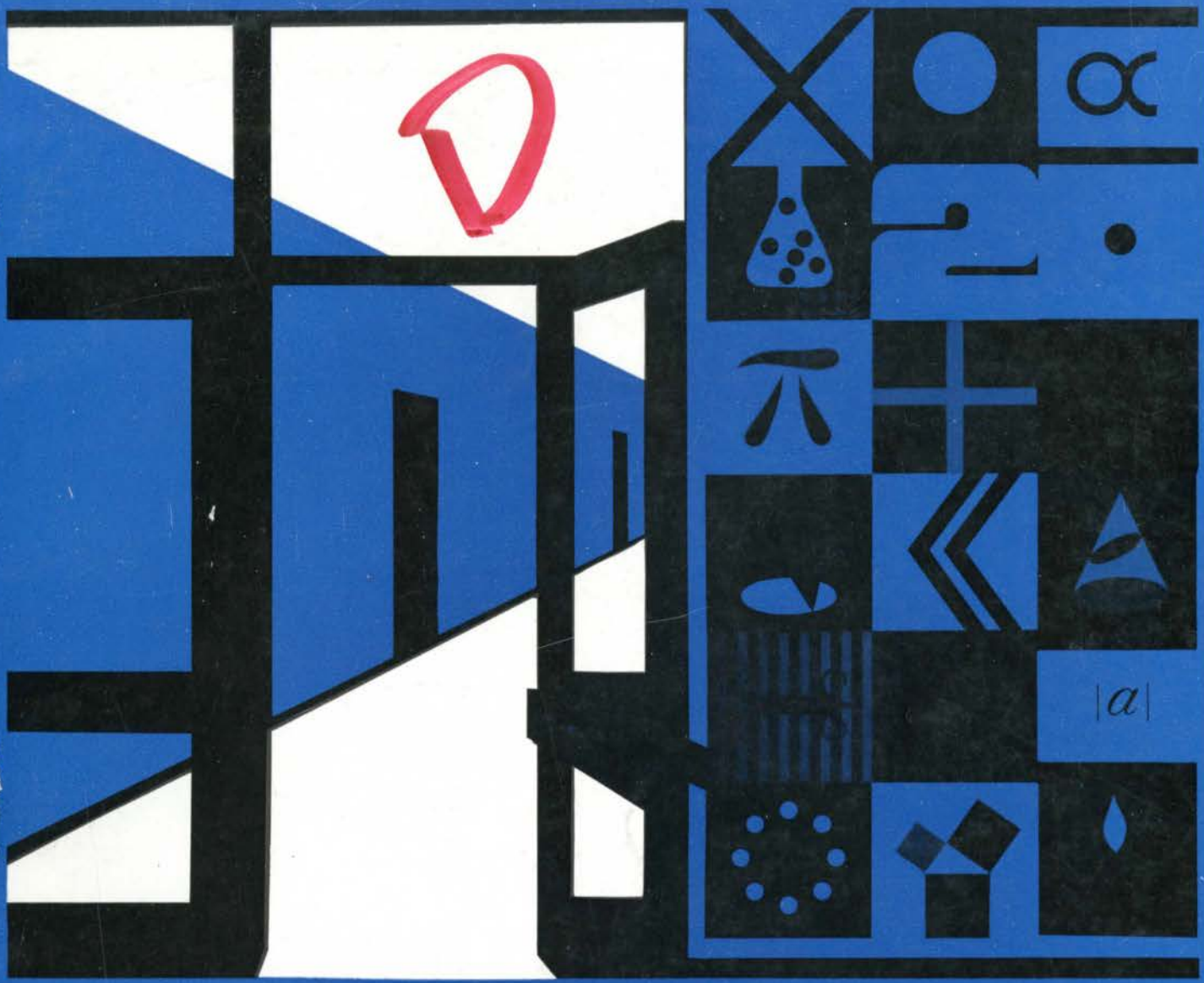

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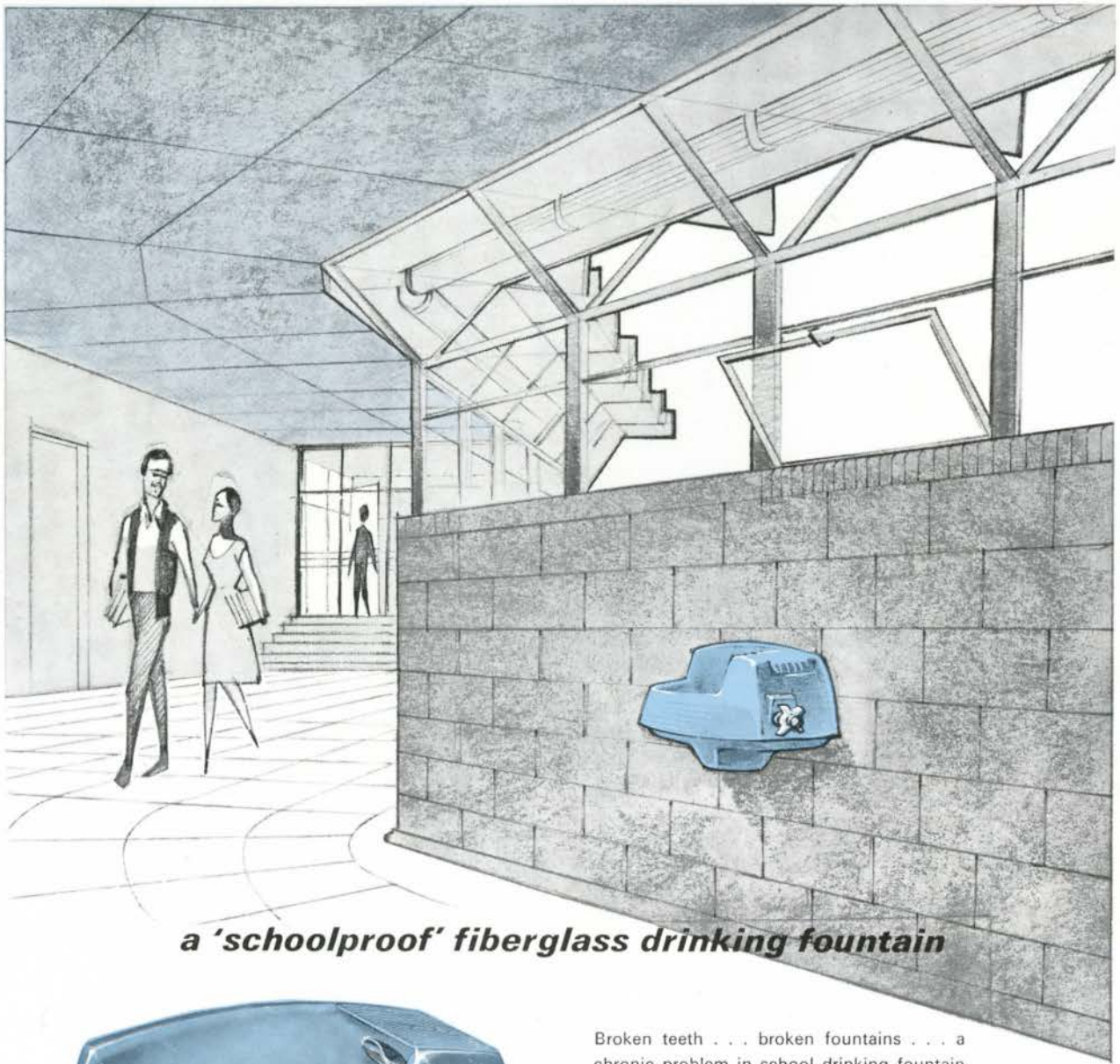

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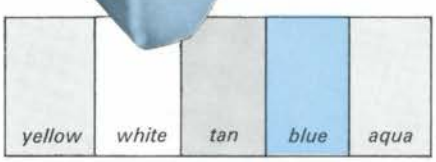

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Serial 457 Volume 40
Number 9

RAIC Journal

SEPTEMBER 1963

SCHOOLS

COLLEGE OF FELLOWS

LEGAL NOTES

TECHNICAL SECTION

DEPARTMENTS

COVER: Corvette Avenue Public School (see p. 66); architect, Jerome Markson; mural by Arnaud Maggs; from a photo by Morley Markson.

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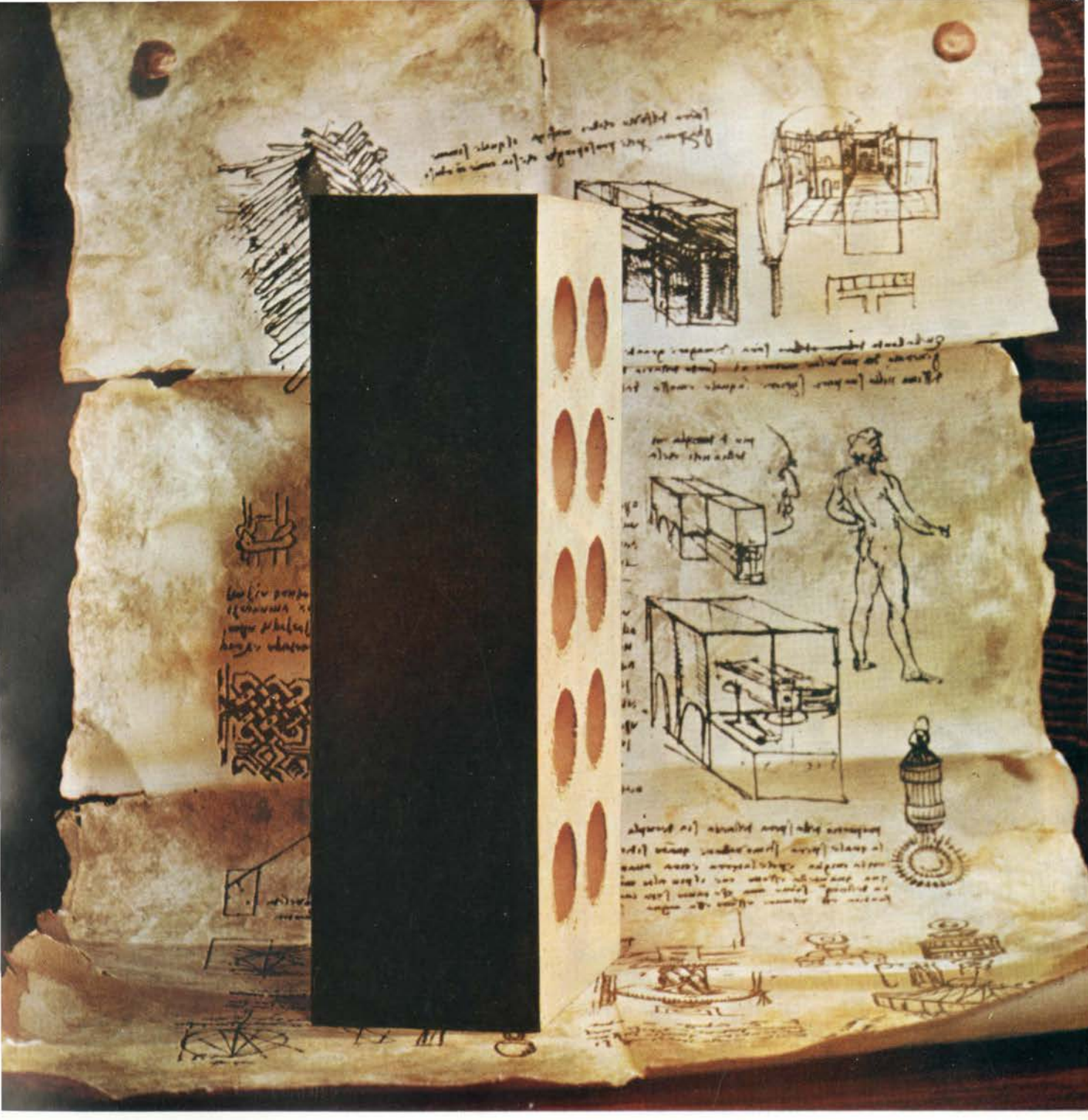

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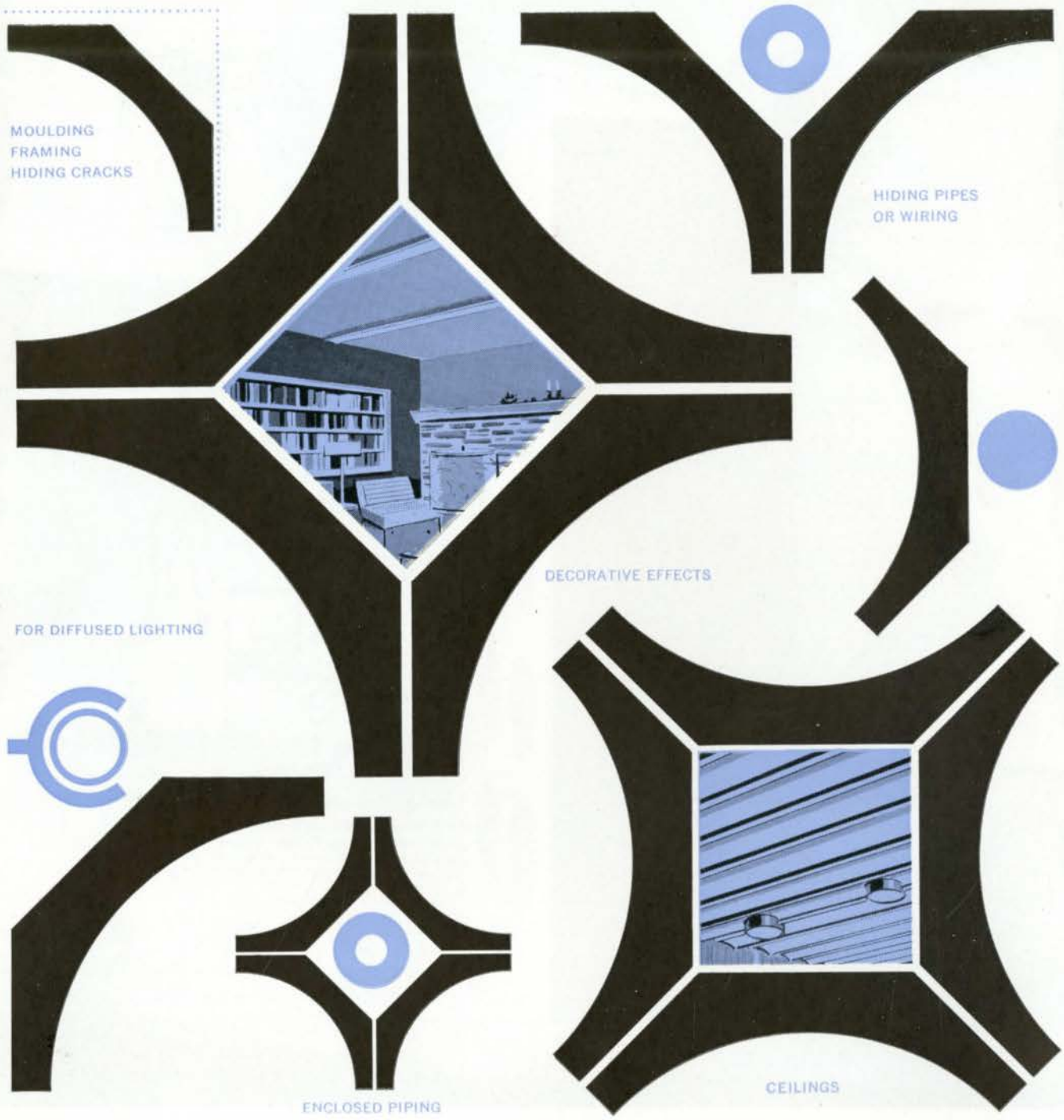

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BOOK REVIEWS

On the left, Seagram building; right, Lever House; facing both Seagram and Lever Houses, with an arcaded top storey, the Raquet Club. Reproduced from "Guide to Modern Architecture."

THE ENJOYMENT OF MODERN ARCHITECTURE

by Peter Collins

GUIDE TO MODERN ARCHITECTURE by Reyner Banham. Architectural Press, U.K. $6.25.

The importance of Reyner Banham's latest book lies in the questions it raises concerning the extent to which it is possible for a layman to enjoy modern architecture. Is it possible, for example, for the general public to enjoy modern buildings in the way so many people enjoy the famous monuments of the past?

Admittedly, much of the popular enjoyment of earlier architectures stems from romantic associations which are not strictly architectural at all. It is no more possible for the lay visitor to Chartres to disassociate the forms he sees from mediaeval piety than it is possible for him to disassociate Versailles from the splendid pomp of the *ancien régime*. But presumably beneath these associations there is a solid pleasure derived from the mere contemplation of forms and the experiencing of spaces, and there is no reason why architects should not create comparable pleasures for the layman today.

Has the architectural profession, for the past fifty years, been doing this? According to Dr Banham it has, and his new book is intended, firstly, to provide laymen with an insight into the nature of the ideals which motivate modern architects, and then to furnish them with illustrated descriptions of thirty-three modern buildings particularly worthy of forming the nucleus of a conducted tour.

The first section, dealing with the nature of modern architecture, is unexceptionable even though one or two of the points made seem debatable; such as the remark that aesthetically, modern architecture is "the creation of sculpture big enough to walk about inside"; his assertion that the chapel at Ronchamp is an example of a church designed functionally "from a rigorous analysis of the ritual to be enacted in it, its needs in terms of space, lighting, sight lines and other forms of human contact"; or his comment that "to blame new functional solutions and new structural methods for the new forms of modern architecture is like blaming the saxaphone for the sound of jazz". But within the limits set by such a short *exposé*, this philosophical analysis is no less admirable than one would expect from a writer of Dr Banham's reputation, and any major adverse criticism his book deserves can only be levelled against the second part.

The buildings described here are, we are told, of a kind which ordinary people would do well to go out of their way to look at, even at the expense of reorganizing a holiday specially for this purpose. All the buildings selected, so Dr Banham tells us, have struck him personally with a power and authority that derive from their being the results of creative acts done in our time, so that they are, for him, what presumably Chartres cathedral is for the enthusiastic Gothicist, and what the château of Versailles is for the enthusiastic Classicist: buildings which enshrine everything that is most beautiful and emotionally inspiring in the spirit of their era, constituting the quintessence of the architectural philosophy of beauty which the age has evolved.

Now admittedly there are few architects today who, if suddenly asked to make a list of the thirty-three modern buildings which they consider, from personal experience, to be most breath-takingly beautiful, would be able to write down a list which they themselves would find entirely satisfying. But at the same time, there are, I suspect, few architects who would accept Dr Banham's list without reservations. His pen has travelled far afield in space and time; from Chandigarh to Kurashiki (including, one suspects, buildings which he has not in fact actually visited himself); and from 1917 to the present day, so he has plenty of buildings to choose from. Yet even so, one cannot help feeling that many of these buildings would be a disappointment to the ordinary layman, and one wonders just how much aesthetic excitement Dr Banham himself got from the Novocomum apartment block in Como or from the Bauhaus at Dessau in its present dilapidated state.

Although Dr Banham pays great attention to the new concept of space in his introductory essay, and asserts, quite correctly, that "the one thing that is undeniably new about modern architecture is the conscious manipulation of space", he frequently selects buildings that have either no striking spatial qualities at all, or, if they have them, are of such a nature (e.g. private apartment blocks) that the spaces cannot easily be inspected by visiting tourists. Moreover, though it may well be a fact that the rubber factory at Bryn Mawr, North Wales, has "one of the most impressive interiors in Britain since St Paul's", there are surely other buildings which have almost as exciting a spatial quality, yet which are more accessible; for example the United Nations auditorium in New York or the UNESCO auditorium in Paris.

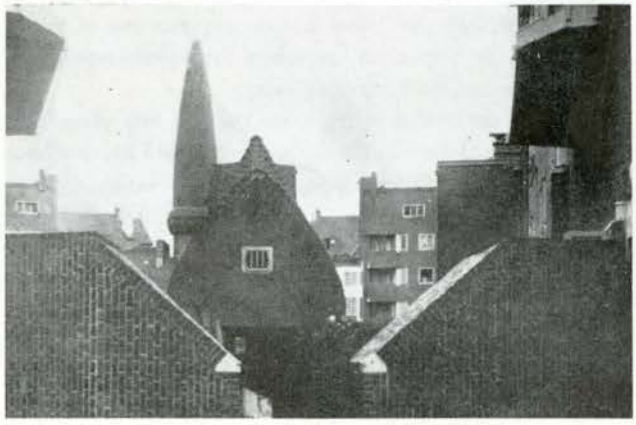
It seems probable, in fact, that the key to the selection of so many of the examples in Dr Banham's book is his statement that the Bryn Mawr factory was "one of the first major pieces of post-war British architecture". Similarly, perhaps the inclusion of the Bauhaus at Dessau (illustrated with old photographs taken

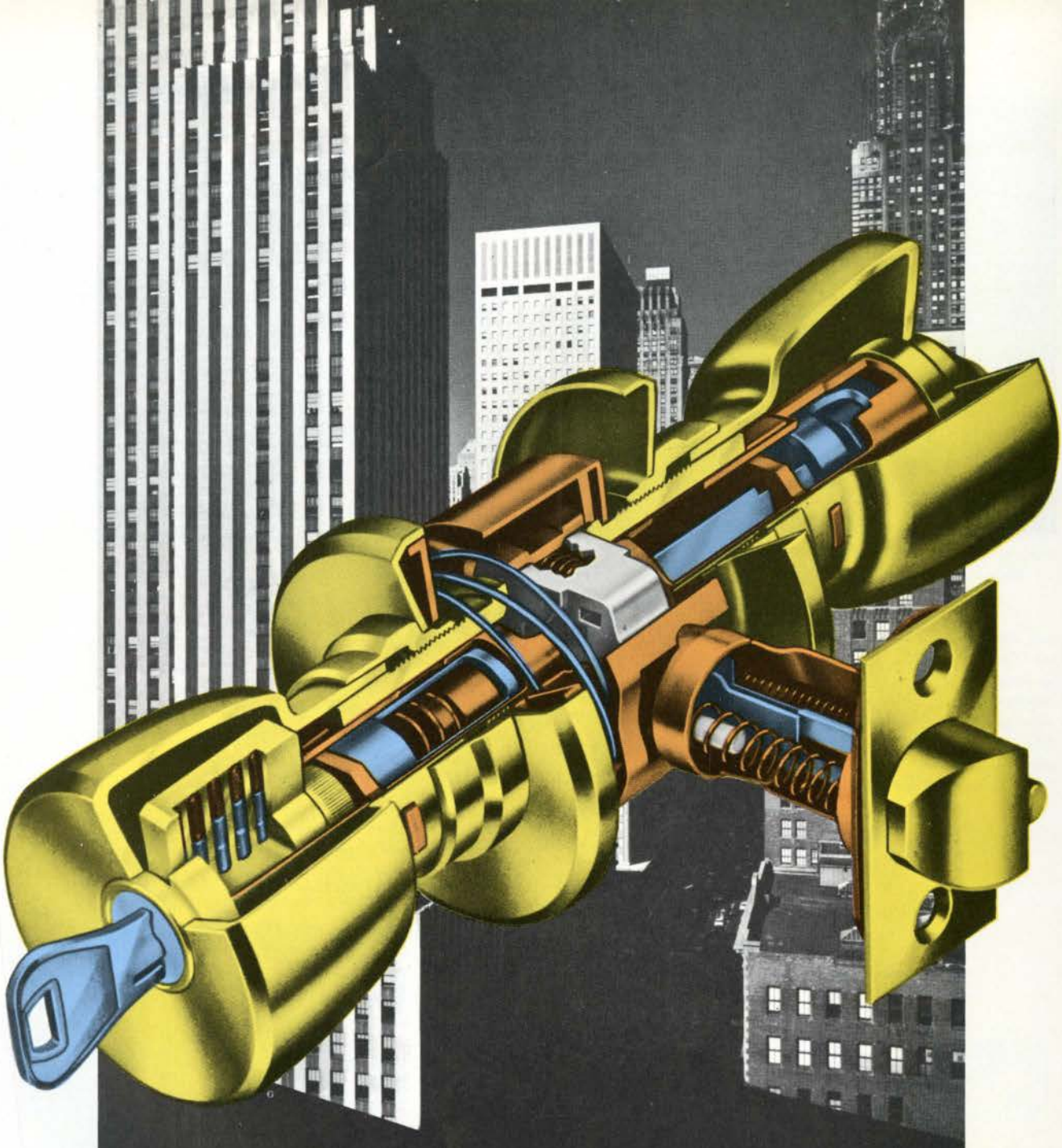
when the building was new) also gives us a clue to the inherent defect in Dr Banham's miscellany. Both buildings suggest that the criterion on which the selection was made was not so much aesthetic significance as archaeological significance. The recommended masterpieces are, in fact, not so much the thirty-three most beautiful buildings constructed within the last fifty years as the thirty-three most significant "key" buildings which would be best exemplified by someone lecturing on the history and theory of modern architecture.

Yet even if we accept as worthwhile the fact that these buildings are the most historically influential, rather than the most emotionally inspiring architectural structures of the last half century, it would seem that those who plan to reorganize their holidays in order to go out of their way to look at them would be wise to make use also of Henry-Russell Hitchcock's *Architecture, Nineteenth & Twentieth Centuries,* since this book at least gives precise addresses, which Dr Banham signally fails to provide. For what is the use of recommending a prospective tourist to go and visit Moretti's Casa del Girasole in Rome as if all one had to do to find it was to go into the Piazza del Popolo and ask directions of the nearest policeman by pronouncing its name?

In conclusion then, it may be said that whilst this is a vigorous and stimulating book in many ways it will be a disappointment to all those who, like myself, regard Dr Banham's previous book on *Theory and Design in the First Machine Age* as one of the half dozen really important books on modern architecture, and who never pick up the *Architectural Review* or the *New Statesman* without wondering with excited trepidation what devastatingly perspicuous thing he will be saying next. Dr Banham is probably the most stimulating living writer of architectural criticisms, and it seems a pity that he should have squandered his talents on a book which tries so hard to improve on J. M. Richards' *Introduction to Modern Architecture,* but which so signally fails in the attempt.

Flats on the Zaanstraat, Amsterdam; architect, Michel de Klerk (1884-1923). The interior court with the common room building. Reproduced from "Guide to Modern Architecture."





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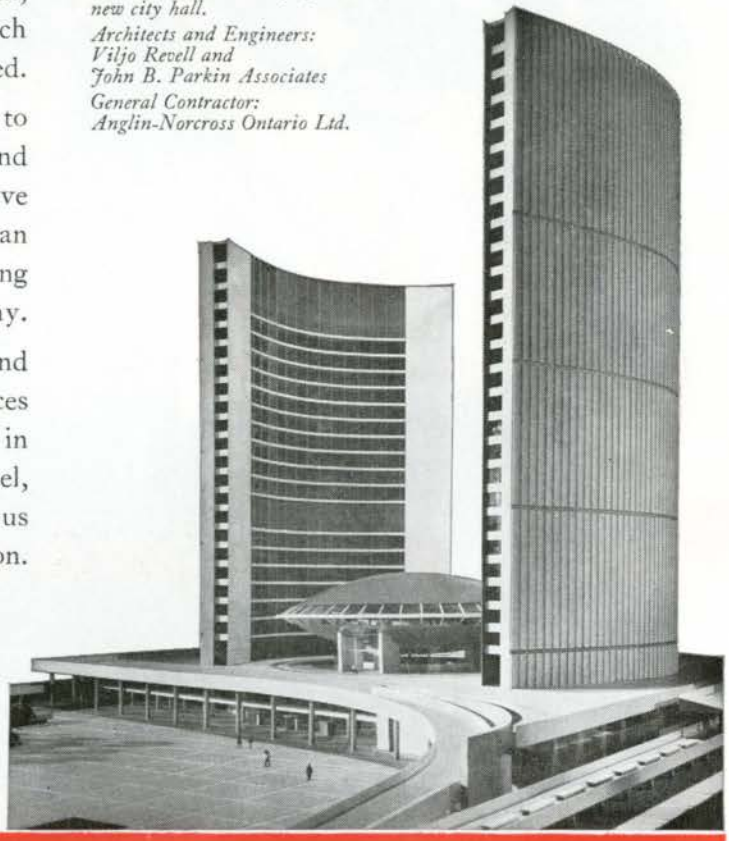

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New exhibition buildings usually twitch and twitter like unexpected birds. The Better Living Centre represents a taming

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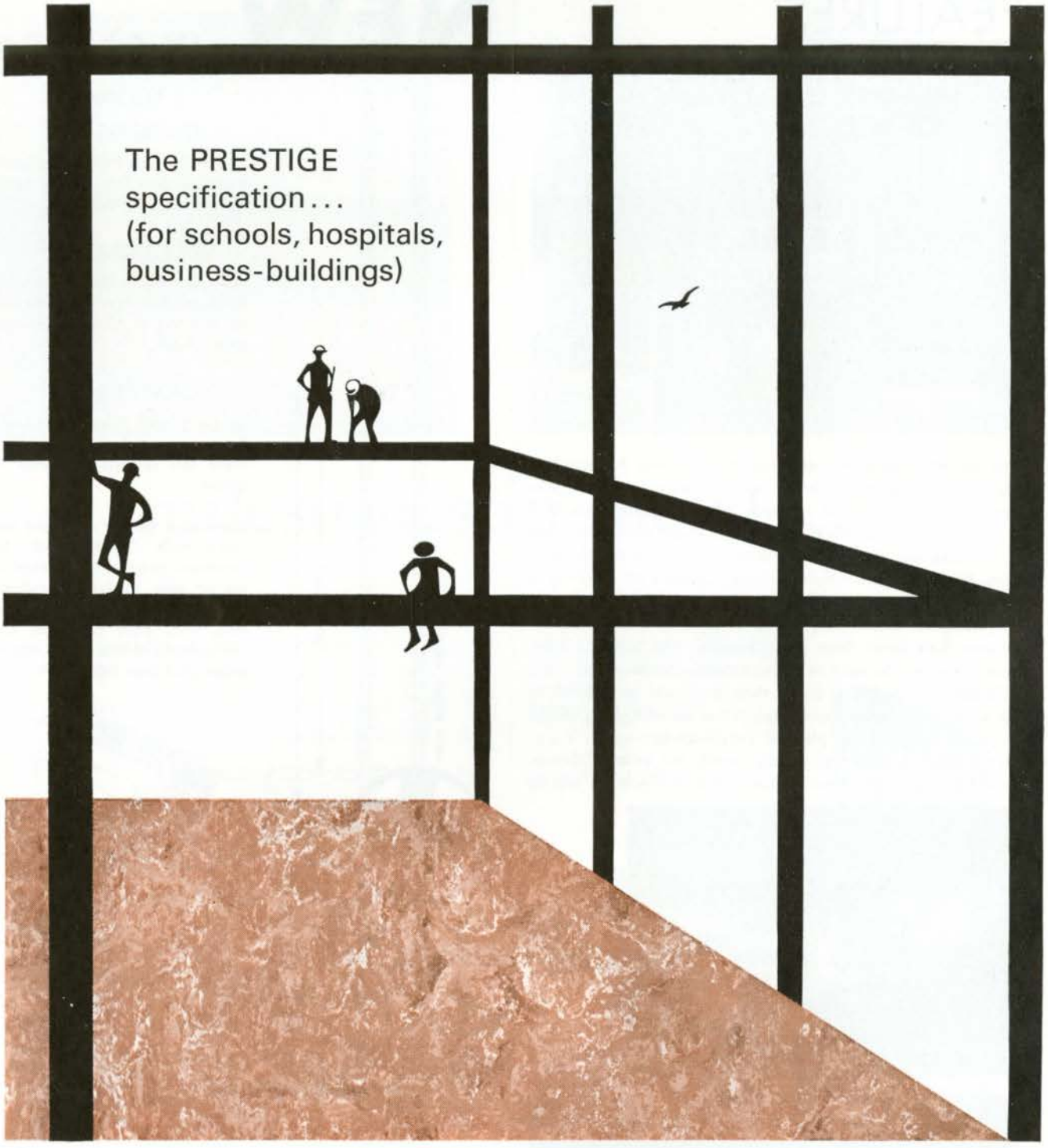

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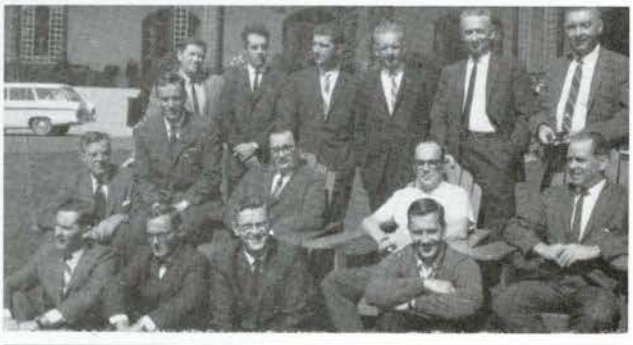
HOST COMMITTEE

Meeting of the pre-assembly host committee in St Andrews, NB., August, 1963. Left to right: (front) A. Chatwin, Saint John, J. S. MacDonald, Halifax, J. Disher, Saint John, P. Siemens, Moncton; (centre) Neil Stewart (F), Fredericton, S. W. Emmerson, Saint John, T. Bauld, Halifax, Jacques Roy, Moncton, A. F. Duffus, Halifax; (back) P. Cochrane, Halifax, C. Roy, Moncton, G. Gaudet, Moncton, J. R. Myles, Saint John, Yvon LeBlanc, Moncton, the *Journal's* new regional editor for the Atlantic Provinces, Walter Bowker, *Journal* managing editor. The 1964 RAIC Assembly will take place at the Algonquin Hotel in St Andrews, June 17th to 20th.



W. WALLACE ALWARD

Col. W. Wallace Alward, M.Arch, FRAIC, of Saint John, NB, passed to his reward on July 19th, 1963, after a creditable career in his chosen profession. Prominent in the interest of the Architects Association of New Brunswick, in which he was a charter member, he was its President at the time of his passing and had held this and other offices in the Association for several previous terms.

Mr Alward, of staunch United Loyalist stock and Scottish ancestry, was educated at Rothesay Collegiate School, Bishops College, and Harvard University, from which he received his masters degree.

During the First World War he enlisted in the Third Regiment of the Royal Canadian Artillery with which he served overseas. In 1917 he transferred to the non-permanent Militia and during the Second World War, to its end, was a member of the Royal Garrison Artillery, serving as a Lieutenant Colonel, Third New Brunswick Medium Brigade, RCA.

Commencing in 1920 he was associated, for five years, with

the Montreal firm of Nobbs and Hyde, and, for two years, with Messrs Ross and MacDonald. He entered private practice, in his native city, in 1926, as a partner in the firm of Alward and Gillies which continued until Mr Gillies retired a few years ago. On occasion, for certain projects, his firm associated with that of Messrs Mott, Myles and Chatwin, and was so connected at the time of Mr Alward's death.

In the architectural field he won credit as the designer of many public and private buildings throughout New Brunswick which with other services to the good of the profession earned him the recognition of the Royal Architectural Institute of Canada which created him a Fellow of the College.

Of a naturally friendly disposition, he was universally appreciated and respected — socially, as a good mixer, and by all his professional associates who will ever remember him as a gentleman and a fair and ethical practitioner. He will be missed and kindly remembered by all who knew him.

Mr Alward was a credit to, and popular with his profession, as was evident by the large number of citizens who attended his funeral services and by the fact that representatives of practically all architectural offices in the province were present.

H. Claire Mott (F), Saint John, N.B.

FERNAND CARON

En mai dernier décédait à Québec notre confrère M. Fernand Caron, un des plus sympathiques et estimés membres de notre profession.

Né à Québec, le 7 juin, 1903, fils de Aimé Caron et Irma Morin décédés, il fit ses études à l'Académie Commerciale de St-Roch et à l'Ecole des Beaux-Arts de Québec dont il était diplômé en architecture.

Il exerça seul sa profession jusqu'en 1951 alors qu'il forma une société avec Robert Blatter, architecte. Outre sa participation aux activités des associations professionnelles, il optait également, pour se créer un cercle d'amis étendu, d'être membre de plusieurs clubs.

Chevalier de Colomb, quatrième degré, il a occupé la présidence de la Société Canadienne de la Croix-Rouge et a collaboré activement à plusieurs organisations philantropiques et sociales. Depuis nombre d'années il était membre du Club de Réforme de Québec, du Club Kinsmen, ainsi que d'autres groupements. Parmi ses principaux travaux, il faut mentionner: Le Colisée de Québec, l'hôpital des Anciens Combattants, l'hôpital St-François d'Assise, la Maison Généralice des RR.SS. de la Charité de Québec, l'Eglise St-Louis de France, l'Edifice de la Mutuelle des Employés Civils et plusieurs autres édifices et immeubles religieux d'importance.

Lui survivent son épouse, Angela Faucher, fille de J. N. Faucher, et de Adéline Maheux, ainsi que ses deux fils, Denis et Michel.

Fernand Caron fut d'abord architecte, il acquit une vaste expérience par ses nombreuses réalisations. Compagnon gai et plein d'entrain, il ne sut se créer que des amis dans tous les rangs de la société. Il avait des amitiés auxquelles il tenait, tous l'ont apprécié pour sa générosité d'esprit et son optimisme en toute occasion.

Je me joins à ceux qui l'ont bien connu pour dire qu'il est disparu bien trop tôt. Nous avons perdu en lui un ami qui possédait des qualités remarquables, et qui nous invitaient à rechercher sa compagnie.

Maurice Payette (A), Montréal

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INSTITUTE NEWS

NEW REGIONAL EDITOR

Yvon LeBlanc, B.Arch., MRAIC, has been appointed regional editor for the Maritimes.

Born in Moncton, NB, where he received his primary education, Mr LeBlanc graduated from Sacred Heart University in Bathurst, NB. During the war he had four years' service with the RCAF, spending three years overseas attached to the RAF. In 1951 he graduated from the School of Architecture at McGill and has since been employed with the CNR in Montreal, the Division of Building Research, NRC in Ottawa, and from 1954 has been in practice in Moncton. On a Canada Council scholarship, he spent a year in Europe doing research on theatre architecture (1958-1959).

Mr LeBlanc is a member of the Association Internationales des Techniciens de Theâtre; the U.S. Institute of Theatre Technology; the Executive Committees of the Dominion Drama Festival and the Canadian Theatre Centre; the AANB and RAIC Centennial Committees; and is a past member of the AANB council.

COMING EVENTS

The 16th fall meeting of the American Concrete Institute will take place at the Royal York Hotel, Toronto, from November 11th to 14th, 1963; the 60th annual convention of the ACI will take place at the Rice Hotel, Houston, Texas, from March 2nd to 5th, 1964. For further information contact A. T. Klassen of the ACI, P.O. Box 4754, Redford Station, Detroit 19, Michigan.

A seminar on structural wood will be held at UBC, from October 17th to 19th, 1963. Sponsored by the Engineering Institute of Canada, in co-operation with UBC, the seminar is designed to stimulate interest and provide instruction in the optimum use of wood for structural purposes. Copies of the program are available from the British Columbia Lumber Manufacturers Association, 550 Burrard St, Vancouver 1.

OAA AWARDS FOR TOURIST FACILITIES

The Ontario Association of Architects recently announced a program of award for excellence in design and construction to be presented to owner-operators who put new or improved tourist facilities into operation in any given year in the province of Ontario.

First and second prizes of parchment scrolls will be awarded in the following categories: 1 hotels, lodges, resorts, and motels of fifty bedrooms and over; 2 hotels, lodges, resorts, and motels of forty-nine bedrooms and under; 3 restaurants; 4 trailer, tenting, and other park facilities; 5 marinas and "boatels"; 6 cottages and ski chalets.

COMPETITION

A two stage competition for the design of a proposed Student Union Community Centre for the University of British Columbia will be announced shortly. Warnett Kennedy, Executive Director of the AIBC, has been appointed professional advisor for the competition, which will be open to architects practising in Canada, and conditions will be published when the site has been selected.

POSITION WANTED

Architect from Chandigarh, India, FRIBA, FIIA, with eighteen years experience as chief architect and town planner with several state governments in India, desires a position, in Canada, with an architectural firm, town planning firm, or development corporation; age, forty-four. Write P. J. Ghista, 21-A, Sector 10-D, Chandigarh, Punjab, India.

SMITH CARTER SEARLE EXPANSION

Smith Carter Searle Associates, Winnipeg, announce the opening of a Toronto office and the expansion of their partnership. William J. Neish, B.Arch., MRAIC, formerly in charge of the Lakehead office, will become partner in charge of the newly established Toronto office. Kenneth W. C. Bacon, ARIBA, MRAIC, formerly associate in charge of design at the head office in Winnipeg, will become partner in charge of the Lakehead office.

ARCHITECT: HOWARD J. STRONG — BUILDER: KARL OTTE CONSTRUCTION COMPANY

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LEGAL NOTES

MECHANICS' LIENS, PART IV
SHORTCOMINGS AND INADEQUACIES

by Norman Melnick

In its treatment of the topic of Mechanics' Lien legislation throughout Canada over the past few months this column has intimated rather strongly that these acts have very serious shortcomings as vehicles of protection.

Due to the construction boom and to the sometimes wanton over extension of credit to the construction industry certain sharp practices have been perfected amongst owners and builders who hide behind corporate facades to take advantage of any opportunity to deceive creditors and, as a result, very great hardship has been worked on subcontractors and suppliers of labour and materials to the construction projects. Unfortunately, our legislation has not kept pace with the rapid growth of the construction industry and, as a result, many of the abuses which have occurred have gone unchecked.

NON-LIENABLE PROJECTS

As has been pointed out, there are certain types of construction projects which are outside the regulations and protection of Mechanics' Lien laws. The foremost example of this kind of immunity is the case of government projects. A very large part of the value of construction carried on today is on Crown lands or is in respect of roads and streets either on public property or on private property in municipal subdivisions. Contractors, subcontractors, and suppliers of labour and materials to these jobs are in a particularly hazardous position. It is true, however, that on government jobs, for example, some measure of protection for these people is secured by the requirement of bonding.

Recently there has been strong agitation for amendments to the Mechanics' Lien laws which would insure that on all government projects holdbacks would be made from progress payments to the general contractor and that these holdbacks would be retained only for the benefit of unpaid subcontractors and suppliers in exactly the same fashion as would be the case if the project were subject to the act. The province of Ontario introduced Bill 156 which purports to remedy this situation. It is to be hoped that this bill will be promulgated and become law.

OTHER SHORTCOMINGS

It would appear that the Mechanics' Lien laws, by implication at least, deny protection to suppliers of rental equipment to a construction project. It does not appear reasonable that legislative thinking purposely excluded the service industries, especially in view of the tremendous growth this type of industry has experienced in recent years. Certainly no one can deny the value of certain types of rental equipment to the progress of any substantial building project carried on today; yet a recent Supreme Court of Canada decision, interpreting the Ontario Act, stated that suppliers of rental construction equipment have no lien rights.

Mechanics' Lien laws seem to accomplish little by way of discouraging the sharp practices that result from the cut-throat competition prevailing amongst contractors. In fact, competition amongst general contractors for work, especially on the smaller projects, has made profit margins almost disappear. This type of competition has arisen from usually under capitalized firms that desperately try to remain in business by accepting jobs at uneconomical levels and manage to stay afloat by juggling an ever increasing volume of liabilities between various corporate shells. This condition encourages, amongst such contractors, business practices which very closely approach actionable frauds upon creditors. The Mechanics' Lien Acts, with one or two exceptions, contain no provisions aimed at such fraudulent activity.

AGITATION FOR LEGISLATIVE AMENDMENTS

For several years now there has been a committee of the Canadian Manufacturers' Association which has worked assiduously in the formulation of a number of recommendations designed to correct many of the inadequacies of the Mechanics' Lien laws. This committee has published its recommendations but little success has been experienced in impressing the legislators. In fact, when the Attorney General for the province of Ontario tabled Bill No. 156, extending to contractors, subcontractors, and suppliers on government projects certain measures of protection, no attempt was made to consult the CMA committee, whose activity in this area was widely known.

Because the construction industry is so volatile and enormously influential to the country's economy, it seems rather surprising that more attention is not given to the legislation governing its activity, especially where it is universally admitted that such laws are unsatisfactory as presently written.

ARCHITECT: BENJAMIN GINGOLD

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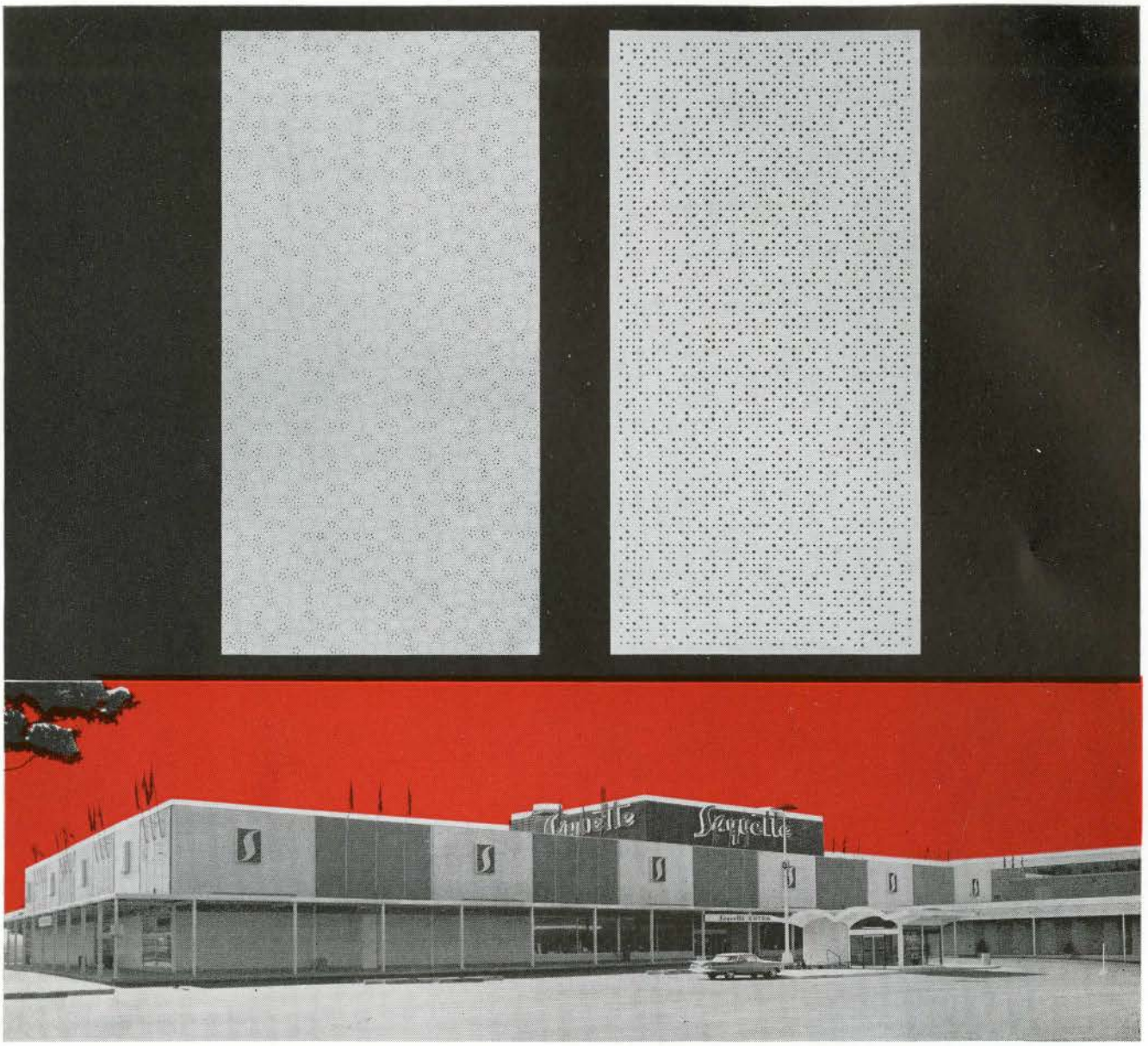

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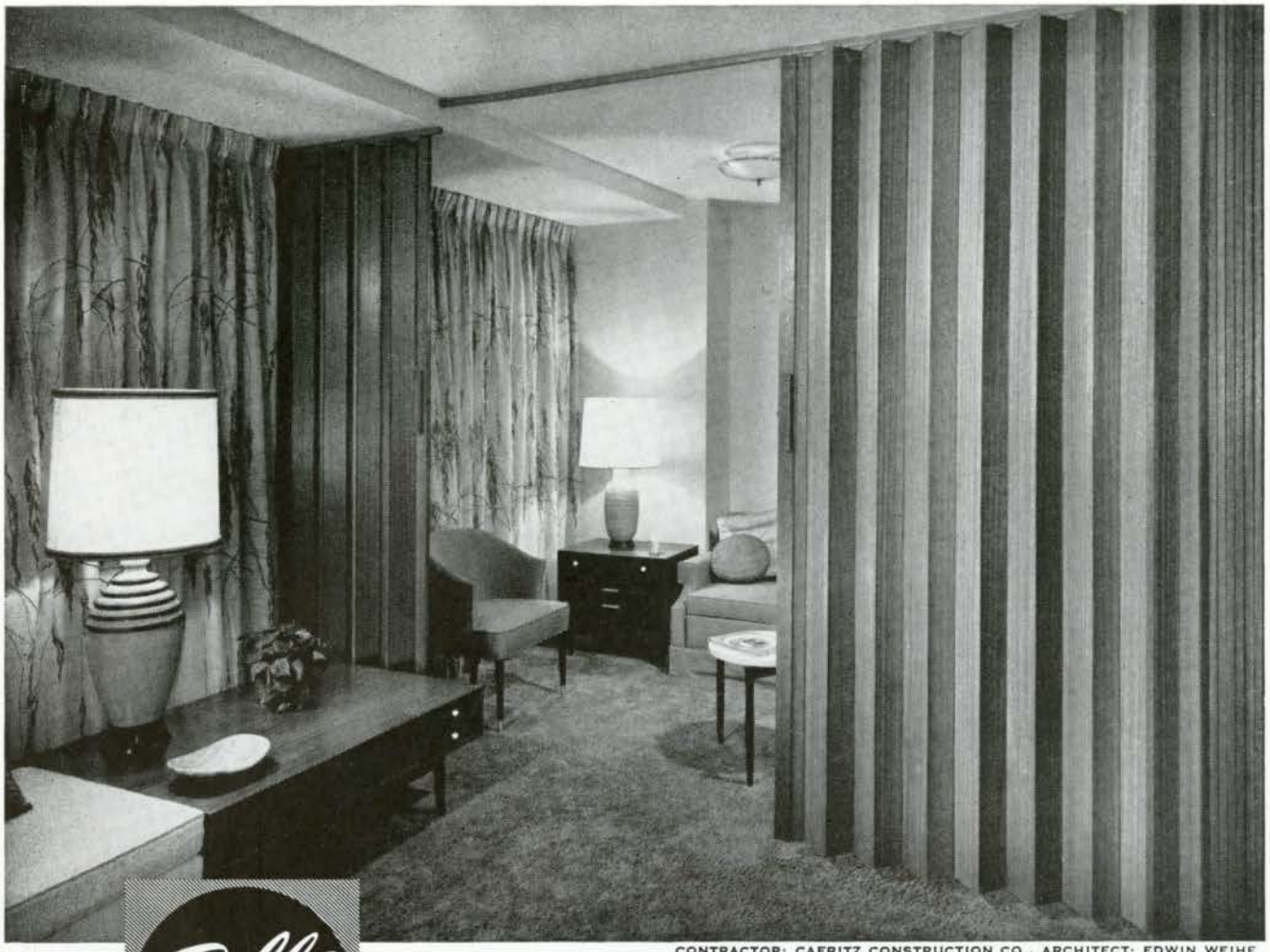

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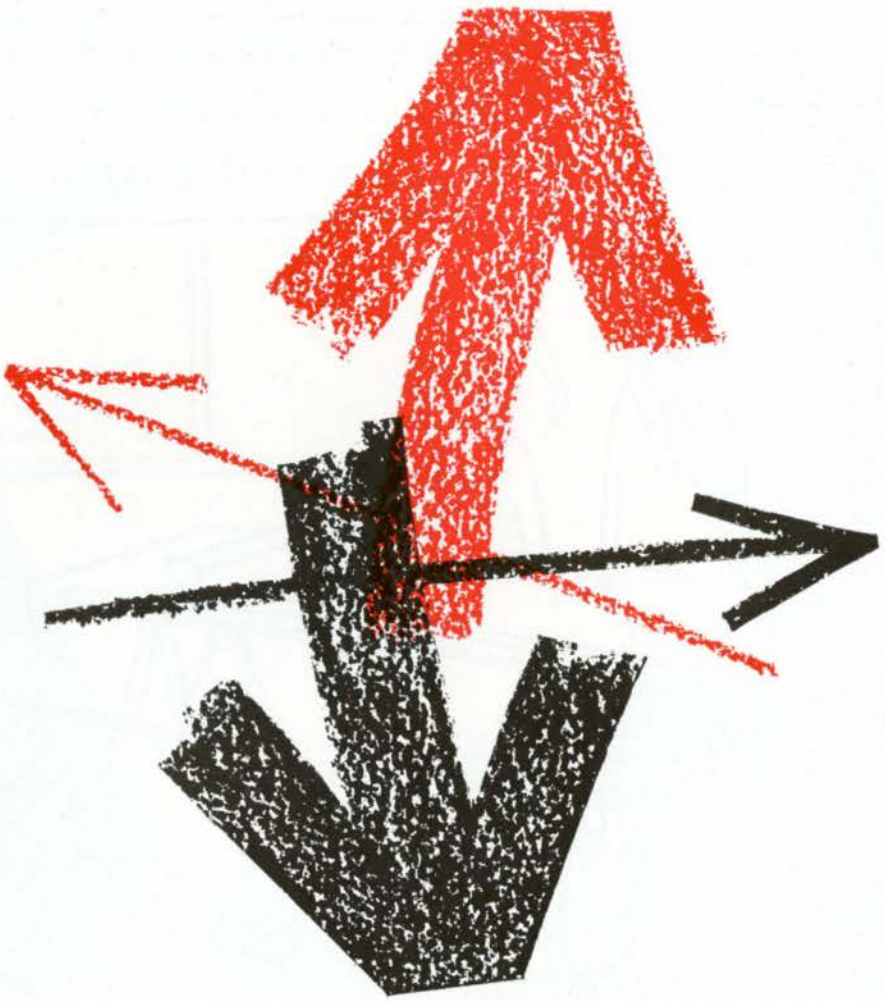

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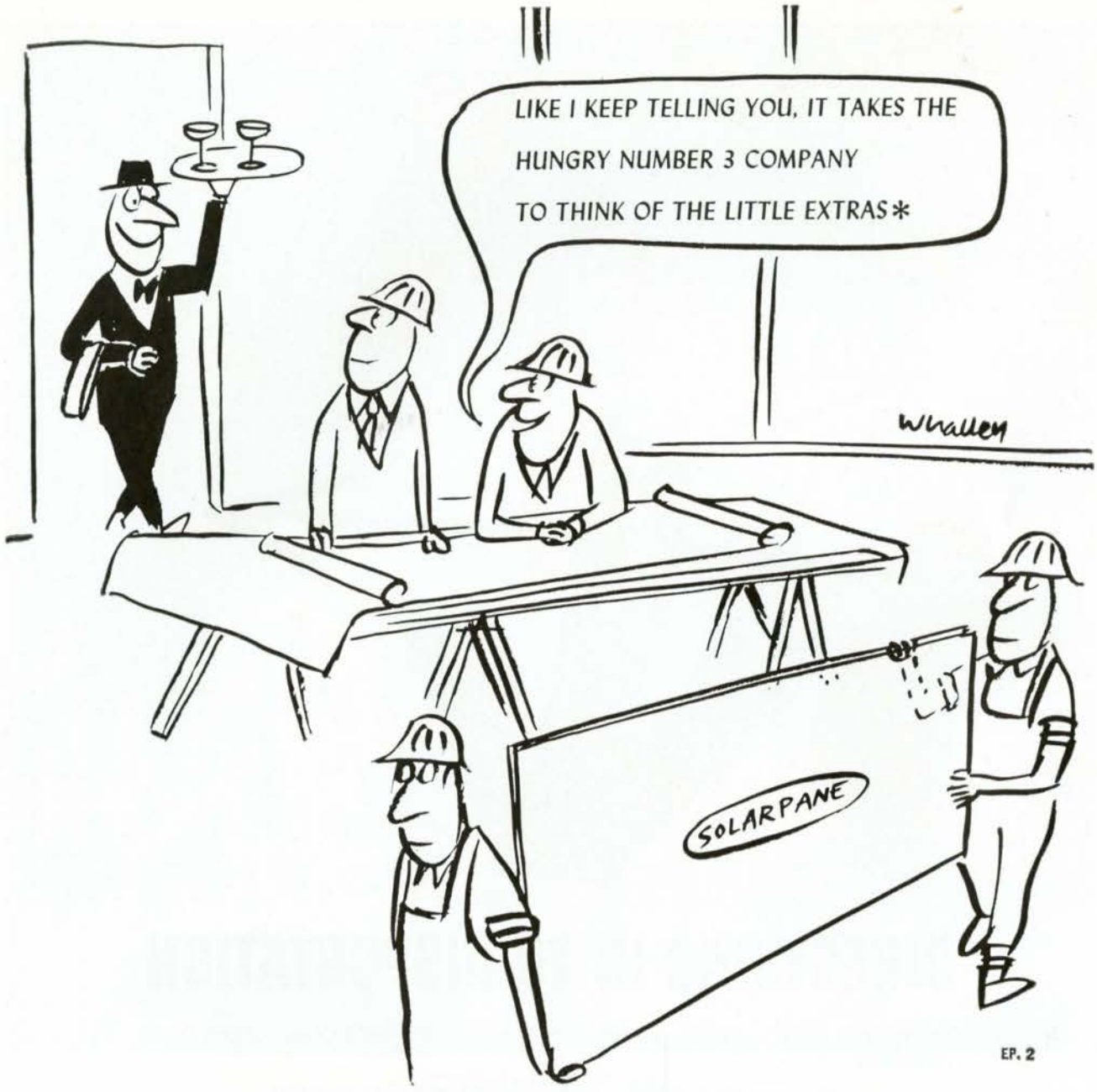

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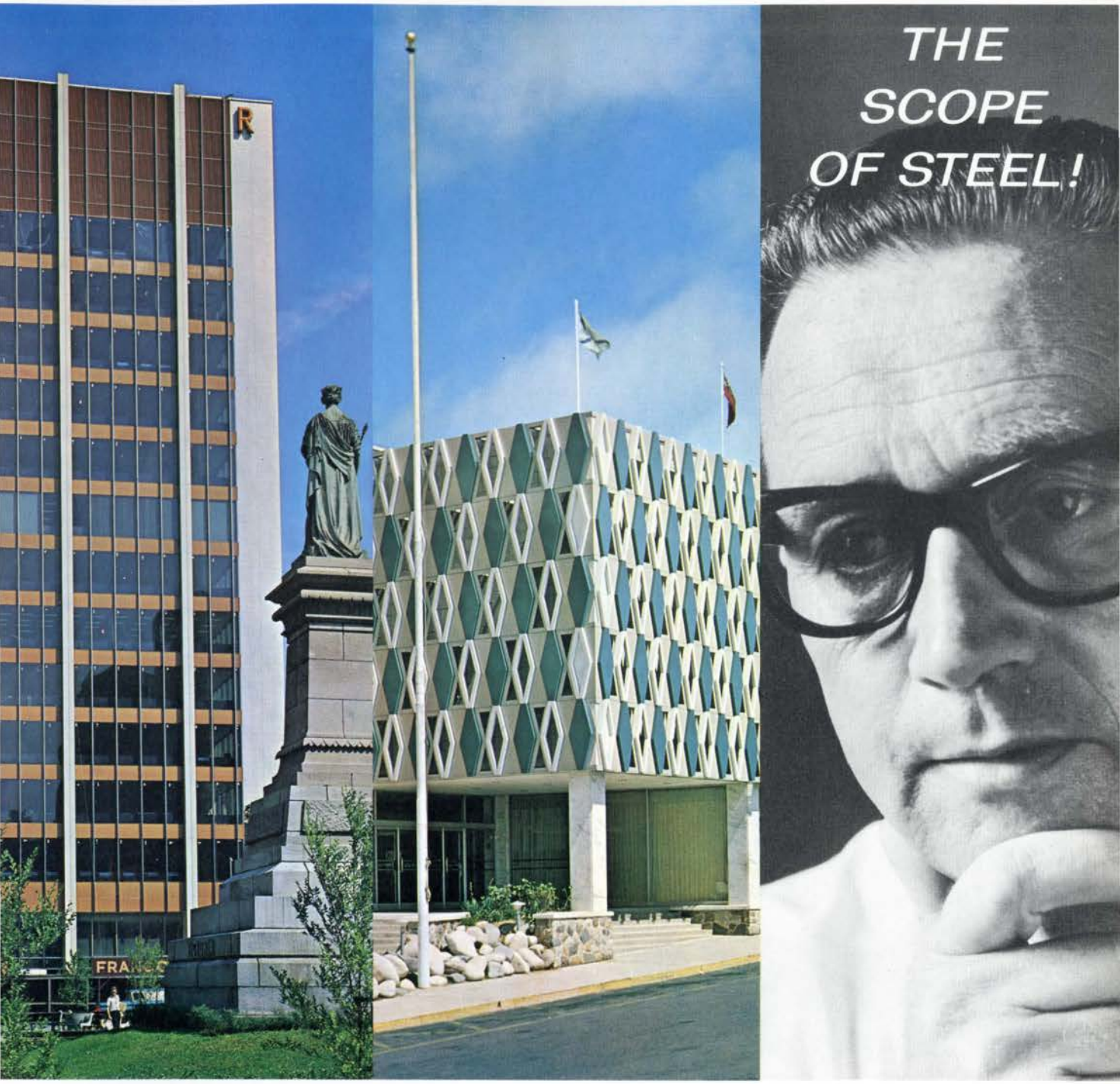

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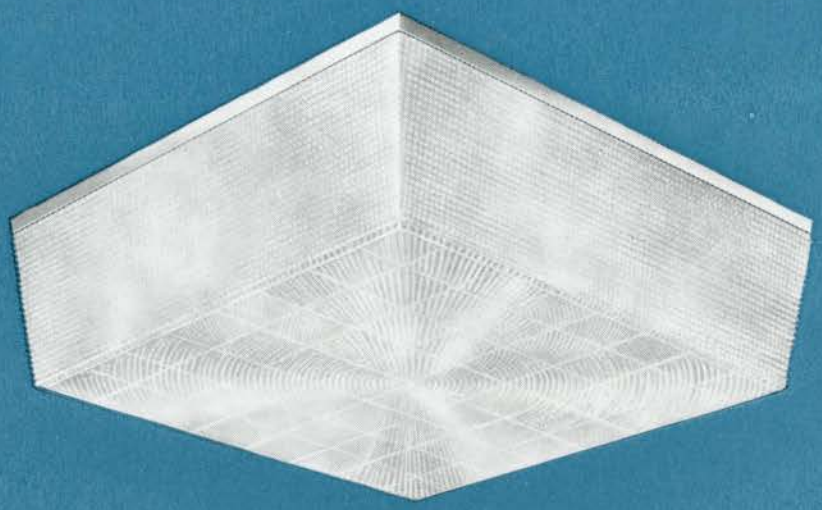

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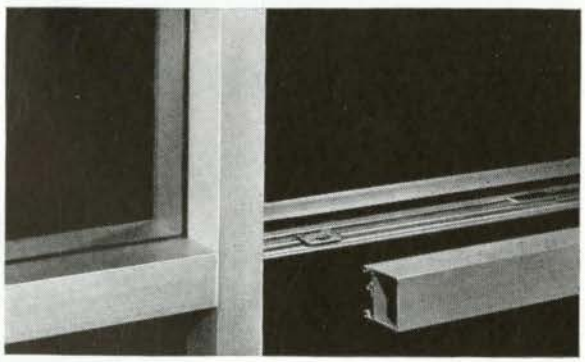
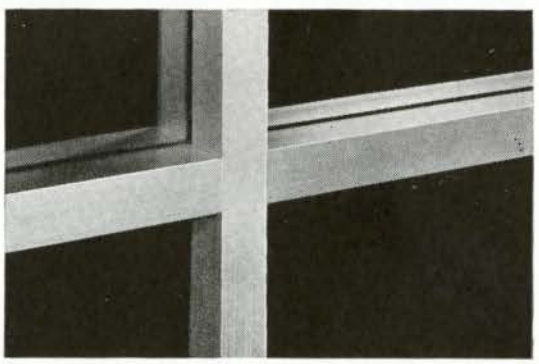


Snap-on Glazing saves time, lowers cost! The secret to speedier erection is the patented Core *clip* that *snap-locks* the face member to the gutter.



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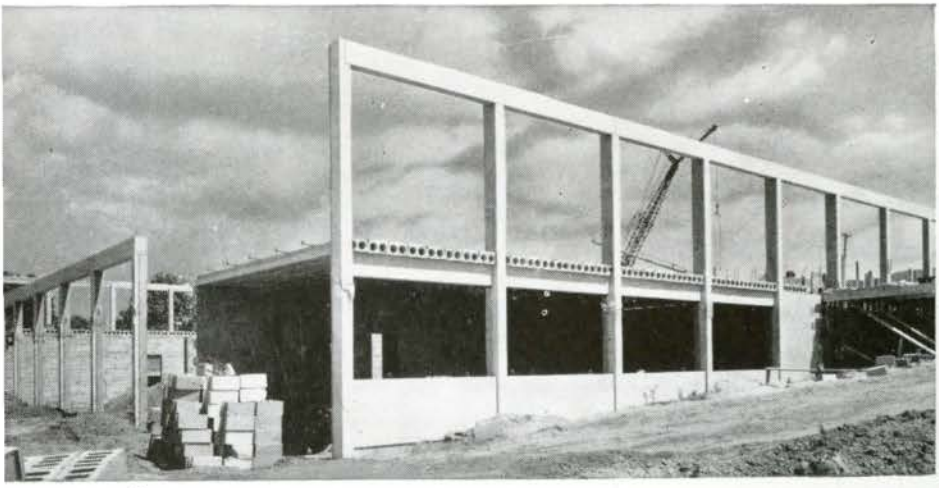

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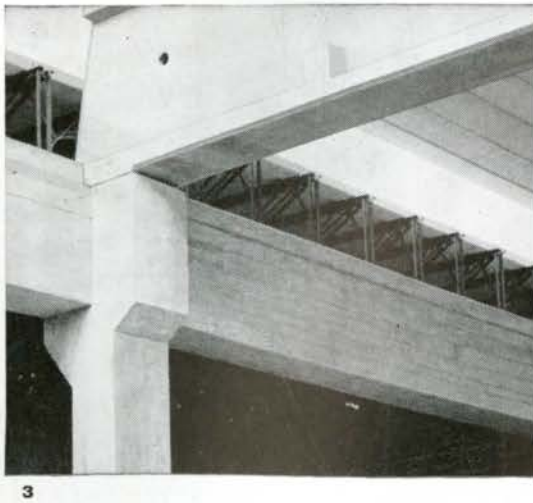

3

CANADA CEMENT

4

5

1 Norman Wade Co. Building, Pointe Claire, Que. Architects: Affleck, Desbarats, Dimakopoulos, Lebensold, Sise. Consulting Engineers: McMillan & Martynowicz. General Contractors: Douglas Bremner Contractors & Builders Limited. Prestressed concrete members: La Precontrainte du Nord.

2 Ridgeway Avenue School, Oshawa, Ont. Architects: Clifford & Lawrie, Toronto. General Contractor: A. Weller and Co. Ltd., Toronto. Precast Concrete: Pre-Con Murray Limited, Toronto. Ready Mixed Concrete: Curran & Briggs Limited, Oshawa.

3 Marquette Park Recreation Centre, Montreal. Owned and designed by: City of Montreal. General Contractor: Omega Construction Co. Ltd. Precast concrete members by: Siporex Company, Division of Domtar Construction Materials Ltd.

4 Riverview United Church, Calgary. Architects: H. W. R. McMillan and Associates. General Contractor: Bird Construction Co. Ltd. Supplier of precast concrete bell tower: Con-Force Products Ltd. Supplier of Ready Mixed Concrete: Consolidated Concrete Ltd.

5 Three Star Co. Building, Montreal. Owner & General Contractor: Three Star Construction Co. Architect: H. M. Tolchinsky. Precast and prestressed concrete members by: Francon Limited, Montreal.

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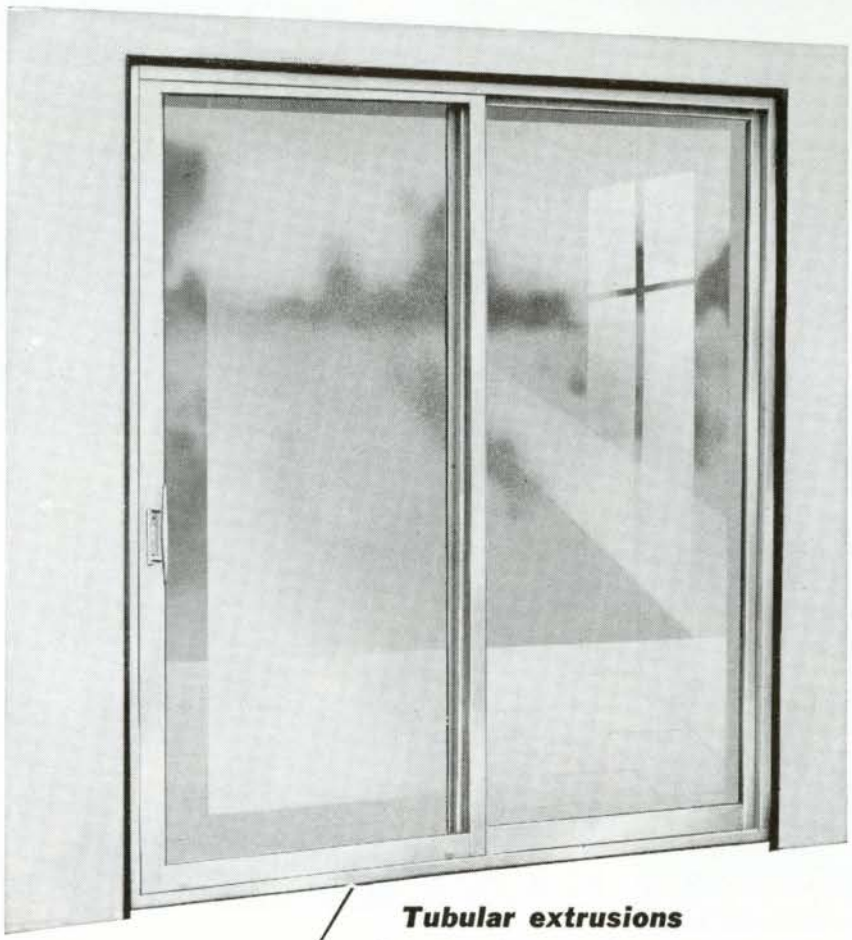

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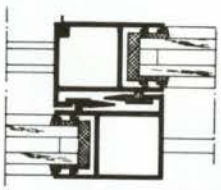

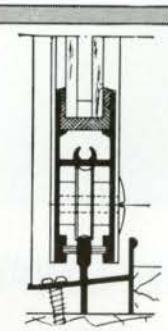

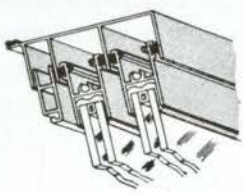

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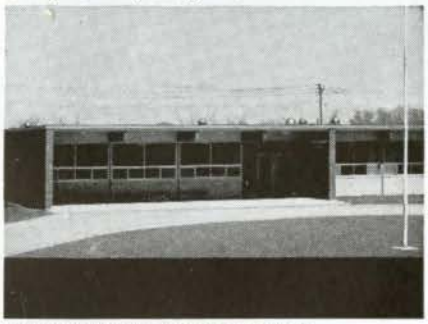
Architect and Consultant—
Selwyn Cooke, Kingston.



Victoria Harbour Public School,
Victoria Harbour.
Architects—Salter & Allison, Barrie.

S. S. No. 7, Osgoode.
Architects—Balharrie, Helmer and
Associates, Ottawa.

Forest Hill Public School,
Midhurst.
Architects—Salter & Allison, Barrie.

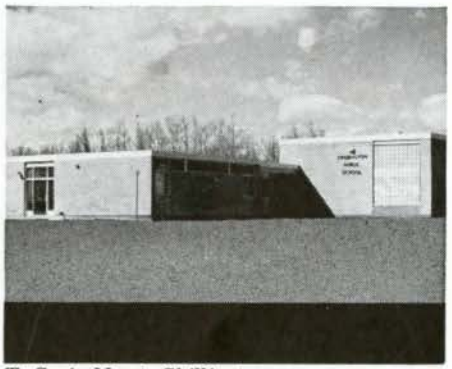
8

more schools enjoy advantages of electric heating

Arthur Township Public School,
Kenilworth.
Architect—Allen T. Sage, Guelph.
Consulting Engineers—Walter
Fedy and Associates, Kitchener.

Eastdale Public School, Listowel.
Architect—D. P. Templin, Toronto.
Consulting Engineer—Dusan P. Lazarevich,
Toronto.

Saint Michael's School,
Fort Frances.
Architect—W. A. M. Kyro, Port Arthur.



T. S. A. No. 1, Shillington.
Architect—C. R. Shnier, Timmins.
Consulting Engineers—Rybka Smith and
Ginsler Ltd., Toronto.

Here are but eight of the thirty recently constructed Ontario schools to install electric heating.

When you examine the advantages, it is easy to understand why the popularity of electric heating continues to grow.

In many parts of the province where winters are more severe, electric heating has solved the very real problem of providing healthful heating comfort efficiently.

School authorities cite these advantages as reasons for their choice of electric heating:

- Economy of installation and operation
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- Reliability
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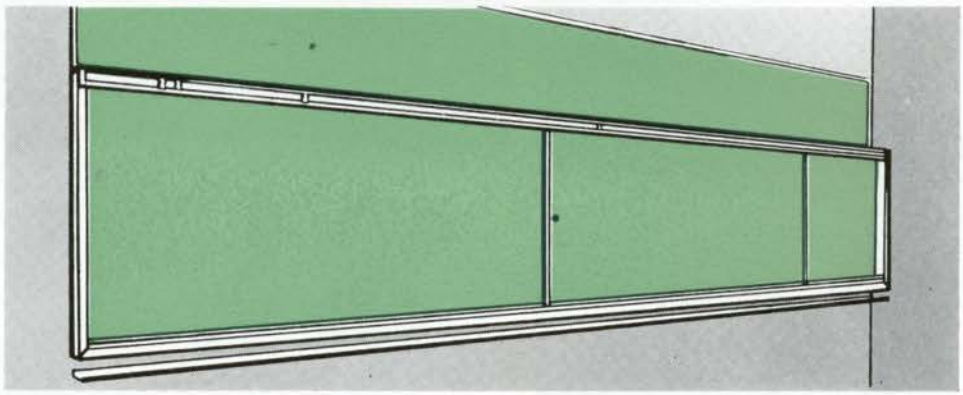

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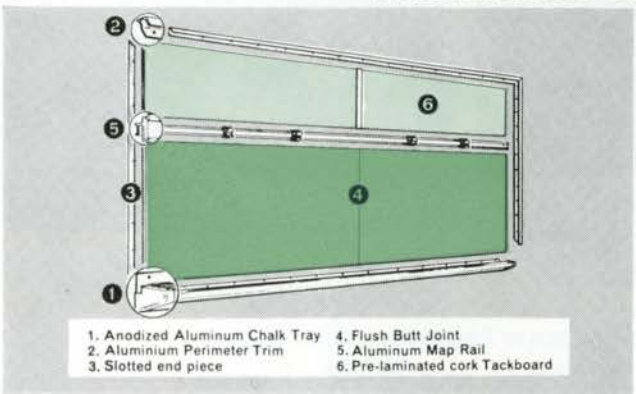

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SCHOOLS

The ever rising cost of education makes it imperative to ensure that we are not making enormous capital investments in school buildings which may be rendered obsolete by changing social conditions and methods of education. It is also essential that we bring together our technological abilities in a concerted effort to solve the dual problem of meeting rising costs and providing the flexibility to allow for changing need.

An event occurred in Ontario this month which brought these and other problems into sharp focus and which may well have far reaching effects on Canadian school architecture. We refer to the Ministers' Conference on School Design, held in Toronto on September 4th and 5th, attended by representatives from every organization concerned with schools (trustees, municipal bodies, inspectors, educators, teachers, contractors, engineers, and architects).

They met to assess the impact of changing demands, to discuss problems existing in our present methods, and to strengthen relationships between the many parties involved in school design and construction.

The two major speakers at the conference were Dr K. F. Prueter, Superintendent of Public Schools, Etobicoke Board of Education, and Jonathan King, Secretary Treasurer, Education Facilities Laboratories Inc., New York. Dr Prueter made a wide ranging exploration of new concepts of education and their possible effect on the planning of our schools; and Jonathan King told of research and practical experiments in the U.S. to help Canadians cope with the physical problems posed by these changing concepts. Group sessions widened the range to include the relationship of school to community.

This issue illustrates new schools which have been planned to facilitate experimental concepts and schools which contribute to their function as civic design. We asked a participating architect, John Sullivan, of the Leman, Sullivan Group of Toronto, to assess the value of the conference. Some applications of the Education Facilities Laboratories findings in new education requirements are extracted from Jonathan King's speech. (Next month we will publish the findings of our Canadian survey which clearly indicates the need for a similar laboratory here.)

The problems posed were peculiar to no one province and in fact demand solutions from research at a national level. Whether we are yet ready for national action is debatable but it is certain that, national or provincial, the profession has a vital role to play and a great opportunity to do so.

Implications of the Ministers' Conference on Canadian Schools

by John Sullivan

The conference was born of a wide-spread need for direction and co-ordination of effort, of a feeling that problems were changing but solutions remaining standard, of a disquiet on hearing of radical changes in education, and of contemplation on our rigid school structures.

IT WAS IMPLICIT IN THE MINISTER'S PROGRAM MESSAGE . . . . . .

"It is important today, as never before, that the contemporary demands of our technological society be thoroughly explored to ensure that your schools of tomorrow fulfil all the requirements necessary to achieve a high standard of student and teacher efficiency and morale. This may only be brought about by assuring ourselves that we are spending every school dollar in areas where maximum value is to be obtained.

The school as the cultural core of our community must reflect our civic consciousness and responsibility. It is my hope that during the next two days our mutual exchange of views on school design will assist all of us toward still better planning for our schools of tomorrow." *G. Davis, Minister*

But can we not rise above our own pedestrian problems to achieve this co-operation? Is the architect to be concerned with his design and "function", the educator with his standard curriculum, and the board with their cost and maintenance. If spirit must be breathed back into our schools then we need new goals, new criteria for design, a new sense of urgency, a new challenge. We are buffeted by clichés, but bereft of a philosophy by which to judge them. We need an opportunity to re-evaluate, re-assess, re-discover our concept of education.

THE OPPORTUNITY WAS PRESENTED IN THE KEYNOTE SPEECH . . . . . .

"Have we in education really sought to understand the magnitude of the technological and societary change sweeping our civilization?"

"Have we really tried to bring into focus its implications for education?"

"How will change alter the basic decision in relation to the educational process and to the physical facilities which accommodate it?"

PARTICIPANTS SETTLED INTO GROUPS TO EXPLORE CAUSES FOR CONCERN

THE NEED FOR BUILDINGS OPERABLE IN THE FUTURE AS WELL AS THE PRESENT

The ever increasing student enrolment and ever expanding body of knowledge are demanding new patterns of instruction, new concepts of physical space, and will not be confined by our standardized schools.

"We must build well for today. What we build for today will have to be used by the children of tomorrow. More and more education becomes a lifelong process and our schools increasingly service the educational needs of other age groups as well. Can we provide specifications which will suit now and provide an adaptable flexible form for tomorrow?"

"The school board which today consents to buildings that are unchangeable, immutable, unresponsive to what future boards will confront is not only wasting present funds, but it is also exhibiting a cultural arrogance that a swift moving society cannot afford."

"The chambered nautilus of a schoolhouse gets in the way."

THE NEED TO RE-EVALUATE COMMUNITY USE OF SCHOOLS . . . . . .

"The schools should be the cultural core of our community."

"Automation will create more leisure time for the masses, and the schools of today should be used in more community functions after school hours."

"Parents take a more important place in education today."

"School boards choose sites for new schools which have no relevancy to the function of the schools. Schools are being built without consulting with library boards, parks committees, shopping centre owners, and traffic experts."

THE NEED FOR CLOSER LIAISON BETWEEN SCHOOL BOARDS AND COMMUNITY BODIES

"Great economies will be realized if the building of the high school is related to the building of the community centre."

"When I was on the board of education I tried to communicate with the city council and couldn't; now I'm on council, I try to communicate with the Board of Education and can't. A shotgun wedding is needed."

THE NEED FOR IMPROVED PLANNING

"Boards and their officials should do their homework regarding the philosophy and needs of a school before asking the architect to start on the plans."

THE NEED FOR LONG RANGE PLANNING

The best intentions to evaluate community and educational needs are lost by lack of time. Procedures must be overhauled and planning forecasts made to allow for programming and design, while regularly reviewing and adjusting such long term plans as accurate figures become available.

"Before any new school reaches the drawing boards the local board should establish what is expected of the schools, community leaders should be consulted on the place of the school in the community, and teachers should have their say about what goes into the classrooms."

"There is the planning of the school and planning for the school."

"Give us time to study the problem."

"Don't expect us to prepare working drawings of a school in two weeks."

"My board is now engaged in a long term survey to discover what the education needs of the community will be in the next ten years."

THE NEED FOR FREEDOM FROM RIGID PLANNING STANDARDS · · · · · · · ·

Some years ago a school research committee submitted an excellent report, which profoundly affected school design in Ontario. Its recommendations, however, slowly crystallized into the hard standards of today, which severely restrict imagination and creativity and are responsible for ". . . today's school . . . a box filled with equal sized little boxes called classrooms". Let us not again fall into this error.

"Architects should be allowed greater flexibility and freedom."

"We must free the schoolhouse from the straight jacket of design."

THE NEED FOR RESEARCH INTO PHYSICAL EFFECTS, OF CHANGING SOCIAL CONDITIONS AND METHODS OF EDUCATION, ON OUR SCHOOLS · · · · · · · · · · ·

"Research on school design has had great usefulness in the U.S. and I certainly think the British research has been extremely valuable to them."

"Education is on the move and architecture must get out of its way."

"School boards are notoriously conservative. I should rather say they are famous for their frugality. They have to be; they represent the communities which expect them to be careful with community funds, and it makes it very difficult for them to experiment."

It is useless to exhort the school board and architects to build for the future when they have little conception of the changes in store. To invest enormous sums of money in permanent buildings, with a negligible amount of research preceeding it, would invite economic disaster in a commercial undertaking. There must be a large continuous research program into all aspects of school planning.

"Illumination intensities from 50 to 150 ft candles were thoroughly explored — with considerable disagreement."

THE NEED FOR RESEARCH INTO MATERIALS SYSTEMS AND METHODS OF CONSTRUCTION

"There has been great progress in the design and installation of operable walls over the last few years . . . it is now possible to get them to work."

"The architects who built the windowless schools thought they were very good; the superintendents who built them thought they were fine; the principals all thought they were excellent. But then again, the number of public servants who spend one and a half million and go out and tell the public what they bought was a mistake are few and far between, and so we expected a certain prejudice there."

THE NEED FOR WIDE DISSEMINATION OF RESEARCH FINDINGS

Isolated experiments in many aspects of school design are taking place all over the province, yet there is no organized method of collecting this information and making it widely available.

"Many did not know where to turn for information."

"A clearing-house for the collation and dissemination is imperative."

In the final open sessions the chairman of each group came forward with his summary. We had advanced greatly. The banalities of the early sessions were forgotten in a series of thoughtful statements showing that the magnitude of the problem had been grasped by many, and that the challenge would be faced. The solutions were clearly beyond the scope of any one board, profession, or association, and speaker after speaker pointed to an imperative need for leadership, direction, co-operation, and organized research. This will come; it must.

NEW SCHOOL PLANNING by Jonathan King

"Some of the attempts to solve these problems in the United States are quite interesting. I think one of the most vigorous of these has been the Whalen High School in Whalen, Mass., designed by the Architects' Collaborative. In it they have taken the bull by the horns: they have simply thrown out the small classroom as a general core of the school building. The school was arranged in a series of units, each one of these subject matter oriented. There is one for science, one for the social sciences, one for the language arts. In the core of each of these is an independent study area surrounded by seminar rooms, one or two standard classrooms, laboratories in the case of the science wing, and several large lecture halls. These large halls were designed specifically for lectures and are not really divisible or useable for other purposes. But they make excellent lecture halls.

A second and less committed way to face this sort of program is to use operable walls, by which I mean walls that move out of the way at will, and at once. . . . . .

. . . They found that sound separation itself was not one of the most vital factors in the teachers' general feeling for the school building, that they were more concerned with the acoustic reaction of the room itself than with whether there was leakage from room to room. . . . . .

Another approach to variable sized groups has been in the use of moveable walls — office partitions. John Lyon Reid pioneered in this five or six years ago with the Hillsdale High School in San Matao, Calif. Here is a great open loft with a bay 28 ft by 28 ft. Skylights were placed periodically throughout but otherwise the interior rooms are windowless . . . last summer they moved in and reorganized something like seventy-five per cent of the spaces in that school, to satisfy their present program requirements, and they did so at a cost of slightly over one dollar per sq. ft. Reid has taken this one step further in his high school in Andrews, Texas which has light weight wooden walls with glass clerestories above (there are no skylights in this) and in which he has not put doors in any of the walls. There are 10 ft openings leading out into the corridors. It has an acoustic insulated floor covering throughout, also known as carpeting in other circles but that sounds like a frill to some people in schools so we will refer to it as insulated floor covering. The teachers are very pleased with the acoustics of this building despite the fact that there is no sealing of rooms. Sound transmission loss is only 20 from space to space . . . It is also air-conditioned; it is also windowless. Reid's school is a step toward open space — really open space where you completely forget about partitions. But this is beginning to emerge here and there on the American scene. . . . . .

Cal Porter, in an elementary school in Huperteno, Calif., has recently designed a room that is 3,840 sq. ft. That's four Huperteno 960 sq. ft classrooms thrown together. Again, this is carpeted; it is open; there are no partitions of any kind between the spaces. Four teachers, working together as a team, occupy this room and nobody is bothered by the noise from other groups. The children get up at any time that is appropriate and move over, form small groups, or move into a second group. There is no problem. The only problem they had in the first

few weeks was with the teachers: they had to teach each other not to speak so loudly. They didn't have any problem with the children. After operating for a year, during which time the teachers were told that if they didn't like that room they would be transferred into some other part of the school, they've had no requests for transfer despite the fact that when the year began two of the teachers were extremely hesitant about teaching in such a bizarre environment. They have one self-contained classroom in this school which is always the last preference for every teacher.

While discussing carpeting I might say that it is not as uneconomical as it might first appear. On a first cost basis carpeting not only eliminates, of course, the tiling of the floor but also makes it possible to eliminate acoustic tile on the ceiling. You can get quite enough acoustic absorption on the floor to avoid putting it on the ceiling, and if this represents a real saving in the school building, which in some cases it may not because of a hung ceiling, it can almost pay for itself. . . . In the aforementioned school, while it takes the janitor fifteen minutes to do each of the hard surface classrooms, he can do the big, carpeted room (which is four classrooms) in forty-five minutes every other day.

We tried to find out something about the effect of windowlessness and we didn't feel that we would find the answer by going to the existing windowless schools. . . . . .
. . . we still don't really know very much about its effect on the kids except that there seems to be very little. I think, in general . . . this is a pointless debate. We should not talk about windowless schools. We should talk about spaces without windows within schools. There should be windows in schools in those places that require windows and no windows in those places that are better off without windows.

I would like to say, to get off the subject of building for a minute and go back to instruction, that one of the things that we have ignored almost totally in school building for a long time has been the individual. The only provision, other than plumbing, that we put in schools for people (one by one) has been the library, and the library in most American schools, both primary and secondary, has been atrocious. They have no books in them; the reading rooms consist of large tables shoved together, which by every survey that's been carried out are without a doubt the worst place for anybody to study that you can possibly think of. . . . . .
. . . The modular library with inter-changeable stacks and seating areas, the study carols, the small tables, the comfortable chairs, the variety of spaces to sit: all these things make sense and pull kids in. We also know that school libraries are beginning to be used far more than the rest of the school plant, and so this charming and wonderful notion that the school library is the heart of the school building and therefore should be put right in the middle of its stomach somewhere in the centre doesn't make any sense. It ought to be the heart of the school building but somewhere on the periphery where it can be opened nights, weekends, or when the rest of the school is closed and the library should be open. It must have some space; it must have some books in it, otherwise it will not be used.

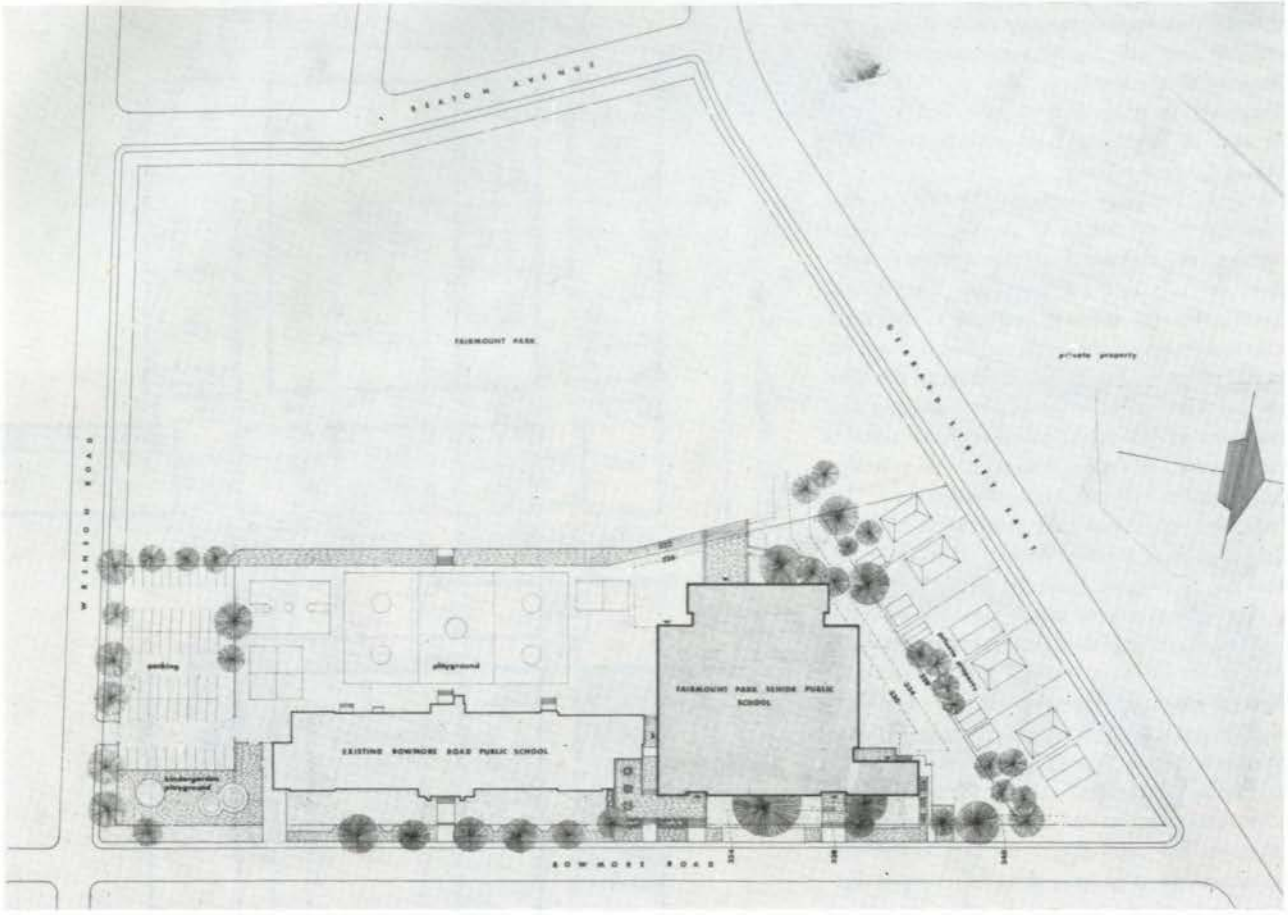
Another thing that is going on in the American scene that may be of some interest to you is the school construction system development project. This is a project quite frankly patterned after the English clasp system. The nature of the project is to develop a series of school building components, not stock school plans but stock parts, out of which schools can be made that are both of better quality and more economical than would otherwise be possible . . . There has been some resistance to this on the part of some architects on the grounds that it will limit their creativity and there is no doubt that it does put a limit on the pallet from which they can work. On the other hand, I think that there are far more architects who would find it easier to work within a limited pallet and who could then devote their time to the problems of programming the school rather than the problems of detailing the school. And so there may be many advantages to individual architects, in the use of such a system, that are not now apparent to some of them.

There is no real building type for a city school. We haven't come to grips with the problem. There are a few things going on. One project that we are involved in is in New York — there the school space is being put in the bottom of an apartment house in a development. We have had the feeling that there is no particular reason why the school house always has to be a separate building. By putting it within the development it is possible to get double use out of the playgrounds and park areas that surround it. The children have less far to go to school; they can wander in within the development without crossing major highways, streets, or avenues.

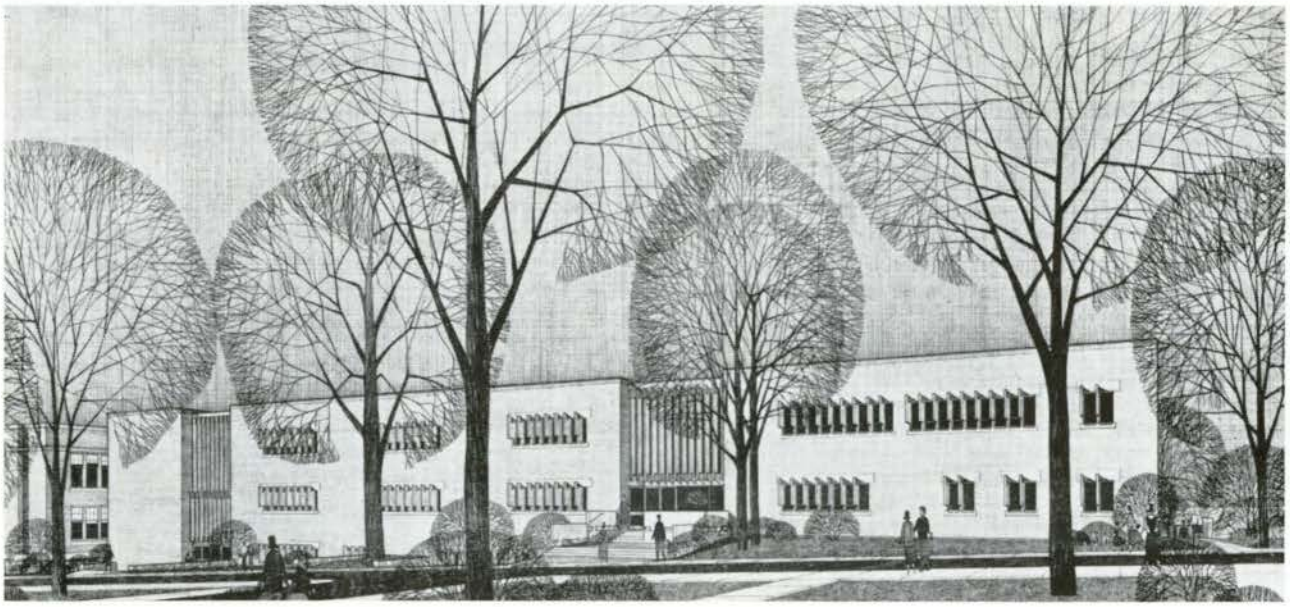
Mr Murray suggested earlier that I might have something to say on the subject of research on school design and whether it would be reasonable for you people to do more in this field. . . . All I can say is that I think it has been greatly useful, in the United States, to have an agency such as ours where architects and educators can turn when they have new problems in school buildings. And I certainly think that the British research on educational facilities, which is government run, has been extremely valuable to them.

In closing I would only like to say one thing and that is 'Make no old mistakes'."

FAIRMOUNT PARK SENIOR PUBLIC SCHOOL



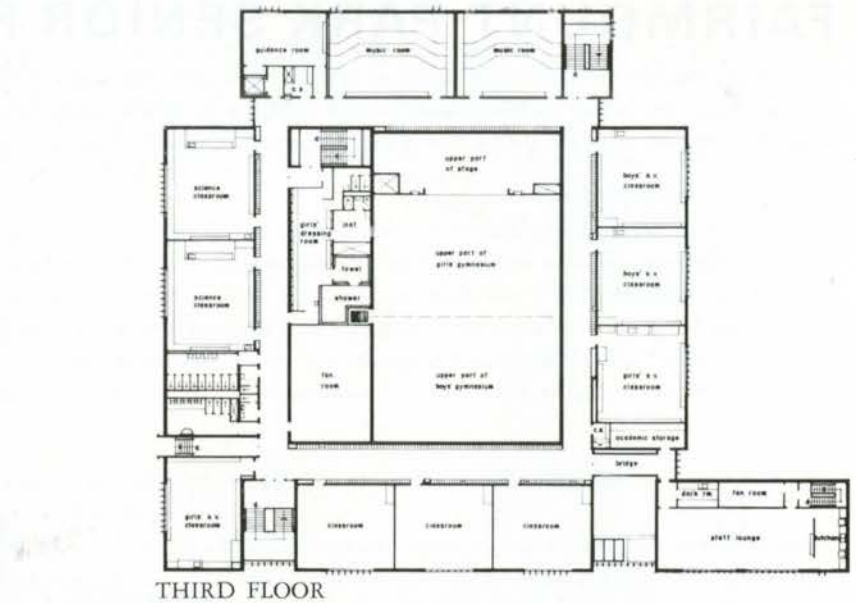
FAIRMOUNT PARK SENIOR PUBLIC SCHOOL • ARCHITECTS – THE ARCHITECTS' PARTNERSHIP • PARTNER IN CHARGE – W. E. CARRUTHERS • CHIEF ARCHITECT FOR THE TORONTO BOARD OF EDUCATION – F. C. ETHERINGTON • CONSULTING ENGINEERS • STRUCTURAL – EDGAR A. CROSS & ASSOCIATES • MECHANICAL – ANATOLE SHUPER & ASSOCIATES LIMITED • ELECTRICAL – EWBANK TUPPER & ASSOCIATES LIMITED • SOIL – DAMAS & SMITH LIMITED • EXTERIOR WORK – H. B. TRYHORN



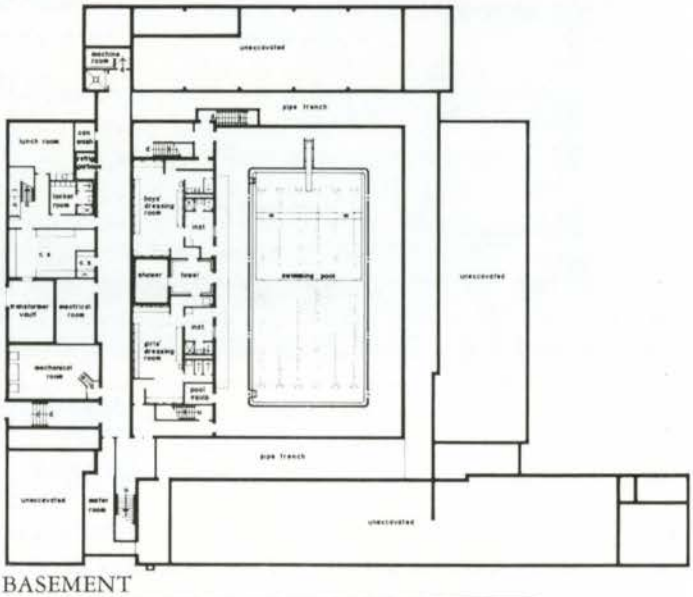
Fairmount Park Senior Public School will be located on a pleasant well shaded residential street. A conscious effort was made to design a building that will not be superinduced on the character of the street and that will relate harmoniously, in terms of treatment and scale, to the near-by houses and the old, but well designed, existing school.

The small, irregular shaped site, formed several years ago by the filling of an old river valley, presents an awkward and restrictive topography for a building of this size. This factor, together with the desire to maintain a residential scale and retain all the large and handsome trees on the property, has greatly influenced the final design. Selection of materials, the spacing and treatment of windows, entrances, and terraces was executed to ensure a sympathetic relationship with the existing school and houses.

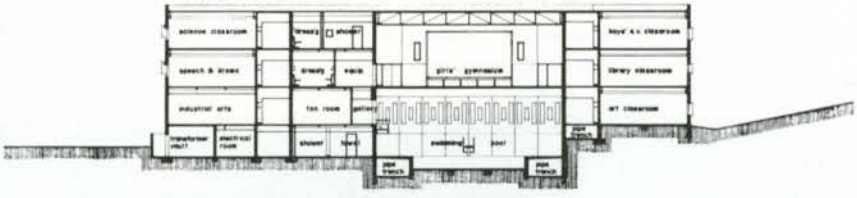
The planning is such that parts of the building can function as separate entities. The gymnatorium can be isolated from the rest of the school by closing two screens in the second floor corridor. The south-west stair provides segregated circulation for this area (including the stage facilities and playing fields) as well as providing a secondary exit and after hours entrance. Separate exterior entrances make it possible to isolate the swimming pool from the rest of the building for extra-curricular use and the summer swimming program. The outdoor covered area to the west permits students to keep out of the school during non-instructional periods while providing protection against inclement weather. It is hoped this factor will also reduce disturbance to neighbouring residents.



THIRD FLOOR



BASEMENT



Each typical classroom will have a window area equal to approximately six per cent of the floor area. Solar protection will be provided by precast concrete sunshade mullions. The necessity of providing substantial walls for sound isolation around the gymnatorium and swimming pool facilities, and the reduced window area in the exterior walls led to a bearing wall structure; the nature of the site necessitates the use of pile foundations. Floor and roof systems will be principally prestressed concrete double-Ts, exposed in most of the rooms.

The principal exterior material will be brick, laid in English bond, to match the existing school and harmonize with the near-by houses. Interior materials will be: walls, exposed slag block, finished with a glazed coating in the corridors, washrooms, and other areas subject to rough use and painted elsewhere, with an acoustical material on the upper portions of walls in some areas; ceilings, mainly exposed double-Ts with suspended acoustic tile in special areas; floors, terrazzo in the corridors, foyer, washrooms, and kitchen, ceramic tile in the shower and towel rooms and throughout the swimming pool area, resilient flooring in other areas, with resilient hardwood in the gymnatorium.

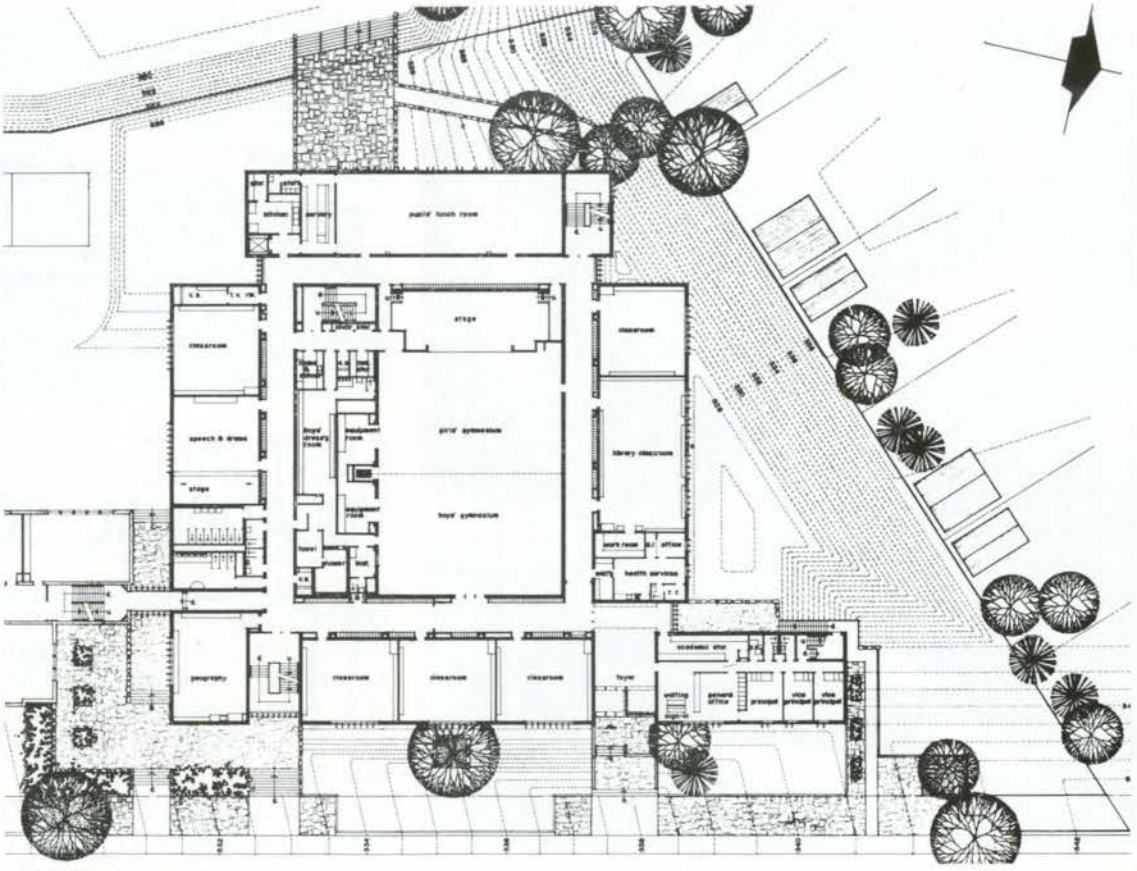
The gymnatorium will have a seven ft high glazed block dado with exposed painted slag block above; the folding partition will be covered with a vinyl fabric; ceiling and wall surfaces above and below the proscenium opening will be of naturally finished cedar strips.

The swimming pool area will have a continuous seven ft high glazed tile dado with upper walls of ribbed concrete finished with a sprayed on anti-condensate material with good sound absorbing qualities.

Classrooms will be lighted by continuous fluorescent tubes, surface mounted between the stems of the exposed double-Ts. Swimming pool lighting will be totally indirect by means of continuous fluorescent tubes carried in suspended vapour tight units located above the edges of the pool.

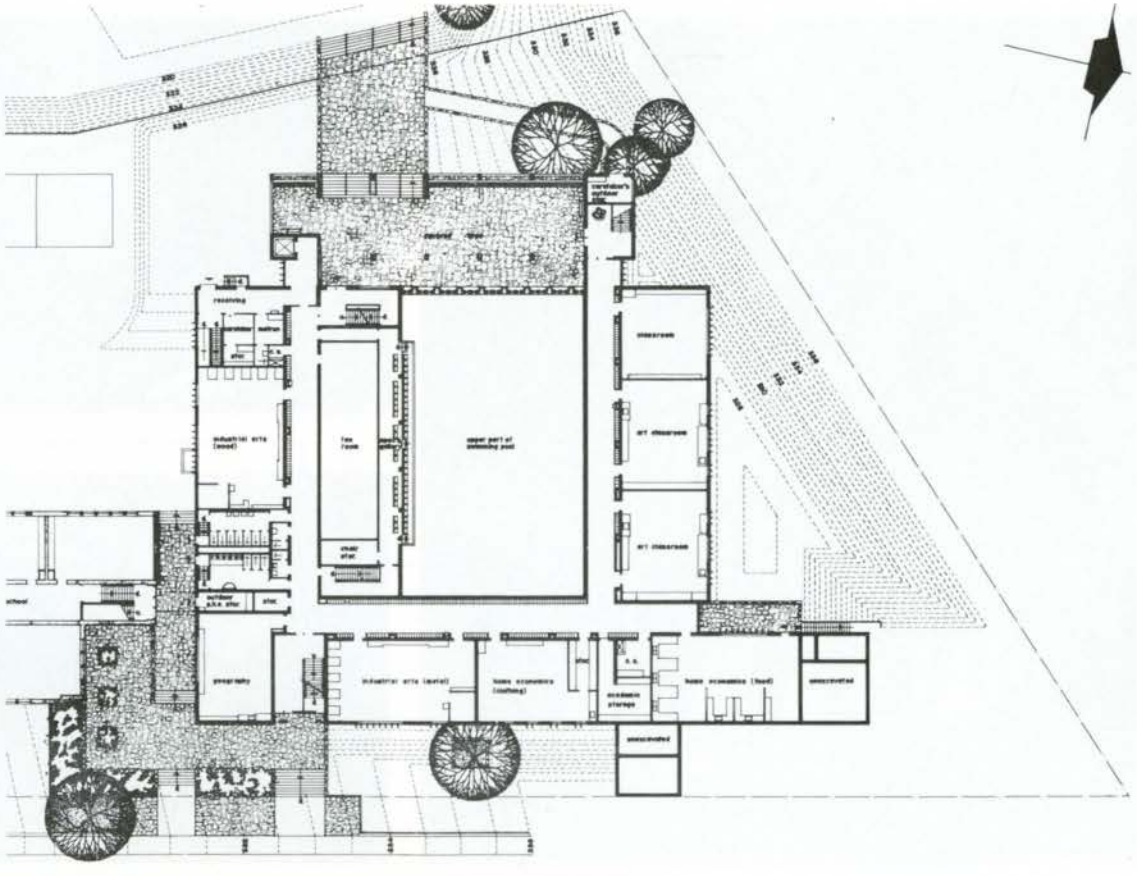
A complete conduit system, terminating in a central location and connected to a single roof mounted aerial, will be installed to accommodate both present and future television requirements.

Cost of the school, excluding furniture, equipment, and fees, is $16.81 per sq. ft.



SECOND FLOOR PLAN

FIRST FLOOR PLAN



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EASTDALE VOCATIONAL SCHOOL

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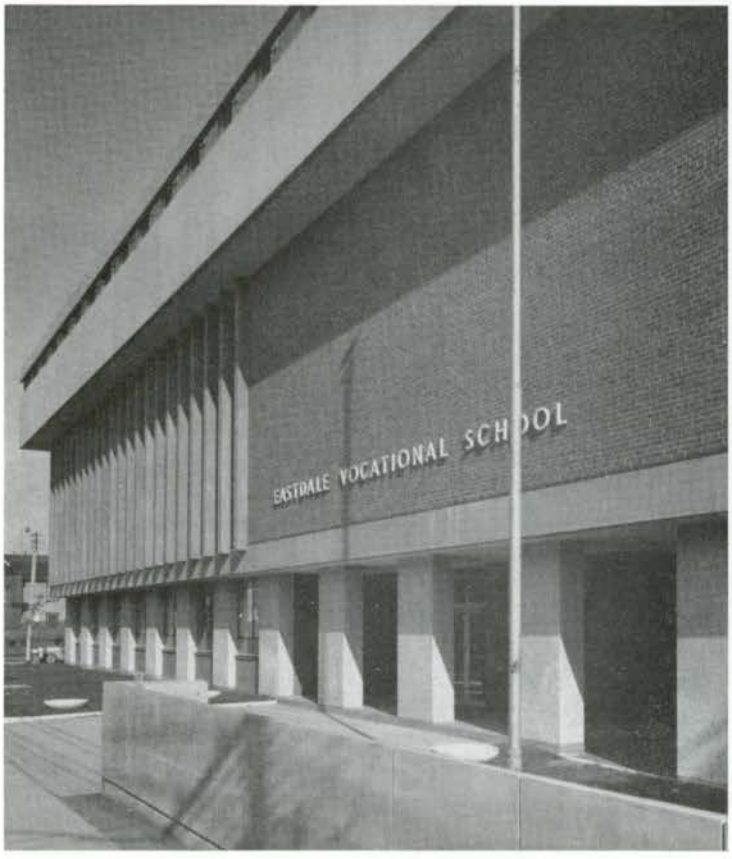

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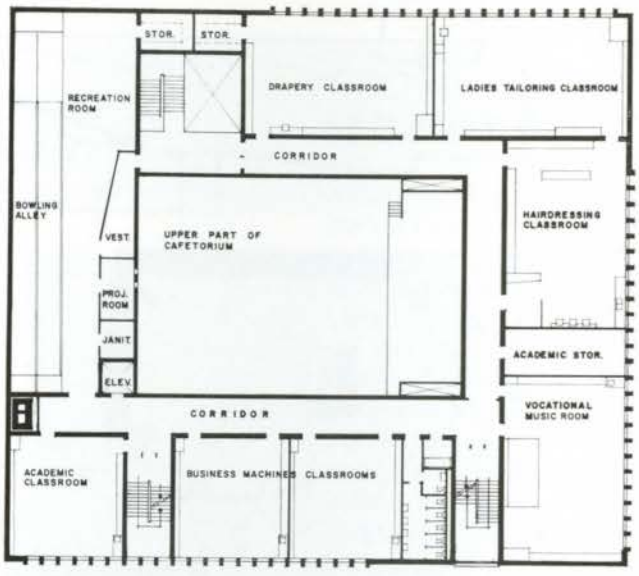
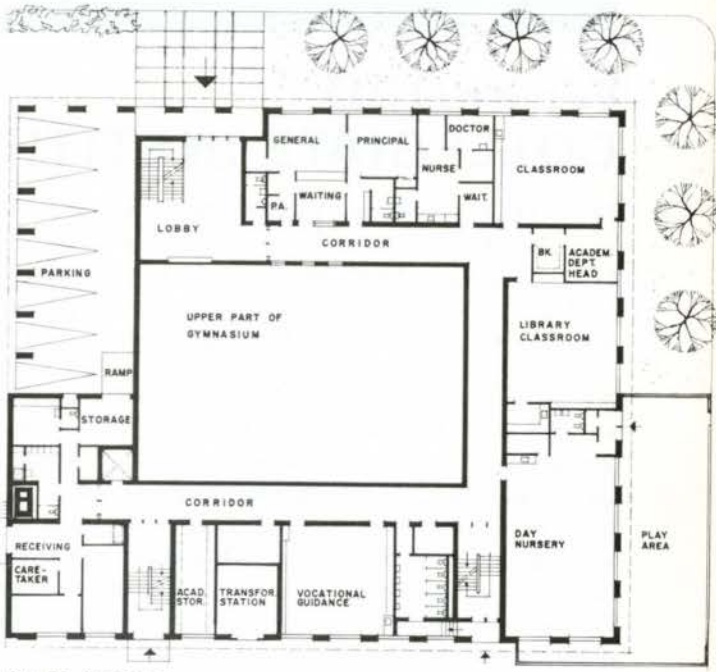
Replacing an existing building on the original site, this girls' vocational school is located on a major thoroughfare in one of the older neighbourhoods of Toronto. From the site limitations a compact building of five storeys evolved; the gymnasium is sunk below grade and the top floor became a roof playground — an innovation resulting directly from the lack of playground space. The plan has a central core with the gymnasium extending through two storeys and the auditorium on the second and third storeys. Classrooms and special teaching areas are located at the perimeter, one of the special facilities being a nursery where the supervision of children is part of the curriculum.



THIRD FLOOR



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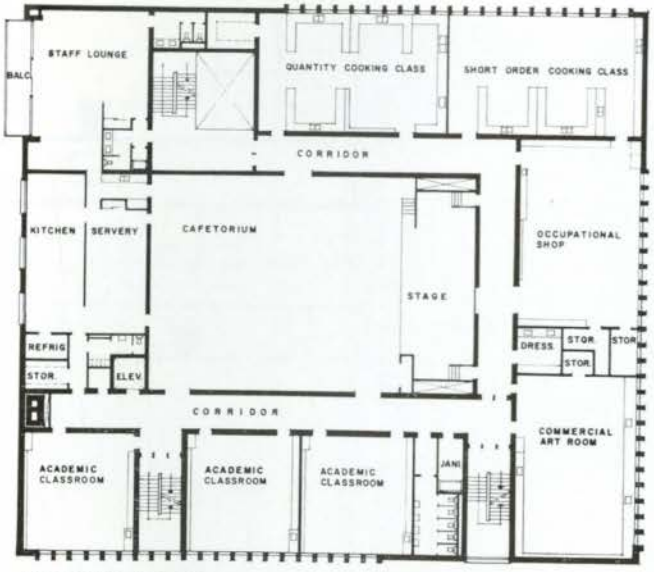

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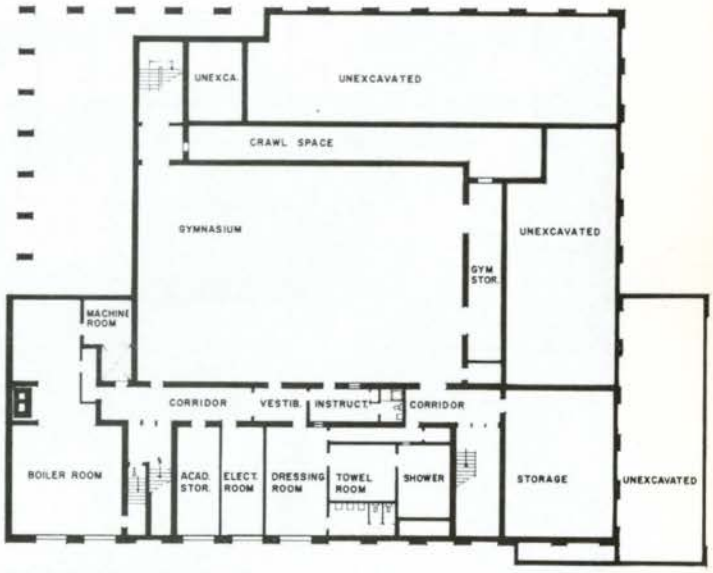

BASEMENT

1. Main entrance lobby and stairway. 2. Facade at Gerrard Street with the main entrance on the right. 3. General view from lower playground. 4. Perspective view of model showing the upper level playground with changing facilities at rear. (Gerrard Street in the foreground.) 5. East elevation showing staff parking facilities.

Photos by Newton

WEXFORD COLLEGIATE INSTITUTE

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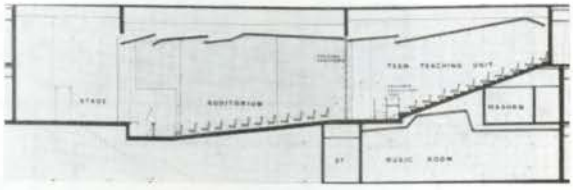
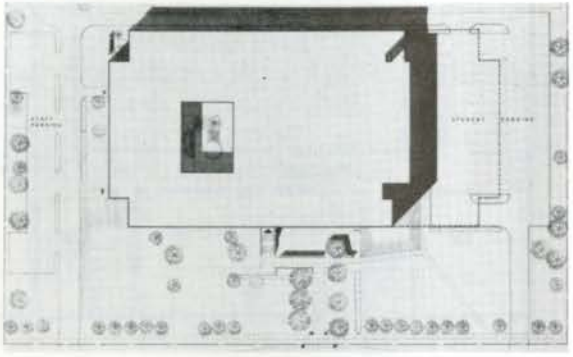
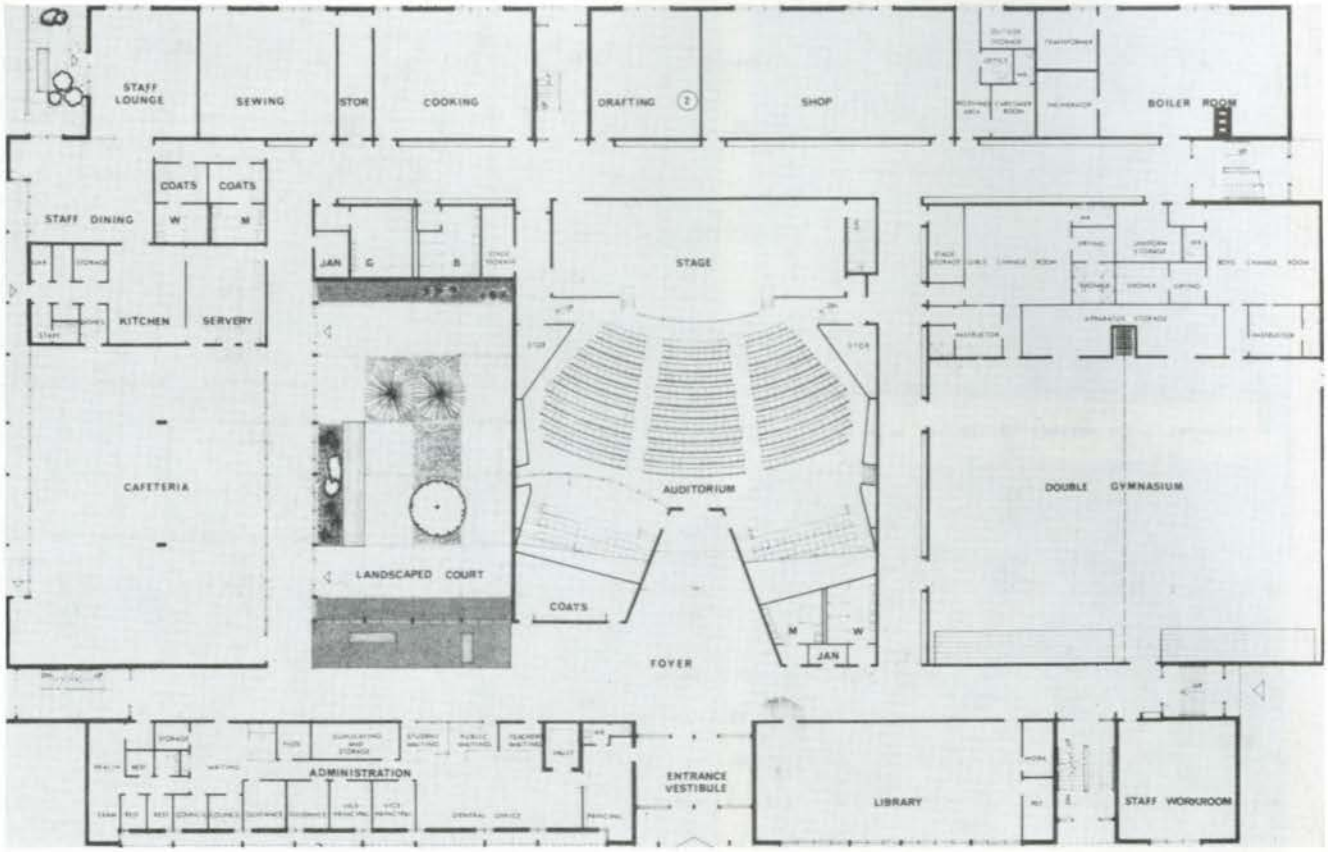
A nine acre estate in a residential neighbourhood is the site of the projected school. It is basically a two storey structure but takes advantage of a slope in the land so that on the east side it is three storeys. To accommodate 1,200 students, it was designed to reflect the character of the neighbourhood while providing maximum indoor space and occupying minimum land space. The auditorium, planned in the form of a Y, can be divided (by partitions) into three separate team teaching units: the lower section gently slopes up to the fork and the two branches are steeply tiered to the second floor roof level. Exterior materials are dark brown brick and precast concrete.



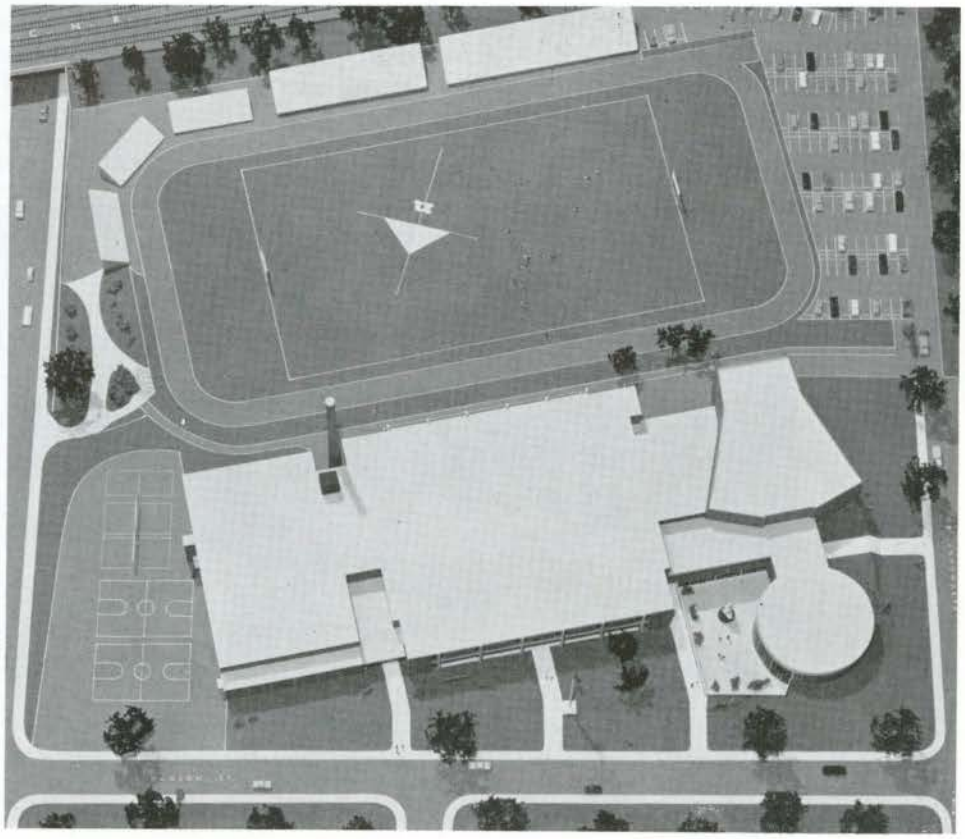




MONARCH PK. SECONDARY SCHOOL

ARCHITECTS — ALLWARD & GOUINLOCK • FOR THE TORONTO BOARD OF EDUCATION — F. C. ETHERINGTON — CHIEF ARCHITECT • CONSULTING ENGINEERS • ELECTRICAL AND MECHANICAL — THE TORONTO BOARD OF EDUCATION — CHIEF ENGINEER — H. G. FACEY • STRUCTURAL — THE ARCHITECTS • GENERAL CONTRACTOR — MITCHELL CONSTRUCTION CO. (CANADA)

Many of the features of this school resulted from a survey, conducted by the Toronto Board of Education, on school systems in the U.S. Monarch Park will have year round air-conditioning and only one third of the classrooms (in the proportion of eight per cent of wall area) will have exterior windows. The auditorium and library wing will be available for use after school hours and has been designed for the future addition of two storeys; flooring in the library will be broadloom. Structure of the building is steel frame and exterior materials are brick and exposed precast concrete. Total floor area is 160,000 sq. ft, providing facilities for 1,200 students, and cost has been estimated at approximately $3,500,000.



CASTLE FRANK HIGH SCHOOL

ARCHITECTS – FLEURY ARTHUR & BARCLAY • PROJECT ARCHITECT – A. STERN • CONSULTING ENGINEERS – STRUCTURAL – MORRISON HERSHFIELD MILLMAN & HUGGINS LTD • MECHANICAL – R. T. TAMBLYN & PARTNERS LTD • ELECTRICAL – G. E. MULVEY & CO. LTD GENERAL CONTRACTOR – BENNETT-PRATT LTD

Courses at this secondary school will offer training, below college entrance level, to prepare students for careers in the service industries. Shop training will be stressed with half of each day spent studying traditional academic subjects slanted in the direction of a particular career. Conditions which the student would find in business after graduation will be simulated in at least two areas. In the merchandising room students will be able to arrange displays and study various procedures including business methods. In the service station, exercises in practice will include office record keeping and window display techniques.

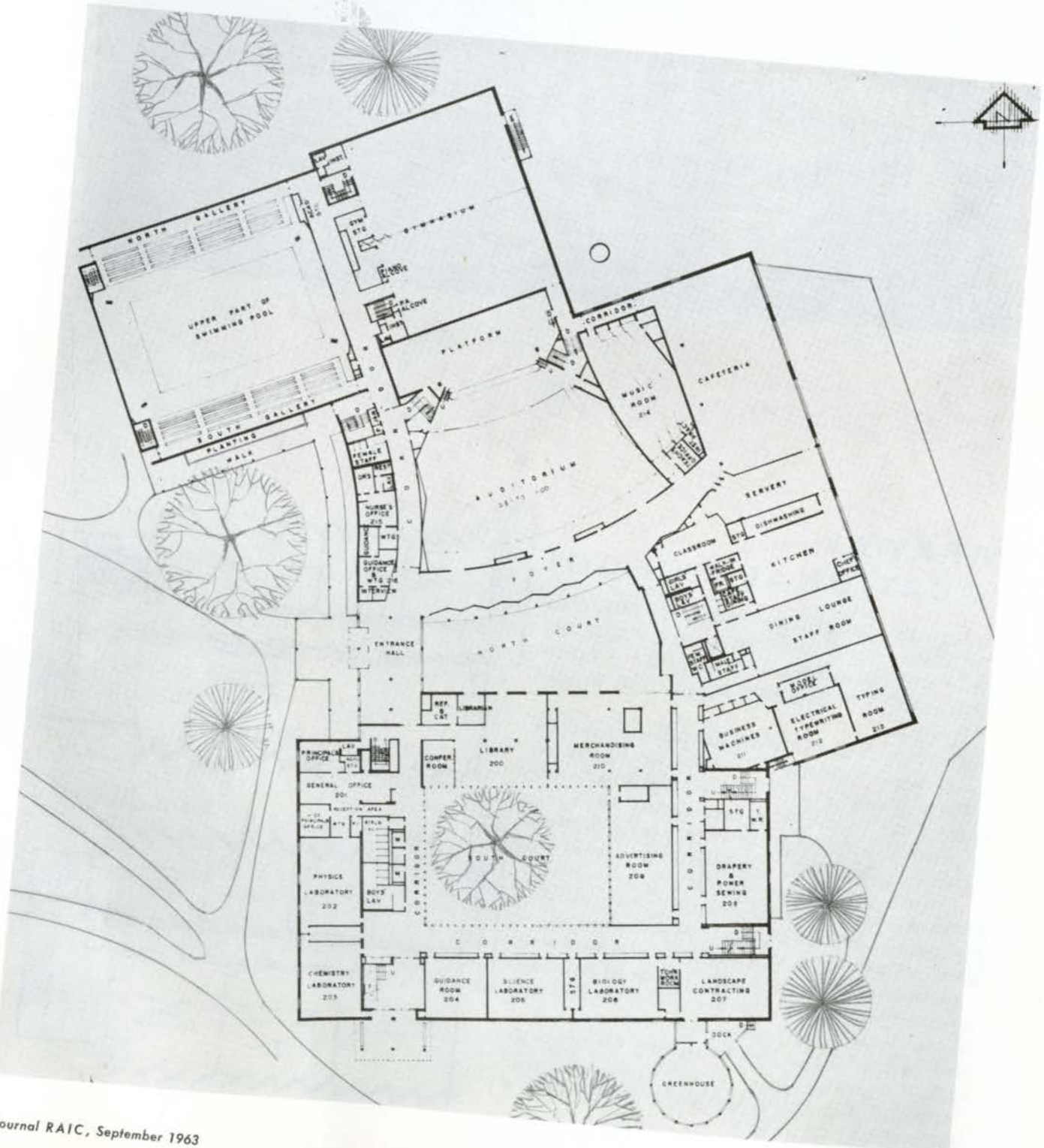
Special teaching facilities include: a library with insulated work spaces; a dark room that will accommodate a class; a green house organized as a teaching unit; four classrooms that can be adjusted into team teaching units by the removal of partitions. Storage for the many forms and documents used in classrooms will be located behind sliding chalkboards.

The swimming pool and its adjacent facilities have been designed for meets with seating for 500 people and will be available for summer classes for children in the district. Except for shops and the gymnasium and pool areas the school is fully air-conditioned.

House owners living on the periphery of the site objected to the school being built at all and so it will be located as far to the east as possible. A park of fine trees will separate the school from the residential area. Wherever possible significant trees were saved; in some cases the building was designed around, or in consideration of, specific trees.

Total floor area is 170,000 sq. ft, providing facilities for approx. 800 students at a cost of $22.75 per sq. ft.

METROPOLITAN


NORTH GALLERY
UPPER PART OF SWIMMING POOL
SOUTH GALLERY
PLANTING
WALK
GYMNASIUM
GYM STG
CLOSET
PA ALCOVE
PLATFORM
AUDITORIUM
FOYER
CORRIDOR
MUSIC ROOM 214
CAFETERIA
SERVERY
DISHWASHING
KITCHEN
CLASSROOM
DINING LOUNGE
STAFF ROOM
FEMALE STAFF
NURSE'S OFFICE 210
GUIDANCE OFFICE & INTERVIEW
ENTRANCE HALL
NORTH COURT
REF. & CAT.
LIBRARY
LIBRARIAN
LIBRARY 200
MERCHANDISING ROOM 210
COMPER ROOM
PRINCIPAL'S OFFICE
GENERAL OFFICE 201
RECEPTION AREA
PHYSICS LABORATORY 202
BOYS' LAV
SOUTH COURT
ADVERTISING ROOM 209
BUSINESS MACHINES
ELECTRICAL TYPEWRITING ROOM
TYPING ROOM 213
DRAPERY & POWER SEWING 208
CHEMISTRY LABORATORY 203
GUIDANCE ROOM 204
SCIENCE LABORATORY 205
STG
BIOLOGY LABORATORY 206
LANDSCAPE CONTRACTING 207
DOCK
GREENHOUSE

METROPOLITAN

PARKWAY VOCATIONAL SCHOOL

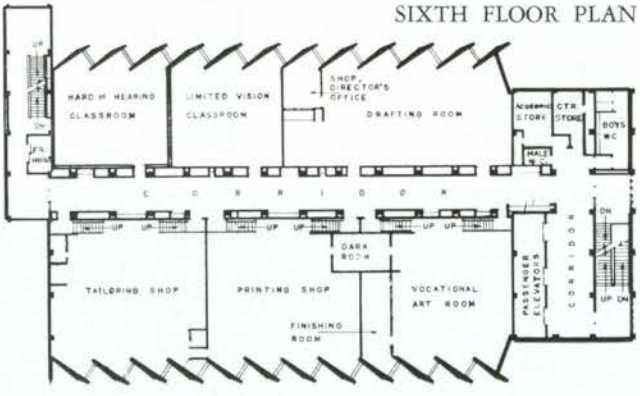
ARCHITECTS & ENGINEERS – TORONTO BOARD OF EDUCATION • CHIEF ARCHITECT – F. C. ETHERINGTON • CHIEF ENGINEER – H. G. FACEY • COMPTROLLER OF BUILDING AND PLANT – R. H. SELF

Construction of the new school was undertaken as part of the general program to improve technical and vocational schools in Toronto. Location is on a six and a half acre site overlooking the Don Valley. To conserve land on the restricted site the main centre containing the library, administrative offices, and thirty-one classrooms is a six storey block linked, by covered walkways, to units on the north and south. The classroom block is served by three high speed elevators and one freight elevator. A pedestrian bridge provides access to a city park and recreational and athletic facilities which are used by students during school hours.

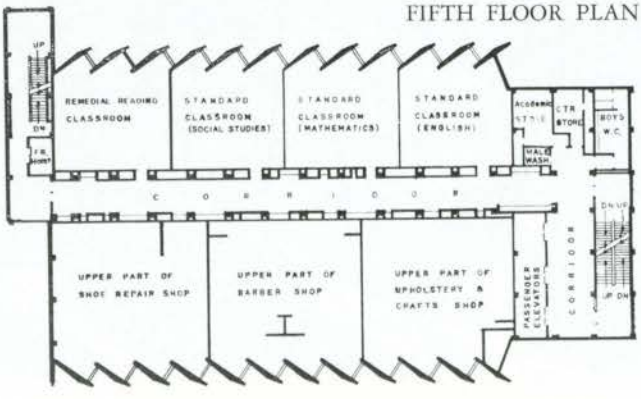
Construction is of precast concrete T beams for floors, reinforced concrete columns and wall fins, with brick facing panels. Windows in the six storey block are splayed at an angle to the classrooms providing minimum sun glare and maximum northern light.

Total floor area is 182,926 sq. ft and cost, including fees and equipment, is $24.57 per sq. ft.

SIXTH FLOOR PLAN



FIFTH FLOOR PLAN



CANADIAN
BUILDING DIGEST

DIVISION OF BUILDING RESEARCH • NATIONAL RESEARCH COUNCIL CANADA

FLAME SPREAD

by G. W. Shorter

UDC 614.841

The possible rate and extent of fire spread throughout a building once a fire has been initiated are of prime importance in fire protection. They are related to the characteristics of the individual building and its parts and can be adjusted over a wide range by the designer. The principal means at his disposal in limiting the extent of the fire is through the use of compartmentation (see CBD's 11 and 33), by which various parts of the building, including exits, are separated by constructions having suitable fire endurance. The designer may also have to consider how best to reduce the rate at which fire will develop and spread within a compartment. This is in part related to the flame spread characteristics of exposed surfaces of enclosing construction, and is the subject of this Digest.

The nature of fire and the way it may be expected to develop within a compartment have been discussed in CBD 31. Fire spread is influenced by a number of factors that vary from one case to another, but experience has shown that it can be markedly influenced by the nature of the interior linings. The flammability of the materials used as interior linings often determines both the likelihood (ease of ignition) and rate of development of a fire within a compartment.

The speed with which a lining material spreads flame is frequently a major factor in determining the size of the fire that will confront a fire department upon its arrival. If lining materials are chosen that have a low rate of flame spread, the rate of development of fire in a compartment will be reduced, provided the contents are not highly flammable. If the rate of development is slow enough it may even be possible, provided there is a prompt alarm, for the fire department to extinguish a fire before it has reached sizable dimensions within a compartment.

Slow development generally also improves the chances of escape of the occupants of the area in which the fire originates. Fires often develop slowly, but when flammable interior linings are involved they tend to speed up the development so that the flashover point is reached more rapidly. Flashover may be said to have taken place when the whole volume of a room is enveloped by flame. At this stage, survival of occupants is no longer possible as there is a rapid rise in temperature, often of the order of several hundred degrees.

Corridors, stairways and other escape routes that can be used during the early stages of a fire are also to be regarded as compartments, although they usually differ from normal occupied spaces in that they have no furnishings. Here the spread of fire is more directly dependent upon the flammability of the surface materials, and their role as escape routes merits special consideration.

Recognition of the hazard of rapid flame spread and the contribution made by flammable lining materials is a relatively recent development. Studies in this field were initiated as a result of several large fires about 1940 in which many lives were lost in the United States. Since that time quite extensive work has been done on the development of test procedures for comparing the surface burning characteristics of building materials. Many building codes, including the National Building Code of Canada, now recognize the flame spread hazard and contain requirements designed to limit it.

Flame Spread Tests

Although the concept of flame spread is quite simple, the real situation is not. Consequently it is not an easy matter to develop a standard test to evaluate the role of interior linings in actual situations. Three flame spread tests developed on this continent enjoy varying degrees of recognition; colloquially they are known as the large tunnel, radiant panel, and small tunnel tests. The large tunnel test was developed by Underwriters' Laboratories Inc., and is at present the only one recognized by the National Building Code of Canada. This test method is described in ASTM Standard E84-61. The radiant panel test, detailed in ASTM Standard E162-60T, was developed later at the U.S. National Bureau of Standards. The third, the small tunnel test, was developed at the U.S. Forest Products Laboratories, and a standard is now being prepared by ASTM. A brief description of each is given below.

ASTM E84-61 Test for Surface Burning Characteristics of Building Materials. This is the large tunnel test, which involves the use of large specimens. The combustion chamber is approximately 25 feet long, 17½ inches wide and 12 inches deep. Two gas burners deliver gas flames upwards at one end against the surface of the test specimen, which forms the roof of the tunnel. The igniting fire is assumed to extend 5½ feet from the burner end of the combustion chamber. Measurements are made of the speed of flame travel, the density of smoke and the temperature of the outgoing gases.

The essential feature of this test method is that following adjustment of the test equipment, flame will spread 19½ feet along select-grade red oak flooring in 5½ minutes. This condition is considered to represent a classification of 100, and asbestos-cement board is assigned a rating of zero; together they provide the fixed points on the scale of rating.

The flame spread classification is determined as follows:

(1) For materials on which the flame spreads 19½ feet in 5½ minutes or less, the classification shall be 100 times 5½ minutes, divided by the time (in minutes) in which the flame spreads 19½ feet.

(2) For materials on which the flame spreads 19½ feet in more than 5½ minutes but not more than 10 minutes, the classification shall be 100 times 5½ minutes divided by the time (in minutes) that the flame spreads 19½ feet plus one half the difference between this result and 100.

(3) For materials on which the flame spreads only part way, then ceases to continue or even recedes, the classification shall be 100 times the distance (in feet) from the igniting flame to the extreme flame travel on the sample divided by 19½ feet.

The test results for fuel contributed and smoke are plotted, using the same coordinates, and comparison of the areas under the respective curves establishes a numerical classification by which the performance of the material can be compared with that of asbestos-cement board and select-grade red oak flooring.

ASTM E162-60T Test for Surface Flammability of Materials Using a Radiant Heat Energy Source. This method of measuring surface flammability of materials employs a radiant heat source consisting of a 12- by 18-inch panel in front of which an inclined 6- by 18-inch specimen of the material to be tested is placed. The specimen is oriented so that ignition is forced near its upper edge and the flame front progresses downward.

The factor derived from the rate of progress of the flame front (ignition properties) and another relating to the rate of heat liberation by the material under test are combined to provide a flame spread index. Provision is also made for measuring the smoke evolved during tests. In general, the classification of materials using this test method corresponds to that obtained with the large tunnel test.

Small Tunnel Test. The equipment includes three main parts, a fire box, an 8-foot specimen combustion chamber, and a hood and stack. The fire box contains a T-head gas burner burning gas at the rate of 3400 Btu per minute. The specimen combustion chamber has insulated walls, floor, and cover, and a horizontal partitioning hot plate located a few inches above the bottom of the chamber. The hot plate has a number of holes of varying diameter along the full length of one side. A specimen 13¾ inches wide by 8 feet long is secured to the under side of the insulated cover, which is placed so that the short dimension of the specimen slopes upward at a 30-degree angle and its lower edge is slightly above the side of the hot plate. A small pilot burner is located under the sloping edge of the specimen.

In a typical test the main gas burner produces hot gases that heat the under side of the hot plate and flow through the holes along the edge of the plate. The specimen is thus

subjected to both hot gases and radiant heat from the hot plate. When the specimen is sufficiently heated by this exposure, it is ignited by the pilot burner. The rate of flame spread along the specimen is observed through ports in the tunnel, and temperatures and smoke density are recorded in the flue.

Flame spread, fuel contributed and smoke density are reported as numerical ratings that can be related to red oak at 100 and asbestos-cement board at 0. It normally takes 18.4 minutes for red oak to burn to the end, so that the test duration is that value or less.

National Building Code Flame Spread Requirements

In the 1960 revision of the National Building Code of Canada detailed flame spread requirements appeared for the first time. General considerations leading to the introduction of these requirements were as follows:

1. In corridors of all public buildings every effort should be made to render them tenable for as long as possible in the event of fire. Sharply limiting the flammability of lining materials, particularly on the ceiling, should assist in prolonging a corridor's tenability.

2. In areas used for public assembly, particularly where care has been taken to reduce combustible content, it would be logical to exclude highly flammable interior linings. In such places as auditoria and theatres it is essential to avoid panic in the event of fire.

3. Care should be exercised in the selection of lining materials for occupancies where people are restrained (e.g., penal institutions) and where people are infirm (e.g., hospitals). Every effort should be made to retard the development of fire because greater lengths of time are often necessary to evacuate the occupants safely.

4. Consideration should also be given to residential occupancies such as hotels where large numbers of people may be sleeping. Again it seems desirable to restrict to some degree the flammability of lining materials.

The National Building Code of Canada, 1960, established the following flame spread requirements based on ratings obtained from ASTM E84 tunnel tests.

Corridors. The flame spread on ceilings shall be less than 25 and on walls less than 75. An alternate provision allows a rating of up to 150 on the lower half of walls if that of the upper half is not greater than 25. If sprinklers are installed a flame spread of up to 150 on all surfaces is acceptable.

Assembly, Institutional and Residential Occupancies. All interior finishes shall have a flame spread rating of less than 150.

Flame Spread Ratings

The majority of tests using the ASTM E84 method have been performed by the American and Canadian Underwriters' Laboratories on proprietary materials generally having ratings of less than 75. Ratings from these tests are found in the Building Materials List, Underwriters' Laboratories Inc., and in the List of Inspected Appliances, Equipment and Materials, Underwriters' Laboratories of Canada. Only a limited number of tests, the majority on untreated lumber, have been performed on other than proprietary materials.

The twelfth edition of the NFPA Handbook (1962) in Table 8-143 lists flame spread ratings for a number of different materials all based on tunnel test results. Some ratings taken from this table are given below. Untreated lumber varies from 60 to 215, and, when treated, varies from 10 to 60. Untreated plywood varies from 100 for Douglas fir to 260 for a walnut-faced plywood. Treated Douglas plywood varies from 15 to 60, with about the same ratings for various facings on a Douglas fir core. Fire retardant coatings applied to Douglas fir can reduce its flame spread from 100 to from 10 to 60, and when it is applied to untreated cellulose board surfaces can reduce flame spread from 225 to from 10 to 60. It can thus be seen that certain fire retardant treatments, including surface coatings, will modify the flame spread characteristics of cellulosic boards to such an extent that they can have a flame spread of less than 25. Plaster wall board (½- to ⅝-inch gypsum core board, surfaced both sides with paper) has a rating of 10 to 15.

Information is now being developed for use with the National Building Code of Canada on flame spread ratings for common materials that can be adequately identified by class or description. It will still be necessary to establish ratings by tests, as required for other materials including those that are proprietary.

General Comments

When discussing the flammability of building materials reference is usually made to the term "flame spread." The "Tentative Definitions of Terms Relating to Fire Tests of Building Construction and Materials," prepared by ASTM defines flame spread as follows: "Flaming combustion along a surface; not to be confused with flame transfer by air currents." The precise mechanism by which flame spreads on a surface is at present not fully understood.

Certain general comments, however, can be made regarding factors that exert an influence on the flame spread characteristics of materials.

Smooth hard surfaces normally will not spread flame as fast as soft or fuzzy surfaces. Thick surfacing materials will usually spread flame more slowly than thin materials, but studies indicate that flame spread is relatively independent of thickness for most materials thicker than ¼ inch. The absorption of heat by base materials to which a finish material may be applied will tend to reduce the rate of surface burning, provided there is intimate contact between the two surfaces. This is most significant where thin surfacing materials are concerned. The method of fastening the surfacing material to the base material is most important. The moisture content of a material also can affect the rate of surface spread of flame, particularly with cellulosic materials, as can the proportion of combustible matter contained in it.

In general, materials having a low combustible content will exhibit low flame spread (ratings under 25). Examples of such materials are stone, glass, most metals, masonry products, ceramic tile, plaster, asbestos products and stucco. It is generally recognized that thin surface coatings, such as two or three coats of conventional paint or a few layers of printed wallpaper, will not raise the flame spread ratings significantly when applied to such materials. Exceptions, of course, are highly flammable coatings such as nitrocellulose lacquers.

Substantially combustible materials such as untreated lumber and cellulosic products will have flame spread ratings normally ranging from 75 upwards. Most species of lumber and a number of plywoods have ratings between 75 and 150. In order to bring the ratings of these materials below 75 it is necessary either to treat them by impregnation or apply a fire retardant surface coating. The permanence of the protection offered by either method, however, is questionable. With impregnation, the salts may leach out under humid conditions, and maintenance procedures may reduce the effectiveness of a surface coating. Use of interior finishes incorporating varying amounts of combustible components often prompts the question of their influence on the fire endurance of the building element to which they are applied.

Interior finishes even of a combustible character will generally increase the over-all fire endurance of an assembly to the extent that such materials afford additional heat insulation. A supplementary fire problem may be created, however, when flammable lining materials are installed on furring strips or studs or are suspended with an open space behind or above them. A fire that originates in such a space can often spread undetected, and if proper fire stopping has not been employed can spread from compartment to compartment. In addition, this type of fire is difficult to extinguish because it is often not readily reached by hose streams.

Of recent years concern has been expressed in many quarters about the effect of the smoke produced during the burning of surfacing materials, and the toxicity of the products of combustion on life safety. Various organizations are now carrying out studies in this field. Reduction of visibility, rather than physiological effects, is generally regarded as the major smoke hazard to occupants attempting to evacuate a building in the event of fire. Although all flame spread test methods include measurement of the smoke produced during the test, there is the question of whether a severe test for flame spread is also appropriate for evaluating smoke production. In addition, there is the problem of relating the figures obtained during a test to actual conditions in a building fire. A number of the studies being undertaken are related to an individual's ability to see an exit sign at the end of a corridor while the corridor fills with smoke.

Conclusion

It is recognized that factors other than flammability of lining materials—ventilation, the nature and distribution of the contents and geometry of a compartment—can materially affect the development of a fire. When these are equal, however, fire will develop more rapidly in the compartment having the more flammable lining. The selection of materials for the interior linings of buildings is therefore an important consideration; it affects not only the safety of property but also the safety of the occupants. The hazard exists, as well, for those in other areas who may be trapped by a rapidly spreading fire. This aspect of fire protection definitely merits the attention of building designers in order that buildings now being designed will not pose a serious life hazard in the future.

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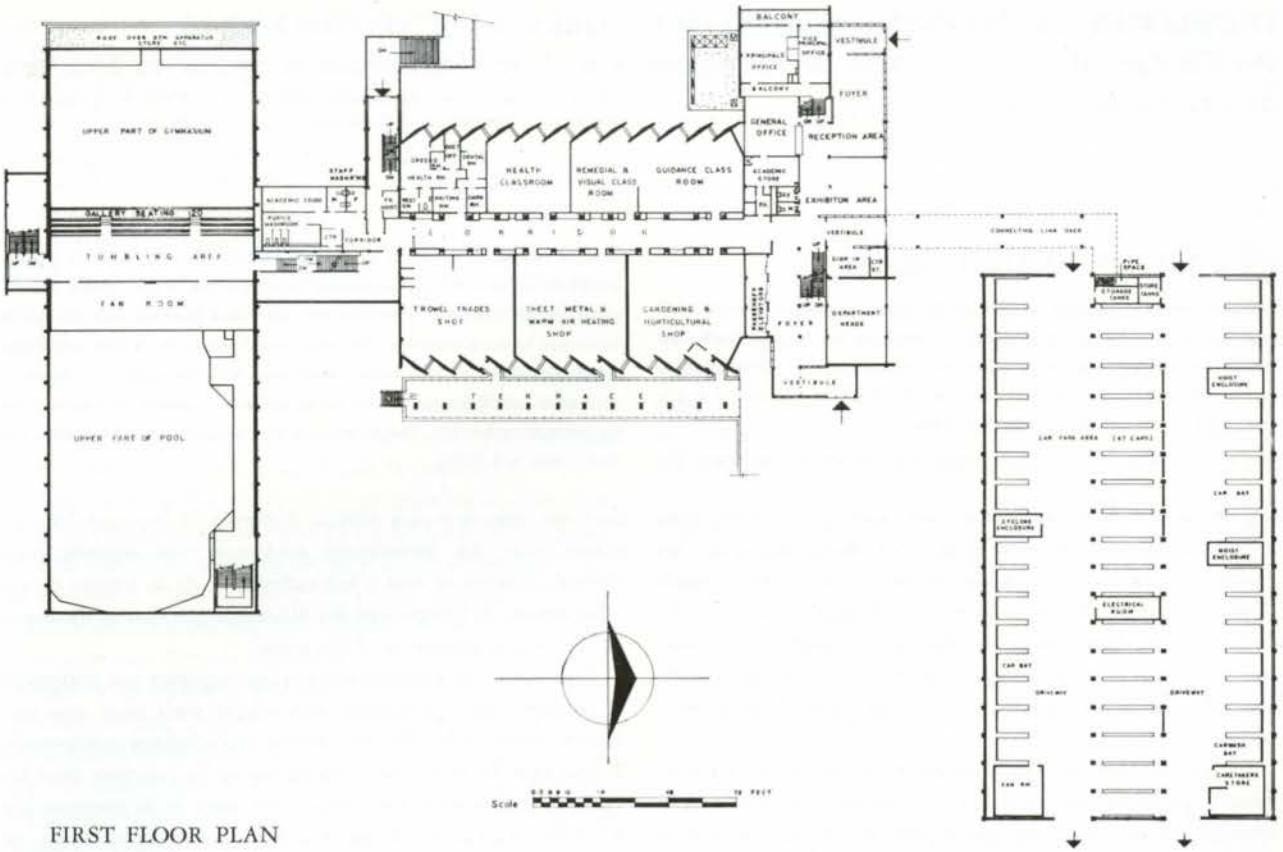
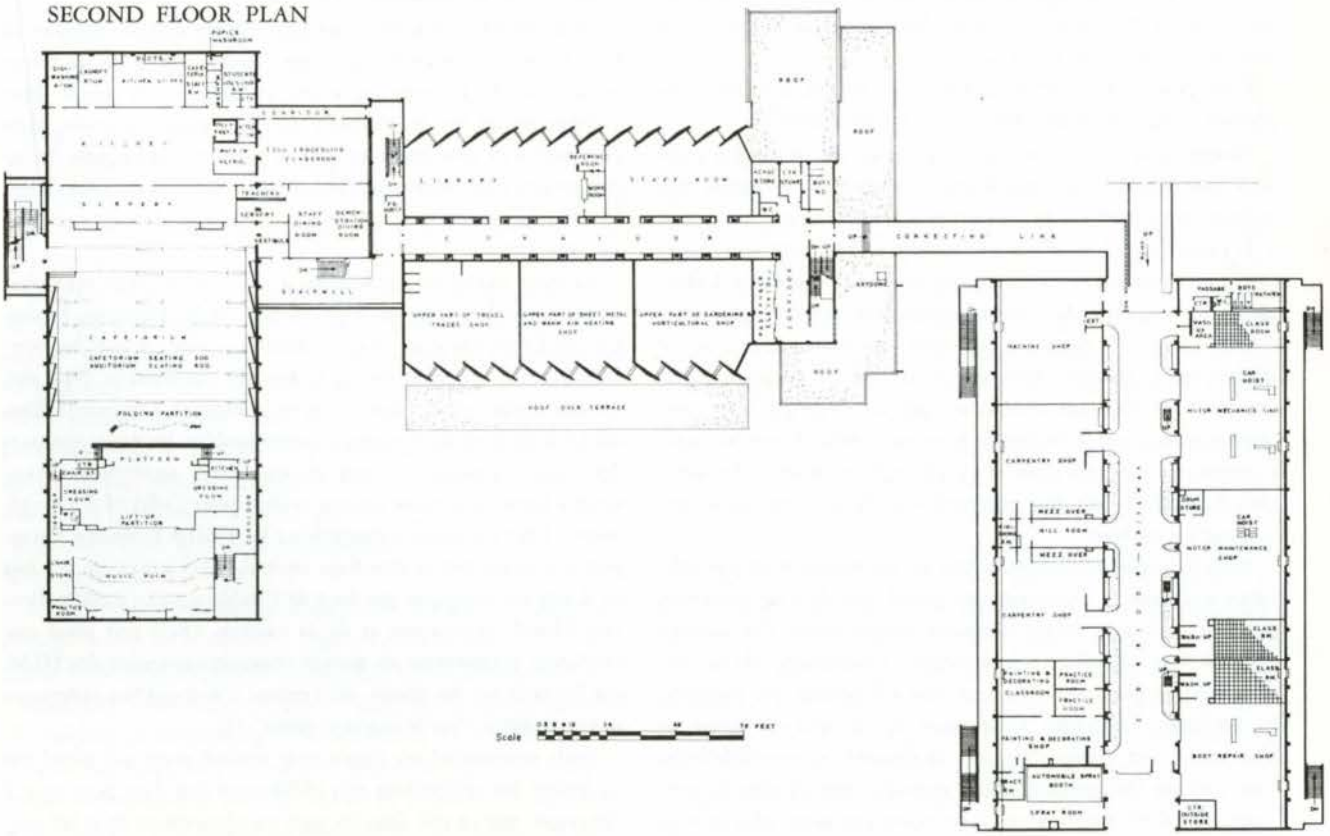


FIRST FLOOR PLAN

SECOND FLOOR PLAN



PROBLEMES DES CONSTRUCTIONS SCOLAIRES ET UNIVERSITAIRES

Par Georges Mesmin / Directeur de l'Equipement Scolaire Universitaire et Sportif au Ministère de l'Education Nationale

Extrait d'un article de l'Architecture Aujourd'hui, no 107 Avril-Mai 1963, Constructions Scolaires et Universitaires.

RESUME BY JEAN GAREAU

The government, in meeting the demand for teaching space, has forgotten the need for planning. Emphasis is applied to obtaining the polished mechanical devices without providing the basic surrounding that invites intellectual intercourse. Demand has been the sole reason for building and therefore it is now necessary to re-discover the concept of building.

The writer suggests that all positive planning approaches should be sought. The result of this search should be applied to all school planning, be it for primary schools or the now existing anonymous housing estates of the colleges. For example, private enterprise fosters the need for mixed planning, and this should be allowed by the government. The result would be that the campus would consist of such things as coffee clubs. record bars, book shops and other forms of commercial establishments as well as the academic structures, all necessary for the needs of student life. The government must co-operate with the public and these results will follow.

Les problèmes quantitatifs sont à tel point préoccupants dans le domaine des constructions scolaires et universitaires, que les problèmes qualitatifs ont malheureusement tendance à passer au second plan de nos soucis quotidiens. En gagé dans la bataille de la quantité, le ministère de l'Education nationale n'a peut-être pas toujours accordé aux problèmes d'architecture, problèmes de qualité par excellence, toute l'importance qu'ils méritaient.

Certes, les constructions scolaires et universitaires ne constituent qu'un secteur limité si on le compare au secteur de la construction de logements, qui représente un volume annuel d'investissements cinq fois plus important. Ce n'est pas, cependant, une raison suffisante pour considérer que les progrès en matière d'architecture doivent être réalisés d'abord dans le secteur le plus vaste. Au contraire, il n'est pas interdit de penser que les écoles, les lycées et les facultés pourraient constituer un champ d'expérimentation pour l'architecture d'aujourd'hui.

Champ d'expérimentation qui grandit de façon sensible d'une année sur l'autre, puisqu'une assez forte progression est prévue pendant la durée du IV[e] Plan. . . . . .

C'est pourquoi l'optique quantitative restera, par force, au premier rang des préoccupations de l'Administration.

Néanmoins, l'expérience des récentes années a montré combien cette optique était insuffisante et le souci de la qualité doit normalement prendre de plus en plus d'importance.

Il s'agit d'abord de la qualité technique. Il est temps de s'apercevoir que certaines économies sont en réalité coûteuses. L'obligation de respecter des prix-plafonds trop serrés engendre, à moyen terme, des dépenses supplémentaires d'entretien ou de réparation. L'économie faite au départ sur les crédits d'investissement est plus que compensée par les dépenses à imputer ultérieurement sur le budget de fonctionnement. Cette politique à courte-vue n'est pas fatale et un effort d'information des autorités financières doit être entrepris afin de leur en démontrer le caractère néfaste. . . . . .

Mais la qualité technique, si elle est nécessaire, n'est pas suffisante. Les maîtres d'ouvrage ont grand tort de s'en contenter, alors qu'ils doivent exiger la qualité architecturale. On confond trop souvent celle-ci avec le caractère "fonctionnel" de la construction. Un plan-masse est jugé bon s'il permet, par exemple, au professeur d'accéder rapidement de la salle de cours au laboratoire, aux élèves d'évacuer facilement les amphithéâtres. Tout ceci est indispensable, bien entendu, mais, à côté de cette "fonctionnalité" stricto sensu, il en existe une autre, plus subtile, qu'il est beaucoup plus difficile d'obtenir. Il faut que les étudiants aient des laboratoires modernes, bien équipés, bien conçus; mais est-ce tout à fait suffisant si, de la fenêtre de ces laboratoires, ils aperçoivent des bâtiments que rien ne distingue de ceux d'une caserne ou d'une usine?

Les lieux où ils étudient doivent leur apporter non seulement le confort d'un équipement bien adapté mais aussi une ambiance propice à la réflexion comme aux échanges intellectuels. Il leur faut les péristyles et les patios où ils pourront faire les cent pas en discutant; les jardins et les parcs où ils pourront lire à l'ombre d'un arbre. Il leur faut surtout évoluer au milieu de formes architecturales exaltant l'esprit.

Ce qui est vrai pour les étudiants l'est aussi pour les écoliers et les lycéens. L'architecture de l'école, du collège ou du lycée ne peut pas ne pas exercer d'influence sur bon nombre de ceux qui y passent leur enfance et leur adolescence. Qui peut dire combien d'enfants ont été dégoûtés des études par le caractère rébarbatif, voire inhumain des locaux d'enseignement?

Nous avons, certes, fait quelques progrès depuis l'époque du Petit Chose. Le contraste entre nos "claires écoles" et les tristes locaux d'antan a même pu servir de thème à un récent court métrage réalisé par le ministère de l'Education nationale. Mais l'utilisation de grandes baies vitrées, ouvertes à la lumière (peut-être un peu trop largement), et l'emploi de peintures plus claires ne suffisent pas automatiquement à créer cette ambiance propice au "gai savoir". . . . . .

Laissons parler un professeur, à qui l'on ne peut reprocher de manquer d'expérience. Voici ce que dit M. Flandrin, Professeur au Lycée Lakanal: "Ce qui m'effraie, c'est de voir les nouveaux lycées se construire sur le modèle des anciens. Bien sûr, ils sont modernes de lignes, l'air et la lumière y entrent à flots, mais les couloirs sont toujours interminables, les cours toujours des cours, les salles de classe toujours aussi anonymes et l'ensemble forme une vaste caserne prévue pour l'effectif d'un régiment... On s'est borné à moderniser les vieilles formules, à remplacer le poêle par le chauffage central, mais jamais on n'a mis en doute les principes qui font de l'établissement scolaire l'enfant bâtard du couvent et de la caserne. Qu'il soit ainsi une excellente préparation au monde concentrationnaire des HLM, des bureaux ou des usines, où l'enfant d'aujourd'hui enfermera sa vie d'adulte, c'est là son seul mérit" (1).

Seuls trouveront ces lignes trop sévères ceux qui n'ont pas pu visiter les réalisations très différentes que l'on peut voir à l'étranger, que ce soit dans les pays scandinaves ou dans les pays

(1) Cahiers pédagogiques n° 37, octobre 1962.

d'Europe occidentale voisins de la France. Les récents congrès de Milan et de Londres ont été très instructifs à cet égard et ont permis aux participants français de constater combien nos conceptions étaient statiques et rigides. Le plan, classique en France, où se juxtaposent le long d'une circulation, des classes toutes identiques, fait place de plus en plus, à l'étranger, à des schémas beaucoup plus souples: l'école, le collège, y apparaissent non plus comme un bâtiment compact mais comme un groupement de plusieurs petites unités, composées de 3 ou 4 classes, ayant une vie pédagogique presque autonome autour d'un lieu de réunion commun.

C'est la traduction architecturale d'un concept pédagogique et les architectes qui liront ces lignes penseront légitimement que c'est l'Administration qui a elle-même fixé des règlements et des schémas qu'ils sont bien obligés de respecter.

C'est pourquoi l'initiative de l'assouplissement doit, certes, venir de l'Administration. Mais les modalités en devraient être étudiées en commun par les pédagogues, les administrateurs et les architectes. Dans une première phase, certaines opérations-témoins devraient pouvoir être réalisées, où la seule contrainte serait le respect du prix plafond et d'un programme minimum énumérant les locaux et leur surface. De toute manière, il faut certainement agir d'urgence car l'enjeu est important et les difficultés seront nombreuses: ce n'est pas du jour au lendemain que l'on peut remplacer par des bungalows entourés de verdure nos écoles traditionnelles avec leurs cours de récréation macadamisées et ceinturées de grillage. C'est tout un état d'esprit qu'il faut progressivement modifier, en tâchant de montrer à tous les aspects positifs des changements préconisés. Pourquoi n'aurait-on pas, par exemple, l'adhésion chaleureuse de beaucoup d'instituteurs à cette conception d'une école plus accueillante, non plus barricadée, mais ouverte sur l'extérieur et dont les aires de jeux pourraient (pourquoi pas?) rester, le jeudi, accessibles aux enfants?

Si les règlementations administratives paraissent bien la raison principale des défauts que nous constatons en ce qui concerne l'aspect de nos établissements du premier et du second degrés, il n'en est plus tout à fait de même pour ceux de nos grands ensembles universitaires. Ici, ce n'est plus la conception pedagogique qui est en cause mais bien la conception architecturale. Lorsqu'on examine les plans-masse de ces ensembles en cours de réalisation dans la plupart des villes universitaires, on est saisi d'une certaine inquiétude quant au cadre de vie qui sera réservé demain à des dizaines de milliers d'étudiants. Au moment même où la "maladie des grands ensembles de logements" a été analysée et où les meilleurs de nos architectes essaient d'y porter remède, ne risque-t-on pas de voir apparaître bientôt la "maladie des grands ensembles universitaires", qui aura les mêmes caractéristiques: monotonie, sécheresse, manque d'humanité? Il serait pourtant dommage que l'expérience faite dans le secteur de la construction de logements ne nous serve pas de leçon. . . . . .

Plusieurs caractéristiques contribuent à créer un sentiment d'ennui, voire de malaise: la régularité de la densité qui supprime toute surprise pour le promeneur, l'abus de la ligne droite, l'insuffisante variété des niveaux, la suppression des espaces clos ou resserrés qui faisaient la vie et le charme des villes anciennes.

Il ne s'agit pas, pour y remédier, de rajouter, çà et là, quelques centres commerciaux; c'est une nouvelle réaction qui est nécessaire, contre cet urbanisme dépersonnalisé, né d'une application trop systématique, voire primaire, de la Charte d'Athènes. Le problème posé est simple: c'est de recréer, avec un style, des moyens et des matériaux modernes, l'ambiance que l'on trouve à Bruges ou à Vérone, à Salamanque ou à Aix-en-Provence, à Oxford ou à Marrakech.

Ces préoccupations sont très actuelles lorsqu'il s'agit des futurs grands ensembles universitaires. Il ne suffit pas de les implanter à proximité des villes nouvelles pour que les étudiants s'y sentent moins isolés. Il faut qu'ils soient eux-mêmes vivants. Ceci exige avant tout un effort d'imagination des architectes, qui n'a pas toujours été fourni (à part quelques exceptions) dans un passé récent. Il ne faut plus que l'on voie se multiplier ces plans en "peigne" qui transforment en usines les facultés des sciences, sous prétexte qu'elles comportent des laboratoires. Il faudrait, en revanche, que chaque ensemble comporte un ou plusieurs centres, plus denses, avec une place, un "forum" autour duquel se concentreront les bâtiments où peuvent venir se mêler les étudiants de disciplines différentes: restaurants, bibliothèques.

Ces bâtiments risquent, malheureusement, d'être peu nombreux si l'on se contente d'édifier ceux qui sont financés intégralement par l'Etat: pendant longtemps encore, le ministère de l'Education nationale devra consacrer l'essentiel des sommes dont il dispose à l'édification des locaux d'enseignement. Mais ceci ne devrait pas être un obstacle déterminant: pourquoi ne pas faire appel à d'autres sources de financement publiques ou semi-publiques pour la construction du ciné-club ou de la maison de la culture; pourquoi ne pas utiliser le système de la concession et faire pénétrer l'initiative privée sous la forme du libraire, du disquaire, de la cafeteria ou du café-club, voire du prisunic, puisque ces ensembles seront peuplés d'étudiants qui représenteront un pouvoir d'achat non négligeable? De toute manière ils provoqueront l'apparition de boutiques nouvelles: mieux vaut intégrer celles-ci dans le parti architectural que de les laisser s'édifier de façon parasitaire aux limites de l'ensemble, comme le bidonville de Brasilia.

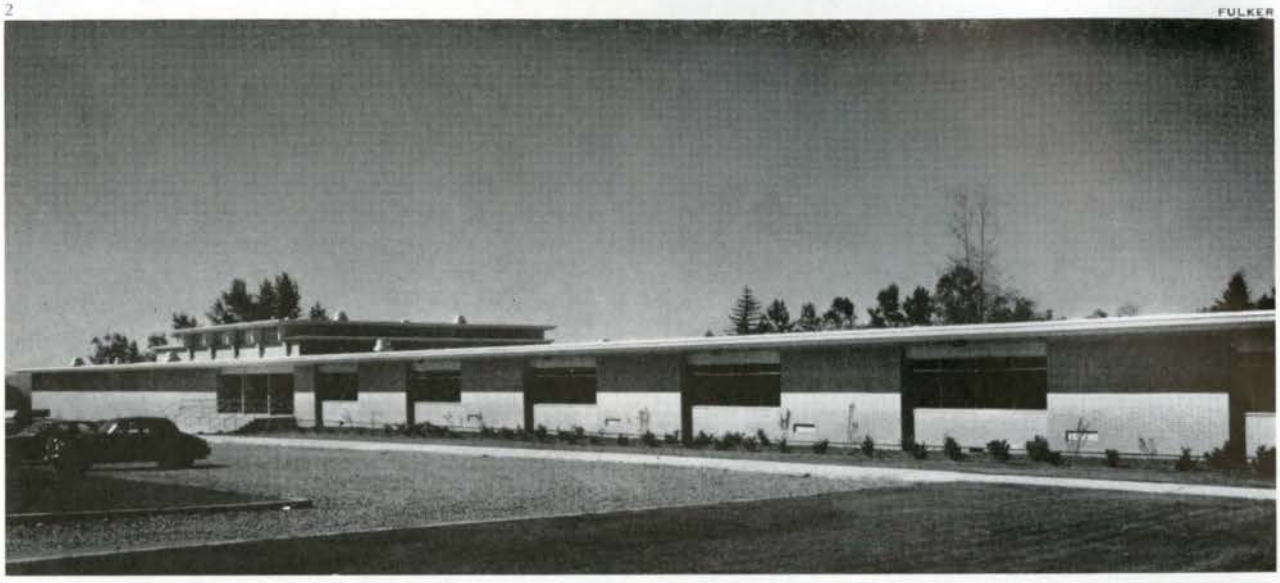
Il serait souhaitable aussi que la décoration puisse concourir mieux que par le passé à créer l'ambiance recherchée par l'architecte. La décoration a été trop souvent "plaquée" à posteriori sur l'architecture, faute d'esprit d'équipe entre les artistes et les architectes. Il faudrait que leurs études soient menées de pair dès le stade de l'avant-projet pour qu'ils puissent s'influencer réciproquement. Est-il naïf de penser que l'on devrait pouvoir recréer, à l'occasion de la construction de nos grands ensembles universitaires, cette atmosphère de travail collectif et enthousiaste qui présidait à l'édification des cathédrales du moyen âge: nos facultés, nos universités ne sont-elles pas un peu les cathédrales du monde moderne?

Tout ceci nécessite une collaboration active entre l'Administration et tous les maîtres d'oeuvre: compréhension d'un côté, imagination créatrice de l'autre permettront d'emporter les obstacles, qui sont nombreux, mais qu'il ne faut pas surestimer. L'obstacle financier, en particulier, qui est souvent invoqué, ne me paraît pas insurmontable. Les autres nations ont également des règles financières strictes: elles ne tendent pas moins toutes à un assouplissement des formules, à une recherche de la qualité architecturale. Il n'est pas sûr d'ailleurs que le beau soit forcément plus cher. En tout cas, l'essentiel est de ne pas confondre les moyens et les fins. Il faut commencer par savoir quelles sont les fins que l'on poursuit, définir une politique. Les moyens, on les a toujours si l'on sait bien ce que l'on veut.

1 FULKER

4

2 FULKER



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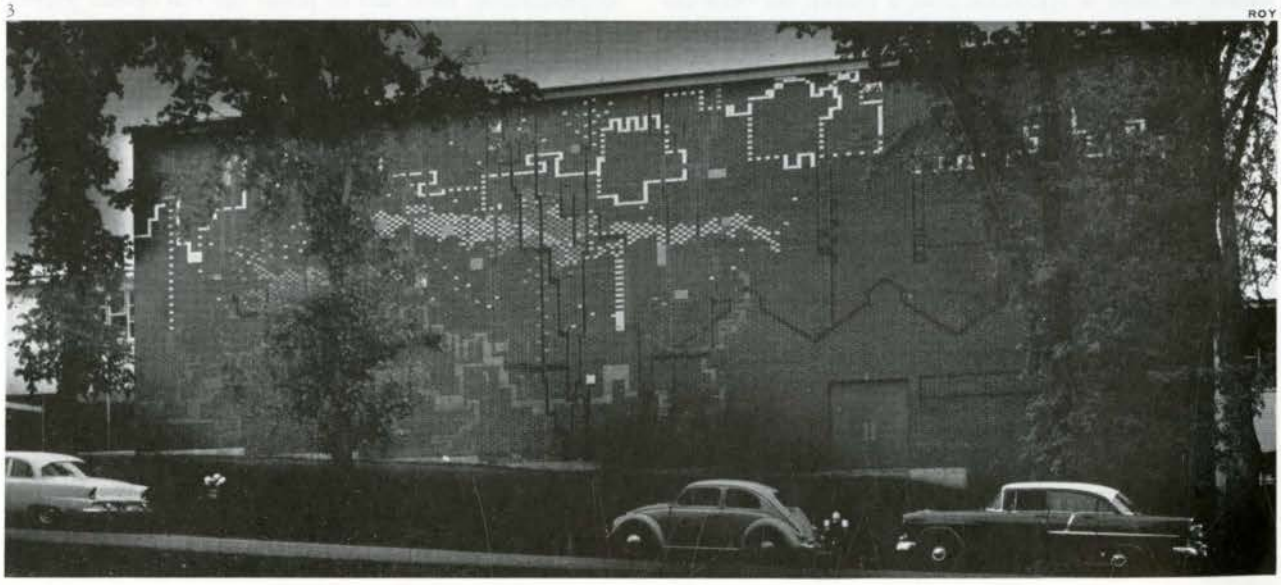

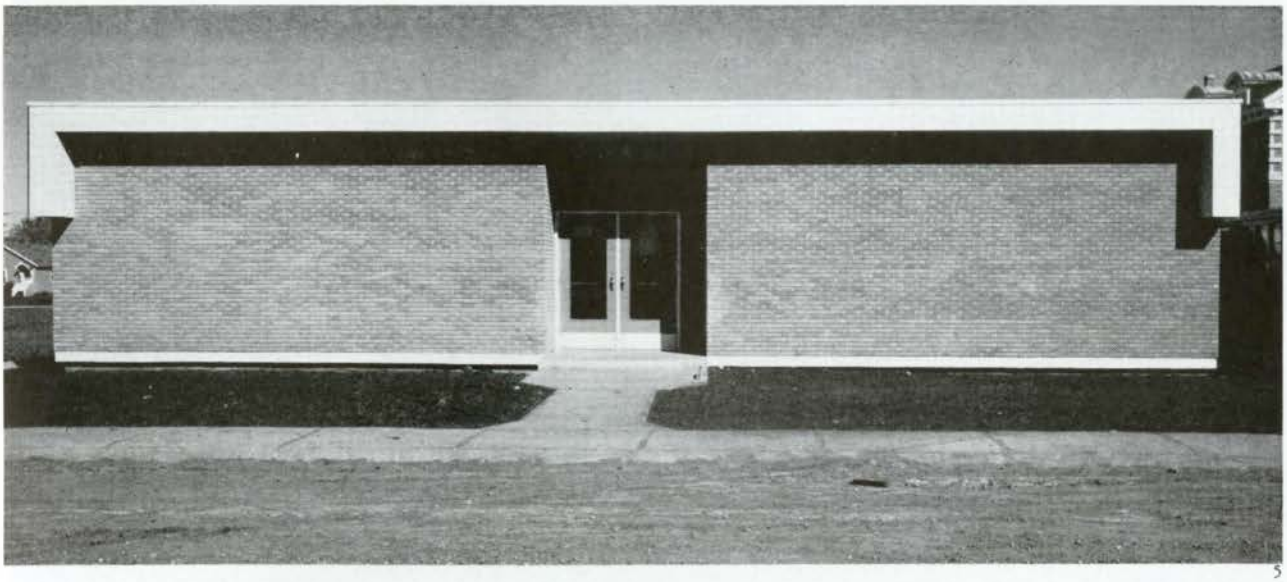

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1, 2. Cloverdale Junior Secondary School, District of Surrey, BC. Architects, Toby, Russell & Buckwell. Views of the main entrance courtyard, and the rear elevation of the classroom units with the general purpose room beyond.

3. Adam Scott Collegiate Institute, Peterborough, Ontario. Consulting architects, Barnett & Rieder, Craig & Zeidler. Mural design, E. H. Zeidler. A pattern in reds, yellows and blues depicting the story of Peterborough.

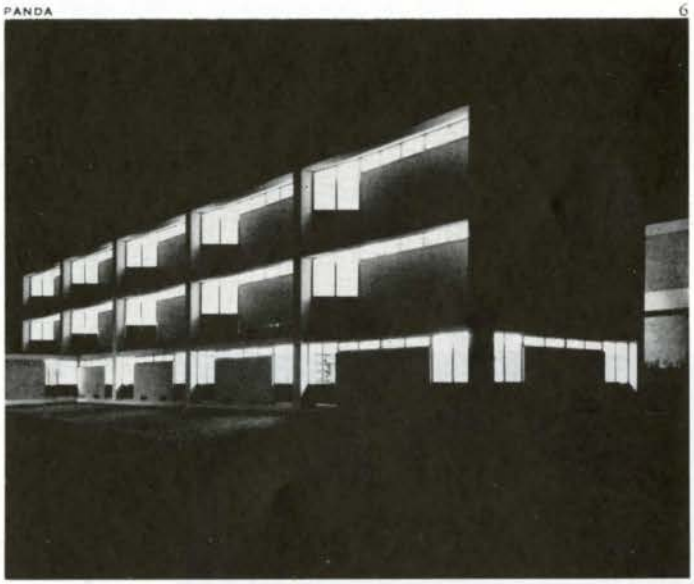
4, 5. King George Public School, Prince Albert, Saskatchewan. Architects, Kerr, Cullingworth, Riches & Associates. An auditorium detail and a view of the end of the classroom wing.

6. Bawating Collegiate and Vocational School, Sault Ste Marie, Ontario. Architects & Engineers, John B. Parkin Associates. Night view of classroom unit indicating the patterned break-up for natural light control.

7. George Kennedy Public School, Georgetown, Ontario. Architects and Engineers, John B. Parkin Associates. Kindergarten is shown in the foreground with the other classrooms behind.

PANDA

6



NEWTON

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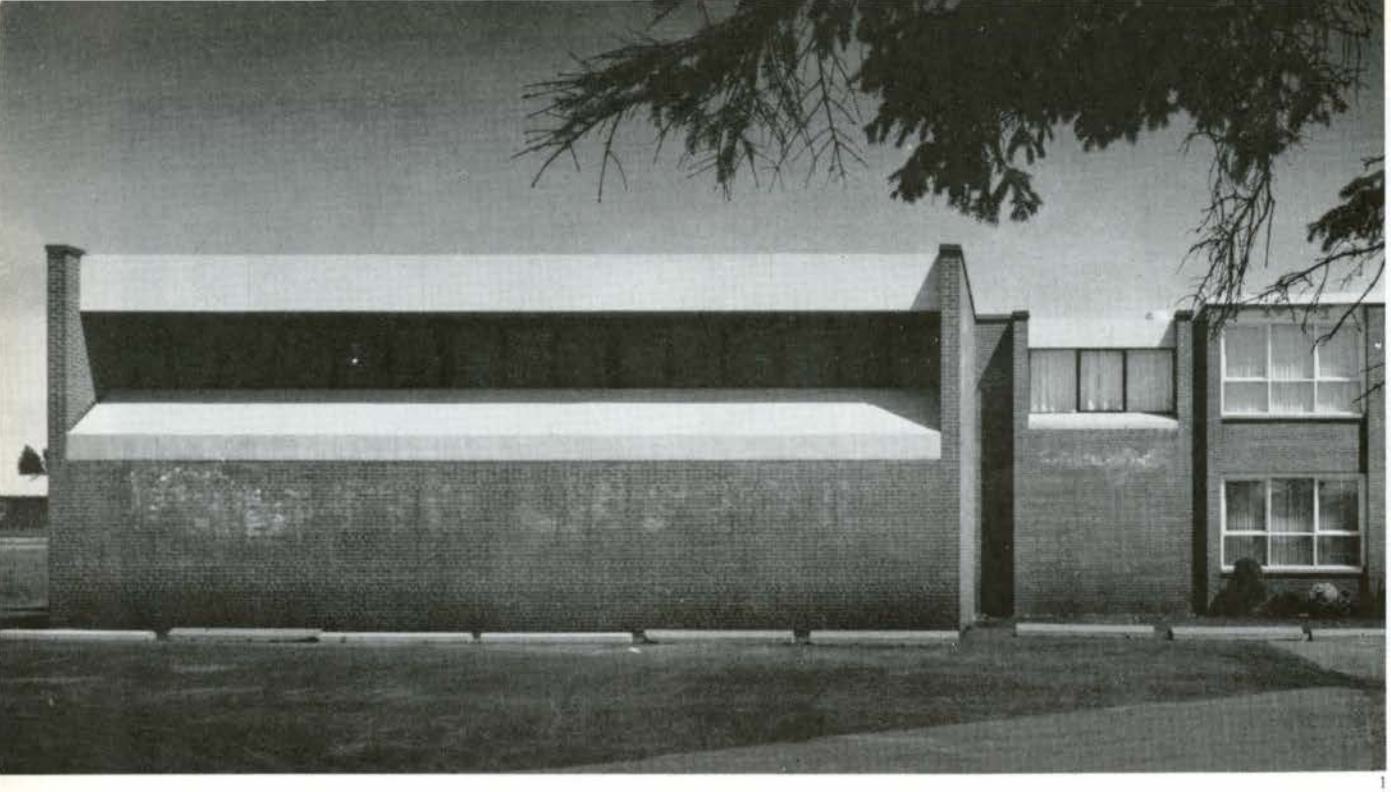


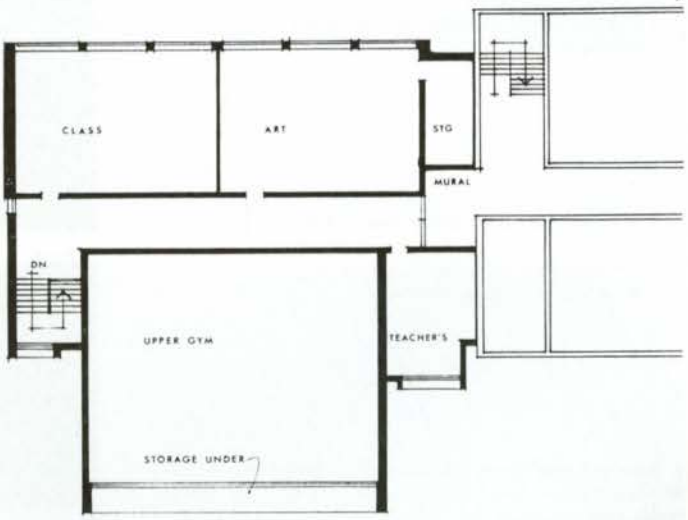
1

CORVETTE AVENUE PUBLIC SCHOOL ADDITION NUMBER 4
ARCHITECT – JEROME MARKSON • STRUCTURAL ENGINEER – M. S. YOLLES ASSOCIATES LIMITED • MECHANICAL ENGINEER – ELLARD-WILLSON ASSOCIATES LIMITED
CONTRACTOR – A. WELLER & COMPANY LIMITED

1. West elevation of gymnasium showing connection to the existing structure.
2. Second floor corridor with clerestorey lighting. 3. Second floor plan. 4. General view from the north-west.
Photos by Morley Markson.

2

3



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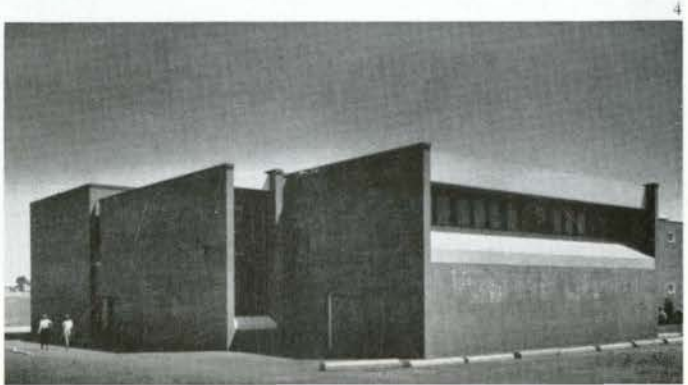


Principles Underlying the Bestowal of Fellowships

In the last two years the College of Fellows has been studying certain improvements to the procedures for the nomination and election of new Fellows. The officers of the College along with a group of senior Fellows, under the chairmanship of Mr. Earle Morgan, Dean of the College, put forward certain improvements and these recommendations were accepted at the last business meeting of the College held in Hamilton, May 18, 1963.

For the information of all members of the Royal Architectural Institute of Canada, we herewith publish the two chief documents which implement these new procedures. One document outlines the Procedures for Nomination and Election; and the other document sets forth the Principles Underlying the Bestowal of Fellowships. A third document, which is being printed — and is not reproduced here — is a new Nomination Form.

H. H. G. Moody, Chancellor, College of Fellows.

Fellowship is the highest honour the Royal Architectural Institute of Canada can bestow upon a member. To guard and further the prestige of the College, to observe the pledge of high professional conduct and service, and to assume full responsibility in maintaining the highest standard of the profession is the duty and obligation of every member of the College of Fellows.

The constant goal of improvement in the architectural profession in Canada is the principal objective of the RAIC College of Fellows. By recognizing the good works of our members who contribute most to the profession, we stimulate others to improve and so deserve equal awards. Recognition must be truly deserved or the objective of the College is destroyed.

A member of the RAIC who is over thirty-five years of age and has achieved professional eminence or rendered distinctive service to the profession is eligible for nomination to Fellowship. He must have proper qualifications under one, or more, of the following categories: design; science of construction; service to the Institute; public service; education or literature. The total membership of the College must never be over eight per cent of the total Institute membership and proper qualifications, regardless of locality or other influences, are the only criteria for election to the College.

To guard and improve the prestige of the College, the procedure for nominations has been enlarged and revised. The work of the Nominating Committees and the Screening Committee is to ensure that unworthy candidates are not elected and worthy candidates are not overlooked.

Proposers should feel quite certain that nominees' achievements have sufficient distinction to make them notable contributors to the advancement of the profession and of architecture and should remember that the personality and popularity of a member does not of itself constitute a notable contribution; nor is Fellowship necessarily an award for the nominee's industry and success.

Letters attesting to intimate knowledge of the good works and character of nominees are required from each of the five proposers.

Procedure for the Nomination and Election of Fellows

"A member of the RAIC who is over thirty-five years of age and who has achieved professional eminence or rendered distinctive service to the profession shall be eligible for nomination to Fellowship."

Any five Fellows may nominate, using the prescribed printed form, and each nominator must write a letter, addressed to the Chairman of the Screening Committee, attesting to the qualification of the nominee. The nominating form and letters must be submitted to a local committee before October 15th of each year.

The Chancellor shall appoint a chairman of a local committee for each provincial association who shall choose a committee of one to six members to either receive and/or initiate nominations for Fellowship in that association. This committee shall forward all documents for nominations to the Screening Committee before November 1st and include a list of those considered, with reasons why those considered but not nominated were omitted. Where nominations have not been initiated by a local committee it shall recommend or otherwise give the reasons, to the Screening Committee, why they have not been initiated.

Not later than February 1st, a list of all proposed nominees shall be sent to all Fellows with notice that if any Fellow objects to any name he must write a confidential letter, stating the reasons for his objections, to the Screening Committee before February 15th. The Screening Committee shall act on any such letters entirely at their discretion.

The Screening Committee will consist of the RAIC President, the Vice-President, the Chancellor, and the Dean of the College of Fellows. It shall consider all nominations submitted, and have the power to accept, reject, or postpone them; thus advising the Chancellor. The Screening Committee shall also recommend Honorary Fellowships and Corresponding Members. They shall meet for this purpose sometime between November 1st and February 1st and confer again between February 15th and March 1st to confirm final recommendations.

The Chancellor shall receive the final list of recommended nominees from a Screening Committee, not later than March 1st, for his presentation to the Executive Committee.

Only Executive Committee members who are Fellows shall meet with the Chancellor to consider the list of nominations and elect new Fellows, accepting or rejecting the Chancellor's recommendations but having no power to add new names or replace rejected nominees. Election will take place at the first meeting of the Executive Committee after March 1st.

The Registrar will send letters to Fellows-elect, advising them of their election, asking them to fill out a "form of consent", and inviting them to attend the convocation ceremony at the next RAIC Assembly.

The Chancellor will write congratulatory letters to Fellows-elect after they have returned the "form of consent".

The Registrar will compose a notice for the *Journal,* naming the newly elected Fellows with reasons for their election, to be published in the first issue following convocation. This notice will be approved by the Chancellor before submission to the *Journal.*

Principes Regissant l'Admission des Agrégés

Au cours des deux dernières années, le Collège des Agrégés a étudié divers moyens d'améliorer les modalités visant la mise en candidature et l'admission de nouveaux membres. Les dirigeants ainsi qu'un certain nombre de membres en vue du Collège, sous la présidence du doyen, M. Earle Morgan, ont proposé en ce sens certaines dispositions qui ont été acceptées par le Collège à sa dernière réunion d'affaires à Hamilton, le 18 mai 1963.

Pour la gouverne de tous les membres de l'Institut royal d'architecture du Canada, nous publions avec la présente les deux documents principaux mettant en oeuvre les nouvelles modalités. Le premier de ces documents expose la méthode à suivre pour la mise en candidature et l'acceptation des nouveaux membres et, le second, les principes qui régissent l'admission des nouveaux membres du Collège. Un troisième, qui est en voie d'impression et n'est pas reproduit ici, est la nouvelle formule de mise en candidature.

Le chancelier du Collège des Agrégés, H. H. G. Moody.

Le titre d'Agrégé est le plus grand honneur que l'Institut Royal d'Architecture du Canada peut conférer à un de ses membres. Chaque membre du Collège des Agrégés a pour devoir et obligation de sauvegarder le prestige du Collège et de travailler à augmenter son rayonnement, de respecter son engagement quant à la haute qualité professionnelle de sa conduite et de ses services et d'assumer pleine et entière responsabilité en ce qui a trait au maintien des plus hautes normes de la profession.

L'objectif du Collège des Agrégés de l'IRAC est l'amélioration constante de la profession d'architecte au Canada. En reconnaissant le bon travail de nos membres qui contribuent le plus à la profession, nous encourageons les autres à s'améliorer et à mériter ainsi le même honneur. Toutefois, cet honneur doit être véritablement mérité, sans quoi le Collège manque son but.

Tout membre de l'IRAC âgé de plus de 35 ans, qui s'est distingué dans l'exercice de sa profession ou a rendu à celle-ci des services signalés, peut être proposé comme membre du Collège des Agrégés. Il doit posséder les qualités requises sous l'un ou plusieurs des chefs suivants: composition, science de la construction, services à l'Institut, civisme, enseignement et littérature. Le nombre des membres du Collège ne doit jamais dépasser 8% de l'effectif global de l'Institut et le mérite est, à l'exclusion de l'endroit de résidence et de toutes autres influences, le seul critère d'admission.

Afin de sauvegarder et de relever le prestige du Collège, on a revisé et élargi le processus de présentation des candidats. Les fonctions des Comités locaux et du Comité de sélection consistent à empêcher que des candidats non méritants soient acceptés et que des candidats méritants soient oubliés.

Les proposeurs doivent s'assurer que leurs candidats se sont suffisamment distingués pour constituer une contribution notoire à l'avancement de la profession et de l'architecture, et, se rappeler qu'en soi la personnalité et la popularité ne sont pas des contributions notoires; en outre, le titre de membre agrégé ne constitue pas nécessairement une récompense pour le travail ou les succès d'un membre.

Chaque candidature doit être appuyée par une lettre de chacun des cinq proposeurs, attestant qu'il connaît personnellement le bon travail et la bonne réputation du candidat en cause.

Régles Visant la Mise en Candidature et l'Admission de Membres

"Tout membre de l'IRAC âgé de plus de 35 ans, qui s'est distingué dans l'exercice de sa profession ou lui a rendu des services signalés, peut être proposé comme membre du Collège des Agrégés."

Cinq membres du Collège peuvent, au moyen de la formule imprimée réglementaire, proposer un candidat; mais chacun doit adresser au président du Comité de sélection une lettre attestant les qualités de ce candidat. La formule de proposition et les lettres doivent parvenir au Comité local avant le 15 octobre de chaque année.

Le Chancelier nomme le président d'un comité local pour chaque Association provinciale. Ce président choisit de 1 à 6 membres pour formersson comité dont les fonctions consistent à recevoir et (ou) proposer de son propre chef des candidatures au titre d'Agrégé parmi les membres de cette Association. Ce comité doit transmettre tous les documents relatifs aux candidatures au Comité de sélection avant le 1er novembre, en y ajoutant la liste de tous les membres dont la candidature a été considérée, ainsi que les motifs qui ont incité le refus de ceux dont les noms ont été proposés mais non recommandés. Il doit faire à l'égard des candidatures qu'il n'a pas lui-même proposées des recommandations motivées, favorables ou défavorables, au Comité de sélection.

Le Comité de sélection se compose du président et du vice-président de l'IRAC ainsi que du chancelier et du doyen du Collège des Agrégés. Il étudie toutes les candidatures soumises et il a le pouvoir de les accepter, de les rejeter ou de les différer et d'aviser en conséquence le chancelier. C'est lui aussi, qui recommande les candidats aux titres d'Agrégés Honoraires et de membres correspondants. Il se réunit à cette fin à une date quelconque entre le 1er novembre et le 1er février et, de nouveau, entre le 15 février et le 1er mars, cette fois pour confirmer les recommandations définitives.

Au plus tard le 1er février, la liste des candidats proposés est envoyée à tous les Agrégés avec une note leur demandant de bien vouloir aviser le Comité de Sélection, avant le 15 février, au moyen d'une lettre confidentielle de leur opposition à tout candidat recommandé, en donnant les motifs qui justifient cette opposition. Le Comité de sélection a entière discrétion quant à la suite à donner à toute lettre de ce genre.

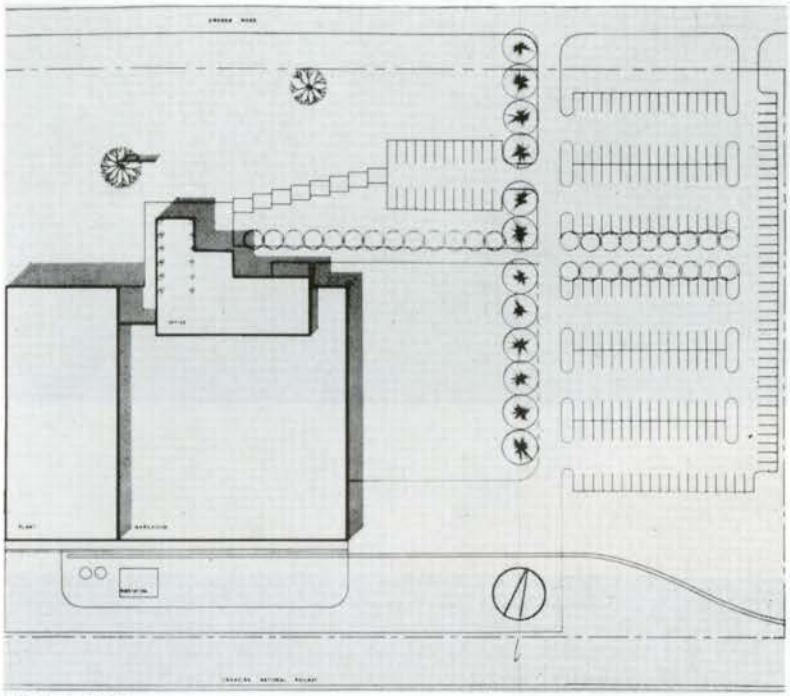
Au plus tard le 1er mars, le Comité de sélection fait parvenir la liste définitive des candidats recommandés au chancelier afin que celui-ci la présente au Comité exécutif.

Seuls les membres du Comité exécutif qui sont également membres du Collège des Agrégés ont le droit de siéger avec le chancelier pour l'étude des candidatures et l'acceptation de nouveaux Agrégés. Ils peuvent confirmer ou rejeter les recommandations du chancelier mais ils n'ont pas le pouvoir d'ajouter de nouveaux noms ni de rétablir des noms rayés. (Première réunion au Comité exécutif après le 1er mars.)

Le secrétaire-archiviste envoie aux candidats choisis une lettre les avisant de leur candidature et leur demandant de bien vouloir remplir la "formule d'acceptation" et les invitant à assister à la cérémonie d'investiture à la prochaine assemblée.
Le chancelier adresse une lettre de félicitations aux futurs membres dès qu'il a reçu d'eux leur "formule d'acceptation".

Le secrétaire-archiviste rédige à l'intention du Journal, qui le publiera dans son premier numéro après l'investiture, un avis contenant la liste des membres choisis et les raisons qui ont motivé ce choix. Cet avis doit être approuvé par le chancelier avant d'être envoyé au Journal.

ARCHITECTS AND ENGINEERS — JOHN B. PARKIN ASSOCIATES
PARTNER IN CHARGE OF INDUSTRIAL STRUCTURES — E. R. WILBEE
PROJECT DESIGNER — W. E. SHERRIFF • PROJECT ARCHITECT W. A. FLANAGAN • STRUCTURAL ENGINEER — J. OZDOWSKI
MECHANICAL ENGINEER — W. E. EMMERSON • ELECTRICAL ENGINEER — J. A. DEVRIES
PROJECT SUPERVISOR — A. R. HITCHINSON • GENERAL CONTRACTOR — REDFERN CONSTRUCTION COMPANY LIMITED

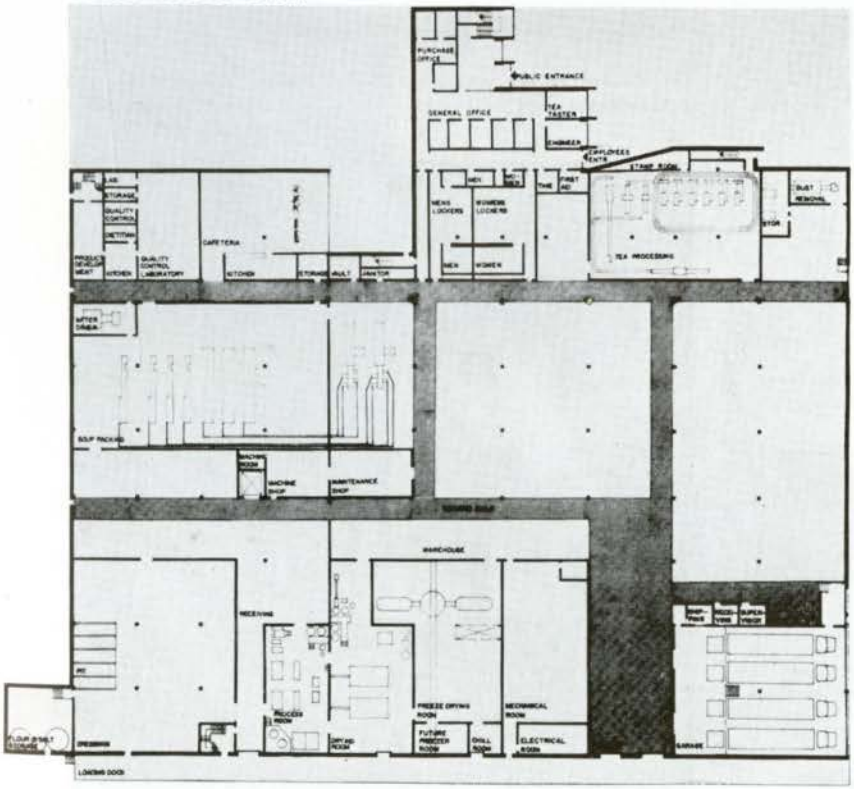


SITE PLAN

LIPTON

THOMAS J. LIPTON LIMITED'S NEW PLANT AND OFFICES • BRAMALEA ONTARIO

FIRST FLOOR PLAN



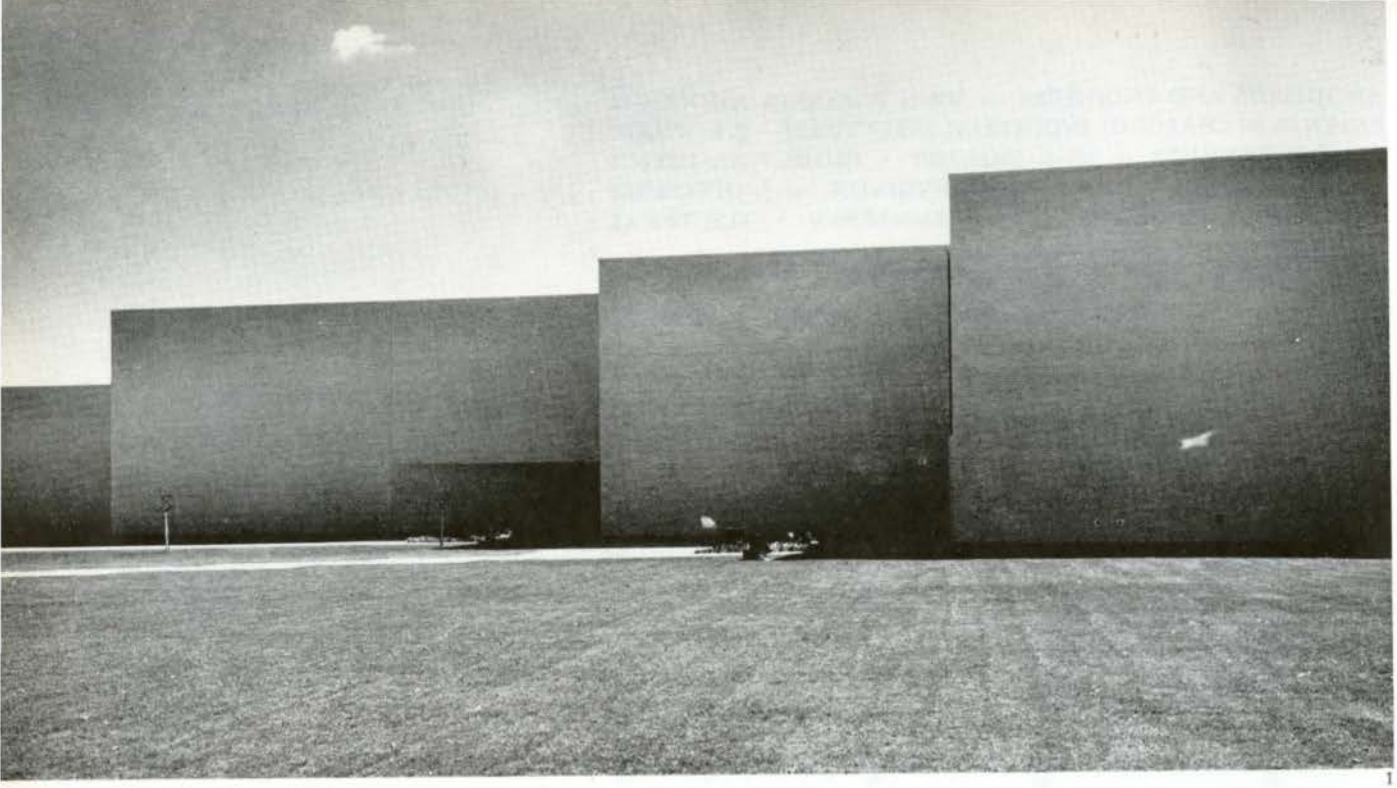
Administration, warehouse, and manufacturing facilities are housed in three distinct blocks of the food manufacturing company's plant and office building. It has been designed to permit expansion up to fifty per cent over the present 155,000 sq. ft. area.

Large, unobstructed expanses of brick on the exterior resulted from the need for temperature control and in turn minimum window space in storage and process areas. White glazed brick is the principal sheathing material on the welded steel structure. Window frames and sashes are steel, painted black.

The high ceiling required for the machinery and pipes in the process rooms was maintained in the office area and because there are no large windows here (facing west, undesirable heat absorption would have resulted) twelve prismatic skylights illuminate the general office.

Surfaces throughout the process and manufacturing room had to be specially treated against infestation and one application is in the cement plaster with a protective thermal plastic finish used on the concrete block walls. Floors in the warehouse are hardened concrete and in certain process areas are covered with a tile resistant to acids.

The offices are fully air-conditioned; heating and ventilation were considered sufficient in the warehouse area. Closely controlled air-conditioning and low relative humidity are maintained for the process rooms. The warehouse has rail and van transport facilities.



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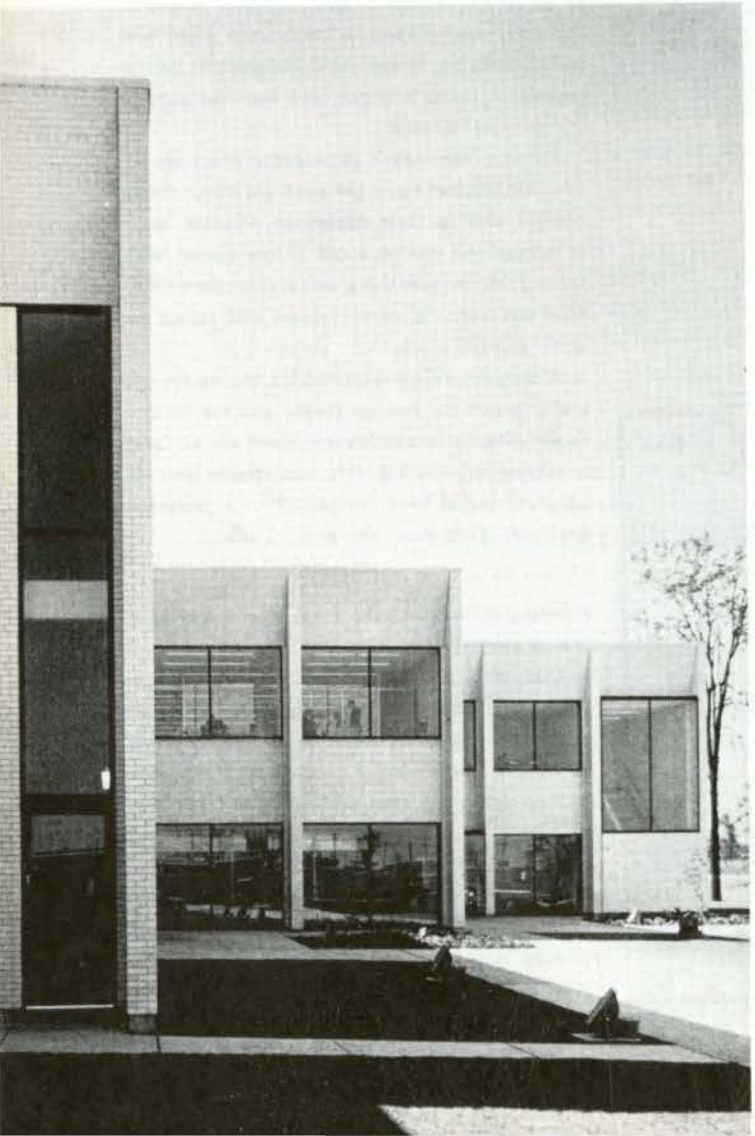


1. North elevation of office and tea processing area. Public and employee entrances are located between the staggered planes.

2. East elevations. Stairways and office areas are located behind the window openings.

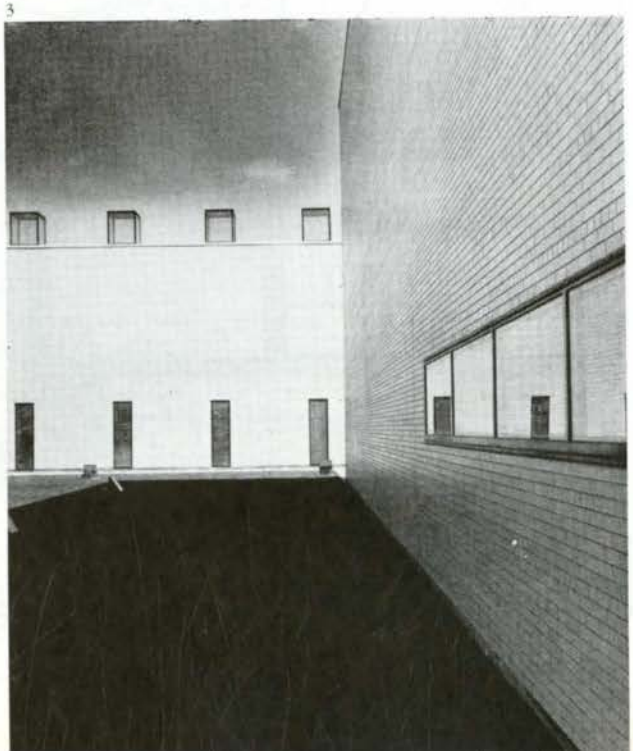
3. West elevation of office area from the cafeteria.

4. General view of building from Orenda Road.

5. Two storey office section on the left with the cafeteria and plant on the right. (The cafeteria is located behind the window openings.)

6, 7. (Overleaf) General relationships of office to plant and detail of prismatic skylights located above the office area. Photos by King's Hart

3



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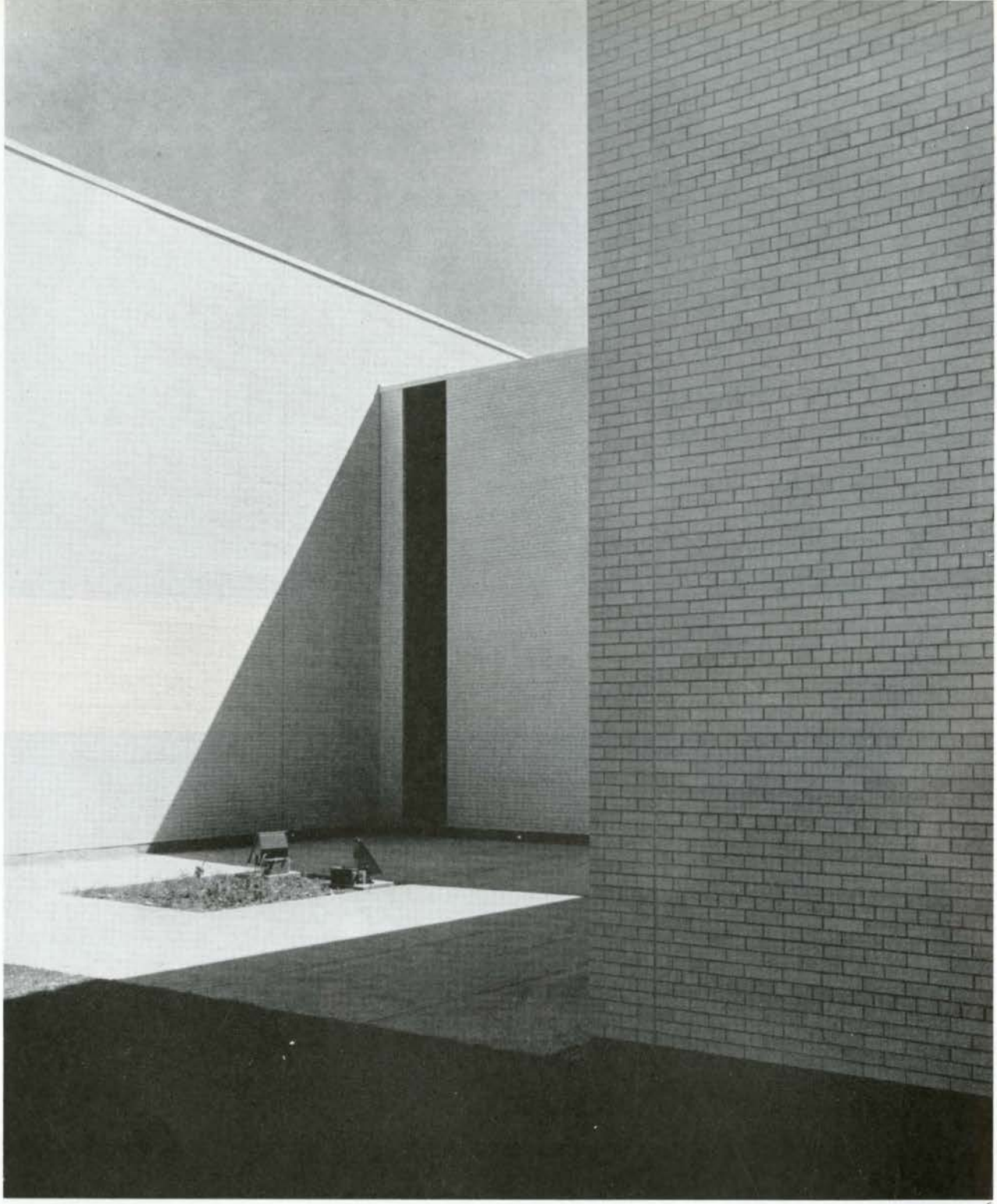

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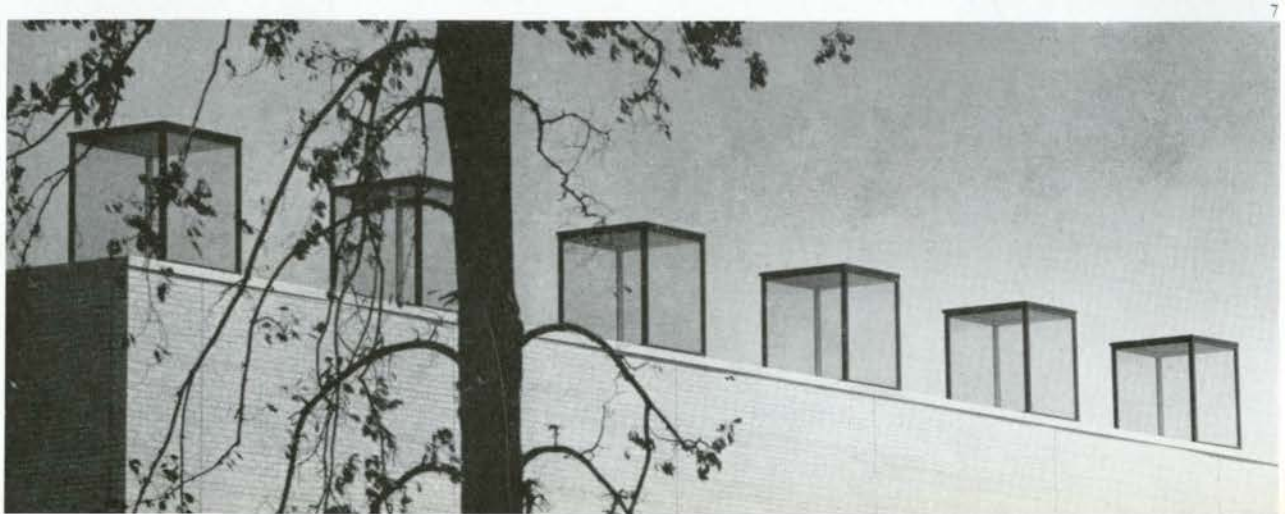
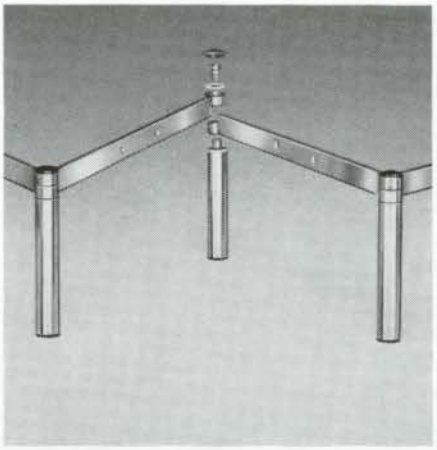


7

This new pivot provides swivel action ☐☐ That gives this seating a special attraction ☐☐ Into the back legs of a chair it fits ☐ Thus, joining together permits ☐



This shows the way chairs are connected ☐ A system which Royalmetal perfected ☐☐ That go in circles, curves or straight lines ☐ To suit any architectural designs ☐ It's done with complete ease. For arrangements that please.

This shows a setting very complete ☐ With tables and benches all quite neat. That makes good use of dead room space ☐ And provides comfort every place. That has "floating action" seat and back. And comes in colours from white to black ☐ This is Viscount 65 — the free-form seating Royalmetal built ☐

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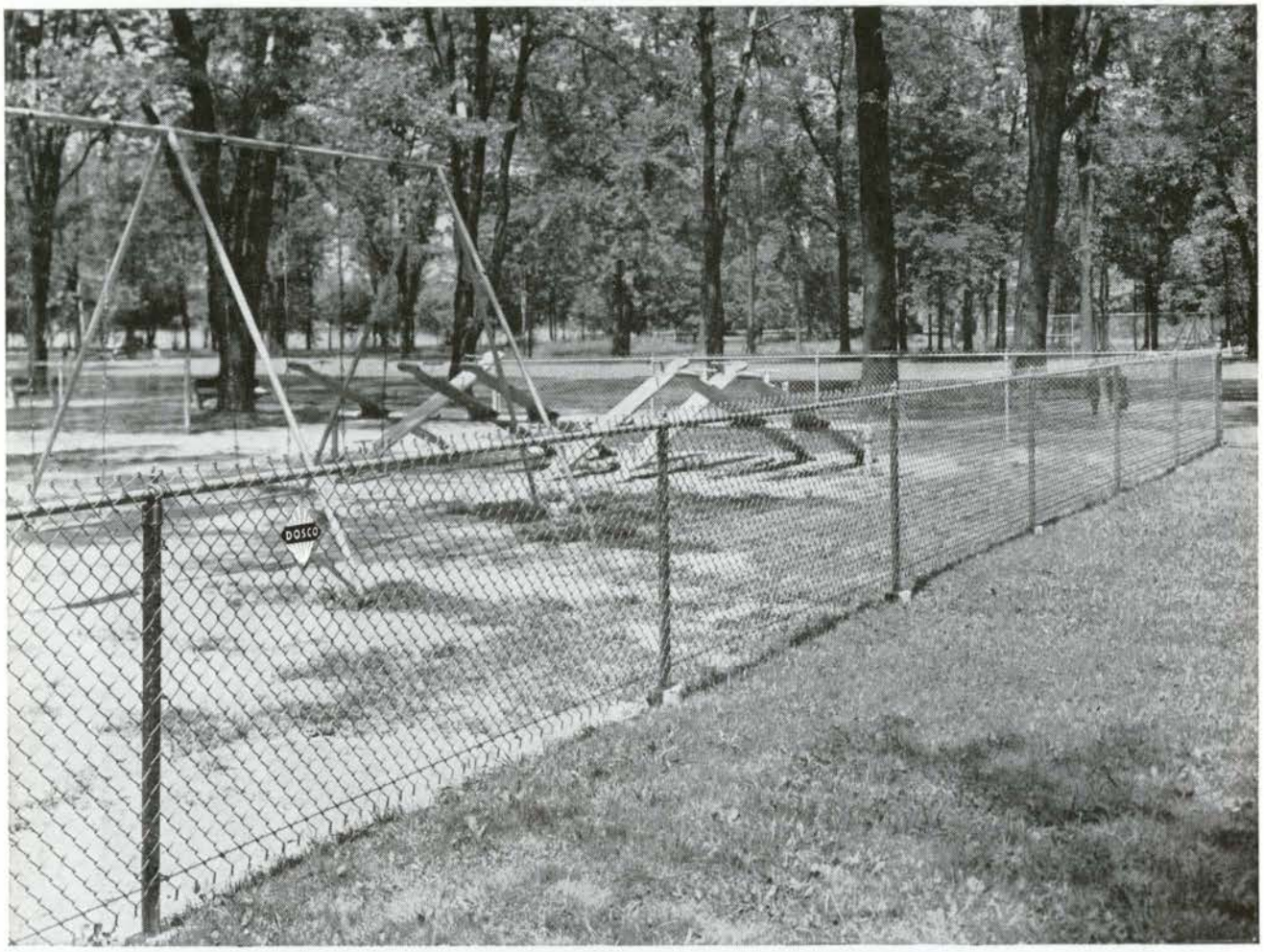

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TECHNICAL COLUMN

Held in San Francisco in October, 1962, the conference brought together, for the first time, many of the outstanding international personalities in the field of shell structures and was a milestone in the development of shell design and construction. Copies of the proceedings may be obtained from the National Academy of Sciences, National Research Council, Division of Engineering and Industrial Research, 2101 Constitution Avenue, Washington 25, D.C. Cost is $20. Readers contemplating the purchase of this document, reported to be running over 700 pages, will likely be interested in the following summary. D.H.L.

WORLD CONFERENCE/SHELL STRUCTURES

by Douglas H. Lee

The first World Conference on Shell Structures brought together, for four days, some 600 professional engineers, architects, builders, and related scientists to listen to and discuss some sixty papers on various aspects of the design, analysis, and construction of shell structures. The appeal of the conference to architects was attested to by the large number that attended and although not all the papers could be fully appreciated by architects they were, nevertheless, all of interest and provided a total picture of the present status of shell construction.

The term "Shell" was used at this conference to describe a wide range of structural forms including domes, plates, vaults, warped surfaces, and membranes. Their international popularity as a structural form was indicated by the speakers who came from Japan, India, Germany, Poland, Spain, Great Britain, The Netherlands, Mexico, the U.S., and Canada. Equally as broad was the range of uses to which such structures had been put in these countries.

Like any structural system, the feasibility of using a shell is determined by the existing local conditions of economics, labour, materials, geography, and climate as well as the functional requirements of the problem. The international scope of this gathering served well to illustrate how these factors worked in the various parts of the world to bring about the choice of shell structure. By far the largest number of shells built in the world today are of concrete and, understandably, most of the papers presented at the conference described some aspect of their design, analysis, or construction. Some work has been done with steel, timber, and plastic shells however, and a number of papers describing these developments were included.

This summary cannot hope to describe all of the papers presented at the conference or the discussions which followed. Assuredly, the proceedings, when they are published, will provide this type of coverage. However, during the course of the conference there were mentioned certain aspects of shell design and construction which seemed to be of particular importance to architects. In the hope that these items might be of interest and possible value to *Journal* readers, they are herewith recorded.

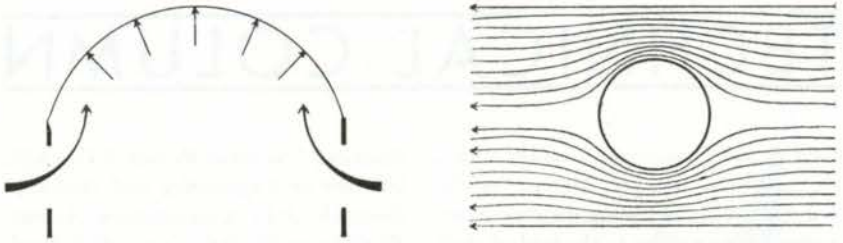
DESIGN AND ANALYSIS OF SHELLS

The architect usually leaves the design and analysis of the shell structure to his structural consultant and trusts that the latter knows what he is doing. Mario Salvadori, the well-known engineer, teacher, and "Salesman of Shells", assured the conference that the design and analysis of shells had now become a rather simple task and suggested that the real problems of shell structures today lies in getting them built. Other engineers at the conference were not as convinced that the design problem was quite that simple and indicated that the increased time required to solve the problems of shell design was generally reflected in increased design costs.

Felix Candela, the master builder of shells, called for simplification of shell design methods in order to make the use of shell structures more popular. He felt that there are already too many complicated theoretical methods of analyses, generally impractical for the design office, and he stressed the need for cataloguing the simple shell forms for the benefit of practising engineers.

SHELL COSTS

Architects are generally wary about the costs of shell structures mainly because they have so little experience and infor-



$$f_{\phi\ cr} = f_T / \left[1 + \frac{2840 + f_T}{7{,}100{,}000} \left(\frac{L}{h} \right) \sqrt{\frac{R}{h}} \right] \text{(psi)}$$

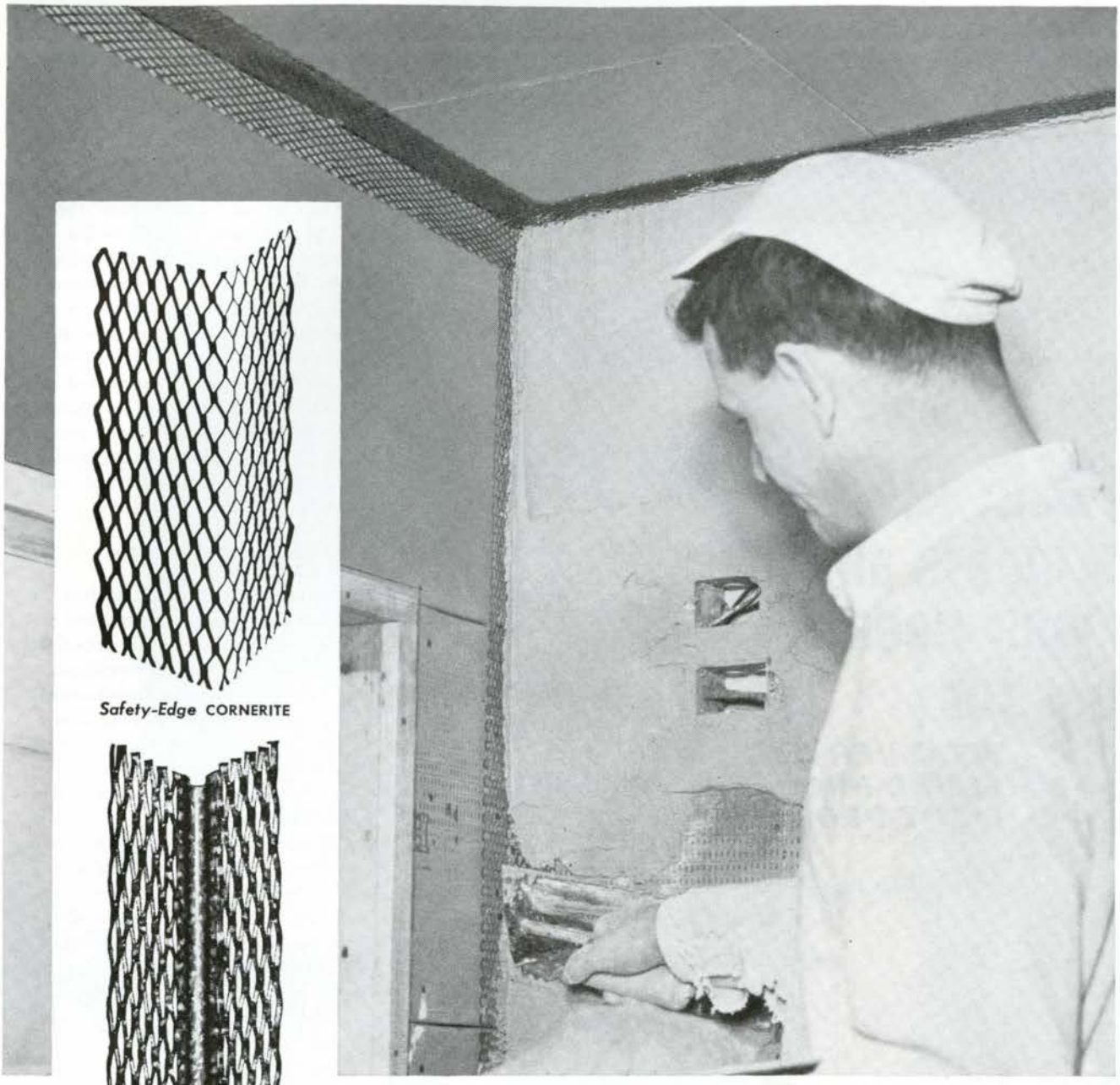
mation to go by. Milo S. Ketchum, well known American engineer with many shell structures to his credit, discussed the economics of shells. When questioned, he furnished cost figures based upon his own experiences but emphasized the danger of using them as generalizations since the factors influencing costs vary so greatly. He did stress the importance of full co-operation between the architect, design engineers, and the builder and, the necessity of a unanimous desire on all their parts to build the shell, if an economical solution was to be achieved. It was also pointed out that the formwork for a concrete shell structure provided one of the most variable and major expenses of construction and in order for concrete shells to be economically competitive with other structural systems, formwork for concrete should be re-used at least four times. Unique or "One-off" shell structures invariably were expensive and wherever economy of the structure was important, the multiple use of shells and/or shell formwork was considered to be essential.

WEATHERPROOFING SHELL STRUCTURES

There is probably no aspect of shell construction that is more vexing to a Canadian architect than weatherproofing. In few areas of the world is it possible to expose to the weather the concrete of the shell roof. In our climate some form of an exterior weatherproofing membrane is essential. Invariably for heated buildings we also require additional thermal insulation and, coupled with this, a vapour barrier. The solutions to these problems, further complicated by the thermal movement of large roof areas, have been the subject of considerable research and investigation and it is significant that they were the theme of a Building Research Institute conference in Washington two years ago. Architect N. N. Culin of New York reported the findings of that session to the conference and left no doubt that lasting and economical solutions to these problems are still major considerations of shell construction in North America. Double shell construction, incorporating an outer weathering shell and an inner structural shell, was put forward by Mr Culin as a possible method of handling these problems but the obvious cost of such a solution as he described it would seem to make it prohibitive in general use.

SHELL ACOUSTICS

Shell structures, particularly concrete shells, can present many acoustical problems and acoustics consultant Robert Newman described, in very certain terms, the kind of acoustic disasters that have



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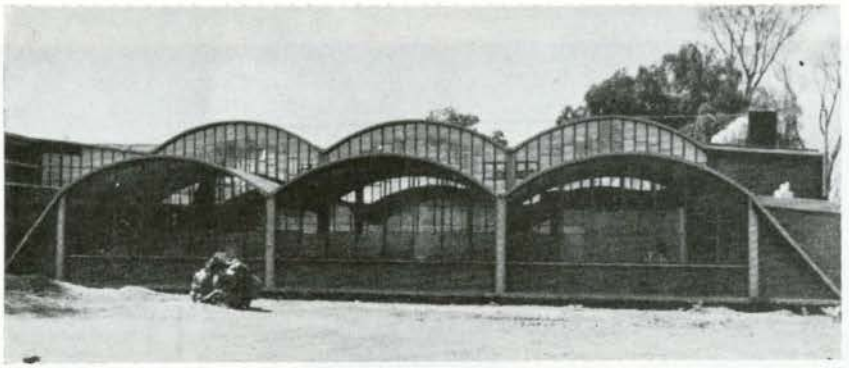

Photo by Armando Salas, Portugal from I. E. Myers, author of "Mexico's Modern Architecture"; reproduced from "Architectural Engineering", an Architectural Record Book.

taken place. The hard undersurface of a concrete shell is highly reflective of sound waves. Besides, many shell forms such as domes and vaults encourage sound distortions and concentrations as the waves reflect off their surfaces. Various degrees of these two conditions can produce spaces wherein it is impossible to hear anything with clarity. To correct such conditions Newman said he has used "Fuzz" (being a sound absorbing material) to line the undersides of the shell. He has also employed devices such as baffles, screens, and hung ceilings to alter the shape of the shell interior. In considering these solutions, their costs, and what they do to the ultimate shell forms, he questioned the wisdom of many architects in selecting the shells that they do and made a plea to designers to pay much more attention to the acoustic considerations of shell structures.

EXPERIMENTAL ANALYSIS OF STRUCTURES

Experimental or "model" analysis of structures has in recent years captured the imagination of architects. The appeal of this method of structural investigation over the more conventional mathematical ones is understandable when one considers the highly developed visual sense of the architect. Experimental methods have been developed and used extensively in several European countries, particularly in Spain, Portugal, and Italy. They have also recently been used in engineering practice in other countries including England and the U.S. R. E. Rowe of the Cement and Concrete Association, London, presented a comprehensive paper on this subject which should prove to be instrumental in expanding the use of model analysis.

Model studies have been used to check the findings of mathematical analyses of complicated structures when such confirmation was deemed necessary. They have also been used as a substitute method of analysis and design in the absence of suitable mathematical methods. The potential design possibilities of the latter are exciting to many architects. However, it should be pointed out that such design methods usually have limited application, particularly in this country, mainly because of their high cost. Besides the expense, model investigations require time to construct the model, to perform the tests, and to interpret the results. They also require a laboratory facility which is not, as yet, a standard tool of the consulting structural engineer. Technicians are needed to perform the tests and experienced engineers, to give meaning to the findings. For these

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reasons model analysis has generally been restricted to large, complicated, and costly structures of sufficient importance to warrant the substantial financial investment required for these investigations.

FUTURE DEVELOPMENT OF SHELLS

The future of any structural system is intimately associated with its economic advantages. In the case of concrete shells, their costs are closely related to the expense involved in creating the formwork over which the concrete is poured. Forms such as the hyperbolic paraboloid (which I discovered was shortened to "hypar" by our American friends) have wide appeal because they provide the strength inherent in doubly curved surfaces but can be formed easily from straight timber members, thereby reducing costly shaping of formboards. Developments in the field of concrete shells seem to be directed towards increasing the multiple use of formwork, deriving shell shapes which do not need formwork, and creating shells through the assembly of prefabricated elements. Dr Frey Otto advocated the greater use of hung membrane structures and showed some very exciting pictures of proposed buildings, in Germany, employing this principle.

The longer time required to design shell structures undoubtedly increases their cost. If the suggestions of Felix Candela are carried out, and ultimately they must be, then the design methods for various shell forms will be simplified and made more practical for the design engineers. This of course will lead to a greater popularity of the shell structure as a building form and bring them into closer competition with other structural systems. Undoubtedly, architects will become more familiar with the various properties of shells, even the acoustic ones, and eventually, sound, economical solutions will be found for the problems of weatherproofing, insulation, and vapour barriers, if, indeed, they have not already been developed.

There is no question that shell structures have come of age and are an accepted practical solution to a design problem and one with considerable aesthetic appeal. This is true even in Canada where the demands made of a structure by our climate are unreasonably severe. For any architect who is considering the use of a shell structure, I would certainly recommend a study of the proceedings of this first World Conference as a good starting point for his design. Perhaps what is just as important is his making sure that both his structural consultant and his builder also have copies of this document.

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Owner: Yonge-Eglinton Building Ltd.
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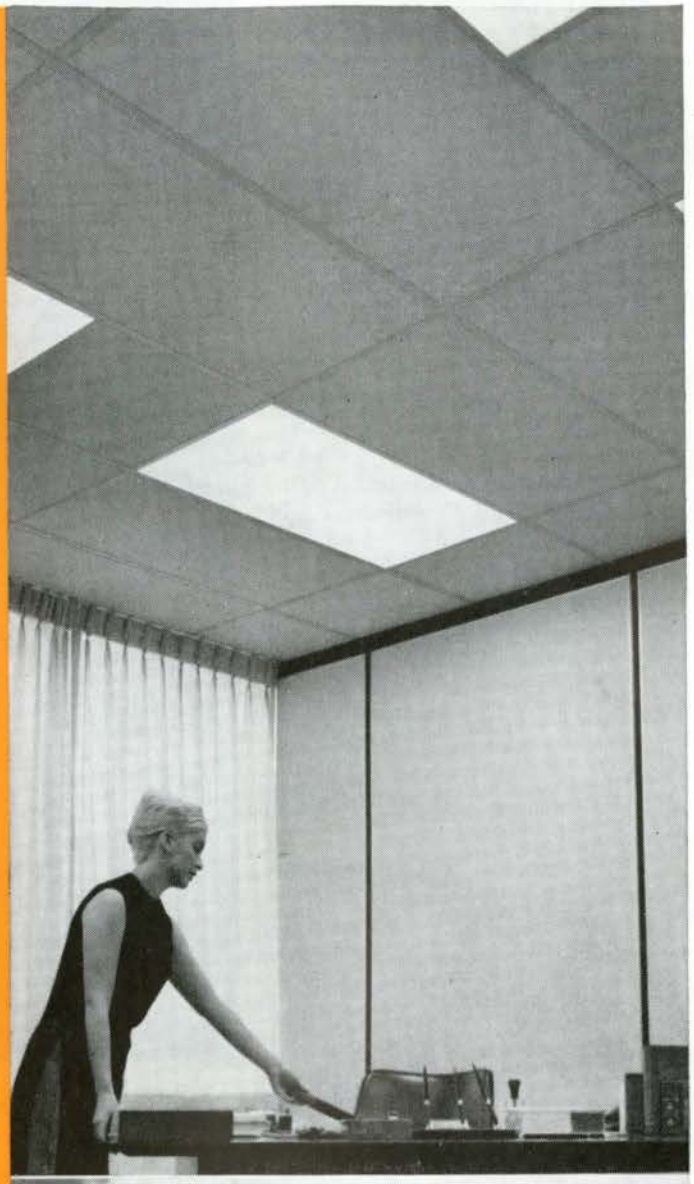

INDUSTRY

PRODUCTS

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Surface Round and Surface Square Art Forms, a line of surface mounted downlights in round and square shapes. Sizes: 8½ in. long by 4½ in. in diameter and 10 in. long by 5½ in. in diameter. *Wakefield Lighting Limited, 644 Highland Road, London, Ont.*

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Novatraz, a light weight terrazzo. Suggested for use in hospitals, schools, laboratories. *Desco International Association, Box 74, Buffalo, N.Y.*

Lite Lift, a vertical sliding frame designed for chalkboards, tackboards, pass windows, and wardrobe closures; anodized aluminum. *Unique Sash Balance Company Ltd, 7590 19th Avenue, Ville St Michel, P.Q.*

Porcelite covering; available in 100 colours. Suggested for use in schools, hospitals, canning factories, swimming pools, washrooms, etc.; also suggested for use in places subject to erosion from wear or weather. *Porcelite of Canada Limited, 130 Rivalda Road, Weston, Ont.*

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Cantilever, a line of library steel shelving: the shelves hang on a central column. *Sunshine Office Equipment Limited, Waterloo, Ont.*

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LITERATURE

Booklets, published by the European Zinc in Architecture Committee, titled Zinc in Architecture/Zinc in School Building; Roofscape; and Domestic Housing are available in Canada from the *Consolidated Mining and Smelting Company of Canada Limited, 630 Dorchester Blvd W., Montreal 2.*

Quarterly booklet, Creative Ideas in Glass, including data sheets. *American-Saint Gobain Corporation, P.O. Box 929, Kingsport, Tennessee.*

Catalogues on all types of radiant heating panels. *Aga of Canada Ltd, Ajax, Ont.*

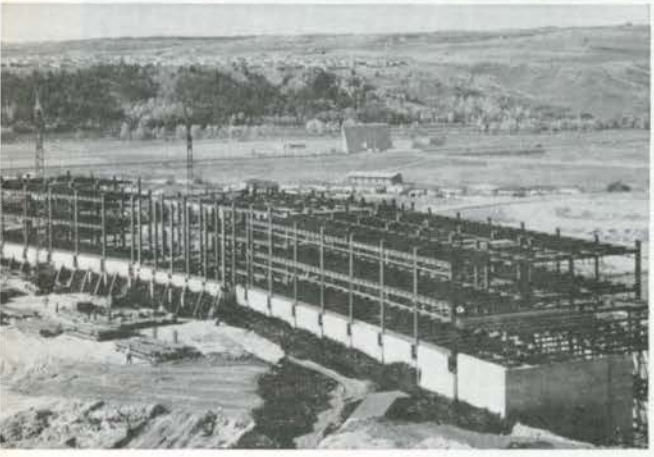
Brochure and specifications of Bay-line architectural aluminum railings. AIA-14-D-4. *Ottawa Iron Works Limited, 256 McArthur Road, Eastview, Ottawa.*

Information sheets on modular precast sculptured panels. *Modular Precast Limited, P.O. Box 155, Welland, Ont.*

in schools

High strength steel and the application of the plastic design theory produced a highly efficient frame for this university extension. The ductility of steel has allowed the designer to take into accurate account the full strength of this structure. The result is clear usable space, architectural freedom, and low cost.

Building: Engineering Building—University of Saskatchewan, Saskatoon.
Architects: Webster, Forrester, Scott & Associates—Saskatoon.
Consultants: Douglas, Micholenko & Dupuis.



in hospitals

6,000 tons of steel are going into this hospital in Calgary. By selecting steel for the frame the owners will have a flexibility of layout that comes from large floor areas free of roof supports. Inexpensive floor reinforcing to permit the installation of presently unplanned heavy medical equipment is also a special advantage of steel. The need for this frequently occurs long after construction is complete and with steel the cost can be reasonable.

Building: Foothills Provincial General Hospital—Calgary.
Architects and Consultants:
Department of Public Works—Government of Alberta.

in bridges

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Bridge: Homer Bridge over the Welland Canal—St. Catharines, Ontario.
Consultants: Foundation of Canada Engineering Corporation Ltd.

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in churches

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Architects and Consultants:
Webster, Forrester, Scott & Associates—Saskatoon.

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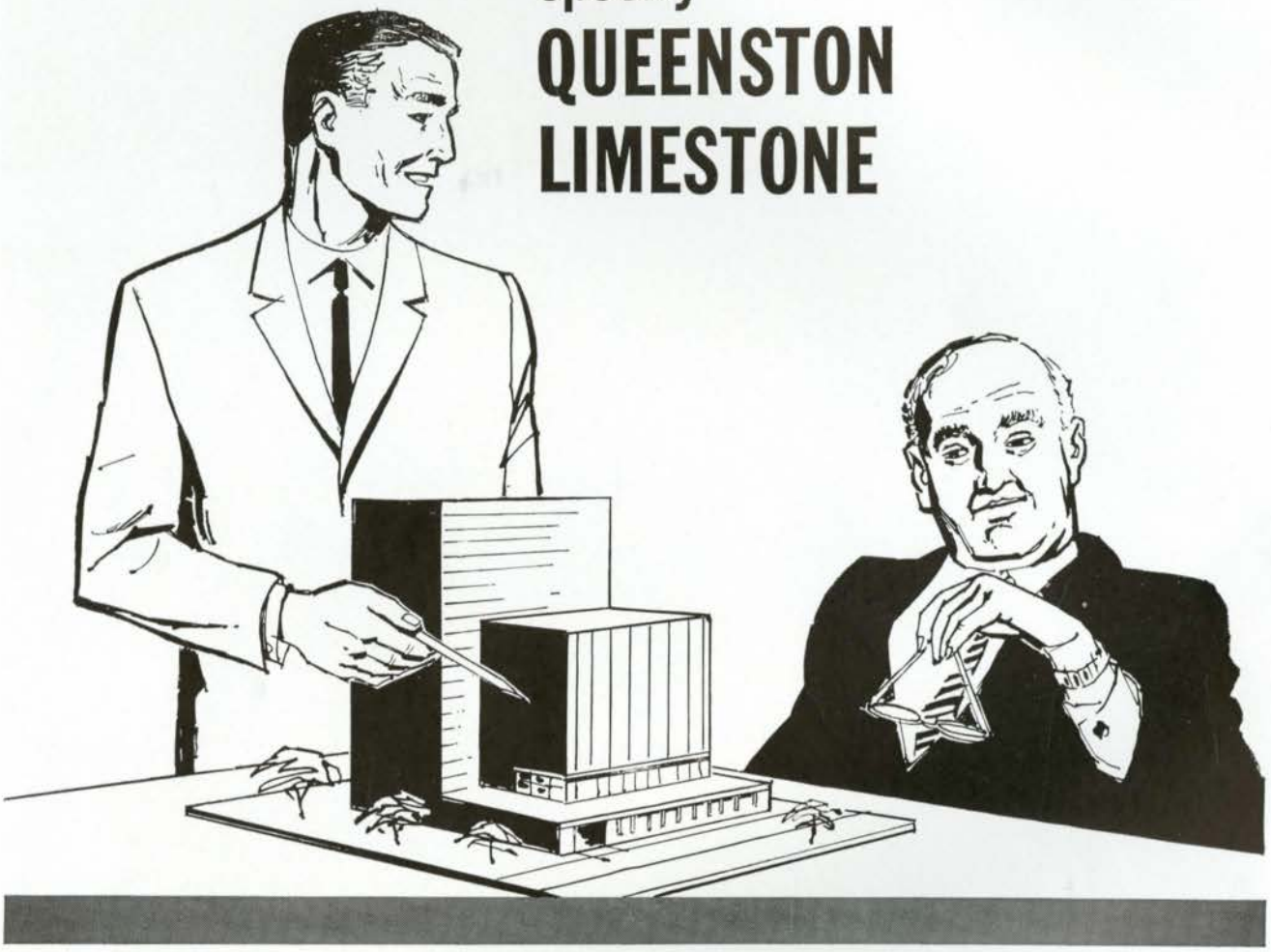

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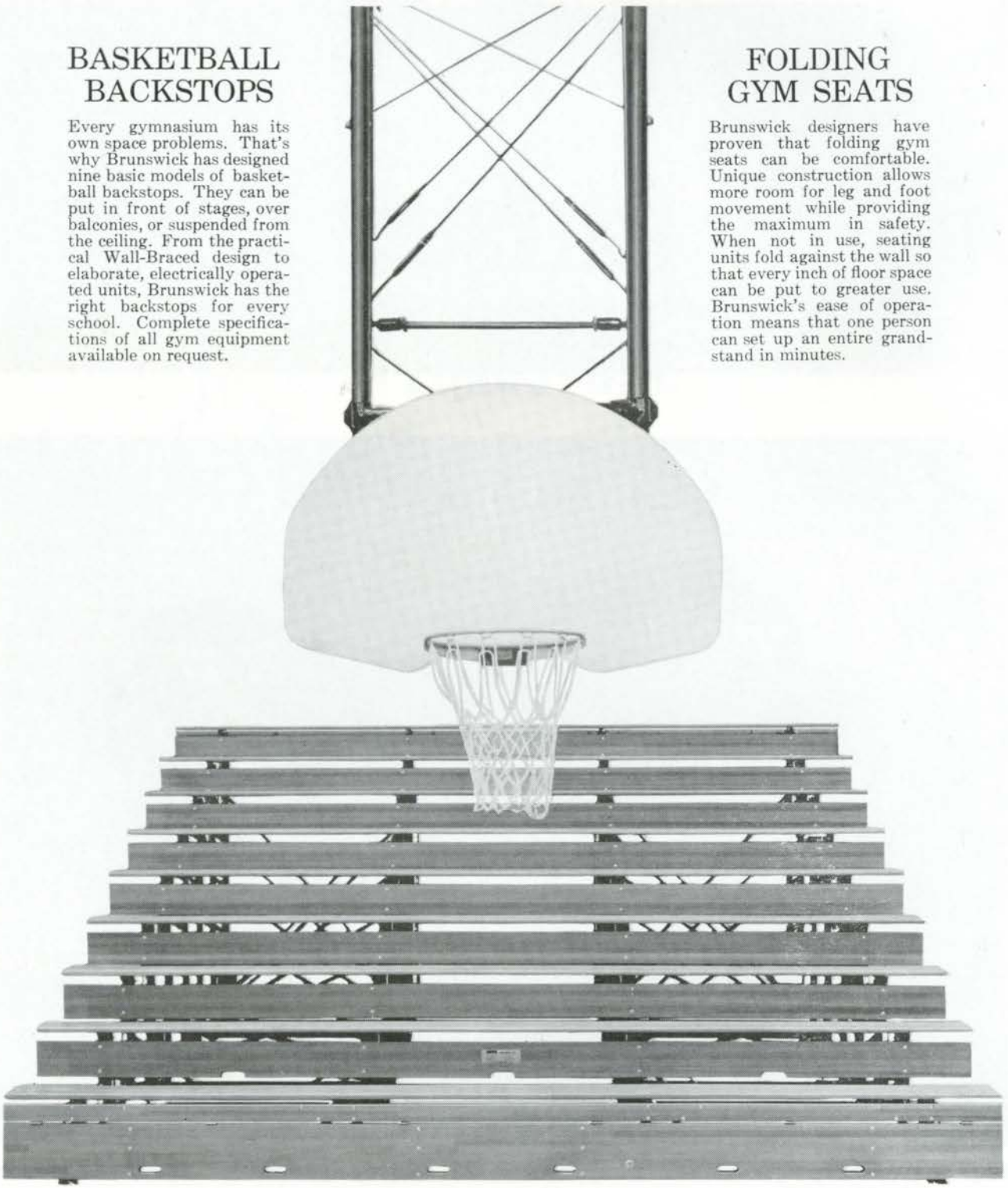

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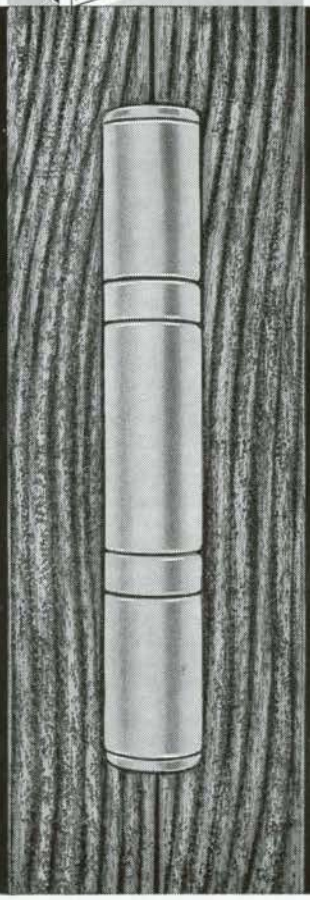

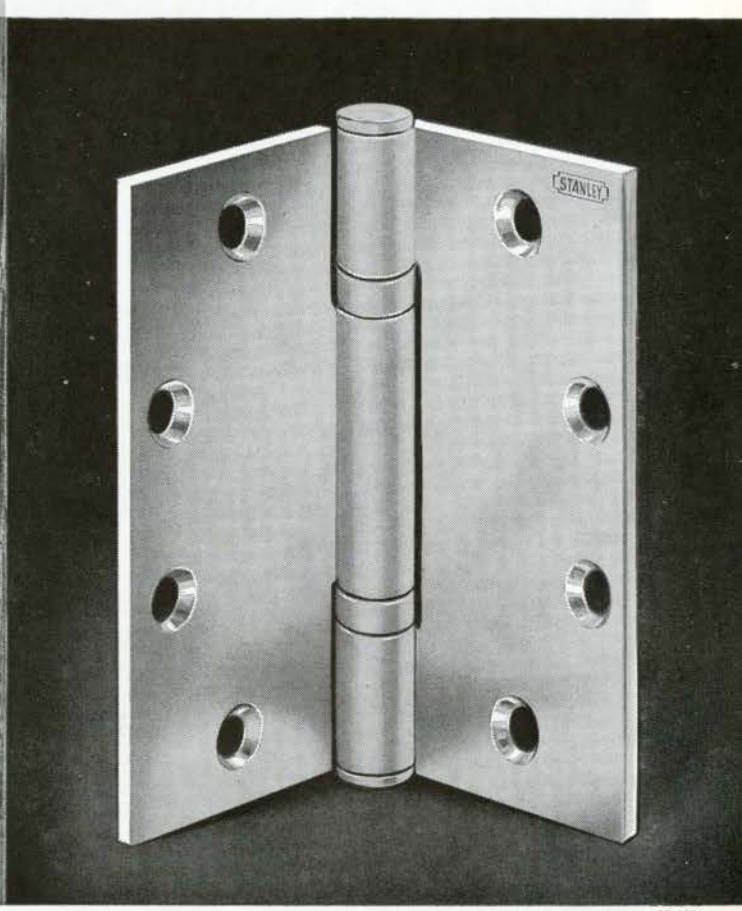

66-219

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FULL MORTISE

HALF MORTISE

HALF SURFACE

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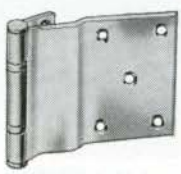

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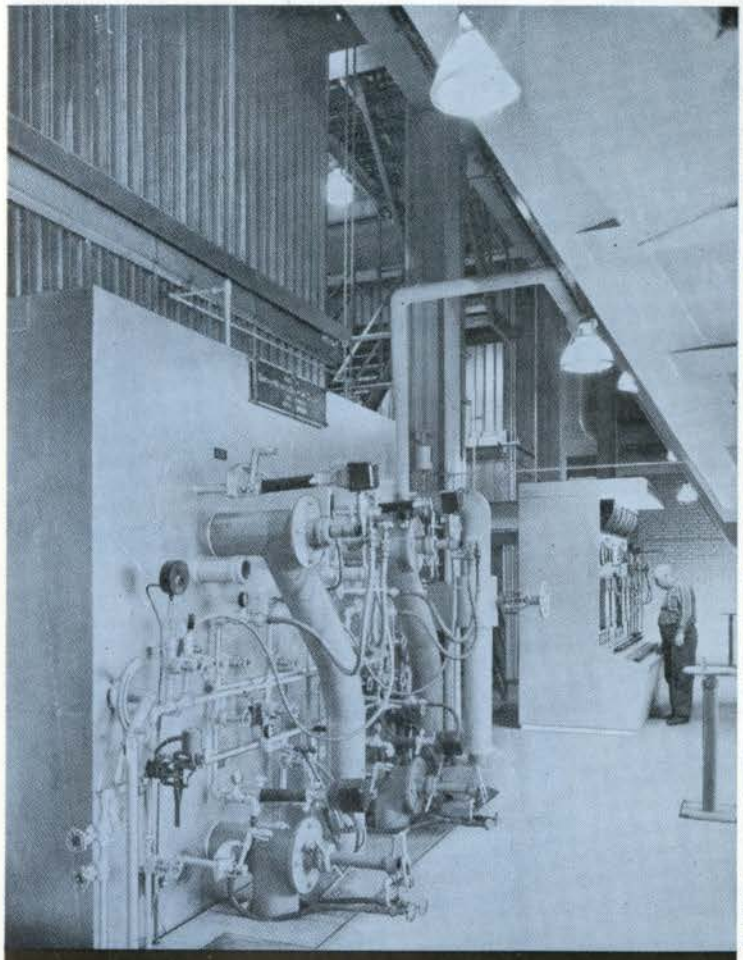
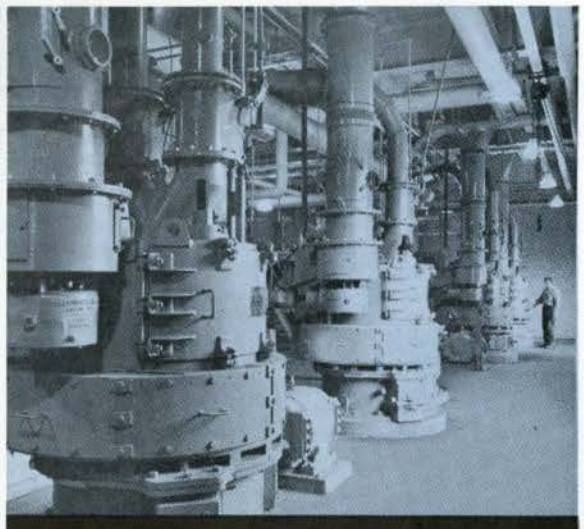
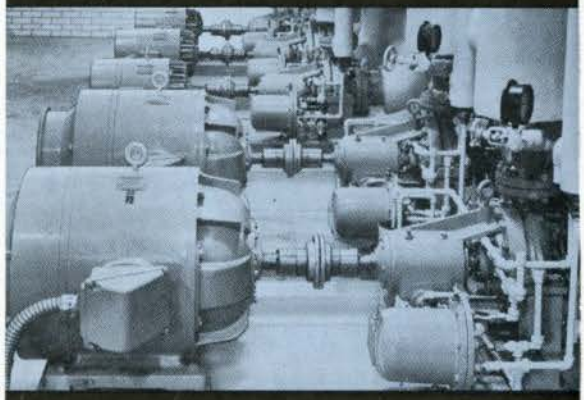


Two, 2-drum B&W Stirling Boilers, in service



B&W Type "EL" Pulverizers handle most kinds of coal



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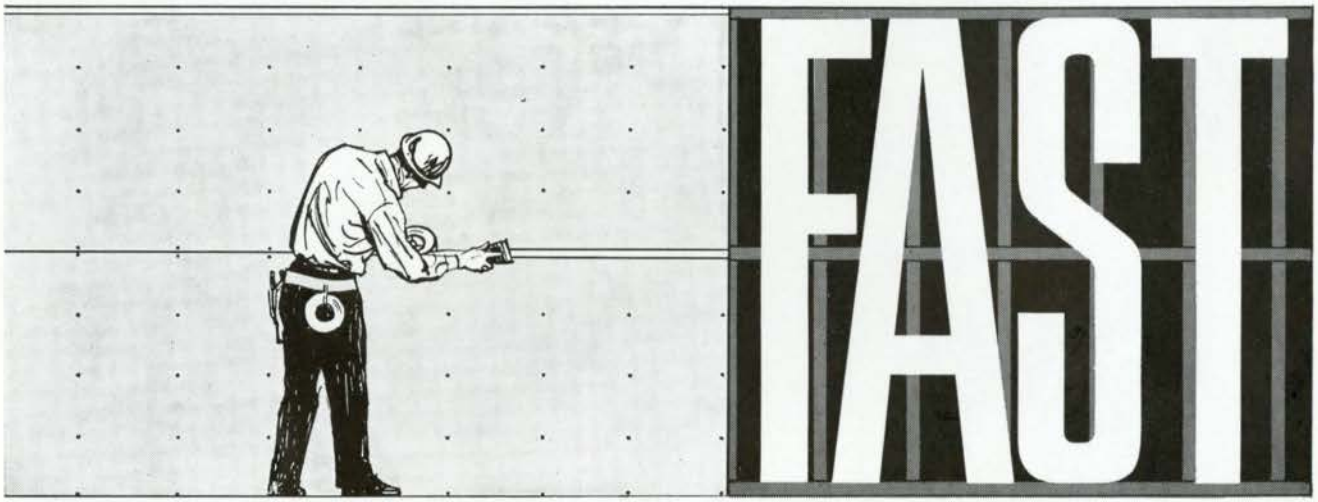

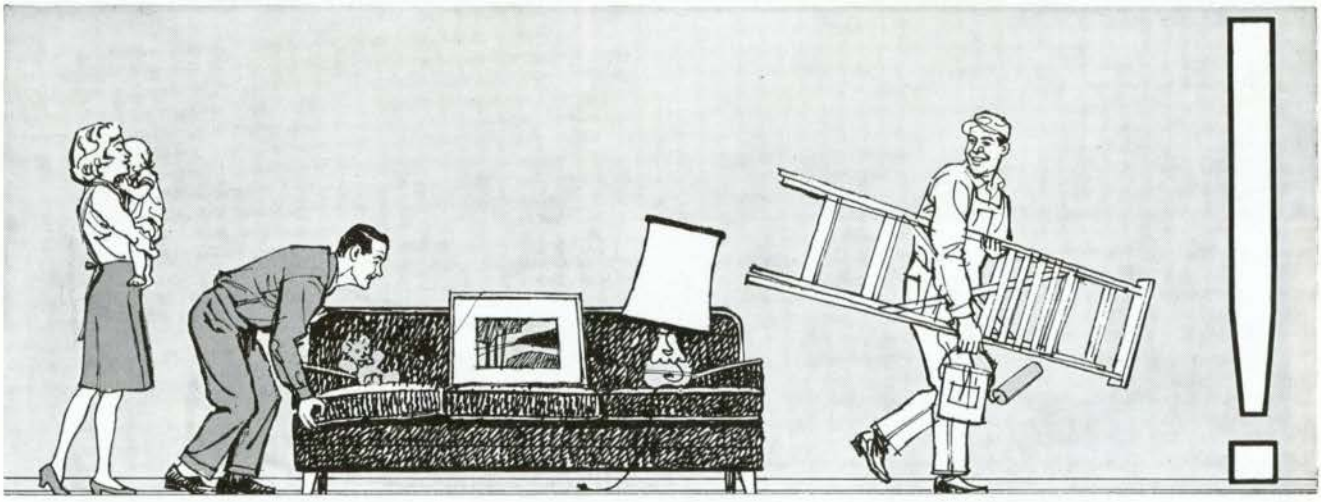

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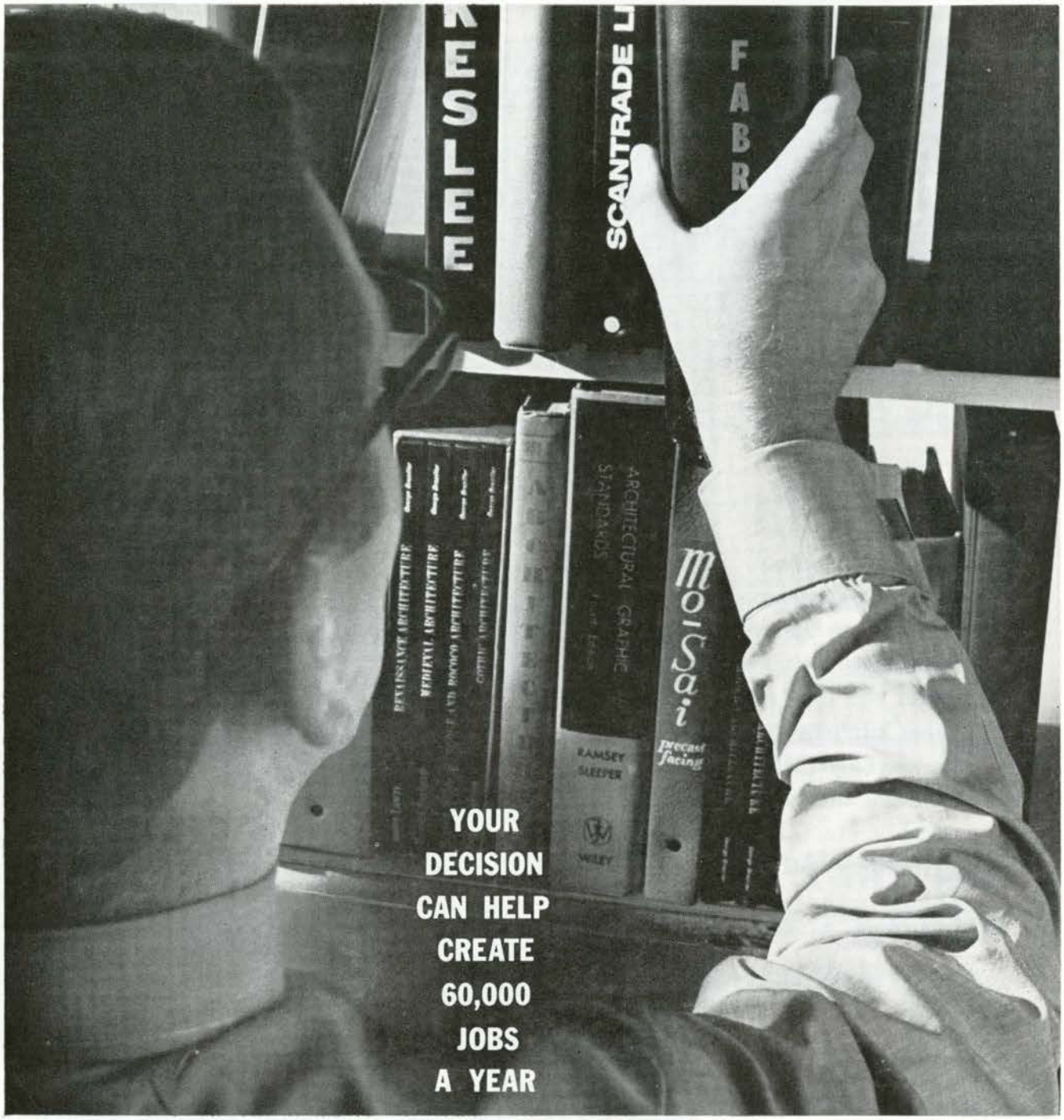

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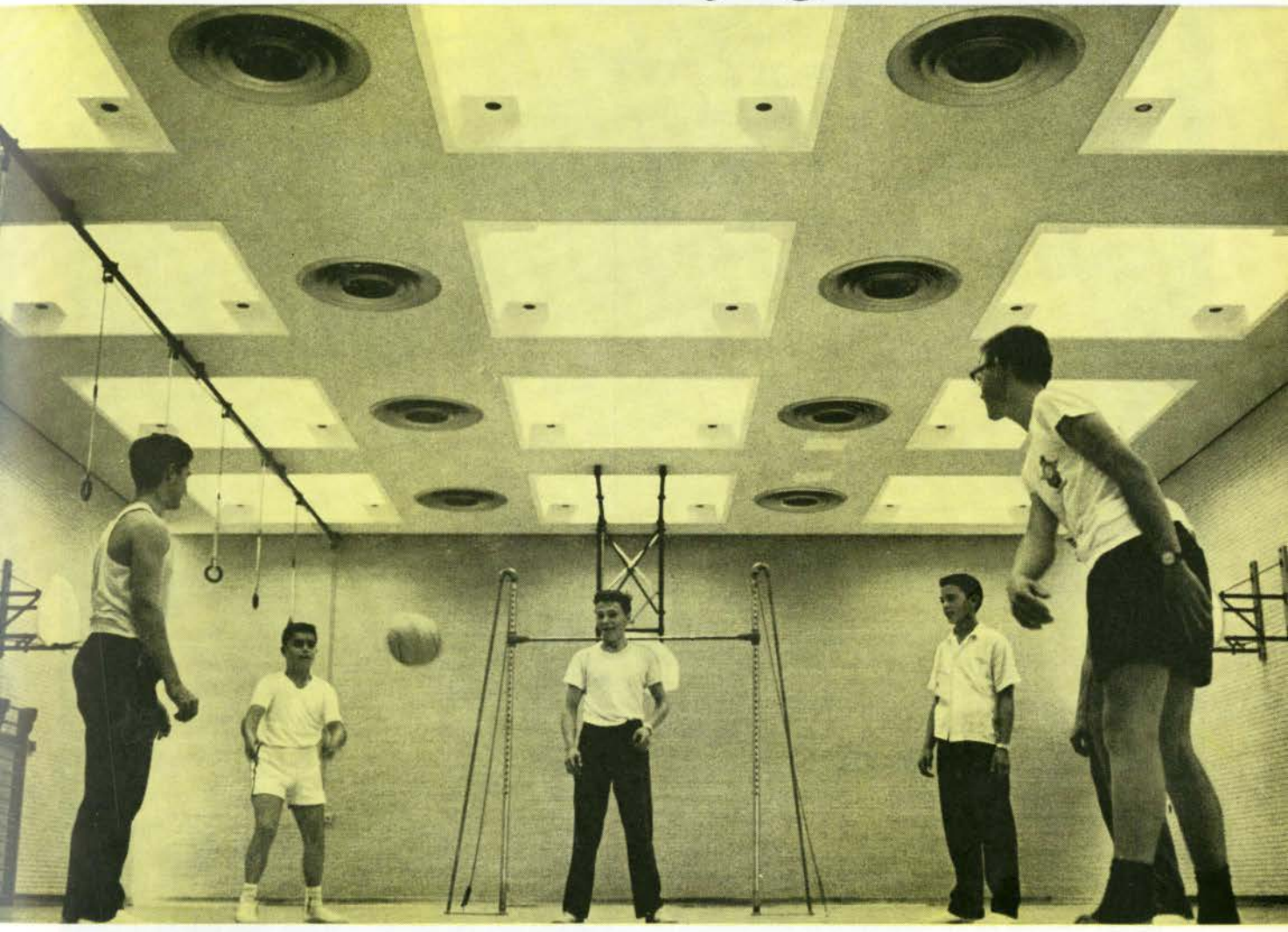

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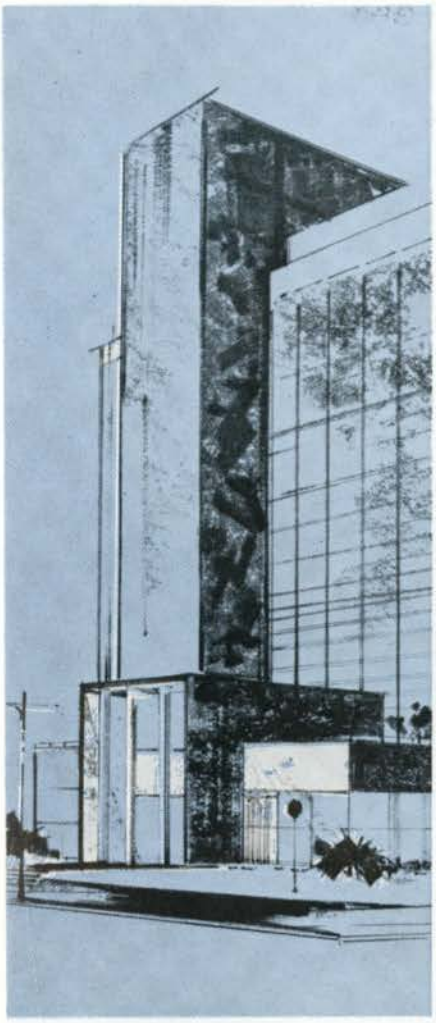

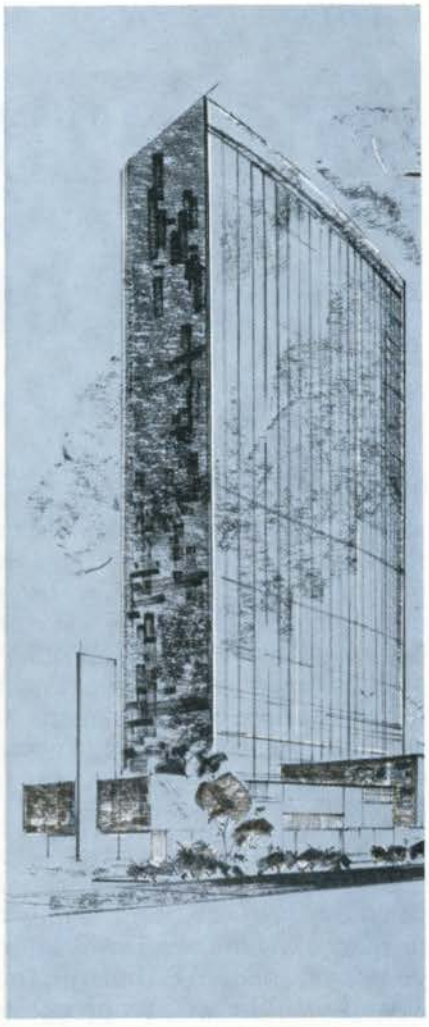

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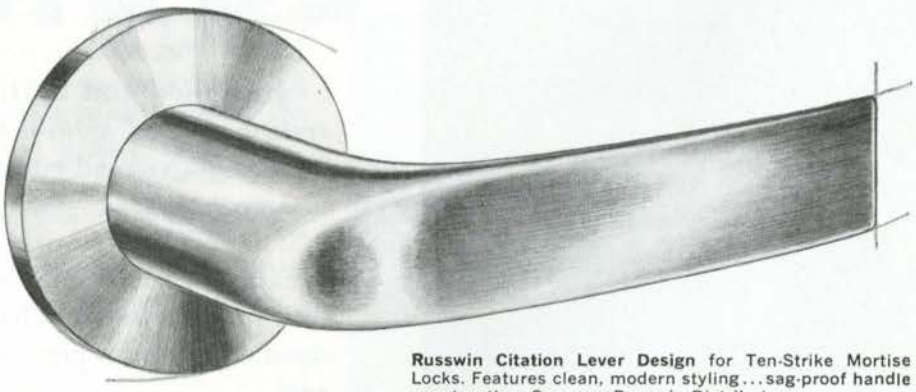

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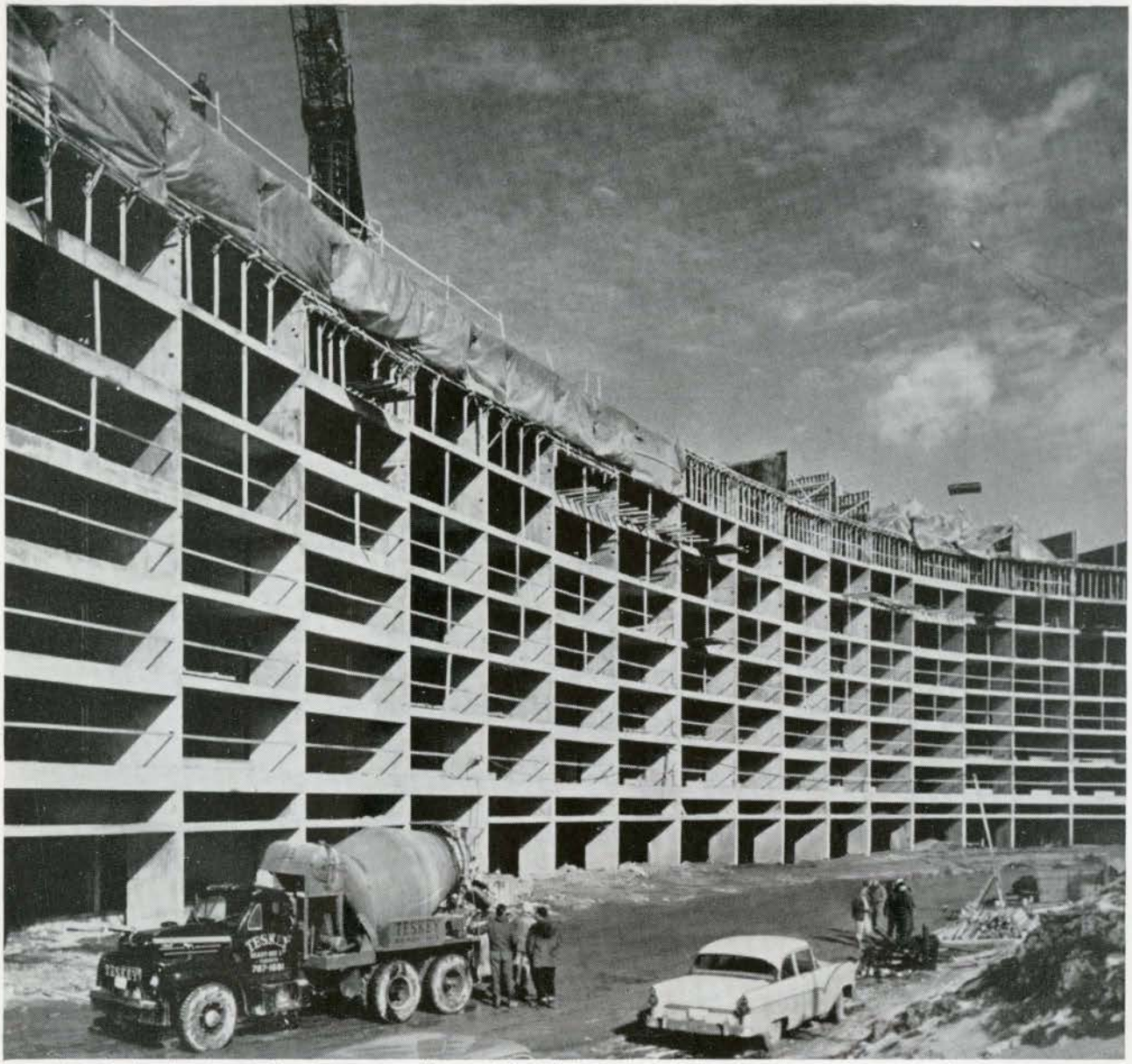

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