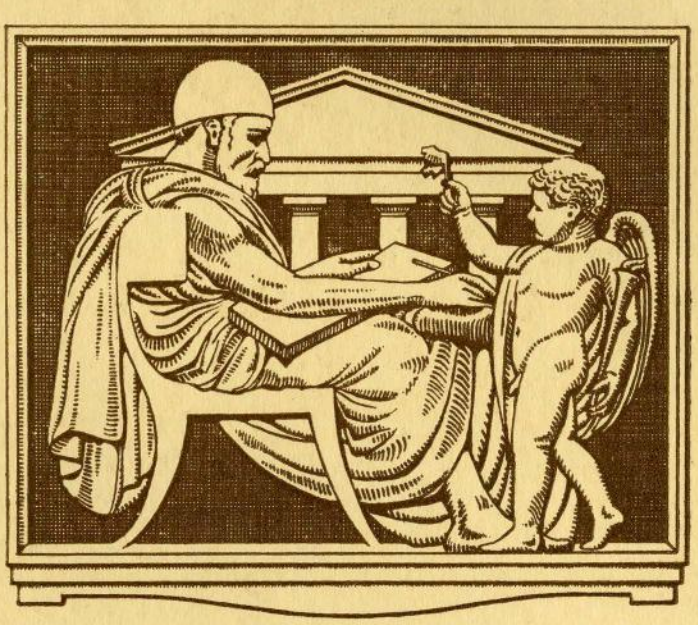
THE JOURNAL
ROYAL ARCHITECTURAL INSTITUTE OF CANADA



JUNE
1929

VOL VI · No. 6

TORONTO · CANADA

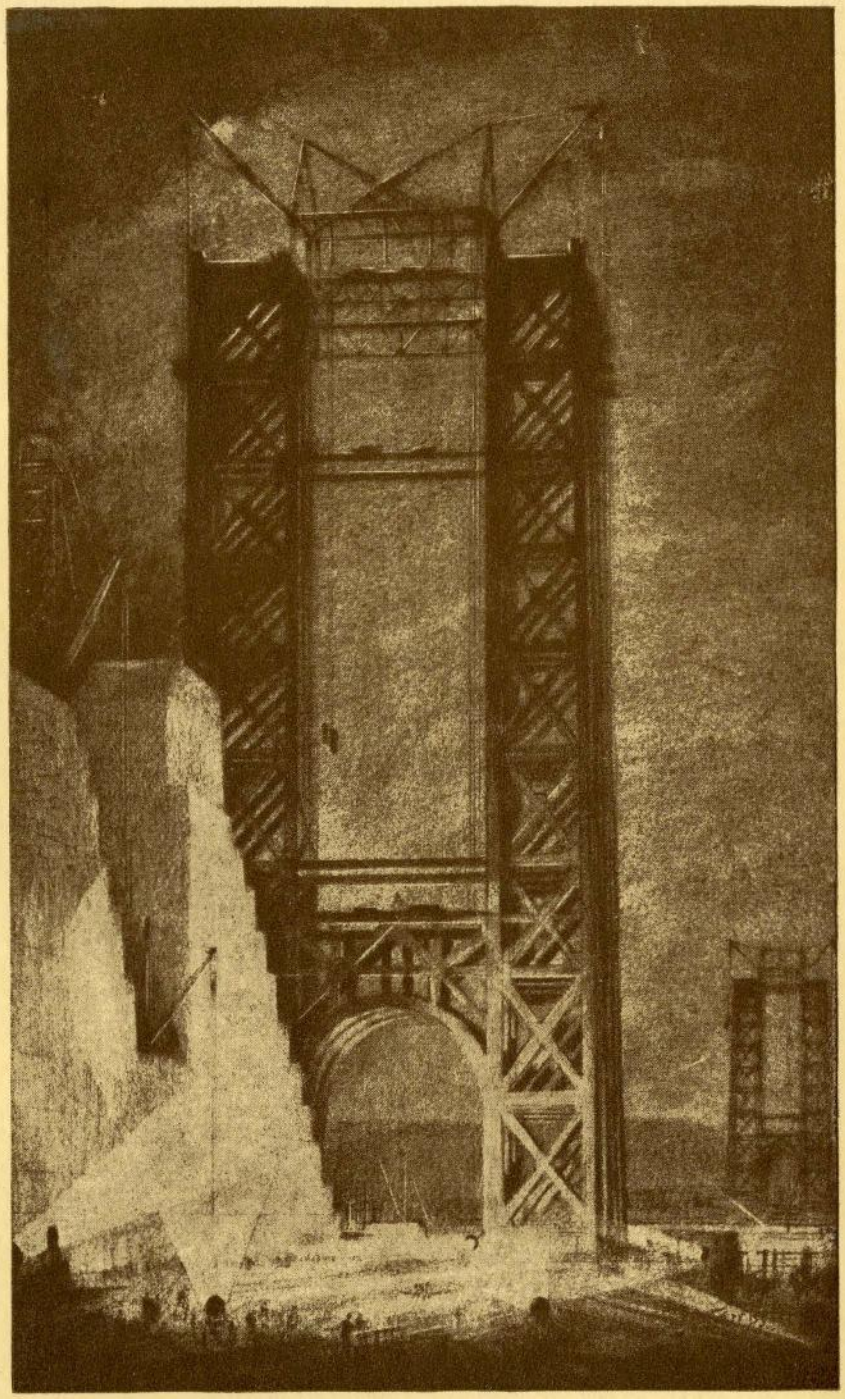
TO LEAP A FLOOD AND TIE THE SHORES

HIGHWAYS of metal . . . bridges of steel —more immense . . . more defiant of the impossible do they become every year. Steel has strength, safety, security . . . and time cannot destroy them. Steel lends courage to design, inspiration to imagination.

A steel bridge not only offers greater artistic possibilities but provides the kind of structure that can always be kept secure . . . modernized, reinforced, altered—even removed with speed and economy.

Steel has such ready adaptability, such preparedness for its duty, that a steel bridge can be erected faster, with less handling of material, with less regard for weather than is required when any other material is used. Steel's quick suitability, its efficient fitness, recommend it for economy. Its versatility makes steel the first consideration where beauty is a factor.

A Technical Service Bureau is at the disposal of architects, engineers, owners and others who have need of any information which can be supplied through the American Institute of Steel Construction, Inc.



A reproduction of this rendering by Hugh Ferriss, suitable for framing, will be mailed free of cost to any architect

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.

The co-operative non-profit service organization of the structural steel industry of the United States and Canada. Correspondence is invited. 200 Madison Avenue, New York City. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas and San Francisco.

The Institute publishes twelve booklets,

STEEL

INSURES STRENGTH

AND SECURITY

one on practically every type of steel structure, and provides also in one volume, "The Standard Specification for Structural Steel for Buildings," "The Standard Specification for Fire-proofing Structural Steel Buildings," and "The Code of Standard Practice." Any or all of these may be had without charge, simply by addressing the Institute at any of its offices.

Dallas Architect

Insulates with Two Inches of Corkboard for Year Round Comfort...

WHEN Mr. H. B. Thompson, architect, Dallas, Texas, planned his own home, he determined to build a house that could be kept comfortable winter and summer by providing *ample* protection against an outside temperature range of 90 degrees. He used two inches of Armstrong's Corkboard Insulation on the walls and second floor ceiling with such excellent results that, a year later, he made the following report:

"After investigating thoroughly the various insulating materials on the market, I decided to use cork for the insulation of my residence. I have been highly pleased with the results obtained in the wide range of temperature, from ten to one hundred degrees above zero. During the hottest weather, the house was at all times cool and comfortable, and the upstairs rooms practically as cool as the downstairs rooms.

"A comparison of fuel bills with houses of the same cubical contents shows a saving of from forty to fifty per cent in fuel bills, which has convinced me that while the initial cost may be higher, the saving in fuel alone will more than pay for the difference in cost, to say nothing of the added comfort."

Armstrong's Corkboard Insulation on the second floor of Mr. H. B. Thompson's residence at Dallas, Texas. The plaster is being applied directly on the cork, without lath.

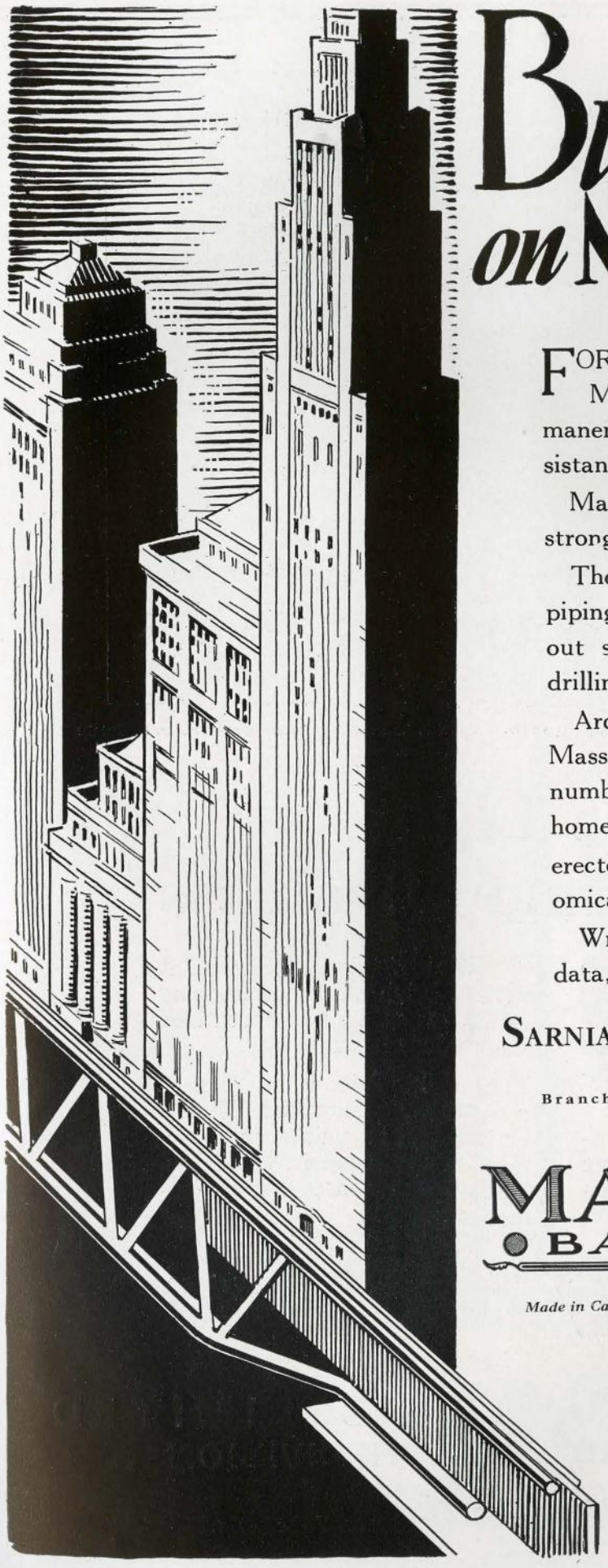
The full value of insulation, from both the comfort and the investment standpoints, is realized only when *ample thickness* is used. Two inches of Armstrong's Corkboard for the roof and at least one and a half inches for the walls is the most economical insulation in returns per dollar of cost.

Armstrong Cork & Insulation Company, Limited, McGill Bldg., Montreal; 11 Brant St., Toronto, 2.

Armstrong's Corkboard Insulation

A Heatproof Lining for Walls and Roof

This is the type of advertisement which appears in rotogravure papers and magazines featuring "Standard" Plumbing Fixtures



Build on Massillon..

FOR speed of erection — build on Massillon! For strength and permanence — build on Massillon! For resistance to fire — build on Massillon.

Massillon Bar Joists are light in weight, strong, easily moved and handled.

The open web makes it possible to run piping and conduits in any direction without suspending ceilings or cutting and drilling.

Architects and builders are using Massillon Bar Joists for an increasing number of jobs. Banks, office buildings, homes and other structures are being erected quicker, better and more economically with the use of these joists.

Write for load-tables, dimensional data, etc.

SARNIA BRIDGE COMPANY, LIMITED

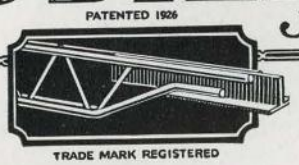
SARNIA - CANADA

Branch Offices - TORONTO, MONTREAL

Agents in all principal cities

MASSILLON BAR JOISTS

PATENTED 1926



TRADE MARK REGISTERED

Made in Canada *of Canadian Steel*

ROOFING
is a problem for experts

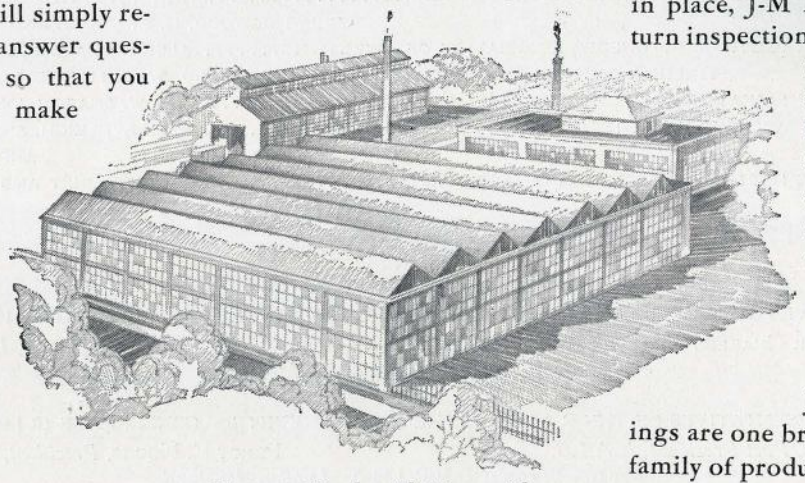
Let a Johns-Manville Roofing Specialist make this part of your Building Plan easier and more efficient.

WITHOUT cost or obligation an architect or builder may have the advice and active co-operation of a Johns-Manville Roofing expert.

The J-M Roofing expert has nothing to sell. He will simply report the facts to you, answer questions, and leave you so that you may be permitted to make your own decisions.

A Roof of J-M Standard for Every Building

There is no industrial building for which Johns-Manville cannot provide a roof of maximum safety and life. The J-M Bonded Asbestos Roof is a smooth surface built-up roof made of Asbestos felts and asphalt, finished with a coating of asphalt to provide a uniform appearance. The finest grade of this roof, our Super Class A Roof, is guaranteed and bonded for 20 years. We also apply roofs bonded for 15 and 10 years. The guarantee carried by J-M Bonded Asbestos Roofs is broader than the usual roofing guarantee. It covers roofs without regard to pitch or other limitations often placed by other manufacturers on the application of their roofs.



Experts Deal with Every Phase

The entire production of the materials used in J-M Bonded Roofs is in the hands of experts. Every roll of Asbestos felt is made to a formula which provides maximum pliability with maximum resistance to wear.

The carefully made materials for our bonded roofs are applied only by expert roofers. Every J-M Roofer is a trained specialist of long experience. A final link between Johns-Manville and a finished J-M Roof appears in the supervision of a J-M Roof Inspector on every bonded job making certain of workmanship in every detail. After roofs are in place, J-M Inspectors make return inspections at regular intervals to remedy any unforeseen trouble before it reaches the serious stage . . . a service which your clients will appreciate.

One Branch of a Famous Family

J-M Bonded Roofings are one branch of a celebrated family of products bearing the J-M trade mark. These include special roofs suitable for every sort of industry, as well as packings, insulations, refractory cements and hundreds of other products which contribute to the conservation of heat and power, and the protection of property from the elements.

It will pay you to fill out the coupon.

Johns-Manville

BONDED ASBESTOS ROOFS

JOHNS MANVILLE JM

CANADIAN JOHNS-MANVILLE CO., LIMITED
19 Front St. East, Toronto 2, Ont.
Please have a Roofing Inspector call at
.....
Name.....
Address.....
City.....*Prov*.....

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA

1410 STANLEY STREET • MONTREAL, QUE.

FOUNDED 19th AUGUST, 1907

INCORPORATED BY THE DOMINION PARLIAMENT 16th JUNE, 1908, and 1st APRIL, 1912

ALLIED WITH THE "ROYAL INSTITUTE OF BRITISH ARCHITECTS"

FEDERATION OF THE ALBERTA ASSOCIATION OF ARCHITECTS; THE ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA; THE MANITOBA ASSOCIATION OF ARCHITECTS; THE ONTARIO ASSOCIATION OF ARCHITECTS; THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS; THE SASKATCHEWAN ASSOCIATION OF ARCHITECTS; THE MARITIME ASSOCIATION OF ARCHITECTS

OFFICERS 1929

PRESIDENT	PERCY E. NOBBS	14 PHILLIPS SQUARE, MONTREAL
FIRST VICE-PRESIDENT	EDWARD UNDERWOOD	21 UNION BUILDING, EDMONTON
SECOND VICE-PRESIDENT	ANDREW L. MERCER	827 BIRKS BUILDING, VANCOUVER
HONORARY SECRETARY	ALCIDE CHAUSSE	30 ST. JAMES STREET WEST, MONTREAL
HONORARY TREASURER	GORDON M. WEST	43 VICTORIA STREET, TORONTO

EXECUTIVE SECRETARY, I. MARKUS, 160 RICHMOND STREET WEST, TORONTO

COUNCIL 1929

REPRESENTING THE ALBERTA ASSOCIATION OF ARCHITECTS.....A. M. CALDERON AND EDWARD UNDERWOOD

REPRESENTING THE MANITOBA ASSOCIATION OF ARCHITECTS.....J. HAWKER, J. H. G. RUSSELL AND E. PARKINSON

REPRESENTING THE ONTARIO ASSOCIATION OF ARCHITECTS.....J. H. CRAIG, J. P. HYNES, MURRAY BROWN, E. L. HORWOOD, H. E. MOORE AND GORDON M. WEST

REPRESENTING THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.....ALCIDE CHAUSSE, EUGENE PAYETTE, PHILIP J. TURNER, ERNEST CORMIER, J. O. MARCHAND, W. S. MAXWELL AND P. E. NOBBS

REPRESENTING THE SASKATCHEWAN ASSOCIATION OF ARCHITECTS.....M. W. SHARON AND R. G. BUNYARD

REPRESENTING THE ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA.....S. M. EVELEIGH, ANDREW L. MERCER AND J. J. HONEYMAN

REPRESENTING THE MARITIME ASSOCIATION OF ARCHITECTS.....RENE A. FRECHET AND H. CLAIRE MOTT

REPRESENTATIVES OF THE R.A.I.C. ON THE COUNCIL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

PROFESSOR CHARLES HERBERT REILLY, O.B.E., M.A., Cantab., F.R.I.B.A. (*Liverpool*), *England*

PERCY E. NOBBS, F.R.I.B.A., *Montreal*

REPRESENTATIVES OF THE R.A.I.C. ON THE ALLIED SOCIETIES' CONFERENCE (R.I.B.A.)

J. P. HYNES, *Past President, R.A.I.C.* PERCY E. NOBBS, *President, R.A.I.C.*

SEPTIMUS WARWICK, F.R.I.B.A., *London, England*

EXECUTIVE COMMITTEE

PERCY E. NOBBS, *President;* ALCIDE CHAUSSE, *Honorary Secretary;* GORDON M. WEST, *Honorary Treasurer;* EUGENE PAYETTE, PHILIP J. TURNER, ERNEST CORMIER, J. O. MARCHAND, W. S. MAXWELL AND I. MARKUS, *Executive Secretary*

PAST PRESIDENTS

*A. F. DUNLOP, Montreal...1907-08, 1908-09, 1909-10	*F. S. BAKER, Toronto.....1910-11, 1911-12
J. H. G. RUSSELL, Winnipeg.1912-13, 1913-14, 1914-15	J. P. OUELLET, Quebec.....1915-16, 1916-17, 1917-18
A. FRANK WICKSON, Toronto.....1918-19, 1919-20	DAVID R. BROWN, Montreal.....1920-21, 1921-22
LEWIS H. JORDAN, Winnipeg.....1922-23, 1923-24	JOHN S. ARCHIBALD, Montreal.....1924-25, 1925
*Deceased	J. P. HYNES, Toronto 1926, 1927, 1928

THE JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Serial No. 46 TORONTO, JUNE, 1929 Vol. VI. No. 6

CONTENTS

PLATE ILLUSTRATIONS

PUBLISHED EVERY MONTH BY THE

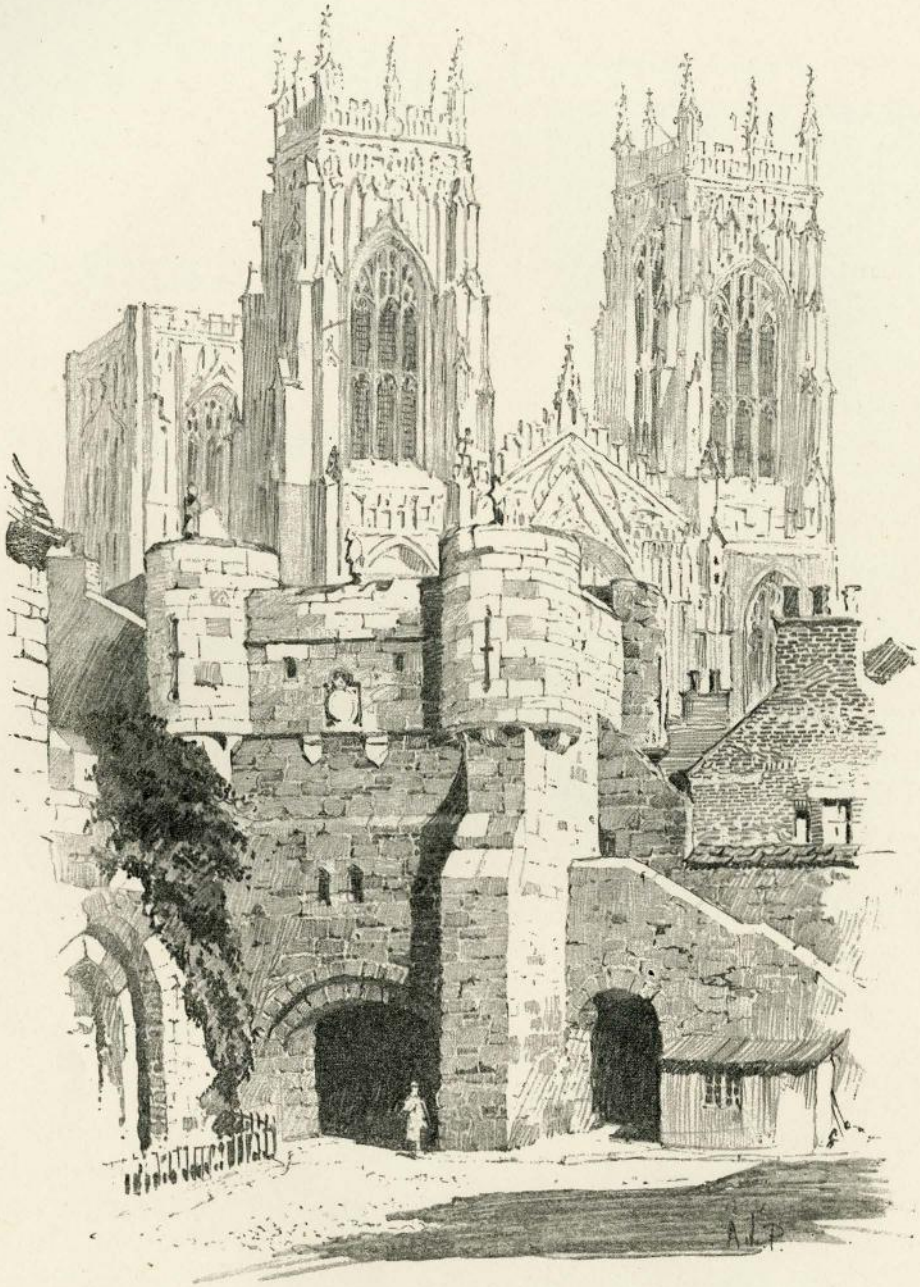
ROYAL ARCHITECTURAL INSTITUTE OF CANADA

***Editor*—I. MARKUS**

Publication, Editorial and Advertising Offices ..... 160 Richmond Street West, Toronto
Chicago Representative ..... Macintyre & Simpson, 75 East Wacker Drive, Chicago
New York Representative ..... L. Ray Nelson, 250 West 57th Street, New York

SUBSCRIPTIONS

Canada and Newfoundland—Three Dollars per year. Great Britain, British Possessions, United States and Mexico—Five Dollars per year. All Other Countries—Six Dollars per year. Single Copies—Canada 50 Cents; Other Countries 75 Cents.



YORK MINSTER

From Sketch by

A. LESLIE PERRY, B.Arch.

THE JOURNAL
ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Serial No. 46 TORONTO, JUNE, 1929 Vol. VI. No. 6

EDITORIAL

AS we go to press we learn with much satisfaction that the amendments to the charter of the Institute, which were introduced in the Senate in the form printed herewith, have been approved by that body.

Slowly, but surely, the Institute is progressing to a point where its usefulness and value to the architectural profession in Canada will be clearly evident to every member. The new charter, which provides for the election of fellows and honorary fellows, will be the means of placing our Institute on an equal basis with other national architectural bodies. It will also make more detailed provision for the membership, and will have the effect of placing the members of the Institute on a more definite basis than has existed heretofore. They will have the legal right to be designated as members of the Royal Architectural Institute of Canada with the privilege of appending to their names the abbreviation M.R.A.I.C.

The power to create fellows will enable the Institute to do honour to those of its members who have succeeded in making some outstanding contribution to Canadian architecture. Such official recognition should be the means of commanding greater recognition for the profession by the public and the press. The same thing applies to honorary fellows, to which body those persons who have contributed through research, public service or professional standing to the good of architecture in Canada or elsewhere, will be elected.

Following the approval of the amendments to the charter by the House of Commons, which action is expected shortly, the executive committee of the Institute will prepare new by-laws defining the conditions and qualifications for membership and fellowship, and also other matters affecting the administration and management of the Institute.

THE AMENDMENTS TO THE INSTITUTE CHARTER

1. Section four of chapter eighty-two of the Statutes of 1908, as enacted by section two of chapter sixty-four of the Statutes of 1912, is hereby repealed and the following is substituted therefor:

Membership—4. (1) The membership of the Institute shall consist of such persons as are members or honorary members thereof when this section comes into force, and of such other persons as become, under the provisions of this Act, members, fellows or honorary fellows of the Institute.

Classes of Members—(2) The membership may comprise the following classes:

(a) Members of The Royal Architectural Institute of Canada;

(b) Fellows of The Royal Architectural Institute of Canada;

(c) Honorary fellows of The Royal Architectural Institute of Canada;

and the class of membership to which a person belongs may be designated by appending to his name the abbreviation M.R.A.I.C., or F.R.A.I.C., or Hon. F.R.A.I.C., as the case may be.

Qualification of Members and Fellows—(3) A person shall not be qualified to become a member or a fellow of the Institute who is not a member in good standing of an association of architects, whether being a corporate body or not, which is recognized by the Institute as properly representative, in Canada, of the profession of architecture.

Qualification of Honorary Fellows—(4) A person shall not be qualified to become an honorary fellow of the Institute unless he has contributed by research, scholarship, public service or professional standing to the good of architecture in Canada or elsewhere.

2. Section five of the said chapter eighty-two as amended by section three of chapter sixty-four of the Statutes of 1912, is hereby repealed and the following section substituted therefor:

By-laws and Rules—5. The Council of the Institute may, from time to time, make, repeal, amend or re-enact by-laws and rules, not contrary to law nor inconsistent with the provisions of this Act, for:

(*a*) defining the terms and conditions of membership in the Institute, and the qualification, admission, expulsion, rights, duties and privileges of all classes of members;

(*b*) the administration, management and control of the property, business and other affairs of the Institute;

(*c*) the appointment, designation, functions, duties and remuneration of all officers, agents and servants of the Institute;

(*d*) the appointment of committees and the designation of their duties;

(*e*) the calling of meetings, annual or special, of the Institute, and of meetings, periodical or special, of the council and of committees;

(*f*) the fixing of the quorum necessary at, the procedure in all respects at or concerning, and all other requirements of, any meeting of the Institute, or of its council or committees;

(*g*) generally, for the maintenance of the honour and dignity of the Institute and the various classes of members thereof, and for carrying out the objects of the Institute.

THE NEW MANOIR RICHELIEU, MUR RAY BAY, P.Q.
John S. Archibald, Architect

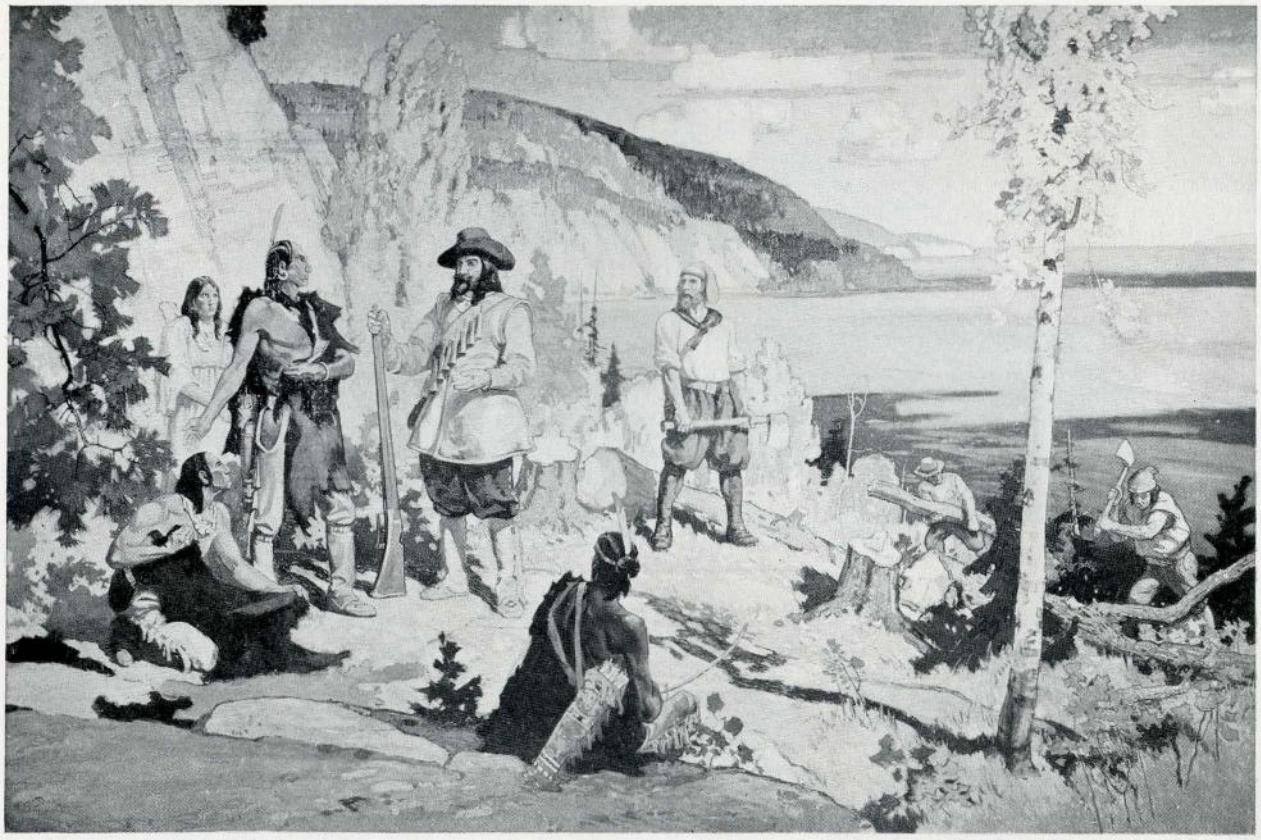
Editor's Note—The newly completed Manoir Richelieu, of which an illustration appears above, takes the place of the former manoir which was destroyed by fire in September, 1928. While no attempt has been made in the accompanying article to describe the building itself, we are pleased to be able to reproduce the two decorative panels, which were designed by C. W. Jefferys, R.C.A., and painted in collaboration with F. S. Challener, R.C.A., and which are now being placed in the lounge room of the manoir. We hope to be able to publish a complete description of the building in a later issue of THE JOURNAL.

Decorative Paintings for the Manoir Richelieu

THE two decorative paintings for the Manoir Richelieu at Murray Bay are designed to be placed on either side of an archway in the middle of the north wall of the central lounge room. The scheme called for a unity of treatment, color and composition, while diversity of interest was secured by the varied subject matter of the two separate panels. Their dimensions are 14 feet long by 9 feet high. The subjects deal with the local history of Murray Bay.

The panel at the right of the archway depicts a scene of the 17th century, and illustrates the early French occupation of the locality. Montagnais Indians are displaying their furs to one of the colonists, while other Frenchmen are at work cutting down trees for a clearing on the high cliff which overlooks the river. The view looks down the St. Lawrence, and shows the light green foliage of early summer, mainly birch and pine, with the rugged rock formation of the shore.

The panel at the left of the archway shows the arrival of Captain Nairne with five soldiers of the Fraser Highlanders at the bay in the autumn of 1761. Quebec was in the hands of the British, and General Murray had granted to Captain Nairne and Lieutenant Fraser seigniories which extended several miles along the river front, and included the territory which to-day is the popular summer resort of Murray Bay. The scene shows the golden yellow of autumn birches, the darker notes of evergreens, the variegated greys of rocky cliffs, and the tangled growth of golden rod, aster and other autumn flowers, seen under a late afternoon sun. The red coats and tartan kilts carry a pattern



DECORATIVE PANEL AT RIGHT OF ARCHWAY, CENTRAL LOUNGE ROOM, MANOIR RICHELIEU

of bright color which repeats the Indian decorations of the companion panel. The view looks up the river toward the Isle aux Condres.

The decorations were planned and designed by C. W. Jefferys, R.C.A., and have been painted by him in collaboration with F. S. Challener, R.C.A.

DECORATIVE PANEL AT LEFT OF ARCHWAY, CENTRAL LOUNGE ROOM, MANOIR RICHELIEU

The Governor-General's Arts Competition

THE final results in the Lord Willingdon arts competition were announced recently. The competition was initiated by his Excellency the Governor-General, who offered prizes with a view to encouraging the arts and letters in Canada. The arts of music, drama, painting and sculpture were included in this competition, which proved most successful. There were 197 entries in painting and 25 in sculpture.

The prize of $200 for the best painting submitted, was awarded to Miss Prudence Heward, Montreal, for her "Girl on a Hill." A number of paintings received honorable mention, as follows: "Byward Market" (tempera), by Paul Alfred; "Louise" (oil), by Charles F. Comfort; "Portrait of G. Pearce" (water-color), by Andre C. G. Lapine; "Marie et Minou" (oil), by Mabel I. Lockberry; "Melting Snows" (oil), by H. Mabel May; "My Western Cousin (oil), by Pegi Nichol; "Street in Hull (oil), by George D. Pepper; "Portrait" (oil), by Frank Iacurto.

In the sculpture section of the competition, the prize of $200 was divided between "Passing Rain" (plaster relief), by Elizabeth Wynn Wood, and "Bronze Head" by Sylvia d'Aoust. Three of the entries received honorable mention. They were, "Portrait Mask" (plaster), by John Byers; "Chief Little Ears, Blackfoot" (plaster), by Claude Gray, and "Portrait Bust" (plaster), by Henri Hebert.

An exhibition of the successful paintings and sculpture will be held shortly in the National Gallery at Ottawa.

Excerpts from Short Addresses Given by Members of the Architects' Club of Ottawa at a Recent Meeting

COLOUR IN ARCHITECTURE, *by W. C. Chalmers.*

"In a northern climate such as we have in Canada, we have to rely on the texture and colour of our building materials for our architectural colour schemes, with the one exception of wood, which may be coloured or stained, but until some colouring pigment is discovered which will resist the action of frost, or a terra cotta which will stand indefinitely the severe and changeable weather of a Canadian winter, we can only have temporary results when we employ them.

The field of coloured interior work, however, might be greatly enlarged, especially as applied to mural decoration, in which art we have many distinguished native mural painters such as Challener, Jefferys, MacDonald and others. Also by giving more careful study to interior painting and decoration, which is in most cases left to the house painter and the furniture dealer."

SHOULD ARCHITECTS ADVERTISE, *by H. H. Richards.*

"When the profession has attained all the dignity and recognition it knows itself to be entitled to, and when the public are enlightened sufficiently to comprehend the proper interpretation of our great profession, and when the government has granted us the status we desire, we will all be practicing so ethically, that it will be quite unnecessary to advertise."

THE ADVISABILITY OF ONE CORPORATION IN LIEU OF PRIVATE PRACTICE, *by R. A. V. Nicholson.*

"The present trend, in almost every field of endeavour, is towards consolidation. Ways and means have been evolved to serve the masses through quantity production and distribution. Even architecture has succumbed to this idea, in some cases; in several cities in the United States the architects have associated themselves together in order to undertake works as a public service. This concerted effort accomplishes things which the individual cannot hope to do; the sacrifice of individual interest for the common cause is reminiscent of the system whereby the great cathedrals of the middle ages were developed. Coincident with this movement is that of the various small house service bureaus; architects in many localities have realized that by thorough co-operation in design and large production and distribution of plans, professional services can be rendered at a fee within the means of all small home builders. While these bureaus are rather executive in character and merely control policies, this feature alone is a decided change from the purely individual character of private practice as formerly understood."

FAILURE TO RETAIN A CLIENT, *by W. J. Abra.*

"Very few clients have any true conception of the real functions of an architect, and engage them with varied interpretations of what services they are entitled to receive.

This condition naturally leads to misapprehension and misunderstandings from the very start, and sometimes results in the complete estrangement of the architect before the building is completed, let alone his securing a second commission from the client.

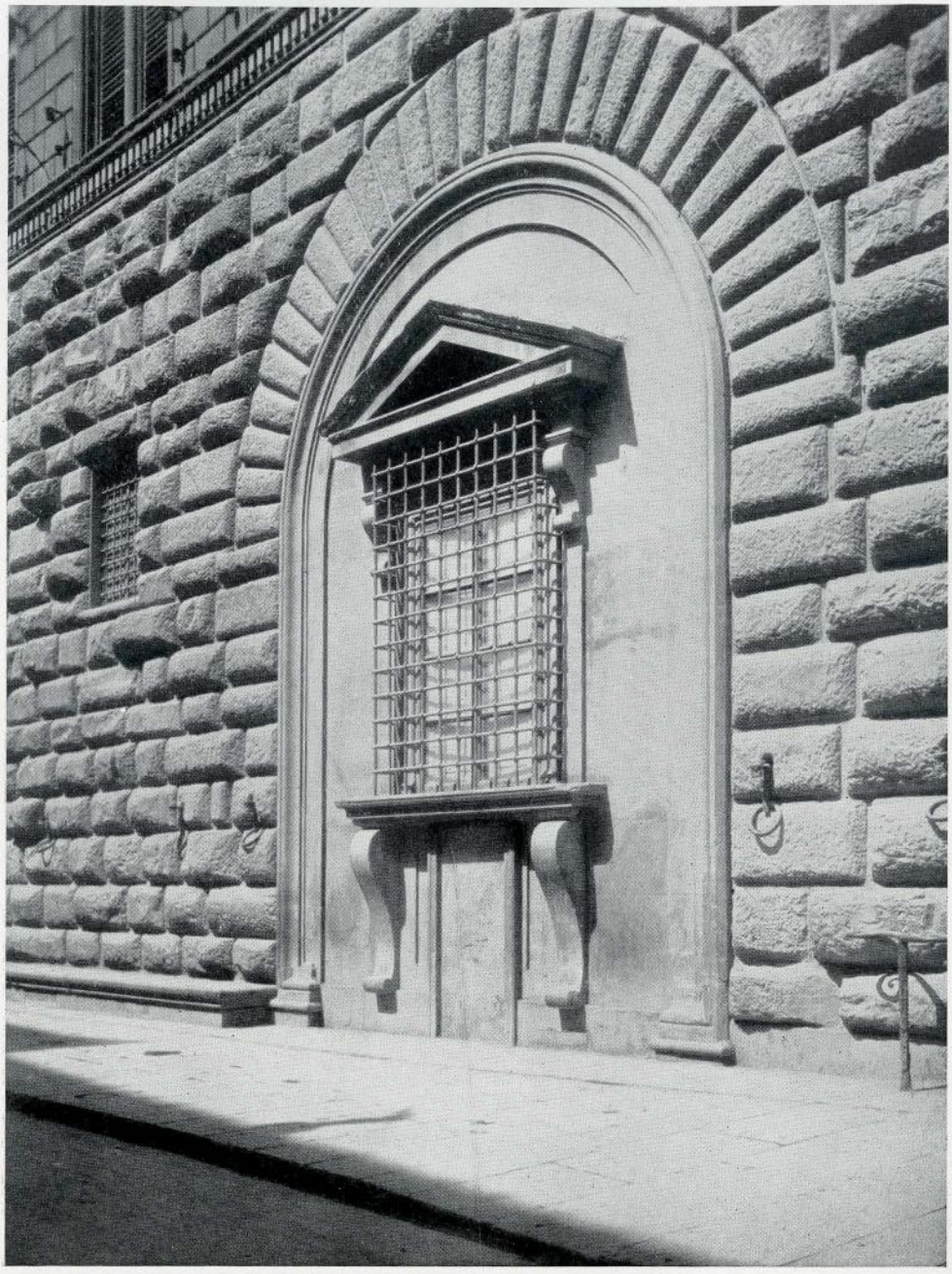
Over anxiety on the architect's part to secure a commission often leads him to conceal the difficulties, and to accept the work under conditions which are practically impossible for a satisfactory culmination of the engagement.

Therefore, I would say that absolute frankness with your client from start to finish of the commission is necessary. Accept responsibilities, but insist upon having a fair chance of completing them properly."

EUROPEAN STUDIES

From Photographs by F. Bruce Brown, M.Arch.

NUMBER XLI

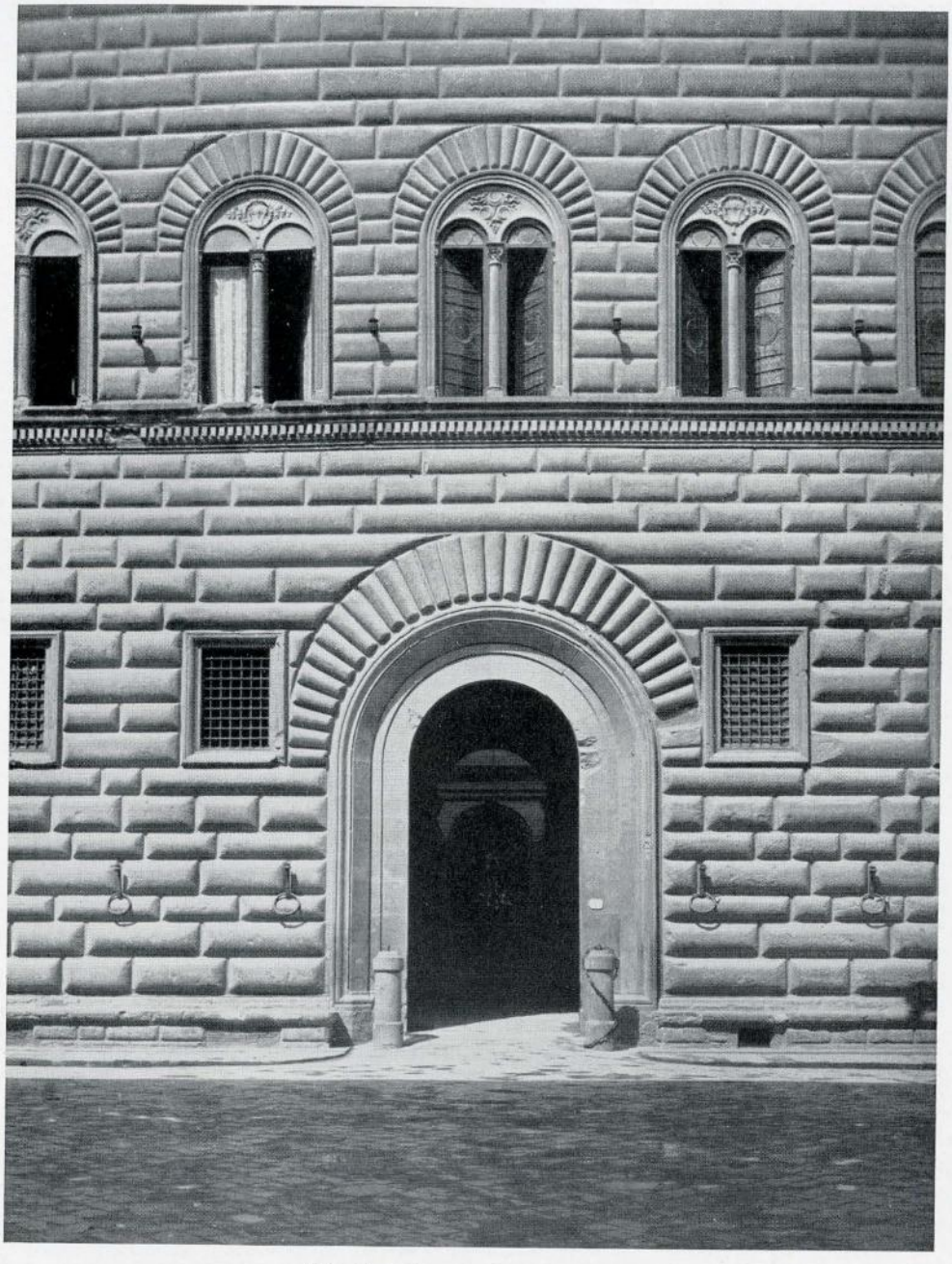


DETAIL, PALAZZO RICCARDI, FIRENZE

EUROPEAN STUDIES

From Photographs by F. Bruce Brown, M.Arch.

NUMBER XLII



DETAIL, PALAZZO STROZZI, FIRENZE

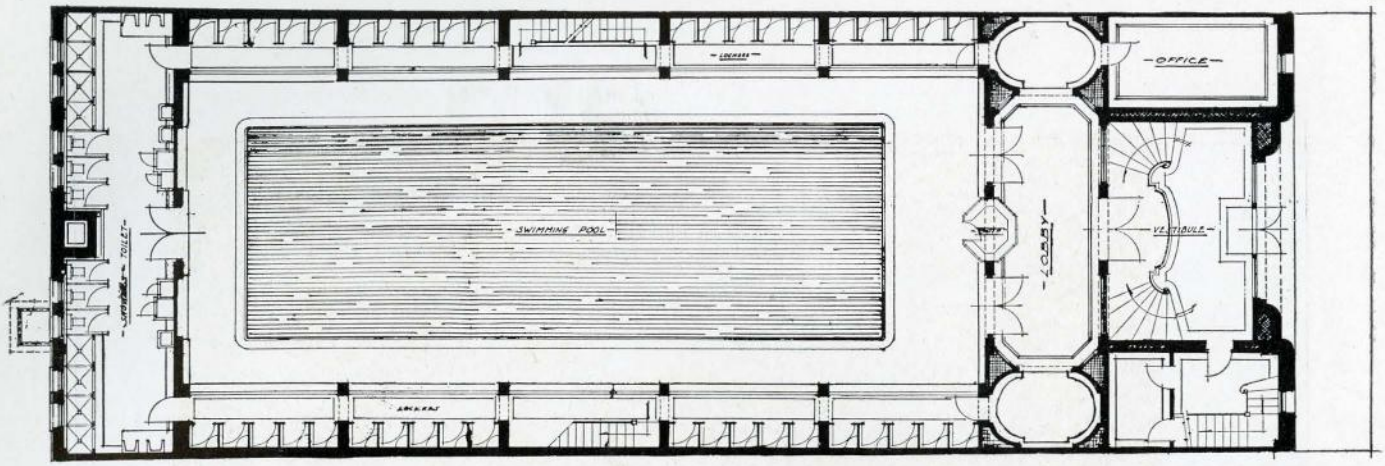
AMHERST PUBLIC BATH, MONTREAL
J. O. Marchand, F.R.I.B.A., Architect

Amherst Public Bath—Montreal

THE Amherst Public Bath, located on Amherst Street, near Ontario Street, Montreal, was completed during 1927 from plans prepared by Mr. J. O. Marchand, architect. It is one of fifteen public baths erected by the City of Montreal, all of which are located in the most densely populated districts. With one or two exceptions, the baths are kept open all the year around, and are free to the public except for a nominal charge for towels, bathing suits, etc.

The latest addition to the chain of public baths in Montreal is of the most modern design and construction. The outside dimensions are 146 feet by 52 feet, and the building is of re-inforced concrete throughout. A public vestibule has been provided on the sidewalk level at the front entrance of the building, with a staircase running to the level of the swimming pool. Above the vestibule are located the caretaker's quarters.

The swimming pool, which is 75 feet long by 25 feet wide, is 3 feet 6 inches deep at one end and 8 feet 6 inches deep at the other. It occupies the centre of the plan, and lockers for the use of the public are located on each side on the two different levels. Before entering the swimming pool the bathers must pass through the shower-room at the rear of the building. One of the interesting features of the bath is that the water in the pool is kept at an even temperature with that of the building, varying between 72 degrees to 75 degrees Fahrenheit. The water is filtered and sterilized three times every twenty-four hours. An inlet located at the lowest level of the floor of the pool receives the water which is drawn by gravity into a coagulating apparatus which has the effect of collecting the bulk of sedimentation or dirt. The water then flows into an electric pump which raises it into a pressure filter. By gravity it again flows into a dual ultra-violet ray sterilizer, and is subjected to

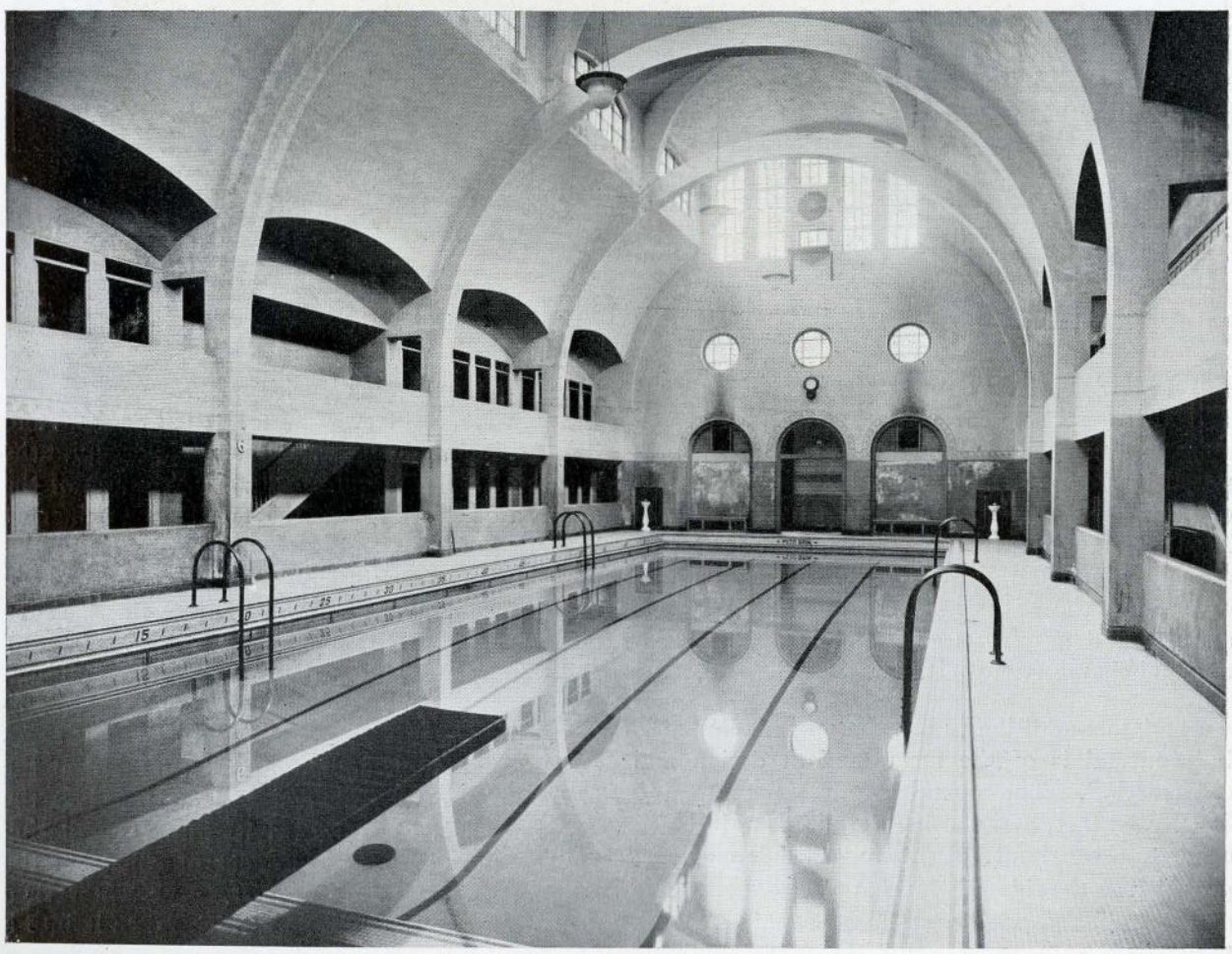


PLAN—AMHERST PUBLIC BATH, MONTREAL
J. O. Marchand, F.R.I.B.A., Architect

the effect of the rays twice in succession, the capacity of this being 250 gallons per minute.

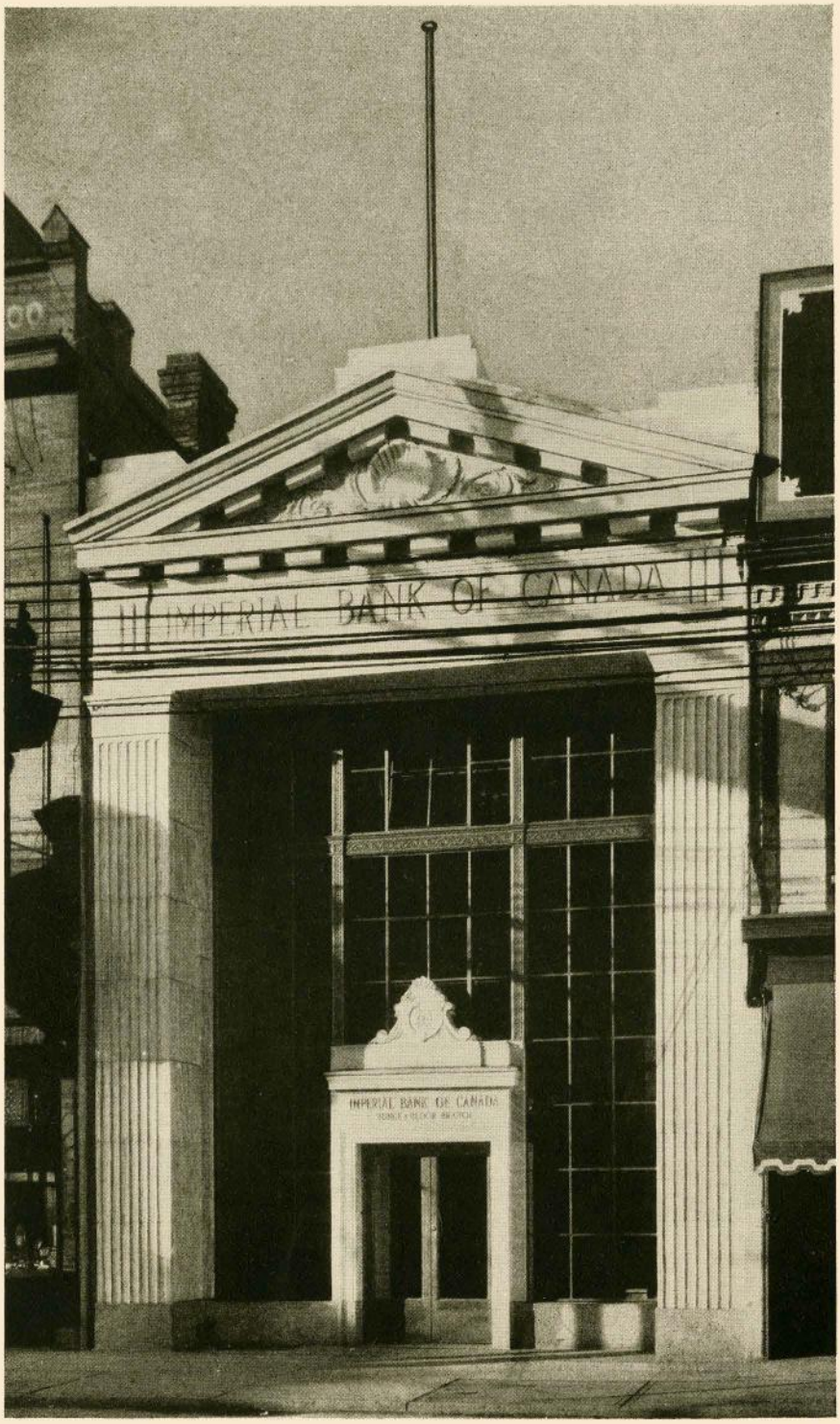
Under the shower-room, in the basement, are located the boilers, mechanical equipment and violet ray apparatus. A low pressure boiler supplies the steam for the jacket heater which heats the water in the pool, and also for the steam-heating system. An extra jacket heater furnishes the hot water for the showers.

The building was erected at a cost of approximately $100,000.00. The general contractors were Ulric Boileau Company, Ltd., Montreal, and the plans were prepared under the direction of H. A. Terrault, City Engineer of Montreal.



SWIMMING POOL—AMHERST PUBLIC BATH, MONTREAL
J. O. Marchand, F.R.I.B.A., Architect

DETAIL OF ENTRANCE, AMHERST PUBLIC BATH, MONTREAL
J. O. Marchand, F.R.I.B.A., Architect
(See article, page 213)



IMPERIAL BANK BUILDING, YONGE & BLOOR BRANCH, TORONTO
Langley & Howland, Architects
(Shown at the recent Toronto Chapter Exhibition of Architecture and Allied Arts)

EGLISE ST. AMBROISE, MONTREAL
Ernest Cormier, F.R.I.B.A., Architect

TERMINAL BUILDING, MONTREAL
Ross & MacDonald, Architects

The Church of Saint Jean, Island of Orleans, Quebec

By Ramsay Traquair M.A. (Hon.), F.R.I.B.A.

Historical material supplied by MARIUS BARBEAU, National Museum, Ottawa

THE parish of St. Jean lies on the south side of the Island of Orleans, between St. Lawrence and St. François. The historical materials for the study of the church are unfortunately very imperfect; the old accounts and deliberations have been lost and the church itself has suffered alterations more severe than those of any other old church on the island.

According to the "Extrait du plan général des missions" of 1683, there was in the parish at that time a wooden church, not yet finished. It measured 45 feet by 20 feet. The parish contained 32 families and 175 persons.[1]

Amongst the papers of the fabrique is a document of answers made by the curé to a questionnaire of the archbishop in 1852. This tells us that there is nothing in the archives to give the date at which the existing church was built but that according to tradition it was commenced by the curé, M. René Philippe Portneuf in 1732. "Nous apprenons pala tradition que ce fut M. Port-Neuf qui fit commencer a bâtir l'église actuelle, mais que les habi-

Photo R. T., 1928

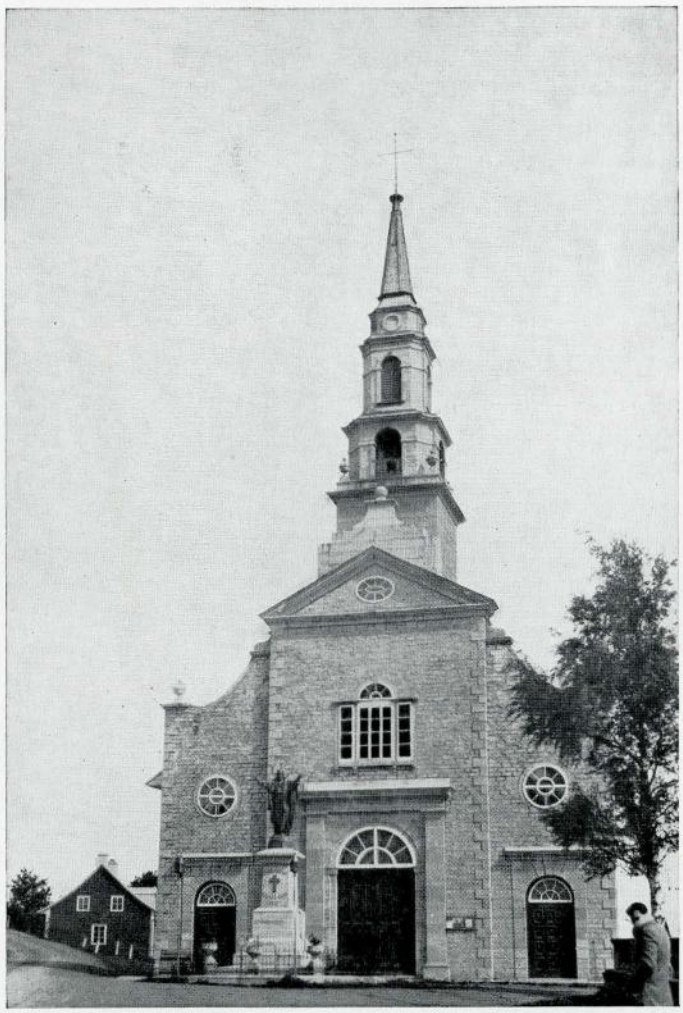
VIEW FROM THE SOUTH WEST

[1] Têtu & Gagnon. Mandements, Lettres pastorales et Circulaires des Evêques de Quebec, Que. 1887, Vol. I (1659-1740), p. 116. Plan général de l'état présent des missions du Canada fait en l'année 1683. Extracts from this are in the archives of Ange Gardien and St. Jean.

tants lui ayant refusé de bâtir sur un plus grand plan et en forme de croix, qu'il en conçut un tel deplaisir qu'il laissa la paroisse. On se repent depuis longtemps de ne pas avoir suivi ses sages avis."

At the time of writing this paper the tradition was already 120 years old, still, as regards the walls of the church it is quite probable. The other churches of the island were being rebuilt in stone at about this time, St. Pierre in 1718, St. François in 1734, Ste. Famille in 1743.

The archives of Ste. Famille, on the other side of the island tell us that a Montreal sculptor, Louis Bazil David was employed there in 1812 to build a vault, or ceiling, to the church. There was some difference of opinion between the curé and a body of his parishioners as to the propriety of employing this sculptor and in the correspondence it is stated that David was a pupil of Quevillon and that he had just completed decorative work at St. Jean.[1]



THE WEST FRONT *Photo R. C. Betts, 1926*

The Livre des délibérations de la Fabrique dates only from 1813 and even then the entries dealing with decoration or architecture are very few. The gallery was reconstructed in 1836. In 1852, as the population had nearly doubled and the spire and porch were in a ruinous condition, the congregation requested permission to enlarge the church.[2] The petitioners proposed to lengthen the church by 25 feet, with a gallery. Their request was approved by Mgr. Turgeon and the work was entrusted to M. Berlinguet, a well-known architect of Quebec.[3]

The new west front was executed during 1852 and 1853. In 1865 the sum of £14 was paid for "Construction d'un banc d'oeuvre" and £10 for the stair to the pulpit. In 1853 three new bells were bought from Le Royer, a bellfounder of Paris. The baptismal font was made in 1855 by Joseph Dion, "menuisier-sculpteur."

The Church

The church is a hall without transepts, terminating in a short chancel and a semi-circular apse, beyond which, entered by a door behind the high altar, is the sacristy. It measures 39 feet broad by 88 feet 6 inches long (to the end of the apse) and is covered by an elliptical wooden boarded vault with panelled cross ribs and painted panels. The chancel is 26 feet broad, narrowed to 23 feet by projecting pilasters where it joins the nave. The secondary altars are placed at each side of the chancel arch.

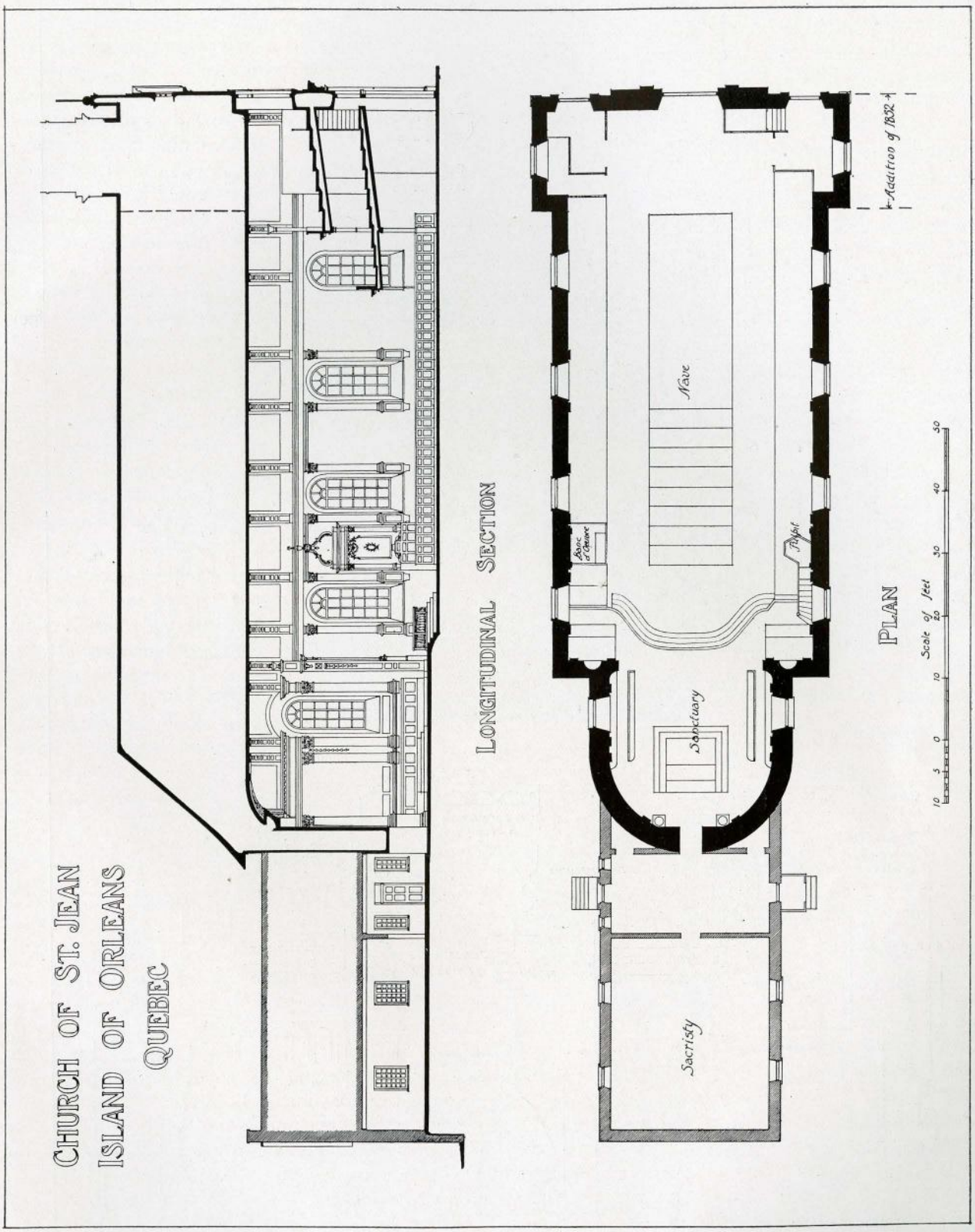
When adding the new front in 1852, Berlinguet lengthened the church by about sixteen feet and increased the width to 50 feet 6 inches outside, so forming a projection on each side and adding to the apparent size of the church. The entrance is by three doors in the front.

In the interior the nave is lighted by five large round-headed windows on each side, four in the side walls and one in the western projection. There are two galleries, of which the lower passes across the first two windows. Beyond this the nave is divided into bays by corinthian pilasters framing the three remaining windows. These pilasters have pedestals with carved panels and are cut off some five feet above the floor, at the internal sill level, evidently to avoid interference with the

[1] Archives de l'Archevêché, Quebec. Cartable de Ste. Famille. Ile d'Orleans, and in the archives of Ste. Famille. Reponse de M. J. Gagnon à une plainte de ses paroissiens, à l'effet qu'il se querellait avec son sculpteur David. . . . un nommé David, éleve de M. Cuvillon, qui travaille maintenant dans l'église de Ste. Famille . . . ce jeune homme a gagné un certain nombre d'habitants à qui il a montré de dorure et des sculptures qu'il a fait à St. Jean et leur a mis dans l'idée de faire ici . . . des entreprises à tort et à travers. . . . Quevillon is known to have done work in the Quebec district, at St. Laurent, I.O., in 1807, at St. Henri, Levis, in 1804, and at St. Charles, Bellechasse in 1806.

[2] Requête pour aggrandir l'église. 20 Mai 1852. Signed by Antoine Gosselin, curé.

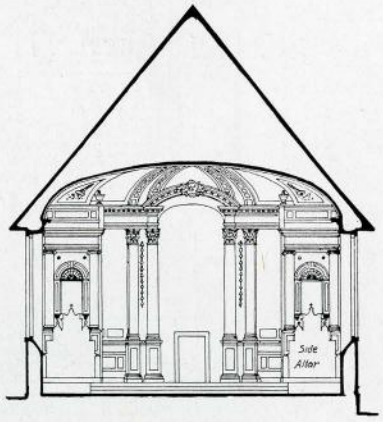
[3] Louis Thomas Berlinguet. See for short notice in "Une Maitrise d'Art en Canada." E. Vaillancourt, Montreal, 1920.


CHURCH OF ST. JEAN
ISLAND OF ORLEANS
QUEBEC
LONGITUDINAL SECTION
PLAN
Addition of 1852
Nave
Sanctuary
Sacristy
Scale of feet
10 5 0 10 20 30 40 50

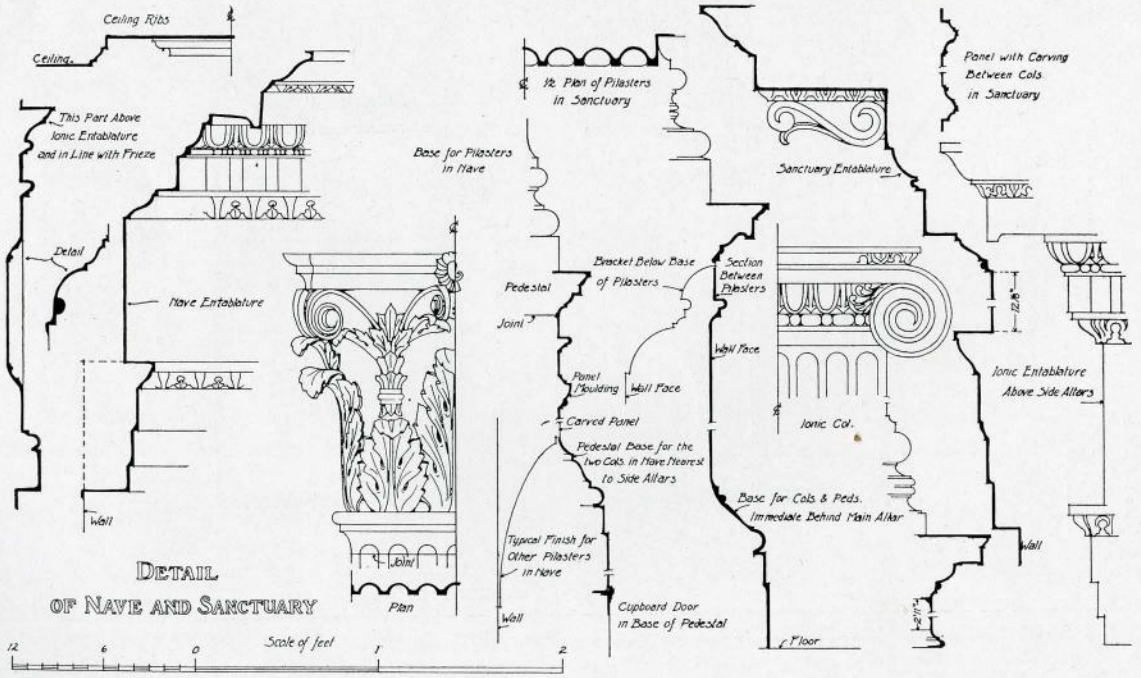
CHURCH OF ST. JEAN
ISLAND OF ORLEANS
QUEBEC

Scale of feet
5 0 5 10 15 20 25 30 35 40 45

FRONT ELEVATION



CROSS SECTION



DETAIL
OF NAVE AND SANCTUARY

seating. This is evidently a recent alteration and originally the pilasters rested on a continuous dado. The same treatment has been accorded to the pilasters of the sanctuary. The main entablature is of frieze and cornice with the architrave omitted over the windows. The pilaster panels are carved with a curious and rather confused pattern of scrolls, the frieze has swags hanging between urns and cartouches.

Above the side altars are semi-circular niches[1] containing statues. They are framed in ionic pilasters with a flat entablature which butts into the nave cornice in a rather clumsy way.

The chancel is lighted by a single window on each side. These rise so high that the entablature has to be broken on each side and a segmental arch thrown across in the vault above them. The walls are treated with doubled corinthian pilasters of which those at the end of the apse retain their pedestals. Those of the others have been cut away, as in the nave.

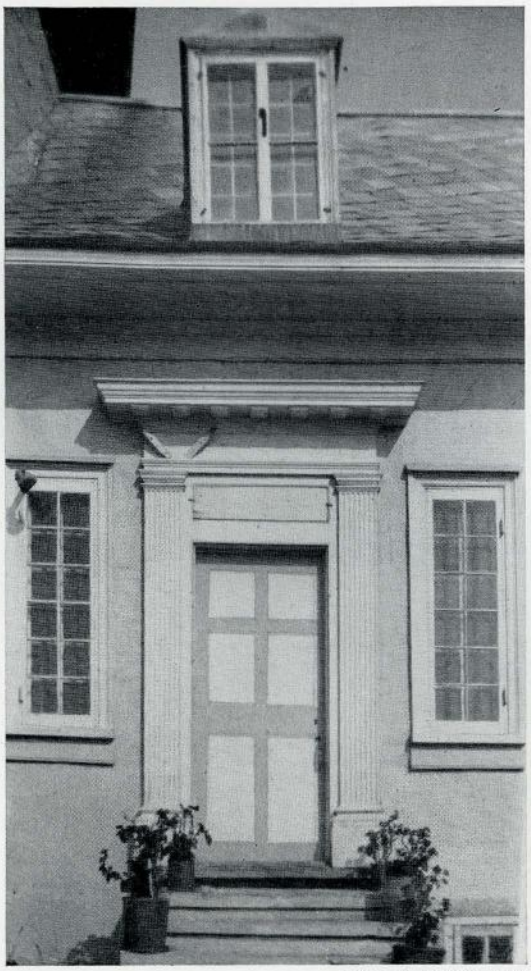


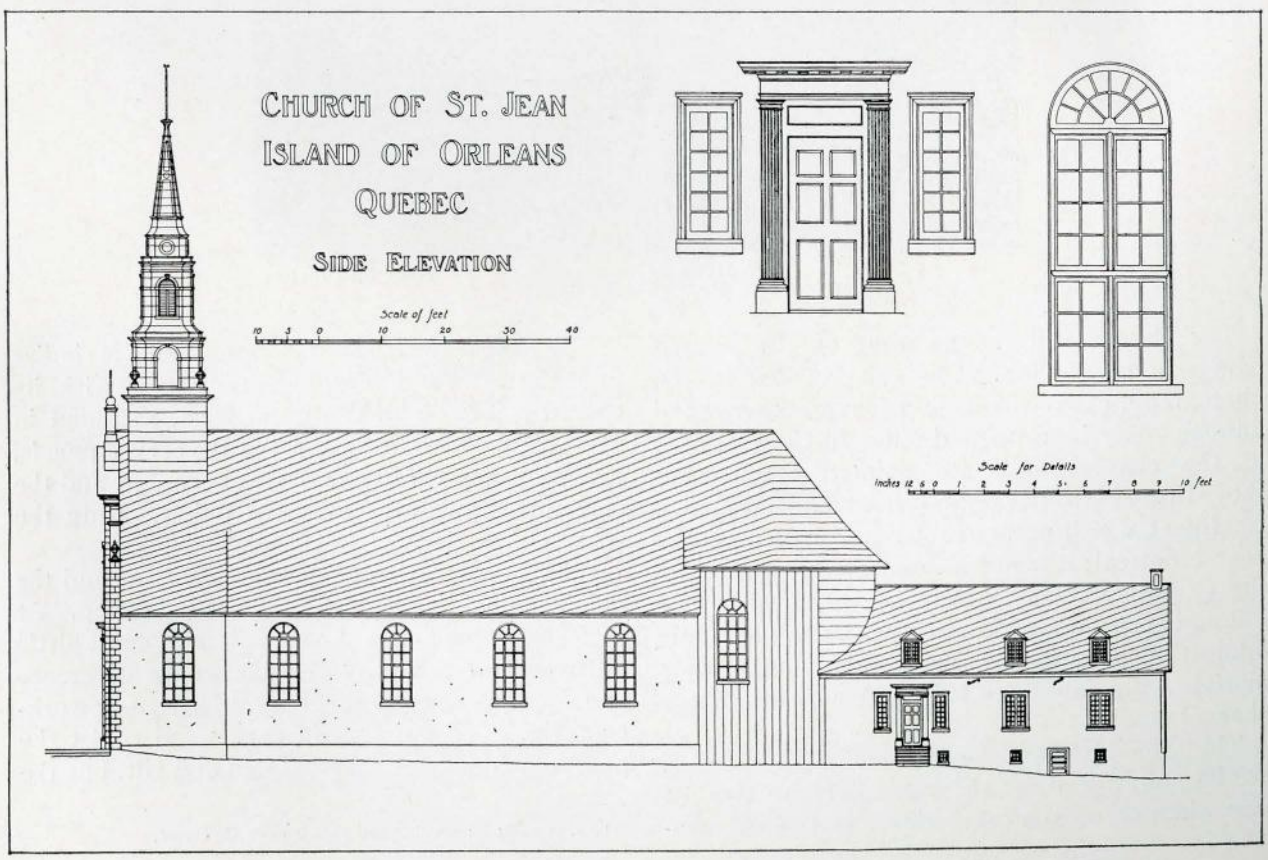
Photo R. C. Betts, 1926

THE DOOR OF THE SACRISTY

The chancel is separated from the nave by high panelled pilasters crowned by a dado and urns behind which springs the arch. This device is evidently introduced in order to reconcile the different springing heights of the two vaults. For, although they rise to the same height, the chancel vault springs from a level some two feet above the springing of the nave.

The result is not altogether happy, indeed at first sight it looks like the result of alterations to some older scheme. The single column and its scrap of entablature behind the pilasters is particularly unfortunate. But the arrangement seems to be

[1] These were inserted in 1864. A note of their cost is given in the accounts for that year.



simply an effort to reconcile the different heights of nave and chancel. It has not, perhaps, succeeded very well; to the eye of an architect there are very evident flaws in the composition though the pilasters and urns give a clean, sheer line to the chancel arch. The difficulty is, of course, accentuated by the treatment of the side altars. But all the work seems to have been done at the same time and by the same hand.

Photo, R.T., 1924

THE CHOIR INTERIOR

The church still retains some of the painted panels in the ceiling. One can be seen in the photograph, above the banc d'oeuvre, others have unfortunately been painted out. In the spandrils of the chancel arch are painted cornucopiae showering down fruits and flowers. This is a treatment which occurs in a number of churches near Montreal; it is not uncommon in churches of the Quevillon school. Here the painting of the ceiling is the work of Louis Bazil David, and it is interesting to note that he used this cornucopia motive again in Ste. Famille, in a panel of the chancel vault.

The three altars are modern and of no interest.

The pulpit occupies the space between the last two windows on the north side. It has an hexagonal body with a plain cornice, leaf trails on the angles and carved panels. Behind it are panels with carved floriated heads framed by corinthian pilasters. The entablature of these is brought forward to form a large hexagonal canopy with a scrolled crown supporting a pot with very conventional lilies. The lower edge of the canopy has a scalloped edge set with little tassels, an ornament derived from drapery hangings.

The banc d'oeuvre on the opposite side is similar in design. The heavy mahogany pew with its carved cornice is of the usual form, as found in other churches on the island, but the carved panels, the corinthian pilasters, the square canopy and the crowning scrolls all match the pulpit. Only the frieze is less elaborately carved.

With the exception of this pew the banc and the pulpit are evidently from the same workshop. At first sight the body of the pulpit looks a little different, but this is rather due to the difference in colour than to any difference in design or workmanship. The pulpit is in dark wood whilst the panelling and canopy are painted and gilt, but the

[1] e.g. at Sault au Recollet and Ste. Jeanne, Ile Perrot.

panel mouldings and the treatment of the carving are the same in both.

The stair to the pulpit was, we know, added in 1865 at a cost of £10.0.0. The pew is probably the item referred to in the accounts of the same year. The rest seems all to be from one hand.

In general design, in the details of the mouldings and of the carving, this work is unlike anything else in the old churches on the island, but it very closely resembles similar features in a number of churches near Montreal. The canopy and the back of the pulpit at St. Mathias-sur-Richlieu in particular are very like this work in St. Jean.[1]

The Ste. Famille correspondence tells us that, just previous to 1812, decorative work at St. Jean was being executed by Louis Bazil David, a pupil of Quevillon. Whilst documentary evidence is lacking as to the extent of this work, yet the resemblance of the whole decoration to work in the Montreal district, of about the same date, is so strong that one inclines to attribute it to a sculptor of the Quevillon school. The decoration of the church does not follow the Baillargé model. To take an instance, the swags in the cornice are not a Baillargé motive but occur in the cornice of St. Matthias-sur-Richlieu.

In all probability, Louis Bazil David executed the retable, nave decoration and vault, pulpit and banc d'oeuvre in this church in or before 1812.

In the accounts for 1864 occur the items:

1864 vente du vieux plancher du sanctuaire . 0.13.0
réparation au sanctuaire 53.0.0

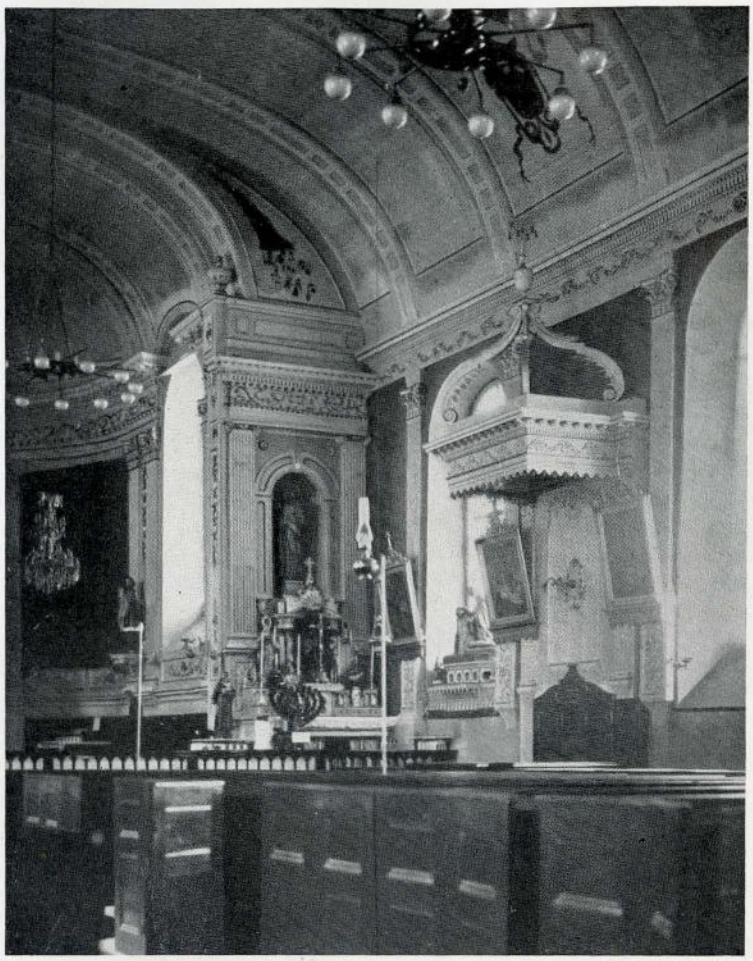


Photo R. T., 1924

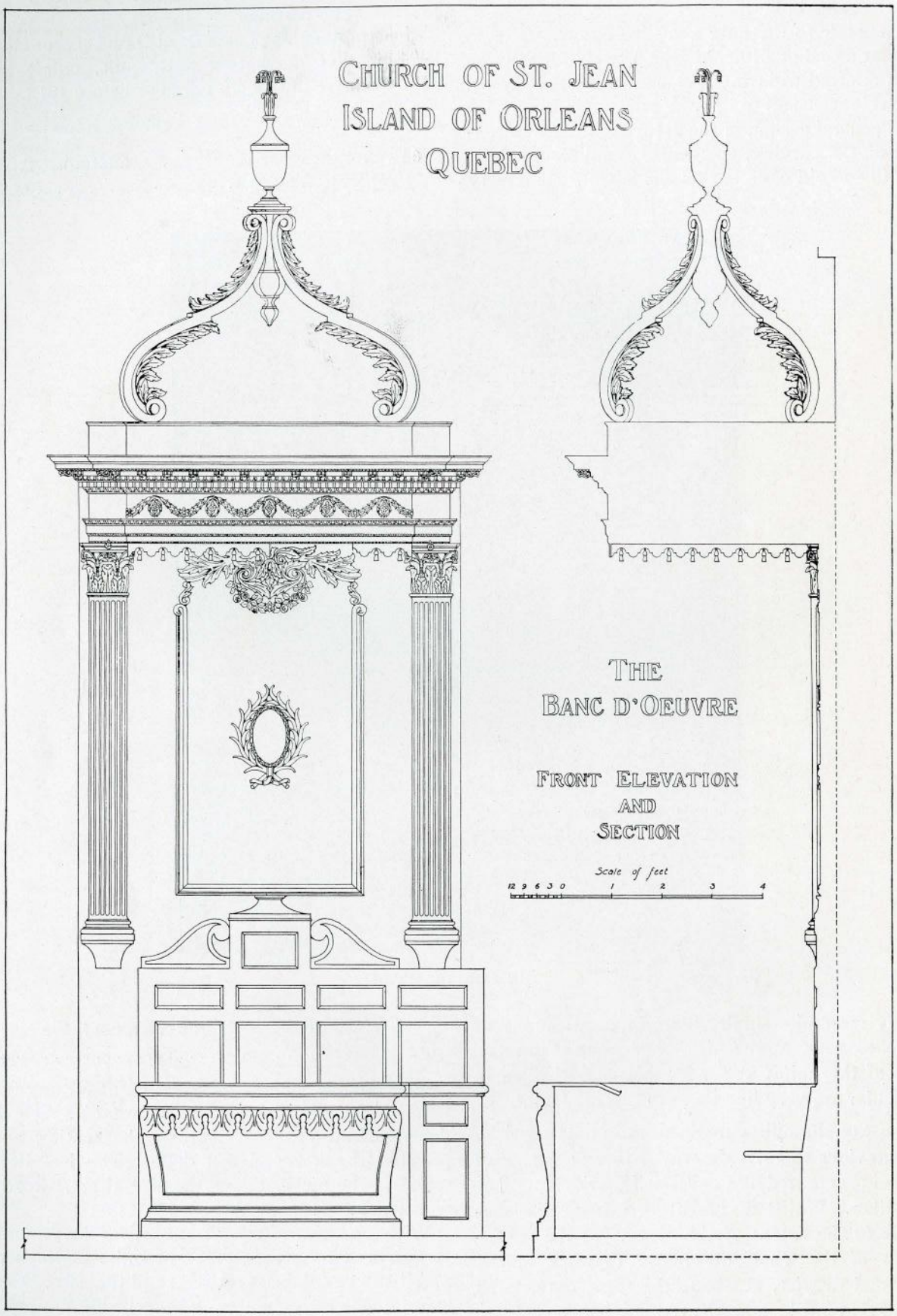
THE BANC D'OEUVRE

les niches de la Sainte-Vierge et St-Joseph 8.0.0

This amount would not be sufficient for any full redecoration of the sanctuary or retable. It evidently applies to the flooring, the seating and possibly the low panelled dado. The last item refers to the niches above the side altars, already mentioned.

With the west front we enter upon known ground. It was built from the designs of L. T. Berlinguet, a well-known Quebec architect, and the date, 1852, is inscribed on the facade. The front has a central

[1] The decoration of St. Mathias is by Quevillon and St. James in 1821-25. See "Une Maîtrise d'Art en Canada," E. Vaillancourt, Montreal, 1920. Compare also the canopy of the pulpit and choir panels at Ste. Jeanne, Ile Perrot, the pulpit canopy at St. Joachim, Pointe Claire (now destroyed), pulpit and panelling at Vaudreuil.


CHURCH OF ST. JEAN
ISLAND OF ORLEANS
QUEBEC
THE
BANC D'OEUVRE
FRONT ELEVATION
AND
SECTION
Scale of feet
12 9 6 3 0 1 2 3 4

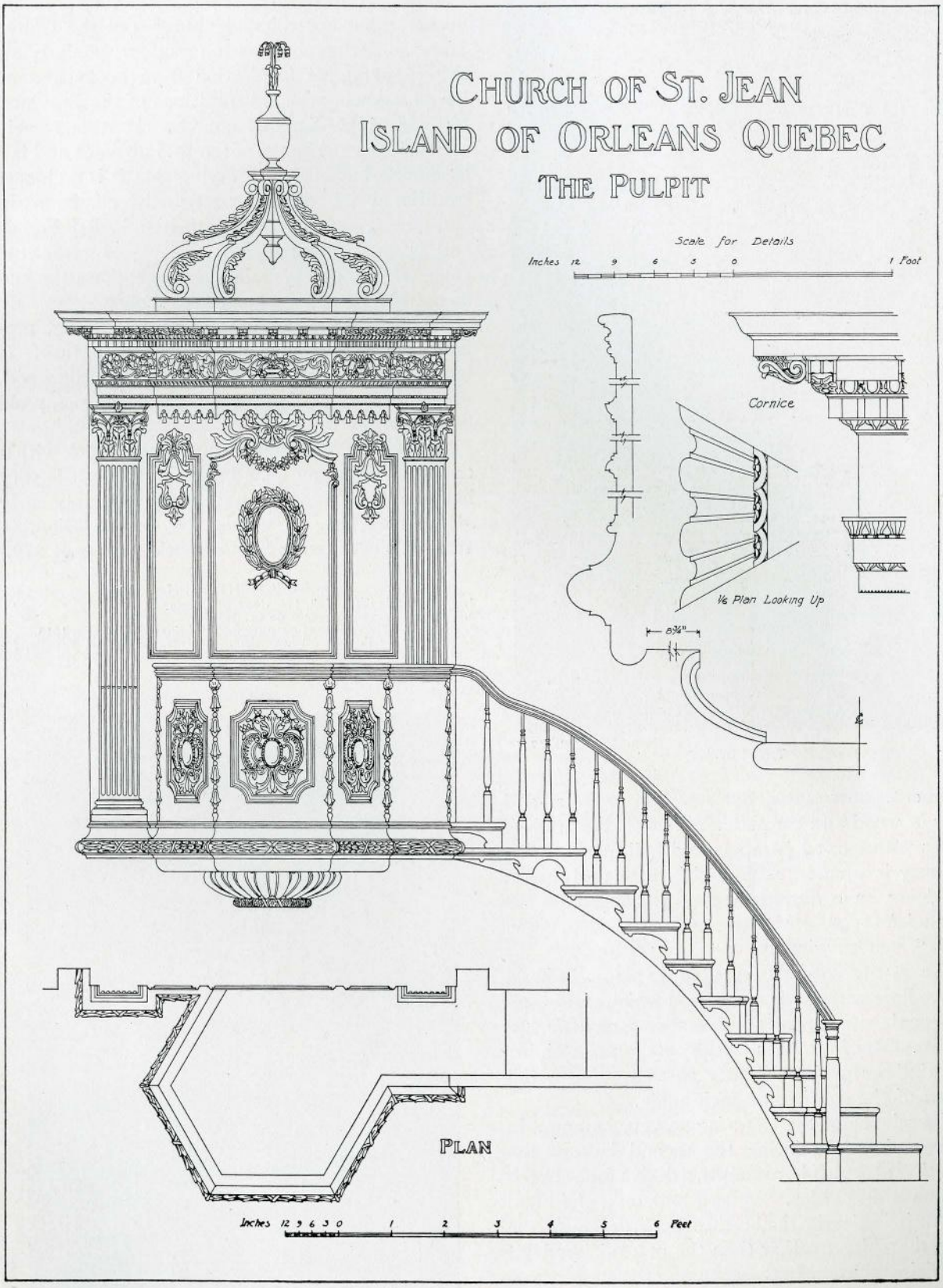

CHURCH OF ST. JEAN
ISLAND OF ORLEANS QUEBEC
THE PULPIT
Scale for Details
Inches 12 9 6 3 0 1 Foot
Cornice
1/6 Plan Looking Up
8¾"
PLAN
Inches 12 9 6 3 0 1 2 3 4 5 6 Feet

Photo R. C. Betts, 1926

THE PULPIT

pediment, surmounted by a curved pedestal and cross in wood and tin plate. At each side are half gables with curved parapets and ball finials. The masonry is squared rubble, with rusticated angles; the doors have a simple stone treatment of the "Vignola" type. Above the central door is a triple Venetian window.

The spire is of wood covered in tin plate. It has a square base with angle urns, from which springs an octagonal belfry in two window stages, an attic and a spire. The four faces of the octagon containing the windows project slightly so as to give a full return of the cornices at each angle.

The scheme of the front is one very common in Quebec churches during the second half of the XIXth century. It is, of course, a design for a church with nave and aisles. As used here on a plain hall church it is clearly the studied book design of the learned architect rather than the natural facade of an aisleless church. In the same way the stone dressings and the features of academic classic architecture mark the end of the old traditional methods of design. In the "Venetian window" and the spire we see equally clearly the influence of the English school of James Gibbs, an architect whose book "A Book of Architecture," exercised a very great influence upon the colonial churches of the United States. Berlinguet was the modern scholarly architect taking his inspiration from books and no longer following the old traditions of the Province. Yet this is a dignified church. It stands finely on its site by the banks of the St. Lawrence and is a landmark for miles. In saying that it is no longer traditional we do not necessarily condemn it. But a design of this kind, with its mingled French and English features and its lack of structural connection with the building foreshadows the end of the old French Canadian Art.

The sacristy is an unimportant building, probably of the beginning of the XIXth century. It has a pleasant door with a doric order in wood, very like some of those which we see on many old houses on the island.

The church has a good Easter candlestick with a tripod base and an ionic baluster stem. It is very like one at St. Mathias and is also probably early XIXth century. The font, by Joseph Dion, in 1850, is illustrated in "L'Ile d'Orleans," page 279.

DOCUMENTATION

1. Registres de l'état civil, 1781-1854. St. Jean.
2. Cahier Faucher; archives de St. Jean.
3. Livre de déliverations et comptes de la fabrique de St. Jean, 1813.
4. Archives de l'Archevêché, Quebec. Le cartable de Ste. Famille, Ile d'Orleans.

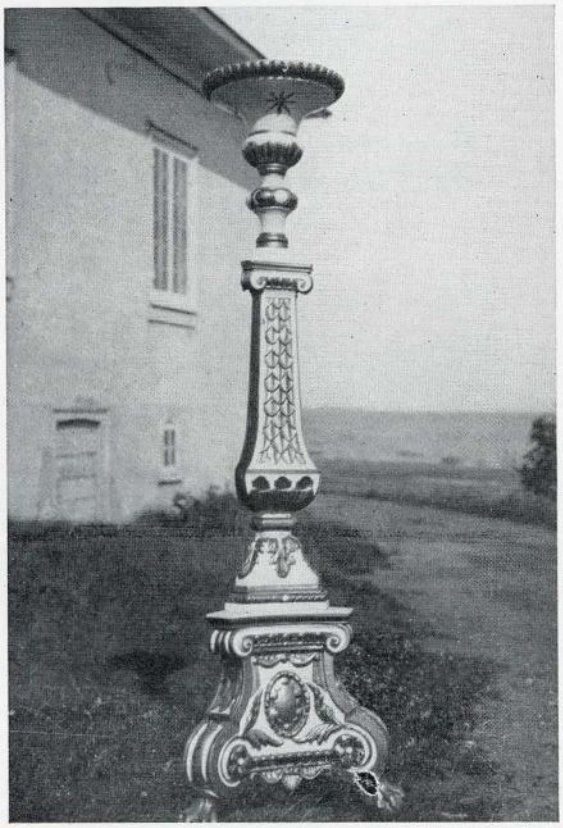


Photo R. C. Betts, 1926

THE EASTER CANDLESTICK

NOTE—The drawings were made by students of the school of Architecture, McGill University, in 1926.

Cracks and Decay in Buildings due to Expansion and Contraction

By OSCAR FABER, O.B.E., D.SC., M.INST.C.E.(*Hon. A.*).

Read before the Royal Institute of British Architects on Monday, January 7, 1929, and reprinted by special permission of the R.I.B.A.

WHEN I was still younger than I am to-day, I used to wonder at the number of cracks I saw in buildings and structures of all kinds. After many years of study, I now wonder at the fact that buildings and other structures do not show many more cracks than they do.

The object of this paper is to indicate as shortly as reasonable accuracy will allow, the causes of movements in building materials, in the hope that this will assist my colleagues to a better understanding of when to expect cracks and how to avoid them. Brevity with clarity demands that I classify materials into three main groups:—

I. Non-porous and impervious.
II. Porous but seasoned.
III. Porous but unseasoned.

I. Impervious Materials.—This group is by far the simplest. It is represented by the metals, such as steel, but other materials such as marble and granite approach closely to imperviousness.

Impervious materials change their length in two ways:—

(*a*) By change of temperature.
(*b*) By change of stress.

(*a*) Thus steel expands approximately .000006 inches per inch per degree Fahr. rise in temperature (the expansion being practically proportioned to the temperature change). This may seem so little as to be of no interest to "practical men."* But if a bridge or viaduct floor expands from 30° F. to 80° F., the expansion at this rate on a length of 100 feet—

$$.000006 \times 50° \times 1200'' = .36 \text{ inches.}$$

Dry and seasoned concrete expands with temperature rise very much as steel, and with practically the same coefficient. A reinforced concrete viaduct at Sittingbourne is 2,400 feet long, which would represent an expansion of $8\frac{1}{2}$ inches. This would clearly be very destructive if unprovided for. Actually the viaduct was divided into 100 foot sections with expansion joints between. The gaps were found to be about $\frac{3}{8}$ inch less at 3 p.m. after exposure to a hot sun, as compared with 3 a.m. on a cold clear night. This is in close agreement with the previous figure. The force of this expansion is enormous. At one stage in construction a granite pebble got wedged into the joint in the morning and resisted the expansion, with the consequence that after mid-day a large piece of deck was blown off with a loud report.

(*b*) Steel (for example) may be lengthened by pulling it or shortened by compressing it. Within the elastic limit the change of length is proportional to the change of stress, the latter divided by the former on a specimen of unit length being therefore a constant for the material, and known as Young's Modulus of Elasticity. For steel it has the value of

$$E = 30 \text{ million lb. per sq. inch.}$$

Again, it may seem that the lengthening or shortening by stress inside the elastic limit is so little as to be of no interest to the "practical man." But a steel deck 100 feet long compressed to 9,000 lb. per square inch will shorten by

$$\frac{1{,}200 \text{ inches} \times 9{,}000}{30{,}000{,}000} = .36 \text{ inches}$$

In flat arches, such shortenings produce considerable fall of the crown and resultant bending stresses unless the arch is three hinged.

But the aspect of the problem to which I wish to draw attention is the interplay between change of length by temperature and stress. There are many places where expansion due to temperature is resisted more or less completely. Suppose, for example, a 100 feet of viaduct floor of steel expands through 50° F. as in (*a*). This tends to lengthen it by .36 inches if the ends are free. But suppose they are fixed in relatively immovable buttresses. Then the latter push it back to its original length, so that the shortening due to compression balances the lengthening due to temperature. Hence the stress developed will be that required to shorten it .36 inches which was shown in (*b*) to be 9,000 lb. per square inch. In this sense, each degree Fahr. of temperature change produces a stress of

$$\frac{9{,}000}{50} = 180 \text{ lb. per square inch.}$$

With dry seasoned concrete having a Young's Modulus of 4,000,000 lb. per square inch the corresponding figure is 24 lb. per square inch. Hence a change of 50° (if resisted) would produce a stress of 1,200 lb. per square inch or double the L.C.C. permissible in compression. If the change is towards lower temperatures it will produce tensile stresses greater than the ultimate and cracks will result. From this aspect, the compressibility under stress enables materials to withstand change of temperature when confined or restrained. The lower Young's Modulus, the smaller will the resultant stresses be. In the case of concrete, however, the strength and the Young's Modulus rise and fall together* so that a given temperature rise will produce the same proportion of ultimate strength whatever the strength of the concrete.

One form of restraint is common, namely, that imposed by the inside of the block on its exposed surface. A wall may have its outer surface exposed to frost at one time and hot sun another, while the inside remains practically at the same temperature. This may easily produce stresses sufficient to produce cracks. After the war, some students

*So far as I can gather, a practical man is one who has no accurate knowledge of anything.

*$E = 1000 \times$ strength of cubes.
$= 1430 \times$ strength of cylinders having a length twice the diameter.

burnt a gun carriage at the base of the Nelson Memorial in Trafalgar Square. The granite surface was heated, tried to expand, but was restrained by its backing, and the resultant stresses were sufficient to spall it off. As they say in guide books, the marks are there to this day to prove it.

II. Porous but Seasoned Materials.—These are represented by timber, concretes, bricks, etc., which have been seasoned long enough to acquire constant volume consistent with the conditions under which they are seasoned. In the case of timber and concrete, a year or two are required, more is better, less is better than nothing. This bracketing together of timber and concrete may seem strange, but the more we learn about concrete, the closer becomes this similarity of properties, as will be seen more clearly later. These materials, when seasoned, expand and contract with temperature and stress—(*a*) and (*b*) as in Section *I.*

(*c*) But a third condition, producing change of length, is introduced, namely, *change of humidity.* Timber, however long seasoned, will absorb moisture and expand if immersed. What is perhaps more remarkable, it will do so if exposed to an atmosphere of greater humidity than that at which it has been kept. Thus a timber seasoned in an atmosphere of 30 per cent. humidity, absorbs moisture from the air if exposed to air at 60 per cent. humidity, and expands in doing so. This is remarkable, when it is realised that 60 per cent. humidity air has no free moisture, the water existing only as water vapour—the air is well below the dew point when the water is deposited on non-porous surfaces. Hence the importance of seasoning woods to the humidity conditions they are likely to be exposed to afterwards, and of keeping down the humidity of buildings by warming them while wood block floors are being laid. Hence, also, the housewife's anxiety to "air" linen sheets (another porous material) before use, however dry they may have been after ironing.

Concretes, and bricks, have these properties also in proportion as they are porous. Thus, a well seasoned ordinary 4 : 2 : 1 ballast concrete (*i.e.*, made with impervious sand and aggregate) expands about .00025 of its length on immersion. This represents .3 inches in 100 feet, that is to say, of the same order as that produced by a change of temperature of 50° F. (see(*a*)) or a stress of about 1,200 lb. per square inch (see (*b*)). Consequently, what was said previously about stresses and cracks produced by expansion or contraction by change of temperature applies equally to expansion and contraction due to moisture changes.

But the ballast concrete to which reference has been made represents a relatively impervious concrete. If we make concretes of porous materials, they expand and contract much more with wetting. Thus, as compared with .00025 for 4 : 2 : 1 gravel concrete, a sample of Aerocrete gave about .0015 (six times as much), and much the same result was found for breeze concrete, Novocrete ("mineralised" sawdust and cement). There is no doubt that these porous concretes are very liable to produce cracks owing to their great shrinkage when a building dries out, even when they are made of well seasoned pre-cast slabs, and this accords well with our experience of partitions made with breeze concrete and similar materials. As in many problems, the porosity which from this aspect is a disadvantage, is associated with corresponding advantages, namely, good "suction" enabling the plaster to adhere well, and lightness.

But good adhesion can be obtained in other ways. In the Bank of England rebuilding, we lay on the centering rubber sheets with raised square ribs with same size valleys between them (see Fig. 1).

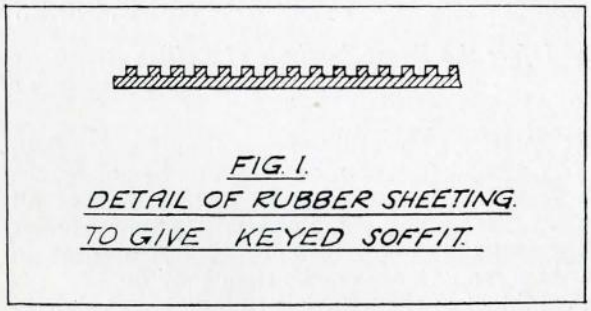


FIG. I.
DETAIL OF RUBBER SHEETING
TO GIVE KEYED SOFFIT.

The floors are cast on this of impervious concrete. After the centering is struck, these sheets are pulled off for re-use, leaving a perfect key for render or plaster.

As compared with the coefficient for concrete (.00025) natural stones range from .00004 for Hopton Wood (one-sixth) to York Stone .0005 (double) along a horizontal bed. Portland is about .00008 (about one-third).

There is little doubt that the relatively low humidity expansion of limestones such as Portland accounts for their comparatively good resistance to a climate with such frequent changes from wet to dry as ours, which is more damaging to sand stones and their greater humidity expansion. The interplay of humidity, stress, and temperature movements are somewhat similar to those of the two we studied for impervious materials. If a wall surface is initially cold and dry and subsequently hot and wet, and restrained from expanding, it would be stressed roughly twice as much as if subjected to expansion by either rise of temperature or increase of moisture contents alone. This would be a very damaging condition. But it probably never occurs over the full range, and generally change of temperature and humidity more or less cancel one another. Thus a shower on a hot wall generally cools it and the sun on a wet one dries it as it warms. Indeed, owing to the absorption of moisture from air even much below 100 per cent. humidity some skill is needed in testing to separate the two effects.

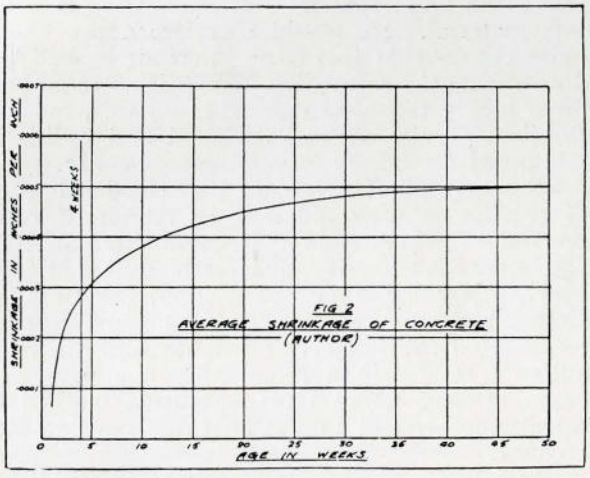
A piece of concrete warmed expands through rise of temperature, but at the same time loses moisture, and suffers contraction in consequence. Similarly on cooling, it contracts from reduction of temperature, but absorbs water vapour by coming in contact with air of lower percentage humidity.

III. Porous Unseasoned Materials.—Examples are newly-sawn timber, and recently cast concrete. All such materials are subject to changes of length previously discussed, due to changes in (*a*) temperature; (*b*) stress; (*c*) humidity; which are all directly proportional and reversible, *i.e.*, they can be repeated in either direction. But they are also subject to two others: (*d*) shrinkage on seasoning; (*e*) plastic yield. These both depend on the duration and age and are irreversible.

(*d*) *Shrinkage on Seasoning.*—Timber, in seasoning, shrinks so much as to be noticeable to the

practical man, a quarter of an inch in a foot across the grain being common. Door panels of partially seasoned timber often show half this shrinkage. Timber shrinks in seasoning much more than it will subsequently expand, even when immersed, showing that the change is irreversible. Similarly, concrete on hardening shrinks enough to produce "shrinkage cracks" when restrained. This is not to be confused with shrinkage on drying, the former being irreversible, and the latter, as we have already seen, reversible.

A typical diagram of shrinkage of ordinary 4 : 2 : 1 ballast concrete with time is shown in Fig. 2.*



It will be seen that the total shrinkage is about .0005 in a year, but in the first three weeks about half this has already occurred.

We noticed before that the expansion of similar concrete on immersion (a similar contraction on drying from fully wet) was only .00025, or one-half, showing clearly that the shrinkage from hardening (or seasoning) is irreversible. The two are indeed quite separate, and may be superimposed or may more or less balance one another. Naturally, the exact value of the shrinkage in seasoning is not independent of wetness, cement contents, and other variables in the concrete, but there is no time to digress on these.

(*e*) *Plastic Yield.*—If a perfectly elastic material is loaded, it deforms, but when the load is removed, it returns to its original shape. Well-seasoned timber and steel (stressed inside the elastic limit) approximate to elastic materials. Thus a steel girder, when reasonably loaded, deflects, and the deflection remains steady however long the load remains on it. When the load is removed, the beam returns to its original shape. Well-seasoned timber does the same.

Unseasoned timber behaves quite differently. A beam of it, when loaded, deflects when the load is first applied, but goes on increasing its deflection as time elapses, relatively fast at first, more slowly later as the timber becomes more seasoned. The deflection may be divided into two parts, the deflection which occurs when the load is first applied, and the remainder which depends on the time element. The former is called the elastic deflection, the second the "plastic yield." If the load is removed after a long application, the elastic deflection disappears and the "plastic yield" remains as a permanent set. This is well understood by builders and timber merchants who, when setting planks of valuable woods to season, carefully level them up, plank by plank, knowing that any bending will become permanent.

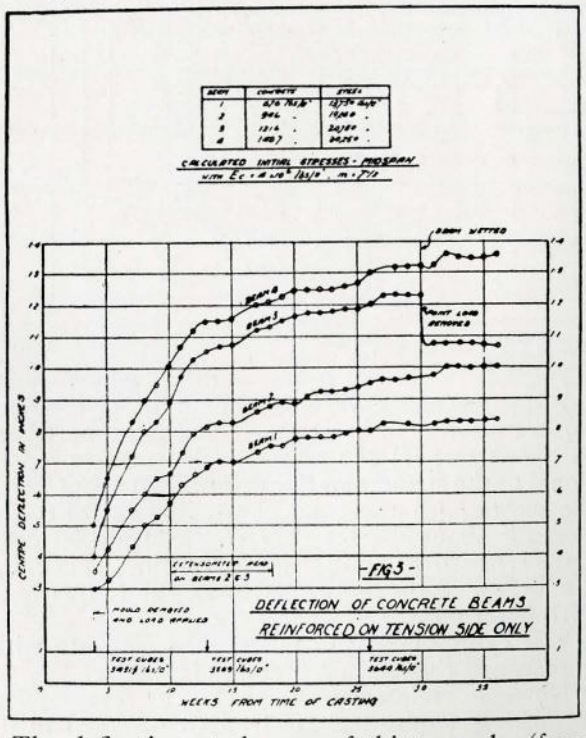
Exactly the same thing happens with recently-cast (or unseasoned) concrete. As this is comparatively recently established on a scientific basis, the author may perhaps be excused for referring briefly to some research of his on this subject, fuller details of which may be found in the paper before the Institution of Civil Engineers, to which reference has been made. He had four similar beams of reinforced concrete made up and loaded so that beam 2 was loaded more than 1, and so on with Nos. 3 and 4, the calculated stresses being:

Beam	*Concrete.*	*Steel.*
1	676 lb. per sq in.	13,750 lb. per sq. in.
2	946 "	19,250 "
3	1,216 "	24,750 "
4	1,487 "	30,250 "

At the age of four weeks they were "struck" and loaded, the deflection then being:

Beam.	*Initial Deflection.*
1	.3 ins.
2	.35 "
3	.4 "
4	.5 "

The load was left quite steady, and the beams were watched for a year. Had the beams been elastic (as steel), no increase in deflection would occur. Actually the deflection increased as shown on Fig. 3.



The deflection at the age of thirty weeks (from casting) being:

Beam.	*Deflection at thirty weeks.*
1	.82 ins.
2	.97 "
3	1.23 "
4	1.325"

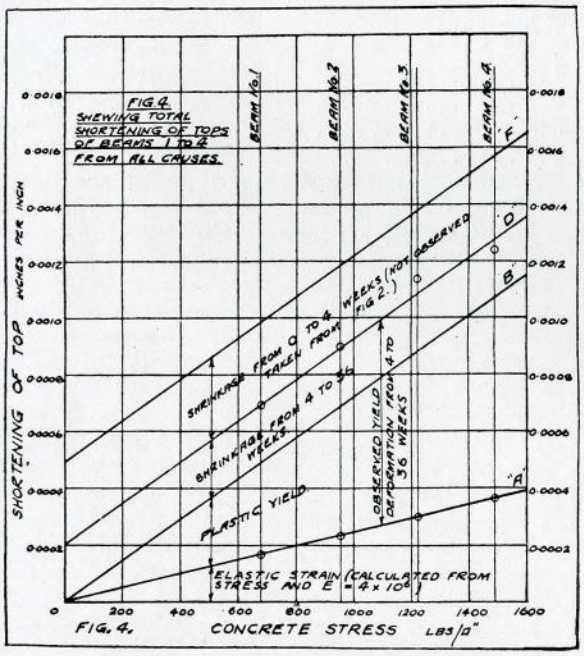
that is, nearly three times the initial, so that in this period the "plastic yield" was about twice the

*Taken from a paper by the author Min. Proc. Inst. Civil Engineers, November 15, 1927, entitled "Plastic Yield, Shrinkage, and Other Properties of Concrete." A copy has been presented to the R.I.B.A. Library.

elastic deflection, but had the load been applied earlier, it would have been even greater.

This result has nothing to do with shrinkage, because the top and bottom would shrink together, and no warping would result. This was verified by keeping beam 4 quite wet after the thirtieth week. The curve shows this had practically no effect. Beam No. 3 had part of its load removed at thirty weeks and replaced a few weeks later. The curve shows that the proportionate elastic deflection disappeared and reappeared, leaving the whole "plastic yield" as a permanent set. Very accurate and delicate optical extensometers were fixed to the top and bottom while this deflection was occurring, which enabled the change in length of the top and bottom to be measured.

Without troubling you with tiresome details and calculations (which can be found in the original paper) it may be stated that careful analysis of these results enabled the shrinkage, elastic strain, and plastic yield of the top to be separated for each beam. These are plotted in Fig. 4.



Against the initial concrete stress, which shows (*a*) the shrinkage is independent of the stress; (*b*) the elastic strain or shortening is proportional to the stress; (*c*) the plastic yield is also proportional to the stress, and (for this period) about twice the elastic; (*d*) the total shortening in thirty-six weeks is about six times the elastic strain for concrete stressed to 600 lb. per sq. inch. This ratio diminishes with higher stresses, and increases with lesser ones.

The close analogy of unseasoned concrete with unseasoned timber is, I think, noteworthy.

Now, in reinforced concrete, a compression member generally has steel rods embedded in it, and the stress in these may be calculated from Young's Modulus when the shortening is known. (See Part I. (*b*)) But the only shortening normally taken into account in the L.C.C. and other current regulations and text books is the "elastic" shortening, and we have seen that shrinkage and plastic yield may increase this (and consequently the steel stress) some six times.

In the paper already referred to the author has shown that a certain concrete column with 1 per cent. of steel and concrete having E = 4,000,000 lb. per sq. inch, would have the following stresses as ordinarily calculated.

Concrete.	*Steel.*
564 lb. per sq. inch.	4,230 lb. per sq. inch.

whereas, if loaded at four weeks, the stresses at the age of a year, taking shrinkage and plastic yield into account, would amount to

Concrete.	*Steel.*
389 lb. per sq. inch.	21,500 lb. per sq. inch.

This difference, particularly the great increase in the steel stress is important.

The author has been represented as intending this to be proof that reinforced concrete is not a safe material. He would therefore desire to say quite clearly that this is an inference he had not drawn from the researches. There is no room here for a highly technical digression on this, but the excellent service of well designed and well-built reinforced structures is sufficient evidence. The researches do, however, show that the distribution of stresses is very different in reinforced compression members from that commonly supposed and show the necessity for close binding and good cover. At the author's suggestion, the Building Research Department put in hand a comprehensive research on this subject and it has confirmed the author's results in a remarkable manner. The paper already referred to contains a method of calculating stresses taking all these matters into account.

General Discussion.—Having now skimmed lightly over the subject, a few general considerations may be of interest.

1. A structure composed of seasoned precast blocks is less likely to crack than one of *in situ* concrete, because while both are subject to contraction with drying and cooling, the *in situ* has the shrinkage in seasoning additionally. (I refer, of course, to precast blocks of the same quality as the *in situ* and not to some of the very porous blocks made by certain block making machines with semi dry concrete.) There is another reason for this superiority. When concrete sets, the chemical action produces heat and rise of temperature. In the Bank of England underpinning there is a retaining wall 8 feet thick of ordinary concrete. A thermometer buried in the heart of this indicated a rise of 50° F. in three days (*i.e.* from 50° to 100° F.).

With some much richer concrete for strong room construction, the temperature rise was approximately 100° F. (*i.e.*, from 50° to 150° F.). Rapid hardening cements release their heat more quickly, and produce higher temperatures, as there is less time for its gradual dissipation by radiation. The shrinkage would therefore include that due to cooling down from these considerable temperatures. If deposited in thick masses where the heat is not readily dissipated, very serious cracks would result in *in situ* work, but in blocks construction, all this expansion and subsequent contraction can occur without restraint, and the seasoned article sets when these movements are completed.

This does not apply, of course, to structures which are free to expand without restraint, such as the viaduct at Sittingbourne already referred to, where the deck was free between expansion joints, and was free from shrinkage cracks. But ordinary buildings are greatly restrained by the weight they

exert on the ground, and often by their neighbours.

2. Seasoned blocks of stone or concrete having a small expansion on immersion are, other things equal, likely to stand much longer before decaying than those having a large expansion. In this respect, limestones are generally better than sandstones. There is no time for the consideration of the chemical aspect of decay.

3. Many structures of precast blocks (particularly brickwork in lime mortar) form their own expansion joints, whether visible or not, in the mortar joints. This enables the surface to expand or contract with relatively little restraint. This surface protects the inner body of wall from great changes of humidity or temperature.

4. It is doubtful whether, in view of these considerations, the monolithic conception is quite as attractive as before these were understood. A small specimen may be cast as a monolith, because its restraint is small, and it is free to shrink without cracking. But a large structure is heavy and requires great forces to move its ends.

5. The raked out joints, thought perhaps to be a survival of an old custom of doubtful justification, or an architectural fad, acquire a new significance.

6. Chimneys, and other structures having to resist considerable temperature changes as well as stresses due to wind and weight, are more liable to crack. In brickwork, the cracks may be so small and frequent (every joint) as not to be noticeable, while in concrete they are likely to occur less frequently (generally at each construction joint, say 3 feet apart) and consequently larger and more noticeable. Concrete chimneys are best arranged with a lining to the top, to provide differentiation of function, the lining resisting heat and no wind pressure, the outer shell *vice-versa*. A chimney built to the author's design in 1908 is still free from cracks, and many have been built since.

7. Reinforced floors and beams, in view of "plastic yield," should have the centering left up as long as possible, and the longer they can be kept unloaded the better. The fact that the concrete does not fail when the centering is struck is not everything and permanent deflection is minimised by allowing the concrete to season as long as possible before it is stressed. Some movement in concrete structures may proceed under load for quite long periods. These are not necessarily dangerous, and may only show that the concrete is seasoning normally.

The test loading of a grand stand of cantilever construction gave the following deflections:—

Test load* applied.	Next day.	Next day.	Load partly Removed	Next day load all Removed.
.407 ins.	.434	.446	.2	.12

The author could quote numerous examples from his own practice, and from America, of gradual deflection over a period of years, without cracking, in quite safe buildings.

8. Nothing in this paper is intended as a criticism of reinforced concrete. This material can be designed to meet all the conditions required. But it is often designed without much regard to them (especially in commercial competitive designing) and then cracks result and (sometimes) decay sets in.

9. *In situ* concreting is best done in lengths with definite rebated joints between sections. If alternate sections are cast first, nearly half the shrinkage can be taken up before the last sections are cast. Better still is to cast the structure in sections with only quite narrow joints left between them, which are cast last, as late as possible. In this way most of the shrinkage due to setting can be eliminated. In some strong room work at the Bank of England rebuilding, with very rich concrete, where the problem is accentuated, this was successful where ordinary methods had produced objectionable cracks.

10. Interesting problems arise in connection with floors heated by hot water in embedded pipes.* When the author first applied this, he had some anxiety on the score of its effect on the structure. But further consideration showed this to be unfounded. Water in these pipes does not usually exceed 130° F. and probably the pipe does not exceed 120° F. The actual concrete floor is not heated to over 100° F. The expansion of the concrete is therefore of the order of 50° F., and amounts to .36 inches in 100 feet. (See 1A). This only balances the seasoning shrinkage of the concrete floor, (also .36 inches in 100 feet). (See 1B). Part I of the Bank of England has had its embedded heating working several months without any sign of crack, and several buildings, including the County Fire Office in Piccadilly Circus, for several years, without any structural damage or cracking. I must resist the temptation to digress into the merits or otherwise of this system of heating and the technics of its proper application.

11. Expansion joints, however, may introduce difficulties of their own if they are not designed with great care. Fig. 5 illustrates the viaduct at Sittingbourne to which reference has already been made.

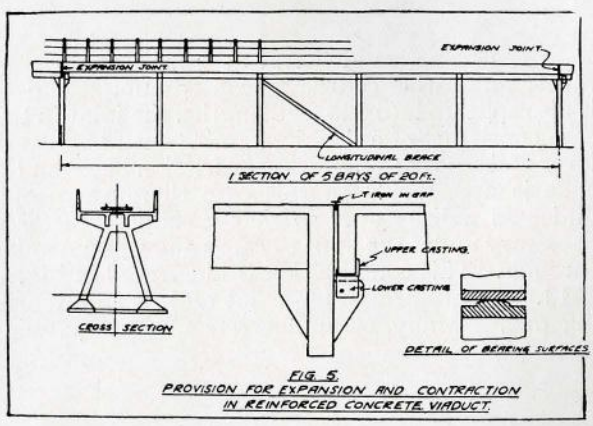


FIG. 5.
PROVISION FOR EXPANSION AND CONTRACTION IN REINFORCED CONCRETE VIADUCT.

It is interesting in this connection as being an example of a long structure in which the stresses due to expansion and contraction are almost completely eliminated.

The figure shows a section of five bays between expansion joints. It is clear that the viaduct needs bracing longitudinally, otherwise a train suddenly applying its brakes would tend to take the section that it was resting on, with it. At the same time, if bracing were put in all bays the effect would be to fix the ends of each section relatively to the ground and prevent the deck from expanding into the gap freely. In fact the expansion of the deck would be resisted by tensions in the diagonal braces. This has been avoided by bracing longitudinally only the centre bay, the brace of which is made strong

*This load took two days to apply, so that the figure of .407 contains some plastic yield.

*Sometimes misnamed "Panel Heating."

enough to take the whole longitudinal forces exerted by the braking of a train on the whole 100 feet section. This leaves the end perfectly free to expand without restraint. The expansion joints in this case contained bearing pads as shown on the figure which were made of machined cast iron arranged to a very slight curve so as to take up the slope of the beam when it deflects and at the same time to be free to move longitudinally.

Fig. 6A showing a division wall between two large expanses of factory floor on which beams are given a bearing with an expansion joint between them, shows an expansion joint badly done. The load from the beams owing to their slight deflection will be near the edges of the bearings as given by the arrows "a." When the slabs expand probably no harm results, but whenever they contract and the beams move apart, as shown by the arrows "b," they drag away the outer portions of the wall which gradually spalls away as shown by the cracks "c." This could be prevented by capping the wall with a steel bearing plate as shown on Fig. 6B.

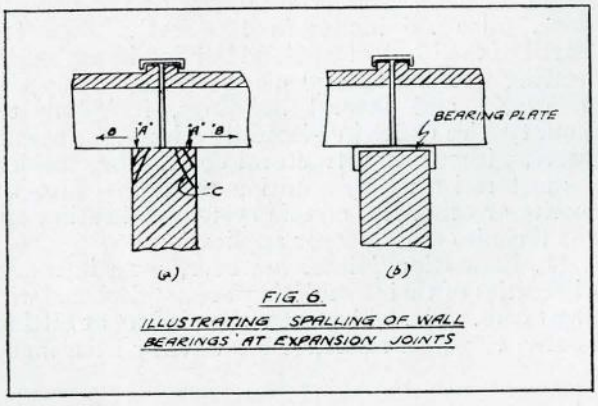


FIG 6
ILLUSTRATING SPALLING OF WALL BEARINGS AT EXPANSION JOINTS

In the new Grand Stand at Lord's, which is a rather interesting cantilever construction, the deck is also split up into 100 feet lengths, the joint in this case consisting of a definite gap between two cantilever ends so that no bearing or friction between the ends is necessary. In this case there are people under as well as over so that a shallow gutter is necessary under the joint to catch any water coming through. This construction is illustrated in Fig. 7.

12. The problem of large flat roofs is an interesting one. Many manufacturers of waterproofing liquids for concrete are so confident that they can make concrete watertight that they have frequently proposed to eliminate asphalt or its equivalent if their compound is used inconnection with the concrete.

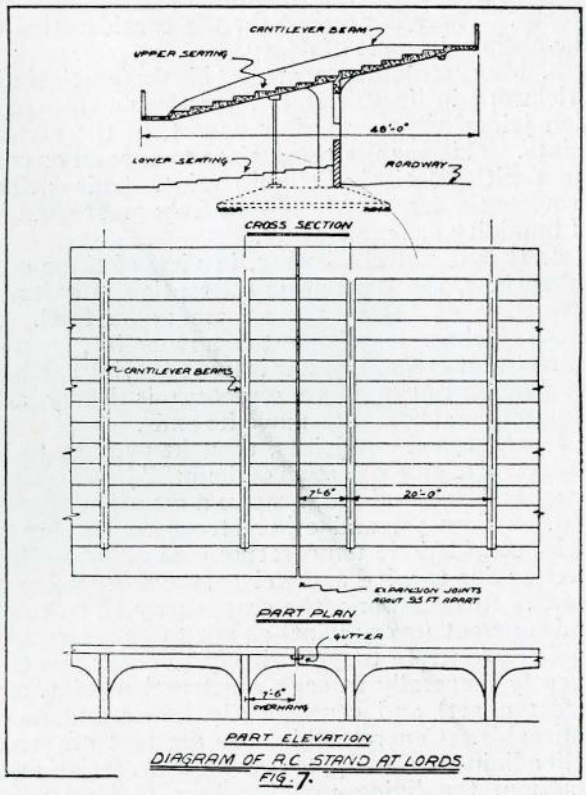


DIAGRAM OF R.C. STAND AT LORDS
FIG. 7.

There is, of course, no difficulty whatever in making concrete watertight, but a large flat roof will inevitably crack owing to the combined action of seasoning shrinkage and the other expansions and contractions to which it is subject, and unless very special provision is made to leave complete freedom by dividing it up into sections with complete freedom it invariably cracks and none of these ordinary waterproofing compounds are therefore any good for this purpose. What is required is a material which will either prevent concrete cracking under these conditions or alternatively a material like asphalt which will stretch across the cracks without itself cracking.

Awards in Columbus Memorial Lighthouse Competition

An international jury of architects, composed of Raymond Hood, representing North America; Eliel Saarinen, representing Europe, and Horacio Acosta y Lara, representing South America, met recently at Madrid, Spain, and after examining the designs submitted in the first stage of the competition for the Columbia Memorial Lighthouse, which is to be erected in Santo Domingo, capital of the Dominican Republic, the jury selected ten of the designs which were placed first in the competition.

The names of the authors of these designs, each of whom will receive $2,000.00, are as follows:—Rice Amon, New York; Helmle, Corbett & Harrison, Rogers & Poor, and W. K. Oltar-Jevsky, New York; Douglas D. Ellington, Asheville, N.C.; Joaquin Vaquero Palacios, Madrid, Spain; Josef Wentzler, Dortmund, Germany; Filippo Medori, Rome, Italy; Louis Berthin, Paris; Theo Lescher, Paris; Donald Nelson, Paris; and J. L. Gleave, Nottingham, England.

The successful architects will now compete in the second stage of the competition for the final selection of the design for the lighthouse. The author of the design placed first, will receive $10,000.00 and will be appointed architect for the work. The author of the design placed second will receive $7,500.00; the one placed third, $5,000.00; fourth, $2,500.00, and the remaining competitors will each receive $1,000.00.

Activities of Provincial Associations

The Ontario Association of Architects

Secretary—R. B. Wolsey, 350 Bay Street, Toronto

At a meeting of the Council of the Ontario Association of Architects, held on March 27th, a discussion on the policy of the O. A. A. re advertising took place, precipitated by recent incidents brought to its attention, and it was the unanimous opinion that general advertising by architectural firms or architects as individuals, or the lending of their names to commercial advertising should be discouraged. The president was requested to write a letter on behalf of the council to all those members of the association who have contributed signed statements or photographs in connection with commercial advertising matter recently published, drawing their attention to the undesirable character of such a practice which is contrary to the best traditions of the profession, and tends to lessen the respect in which it is held by the general public.

It was also the opinion of the council that architects should be encouraged to place their names in a restrained and dignified manner on buildings under erection. Wherever possible the architects' names should be associated with that of the owner, and disassociated from that of the contractor. For instance, in the case of contractors large signs carrying the name of owner, architect and contractors, the names of the owner and architect should be distinctly grouped together. Identification cards in directory lists carrying the firm name, profession and address only should be encouraged.

Awards to Students, Department of Architecture, University of Toronto.

H. P. Smith, fourth year student, has been awarded the Guild Silver Medal, which is given by the Ontario Association of Architects to the student who presents the best work of the year in architectural design. No award was made of the Guild Gold Medal. I. Richmond, second year student, was successful in winning the O.A.A. scholarship.

The Darling and Pearson prize (a sum of $100.00 to be spent on books) for the best solution of a problem in architectural design, has been awarded to two fourth year students of equal standing, viz.: J. B. Sutton and D. G. W. McCrea, honorable mention was given to H. P. Smith.

The Toronto Brick Company's prizes (a first of $75.00 and a second of $25.00 to be spent on architectural books) for a country house design by third year students, was awarded to P. J. A. Helliwell and J. F. Green, respectively.

Royal Canadian Academy of Arts

A meeting of the council of the Royal Canadian Academy of Arts was held at Toronto on May 11th. It was decided to hold the 51st exhibition of the Academy in the galleries of the Art Association in Montreal. The exhibition will be opened on the 21st of November, and the last day for receiving works of art intended for the exhibition will be November 11th.

The council has declared one vacancy for an academician painter, and four vacancies for associate painters.

A collection of works of art is being selected by the Academy, and will be sent in July to Calgary and then to Vancouver and New Westminster, B.C. This will be the first representative exhibition of Canadian art to go to the Coast.

Vacancies in the Civil Service for Assistant and Junior Architects

The Civil Service Commission announces open competitive examinations for the following positions:

ASSISTANT ARCHITECTS, $2,220

16253. Two Assistant Architects for the Department of Public Works, Ottawa, at an initial salary of $2,220 per annum, which will be increased upon recommendation for efficient service at the rate of $120 per annum, until a maximum of $2,700 is reached.

Duties.—To prepare and supervise the preparation of designs and plans of buildings and interior and exterior decorations; and to perform other related work as required.

Qualifications Required.—Education equivalent to high school graduation; either graduation in architecture from a school of applied science of recognized standing with three years of experience in architectural design, estimate, and construction, one year of which shall have been in a position of professional responsibility, or five years of experience in architectural design, estimate, and construction, one year of which shall have been in a position of professional responsibility; firmness, tact, and ability to manage men. While no definite age limit has been set for this competition, age may be a determining factor in making a selection.

Nature of Examination.—A rating on Education and Experience will be given from the sworn statements, supporting documents, and other evidence submitted by applicants on and with their application forms. An oral examination may be given, if considered necessary. Candidates should forward with their application forms sample drawings.

An eligible list may be established which will be valid for a period of one year.

JUNIOR ARCHITECTS, $1,800

16254. Three Junior Architects for the Department of Public Works, Ottawa, at an initial salary of $1,800 per annum, which will be increased upon recommendation for efficient service at the rate of $120 per annum, until a maximum of $2,160 per annum is reached.

Duties.—Under direction, to execute designs and draw plans and sketches for proposed government buildings; and under direction to inspect the work on buildings under construction; and to perform other related work as required.

Qualifications Required.—Education equivalent to high school graduation; graduation in architecture from a school of applied science of recognized standing with two years of experience in an architect's office, or four years of experience in an architect's office; ability to make calculations and knowledge of materials used in building construction. While no definite age limit has been set for this competition, age may be a determining factor in making a selection.

Nature of Examination.—A rating on Education and Experience will be given from the sworn statements, supporting documents, and other evidence submitted by applicants on and with their application forms. An oral examination may be given, if considered necessary. Candidates should forward with their application forms sample drawings.

An eligible list may be established which will be valid for a period of one year.

NOTES

The amendments to the charter of the Royal Architectural Institute of Canada received the approval of the Senate, on May 16th, 1929.

* * * *

C. A. Reeves, architect, of Montreal, has removed his offices from the Power Building, to room 712, Tramways Building, 159 Craig St. West.

* * * *

The headquarters of the Province of Quebec Association of Architects, formerly at 2020 Union Avenue, Montreal, have been removed to room 407, Castle Building, 1410 Stanley Street.

* * * *

Eugene Larose, architect, of Montreal, has moved from 3725 to 3733 Berri Street, and will continue to practice at the new address.

* * * *

Mr. E. Wyly Grier has removed his studio from 771 Yonge St., to 6 Crescent Road, Toronto.

* * * *

Mr. Noulan Cauchon, chairman of the Town Planning Commission of Ottawa, delivered an address on "Hexagonal Planning and Some Town Planning Problems in Canada" on April 26th, 1929, at a meeting of the Town Planning Institute held in London, England.

* * * *

R. E. Bostrom, architect, of Montreal, announces the removal of his offices to the fifth floor of the Castle Building, 1410 Stanley Street.

Mr. Jacques E. Laliberte announces that the firm of Gravel & Laliberte, architects, has been dissolved, and that his new address is 81 Boul Gouin East, Montreal.

* * * *

Among the exhibits shown at the R.I.B.A. International Exhibition of Modern Commercial Architecture were several photographs and drawings of recent Canadian buildings. The Manufacturers' Life Insurance Building, Bloor Street West, Toronto, Messrs. Sproatt & Rolph, Toronto; The Royal York Hotel, Toronto, Messrs. Ross & MacDonald and Sproatt & Rolph, architects; and The United Grain Growers' Elevator, Port Arthur, Ont., C. D. Howe & Co., architects, were, according to a review of the exhibition in one of the English architectural magazines, among the most outstanding buildings shown at the exhibition.

* * * *

The British Architects' Registration Bill, which was considerably amended when presented to Parliament about one year ago in order to meet the objections raised at that time, has now been definitely dropped for this year.

* * * *

Sir Reginald Blomfield, R.A., F.R.I.B.A., has been elected a corresponding member of the National Academy of Science of America. Sir Reginald is the first English architect to be elected to that honor, which he shares with such eminent men of art, music and literature as Galsworthy, Elgar, Orpen and Barrie.

(*Concluded on page xxxiv.*).

Notes—Concluded

Mr. C. Herrick Hammond of Chicago was re-elected president of the American Institute of Architects at the sixty-second annual convention of the Institute held at Washington, D.C., during the latter part of April.

* * * *

The R.I.B.A. London Architecture Medal for 1928 has been awarded to Messrs. Easton & Robertson, architects for The Royal Horticultural Hall, Greycoat Street, Westminster.

* * * *

Edgar Brandt, famous French craftsman, was elected an honorary member of the American Institute of Architects at its recent annual meeting.

* * * *

At the forty-fourth annual exhibition of the Architectural League of New York, Messrs. Davis, Dunlap & Barney, architects of Philadelphia, were awarded the Gold Medal of Honor by the Architectural League for the American Bank and Trust Building in Philadelphia. The Silver Medal of Honor was awarded to Albert Kahn of Detroit for the Fisher Building, Detroit.

BOOKS REVIEWED

PUBLISHERS' NOTE—We wish to remind our readers that any books reviewed in these columns, as well as any other architectural book, can be secured through "The Journal" of the R.A.I.C., at the published price, carriage and customs duties prepaid.

THE PRACTICAL REQUIREMENTS OF MODERN BUILDINGS. By Eugene Clute. Published by The Pencil Points Press, Inc., New York. Price $6.00

Architects are sometimes criticized by individuals and organizations who employ them, for lack of "practical" knowledge as to the requirements of modern buildings. The volume under review, by Eugene Clute, should be of very considerable help to members of the profession in assisting them to avoid giving cause for such criticism.

The book outlines the requirements of different types of buildings, which are often very difficult to obtain with any clarity from clients, and furnishes the architect with a general knowledge of the fundamental principles and requirements of such buildings as hospitals, theatres, railway stations, garages, apartment houses, residences, clubs, religious buildings, etc., etc.

As the preface explains, the habit of taking many things for granted concerning their particular trades or professions is so firmly fixed in the minds of most men, that they find it difficult to clearly explain to an architect the needs of the particular type of building they are contemplating. This book gives the architect a working and talking knowledge of the general requirements of many types of buildings, which should be of considerable use to him in "drawing out" his clients when such situations arise. It does not attempt to lay down standard requirements, or solve planning problems, but it is full of suggestions which should go a long way to clarify architectural thought in analyzing problems.

While the book does not try to furnish all the detailed requirements of the classes of buildings touched upon, it does furnish a great many dimensions and similar technical data which have proved satisfactory in certain places. The writer, when reviewing this book, felt that if the ordinary layman could be persuaded to read this book, he would lay it down with a feeling of very great respect for the amount of knowledge that architects are supposed to have at their finger tips.

While the plate illustrations are interesting and valuable, the text is the real meat of this book, and should not be overlooked as is often the case in architectural publications.

The book contains 231 pages and is 9 ins. by 12 ins. in size.

—GORDON M. WEST.

The Star Building—King Street West, Toronto

This building, like many another distinguished Canadian edifice, is equipped with Teck Flush Valves.

The Galt Brass Company are also makers of the one-piece TN toilet which flushes so quietly it cannot be heard outside the bathroom.

"Were it not for the ambitious urge in the hearts of architects and engineers . . .

we would never have seen our cities crowned with the mighty majesty of magnificent buildings which are as splendid in their interior equipment as they are in their outer appearance."

As undaunted as Columbus, the architect and engineer venture over trackless seas to discover new continents of industrial progress.

The future is their workshop.

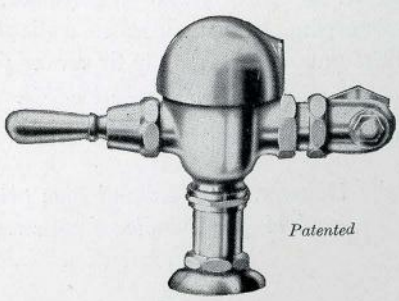
It is there they are ever welding utility with beauty and by the time the astonished world stops rubbing its eyes at their visible achievements, these adventurers are once again over the horizon, discovering the improvements of to-morrow.

What a privilege it is for the Galt Brass Company to stride forward with such pioneers and by valiant endeavour and painstaking persistence to so perfect the Teck Flush Valve that to-day it is the only flush valve which can be adjusted with a screwdriver, without turning off the water.

The
GALT BRASS COMPANY
LIMITED

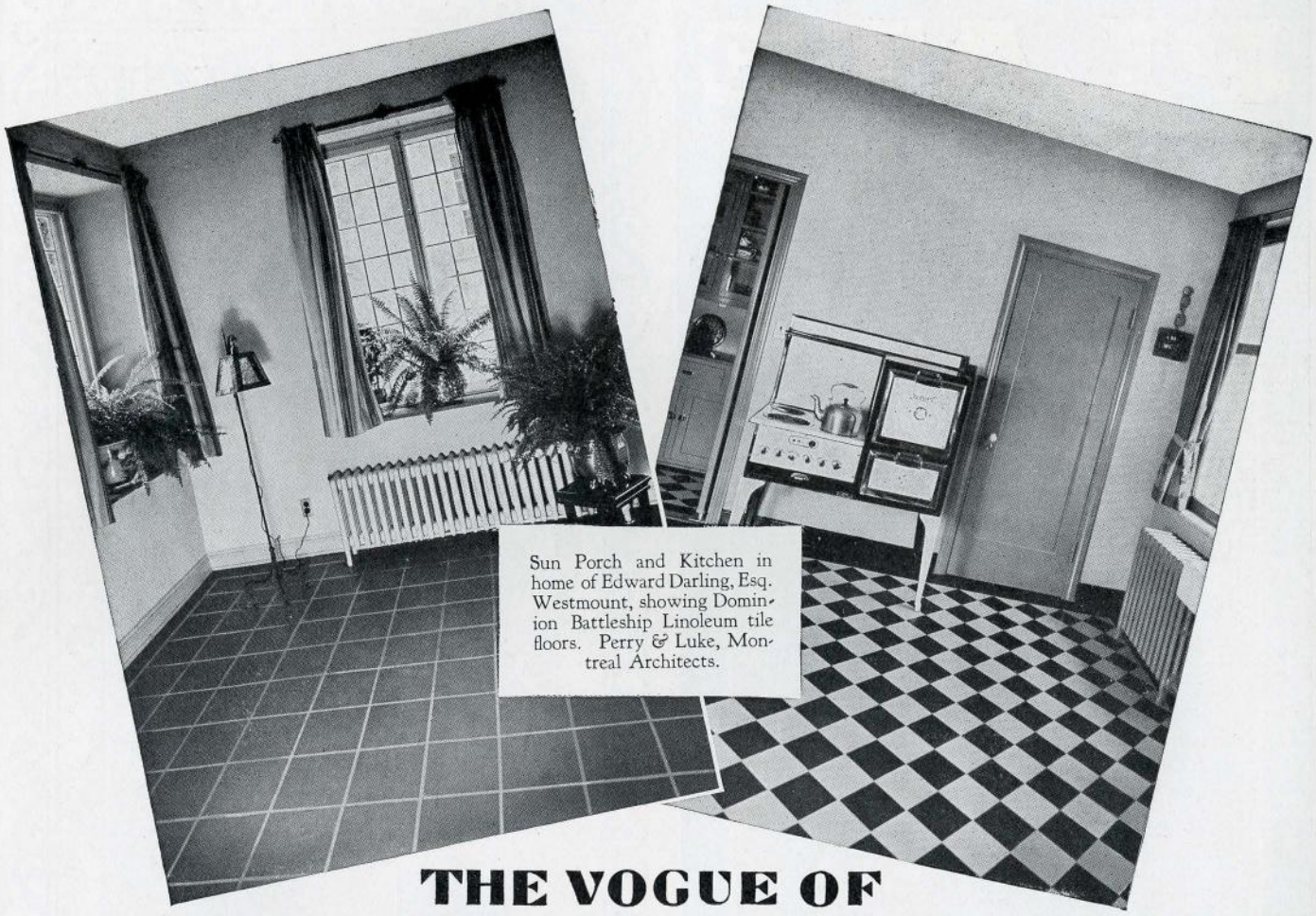
Head Office and Works; Galt, Ontario

Toronto Showrooms: 75 Adelaide Street West
ELgin 2921



Patented

The Teck Flush Valve—like all the products of the Galt Brass Company—has won the confidence of the trade by trustworthiness. No architect or plumber ever regretted specifying Teck Flush Valves . . . and none ever will.



Sun Porch and Kitchen in home of Edward Darling, Esq. Westmount, showing Dominion Battleship Linoleum tile floors. Perry & Luke, Montreal Architects.

THE VOGUE OF TILES

APPEALING beauty combined with utility; cleanliness; durability; are some of the features responsible for the growing popularity of Dominion Battleship Linoleum tile floors.

Appropriate designs are readily evolved for Sun Porch, Kitchen, Hall, Library or any room—Tile effects in contrasting or harmonizing colours—with or without interlining—that show to wonderful advantage and wear indefinitely.

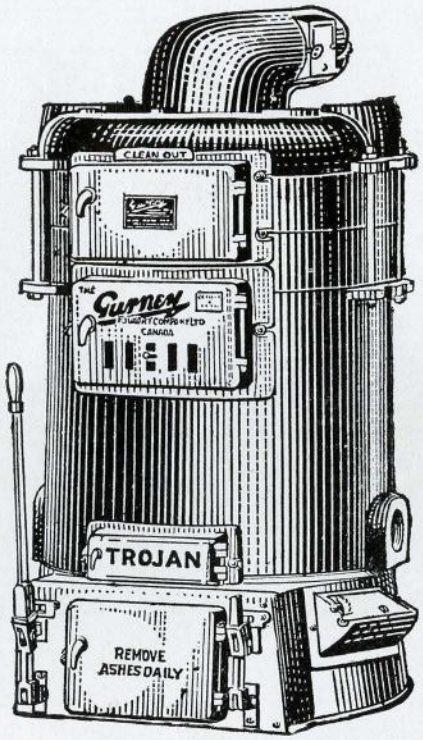
Dominion Battleship Linoleum tiles are odourless, quiet, stainproof, waterproof. Available in eight colours—brown, green, buff, terra cotta, black, blue, grey and white.

Installed by large house furnishing and departmental stores.

DOMINION OILCLOTH & LINOLEUM COMPANY, LIMITED MONTREAL

Makers of Floor Coverings for over 50 years.

DOMINION OILCLOTH & LINOLEUM CO. LIMITED · MONTREAL · MADE IN CANADA



Definite, Substantial Reasons for Specifying

Gurney Trojan* Boilers *for home heating*

FOR economy and lasting qualities, the Gurney Trojan hot water boiler is in a class by itself. Gurney engineering and workmanship have produced a boiler that meets every requirement of Canadian householders. Look over these points of superiority in the Gurney Trojan:

1. Bigger combustion chamber ensures complete combustion of any kind of fuel, including Canadian coals.
2. Flue spaces 33% larger, easy to keep clean.
3. Firepot, 40% deeper, holds more fuel, requires less attention and gives steadier and more economical heat.
4. Two water passages, one on either side, assure a freer flow of hot water to radiators.
5. Tight-fitting, dust-proof doors.
6. Draft at side, with damper chains out of the way.
7. Specially adapted for oil burners.

You make certain of comfortable warmth when you specify a Trojan boiler. Write us for full details regarding size required, amount of radiation, and approved method of installation.

*Trojan is the new and appropriate name given the Gurney "100 Series" boiler.

The Complete Heating System

With Gurney Trojan Boilers we recommend Copley Radiators to give complete heating satisfaction.

The Copley gives off more heat because the spaces between the tubes are wider, thus allowing for a freer circulation of air.

Artists designed the Copley. Its graceful lines and balanced proportions make it harmonize with any plan of interior decoration.

The Copley is the modern radiator.

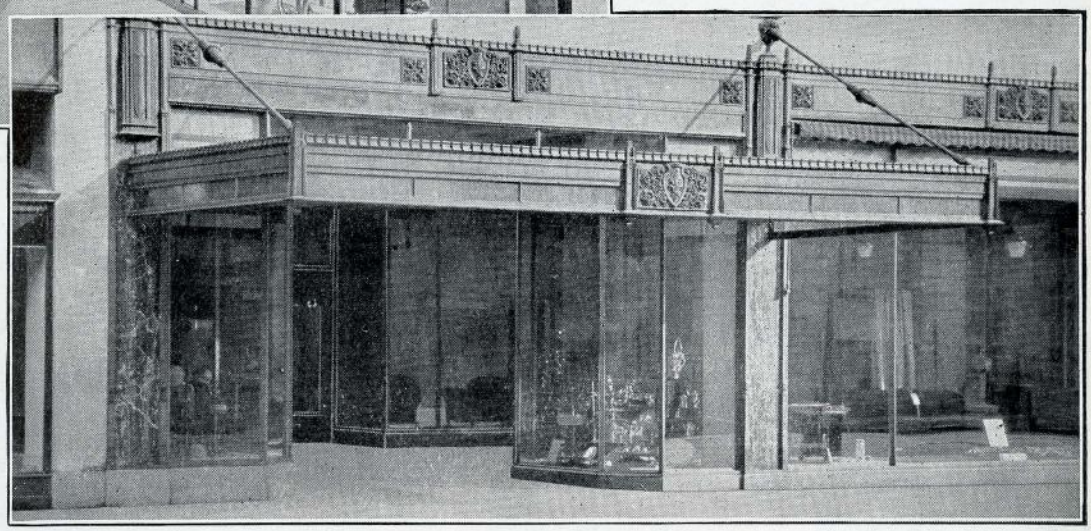
Gurney

BOILERS & RADIATORS

THE GURNEY FOUNDRY CO., LIMITED

MONTREAL, TORONTO, WINNIPEG, VANCOUVER

116



New Building of
DAVID SPENCER LIMITED
Vancouver, B.C.

Architects:
McCarter & Nairne, Vancouver.

General Contractors:
Northern Construction Co., Limited, Vancouver.

Ornamental Metal Contractors:
The Robert Mitchell Company, Ltd., Montreal.

Above—Arcade, showing store fronts.

Right—Marquise over entrance way.

IN the ornamental metal work, The Robert Mitchell Company has demonstrated the practicability of adapting Standard Anaconda Architectural Bronze Extruded Shapes in executing original designs.

An Adaptable Architectural Medium

ENDLESS combinations of Standard Anaconda Architectural Bronze Extruded Shapes offer unlimited artistic possibilities in the execution of original designs, particularly when used in conjunction with occasional sheets or castings.

Anaconda Extruded Shapes are close-grained and free from blow-holes and other defects common in sand castings. Their greater strength permits the use of thinner sections with a consequent saving in metal. They are smooth and clean-cut, requiring very little finishing. These advantages, together with the elimination of the cost of special dies, combine to make the use of these standard shapes a real economy without affecting the quality of the design.

A set of renderings, reproduced in color, suggesting the adaptability of Standard Anaconda Extruded Shapes to original designs will be mailed to architects upon request.

ANACONDA AMERICAN BRASS LIMITED
MAIN OFFICE AND MILL: NEW TORONTO, ONT.
Montreal Office: 1253 McGill College Ave.

ANACONDA
EXTRUDED BRONZE

MEMBER COPPER AND BRASS RESEARCH ASSOCIATION

NEW ARCHITECTURAL BOOKS

Any of the books mentioned in this announcement, as well as those which are reviewed in our columns, may be secured through the Journal of the R.A.I.C. at the published price, carriage and customs duties prepaid.

THE ENGLISH HOMES SERIES

By H. Avray Tipping, M.A., F.S.A.

Price per volume **$18.75**

The English Home Series was designed to give in worthy and permanent form an historical and adequate illustration of the great heritage of English domestic architecture. Nearly every home of importance, from mansions such as Hatfield or Knole to small manors which are unknown to the general public, has been photographed during the last thirty years, and the most interesting and beautiful of them are included in the series. Furthermore, the arrangement into chronological periods, and the full historical introductions to each period, make the whole a valuable work of reference.

VOLUMES PUBLISHED

Period I.	Volume I.	Norman and Plantagenet (1066-1485).
Period II.	Volume I.	Early Tudor (1485-1558).
Period III.	Volume I.	Late Tudor and Early Stuart (1558-1649).
	Volume II.	(With Historical Introduction on Early Stuart Architecture.)
Period IV.	Volume I.	Late Stuart (1649-1714).
	Volume II.	The Work of Sir John Vanbrugh and His School (1699-1736).
Period V.	Volume I.	Early Georgian (1714-1760).
Period VI.	Volume I.	Late Georgian (1760-1820).

ENGLISH GARDENS. *By H. Avray Tipping.* Uniform with English Homes. With Historical Introduction on English Gardening from the earliest times till to-day.

Each volume contains about 450 pages and about 600 illustrations. Bound in Quarter Buckram and Cloth with gilt tops—size 11 in. x 16 in.

HOUSES OF THE WREN AND EARLY GEORGIAN PERIODS

By Tunstall Small & Christopher Woodbridge **$8.00**

The aim of the authors has been to select a number of houses which are not only among the finest examples of the domestic architecture of the period, but are also comparatively little known; these have been recorded by means of specially prepared measured drawings of general elevations, gates and railings, exterior and interior doors, entrance halls, staircases, panelled rooms, fireplaces, etc., accompanied by photographs. The book contains 112 plates, photographs and drawings, and is bound in full cloth gilt. Size 10 in. x 13 in.

DOMESTIC ARCHITECTURE OF ENGLAND DURING THE TUDOR PERIOD

By Thomas Garner and Arthur Stratton **$57.00**

New edition, completely revised in both illustrations and text.

A series of photographs, measured drawings of country mansions, manor halls, and smaller buildings giving constructive and ornamental details, with plans drawn to scale, accompanied by historical and descriptive text. In addition to many new plates, the whole has been systematically arranged. The American Architect commented on the first edition: "There never has been before and probably there will never be again such a collection of helpful materials placed at the disposal of the architect." Second edition contains everything included in the previous edition, together with material covering twenty-one additional Tudor houses. With 210 collotype plates, 462 illustrations in color and line, plans, details, etc., showing over 1,000 subjects. 2 vols. 12 x 16 inches.

THE HISTORY OF ARCHITECTURE

By Banister Fletcher

Eighth Revised Edition **$12.00**

No architect or student should be without this standard work, which is itself a triumph of art. The illustrations alone are a treasure-house of noble form, and create to the observer a sense of delight and exultation as he passes in review all these magnificent monuments of man's effort and his aspiration.

THE METAL CRAFTS IN ARCHITECTURE

By Gerald K. Geerlings **$7.50**

Metal work, ancient and modern, in architecture and interior decoration has been reproduced in numerous photographs and drawings, and explained by an architect who has sought historic examples in Europe and America, and has obtained first-hand information by visiting the leading foundries and workshops. Each metal has been treated in a separate section, and among the headings are: Bronze, Brass, Cast Iron, Copper, Lead, Zinc, Tin, Lighting Fixtures, Preparation of Specifications, not to speak of current developments, such as enamelling and electrical aids in depositing metals. With about 300 photographs and drawings. 9 x 12 inches.

THE JOURNAL, ROYAL ARCHITECTURAL INSTITUTE OF CANADA

160 Richmond Street West **Toronto, Ont.**

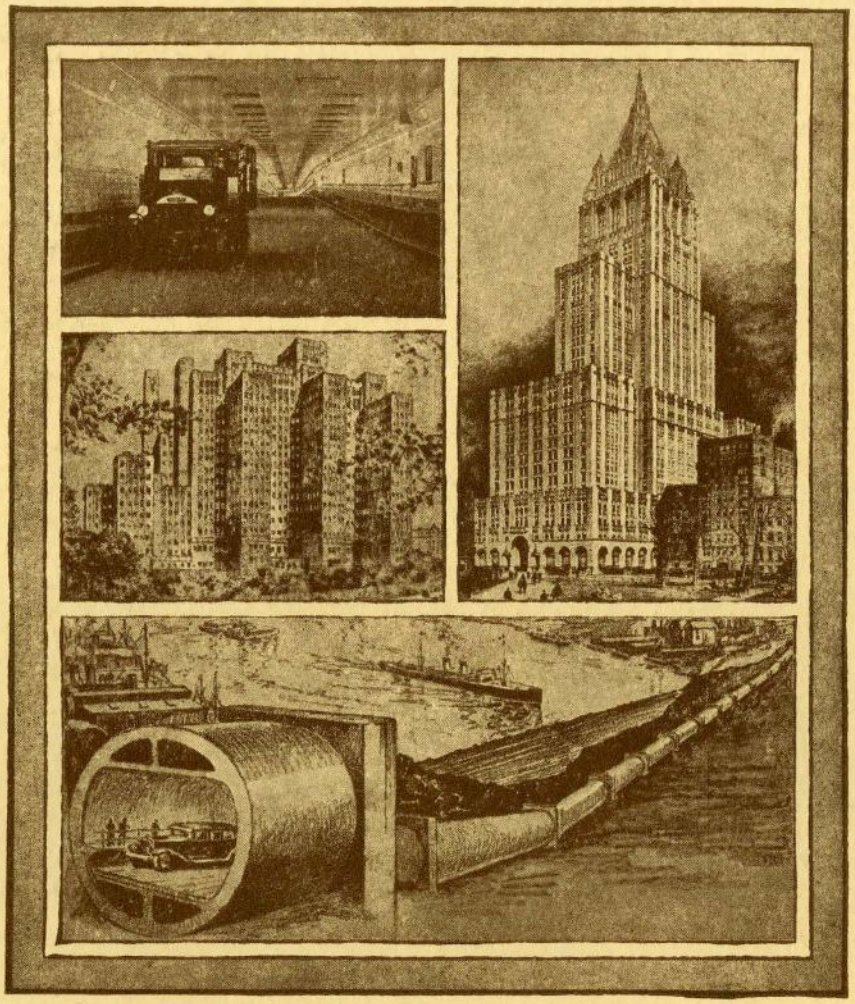
Cheques payable to the Journal, Royal Architectural Institute of Canada

List of Advertisers

NOTE

Advertisers and Advertising Agencies are requested to note that the next issue of the Journal will be published early in July, 1929. Copy should be supplied not later than June 25th.

The Journal, Royal Architectural Institute of Canada



Inside the Holland Tunnel under the Hudson River.

The Presbyterian Hospital, New York City.

The New York Life Building, New York City.

The George A. Posey Tube, linking Oakland and Alameda, California.

Four Classics of Ventilating Science

. . . . *and initiative!*

. . . The Holland Tunnel with its specially built giant fans handling 1400 tons of air per minute;

. . . The Presbyterian Hospital, New York, one of the most modern—and exacting—heating and ventilating achievements. 369,000 cubic feet of outdoor air, properly tempered, supplied every minute;

. . . The New York Life Building where one million cubic feet of air is supplied every minute to an army of workers;

. . . The George A. Posey Tube linking Oakland and Alameda, California,—flooded with 80 tons of pure air every minute—unfailingly!

It is significant that Sturtevant equipment was the choice of the Architects and Engineers for all of these striking examples of American constructional genius . . . But the reason that the name "Sturtevant" is linked with these great enterprises is because of the superior operating characteristics of Sturtevant ventilating equipment!

It would be a pleasure to send you the Catalogs which describe in detail the Fans, Turbines or other equipment operating in the above mentioned tunnels and buildings. Please address our nearest Branch office.

B. F. STURTEVANT CO. of CANADA, Limited

Works in Galt, Ontario

MONTREAL—553 New Birks Bldg. WINNIPEG—Kipp Kelly Limited, 68 Higgins Ave. TORONTO—1010 Lumsden Bldg. EDMONTON—Empire Engineering & Supply Company.

Sturtevant

TRADE MARK

HEATING-VENTILATING AND POWER PLANT EQUIPMENT

PRODUCED BY BRIGDENS LIMITED TORONTO