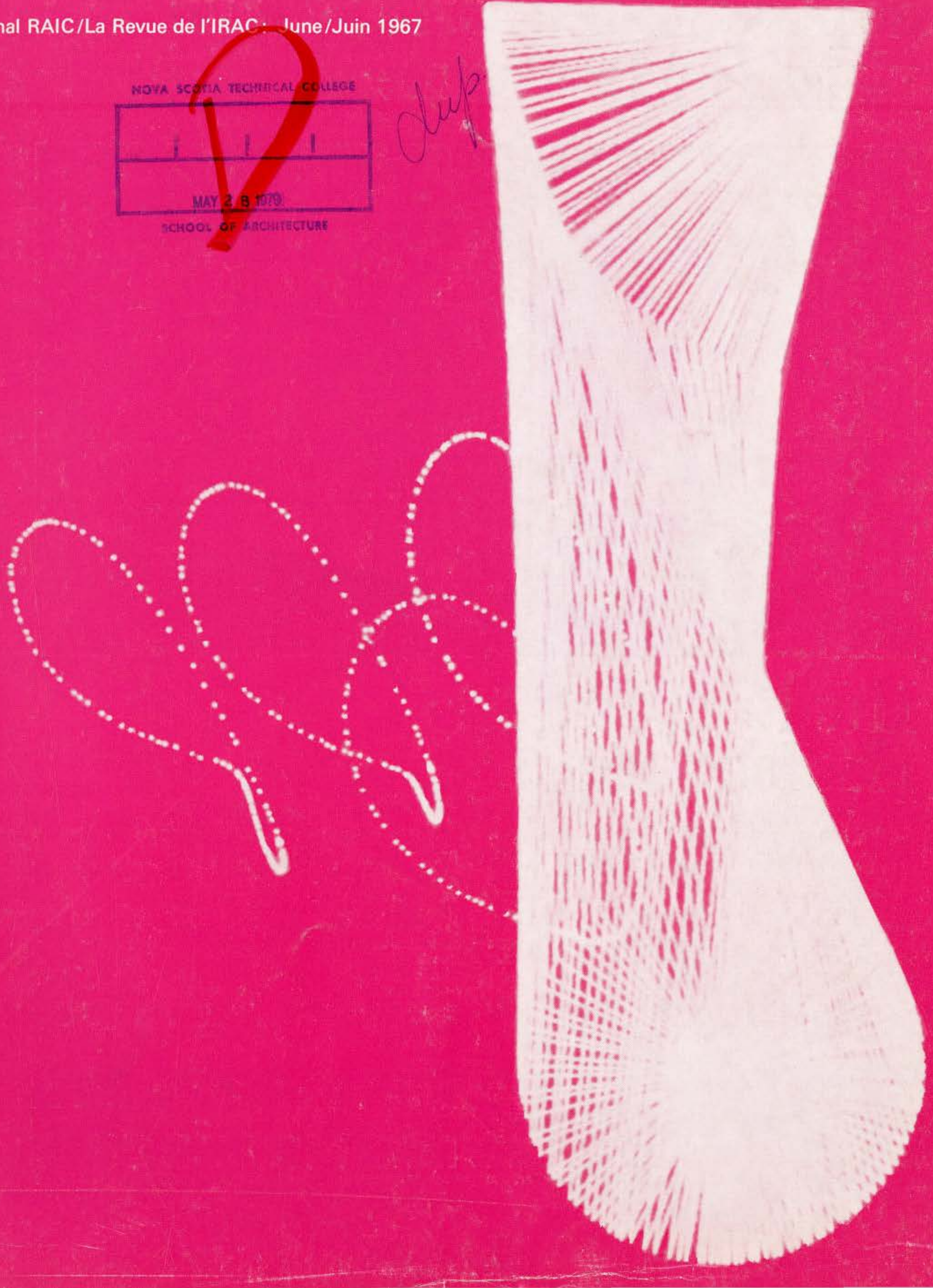
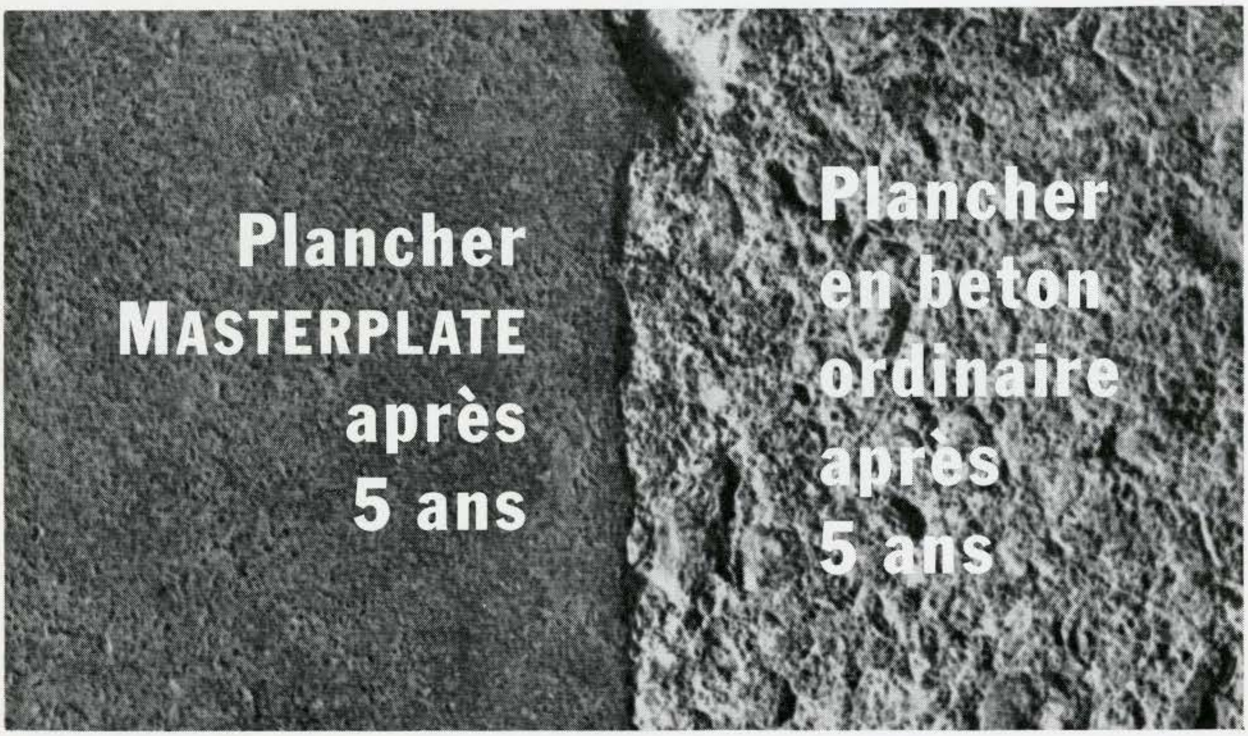
Architecture Canada

Journal RAIC/La Revue de l'IRAC : June/Juin 1967



Pourquoi dépenser de 20 à 25 cents de plus par pied carré pour un plancher Masterplate?



Il dure de 4 à 8 fois plus longtemps.

Ces deux planchers ont été exposés à une circulation également intense.

La surface rugueuse du béton ordinaire nuit au déplacement des charges. Elle crée de la poussière, offre des risques, réduit l'efficacité du travail.

Le plancher MASTERPLATE résistera à *plusieurs* années supplémentaires de dur service.

La raison: MASTERPLATE renforce la surface écailleuse du béton et la revêt comme une armure, souple mais résistante aux chocs, qui empêche la désagrégation et l'érosion.

Notez bien tous ces avantages:

GRANDE RESISTANCE DE SURFACE: Après 28 jours, cette résistance équivaut à plus de 12,000 lb/po. ca.

SURFACE RESISTANTE A L'ABRASION: de 4 à 8 fois supérieure à celle d'un bon béton de qualité ordinaire.

TAUX D'ABSORPTION REDUIT: de 50% moindre que les surfaces en béton ordinaire. Les liquides restent à la surface où on les essuie facilement.

ABSENCE DE POUSSIERE: La surface ne se désagrège pas; la poussière ne risque pas de contaminer les produits ni d'endommager l'outillage de précision.

FACILITE DE NETTOYAGE: La surface résiste aux nettoyages répétés, aux huiles et aux alcalis, à la vapeur, à la plupart des détergents énergiques et à de nombreux produits chimiques industriels.

SURFACE DURABLE, ANTIDERAPANTE: On peut obtenir cette qualité supplémentaire par un crêpage des surfaces en MASTERPLATE avec une truelle.

MOINDRE RESISTANCE PAR FRICTION: Permet d'accélérer et facilite le déplacement des charges, soit à la main soit sur des chariots.

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RAIC 1967 Assembly

We held open this one page in the June issue for a stop-press report on the highlights of the RAIC 60th Annual Assembly in Ottawa May 24-27 and the visit to Expo by most of the delegates on the three days following. From last minute reports, the Expo visit was not all that it was expected to be. On all counts the Assembly was a great success. The attendance (about 300) was the largest for some years; the speakers were very good; the seminars, exhibitions, etc, interesting and the social events very well arranged and much enjoyed by everyone. Even the weather was delightful. George Bemi and his host committee deserve the thanks and congratulations of all who were there. (Assembly report and photographs will appear in the next issue.)

The program more than made up for the indifferent food served on cold plates by the Chateau Laurier, and the construction program in the heart of the National Capital which gives it a sort of bombed-out look. There was also a curious absence of Centennial decorations in the Capital, apart from some reviewing stands on Parliament Hill. Perhaps Expo appropriated all the bunting.

Assessment to Finance Survey Recommendations

The business side of the Assembly also was productive. The determination of the membership to implement the recommendations of last year's Survey of the Profession was convincingly demonstrated by a unanimously approved resolution asking RAIC Council to proceed at once to receive voluntary contributions to the RAIC Foundation (tax deductible) for the exclusive purpose of providing adequate funds for staff, offices and a proper annual working budget for the implementation program. No announcement was made about the appointment of a Director of Professional Service for RAIC Headquarters, the committee not yet being ready to make a recommendation.

The main event of the first day was the presentation of the 1967 Massey Medals by External Affairs Minister Paul Martin (see Massey Medal Supplement page 41). The extra medal awarded by the Jury to Montreal Metro was accepted on behalf of Metro by Aime Desautels, Montreal Director of City Planning.


Eugene Beaudouin


Arthur Gould Odell Jr

The College of Fellows admitted 15 Fellows and two Honorary Fellows, the latter being Eugene Beaudouin, Paris, France, President of the International Union of Architects; and Arthur Gould Odell Jr., Charlotte, NC, Past President of the American Institute of Architects. Peter M. Thornton, Vancouver, succeeded Harland Steele, Toronto, as Chancellor of the College.

Officers of the RAIC Foundation changed; Gerard Venne (*F*), Quebec, succeeded H. H. G. Moody (*F*), Winnipeg, as chairman; Randolph C. Betts (*F*), Montreal, became Vice-President; and John L. Davies (*F*), Vancouver, Honorary Secretary. Maurice Holdham remains Executive Secretary-Treasurer.

Eleven entries from seven schools for the 1967 Pilkington Travelling Scholarship in Architecture $4,000 award were judged at the Assembly by a jury composed of Hart Massey (*F*), Ottawa; D. Dimakopoulos, Montreal; M. P. Michener, Winnipeg and Irving Grossman, Toronto. The winner was Lewis Morse, 23, of University of Manitoba.

National Architectural Archives

Establishment of a National Architectural Archives for Canada made progress when a nationally representative steering committee of 18 members of the Institute and other specially interested individuals held a meeting with Dr Kaye Lamb, the Dominion Archivist and National Librarian, in the new National Library Building on May 26. Last fall the Publications Board suggested to RAIC Council that a proposal for such an archives be made to the Federal Government. Council subsequently invited Dr Eric Arthur (*F*) and H. D. R. Buck (*F*), Toronto, to be chairman and vice chairman respectively of a permanent RAIC Advisory Committee on the Archives. Mr Buck presided over the Ottawa meeting, which discussed chiefly terms of reference and methods of operation. Dr Lamb said he welcomed the proposal to establish the archives and expressed his gratification at the enthusiasm of the RAIC membership for the project. He felt that expertise in criteria was the key role of the committee and the work should be approached from three points of view – first, historic; second, architectural landmarks; and third, building techniques.

Application would be made for a Canada Council grant to make possible a full organization meeting and a study of methods and techniques. Maintenance of the Archives when actual operation begins would be the responsibility of the National Archives.

Officers/Direction 1967/68

James E. Searle (*F*) of Winnipeg was elected President of The Royal Architectural Institute of Canada for 1967, at the 60th Annual Assembly of the Institute, held in the Chateau Laurier Ottawa, May 24-27. He succeeds Charles A. Fowler (*F*) of Halifax. Other officers elected were Vice-President, Norman H. McMurrich (*F*) Toronto, Honorary Secretary, William G. Leithead (*F*) Vancouver and Honorary Treasurer, Gordon Arnott, Regina.

Au cours d'une réunion de la 60e Assemblée annuelle qui a eu lieu à Ottawa au Château Laurier du 24 au 27 mai, James E. Searle (*F*) Winnipeg, a été élu président de l'Institut royal d'architecture du Canada. Il a succédé à M. Charles Fowler (*F*) de Halifax. Parmi les autres membres élus se trouvaient Norman H. McMurrich (*F*) Toronto, vice-président; William G. Leithead (*F*) Vancouver, secrétaire-honoraire et Gordon Arnott, Regina, trésorier-honoraire.

Mr Searle, a partner in Smith, Carter, Searle, Associates Architects and Engineers, Winnipeg, was born in Winnipeg and received his Bachelor of Architecture degree in 1951 at the University of Manitoba. Upon graduation he joined the staff of the practicing firm headed by Ernest J. Smith and Denis H. Carter. In 1959 he became a partner. He has served in an executive capacity and on boards and councils of the Manitoba Association of Architects, the Community Planning Association of Canada and the Royal Architectural Institute of Canada. He was elected a member of the College of Fellows of the RAIC in 1965. His firm's projects have taken a significant part as finalists in several architectural competitions and have been selected for showing in many exhibitions. Two of their designs have been awarded Massey Medals and the design for the Canadian Embassy Building in Warsaw, Poland, was awarded to Mr Searle's firm by the Architectural Design Selection Committee for the Federal Government.

New councillors are: Kenneth L. Bond, Calgary; A. W. Davison, D'Arcy Helmer (*F*), Ottawa; Alan F. Duffus (*F*) Halifax; Harry Mayerovitch (*F*), Montreal; M. P. Michener, Winnipeg; Earle C. Morgan (*F*), Toronto; John R. Myles, Saint-John; F. Noseworthy, St-John; Jean Ritchot, Ste-Foy.

J. E. Searle (F)

C. A. E. Fowler (F)

N. H. McMurrich (F)

W. G. Leithead (F)

Gordon Arnott

College of Fellows
Collège des Fellows

New Members, 1967 Convocation
Nouveaux membres, Convocation 1967

H. D. R. Buck, Toronto, graduated from the Polytechnic School of Architecture, London, in 1947. He became an associate of the Royal Institute of British Architects in 1950, and was registered with the Ontario Association of Architects in 1955. He joined the firm of Page and Steele in Toronto in 1954, became a partner in 1962 and a senior partner in 1965. Mr Buck has been very active in Association and Institute activities, serving as a member and Chairman of several OAA Committees. He became a member of the Editorial Board of the RAIC Journal in 1961, was Chairman of the Publications Board during 1963 and 1964, and is a member of Publications Board Management Commettee. His firm won Massey Medals for Architecture – in 1955 for the Toronto Teachers College, in 1958 for the Workmen's Compensation Building and in 1961 for the High Rise Apartments at Regent Park South. Furthermore, the firm designed the Montreal Trust Building, the National Trust Building, the Moss Park Armouries and the Dennison Armouries, all in Toronto.

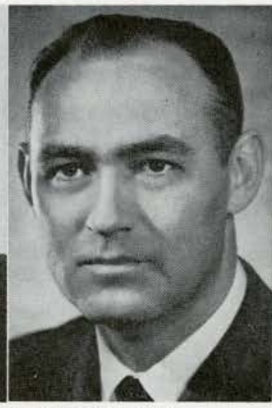
Peter Collins, M.A., Montreal received his diploma in Architecture with "Distinction in Design", from the Leeds School of Architecture in 1958, and his Master of Arts degree from Manchester University in 1955. He served in the British army from 1939 to 1946, was awarded the Silver Medal of the RIBA in 1954 for an essay on the theory of architecture in 18th century France, received a Fulbright Travelling Scholarship in 1955, and a Henry Florence Architectural Book Scholarship in 1960. He has published several books on architecture and many essays and reviews in most of the architectural periodicals in North America and England. He has taught in Manchester University and Yale University, and since 1962 has been Professor of Architecture at McGill University. He is a member of the Province of Quebec Association of Architects and the Royal Institute of British Architects.

Douglas Cumming Johnson, B.Arch, Windsor, graduated from the University of Toronto in 1950. He is registered with the Ontario Association of Architects and is an Honorary Member of the Architects Society of Ohio, AIA. He entered partnership with C. S. McWhinnie in 1953 in Windsor. The firm won the competition for the civic Auditorium and Memorial Convention Hall for the City of Windsor, in 1953. Among the many buildings for which his firm has been responsible are the Paulin Memorial Presbyterian Church, Beaver Oil Service Station, Cody Hall Men's Residence of the University of Windsor, Riverside Composite High School, William Hands Special Vocational School, Budimir Memorial Public Library and Windsor Medical Services Building. Mr Johnson served the OAA as Chairman of the Windsor Chapter from 1956 to 1958, member of Council from 1962 to date, having served as Treasurer, Vice-President and in 1965 President of the OAA. He has served on the RAIC Publications Board since 1966.

James A. Langford, B.Arch., Ottawa, graduated from the University of Manitoba in 1951. The Langford name was well known in football circles when both he and his brother played for the Calgary Stampeders. From 1949 to 1952 Mr Langford was employed by Rule, Wynn and Rule of Calgary and from 1952 to 1954, was with J. A. Cawston. For the next two years he was resident architect in Kindersley, Sask. Private practice during this period involved work on a wide architectural base including regional hospitals and nursing homes. In 1956, he was appointed Deputy Minister of Public Works for Saskatchewan. He served on the Council of the Saskatchewan Association of Architects, was appointed to the Editorial Board of the RAIC Journal (now *Architecture Canada*), an appointment he still holds, and was a member of the Regina Community Planning Commission during the preparation of the main Regina City plan. Also during this period he served as chairman of the action committee that created the Wascana Centre. Mr Langford was appointed Chief Architect of the Federal Department of Public Works in 1963, and in


H. D. R. Buck


Peter Collins


Douglas Johnson


James Langford


Stewart Lindgren

1966 was promoted to Assistant Deputy Minister responsible for all design within the Department of Public Works. He is a member of the Ontario Association of Architects (on the council of the Ottawa Chapter), the Institute of Public Administration of Canada, the American Society of Planning Officials. He serves on the Architectural Advisory Committee to the University of Saskatchewan and was a member of the committee on the Survey of the Profession for the Royal Architectural Institute of Canada.

Stewart E. Lindgren, B.Arch, Winnipeg, served overseas with the Royal Canadian Engineers from 1939 to 1945 and graduated from the University of Manitoba in 1951. He was registered with the Manitoba Association of Architects in 1953 and entered private practice in partnership in 1954. His firm is Pratt, Lindgren, Snider, Tomcej and Associates. He was a member of the Manitoba Association Council from 1960 to 1963, Vice President in 1961 and President in 1962. He has served on a number of committees for both the MAA and the RAIC. He served on the Citizens Committee for St Vital in 1962 and as President of the St Boniface Kiwanis in 1961. Buildings for which Mr Lindgren has been responsible include schools, hospitals, senior citizens' homes and churches.

George W. Lord, B. Sc. (Arch), Edmonton, graduated from the University of Alberta in 1939. During the war he served with the Architectural Department of the CNR in Montreal, the Department of Munitions and Supply in Ottawa and the RCE. He was registered with the Alberta Association of Architects in 1942, served on Council from 1950 to 1956, as Honorary Secretary in 1951 and President from 1952 to 1953. He again served as Honorary Secretary in 1965 and is now Second Vice-President. He is now a member of the RAIC Electoral Board. In 1960 he became a partner in the firm of Rule, Wynn and Rule, now Rule, Wynn Forbes, Lord and Partners, and has been involved in school and commercial architecture. He is President of the Edmonton Art Gallery.

Hart Massey M.A., B.Arch., Ottawa, attended Balliol College, Oxford, where he received his Master of Arts degree 1939. He graduated from the University of Toronto in 1951, and travelled abroad for one year on a Pilkington Scholarship. In 1953 he was registered with the Ontario Association of Architects and commenced private practice in Ottawa. Mr Massey has served on the OAA Committee on Fees, is a member of the National Capital Commission Advisory Committee on Design, and serves on the Building Appearance Committee of the City of Ottawa. He has won two Massey Medals for Architecture, one in 1958 and the other in 1964, and has received three Annual Design Awards from the Ottawa Chapter of the OAA in 1966. Mr Massey served in the RCAF in the UK, France, Belgium and Holland from 1939 to 1945. Some of Mr Massey's principal works are: The Master Plan of Carleton University, Ottawa (in association), the preliminary design of the Science Building and Phase I of the Library, both in association, at the University. He is responsible for the Lecture Room Building and its extension, and the Arts Building extension at Carleton University; the Pavilions in Hog's Back Park; the Faculty of Law Building at the University of Toronto (in association); the Department of Agriculture Administration Bldg; Minirail Stations for Expo '67.

Joseph Pettick, Regina was registered with the Saskatchewan Association of Architects in 1954. He then enrolled as a special student at the University of Oklahoma for post registration studies in Architectural Design and Structure. He established himself in private practice in Regina in 1955. Among the many buildings for which Mr Pettick has been responsible are the Head Office Building for the Saskatchewan Power Corporation in Regina, which won the 1964 Illuminating Engineering Society Applied Lighting award in Canada and the USA; the Moose Jaw Physical Education Centre Building, which won a Massey Medal in 1961; and the Physical Education Centre for the Regina Campus of the University of Saskatchewan. He is the official representative of the RAIC to the International Union of Architects, past president of the Saskatchewan Association of Architects, past chairman of the Civic Committee Regina Chamber of Commerce, and he has served on the Structural Advisory Group of the National Research Council, on the Board of Governors of the Regina Orchestral Society, and as Past-Chairman of the Regina Local Housing Authority administering subsidized housing in the City of Regina.

Cyrille Roy, Moncton ADBA, est né à Montréal. Il a reçu son diplôme d'architecture en 1948, de l'Ecole des Beaux-Arts de Montréal. Il a fait ses études secondaires à l'Ecole Supérieure Saint-Stanislas. Inscrit architecte en 1949 par l'Association des architectes de la Province de Québec, il débuta sa pratique privée en formant la société des architectes Belanger et Roy. Parmi les nombreux projets d'édifices publics, institutionnels et religieux, il est intéressant de souligner l'Edifice du Centenaire à Fredericton, Nouveau-Brunswick. Membre du Conseil de l'Association des architectes du Nouveau-Brunswick depuis 1957, M. Roy est également membre de la Commission des publications de l'Institut Royal d'architecture du Canada.

Norman C. H. Russell, B. Arch., Winnipeg graduated from University of Manitoba in 1931 and has been in private practice since 1936. He was President of the Manitoba Association of Architects in 1957 and was a member of Council from 1954 to 1958 and from 1961 to 1963. He was a member of RAIC Council from 1956 to 1958, served on the Editorial Board and was a member of the Public Relations Committee from 1961 to 1965. He has served on the MAA Public Relations Committee for the past six years and is Chairman of a Committee commissioned to prepare a history of the Association. He is member of Council of the Manitoba Historical Society and chairman of a committee photographing and cataloguing early structures. His special interest is religious architecture and he designed Regents Park Church in Winnipeg and St Andrew's church in Moose Jaw. He prepared

George Lord *Hart Massey* *Joseph Pettick* *Cyrille Roy* *Norman Russell* terms of reference for church buildings for the Property and Architectural Committee of the United Church of Canada. He also designed two pilot projects for senior citizens in Manitoba.

Douglas Shadbolt, B.Arch. Halifax, graduated from the University of Oregon in 1957, having previously studied applied science at the University of British Columbia, and attending the School of Architecture at McGill University. From 1945 to 1955 he worked with several architectural firms in Vancouver, Victoria and Ottawa. He taught at University of Oregon and produced a thesis on design of a School of Architecture, which included a study of architectural education, curricula, teaching methods, course content, physical plant, etc, and culminated in a proposal for an independent School of Architecture and Design, supported by a Building Information Centre and an Institute of Building Research and Technology. He taught architecture at McGill University, and became a member of the Province of Quebec Association of Architects, in 1958. In 1959 he studied architecture in Europe on a Canada Council Scholarship project. In 1961 he was appointed Director to start the new School of Architecture at the Nova Scotia Technical College, Halifax, and he became a member of the Nova Scotia Association of Architects. Since moving to Halifax, Prof. Shadbolt has been very active on civic and professional committees. He was appointed design consultant of the City Sewage Plant, commissioner of Peggy's Cove Preservation Area Commission, a member of the Advisory Committee on Architecture of the Canadian World Exhibition Corporation, appointed a member of a collaborative to design Atlantic Provinces Pavilion for Expo '67, associate architect for urban renewal project of the City of Halifax, and he developed the master plan for the Nova Scotia Technical College campus in collaboration with A. J. Donahue and O. Biskaps.

Hazen Sise, B. Sc. (Arch), Montreal, attended McGill School of Architecture and graduated from MIT School of Architecture in 1930. He was registered with the Province of Quebec Association of Architects in 1931 and became an Associate of the Royal Institute of British Architects. He has worked with architectural firms in London and Paris, with the National Film Board of Canada and with firms in Canada. He is now a partner with Affleck, Desbarats, Dimakopoulos, Lebensold and Sise. Some of his many affiliations are: National Councillor-at-Large, Community Planning Association of Canada; executive of the Montreal Citizens' Committee; Executive Committee, Historical Council of the Montreal Region; director of the Montreal Parks and Playgrounds Association; on the Committee for the Conservation of Historic Monuments and Sites; member of the Canadian Theatre Centre, the US Institute for Theatre Technology; and the Advisory Committee, Community Improvement Project of the Centennial Commission.

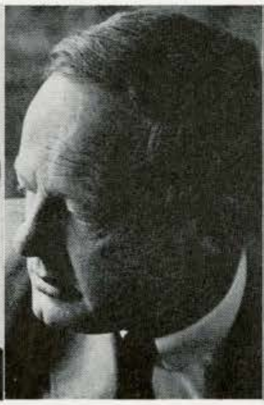
Ronald James Thom, Toronto began his career in the Vancouver School of Art. This was interrupted by war time service with the RCAF after which he returned to complete his degree. He then taught at both the Vancouver School of Art and the then newly formed Department of Architecture at the University of British Colombia. He subsequently joined the firm of Thompson, Berwick, Pratt, becoming a partner in 1957. He is a member of the Architectural Institute of British Columbia and the Ontario Association of Architects. He was the architect of Massey College and first came to Eastern Canada to supervise its construction. It was during this period that he received, on behalf of Thompson, Berwick, Pratt, the apointment of master planning architect of Trent University. His work within the firm includes co-design of the Vancouver and Victoria British Columbia Electric Buildings; religious, recreational, education and commercial buildings in BC as well as Eastern Canada; and a long succession of houses throughout BC. Mr Thom's work has received many awards and he had the first one-man architectural exhibition at the Vancouver Art Gallery.

Paul O. Trépanier, ADBA, Granby, P.Q. a poursuivi ses études classiques au collège Bréboeuf, Montréal. Il s'est ensuite dirigé vers l'école des Beaux-Arts (section architecture) où il a gradué en 1949. Après avoir travaillé au bureau des architectes de Radio-Canada, et à l'agence architecturale Greenspoon, Freedlander et Dunne, de Montréal, il a ouvert un bureau à Granby en 1953. En 1955 il éstablissait une sous-agence à Montréal. M. Trépanier a été maire de Granby et président de la Chambre de Commerce du district de Granby, et président de l'Association des architectes de la province de Québec. Il est actullement président du Comité des Relations Publiques de l'Institut Royal d'Architecture du Canada. Bien connu comme conférencier à maintes occasions et ce, aux quatre coins de la province, en 1966. M. Trépanier a été élu président de l'Association Profressiste-Conservatrice Fédérale du Québec.

Eberhard Heinrich Zeidler, Dipl. Ing. Arch., Toronto. Mr Zeidler graduated from the Bauhaus Weimar, Karlsruhe University, Germany with the degree Dipl. Ing-Arch. (magna cum laude), and was registered with the Ontario Association of Architects in 1954. In 1951 he associated with J. S. Craig, and is now a partner of the firm Craig, Zeidler & Strong of Toronto and Peterborough. He served on the OAA Selection Committee for Exhibition of Ontario Architecture in 1961, and on the RAIC Journal Seminar on Schools in 1965. He has received four Massey Medals for Architecture and mentions; the Ontario Masons Relations Council Design Awards, "Award of Merit" 1964, and again in 1966, – and their "Award of Excellence" in 1965. He also received a National Design Award for Housing for Elderly Citizens. Among the principal buildings for which Mr Zeidler has been responsible are the Peterborough Memorial Centre, the Lennox and Addington County General Hospital, Beth Israel Synagogue, Parkwoods United Church, Thomas A. Stewart and Auburn Vocational Schools, the Scarborough Centennial Recreation Centre, and the Ajax Municipal Building.


Douglas Shadbolt


Hazen Sise


Ronald Thom


Paul Trépanier


Eberhard Zeidler

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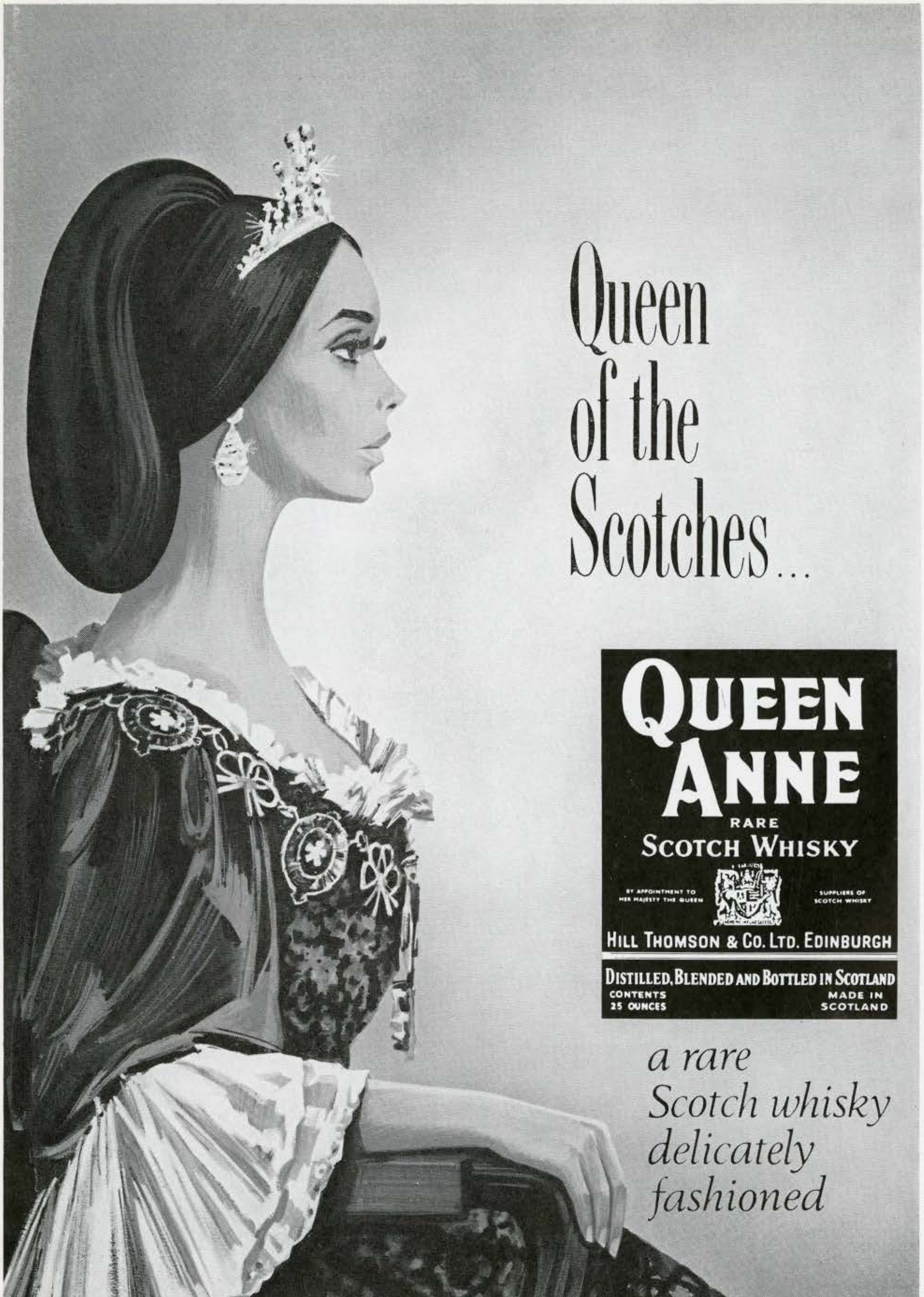
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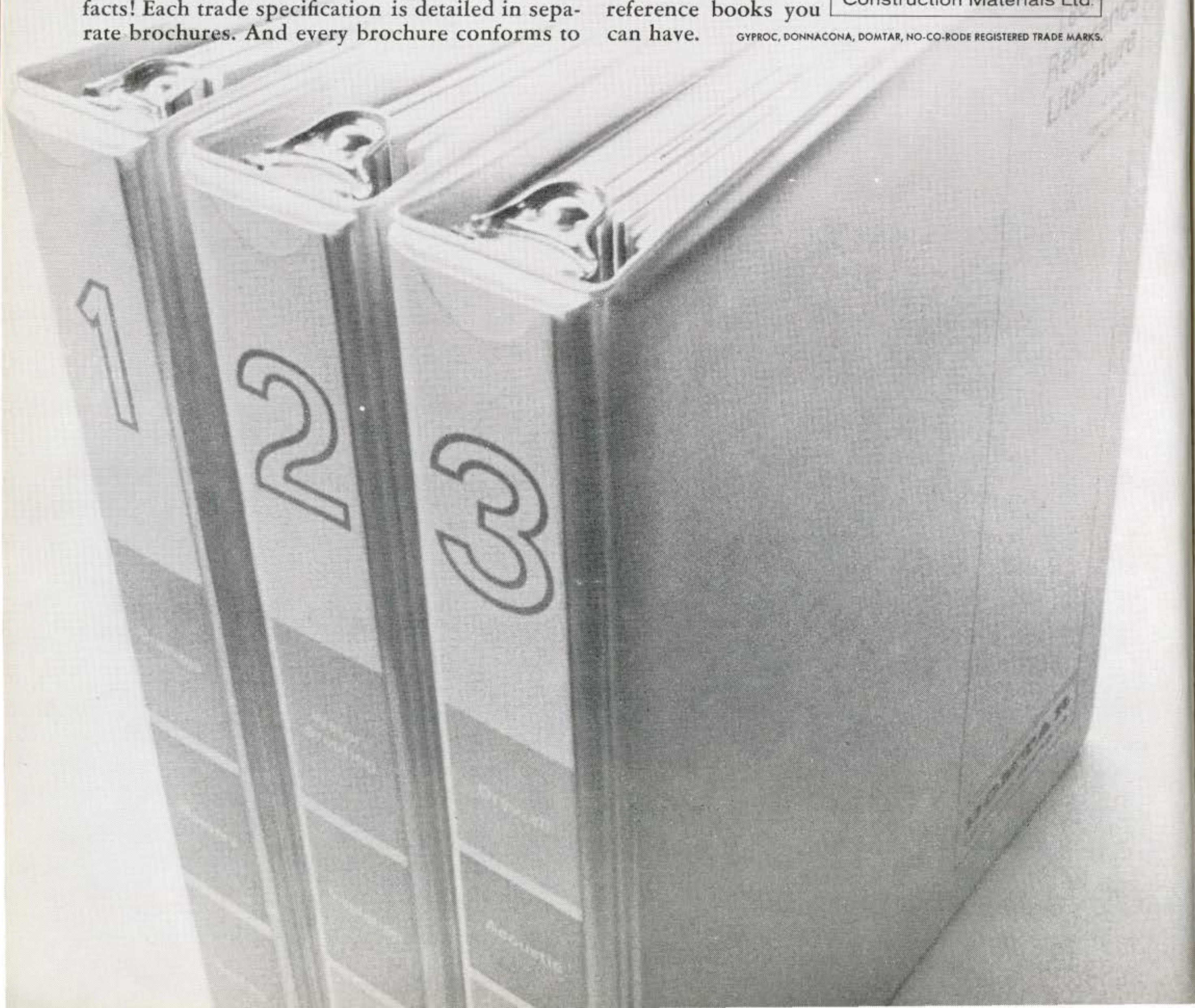
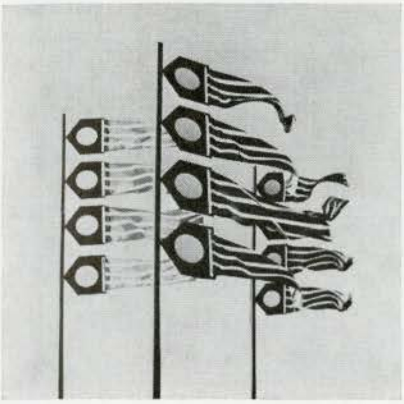


The Artists and Expo

Designers, Integrators, Fine Art, Exhibitions
Part 1 – Introduction and The Designers



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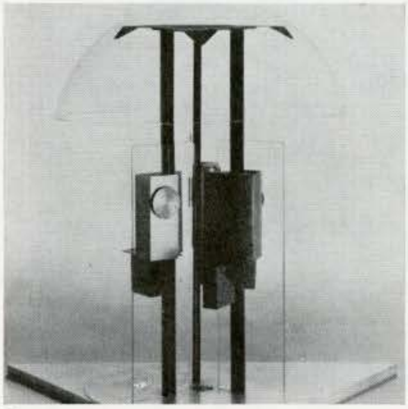

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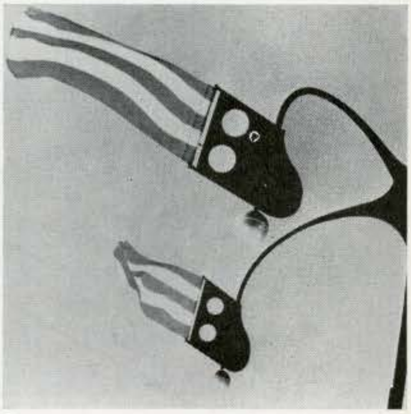

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Expo 1967 undoubtedly and without reservation is a great show. The policy of less accent on commercial profit has given us perhaps the first genuine "peoples show" yet. Directions and new horizons are clearly evident for future expositions. More important are the signs and signals for action in every-day life. The "peoples world" in post World War II era has been protesting long enough that all is not materialistic in contemporary life. At last it has found a worthy public forum for expression. Expo 67 as a whole is worthy of constructive aesthetic criticism and in evaluating and criticizing, positives and negatives must be carefully weighed; for French Canada through the enthusiasm of "Drapeau's Dream", has created a non-materialistic milestone in North American life. This is no mean feat in the battle of materialism versus aesthetics.

The Artists and Their Role

Architect, painter, sculptor, designer, film maker and lighting expert trespass so thoroughly on common territory that arbitrary divisions are useful but not always true, although each category seems to have found a special function with varying success.

The Architect

Expo 67, as usual, is no exception for world expositions, in being a tour de force for the conceptual architectural designer. This time however the landscape architect too takes an important role as coordinating designer of the whole. Surely this alone is a high sign for new urban development, for with the exception of irresolute decision on borderline projects the landscape teams succeed in weaving man made structure and natural passages of rest into plastic inevitabilities.

The architect with huge shells and acrobatic forms overwhelms the lesser with the greater. Russia, USA, Great Britain with the order of the day, achieve what they set out to do . . . grand scale and national aggressiveness to accent their architectural presence. Within the shells, however, people got to work – government officials, artists, designers and the myriad of national workmen with all their very human activities. The god-head architecture is now peopled by humans whose scale of thought is somewhat less monumental and less self-conscious than the architect-designers. That is the tale. Great architectural effort and eager small scale human activity . . . can the two be compatible?

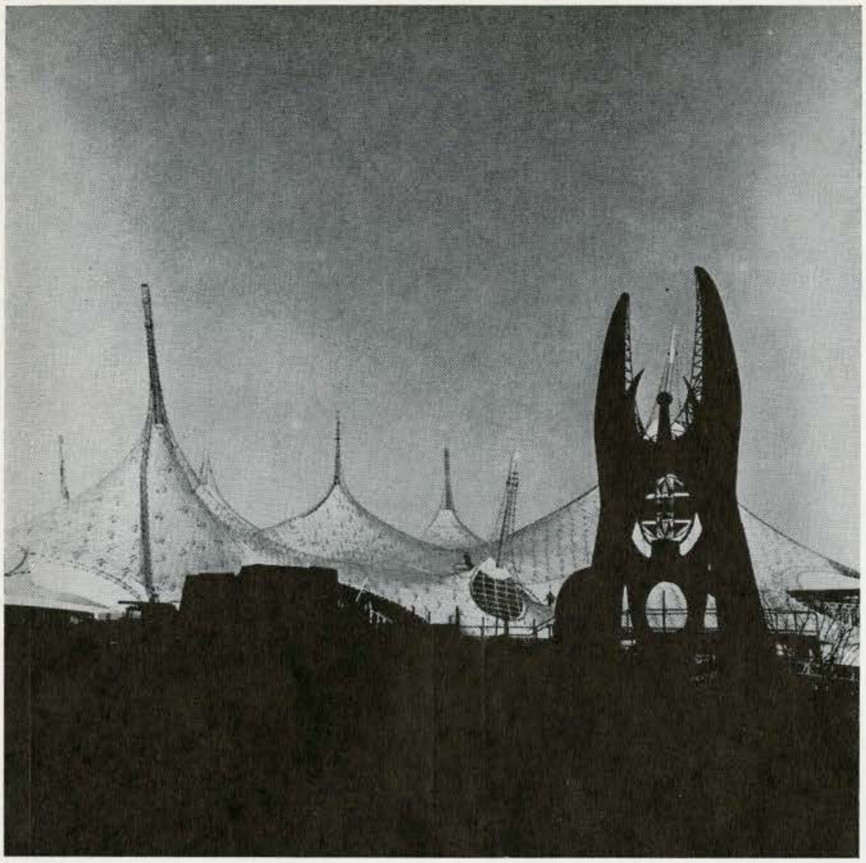
Truly Expo exists as a new metropolis, a temporary city of nations for the ingredients are all there. One is aware of international differences and similarities and of "controls" which work and those which fail. One is aware of harmonies and dissensions, of understatement and overstatement, of modesty and wealth. In this grandstand exposition of the world in a nutshell, official government statement and contemporary creative expression persuade perception to seek the truth of Man and his World for oneself.

This has been a fine opportunity for the visual artist to perform and state his case for he has been given space and commitments in every area of operation. How has his response fared in the total scene? On careful examination it would seem that the visual arts outside the forthright statement of major allotment to architectural structure, fall into four categories: the Designers, the Integrators, the Fine Artists and finally the Exhibitions. With the intention of breaking this series into four parts the survey begins with Part 1 devoted to the Designers.

The Designers

In the past, architects have had their field-day at world expositions but Expo 67 is a minor triumph for the North American designer – industrial or graphic or what you will. Given the right to "control" his areas, the designers of graphics, street furniture and architectural boutiques have contributed a trump card for order and aesthetics in commercial display for public exhibition and, all this without sacrifice to fun, fancy and excitement. The creative contributions of this most respected branch of commercial artists should be a positive directive for immediate action in urban development to

1
Standards at Expo by Len Levitan
Bannières à l'Expo par Len Levitan
2
Expo Telephone Kiosk
Cabine téléphonique à l'Expo
3
Levitan's Standards
Les bannières de Levitan



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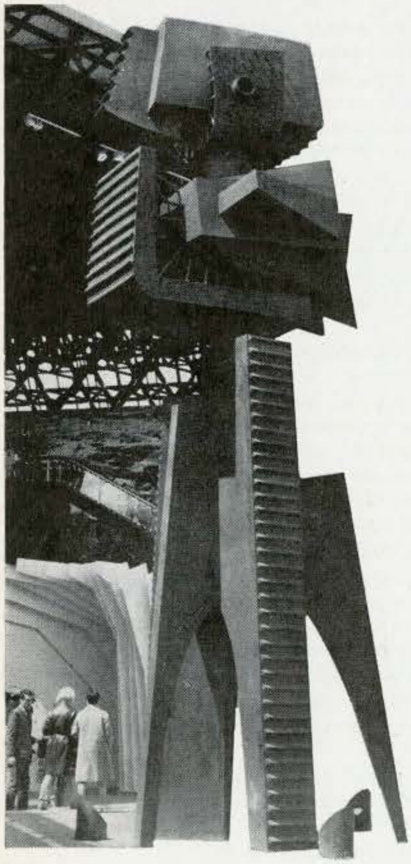

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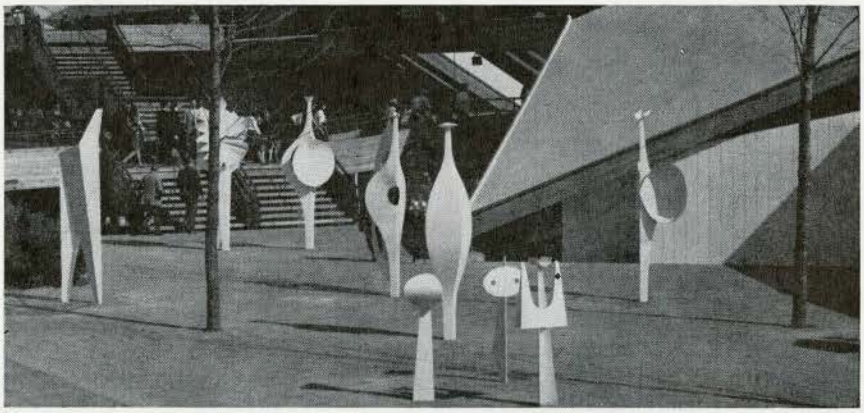

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The Fuhrer sculpture in front of the German Pavilion
Sculpture par Fuhrer devant le pavillon allemand
5
Cosmic Lighthouse, by Yves Trudeau at "Plaza of the Universe Theme Pavilion"
Sculpture is mechanized with sound effects.
Phare cosmique par Yves Trudeau.

6
Louis Archambault's "People", 5 to 10 feet welded steel, at Canadian Pavilion
"Groupe" de Louis Archambault, en acier soudé 5 à 10 pieds, au pavillon canadien
7
Wall and sculpture by Norwegian artists in Scandinavian pavilion
Mural et sculpture par des artistes norvégiens au pavillon scandinave

8
Glass sculpture, Czechoslovakia Pavilion
Sculpture en verre

liven up street furniture, terminals and lighting of decaying suburbia. Contemporary, sensible, practical but light hearted the various elements created by Luis Villa and Frank Macioge, interrelate in their various purposes with sensitive beauty. Created for multiple assembly and variable placements, one can only say hurrah for the time when some municipality will, with minor functional adjustments, order phone boxes, seats and standards for lights for our dour Anglo-Saxon streets.

In paying credit to these people and to the excellent success of an overall graphic signage, which Paul Arthur and Associates showed themselves quite worthy and responsible agents in commission, one must also pay credit to the obstinate and obdurate policing of the project by the agency of Norman Hay (Art Director Expo 67) and his vigilant cohorts whose gentle but firm insistence against commercial pressures have given the total scene the quality it has. This is indeed the spirit of this Canadian enterprise in Quebec – excitement and aesthetic pleasure rate higher than commercial profit. I would like to feel that other provinces of Canada would have been as similarly insistent given the opportunity under similar pressures.

Chalk up to the *artists* the first score for the designers' most positive contribution in imposing order and taste without dull conformity on street furniture, lighting shops, boutiques and signage. This success alone should add to Canadian awareness.

In many other ways the industrial designer has responded to the conditions of a world fair more successfully than his "artistocratic" brother, the "fine" artist. His sculptural fantasies are more exciting, contemporary and correct for architectural scale than those purposely contrived by the more serious sculptors for similar purpose. Light-hearted but by no means light-minded the designer manages to assemble large planes, plastic materials, wood or plaster into contemporary form compatible in scale to the architects' monolithic ceilings. They are forms arrived at to conjure up an image for contemplation, to excite, amuse or even terrify. They strike as much wonder as any esoteric piece of gallery acquisition. The designer is more at home here, and reaches his public, through an appreciation of the use of scale and the exciting use of material. He suffers equally from incorrect isolation of his product in a "carnival" atmosphere but manages to survive more happily.

Before leaving the total scene for more particular items the next important contribution at Expo is La Ronde. The success of separating the Carnival area from the general pavilions, the unadulterated fun palace of planned vulgarities is another enormous success for controlled designing.

La Ronde

La Ronde is a tacit understanding that *Vulgarity* (not tastelessness) is a necessary part of Man's expression in his enjoyment of life. La Ronde, separated from the more serious intentions of Expo will remain as it is, an organized fun palace for more temporary, frivolous and less reflective sensualities of man. Here is to be had the belly laughter of human happiness. It is, in fact, the epitome of brass bands and the clashing cymbals of the street carnival now shackled to fixed position. La Ronde at last makes the raucous carnival decadence more palatable with a visual world of essences of "shock" "fright" "laughter" "fear" and "surprise". The areas of the past, Pioneer Village etc are as a cardboard cylinder of a giant kaleidoscope, rotating human beings through these areas on the minirail. The designers have shown a proper understanding of the philosophy of Fun . . . the childlike rather than the childish. A sense of wonder and delight through orgiastic sensations of fear, surprise, shock and visual excitement. Mechanistic means have been subjugated to clever design organization. The work began as a group of four after much procrastination where expert disagreed with expert. Curtailment of budget and a late start may have hampered but certainly not dampened the ardor of the team, Joe Baker, Canadian architect, Norman Slater, Canadian architect designer and specialist in lighting, François Dallegret, French designer of special effects, and Leonard Levitan, talented American designer. A unique international team with assigned sections for the individual managed to bring much color and coordination of activity to a naturally restless area. Baker with probably the most thankless and less prestigious task on the site of Expo, as far as future commissions are concerned, has shown his creative ability to coordinate fun forms into a kind of structure that satisfies commercial carnival mentality without descending to the low level of tastelessness which seems to surround such projects. His forms, mathematical but lively, restrict chaotic tendency, for in this area architecture is controlled and design is the wayward child. Juggling them nicely in continuity, Baker lifts the dictum of purity and formality by dressing them in party clothes of the brightest possible hue that chemical aid to color can produce.

Eye shattering color, wind blown flags, pin wheels, rotating units, "spinner trees", "fleur des vents", windsocks conduce a wide-eyed sensation of prevailing gaiety.

I was interested to find here again a control in the person of diminutive French-American Solange Labbé who was firmly but tactfully exerting directives on the design for graphics of the mechanical rides purchased in total by concession owners. Such redesigning of the hand rails from mass produced to the circumventing wooden ribbons and the removal of mawkish extraneous superstructure of commercial rides is part of the success not apparent to the casual eye. That Solange was able to convince hardbitten carnival men is a credit to both of their abilities to make this show "swing". Lighting bolards and various new imaginative ideas, landscape planning by Sasaki & Strong give creative rejuvenation to one of the most tired areas of public exhibition. CNE please note!

I can only quarrel with the thoughtless intrusion of one or two items which throw things out of key. For example, the Gerald Gladstone sculpture, one of the few Canadian pieces to achieve proper site scale for Expo, appears unnecessary and unwanted. Much more could be written of La Ronde and its coordinators but it is sufficient to say that here again designers have revitalized a tired and sick aspect of urban development . . . the "decayed" country fair is now an intelligent metropolis vent for "unsane" behaviour.
Anita Aarons

Expo Art continued next issue

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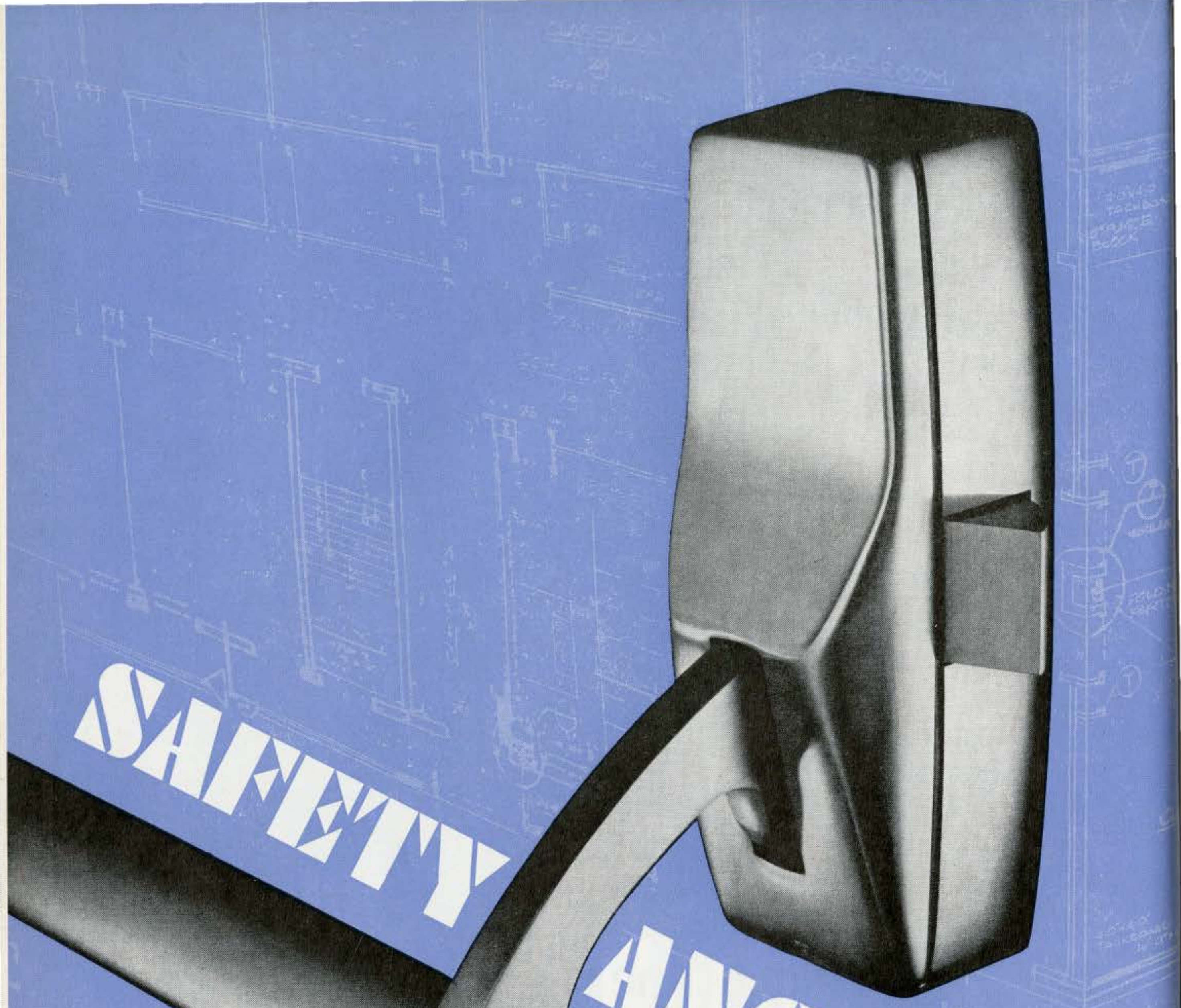

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RUSSWIN

Review
Revue

4

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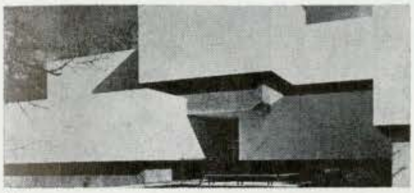

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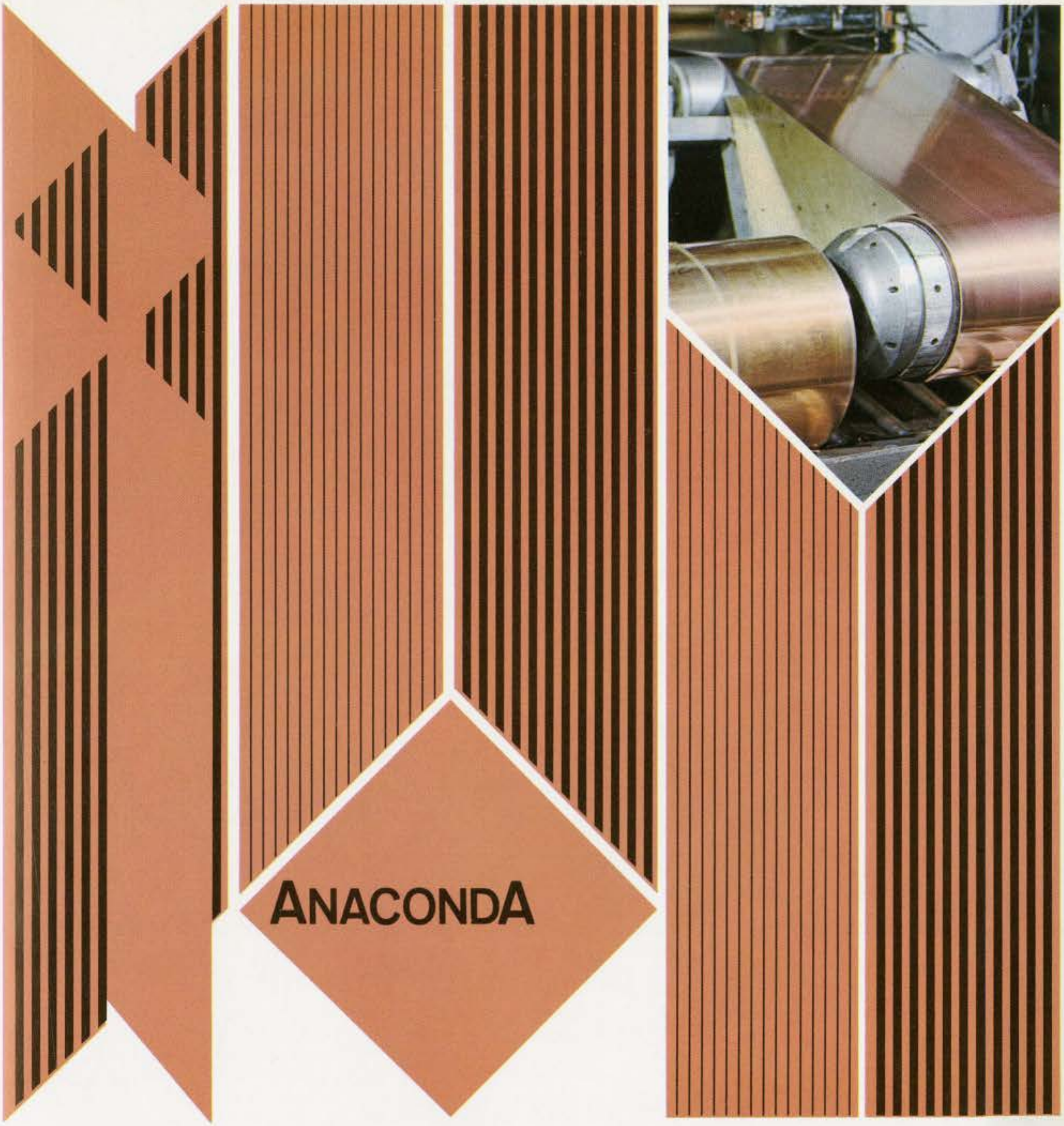
The Reynolds Aluminum Company have introduced a second prestigious (and profitable) prize to their Memorial Award for Distinguished Architecture. There is now also a $25,000 Memorial Award for Community Architecture. The first recipient of this award is Cumbernauld New Town (**1**) in Scotland, cited as "The western world's highest achievement in new urban design", and it is worthy of the award. Not so worthy, however, is the building (**2**) that has received the 11th Reynolds Memorial Award for architecture. The donors, one feels, must have been dazzled by the aluminum used in the James F. Lincoln Library, Lake Erie College, Ohio, Victor Christ-Janer, Architect. The building is not much more than modish monumentality; it is not in the same class as previous Reynolds Award winners.

The *RIBA Journal*, May 1967 gives the Architectural Awards for the year. The *RIBA Journal* notes that the standard of the buildings that have received awards is very high. A scrutiny of these awards, and the Massey Medal winners published in this issue of *Architecture Canada*, shows that our standards must be even higher. Apart from perhaps Dunelm House (**3**) (Architects Co-Partnership) and St Peters College (**4**) (Gillespie, Kidd & Coia) there is nothing that particularly distinguishes the British awards.

Birmingham Mining and Metallurgy Building, by Arup Associates, Architects and Engineers (*Architectural Design* April 67) (**5**), (**6**) completed in 1966, is the forerunner of three further science complexes; the New Museums laboratories, Cambridge, now under construction, Loughborough University of Technology and the Addenbrooke's Development for Biological Sciences, Cambridge, both in the design stage. Embodied in the design of these laboratories are ideas which have been considered over a period of years, as a result of experience in the design of science buildings and the problems of adaptability and servicing which are involved. The first phase provided one pavilion for each of the two departments. The exact size of the future increments was at this stage unknown, and the junctions between them were cut to a minimum to restrict as little as possible the shape and size of future extensions, while still taking advantage of the contiguity and the sharing of certain facilities that this arrangement provided. The ideas of growth and change implicit in the design were put severely to the test while the first phase was still under construction: The Robbins Report was published and the architects were asked to proceed immediately with the construction of the second phase – doubling the size of the scheme – before a program had been determined. Surprisingly, this presented few real difficulties. Birmingham proved that it was possible to design a special system for a complex building on a particular site, using semi-industrialized methods, and still be well below the UGC cost limit. The construction method, based on an assembly of separate 17-ton, 20 ft square, precast concrete tables, was a departure from anything the architects had done before. With no precedents, normal cost plan methods were of little use. The difficulty is that established methods, however inappropriate, are more easily costed, so outside these there are costing problems. The decision to use an entirely precast construction was justified also by the standard of finish achieved, and in addition by the speed of the erection, in that both first and second stages, amounting to some 152,000 sq ft were structurally erected and waterproofed in little over five months. The principles underlying the design of all three related science buildings are derived from the relationship: Planning discipline/services network/construction.

More kookiness – slick perversity. The playboy architecture of Charles Moore's New Haven house (*P/A*, May 67) is further indicted by Moore's own frippish explanations: "I wanted these graphics (sic) to seem like part of an even bigger world. It is a latter-day manifestation of a Piranesi complex. The 18th century got its kicks by drawing people too small and I thought I could get mine by making the graphics twice too big. These are like pieces of great wheels rolling around and grinding over you. . . . I don't think it evil to puncture whatever architectural balloons I can find lying around." While we could not agree less that irreverence for everything is a virtue, Mr Moore has certainly blown up a very inviting balloon.
A.J.D.


ANACONDA


modern

Page 29
Le Graphisme par Computer
Timothy E. Johnson

Le graphisme est l'outil principal des architectes pour la formation et la transmission des idées. En commencant par des croquis symboliques de l'interaction des activités et en finissant avec des perspectives accomplies, le graphisme domine les procédés de dessin. Mais, lorsque l'architecte veut profiter des services d'un computer, il est obligé d'employer le langage ritualistique de ce computer . . . le mot écrit . . . donc, le plus souvent, il revient à ses méthodes traditionelles. Même en essayant d'apprendre le langage du computer, très peu du procédé de dessin, tel que l'analyse des tensions, est aidé par cette machine. Le graphisme par calculatrice promet pourtant d'enlever la plupart des obstacles rencontrés par l'architecte.

Dans un système de graphisme par calculatrice, on dessine avec un instrument spécial sur une surface consistant d'un Tube de TV modifié qui reçoit ses signaux d'une calculatrice plutôt que d'une station de TV.

Cet instrument, qui s'appelle un stylet lumineux, est sensible à la lumière et est opéré manuellement. Il "tire" un point de lumière par dessus l'écran. Pour faire une ligne droite, le curseur est positionné par le stylet au point de départ voulu ; puis, on appuie sur un bouton et la calculatrice trace une ligne allant jusqu'à la position du curseur pendant qu'il est déplacé par le stylet, donnant l'effet d'une bande élastique l'umineuse tirée sur deux épingles dont l'une se déplace en dessous du stylet et l'autre est fixée sur l'écran. Un mouvement du stylet arrêtera l'action et signalera à la calculatrice d'enregistrer la position finale de la ligne dans la mémoire de la calculatrice. S'il faut effacer une ligne, on pointe le stylet vers la ligne et on presse le bouton marqué "effacer". Une fois le dessin fini, le dessinateur pourra ajouter d'autres renseignements tels que les types de matériaux et le coût en pointant le stylet vers une ligne donnée et en tapant à la machine les caractéristiques relatives. Tout cela est enregistré dans la mémoire de la calculatrice, donc, tout programme de computer conçu pour fonctionner à partir de cette information pourra être employe immédiatement aux fins d'analyse et de dessin. Les résultats sont produits dans une minute ou deux en forme de plan graphique. Le dessinateur pourra modifier ces résultats rapidement en cas d'erreur ; l'experimentation est encouragée pour pouvoir arriver à une meilleure solution. Donc l'homme, avec son expérience en dessin, fournit les alternatives de dessin à la calculatrice pendant que la machine lui fournit les implications de ses suggestions.

Beaucoup des opérations sophistiquées en graphisme par calculatrice sont disponibles qui dépassent de loin la méthode "crayon et papier". On n'est pas obligé de dessiner une figure précisément afin d'assurer que certaines lignes soient parallèles ou perpendiculaires. N'importe quand, l'architecte pourra appliquer des "contraintes" graphiques à son dessin en pointant le stylet et en pressant sur un bouton marqué "contrainte" ; les lignes tracées, et toute ligne y raccordée, se mettent en position. Donc, on n'a pas besoin d'anticiper une forme. Un croquis peut être "contraint" à des proportions et échelles voulues mais si ces positions sont trouvées indésirables, elles peuvent être élimines sélectivement.

Des croquis fait à la main d'objets en trois dimensions sont également possibles. On dessine directement en trois dimensions plutôt que de faire un plan et puis une élévation. Lorsqu'on dessine d'un point de vue, la ligne élastique apparaît simultanément dans d'autres vues pour rehausser l'effet de perception en profondeur. Un objet en trois dimensions pourrait être montré dans n'importe quel attitude dans l'espace simplement en tournant un bouton sur la console de la calculatrice. Des objets en trois dimensions peuvent être créés en trouvant des formes préprogrammées – parallèlipeds et coins – dans l'espace avec le stylet. Des bâtiments complexes peuvent être créés d'une série de "blocs" et pour la clarté visuelle, toute ligne cachée par des surfaces peut être éliminée temporairement par un programme de calculatrice.

Faire des croquis, manipuler des courbes dans l'espace sur une console de calculatrice peuvent être des expériences extraordinaires. D'autres programmes permettent le dessin de surfaces arbitraires. Une surface est construite en tracant les bords courbés seulement. De cette ossature le programme du computer fera une surface lisse sur les limites. Si un raffinement de la forme supplémentaire est requis on peut faire fléchir la surface au moyen du stylet. Une fois que le dessin a été fixé pour la production, il n'y a pas de danger de fausse interprétation puisque le programme pourrait transformer la représentation par calculatrice de la surface en commandes pour l'émission automatique d'une forme ou estampille. Le graphisme par computer pourrait éventuellement libérer l'architecte de la dictature de la ligne droite. Mais quand est-ce qu'on pourra en profiter dans notre travail de tous les jours ? En ce moment, des systèmes bilatéraux de graphisme par calculatrice existent, à application limitée, difficles à modifier et très chers à opérer. On peut employer le graphisme par calculatrice maintenant si on est satisfait avec une sortie (output) graphique seulement, sans "entrée" (input), donnant des représentations statiques. L'usage est limité ; par exemple, des expériences en textures ou en dessins de perspectives. Des stylets peu chers fournissent une "sortie" graphique sans qu'on ait besoin de tubes qui coûtent chers. Mais avant que le graphisme par calculatrice fasse partie de nos vies, il existe bien de problèmes à resoudre.

Tout système graphique bilatéral est fait d'une énorme collection d'instructions pour computer, sur un ruban ou disque magnétique prêt à être donner en parcelles (bits) à la calculatrice (selon les sections requises pour une opération donnée). Toutes les commandes minutieuses sont nécessaires à chorégraphier la calculatrice, l'écran, le stylet, les boutons et les autres dispositifs dans une opération fluide et sensible à l'homme, programme qui nécessite des programmateurs experts. Le graphisme par calculatrice pour le dessin seul n'est pas un bon usage d'un dispositif général, telle que la calculatrice. Ce n'est que lorsque des qualités de dessin sont ajoutées aux descriptions graphiques et que les dessins peuvent travailler pour nous comme outils d'analyse que nous pouvons approcher l'emploi potentiel de la calculatrice.

Les programmateurs sont toujours nécessaires pour écrire de nouveaux programmes d'application, tel que l'analyse des tensions et l'allocation de l'espace.

Le graphisme par calculatrice ne surmonte pas le besoin du programmateur mais il surmonte l'obstacle de descriptions et d'explications des problèmes auquel les non-programmateurs doit faire face.

D'autres problèmes existent. Il faudra trouver les moyens de profiter des avantages d'emmagasinage des calculatrices qui sont capables d'emmagasiner des milliers de parcelles d'information. Actuellement, des petits aspects d'un problème en dessin sont choisis pour étude par computer, puisque la mémoire d'un computer est relativement restreinte (10,000 à 200,000 cellules de mémoires). Les nouvelles calculatrices peuvent rassembler des centaines de milliers de parcelles et une seule parcelle peut être choisie dans une fraction de seconde. Et puis, le coût actuel d'une installation graphique bilatérale dépasse par cinquante fois le coût d'un appareil de TV. Pour être pratique, ce coût doit être diminué.

Le coût d'opération est également élevé en dollars par minute. Si une calculatrice pourrait être programmée à faire plusieurs travaux automatiquement, allant d'un problème à l'autre sans nuire à sa sensibilité à l'architecte, le coût élevé serait amorti sur plusieurs usagers. Ce genre d'opération, appellé "le régime du temps partagé" (time-sharing) est disponible en commerce à usage limité. Mais ces systèmes ne peuvent être appliqués à la communication bilatérale graphique à moins que les systèmes subissent des changements majeurs. Toujours expérimentale, le régime du temps partagé coûte cher, mais dans les dix ans à venir, des systèmes graphiques responsifs seront à la portée du plus modeste bureau d'architecte. D'ailleurs, avec les nouvelles méthodes, le coût d'un computer baissera autant que le "temps partagé" ne sera peut-être plus nécessaire. Dans deux ans, un système de graphisme par computer, partagé entre plusieurs bureaux, coûtera probablement moins que les salaires de trois ou quatres architectes.

Le moins qu'on puisse dire est que le dessin, aidé par computer et par graphisme par computer, permettra à l'architecte d'explorer beaucoup plus de variantes en dessin qui ne sont possibles de nos jours. Mais ce qui est plus important c'est que lorsque l'architecte acceptera le computer comme partenaire en dessin, il pourra produire de nouvelles méthodes, des formes radicalement nouvelles et l'urbanisme total.

Page 33
La Sélection par Computer des Produits par Performance
R. P. G. Pennington

Un des problèmes de l'architecte est la sélection des matériaux. Un projet à l'étude actuellement serait disponible pour tous dans un delai de deux ans et pourra nous aider à résoudre cette difficulté. Dans le choix d'un produit, nous avons recours à plusieurs "bibliothèques", allant des classeurs de nos bureaux jusqu'àux systèmes continentaux compliqués exigeant des années de formation avant de pouvoir les comprendre. L'Index de Construction en Bâtiment (Building Construction Index, ou BCI) a été accepté et adopté par l'IRAC, L'Association des Ingénieurs conseils du Canada et l'Association canadienne de la Construction. Dès que ce système d'indices sera développé et aggrandi, nous aurons un bon et simple système, acceptable et utilisable par toute l'industrie de construction avec le moins de "re-éducation" nécessaire. Le système que je vais décrire emploie l'indice des codes du BCI et nous mènera vers une industrie coordonée.

En septembre 1966, une démonstration d'un projet pilote a été donnée à Toronto. Il a été démontré qu'en dix minutes, n'importe qui pouvait apprendre le procédé de récupération d'information par computer en choisissant un produit par sa performance. Ce système est basé sur *la performance* d'un produit, non pas par sa *préscription*. Prenons en exemple le choix d'un absorbant acoustique. Normalement, on fera appelle aux services d'un spécialiste qui suggèrera soit des carreaux, du plâtre ou des panneaux spéciaux, le tout constituant des produits que lui, il connaît. Il devrait dire plutôt: il me faut un produit absorbant une quantité "X" de bruit, ayant un bon dessin et apparence, facile à entretenir et résistant à l'abrasion. Puis, mettant en code les exigences ou données et caractéristiques voulues et les processant par computer, il devrait pouvoir obtenir la solution.

Mais il faut dire tout de suite que malgré les avantages des computers, notre responsabilité n'est pas diminuée envers nos professions, nos associés ou compagnies. Le système est conçu pour réduire le temps que nous et nos employés gaspillons avec les systèmes actuels de recherches d'informations techniques et générales et de nous libérer pour une meilleure utilisation de nos efforts.

20,000 nouveaux produits employés par l'industrie de la construction sont lancés chaque année et 5,000 sont retirés – des quantités impossibles à retenir par le cerveau humain. Et encore, les renseignements relatifs aux produits et à leurs caractéristiques sont dans un état chaotique.

Un problème commun à nous tous est le manque de communication; un autre, le manque de normes uniformes et de normes d'essais uniformes. Un tel système nous aidera à résoudre ces problèmes, mais afin de le réaliser, il faudra une coopération étroite entre les organisations professionelles, commerciales, et gouvernementales.

Quel sera ce système? Basé sur les propriétés et caractéristiques d'un produit, tout ce que vous avez à faire c'est à décider ce que vous attendez d'un produit et jusqu'à quel point. Un diagramme vous aidera énumérant toutes les propriétés et caractéristiques disponibles. Les propriétés sont codées au diagramme des propriétés désirables, et tout ce que vous avez à faire c'est de remplir un petit code composé récupérable, le donner à votre secrétaire et en quelques secondes, grâce au computer, vous aurez votre réponse. Pour que ce système soit efficace, presque tous les produits employés en construction devront être analysés et comparés – tâche gigantesque exigeant 15 mois et 50 personnes. Les renseignements fournis par un tel système sont illimités, nous laissant donc bien plus libre à exercer "l'art" de notre profession, au lieu de passer des heures en recherches redontantes.

Page 39
Usine automatisée
Dudas, Kuypers Rowan Ltée, Dessinateurs

Cette tour d'usine pour la fabrication automatisée en série est capable de produire un appareil de télévision et un projecteur toutes les quinze secondes. Elle se trouve dans la Section Progrès du Pavillon de l'Homme à l'Oeuvre à l'Expo et simulera les opérations de fabrication, y compris les services d'entretien nécessaires. Les matériaux commencent au sommet de la tour de 85 pieds et descendent de station à station où une nouvelle opération est performée toutes les deux ou trois secondes avec une précision à une fraction de seconde près. Toutes les machines de fabrication automatisée sont raccordées par des stations de transfert, de sous-assemblage et d'essai. Chaque produit passe par sept stations de sous-assemblage et six stations d'assemblage définitif. Les machines sont raccordées par 380 pieds de convoyeurs. Une grue de 5 tonnes au sommet peut être employée pour le remplacement des machines ou pour l'entretien général. Toutes les machines dans cette usine sont disponibles au Canada, aux Etats-Unis ou en Europe et sont en usage général dans l'industrie.

Computer Graphics

Timothy E. Johnson

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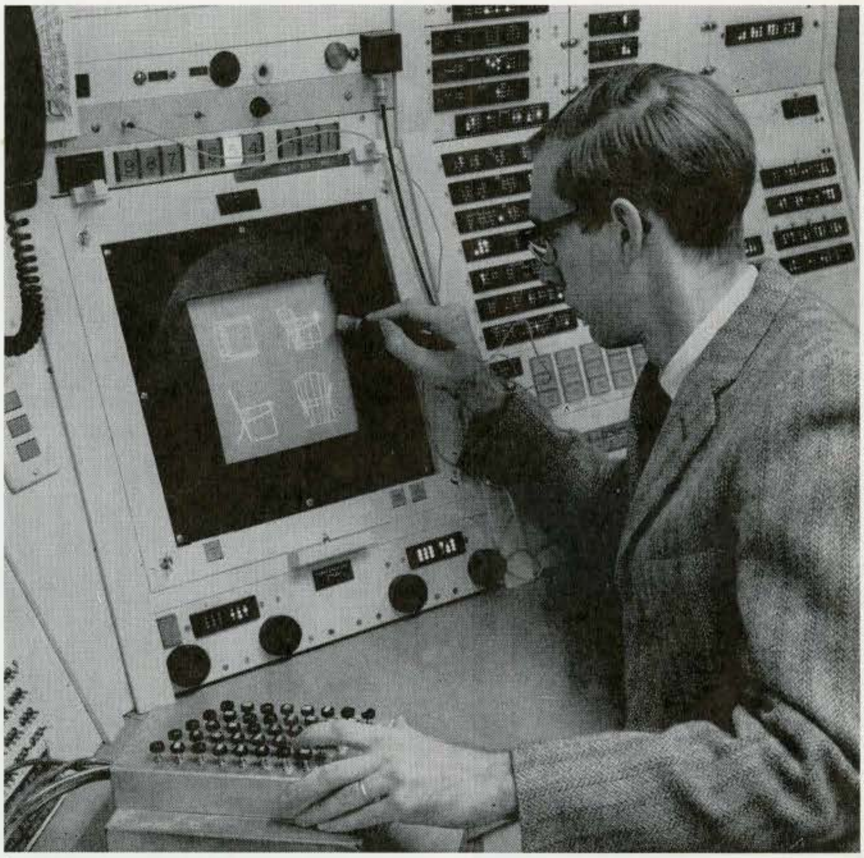
Graphics is the architect's principal tool for molding and conveying ideas. Beginning with symbolic sketches of activity interactions and ending with artful renderings in perspective, graphics predominates the design process. Yet when an architect wishes to take advantage of the modern high speed computer with its prodigious memory capacity and tireless accuracy to obtain solutions or insights to problems containing hundreds of design parameters, he must convert his problem description to the ritualistic language of the computer – the written word. Faced with this inadequacy of the computer the architect usually returns to his drawing board and continues to produce circumscribed designs. Even when the effort is made to learn a computer language, communication with the computer remains obtuse and only small segments of the design process, like stress analysis, are aided by the computer. Computer graphics, however, promises to remove most of the obstacles now encountered by an architect in entering a problem description.

In a computer graphics system, one uses a writing instrument on a drawing surface, but the similarity to pencil and paper ends there. Here, the drawing surface is a modified TV tube which receives its signals from a computer rather than a broadcast station. The drawing instrument is a light sensitive, hand-held device called a light pen. The light pen is used to "pull" a spot of light over the screen (the luminous cursor follows the pen movements so readily that no resistance to movement is sensed). To draw a straight line the cursor is positioned by the pen at the desired starting location of the line and a button is pressed; whereupon the computer program displays a line from the initial point to any subsequent position of the cursor as it is moved by the pen. The effect is that of a luminous rubber band stretched over two pins – one pin moving underneath the light pen and the other fixed on the screen. When the line is laid out, a flick of the pen will stop the motion and signal the program to record the final position of the line in computer memory. As lines are added one can erase unwanted lines merely by pointing at them with the pen and depressing the *Erase* button. Once the drawing is complete the designer can associate design parameters with the graphical elements by pointing at individual lines with the pen and typing in the related design properties – such as material types and costs. Since the drawing geometry and design properties are retained in the computer memory, any computer program designed to operate on this information may be used immediately for analysis and design purposes. Results are usually returned within a minute or two as a graphical plot (or in terms of the graphical input as in a stress analysis where failing members are designated by a symbol). If the results are unsatisfactory, the designer can rapidly modify the graphical description while his train of thought is still fresh and can run the analysis program again. Experimentation is encouraged and the designer progresses toward a better solution. Thus the human calling on his design experience supplies design alternatives

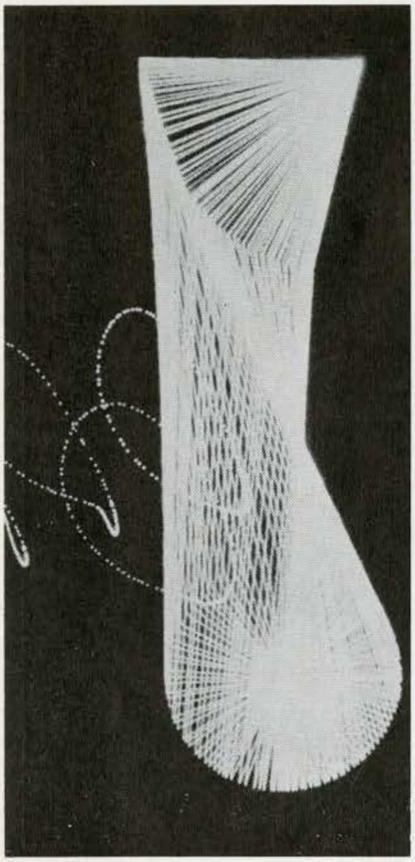


1

1
Sketchpad III *in operation on the MIT Lincoln Laboratory TX-2 computer. Note the position at which the author is pointing with the light-pen is shown as a bright point in each view of the wire-frame chair. The knobs below the scope are programmed to rotate and scale the drawing. (Photo courtesy of MIT Lincoln Laboratory)*
Sketchpad III *en action sur l'ordinatrice TX2 du Laboratoire Lincoln MIT. Remarquez la position avec laquelle l'auteur pointe le crayon électronique qui est présentée comme un point lumineux dans chaque vue de la chaise en fil métallique. Les boutons de règlage au dessous de l'écran sont destinés à pivoter et mettre à l'échelle le dessin.*

2
A time exposure of a moving crank and follower mechanism drawn with Sketchpad. (Photo courtesy of MIT Lincoln Laboratory)
Une pose d'une manivelle mobile et le mécanisme de traçage sont tracés avec le Sketchpad.

3
Computer display of a freehand drawing exemplifying the use of curves. (Photo courtesy of MIT Lincoln Laboratory)
La démonstration par l'ordinatrice d'un dessinamain levée donnant l'explication de l'utilisation des courbes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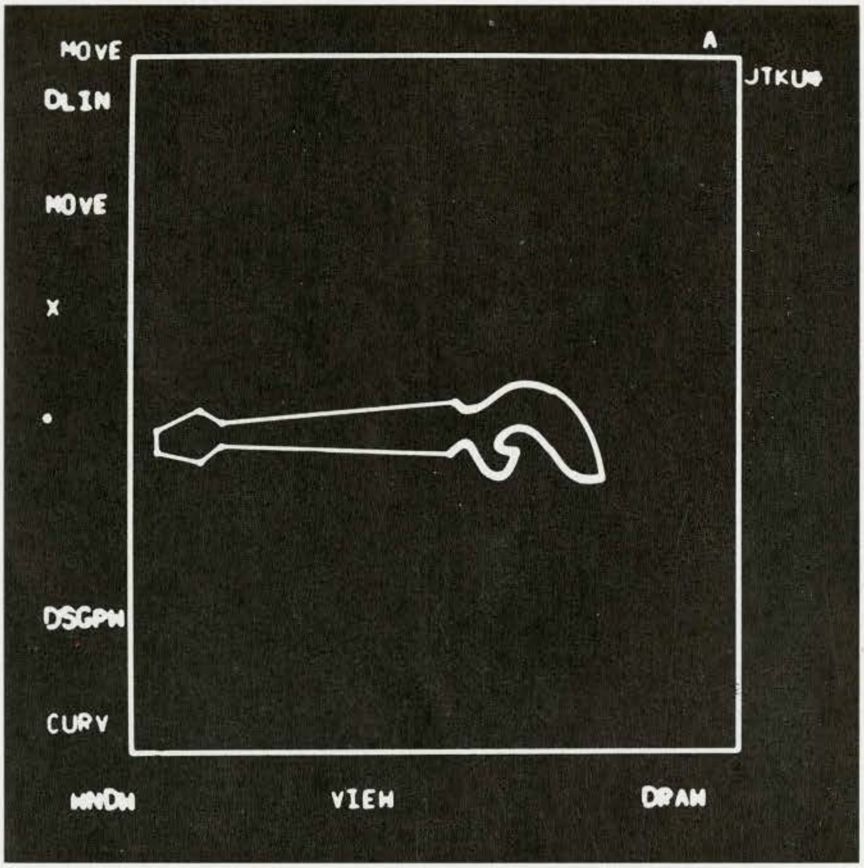


3

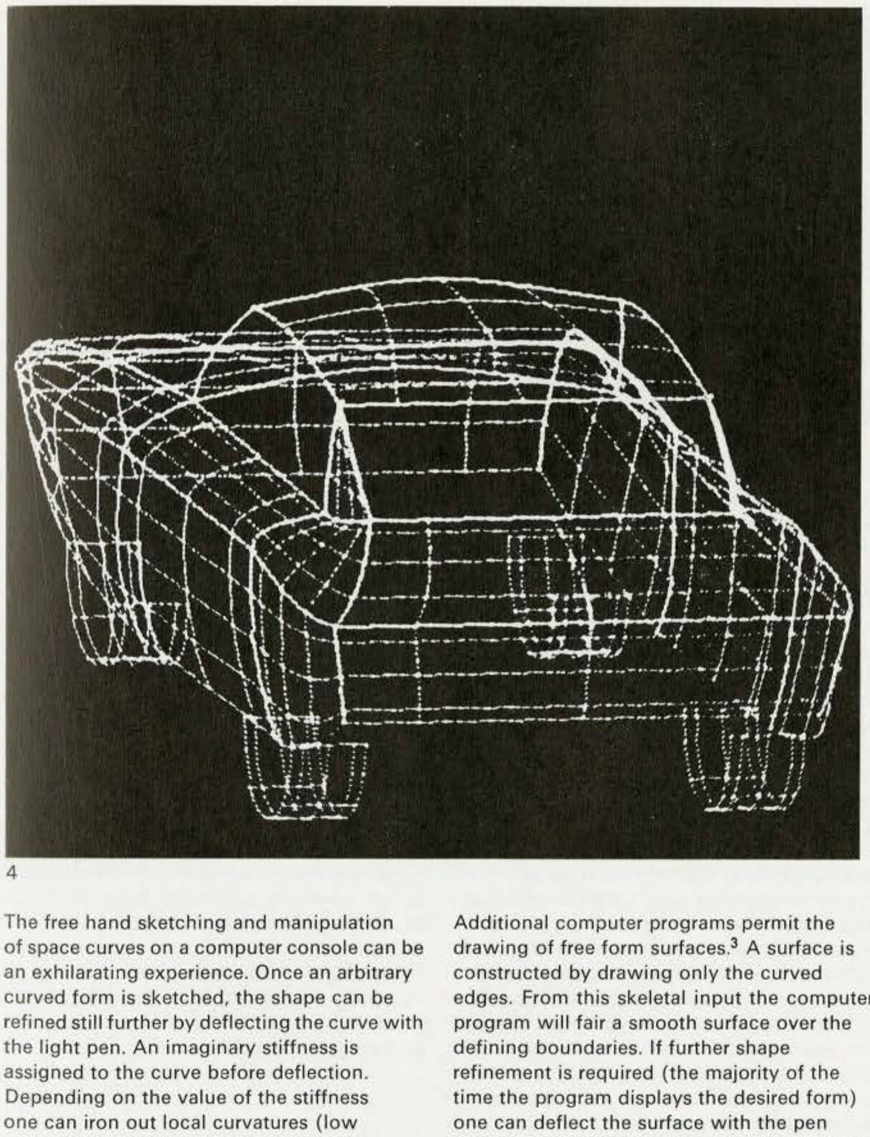
to the computer, while the computer informs him of the implications of his suggestions.

Many sophisticated operations are available in computer graphics that leave the pencil and paper method far behind. One is not required to draw a figure with draftsman-like precision to insure certain lines are parallel or perpendicular. At any point in the architect's design he may apply graphical constraints to his drawing.[1] If one wished to make two lines parallel after the lines had been drawn free hand, one would point the pen at the lines under consideration and press a constraint button. At this moment the lines would snap into parallel position carrying any other connected lines with them – thus one never has to anticipate a form. Initial freehand topologies are drawn and analyzed; once enough insight has been gained, one can begin to constrain the drawing to certain proportions and scales. If the constraints are subsequently found to be undesirable, they can be selectively removed. After all this is how the design process itself works – one would expect computer graphics to lend itself to such an iterative process.

Freehand sketching of three dimensional objects composed of lines and space curves is also possible.[2] Drawing is done directly in three dimensions (rather than drawing, say, a plan and a separate elevation). To enhance depth perception a three dimensional object is displayed from several vantage points simultaneously. When drawing in any one view, the moving, rubberband-like line appears simultaneously in the other views. The depth coordinate at which one draws is selected by momentarily pointing the light pen at the desired level in an opposing view. Objects can be displayed in perspective and, by turning a knob at the computer console the object can be rotated to any attitude in space. Thus, with a computer display one can simulate the perception of an actual building.

Three dimensional objects can also be formed by locating preprogrammed shapes – parallelpipeds and wedges, for example – in space with the light pen.[4] Complex buildings can be constructed from a series of "blocks". For visual clarity any lines that are hidden by obstructing surfaces can be temporarily eliminated by a computer program.

4
An arbitrary surface generated by a computer program. (Photo courtesy of Ford Motor Company)
L'écran de l'ordinatrice enregistre le programme d'une surface arbitraire. (photographie avec la courtoisie de la Cie Ford Motor)



4

The free hand sketching and manipulation of space curves on a computer console can be an exhilarating experience. Once an arbitrary curved form is sketched, the shape can be refined still further by deflecting the curve with the light pen. An imaginary stiffness is assigned to the curve before deflection. Depending on the value of the stiffness one can iron out local curvatures (low stiffness) or introduce a more gentle curvature throughout the entire curve (high stiffness). Any form can be developed in the above manner. Although the curve appears arbitrary, the internal representation of the curve in computer memory is analytic (a series of compact equations), so analysis routines can be readily applied to the geometry.

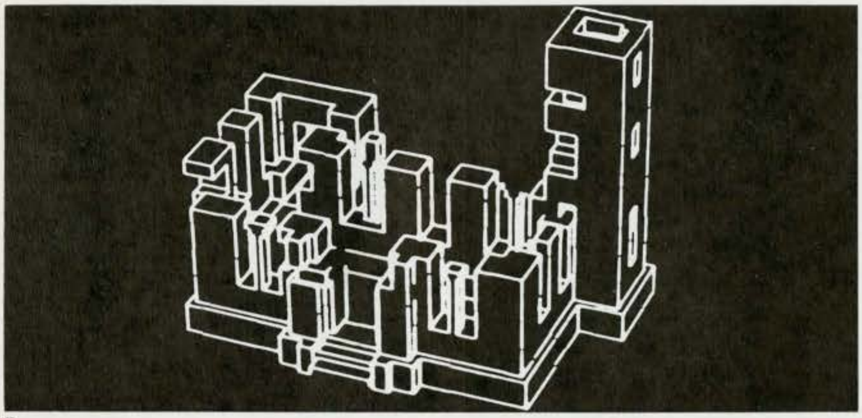
Additional computer programs permit the drawing of free form surfaces.[3] A surface is constructed by drawing only the curved edges. From this skeletal input the computer program will fair a smooth surface over the defining boundaries. If further shape refinement is required (the majority of the time the program displays the desired form) one can deflect the surface with the pen as above. Once the user has frozen the design for production, potentially there is no danger of the shape being misinterpreted, for a program could transform the computer representation of the surface into commands for automatically milling out a form or stamp.

Computer graphics has the potential of freeing the architect from "the tyranny of the straight line". How close are we to using computer graphics and related computer aids to design in our everyday professional life? At the moment only special purpose, bilateral computer graphics systems exist. Written for limited applications, these systems are difficult to modify and expensive to run. If graphical input is not necessary, and if one is satisfied merely with graphical output (composed of static displays), then computer graphics is ready for use today. Many useful applications lie in this limited area (texture experiments and perspective rendering, for example). Inexpensive pen plotters provide graphical output without relying on expensive display tubes. However, bilateral computer graphics is our ultimate concern, for only graphics allows the architect to converse with the computer naturally. Unfortunately many problems must be resolved before computer graphics will be in everyday use.

Any bilateral graphics system is a gargantuan collection of tens of thousands of computer instructions residing on a magnetic tape or disk ready to be run piecemeal on a computer (only those sections required for a particular graphical operation are present in the computer memory). All these meticulous commands are necessary to choregraph the computer, display, light-pen, pushbuttons and other special purpose devices into a fluid, responsive partner to the man. At the moment, if one wishes to expand into an applications area not originally included in the system, an intimate knowledge of the system's inner workings is required to stitch in the new application program. Researchers are attempting to overcome this problem of a highly vulnerable system by developing straightforward computer interfacing languages for use by applications programmers uninitiated in the mysteries of computer graphics. Computer graphics for the sake of drawing alone is not a wise use of such a general purpose device as the computer. Only if design properties are added to the graphical descriptions and the drawings are made to work for us as analysis tools can we expect to approach the potential usefulness of the computer.

Thus, computer programmers will still be needed to write new applications programs, such as stress analysis and space allocation. Computer graphics does not overcome the

5
Perspective of a building "constructed" on a computer display by stacking a series of blocks with the light-pen. Hidden lines and the lines common to tangent blocks have been removed by program. (Photo courtesy of MIT Lincoln Laboratory)
La perspective d'un bâtiment construit par l'empilement d'éléments agglomérés en tenant compte des instructions fournies par le crayon électronique. Les lignes cachées et les lignes communes bordant les éléments agglomérés ont été effacées par le programme.



5

need for the programmer, but it does overcome the barrier of problem description and discourse faced by the non-programmer. (Perhaps computer graphics may be used eventually to program computers directly by permitting the user to draw his program as a flow or procedure diagram.)[5]

Other problems remain. Since real design problems deal with tens of thousands of items cross coupled in hundreds of thousands of ways, means must be found to efficiently take advantage of the emerging high speed computer mass storage devices. Presently only small aspects of the total design problem are singled out for computer scrutiny, since computer memories are relatively small (10,000 to 200,000 memory cells). Hundreds of millions of items can be stored in the new mass memory devices, yet any single item can be located in a fraction of a second. Extensive building code data could be readily accommodated allowing potential split second code checks to be performed by the designer. At the moment many researchers are experimenting with data organization methods to overcome the slower search processes now in use.

The TV-like displays used in bilateral computer graphics installations are far from being like TV in cost – being over fifty times the cost of a TV set. If computer graphics is to be a partner in one's daily design operation, this cost must be driven down.

The cost of running a computer is very high, measured in dollars per minute. When using a graphics console a designer will spend most of his time digesting the computer's responses – leaving the computer idle. During this time the computer could be working on another job. Even when the designer is drawing on the display the computer could spend part of its time running other jobs intermittently without the designer sensing less responsiveness. Thus a computer could be programmed to move automatically from job to job – amortizing the high cost of computer operation over several users. This type of operation is called time-sharing and it has already become available commercially on a limited basis using typewriter consoles only. Unfortunately, the existing commercial time-sharing systems cannot be extended into the realm of bilateral graphical communication unless a major rewrite of the systems is undertaken. Bilateral computer graphics has been included in experimental time-sharing systems, but costs still appear high. Time-sharing is comparatively new and it is still basically experimental. However, within ten years, responsive graphics systems will certainly be within the reach of even the smallest architecture office. Computer fabrication costs are plummeting because of integrated circuit technology – the field of depositing hundreds of transistor circuits on a silicon chip the size of a dime. (Costs for computers may become so low that time-sharing will not be necessary.) Within two years some form of a time-sharing computer graphics system with related analysis and design routines will probably cost less per month than the combined salaries of three or four architects. When one considers that one designer using such a system can do more work in one hour than the designer and a support staff of analysts could do in one day, some of the larger offices could afford this equipment today.

At the very least computer aided design and computer graphics will allow the architect to explore many more design alternatives than are possible today. But what is more important, new design methods, striking new forms, and total city planning will rapidly evolve when the architects can accept the computer as a design partner. □

Bibliography

[1] *Sketchpad: A Man-Machine Graphical Communication System*, Ivan E. Sutherland, 1963, TR 296, M.I.T. Lincoln Laboratory, Lexington, Massachusetts.
[2] *Sketchpad III, Three Dimensional Graphical Communication With a Digital Computer*, Timothy E. Johnson, 1963, TM 173, M.I.T. Electronic System Laboratory, Cambridge, Massachusetts.
[3] *Surfaces*, S. A. Coons, 1965, M.I.T. Mechanical Engineering Department, Cambridge, Massachusetts.
[4] *Machine Perception of Three Dimensional Solids*, Lawrence A. Roberts, 1963, TR 315, M.I.T. Lincoln Laboratory, Lexington, Massachusetts.
[5] *On-Line Graphical Specification of Computer Procedures*, W. R. Sutherland, 1966, TR 405, M.I.T. Lincoln Laboratory, Lexington, Massachusetts.

Computerized Product Selection by Performance

R. P. G. Pennington, MRAIC, ARIBA

Mr Pennington, Past President of the Specification Writers Association of Canada, is President of Construction Computer Systems of Canada, Toronto.

It is becoming increasingly difficult for the architect to fulfill his responsibilities to his client and to society in general. Just one of the problems is the selection of materials; however this can be solved more readily than many of our difficulties and a project is presently underway which could be available for use by everyone in the next two years.

In order that any method can effectively be put into operation it has to be simple enough for anyone to use. If a re-education process is required it is unlikely that the "specifier" will take the trouble to learn.

There are many "Library Systems" presently in existence, from your own office filing system to complicated continental systems which may require years of training to change your mental approach to a specific method of "material classification".

The last thing we require is another library of materials. The Building Construction Index produced by the Specification Writers Association of Canada, or BCI as it is now known, has been accepted and adopted by the Royal Architectural Institute of Canada, Association of Consulting Engineers of Canada, and Canadian Construction Association, and by the time this indexing system is further developed and expanded we shall have a good simple system which is acceptable to and usable by the entire construction industry with an absolute minimum of "Re-education" involved. The USA is presently completing a Construction Indexing system which is almost identical to the BCI.

The system I am about to describe uses the BCI coding index which will lead us into a co-ordinated industry.

In September 1966 a demonstration was given of a pilot project to forty leaders in the Canadian construction industry at the Royal York Hotel in Toronto. At that time it was demonstrated that in a period of ten minutes anyone could learn the process of retrieving information, via a computer, and to select a product by *performance*. This demonstration was well received by architects, engineers, manufacturers, suppliers and government representatives.

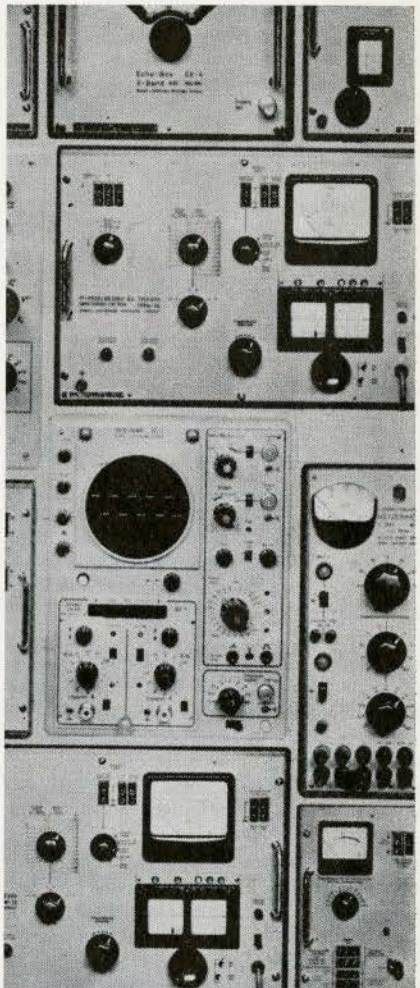
The system is based on the *performance* of a product and not the prescription of it. Let me give you an example. Let us assume that we require an additional acoustic absorbent on the walls of a room, so we call in an acoustic consultant – he scratches his head and says that we could use acoustic tile in one of its many forms, or *acoustic plaster*, or *special acoustic perforated panels* with cotton battens behind. But this consultant is only suggesting the products with which *he* is familiar. What he should be saying is, I require a product which will absorb "X" amount of sound, will have an attractive pattern and appearance, must be easily maintained and must resist abrasion. By coding the *requirements* or *desirable properties and characteristics* and feeding them into a computer he should be able to obtain his answer which could probably be *carpet* because it fulfills all his requirements.

This is one of the advantages that can be obtained by computerization of *Product selection by performance*, I repeat, *product selection by performance.*

Let me say right now that computerization will not reduce in any way the responsibilities we each have to our professions, associations or companies. The system is designed purely to reduce the amount of time we and our staffs presently *waste in a hunt and find* system for technical and general information and to free ourselves to utilize our efforts to better advantage.

To our knowledge there are at least 80 new construction industry products appearing on the market every day *i.e.* 400 per week or *20,000 per year*. Assuming that only 10% of these are relative to any one specialized field of application it is still an almost impossible task of human memory. We have also discovered that approximately 20 products go off the market every day for one reason or another, *i.e.* 5,000 a year, either revised, reformulated, obsolescent by reason of new products, cost, or many other reasons. The *information* on available products and their *properties* is in chaos.

For the purpose of this article I would like to use the subject of acoustic tile. The reason I chose this was because I consider it to be one of the most *comprehensively*



1
Available Properties and Characteristics Chart
Tableau des caractéristiques

2
Office or shared equipment
Equipement de bureau ou partagé

1

catalogued and documented products commonly used, and we should congratulate the acoustics industry for their sincere attempt to assist the specifier and user. It is well tested, well documented and I believe honestly presented before us by the manufacturers.

There are thirteen companies listed in the Acoustical Materials Association brochure on Architectural Acoustical Materials, representing approximately 1,100 different acoustic tiles. These are certainly not all the companies making tile which are available on the market.

How can we select the best tile or tiles for a project? *This is our problem.* How can we honestly say to a client this is the best product and the most economical for your project when we don't know what came out on the market *yesterday*, or *last week*, or *last month*, or *in Canada*, or the *USA* or some other country? How many times has a product been specified which is no longer manufactured? How many times are we advised when a product goes off the market? How does the contractor know what is "equivalent" to a specified product?

For example I set myself a problem of selecting an acoustic tile for a specific project. The first thing we have to do in selecting a material is to find out the *available properties and characteristics* and I was delighted to find out that for acoustic tile there were: 12 NRC Ratings available (Noise Reduction Coefficient), 3 lengths, 9 thicknesses, 3 widths, 8 different types of installation, 4 light reflectivities, 4 flame resistance classes, 4 heat and tire endurance classes, 9 patterns and a still unknown number of sound transmission loss classes.

This results in 72, 900,000 alternative combinations of acoustic tile and excludes the variation of *attenuation, washability, paintability, thermal value and weight.*

My simple problem of selecting an acoustic tile now loomed as a gargantuan task, so I realized that I had to limit my frame of reference. I decided that the tile should have the following properties:

1 An NRC Rating between .65 and .80
2 12" long
3 Either surface applied or mechanically suspended
4 12" wide
5 Either ½" or ¾" thick
6 The best flame resistance
7 The best light reflection
8 Best flame spread
9 Random perforated pattern

Then I decided I was only going to select tile from three companies.

I spent two days looking through all their catalogues and came up with 12 tiles to do the job. I called the manufacturers, interviewed them and asked them each to produce a list of tiles they made to fulfill my requirements. They came up with *22* tiles to do the job. (In my research I had missed 10.) Each was then sent a composite list of all three manufacturers for checking. They found

2

3
Product Properties and Requirements Analysis Form
Formule d'analyse des caractéristiques et exigeances des produits
4
Composite Retrieval Code Form from which secretary can dial in code letters and numbers to computer
Tabulateur composé duquel la secrétaire peut adresser des messages chiffrés à l'ordinatrice

CONSTRUCTION COMPUTER SYSTEMS OF CANADA
PRODUCT PROPERTIES AND REQUIREMENT ANALYSIS

OPERATOR'S NUMBER	C.C.A.	PROBLEM NAMES:	CODE C.C.S.C.	PROJECT TITLE	FILE NO.	JOB NO.
COMPUTER STATION	151.	HEAD B.C.I. DIVISION	5·09	C.C.A DEMONSTRATION.		67·1·24
DATE	24·1·67.	SECTION	·01			
TIME	4·30 p.m.	SUB-SECTION	·T-69			

SBL.	PROPERTY	PROPERTY REQD.	CODE	SBL.	PROPERTY	PROPERTY REQD.	CODE
AB.	ABSORPTION			DT.	DUCTILITY		
	1. AIR						
	2. CHEMICAL			DR.	DURABILITY		
	3. HEAT						
	4. LIGHT			EL.	ELASTICITY		
	5. LIQUID						
	6. SOUND	·65 – ·69	AB/06/6	E.P.	ELECTROLYTIC PROPERTY		
AH.	ADHESION			FX.	FLEXABILITY		
	1. BOND						
				FL.	FLOW		
AT.	ATTENUATION						
				FR.	FRIABILITY		
BU.	BUOYANCY						
				F.T.	FREEZING & THAWING CYCLE		
BR.	BRITTLENESS						
				HD.	HARDNESS		
CY.	CAPACITY						
				HT.	HEATING		
CL.	COLOUR						
	1. FASTNESS			IM.	IMPERMEABILITY		
	2. RANGE						
				IN.	INSTALLATION		
CM.	COMPOSITION				1. MOUNTING	# 7.	IN/01/7.
CD.	CONDUCTION			LT.	LIGHT		
	1. ELECTRICAL						
	2. LIGHT			M.G.	MAGNETIC PROPERTY		
	3. THERMAL						
	4. VIBRATION			MA.	MALLEABILITY		
CG.	COOLING			M.P.	MELTING POINT		
DN.	DENSITY			M.C.	MOISTURE CONTENT		
D.S.	DIMENSIONAL STABILITY			PA.	PATTERN	# 5	PA/05.
	1. EXPANSION						
	2. CONTRACTION			PB.	PERMEABILITY		
DM.	DIMENSION			PL.	PLASTICITY		
	1. CIRCUMFERENCE						
	2. DEPTH			PT.	PROTECTIVE		
	3. DIAMETER						
	4. HEIGHT			RF.	REFLECTIVITY		
	5. LENGTH	12"	DM/05/12		1. HEAT		
	6. RADIUS				2. LIGHT		
	7. THICKNESS				3. SOUND		
	8. VOLUME						
	9. WIDTH	12"	DM/09/12	RI.	RESILIENCE		

3

EXAMPLE "1"

COMPOSITE RETRIEVAL CODE

BASIC		PROPERTIES			CONSTANT	ACTION
	CODE NO.	CODE NO.	CODE NO.	CODE NO.	CODE NO.	CODE NO.
OPERATOR'S NO.	C.C.A.	AB/06//6			MF	
COMPUTER STA.	151	DM/05//12			DR.	
PROBLEM NAME	C.C.S.C.	DM/09//12			PN	
B.C.I. DIV. NO.	5·09	IN/01//7			ST	
SECTION NO.	·01	PA/05			TA	
SUB-SECTION NO.	T-69				TN.	

4

tiles made by their competitors and the list grew to 33. After one final check by everybody the list grew to 37.
37 tiles – all within this restricted frame of reference, now which of the 37 do we use?

During my talks with the technical consultants of these companies who provided a fresh breeze of cooperation in the industry as opposed to continual competition we found out the following points of interest:
1 Three NRC ratings were listed for the same tile in different literature by the same company all which mean the same thing as far as the Acoustical Materials Associations which require .05 tolerance only.
2 NRC's given in different ways .60–.70, .63, .67.
3 There was a violent disagreement on acceptable tolerance in thickness
4 Irregular terminology for patterns
5 Different information in printed literature
6 Attenuation factor or sound transmission loss, but, there are too many definitions and methods of calculation.

This is, I repeat, one of our best documented products by three of our very best and most reputable companies. It is obvious that there is a very real problem.

I believe that a computerized system can help us solve some of the following:
1 We can save time in searching reference files
2 Save time in filing, opening mail, sorting
3 Save time in re-filing
4 We can get more accurate information
5 Get more comprehensive information
6 We can more closely relate a product to its function
7 Save space occupied by filing systems
8 Release men and women for more important functions
9 Save on the amount of wasted literature
10 Give all companies an equal chance to be specified if they meet all the required properties and characteristics
11 Get a better use of materials. Many materials could be used for other functions
12 Release the sales representatives from the role of a human memory system and let him concentrate on providing technical advice
13 Save time on phone calls to manufacturers and suppliers
14 Immediately make new products

available to the entire construction market
15 Immediately delete products which become obsolete
16 Cut down on literature printing costs

Many other advantages will, I believe, become evident during the development and sophistication of the system.

The problem of our manufacturers and suppliers and the information they prepare for us is not solely upon their shoulders; we must all share jointly in the error of our ways. Our problem is in Communication. It is amazing that the technology of construction has advanced so far with us all sitting in our tight little cubicles.

The other problem we all are faced with is lack of uniform standards in Canada and the lack of standard testing procedures. We need a central clearing house for uniformity and if we are unable to do it with recognized legislation, then we have to create a new set of rules and legislation on which most of us would agree.

In order to implement this computer program there must be the absolute cooperation of everyone, and every organization, be it government, professional or commercial. We can place Canada and the Canadian construction industry in an enviable world position, for as far as we know there is *no* other system in the world like this one.

This system is based on the *properties and characteristics of a product.* Virtually all you have to do is decide *what you want a product to do* and to what extent. To assist, a chart is provided which lists all the *available* properties and characteristics, for unfortunately few specifiers know what properties are available on the market. The *available properties* are coded to the *desirable properties* chart and all you have to do then is fill out a small composite retrieval code, give it to your secretary and she should have the answer to your question in a few seconds.

We must remember that in order that the system be fully effective, practically every construction product will have to be analyzed and fairly equated one to the other – a gigantic task, and even with the assistance of manufacturers it is estimated that 50 people will be required for 15 months, and then a considerable permanent staff to keep the system up to date with new products and deleted products.

This system can be made available to anyone who wishes to use it; it will be just as economically feasible for the one or two man office to use as it will be for a very large office. It will be economical for the manufacturers to file their products in the system and can save them a great deal of money – and give them better coverage.

The sequence used in selecting a product will be:

Stage 1
Refer to the "Available Properties and Characteristics" chart to find out what is available on the market for a particular product. One of these charts will be produced for every product type with explanatory notes on terminology. *Chart No. 1*

Stage 2
Fill out the "Product Properties and Requirements Analysis" form referring back to the "Available Properties and Characteristics" chart for the right code numbers. This form then provides a permanent record in the office for product performance analysis. *Chart No. 2*

Stage 3
Transfer the code numbers from the Analysis form onto a "composite retrieval Code" form. This form can then be given to the secretary who can dial in the code letters and numbers, directly to the computer. *Chart No. 3*

Stage 4
The teleprinter will print out for you as a permanent record the analysis of your problem. *Chart No. 4*
The answers provided by the teleprinter will be to the questions you ask, *e.g.* dial
MF — Manufacturer's name, address and telephone number
AV — Availability of the product, whether it is standard or custom
PN — Product Name
TA — Testing Authorities
TN — Test Number
DR — Information on your Local Dealer

5
Hard copy that comes out of computer
Résultats sortant de l'ordinatrice

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JOHNS MANSVILLE
565 LAKESHORE RD. E.
PORT CREDIT ONT.
PHONE 278-7211

CALL MANUFACTURER
STANDARD ITEM

FIREDIKE        CCSC NO. 1.15
                A.S.T.M. C423-60T
                A.M.A.   A.8308

FIBREGLAS CANADA
48 ST. CLAIR AV. W.
TORONTO ONT.
PHONE 924-9511

CALL MANUFACTURER
STANDARD ITEM

FIBERGLAS       CCSC NO. 2.03
                A.S.T.M. C423-60T
                A.M.A.   A.8003

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                A.M.A.   A.9502
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By dialing other code numbers or initials you can automatically have a request sent to the manufacturer asking for: technical advice, samples, etc. You will also be able to obtain a list of special consultants in your area such as arborists, testing companies, landscape architects, etc, without having to rely on the "Yellow Pages".

By dialing DD plus a code number, you will be able to receive design data, design principles and formulae for any subject you require, without having to search technical reference books. Of course by dialing SS you will be able to have a standard specification format typed out for you just ready for filling in the blank spaces for your specific requirements. *Chart No. 5*
The information that such a system can

6
Part of standard specification format that also comes out of the system
Partie de la formule du devis descriptif standard sortant également de l'ordinatrice
7
Reverse system to find all the properties of an individual product
Système opposé pour découvrir toutes les caractéristiques des produits individuels

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*STANDARD SPECIFICATION FORMAT*

1.   GENERAL PARAGRAPHS

1.1  EXAMINATION
     SPECIFY SPECIAL EXAMINATION REQUIRED ADDITIONAL TO SITE
     EXAMINATION

1.2  SHOP DRAWINGS
     SPECIFY REQUIREMENTS IN ADDITION TO THOSE STATED IN RAIC
     DOCUMENT NO. 12

1.3  INSPECTION/TESTING
     SPECIFY STANDARD REFERENCES AND TESTING PROCEDURES REQUIRED

1.4  SAMPLES
     SPECIFY SIZE AND QUANTITY OF SAMPLE REQUIRED AND SUBMISSION
     DESTINATION

1.5  DELIVERY/STORAGE
     SPECIFY SPECIAL REQUIREMENTS FOR DELIVERY/STORAGE

1.6  SPECIAL PROTECTION
     SPECIFY PROTECTION REQUIRED IN ADDITION TO NORMAL PROTECTION

1.7  SPECIAL CLEANING
     SPECIFY CLEANING REQUIRED IN ADDITION TO NORMAL CLEANING

1.8  CASH ALLOWANCES
     SPECIFY ALLOWANCE AND WORK COVERED BY SAME; CONSIDER GROUPING
     IN DIVISION 1

1.9  PRICES—SEPARATE/UNIT ALTERNATE
     SPECIFY PRECISELY THE WORK COVERED BY REQUIRED PRICE; USE WITH
     DISCRETION TO MINIMIZE BIDDERS WORK DURING TENDERING PERIOD

1.10 MAINTENANCE
     SPECIFY PRECISELY THE DATA REQUIRED WHICH WILL OUTLINE
     MAINTENANCE ON INSTALLED ITEMS

1.11 WARRANTY/GUARANTEE/BOND
     SPECIFY FOR PERIODS IN EXCESS OF 1 YEAR WHICH IS COVERED IN
     RAIC DOCUMENT NO. 12; STATE FULL REQUIREMENTS
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6

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INPUT CODE? MNF

PRODUCT NUMBER? 2

PRODUCT NUMBER? 2.01
AB6  F
DK5  12
DM9  12
DM7  0.625
IN1  1
PN   5
RF2  A
RS9  A
RS10 1
PN   4

INPUT CODE? PRP

PROPERTIES CURRENTLY APPLICABLE

AB6  F-J
AT   25-50
DM5  12"
DM7  0.5,0.625,0.75
DM9  12"
IN1  1,2,7,X
PN   4,5,9
RF2  A
RS9  A
RS10 1
RS11 1,2,3
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provide is almost limitless and I sincerely believe will increase our efficiency to the extent that we will have more time to utilize our training and experience in the "art" of our profession instead of spending hours in repetitive research and a fatuous attempt to keep up to date with new products.

It should be remembered that a computerized system can be added to or deleted from more readily than probably any other medium of communication. ☐

Editors' Note:
Building product information is now available in two printed forms, and two new methods utilizing computerized information retrieval, are now being developed.

The RAIC Publications Board is now producing its third issue of ADA, the Architectural Directory Annual, containing the Building Construction Index (BCI) with names and addresses of manufacturers and suppliers of the products listed; and Sweet's Canadian Catalogue contains product literature of those manufacturers who purchase catalogue space in it.

First in the computer field, with demonstrations to potential clients last year, was Construction Computer System of Canada, 119 Davenport Road, Toronto, of which Peter Pennington is president. This firm uses the BCI. Early this May, Construction Computer Company of 6 Thorncliffe Square, Overlea Blvd, Toronto, began demonstrating another computer service which uses the European SfB indexing system. The president is Ronald Marsh of the specification writing firm of Marsh & Associates.

The American Institute of Architects and the US Construction Specifications Institute will shortly be bringing out their new indexing system (expected to be practically identical to the Canadian BCI) to replace the old AIA Standard Filing System. Which of all these facilities will turn out to be the most efficient, practical and economical for the user and the best selling tool for the manufacturer is a most interesting question. To it may be added the supplementary questions of the how, what, when and where of the building information centers the Federal Department of Industry is promoting.

Hit the Gold

Robert C. Smith

Mr Smith is the President of Robert C. Smith & Associates Management Ltd, Toronto, a firm which has specialized in time planning and management.

No one disagrees with the need for timely information for project management, but there is still considerable controversy on the methods used to obtain and make use of all that is available. The development of techniques such as critical-path and P.E.R.T. has been heralded as a major step in the collection of information and the ubiquitous "arrow diagram" has managed to attain a degree of respectability in the construction industry. Why not the same for architects? The problems of time planning and time management are just as applicable to design as to any other profession.

There is a general belief that to-day's accelerated business climate nurtures these problems but in fact they have always existed. This quotation from Virginibus Pverisque by Robert Louis Stevenson is as timely now as it was when written in 1887. "To reach the truth by yea and nay communications implies a questioner with a share of inspiration such as is often found in mutual love. Yea and nay mean nothing; the meaning must have been related in the question. Many words are often necessary to convey a very simple statement; for in this sort of exercise we never hit the gold; the most we can hope is by many arrows more or less far off on different sides, to indicate, in the course of time, for what target we are aiming, and after an hour's talk, back and forward, to convey the purport of a single principle or a single thought."

The very essence of critical-path planning is to set out, in pure logic, all of the actions necessary to reach our target dates and to ensure, by the production of "arrow diagrams," a complete understanding of the sequence and time parameters. Our inter-communication problems are defined and solved, the details stand out crystal clear. In a later writing Stevenson says, "Speech which goes from one to another between two natures, and, what is worse, between two experiences, is doubly relative. The speaker buries his meaning; it is for the hearer to dig it up again; and all speech, written or spoken, is in a dead language until it finds a willing and prepared hearer. Such, moreover, is the complexity of life, that when we condescend on details in our advice, we may be sure we condescend on error; and the best of education is to throw out some magnanimous hints." In our experience of applying critical-path techniques to project management, by far the greatest benefit to accrue is that of being the prepared hearer.

Let us consider the implementation of an information system to a project. We must recognize, initially, that no system really works well unless all agencies involved play an active role. The owners, the consultants, or any other agencies external to the architects' office, must supply input information which may constrain the development of the design, or later, the working drawings. As the design progresses output information, such as a simulation of a construction schedule, must flow back to owners and consultants with the attendant possibility of a change in design determinants. Some architects believe that the working drawing stage is the only one where critical-path can be applied and probably believe so only because they are considering it as a scheduling technique.

Many projects are started on an information system as early as the preparation of facility sheets, space programming and study models: there is, however, a slight change in the approach, which is best explained by definition of the diagrams. There are two basic types: 1. The decision diagram; 2. The operational diagram. The decision diagram consists of all the activities which could occur during any phase of the design and we are only concerned with logical sequence. This diagram is defined as one where decisions are required to make work flow or because of the work flow and includes the organizational responsibility for the decisions. It has a further role in acting as a check-list of all activities that may be required.

The operational diagram depicts the method, the time, and manpower or other resources, which are required to complete the project by the target date.

The approach is one of complete analysis of the project and it is obvious that as the diagrams are produced, evaluated, and activities finally scheduled, that the direct and indirect costs of the design period may be forecast as well. Some activities in the preliminary design phase may be very difficult to assess, from a time base, because of their creative nature, but we will, at least, know how much time is available. It must also be remembered that very few diagrams remain static, their real value lies in being dynamic, constantly being fed back information, probing the future and evaluating alternative courses of action. The feed-back comes from a monitoring system on a regular frequency determined by the complexity or degree of control desired. Some systems use computer print-outs for monitoring but it should be emphasized that they are not necessary but are excellent tools if costs and volume warrant their use. In a small office a review of the diagrams with notations as to new restraints and marking of progress serves admirably as a status report, larger offices may wish additional documentation in the form of production time sheets, job lists, etc.

Key points to setting up an information system are:

1 It is the responsibility of senior partners to judge the practical feasibility of the application with a full understanding of their information needs.

2 It is not an automatic system but a device for accumulating and integrating judgments and presenting them for further judgment.

3 It is not rigidly standardized but does have a consistent pattern.

4 It is not a substitute for management.

Properly set up, to any degree or sophistication, and information system exists for only two reasons, (1) to make a decision or (2) to cause something to happen when a decision has been made.

"... hit the gold; the most that we can hope is by many arrows ... to indicate, in the course of time, for what target we are aiming ...." □

Automated Factory

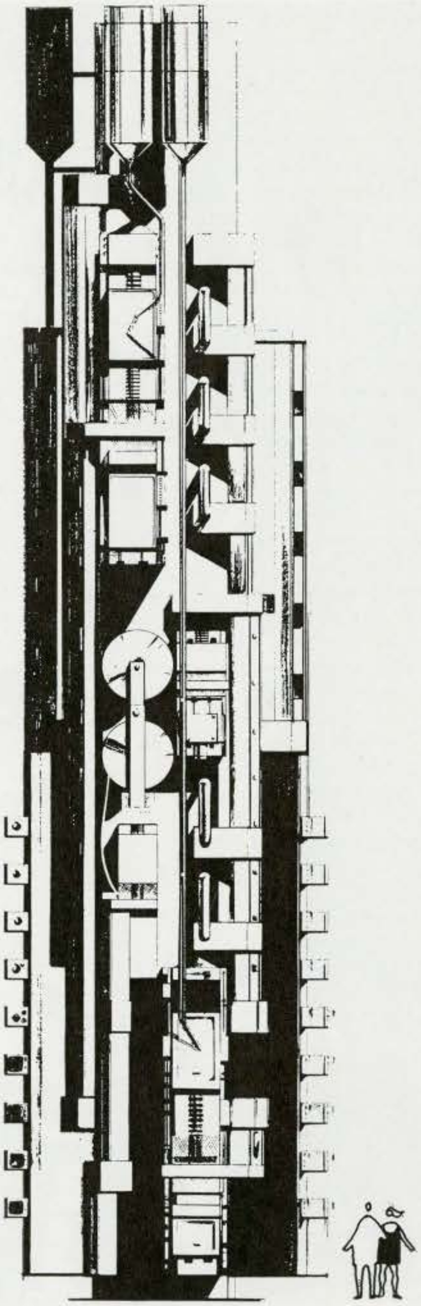
Dudas Kuypers Rowan Ltd, Designers

This mass-production automated factory tower is capable of turning out a television set and movie projector every 15 seconds without any workers involved.

Located in the Progress Section of the "Man the Producer" Pavilion at Expo this exhibit will simulate production operations and will require daily maintenance as if it were in actual production. Materials start at the top of the 85 ft tower and move down station to station where a new operation is performed every few seconds. Plastic cases are molded, circuits are printed, metal shapes are formed, holes are drilled, bits and pieces are cast, finished and readied for final assembly with split-second precision.

All automation production machines such as the die-casting machine, plastic injection molding machines, are connected through transfer stations, sub-assembly and test stations. Each product goes through seven sub-assembly stations and six final assembly stations. Machines are connected by 380 feet of conveyors. A 5-ton overhead hoist may be used for replacing a machine in the vertical factory or for general maintenance.

All machines in the factory are actually on the market in Canada, US or Europe and are in general use in industry. □



Elevation

2
Perspective

3, 4, 5
Actual Photographs
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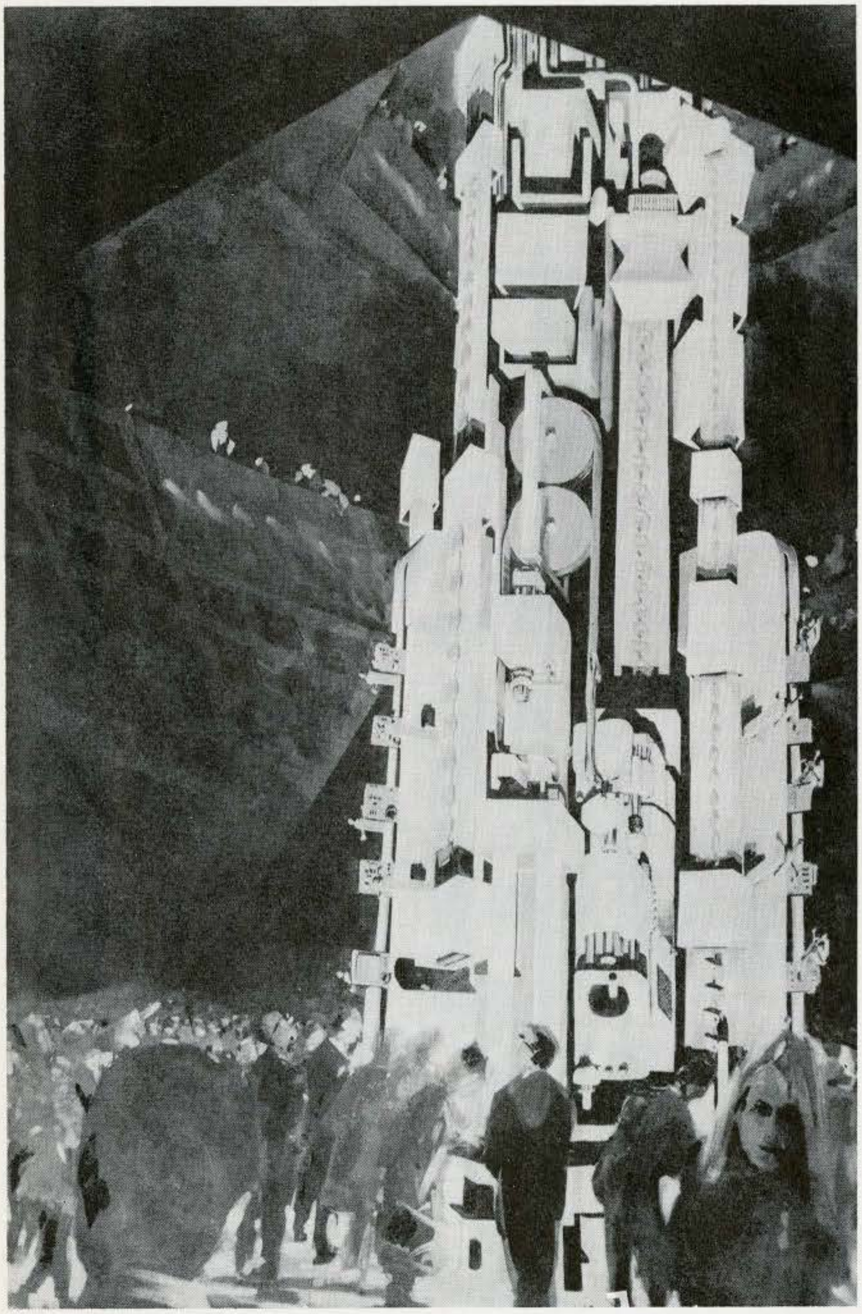

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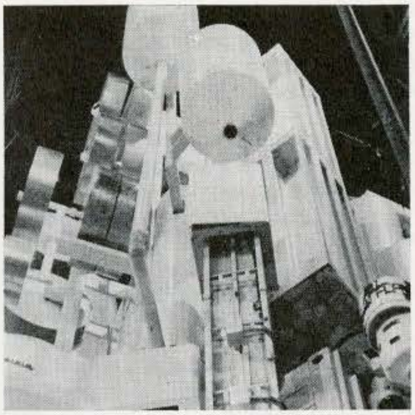

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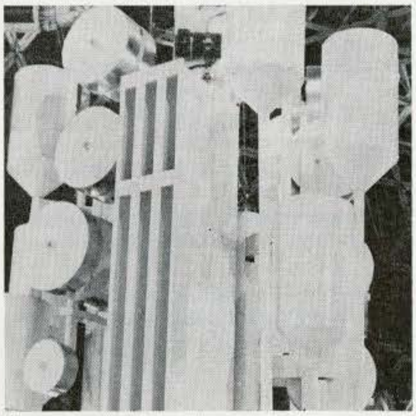

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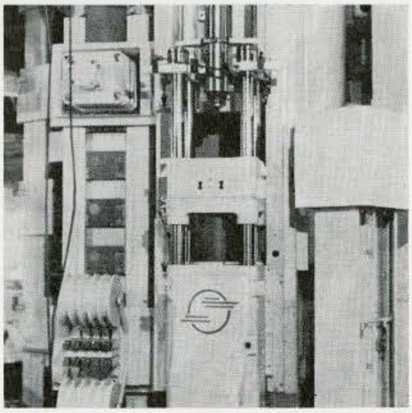

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CANADIAN
BUILDING DIGEST
DIVISION OF BUILDING RESEARCH • NATIONAL RESEARCH COUNCIL CANADA

COATINGS FOR INTERIOR WALLS

by H. E. Ashton

UDC 667.6

One of the most common questions raised with regard to painting or repainting interior walls and ceilings of buildings concerns the type of finish to use. The problem is one that applies equally well to the architect drawing up specifications for a new building or the "do-it-yourselfer" contemplating the next long weekend at home. There is no one perfect coating, as is evidenced by the multiplicity of types on the market.

CBD 78 discussed the general composition and properties of the main types of coatings, and CBD 79 described some specific classes. This Digest will outline the different interior grade coatings and the properties that influence their selection for a particular job.

General Factors

Weather resistance is not a factor with interior coatings, and materials that would fail rapidly on exterior exposure can give quite satisfactory service indoors. In many interior locations appearance is more important than protection.

The most visually-evident appearance property is gloss. The higher the gloss, the more the surface reflects like a mirror and the more distinct the image. Four levels of gloss are usually distinguished in coatings: flat, eggshell, semi-gloss and gloss. A flat or matt finish has no gloss and little sheen, i.e., when viewed along the surface it is not shiny. An eggshell or velvet finish has little gloss, but a fair amount of sheen may be present. A semi-gloss or satin has considerably more gloss, especially when first applied. A gloss finish naturally has the highest amount of gloss. Within these general categories the degree of gloss can vary with different materials, since each manufacturer has his own opinion as to which level is best for a particular product.

It is possible to produce different levels of gloss with various binders, although the range has been somewhat restricted in water-dispersed coatings. Recently semi-gloss latex paints have been introduced; but the opinion has been expressed that it will be another three years before satisfactory gloss latex finishes will be produced. The water-based coatings described as satins have usually had a lower gloss than solvent-based satins.

Low gloss finishes generally give a more pleasing appearance on large surfaces, although this may be a matter of personal preference or custom. As is shown in CBD 76, low gloss is achieved by increasing the proportion of pigment to binder. The rougher surface, however, is more easily soiled and is more difficult to clean than a smooth, high-gloss finish. If dirt penetrates into the pores of a flat, it is frequently only removable by abrading the film; and when adjacent high spots are also worn away, the gloss tends to increase and such "polished" areas are objectionably visible. Consequently, where frequent cleaning is anticipated, low gloss finishes should not be used. High gloss, on the other hand, accentuates imperfections in the substrate so that more careful surface preparation is required. Semi-gloss is often accepted as a compromise between the necessary protection and the desired appearance.

Another visual property of importance is hiding power or covering capacity. This is the ability of a given amount of a liquid coating to conceal a certain area. Because of its higher pigment content, it is easier to obtain high hiding in a flat than in a gloss finish, and is one reason why undercoats are used beneath gloss finishes. As was discussed in CBD 78, latex paints have two disadvantages in achieving hiding power equal to that of corresponding solvent-based coatings. In addition, because of their easy brushing characteristics, they can readily be spread too far. As a result, more coats of latex are often required where a change in colour is desired. The homeowner may be willing to accept this in return for ease of application and absence of solvent, but it is a factor to be considered where labour costs are involved.

Types of Interior Coatings

Water Based. At present the only water paints of importance are the latex paints. They are tremendously popular for various reasons: they are non-flammable during application and allow easy clean-up, since water is the thinner; are easy to brush on; dry rapidly; and have little "paint" odour. Missed areas (holidays) can readily be touched up without showing. Although they are water-based, dried latex films have good water resistance unless highly modified. Because of their high polymer binder, they have better washability than air drying solvent-based coatings of the same degree of gloss.

Latex paints are available as flat, satin (really a velvet) and, just recently, as semi-gloss finishes. Latex primer-sealers are also produced. These are not required for interior latex finishes, which are self-priming, but they are used under solvent-based coatings when their quick recoatability is important. They have been used with success on fresh plaster, except where an abnormal amount of water was present. Latex primers are excellent for paper-faced wallboards also, because they do not raise the fibres. Latex paints should not, however, be applied directly over calcimine, glue size, or surfaces that have been treated with zinc sulphate.

With the advent of latex, other types of water paints have decreased markedly in use. Listed in decreasing order of durability and cost, they are resin-emulsion paints, casein paints, and calcimine. All are quite inferior in washability to both latex and solvent-based coatings.

Oil Paints. The only oil paints still used on interior walls are the flat oil paints. They are quite flat and hide well, but these properties are often obtained inexpensively through high pigmentation, which leads to poor washability. The films are relatively porous, so that they do not act as undercoats for finishes with a higher gloss. Deep-coloured flat oil paints generally require preliminary application of a sealer. White and light tints can be used over most wall surfaces. In fact, they were first developed for painting directly over calcimine and wall paper, although this is no longer recommended because it may lead to difficulties at a later date. Flat oil paints have good application properties.

Oleoresinous. These binders are generally no longer used in low-gloss finishes, but find some application in semi-gloss and gloss enamels, undercoats, and interior varnishes. They are often supplied under the so-called "painters line" of materials. Oleoresinous finishes are fairly easy to apply. They dry rapidly to a hard finish, provided the proportion of oil is not too high. Oleoresinous enamels have better alkali resistance than gloss paints or alkyd enamels, but they have poorer colour retention than the latter.

Alkyd. Alkyds are the most widely used resin in coatings. They are, therefore, available in all the different interior types: flat, velvet, semi-gloss, gloss, undercoat, and clear varnish. Finish coats of all degrees of gloss should have good hiding power. Low-gloss alkyd enamels can be formulated to withstand washing almost as well as latex paints and to be self-sealing. Hence, they can be used over almost all surfaces except fresh plaster. Most gloss and semi-gloss enamels require primer-sealers or undercoats before application to plaster or wood. There are a few medium-gloss finishes on the market that act as their own sealer, but because they cost more than normal sealers it is often more economical to use the two separate materials.

The colour retention of alkyds is very good. They should not be used where they will be exposed to fairly strong alkali, and they are generally not so easy to apply as latex finishes. With regard to "paint smell," alkyd finishes can be prepared with ordinary mineral spirits, low-odour thinners or odourless thinners. Even with the latter, however, there will probably be some odour from the oxidation of the binder. This will be most noticeable in confined quarters.

Epoxies. Epoxy-esters have little to recommend them over other air-drying coatings, but cold-cured epoxies are quite different They can be formulated into finishes having excellent chemical resistance for use in industrial plants. They can also produce coatings with high impact and wear resistance. In general, epoxies have excellent adhesive properties.

In most epoxy finishes the resin is dissolved in solvent so that the resultant film thickness is about the same as that obtained from other coatings. Where it is desired to obtain a thick film from only one or two coats, high-build epoxies can be used. Neither type, however, can be said to possess good application properties. The high-build epoxies, in particular, require trained applicators or serious difficulties may be encountered.

Urethanes. This class of resin is available in five types, as is outlined in CBC 79. In urethanes, the oil-modified variety retains to a considerable degree the beneficial properties of the reactive types. Their chief attributes are rapid dry and film toughness. As with the two component epoxies, reactive urethanes with outstanding wear and impact resistance are available. They are somewhat easier to apply than the epoxies. Generally, they contain lacquer-type solvents that may lift previous coatings and have a strong odour. The chief difficulty with urethanes has been in recoating. Even fresh coats require light sanding if more than 24 hours' drying time is allowed between coats, and old finishes need to be sanded thoroughly for subsequent coats to adhere. Except with the oil-modified and baking urethanes, reactivity with water vapour in the air leads to loss of stability once the container has been opened.

Preparatory Coats. There are two different classes of finishes that are used under interior topcoats: primer-sealers and undercoats. They are sometimes known by other names or combinations of names such as surfacer, primer-surfacer, etc. Primer-sealers are used on unpainted walls and wallboard and on porous painted walls before the application of gloss and semi-gloss enamels or deep-tone flat oil paints. If the material is not pigmented it is usually referred to simply as a sealer. The chief disadvantage of solvent type primer-sealers is that they raise the nap on paper-coated wallboards, thus requiring sanding followed by a second coat.

Undercoats or surfacers are used on woodwork and on walls when minor surface irregularities have to be hidden. They are highly pigmented so that they will provide a smooth regular surface that can be easily sanded, if desired. Some manufacturers recommend a first coat of sealer or primer-sealer on new woodwork, but the current trend is to use only the undercoat. Both sealers and undercoats are made from oleoresinous and alkyd vehicles, with the latter usually regarded as the premium grade.

Epoxy, urethane and other specialized coatings are either self-priming or require a specific undercoat. The term "tie-coat" has come to mean a particular intermediate coat that allows use of a normal top-coat over a special primer or a unique topcoat over a normal type primer.

Recommended Uses

If one kind of interior finish were superior in all properties, each manufacturer would have just one product. As there are so many, it is evident that the type of material to be used depends chiefly upon the circumstances of use. Each protective coating is a compromise, and it should be realized that coatings chemists do not always agree on the best solution to every problem. The recommendations given in this Digest, therefore, are those that the author believes will be most generally applicable.

Dwellings. Flat finishes are generally used in living rooms and bedrooms. For new work or in repainting where there is only a minor change in colour, latex paint is preferred. Latex is also suggested for children's bedrooms because of good washability. If there is a marked colour change or the surface has been coated with a water sensitive material, a low-gloss alkyd enamel of the self-sealing variety is recommended. It has been reported that in a few cases, for reasons unknown, successive coats of either latex or alkyd failed to provide a uniform finish. The defect has been overcome by applying one coat of the opposite type.

In halls a velvet or, preferably, a semi-gloss finish is appropriate. In large apartments, use of wear resistant epoxy or urethane coatings should be considered at least for the dado.

Kitchens and bathrooms are usually finished in semi-gloss or gloss because of the greater need for washability. Some people, however, prefer to repaint with an easily applied coating rather than wash kitchen walls frequently. The amount of cooking, type of stove and venting, if any, all have some bearing on the final choice. For a gloss or semi-gloss finish an alkyd is preferred unless extremely good washability is required in areas of heavy use. In the latter case, an oleoresinous enamel or, for extreme alkali resistance, a chlorinated rubber or urethane enamel can be used.

Wood trim is usually finished with gloss or semi-gloss enamel, although this may be more a custom than a necessity. For a clear finish on wood panelling, alkyds and moisture-cure urethanes have the palest colour. It should be noted that it is almost impossible to put a clear finish on wood and still retain its original appearance. Any finish that wets the surface, including water, makes wood look darker in colour than it does when in contact with air. Shellac is not usually recommended, even as an initial coat on wood, because of poor water resistance and poor adhesion of subsequent coatings.

Urethanes can be highly recommended on floors because they offer the best combination of hardness and flexibility required for this service.

Institutional and Commercial Buildings. Some areas of large buildings such as the ceilings do not receive any more wear than similar locations in dwellings. The same types of coatings can therefore be used satisfactorily. The halls and corridors of hospitals, schools, large apartments and office buildings, on the other hand, are subjected to intensive use. Only the more resistant coatings are practical in these situations. Not only is the cost of labour increased by frequent repainting but unnecessary interference with normal use of the building should be avoided; and heavy-duty materials that can easily be applied before occupancy may not be suitable for recoat work because of odours or application techniques that are objectionable.

Walls of individual or small offices may be coated with an eggshell finish. Larger offices, depending upon the type of use, may require at least a satin. For recoat work latex paints are preferred because of fast dry and inoffensive odour. Any flat finish is suitable on ceilings. The question of painting acoustical tile is frequently raised. Conventional flat finishes, regardless of type, should not affect their function to any extent.

Wear-resistant epoxies and urethanes are recommended for corridor walls. In hospitals and schools where there will probably be considerable impact and abrasion use of high-build coatings is advisable. These materials are particularly suitable for application to concrete block walls because they give a smooth tile-like coating that can be repaired if damaged. A block filler should first be applied to fill large pores and seams. High-build epoxies, both with and without laminate reinforcing, have been used on walls of showers.

Most floors of large buildings do not require painting because of the use of floor coverings or terrazzo. In high-rise buildings, where the weight of the latter limits its use on upper floors, seamless terrazzo based on epoxy or urethane binders and plastic chips have been employed. Basement floors are usually concrete and should be treated to stop dusting. Magnesium fluosilicate can be recommended as an unpigmented treatment that can subsequently be painted. Water glass (sodium silicate solution) may lead to difficulties, if applied to concrete before painting. Provided there is no hydrostatic pressure, two-component or moisture-cure urethanes should give good service in areas of heavy traffic.

Conclusion

This Digest has considered the different finishes applicable to the interiors of buildings. An attempt has been made to relate the properties of the materials to their field of use.

Little mention has been made of the care necessary for preparing the surface or in applying the coating. It is well recognized in the paint industry that an inferior material applied to a properly prepared surface will outperform a superior material applied to a poor surface. In addition, if a surface is prepared well but the coating is not applied properly, an unsatisfactory job will probably result. These statements are especially true of the newer, high performance coatings. After selecting the best material for a given job, it is necessary that instructions are followed thoroughly.

This is one of a series of publications being produced by the Division of Building Research of the National Research Council. It may be reproduced without amendment as an article in a magazine if credit acknowledgement is made. Arrangements for issuing it as a separate pamphlet must be made through the Division of Building Research. French translations of the Digests are being issued as quickly as possible. Vinyl binders (price $2) are available on request.

The Division issues many publications describing the work carried out in the several fields of research for which it is responsible. A list of these publications and additional copies of Digests can be obtained by writing to the Publications Section, Division of Building Research, National Research Council, Ottawa, Canada.

Massey Medals for Architecture Centennial Competition

Médailles Massey en Architecture Concours du Centenaire

1967

Published by
the Publications Board of the Royal Architectural Institute of Canada

Publié par
la Commission des Publications de l'Institut Royal d'Architecture du Canada

May/Mai 1967

Price/Prix 50c

Jury Report

The competition was held in two stages; the preliminary stage, in which some 424 entries were received; and the final stage, in which 100 of the first entrants were invited to submit more detailed information in the manner of large scale photographs and drawings suitable for exhibition purposes. In the end, a total of twenty-five medals was awarded, plus a special medal to Montreal Metro.

The Jury was impressed by the generally high standard of architectural design and, without reservation, was in agreement that the top awards represented work of international significance and outstanding achievement. The remainder was thought representative of a high order of architectural achievement comparable with that to be found today in any of the progressive parts of the world.

A sense of satisfaction arose from the contribution made by architects in Canada in the field of University building, for it was felt that new and better standards were being met. It was also thought that the civic architecture represented in the competition showed an awareness at the level of public administration that contemporary architecture has an important part to play in the creation of man's environment, particularly within the urban scene; in fact, some of the projects were thought to be of the highest order. Disappointment was expressed concerning the absence of buildings associated with industry, high density housing and religion.

A special medal was awarded to the designers of the Montreal Metro System which was considered to be an outstanding and significant achievement in the design of our urban environment. The award recognizes the total system including the design of stations and rolling stock, art work, graphic design, etc.; in short the overall design of a system which will affect the daily lives of thousands of people. The Jury wishes to congratulate the Civic Authority on its drive, determination and imagination. The Metro reveals a profound understanding of three-dimensional form and traffic movement, but it also shows how such significant parts can be integrated into the urban scene to produce what is probably the finest Metro in the world.

In conclusion, it should be recorded that many of the difficulties encountered in assessing the work submitted appeared to arise out of improved standards of architectural accomplishment throughout Canada and, therefore, the Jury was greatly encouraged.

The Jury wishes to acknowledge with sincere thanks, the assistance of the secretary and staff of the Royal Architectural Institute of Canada in making their duties most convivial. Tribute is paid to the Review Committee under the chairmanship of Orval F. Bush, who prepared the entries for and assisted the Jury.

Thanks are proffered to the National Gallery of Canada for their co-operation in providing space and facilities for the judging to take place, particularly at a time when they were overburdened with other demands related to Canada's Centennial Year. The Jury also extends to Professor Henry Elder a vote of appreciation for his patience, guidance and encouragement as the Professional Adviser standing in for Dr Thomas Howarth.

Hugh Casson
Etienne J. Gaboury
Gerhard Kallmann
Ian R. Maclennan
James A. Murray

Rapport du Jury

Le concours a eu lieu en deux étapes. Il y a eu d'abord un choix préliminaire entre quelque 424 oeuvres soumises, puis un choix définitif pour lequel cent des concurrents à la première étape ont été invités à fournir plus de détails sous forme de photographies en gros plan et de dessins appropriés à une exposition. Lors de ce dernier choix, vingt-cinq médailles ont été accordées, en plus d'une médaille spéciale décernée à l'égard du Métro de Montréal.

Le Jury a été très favorablement impressionné par la haute qualité forme à trois dimensions et du mouvement du trafic. Il montre aussi comment les divers éléments peuvent s'intégrés dans l'ensemble de la scène urbaine pour produire ce qui est probablement le plus beau Métro au monde.

En conclusion, nous tenons à signaler que les difficultés du choix entre les oeuvres soumises semblent avoir tenu surtout à l'amélioration de la qualité de l'architecture dans les diverses régions du Canada, ce qui est pour un jury tout à fait consolant.

Nous tenons tout d'abord à remercier très chaleureusement le secrétaire et la personnel de l'Institut royal d'architecture du Canada des efforts qu'ils se sont imposés pour rendre notre tâche agréable. Nous tenons également à exprimer notre appréciation au Comité de revision qui, sous la présidence de M. Orval F. Bush, a préparé les pièces à notre intention et nous a aidés de diverses manières.

Nos remerciements s'adressent aussi aux autorités de la Galerie nationale du Canada qui nous ont fourni l'espace et les services nécessaires pour le choix que nous avions à faire parmi les oeuvres soumises et, cela, à une époque où elles étaient débordées d'autres demandes en rapport avec la célébration du Centenaire du Canada. Enfin, un témoignage spécial de reconnaissance est adressé au professeur Henry Elder qui, en sa qualité de conseiller professionnel, poste auquel il a remplacé M. Thomas Howarth, a fait preuve d'une grande patience et nous a prodigué ses conseils et son encouragement.

Hugh Casson
Etienne J. Gaboury
Gerhard Kallmann
Ian R. Maclennan
James A. Murray

Etienne J. Gaboury, MRAIC, Winnipeg; James A. Murray, FRAIC, Toronto; Sir Hugh Casson, MRAIC, FRIBA, London, England; Professor Henry Elder, MRAIC, FRIBA, Vancouver; chairman; and Gerhard Kallmann, AIA, Boston, Mass; and Ian R. Maclennan, FRAIC, Ottawa.

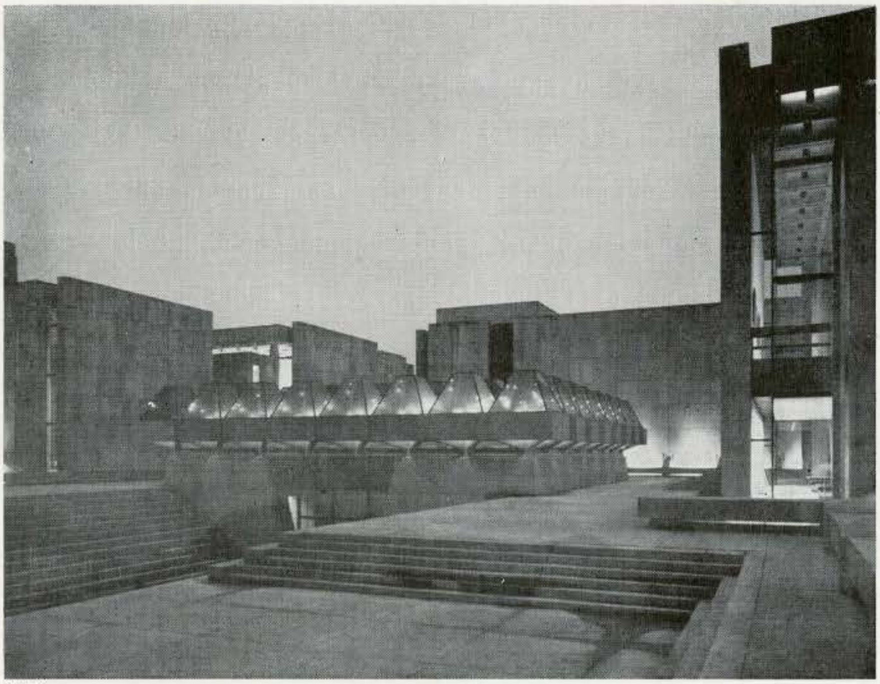
Confederation Centre
Charlottetown, P.E.I.

Architects / Architectes : Affleck Desbarats Dimakopoulos Lebensold Sise

Structural Engineer / Ingénieur en charpente Adjeleian & Associates

Owner / Propriétaire : Fathers of Confederation Memorial Citizens Foundation

General Contractor / Entrepreneur général Pigott Construction Co.



Jowett

Place Victoria
Stock Exchange Tower
Montréal, Québec

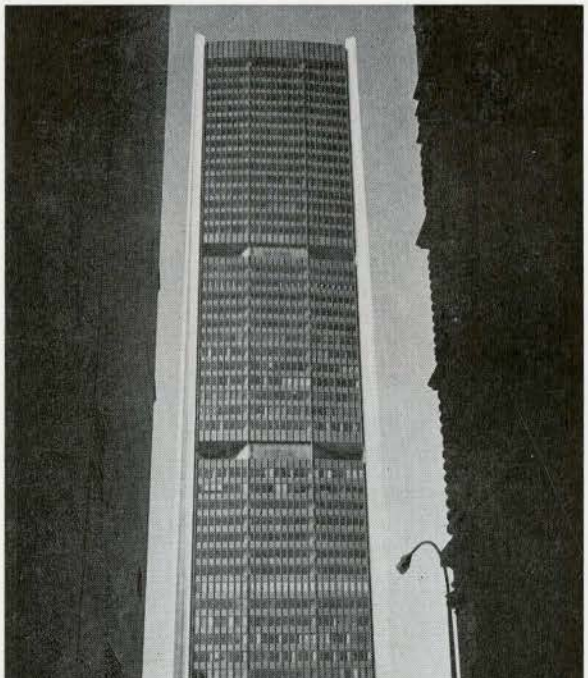
Architects / Architectes : Greenspoon, Freedlander, Dunne and Luigi Moretti

Structural Engineers / Ingénieurs en charpente D'Allemagne & Barbacki ; Luigi Nervi

Owners / Propriétaires : Place Victoria St. Jacques Co. Inc.

General Contractor / Entrepreneur général E.G.M. Cape (1956) Ltd

Concrete Contractor / Entrepreneur de béton : A. Janin & Co. Ltd



Payne

Girls' Residence
University of Montreal
Montréal, Québec

Architects / Architectes : Papineau, Gérin-Lajoie, Le Blanc

Structural Engineers / Ingénieurs en charpente Bourgeois & Martineau

Mechanical Engineers / Ingénieurs en mécanique Letendre, Monti & Associates

Owner / Propriétaire : University of Montreal

Contractor / Entrepreneur : Omega Construction Company Ltd

Han Sa

Peel Subway Station
Montréal, Québec

Architects / Architectes : Papineau, Gérin-Lajoie, Le Blanc

Structural Engineers / Ingénieurs en charpente Cartier, Coté, Piette, Boulva et Wermenlinger

Mechanical Engineers / Ingénieurs en mécanique De Guise et Rouleau

Owner / Propriétaire : The City of Montreal

Contractors / Entrepreneurs : Perini Quebec Inc. & Secant Construction Company

Han Sa

Habitat '67
Phase 1
MacKay Pier, Montréal, Québec

Associated Architects / Architectes associés
Moshe Safdie & David, Barott, Boulva

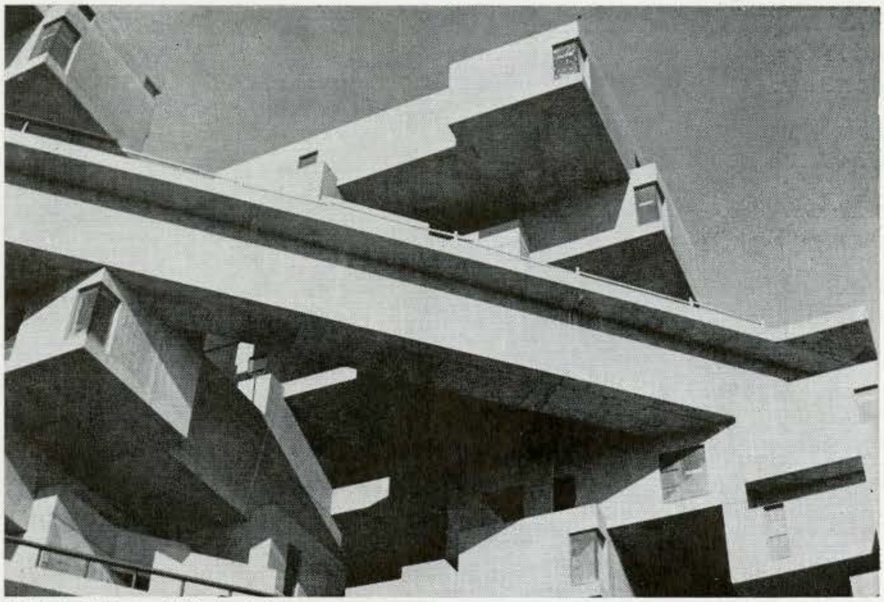
Structural Consultant / Conseil en charpente
Dr A. E. Komendant

Structural Engineers / Ingénieurs en structure
Monti, Lavoie, Nadon

Mechanical and Electrical Engineers / Ingénieur en mécanique et électricité : Huza-Thibault and Nicholas Fodor & Associates

General Contractor / Entrepreneur général
Anglin-Norcross Corporation Limited

Owner / Propriétaire : The Canadian Corporation for the 1967 World Exhibition ; Department of Installations : Colonel E. Churchill, Director ; Chief Architect's Branch : E. Fiset, Chief Architect



Architectural Photographic Services Reg'd

Résidence Des Missionnaires de la Consolata
Cap Rouge, Québec

Architect / Architecte : Jean-Marie Roy

Ingénieurs en charpente / Structural Engineers
Beaulieu, Poulin & Robitaille

Architecte-paysagiste / Landscape Architect
L'Atelier d'Urbanisme

Propriétaire / Owner : La Corporation du Séminaire St-Augustin

Entrepreneur général / General Contractor
BD Construction Ltée

Ellefsen

Administration & News Pavilion
South MacKay Pier (Citédu Havre)
Montréal, Québec

Architect / Architecte : Irving Grossman

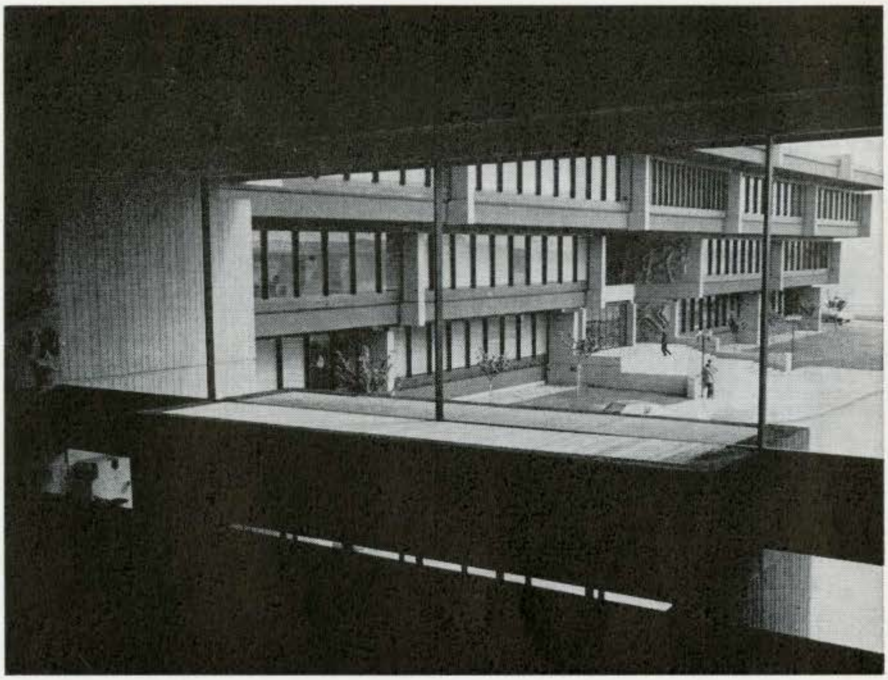
Structural Engineer / Ingénieur en charpente
M. S. Yolles Associates Limited

Mechanical Engineer / Ingénieur en mécanique R. T. Tamblyn & Partners Ltd

Electrical Engineer / Ingénieur en électricité
Jack Chisvin & Associates

Owner / Propriétaire : Canadian Corporation for the 1967 World Exhibition

Contractor / Entrepreneur : Desourdy Construction Ltd

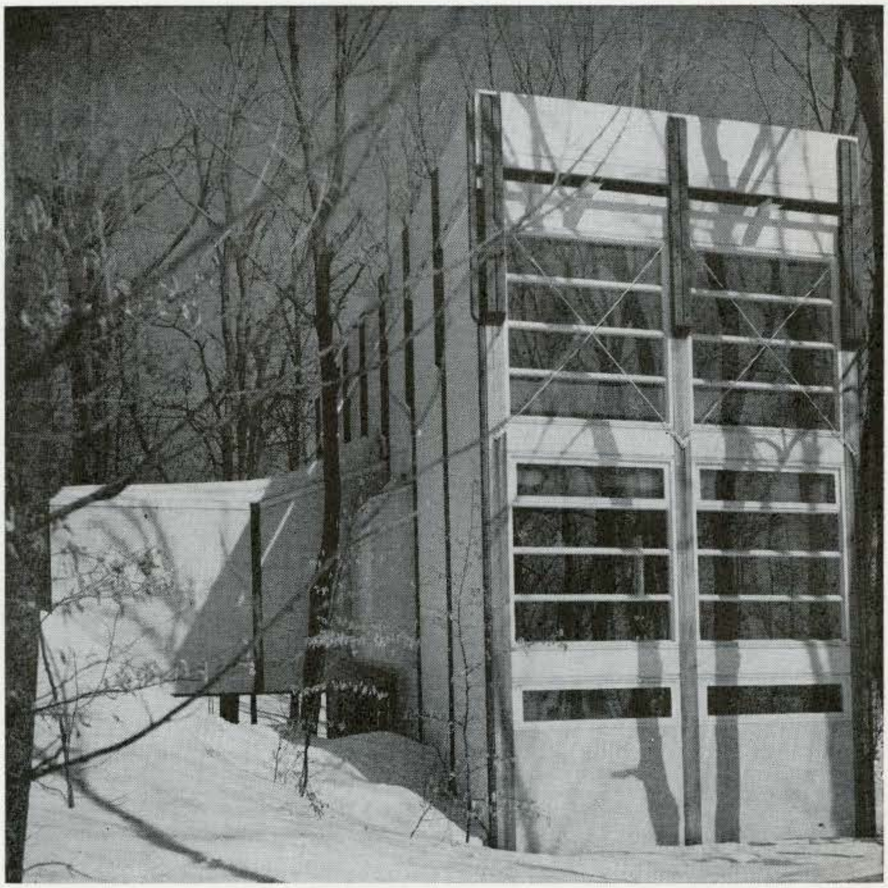


Frank B. Mayrs House
Lucerne (South Hull) Québec

Architect / Architecte : Barry Leonard Padolsky

Owner / Propriétaire : Frank B. Mayrs

General Contractor / Entrepreneur général
W. N. Construction Ltd



Mimico Centennial Library
Mimico, Ontario

Architects / Architectes : Banz-Brook-Carruthers-Grierson-Shaw

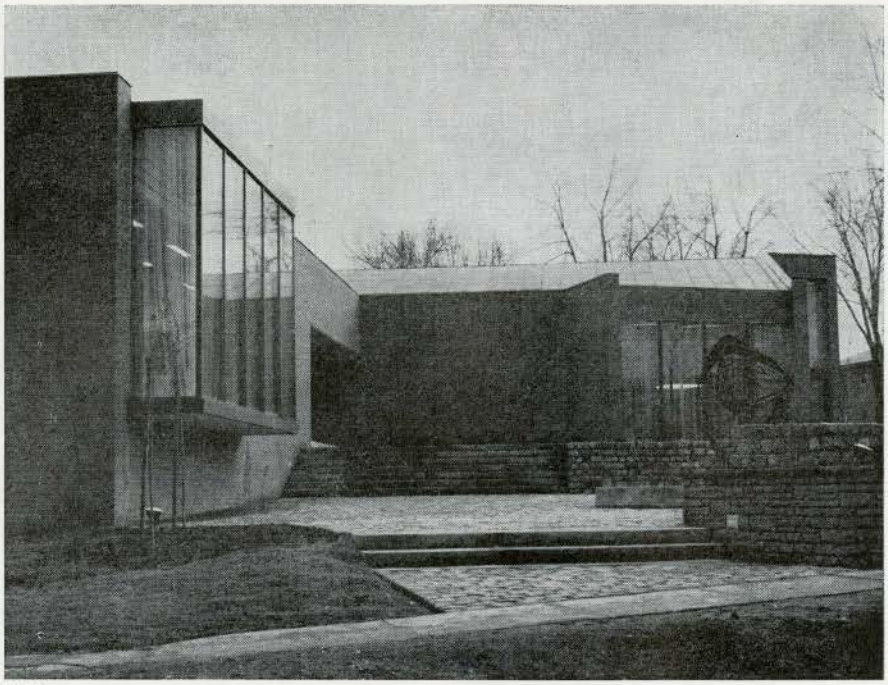
Structural Engineer / Ingénieur en charpente
Seethaler Associates Limited

Mechanical and Electrical Engineers
Ingénieurs en mécanique et électricité :
Ellard-Willson & Associates Limited

Landscape Architect / Architecte-paysagiste
Michael Hough Associates Limited

Owner / Propriétaire : Mimico Public Library Board

General Contractor / Entrepreneur général
W. G. Gallagher Construction Limited



Brook

Stephen House
Upper Canada College
Norval, Ontario

Architect / Architecte : C. Blakeway Millar

Owner / Propriétaire : Upper Canada College, Toronto

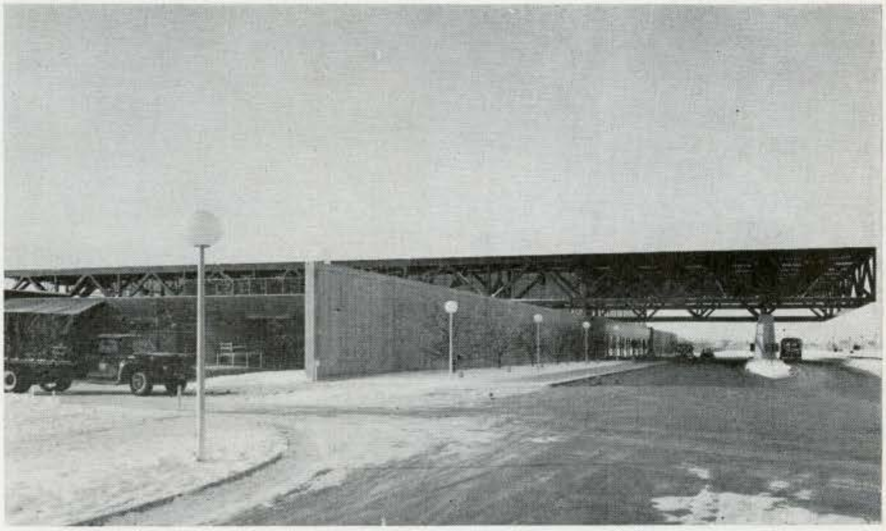
General Contractor / Entrepreneur général
Gardiner-Wighton Ltd

Ottawa Station
Ontario

Architects / Architectes : John B. Parkin Associates, Architects and Engineers

Owner / Propriétaire : National Capital Commission

General Contractor / Entrepreneur général Thomas Fuller Construction



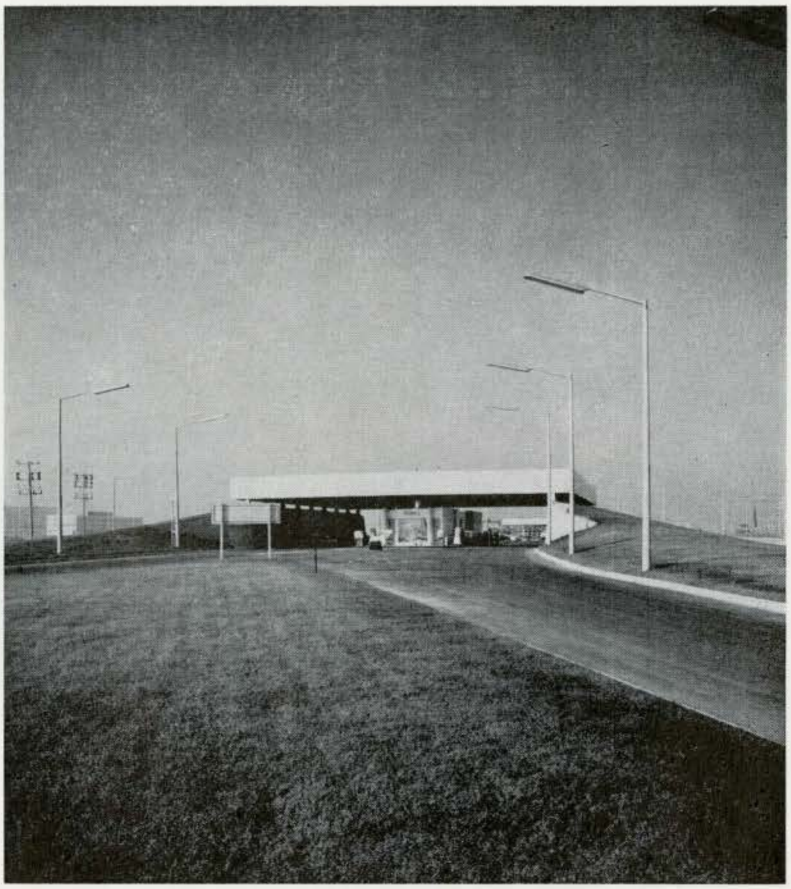
Harris

Automotive Service Centre
Toronto International Airport
Malton, Ontario

Architects / Architectes : John B. Parkin Associates, Architects and Engineers

Owner / Propriétaire : Aeroquay Services Limited

General Contractor / Entrepreneur général Stewart-Hinan Corporation Ltd



Etobicoke Public Library
Richview
Etobicoke, Ontario

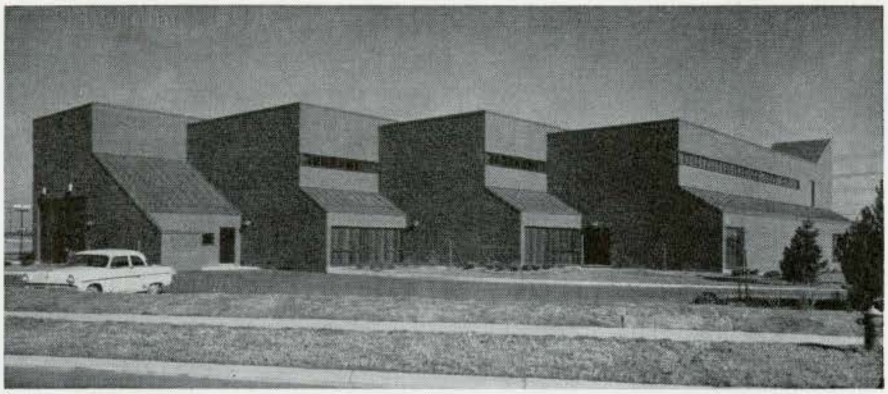
Architects and Engineers / Architectes et Ingénieurs : Dunlop, Wardell, Matsui, Aitken

Structural Engineer / Ingénieur en charpente James S. F. Ma

Landscaping by architect / Piquetage fait par l'architecte

Owner / Propriétaire : Borough of Etobicoke Public Library Board

General Contractor / Entrepreneur général John Goba


Jowett

Grant Sine Public School
Cobourg, Ontario

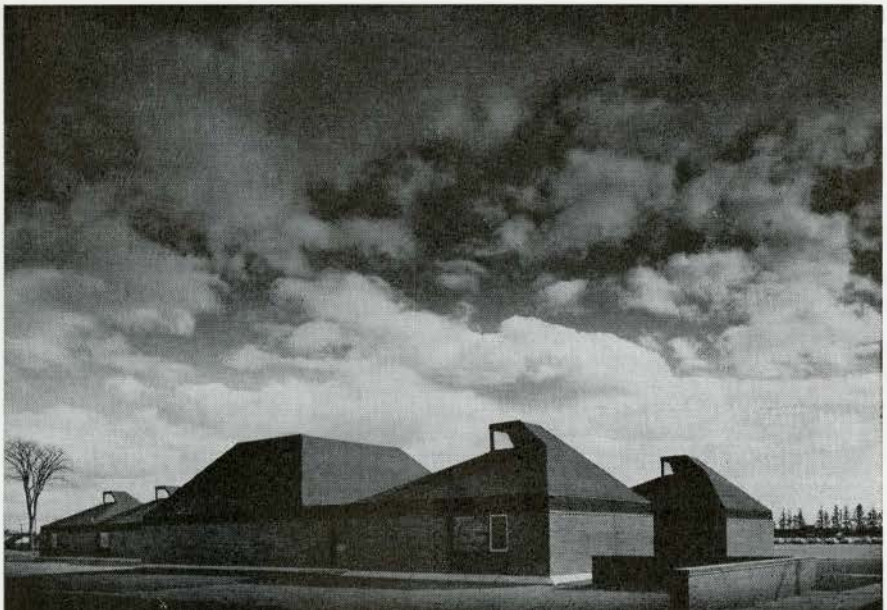
Architects / Architectes : Craig, Zeidler & Strong

Mechanical and Electrical Engineers Ingénieurs en mécanique et électricité W. Hardy Craig

Structural Engineers / Ingénieurs en charpente Totten, Sims & Associates

Owner / Propriétaire : Cobourg Public Schools

General contractor / Entrepreneur général West York Construction


Panda

Pickering Municipal Building
Pickering, Ontario

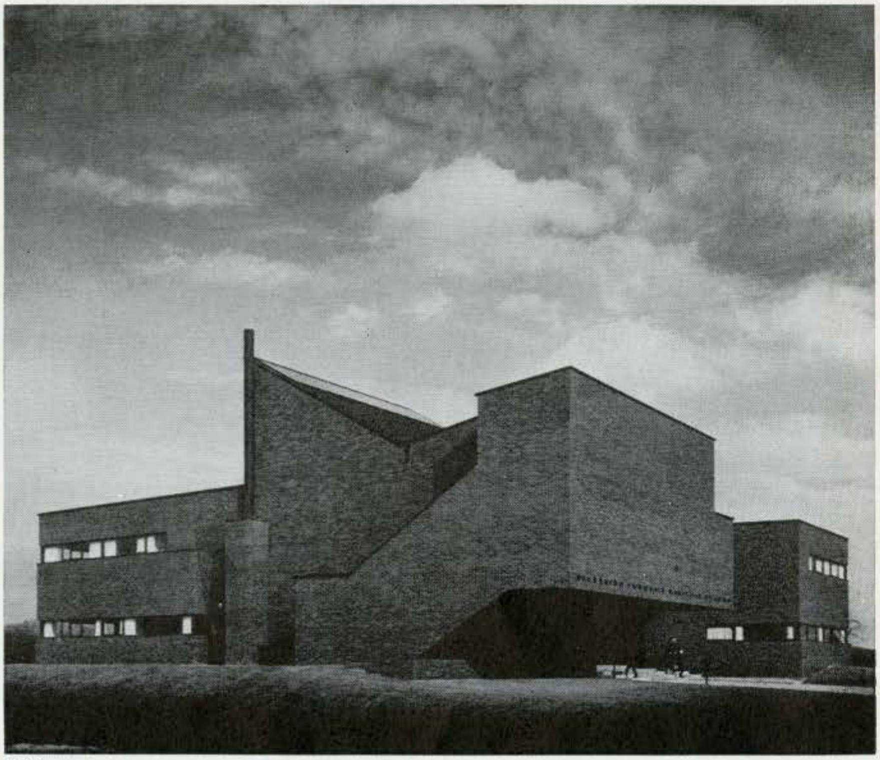
Architects / Architectes : Craig, Zeidler & Strong

Mechanical and Electrical Engineers
Ingénieurs en mécanique et electricité
W. Hardy Craig

Structural Engineers / Ingénieurs en charpente
G. Dowdell & Associates

Owner / Propriétaire : The Corporation of the Township of Pickering

General Contractor / Entrepreneur général
Malan Construction Company Limited



Panda

Ceterg Office Building
Don Mills, Ontario

Architects / Architectes : Fairfield and DuBois

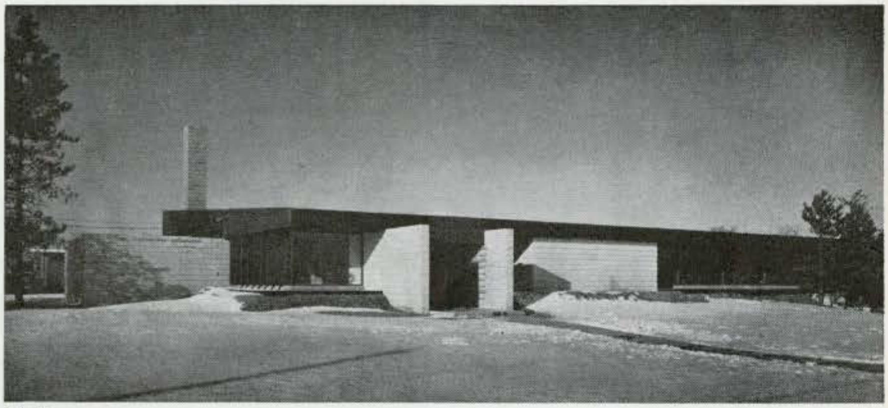
Structural Engineers / Ingénieurs en charpente
A. A. Goldes and Associates Ltd

Mechanical Engineers / Ingénieurs en mécanique G. Granek and Associates Ltd

Electrical Engineers / Ingénieurs en électricité
Jack Chisvin and Associates

Owner / Propriétaire : Ceterg Limited

General contractor / Entrepreneur général
Thornwell Construction Limited



Jowett

Scarborough College
West Hill, Ontario

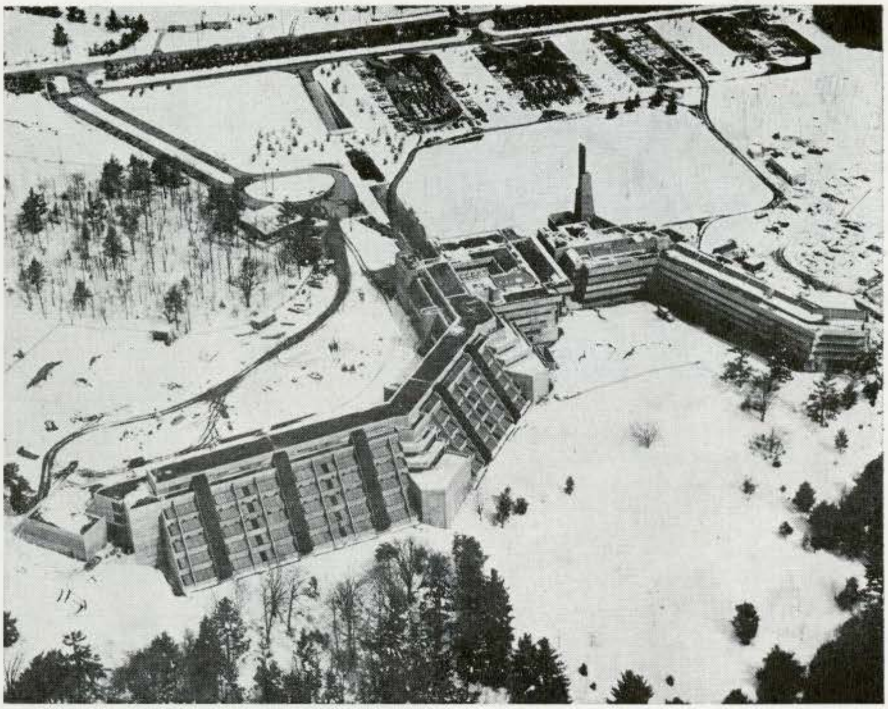
Architects / Architectes : Page & Steele and John Andrews

Engineers / Ingénieurs : Ewbank-Pillar & Associates

Landscape Architectes / Architectes-paysagistes Michael Hough & Associates

Owner / Propriétaire : The University of Toronto

Contractors / Entrepreneurs : E. G. M. Cape Co. Ltd



Reeves

Don Valley Woods Phase Two
North York, Ontario

Architects / Architectes : Klein and Sears

Developer / Agence immobilière : Rubin Corporation

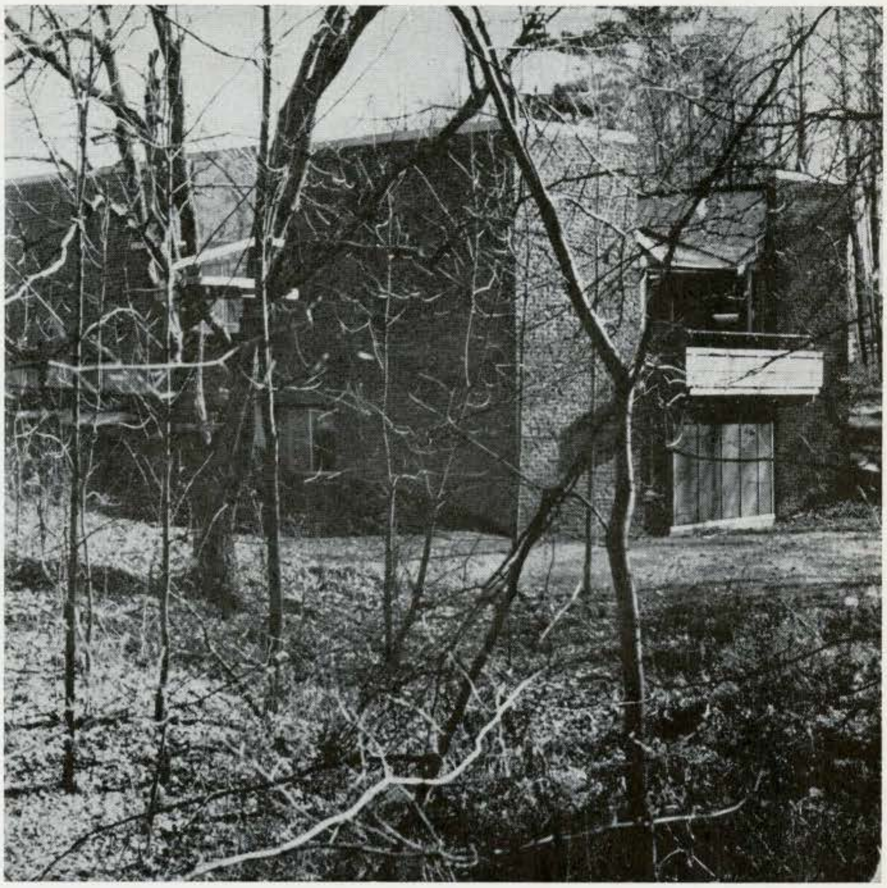
General contractor / Entrepreneur Général Thornwell Construction Limited

Jowett

Wayland Drew House
Port Perry, Ontario

Architect / Architecte : Carmen Corneil

Owner / Propriétaire : Mr Wayland Drew

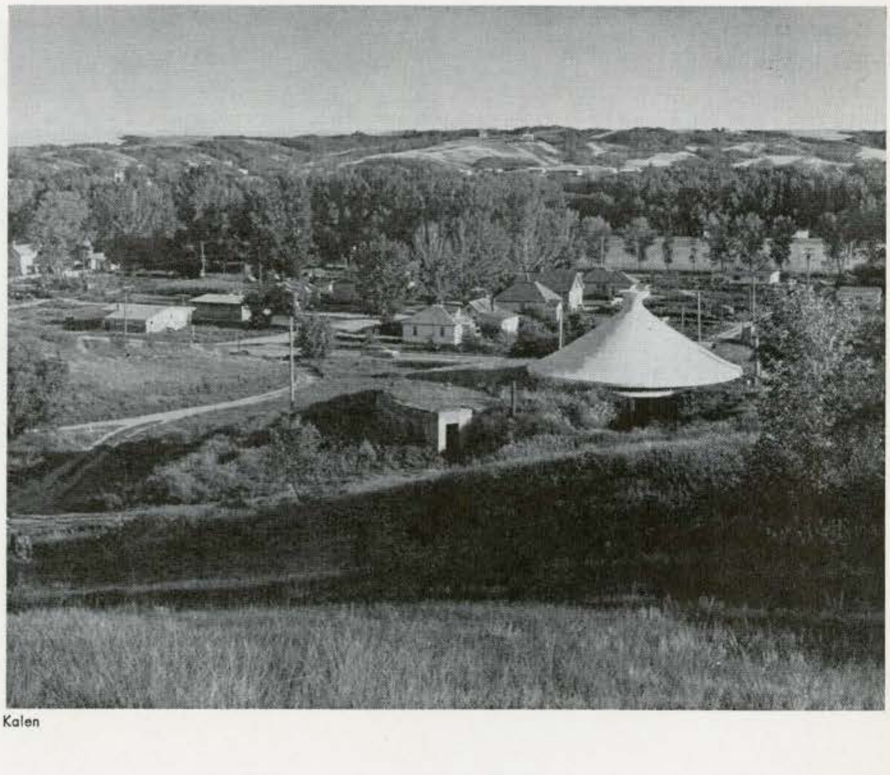


St Mark's Shop
Lumsden, Saskatchewan

Architect / Architecte : Clifford Wiens

Owner / Propriétaire : John Nugent, Artist & Craftsman

Builder / Constructeur : John Nugent



Kalen

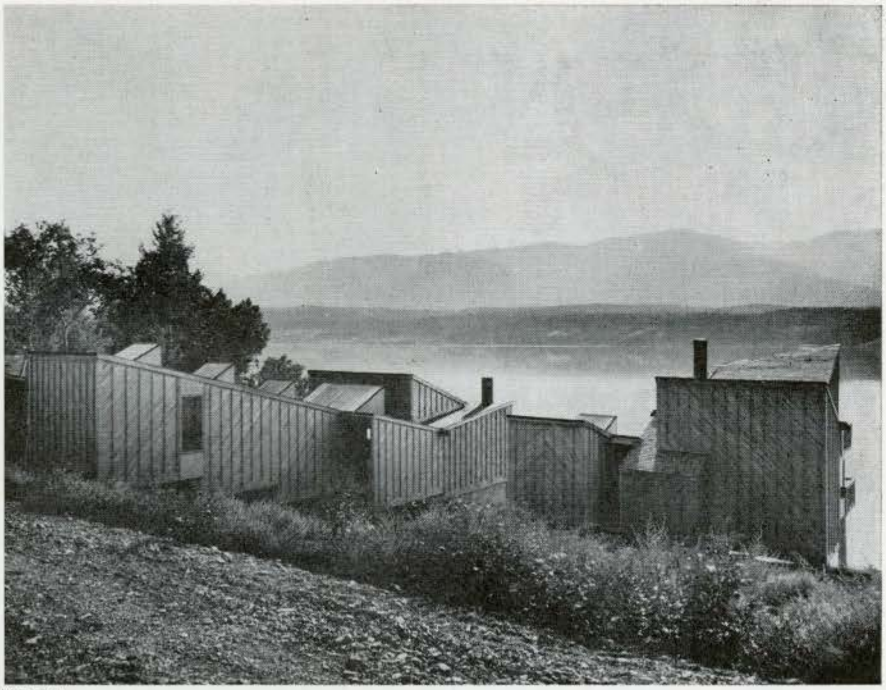
G. E. Melchin and H. Melchin Summer Homes Windermere, BC

Architect / Architecte : Gordon L. Atkins

Landscaping incomplete (by architect)
Architecte-paysagiste (projet incomplet)

Owners / Propriétaires : Mr and Mrs G. E. Melchin & Mr and Mrs H. Melchin

Contractor / Entrepreneur : Lowes Construction Co.



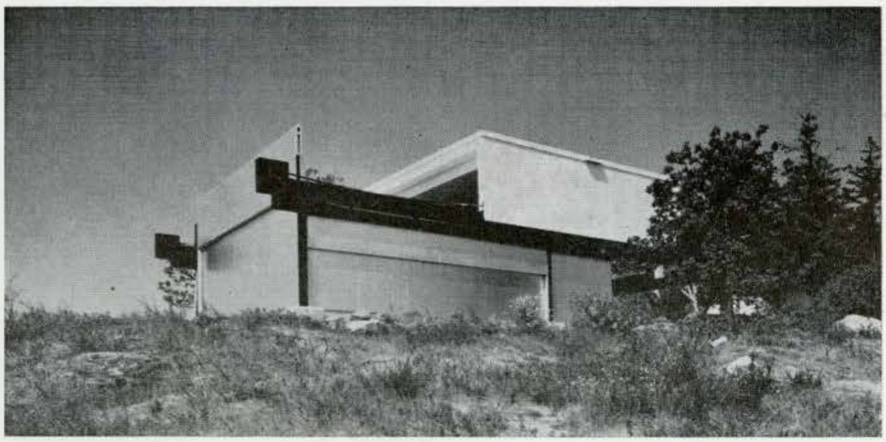
Matthews

16" Telescope Housing Dominion Astrophysical Observatory Little Saanich Mountain Victoria, BC

Architect / Architecte : Roger Kemble
As consultant to Chief Architect Departement of Public Works, Ottawa
Conseiller de l'Architecte en Chef Départment des Travaux Publics, Ottawa

Owner / Propriétaire : Department of Mines and Technical Surveys

Contractors / Entrepreneurs : K. C. Johnson Construction Ltd

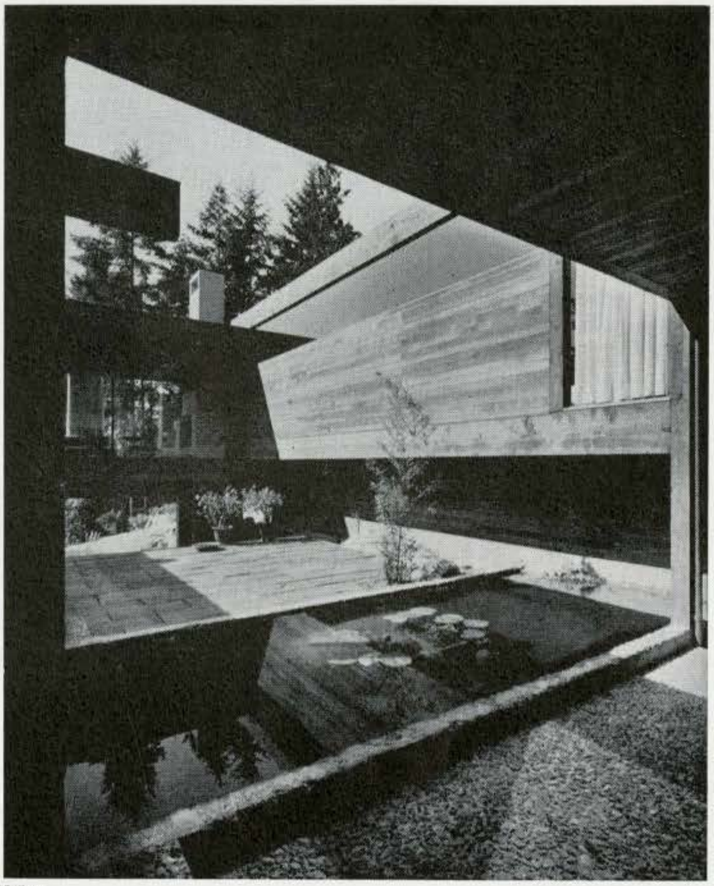


Smith Residence
West Vancouver, BC

Architects / Architectes : Erickson / Massey

Owners / Propriétaires : Mr and Mrs Gordon A. Smith

General Contractor / Entrepreneur Général : Torstein Kravik



Fulker

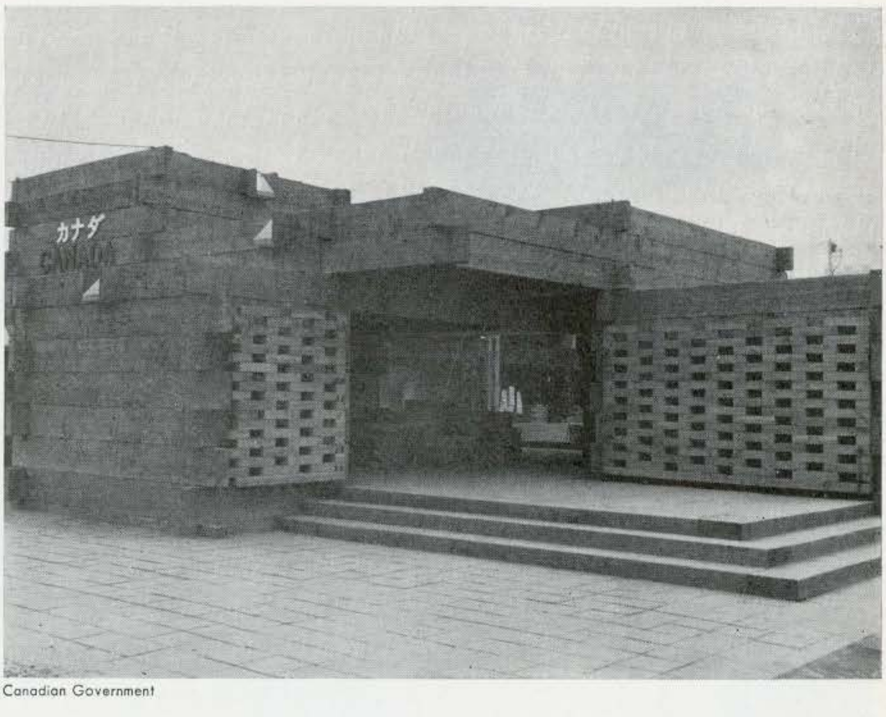
Canadian Pavilion
For the International Trade Fair
Tokyo, Japan

Architects / Architectes : Erickson / Massey

Engineer / Ingénieur : Bogue Babicki

Owner / Propriétaire : Canadian Federal Exhibition Commission

General Contractor / Entrepreneur Général Contract undertaken by Japanese construction firm



Canadian Government

Simon Fraser University
Burnaby Mountain, Burnaby, BC

Owners / Propriétaires : Board of Governors, Simon Fraser University

Architects / Architectes : Erickson / Massey, Rhone & Iredale, Zoltan S. Kiss, Robert F. Harrison & Associates ; McNab, Lee and Logan

Co-ordinating Architects-Planners / Architectes-cadres coordonnés ; Erickson / Massey

Central Mall Charpente / Structural : O. Safir and Co ; Mechanical / Mécanique : D. W. Thompson & Co & Swan Wooster Engineering ; Electrical / Electricité : Simpson McGregor & Scott ; Mall-roof : Jeffrey Lindsay & John Karriotts ; Contractor / Entrepreneur : Laing Construction & Equipment

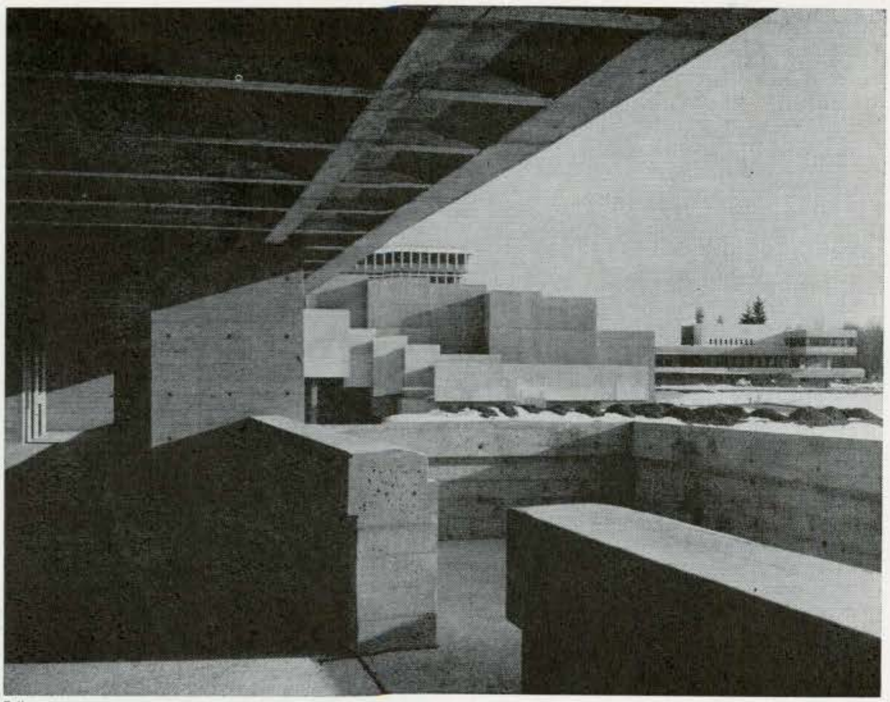
Science Complex Structural / Charpente : Bogue Babicki ; Electrical / Electricité : Simpson, McGregor & Scott ; Mechanical / Mécanique : D. W. Thompson and Co ; Contractor / Entrepreneur : Burns and Dutton Construction

Academic Quadrangle Structural / Charpente : O. Safir and Co. ; Mechanical / Mécanique : J. D. Kern and Co. ; Electrical / Electricité : A. E. Simpson ; Contractor / Entrepreneur : Ptarmigan Constructors

Library Structural / Charpente : Choukalos, Woodburn & McKenzie ; Mechanical / Mécanique : D. W. Thompson and Co. ; Electrical / Electricité : Rich-Webster and Co. ; Contractor / Entrepreneur : Ptarmigan Constructors

Gymnasium and Swimming Pool Structural / Charpente : Thorson and Thorson ; Mechanical / Mécanique : D. M. Drake ; Electrical / Electricité : R. M. Campbell ; Acoustical / Acoustique : C. A. Tiers ; Contractor / Entrepreneur : A. R. Grimwood Limited

Theatre Structural / Charpente : Read, Jones, Christoffersen ; Electrical / Electricité : R. M. Campbell ; Mechanical / Mécanique : John M. Bean ; Acoustical / Acoustique : C. A. Tiers & J. E. Breeze ; Contractor / Entrepreneur : Burns and Dutton Construction

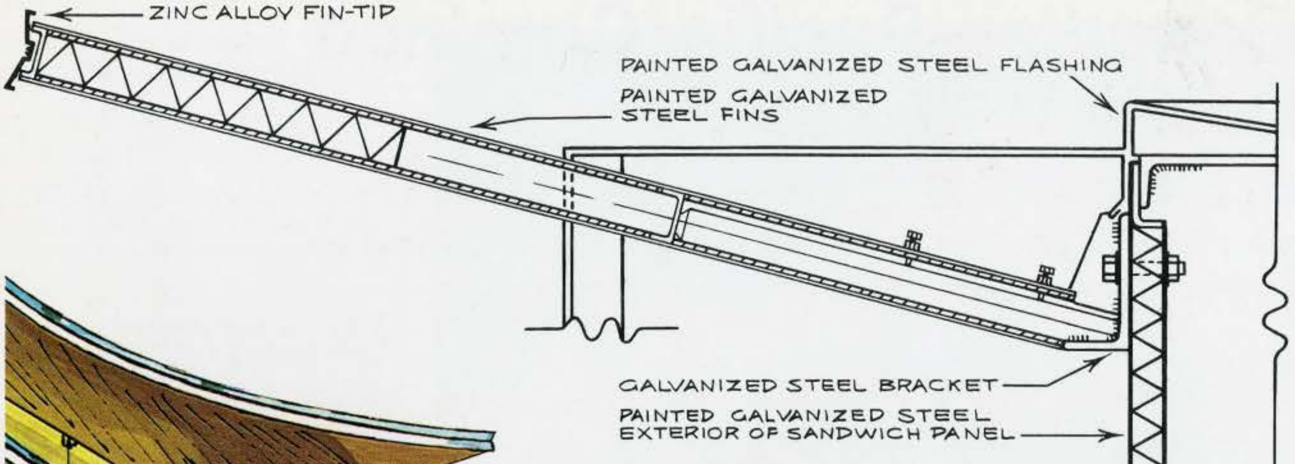


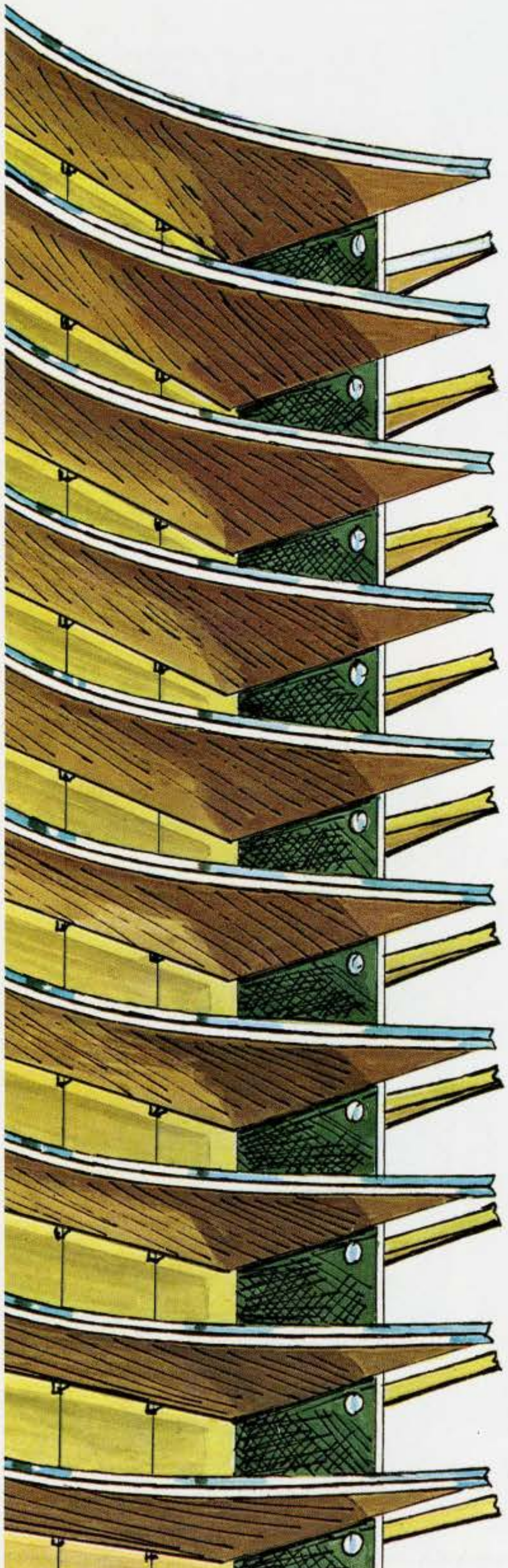
Fulker

Canadian Pacific/Cominco Pavilion—Expo 67

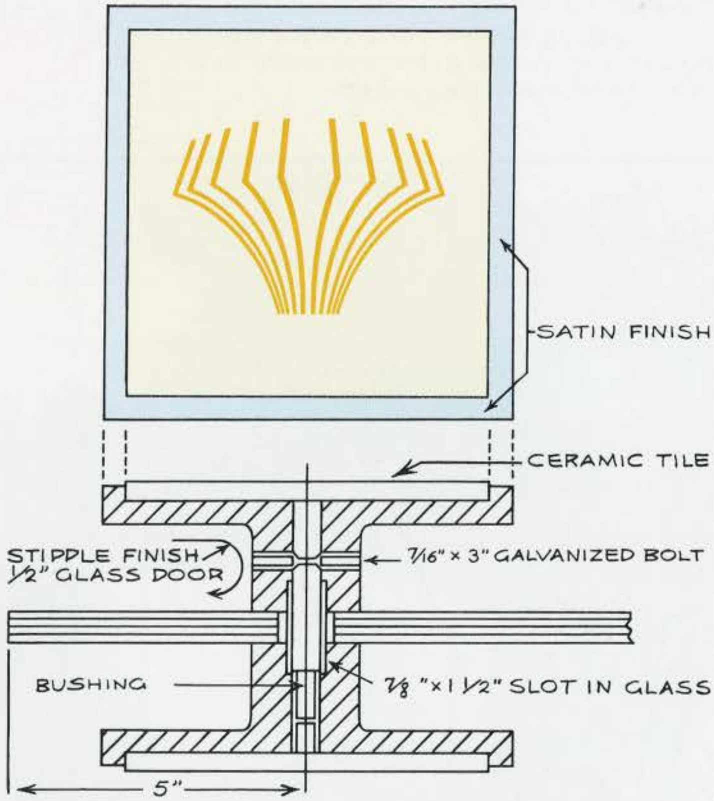
Designers: De Martin · Marona of Canada Limited
Architects: Dobush, Stewart, Bourke, Longpré, Marchand, Goudreau
General Contractors: Hewson Construction Ltd.

This two-building pavilion, costing in excess of 4 million dollars, is one of the largest individual corporate projects at Expo 67, and one of the most interesting architectural statements of corporate activity in the entire exhibition. Designed essentially as volume-containing structures to house specific programmes and to provide a comfortable environment for visitors, the pavilion also implies movement and diversity, rhythm and expansion and utilizes many architecturally significant applications of lead and zinc products in its construction. The pavilion, which consists of a multiscreen motion picture theatre, an exhibits building, a landscaped plaza, and a dominant high rise element, should be of particular interest to members of the architectural profession visiting Expo this year. Some aspects of design are illustrated in the following pages, but only a personal visit can reveal the many exciting ideas and architecturally interesting features of the pavilion.

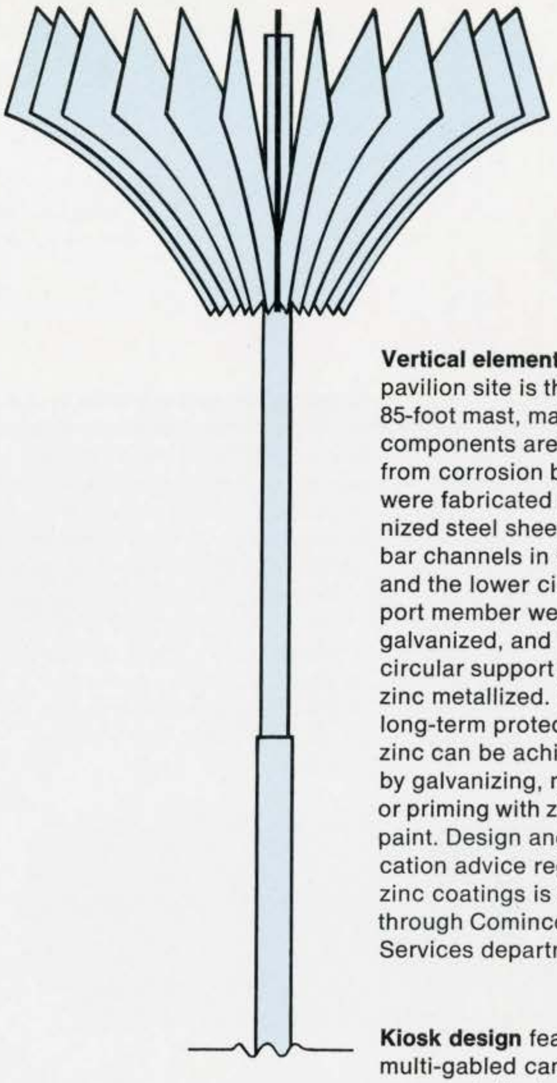




Galvanized sheet steel was used for the fins as well as for the sandwich wall-panels and roof flashing of both the theatre and exhibits buildings. The "horizontal" fins on the theatre building are anchored to hot-dip galvanized steel brackets. The decorative fin-tips, shown on the detail drawing above, are roll-formed from a highly polished zinc alloy — one of many such alloys widely used in architectural applications.

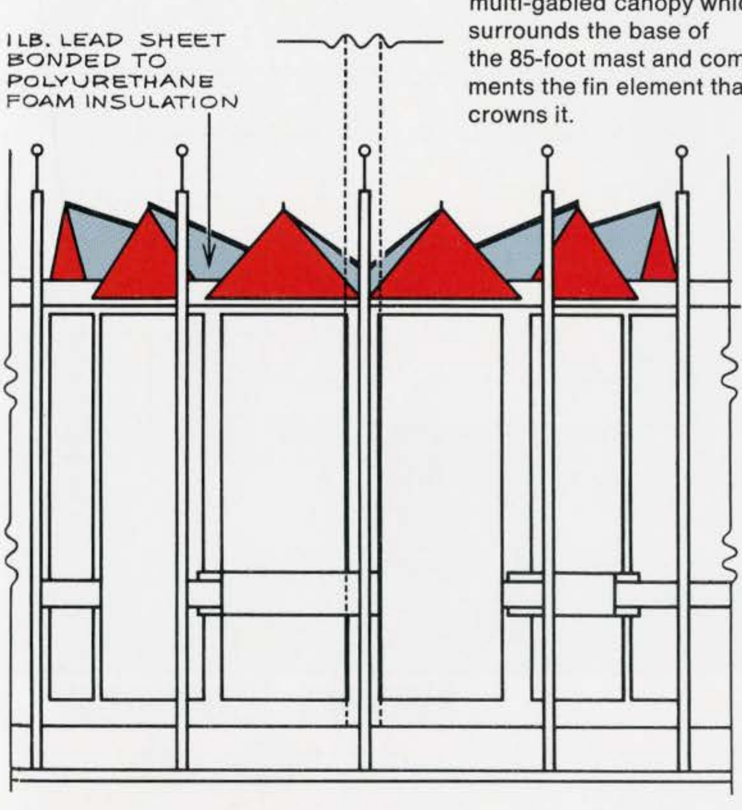


Cast zinc alloy door pulls with ceramic plaque inserts were specially designed for the glass doors of the pavilion; details are shown on the sectional drawing above. The plan view shows the plaque design which complements the fin motif of the vertical element.



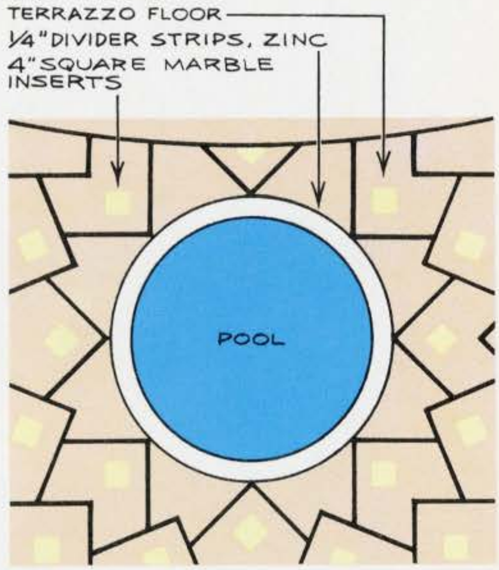
Vertical element on the pavilion site is the striking 85-foot mast, many of whose components are protected from corrosion by zinc. Fins were fabricated from galvanized steel sheet; the 3-inch bar channels in the fins and the lower circular support member were hot-dip galvanized, and the top circular support member is zinc metallized. Effective, long-term protection with zinc can be achieved by galvanizing, metallizing or priming with zinc-rich paint. Design and specification advice regarding zinc coatings is available through Cominco's Marketing Services department.

Kiosk design features this multi-gabled canopy which surrounds the base of the 85-foot mast and complements the fin element that crowns it.

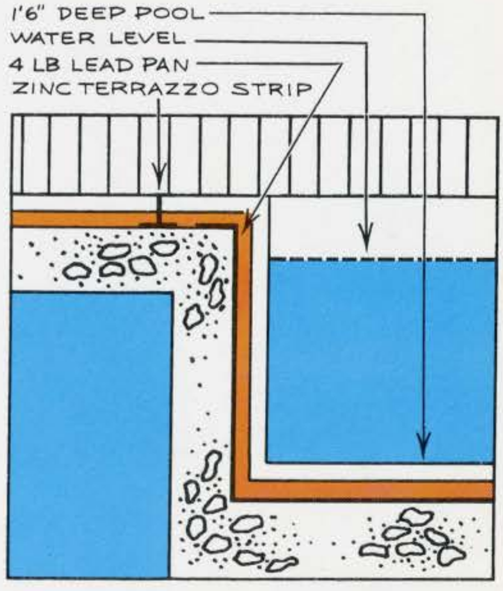


Lead-lined pool. Many architectural uses of lead and zinc are evident in these buildings: for example, the lead-lined pool shown above is surrounded by a terrazzo floor divided by zinc strips and graced by a hanging planter made of chrome-plated zinc sheet. Aside from conventional galvanized conduit, ductwork and roof-deck, other interesting uses of zinc are: in extruded form as handrails and carpet trim, and in cast form as furniture accessories, door handles, door stops and light fixtures for illuminating the exterior of the pavilion.

PLAN



SECTION



Creating the sound barrier is one of the most recent additions to the many architectural uses of lead sheet. Preventing the transmission of sound from a mechanical service area into the theatre is one demonstration of this use (depicted in the section drawing on the left). Other areas where lead is used for sound insulation are in the doors to the lounge areas, the walls of the projection booth and as a plenum barrier in the exhibits building.

Reservations to attend film showings in the theatre may be made through Cominco. Simply fill in the coupon on this page or drop a note to Cominco Ltd./ Marketing Services/630 Dorchester Boulevard West/Montreal 2 — for the attention of Arthur Ash.

Please send me
my free copy of (check √)

- Literature on precoated steel ☐
- Stop Corrosion — Metallize with Zinc ☐
- Waterproofing with Lead Sheet ☐
- Architectural Applications of Lead for Noise Control ☐
- Sheet Lead for Effective Noise Control ☐
- Cominco's technical-film catalogue ☐

I would like to make reservations for free theatre seats.

*Number of seats required*__________

*Date and time preferred*__________

NAME__________

FIRM__________

ADDRESS__________

CITY__________ PROVINCE__________

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CELOTEX
PRODUCTS

CANADIAN **CELOTEX CWECO** INDUSTRIES LIMITED
100 Jutland Rd., Toronto 18, Ont./CL. 5-3407

Multi-Storey Elements

Harvey Cowan, MRAIC

Mr Cowan is with the Toronto architectural firm of Craig Zeidler Strong. He also writes a monthly column called "The City" in the Toronto Telegram's weekend Showcase.

A year ago, this column analyzed the development of vertical transportation in buildings. Although there is little information available, we will speculate on the future development of this field as indicated by newer installations. Future trends in vertical transportation design point to one major objective: *Speed.*

The value of an elevator is closely related to the number of passengers it can handle in a given length of time. More attention and improvements in floor-to-floor time, including the door closing and opening time, will be given in future designs. A generation ago we were satisfied with 10 seconds floor-to-floor, door-open-to-door-open- time. Now we want 7 seconds but seldom get it. We may confidently expect to attain 7 seconds consistently in the next 10 years. There will be better electrical performance and the use of lighter materials to reduce moments of inertia.

In addition to improvements in floor-to-floor time, the industry is now engaged in redesigning supervisory control system to reduce wasted traveling time and passenger waiting time. Future supervisory systems will be designed upon the basis of computer simulation of anticipated traffic and elevator system performance.

Architects will demand guaranteed performance with regard to waiting time under different traffic conditions, since this information bears heavily upon the value of an elevator system and is a very important measure for the manufacturer to gauge the performance and value of his elevator.

It is expected the present standard escalator speed of 90 f.p.m. to be gradually replaced by the 120 f.p.m. speed now occasionally used. Eventually this will be raised to 200 f.p.m., first for business and institutional use.

When we realize that our normal walking speed is 300 f.p.m. (4 miles an hour) we can readily understand that increasing the speed from 90 f.p.m. to 120 f.p.m. is only a token improvement. From a mechanical standpoint, it is entirely possible to speed up an escalator to almost any rate, but it would be useless if the rate of speed prevented access or exit. The limiting factor on the speed and capacity of an escalator is the ability of the public to negotiate an entrance to the equipment, which expresses itself in a steadily increasing hesitation until the point of outright refusal is reached.

Moving sidewalks will be used not only in airports and stores, but in connecting corridors between businesses, institutional buildings and in cluster construction. Here, too, speeds will be raised to 120 f.p.m. and then to 200 f.p.m. as people become accustomed to moving at higher speed.

The highest-speed electric elevator in 1901 was 325 f.p.m. while water-hydraulic elevators had reached a speed of approximately 600 f.p.m. The first gearless machine was introduced and being developed in 1900. By 1924 the highest speed was 700 f.p.m. with the first signal control electric elevator. The cost of a water-hydraulic, high-speed, high-rise elevator with its large power plant was about four times that of an electric gearless that required car switch or hand-lever control.

In 1924 the Tribune Tower in Chicago (approximately 25 storeys) had the first 800 f.p.m. signal control elevators; then came the LaSalle Wacker Building of Chicago (40 storeys) 1000 f.p.m. with signal control and nonsequence dispatch. It took several years to perfect satisfactory controls for these speeds. New York City still had a code limit of 700 f.p.m. at that time. Then came the 80-floor elevator rise of the Empire State Building with a rated speed of 1200 f.p.m.; next the 70-storey Rockefeller Center of 1400 f.p.m. Following this was the first operatorless 1400 f.p.m. installation at the 41-storey Prudential Building in Chicago. More recently there is the 60-storey Chase Manhattan at 1600 f.p.m.; the 59-storey Pan American at 1700 f.p.m. and now the 100-storey John Hancock Building at 1800 f.p.m.

The following chart graphically indicates the companion development of elevator speeds and skyscraper development.

Building	*Height in ft.*	*Number of Floors*	*Number of Elevators*	*Elevator speed FPM*
Empire State Bldg.	1250	102	67	1200
Rockefeller Center (RCA Bldg)	850	70	75	1400
World Trade Center	1350	113	99	1600
Hancock Center	1105	100	50	1800

It is conceivable with uniformly pressurized buildings that speeds in excess of 5000 f.p.m. or more can be successfully met with present-day design methods. With present-day control refinements, and the resulting smooth, rapid acceleration and deceleration, there is little discomfort noticed in 60 floors of traveling nonstop, and then only in the down direction at 1700 f.p.m.

With long shafts and express nonstop operation probable in future tower buildings, the use of more than one elevator per hoistway would seem likely, probably with block signals and by-pass areas. One thing to note in the layout of the John Hancock Center is that out of the eight banks of elevators, only one travels all the floors. About midway is the sky plaza which separates the apartment floors from the office floors. Building sections are sub-divided into elevator zones so that no traffic will have to travel more than approximately 25 floors of local service.

Keeping pace with the development of new materials in other fields, probably lighter materials will be used in the design of machines, controller, car, pit and hoistway equipment.

Changes such as these would improve performance and reduce handling and installation costs. There is a constant trend to make

control units and machines more compact to reduce installation and repair time, and the use of solid state or static switch controls would permit the use of component or module control units – reducing space-requirements and facilitating assembly and replacement. Complete printed circuits will, no doubt, be seen in the near future. Anti-friction ball or roller bearings will replace any present use of sleeve bearings. The steady improvement in the gearless machine and its lower cost will extend its use further into the geared speed area and new unit type and better controls will help bring this about.
Better performance by gearless machines is obtained by the use of forced ventilation and its use will probably be extended with the increased demand for better floor-to-floor performance. Together with the improved time in floor-to-floor operation would be greater accuracy in floor level landing.

Worm gear drive, now commonly used in speeds up to 350 f.p.m., could be reduced in cost and improved in performance by the use of "gearless" double reduction multiple belt or multiple chain drive. Today's belts are almost as dependable as hoist cables or can be made so. Broken belt or belt failure devices can be used if necessary.

The wide and successful use of dry-plate rectifiers, such as the silicon type with its high efficiency, small space and virtually no maintenance, will replace exciters for operation power purposes. Dry-plate rectifiers have for some time been successfully used for power conversion from AC to DC on geared machines, although the feedback or regenerative braking control required for rectifiers has been a handicap to their wider use for primary power conversion. Failures have been due to poor design, incorrect specifications, improper installation and maintenance. Large power-type vacuum tubes have also been successfully used to convert primary AC power to DC for operating banks of gearless machines with resistant control.
A breakthrough is expected soon to replace the present motor generator sets for variable voltage control.

Computer operated elevators are an accepted fact and are becoming quite sophisticated. Variable interval programming is capable of handling all degrees of traffic from 100% up traffic (or the heavy incoming traffic situation) to 100% down traffic (or the heavy outgoing traffic situation), plus any variation in between. It dispatches cars in the proper direction co-ordinated with dispatch in the opposite direction. The two directional dispatching is simultaneous, or separated by varying fractions of an interval depending on traffic intensity or distribution. Dispatch interval adjustment is continuous and is determined by predicting the round trip time of all the elevators and dividing that time by the number of elevators in operation.
Elevator trip time is predicted by the number of car calls in each car, the hall calls the cars are expected to encounter in each direction, the number of elevators in each direction, the loading in the cars and the prevailing intensity of traffic. This information is fed into a battery of solid state operational amplifying computers and each elevator is sent on its trip sooner or later depending upon its anticipated round trip time.
The computer network which determines the proper dispatch time for an elevator, also determines whether additional elevators are required to fulfill the traffic demand in a particular direction. It operates continuously as the traffic load is changing and as the cars are travelling and answering calls. This is "real time" operation in latest computer terminology.

As the vertical skyscraper spawned the elevator, new forms of high rise construction will pose new problems in movement. Early publications of proposed structures at the Japan World Fair in Osaka, 1970, indicate elements thrusting into space diagonally as well as vertically. If the servicing life-lines of buildings move diagonally in future structures, should not the circulation of people be considered as part of this diagonal system?

It has been the great failing of our technical means that we have not been able to move people horizontally, with the same efficiency and dispatch as our vertical systems. Might we now add the problem of high speed diagonal movement? ☐
"Elevator World" – Mr Charles Lerch
Otis Elevator Co. – Mr G. L. Slearce

Estimating

Last year I mentioned the factors which affect the cost of a building when it has more than one storey, and gave an example of how a two storey building can be less expensive than a single storey building of the same area.

I pointed out then that the factor contributing mostly to the difference in costs was the cost of the roof. If the roof can be reduced in cost, then the overall difference can be lessened, and a point will be reached when the single storey building becomes less expensive than the two storey building. There is, however, another factor which should be considered. This is the exterior cladding.

The quantity of exterior cladding required to enclose a building is dependent upon the shape and size of the building. The ratio between the quantity of exterior cladding and the floor area it encloses is lowest when the shape of the building most nearly approximates to a simple square. Similarly an in-increase in size does not increase the quantity of exterior cladding in the same proportion as the increase in floor area. It is for this reason that it is always preferable to construct one large building than it is to construct two or more smaller buildings with the same total floor area.

With a given total floor area, the more storeys a building has, the smaller must the plan size be. A building which can cover several acres if spread over one storey begins to look like a pencil if the same floor area is provided on thirty storeys.

Using the same example as last year, but incorporating the exterior cladding into the figures, the comparison is as follows:

Single storey: 200′ x 50′ on plan

Foundations 10,000 SF @ .65 =	$ 6,500.00
Slab on grade 10,000 SF @ .60 =	6,000.00
Roof construction & finish 10,000 SF @ 2.25 =	22,500.00
Exterior walls 500 LF x 10′ = 5,000 SF @ 3.50 =	17,500.00
Total	$ 52,500.00

Two storey: 100′ x 50′ on plan

Foundations 5,000 SF @ .75 =	$ 3,750.00
Slab on grade 5,000 SF @ .60 =	3,000.00
Suspended floor 5,000 SF @ 2.00 =	10,000.00
Roof construction & finish 5,000 SF @ 2.25 =	11,250.00
Exterior walls 300 LF x 20′ = 6,000 SF @ 3.50 =	21,000.00
Total	$ 49,000.00

This example shows that, ignoring the cost of a stair and the additional gross floor area required to accommodate it, the two storey building is still slightly less expensive than the single storey building, but it is dangerous to disregard the effect the exterior cladding has on the costs. A small change in the unit cost of either the roof or the exterior cladding would considerably influence the choice of whether a single or two storey building would be the more economical.

Unit prices which might be used for multi-storey elements in a preliminary estimate are as follows:

Stairs $9.00 – $22.00 per LF of riser
Passenger elevators: Hydraulic $30,000 – $40,000 each.
Electric $35,000 – $120,000 each

Freight elevators $10,000 – $25,000 each.

Dumbwaiters: Hand $1,500 – $2,000 each
Electric $2,500 – $10,000 each

Trayveyors $2,500 – per floor

Escalators $30,000 – $60,000 each

Pneumatic tube systems $2,500 – $3,500 per station

Mail chutes $400 – $500 per floor

F. W. Helyar

The Computer – Its Current Role in Architectural Education

Findings of a questionnaire survey conducted in Spring 1967 by the Association of Collegiate Schools of Architecture Committee on Research and Graduate Studies

Arizona State University: College of Architecture
290 architectural students

Computer system: A GE 225 and a CDC 3400 have been in use since 1965.
Extent of use: Mainly by students and the engineering faculty teaching structures courses for architecture students. Beginning in fall 1967, structures instruction will be handled in the College of Architecture and there will probably be substantial consideration for computers and computer applications in the reorganization of the structures sequence. The fourth-year design classes have recently taken a 2-week course of instruction on computer applications and their potential in architectural design.

Auburn University: School of Architecture and the Arts, Alabama
230 architectural students

Computer system: University's IBM 360, in use by architectural faculty since 1965.
Extent of use: For research in advance structures, also limited contact in programming for architectural problems. Expect to introduce programming, operations and research courses, as well as seminars relating computer application to design, with use of "sketchpad" techniques in design labs. Computer programs already prepared include queuing, time-use, CPM, and structural analysis, but not at present available for outside use. Local architects have used the school's computer service for design analysis and urban design right-of-way location.

Boston Architectural Center: School of Architecture
330 architectural students

Computer system: School has no computer of its own but students and faculty have been using facilities for computer graphics in other institutions in area since fall of 1966.
Extent of use: Mainly in design methodology courses in third and fifth years. Teaching has been made more explicit through flow diagrams, thinking by logic, and specific programming by teacher and student. Richard Bertman gives a lecture course for fifth year and thesis students. Seminars for advanced fifth year students are given on alternate weeks with Lavette Teague, Jr., as instructor. Stuart Silverstone is working on graphic extension of simulation, and models for transportation planning have been developed for local academic research projects. John Nichols is working with a group at Harvard in developing computer graphics systems for design teaching. A computer conference was held in 1964 and attracted national interest, with audience and participants coming from a wide geographical area; proceedings available in published form at $3 a copy. Students are currently preparing a one-day seminar conference, with panel and group discussions, to be held first week in May.

California State Polytechnic College: Department of Architecture and Architectural Engineering
840 architectural students

Computer system: Not specified. In use by Department beginning four years ago.
Extent of use: By entire College. All sophomores take a required 1-unit course on computer usage. This course is still largely engineering-oriented.
Commentary by school: Concerning effect on curriculum, as expressed by George Hasslein, Head, "Nothing radical, but possibilities for new course work are on the horizon."

University of Cincinnati: Division of Architecture
400 architectural students

Computer system: University's Computer Center is located on a separate medical campus, which detracts from its accessibility. Computer time is free, however, and delay for runs is minimal. System includes a 7040 computer, a high-speed plotter and a medium-speed printer. Use by architecture division started this school year.
Extent of use: Main users are Stuart W. Rose and students in second and fourth year design classes, for activity programming, material selection systems, and the like.
Commentary by school: Although the school has no graduate program, some undergraduate courses involve concentrated exercises and the type of complexity which would suggest computerized solutions. It is felt this may grow as a few more instructors move into systems approaches in education. Students are becoming aware of the computer and are inquiring into potential applications.

Columbia University: School of Architecture

Computer system: University's IBM 7094 is being used by 4 faculty members in the School.
Extent of use: As reported by these individual faculty members:
1 In a special course, "Computer Application in Urban Planning," started in 1963 and currently attended by 50 planning students, including some practicing architects, under S. Grava, Assistant Professor of Urban Planning. Mainly for data handling and graphic outputs in class projects. Computer programs on time series, correlation analysis, population pyramids, and column graphs are available by writing to Professor Grava.
2 By Mr McCormick, for research and instructional purposes, beginning three years ago. Computer programs embrace structural analysis and design (trusses, frames, composite beams, etc.).
3 By D. Geiger, for plate analysis, beginning one year ago.
4 By Barry Jackson, for various programs associated with architectural and urban design theory, beginning spring semester of 1966. A course, "Variables and Form in Architecture," involves a series of problems which are structured by using various techniques for the decomposition of linear graphs. Computer programs are available to the architectural profession through the consulting service offered by Fisher/Jackson Associates, 13 East 16 Street, New York, N.Y.

The Cooper Union: School of Art and Architecture
110 architectural students

Computer system: IBM 1620, operated for the Architectural School by the School of Engineering. Use began this year.
Extent of use: So far only as a teaching tool. Third, fourth and fifth year students are given demonstrations in the use of the system for structural analysis, organizational analysis, and information storage and retrieval. An elective in computer programming is offered.
Commentary by school: As expressed by Professor Richard Bender, "The emphasis on calculation in technical courses has been reduced to that which develops understanding rather than proficiency."

Cornell University: College of Architecture
455 architectural students (375 undergraduate, 80 graduate)

Computer system: The Cornell Computing Center's Control Data 1604, in use by planning division since 1960, by structures division since 1963.
Extent of use: Mainly by staff and graduate students in city and regional planning and in M.S. program on architectural structures. New courses have been instituted in computer programming and utilization specifically directed towards planning and structures. All graduate students are taught programming. Several thesis projects have been completed in which use of the computer played a principal part. No computer programs are generally available as yet, however, since the ones developed so far have been specialized to meet specific project or research needs. Use of the computer system by local architects is anticipated for the near future.

University of Detroit: School of Architecture
190 architectural students

Computer system: Terminal link to Ford Motor Company's computer center, beginning this school year.
Extent of use: Mainly by individual students.
Commentary by school: As expressed by Bruno Leon, Dean: "Rather early to tell effect on curriculum, but main change is in terms of program definition."

University of Florida: Department of Architecture
400 architectural students

Computer system: IBM 714 Digital, beginning last year.
Extent of use: Mainly by senior students taking courses offered on campus.

Georgia Institute of Technology: School of Architecture
370 architectural students

Computer system: Burroughs B-5500 and 220 in Campus Computer Center, in light use by faculty and advanced students since 1965.
Extent of use: For problem definition, structural solutions, and CPM analysis. City planning students are required to take programming course. Architectural curriculum has already been affected from increased use of computer by other schools on campus; for example, a course in structural analysis formerly shared with Civil Engineering is now taken solely by architectural students, since the C.E. students are being taught entirely by computer. Two computer programs, "Economic Analysis for Apartments" and "Allowable

Unit Cost to Produce Predetermined Cash Flow," are available from the school.

Harvard University: Graduate School of Design
125 architectural students

Computer system: University's 7094, in use by Allen Bernholtz since August 1966 through his connection with the Laboratory for Computer Graphics. Not available to architectural students until recently.
Extent of use: Mainly by Professor Bernholtz, in order to make certain computer programs operational. However, since February, when funds were obtained to purchase computer time for his computer technology course, architectural students have been using the computer. No computer programs have yet been prepared by the School, but a program written by Professor Bernholtz while at the University of Toronto, which synthesizes the subsystems generated by Alexander's HIDECS 3 programs, will be made available when money is obtained for its publication and distribution. Recently, as a first step in the implementation of an important objective of the GSD Development Program, which is "to increase the interaction between the practicing professionals and the ongoing research and teaching activities of the school," the Laboratory for Computer Graphics has announced two extension training courses on computer mapping: (1) a short introductory program by correspondence, on a first-come, first-served basis; (2) a two-week intermediate and advanced training conference May 8–19, open to persons registering in the introductory program, with a tuition fee of $400 and 30 scholarships available on a competitive basis. Howard T. Fisher is director of the new Laboratory.

Howard University: Department of Architecture, Washington, D.C.
180 architectural students

Computer system: University's IBM 1130, with 026 key punchers and IBM 407 printer, in use by architectural faculty since September 1966.
Extent of use: Mainly in the undergraduate program for fourth and fifth year students. No specific computer programs yet prepared.

Illinois Institute of Technology: Department of Architecture
270 architectural students

Computer system: Institute's IBM 7094, with STRESS language (IITRI), in use by Architecture Department since October 1966.
Extent of use: Mainly for structural analysis by graduate students and third-year undergraduates.

University of Illinois: College of Architecture and Art

Computer system: IBM 1620-40K with disk. In use by architectural faculty and students since 1963.
Extent of use: Mainly for faculty research and student instruction. Also used by students to solve class assignments. Computer programs ("too numerous to specify") are available to other schools and to the profession.

Iowa State University: Department of Architecture and Architectural Engineering
460 architectural students

Computer system: University's IBM 350, on a free-time arrangement, in use since 1963.
Extent of use: Mainly by graduate students for research purposes and by undergraduate students in structural design and construction scheduling. Also some use in architectural design classes. One new course has been established within the Department. Computer programs have been prepared and are available to other schools on the processing of network diagrams and in the area of time-cost relationships and resource allocation. Architects have not yet made use of the School's computer service, although contractors have been doing so.

University of Kansas: School of Architecture and Architectural Engineering
335 architectural students

Computer system: University's GE 625, in use by School since 1962.
Extent of use: Mainly by faculty and students in architectural engineering. A new course, "Introduction to Computers," has been introduced as an elective for undergraduate students in architecture. Descriptions of other courses in the curriculum have been rewritten to provide for more use of the computer facilities. Computer programs developed by the School are in the area of structural analysis for the most part; for example, analysis of general frames and trusses, comparative analysis of flat plates, and acoustical analysis of space.

Kent State University: Department of Architecture, Ohio
300 architectural students

Computer system: University's Honeywell 2200 and IBM 1620, in use by structures faculty since September 1966.
Extent of use: Mainly for truss and frame problems, as basic study for later introduction into structures classes.

University of Kentucky: College of Architecture
200 architectural students

Computer system: University's IBM 7040 and IBM 360-50. Also available is a graphic plotter. Facilities in use by architectural faculty since 1966.
Extent of use: Mainly by John W. Hill and Charles F. Davis, for incorporation into student design problems and research projects. Three computer programs have been prepared: EVAPROBST (evaluation of problem structure), PERSPECT (perspective drawing), TYPMIX (building type mixes in site planning).

Louisiana State University: Department of Architecture
255 architectural students

Computer system: University's IBM 1620-60K (high speed memory) and IBM 7040-32K (with tapes and disks), in use by Department of Architecture since September 1965.
Extent of use: Mainly by faculty and students for education and research. A new curriculum in architecture systems is under study, and computer courses will be available in the revised curriculum. Computer programs have been developed which involve versions of COGO and STRESS and are adapted to the 7040 system; other work now under way. Some local architects have used the school's computer service, but not extensively.

University of Manitoba: Faculty of Architecture
300 architectural students

Computer system: Not specified. In use by faculty since fall 1965.
Extent of use: Main users are first and second year students. Current studies by students are concerned with programming and the limitations of computer language. No use of computer for research purposes as yet, but the City Planning Department has recently become involved in a project to computerize land-use information in the Province. Extension into use of sketch-pad techniques anticipated.
Commentary by school: "The University of Manitoba has recently installed one of the largest computers in North America. Two sketch-pad units are being delivered within 18 months, one of which will probably be installed in Architecture. Since both our graduate and research programs are in their infancy, it is difficult to anticipate the extent of future use. Several faculty members have been studying computers and computer techniques for the past few years and will certainly be able to employ the computer in future teaching and research."

Massachusetts Institute of Technology: School of Architecture and Planning
160 architectural students

Computer systems: Available are the Institute's (1) IBM 360 models 40 and 65 in conjunction with a 2250 display console; (2) IBM 7094 with DEC display consoles within the MAC time-sharing system; (3) IBM 7094 for regular batch processing or plotting equipment. In use by the architectural school since 1965.
Extent of use: Mainly for various thesis projects, computer-aided design projects, a new computer-aided urban design course, and special projects (NSF). An introductory course in computer use is now a prerequisite for the B.Arch. degree. The new computer-aided urban design course, given by Leon Groisser and Nicholas Negroponte, is both a graduate and undergraduate professional elective, and its hours are open. Developed computer programs include a perception simulation program, two display programs, a data structure, and Tim Johnson's "Sketchpad III" will be available soon on standard 360's. Perspective programs developed at M.I.T. are commercially obtainable at the Center for Environmental Studies.

University of Miami: Department of Architecture and Architectural Engineering
155 architectural students, 125 architectural engineering students

Computer system: Not specified. Use began in 1963.
Extent of use: Mainly by students in engineering option. These students take courses in computer programming.

University of Michigan: Department of Architecture
300 architectural students

Computer system: A remote-control console was installed in the Department's Architectural Research Laboratory in September 1966 and has been used daily by faculty and students in conjunction with the time-sharing computing services offered by Dartmouth University (GE 235) and the Ford Motor Company. Facilities in the University's own Computer Center (IBM 7090, with Cal-Comp Plotter, and, in prospect, a new IBM 360/67) have also been used. Cost of the teletype rental and data phone service has been met through a grant from U.S. Steel.
Extent of use: Short orientation courses for programming in BASIC and in the use of teletype have been conducted for faculty and students, principally by Professor Willard Oberdick, Assistant Professor Harold Borkin, and Assistant Professor Sterling Crandall. The available computing services are now being used regularly in numerous class projects. Many faculty members as well as graduate students have also been taking a special course on computer graphics, offered by Professor Bertram Herzog of the Industrial Engineering Department. Early introduction of graphic display facilities (Sketch Pad system) within the Architectural Research Laboratory is anticipated. A proposed new 6-year curriculum for the Department includes a separate course on computer-usage in architectural design. Computer programs have already been prepared for various selected structural and building programming problems, including the simulation of roof performance. These programs will be made available to practitioners as part of a one-week seminar-workshop, "Computers and Performance Factors: Implications for Architecture," now being planned by a faculty committee consisting of Professor Oberdick, Professor Lytle and Professor Larson, given May 1–5 (enrollment fee of $200) as the Department's first spring course in continuing education for the architectural profession.

Université de Montréal: École d'Architecture
165 architectural students

Computer system: Within the School a Control Data LGP30 is being used as an introduction to programming. Available in the University's Computer Center are CD 3100, 3400 and Cal-Comp Plotter, which have also been used by the School since fall 1966.
Extent of use: Under Professor J. Derome, an adaptation of Grumman Aircraft's DRAFT program, known locally as BOUBOU, has been developed for the drawing of perspectives with the Cal-Comp Plotter, for first year students. Professor M. Barcelo has been using SYNAP, a program developed by Howard T. Fisher at Northwestern for plotting statistical data directly on maps by the typing output method. This local version of SYNAP is now available to local architects, and further cooperation in its development has been initiated with

the Geography Department at McGill University. Interest is expressed by the School in utilizing Christopher Alexander's report on HIDECS 3: "The Hierarchical Decomposition of Systems which have an associated linear graph," developed by the University of California in Berkeley.

University of Nebraska: School of Architecture
375 architectural students

Computer system: University's IBM 360, IBM 1620, and Cal-Comp Plotter, in use by architectural faculty and students, haphazardly beginning in 1964, systematically since 1966.
Extent of use: By all students in construction and in the science and business options of B.Arch. program. Elective for others. Also by some staff members. Mainly for CPM/PERT solutions in Arch 285 and 286 (Construction Management Systems), two courses being given by B. M. Radcliffe, Professor of Construction Sciences; also for cost estimating and accounting. Anticipate applications in structural analysis and in research and development. Using IBM computer programs. Experimenting with PLOTTER software to yield analog type charts and diagrams for CPM. May apply to excavation estimating, shear, etc. Little to offer others at this stage. Local architects, engineers and contractors attending a current 8-week short course (condensed version of Arch 285).

University of New Mexico: Department of Architecture
110 architectural students

Computer system: Working with the University Research Center, which has a FORTRAN Computer, since September 1965.
Extent of use: Mainly by fourth-year design students. A course, "Systematic Methods of Design," is taken by all students in the fourth-year architectural program. One computer program similar to the Alexander method for interactions and decomposition has been made; this material is still in a rough stage and not available.

A & T College of North Carolina: Department of Architectural Engineering
85 architectural students

Computer system: IBM 1620, since a year ago.
Extent of use: By all students in engineering courses, for general instruction and use programming and executing of programs.

North Carolina State University: School of Design
415 architectural students

Computer system: University's IBM 3630. Also IBM 1130, installed in consulting office of Charles H. Kahn, Professor of Architecture. In use since September 1966.
Extent of use: Main users are Professor Kahn and fifth year architectural students. The IBM 3630 is being used by both faculty and students in various research and theses projects, the IBM 1130 as a means of introducing students to computer techniques and programming. According to Professor Kahn, computer use has reoriented the direction and content of courses in structures and in mechanical equipment of buildings, as well as the handling of information involved in architectural design. A fifth-year student is currently writing a program for the removal of hidden lines in computer-aided perspective drawings. No practicing architects have yet used the School's computer service although they have made extensive use of the consulting computer service on structural engineering problems.

Ohio State University: School of Architecture and Landscape Architecture

Computer system: University's IBM 7094, available free for student and faculty work, since 1964.
Extent of use: By a few faculty members and interested graduate students, mainly for (1) games, (2) problem-solving methods research, (3) architectural graphics output. Following a conference on computer graphics, to be held in early April 1967, short courses will be given in this field and also in problem-solving methods. Computer programs are being developed which involve a few problem-solving algorithms and games. Two display programs are also being adapted to the available equipment. This material is not yet generally available. Local architects are utilizing the computer service by enrolling as special students in the graduate program.

Ohio University: School of Architecture and Design
200 architectural students

Computer system IBM (FORTRAN), started fall 1966.
Extent of use: Fifth year students at present, but lower level students will become involved next year.
Commentary by school: According to J. Ingraham Clark, Director, "Students now look on the design problem in a different perspective in that they can deal with more variables and not jump to a preconceived solution to a problem."

Oklahoma State University: School of Architecture
260 architectural students

Computer system: University's IBM 1620 and IBM 7040, in use by school since 1963.
Extent of use: Mainly by Professors Thomas S. Dean, Louis O. Bass, and W. G. Chamberlain, and Instructor Philip A. Hendren, in addition to all architectural engineering students. A computer science course is required in the architectural engineering curriculum and is being applied in architectural design courses and in shades, shadows and perspective. Advanced courses in structures, specifications and estimating also make use of the computer, since, as F. Cuthbert Salmon, Head, observes, "It provides optimizations which are not available without its use." Local architects are reported to be making use of the school's computer service for structural analysis, feasibility studies, accounting, project control, and the like.

University of Oregon: Department of Architecture
600 architectural students

Computer system: University's IBM 1620, in use by Department beginning with current winter term. Use of a new IBM 360 model 50 is anticipated.
Extent of use: For computation of networks for a course in CPM techniques. Computer programs dealing with CPM and PERT have been prepared and are available for use by others. Last year 13 fifth-year architectural design students, with the help of Assistant Professor Murray Milne, undertook a year-long investigation of the potential use of the computer in the design process, based on the approach worked out by Christopher Alexander in his book, "Notes on the Synthesis of Form" (Harvard University Press, 1964). During the last term each member of the student team proceeded with an individual terminal project, using the information organized during the first two terms. The results of their combined effort are available in an impressive report, "Computer-Aided Design: an Experiment with a Design Process as Applied to the Problem of Undergraduate Study," published by the University of Oregon Press, 1966. According to Professor George Andrews, the school still has to decide how this experiment should be followed up, since a complete evaluation of the proposed program has not yet been made by the faculty.

Pennsylvania State University: Department of Architecture
430 students (300 architectural, 130 architectural engineering)

Computer system: Architectural Engineering Computer-Aided Design and Simulation Laboratory (AE CAD LAB) presently consists of a digitizing system and an IBM 1050 data communications system linked to the central computer facility on campus (IBM 7074 and 1401, with IBM 360/50 also being used on restricted basis until conversion to IBM 360/67 is completed). Future plans call for incorporation of a cathode ray tube design console and data plotting equipment, permitting all input, design, checking and output of building schemes to be done in one location. First use of 7074 began in 1961, use of CAD LAB in 1965.
Extent of use: All architecture majors are required to take basic courses in computational systems which are taught by the architectural engineering faculty. All AE majors take, in addition, computer science courses. Many AE thesis students use the computer as a design tool after having taken AE 441 (Integration of Architectural Engineering Systems), which uses the CAD LAB for many required areas of analysis. At present three research programs are being sponsored through the University's Institute for Building Research: (1) Project "Alpha", the development of a problem-oriented language to enable building designers to select and specify the wall and roof envelope systems for a building; (2) Project "Beta", the classification and codification of building materials and systems data to be used in a computer data retrieval system; (3) Project "Performance Concepts", a study of techniques and methods of evaluation of performance of building systems and materials. These programs will be issued as AE CAD LAB reports and made available on same basis as other research reports of the Department. Already available is a useful handbook prepared by the LAB's Director, Larry D. Degelman, entitled "Introduction to Modern Computational Systems: Basic Fundamentals of Computation and Computer Applications for the Design Professions and the Building Industry."

University of Pennsylvania: Department of Architecture
165 architectural students

Computer system: Not specified. Use by Department began in 1958.
Extent of use: For doctoral dissertation research, hospital research on a PHS grant, and civic design (mapping and the like). Local architects have used the University's computer service largely for structural design and urban renewal planning.

Pratt Institute: School of Architecture, New York
450 architectural students

Computer system: Not specified. Available in Engineering School since 1964.
Extent of use: Mainly by engineering students, although a few architectural and planning students are included. Elective courses are available on the use of the computer. The Engineering School provides undergraduate introductory courses, also graduate courses.

Princeton University: School of Architecture

Computer system: University's 7044, in use by School over past three years.
Extent of use: Mainly for structural analysis in engineering courses. Also occasionally by Professor Olgyay for climatology research and by graduate students doing independent research. General programs for statically indetermined frames and arches are available. University now gives a computer programming seminar twice a year in the evening. A new computer graphics will utilize a PCD 360/67 computer.
Commentary by school: "The University is planning to build a new computer center in the near future which will be available to all departments. Its use will be included in every department budget from next year on. At present students and faculty have free use of computers, but not for long."

Rensselaer Polytechnic Institute: School of Architecture, New York
250 architectural students

Computer system: Institute's IBM 360, model 50, in use by the School since April 1966.
Extent of use: Main users have been Professor Caravaty and Professor Haviland in research projects and several fifth year students in thesis work. A graduate program is based on the use of computers in architecture with specific application to architectural programming. So far the computer has been used as a data handling tool for a limited number of fifth year and graduate students. Several graduate and undergraduate students are taking a programming course. A current study of curriculum is investigating further contributions in detail. Local architects have used the computer service but only as a tool for producing charts for structural design.

Rice University: School of Architecture
135 architectural students

Computer system: Rice University has several computers, including an IBM 7040 which is available to all departments. The School of Architecture has been using this computer since 1965 for short periods of concentrated use.
Extent of use: Mainly by fifth year students. Last year and again this year these students have learned the FORTRAN programming language and then have written programs having direct application to architecture. The prepared programs have not yet been made available to anyone else.

University of Southern California: School of Architecture and Fine Arts
200 architectural students

Computer system: Honywell 400 and 800 equipment is available for general University use. In use by School during past 3 years.
Extent of use: Mainly by students in the design laboratory and in the structures program. A programming course has been added to the curriculum. Studio techniques have changed in great part from individual synthesis to group handling of alternative solutions. This has been made possible by the ability of students to handle numerous alternatives through use of the computer. Computer programs have been prepared for the determination of variable effects of insolation and for the optimization of specifically responsive form; these will probably become generally available next year.

Stanford University: Department of Art and Architecture
60 architectural students

Computer system: Not specified. In use by Department since 1965.
Extent of use: Students are enrolled in a class, "Computing in the Social Sciences and Humanities," embracing concept and properties of an algorithm, language and notation for describing algorithms, and the analysis of computational problems and development of algorithms for their solution.

Syracuse University: School of Architecture

Computer system: University's 714, in use by architectural faculty since fall 1965.
Extent of use: Mainly by graduate students and faculty in Metropolitan Studies and Planning Real Estate courses. A number of graduate students, particularly those in the M.S.P.-D.S.S. program, use a computer in their dissertation research. Annually the School's Planning Division invites Professor Richard Duke of Michigan State University to conduct a session of an Urban Planning Game; the computer is used for short times during the entire day that the Game consumes.
Commentary by school: As reported by Dean D. Kenneth Sargent, "The computer has not affected our program because we do not believe in utilizing a computer unless complexities demand it. We are contemplating to introduce the computer to all professional students, however."

University of Tennessee: School of Architecture
200 architectural students

Computer system: IBM 7040 in University's central computing facility, intended entirely for scientific computation, in use by architectural students and faculty since November 1966.
Extent of use: Mainly in field of structural analysis where tedious calculations are carried out on the computer. Simple applications, such as matrix inversion, are introduced in second quarter of structures program. No complete computer programs yet prepared by school.

Texas A & M University: School of Architecture
600 architectural students

Computer system: University's Data Processing Center, in use by School since fall 1965.
Extent of use: Mainly by Assistant Professor Ralph Clampitt and Assistant Professor Wes Harper on two research projects: (1) design problem partitioning, (2) automatic plotting in computer graphics. One brief exposure problem related to computer-aided design has been given in a second-year design class. A computer plotting program using FORTRAN IV and Cal-Comp Plotter has been prepared and is available to others.

Texas Technological College: Department of Architecture and Allied Arts
550 architectural students

Computer system: IBM 7040, in use since 1965.
Extent of use: By structural staff.

Tulane University: School of Architecture, Louisiana
160 architectural students

Computer system: University's Computer Center. In use by School since 1964.
Extent of use: Mainly by structural faculty, notably Professor Mouton and Professor Powell, for design and checking of major building projects. Computer methods and approximate analysis methods are compared and explained to the classes in structures.

University of Utah: Department of Architecture
150 architectural students

Computer system: An IDI graphic display and light pen interfaced to a UNIVAC 1108. In use since summer 1966.
Extent of use: Professor Stephen MacDonald and Lecturer Robert Wehrli are conducting research in computer graphics under an ARPA grant to Professor David C. Evans, Director of Computer Science. The development of new equipment is a central objective of the research. About a year hence it is expected that a remote display will be located in the Architecture Building for use by all faculty and students. The computer-use researchers are presently developing list structure programs for describing objects graphically. They intend to develop both hardware and software for many architectural and city planning needs including simulation programs. Services of the University's UNIVAC 1108 are already available to the architectural community and it is hoped that the graphics services when ready will also be used by local architects.
Commentary by school: As stated by Robert Wehrli in the opening paragraph of recent paper: "Computer-aided architectural services are now as inevitable as sunrise tomorrow. The question is not if architects will be practicing by computer, but only when and by whom. Perhaps this is a question of boon or doom for the profession and especially for the small office."

Virginia Polytechnic Institute: College of Architecture
450 architectural students

Computer system: Not specified. Use by College began mainly this past year.
Extent of use: By research faculty involved in three projects: (1) planning information systems, (2) central city functional location analysis, (3) structural engineering. Next year use of the computer will be introduced into Design Laboratory as part of an environmental systems program.

University of Washington: College of Architecture and Urban Planning
475 architectural students

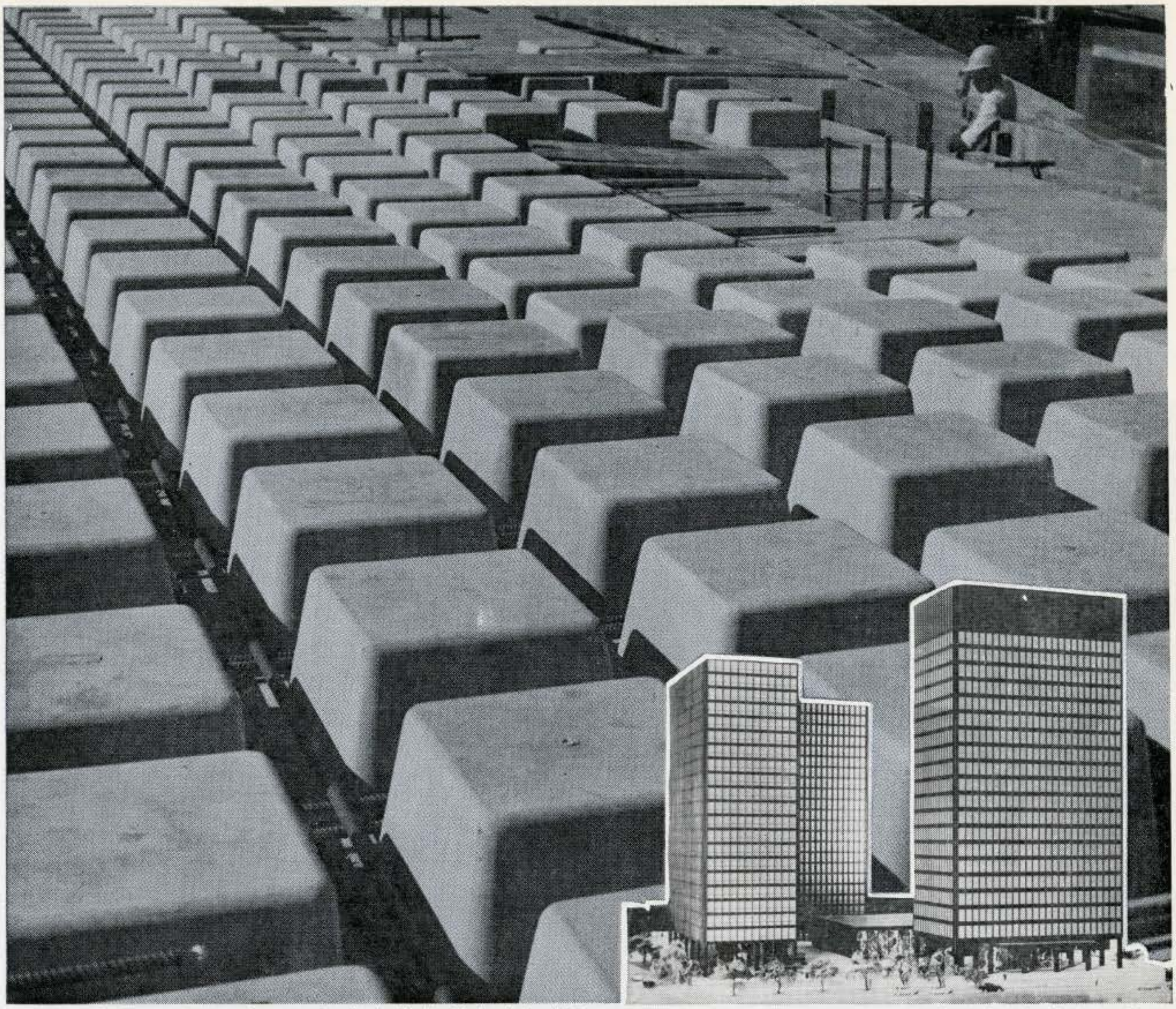
Computer system: For instructional purposes faculty has access to University's Computer Center with IBM 7040-7094 DCS, EAI and Cal-Comp Line Plotters. Students pay 25 cents for each two minutes of computer time. Use in architecture began 1964-65, earlier in planning.
Extent of use: Chiefly (1) faculty research, (2) graduate student projects, (3) undergraduate use in structures courses and occasionally in design studio. Use of computer is introduced as part of first year design "awareness". Subsequent use is encouraged for those interested. Elective courses in computer programming and applications (CPM) are available on campus. Greater use of graphic capability and programming for design process is anticipated. Computer programs would be made available through SHARE, an organization of computer facilities. Some planning programs are published by the Urban Data Center as part of its research program. A listing of completed projects and contemplated projects in architecture appears in a memo, "Computed Graphics," prepared by David Bonsteel and Robert Sasanoff, architectural faculty members.

Washington University: School of Architecture, Missouri
245 architectural students

Computer system: IBM 7070, in use by the School since 1964. By next year STRESS programs modified for this computer are expected to be available. The University also has an IBM 360 with very large capacity and very high speeds which will be used for research but not for teaching purposes.
Extent of use: Mainly by Joseph R. Passonneau, Dean, and by faculty and students interested in structural engineering. Such use has not yet changed the curriculum, but eventually "it will affect our structures program." The computer has also been used for data mapping projects and for analysis of urban growth. Computer programs have been prepared in both these fields.

Yale University: Department of Architecture
150 architectural students

Computer systems: University's IBM 7090-7094 and IBM 1620, in use by architectural faculty and students since fall 1966.
Extent of use: Mainly by 3 faculty members (Milne, Summers, and Goeters) and about 15 students. A course on computer applications to architectural problems is currently being offered. Some computer use by individual students is expected in connection with a special studies course and on spring semester theses. A simple class project has produced programs involving spatial identification (SID), conflict isolation, perimeter and structure articulation, and graphic output, as well as structural programs dealing with analysis and design of structures.
Commentary by school: As stated by Luis H. Summers, Deputy Computer Administrator and Assistant Professor of Architectural Engineering: "It seems to us that no outstanding effort towards organizing *significant* research of computers use in architecture has been attempted." □



The Westmount Centre Architects: Greenspoon, Freedlander, Plachta & Kryton, Montreal, P.Q. Pans by Protective Plastics Ltd., Toronto

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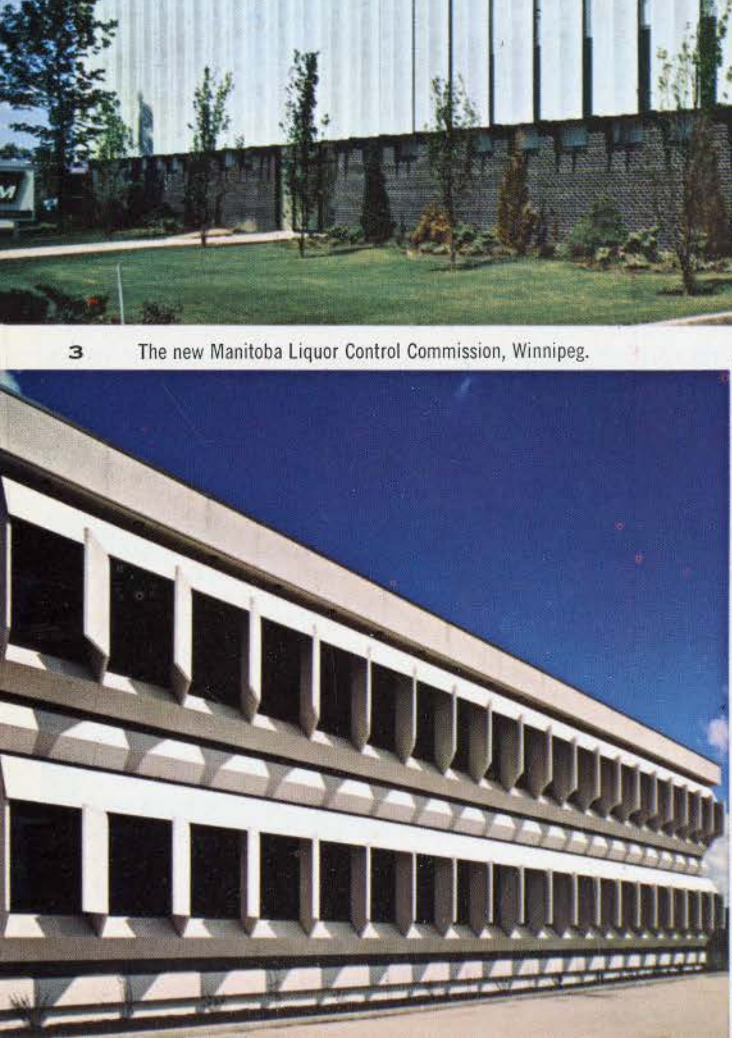
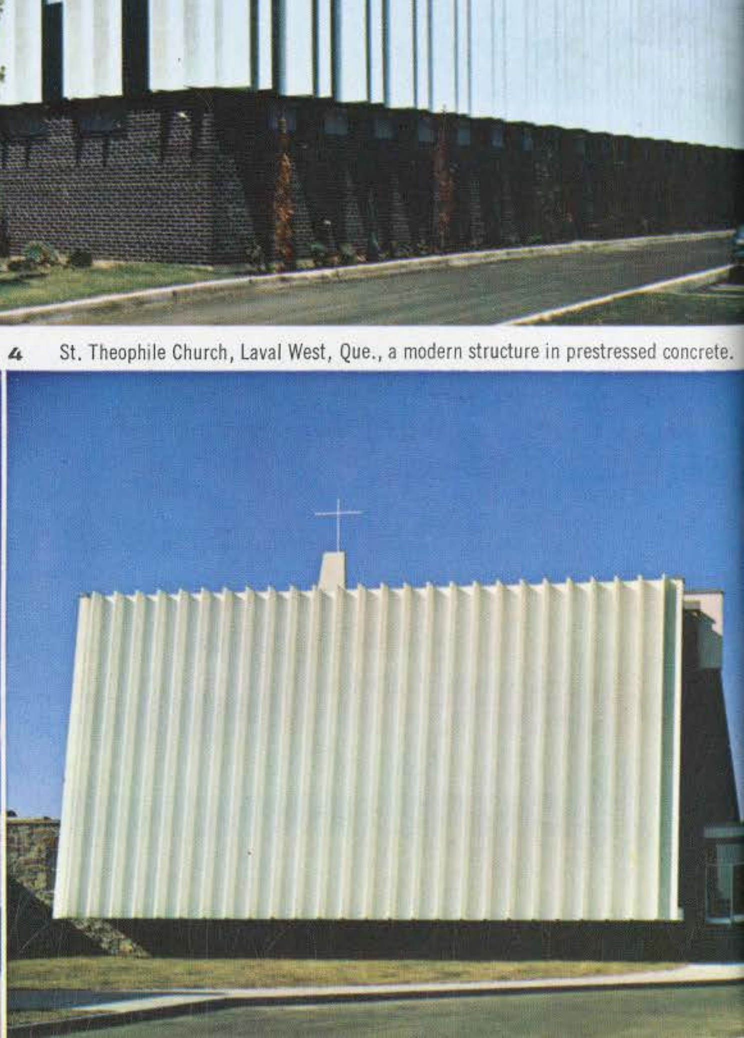


4 St. Theophile Church, Laval West, Que., a modern structure in prestressed concrete.



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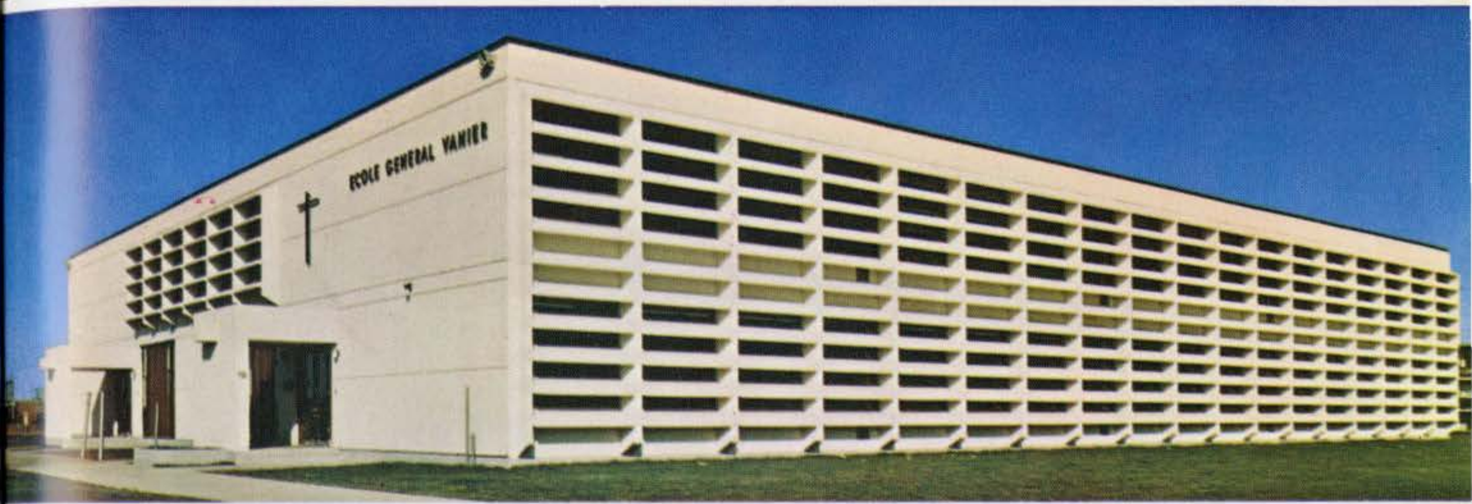
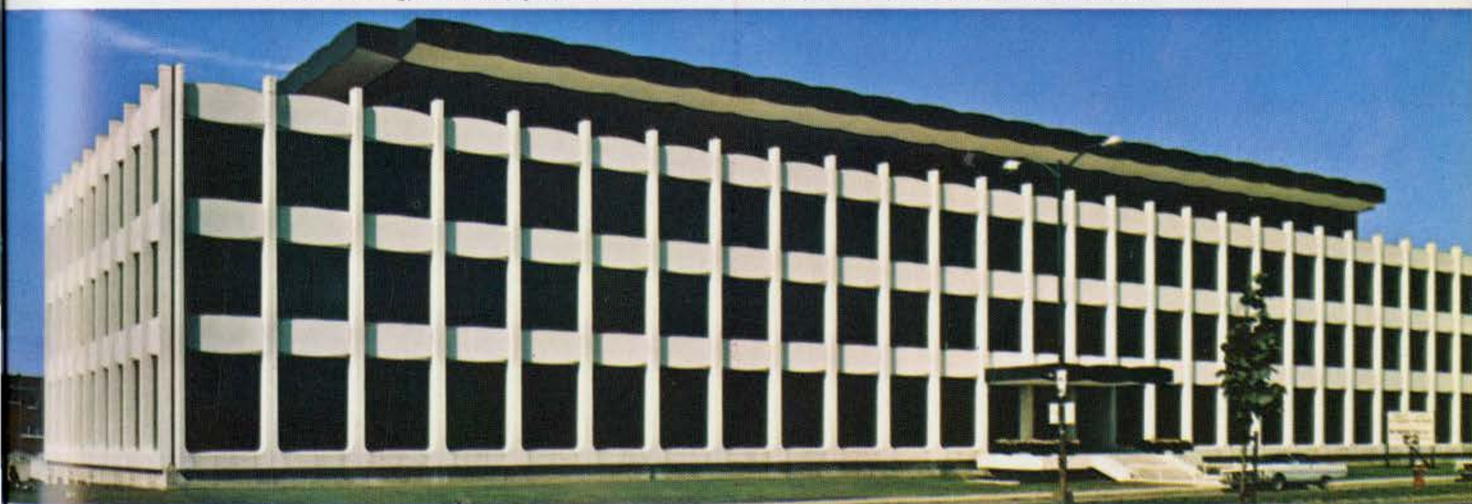
1. Owner and Builder: H. G. Winton Ltd. Architects: Ogus & Fisher Consulting Structural Engineers: G. Dowdell & Associates Prestressed concrete members: Standard Prestressed Structures Ltd.
2. Architects: Papineau, Gérin-Lajoie, Le Blanc Consulting Structural Engineers: Di Zazzo, Martinoli, Vigneault General Contractor: L'Archeveque & Rivest Ltée Precast concrete members: Arco Stone Co. Ltd.
3. Architects & Consulting Structural Engineers: Smith, Carter, Searle, Associates Gen. Contractor: Trident Construction Ltd. Precast concrete panels: Supercrete Ltd.
4. Architects: Damphouse & Vincent Consulting Structural Engineers: Claude Bourgeois & René Martineau General Contractor: Bernard Malo Inc. Precast and prestressed concrete: Francon (1966) Ltd.
5. Owner-developer: Immobilia Inc. Architects: Beauvais & Lusignan Associate Architect: F. A. Dawson Consulting Structural Engineers: Lalonde, Valois, Lamarre, Valois & Associés General Contractor: Paré & Quart Ltd. Precast and prestressed concrete: Francon (1966) Ltd.
6. Architects: Diamond-Clarke & Associates Consulting Structural Engineers: Angus Butler Engineering Ltd. General Contractor: Bird Construction Co. Ltd. Precast concrete members: Con-Force Products Ltd.

The General Vanier School, St. Leonard, Que., features precast concrete panels and louvers.



The Alliance Building, St. Laurent, Que., illustrates the distinctive beauty of an all precast and prestressed concrete building.



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ADA 67|68

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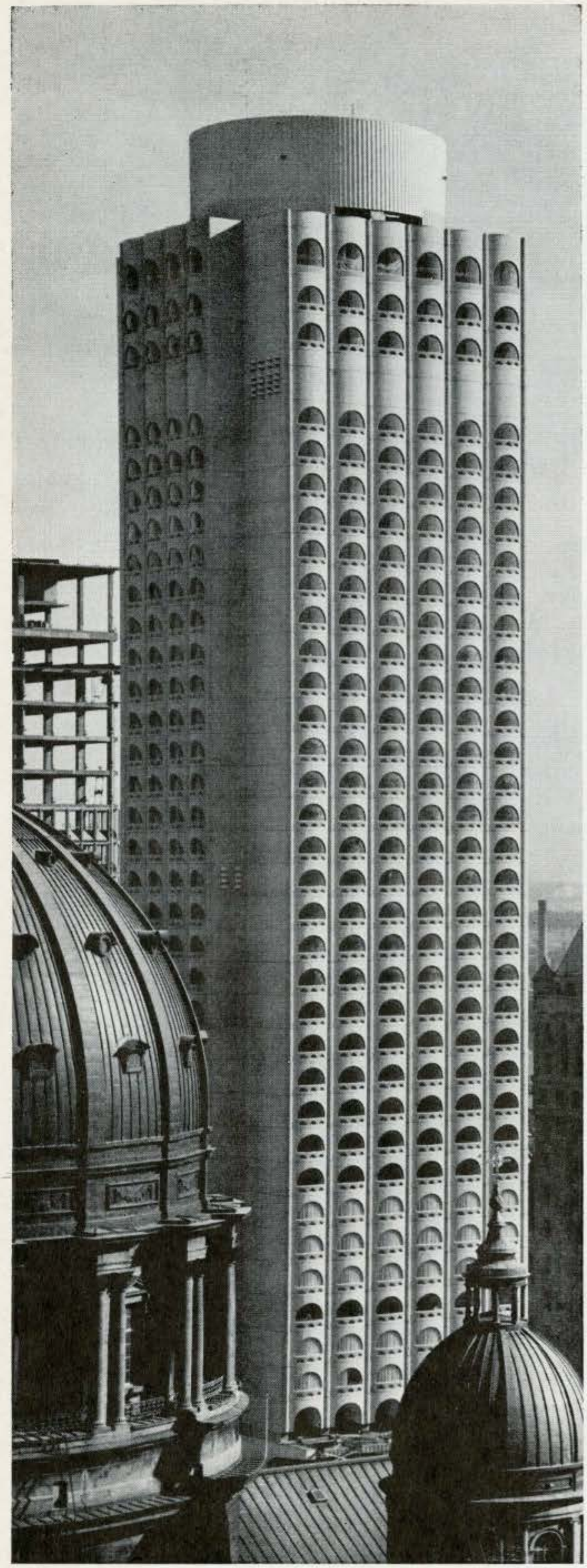

The Editors:
I read with interest your thoughtful presentation on Ottawa and the Confederation Square Redevelopment in the April issue of "Architecture Canada". Regrettably the firm of Richard Strong Associates Limited Landscape Architects was not credited for their contribution as landscape consultants for the Confederation Square Redevelopment project area. We kindly request a correction to the list of credits, to include Richard Strong Associates Limited, Landscape Architects.
John B. Parkin Associates

The editors also regret the omission of landscape architects Richard Strong and Associates Limited but that firm was not mentioned in the credits supplied.
The Editors

The Editors:
The comment in the April issue (Review, page 25) tells us more about AJD than it does about the Kline Biology Tower or Philip Johnson's attitude to architecture.

Serious architectural criticism would make a welcome addition to *Architecture Canada*. If Canadian architects are ready for it, reasoned examination of buildings in their context in relation to the client's needs and the architect's intentions could teach us a great deal. Occasional hit-and-run pronouncements in the Review section are no substitute.
Michael McMordie, Department of Architecture, University of Edinburgh, Scotland

The Editors:
Thank you, "Architecture America", for the space accorded Trend #24 in your most recent issue (May), page 25! Our patriotism is stung, however, by your inaccurate naming of our company. As everyone knows, we are The Steel Company of Outer Mongolia!
Best regards!
Yours very truly,
S. S. Dunmore, Supervisor Product Publicity & Sales Promotion

Editors' Note:
A Freudian Trend?

Coming in July Architecture Canada

— Place Bonaventure
— RAIC Assembly Addresses

Classified Annonces Classées

9

Advertisements for positions wanted or vacant, appointments, changes of address, registration notices, notices of practices including establishment or changes in partnership, etc., are published as notices free to the membership.

Practice Notes

George F. Eber Architect announces the appointment of Walter J. Mace, B. Arch, MRAIC as an Associate in the firm. Mr Mace who joined the firm in 1962, graduated in 1960 from the School of Architecture, McGill University. He has had varied experience with industrial, commercial and exhibition projects and will continue as Associate in charge of supervision and contract administration.

PositionsWanted

Ian McDonald and Peter Flack, two 4th-year students from the University of Natal, South Africa, would like employment in an architectural office in Toronto or Montreal from August '67 to February '68. Reply Box 139 *c/o Architecture Canada*.

Urgent employment required in Toronto/Montreal area 6-8 weeks from July 3rd by Scot, 26, qualified to intermediate standard RIBA, four years University of Strathclyde (Glasgow), four years London office experience, (working drawings, design, etc). References, Alexander K. Allison, 33, Thurloe Street, London, S.W. 7.

Graduate of Bachelor of Science in Architecture – University of Santo Tomas (Class 1959) Manila, Philippines, willing to start as an architectural draftsman, 4 years experience, age 31, single; Write by airmail to: Jesus F. Ruiz, 2839 Benita St, Patricia Subd. Tondo, Manila, Philippines.

Australian architect 28 years, B.Arch., migrating to Canada, experienced in town planning, commercial, industrial and residential work, seeks suitable position. Arriving Canada June 24, 1967. Peter Fuller 114 Blue's Point Tower, Blue's Point Road, McMahon's Point Sydney, Australia.

English architectural student aged 23 years expected to qualify with Bachelor of Architecture, Bristol University in June, seeks position in Toronto for a year. Has 10 months practical experience and is a member of Royal Institute of British Architects. Paul Davis, 23 Victoria Square, Clifton, Bristol E., England.

Intermediate Grade Architectural Assistant requires temporary employment, during twelve months pre-graduate training commencing July 1967. Vacation experience in private and public offices and student member of WYSA: D.P. Normanton c/o Leeds School of Architecture, 430 Woodhouse Lane, Leeds 2, England.

Architect, Israel, speaking English and French seeks employment. Intends to leave for Canada August 1967. Adolfo Fihman, 23 Golong St., Jerusalem, Israel.

Architect, 33 years of age, diploma of the Academy of Art in Vienna, member of the Austrian Association of Architects, skilled in the field of design (4 international awards), experienced in construction and detailing, industrious and devoted to his profession, seeks any position in architectural office. Mr. Kurt Zugaj, c/o E. Buchstatter, 114 Laurel Ave, Scarborough, Ont.

Indonesian, male, single, 24 years old, B.S. Arch., 1967 from University of Santo Tomas, Manila, Philippines, seeks position in a progressive architectural firm in Canada. Write to: Tek Hong Yaplim, 18 Dapitan Street, Quezon City, Phillipines.

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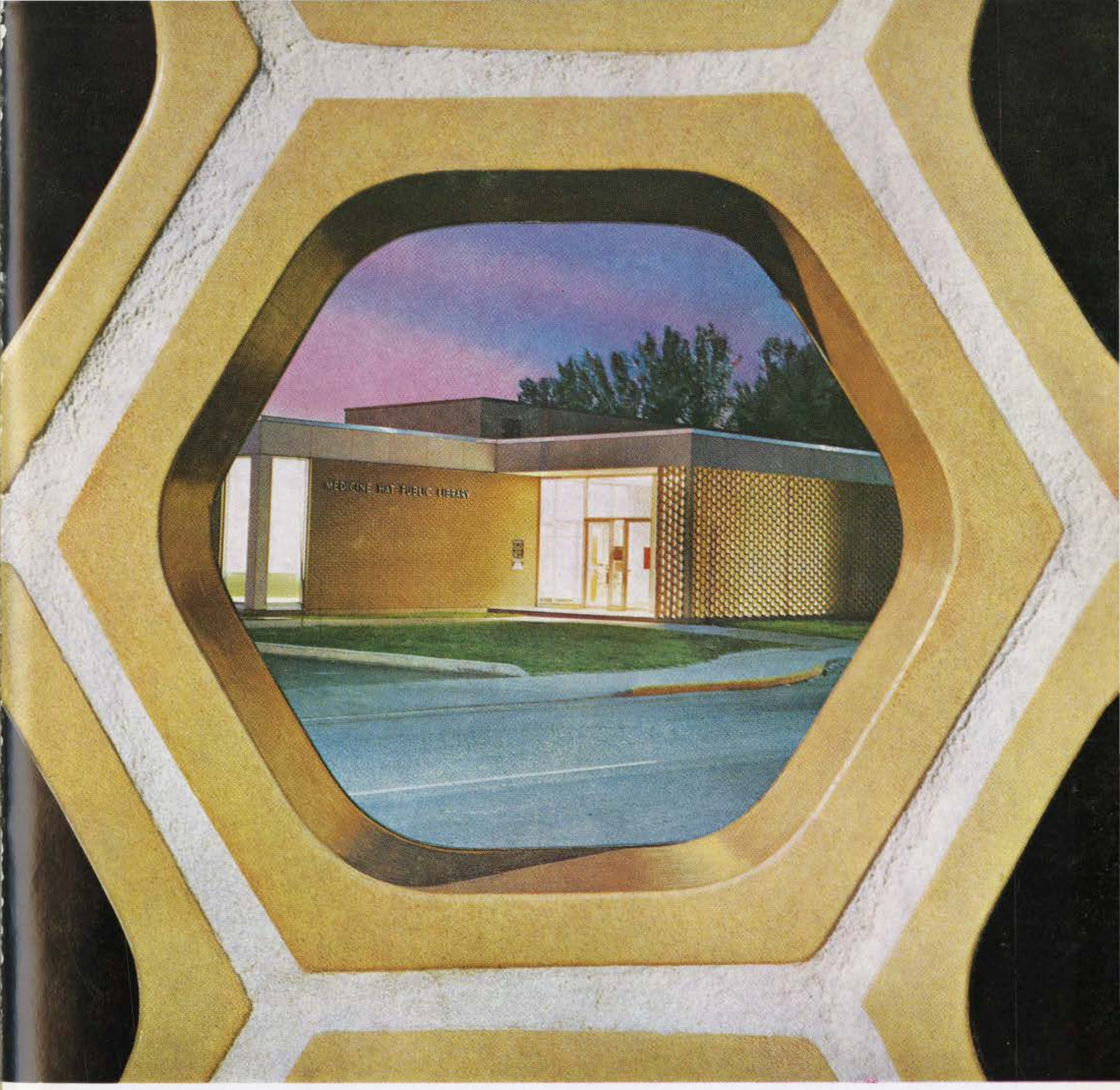

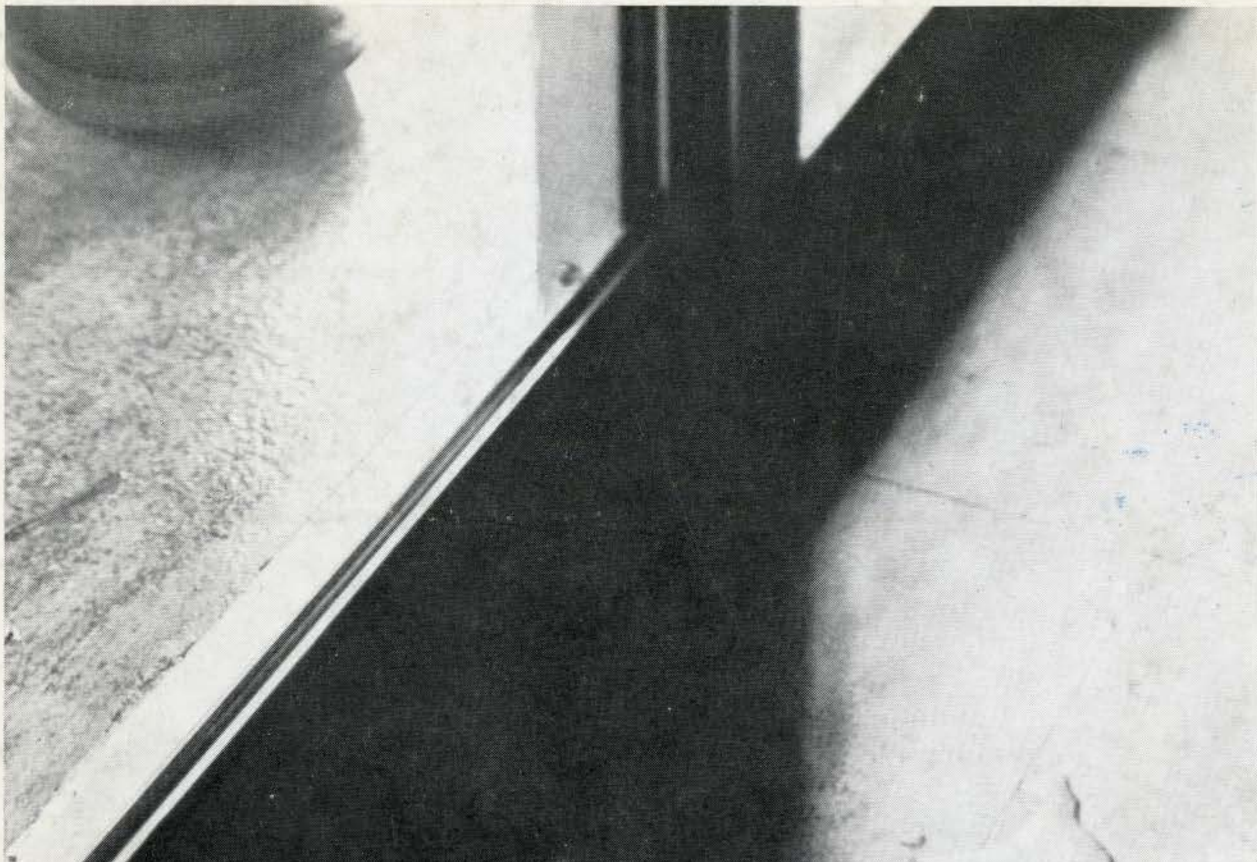

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