

THE CANADIAN ARCHITECT AND BUILDER

Vol. XX.—No. 9.

Toronto, Montreal—SEPTEMBER, 1907—Winnipeg, Vancouver

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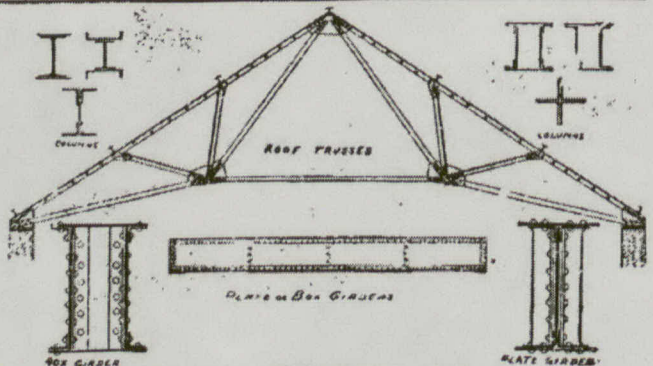
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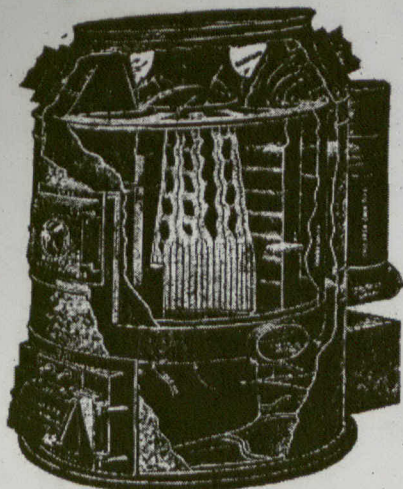
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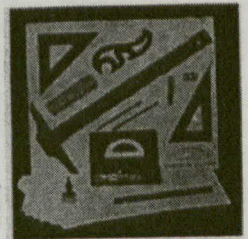
"The color of a room should depend very largely upon its exposure. For a sunless north room cold colors, such as blue and green, should never be employed. The sunny side of the house is the place for blues and greens and sombre effects."—"Architect and Engineer of California."

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Catalogues will be forwarded to Architects and Building Supply Houses in Canada on application.



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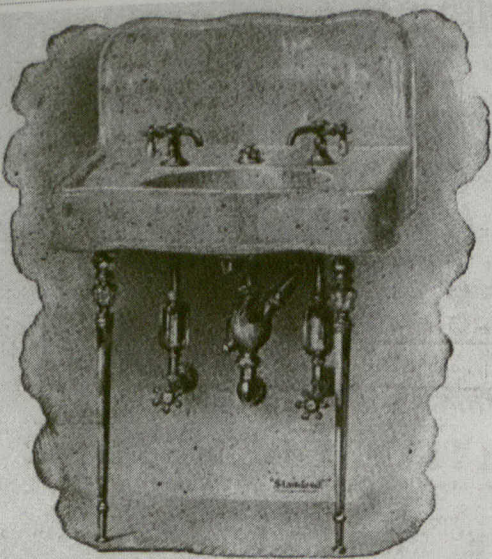
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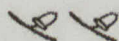
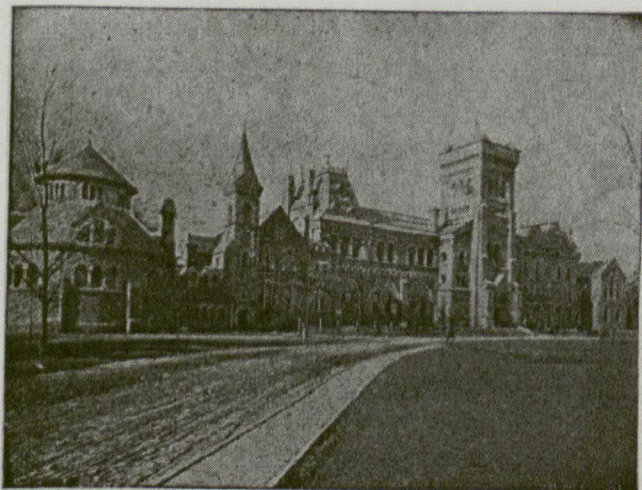
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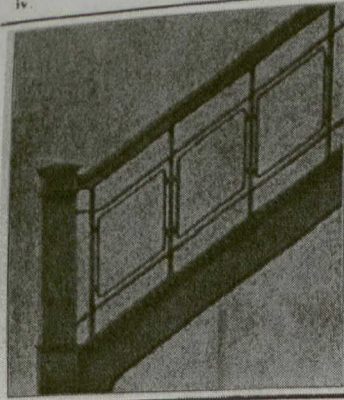
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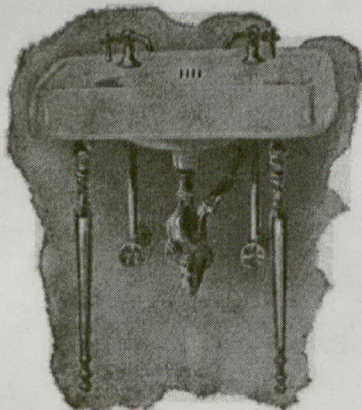
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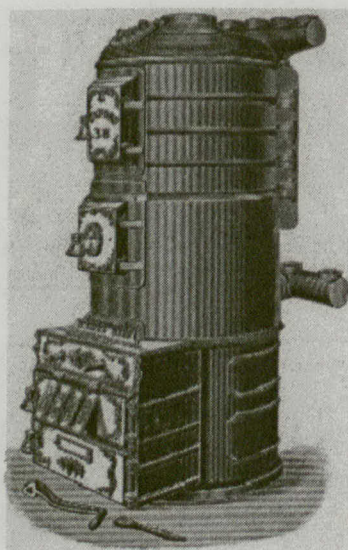
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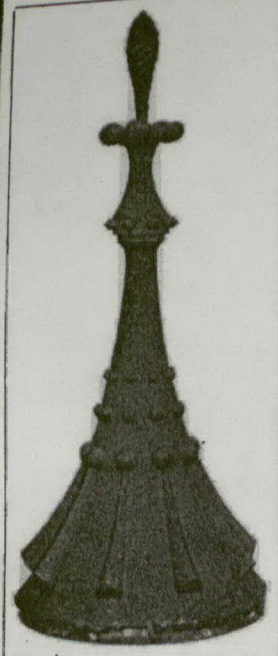
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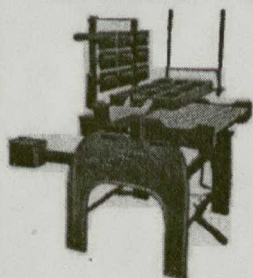
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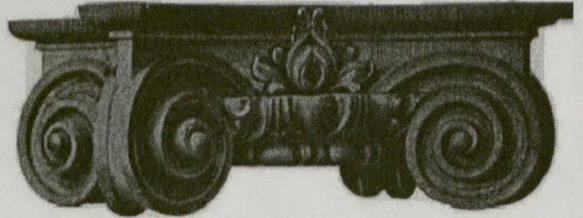
Had the men of old known this, the pictures of Apelles might still live in the first freshness of their colors, and the work of Raphael and Michael Angelo would look to-day as it looked when it left the painters' hands.

The Dominion Trades and Labor Council met in Winnipeg recently for a four days' convention, beginning September 10.

McCORMACK & CARROLL

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82 ADELAIDE STREET E., TORONTO

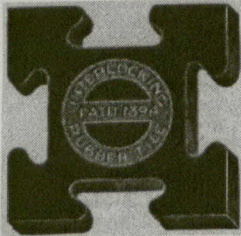


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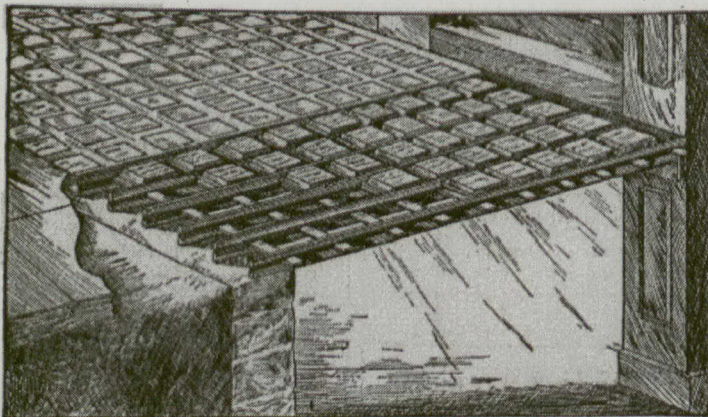
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OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XX.—No 237.

SEPTEMBER, 1907.

ILLUSTRATIONS.

Plans by E. & W.S. Maxwell, awarded first prize in Dominion Government competition for proposed Department and Justice Buildings, Ottawa.

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Exhibition Facilities for Builders' Display.

The Canadian National Exhibition for 1907 has passed into history. Admittedly the greatest annual exhibition in America, perhaps in the world, it will still bear considerable improvement, particularly in providing accommodation and encouragement for builders' exhibits. In point of natural situation a more suitable geographical site than that on which the exhibition now stands cannot well be imagined, but immediate steps should be taken to acquire more land westward. Dufferin street should be included in the present park area and also land to the westward of Dufferin.

Of equal importance with the need for more land acquirement is the necessity for providing accommodation for the display of apparatus and improvement in all that makes for greater comfort and more satisfactory sanitary conditions in the modern home. In the exhibition just closed the Machinery Hall and the Process and Manufacturers' and Liberal Arts Building were all utilized to house the displays in which builders and contractors are interested. If an architect desired to make a study of improved building facilities he had perforce to wander through three large buildings and search the open ground between to discover amid a buzz of power machinery or the music of a phonograph display the object of his search.

To the builder and contractor the Machinery Hall should have offered considerable attraction. As a matter of fact conditions prevailing there were far from satisfactory. The building is totally inadequate

for a satisfactory display of mechanical apparatus, and many firms, who would willingly have exhibited, were better facilities available, declined to do so under the present unsatisfactory conditions. Moreover, the constant confusion and noise made by one or two pieces of apparatus, that might well occupy a prominent place in the open air, are as annoying to the ear as is the sight of the slovenly shafting to the eye when looking overhead.

To one passing through the Machinery Hall the lack of arrangement and proper disposition of apparatus are woefully apparent. In this building are miscellaneous grouped power engines and machinery, heavy pumps and huge mill fixtures, side by side with the delicate mechanism of modern electric fixtures for the most costly dwelling house or the miniature reproduction of the City of London's Public Library, covered with a patent roofing material and on display in a tasty log cabin composed of asbestos logs. The incongruity of the various displays is amusing. Passing to the Process Building, a similar confusion reigns.

Of course it is only very recently that the building trade has felt the necessity for the taking of some definite steps in periodically having displays of apparatus of particular interest to builders and contractors. Last month there was held in Montreal the first Builders' and Contractors' Exhibition ever held in Canada, an affair very successfully carried out and apparently likely to become an annual event. The attendance was satisfactory to the directorate and the display extremely creditable. If men will thus

gather together at a busy time of the year for the sole purpose of studying building conditions, what would be the welcome accorded a similar exclusive builders' display at our National Exhibition? Not only would there be an audience of the trade, but the general public as well would be able at first hand to gather much valuable information on desirable building methods, suitable materials and the latest sanitary and fireproof devices. It is a common educational maxim that example is better than precept and a series of object lessons in structural building furnished by our National Exhibition would go far toward improving the health and comfort of our rapidly increased Canadian population.

The Congress of Canadian Architects, called to meet in Montreal last month, had the project of an Act of incorporation under discussion. There were two draught projects; the one having in view the establishment of a society for improving the status of the profession along general lines, the other seeking to exclude unregistered persons from practising as architects. This latter alternative was the one adopted by the meeting, and, although a number of minor changes were made in the draught as a result of this discussion, the project in the main stands as originally draughted.

The work of the Institute will be to "facilitate and encourage" the acquirement and interchange of professional knowledge amongst architects. The fact that registration, as the result of examination, will ultimately become compulsory on all entering the profession of architecture will establish this Institute as an examining body, and their power to enforce a given standard of efficiency in the necessary elements of an architect's work may be considered as one of the means, and a very cogent means, of "encouraging" the acquirement of knowledge. Men will not be allowed to drop into architecture casually, or simply because they are not fit for other professions.

It is to be hoped, however, that the new Institute will lay even more stress on "facilitating" the acquirements of knowledge. It is not to be expected that, as a body, it can establish or supervise schools or classes, and here must of necessity open up a fruitful field for the labors of the directorate of the new Institute. To the technical institutes, which are springing up in all parts of Canada, or preferably to the universities of the country, must eventually be relegated the instruction in the work required for architectural examinations. It is inevitable, however, that, until the project has been put upon a working basis, the scope of the examination must be very vaguely defined.

Apparently the abolition of examinations by those provincial bodies which now practise registration is not at present contemplated by the Institute. That such abolition must follow, however, seems inevitable, otherwise a needless duplication of examinations must ensue.

The cause of architectural education may be materially aided, moreover, by an Institute which represents the profession throughout the Dominion, as the Government would then know precisely where to turn for information requiring special professional know-

ledge. The Government has of late shown signs of a desire to encourage artistic training in Canada, and the architectural profession ought to be ready at all times with advice and suggestion in all matters of constructional and decorative design. If national collections are to be made none should be better fitted to exercise catholic and sound judgment in selection and arrangement than men well trained in the study of architecture, and it may be added that none should be prepared to derive more benefit from such collections than students of architecture. Apart from educational matters, of course, the Institute could in many ways exert an influence on matters architectural which would be to the benefit both of the public and of the profession.

A number of clauses in the projected charter had reference to details of examinations and were, after discussion, withdrawn from the act itself, to be discussed by the board and included in the by-laws. The composition of the examining board, as suggested in clause 5, was approved with verbal amendments. This clause provides for a board of examiners of not less than seven persons, who shall be resident in the Dominion of Canada, to examine candidates for admission to the study or for admission to the practice of architecture. Two of these, qualified and competent to examine all candidates for the preliminary and final examinations in French or in English, at the option of the candidate, shall be appointed by the Council, one member from McGill University, one from Laval University, and one from Toronto University. This clause shows a praiseworthy desire to work in accord with the great centres of learning.

It may be noted in this connection that university students of architecture consider it rather a grievance that, after obtaining their academic diploma, they should still be required to pass an Association's examinations before being admitted to the practice of their profession. They argue on a perfectly logical analogy from the system in use in the medical profession. A student is entitled to practise medicine immediately after he has obtained his diploma. It is true that lack of experience and of opportunity may render him incompetent to do so. His training has fitted and equipped his mind for entrance to actual practice, and this he is free to obtain as he can find opportunity. It has been decided, however, to try to establish this Institute of Architects of Canada as an examining body, and, if there is not one gate for all, with a fixed standard for admission, there is likely to be dissatisfaction and allegations of unequal justice amongst disappointed candidates.

The provisional board which has been at work organizing the Institute has been nominated "en bloc" as the first Council of the Institute. These represent cities all the way from Halifax to Vancouver, and are worthy of confidence in undertaking a difficult and, from a pecuniary point of view, unremunerative labor. Many, perhaps too many, well-known names are absent from the list. It will take time, however, to arouse general interest in a project whose *raison d'être* is as yet imperfectly understood by many whom it aims to benefit, but doubtless the day will come when indifference will be superseded by a keen interest in a project from which no architect should hold himself aloof.

Investigations of Structural Materials by the United States Geological Survey

By RICHARD L. HUMPHREY,

(Engineer in Charge of Structural Materials Division U.S. Geological Survey).

With the problems arising from the growing scarcity and consequent increase in the price of wood, principally lumber used in building construction, the search for a desirable substitute becomes a matter of prime importance and justifies the work now being done by the United States Geological Survey at its structural materials testing laboratories at St. Louis.

A committee, called the Joint Committee on Concrete and Reinforced Concrete, was invited to assist in outlining the work at the laboratories. This committee is composed of members of the American Society of Civil Engineers, the American Society for Testing Materials, the American Railway, Engineer-

and following as closely as possible practical conditions.

In addition to the study of the constituent materials of mortars and concretes, structures of various kinds similar to those used in buildings are made and tested.

The equipment of the laboratories at St. Louis for carrying on this work is very complete. In addition to all needed smaller apparatus there are four testing machines of 200,000 pounds capacity and one of 100,000 pounds capacity, suitable for testing beams and other structures used in buildings. These machines will test beams up to twenty feet in length and are

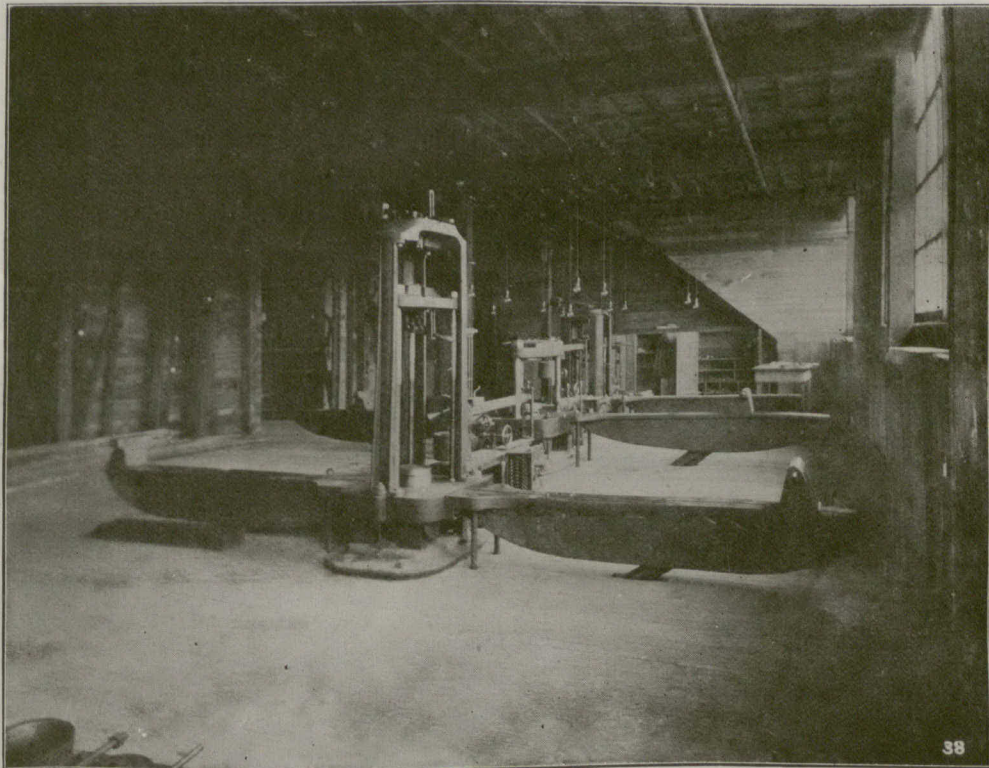


FIG. 1.—THREE CONCRETE-BEAM TESTING MACHINES.

ing and Maintenance of Way Association, and the Association of American Portland Cement Manufacturers. The leading professors of engineering from all of the large colleges in the country are members of this committee, and they exercise general supervision over the work.

An advisory board composed of leading engineers throughout the country was at once created and has had general supervision of the work.

Tests are being carried on to determine the value of different sands, stones, and other materials used in the manufacture of concrete. The material is shipped from all parts of the country by geologists connected with the work and a complete record of the material is sent in by them. At the laboratories this material is made into mortar and concrete by using the different percentages ordinarily employed in practical work

equipped to make tests of the different materials used in construction work. Three of these machines used in the beam division are shown in Fig. 1.

In addition to the above machines a very large machine, having a working capacity of 600,000 pounds, will in a few weeks be installed at the laboratories at St. Louis. As far as known at this time there is only one other machine in the United States similar to this. This machine will make it possible to test columns, beams, and in fact all the different kinds of construction material now used. It will test very large reinforced concrete girders up to spans thirty feet in length and concrete columns up to thirty feet in length.

The value of such tests as these is readily apparent, since their results can be applied directly to practical work. A very serious objection to the use of re-

sults obtained in tests made by private investigators is due to the fact that the tests were applied only to small specimens not nearly approaching in size the parts or pieces used in actual construction. Heretofore it has been necessary to consult the results of these small tests in order to have some basis for design, but it is now clearly recognized that the best results can be obtained only from tests made on members as large as possible, or at least on pieces as large as those ordinarily used in structural work.

All the concrete used at the laboratories is mixed in three Chicago cube concrete mixers, each of which

sion are equipped with all apparatus necessary for conducting their tests.

Although reinforced concrete is used to a remarkable extent at the present time, and both concrete and reinforced concrete construction is becoming more and more popular every day, it is evident to anyone familiar with construction work that these materials will be more generally employed within the next few years. Many engineers are prejudiced against the use of concrete and reinforced concrete, but this prejudice is rapidly being removed by the obtainment and publication of reliable data regarding this material.

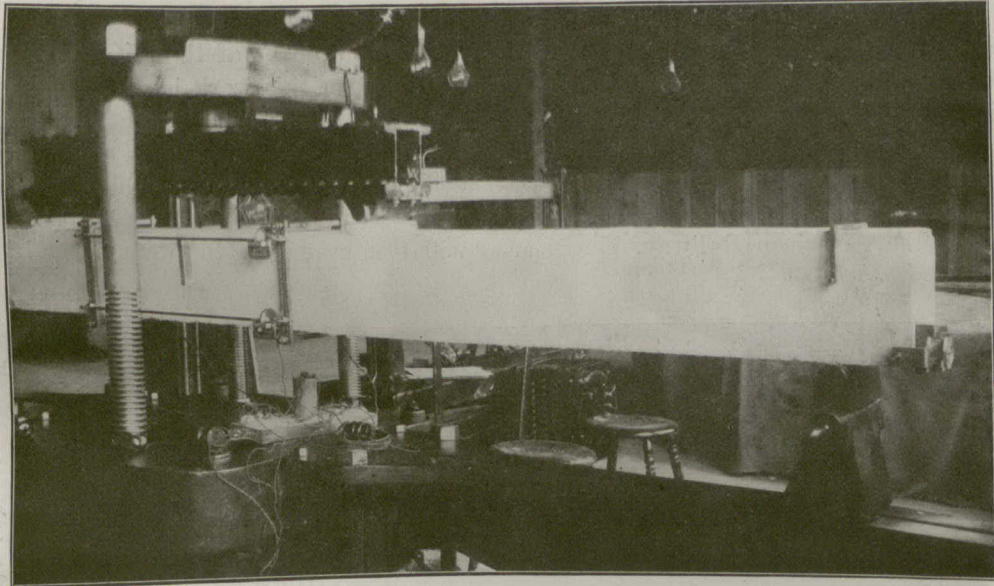


FIG. 2.—TESTING A THIRTEEN-FOOT CONCRETE BEAM.

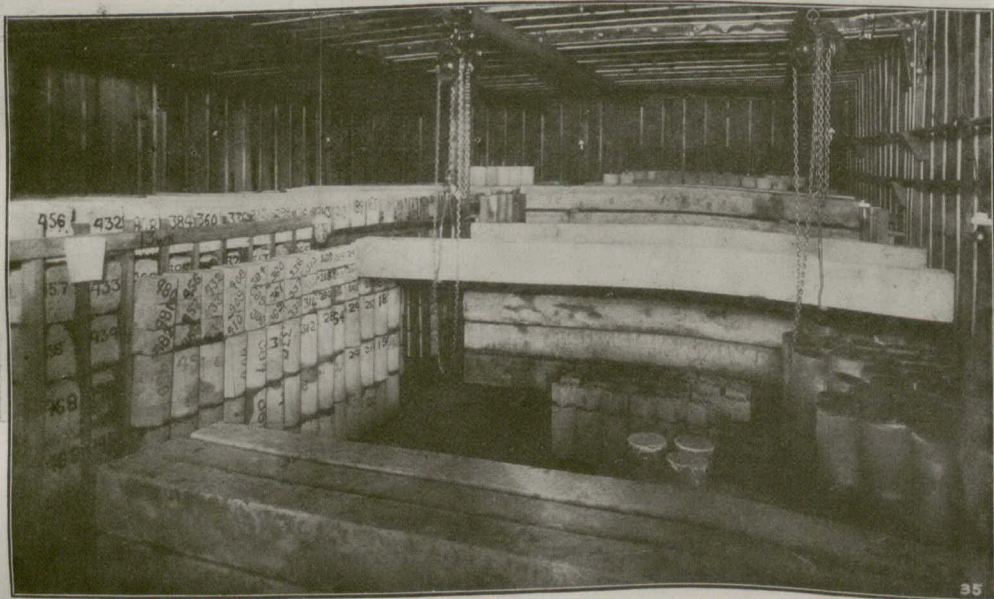


FIG. 3.—ROOM IN WHICH CONCRETE BEAMS ARE STORED.

is mounted on skids, geared to a motor and equipped with charging hopper. One of these mixers has a capacity of one cubic yard, and the others will contain one-third cubic yard each. After the concrete is mixed it is carefully tamped in moulds to form the different pieces on which the tests are made, such as cylinders, cubes and beams.

The laboratory also uses five hollow concrete block machines, used for making concrete blocks similar to those used in actual construction, and the several different divisions—the constituent materials division, the beam division, the concrete block division, the permeability, the shear and tension and the chemical divi-

Without doubt, in a very few years, when most of the principles underlying the use of concrete and reinforced concrete have been fully established from tests and investigations, there will be little prejudice against the use of concrete; the present prejudice evidently being due to lack of information.

The longest beam thus far tested in the beam division has been thirteen feet in length. Beams of this length for testing purposes are made in some cases without steel, and in others with varying proportions of steel, ranging from very small percentages up to three per cent. A full size beam in the testing machine is shown in Fig. 2. The load is applied at the

top of the beam at points four feet from each end. The men conducting the tests watch the beam very closely while it is in the testing machine, and examine its surfaces with magnifying glasses in order to locate the fine cracks as they appear. In the beginning a load of about 5,000 pounds is applied and the machine is stopped with this load on the beam. After the observers have examined the beam carefully and made a record of the cracks appearing at that time, the load is increased, and, after every 1,000 pounds

In beginning tests of reinforced concrete, simple round rods were used, as it was thought that more uniform results could thus be had than if any of the patented systems were used. After a complete series of tests with the round rods has been made, it is proposed to take up tests of the different forms of bars that are used in practical work, and the results will be published from time to time by the Geological Survey. Tests will be made of beams ranging from six to twelve feet in length, and because of longer span

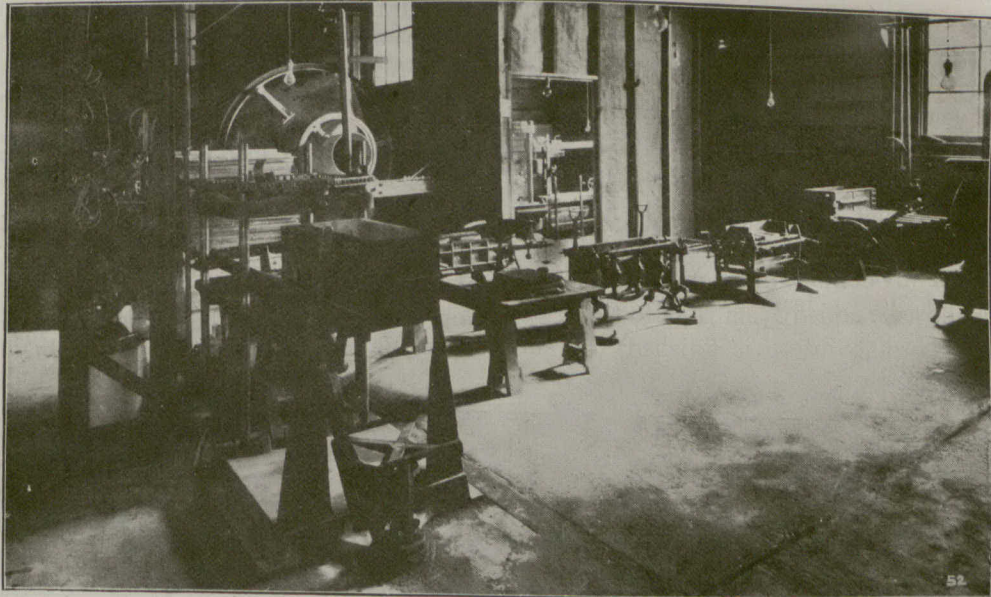


FIG. 4.—CEMENT BLOCK MACHINE.

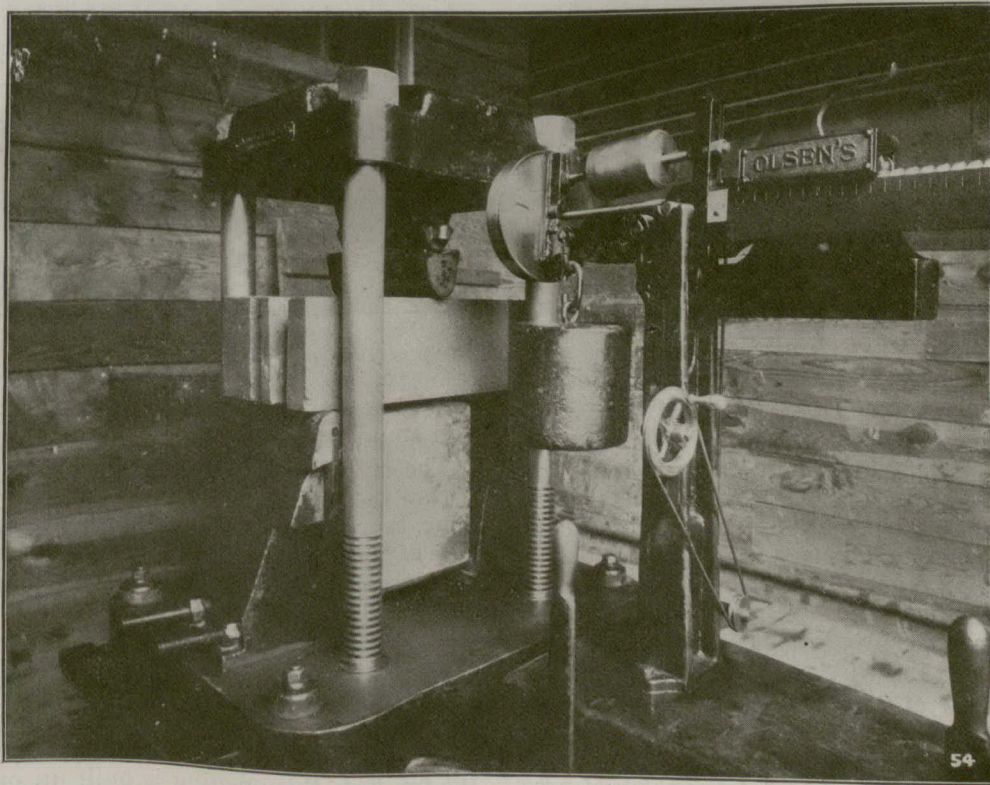


FIG. 5.—TESTING CONCRETE BLOCKS.

additional, the beam is again examined until the maximum load is applied.

In a very large number of tests the beam shows no cracks that are visible to the eye until the maximum load is reached, when the steel reaches its elastic limit and begins to stretch fast, this result ending the test. The cracks that appeared on the beam and the loads at which these cracks appeared are recorded by photographs.

will be tested later, if necessary, in order to get results that can be applied to almost all practical conditions.

The concrete used in the different beams tested, as described above, is moulded into cylinders and cubes, which are tested in order to get the direct strength of the concrete. These cylinders and cubes are all tested at different ages, generally at ages of 7, 28, 90, 180 and 360 days. The cement, sand, stone, gravel, or

other material composing the concrete, is carefully proportioned by weight, the correct percentage of water is used and the whole mass is placed in a mixer and thoroughly mixed. It is then deposited very carefully in moulds or forms which, after twenty-four hours, are removed. The concrete is then moved into a storage room, shown in Fig. 3, and is there sprinkled with water three times each day. Each test piece is numbered on a card index, which tells where information relating to the test pieces can be found and also indicates the dates on which the different pieces are to be tested.

A branch of the work that should be of interest to everybody, especially the small home-builder, is the investigation of cement building blocks. Many houses are now built of cement blocks in preference to wood, because, generally, cement block construction is cheaper and better than wood, since it is fireproof, more durable and less expensive to maintain. The exterior surfaces of wooden buildings must be painted, and clap-boards must be added from time to time; but when the cement block building is finished, the sur-

face is there once for all; no further treatment, no repairs, no maintenance are necessary.

that shown in Fig. 3. Cylinders are also made from the same concrete that is used in the blocks, and the results of tests of the cylinders and of the blocks establish a relation between the strength of the concrete in the cylinder and that of the concrete in the block.

When the blocks and cylinders are placed in the storage room, each test piece is numbered and its number is filed away on a card in a card index. Each card bears the date on which the test piece is to be tested, and the cards are filed in chronological order. This brings the current date at the front of the drawer each morning, when cards bearing the same date are taken out and the pieces are taken from the storage room and tested. The results are compiled on forms and later published in reports issued by the Geological Survey.

Concrete blocks are tested at the laboratories in two different ways: first, as shown in Fig. 5, to see how much of a centre load each block will stand. Although blocks are not actually subjected to a load of this kind in practice, the results of this test make it possible to compare the relative values of different building blocks. Second, after the block has been broken at the centre by this load, each half is placed in the testing machine and crushed, in order to find the crushing strength of the block. The results of this crushing

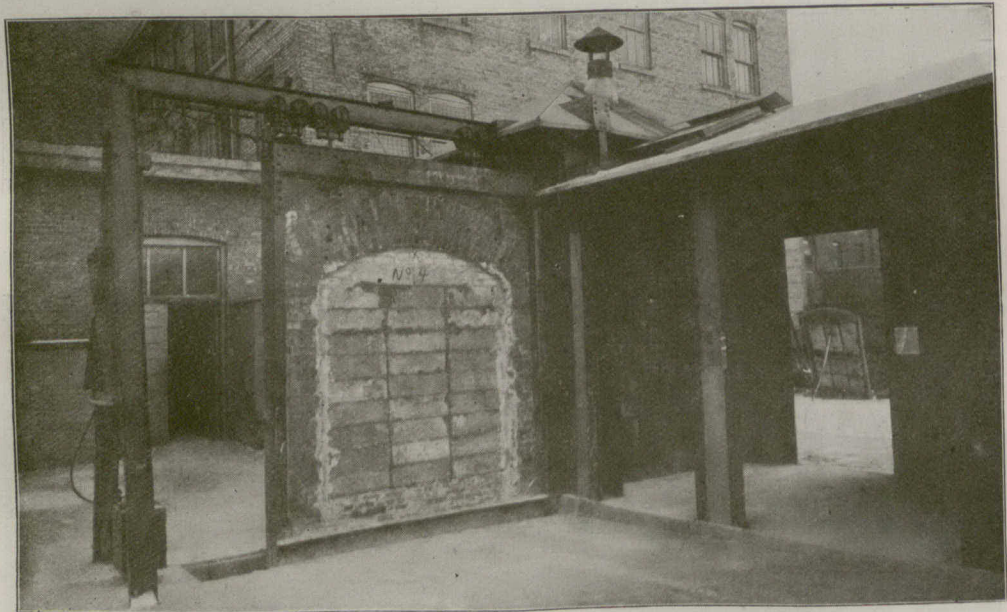


FIG. 6.—TESTING FIRE-PROOFING QUALITIES OF CONCRETE.

test show how much pressure similar cement blocks will stand when used in actual building construction.

The art of fireproofing has been developed rapidly within the last few years, but there is still much to be done, especially in relation to the fire-resisting properties of concrete. In order to obtain information to meet these needs a series of fire tests are being carried on by the Geological Survey at the Fire Underwriters' laboratory at Chicago.

For this purpose a hanging door having a steel frame and a one-foot wall of fire brick inside of it is used. At the centre of this frame there is an arched opening of about the size of an ordinary door. For the fire tests this opening is built up successively with different materials, ordinary building brick, fire brick, hollow tile blocks, the different kinds of cement building blocks, stone, concrete and terra cotta. When the opening is filled with cement blocks, it has the appearance shown in Fig. 6. After the opening is filled a flaming gas jet is played all over the door for a long time and when the heated surface is very hot the gas is turned off and the door allowed to cool. In some tests the cooling takes place slowly, in others a stream of water is played on the door immediately after the gas is turned off in order to reproduce as nearly as possible the actual conditions in a fire.

FIRST CONGRESS OF CANADIAN ARCHITECTS

For the first time in their history, architects from all over Canada were gathered together in Montreal, from August 19-23 last, for what will be known in architectural annals as the first congress of Canadian architects. For months past, preparations looking towards the formation of a national association, which would embrace architects from all over the Dominion, had been in progress. Circulars had been sent out to the addresses of all known architects, inviting them to join in the formation of the Institute of Architects of Canada, and the responses were so encouraging to the provisional board, that arrangements were made for holding the congress. No pains were spared to make the affair successful, and throughout the entire convention a genuine esprit de corps was manifested by the delegates.

The convention was opened on Monday, August 19th, by an address of welcome by the Hon. W. A. Weir, Minister of Public Works of the Province of Quebec, the meeting being called to order by Mr. A. F. Dunlop, the president of the provisional board. The first day was given up entirely to business, morning, afternoon and evening, but on the succeeding days of the week the proceedings were varied by visits to points of interest in Montreal and vicinity. Invitations were extended to the delegates to visit the works of the Dominion Bridge Company, Warden King foundry, Montreal Terra Cotta Company, Canadian Dolomont Flooring Company, Builders' and Contractors' Exhibition, and the quarries of the Phillipsburg Railway & Quarry Company at Phillipsburg, P.Q., at all of which places the visitors were most hospitably entertained.

On Tuesday morning a special train took the delegates to Ste. Anne de Bellevue, where a visit was paid to the Sir Wm. C. MacDonald College, the visitors being shown through the buildings by the architects, Messrs. Hutchinson & Wood.

On Thursday evening the members' dinner was held at the Windsor Hotel. This festivity was presided over by Mr. Dunlop, and passed off most successfully, an interesting feature being the presence of ladies at the tables. The meetings of the congress were held in the Assembly Hall of the Canadian Society of Civil Engineers, and to the delegates were extended the privileges of the Engineers' Club of Montreal, whose clubhouse is in close proximity to the Assembly Hall. Votes of thanks to both the Society of Civil Engineers and the Engineers' Club were passed at the congress for the courtesies extended to the delegates.

INSTITUTE OF ARCHITECTS OF CANADA.

An event of more than passing importance to the architectural profession in Canada was the decision by this congress to bring before the Parliament of Canada an act incorporating the Institute of Architects of Canada, which act, on becoming law, would bind together in close corporation, all the practising architects of Canada. At present, Quebec and Alberta only, of all the provinces in the Dominion, have close provincial corporations. The projected act, if put in force, will unite all other open provincial organizations and will give Quebec and Alberta the option

of coming in, if they so desire. Two projects of incorporation came up for consideration; the first of which contained a clause limiting the use of the title "Architect" to the members of the Institute, the second omitting this clause. The delegates were practically unanimous in the desire to adopt project No. 1, which provided for a close corporation, but there were many lively discussions on particular sections of the proposed act. In regard to the proposal to limit the use of the title "Architect" to the members of the Institute, Mr. Eden Smith, of Toronto, wrote to the secretary, taking the ground that a close corporation such as the project advocated was undesirable as, in his opinion, it would be a means of fossilizing the organization, and that something better than mere mathematical ability was required to become an



A. F. DUNLOP,
President Institute of Architects of Canada.

architect. Mr. F. Deggendorfer, of Edmonton, the president of the Alberta Association of Architects, took a diametrically opposite view of the question, and in a communication to the secretary stated that he was in favor of a close corporation without the option being given provincial organizations of becoming affiliated and what was wanted, in his opinion, was a law covering the whole Dominion. Mr. Deggendorfer's statement, backed as it was by the almost unanimous opinion of Quebec architects, who declared that the close corporation now in operation in Quebec had proved entirely satisfactory, carried great weight in influencing the delegates in adopting the close corporation scheme. Provision, however, was made to protect existing organizations, by a clause which reads as follows: "Nothing in this act shall be deemed to encroach upon the rights and privileges conferred on any association of architects which has received a charter by an act of the legislature in any province in the Dominion of Canada." It was further pointed

CANADIAN ARCHITECT AND BUILDER

out in defining the phrase "close corporation," the title of "Architect" alone was to be protected. There would be no objection raised by the Institute to a man preparing plans for a building, or supervising the construction, provided that he did not call himself an architect.

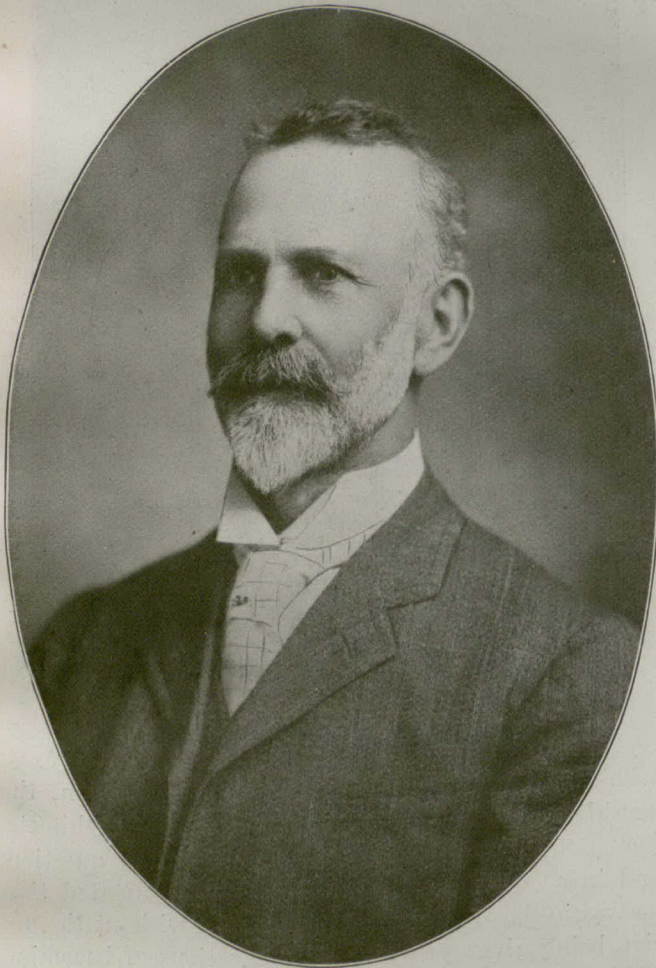
An amendment was also proposed to clause three to remove the two year period during which an architect would have to practise before admission to the Institute, but Mr. Maurice Perrault pointed out that this would be an injustice to the Provinces of Quebec and Alberta, as by the wording of the clause those calling themselves architects, though probably contractors or draughtsmen, could be admitted at once in other provinces if they had been practising as architects at the time of the passing of the act, but in Quebec the same class of men would have to wait six months or more. The amendment was accordingly withdrawn.

Clause four, specifying what associations or individuals shall be admitted as corporate members of the Institute, was also accepted without change. There

examination and have been licensed by the Institute; members of British and foreign associations of equal standing with the Institute.

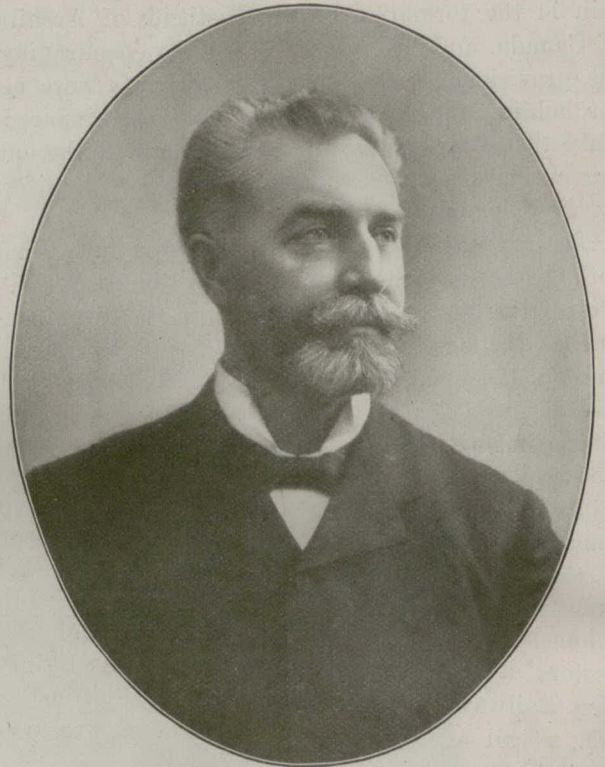
It was decided to omit from the act the sections with regard to examinations, etc., it being deemed advisable to have these embodied in the by-laws, which will be framed later.

Considerable discussion took place as to the wisdom of admitting as associate members those interested indirectly in architecture, but who were not practising architects. Several delegates opposed the suggestion,



EDMUND BURKE,
1st Vice-President Institute of Architects of Canada.

are included all persons now members in good standing of the Province of Quebec Association of Architects, the Ontario Association of Architects, the Alberta Association of Architects, the Manitoba Association of Architects, Toronto Architectural Eighteen Club and the Regina Architectural Club, also all persons being practising architects within the Dominion at the time of the coming into force of the act, who, within one year therefrom, apply for admission to and pay the entrance or admission fee and the subscription fee required under the by-laws of the Institution; all persons who have passed the prescribed



MAURICE PERRAULT,
2nd Vice-President Institute of Architects of Canada.

contending that an associate should be one who had passed certain preliminary examinations with a view of becoming an architect.

The election of officers for the Institute resulted in the retention of those who had already served on the provisional board. They are:

President—A. F. Dunlop, Montreal.

Vice-presidents—Edmund Burke, Toronto; Maurice Perrault, Montreal; S. Frank Peters, Winnipeg.

Secretary—Alcide Chausse.

Treasurer—J. W. H. Watts, Ottawa.

Council—Wm. H. Archer, Vancouver, B.C.; C. B. Chapell, Charlottetown, P.E.I.; F. Deggendorfer, Edmonton, Alta.; David Ewart, Ottawa, Ont.; G. E. Fairweather, St. John, N.B.; H. E. Gates, Halifax, N.S.; H. B. Gordon, Toronto; W. W. Hilton, Regina, Sask.; R. P. LeMay, Quebec, Que.; H. C. McBride, London, Ont.; L. Munro, Hamilton, Ont.; R. B. Pratt, Winnipeg; Eden Smith, Toronto, and Joseph Venne, Montreal.

A special vote of thanks was tendered Mr. Alcide Chausse, who, as provisional secretary, had worked indefatigably to bring the congress to a successful culmination.

Ottawa was decided on as the headquarters of the Association for the present, the choice being made in view of the central position of the capital and the necessity for keeping in active touch with legislators until everything was put on a good running basis.

When the question as to the place of meeting of the next congress was up for discussion, Mr. Peters, of Winnipeg, gave a very pressing invitation on behalf of the Winnipeg architects to hold the congress in that city; but it was felt that, in view of the Parliamentary business which might have to be taken up, it would be best that Ottawa should be chosen.

UNIFORM BUILDING LAWS.

In connection with the reading of a paper on "Uniform Building Laws," by Mr. F. W. Fitzpatrick, of



S. FRANK PETERS,
3rd Vice-President Institute of Architects of Canada.

Washington, D.C., a motion was read by Mr. Chausse as follows: "That in view of the wide range of architectural activity, involving the erection of buildings in widely separated centres, in view of the great losses involved by conflagration of poorly constructed buildings, and in view of the danger of serious accidents, the Institute of Architects of Canada do hereby urge upon the various municipalities of the Dominion the desirability of the enactment of uniform building by-laws, which could be graded to suit the conditions and requirements of rural communities, villages, towns, and cities."

Mr. Watts suggested that it might be advisable to go further and offer to aid cities and towns by draughting regulations for the construction of good buildings. The suggestion was added to the motion, which was adopted.

Mr. Fitzpatrick's paper was in part as follows:

"We have reached a point where the community has to legislate and, do it strenuously, for it must be recognized that little can be expected of the individual, even where his own interests are at stake. As far as building is concerned the average individual will only build as well as he is compelled to. The essential pur-

poses of building restrictions should aim at the preservation of property and the protection of the interests of the many against the aggression or even the private rights of the individual.

"To prevent destruction a building must perforce be indestructible; to avoid burning it must be incombustible, and to escape damage by fire it must be fireproof. It is not asking too much that our building laws be uniform, even at the risk of being thought visionary; and, as one expecting the millenium, I would insist that those laws prohibit everything but incombustible and fireproof construction. Mark my words, it is only a question of time when such regulation will be enforced, and the sooner we have it the less danger will there be of other such horrors as San Francisco and Baltimore.

"We cannot leave that process of transformation to the individual, and the community may only act through wise laws and their rigid enforcement. Why should those laws be more exactly or more strictly enforced in one community of a country than in another. "Unjust discrimination" and uniformity is the only thing that can efface that stigma.

"But the state can coax its people into this right way of building as well as it has the power to force them into it. Why should not our taxes be upon a sliding

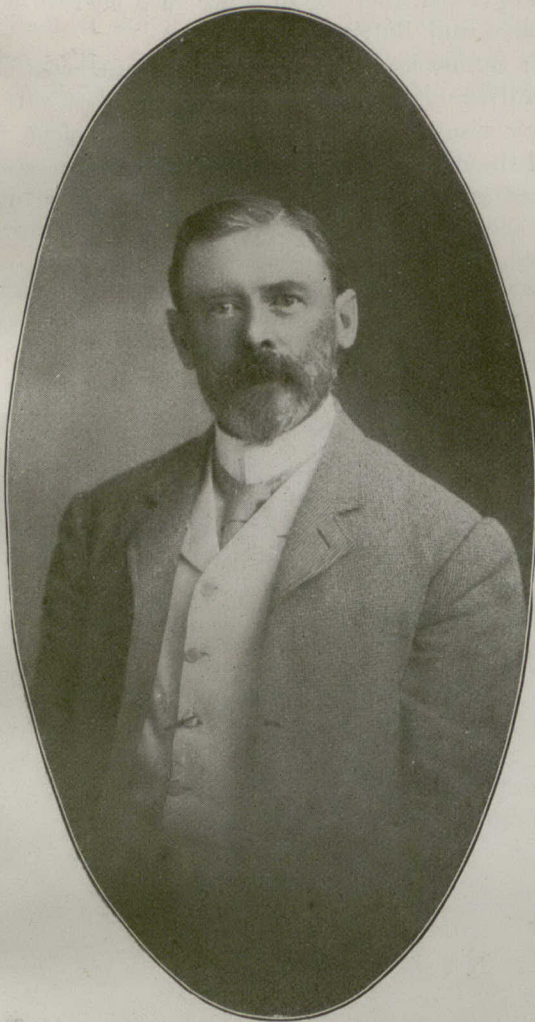


ALCIDE CHAUSSE,
Secretary Institute of Architects of Canada.

scale? Why should a man who voluntarily builds well and pays the increased cost of such construction be taxed upon a virtually self-imposed tax, a species of compound interest, as a penalty for having so well-built? Would it not be infinitely more equitable to have a regular ground tax to begin with and then a sliding scale of tax upon improvements, buildings, the minimum rate upon those of the fire-class fireproof structures that cost the community the lowest amount, the very minimum of expenditure for protection, fire

departments, etc.; and then charge the maximum rate against the old combustible and dangerous structures, for the comparative safety of which the city has to spend so much for fire departments and all that sort of protection?"

Apropos of the successful attempt made by the Royal Canadian Academy of Art in inducing the Federal Government to appoint the Advisory Council of the Fine Arts, the following motion, looking to the appointment of a similar Council in Architecture, was unanimously adopted: "That the Institute of Canadian Architects respectfully bring before the Government of Canada the advisability of the appointment of a committee of architects who shall ad-



J. W. H. WATTS,
Treasurer Institute of Architects of Canada.

vice upon all architectural matters of importance in connection with the public buildings and monuments of the Dominion."

Mr. Chausse also introduced the question of the responsibility of governments in the conservation of historical monuments. He thought it was not enough to leave the preservation of such monuments to individuals or societies. It was decided to instruct the council to write to the historical societies in Canada, expressing full sympathy with their objects, and stating that the Institute would be glad to join with them in any movement looking to the preservation of ancient buildings and monuments, and in influencing the Government in the preservation of the same.

A submerged city of great antiquity has been discovered by sponge fishers, who went down in a diving bell at Sfax, off the coast of Tunis. It is believed that the land on which the city was built subsided.

OUR ILLUSTRATIONS.

Illustrative of the designs of Messrs. Edward and W. S. Maxwell, of Montreal, which were awarded first prize in the recent competition for the Departmental and Justice Buildings at Ottawa, and which appear on our illustration pages this month, we publish below the notes appended to the plans and which will make clearer the architects' ideas:

"We have the honor to submit for your consideration designs for the proposed new Departmental and Justice Buildings, consisting of plans, elevations, sections, a bird's-eye view and a plan of the grounds showing the location of the proposed buildings with reference to the existing Parliament and Departmental reference to the existing Parliament and Departmental blocks and the approaches thereto.

"These notes are intended to make their intention more clear to you with regard to planning of the various departments to be accommodated, in a manner suitable to their importance, and to their accommodation to the site available, with due regard to an abundance of light, air and ventilation, as well as architectural setting and effect.

"GENERAL SCHEME.—A careful study of the survey sheet and a personal inspection of the site results in the formulation of a scheme incorporating a reasonable acceptance of existing grades, the accentuation of a main axis; and the acceptance of the fact that the Justice Building presents a rare opportunity for a really monumental composition, capable of a distinct character and a truly Gothic treatment, in plan as well as elevation.

"The acceptance first of all of the fact that the ideal conditions of the lighting and plan should be accepted for the courts and library, hence the court rooms have lighting on both sides, a comparatively flat treatment of ceiling and plenty of light admitted at a low as well as a high level. These conditions are accepted by authorities as the ideal ones to obtain for important courts wherever possible. (See Gaudet's *Elements et theorie d'Architecture*, 1905).

"The library is arranged with windows on both sides, and conditions of convenience for special studies are arranged for, while the large windows at the upper part admit of an ideal condition of lighting.

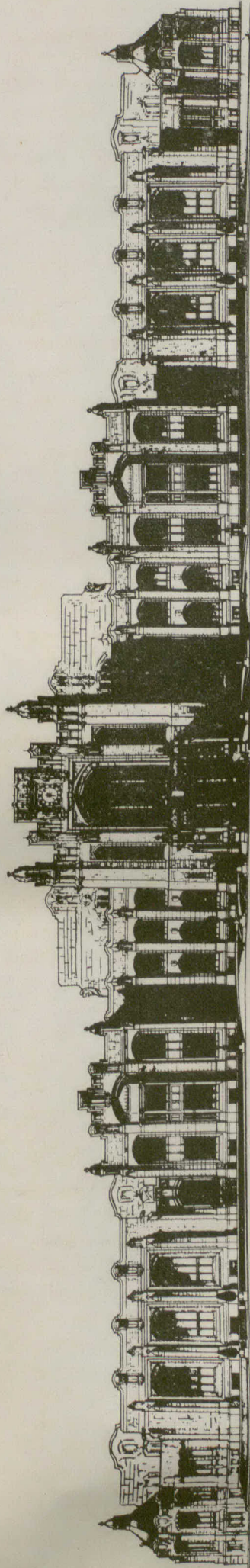
"The isolation of judges with a special corridor, entrance, etc., entirely distinct from any other entrance or department of the Justice Building, but still accessible from the main portion of the building, when occasion arises.

"On the ground floor of the Justice Building is accommodated the Department of the Minister of Justice, facing on Sussex street, and at an average elevation of 12 feet above the street level.

"The approach is by two entrances on Sussex street; from hence stairways and elevators give access to the first and second floors above, as well as by the main central stairs and elevators leading from the Parliament entrance to this building.

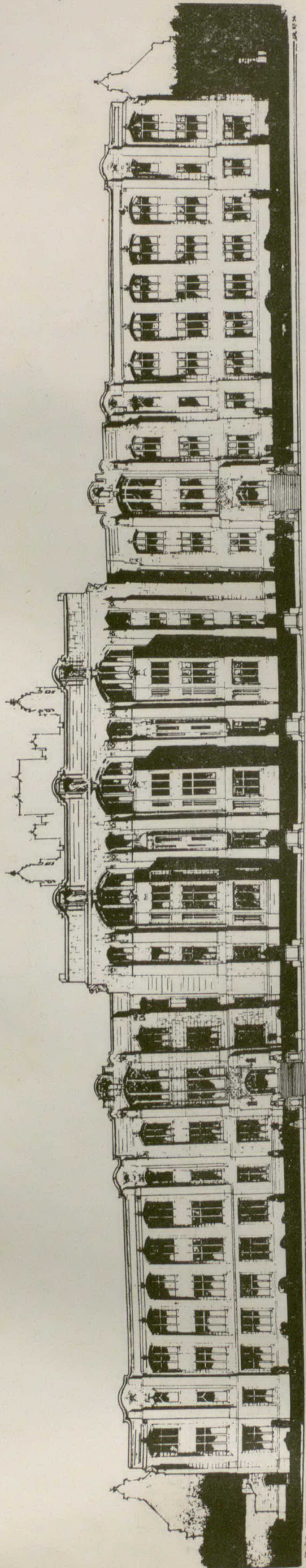
"The accommodation furnished is approximately 20,228 square feet of office space, with convenient lavatories, vaults, etc. The balance of this floor is devoted to the storage of records, etc., a receiving room for the library, and one for the restaurant and kitchen above.

"Under the whole of this floor is a basement to be



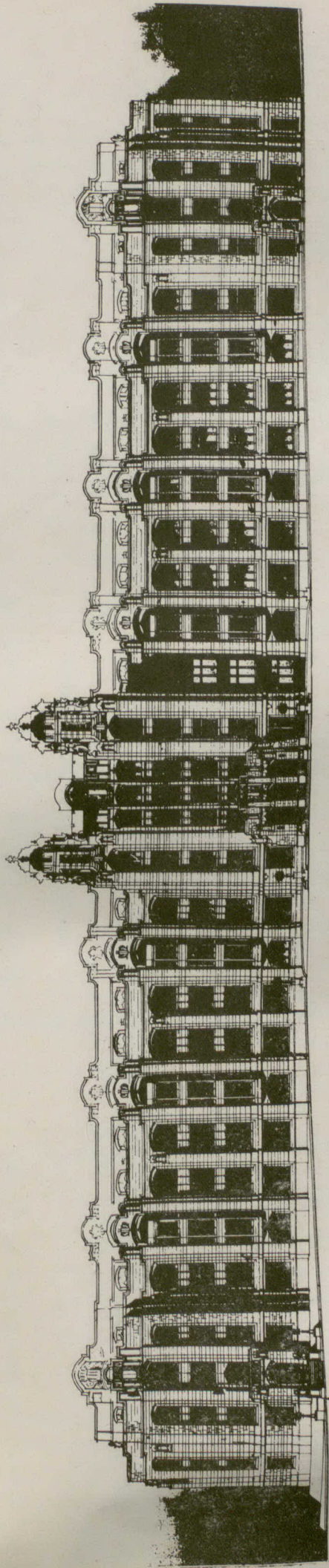
JUSTICE BUILDING, PARK ELEVATION
SCALE SIXTEEN FEET TO ONE INCH

DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA



JUSTICE BUILDING STREET ELEVATION

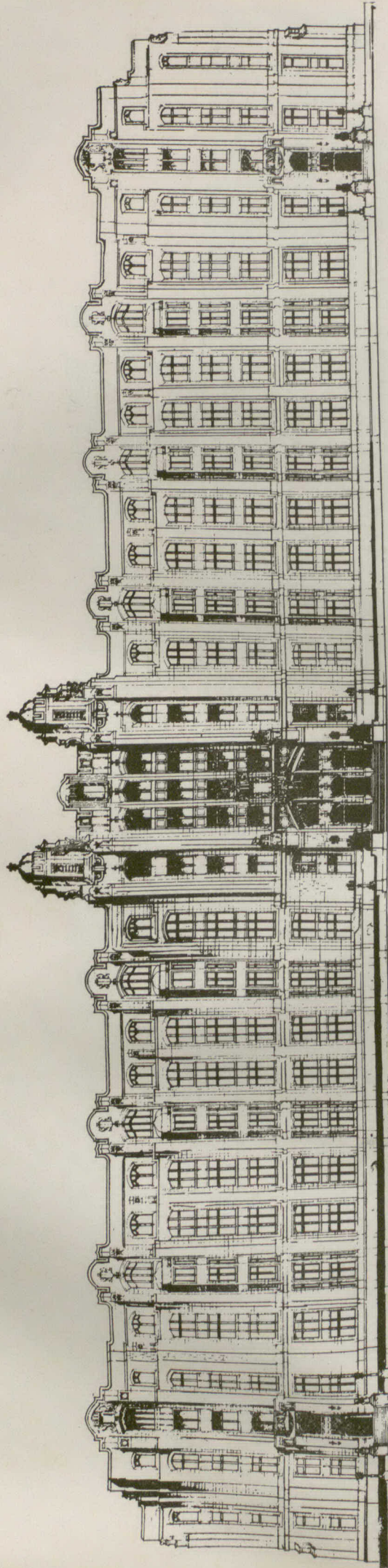
❖ DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA ❖



DEPARTMENTAL BUILDING PARK ELEVATION

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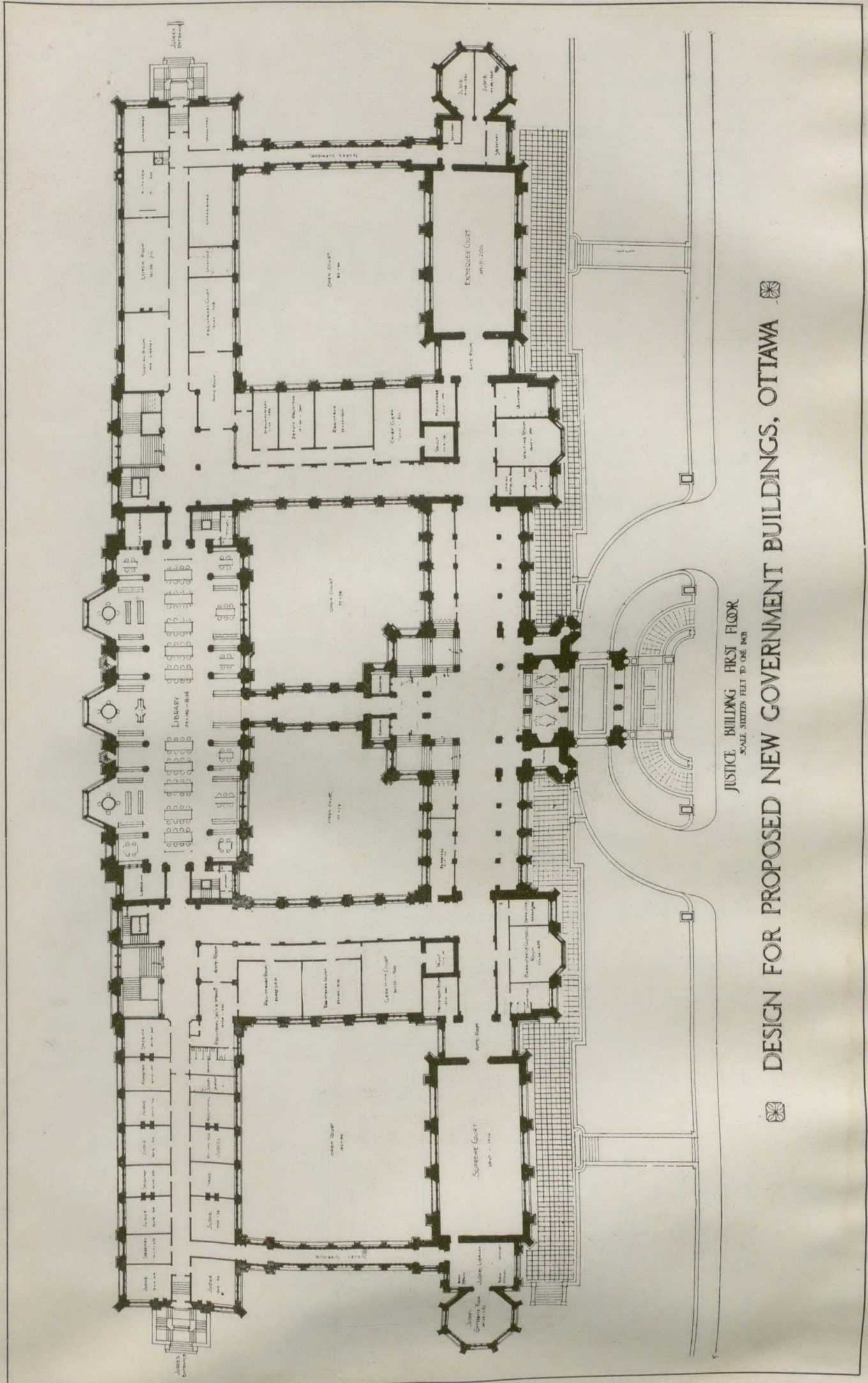
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DEPARTMENTAL BUILDING STREET ELEVATION

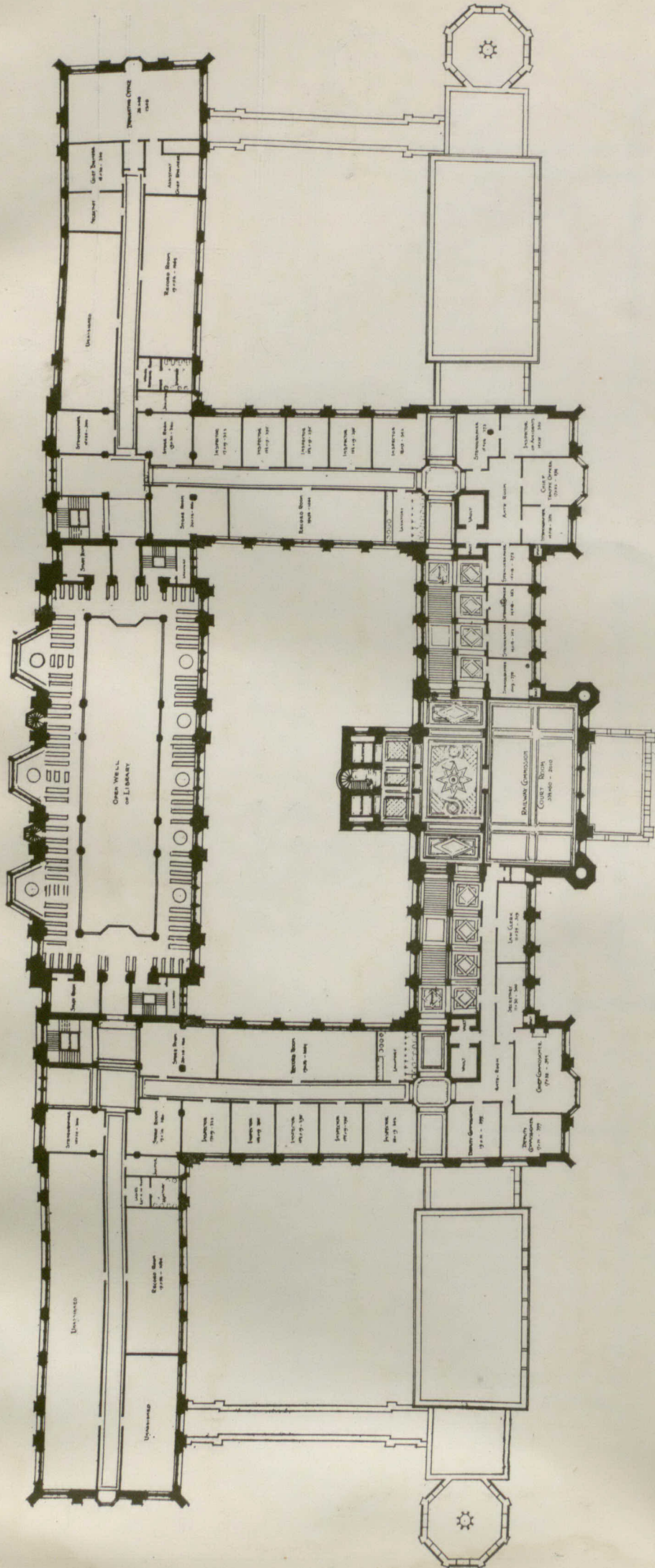
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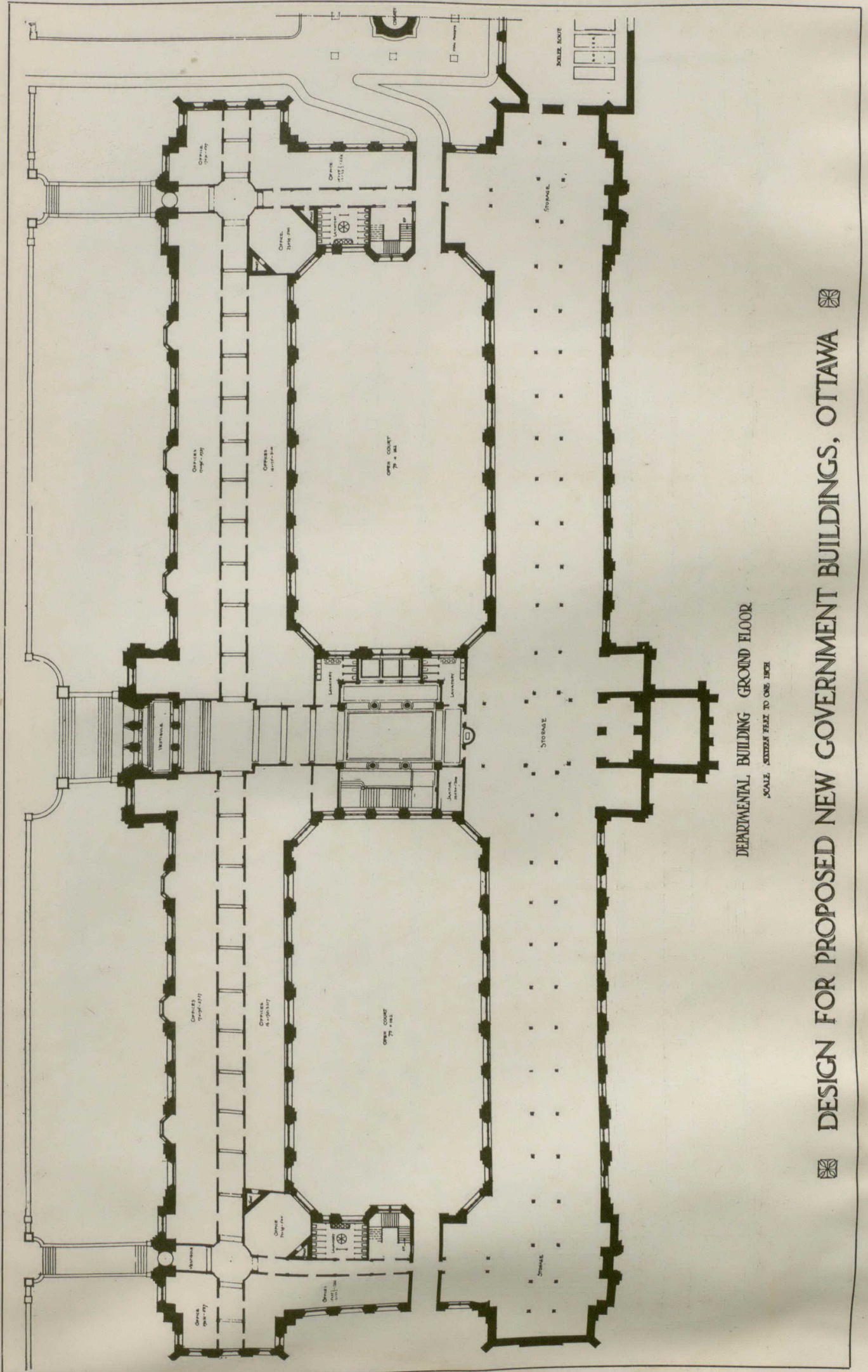
JUSTICE BUILDING FIRST FLOOR
SCALE SIXTEEN FEET TO ONE INCH

DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA



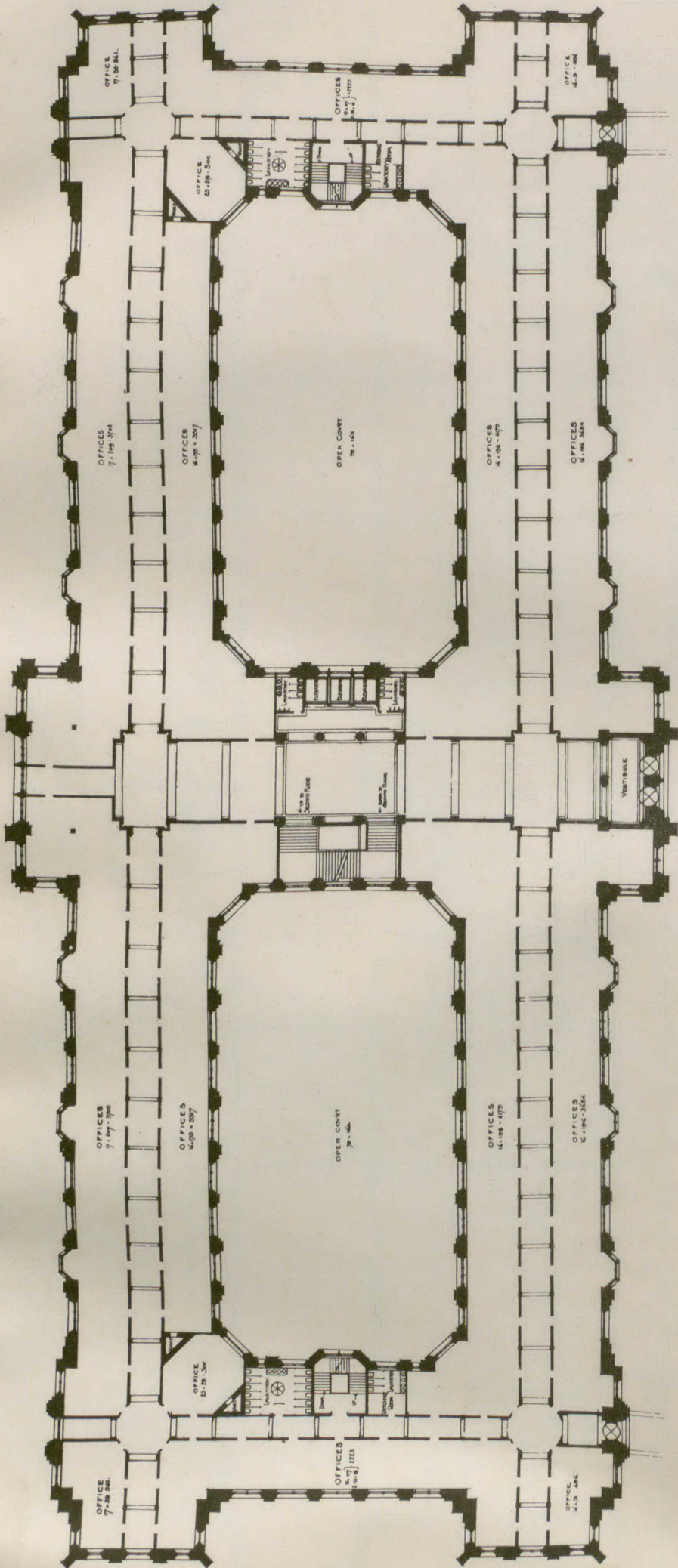
JUSTICE BUILDING, SECOND FLOOR.
SCALE, SIXTEEN FEET TO ONE INCH

DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA



DEPARTMENTAL BUILDING GROUND FLOOR.
SCALE, SIXTEEN FEET TO ONE INCH

DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA



DEPARTMENTAL BUILDING FIRST FLOOR
SCALE: SIXTEEN FEET TO ONE INCH

DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS, OTTAWA



devoted to storage purposes, and for the distribution of the various pipes, ducts, etc., required throughout the building.

"The first floor is devoted to the Supreme Court and the Exchequer Court, together with their dependencies, and the library. It will be noted that the accommodation provided is almost identically the same as that required by your conditions, viz., 24,600 square feet, with the addition of a limited amount of space for future growth and expansion.

"On the second floor is located the Railway Commissioners and their dependencies, all in accordance with your requirements of 16,000 square feet, with a very moderate amount of space available for expansion. It is felt that due provision should be made in this respect to a limited extent.

"It will be noted that every room, corridor, etc., in both buildings is amply and well lighted. The aim has been to produce, first and foremost, buildings that would fulfil their practical requirements in the best possible manner, and in no case has convenience or light been sacrificed to secure an artificial architectural effect.

"The Justice Building has practically but one large court yard, as the judges' passages and the library passage are in the nature of cloisters, not interfering in any way with the circulation of air and light. Driveways are provided so that access is had to all portions of the court yards.

"The Departmental Building has been along with the Justice Building placed on the larger plot of ground. It is felt that there is ample room for both buildings here, and as a matter of convenience, it is a distinct advantage to be in closer touch with the existing Parliament and departmental blocks than if the new Department Building had been placed on the smaller plot, where it would have the additional disadvantage of being obscured by the Printing Bureau.

"Another strong point in favor of this location is the great practical advantage of having one power plant to serve both buildings, located as it is midway between the two, where the heat, noise and dust incident to its operation will be least objectionable, and still be at the most convenient point for the distribution of heat, light, power, etc. It will be noted that the coal is delivered and dumped through pockets in the roof of the fuel storage chamber, without any handling, when it is then available for the boilers, which are on the same level. The boiler and engine house are lofty and well lighted by both windows and skylights.

"The Departmental Building, it is felt, needs but a scant description, as the drawings clearly indicate it as a practical example of a monumental office building, embodying all the features that would enter into the best type of a modern commercial structure of this type.

"It will be noted that the Park elevation shows but four storeys in height, while the Sussex street elevation accommodate six storeys, the building is thus accommodated to the inequalities of the ground to the best advantage, and at the same time provides an elevation on the Park front that does not overpower or dominate the Justice Building.

"The bridge level, in order not to ruin perspective from Spark street and Park grounds, is kept at grade 118. It would be a strain to anyone to walk up steps from grade 118 to 153.6, so easy ramps are introduced, thus permitting of easy ascent and a treatment which avoids the thread-like result which a straight line would produce, if carried from the hill on which the Parliament Buildings rest to the Justice Building opposite.

"It is felt that the acceptance of climatic conditions is a most essential feature which demands flat roofs, drained in the centre, as being the best type.

"In the design a type of Gothic architecture has been adopted, freely and individually treated, which permits of lighting the rooms and offices in a manner equal to the best traditions of practical architecture, for this reason, the perpendicular and decorative styles have been avoided as not being practicable, especially for the Departmental Building. The new buildings will thus be in harmony with the existing structures.

"**GROUNDS.**—The Justice Building is accentuated by a formal treatment, being located on the axis of the pavilion of the Parliament Building, while opposite the new Department Building freer and a more naturalistic treatment is observed, as being more in accord with the existing landscape, thus from the ground one would not find the effect of the Justice Building injured by the Departmental Building, being in places higher.

"The matter of convenience has been carefully considered, a reference to the paths will demonstrate this for both vehicular and pedestrian traffic.

"A full recognition of the bank of the ravine is considered as very important, the formal planting of the banks by poplars as shown is advocated as not interfering with the vista, but recognizing the bank of the ravine and the gradual change from the formal to the naturalistic treatment.

"In conclusion we may say that it has been the aim of the authors of this design to produce a group of buildings that shall supplement and still be a part of the noble group on Parliament Hill, connected to them in a formal and serviceable manner, the old and the new forming as it were one grand connected design that might have been planned at one time by a master mind.

The group will be impressive as seen from any point of view, varied only as the Gothic style can be varied, but without restlessness, rich without ostentation or undue ornamentation, with simple masses, logical composition, and the purpose of the plan unmistakable, a general character of distinction and refinement has been sought that shall live and be an added attraction for the future."

It is seldom that a public gift has met with more general appreciation than has Canada's contribution to the Queen Victoria Memorial at Buckingham Palace of the beautiful gates recently put in position there. In the scheme of the Queen Victoria Memorial they form one of the five outlets from the circle now known as the Queen's Gardens, in the centre of which will stand Brock's statue of the Queen.

THE COMPETITIVE DESIGNS AT OTTAWA.

BY "A. BRITONIAN."

The announcement of the judges' decision in the competition for plans for the proposed new Departmental and Justice Buildings has been made and the thirty designs submitted were on exhibition in the Railway Committee Room of the House of Commons from September 4 to 18. The first prize of \$8,000 was awarded Edward & W. S. Maxwell, of Montreal; second, \$4,000, Darling & Pearson, Toronto; third, \$2,000, Saxe & Archibald, Montreal; fourth, \$1,000, Brown & Vallance, Montreal.

The judging committee was composed of Mr. D. Ewart, chief architect of the Public Works Department, Ottawa, President Edmund Burke of the Ontario Architects' Association, and President Chausse, of the Quebec Architects' Association. In judging considerations of architectural beauty, relative cost, allocation and economy of office space and general suitability of design to the needs of the service were made the basis of award. No fixed cost was named in the conditions of the competition, but a building costing about three millions was the desideratum.

The designs are fairly representative of the average capacity of the profession in Canada, the roster containing the names of some of the most distinguished practitioners thereof, although in several cases the designs are not up to the level of the authors' reputation. With a few exceptions some type of Gothic was chosen, generally late English, Flemish or Italian Gothic, only one design being distinctly French Gothic. With the exception of the designer of No. 9, none has closely followed the tradition and grammar of his chosen style of developing his design.

The first prize goes to E. & W. S. Maxwell, of Montreal (No. 24). The floor plans are so simply and conveniently arranged that there appears no reason to cavil at this award so far as they are concerned, although the planning of the Justice Building is inferior to that of the main building. The architecture is disappointing, lacks impressiveness and dignity as well as picturesqueness, this last a *sine qua non* in such surroundings.

The second prize (No. 12) is awarded to Darling & Pearson, of Toronto. Their's is a vigorous and scholarly design, irregular in plan, and conspicuous for the qualities which the first prize design lacks. Although displaying individuality, it, nevertheless, shows a family resemblance to the work of the late G. E. Street, from whose office the authors are graduated. This design is admirably suited to the site.

The third prize is awarded to Saxe & Archibald, Montreal (No. 19), for a design in a modernized type of Continental Gothic, shown in an excellent set of drawings. The floor plans are remarkably good, and, excepting the placing of the Justice Library, it would not be easy to say they could be improved. The architecture is among the best shown, but, however well handled, it is debatable whether these large oblong blocks with high central towers would be effective on the site proposed.

The fourth prize is awarded to Brown & Vallance, Montreal (No. 30), who submit a beautifully delineated and tinted set of elevations and sections, showing a modern French adaptation of late Gothic civil archi-

teature. The plans are well arranged and the elevations fairly effective, but there are doubtless many of the unpremiated designs quite as good if not better. Certainly the design was not suggested by the site.

order of merit are in the following order:—

The seven designs placed by the judges as next in

Fifth—Alfred H. Chapman, Toronto (No. 18). A well-chosen and freely handled type of Tudor Gothic of the scholastic variety, severe but plain, suitable and well drawn by a hand familiar with his style. The plans are simple and the arrangement convenient.

Sixth—John M. Lyle, Toronto (No. 22). A design in domestic Tudor Gothic, well massed and dignified, but somewhat cold, heavy and plain in treatment. The plans are well studied and suitable and the drawing is of high quality. There is a good general view, showing the grouping and general effect to have been well considered.

Seventh—J. A. Ewart, Ottawa (No. 8). This architect places his Justice Building in the middle and the two Departmental Buildings as flanking blocks. Among the drawings is an effective general view from Banack Hill, showing the bridge and approaches in the foreground. The architect, who has pinned his faith to the same type of architecture that he used when retained to build the adjacent Archives Building, gives a striking design with a good plan of a group of buildings which would be likely to cost less in execution than any of the premiaded designs. The bridge is one of the best in the collection.

Eighth—John McLaren, Vancouver, B.C. (No. 5). This design falls short in its plans, which are unsuitable for the chosen site, but the architecture is an excellent adaptation of Flemish Gothic, well drawn and admirably treated. There is a good bridge which it is well to note, as few of the competitors have given due thought to this feature.

Ninth.—Sproatt & Rolph, Toronto (No. 6). A rarely artistic composition, thoughtfully and skilfully designed with due regard to its surroundings, position and use, and detailed in a masterly manner. It appears to be the result of a study of pure monastic English Gothic and is simple in detail, broad in masses of light and shade, restful to the eye and possessed of a skyline, which, from any point of view, would be satisfying. The plans are good. The bridge is of stone and would harmonize well with the canal locks which it is designed to span.

Tenth—James Foulis, Ottawa (No. 28). A design in correct Georgian English architecture, carefully and well drawn. The author is evidently familiar with the style he has chosen. The plan shows careful attention to lighting, the corridors especially being well arranged and lighted. The bridge is of stone and is probably the best in the collection.

Eleventh—Hutchison & Wood, Montreal (No. 25). This design is shown by a large and very complete series of well-executed perspective and geometric drawings. The style is civil Gothic of a Flemish cast. This drawing receives a good deal of attention from visitors, as indeed do several others not fortunate enough to land a ribbon. It is original in treatment and does not lose by comparison with its more fortunate neighbors.

In addition to the foregoing there are eighteen

others entered by seventeen competitors, two being by one firm. Some of these bear the names of distinguished firms, a number of whom send worthy drawings of their reputation, while a few send hasty and ill-considered work. Some of the architects who have chosen the Gothic style are unfamiliar with its traditions and are unpractised in its forms and, as a consequence, their work lacks style and individuality, and is tame, no matter how good the draughtsmanship lavished on the drawings happens to be.

The following is a list of the architects not enumerated in the foregoing, placed in the relative positions accorded them by the judges:—

- Twelfth—Geo. W. Gouinlock, Toronto.
- Thirteenth—Maurice Perrault, Montreal.
- Fourteenth—Furley & Spence, Montreal.
- Fifteenth—Finlay & Spence, Montreal.
- Sixteenth—Gordon Q. Helliwell, Toronto.
- Seventeenth—Unnamed.
- Eighteenth—Routhier & Lefort, Ottawa.
- Nineteenth—J. B. McRae, Ottawa.
- Twentieth—P. S. Gregory, Cooper street, Ottawa.
- Twenty-first—Horwood & Taylor, Ottawa.
- Twenty-second—S. F. & W. A. Peters, Winnipeg, Man.
- Twenty-third—John Gemmell, Toronto, Ont.
- Twenty-fourth—J. Arnold Thomson, Ottawa.
- Twenty-fifth—Canan Boullon, Ottawa.
- Twenty-sixth—R. H. Barber, Toronto.
- Twenty-seventh—Melville McKean, Moneton, N.B.
- Twenty-eighth—A. J. McAdam, Halifax, N.S.
- Twenty-ninth—Bella Campbell, Teulon, Man.

EXHIBITION ART GALLERY.

The visitor to the Art Gallery at the National Exhibition two weeks ago had a rare opportunity of studying, side by side with some of the old world's masterpieces, the best works of some of our Canadian painters. To say that the latter suffered by the comparison would be to do an injustice to the splendid collection of Canadian paintings that were there on exhibition. True, art in Canada is still in its infancy, but it is an infancy full of promise, and perhaps no better way can be adopted of developing the artistic taste of the community than by occasionally giving the public the opportunity of studying good paintings. No doubt thousands of those who thronged the Art Gallery during the Exhibition gained little good from the collection, but, on the other hand, there could be no mistaking the keen interest felt by many in endeavoring to interpret the artists' meaning.

This year nearly 300 pictures hung on the walls of the Museum, including a wide range of subjects. To name any one painting as having attracted particular attention would be a difficult matter in view of the immense crowds that continually thronged the Gallery, but it is safe to say that none received more favorable comment than "The Picture Gallery," by Sir L. Alma Tadema. The painting is that of an artist's gallery, in which are gathered together a group of observers. Before an easel on which apparently stands the artist's latest work, is an interested group listening to an explanation of the subject depicted. In the foreground and alone sits a girl, whose mingled expression of interest and indifference seems to be an

object of concern to the artist, who, while explaining the picture to those near him, is apparently more interested in the girl than in his narration. In the background are two or three other figures carelessly contemplating a picture hanging on the rear wall. The painting is large and beautifully distinct in coloring and expression. The minute details of the furnishing of the gallery and the robes of the figures are worked out with an accuracy that renders totally inadequate a cursory examination of the painting. "A Lover of Art," by the same artist, shows the court of a Greek dwelling supported by dark marble pillars with Ionic capitals and mosaic floor. The group of four persons in the room are intent on the examination of the statue of a young girl, who is represented as rescuing a dove from a snake.

In the same class were the two paintings by Sir Joshua Reynolds, "George III." and "Queen Charlotte," astonishing in their freshness of coloring and in regard for the minutest detail of dress and figure.

Second to none in popularity was J. Pettie's "Two Strings to Her Bow," the subject appealing keenly to the susceptible minds of the holiday visitors, who stopped in scores to admire it. Of scarcely less interest to the majority was Sir Edwin Lanseer's "There's No Place Like Home," the painting showing a Scotch terrier just returned "Home," which for him consists of an empty, headless barrel. In W. P. Frith's "Honeywood Introducing the Bailiffs" the public saw much to admire in the artist's clever method of explaining the difficult situation in Goldsmith's "Good-natured Man." The two bailiffs are shown bowing awkwardly to Miss Richland, who curtsies as they are introduced to her by her suitor, Honeywood.

The large painting loaned by the corporation of London, England, showing John H. F. Bacon's painting of the City of London Imperial Volunteer's receiving the thanks of the city on their return from the South African war, October 29, 1900, was always the centre of a group of admirers. Always a subject of interest also was "A Chip of the Old Block," by R. Caton Woodville, showing a charge of cavalry taking place late in the twilight of a laborious day. The central figure is Trumpeter Shurlock, a boy of 17, who in the course of the charge killed or disabled several of the enemy.

"A Chat Around the Braser," by John Phillips, was unfortunately given an interpretation which the picture itself scarcely warrants. An idle Spanish group are chatting interestedly about a brasero listening to an amusing tale from the lips of a priest. To think that the tale is questionable and to thus cast a reflection on the author's production is as puerile as it is baseless.

A beautiful painting, "An Idyll," by Maurice Greiffenhagen, occupied a conspicuous place in the Gallery, and was deservedly the subject of much admiration. Amid the flowers and meadow grass, tinged red by the light of a low red sun, a youth has clasped in his arms the form of a young girl.

Of the same vague character was Arthur Hocken's "The Cloister or the World." Before the kneeling figure of a pure-faced woman in the anguish of perplexity lies the parting of the ways. To her right is an angelic figure in white with outspread wings, offer-

ing the purity of a life hidden away in religious seclusion; behind, the shadowy figure of a smiling girl holding aloft a bowl of bright flowers, emblematic of the pleasures of the world.

A beautiful painting is "Tranquility," by G. A. Reid, of Toronto. The dreamy restfulness of the green tones predominating in the picture and the vague outlines of the motionless stork, poised on a stone in midstream, seemingly no less motionless than her mate stretched in a long low flight over the edge of the unrippled water, can be better felt than described.

Of other scenes of nature there are many examples, notably, "On the Fraser River," T. M. Bell-Smith; "On a Backwoods Road," F. H. Brigden; "Dedham Lock," John Constable; "Dutch Winter Scene," A. Van der Velde; "Early Morning," Ben Foster; Landscapes, Jacobi; "October," Elizabeth A. McG. Knowles; "Flowing Through Canterbury," C. M. Manley; "In the Meadow," H. Britton; "A Peaceful Hour," W. Cutts; "Evening," G. Chavignaud; "At Play," F. S. Haines; "In the Grampians, Scotland," R. F. Gagen; "In the Fields," C. M. Manley; "A Sunny Day at the Island," O. P. Staples.

For the historian there were many portraits of Canadian national celebrities, including many loaned by Laval University, Quebec, not so well known perhaps, but, nevertheless, of more than passing interest. Of portraits there were numerous examples, including a recent likeness of S. H. Blake, of Toronto, by E. Wyly Grier. In "The Dreamer," a beautiful study of childish reverie, Mr. Grier has executed a striking portrait.

CLOSER ARCHITECTURAL UNION.

To consider the relations of the American Institute of Architects and its chapters to the various architectural societies throughout America and to formulate some scheme tending to a closer relationship in the future, the following committee has been appointed by the president of the American Institute of Architects:—Edward L. Tilton, 32 Broadway, New York; Louis C. Newhall, Boston, and C. C. Zantinger, Philadelphia. It has been considered that the ultimate aims of the Institute and the various societies are similar and, although consolidation might be undesirable, if not impossible, much may be gained by a limited co-operation, so successfully tried in other countries, notably that of the Architectural Society of London and the Royal Institute of British Architects.

By a proportioning of the work among the different architectural associations, a conservation of energy would be effected and by a combination the influence of the profession would be greatly increased.

CURIOUS CHURCH.

There stands upon a hill in the village of Uphill in the county of Somerset, England, a small and very old church, which is surrounded by caves in which the bones of all kinds of animals have been discovered. This historic place of worship, which looks down upon Uphill Castle and the village itself, was at one time the only place of worship for miles around.

For several years no Sunday services have been held within its walls, says the "London Tit-Bits," and the only time that the public is allowed to worship there is one night in the year—on Christmas eve—when the vicar of Uphill or some other clergyman officiates. There is a footpath leading up the hill to the church, but as the hill is a very steep one and the distance great, very few people visit the church. It is by order

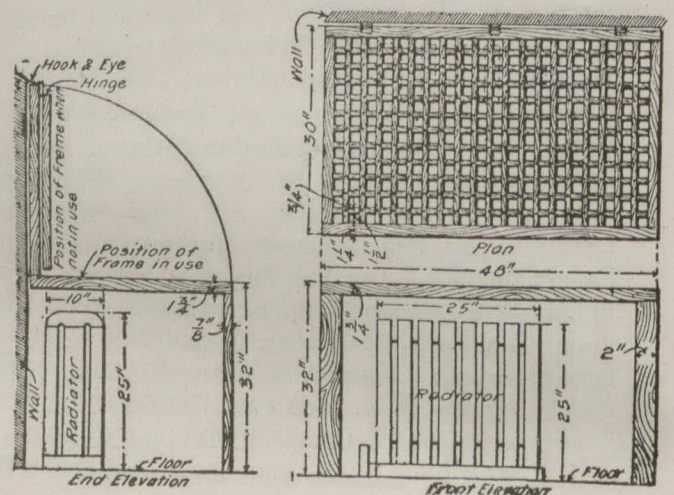
of the ecclesiastical commissioners that it is opened to the public once a year.

Curious stories are told regarding this interesting edifice, one of which is to the effect that the church was purposely built on the top of the hill so that the preacher could feel convinced of the sincerity of the faith of those who accomplished the task of climbing to it. The church has been visited by people from all parts of the world. It is the only building in England—probably in the world—in which divine service is conducted only once a year.

BLUE PRINT DRYING FRAME.

When blueprints are required in a hurry the drying frame shown in the accompanying illustration from the "Railway Review" will prove very useful. A white pine latticed frame was constructed on which a large piece of blotting paper is placed to receive the wet print.

The wet prints on the upper side of the frame and



DRIVING FRAME.

the intense heat of the radiator about 2 1-4 inches beneath the lower side made a specially strong construction necessary to resist the warping and buckling strains due to the difference in temperatures.

The frame is 48 inches long by 30 inches wide. It is composed of strips 3-4 inches wide, halved and screwed at all intersections and spaced 2 1-2 inches apart in centres. The recesses cut in each strip are bolted together in a manner so substantial that buckling is impossible. The frame is finished with shellac. The height above the floor is 32 inches when the table is down ready for service. The frame is hinged and equipped with hooks and eyes so that it folds back against the wall when not in use.

SASKATCHEWAN PUBLIC BUILDINGS.

A limited competition has been inaugurated by the Saskatchewan Government for the purpose of securing plans for the new Executive and Administrative Buildings, which it is proposed to erect at Regina, the provincial capital. The competition is restricted to the following firms:—Messrs. Darling & Pearson, Winnipeg and Toronto; Mr. Cass Gilbert, New York, U.S.A.; Messrs. Marchand & Haskell, Montreal; Messrs. E. & W. S. Maxwell, Montreal; Messrs. Mitchell & Raine, London, Eng.; Mr. F. Rattenbury, Victoria, B.C.; Messrs. Storie & Von Egmond, Regina. The competition is for a building to cost about \$1,250,000. The competitors are guaranteed a fee of \$1,500 each, the author of the premiated plan being awarded the construction of the building as well.

The assessors in the competition will be:—Mr. Bertram Goodhue, of Messrs. Cram, Goodhue & Ferguson, New York, and Mr. Percy E. Nobbs, Professor of Architecture, McGill University.



[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.]

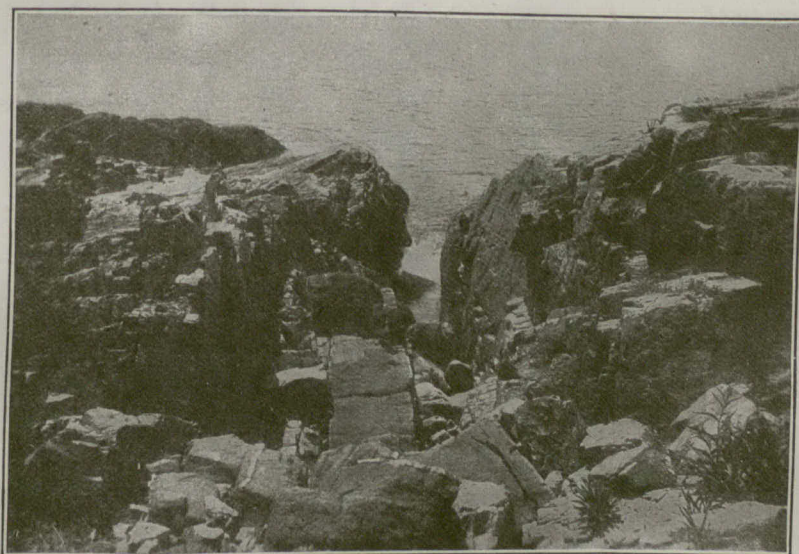
THE DURABILITY OF CERAMIC TILE.

C. J. FOX, PH. D.

One of the most remarkable properties of the ceramic or clay tile is its extreme durability. Geology shows many examples of remarkably preserved rocks formed of baked clay placed side by side with granite and other stones which are gradually being ground to dust by the very forces which are impotent against the harder clay. Archaeology has given the world many examples of tile and other ceramic products which date back several thousand years before the Christian era. History tells of ceramic floors in cathedrals, churches and abbeys which have been used without injury for centuries. Simple experiments

mass, but the wearing away of the granite has left the cove seen between the smooth and sharp angled ledges formed of baked clay. At the bottom and centre of the picture can be seen the remnants of the granite, which have the appearance of worn, spongy looking stone. Thus granite, which is to us almost a symbol of all that is hard and durable, is really a perishable substance in comparison with baked clay. If one tries to scratch these rocks of clay it will be discovered that steel makes no impression upon them; moisture can not penetrate them and no agency common in nature can corrode them.

Among the articles found in the mounds of the Mississippi valley are many bowls, jugs, cooking uten-



ROCKS ON MAINE COAST.

and scientific tests demonstrate that baked clay is the most durable of all the substances used for floor or wall.

The accompanying photograph of cliffs on the Maine coast shows two distinct classes of rock; the one stands out boldly, presenting its sharp angles and unscarred sides to the ceaseless beating of the waves and to the deteriorating effect of the rain, wind, heat and frost; the other appears worn, its corners rounded off, its base strewn with debris caused by wind and wave, rain and sun. The geologist tells us that these sharp angular cliffs were originally strata of clays, which were depressed to a depth below the surface of the earth where the internal heat baked them in a manner similar to the potters' fire, and subsequently cast to the surface by geologic upheaval. The rounded cliffs are layers of granite, produced by the metamorphic action of the heat on other layers associated with the clay. The wearing away of this softer stone has formed the clefts, cracks and coves between the harder cliffs of clay. These rocks were at one time a solid

sils and other things of baked clay used by pre-historic man. All of these have been broken, but their fragments have neither decayed nor changed in color. The most striking examples of the ancient potter's craft have been found among the ruins of Babylon, Assyria and Egypt. The British Museum and other museums of Europe contain many examples of tiles from these countries, which are from two to six thousand years old. These tiles are generally well preserved, retaining even their original brilliancy of color. The famous Lion of Babylon, made of yellow and green glazed tile, and the clay tablets bearing Babylonian inscriptions, antedate the Christian era by several thousand years; yet in many cases they are as well preserved as if they had been taken from the kiln but yesterday.

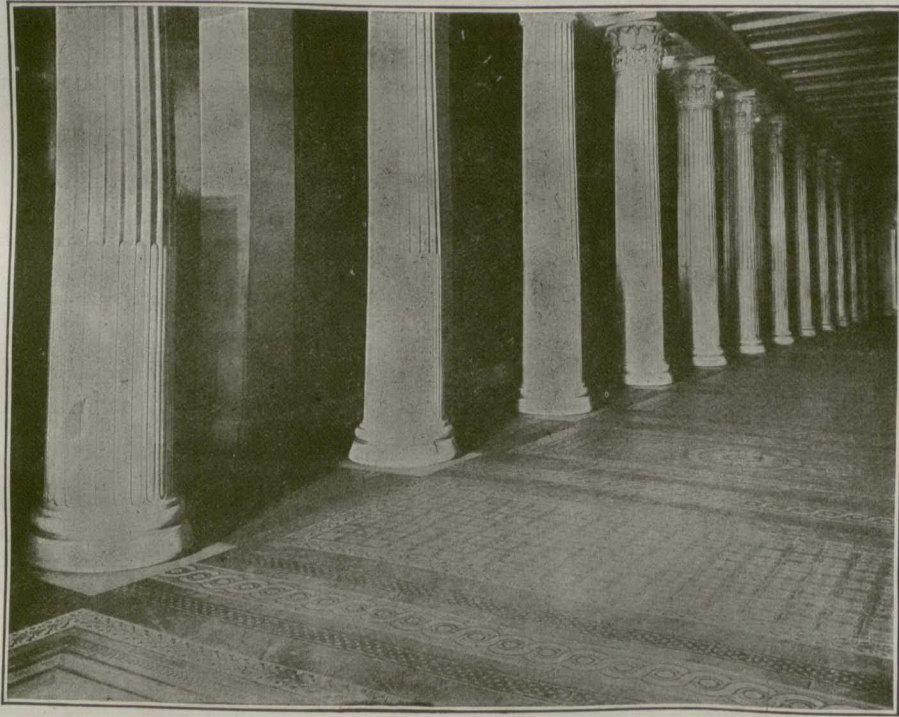
An excellent comparison of the durability of Babylonian clay products with those of stone was made by the discovery of a colossal stone lion among a pile of brick and tile. The angles of the stone figure were worn and the features obliterated, but the sharp clear

angles of the brick and tile were still intact after four thousand years.

The elaborate mosaic floors and pavements of the Romans formed a striking feature of their architecture. There are many examples of these mosaic floors in existence in Italy and throughout the former Roman colonies. The mosaics were formed of tesserae of marble and of baked clay, the latter being used to form the red, buff and brown colors. It is a noteworthy fact that in all these floors still in existence the marble portions have been well worn by use, while the clay tesserae are in almost perfect condition.

During the mediaeval centuries of Europe encaustic, or monastic, tiles were used extensively for the pavements in the interior of English churches and abbeys. Many well-preserved examples of these tiles, bearing the armorial, pictorial and symbolical designs traced by the monks, can be seen to-day in England; they are almost unworn by the tread of the countless multitudes who thronged the churches during the middle ages.

The relative durability of various flooring materials was tested several years ago by an ingenious experiment of Mr. Frank Furness, an architect of Philadelphia. The several specimens were cemented to identical blocks of sandstone, each of which weighed twenty-one pounds. Each sample presented a surface six inches square and a thickness corresponding to the usual thickness of flooring materials. They were placed face downward on a horizontal iron rubbing wheel, ten feet in diameter, which was run for one hour at a speed of seventy-five revolutions per minute. The blocks were held in place by a frame and the face of the wheel supplied with rubbing sand and water. The wear of the various flooring materials was then measured, showing the amount that was worn away by the wheel. The clay tile lost but one-eighth of an inch in thickness by the hour's grinding of the wheel; the Vermont marble lost three-quarters of an inch; the marble mosaic collapsed altogether, one inch being rubbed away within fifteen minutes, and the whole slab disappeared after thirty-five minutes. Owing to



TILED FLOOR IN CAPITOL, WASHINGTON, D. C.

Coming from mediaeval Europe to modern America, one of the first tiled floors of note in this country was that in the Capitol at Washington, laid about fifty years ago. These tiles were made by an English firm, as half a century ago there was not a tile manufacturer in the United States. With the exception of one or two tiles at the entrance, which are worn less than an eighth of an inch, these tiles appear as if they had been put down but yesterday.

Ten years later an elaborate marble and slate floor was laid in a large hotel at Washington, but a short distance from the Capitol. To-day the marble slabs of this floor are in many cases worn completely through, especially in front of the door and the clerk's desk, and the holes are filled up with cement. As slate makes a more durable floor than marble, the alternating slabs of worn marble form deep indentations, in many cases hollowed out as much as three-quarters of an inch between the harder slabs of slate. But even the slate is worn considerably and cracked in many places.

the scientific accuracy with which this experiment was carried out, it was a valuable and reliable contribution to the practical knowledge of the architect and builder.

Another simple experiment by which the extreme durability of the ceramic tile can be demonstrated is to take an ordinary jack-knife and try to scratch the tile with the sharp steel blade. It will be seen that the hardest kind of steel does not make an impression on the vitrified or the unglazed floor tile, but merely leaves a mark resembling that of a lead pencil, and which can be removed by simply wiping it off with a cloth. If one tries the same experiment with a piece of marble, it will be found that steel easily scratches the marble. This is a very important consideration, especially for floors and hearths. The nails of the shoes will scratch and gradually wear out marble, but will make little or no impression upon tile.

Tile is the ideal covering for floor or wall. It is so hard that it cannot be scratched by the nails of the shoe or other sharp pieces of hard material. As a fire-

resisting material it makes an excellent hearth, as it cannot be burned by red-hot coals. It is impervious to moisture, and, unlike marble, it is so non-porous that it can not absorb dirt or dampness. Ink spilled upon it will leave no stain, while it is difficult to remove such stains from marble.

Many centuries' experience has shown that the durability of the tile enables it to withstand not only knocks and blows but also the insidious wear and tear of time and constant use.

MONTREAL NOTES.

The total assessed value of real estate in Montreal is estimated for the current year at \$230,000,000. The value of the city's real estate has thus doubled in fifteen years and has increased by twelve million dollars during the past year, as compared with an increase of twenty millions during the previous year. The percentage due to the municipal exchequer as taxes has two very strong claims being made upon it. The roads, in spite of the fact that during one-third of the year they are covered with snow and therefore not subjected to any appreciable wear, continue nevertheless to be the cause of loud complaint. The other demand is for more adequate protection in case of fire. Montreal has never been visited by any extensive sectional fire, but allegations of inefficient water supply, on several occasions when destructive fires have broken out, have made the public uneasy on this score. The breaking down of pumps and the non-delivery of new ones ordered have repeatedly left sections of the city without water to drink or to flush the drains. One might suppose that the strongest plea in favor of a better water supply should be based on the discomfort and disease occasioned by water famine (as if water should ever be scarce in a land of innumerable lakes and mighty rivers!). The most active protest, however, is being made by business associations, such as the Montreal Board of Trade, the Chambre de Commerce and the Canadian Manufacturers' Association. It has even been resolved by these bodies to engage independently the services of a consulting engineer to examine into the state of matters and make suggestions for improvement. The whole question of water supply is one on which the management of the city cannot be congratulated since it has never been given the attention due to this first necessity of life and most essential protection against disaster.

Two new schools to be open for the new session are the Delorimier Protestant School at Fairmount, which has cost \$15,000, and St. Michael's School, at the corner of Drolet and Boucher streets, at present to accommodate 350 pupils and later on to be extended for 750. Both are constructed of brick with stone dressings on a basement of Montreal stone.

The much delayed fire station in Berthelet street is now promised for Christmas. The site for the ten storey Eastern Townships Bank and the Canadian Bank of Commerce are still holes in the ground. The Canadian Transport Company's large building in McGill street is rapidly mounting skyward. Bennett's vaudeville house is now in operation. A new theatre almost directly opposite the last is now rising above the ground. The sash and door factory of V. E. Traversy in Papineau road was destroyed by fire on August 16.

Mr. Max Donmie, from France, has been appointed

Professor of Architecture at the Ecole Polytechnique, affiliated to Laval University.

"ECLIPSE" ROOF GLAZING.

An exhibit at the National Exhibition that attracted considerable attention was that of Mellows & Company, of Sheffield and London, England, which introduced for the first time to Canadian architects and builders their "Eclipse" system of puttyless roof glazing.

The steel bar which takes the place of the ordinary wooden sash bar is said to be absolutely imperishable, being covered with a strong "Eclipse" metal cover, which is soldered at both ends, thus preventing any rust or weather getting to it. Neither zinc, putty nor paint is required. Snow or rain cannot possibly drift in between the glass and the woodwork, owing to the existence of a lead windguard which is fixed underneath the bottom of the pane and between the bars.

The use of this bar for over twenty-five years on railway stations, engineering works, baths, dye works and other buildings, subjected to the worst atmospheric conditions that could be selected, proves that it is imperishable, and entirely unaffected by atmospheric action.

The perfectly watertight condition of this system of roof glazing and also the keeping out of dirt and dust is due to the existence of three webs which (unlike either zinc or copper), are rubbed firmly against the glass, two webs above and one below.

ELECTRIC STANDPIPES.

The attention of architects and builders is directed to an important requirement by the electrical department of the Fire Underwriters in connection with supply mains in buildings where electric lighting and power is furnished to various consumers on the different floors. It is just as necessary that an architect provide proper mains in such buildings for the supply and distribution of electric light and power as for gas and water, and the failure on the part of architects to provide for this standpipe has in the past been the cause of a multitude of overhead service wires being run from the street into the windows on different floors of buildings throughout the city.

In cases where buildings are situated on the underground electric light service, a rising main can be run up through the entire height of the building in an iron conduit, sufficiently large to contain wires of sufficient carrying capacity to furnish all the lighting which is ultimately likely to be required on each floor, and, in the case of power supply, the power service may be brought into the building through the standard outside service pipe, such as is compulsory in the City of Toronto, and then rise up through the inside of the building with a meter loop on each floor. The details of this construction can be obtained from the electrical department of the Fire Underwriters.

A HANDSOME BUILDING.

The New Vancouver Courthouse will be the chief architectural feature of the City of Vancouver. It will be built of Haddington Island stone, which was also used in the provincial legislative buildings. The stone is grey, mellowing to a softer shade almost approaching white in process of time.

CEMENT AND CONCRETE

[NOTE --Contributions suitable for publication in this Department are invited from subscribers and readers]

SOME ESSENTIALS IN REINFORCED CONCRETE WORK.

BY FRANK B. GILBRETH, New York.

The apparent simplicity of the design and construction of reinforced concrete has caused to rush into the business large numbers of engineers and contractors, who have not been properly prepared, either by education or by practice. Unless legislation is speedily enacted that will protect the layman from his own ignorance, reinforced concrete will soon receive a setback that will require years to overcome.

The following points, embodied in the standard practice of the writer's organization, would have prevented all of the well-known failure of reinforced concrete in America in the last two years. They are recommended as absolutely necessary for the best results:

(1) All rods should be anchored at the ends regardless of whether or not they are deformed their entire length. If rods are 7-8 in. or less in diameter, a simple bend at right angles will be sufficient anchorage. If more than 7-8 in. in diameter, the anchor must consist of a threaded plate which is to act as a large nut on the threaded end of the rod. Aside from the question of bond stress at the end of the rod, where it is at its maximum, it is well known that the more a rod is deformed the quicker will the concrete peel off under fire.

(2) Rods should be of a cross-section that will permit the concrete to flow up under the lower side of the rod with the least resistance, and with no deformation on the rod that will tend to pocket or confine the air in such a manner as to prevent the concrete from completely surrounding and attaching itself by adhesion to the rods and thereby insuring prevention of rust and adequate fire protection.

(3) All rods in the tops of beams and girders at their supports should extend far enough beyond those points to insure sufficient anchorage even when all of the concrete below the rods in the bottom of the section has peeled off, due to the wedging action caused by the use of deformed reinforcement, or to the action of fire.

(4) Preference should be given to rods with a cross-section that will give the least wedging action to the concrete fireproofing underneath the rod when the beam is subjected simultaneously to a load overhead and a fire underneath.

(5) Rods running in the same direction should never be permitted close to each other for the reason that the spaces between them will be filling with air bubbles which will exclude a proper filling of the spaces by concrete. (While nearly all building laws relating to reinforced concrete cover this point, it is well known that this requirement, in many instances, is practically ignored.)

(6) Rods in the bottom of beams, girders and slabs should be spaced far enough apart to permit a good bond of the fireproofing concrete to the interior of the section.

(7) In no case should anything but smooth rods be used vertically. Where hooping is used in columns it should not be wired so rigidly as to prevent the concrete from settling and shrinking during its initial set. An ordinary warehouse or office building column will shrink in height from 1-4 in. to 1 in. during the period of initial set, and taller columns in proportion, if filled with concrete wet enough to permit thorough ramming both inside and outside of the hooping. Unless the vertical reinforcement is smooth and the hooping not too rigid, it will disrupt the concrete during the process of shrinking. This principle is so well recognized by some engineers that they insist on very long columns being poured from a point midway their height. After the bottom portion sets the rest of the concrete is poured from the top of the column.

(8) All beams and girders should be constructed as continuous beams, even if for no other purpose than to prevent accidents through gross carelessness during construction. For instance, removing a portion of the shores too soon. This should also be done to prevent cracking over the supports due to negative moment, notwithstanding that rules and regulations for the use of reinforced concrete may require that the midsection be calculated as a simple beam.

(9) Spacers and separators of concrete should be used to space all rods from each other and from the forms. This is not only necessary from a construction standpoint, but also for prevention of damage by fire and rust. If separators are not used the rods will surely be more or less displaced by the dumping of the concrete carts and during ramming. Metal spacers and separators form a straight joint in the fireproofing and also tend to conduct heat to the rods.

(10) Forms should be as nearly watertight as possible. This means that the lumber must be sized and matched or tongued and grooved. Otherwise the cement will escape.

(11) Sand should be tested for foreign matter, for adhesion of cement, for crushing resistance and also for fire resistance.

(12) The broken stone should be tested for adhesion to cement, crushing resistance and fire resistance.

(13) The cement should be tested in accordance with the standard specifications of the American Society for Testing Materials. Samples of actual concrete should be taken out of the wheelbarrows as they are being transported to the forms. This will furnish data, under actual working conditions, as to crushing strength, as well as the correct proportions of materials and fire resistance of the cement. In addition, the moral effect on the workmen is good and will add

to the care that the man in charge of measuring cement at the mixer takes in his measuring.

(14) The reinforcement should be tested in accordance with the requirements of the American Society for Testing Materials for structural steel used in buildings.

(15) The floors must be kept covered in warm weather with wet sawdust or wet sand for three weeks, beginning 24 hours after the concrete is placed. The longer the floor can be kept wet the better the result will be. In properly designed and constructed reinforced concrete work no expansion joints of any kind are necessary except in horizontal surfaces exposed to the sun.

(16) All forms should be pounded with a mallet while being filled. This will exclude air bubbles and make the concrete more dense as well as giving better adhesion of the cement to the surface of the reinforcement.

(17) After the forms are removed no patching or plastering should be permitted until all surfaces have been inspected, and permission given in writing by the engineer. This makes every man on the job, from the foreman down to the most unimportant laborer, more careful as to the filling of the voids in the forms. While some small patching is generally necessary, the general appearance of the surfaces that need patching is the best indication of the quality of the hidden workmanship. Great care should be taken to prevent any of the false-work dropping upon finished concrete even if it is several weeks old, as it materially injures it to do so. The less the work is jarred while removing the forms the better. The jar of a hoisting engine and concrete mixer or other moving machinery should not be allowed to reach the setting concrete.

General state or city legislation, in accordance with the practice mentioned above, and fire, water and loading tests similar to the requirements of the Build-

Department of the City of New York, are, in the writer's estimation, absolutely imperative.

REINFORCED CONCRETE CHIMNEY BLOWN DOWN.

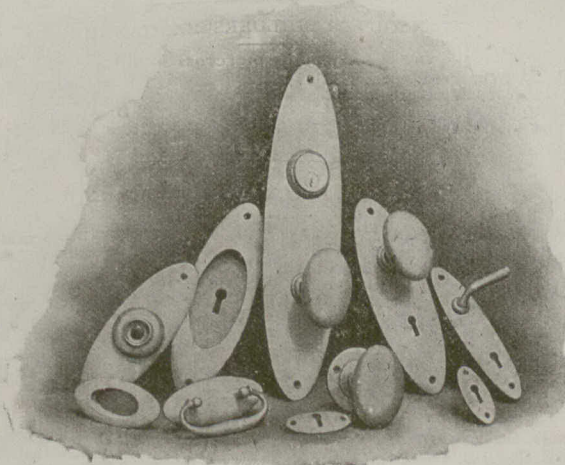
During the severe windstorm of August 11th, the new reinforced concrete chimney of the plant of the C. & J. Michel Brewing Company, at La Crosse, Wis.,



REINFORCED CONCRETE CHIMNEY BLOWN DOWN BY HIGH WIND.

which is now in course of construction, was blown down. The chimney, which was 150 feet high, had just been completed a few days before the storm, and the fact that the cement had not set is given as the reason for its blowing down. The chimney was built by a St. Louis company, and it was guaranteed to stand a hundred mile per hour gale. The greatest velocity attained by the storm was sixty miles an hour. The loss is estimated at \$6,000. There was no insurance on the chimney.

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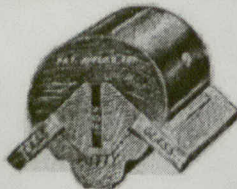
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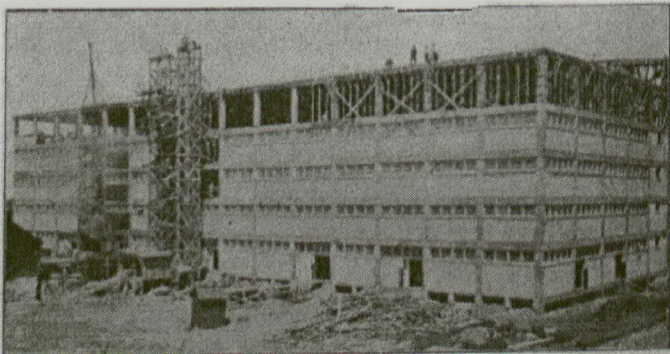
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With light generated by its own power the Falls of Niagara are now being illuminated. Lights aggregating 1,115,000,000 candle-power thrown from 36 great lensed reflectors clothed the tumbling water with an almost inconceivable grandeur. Twenty-one fifteen-inch and fifteen thirty-inch searchlights set in batteries scattered along the gorge and cliffs on the Canadian side converge their rays first on the American Falls and then on the Horseshoe Falls. At first the light is white, turning gradually to a rose tint, then green, yellow and blue, until all the colors of the rainbow appear to play on the foaming waters. At intervals all the lights are turned heavenward, their rays forming a great colored fan visible for many miles around.

The lighting was designed and the plant, the largest in the world, by W. D. A. Ryan, of the General Electric Company. The scheme of lighting the falls was conceived by Mayor A. C. Douglass, of Niagara Falls, the expense being borne by the business men of the city. The lighting scheme will be continued for at least thirty days, and perhaps permanently.

BOOK REVIEW.

Of more than passing importance to contractors in reinforced concrete structure is "A Hand Book of Practical Calculation and Application of Reinforced Concrete," compiled and published by the engineering department of the Trussed Concrete Steel Company, Toronto. That there is a necessity for publishing such a work is indisputable in view of the rapidly growing field for reinforced concrete construction. The object of the present hand book, as set forth in the preface, "is to present to the designer tables and information in such form as to be immediately available for use in actual designs, and at the same time to have these tables founded upon scientific formulæ approved by our very best engineering practice." The work as presented deals mainly with the Kahn Trussed Bar, and by illustrations sets forth its advantages over other and more primitive methods of reinforcement.

Of particular technical value is a chapter on allowable stresses, methods of design, etc. By means of tables and diagrams the theory of reinforced concrete beam work is treated in an admirable manner. Following this section of the subject, details of floor construction framing between steel girders are given, including information on rectangular floor slabs. Not the least valuable pages by any means are those whereon appears a table showing the spacing of bars in inches for various safe live loads per square foot and also the safe live loads per square foot for hollow tile floors of various thicknesses. Following these appears a series of tables showing the safe total load in hundredweights uniformly distributed for concrete beams and also for reinforced concrete columns. Footing tables are also given, figured for column loads from 75,000 pounds to 600,000 pounds. Highway box culverts and girder bridges also come in for description and illustration, typical highway arch bridges being treated by means of tables and diagrams. A final chapter, entitled "Notes Regarding Erection," gives a brief outline of construction methods, including information on placing concrete, removing forms,

finishing and waterproofing. "Hahn System Standards," Trussed Concrete Steel Company, London, Detroit and Toronto. Price, \$1.50.

A book that promises to be of considerable assistance to mill building contractors is that entitled "Details of Mill Construction," by H. W. Morton. It must be admitted that heretofore attention has not been directed particularly toward the treatment of that line of work known as mill construction, and contractors generally will welcome a publication that promises adequately to fill the deficiency. In the present volume the author has attempted to bring forward in a simple way the general details and facts underlying this very important branch of work. To do this no printed explanation whatever accompanies the twenty-five plates which compose the volume, the author evidently assuming that a careful study of these will give the reader a more satisfactory idea of mill construction than can be obtained by more printed detail. "Details of Mill Construction," by H. W. Morton. Publishers, Bates & Guild Company, Boston, Mass.

WONDERFUL PIECE OF MECHANISM.

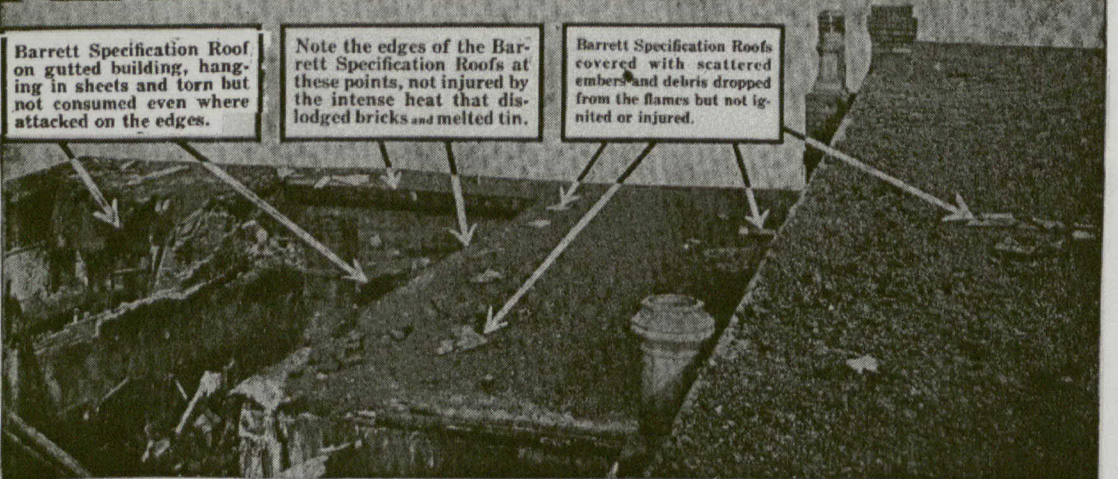
With a scroll saw, plane, a hammer and a common pocket knife, a one-armed cripple has made the most remarkable clock in the world, says a Cleveland dispatch in the Philadelphia North American. The maker is Marvin Shearer, of Akron, O. He is a scenic artist, but his hobby is mechanics. His pet project for the last fifteen years has been to make a surpassingly wonderful timepiece, but it was not until disabled for daily work at his profession that he found the time. The clock is twelve feet four inches high, more than four feet wide and almost three feet deep. It contains 4,161 pieces of wood of thirty-seven different kinds. There are 192 pictures in or on the clock, all of which Mr. Shearer painted. The motive power consists of a water pump having a capacity of 200 gallons per hour, a one-half horse-power electric motor and several other electric appliances. The clock weighs 850 pounds, and is constructed in three sections. On the face of the top section are nine dials, seven of which give the time in three foreign cities and four American cities; one, standard time, the other, the calendar dial, indicating all the changes of the moon, the month, the day and date. The weather signals are translated by signal flags on a revolving staff directly in front of the calendar dial. Thermometers, barometers and hydrometers, each tell its tale, and around the dials pieces of wood from each state, territory and foreign possession in the union are arranged, decorated with the coat-of-arms of each. On either side of the clock dial can be seen every man-of-war in the United States navy, arranged according to their class and speed, followed by the different squadrons in their official order. Under the navy is shown a Passion history of Christ. All these pictures have their stated times of appearing, passing from view behind a screen. The middle section is by far the most beautiful. In the extreme top is located a miniature Niagara Falls, over which 180 gallons of water fall every hour. Both the American and Horseshoe Falls, are shown, with Goat Island in the foreground, and the sparkling water is illuminated by colored and changing electric lights, making a most effective water display. At each hour, as the clock strikes, the figures of Uncle Sam and the Goddess of Liberty appear from an elevator at the right, walk in front of the American Falls, pass through a gate that opens automatically, descend a flight of steps, continue their walk around the front of the falls, where they turn and bow to the audience. Behind glass plates pass in review pictures of all the presidents of the United States, and on each end a silhouette of Washington shows.

REAL FIRE PROTECTION

Barrett Specification Roof on gutted building, hanging in sheets and torn but not consumed even where attacked on the edges.

Note the edges of the Barrett Specification Roofs at these points, not injured by the intense heat that dislodged bricks and melted tin.

Barrett Specification Roofs covered with scattered embers and debris dropped from the flames but not ignited or injured.



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THE accompanying photographs illustrate forcefully the fire retarding properties of Barrett Specification Roofs.

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The photographs show part of the ruins of the Kenyon Hall fire in Allegheny, Pa., which destroyed \$200,000 worth of property on February 17th, 1907.

The buildings illustrated were roofed along the lines of The Barrett Specification, and, although scores of burning embers fell upon them during the fire, they stood the severe test *without damage of any kind* except where the support was burned away from below, causing the roof to fall through.

Because Barrett Specification Roofs are constructed of Felt and Coal Tar Pitch it is sometimes assumed that they are not fire retardant. *Experience proves, on the contrary*, that they are a much more efficient fire retardant than Tin or Slate, which of themselves will not burn, and of course vastly more so than prepared roofings.

Repeated tests by fire marshals and fire underwriters have demonstrated that roofs laid according to The Barrett Specification are fire retardant in the full sense of the word. The best proof that they are so considered is the fact that a very large proportion of the manufacturing plants and railroad buildings of the country are covered with these roofs, as are also practically all of the famous fireproof sky scrapers of the land.

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ACETYLENE LIGHTING.

Acetylene as an illuminant has thus far received but scanty attention from illuminating engineers,—at least, to judge by the proceedings of their Society. This in reality is not a reflection upon this means of illumination, but a simple result of existing conditions. The field of illuminating engineering is, so to speak, a virgin forest, and the first task is to blaze a trail, which the immediate successors of the pioneers may follow; and this trail must naturally lead to the most prominent land marks, which are electricity and gas.

Acetylene is in the unfortunate position of the dog with the bad name, and if illuminating engineers can do nothing further than to correct the popular misconception of this valuable illuminant, they should at least lend their energies to this task. On account of a few disastrous explosions, which resulted from ignorance of its properties and the simple precautions necessary in its use, at the very outset, the bad name thus obtained has followed it all the days of its life; and to those who have never actually used it, the word acetylene at the present time is only another expression for explosion.

It is unnecessary here to go into a discussion of the relative safety of acetylene lighting. That it is at least as safe as ordinary illuminating gas as commonly distributed, has been proven time and again, both in theory and practice; and to disabuse the public of its prejudice in this respect is a duty to which all those concerned with the progress of lighting should lend a hand.

The beautiful quality of the light of the acetylene flame should also appeal to illuminating engineers.

The manufacture of carbide at present is an absolute monopoly of the one kind which the government not only permits but creates, otherwise known as patent protection. Such monopolies are comparatively short lived; and when these particular patents have expired, which will be in the near future, the price of carbide will naturally be greatly reduced by open competition, and acetylene lighting take a consequent long leap forward. There is said to be 150,000 residences using it at the present time and some 350 cities and towns using it for public lighting.

It is worth observing that carbide is a product of the electric furnace and hence acetylene lighting may be considered an indirect form of electric light.—
"The Illuminating Engineer."



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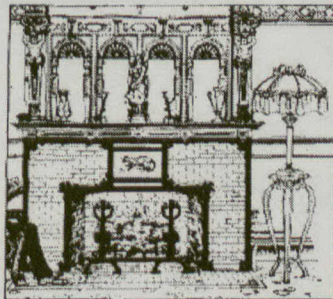
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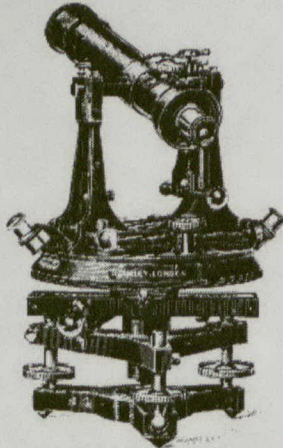
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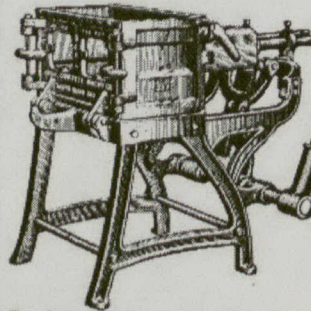


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F. Shephard, C.E., in charge of the C.P.R. advance survey now in camp near Sproat Lake, B.C., has drawn attention to an interesting discovery. On a wall of solid granite bordering on Sproat Lake may be seen rude engravings cut into the rock. They represent some eight different animals, the whale apparently predominating. Some think that a representation of a mastodon is also intended.

Mr. Shephard by means of tracing the lines of the rock drawings with chalk, has obtained some excellent photographs of the pictures, which cover a space of some twenty feet square. When these engravings were done or by whom is at present a mystery.

The indentations in the rock, though made into solid granite and bearing evidence of having originally been made fairly deep, are now very much worn, and in places hard to decipher. Similar rock engraving in some parts of England, known to have been done twelve hundred years ago, are still plainly visible, though made only in sandstone rock so readily destroyed by the action of frost and rain. Thousands of years must have elapsed to have produced the erosion on the solid granite at Sproat Lake.

As to who performed the work indications would point naturally to the Indians. Some of the sketches somewhat resemble the carved figures of birds and animals to be seen on their totem poles. Some carving of an inferior description may be seen on the sandstone rock near the Indian village of Wyah, at the entrance of the Nitinat lagoon, which are reputed to be the work of Indians.

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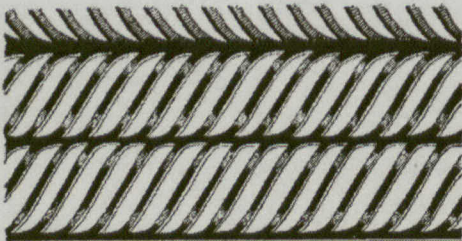
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