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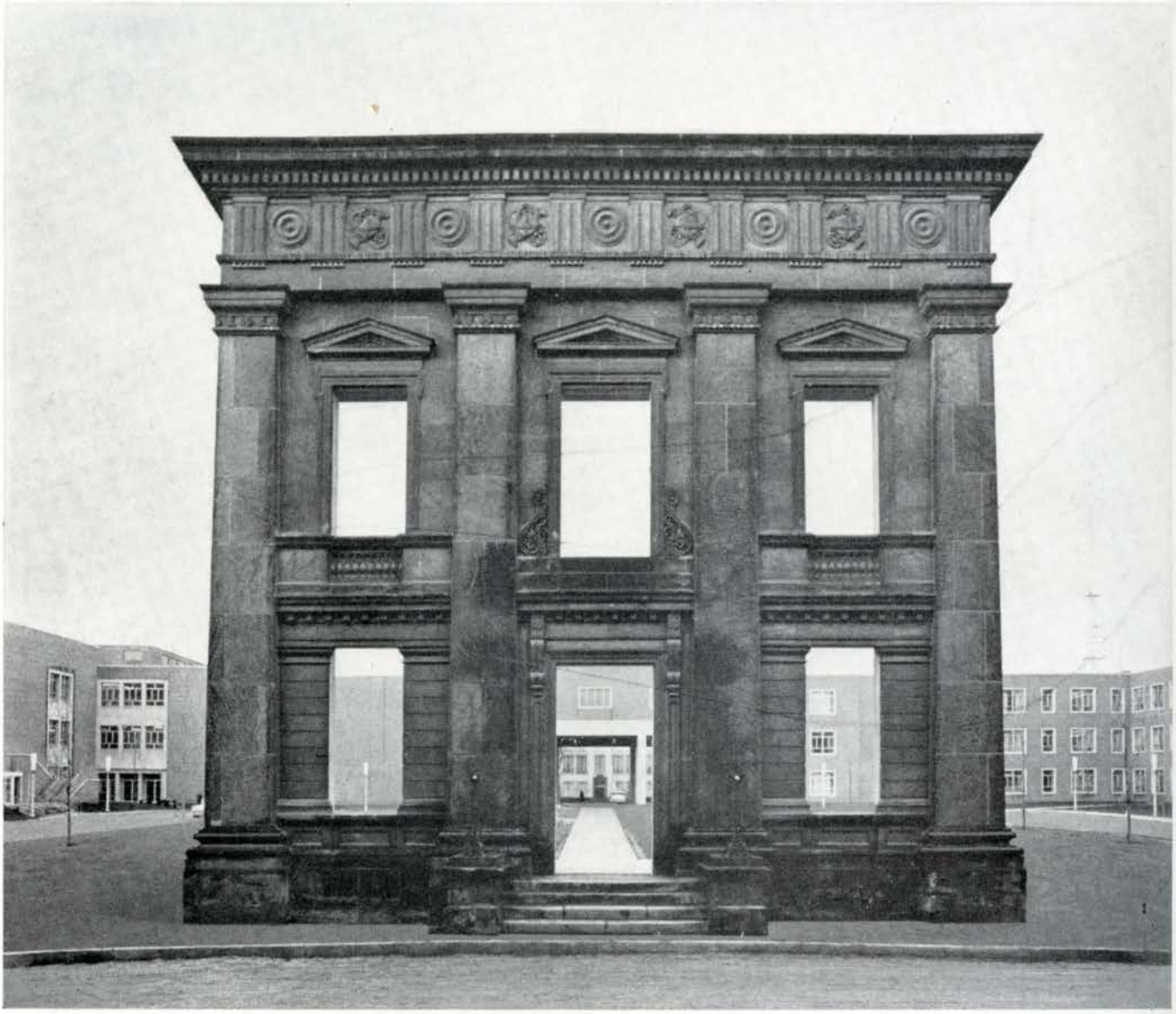

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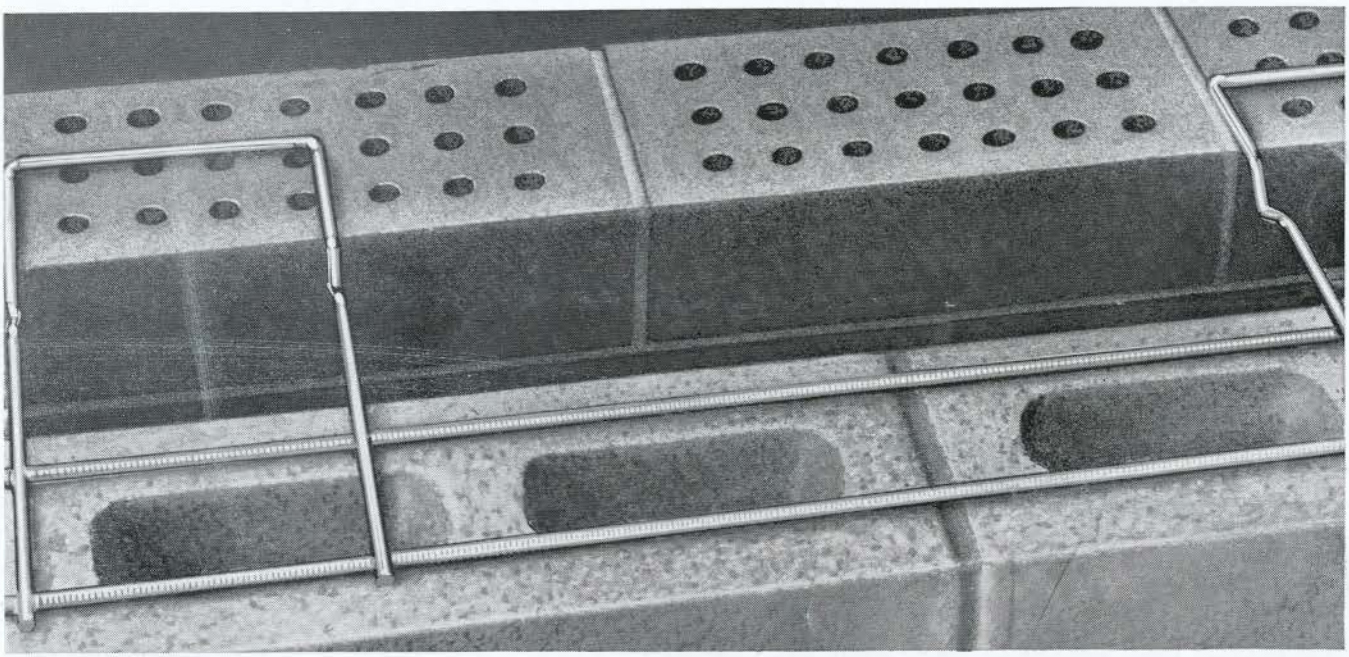

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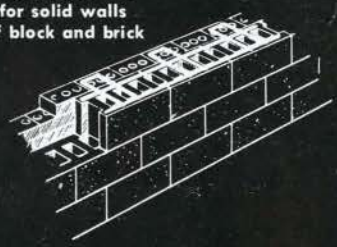

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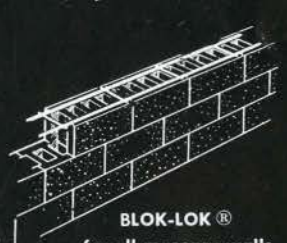

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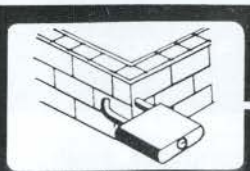

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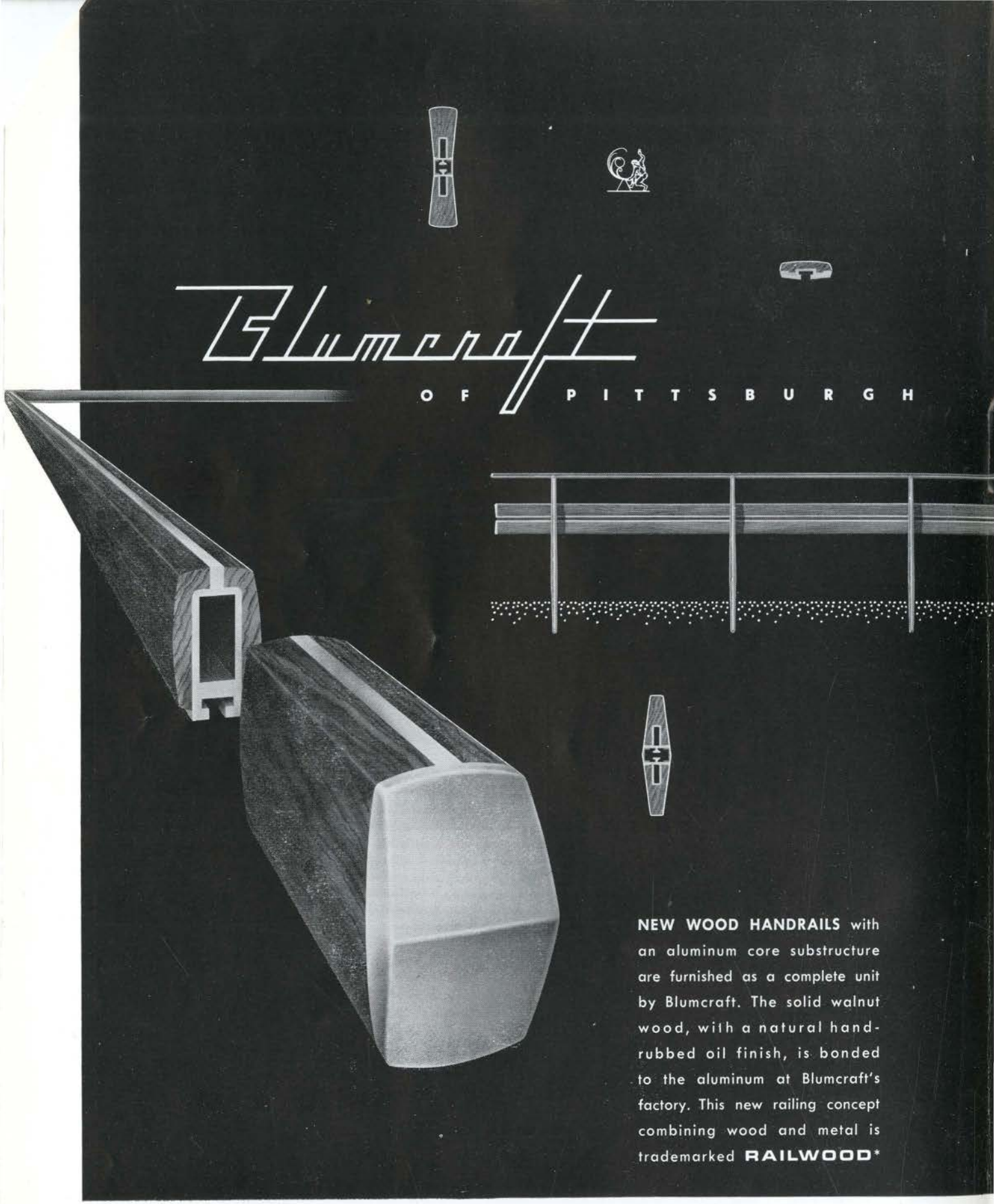

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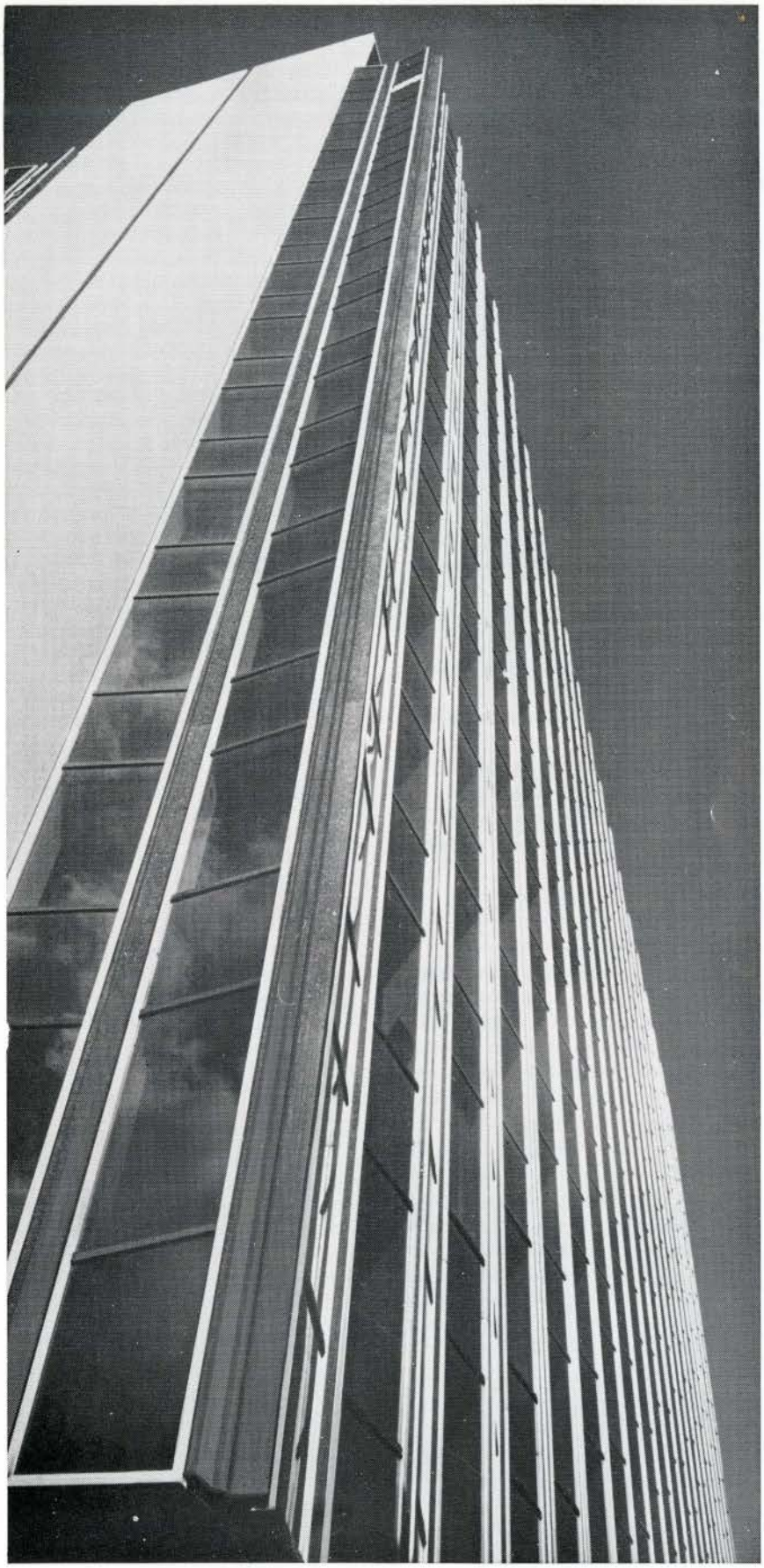

The Toronto Professional Building, 17 levels, 180,000 square feet.
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Editorial

Is it a Weasel Clause or Are We Specifying Ourselves Out of Work

The Mechanical Contractors Association of Toronto some while ago became concerned with the problems that face the building industry, and requested meetings with representatives of the architects and engineers to discuss specific questions.

The object of the meeting (in their words) was to find out from the architects and engineers where the Mechanical Contractors are falling down on the job; where they can improve operations and what can be done to correct certain shortcomings and omissions that annoy and, therefore, create unnecessary friction between the Mechanical Contractors and the design professions. The Association believes that, if a closer liaison can be maintained between the groups, it will result in better understanding of each other's problems and eventually lead to an improvement in the quality of work done by members and the quantity of work done by those members who prove they are competent mechanics.

The problems discussed at meetings are interesting and frequently have many facets. An example supplied by the Mechanical Contractors Association was the following clause from a current mechanical division of an architectural specification.

Is it a "weasel" clause?

Is it written to cover incomplete drawings, or is the architect-engineer specifying himself out of future work? The clause was used in a base bid specification and read as follows:

"Submit six (6) copies of boiler room and mechanical equipment room detail drawings including drawing, elevations and sections, dimensioned and at least ¼"— 1'0" scale, showing the exact location of equipment bases, piping, valves and appurtenances, floor and hub drains, drainage piping, electrical conduit and panels, and main equipment such as supply and exhaust fan units, pumps, tanks etc. These detail drawings shall be prepared after receipt of approved shop drawings and shall include details pertaining to clearances, access, tappings, etc., and relation of the work and equipment to adjacent work or work of other trades. Prepare for Architect's approval, detail-to-scale interference drawings of all critical areas in order to prevent interference between trades and to maintain headroom clearances and dimensions shown on Architectural drawings. The mechanical contractors present asked the following questions:

- Is this a weasel clause — written with the idea that it will be implemented only if the successful bidder is the lowest common denominator of mechanical contractor?
- If it is not a weasel clause, it poses a problem of pricing the work at the time of tender.
- Is the work outlined in the clause a contractor's responsibility or is it the responsibility of the design professions?

The Contractor asked for our comments. They are:

- The Architectural - Engineering profession is responsible for design.
- The Mechanical Contractor is responsible for construction in accordance with that design.
- This sort of clause obliterates or badly smudges the clear line that should exist between two groups.
- The clause removes part of the design responsibility to the contractor and by so doing shows lack of professionalism.
- Leaving aside the question of professional responsibility the clause causes a reaction which is disturbing.
- If Mechanical Contractors are required to produce design drawings by our profession it follows that they require someone with design training and knowledge. If they acquire such a person he undoubtedly will end up doing a full day's work. Part of that full day's work will probably lead him into designing mechanical installation for apartments, factories, etc.

Under these circumstances, why should an owner go to an architect or an engineer — why not to a contractor?

- By specification we seem to be aiding and abetting the design — finance — build arrangements of contractors.

If our first comment is unpalatable on the grounds that it is too narrow a professional approach then perhaps the second comment may appeal to those with practical minds. P.M.K.

Book Reviews

PLANNING FOR MAN AND MOTOR, by Paul Ritter, Pergammon Press, The MacMillan Co., New York, 1964, 385 pages, $16.50.

BY STUART WILSON

Twelve years is a long time to till a field. One hesitates to sully the fruits of such labour.

This work attempts an investigation and assessment of the relationships between man, motor and habitat. The emphasis in the title is misleading unless one assumes that "man" includes such attributes as where man lives and how. A reference to the first portions of the book might lead one to think that an ergonomic study of man and motor vehicles was intended.

Any such idea is quickly dispelled by a reference to the latter portion of the book which deals with replanning the physical built environment to better accommodate the automobile in a human environment.

The gathering together of heterogeneous materials from many sources with a view to proving a thesis is the chief weakness of the treatise. The objectivity of the work has been destroyed, and the presentation of data and information is partial and spasmodic.

The automobile is considered to furnish sufficient and necessary reasons to justify costly replanning and reconstruction. When discussing a balance between variables one would assume that some attention should be paid to all possible adjustments of each variable.

This book contains a collection of material gathered from many sources, and arranged in accordance with the author's insights. The employment of graphs, charts and tables lends to the book an appearance of objectivity and clarity which further perusal dispels. Initial assumptions and a bias in interpretation imparts a slant to the writing.

The first five parts discuss man and vehicle. The environment created by and for the vehicle are examined, and the incompatibility of man's habitat with the automotive environment is revealed.

Man/motor segregation is advocated. Segregation is studied in both urban and residential environments. Comparative studies of existing and proposed methods of segregation are displayed. Methods of adapting existing built-up environments to achieve separation are investigated.

Elaborate replanning of circulation routes is advocated. The author's suggestions would place a heavy economic burden on man. Networks of automotive connection are seen as active movement patterns in relation to the more stable areas for working and living.

The wisdom of a very close integration between these variables may be questioned. Should the automobile become obsolete, then so would the replanned vehicular city.

Investigations of other possible lines of approach to remedial solutions of the problem are limited. Little or no reference could be found in the book to the following:

(a) control of number of vehicles
(b) control of size of vehicles
(c) redesign of automobiles
(d) invention and development of other forms of transportation (e.g. hovercraft)
(e) traffic control by means of toll charging pro rata with the extent of use of a road or highway.
(centrally monitored electronic meters)
(f) scheduling of work hours to permit leveling out of traffic peak periods.

Such controls may seem far-fetched but they cannot be more so than proposals to destroy and rebuild entire cities.

This volume contains many examples, but the total effect is confused. However, the number of plans and diagrams may make the book a useful addition to an architect's library.

Text is indigestible. The omnibus sentence is common. General trends and particular cases are incoherently mixed. Emotions, concepts, systems and events are brought into unbalanced juxtaposition. Reading is more difficult than browsing.

The richness of the graphic and pictorial material should appeal to many. Let us hope that it does not overwhelm their critical sense.

Solutions shown apply to restricted and special areas such as dwelling and shopping. The general validity of these examples is not wholly proven since they are not set into larger contexts. Overall systems of traffic handling in urban situations is discussed superficially.

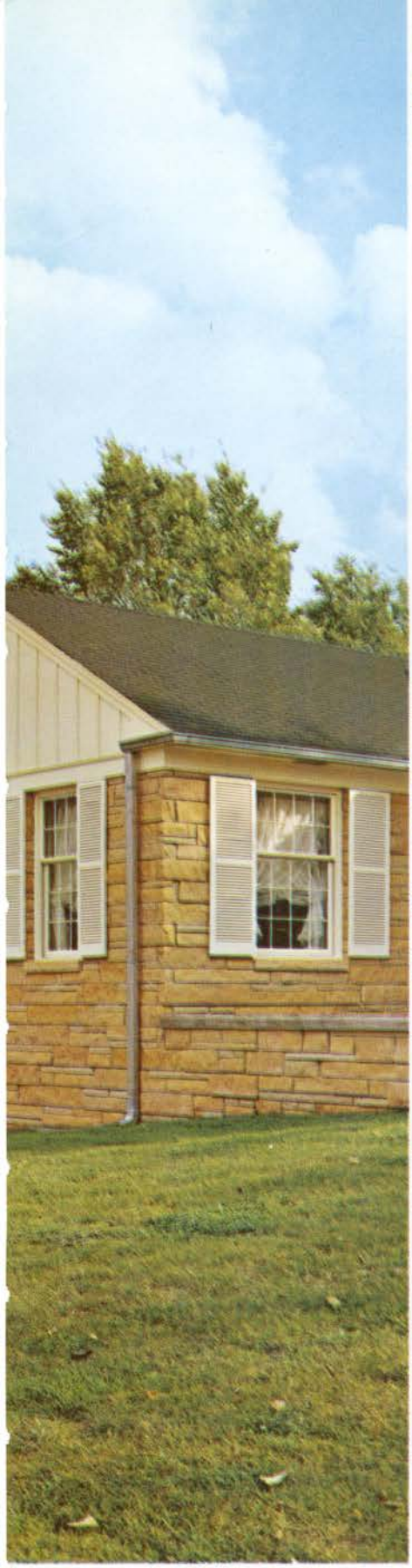
Merely to separate auto traffic from buildings and people seems inadequate. Obviously as traffic increases, separation will become more difficult. Control is required over the quality and quantity of traffic.

Otherwise, a future landscape will disappear under seething masses of automobiles while buildings soar in the air.

New Books Received

ARCHITECTS' WORKING DETAILS, Edited by Lance Wright and D. A. C. A. Boyne. The Architectural Press, London S.W.1, 1964, 159 pages, 30 shillings.

CARLOS RAUL VILLANUEVA AND THE ARCHITECTURE OF VENEZUELA by Sibyl Moholy-Nagy. Fredrick A. Praeger Inc. N.Y., 1964, 179, $12.50.



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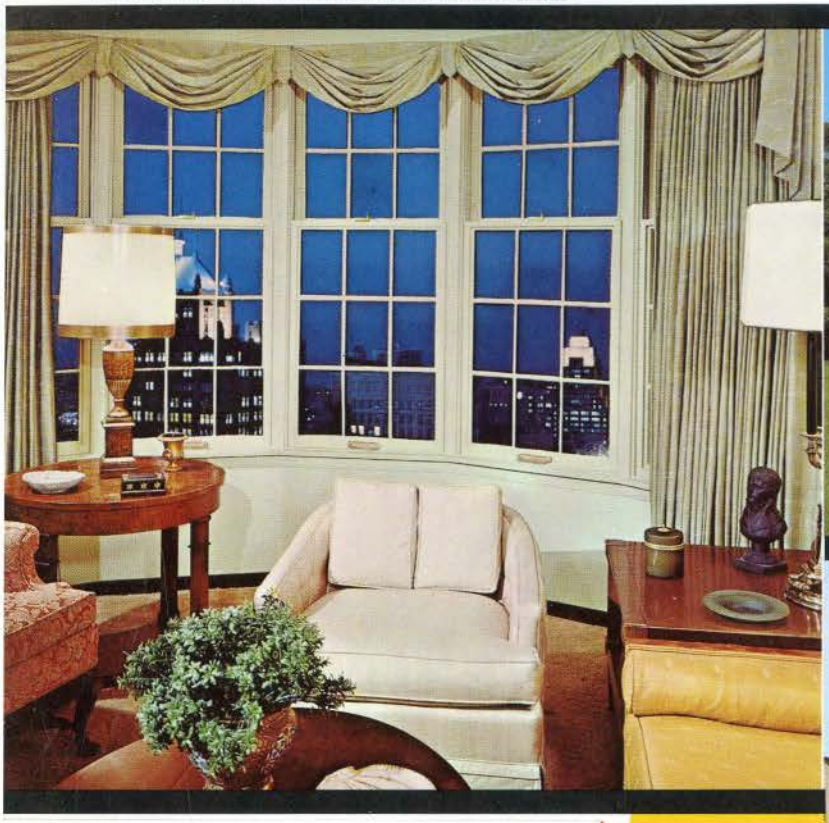

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Institute News

PERCY E. NOBBS, MA, LITT.D., HON FRAIC, FRIBA, RCA — 1875-1964

In the fullness of his years Percy Nobbs died, November 5th, 1964. He was in his ninetieth year. He had been Professor of Architecture at McGill from 1903 to 1940 and had practised in Montreal for forty-two years. Few men have known a longer or more active life and exceedingly few men have ever seen the world around them with a more extraordinary sight or a greater capacity to retain the image of what they saw. Percy Nobbs could draw vividly and accurately from memory and when one expressed surprise at his uncanny ability, he would generally remark that one has not really seen something unless one can draw it. Seeing and comprehending were the same thing for him. His eyes and mind were like a sharply focussed camera equipped with a sensitive film. Everyone who knew him will remember how he squinted and screwed his face when he looked at something that interested him. He could see colours beyond the spectrum normally imperceptible to human sight and he could judge distance with the accuracy of a good range finder. He was also quick and immensely alert and it is not surprising that he was an expert fisherman. He could make a fly and cast it to outwit the most wary salmon. As a fencer he had few equals. He was awarded a silver medal for fencing at an international foils display during the 1908 Olympic Games in London, when he was thirty-four, and at eighty, he was still fencing. He had been an instructor in bayonet fighting in the first great war and when he was old and thought about the men he had taught, the architects, he felt, were not a bad breed of cats, but there was something impossible to put into words between him and the men who had used their bayonets.

Although born and educated in Scotland, his boyhood home was Russia and the memories of that country were still bright in his mind when many other things had been forgotten. As a special artist correspondent for a newspaper, he had attended the fabulous ceremonies of the coronation of the last Czar. Cameras had been forbidden and only skilled draughtsmen were permitted to record the proceedings in the gorgeous privacy of such affairs. Some years ago the man responsible for the decorations at Westminster for the last coronation was taken to meet him in the belief that his love for ornament, decoration and heraldry would be aroused by hearing about what had been done. The account only served to excite his memory of the splendours of the Kremlin, hung with ropes of twinkling lights. He recalled Tchaikowsky leading massed bands including batteries of artillery which boomed as the ceremonies reached a glittering climax in a company of now vanished European nobles. The forest, and lakes of Russia retained a fascination for him and only a year or so ago, he was hunting for a map of what he called the Petersburg System to show a place where he remembered some happy youthful encounter which he wanted to describe more vividly than his words were able to convey.

He was always anxious to have people share his experiences. In this way he was a natural and exciting teacher, and he enjoyed his skill. While to say he was a well rounded man is true, it seems insufficient to describe his range. He could be persuasive and charming, yet he had a frightful temper. He could say the most poetic things and he could use the most unprintable language if it was necessary to make a point. He loved old Sir William Macdonald, the Chancellor of McGill in his early days, yet there is an account of a dispute between them in front of the Macdonald Engineering Building, (they were then constructing together,) which Sir William Peterson, the Principal, could hear from his house on Sherbrooke Street. He often fought with his clients, as good architects do, and once, after a herculean struggle to make a beautiful plan, and fearful of how the building would be furnished, he turned to make plans for an exquisite ceiling, muttering "at least they will never get their bloody hands on this". On another occasion, after a dispute with a churchman, he is remembered to have said that the man is a saint but he is no god damn architect.

Like many gifted men who are impatient, Percy Nobbs' anger was often aroused by people whom he thought were willfully obstinate, never imagining that they could be merely stupid. He was outraged by carelessness, disinterest and ignorance, and therefore he made both friends and enemies.

He was a supremely good architect according to humanist standards. Although his work is now outdated, a day will probably come when it will be so far removed from current modes, it will be possible to see it independently for what it is. All his buildings were carefully built and no details were inconsidered. He knew good wine tasted better in a silver tassie and he was compelled by this conception when called upon to design. Working with students, his effort was always to heighten the expression of their ideas, which was his way of designing. He was acutely aware of the extraordinary sensitivity of animals and he greatly admired their dignity. Even common cats interested him. He felt their sense of space in movement, their awareness of environment and interest in comfort greatly exceeded the sensitivities of most architects. He disliked things that were pretentious or phony as we say, and one of the last things he designed was his simple clear pine coffin having stout rope handles and brass screws to keep the top on neatly spaced around it.

At a memorial service recently held at St. Mary's Church, Como, the following information concerning his life was given and is repeated here as a brief account of his achievements.

Percy Erskine Nobbs was born in 1875 at Haddington, Scotland. He was raised in Petersburg, Russia, the son of John Leader Nobbs of that city. He was educated at the Edinburgh Collegiate School and Edinburgh University, where he earned the degree of Master of Arts at 21. From 1896 to 1901 at the Edinburgh College of Art, he was a pupil of Sir Robert Lorimer, a most excellent architect and teacher whose philosophy Percy Nobbs was proud to continue and develop. In open competition with all students of the Royal Institute of British Architects, he won the Tite Prize in 1900, which enabled him to continue his studies in Italy. In 1902, again in competition with British Architects, he won the Owen Jones Studentship which was awarded for work in colour. The winning of these prizes marked an outstanding capacity in design, draughtsmanship and colour, so at 27, Percy Nobbs was an acknowledged master of the principal crafts of architecture.

To our great fortune, he was offered the Macdonald Chair of Architecture at McGill, which he accepted in 1903. From that date, he directed our School of Architecture until 1911, when he retired as professor in charge to become Professor of Design and to embark upon a practice of architecture with Mr George T. Hyde, which continued until 1945. Together Nobbs and Hyde produced a number of exceedingly graceful works in Montreal, particularly for McGill, for the Protestant School Board of Montreal and for individuals who were seeking delightful houses; in Edmonton, for the University of Alberta, and in Halifax, for the Naval Monuments Commission. Earlier greatly coveted prizes confirmed his ability to draw, but now a series of beautiful buildings established for all to see and enjoy, his remarkable humanity, unerring taste, scholarship and love for tradition. His carved words in the stone over the door of the McGill Library, "Fiat Lux", and over the gate of the Pathology Building, "Hic Est Locus Ubi Mors Resurgens Rediviva Est", and his treatment of the arms of Queen Victoria supported by angels on the wall of the Royal Victoria College in 1931 showed his wit, love for man and respect for God.

In 1909, he was married to Mary Cecilia Shepherd, who with their children, Phoebe Erskine Hyde and Francis John Nobbs, and their grandson, Peter Sanson Nobbs are his survivors.

Percy Nobbs was a Fellow of the Royal Institute of British Architects, a Fellow of the Royal Society of Arts, Past President of the Province of Quebec Association of Architects, the Town Planning Institute of Canada, the Royal Architectural Institute of Canada and the Royal Canadian Academy. In another capacity he was once President of the Quebec Association for the Protection of Fish and Game and he founded the Atlantic Salmon Association. Both fisherman and salmon owe much to him, but particularly for the fish-ways he forced governments and power companies to build for them. In 1952 he earned the Outdoor Life Conservation Award marking him as the man who contributed most to the conservation of wild life in that year.

When he was 33 he won a silver medal for fencing in the Olympic Games of 1908 and he maintained his interest in this graceful sport long past the day when other men would have put away their foils.

As a Captain and a Major he served in the World War from 1915 to 1919.

His love for the association of men and their activities is attested by a life membership in the Montreal Amateur Athletic Association, the Montreal Fencing Club, the Pen and Pencil Club, the Arts Club and the University Club, of which he was a founder and whose delightful club house is his work.

Although he had retired from McGill in 1940, it was in 1957 that he was awarded the Honorary degree of Doctor of Letters as a tribute by the University he had so greatly helped to form, whose flag and arms and seal he had designed and whose most pleasant buildings were his works.

"Salmon Tactics", "Fencing Tactics" and "Design" are his three principal publications, although many articles and carefully written lectures are hidden away in journals waiting to reward a searching mind. His review of architecture in Canada, the subject of a British Empire Exhibition Lecture in London in 1924 and later published by the Royal Institute of British Architects, is a masterful summary of the circumstances of architecture in this country which is full of wisdom and kindly instruction worthy to be mentioned with the others.

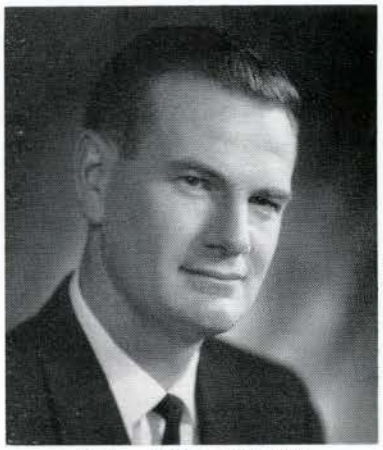
John Bland, FRAIC

PETER T. M. BAROTT FRAIC 1917-1964

We regret to report the sudden death on December 16 of Peter T. M. Barott, FRAIC, partner in the Montreal firm of David, Boulva and Barott. He was 46. Mr Barott was widely known as a devoted and energetic leader in professional affairs. He was first vice-president of the Province of Quebec Association of Architects, a member of the Council and Executive Committee of the RAIC; chairman of the RAIC Standing Committee on Public Information and member of the Canadian Joint Committee on Construction Materials. He was also president of the Specification Writers Association of Canada. Born in Montreal Mr Barott was a graduate of McGill University and the University of Michigan. He served overseas as a Captain in the Black Watch Regiment of Canada and was taken prisoner at Dieppe.

ROBERT BRIGGS HEADS CJCOCM

Roberts Briggs, MRAIC, Toronto, was elected chairman of the Canadian Joint Committee on Construction Materials at the eleventh meeting held December 12. He succeeds C. O. P. Klotz, of Alcan International Ltd, Montreal. Robert Halsall, MEIC, P.ENG., ACEC, Toronto, was elected vice president.



Robert Briggs, MRAIC

In addition to reviewing past activities and electing new officers, the meeting:

(1) Made plans for the fourth annual competition for Excellence in Building Product Literature in 1965, with awards to be presented at the Annual Assembly of the RAIC in Montreal in June;

(2) Complimented the RAIC Journal on the comprehensive nature and usefulness of the first edition of ADA, the Architectural Directory Annual; and heard plans for publication of the 1965 edition this summer.

(3) Cordially welcomes the advent of a "Canadian edition" of Sweet's Catalogue in 1966, and heard an explanation of the new "Canadian Construction Catalogue File", as it will be called.

(4) Endorsed the Construction Specification Institute's revised format for Construction Specifications, now recommended for use in Canada by the RAIC and the SWAC;

(5) Advocated the elimination of lengthy descriptions and the "or equal" clause in specifications, and their replacement wherever possible by references to standards of materials and workmanship generally recognized in Canada (Canadian Standards Association, Canadian Government Specification Board.)

(6) Undertook to produce a guide to the preparation of maintenance manuals (similar in nature and function to the earlier, successful "Guide to the Preparation of Effective Product Literature"), and, to launch the project, decided to establish a producer-user committee under the direction of Messrs Briggs and Halsall, and invite comments and suggestions.

Computer Design

Part II

The Computer is not just an ingenious calculating machine or a scientific toy, but an instrument of incredible potential for the architectural, planning and engineering professions.

Dr Thomas Howarth

Mr Allen Bernholtz, Lecturer, School of Architecture, University of Toronto, continues the explanation of the subject begun by Dr Thomas Howarth, Director of the School, in the December issue.

At the recent Boston Architectural Centre Conference on Architecture and Computers, many architects were confronted for the first time with examples of advanced 20th century technology — particularly in the form of the electronic computer. Roughly seven areas were treated in the various papers presented: (1) information storage and retrieval; (2) building engineering situations involving structural analysis and design; (3) design of optimum mechanical systems; (4) critical path method and its second generation development, precedence method, for use in construction planning, scheduling and control; (5) the processing of complex statistical data into meaningful graphic form; (6) computer aided design through the use of graphic communications systems; (7) systems analysis applied to hospital design.

(1) *Information Storage and Retrieval Systems*

The AIA has created a task force to study the problems of information retrieval with the purpose of setting up a "data bank" on materials, methods of construction and available technology.

Basically it is possible, where large quantities of data are available, and are in need of continuing reassessment, and upgrading, to set up a "data bank", such as we have in Metro Toronto for dealing with traffic problems. The bank is in effect a large storage library, but instead of books, pamphlets and manuscripts there are punched cards, magnetic tapes, punched paper tape, and micro-film means of storage. By the use of machines known as "descriptors" vast quantities of data can be stored and made readily available. Tape, drum and disc retrieval methods make possible the speedy location and "printing-out" of required information. Print-outs may be in the form of bar charts, graphs, statistical data, micro-film or graphic displays. One advantage of this system, other than the basic capacity to supply information when it is needed, is the possibility of the tailored-to-measure specification.

Initially, it is necessary to get a lot of data onto cards or tape, as the AIA is presently doing, and to employ personnel to keep the 'bank' current at all times. Using a centralized organization eliminates costly and wasteful duplication, and keeps the cost of capital expenditures for expensive computer equipment to a minimum.

Dean Kenneth Sargent of Syracuse University, who presented a paper on Information Retrieval, suggested that prior to the application of automated devices architects will have to define their needs and upgrade their performance standards. Implicit in the system is the need for architecturally-trained librarian-research personnel, who may turn out to be as legitimate a concern of the schools as the designer-architect is today.

(2) *Building Engineering Situations Involving Structural Aanalysis and Design.*

The search for ideal programming languages and systems has culminated in such specifically problem-oriented languages as COGO (co-ordinate geometry) and STRESS (Structural Engineering System Solver).

William J. Le Messurier discussed the STRESS system which was used in the structural analysis of the Boston City Hall.

The problem-oriented language must conform to the following important specifications to be an 'ideal' language:

(i) The level of man-machine communi-

cation must permit instructions to the computer to be made in the common language of the architect/engineer.

(ii) Each architectural/engineering problem should be unique and original allowing the architect/engineer free use of his creative thinking, intuition, judgement and experience.

(iii) The order of instruction to depend entirely on the architect/engineer.

(iv) Any necessary changes or modifications must be easily accommodated by the system.

(v) The machine response should provide the architect/engineer with a basis for judging the quality of his decision.

(vi) There should be no limit to the size of the problem.

STRESS is a programming system for the solution of structural engineering problems on digital computers. It consists of two main parts, a *language* used to describe a structural problem and a *processor* for a computer which produces the requested results.

With STRESS the engineer need not have detailed knowledge of data processing. The STRESS language is formed by a number of statements describing the nature and the size of structure, the loads, a solution procedure and the results desired. The terms are essentially the same as those which engineers use in communication with each other. Modifications of portions of the problem can be easily specified and the corresponding results produced. In this system geometric as well as numerical inputs and words are acceptable.

As Le Messurier has suggested, one disadvantage in the use of the system is that the computer often gives back too much information. What to analyse must be carefully determined. The actual cost of a specific analysis on a rented computer was $300 as against $6000 for manual analysis of the same problem.

(3) *Critical Path Method*

This special technique for effectively conducting a project to a profitable conclusion has been discussed in the *RAIC Journal* on several occasions.

Suffice it to say here that CPM is a management technique for planning, scheduling and controlling projects, based on a project network model. CPM considers duration, estimates over a range of facility and cost levels, and provides a range of possible project durations to an associate range of project cost and resource requirements. A rigorous mathematical formulation, of which the architect need only be aware, ensures that CPM computations will establish the absolute minimum cost of achieving any feasible project duration.

CPM has now entered its second generation language phase, in the form of the Precedence Method which supersedes the first arrow diagram method. It also obviates the need for the inclusion of "dummy" events to give a unique description to each activity. Each event has instead a key number which can be readily tied into an efficient accounting system without some of the manipulations required of the earlier system.

(4) *Computer Aided Design Through the Use of Graphic Communications Systems*

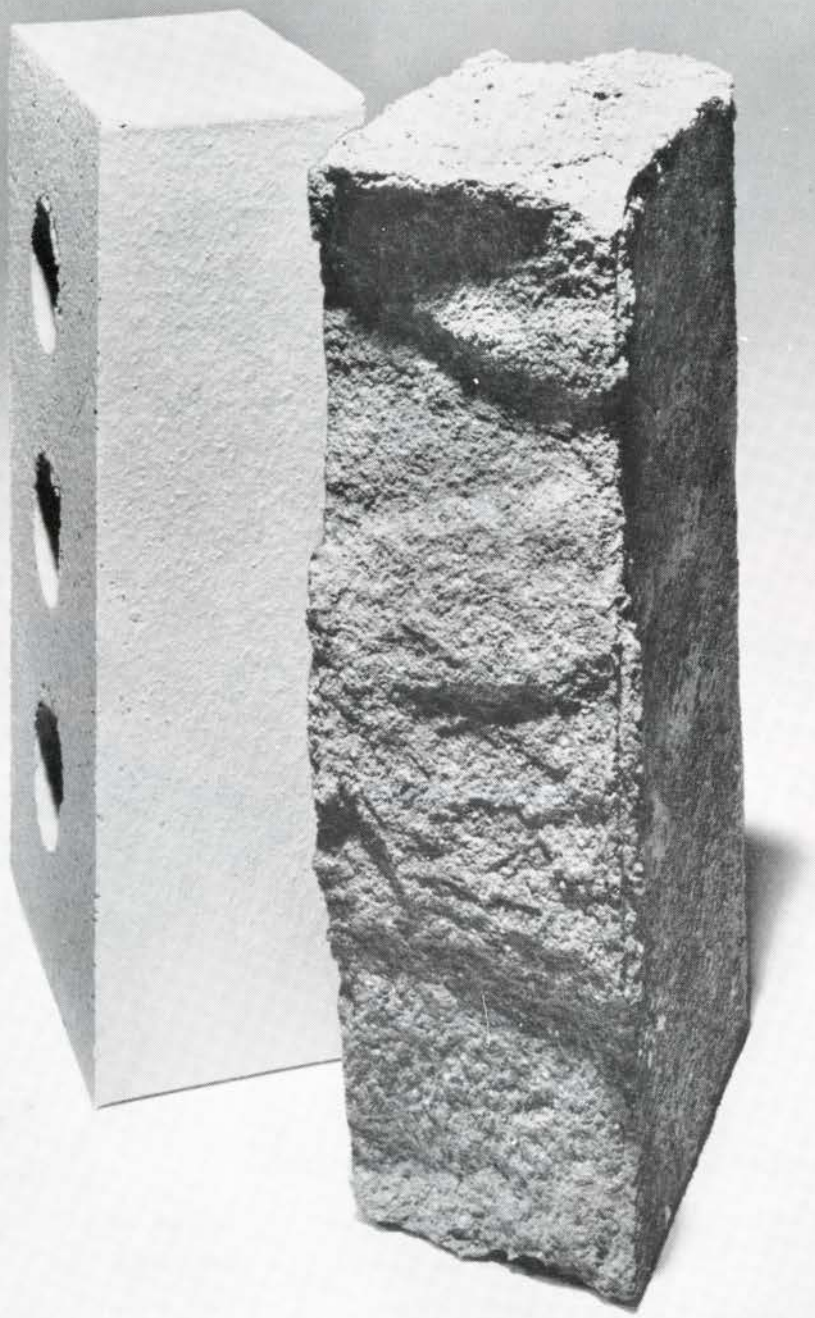
The function of the computer in architectural practice will be productive only when the architect can produce a "graphical input" — similar to pencil on tracing paper — to express his ideas and problems in the form of sketches as he does when communicating with other architects, engineers, clients, builders and himself.

Plotters with electronically controlled armatures are available for the purposes of plotting information, graphs, maps and tables for immediate evaluation. TV tubes (cathod-ray tubes) are also available on which light from a source can be extruded through various shapes on a template, focused on the face of the tube,

(concluded on page 18)

"MY, YOU HAVE AN INTERESTING FACE."

"You're just an old smoothie."



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photographed and made available in microfilm or "hard-copy" similar to the present blue-print stage of drafting.

Prof. Steven Coons of MIT described the various Sketchpad Systems which had been developed at MIT under his direction In this system, a sketch representing geometrical configurations on abstract ideas, can be made on an oscilloscope (similar to the cathode ray tube of a TV set) with a light sensitive photo-electric device called a "light-pen". This device responds to the phosphor on the tube face which is comprised of a network of thousands of moving dots.

With a touch of the pen, press of a button, flick of a toggle switch or turn of a dial, the sketch on the tube face can be manipulated in many different ways.

This instrument — the "Sketchpad" can draw an object in perspective while a designer sketches plans and elevations. The device can also shift, rotate, enlarge or make the picture smaller as required. It is claimed that a drawing roughly a quarter of a mile square can be made from a 7-in. square tube face.

Then Sketchpad system makes it possible for a man and a computer to converse rapidly through the medium of line drawings. Shape description of a structural object must convey three-dimensional information to both man and computer. In modifying a design part, an architect must be able to examine the structure from any attitude in space; the Sketchpad provides this capability.

The Sketchpad system will, ideally, allow the designer to initiate machine-tooling directly from the computer, in essence bypassing such things as shop-drawings and restructuring the working relationships which now prevail.

Another visual and graphic display system was described by William Fetter, of Boeing in Seattle. It is the result of the combination of art — graphic design — and computer methods. It is a simplified, fast and economical method of converting a virtually unlimited amount of engineering, scientific and design data into pictures through the use of computers and photography.

The tedious process of transposing orthographic views into true perspective illustrations is reduced to a simple translation of points of reference from the orthographic drawings to punched cards. These cards are fed into the computer along with the pertinent computer graphics programming. The perspective views are then drawn by an automatic plotter (or micro-filmed) and the illustrator is provided with any desired projection or view of the object as an accurate basis for further art work. Pictures from the system just described can be used in still, stereo, motion and oscilloscope presentations.

Sufficient has been said of the Boston Conference to point up the need for a problem-oriented-computer language for architects. In my research into this problem, it became evident that architects have been deterred by a language barrier and a lack of appreciation of the potential of computer technology. It has been necessary to have a programmer intermediary until now. However, recent advances in "hardware" — the actual machinery — and "software" — the programming which determines the capabilities and limitations of the machine — make possible direct man-machine communication. In a communication system of this nature, architects can sit down at a console and with mechanical, structural and electrical engineers, landscape architects and planners, work out dynamically and simultaneously an integrated, organic design at a previously unattainable level. The shifting of emphasis in time allocation in the design process made possible by computer technology should allow the architect freedom to concentrate on the more creative aspects of his profession — a consummation devoutly to be wished.

O.A.A.

1965 CONVENTION and ANNUAL MEETING

February 18, 19 and 20

ROYAL YORK HOTEL,

Toronto

HIGHLIGHTS INCLUDE:

Thursday, February 18

9.30 a.m.	Public Relations Seminar
2.00 to 4.30 p.m.	Tour of City Hall and other tours
6.00 p.m.	Opening of exhibits and exhibitors' reception
7.00 p.m.	O.A.A. dinner followed by exhibitors' entertainment

Friday, February 19

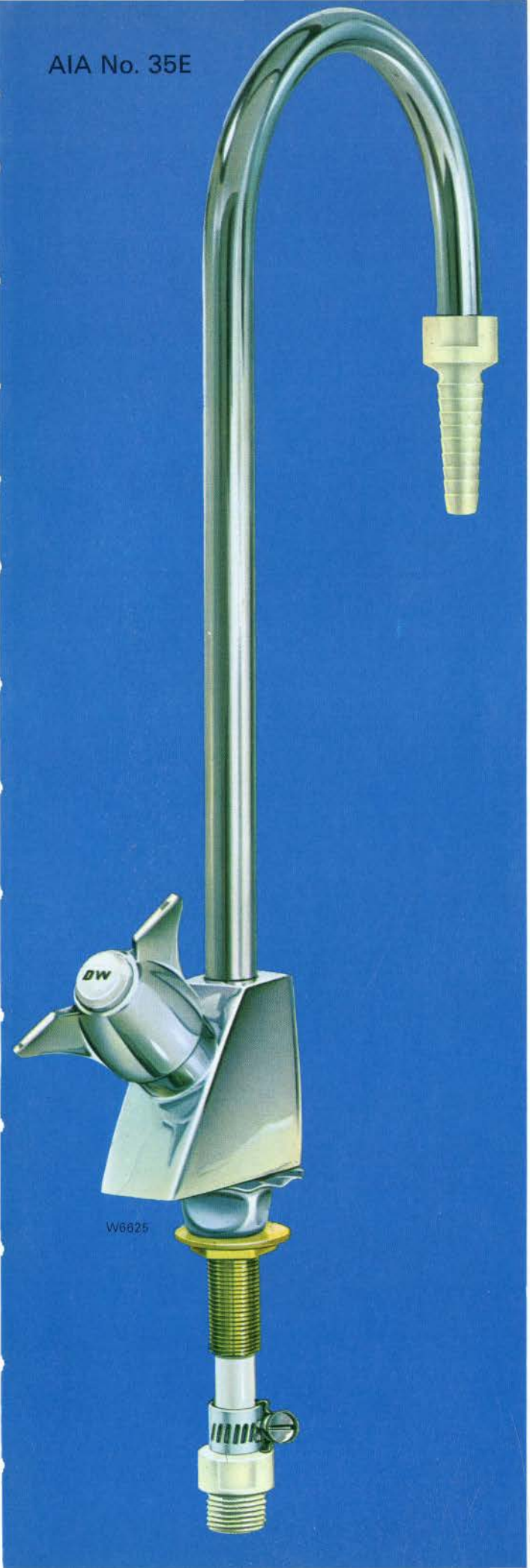
10.00 a.m.	Major Seminar
2.30 p.m.	Annual general meeting, Part I
6.30 p.m.	Cocktail party and dinner with major speaker

Saturday, February 20

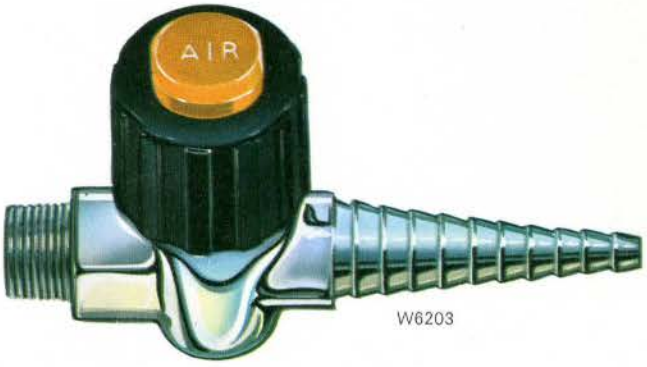
9.30 a.m.	Annual general meeting, Part II
1.00 p.m.	Luncheon with major speaker
6.00 p.m.	President's reception followed by annual dinner and dance

Program details, advance registration forms and other information available from the O.A.A. office.

AIA No. 35E



Wallaceburg's newest fittings are for laboratories that require an exact degree of purity



or pressure.

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The Canadian Education Showplace

by Frank J. Nicol, MRAIC, ARIBA

Director, Division of School Planning and Building Research, Ontario Department of Education

Those responsible for the organisation of the Canadian Education Showplace while discussing its original concept, felt that as a service to all those interested in education would appreciate the opportunity to view, during attendance at the Showplace, examples of the best in school architecture from all across the Dominion.

I was asked by these organisers if I would be prepared to act as Chairman of an Architectural Advisory Committee who would be charged with the responsibility of determining the type and quality of this exhibition. The committee was then formed, consisting of: Frank J. Nicol, MRAIC, Chairman, Gordon S. Adamson, FRAIC, Irving D. Boigon, MRAIC, Jean-Louis Lalonde, MRAIC, Roderick N. McLeod, Superintendent of Public Schools, Brantford, J. M. Porter, Director of Education, Gault.

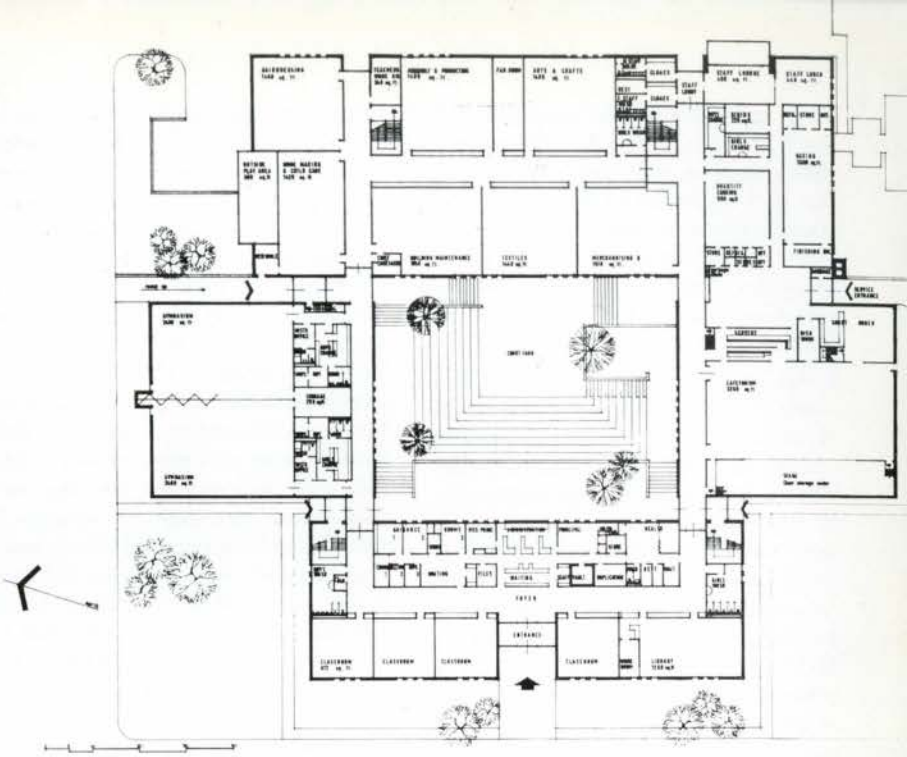
The committee decided to invite all architects in Canada to submit to the committee the best examples of their work in the field of school design. The committee felt however that in order to serve the best interests of the meaning and intent of the Exhibition, that only the best of the projects submitted should be accepted for exhibition. The committee made its choice, not only on architectural and technical competence, but also on the quality of plan arrangement and of those schools which illustrated progressive educational planning in the provision of new types of learning and teaching spaces. The exhibition therefore, will not only serve to illustrate the merit or otherwise of the architectural solution, but will also reflect the educational philosophy of the school administrative unit responsible for the project.

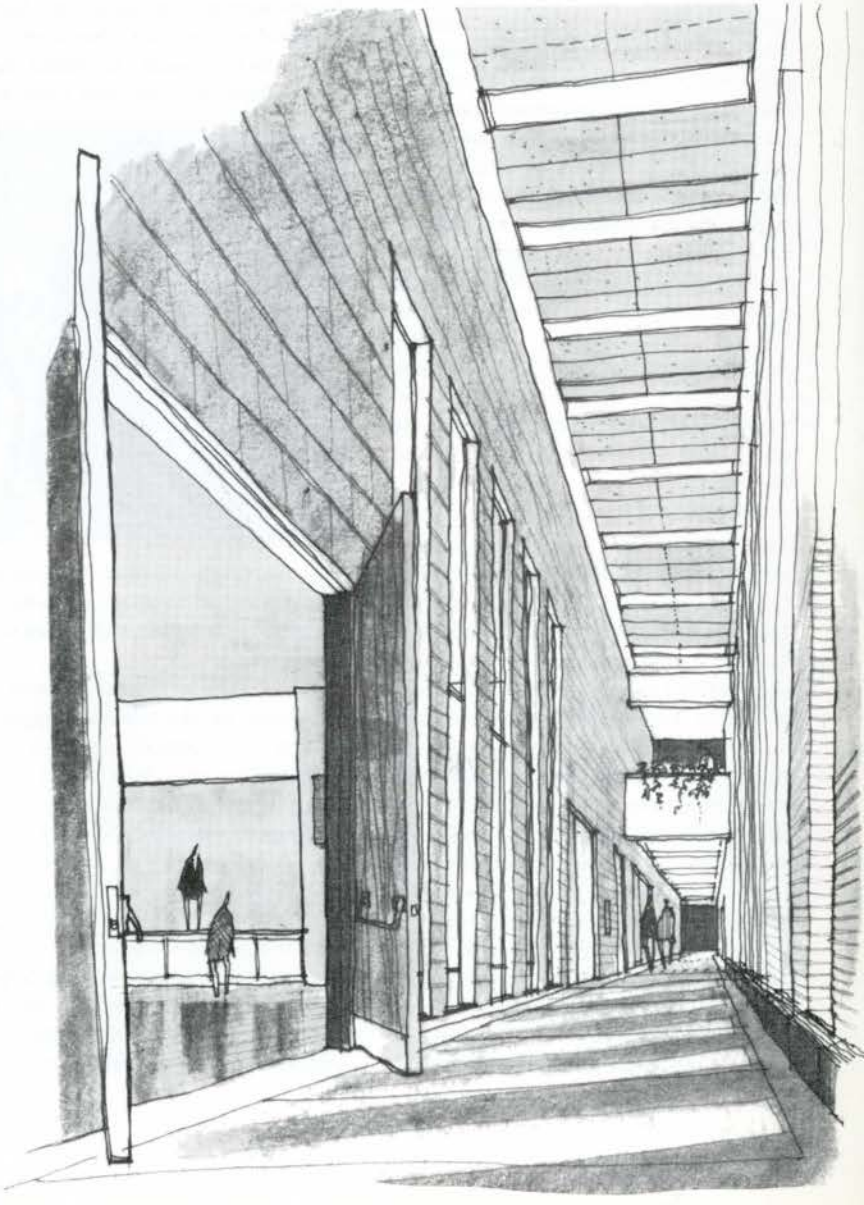
The bulk of the entries submitted came from architectural practices centered primarily in Eastern Canada, principally Ontario, with no projects submitted from the West Coast or from the Maritimes. Perhaps it was felt that few educators would attend an exhibition which was to be held in Toronto, if they had to travel from the extreme east or west of the nation. It is unfortunate however, that the Architects from all across the country did not take this opportunity to compare the quality of school architecture from Province to Province and the educational philosophy of the educational bodies in all the jurisdictions in Canada. The exhibition I feel, will serve many useful purposes. It will give all architects an opportunity to learn from each other and will give the educator the opportunity to realise that educational function can be housed in architecture of excellence, without compromising the educational needs and requirements, or the budget requirements which vary from area to area.

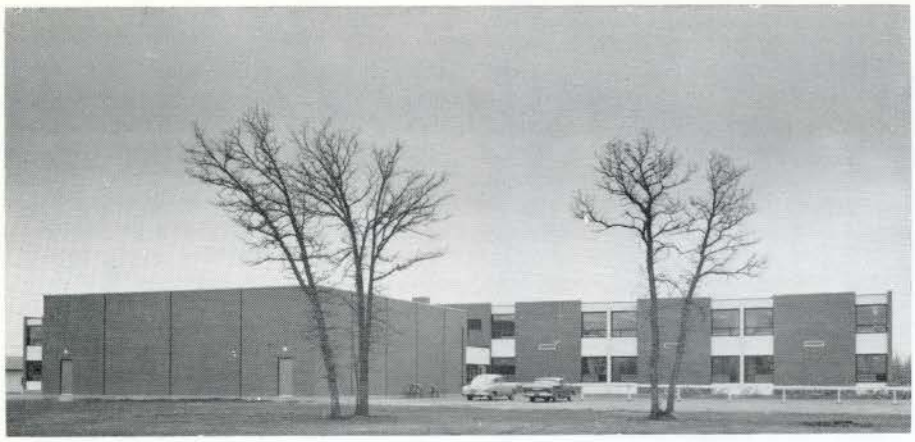
Because of the nature of the organisation of educational matters in Canada, it is difficult to directly relate school architecture from region to region on a national basis. Education is a matter which is completely within the jurisdiction of the Provincial Governments and very little has been done on a national basis to provide both architect and educator with information regarding new concepts in teaching and learning and the necessary changes which these concepts will bring to bear on school architecture. It is only through exhibitions of this type that we as architects have any opportunity to find out what approach is taken in areas outside our immediate concern. We therefore tend to base our architectural concepts on our narrow local experiences, broadened perhaps by architectural and educational literature which originates for the most part in the United States. It is not often therefore, that architects or educators in Canada can gather together information on a national basis so that they may evaluate what is happening in Canada and to compare the solutions to the growing complexity of school requirements.

Selection Committee for Education Showplace in Toronto, February 5 and 6. Left to right: Mr Nicol, James Nuttall (Showplace official), J. M. Porter (Director of Education, Galt, Ont.,) Gordon S. Adamson, FRAIC, Jean-Louis Lalonde, MIRAC, Roderick N. MacLeod (Superintendent of Public Schools, Brantford, Ont.). Committee member not present is Irving D. Boigon, MRAIC.

The examples of school projects which are shown on the following pages are a few of the typical examples of the accepted projects. It is hoped that they will give the writer an opportunity to compare the varying solutions to basically the same problem, that all providing the facilities necessary to house the mechanics of education. It should be encouraging to note that school architecture in Canada is in every way as progressive in approach as is produced anywhere in the world, within the limitations determined by the educational needs of the Educator.







Robert Browning Elementary School

Kirkfield Park, Manitoba

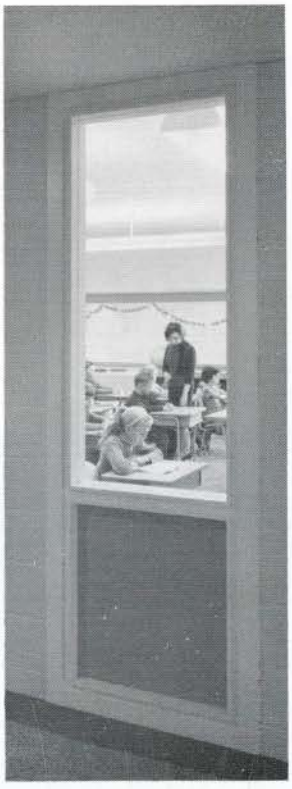
This is an elementary school with fairly standard requirements. The solution is straightforward and simple to allow for ease of supervision. The auditorium and gymnasium allows for segregation of activity and also provides easy access for use by outside groups, without interfering with normal operations of the school. It is a simple and precise architectural statement achieved with consistency of detail within and without at a remarkably economical cost.

The school is sited so that the classrooms face north and south to avoid the most severe sun conditions during the school year. This school is situated in an area consisting of middle income homes and the scale of the building does not interfere with the residential environment.

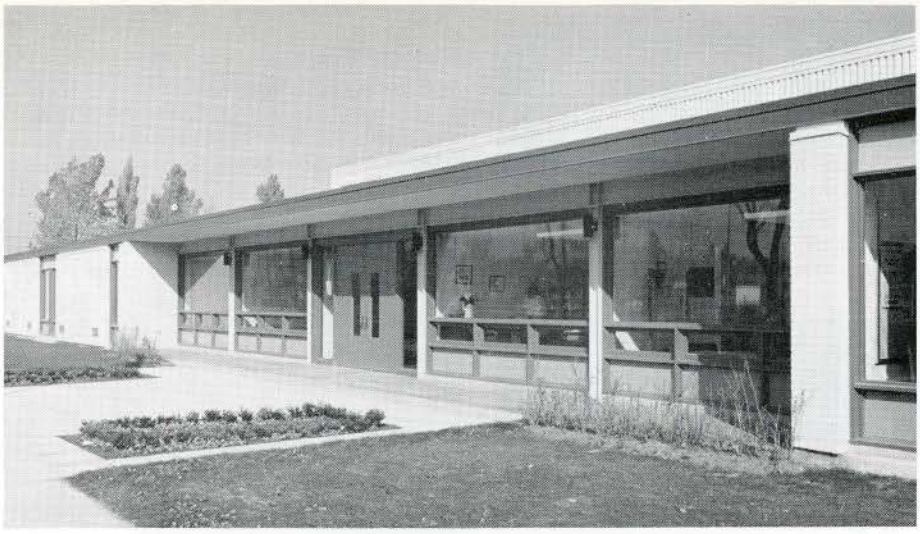
Technical Data

The school is concrete frame and masonry bearing walls, with open web steel joists and 2½" concrete slabs for floor and roof areas. The exterior consists of alternate brick panels and pre-cast concrete panels faced with ceramic tiles. Windows are double glazed in wood frames with hopper type opening sections. Interior materials include terrazzo in the corridors, stairs and washrooms and asphalt tile in classrooms. Walls are painted concrete block and wood panelling, ceilings consist of mineral acoustic tile in classrooms and corridors, plaster in the service areas and steel deck in the auditorium. Heating and ventilation is a gas fired hot water system with individual unit ventilators in each classroom. Colour schemes allow for the use of bright primary colours to add variety to the interiors.

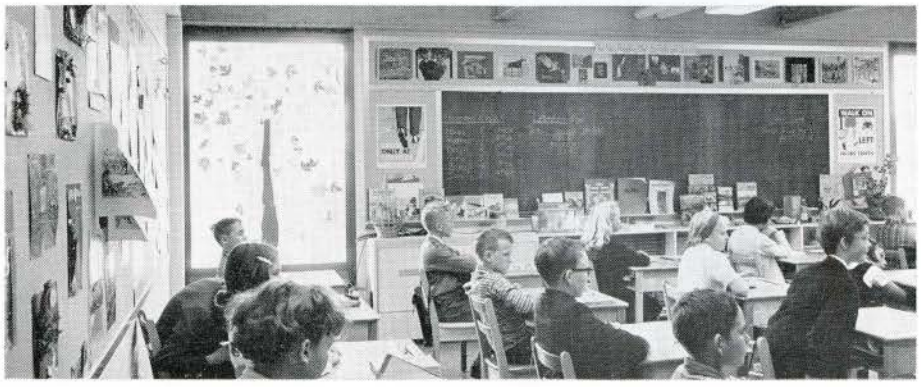
1. CLASSROOM
2. STAIRS
3. CORRIDOR
4. LOBBY
5. VESTIBULE
6. NURSE & WORK RM.
7. SUPPLIES
8. LAV.
9. PRINCIPAL
10. WORK RM.
11. VEST.
12. LAV.
13. BOYS LAV.
14. STORAGE
15. GIRLS LAV.
16. VEST.
17. JANITOR
18. KITCHEN
19. CHAIR STOR.
20. STOR.
21. AUDITORIUM



Architects/Pratt, Lindgren & Associates
Structural Engineers/Crosier & Greenberg
Mechanical & Electrical Engineers/W.L. Wardrop & Associates
General Contractor/Taubensee Construction Ltd.



GROUND FLOOR PLAN



Christmas Park School
Beaconsfield, Quebec

This elementary school is in a city suburb of Montreal. It has been located adjacent to Christmas Park and forms the School Commission's contribution to the complex of community services which the City intends to develop in the area of this civic park. Valuable parkland was preserved by the form of the building, which is orientated towards the park. The parking area serves both the school and the park and therefore is larger than would normally be expected. The plan is evolved from the basic considerations of circulation and light. The centre of the building contains the common facilities which do not require natural light, such as gymnasium, general purpose room, mechanical rooms, washrooms etc. The plan has been kept as compact as possible with short direct corridors and low ceilings, in order to preserve a scale in keeping with pupils of elementary grades. The classrooms are square in shape with storage walls on the corridor side.

The Architect has relied upon artificial light and ventilation to permit lower ceilings and has therefore considerably reduced the amount of window area. The simple compact plan form allows for ease of administration and supervision and provides for ease of circulation within the building. The scale and quality has been maintained externally. It is obviously a school designed for children.

Technical Data

The school is steel frame structure which is exposed externally and internally. Double glazed window and window panels and direct panels are used alternately on the external walls. The interior partitions are exposed concrete block or brick pointed in light colours. The ceilings in most rooms are unpainted lightweight pre-cast concrete slabs with the exception of the corridors which have suspended acoustic ceilings. The floor is vinyl asbestos tile in broad alternating bands of light colour. The gymnasium is sheathed externally with corrugated aluminum, with vinyl acrylic. Heating is by hot water system with unit ventilators in each classroom.

Architects/Dobush, Stewart & Bourke
Structural Engineers/De Steen & Associates
Mechanical & Electrical Engineers/Malcin & Hoskin
General Contractor/Leonard J. Weber Construction Company

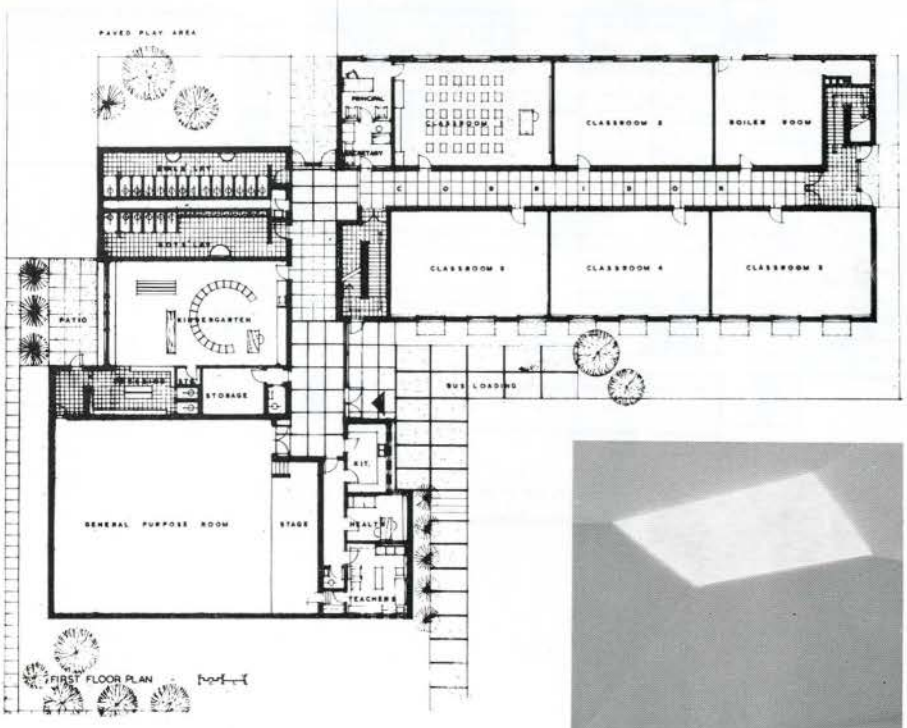
Edmison Heights Public School

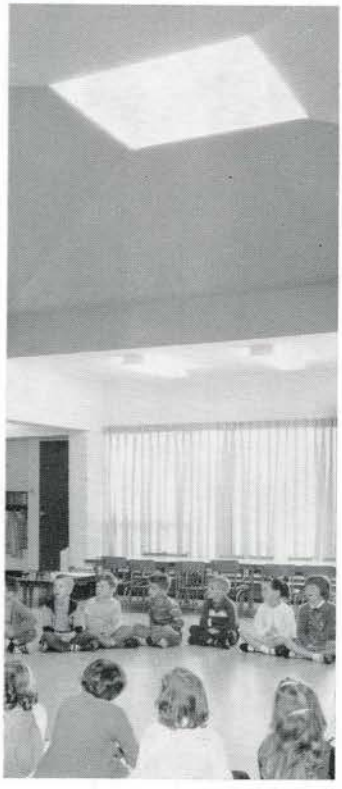
Peterborough, Ontario

The Edmison Heights school is an example of a typical Ontario Public School with very simple teaching space requirements. The Architects however, have created an architecture which avoids the standard institutional appearance. The materials and textures are warm and human and help to convey a scale in keeping with the public school child, as well as a harmonious indication with the site and its environment. The consistance of detailing within and without maintains a well ordered architectural articulation. The site is planned so that teacher parking is within easy access of the building and the loading and unloading of school buses has been carefully controlled to allow for well ordered use. The Kindergarten is well separated from the other classroom facilities, giving a greater measure of protection for the very young. It also provides for an outside Kindergarten play area which can operate without interference from the older children. The General Purpose Room and the ancillary facilities are well located for extra curricular community use. The whole is planned in a simple straightforward statement, providing easy supervision and administrative control.

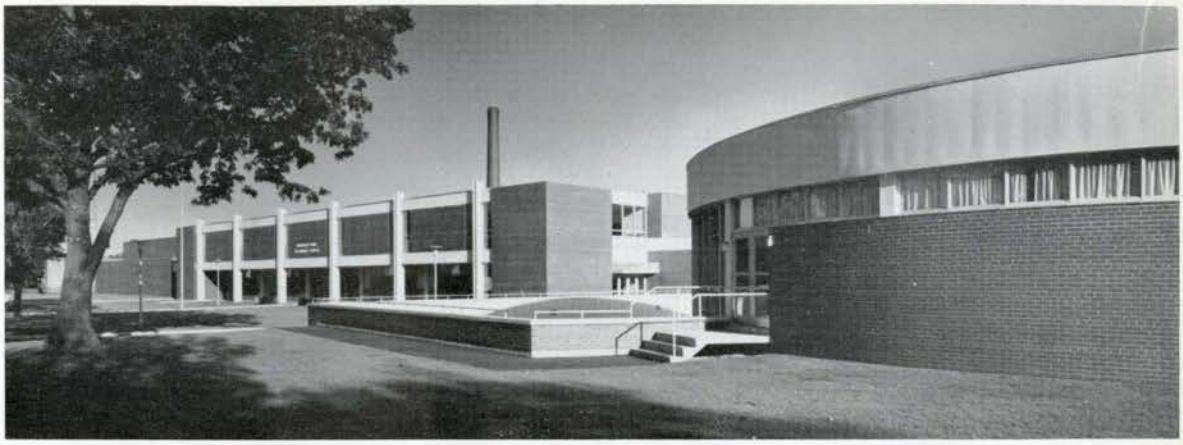
Construction Methods & Materials

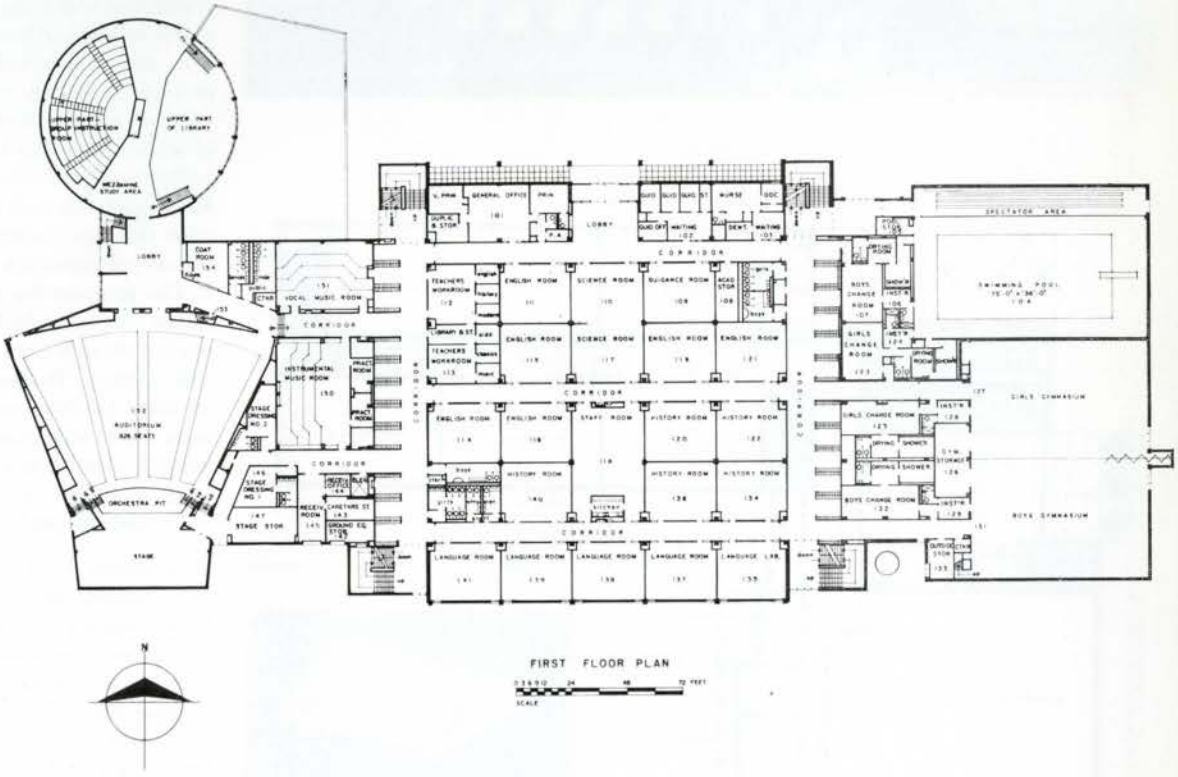
Brick bearing walls with open web steel joists, concrete slab on grade. The main school has a steel deck roof but a mill deck has been installed over the General Purpose Room. Materials — exterior brick and copper, interiors; terrazzo floors, brick and block walls; suspended acoustic tile ceiling; mechanical hot water radiation.

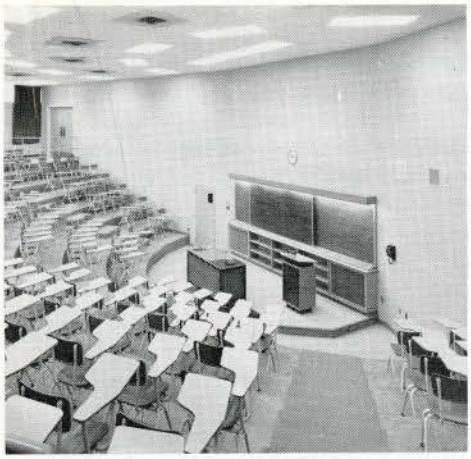


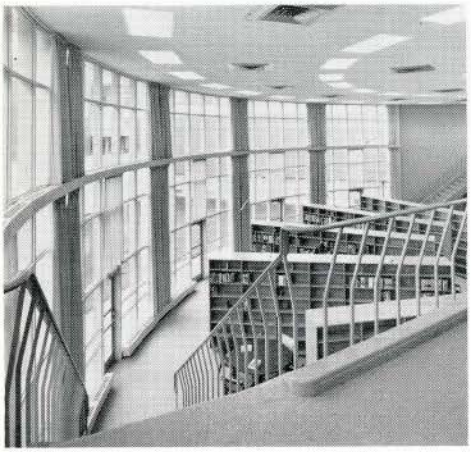


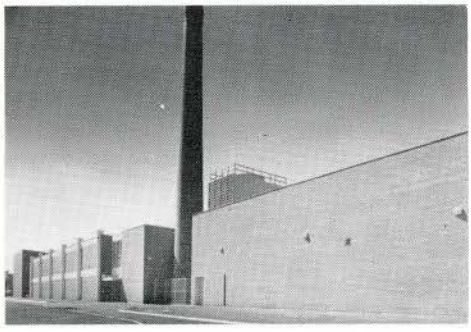
Architects/Craig, Zeidler & Strong
Structural Engineers/J. Dowdell & Associates
Mechanical & Electrical Engineers
W. Hardy Craig
General Contractor/Van Hoof Construction




UPPER PART OF LIBRARY
LOBBY
COAT ROOM
VOCAL MUSIC ROOM
CORRIDOR
INSTRUMENTAL MUSIC ROOM
PRACT. ROOM
AUDITORIUM 826 SEATS
ORCHESTRA PIT
STAGE
STAGE DRESSING NO. 1
STAGE STOR.
RECEPT. ROOM
CARETAKER'S OFFICE
GROUND EQ. STOR.
V. PRIN.
GENERAL OFFICE
PRIN.
GUID. & STOR.
GUID. OFF.
WAITING
GUID. SUPV.
NURSE
DENT.
SOC.
ENGLISH ROOM
SCIENCE ROOM
GUIDANCE ROOM
ACAD. STOR.
TEACHERS WORKROOM
LIBRARY
STAFF ROOM
HISTORY ROOM
LANGUAGE ROOM
SPECTATOR AREA
SWIMMING POOL
BOYS CHANGE ROOM
GIRLS CHANGE ROOM
SHOWER
INSTR.
DRYING
GYM STORAGE
GIRLS GYMNASIUM
BOYS GYMNASIUM
OUTSIDE STOR.
N
FIRST FLOOR PLAN
SCALE







Monarch Park Secondary School

Toronto, Ontario

This large secondary school in the City of Toronto provides accommodation in the four and five year programme in the arts and science, business and commerce fields. It was specifically designed to provide accommodation to house a form of team teaching and includes space for large and small group instruction, seminar discussions as well as intensive facilities for individual study and research. It provides for the use of a library by students after normal school hours and much of the original design concept was based upon the use of the entire facility as a community building, providing for its adequate control.

The plan arrangement is based upon the development of three distinct elements, the first houses the recreational areas which, although they are used continuously by the student programme, are used extensively by outside groups. The swimming pool is used in conjunction with the local recreation department programme during the summer months. The second block contains the prime academic areas of the school, the administrative and other ancillary areas and includes teaching staff work space to allow for adequate study and research facilities. The third element with its own distinct entrance comprises an 800 seat auditorium, music rooms, cafeteria, a library and a large group instruction room, which will be used to some extent by outside groups.

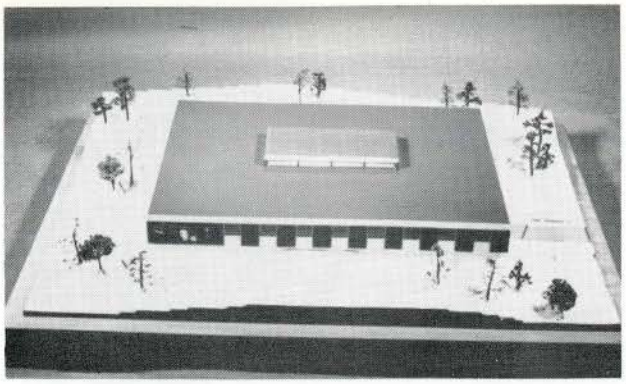
Because of the limited site size, many of the teaching areas are interior spaces, which has tended to produce a compact plan with only 30% of the classrooms on outside walls. It was felt, however, that the library which includes not only a reference room but also a mezzanine study area, should be provided with a glass area which opens out on a landscaped court. This school, because of the progressive education requirements which have been more than adequately solved architecturally, should provide a focal point for school architecture in Canada for some years.

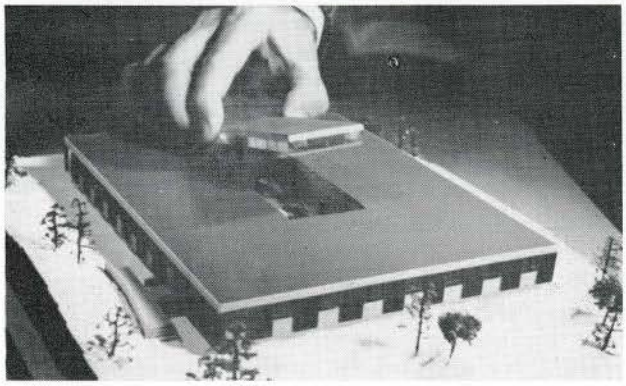
Technical Data

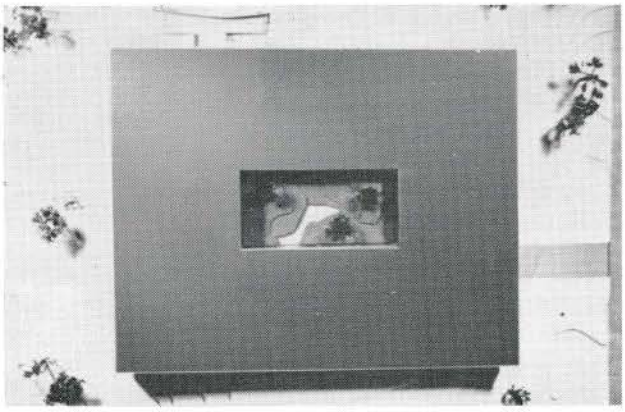
The entire structure is of fire proof steel frame with one way reinforced concrete slabs framing; interior partitions to be located with freedom for future change. Because of the sub-soil conditions, the westerly one-third of the building is supported on concrete filled tubular steel piles, driven in some cases to a depth of 60 ft.

Full climate control is obtained by using hot water for heating and a steam absorption chiller for cooling. In summer, outside air is filtered, dehumidified and cooled and in winter it is pre-heated, humidified and re-heated as necessary. All areas have a two-way ventilation system. Windowless rooms require the ventilation of a diesel generator for emergency lighting and ventilation in case of Hydro failure.

Architects/Allward & Gouinlock
Engineers/Engineering Department, Toronto Board of Education
General Contractors/Mitchell Construction Company of Canada







Elementary School

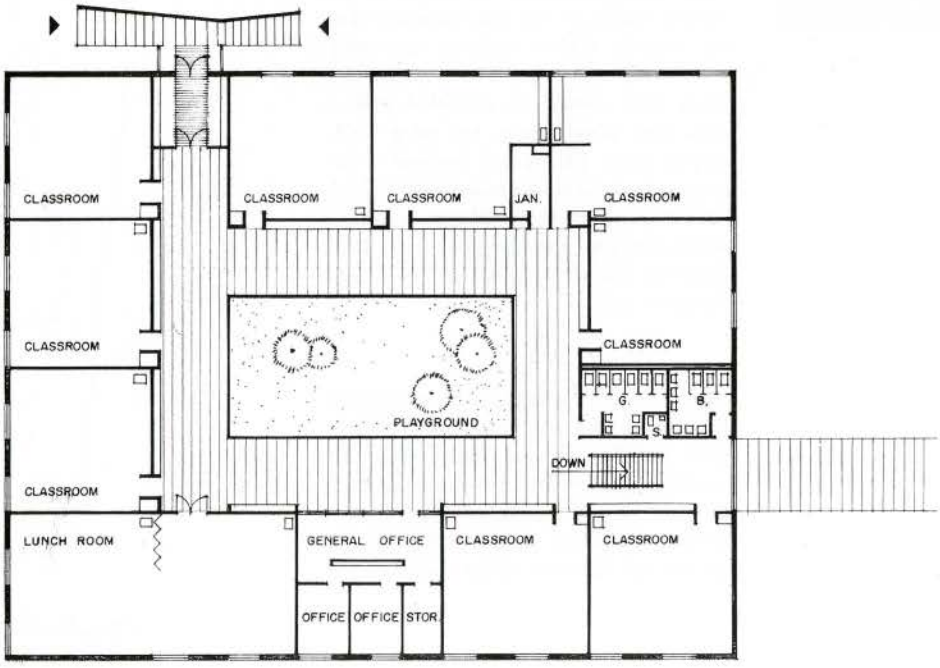
Yellowknife, North West Territories

The plan has been developed around an interior playground space and intention is that this space would provide an area as close to a natural environment as possible, with the exception of temperature control.

The Architect obviously felt that the climate in Yellowknife is such that this interior playroom space is essential to the health and welfare of the children. Around this space is planned an open colonnade which is to be paved and finished with fixed seating groups.

There is no doubt that this school will do much to provide a fresh approach to the problems of school planning in a severe climate. It is a clean and simple architectural statement of high calibre and it is intended that Indian and Eskimo art forms will be incorporated as essential design features.

Architects & Engineers/Richards, Berretti & Jellinek
General Contractor/Not yet awarded



L'Architecture Scolaire Piétine

par Jean-Louis Lalonde

Jean-Louis Lalonde, MIRAC, Montreal, a member of the Architectural Advisory Committee for The Education Showplace, was asked by the Journal to comment on school design in the Province of Quebec.

Les quelques réalisations groupées dans ces pages représentent les meilleurs exemples d'architecture scolaire récente au Canada. Il est possible que quelques autres oeuvres de valeur n'aient pas été soumises au concours, (je pense en particulier à certaines écoles du Québec), mais dans l'ensemble nous avons là un échantillonage représentatif de notre effort dans ce domaine particulier. Chacun de ces exemples mérite une étude détaillée et constitue un ouvrage dont les responsables n'ont certes pas à rougir. Mais à l'exception peut-être de l'intéressante solution proposée par John Andrews, qu'il faudra d'ailleurs revoir une fois terminée et habitée, aucune de ces écoles ne s'impose comme une oeuvre transcendante qui marquera une étape et influencera l'architecture scolaire des prochaines années. Pourquoi? Je ne prétendrai pas pouvoir répondre à cette question d'une manière irréfutable ni analyser tous les facteurs de cet état de chose. Je me permettrai de soulever quelques points particulièrement importants et d'en tirer des conclusions qu'on disputera peut-être.

A l'origine, il y a le programme, et derrière le programme, l'incertitude des données pédagogiques. La formation de l'esprit et l'éducation d'un enfant dans un monde qui se cherche ne peut pas se représenter par une équation mathématique ni se définir en formules d'éléments définitifs de dimensions fixes. Les nouvelles techniques d'enseignement sont à peine explorées, que d'autres objectifs s'ajoutent pour en suggérer la modification. Et lorsqu'on parle de laboratoire de langue, de salles de manipulation, de bibliothèque, d'amphithéâtre pour enseignement audio-visuel, de locaux pour activités dirigées, même l'enseignant hésite sur la définition et l'utilisation de ces nouvelles armes. En maître formé par des méthodes plus classiques, il cherche lui-même à s'adapter à ces techniques imprécises et n'a pas le loisir d'analyser le cadre dans lequel cet enseignement est donné.

L'administrateur, pour sa part, doit définir les programmes et se voit imposer des normes budgétaires basées sur les besoins quantitatifs mais ne tenant nul compte des problèmes qualitatifs. Dans tous les pays du monde, les ressources financières sont exploitées au maximum pour répondre au besoin pressant de locaux d'enseignement. Et dans la hâte d'en produire en quantité, les dirigeants, des Ministères de l'Education aux commissions scolaires n'accordent pas aux problèmes de qualité toute l'importance qu'ils mériteraient.

L'architecte, de son côté, piétine lorsqu'il s'agit d'analyser des programmes considérés comme établis et définis. Si on lui demande de concevoir un centre de recherche nucléaire, il considérera que le problème est relativement nouveau et qu'une solution originale s'impose. Mais pour une école, les exemples pleuvent et la recherche se fera dans la documentation plutôt que dans l'investigation des données de base — le résultat pourra tout au plus constituer un autre bon exemple. Comment concilier ces trois facteurs de base que sont le programme académique, le budget et l'organisation fonctionnelle pour obtenir une oeuvre transcendante? En reposant le problème dans sa véritable optique; l'enfant dont il faut développer toutes les facultés intellectuelles, et le maître qui a besoin d'un cadre propice à la communication, à l'échange. Le comfort physique, la qualité technique de la construction, l'organisation rationnelle des divers locaux, sont sans doute des caractéristiques fonctionnelles essentielles pour une école; elles le sont aussi pour une usine ou pour un bâtiment commercial. Mais un plan qui fonctionne ne donne pas nécessairement l'ambiance propice à la réflexion, à l'étude, à l'expérience. Monsieur René Maheu, directeur général de l'Unesco, résumait ceci par ces mots: "Un établissement d'enseignement n'est pas qu'un assemblage ingénieux d'espaces, fait selon un plan techniquement cohérent. Pour l'enfant, l'école est le premier lieu de contact avec l'époque dans laquelle il vivra. Elle doit évidemment refléter l'écologie de son milieu. La brique crue du Pakistan ou le buré des îles Fidji ne sont pas plus déplacés dans leur contexte que le bois poli de la Finlande ou le béton de Sao Paulo. Mais l'école doit aussi, par ses formes, par ses couleurs, par l'abri et les facilités qu'elle offre, réaliser une ambiance dans laquelle la personnalité de l'enfant peut éclore dans une sécurité faite d'action et de joie. Le temps des "geôles de jeunesse captive" est révolu." Il n'y a pas de recette pour la création d'un milieu stimulant; comme il en est pour tous les intangibles, c'est la sensibilité et le talent du créateur qui donnent une âme à un espace. Mais si les données du programme sont telles qu'elles dictent les volumes et même la composition du décor, comme c'est le cas pour la classe type, comment espérer que les espaces soient autre chose que repétitifs et monotones. Comment s'attendre à ce que le maître puisse interpréter un programme académique dans un cadre stereotypé? Comment croire que ce local puisse également convenir à l'enseignement d'une science précise et à la pratique des methodes actives? La situation actuelle où la classe type conditionne le parti n'a que trop duré. Entre le péristyle de l'Agora et la coserne aux cellules identiques il y a surement place pour des formules plus souples qui laissent le choix des méthodes pédagogiques et de la liberté d'interprétation du programme académique par le maître qui pourra ainsi l'adapter à la capacité intellectuelle de l'élève.

School Design Workshop in Ontario

The Conference on School Design held in Toronto in September 1963 clearly indicated that the people of this province have a keen interest and sincere appreciation of the problems which we all face in attempting to provide economically the school facilities to best serve the present and future needs of Ontario.

It did become clear at that time, however, that a closer study on a regional basis would provide the Department of Education and local officials with a more precise background of local conditions and needs. It is intended, therefore, to operate these Workshops in various centres throughout the province, so that we may all evaluate and compare the wide range of conditions which exist in Ontario. The inter-play of opinion and ideas from the wide variety of those in attendance will help us all to assess in depth the special needs of our local communities.

The Journal asked Mr. Oyrst H. Sawchuck for comments on the success of the Workshop. He has this to say —

A valuable exchange of opinion was the tangible result of the School Design Workshop held in Sudbury last November. It was the first of a series of conferences in Ontario sponsored by the Department of Education. The purpose of this meeting was to bring together representatives of all groups concerned with the school building programs.

The resulting contact between architects, engineers, school trustees and municipal officials gave rise to a healthy exchange of views in the quest for improvements in design and construction, and ways to reduce school building costs. Every opportunity was afforded the architects to discuss their experience in the building of schools, their attitude toward building committees, school trustees and teachers generally, and to be reciprocally challenged and prodded by the assembled members of school boards and inspectors.

A plea repeated by several of the 100 delegates in attendance was ably expressed by J. E. O. Tremblay, separate school inspector in Sudbury. He was one of the speakers at the opening session and voiced an appeal for more efficient channels of communication between architects, school boards and educators. "Otherwise," he said, "the curriculum will be fitted to the school building rather than organized to meet the present and future needs of our school population. "Architects are not educators," said Tremblay, "and cannot visualize as well how the physical facilities might have a certain effect on the school curriculum, and how architectural details might have great advantages or disadvantages for the teacher and his pupils."

It may be said that from a professional point of view little if any information was gained that could be used to help design or build a better school. But those who participated did leave with a greater appreciation for each of those concerned with the education of our young people. From that point of view the workshop was impressive and successful.

The workshop concept allows the architect to meet with those who may be clients and express opinions that he could not on the restricted basis of an individual client-professional relationship. It is an ideal public forum for the profession — in this particular area of interest — to voice candid, controversial and specific statements on the subject and be heard. It provides an excellent opportunity for architects to be of public service.

Local significance of the workshop's theme was incorporated in a half-hour television program prepared by the OAA's Northern Ontario Chapter and shown immediately following the final session. The ambitious project was undertaken to publicly review changes in design and facilities contained in the many new secondary schools built in the last two years in the Sudbury area. Entitled "The Changing Classroom" the program, with the comments of an architect, school board officials including the chairman, and an educator, took the viewers on an illustrated tour of these schools and explained their modern features in popular terms with strong contrasts to conditions which prevailed in the recent past.

F. J. K. Nicol, research architect with the Department of Education, was director of the Sudbury workshop and took part in the TV program on behalf of the Minister of Education who had been invited by the local Chapter of the OAA.

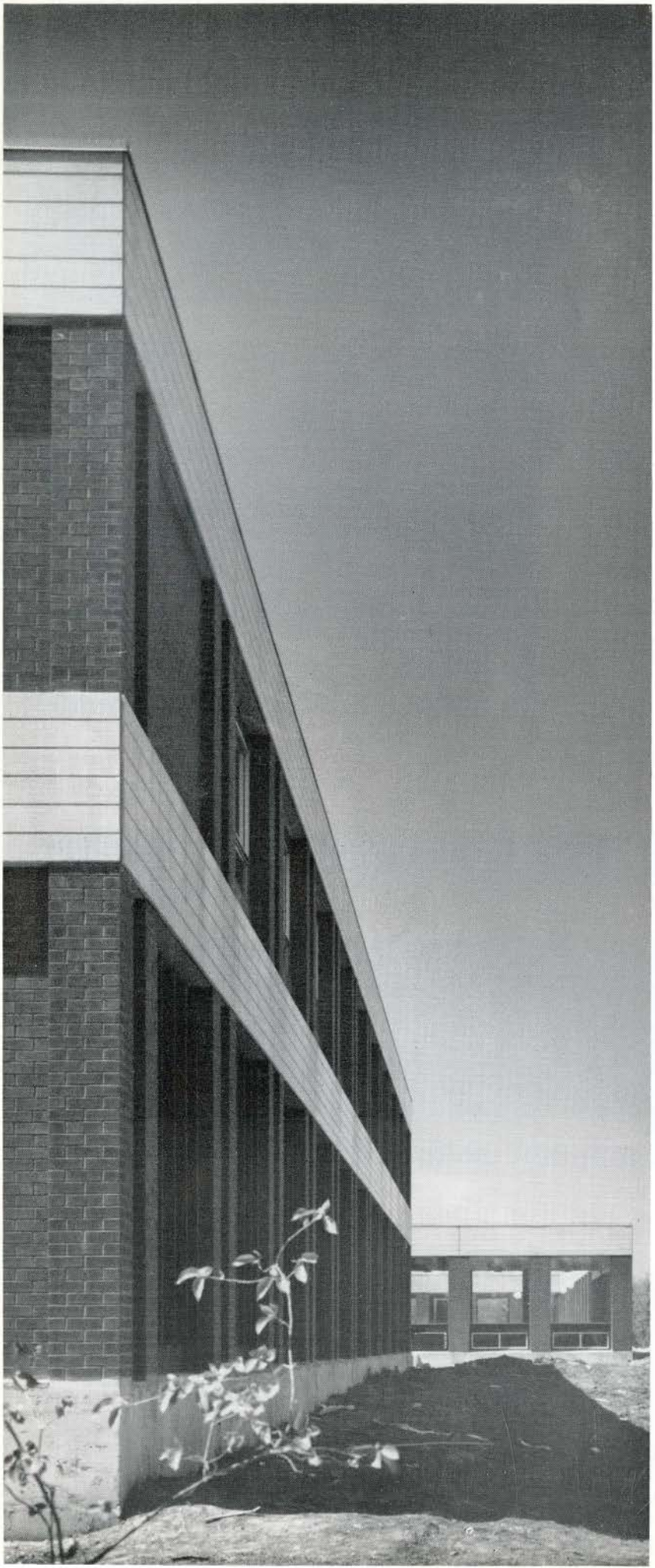
The Fort William Workshop

Recognition of the special needs of electronic and visual aids in teaching was among the resolutions that went forward at the Fort William workshop sessions in December. Mr Nicol, who also directed this session, told the 85 delegates present that teaching equipment as used in "language labs" was far from being fully exploited. The term "language lab" was, in fact, misleading, as the equipment could be readily used for the teaching of many other subjects. Wider use of the equipment would, he felt, make the expense of electronic laboratories more acceptable to economy minded school boards.

Electronic equipment, added Mr Nicol, had further implications, because within the next two decades a greater emphasis would be placed upon the individual's responsibility for learning. In other words, the pupil would be afforded the opportunity to undertake more personal and individual study and research. There was now available a library computor which gives not only the text required but would provide a video tape moving picture of the item.

T. R. Ide, district inspector of secondary schools for Port Arthur, said school design should include requirements for installation of cables and wiring for closed circuit television.

Speaking on educational facilities, Mr Ide said that the portion of national income devoted to education would continue to grow, but, at the same time, the use of the school plant in the general community structure would have to be expanded to give the taxpayer greater value for his capital investment. There was, he felt, an obligation on the part of the educational authorities to ensure that the school buildings would be fully used throughout the 12 months of the year, and would be available to all age groups for educational, recreational and cultural purposes, not restricted to students. It was only common sense, he felt, that the school library also serve as a branch of the public library system for all to use, and the school auditorium be the community theatre and meeting place. Even school washrooms, he felt, should be located within the building so that these could be used to serve adjoining public facilities, such as skating rinks. He advocated that school grounds be physically linked to and integrated with the parks systems when new residential areas are being planned. In this way students and public would gain maximum benefit from the assembled open space at the most reasonable cost to the taxpayer.



Massey Medal School Award

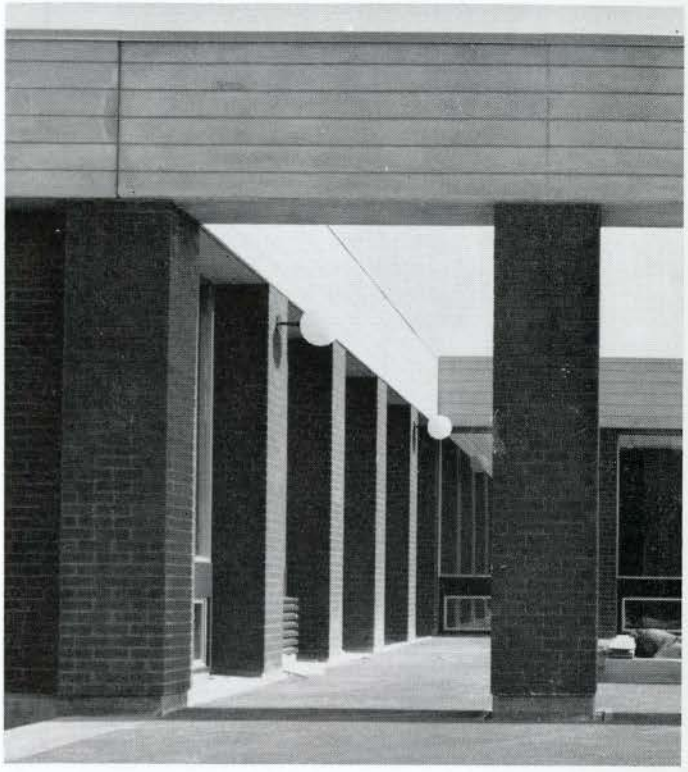
To supplement the samples of school design selected for The Education Showplace, the Journal presents St Paul's College High School, Tuxedo, Man. by Libling Michener and Associates, the only school to be awarded a 1964 Massey Medal not previously published (See page 51, August 1963 for Central Technical School Art Centre). Three additional Massey Medal finalists which merit examination also are presented: Don Mills Collegiate Institute and Junior High School, North York, Ont., by John B. Parkin Associates, The Hillsdale Public School, Oshawa, Ont., by Jackson Ypes & Associates, St Norbert Collegiate, St Norbert, Man., by Etienne J. Gaboury.

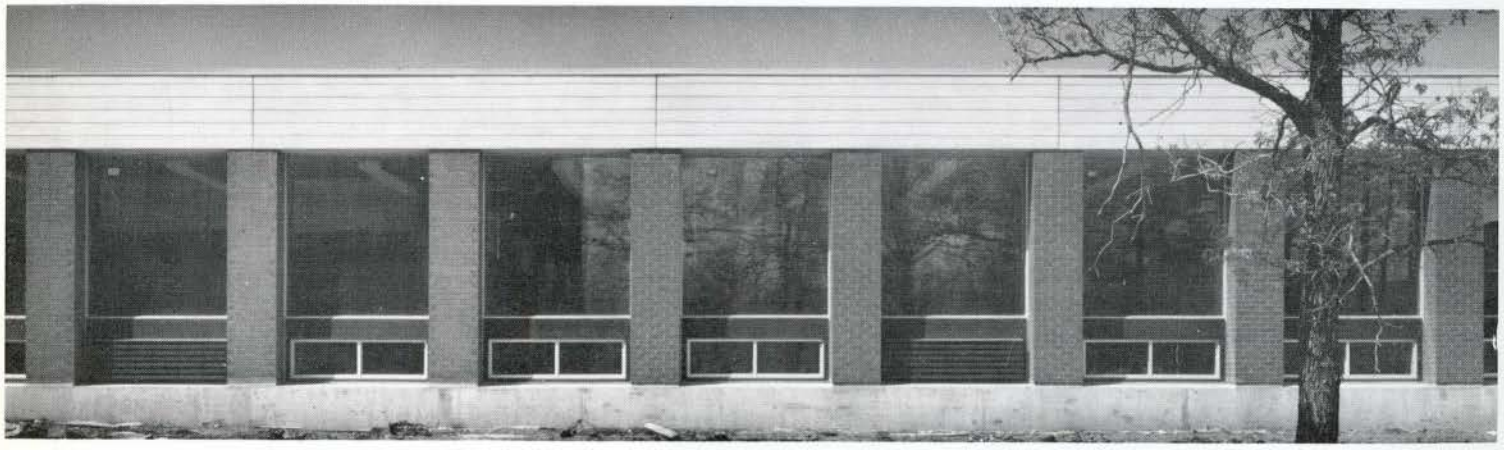
St Paul's College High School

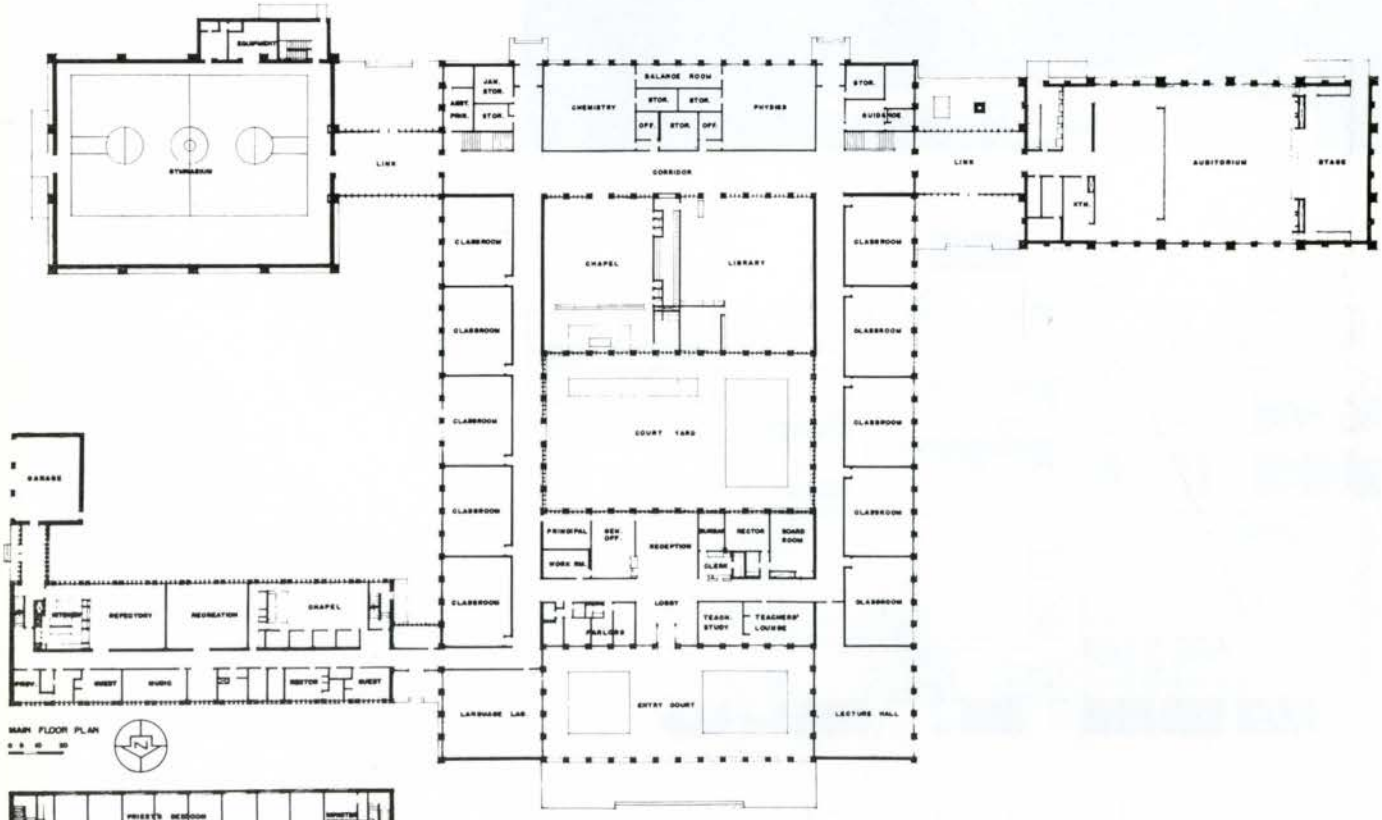
St Paul's College High School

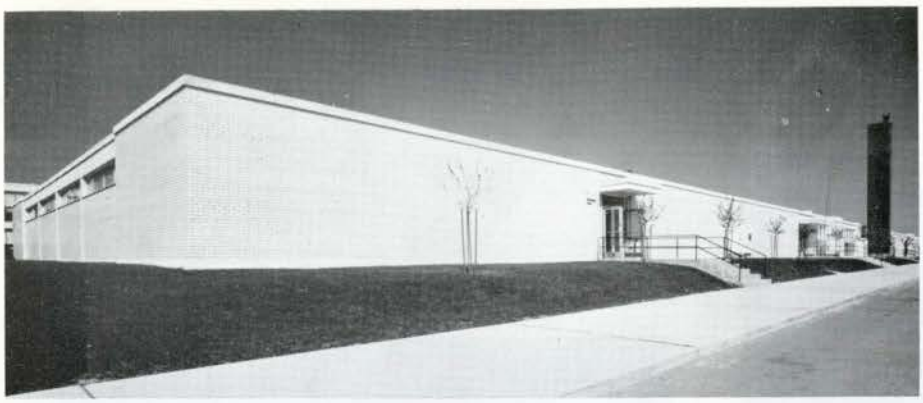
Tuxedo, Manitoba
Architects/Libling Michener
and Associates
Consulting Structural Engineer
R. Lazar, P.Eng.
General Contractor/G. A. Baert
Construction Limited

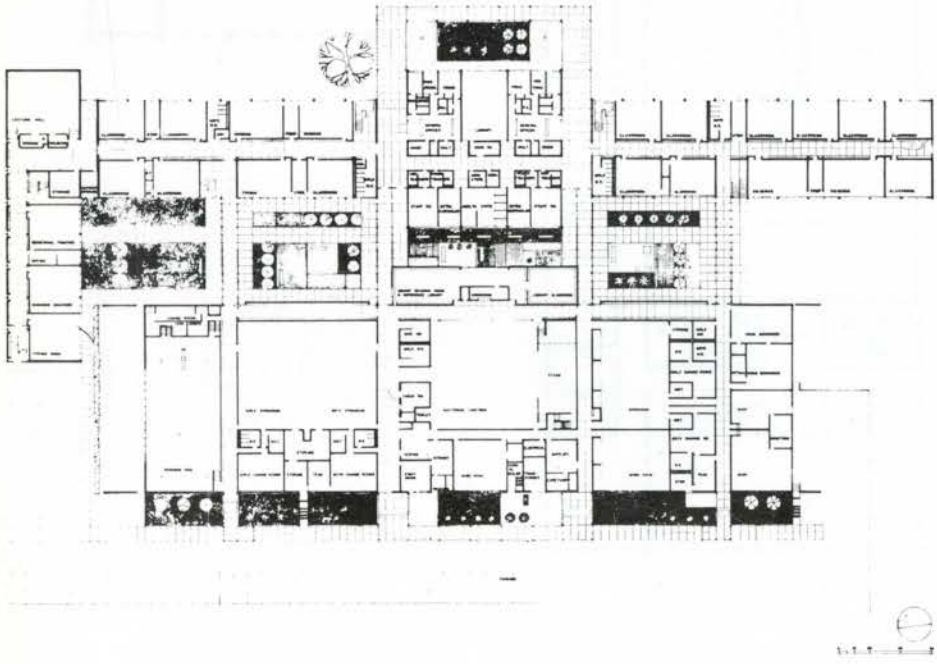
Foundations are of reinforced concrete on piles and caissons. Roofs are framed by steel joists and steel deck and supported on precast concrete lintels spanned on top of masonry piers. Exterior materials are limited to brick bearing piers and wall facings of a red brown color, natural stained window frames and natural grey precast concrete beams. Major interior finishes are brick, rough finished plaster and wood.






GYMNASIUM
LINK
CORRIDOR
CHEMISTRY
BALANCE ROOM
PHYSICS
AUDITORIUM
STAGE
CHAPEL
LIBRARY
COURT YARD
CLASSROOM
PRINCIPAL
RECEPTION
RECTOR
BOARD ROOM
REFECTORY
RECREATION
CHAPEL
LOBBY
PARLORS
TEACHERS' LOUNGE
LANGUAGE LAB
ENTRY COURT
LECTURE HALL
MAIN FLOOR PLAN
PRIEST'S BEDROOM
CORRIDOR
SECOND FLOOR PLAN





Don Mills Collegiate Institute and Junior High School

North York, Ont.
Architects/John B. Parkin Associates
General Contractor/Eastern Construction Company Limited

Reinforced concrete has been utilized as the structural basis for the two-storied classroom wings. The single-storied auxiliary wing is constructed of an exposed steel frame, and light weight concrete decking. Steel framed, glazed passageways connect these wings. Exterior sheathing is white glazed brick panel wall construction, utilizing steel sash. Painted concrete block walls have been combined with resilient tile flooring and acoustic tile ceilings on the interior.

CANADIAN
BUILDING DIGEST

DIVISION OF BUILDING RESEARCH • NATIONAL RESEARCH COUNCIL CANADA

Frost Heave in Ice Rinks and Cold Storage Buildings

by W. G. Brown

UDC 624.131.436.6

Cold storage buildings and ice rinks frequently encounter trouble from frost heaving. It is not unusual to find curling rinks with 2 to 3 inches of irregular heave, and cold storage buildings have been observed where the centre of the floor has heaved more than a foot. Although uniform heaving will have little effect on the use of curling or skating rinks, irregular differential heaving must be avoided. Only a small amount of it can be accommodated by ice making techniques, and the structure itself may suffer damage. Cold storage buildings or rinks used year round will eventually suffer serious damage if the freezing plane is permitted to move into frost-susceptible soil where moisture is present because of the subsequent continuous build-up of ice. This Digest discusses methods that can be employed to avoid or alleviate these troubles. It should be pointed out, however, that differential settlement can be caused by poor building design or poor workmanship, which will also cause uneven floors and ice surfaces, and damage the structure.

Mechanism of Heaving

Heaving problems generally occur as the result of imperfect understanding, during design, of the nature of frost heave. For heaving to take place two conditions are necessary, in addition to sub-freezing temperatures. As discussed in CBD 26, these are:

(1) a fine-grained material (soil) through which moisture can move, and
(2) a supply of water.

In fine-grained soils such as silts and clays, moisture is continuously drawn to the freezing plane where it forms ice lenses. These lenses physically lift the soil above them, thus causing heave at the ground surface. It should be emphasized that this type of heave, due to formation of ice lenses, is not related to the very much smaller volume change of water frozen *in situ*. In general, fine sands, silts and clays are susceptible to heaving and coarse sands and gravels are not. The frost susceptibility of a soil can often be determined by comparing its sieve analysis with that of a soil known to be frost susceptible.

By way of illustration of the extent of frost heave that can occur under ice rinks, Figure 1 gives calculated values of maximum possible heave after six months of operation for a saturated clay sub-soil overlain with well-drained non-susceptible back-fill of different thicknesses. The two curves shown are for ice temperatures of 22 and 27°F, the off-season temperature in the building averaging 60°F. It should be emphasized strongly that the assumed conditions of extremely frost-susceptible soil and a high water table will very seldom, if ever, be encountered in practice. Consequently, the frost heaves given in Figure 1 should be considered representative of maximum limits only. It should also be noted that the brine temperature of the refrigeration system is usually 4 or 5 F deg lower than the ice temperature. With these factors in mind, it can be seen that as much as 5½ inches of heave can occur under a rink with an ice temperature of 22°F and 3 feet of non-frost-susceptible soil over the frost-susceptible material.

Methods of Preventing Frost Heave

If more than one site is available, one that has a non-frost-susceptible soil should be

given and the temperature change between any two lines is one-tenth of the difference between the building temperature (floor or ice) and the mean annual ground temperature. It is also helpful to note, in considering ground thermal problems generally, that heat always flows perpendicular to lines of constant temperature between the outside ground surface and the building floor.

Use of Insulation to Prevent Ground Freezing

It would not be economical to replace the frozen regions in the previous example by non-susceptible material. Consideration must therefore be given to reducing the depths required by using insulation and supplying heat. The effect of insulation can be judged by noting that for steady-state problems 1 inch of insulation is thermally equivalent to about 2 feet of soil. Thus, freezing could be entirely prevented under the cold storage building by 35 inches of insulation and under the ice rink by 11 inches. Actually, less insulation is required near the edges of the building, so that with tapering the average thicknesses required would be about 24 and 7 inches, respectively. It must be emphasized that only high quality, moisture-impermeable insulation is suitable for below-grade application, and that its cost usually prohibits use in such large quantities.

Use of Soil Heating Systems

Penetration of the freezing plane into the ground can be controlled by providing heat to compensate for that removed by the refrigeration system, while maintaining the desired conditions inside the building. The amount of heat required and the installation costs of the heating system can be minimized by the application of insulation or an equivalent thickness of non-frost-susceptible back-fill between the heating conduits and the building floor. Although with some combinations of insulation and heating it may not be necessary to replace any of the frost-susceptible soil, the use of 1 or 2 feet of non-frost-susceptible soil generally provides for proper drainage of the site and, in many cases, space for the heating system. The final decision on the design should be based on economic considerations.

Table I gives calculated duct temperatures and heat flow requirements for a warm-air system designed to prevent freezing under a 3-inch layer of insulation, with 8-inch diameter ducts on 10-foot centres located with their centrelines 1 foot below the insulation layer. Because 1 inch of insulation is thermally equivalent to 2 feet of soil, the same values would be obtained with the ducts located below 6 feet of back-fill. For other duct sizes and spacing arrangements the reader should follow the method of calculation given in NRC 5095, which was used to calculate the values given in Table I.

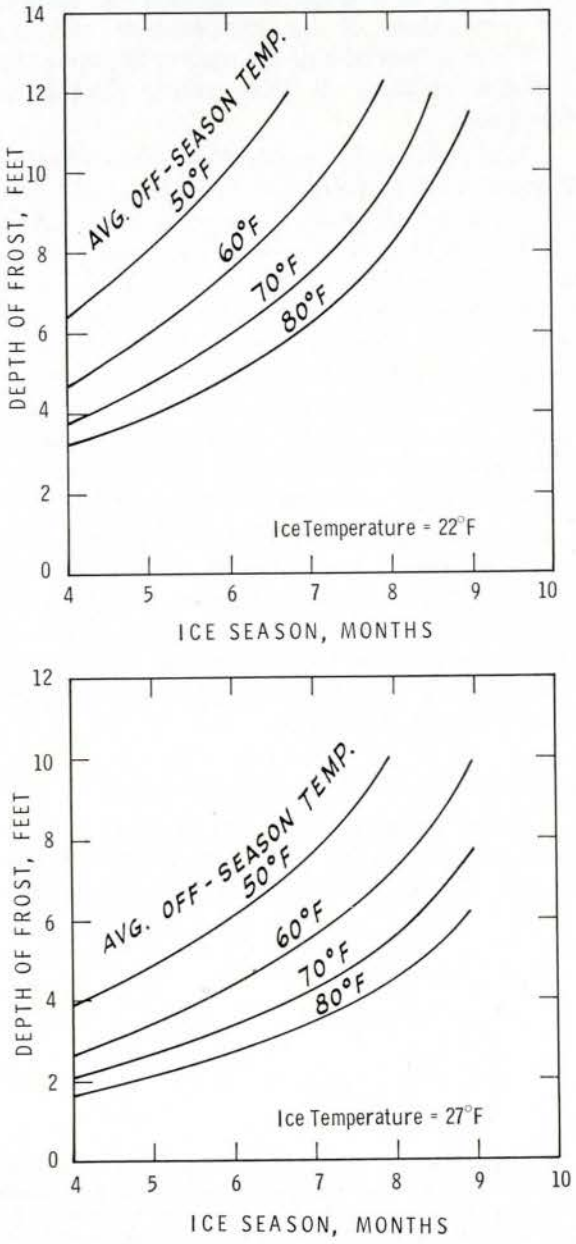


Figure 3 Frost penetration under ice rinks

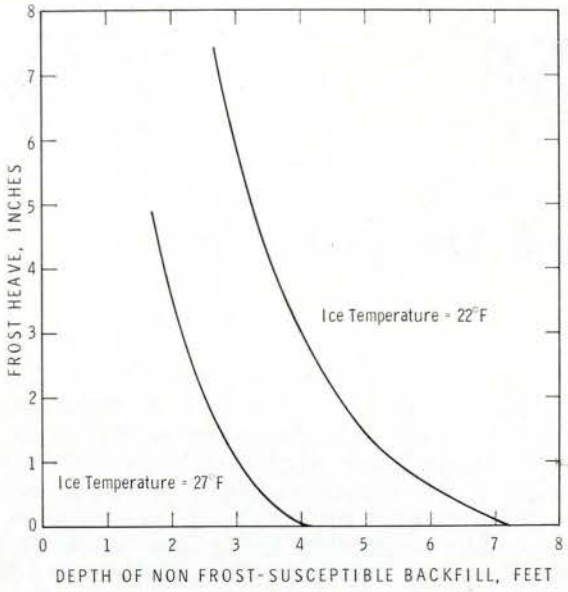


Figure 1 Maximum possible frost heave at end of a six-month cold period (average off-season temperature = 60°F)

chosen. Very often, however, the site is fixed by other considerations, making it necessary to take suitable precautions to prevent frost heave. Basically there are two methods of doing this: either replace the frost-susceptible soil or prevent it from being frozen by supplying heat or insulation, or a combination of both. In addition, every effort should be made to ensure maximum drainage.

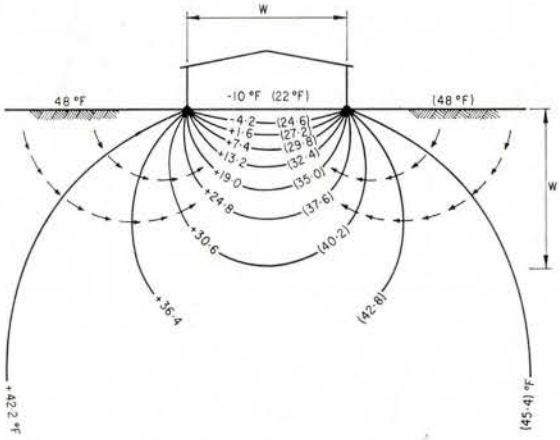


Figure 2 Ground temperature regime under a cold storage building maintained at –10°F or 22°F in a region where the mean annual ground temperature is 48°F (arrows show heat flow direction)

Rinks and cold storage buildings can be separated into two classes: those that operate on a seasonal basis and those that operate on a continuous basis. The depth of frost penetration under buildings operated continuously can amount to tens of feet, depending on the inside design temperature, the average outside air temperature and the plan area of the building. With seasonal operation, the freezing plane will normally extend several feet into the ground in the winter and recede during the summer. For simplicity, this paper will deal with the two cases separately.

Permanent Operation of a Building at Sub-Freezing Temperatures

Figure 2 shows the temperature distribution under a long narrow building of width, w, as it would occur after a number of years of operation. In this particular case the mean annual ground temperature is assumed to be 48°F (Ottawa) and the building is maintained at –10°F (cold storage) or 22°F (ice rink). For the cold storage, the freezing plane (32°F) is found to be at a depth of 1.16 w under the centre of the building and for the ice rink, at a depth of 0.36 w. Thus, if the building were 60 feet wide, the maximum depth of frost under the centre would be 70 feet for the cold storage and 22 feet for the ice rink. The temperature distribution with different inside and outside temperatures can easily be established from Figure 2 by noting that there are just ten lines of constant temperature

TABLE I

DUCT TEMPERATURE AND HEAT FLOW REQUIREMENTS TO PREVENT FREEZING UNDER LOW-TEMPERATURE BUILDINGS

(8-inch diameter ducts on 10-foot centres buried 1 foot below the bottom of insulation on the floor surface; 3-inch insulation (equivalent to a soil cover of 6 feet))

Building floor temperature, °F	20	10	0	−10
Duct temperature, °F	37	42	46	50
Heat flow per foot of duct (Btu/(hr) (ft))	7.3	13.8	19.8	25.9

Ice Rinks and Seasonal Operation

The maximum depth of frost under a rink depends on the ice temperature, the duration of the ice season, the average air temperature in the building during the summer off-season, and to a lesser extent on the thermal properties of the soil. Figure 3 summarizes calculated results and gives the maximum depth of frost penetration in average coarse-grained material for two values of ice temperature (22 and 27°F) as a function of ice season duration and average building air temperature during the off-season.

It is to be noted particularly from Figure 3 that for average Canadian conditions, in which the average off-season temperature is about 60°F, the frost depth for an ice temperature of 22°F lies between about 7 feet for a six-month season and 12 feet for an eight-month season. The corresponding depths for an ice temperature of 27°F are 4 feet and 7 feet, respectively. Consequently, the amount of excavation and back-fill required for frost-susceptible soil can be considerably reduced by keeping the ice temperature as high as possible.

It is not imperative that the freezing plane never penetrate frost-susceptible sub-soil. For example, Figure 1 indicates that if only 5 feet of back-fill is used for a rink at 22°F, the maximum possible heave is 1.5 inches. It should be remembered that Figure 1 represents uncommonly severe conditions.

Insulation and Soil Heating Systems

Either insulation or soil heating can be used to prevent or limit the extent of frost heave. The economic merits of each must be determined for individual situations, however, as was outlined for the permanent operation of the building at sub-freezing temperatures.

Alleviating Frost Heave Problems and Extending the Operating Season

Some reduction in frost heave in existing rinks can be obtained by raising the ice temperature during the colder months. In addition, Figure 3 shows that frost penetration can be reduced by raising the temperature in the building during the off-season. For example, if frost heave occurs with 5 feet of back-fill (or 2½ inches of insulation), then increasing the average off-season air temperature in the building from 60 to 80°F should eliminate the heaving. It is also apparent that supplementary heating can be used to extend the operating season. For example, increasing the off-season temperature to 80°F would allow a 7½- to 8-month season instead of a 6-month season. Probably the best method of raising the average off-season air temperature is to melt the ice and warm the frozen ground at the end of the season by circulating warm brine through the system.

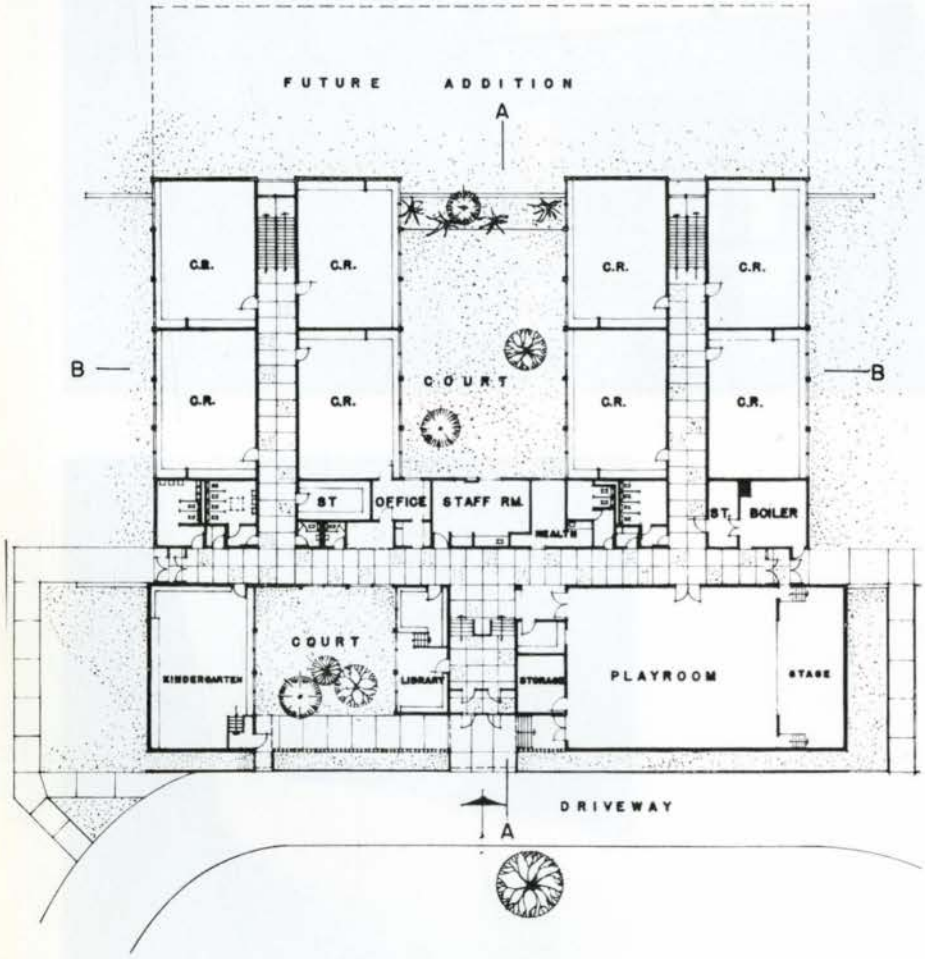
Conclusion

Provided the mechanism of frost heave is understood, difficulties associated with it can be prevented at reasonable cost. For plants operated continuously at below-freezing temperatures it is probable that the most satisfactory solution is to provide heat. In plants operated on a seasonal basis the use of non-frost-susceptible back-fill and insulation may be preferable.

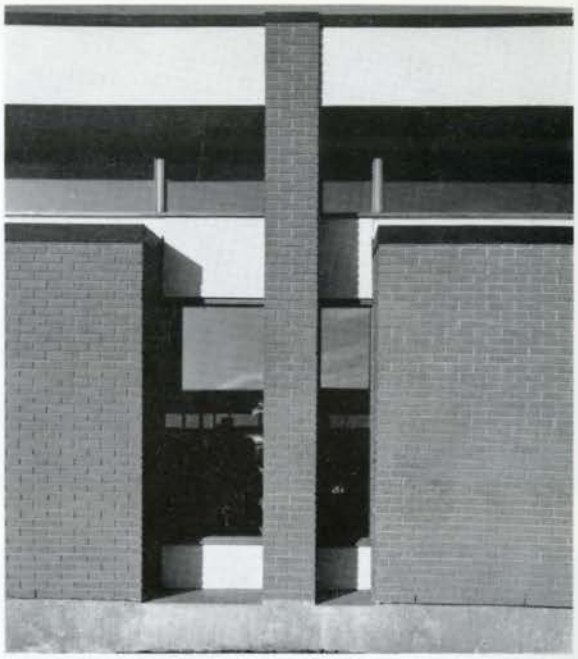
The Hillsdale Public School

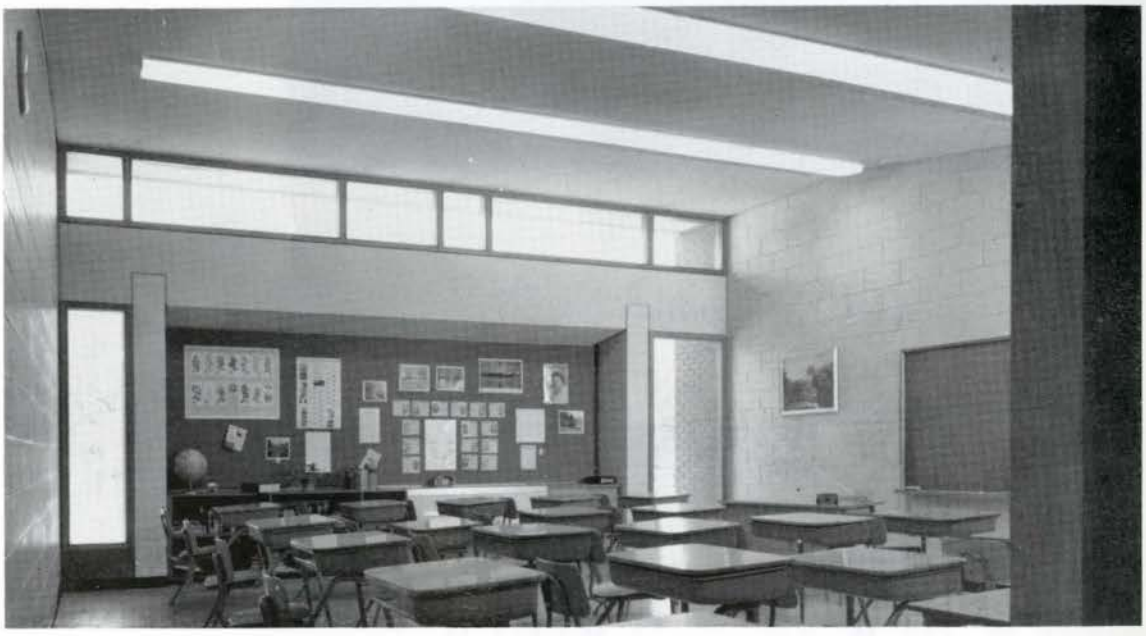
Oshawa, Ont.
Architect/Jackson, Ypes & Associates
Contractor/Newman & Bros Limited

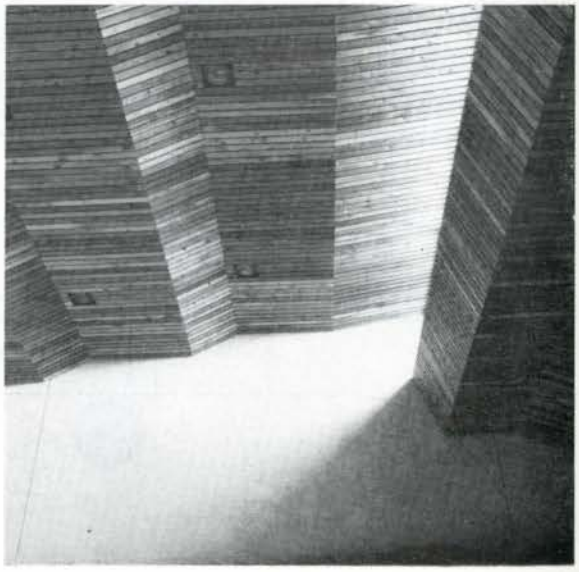
Poured reinforced concrete columns and beams support precast concrete floor and roof slabs. The concrete frame is exposed and infilled with glass and brick panels. Exterior panels are brown brick, frame of white pointed concrete, aluminum windows with charcoal colored sashes.



FLOOR PLAN



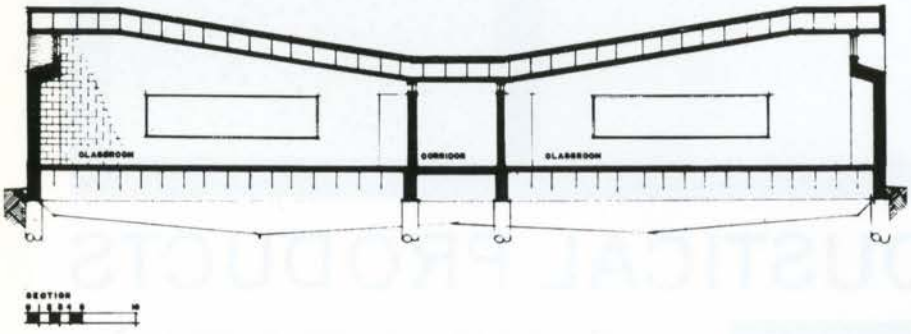


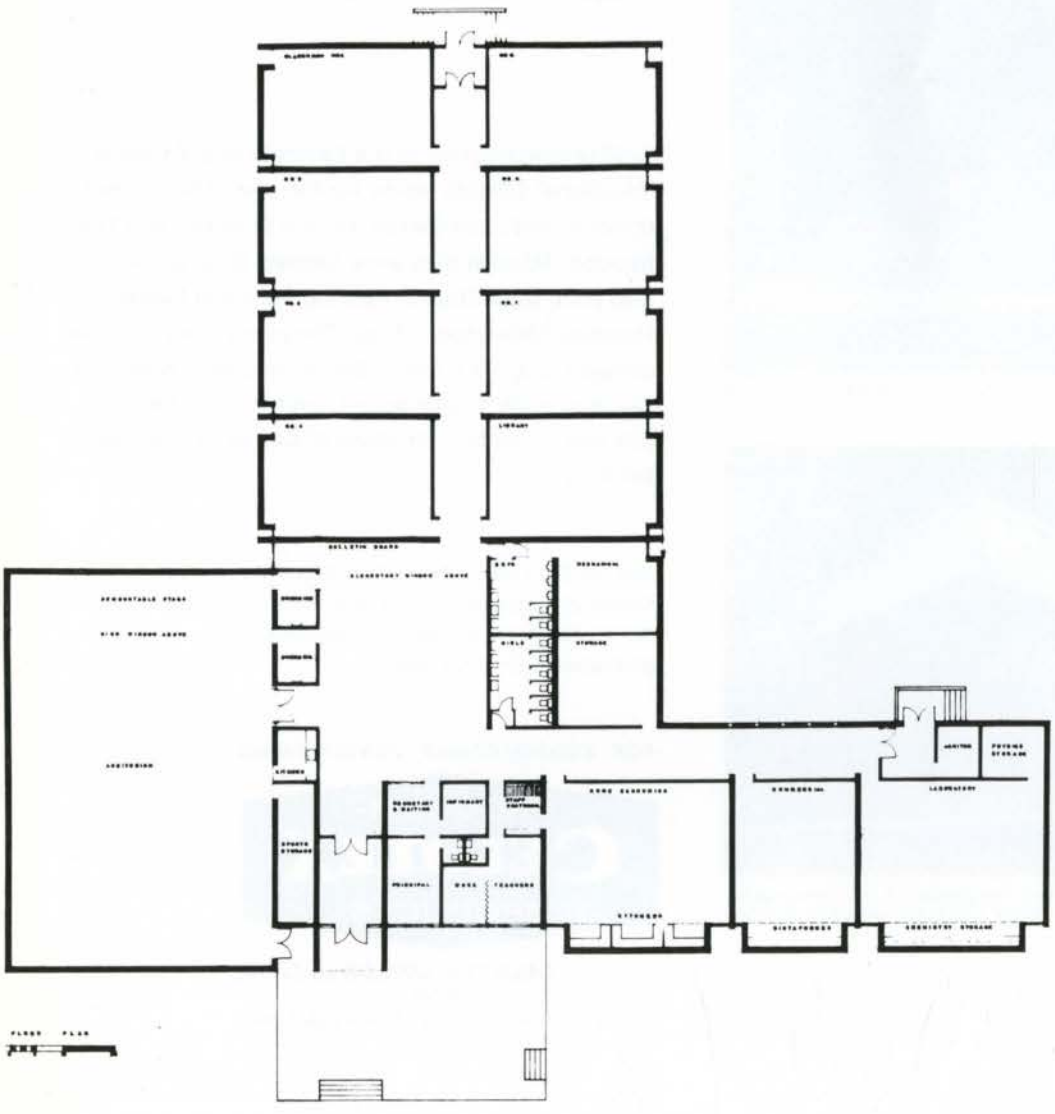


St Norbert Collegiate

St Norbert, Man.
Architect/Etienne J. Gaboury
General Contractor/Trident Construction

Structural system is masonry bearing walls on concrete grade beams and piles; 2½" concrete slab over steel joists on the ground floor. Roof structure is wood sheeting over short span wall joists in the classrooms and small spaces, and long span steel joists in the auditorium. Colored concrete brick is used for the exterior and painted concrete block walls for the interior.





■ SOUND CONDITIONING
■ BEAUTY
■ FIRE PROTECTION

CWECO ACOUSTICAL PRODUCTS

Yorkdale Vocational School, North York. *Architects:* Marani, Morris & Allan, Toronto.

Eastdale Vocational School, Toronto Board of Education. F.C. Etherington, chief architect. *Associate architects:* Henry Fliess and James A. Murray, Toronto.

Top left: 12" x 12" x ½" Linear Random "Silvertone" Tile.
Centre: 12" x 12" x ¾" Fire-Tested Natural Fissured Mineral Tile.
Top right: 12" x 12" x ½" Fire-tested Full Random Mineral Tile.

Ceiling construction in the Eastdale and Yorkdale Vocational schools called for the use of fire-tested mineral tiles; and Cweco Natural Fissured and Full Random Mineral tiles were chosen. Both schools also used quantities of Full Random and Linear Random "Silvertone" tiles. The above tiles in three designs, are but a few of the many Cweco products which provide sound/sound conditioning, beauty and fire protection for many of Canada's fine new buildings.

Ask for the Cweco Acoustical Manual and the Cweco Acoustical Fire/Tested Mineral Tile brochure covering products, specifications and application methods.

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"Promotion of Highest Standard in Practise of Architecture"

Editorial Board Members from all Regions in Special General Meeting Define RAIC Journal's Function and Plan Policies and Editorial Programs Designed to Best Serve Professional Needs.

Part I

"The promotion of the highest possible standard in the practise of architecture in the nation" was defined as the function of the RAIC *Journal* and its guide to editorial policy at a special general meeting of the Editorial Board in Toronto October 30 - 31.

Purpose of the meeting, attended by Editorial Board members and representatives from all parts of Canada, was to examine in detail the *Journal's* editorial programs and practices, discuss how the Journal can be of maximum interest and value to the practising architect, and offer suggestions to guide the expenditure of Journal resources over the immediate future.

It was the first meeting of its kind in the *Journal's* forty one year history, and it recognized that:

- The nature and requirements for architectural practise are changing and, among other things, the changes involve re-orientation in architect's thinking and re-definition of the architect's services and responsibilities to the public.
- The function of the Institute is to study the nature of the change and provide its members with information and professional guidance.
- The role of the *Journal* is to be the vehicle of communications, the recorder, interpreter and commentator for the Institute, the provincial associations and the membership.
- There is nothing incompatable, undesirable or unprofessional about the advertising sections of the *Journal* in relation to the editorial; both are means of communication. At the same time the *Journal* does try to guide manufacturers in the production of better and more useful literature. The *Journal* is a successful business publication, and must continue to be so. Since 1962, when it was relieved of responsibility to be a major contributor to Institute general revenues, it has devoted more and more of its resources to improvements in the magazine, support of Institute activities, payment to contributors, and financial support of causes and projects in the furtherance of its function.

The meeting was preceeded by a reception in the evening of 30th October which gave Board members an opportunity to meet *Journal* full and part time staff, editors of departments and major contributors, and members of the *Journal* Committee. The President *RAIC,* Dr F. Bruce Brown *(F),* welcomed the members, and emphasized the vital role of the *Journal* in keeping the membership abreast of broadening Institute and Provincial Association activities.

Opening the session on 31st October, the chairman H. D. R. Buck, stressed that the success of the *Journal* depended upon its ability to make a vital contribution to the architectural profession and to fill a major need in the architect's practice. To this end, it was imperative that the *Journal* in future hold such meetings periodically as only at such meetings could sufficient time be devoted to critical review of what we were doing, how we were doing, and what we should be doing.

Prior to consideration of reports of subcommittees appointed earlier to study current editorial policies and programs, the Managing Editor, Walter Bowker, gave his views on the publication of the *Journal* and outlined some of the considerations affecting management with which the members might not be too familiar.

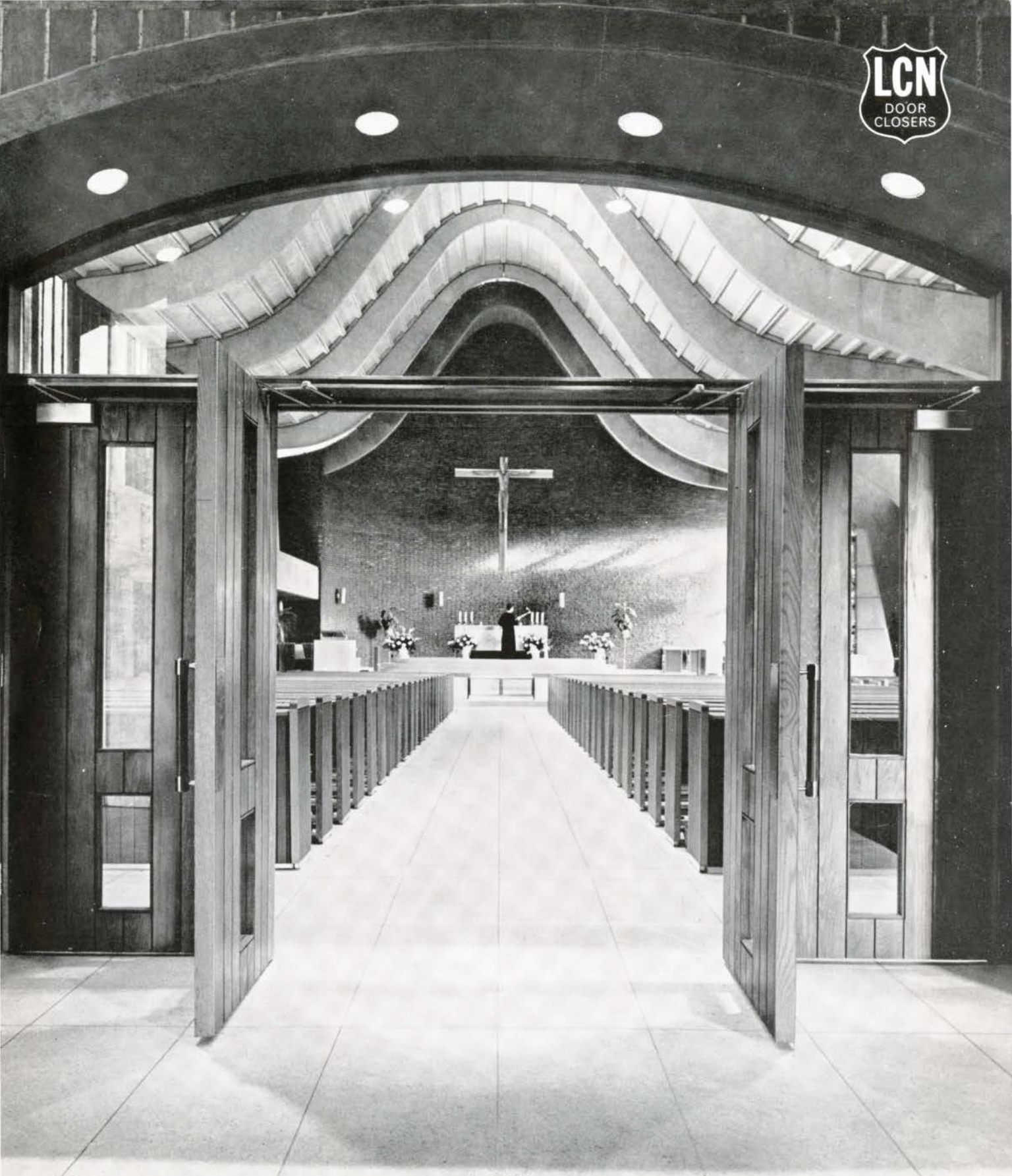
The purpose of the meeting, he said, was to decide what constituted the best magazine for the RAIC and for the profession, and the best method of providing it, all within the framework of a successful business operation; successful because, to him, it was unrealistic to consider the operation in any other light. We were in a highly competitive field which was dominated by two very large and powerful publishing houses, Southam, with about 52 publications, including our two direct competitors in the field, the *Canadian Architect* and *Architecture-Batiment - Construction;* and in Vancouver the *Journal of Commerce;* and secondly, the Maclean - Hunter publishing group. Both of these groups had immense financial and administrative resources and it was fair to say that they would enter any part of the publishing field where they could see profit. Mr Bowker said he was not implying that there was anything wrong with this strictly business attitude towards publishing, but it did point up why a realistic view must be taken of the operations of the *Journal;* why it must give good value to its advertising clients. It was apparent to him that the existing editorial organization, established many years ago, was no longer the best kind of organization to achieve the *Journal's* purposes. Adequate and properly balanced editorial and management staff was the first and basic requirement. He thought it was not practical for one individual to be completely responsible for the execution as well as the administration of all aspects of publishing, and the Board was aware of recent staff problems. He was therefore very happy to be able to announce the acceptance, in acting capacity, of an associate editorship by Mr P. M. Keenleyside, of Toronto, a member of the Board and an architect who, as a member of the RAIC Committee on the Profession, had already made an extensive contribution to the affairs of the Institute. The Managing Editor added that Mr Noel Hancock, while no longer full time assistant editor, was continuing, with Mrs Hancock, on a part time basis; and a new full time editorial assistant, Miss Annabel Gerald, had been appointed.

A second basic requirement was the freedom and ability to be completely objective in the editorial approach.

The Managing Editor continued with an explanation of the *Journal's* business affairs, including administration, advertising ,circulation and promotion. He noted that, as a result of the decision by the RAIC Executive, students of Canadian schools of architecture now receive the *Journal* without cost upon graduation. Paid circulation had very substantially increased over the past two years, and, in the architectural and design field in Canada, the *Journal's* circulation far exceeded any Canadian or foreign publication. The *Journal* also carried on a number of other activities not directly

part of publishing the regular monthly issues and the Managing Editor quoted from a report by the Chairman of the Journal Committee to the RAIC Executive Committee: "The Journal has been able to perform increasing services for the Institute which result in considerable net financial savings to the Institute, but represent additional work load and expense to the *Journal*. A full cost to the *Journal* of these services does not appear on the financial statement since the time of the staff is not being charged. The membership list is now a *Journal* responsibility and has been included in *ADA*, the Architectural Directory Annual, 1964. For the past three years the *Journal* has organized and conducted the annual Product Literature Competition of the Canadian Joint Committee on Construction Materials. The annual reports were edited and printed in the *Journal* for the first time this year, with an addition of an eight page financial statement circulated to the membership only. The *Journal* office staff assisted Professor W. G. Raymore in preparations for his survey of the profession for the RAIC Committee on the Profession and produced and distributed survey literature. This year the *Journal* had undertaken the complete production of the Massey Medals brochure illustrating the 94 finalists, in the form of a reprint from the November issue. This replaced the Massey Medal exhibition brochure produced for the 1961 competition by Institute Headquarters". Also, during this summer, the chairman, Mr. Buck, had been requested by RAIC Headquarters to organize a panel exhibition of recreation buildings by RAIC members to show in Japan during the Olympics. To assist Mr Buck the Journal staff (at RAIC Headquarters' expense) designed, produced and shipped the panel exhibition, utilizing material gathered by Mr Buck. *(continued on page 53)*

Nave to narthex:
St. Gerard Majella Church & Presbytery,
St. Jean, Quebec.
Affleck, Desbarats, Dimakopoulos, Lebensold, Sise; Architects



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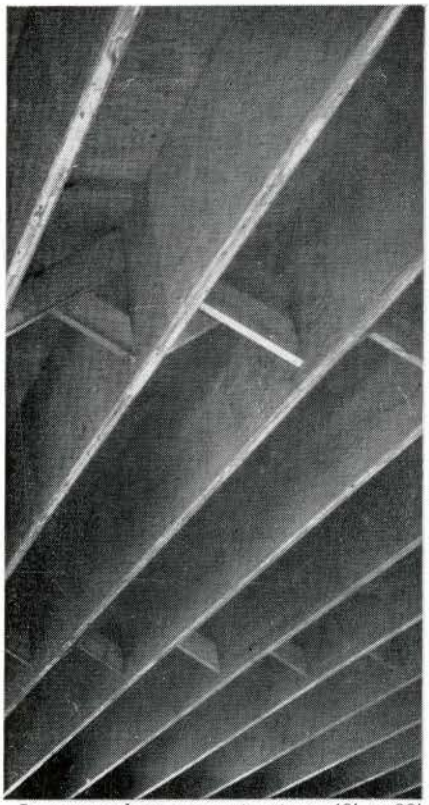
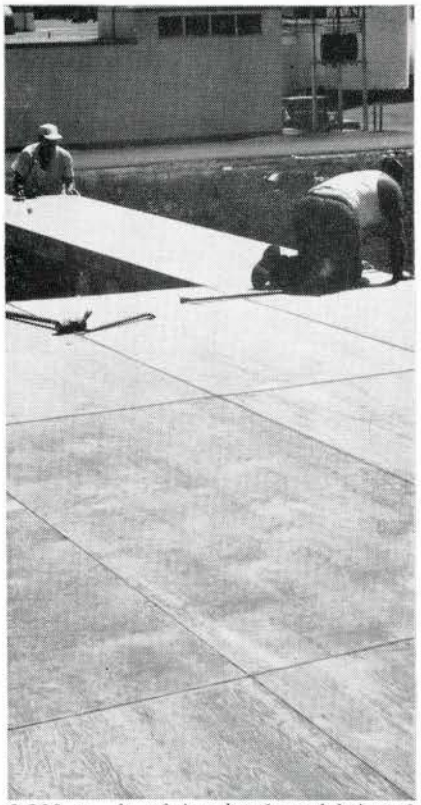
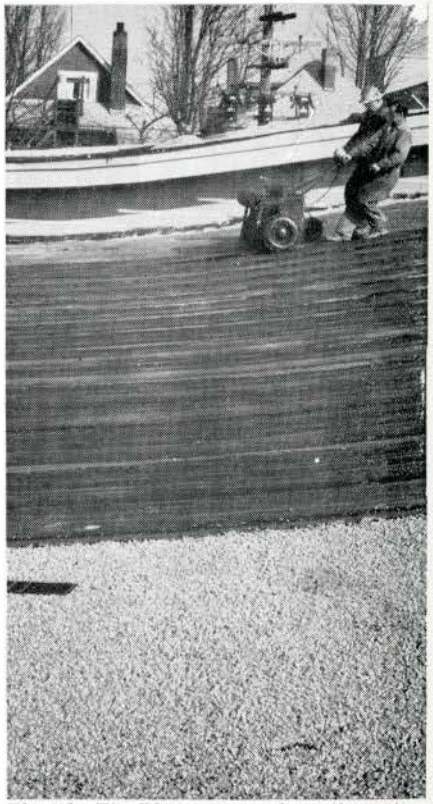


Low-cost clear span structure 40′ x 60′ uses Fir Plywood box beams under T & G plywood decking for built-up roof. Sebringville, Ont. Fire Hall. Architect – R. M. Ritchie.



3,200 sq. ft. of insulated prefabricated plywood stressed skin roof panels were installed over laminated beams in less than a day. London, Ont. Lumberteria. Owner-builder – R. Kernohan.



Flexible Fir Plywood panels nail easily to joists on gently curving roofs. Light weight structure utilizes 2″ rigid insulation under built-up roof. Vancouver, B.C. Safeway Store. Architect – F. E. Roy.

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S-64-G

FIELD OFFICES: Vancouver, Edmonton, Winnipeg, London, Toronto, Ottawa, Montreal, Moncton

The first issue of the Architectural Directory Annual was produced and the Journal had received many compliments upon it, as well as a number of comments about omissions in the listings of the architectural firms. These will be corrected in the 1965 edition, now in preparation.

The meeting then turned to reports of sub-committees appointed in advance to examine and report on various aspects of *Journal* activities and operations.

"Terms of Reference" Sub-Committee, under W. N. Greer, felt that adequate, direct, official communication with provincial associations was lacking. K. E. R. Kerr thought provincial editorial committees no longer were essential since the *Journal* had adopted the practice of sending travelling editors across the country. He thought the latter a better system. W. F. Kelly and Alton Bowers agreed. Boyle Schaeffer also agreed, but said that the Manitoba Association had for some time required that its Editorial Board member be a member of Council. He felt that duties of provincial committees and regional editors should be clarified. Jean Gareau felt provincial editorial committees were useful. He was against "one man juries" for selecting work to be published, such as travelling editors, might, in effect, constitute. He felt there was no need to translate articles; they could be in either French or English.

It was pointed out during the discussion that one advantage of having senior officers of Provincial Associations as Editorial Board members was that they possessed an intimate knowledge of Association affairs and could have available the services of Association full or part time staff. The meeting finally adopted unanimously the following resolution, moved by Mr Greer and seconded by Mr Bauld:

"That the Editorial Board request the Journal Committee to arrange for each Provincial Association to appoint a representative to the Editorial Board who is a member of Council, and has as part of his official duties all contacts with the RAIC *Journal;* and that it be left to the discretion of the Journal Committee whether these new appointments are in addition to or in lieu of the present representation; and that Provincial Editorial Committees may be formed at the discretion of Provincial Associations."

"Method of Presentation of Buildings" sub-committee, under John Spence, recommended techniques and procedures. The members, with the exception of Boyle Schaeffer, were in favor of the present method of presenting building. J. A. Langford, who was not able to be present, forwarded a recommended text for a "building information sheet" for *Journal* use, which will be distributed. There was considerable discussion on the problem of duplication of publication of buildings in other magazines,. and the meeting generally felt that if the *Journal* was prepared to spend a lot of time and money on a good presentation of a project, then it should enjoy first rights. Denis Tremblay favored presentation of building types, rather than individual buildings.

(to be concluded in the February issue)

Present at the meeting were: Derek Buck, Chairman, Toronto; W. A. Greer, Vice-Chairman, Toronto; Tom Bauld, Halifax, representing the Atlantic Provinces; Alton M. Bowers, Calgary; Jacques deBlois, Quebec; W. F. Kelly, Regina; K. E. R. Kerr, Vancouver; Boyle F. Schaeffer, Winnipeg; Peter Tillman, London; Denis Tremblay, Sherbrooke, P.Q.; and from Toronto, Peter A. Allward, Douglas B. Brown, W. E. Carruthers, Michael Clifford, R. G. Cripps, F. E. Fletcher, Alexander B. Leman, Loren A. Oxley *(F)*, John G. Spence; P. M. Keenleyside, acting Associate Editor; Walter B. Bowker, Managing Editor; Fred W. Price, Ottawa, RAIC Executive Director.

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There is a wide variety of directories and catalogues that list the products of Canadian Industry. It's worth your while to consult them frequently, and to select the materials and components you specify from their pages.

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Research confirms that imported products are too frequently specified despite the ready availability of Canadian equivalents. The Ontario Government's Manufacturing Opportunity Shows have proved the value and quality of thousands of Canadian-made items—and diverted millions of dollars in orders to Canadian industry.

When the price and quality are right, make it a habit—look for and specify Canadian products.

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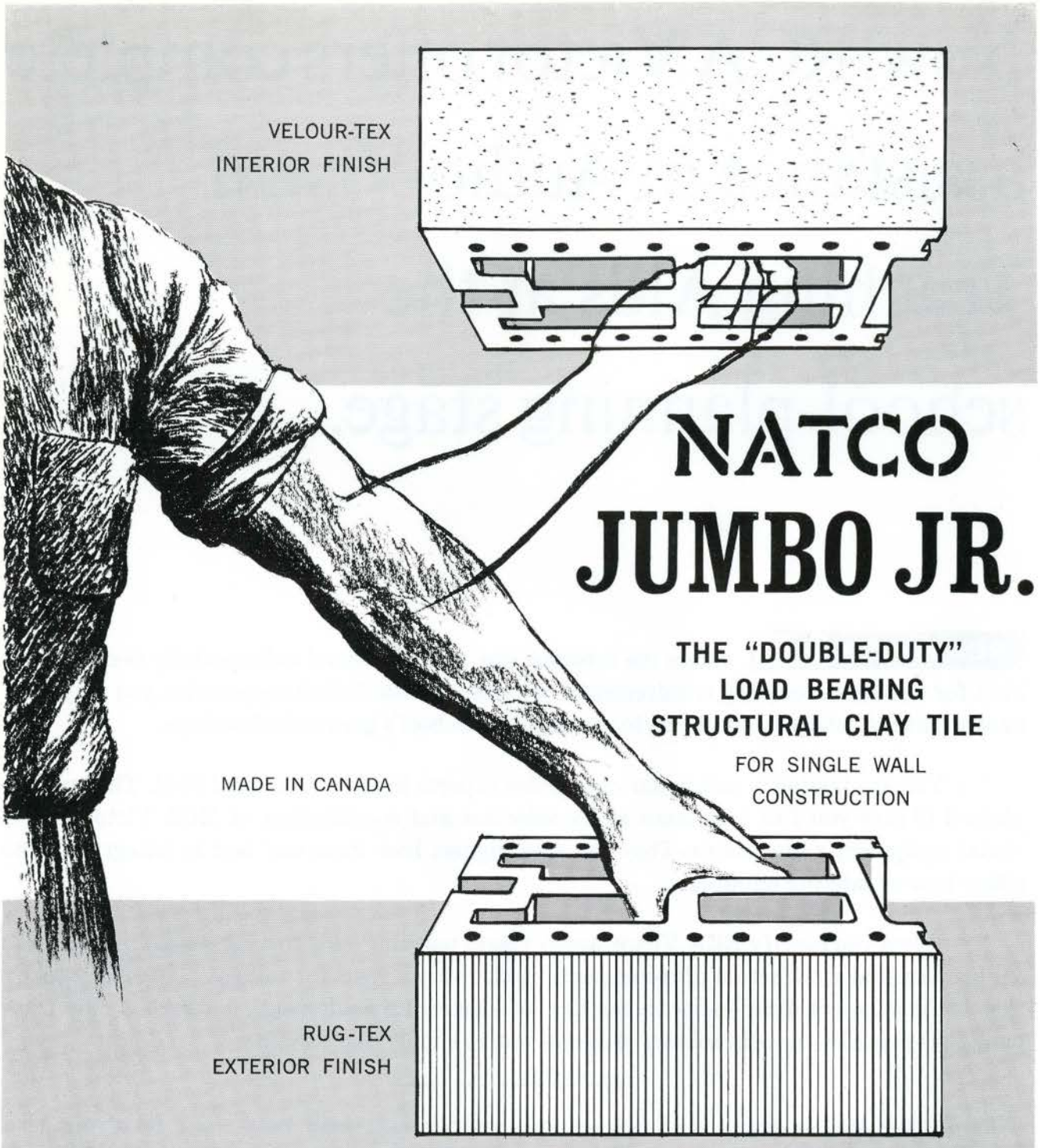

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When you specify RCA Victor audio-visual teaching aids to a school-board, you have the professional satisfaction of recommending two very important things . . . one, a company that is the acknowledged leader in the field of electronics equipment . . . two, the only company that provides the convenience of single-source supply and service.

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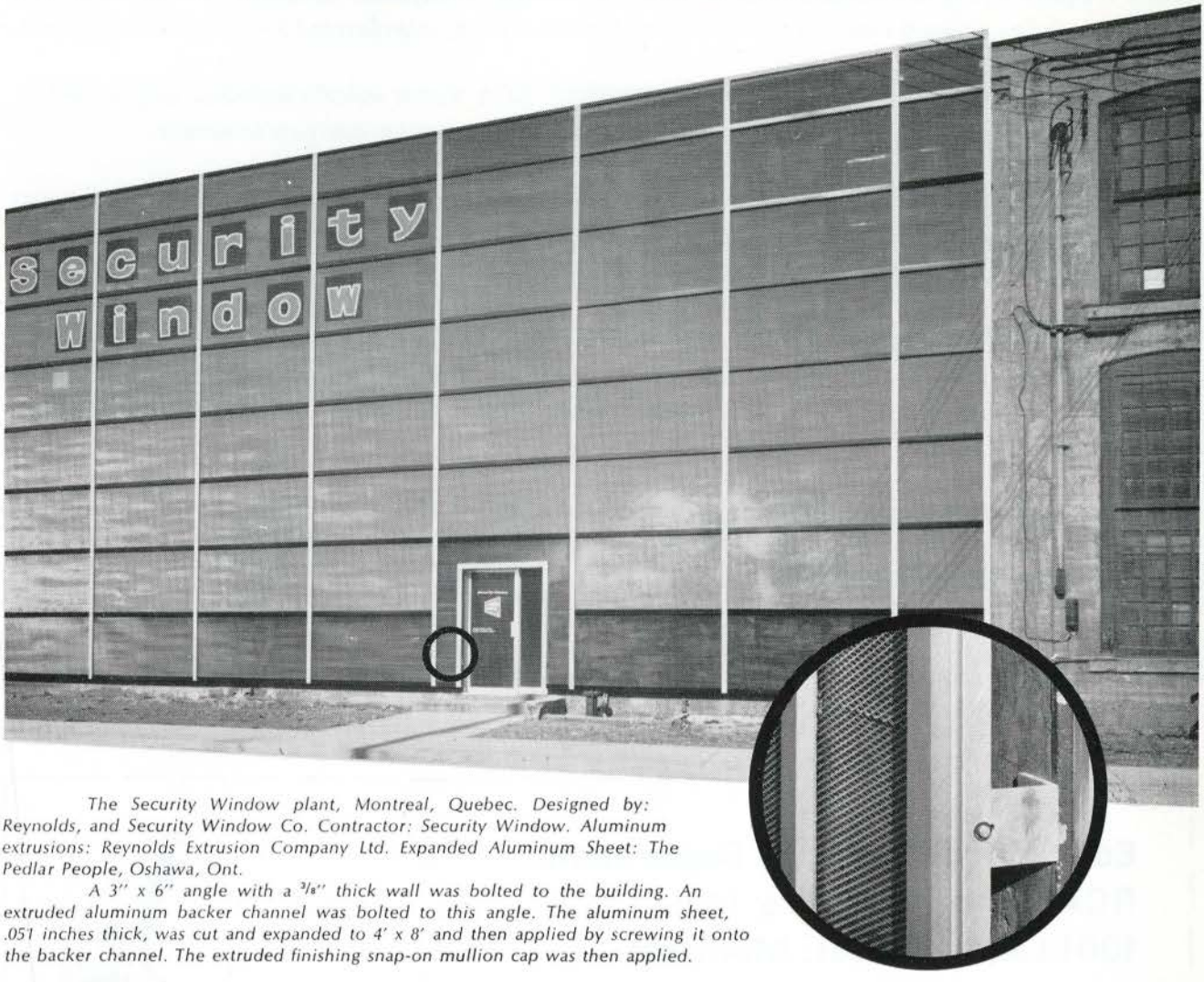

The Security Window plant, Montreal, Quebec. Designed by: Reynolds, and Security Window Co. Contractor: Security Window. Aluminum extrusions: Reynolds Extrusion Company Ltd. Expanded Aluminum Sheet: The Pedlar People, Oshawa, Ont.

A 3" x 6" angle with a 3/8" thick wall was bolted to the building. An extruded aluminum backer channel was bolted to this angle. The aluminum sheet, .051 inches thick, was cut and expanded to 4' x 8' and then applied by screwing it onto the backer channel. The extruded finishing snap-on mullion cap was then applied.

Design flexibility and unique utility have created thousands of forms and functions for aluminum in modern architecture. The latest: the aluminum facing used to renovate the front of the 50 year old Security Window plant.

An expanded aluminum sheet was screwed to an extruded aluminum frame, which had been bolted to the building. An extruded finishing strip was then snapped on.

The advantages of this type of renovation are the ease of application and the low cost. No windows are needed since you can easily see through from the inside.

A first of its kind in Canada, this new use for aluminum was designed by REYNOLDS, who also supply a broad spectrum of creative ideas on the architectural uses of aluminum.

REYNOLDS new easy-to-use catalogue lists thousands of extruded shapes. Use it when you specify aluminum. For a copy see your REYNOLDS representative or write:

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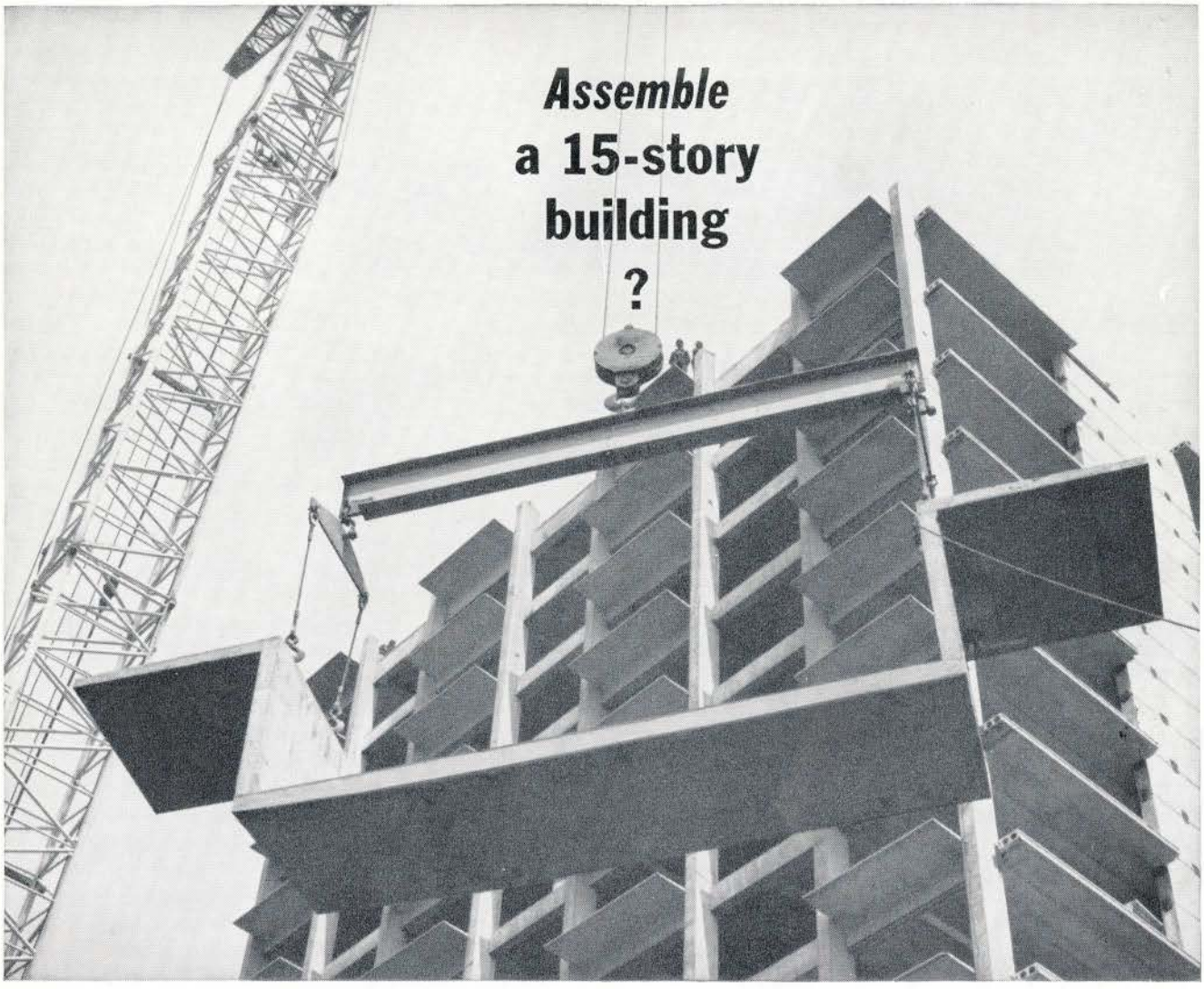

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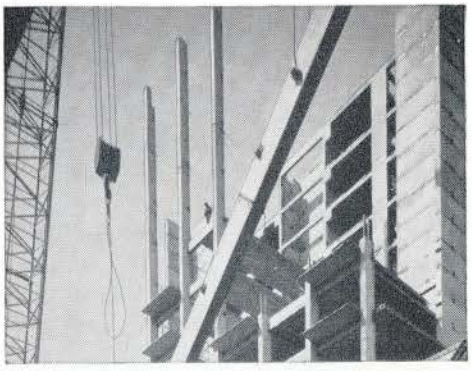
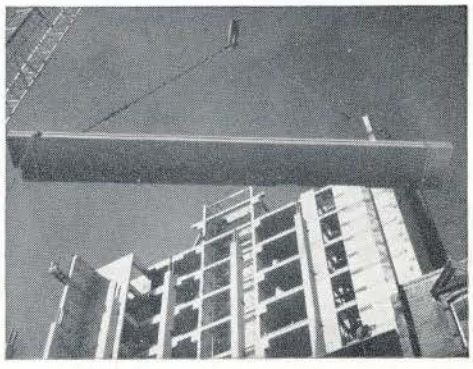
and: Construction time cut in half, costs cut by 15%! The seemingly impossible is commonplace in construction with good planning. Here, a carefully worked out design, taking full advantage of precast concrete units, enabled MJL Construction Ltd. to assemble for the owners, Peter Vida Inc., this 15-story, 112-suite apartment building. This project was completed in record time, at impressive savings, and with a minimum of traffic interruption on a narrow street.

These are some of the astonishing facts about Sussex House, Montreal: There are 1,043 separate precast concrete elements in the building, ranging from 12-ton columns to 600-pound balconies • Every single piece was consecutively numbered and paint-coded for correct assembly • The building is North America's tallest completely precast concrete structure • The roof-top swimming pool was also built of three large precast concrete sections.

Credit is due to: Francon Ltd. — *Suppliers of precast and prestressed concrete units;* Fish, Melamed, Croft & Grainger — *Architects;* Blauer Horvath Taylor Associates — *Consulting Structural Engineers:* MJL Construction Ltd. — *General Contractors.*





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Showcased in Dofasco's new office building

Steel Piles

The building is supported on piles, because the site on industrial fill ruled out a foundation. 136 steel tubes were driven approximately 70 feet to bedrock, then filled with concrete. Steel piles drive quickly and are readily checked for straightness by sighting down the inside of the tube.

Fabricated Steel Beams

The 42-inch deep girders were fabricated from steel plate. Perforations in the girders accommodate heating ducts, electrical conduits and piping for maximum concealment of facilities with minimum floor thickness.

Composite Floor with Cellular Steel Decking

Cellular steel flooring was welded to the beams with Nelson studs. Three inches of concrete were poured on top. The floor load is carried by the steel deck; the concrete fill serves as the structural compression flange. The cellular flooring provides raceways for electric power and communication wires.

Steel Curtain Wall

The curtain wall treatment was developed after extensive research that led to a wall which includes thermal barriers and is double-glazed.

In-fill panels have porcelain enamelled steel on exterior surfaces, and baked enamel steel for interior walls. Two inches of insulation between the two layers are approximately equal to 10 inches of masonry. The comparatively thin wall (only 3½ inches) provides additional usable interior space. Because the curtain wall weighs only 12 lbs. per square foot, it was possible to reduce the size of foundation and structural steel.

Exterior Steel Paneling

The ground floor walls are of cement block covered with porcelain enamelled steel panels. The 4'4" x 9'8" panels are laminated to ¾" plywood, which is backed by galvanized steel. These panels, that contribute distinctive and enduring beauty, are anchored to the cement blocks with stainless steel fasteners.

Steel Clad Cement Blocks

This is among the most significant new techniques developed for the Dofasco building. Before or after the blocks are laid, pre-formed steel pans are attached with tile cement. Some pans received a baked-enamel finish before application. Others were painted on site. An infinite range of colours and finishes can be achieved. The steel surface offers excellent resistance to damage, yet the cost is less than for glazed block or vitreous tile.

- ☐ PERFORATED STEEL GIRDERS
- ☐ INSULATED STEEL CURTAIN WALL
- ☐ STEEL CLAD CEMENT BLOCKS
- ■ **PROGRESSIVE IDEAS IN STEEL**

Steel Ceilings

The largest perforated steel ceiling pans ever fabricated, 4'8" x 4'8", are used in the Dofasco building. Lighting and air handling units are incorporated into the suspended ceiling panels. Lower maintenance costs result from the use of this ceiling technique because these units are hinged for ready access and removal.

Steel Partitions

Efficient office layout now and in the future has been assured by the use of prefabricated steel partitions. Because the partition units conform to standard building modules, they are interchangeable to meet changing needs. In the general offices, partitions were pre-finished with baked enamel for long, maintenance-free service. Steel partitions in the executive offices are covered with a variety of materials, such as wood veneers and grasscloth.

Steel Office Furniture

The clean-lined efficiency of the steel office furniture complements the total design approach. Moreover, the strength and endurance of steel assures a lifetime of unmarred beauty and minimum maintenance.

Steel—the *versatile* material

The sculptured steel screen in the executive lobby symbolizes the many-faceted role of steel in contemporary architecture. Steel is, of course, unmatched for strength and endurance. Moreover, it makes an important contribution to the aesthetic appeal of the new Dofasco office building.

The new Dofasco office building is among the most modern to be found anywhere. Much of its efficiency and clean good looks stem from the extensive use of steel. The building is more than the nerve centre of a growing steel-making complex. It is a showcase of the most modern concepts in the use of steel. Write for a 32-page full colour book describing these techniques in more detail.

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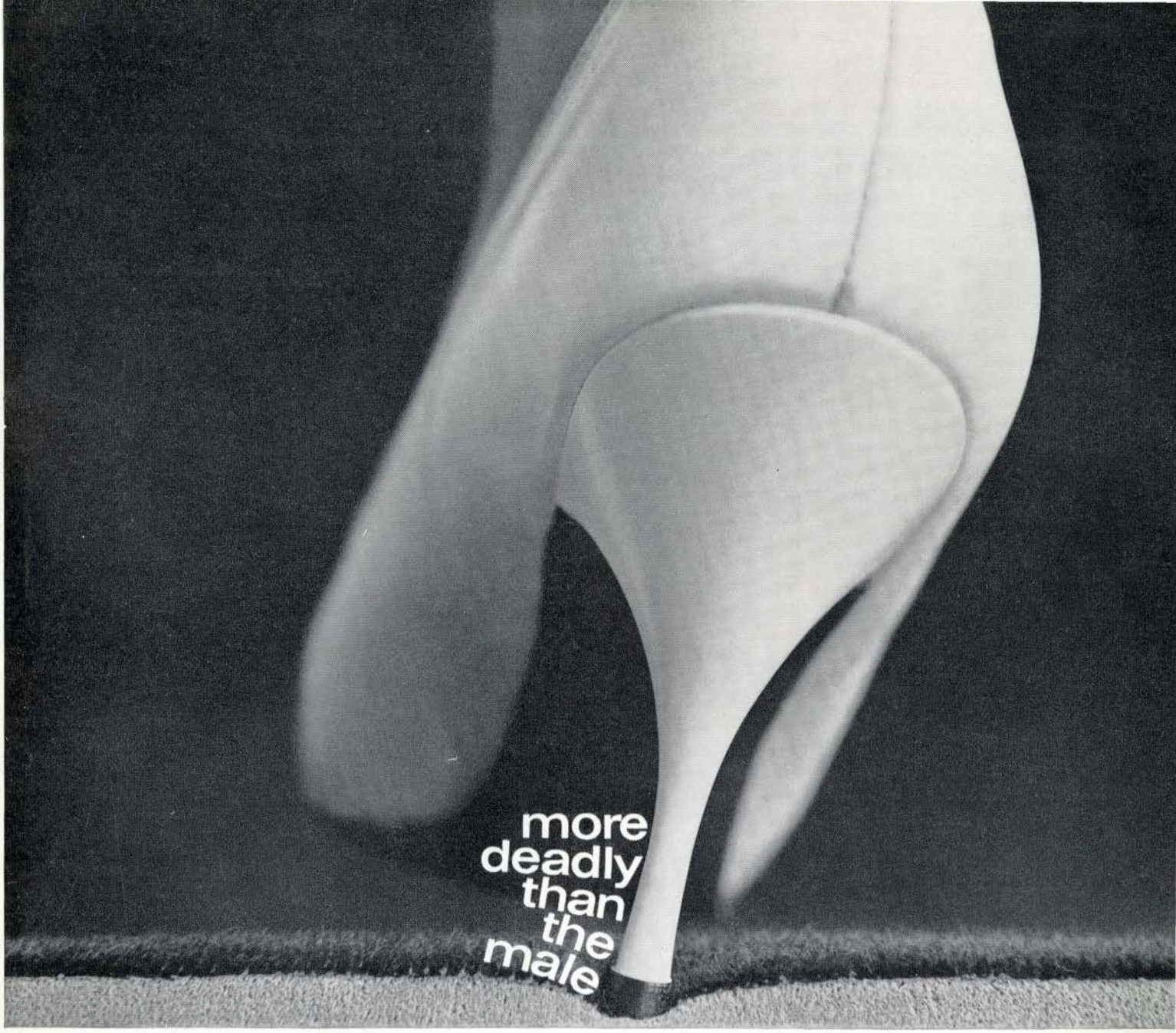

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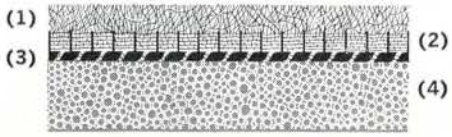

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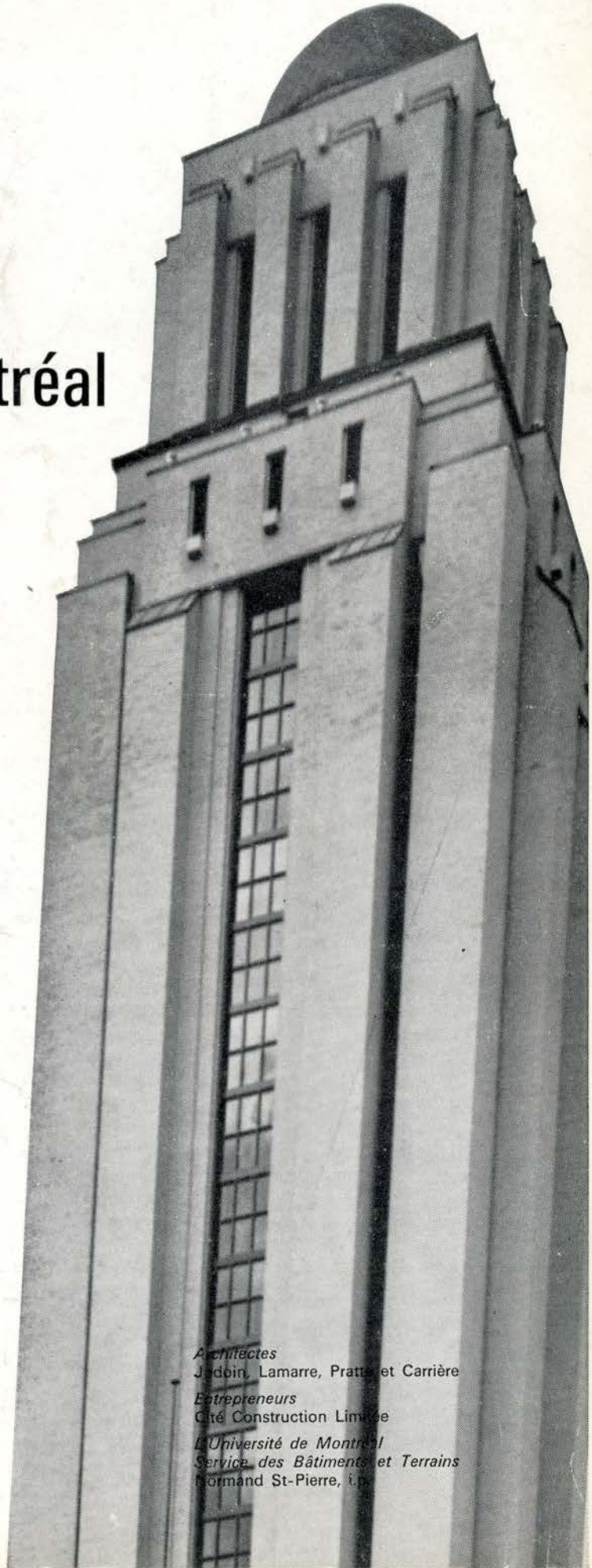

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