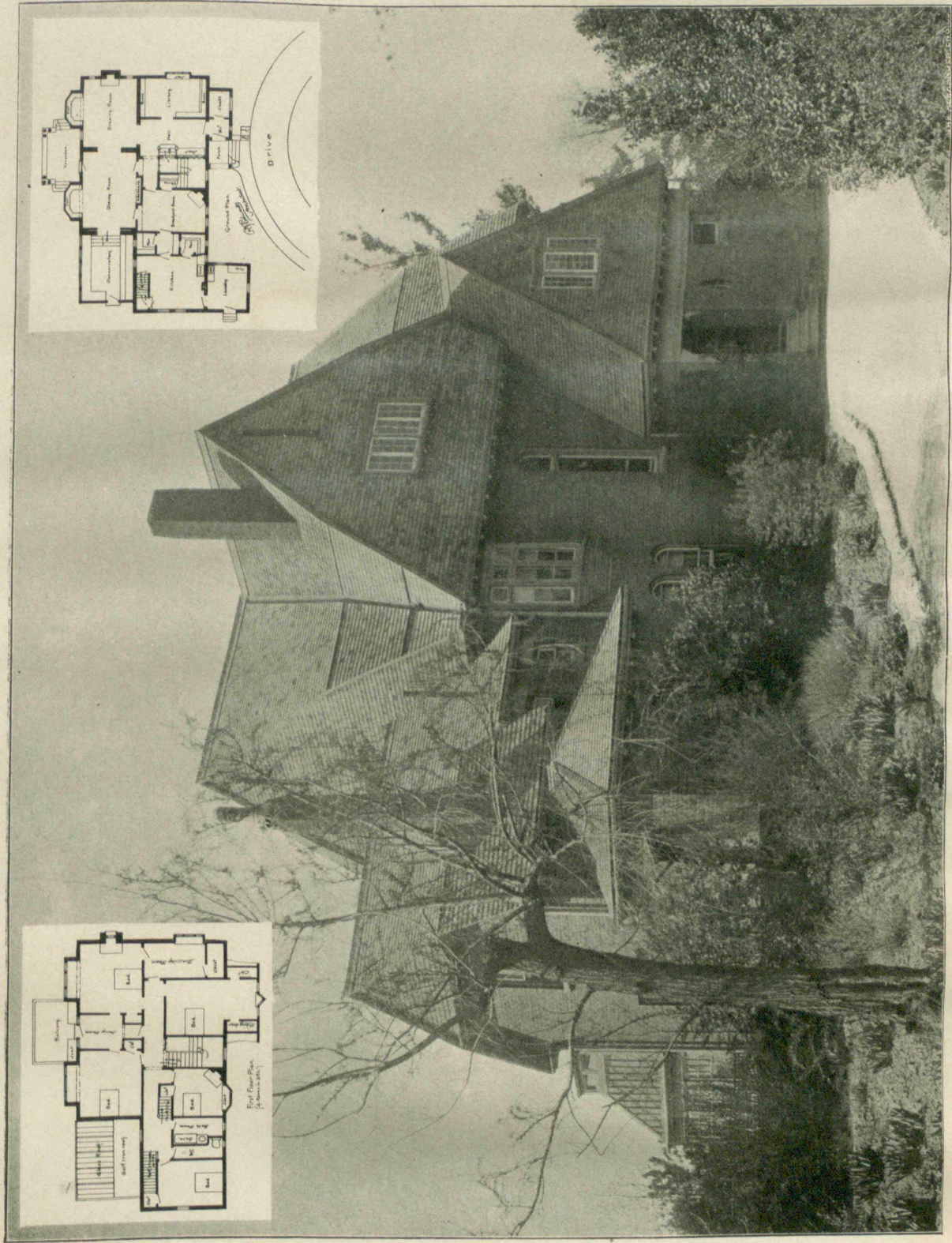




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JANUARY, 1902





RESIDENCE OF MR. MUNRO, EAST TORONTO.  
R. J. EDWARDS, ARCHITECT.



cient Greece and the Middle Ages. One of the conditions brought about by the rapid growth of our cities is the necessity for more floor space within a limited area, and in order to accomplish this buildings of graded heights have been erected, finally culminating in the modern skyscraper. For the solution of these problems it was necessary to appeal to the engineer; and mark how carefully, step by step, he has dragged us with him into the vortex at the imminent risk of losing our reputation—our fair heritage of centuries of standing. (Hear, hear). No sooner was the problem of the seven-story building solved than he insinuatingly suggests ten, and so on, worming his way insidiously, Uriah Heep fashion, until finally he takes the reins out of our hands and is dragging us, wether knows, ever onward, higher and higher, our fates indissolubly linked together, for each art is interdependant. He ruthlessly tramples all our aesthetic feelings under foot, turns a deaf ear to all our cries and protestations, and as already pointed out to him by someone, he looks not upon the sanitary aspect of this question—the damp, unwholesome and

microbe-laden air, which must lurk in the deep ditches of streets between these mountainous structures, the dark, untenable, uninviting offices of the ground floor and the congested condition of the sidewalks, when the vertical carrying capacity exceeds the horizontal. But there is no turning back in his mad career: his day has come and he is stung to greater madness, when he thinks of the long-continued sway of the noble art of architecture. Why cannot his profession be characterized a noble art? And in his hallucination he drags his now passive brother to his destruction, until finally he lands him, a drivelling, ornamental draughtsman, to pilaster, and be-cornice and drape his awful Eiffel Towers. (Laughter and applause). Gentlemen, I think our heartiest thanks are due Professor Wright for his paper and in moving this vote of thanks I take this opportunity, now that we are all assembled together, to make mention of the deep interest he takes in this Association—a working interest, not a passive interest, that costs but little. He is always willing to saddle himself with work, and the thorough manner in which he goes

The Samson Cordage Works, of Boston, are sending out a very neat desk calendar, showing sample of their cord, and table of sizes and weights.

We have received from The B. Greening Wire Co., Limited, Hamilton, an advance copy of their annual calendar for 1902, which no doubt will be much appreciated. The leading feature is good bold type that can be read from some distance. The extra spaces of each month are filled in with attractive cuts illustrating the principal seasonable lines of manufacture. We are pleased to hear that this enterprising firm have had a very successful year's business, and have in contemplation some important changes. Contracts will be signed in a few days for the erection of fine new offices. Plans are being prepared for a large new paint tower. Their last catalogue was issued January, 1900, and should be in every architect's office.

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### EXAMINATION TO QUALIFY FOR ASSOCIATESHIP IN THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The Royal Institute of British Architects desiring to give facilities for those in the Colonies to qualify by examination for associateship in the R. I. B. A., will hold the second examination from July 4th to 16th, 1902, in Montreal. Applications, fees and probationary work must reach London not later than May 31st, 1902. Intending candidates who must be over 25 years of age, can obtain application forms and copies of the previous examinations on application to

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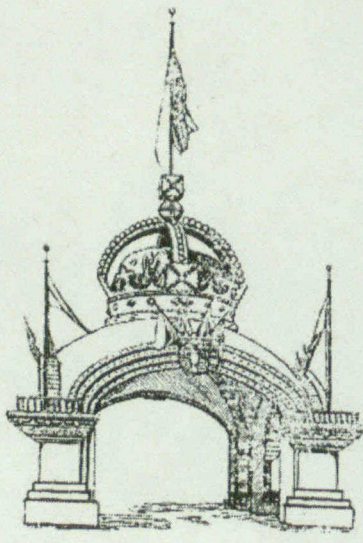


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THE CANADIAN SOCIETY OF CIVIL ENGINEERS.

The annual meeting of the above Society will be held in the Society's rooms, 877 Dorchester Street, Montreal, on Monday and Tuesday, the 27th and 28th inst., beginning at 10 o'clock a. m., on first mentioned day. In addition to the business session, tea will be served from 4.30 to 6 o'clock on Monday, and at 8.30 p. m., a lecture will be given by Wallace C. Johnson, M. Can. Soc. C. E., on the "Shawinigan Water & Power Development." Tuesday will be spent in inspecting the water power development works of the Shawinigan Water & Power Company at Shawinigan Falls, Que. On Tuesday evening the annual dinner of the Society will take place at the Place Viger Hotel.

METHOD OF HEATING A LONDON THEATRE.

The Theatre Royal, Drury Lane, London, has recently been entirely remodeled inside, but perhaps one of the greatest improvements effected is in regard to the warming and ventilating. The theatre was previously very draughty, and in the stalls especially it was very cold to the feet, the floor being like the floor of an ice-house. All this has been altered, and when the new installation is complete such troubles will be a thing of the past. The theatre proper and stage contain together half a million cubic feet of space, and it has not been an easy matter to deal with such a large building, but fresh air is now introduced from the outside by means of three powerful fans, driven by electric motors. Before this fresh air is blown into the theatre it has to pass through a filter screen constructed of coke, which takes out all the dust and smut. The fans are sufficiently powerful to change the whole of the air in

the theatre five times per hour, and this means that three hundred and eighty tons of fresh air will be blown in during the average performance of four hours' duration. The temperature of the air is warmed to any desired degree, and this is so distributed that no draughts are felt. The effect of blowing the air instead of exhausting—the usual custom—is that the air from the theatre passes out at all doors and crevices, and draughts are completely avoided.

NOTES.

A unique and handsome new year greeting card was issued by the Dominion Radiator Co. Below the reminder that "Time Flies" Father Time is depicted as making his exit, but the reader is assured that "Safford Stays Forever." The company's exhibit at the Glasgow Exhibition received the highest award in the British Section.

A Chicago despatch announces the consolidation of twenty-five companies to control the principal gypsum deposits of the United States. The new organization will be known as the United States Gypsum Company, and will have a capital of \$10,000,000. The Company state their purpose to develop the use of gypsum in the manufacture of plaster as against that of lime.

The Horseshoe Quarry Company have lately opened up a new stone quarry at St. Marys, Ont., from which can be obtained unlimited quantities of stone of excellent quality. The proprietors have built a switch three-quarters of a mile in length, connecting the quarry with the main line of the Grand Trunk railway, and are thus in a position to supply any quantity or size of stone required.

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about it and the care and pains he takes with it should evoke our warmest appreciation; and all this voluntary work added to his multitudinous duties at the School. If it were not that he best illustrates it himself in the paper he has given us, "The Behavior of Steel Under Stress," I would feel called upon to take up more of your time and tell you of the behavior of Wright under stress. (Applause.)

#### PERSONAL.

Mr. S. G. Curry, a well known Toronto Architect, has been elected a member of the City Council.

The Toronto Builders' Exchange have elected as their representative on the Board of Management of the Toronto Technical School Mr. Jas. D. Allan.

Messrs. John Gemmell and John A. Pearson have been elected to represent the Ontario Association of Architects on the Board of Management of the Toronto Technical School.

Mr. Wm. J. Smith, formerly a well known builder and contractor, and later on superintendent of public buildings for the Dominion Government at Toronto, died in that city a fortnight ago, aged 61 years.

□ Miles Vokes, of the Vokes Hardware Company, and J. M. Taylor, manager of the Dominion Radiator Company, have been elected to the Executive Committee of the Hardware Section of the Toronto Board of Trade.

#### R. I. B. A. EXAMINATIONS.

The attention of our readers is directed to the advertisement appearing in this number giving particulars of the R. I. B. A. Examinations to be held in Canada from July 4th to 10th, in Montreal. At the first examinations held in Canada last year several candidates presented themselves, and one, Mr. Andrew Sharp, succeeded in passing.

#### BUILDING IN MONTREAL.

The second annual report of Mr. Chausse, Building Inspector, states that during 1901 there were erected 443 new buildings valued at \$2,568,378, and alterations to buildings costing \$332,361, the total expenditure being \$2,900,733 as compared with \$3,084,403 in 1900, and \$2,370,080 in 1899. The Inspector reports last year as having been the busiest in the history of his department, extra work being imposed by the new building by-law. He requests the Council to appoint an assistant inspector in order that the by-law may be properly enforced.

Very satisfactory progress has been made with the construction of the new Toronto hotel. The first five storeys have been completed and closed in, and work is proceeding on the interior. It has recently been decided to increase the height of the building by two storeys which, in addition to giving increased accommodation will improve the appearance.

The Bricklayers' Union of Toronto is said to be considering the advisability of making a demand for an increase in the rate of wages at the termination of their present agreement with the employers on May 1st next. It is reported that this demand will be for an increase of 7 cents per hour, which, if granted, would bring the rate per hour up to 45 cents. The builders' laborers are said to be considering a similar proposition, while the Teamsters' Union have already notified the contractors that after the 1st of May they will demand 45 cents per hour. The Plasterers' Union have made an agreement with the Builders' Exchange at 38 cents per hour. It will thus be seen that there is likely to be a demand all along the line for increase of pay. It is to be hoped that the effect of this announcement made so early in the year may not be prejudicial to the starting of new building projects.

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PUBLICATIONS.

Light, Heat and Power in Buildings, by Alton D. Adams, Member American Institute of Electrical Engineers. One 12 mo. vol., cloth; 102 pp. Price \$1. New York, W. T. Comstock.

This book is intended as a convenient manual on the subjects treated, its object being to present in compact form the main facts on which selections of the sources for light, heat and power in buildings should be based. The feature of special interest in the work and its main novelty, that of arrangement by cost of service from widely different sources, are set down side by side.

The American League for Civic Improvement, whose headquarters are at Springfield, Ohio, has published in an 80 page booklet entitled The Twentieth Century City, the proceedings of the annual convention of the League held at Buffalo in August of last year. Not the least important of the suggestions is the action of the Convention, urging the provision at the St. Louis Exposition of an object lesson in modern city making by the arrangement of a model city, not on a small scale, but "life size."

The effect of artificial light on colours is sometimes overlooked when choosing a decorative scheme. The

fact is, gas and electric light will change colours wonderfully. Yellow is paled and sometimes wholly lost; certain blues turn black; other blues, absorbing the yellow light, become green; such colours as violet, pink or purple are entirely altered. To guard against disagreeable effects, the colours used should be so selected and juxtaposed that the finished work will look as well by night as by day, even though the whole will be somewhat changed in tone.

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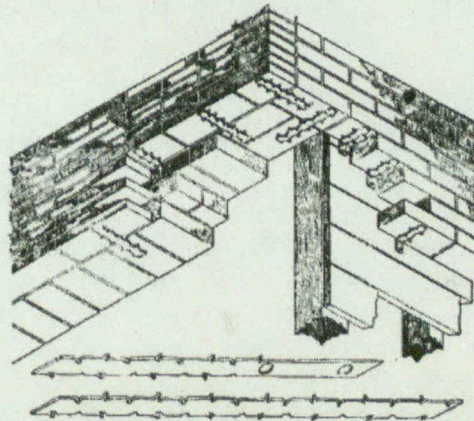
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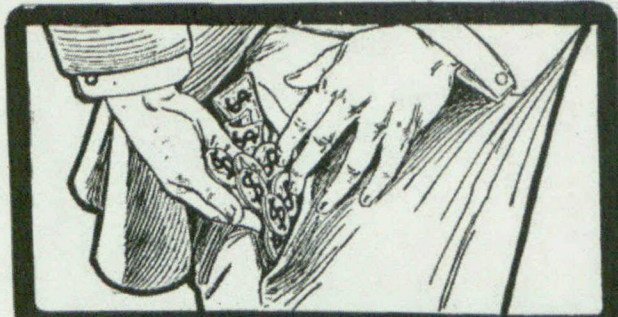
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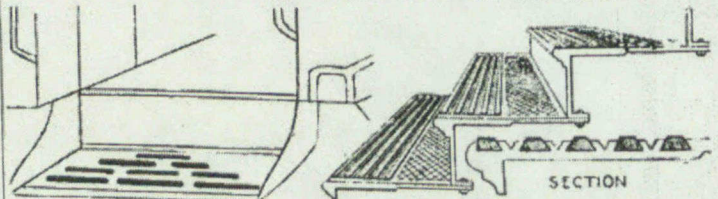
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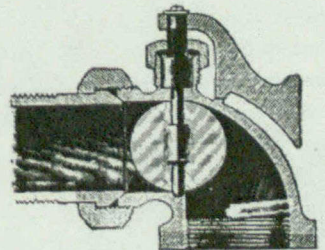
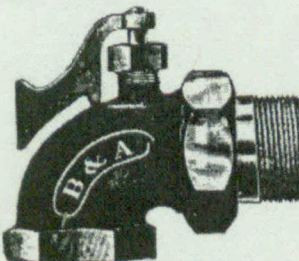
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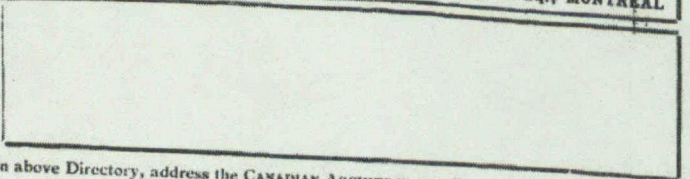
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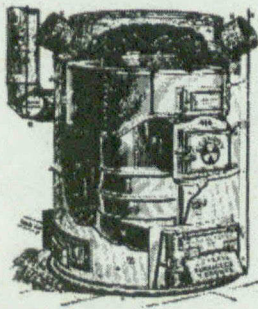
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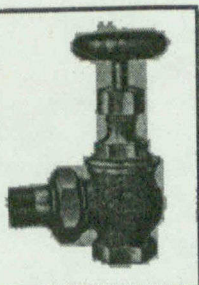


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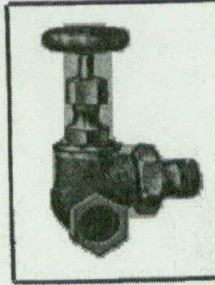
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