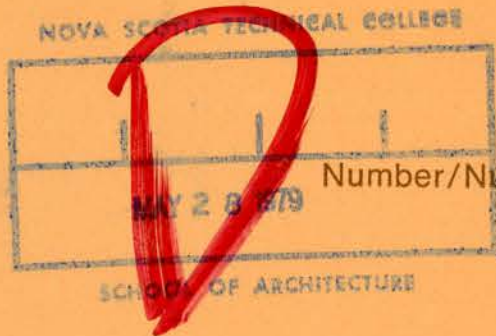


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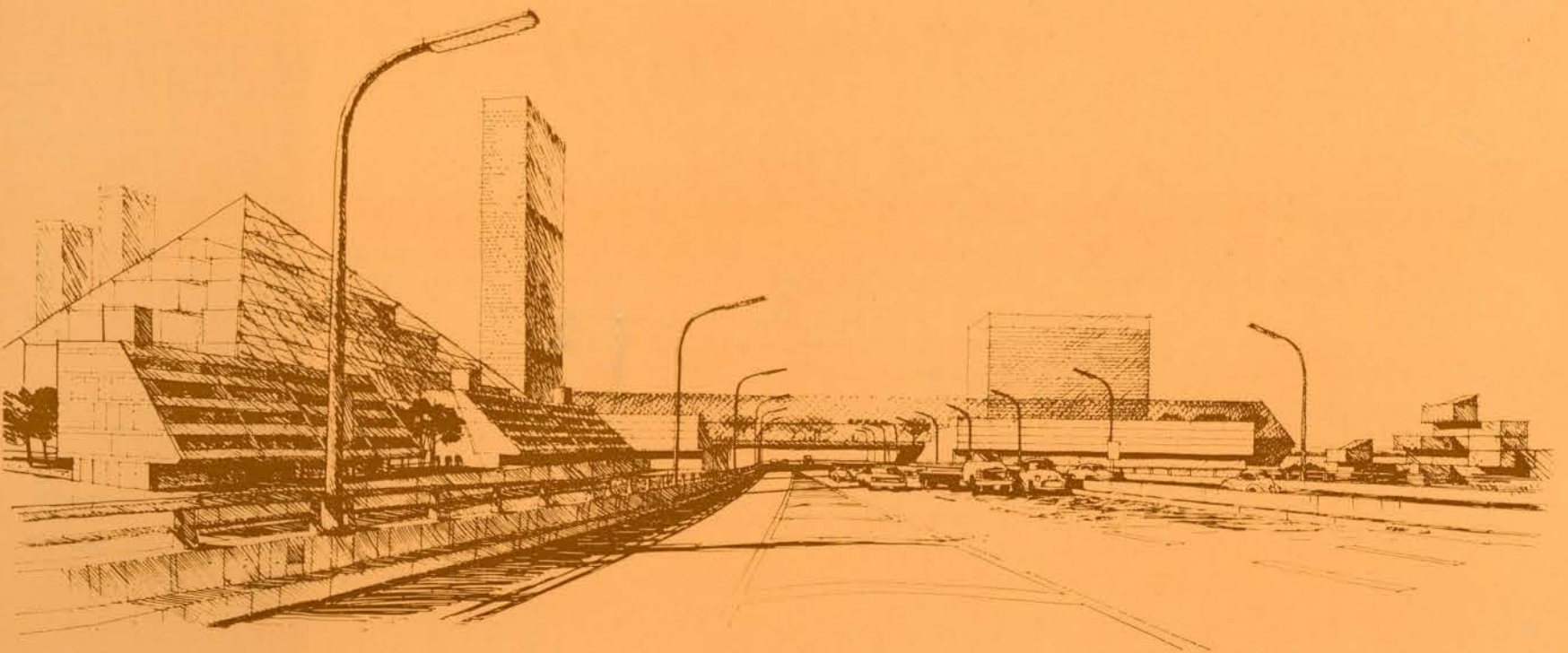
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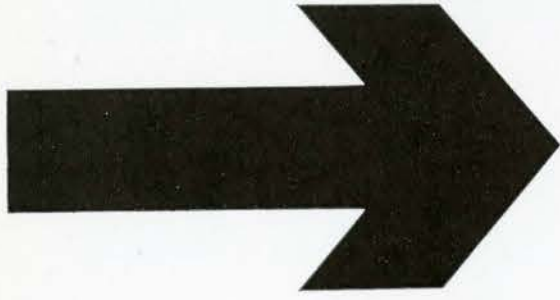
The Allied Arts: "Illusions and Architecture", the work of some contemporary painters in geometric imagery, by Anita Aarons

Features: "Project Toronto", a presentation and commentary on the study by Buckminster Fuller for the development of the city and region: "A Systems Approach to Urban Housing" by Anthony Collins

Technical Section: "CPM Graphics as a Design Tool" by Randle Iredale; regional unit prices for doors, glass and windows



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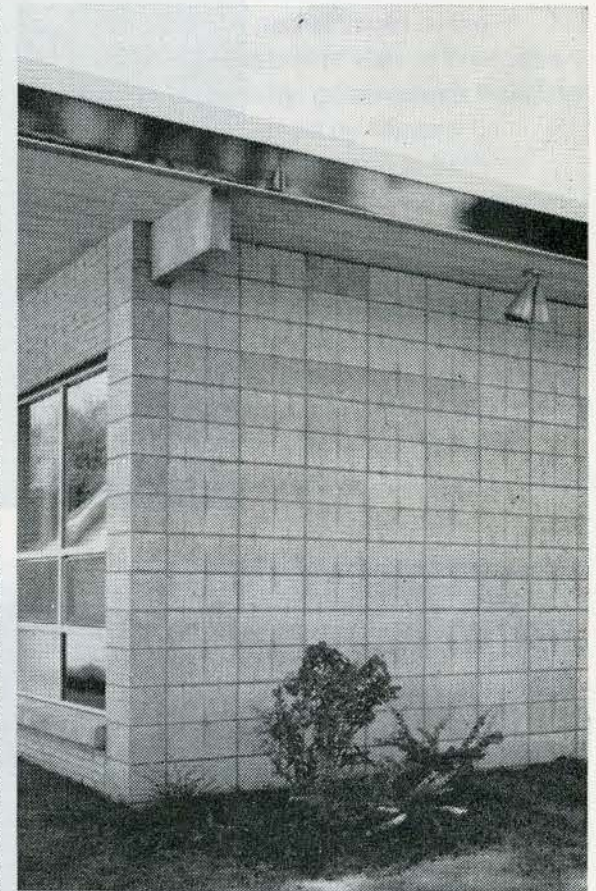
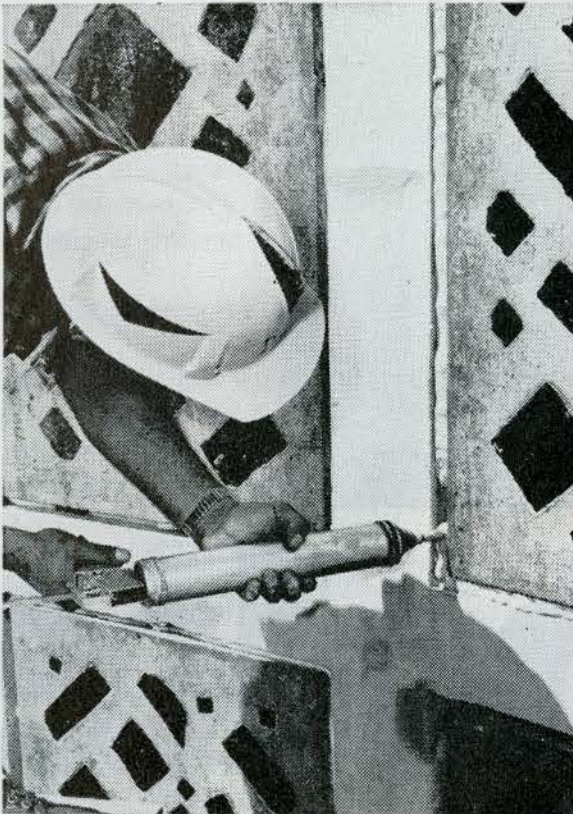
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"Profile 68", the 61st RAIC Annual Assembly at Regina, Sask., from May 29 to June 1, drew a representative group of architects and their wives from across Canada to a convention featuring a tightly knit and interesting program of speakers, discussions and tours, plus the usual social events, at which those not familiar with the famous "Western hospitality" learned that it was much more than just a phrase used in Assembly promotion literature.

The Annual General Meeting, apart from accepting without discussion the annual reports of the Officers and of RAIC Committees, was devoted mainly to discussion and comment on the changes to the Institute by-laws proposed last year by the Province of Quebec Association of Architects. Some of the comment appears elsewhere in this Assembly report and the subject is touched on in this month's "Communiqué" column.

Late Vincent Massey Honored

The Institute's highest honor, the RAIC Gold Medal for distinguished achievement and contribution to the advancement of architecture, was awarded posthumously this year to the late Right Honorable Vincent Massey, CC, CH, Hon. FRAIC, in recognition of his services to Canada and his life-long support of art and architecture. In 1950 he instituted the Massey Medals for Architecture Awards, a competition held every three years and administered by the RAIC on behalf of the Massey Foundation. The Medal was accepted by Mr Massey's architect son, Hart Massey (F), of Ottawa at the Assembly Annual Dinner.

Artist and Architect Honored

The RAIC Allied Arts Medal for 1968 was presented to artist-teacher-editor Eli Bornstein of Saskatoon, whose interesting career was described in the May issue.

Honored for long service to the profession in office practice, provincial and Institute affairs was H. Claire Mott (F) of Saint John, NB, who was made an Honorary Member of the RAIC. In the August issue Mr Mott reminisces on a career in architecture which began at the opening of the century

and ended with his retirement a few years ago.

RAIC Officers for 1968

The incoming President, Norman H. McMurrich of Toronto, was inducted at the annual dinner by his predecessor, James E. Searle of Winnipeg. W. J. Leithead, Vancouver, became Vice President, Gordon R. Arnott of Regina, Honorary Secretary, and Harry Mayerovitch, Montreal, was named Honorary Treasurer.

College of Fellows

The College of Fellows held its business meeting Friday morning, when Howard Bouey succeeded Neil M. Stewart as Registrar. The annual Convocation was held Saturday morning. AIA Past President Charles M. Nes Jr. was made an Honorary Fellow, and Fellowships were conferred on Gordon R. Arnott, William E. Barnett, James B. Bell, John M. Dayton, Robert Stirling Ferguson, Douglas C. Haldenby, Mel P. Michener, John R. Myles, Victor Prus, Ray L. Toby and Allan H. Waisman. Two new Fellows not able to attend the Convocation were Aimé Desautels and Arthur Erickson.

Tours and Visits

Outside events during the Assembly included the opening at the Norman MacKenzie Art Gallery of an exhibition of Saskatchewan architecture, which included a collection of excellent photos of early buildings in the province and a one-man show of the work of Regina architect Clifford Wiens, who has won ten national and international awards, including five Massey Medals. On the Friday afternoon there was a guided tour of Wascana Centre, followed by a reception for members given by the Centre, and later in the evening a number of Regina architects held open house for all visitors. For most of the members it was their first visit to Wascana Centre, the University, government building and park area designed by Minoru Yamasaki. The new Wascana is both an extension and an elaboration of Thomas Mawson's pre-First World War master plan for the government and civic centre area. Incidentally, the tour of the Legislative Building gave visitors an opportunity to see the modifications to the interior, by Clifford Wiens, which provide exhibition galleries for the province's collection of portraits of Saskatchewan notables, including the Indian



1968-69 RAIC Council: front, left to right: Maurice Holdham, Executive Secretary, Ottawa; G. R. Arnott (F), Hon. Secretary, Regina; N. H. McMurrich (F) President, Toronto; J. E. Searle (F), Past President, Winnipeg; Harry Mayerovitch (F), Hon. Treasurer, Montreal; Earl Mayo Asst. Secretary, Ottawa. Rear, Councillors F. Noseworthy, St. John's; M. P. Michener (F), Winnipeg; R. W. Siddall (F), Victoria; D. L. Sinclair, Edmonton; C. F. T. Rounthwaite (F), Toronto; John R. Myles (F), Saint John; Allan F. Duffus (F), Halifax; (absent: W. G. Leithead (F), Vice President, Vancouver; Jean-Louis Lalonde, Montreal; A. W. Dennison, D'Arcy Helmer (F), Ottawa)

1

Neil Stewart (F), Fredericton, was awarded best men's costume prize by judge Mrs Denise Ketcheson

Neil Stewart (F), Fredericton a remporté un premier prix au bal costumé, juge Mme Denise Ketcheson

2

Mr and Mrs Gerry Norbraten of Regina
M. and Mme Gerry Norbraten de Regina

leaders of early days. Saturday afternoon was free for tours of other local centres of interest.

The Saskatchewan Association of Architect's welcoming reception on the Wednesday night was followed on Thursday evening first by the Sweet's Catalogue reception and later by the Buffalo Days costume dinner and dance. Some of the costumes which can be published are shown with this Assembly Report. The Buffalo hats given everyone attending were the gift of the City of Regina. Great credit is due the host committee, headed by Mr and Mrs Gordon Arnott and Mr and Mrs Alex Hermann, for the liveliness and the smooth running of the Assembly program.

Theme Speakers

Opening speaker on the Assembly theme, "The Profile of the Architect", was Washington architecture critic and author Wolf von Eckhardt who in the opening luncheon address on Thursday May 30th on "The Challenge of Urban Growth" spoke of the professional, social and moral responsibility of the architect toward the urban environment. Architects could not talk about their theoretical role in creating the total environment of the future without accepting some responsibility for what had happened in the past. "What has happened," he asked, "to the great architectural revolution, the prescriptions of 40 and 50 years ago for the needs of today; the dreams of Corbusier, Gropius and CIAM." In the United States the dreams of the revolution had been betrayed. "You still have a chance in Canada, and I beseech you to avoid our mistakes." It was better to be good than original. What mattered was not urban growth, but human growth; what was needed was a creative environment in which the individual had room to grow the greatest intellectual, artistic and cultural capacity. Mr von Eckhardt was theme leader the following day for the seminar on architectural criticism, a report on which appears in the next issue.

Architectural Education

"Education Profile" was the title of the Thursday afternoon paper on architectural

education by Prof. Gerald M. McCue, AIA, chairman of the Department of Architecture, University of California (Berkeley). Prof. McCue, whose paper is published elsewhere in this issue, is chairman of the AIA Committee on the future of the Profession, and in a luncheon address on Friday he gave a brief outline of the committee's approach to the subject.

Incidentally Prof. McCue's firm won one of the Prestressed Concrete Institute's recent awards.

Tools for Better Design

The third theme speaker, Prof. C. Herbert Wheeler Jr., AIA, of the Department of Architectural Engineering at Pennsylvania State College, took as his "Profile" architectural practice and its many variations. Prof. Wheeler, whose paper will be published in a later issue of *Architecture Canada*, described, with the aid of slides, the emerging technologies and techniques which, he believes, will change the profession of architecture as it is known today. As a consultant on the subject Prof. Wheeler has done considerable research with American and Canadian architectural firms, contributed to the AIA's publication program.

Assembly Report: the Annual Meeting

Announcement by President James Searle at the Annual Meeting Thursday morning that the Committee of Presidents had received and passed to RAIC Council earlier in the week the proposed revisions to the RAIC By-laws, which Council had accepted, with the exception of modifications to the voting procedures, opened the general discussion on the subject.

The President first outlined the events leading up to the preparation of the proposed revisions, saying that last fall the Province of Quebec Association of Architects, after consultation with its members, had agreed to resume paying annual per capita dues at the established rate, but, at the same time, requested consideration of certain amendments to the Institute By-laws with the aim of establishing closer liaison between RAIC Council and



1



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*Mr and Mrs Eric W. Thrift, Ottawa, won the prize for best dressed couple
Le prix du couple le mieux habillé allait à M et Mme Eric W. Thrift, Ottawa.*

the provincial association councils. Norman McMurrich was appointed chairman of a committee to work with the RAIC solicitor, John Nelligan of Ottawa, on a review of the PQAA suggestions which, incidentally, were the result of a very good analysis by them of the present By-law structure. The proposals were sent to all provincial associations for comment. The comments were then analysed by Mr McMurrich's committee with regard to points unanimously acceptable; points which a majority of provinces or a majority of the architects in Canada represented by provincial councils seemed to desire and points which were unacceptable to the majority. From these was drafted a synopsis



in lay terms of a new form of By-laws which expressed, in essence, what the various provincial councils wished to achieve. It was no longer correct to refer to the draft as a PQAA By-laws proposal because the PQAA at first did not agree with some of the changes in their original proposals which the majority desired. It was this draft which had been submitted to the Committee of Presidents and RAIC Council and it was now the intention to have the RAIC solicitor prepare new draft By-laws based on the conditions in synopsis; these would be submitted to RAIC Council and the provincial associations for comment and then to the RAIC Electoral Board for vote. If approved, the new By-laws would become law by the end of 1968. Mr Searle then read the 10-point draft proposals.

Discussion was perhaps hampered because copies of the draft were not available for general distribution, and in reply to a criticism on this the President pointed out that distribution had been restricted to provincial and RAIC councillors at the wish of the provincial associations who, in turn, were responsible for informing their members.

John L. Davies, an RAIC Past President, expressed concern that re-structuring of the RAIC Council would result in a return to its domination of earlier years by Ontario and Quebec and that special interest groups like employed architects in government, might not have direct representation.

AIBC President John Dayton said he thought all the provincial presidents had tried very hard at the meeting of the Committee of Presidents to arrive at a compromise that would have the support of Ontario and Quebec, but he felt that RAIC Council might become too powerful. Mr Searle said that this obviously was not the intention; and Jean-Louis Lalonde, PQAA Vice President, said that if it was thought that the new By-laws would remove voting power from the Annual Assembly, he would like to point out that the Assembly never did have voting power. It was not in the RAIC Charter.

OAA President John Spence said that what his association was interested in was

*G. R. Arnott (F), Regina, Chairman of the Host Committee
G. R. Arnott (F), Président du Comité d'accueil*

maintaining the national body. "We didn't agree with Quebec out of love for Quebec. We agreed (with the revisions) because we want to see this a national body, promoting architecture on a national basis and for the benefit of architects on a country-wide scale, and we are not doing anything towards this cause by being troubled by past ghosts of the origin of the Institute as it started in Quebec and Ontario."

Manitoba Association Past President Mel Michener said that when he joined RAIC Council a year ago his views were very similar to those expressed by John Davies, John Dayton and some others, but now he realized that what Ontario and Quebec were trying to do was to make the RAIC in fact



The incoming RAIC president Norman H. McMurrich (F), Toronto (left) and retiring president James E. Searle (F), Winnipeg
Le nouveau président de l'IRAC Norman H. McMurrich (F), Toronto (à gauche) et le président sortant de charge James E. Searle (F), Winnipeg

more effective by involving the provincial associations and, through them, the individual members, in a more positive way. One of the most important results of the changed By-laws, he thought, would be the re-structuring of the committees, because it was in the committees, not in council, that the real work of the RAIC was done. National committees would work in close co-operation with provincial associations so that there would not be duplication at the national level of work being done very ably at the provincial level. Judging from his experience on council he thought that the issue of voting rights was a red herring. If attempts by a few members to control Council had not occurred in the very difficult past year, they would not occur in the future. He thought that the Institute could now move on to the very important job of helping architects in Canada to run their practices better. Speaking to the question raised by some members about the possibility of the restructured Council not being fully representative, the President said that the problem did exist at one time, but did not now and the proposed revisions structured the Council so that it was mandatory that each province had a voice. It was inconceivable that things would not be discussed.

It was not the intention, Mr Searle added, to have a vote on the matter at this annual

meeting because Council had not received formal replies from the provinces, nor was the draft a formal document. The comments heard would be taken into consideration in preparation of a new draft By-law which, as he said in the beginning, would be sent to provincial associations and the Electoral Board for consideration.

Joseph Baker, President of the Province of Quebec Association of Architects, found himself in a somewhat strange and anomalous position – that of listening to criticism of the RAIC officers and Council for things they had not done – not criticism from Quebec, but from members from other provinces. He thought the meeting should know of the tremendous efforts and energies which President Searle and Vice President McMurrich, together with the RAIC solicitor, had devoted to arriving at the point where the recommendations were acceptable in a province which at one time took – and he thought members should realize this – an extreme position.

“If you find these recommendations today extreme, then you should have been familiarized with what was demanded in the Province of Quebec when we started negotiations some time back. But due to the energies of your President and Vice President, together with the component associations, we arrived at what you might call a compromise. This is a word which



1968 Allied Arts Medalist Eli Bornstein, Regina.
Eli Bornstein, Regina, titulaire de la médaille des Arts connexes pour 1968.

H. Claire Mott (F), Saint John, awarded RAIC Honorary Membership
H. Claire Mott (F), Saint John a été nommé Membre honoraire



8
Hart Massey (F) receives the RAIC Gold Medal for 1968 on behalf of his father, the late Right Honorable Vincent Massey
Hart Massey (F) reçoit la Médaille d'or de l'Institut pour 1968 au nom de son père, le très honorable Vincent Massey

9
RAIC Convention Desk at Regina Inn, left to right Mrs Louise Procyshyn, Mrs J. Nishakawa, Sharon Kurtz, Mrs Ross Goldie, Regina; Terry Brady, RAIC Staff, Ottawa; Mrs Eileen Hippe, Executive Secretary SAA; Therese Nault, RAIC Staff, Ottawa



8
 generally I shun, indeed am somewhat afraid of, and people in the Province of Quebec are also, but this brings me to a second anomalous position – that I, a relatively new Canadian, should have to explain . . . that Canada itself is a compromise. It is not 'dear old England', governed by a rather central kind of government, with the RIBA in easy and quick contact with its membership. Canada is 5,000 miles wide, and despite the miracle of aircraft, is still a rather difficult country to govern, and the institutions in the country are also difficult. However, we have found, a compromise solution in governing the country, and I think the arrangements which we are making in the RAIC are also a compromise, but we accept them and we think they are in the interests of the profession.

"If you will appreciate that this is not an extreme position which is being put before you, but one which has come a long way, a different light will be cast upon it. Questions have been raised which deserve answers. First, we do not believe that the recommendations in any way weaken the RAIC. I don't need to dwell on this, because the President, Mr Michener and several others who spoke before me have made a far better case and explanation of how RAIC will be strengthened.

"We believe it will be strengthened because it will make this body truly representative of the associations and the architects of this country. For better or for worse, we divide

ourselves into component associations. We govern more effectively that way. We've each got an Act and Charter from the government to regulate the profession and we do this within the provincial boundaries but, because we believe in interchange and because we believe it is necessary to liaise one with the other, we establish a central body. Now there have been some misimpressions given that there is something almost anti-Canadian about what is being suggested; that by eliminating an annual convention such as this meeting which, it has been pointed out to you, is without true power, would be anti-Canadian;

that it is anti-Canadian to bring together the authoritative bodies which govern the architects in this country at a general meeting where decisions might be taken with the full authority of elected representatives. I find this a curious misconception, and I believe it should be corrected. We wish to have an annual meeting where, if possible, every member of provincial council elected by its membership will be present. It will give them the votes representative of the numbers in their membership.

"I find this democratic. I find it Canadian."

The last item of business at the annual meeting was a resolution from the PQAA concerning reciprocity in registration. The PQAA Council minutes read: "That we send a motion to the RAIC for the coming annual meeting to the effect that the component associations of the RAIC favor the breaking down of barriers now existing to effective interprovincial practice on the part of architects registered in any province of Canada". After discussion the meeting voted to refer the matter to the incoming Council.

The meeting closed with an expression of appreciation, voiced by W. N. Greer, for the work and the dedication retiring President Searle had given to the Institute over the past year.





Howard F. Bouey (F)

Registrar College of Fellows

Howard F. Bouey (F) of Edmonton, has been appointed Registrar of the RAIC College of Fellows. He succeeds Neil M. Stewart (F) of Fredericton. Mr Bouey is a past president of the Alberta Association of Architects and served on RAIC Council from 1956 to 1964. He was the author of the 1965 report on the Aims and Functions of the RAIC. Since 1962 he has practiced in Edmonton with his brother under the firm name of Robert and Howard Bouey.

Revisions to Saskatchewan Architects Act Announced at SAA Annual Meeting

The announcement by President Desmond Paine that the revised Saskatchewan Association of Architects Act had been approved by the Legislature featured a busy day for Saskatchewan architects on May 29th. At the conclusion of the Association's annual meeting, which started in the morning, the members became very active hosts for the RAIC Annual Assembly which opened that day in Regina.

The revised Act now puts the Association in a position to negotiate reciprocal arrangements for practice with other provinces; and consideration, at least, may now be given to the incorporation of architectural practices. Many items previously in the Act were removed and incorporated in the by-laws, thus allowing more freedom for possible revision.

E. H. Grolle, Regina, succeeded Desmond Paine, Saskatoon, in the presidency, and continuing Council members in addition to the latter are P. M. Scott, Saskatoon, first vice president; G. R. Arnott (F), Regina, second vice president; and Clifford Wiens, Regina. New Councillors elected were F. W. Moore, Prince Albert; W. R. Ganes, Saskatoon and K. L. McMillan, Regina.

by Mr Fuller and his associates provides us with a good reason to publish the second OAA letter.

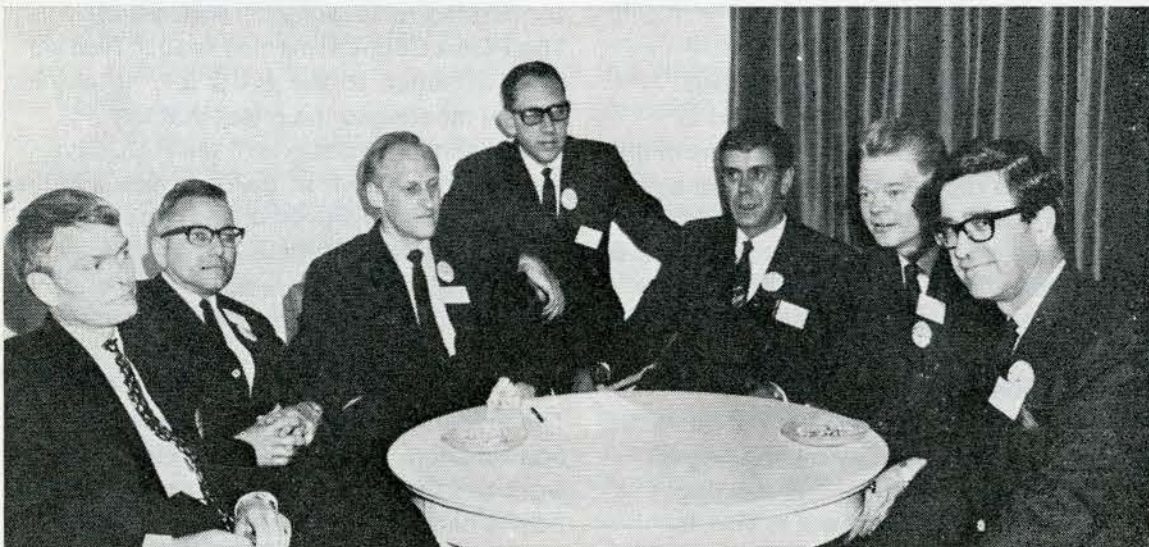
The exchange began last March with a letter to Mr Fuller saying that it appeared from newspaper reports of Project Toronto that he might be intending to perform architectural services in the province. His attention was drawn to provincial legislation governing the practice of architecture in Ontario and copies of the Architects Act and the Regulations of the Registration Board were enclosed for his guidance.

What the OAA thought to be a routine letter on a routine procedure was taken by Mr Fuller to be abrupt and unfriendly, and his reply, which was published in the local press, said that while he had been honored by the architectural and engineering professions, he was not an architect and had never professed to be one. He explained how Project Toronto came about and added that should he or his associates be asked to undertake any architectural services in Toronto they would become associated with a Toronto architectural firm in the regular way.

John Spence, OAA President, has now written Mr Fuller to express regret that he considered the first letter abrupt and unfriendly in tone. "It was certainly not our purpose to insult a person who has achieved the distinctions which you mention in your reply", wrote Mr Spence. "These distinctions are well known to us in Ontario and your inventive genius, in our opinion, is held in high respect not only here but throughout the world.

"The purpose of our original letter, which is sent to all international consultants who may be contemplating engagement in Ontario, is to simply outline in a business way, for information purposes, the conditions which govern the practice of architecture in Ontario.

"We appreciated the assurance of your reply and we extend on behalf of the Ontario Association of Architects the same personal and wholehearted welcome to Ontario which, we believe, has been yours on past occasions".



Saskatchewan Association of Architects 1968 Council, left to right: Clifford Wiens, Frank Moore, President Henry Grolle, Phil M. Scott, Past President Desmond Paine, Ken McMillan, G. R. Arnott (F). (Absent, W. R. Ganes, Secretary Treasurer)

New Publication on Tendering Procedures

"Guide to Construction Tendering Procedures", a new 20-page publication for the use of buyers of construction services, architects, engineers and contractors, has been published by the Canadian Joint Committee on Construction Documents and Procedures of the RAIC, ACEC, EIC and CCA, in consultation with the SWAC. Copies are available from RAIC Headquarters, Ottawa, at 25¢ each.

Buckminster Fuller and the OAA

Professional organizations to which governments have delegated the responsibility of administering their Legislative Acts sometimes in the routine discharge of their duties encounter reactions quite different than those expected. The exchange of correspondence between Buckminster Fuller and the Ontario Association of Architects is a case in point, and the publication elsewhere in this issue of *Architecture Canada* of "Project Toronto"

James A. Murray, Chairman CHDC

James A. Murray (F), Toronto was elected Chairman of the Canadian Housing Design Council at the Council's annual meeting held recently in Edmonton. He succeeds Ronald K. Fraser of Hamilton.

N.R.C. Publications

Supplements No 28 and Nos 13 to 24 to the list of publications of the Division of Building Research, NRC, Ottawa, are now available.

John C. Parkin Given Manitoba Alumni 1968 Jubilee Award for Distinguished Achievement

The 1968 Alumni Jubilee Award for distinguished achievement of the University of Manitoba Alumni Association was bestowed upon John C. Parkin, RCA, FRAIC, FRIBA, of Toronto, at the University's Convocation at Winnipeg May 24th.

Mr Parkin, who graduated with honors in 1944, in addition to being a distinguished architect, has played a leading role in the affairs of a number of national institutions, including the Canadian Conference of the Arts and the National Design Council, of which he has been president for the past ten years. Recently he was selected as a juror for the British Government Commonwealth Competition for the Redevelopment of Whitehall, the Houses of Parliament in London.

In his address of acceptance, which he began with a tribute to the Manitoba Faculty of Architecture and its late beloved Dean, Dr John Russell, Mr Parkin spoke of the present condition of the urban environment, the multiplicity of governments or, in some cases the absence of government, which inhibits social action and of the urgent need for an organized study by Parliament. He was particularly concerned about the role of the architect in contributing to the solution, and *Architecture Canada* has extracted from his address remarks particularly pertinent to the profession.

- "A kind of political neutrality has been characteristic of the architect of the past for architects, more often than not, appear to worry about involvement with the power structure. Is it because we have feared that, like some modern Faust, we would sell whatever freedom we may have obtained for power and authority? I would like to put forward some ideas that might dispel this notion of the architect's uncommitted role, particularly as it affects the design of cities, for the architect cannot remain uncommitted, in my view, if he is to find cures for the urban migraine which has beset our nation.

"The architect has, after all, *some* things in common with the politician. There are, for example, no second prizes for either . . . one builds or one governs. The alternative is to simply observe or to criticize. Lobbying is an occupational hazard for both. Apathy is the normal climate in which both the architect and the politician appear to work."

- "The enormous task of adjustment facing us demands an immediate and fundamental realignment in the decision making techniques affecting the urban environment. The nature and form of our environment are capable of being controlled. While the adjustments and cost of solving the problems of urbanization will be truly enormous,



I am nonetheless more confident of *their* compromise and *their* ultimate solution than I am of a realization of our human and visual objectives. The reason for my doubts lies in what might be called our underdeveloped ecological conscience. A Canadian authority, Dr John Dakin, stated it very well when he said 'Our difficulty lies not in technology, but how to develop the social will to use technology intelligently'.

"I do not presume to suggest how a deeper social conscience can be developed, but I do say that until we do we will never have a *quality of life* we desire for ourselves in our city. This is where the role of the architect assumes a central position. But for the architect to assume that central position he must make basic changes in his professional posture and his techniques of working. The architect must become part-political, for the principal impediments to the renewal of cities appear to be owed, in some instances, to over-government and, in others to absence of government. Indeed, we are over-governed in Canada, at least in the sense of being overcrowded with governments. We have in our country 1 Federal, 10 Provincial, 2 Territorial and 4,866 Municipal jurisdictions, a total in Canada of almost 5,000 governments."

- "Concomitant with the re-ordering of the democratic process in this country, may I conjecture the possibility of a standing committee on urban affairs and urban problems in the Federal House. Such a committee might well be the genesis of a Royal Commission into the total environment. Other royal commissions have been established which come close, or even closer, to provincial jurisdictions and *their* responsibility. Unless such a commission is established at the Federal level, it is less likely that any true co-ordination could be obtained at the other levels. As has been the case, those Provincial Governments not in agreement with the commission's findings or, indeed, with the establishment of the commission itself, could opt out. The intent of such a royal commission would be to identify all those resources within the Federal Government which influence the form of our urban society and to recommend how those resources could be organized so

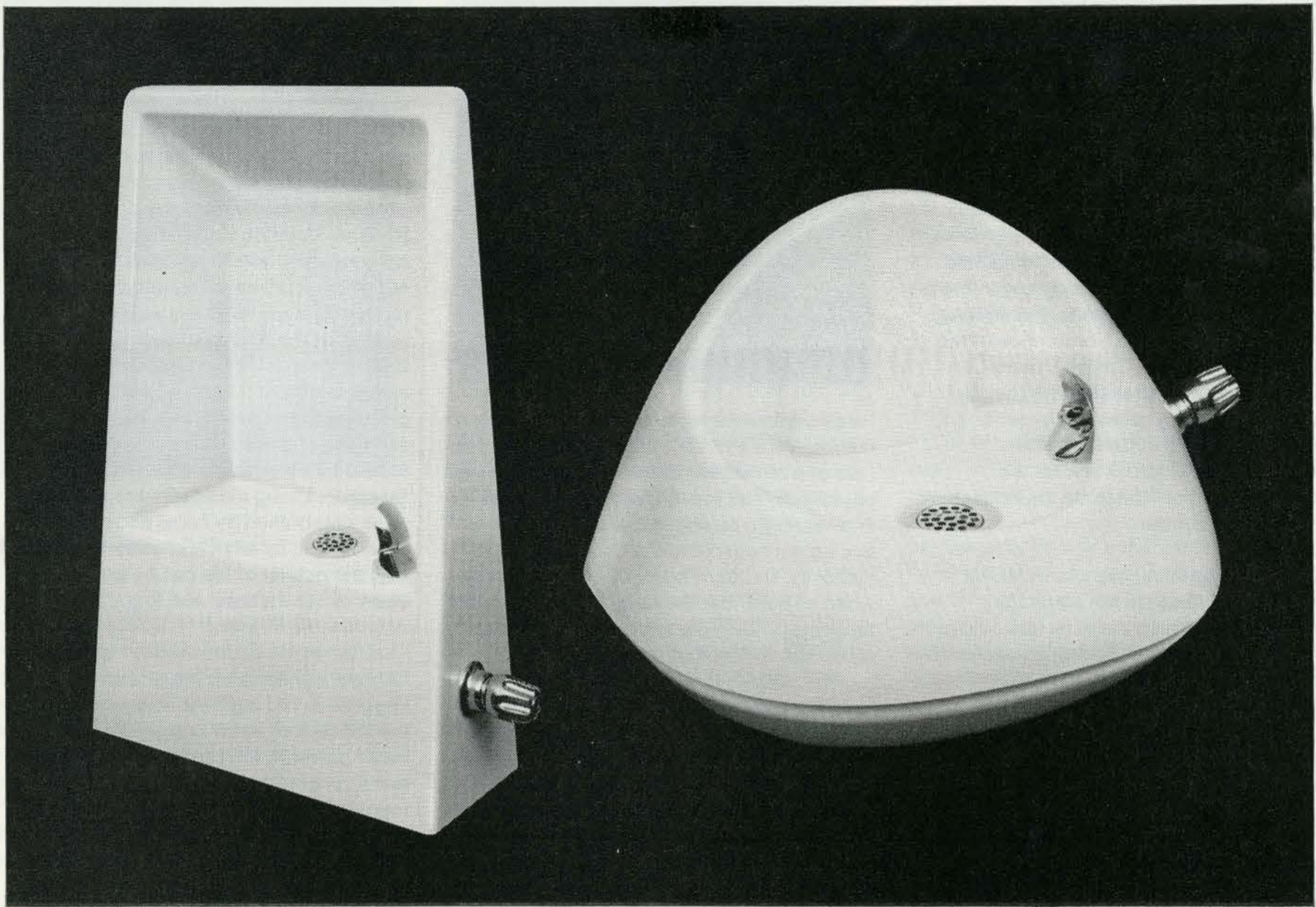
as to make the Federal Government a more effective instrument in its relationship with Provincial Governments and subsequently to local government throughout the country. It would direct itself to the very real need to establish qualitative standards in all Federal programs where Federal money is used as the basis for local problems. It would examine the ways and means to secure adoption across the country of the National Building Code; it would likely concern itself with the means whereby research could be increased into technical matters, the social sciences and the behavioural attitudes of Canadians in order that we determine the best kinds of housing suited to different age and economic groupings. The best minds in the social sciences and behavioural disciplines should be attracted to environmental research. Living standards are now more often determined by fiscal and mortgage criteria than by any clear understanding of how the quality of life can be best achieved. Many of our attitudes are founded on intuition and hearsay.

"A royal commission into the environment might take into account water control and the strategy of water management. It might be empowered to recommend to government the control and ordering of transportation systems in such a way as to aid and strengthen the *urban* environment, and possibly acquire corridors of land for transportation in anticipation of urban growth. Urban transportation is surely a matter for the concern of the Federal jurisdiction just as transportation is in the more general sense.

- "No study of environment could be complete without an examination of the state of the construction industry itself. I think of the construction industry as the Industry of Environment, concerned with providing a product of quality and human value, rather than simply housing starts, teaching positions, hospital beds and other statistics of placement."

"The training of the architect, in fact, of all the design disciplines, must be equally responsive to the forces of change.

"The practice of architecture today involves not dozens, but oftentimes hundreds of people. Tomorrow it will be multi-national, corporate, research-minded, and human-based. New schemes for organization in government, in industry, in production, in design, must be established, as Doxiadis has reminded us, for the alternative will be Dystopia (which he defines as "evil place") rather than Utopia. The architect must establish authority in government as in his own practice. We must, nonetheless, maintain our concern for order as a valued human goal having obvious connections with happiness, welfare, fulfillment and satisfaction." □



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Message from the President

What the RAIC intends to do in the next year to develop Institute programs and increase services to the membership is outlined by the new President, Norman H. McMurrich (*F*), of Toronto.

Top priority is being given to the appointment of an experienced architect to join the staff of RAIC Headquarters as Director of Professional Services.

A Committee is now examining applications for the position and announcement about the appointment is expected at the next meeting of Council at St John's, Newfoundland, September 16. Incidentally, it will be the first Council meeting to be held in Newfoundland.

During the Assembly at Regina at the end of May, the Committee of Presidents and RAIC Council decided that immediate examination of standing committees was needed in terms of composition, terms of reference, budgets and frequency of meetings.

The Chairmen of the standing committees on Research and on Architectural Education, with the officers of the Institute and representatives of the schools of Architecture, will be guests of the Canada Council at a week-long study session at Stanley House in the Gaspé from August 5th to 9th to discuss architectural education. The meeting will mark the start of implementation of the education section of the recommendations in the Survey of the Profession, and Canada Council grants for education and architectural research will be discussed.

A suggestion at the Assembly that efforts be made to obtain a standard and improved fee for government work is being acted upon and there are grounds for optimism that the objectives will be achieved.

The Institute has faced a number of difficult internal problems over the past three years – constitutional, political and financial problems, which, until they were solved,

made it impossible to implement the recommendations in the report of the Committee on the Survey of the Profession and inhibited normal committee activities. Tolerance and patience, on both sides, in dealing with the province of Quebec Association of Architects has resulted in a basis for common understanding. The PQAA is again a member of the Institute in good standing and the revisions to RAIC by-laws recommended by that Association have been studied and amended to meet the wishes of a majority of the other provincial associations. The changes, in brief, restructure the RAIC more closely in accord with the Constitution and define its position as a confederation of the provincial associations and institutes. The result will enable the Institute to play a strong role in matters of national importance without duplicating or conflicting with provincial affairs.

Message du Président

Norman H. McMurrich (*F*), Toronto, nouveau président de l'IRAC, a abordé le sujet du développement d'un programme d'expansion de l'Institut et a aussi souligné que l'IRAC aimerait étendre l'activité de ses membres au delà des services traditionnels.

Une importance primordiale est attachée à la nomination d'un architecte de compétence professionnelle pour assumer les fonctions de Directeur des Services Professionnels à l'Administration de l'RAIC. L'examen des demandes pour la candidature est en cours et l'annonce de la nomination se fera à la prochaine réunion du Conseil qui se déroulera à St John's, Terre Neuve vers le 16 septembre prochain. Au cours de l'Assemblée nationale à Regina, en fin mai, le Comité des présidents et le Conseil de l'Institut ont décidé qu'un examen immédiat des Comités permanents était nécessaire au point de vue composition, termes de référence, budget et fréquence des réunions.

Les présidents des Comités permanents sur la formation des architectes, les cadres de

l'Institut et les représentants des Ecoles d'Architecture seront appelés à participer à une séance d'études sur la formation professionnelle des architectes qui durera une semaine et se tiendra au Stanley House, Gaspé entre le 5 et 9 août. Cette réunion marquera le point de départ de la formation d'un comité d'études sur la profession; une discussion sur l'octroi des bourses d'études destinées aux recherches professionnelles s'en suivra.

Des efforts en vue de l'obtention d'une révision des honoraires concernant les travaux publics se poursuivent et il y a lieu de croire que cet objectif sera atteint.

Dans le passé, l'Institut a dû faire face à un grand nombre de problèmes d'ordre politique, constitutionnel aussi bien que financier ce qui a empêché le comité de poursuivre normalement ses activités. Tolérance et patience, des deux côtés, pendant les pourparlers avec la PQAA ont finalement abouti à une entente. La PQAA est de nouveau un membre permanent de l'Institut et une révision des décrets recommandés par celle-ci est envisagée. Ils seront étudiés tout en tenant compte de l'opinion majoritaire des autres associations provinciales. Les changements recommandés sont les suivants: réformer la structure de l'IRAC en accord avec la constitution et définir sa position envers les instituts et associations provinciales, ce qui permettra à l'Institut de jouer un rôle important dans les affaires d'ordre national sans entrer en conflit avec les intérêts provinciaux.

Two universities demonstrate the versatility of Electric Heating

Two new universities being built in Ontario have chosen all-electric heating. They are Brock University at St. Catharines, and Trent University at Peterborough.

Any university is a complex heating project. The environment to be controlled extends from small residential units to auditoriums and sports arenas. The scale of these two undertakings is impressive; between them, Brock and Trent Universities will accommodate nearly 12,000 students when they are completed. Since each has been planned with the aim of providing the best possible working and living conditions at the lowest possible cost, it is especially interesting to see how the designers have used electricity to meet the heating demands of two very different structures.

At Brock University

the 14-storey Brock Tower is complete, and a cluster of buildings at its foot is under construction. The campus is expected to be completed by 1980. Both central and localized conditioning systems are being combined for maximum efficiency.

Chilled water for cooling every building is produced in the Central Utilities Building, located off-campus in a disused quarry. Electric power at 13.8 KV is also distributed from there; but each building has its own transformer room, heating plant, and ventilation system. Brock Tower, the only building presently in use, has a hydronic system fed by two



Brock Tower. The heart of a new University. Gordon S. Adamson & Associates, John B. Parkin Associates, Shore & Moffat and Partners; Architects and Engineers. A joint venture to carry out architectural and engineering commissions on projects managed by U.P.A.C.E. Limited. Consultants (site services) H. G. Acres & Co., Ltd.

750 KW boilers in the basement. Hot water from this plant—or chilled water from the Central plant—is piped to sill units, where ventilating air is blown over the coil to maintain comfortable room temperatures. Heating or cooling is therefore available in all parts of the building, at all times. Larger rooms receive additional heat from resistance coils in the air ducts.

All buildings on the Brock campus will not necessarily use the same heating techniques. The designers will select whichever electric system is best suited to the needs of each separate building—taking full advantage of the versatility of electric heat. There are other good reasons why electricity was chosen in the early planning stages. One was electricity's cleanliness, which will help reduce the cost of internal and external maintenance on the campus, and avoid air pollution. Others were

aspects of electric heating's simplicity. Competitive systems would have required a central boiler house, an extensive steam supply and condensate return system, together with a specialist staff to maintain them. Electricity needs none of these, and is therefore simpler, and cheaper both to install and to maintain. The ease with which electric heating can be added, phase by phase as the campus grows, was another sound reason for its choice.

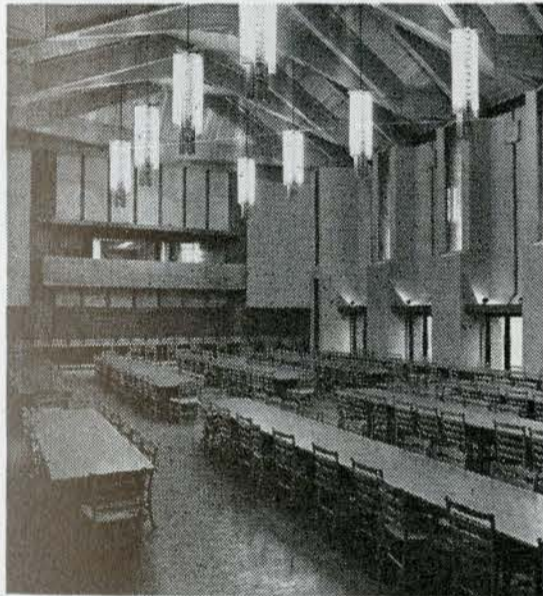


Brock University; model of the projected campus.

Trent University

is very different in concept from Brock. At Trent, the University Planning Committee chose the residential college system, in which the student body is divided for social and study purposes into groups of about 300. Eventually the campus is expected to contain fourteen colleges; the first, Champlain College, is complete and occupied.

Champlain College at Trent University is a structure so complex that six different electric heating methods are used within its walls. The complexity arises from the way so many student activities are accommodated in a small area. The college has study bedrooms for about 200 undergraduates, apartments and housing for graduate teachers, a separate house for the Master; library, cafeteria, squash court, lecture rooms, social and meeting rooms for staff and students, changing rooms, kitchens, and the Great Hall.



The Great Hall, Champlain College.

As at Brock, the basic heating system is hydronic, with seven immersion-type electric boilers totalling 750 KW. Most rooms throughout the college have *finned-tube convectors* in floor or sill units to provide basic warmth. Larger rooms have additional heating from *warm air ducts*. Air supply for these is warmed at the intake point by a hot water coil. The lecture room, the Great Hall and the squash court are among the larger rooms heated



The South Block, Champlain College, Trent University. Architect: Ronald J. Thom of Thompson, Berwick, Pratt & Partners. Engineers: R. E. Crossey and Associates, Ltd.

this way. These ducts will eventually accommodate a cooling system. Utility rooms and passages use *fan-forced unit* heaters suspended at strategic points. Since the kitchen has its own ventilation system, its air supply can vary between 100% recirculated and, with the aid of an in-duct *resistance coil*, 100% outdoor air. *Electric cable* is embedded in concrete landings where the staircases lead outdoors. Finally, *resistance convectors*, mainly of the baseboard type, are installed throughout the Master's house, further demonstrating the versatility of electric heating.

Despite the differences in appearance, layout, and style between these two new universities, Trent's reasons for choosing electricity for heating are very similar to Brock's. A painstaking analysis of five possible systems at Trent proved that electricity would be most *economical in terms of owning and operating costs*. Operating the system is simple, since minimum maintenance staff is required, and a high degree of both

central and localized automatic control is possible. Finally, alternative systems required a central boiler plant, which would have interfered with the appearance and organization of the campus.

Electric heating provides both these universities with *the kind of heat they need, where it is needed, economically*. Designers and owners of many other buildings in Ontario find electricity the most practical answer to their widely differing heating problems. Write to Ontario Hydro for copies of Electric Heating Reports, which describe recently completed installations. Commercial and Industrial Sales, 620 University Avenue, Toronto 2.

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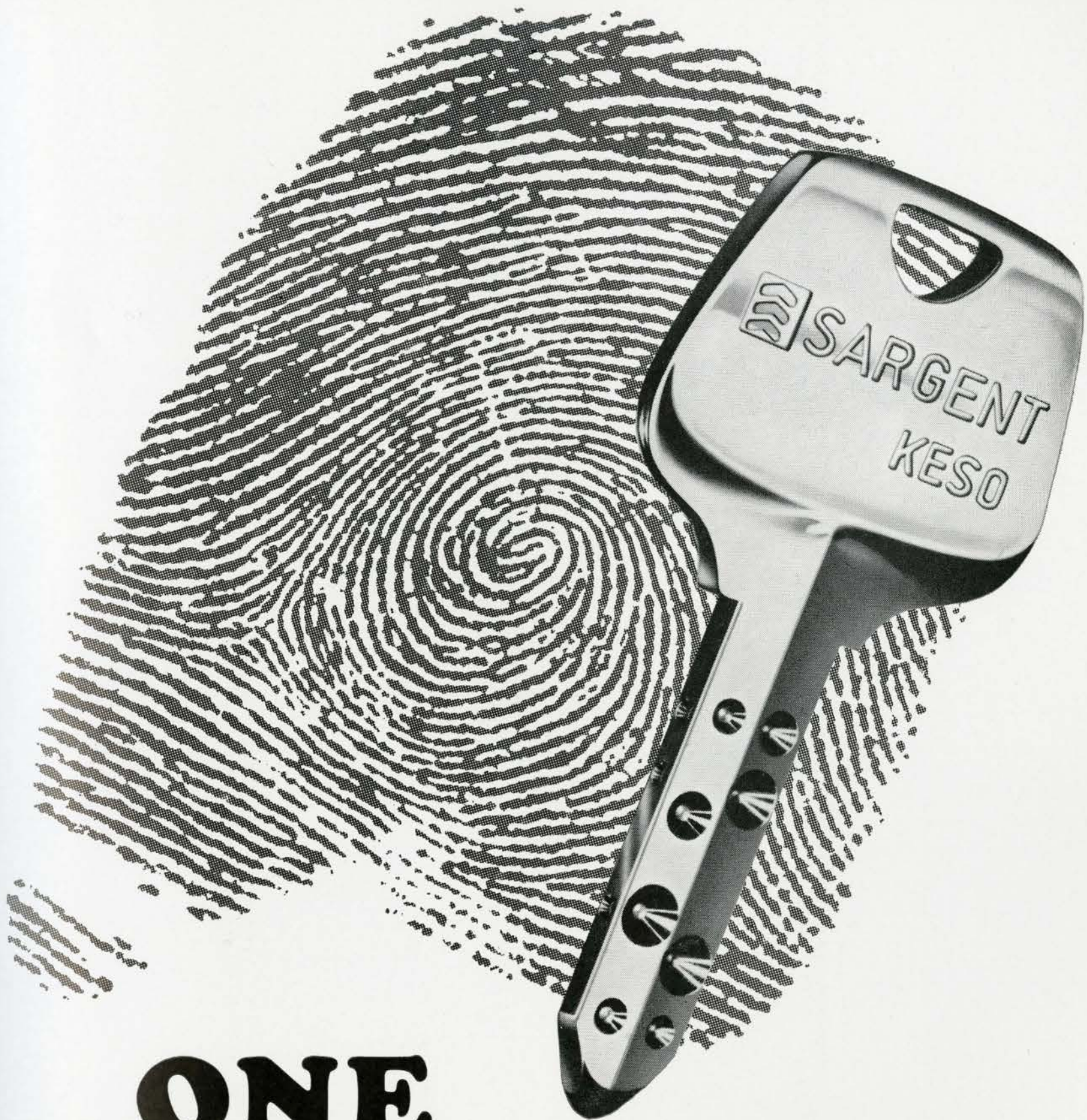


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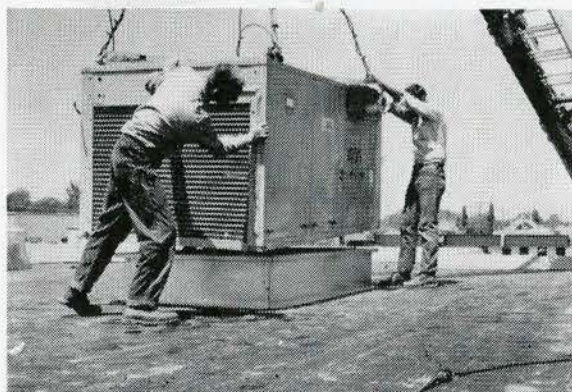
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Illusions and Architecture Some Contemporary Painters

Arts

3

The three-dimensional plane is the plane of "Reality". The two-dimensional plane is the plane of "Illusion". The architect and the sculptor deal in three-dimensional terms, in the hard facts of actual form in space, kinetic realities – forthright, unambiguous and in general immovable. The statements when made are final. The painter deals in terms of two dimensions. In his true sense, by ambiguous image and "poetic" license so to speak, he creates an illusory world out of "flat" space.

For the perceptive architect, the painter, as arch-illusionist, offers many alternatives to the stern problems of space dictated by the

architectural wall.

Economic pressures and a resultant vertical straight-jacket often dictate to the urban architect a channeled space of corridors, ante-chambers and finally rabbit warren cubes of horrifying claustrophobic character. Equally the formless space of public terminals are discomfiting in their boundaries of "nowhere" when emptied of the myriad people who belch from portals disgorging vehicular traffic.

What to do? Truth in architecture, from a purist point of view, might dictate to leave well alone – "the building is built" and that

is enough. However, this simple, almost boorish aesthetic attitude is *not* enough. Man is more of a sophisticate and entertains his illusions as well as his realities in a scheme for imaginative living. Poetry as well as prose is a valid communication.

To the architect, this column commends some young Canadian painters, who with classic geometric imagery, close to the functional form of architecture excite the eye to believe in mythical vistas of unending space which turn blind corners with fresh implications of infinite energy. They invite one to participate in an infinity, created with paint and canvas. These are not murals



Transformation. The narrow walls of the Carmen Lamanna Gallery, Toronto, articulated with Bolduc's illusions

Transformation. Les oeuvres illusionnistes de Bolduc à la Galerie Lamanna, Toronto

2
Perspective illusions in the Isaacs Gallery were achieved by the "hat tricks" of Reg Holmes' canvases
Illusions linéaires à la Galerie Isaacs, toile par Reg Holmes

3
Frank Stella, American illusionist, pushed the 9 foot walls of the tiny Mirvish Gallery, Toronto, into an endless depthless maze with a group of these 8 foot paintings
Avec un groupe de peintures mesurant 8 pieds Frank Stella, illusioniste américain donne l'impression de pousser les murs de la minuscule Galerie Mirvish vers l'infini

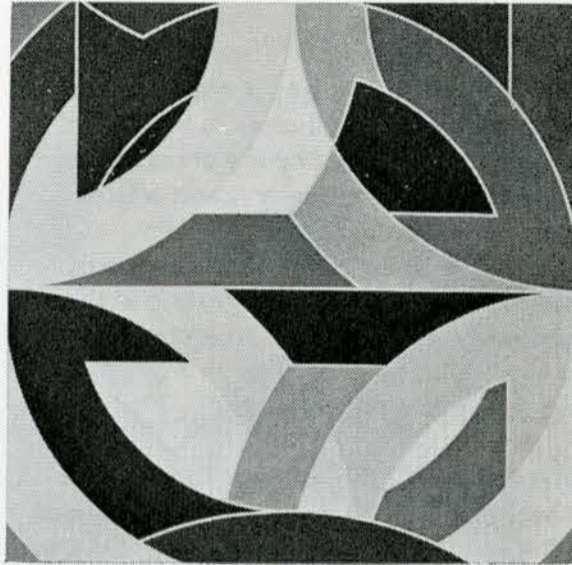
4
Other perspectives, seven feet of undulating energetic avenues, by Wallace French, Pollock Gallery
Sept pieds d'actives lignes courbées donnent l'impression d'une perspective irréaliste. Peinture de Wallace French à la Galerie Pollock

5
Vertical restrictions overcome by Kolynik's inventions. Peter Kolynik can be contacted through the Pollock Gallery, Toronto
Dans ces oeuvres Kolynik a triomphé des restrictions verticales. Galerie Pollock, Toronto

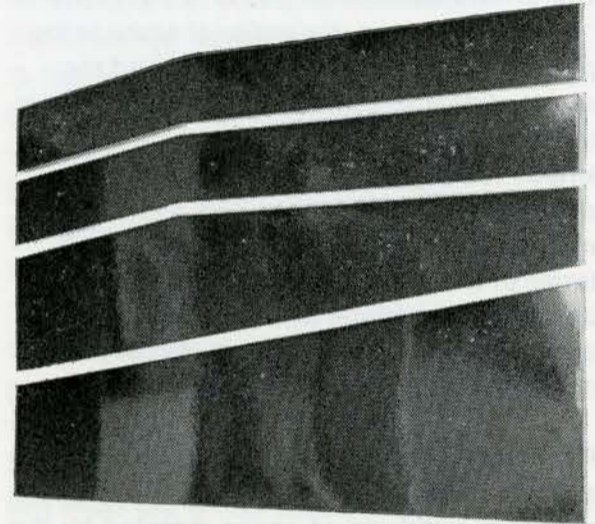
which are facades of fancy, turning the wall into a picture book. These are poetic illusions extending the limited space (which, could be architectural) into a universe of articulating heavens of ambiguous possibilities.

Our young "magicians" of art could be used and should be used *now* . . . by the architect who appreciates that some of his environmental spaces are anonymous, lacking in a sense of identity and in all, coldly aseptic. To you, I commend these exciting image-makers – the rest for posterity's sake is up to you.

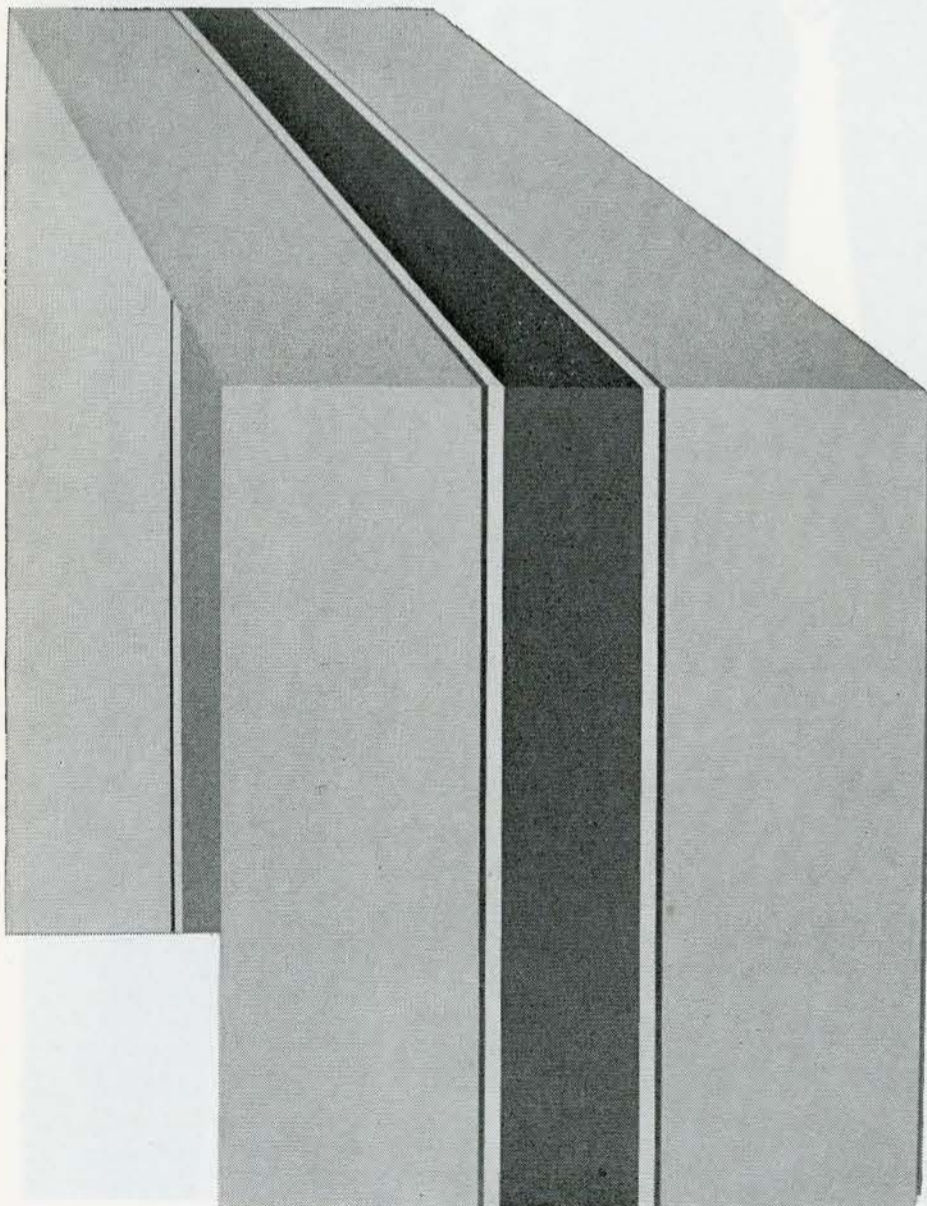
Anita Aarons



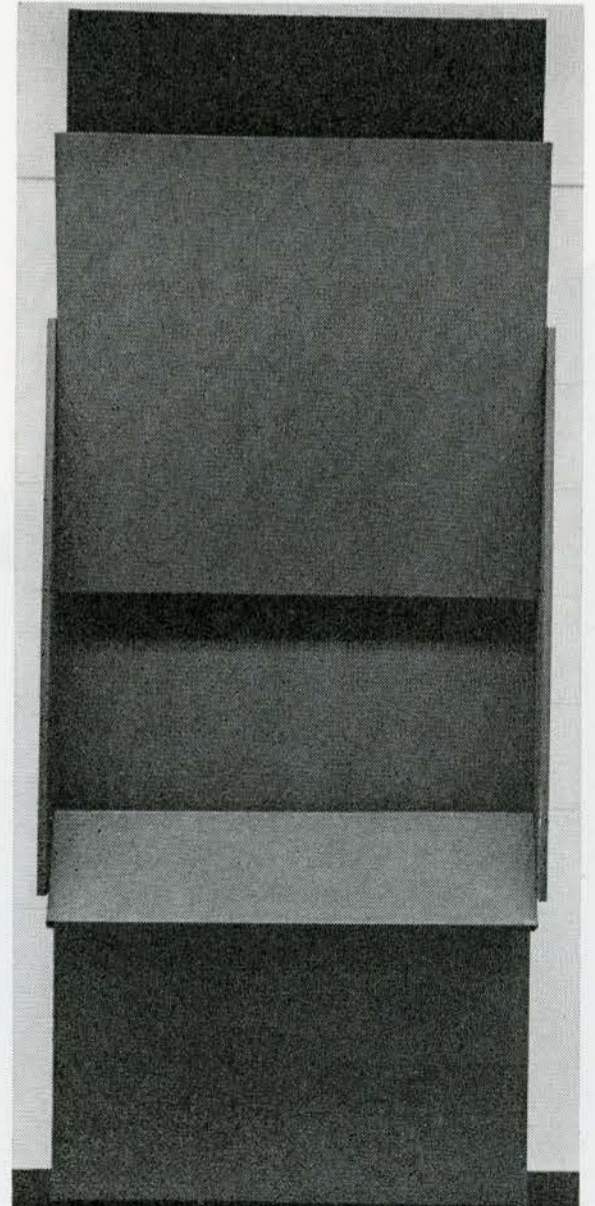
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Education and the AIA: A Process for Change

Review Revue

4

This is a review of the Princeton Education Report as it appeared in Architectural Forum, May 1968

The AIA's much-heralded Research in Education is completed, the product of Robert L. Geddes, dean of Princeton's School of Architecture, and Bernard P. Spring, senior research architect at Princeton. And the AIA, having spent two years and \$100,000 on the work, may now be wondering what it has bought. An ad hoc task force is figuring out where to go from here (they have advised turning it over to the Interprofessional Commission on Environmental Design), and there are further plans to send some 2,000 copies of the report to all faculty members in the nation's schools of architecture, and a brief summary to all AIA members.

If the report is seriously weighed by the profession – educators and practitioners alike – the ensuing discussion will involve no less than the future of the entire profession. Somewhat veiled by the staid language of the report, but at its core, is the implication that the architect is not necessarily meant to assume central command in designing the man-made environment.

This will be heresy to those of the profession whose public posture and private energy seeks to stake out the territory of Architect and protect it from all others. The Geddes-Spring report challenges, as hopeless anachronism, the view that an architect's task can be clearly identified and legally bounded in this way; instead, they say, architects must share the overall task with others in the environmental design professions *on the basis of performance*. A narrow trade-unionism will ultimately be self-defeating.

The report's other major implication also links the performance of the design professions to the desperate needs of the environment. This AIA study was commissioned, they write, "because of a widespread feeling that education for environmental design must change." But the situation is too desperate to have educational change only for the sake of change. Innovation not directed towards well-defined objectives, and not evaluated

according to whether these objectives are being achieved, will be aimless and mostly worthless.

Yet the report does not propose a specific course content to adopt, specific teaching methods to use, or a specific professional goal to pursue. Thus it will be baffling, perhaps infuriating, to many a practitioner (and educator) who will consider it an affront to his notion of research and conclude that it has all been a waste of AIA funds.

All these omissions are deliberate – and crucial. To the extent that architects want an easy answer (and the research as formulated in 1965 seemed to point toward the ultimate issuance of a specific set of programs), architects will find the report of little value. Actually, it has extraordinary value. If followed in the spirit in which the report is given, it could mean nothing less than a serious nationwide effort at the most basic level to seek new answers for an educational system that needs precisely such restructuring to the core.

No single answer

How to remodel the system, without offering a model to copy? "The comprehensive master plan is dead," says Spring. "What we've suggested instead, is a process by which people can build curricula in the ways they want. It would be folly in a society as complex and dynamic as ours to have a single authoritarian structure handed down from above. Nor were we asked, in this research, to give our views. What we've posed is a format for everyone's views.

"We urgently need to communicate with each other, and in terms of the real issues, not in terms of our supposed stances for ourselves and our easy labels for the other guy – these only keep people from talking with each other. At the bottom of this research, then are techniques making it possible for people to think through their educational objectives – what it is they want the environmental designer *to be able to do*. if we disagree, fine, but let's at least know

where we disagree, instead of talking about matters of status (the-architect-as-leader-of-the-team sort of thing) and glossing over the real issues."

Major recommendations

The report's main recommendations were carefully selected as the minimum necessary for institutional support of environmental education. Note the consistent use of the term "environmental," whereas the charge to the researchers spoke of "architectural" education.

It is no surprise, then, that the primary recommendation concerns relationships among all the professions involved in designing the man-made environment. It is impossible, believe Geddes and Spring, for education to deal separately with architecture, engineering, planning, landscape architecture, etc., when these subjects refuse to stay compartmented in the real world. It is also impossible to isolate any aspect of physical change from its social- economic-political context. The report thus recommends that for educational purposes all professional work be redefined in terms of the *task* to be accomplished (or the *problem* to be solved), "with a clear understanding of the specific but partial contribution" of any single team member. The report makes clear that this "does not at all require that traditional disciplines give up their identity or their professional standards." But it does demand that the professional organizations, and the registration and accreditation boards, find ways to recognize this professional interdependence.

To define the environmental design task – its extent and its components – Geddes and Spring have developed a concept that is simple but not simplistic. As a working tool, the concept has value for the individual who is building a career, the school that is building a curriculum, or the profession that is building a new relationship with other disciplines.

The model's three dimensions each

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comprise a basic characteristic of design work – the problem-solving process, the *scope* of the work, its *scale*. Each of these three characteristics is subdivided into six parts, and the 216 points of intersection (6 by 6 by 6) each represent a different kind of design activity. (The six subdivisions under *process* are identification, formulation, prediction, selection, management, and evaluation; under *scope* are basic research, applied research, pilot study, proposal, communication, and effectuation; under *scale* are region, area, district, group, unit, and component.) Use of the matrix can be best understood by verbalizing any of the 216 activities – 1De, for instance, becomes: *Identification* of the goals, needs, resources, and priorities of the client, user, and community groups for a design *proposal* at the *unit* (e.g., building) scale.”

“With this matrix,” says Spring, “it becomes obvious that the professions hopelessly and eternally overlap, and that none fills the entire matrix.”

Assuming that no single school can cover the whole task, the study proposes that each school build its own strengths in offering whatever portion it chooses to cover. The concept that clarifies the hoped-for nationwide diversity is another three-dimensional model. Six hexagonal blocks each represent a distinct time period (probably two years); the joints between them are choice points when a student either goes on to any program on the next module or terminates his formal education.

Of the nine types of program on the modules, it is suggested that four be professional in content; three, general education; two, internship. Their combination yields the possibility of several *thousand* careers, in contrast to the “dozen or so” careers available today. “We don’t say what decisions to make on programs or careers – these remain with the schools and the students,” Geddes and Spring explain. “We also don’t say what decisions to make on accreditation and registration, but this concept is a way of dealing with the problems. A registration board in any profession can say, for instance, ‘at least two modules have to be such-and-such, two can be free.’”

Further redefinition

There are other formulations that the report makes – defining educational goals in terms of “behavior, understanding, and ability” desired in individuals, rather than status desired for the group. The three basic (and conflicting) goals are distinguished according to whether behavior is oriented to operating within real-world constraints, is adaptive to changing situations, or is focused on bringing about solutions in the context of a different (or Utopian) future. The central issue of education, says the report, is the *balance* between these goals. Again, this is only a framework; the

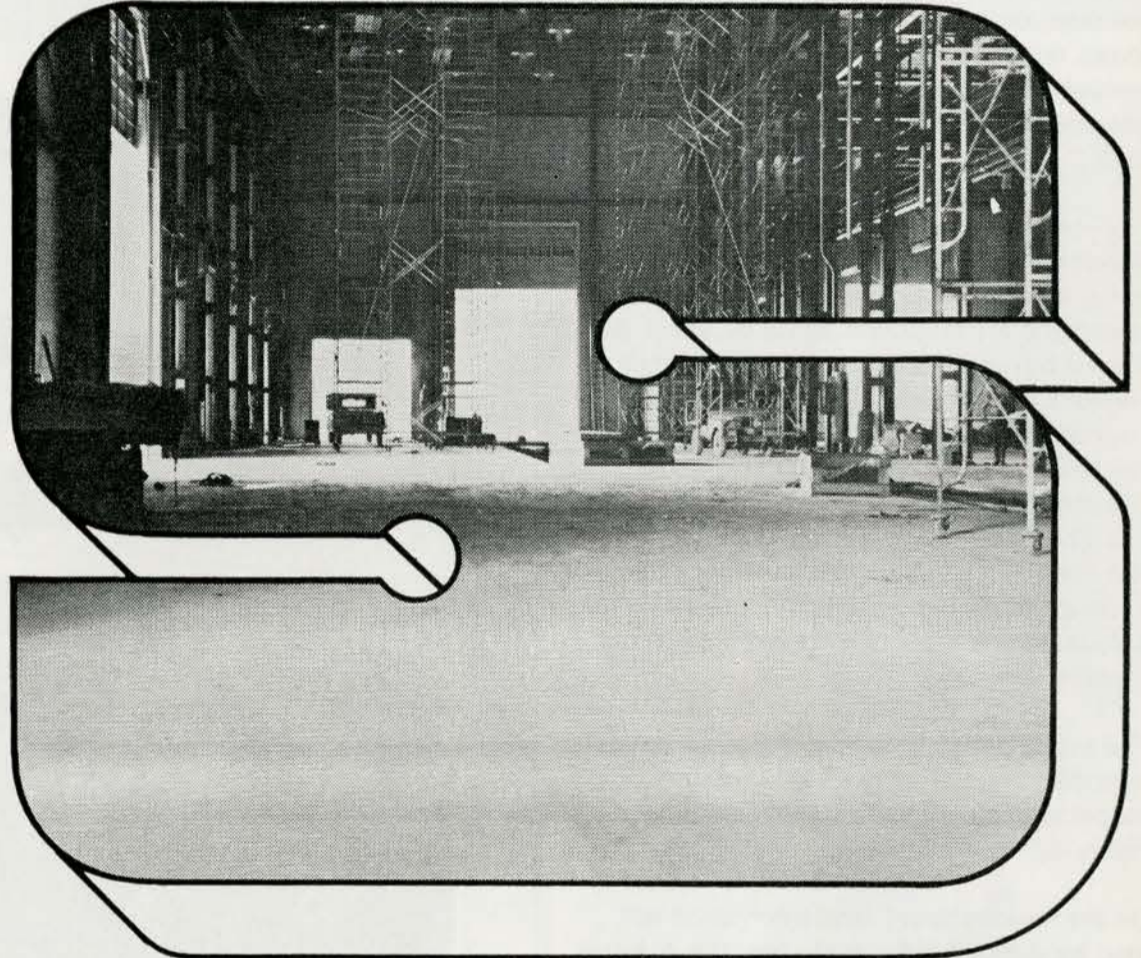
decisions are left to each school.

Courses, too, should be described in terms of objectives – the behavior expected of the student at the end of the course, and the teaching methods.

In addition (the report is a veritable cornucopia of rich thought), are specific “strategies” for key “problems” in environmental education. These are problems of *continuity*: how to get clients and users on the same wave-length as professionals; and how to match appropriate educational programs to the wide range of student abilities and motivations; *scope*: how to increase breadth without loss of

depth; *method*: how to develop explicit design methods for dealing with the increased complexity of design decisions, and make it possible for more clients and users to enter a decision-making process that can no longer be mystical and elitist; *reality*: how to deal with the most pressing problems of our time, in their actual setting, without sacrificing a larger and theoretical perspective; *numbers*: how to train the numbers needed, assuming that the number will only grow in response to how well people are trained to do the job.

Geddes and Spring call for a great diversity of experimentation to meet these problems – experimentation, however, within their



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process of matching programs to objectives. Despite their explicit suggestions of *some* strategies, then, their report does not deal with product but with process — “the process for planning and evaluating the unprecedented diversity of new programs that are needed . . .”

A model for the future

Th Geddes-Spring research is a model of rationality. “What we did was very simple,” says Spring. “We wanted to make explicit the kind of wisdom people gain from experience when they’re wise to begin with, and make this available to people who are *not* wise to begin with. Education can no longer rely on the star system, which doesn’t work, and there are simply not enough ‘good guys’ to go around [the report does not mention any person or school by name]. Ideas, not people, are needed. Eventually, enough good guys will be produced if we can specify what a good guy should be able to do.”

The research is also a model of academic freedom. “Everyone told us we would be doing for architecture what the Flexner report did for medicine about 60 years ago. But we haven’t. Flexner believed in Johns Hopkins as a model, and with Rockefeller Foundation grants going to any school that conformed to this model, all the nonconforming schools were soon wiped out. That is not our intention here. Nor should the AIA think it must pass out national policy in education. It can, however, help make the profession responsive to our pluralistic society.”

The schools may find it difficult to do their own thinking. “They’re all looking for a model to copy, all hoping to be the next Harvard,” says Spring.

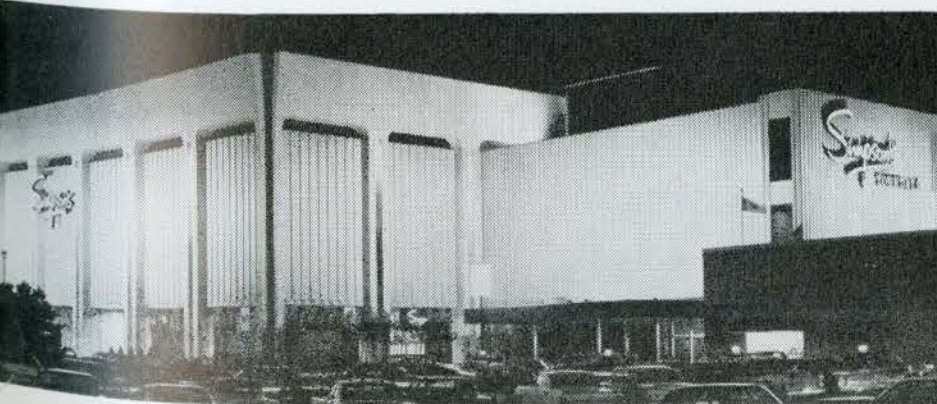
On the national level, implementation will also be difficult. As a first step, the AIA has commissioned a handbook from Educational Testing Service to help the schools evaluate their curricula, methods of certifying and grading, etc. But the real implementation of the report’s major directions will involve real commitment from the AIA. (In addition to the concepts described above are recommendations for environmental education at the primary and secondary level; continuing professional education; institutes for advanced studies; national centers for course development; each of these would need interprofessional cooperation.) Change will be impeded by those whose success has been achieved under protectionism. Change will be demanded by those young enough (whatever their age) to have a different view of the world.

In focusing on the issues, and recognizing the enormous job to be done, Geddes and Spring have rendered a distinguished service to the profession. The profession can show its gratitude by accepting the challenge and proceeding with the work. □



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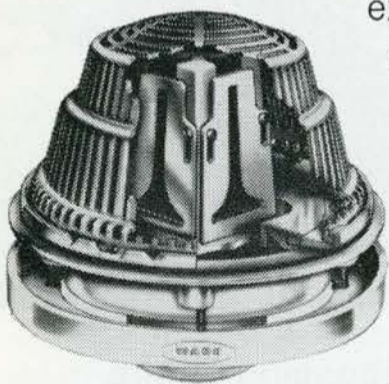
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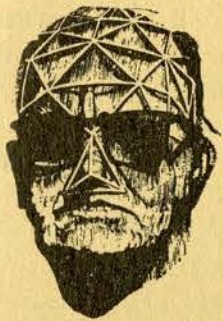
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Projet Toronto
Une Etude du Développement Futur
Fuller-Sadao Geometrics Inc

L'emplacement géographique de Toronto est un facteur important en considérant son avenir. L'accroissement de la population en banlieue, mais non au centre ville, est aussi une considération importante, mais les vraies problèmes sont le besoin de créer une image spéciale et la question de l'organisation et la fonction du centre ville par rapport aux banlieues. Les changements du mode de vie et des idées des citoyens influencent les changements de la ville plus que l'accroissement de la population. En tant que centre de service régional, Toronto dessert environ 10 millions de gens; pour ne plus être "provincial", Toronto doit découvrir une identité spécifique, une fonction en dehors de la région, jouer un rôle unique, pour générer une influence dans le monde entier. Comme la plus grande ville de l'intérieur du Canada, elle a les capacités technologiques, une liberté de contrainte sur la discussion et la coopération avec d'autres pays. L'éducation est une des plus grandes industries de l'avenir et pourrait se trouver le meilleur moyen d'atteindre le rôle extra-provincial. Le rapport éducation-industrie pour la recherche et le développement est nécessaire à l'avenir de l'éducation et l'Université de York est à l'emplacement le plus logique pour développer cette liaison. On devrait considérer aussi une nouvelle université spécialisée dans la recherche en technologie urbaine (au CNE) et qui pourrait jouer un rôle international.

Le centre ville de l'avenir sera hétérogène, la banlieue, homogène. Toronto a développé sa banlieue comme peu d'autres villes nord-américaines, mélangeant les appartements "gratte-ciels" et les autres habitations, le commerce et l'industrie. Il faut réévaluer et coordonner la planification des banlieues et du centre ville; Toronto se rend compte du besoin de considérer la région métropolitaine comme un ensemble. Mais il manque une échelle définitive dans la séparation des usages des terrains. Le développement courant n'engendre pas une délimitation physique plus grande que le développement de chaque parcelle et

l'essence d'une organisation compréhensible et visuellement impressionnante n'y est pas.

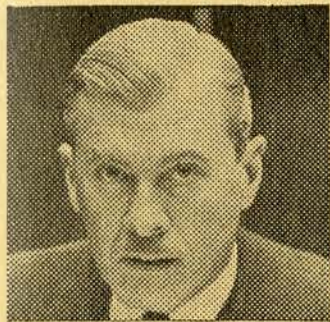
Les critères principales de nos propositions sont:

- 1 Elles doivent entraîner une construction physique significative;
- 2 représenter des concepts frappants conçus pour élever Toronto au rang des centres urbains les plus importants;
- 3 incorporer des éléments garantis à influencer le développement culturel autant que physique;
- 4 adapter les aspects physiques aux conditions du climat (tels que les grands espaces couverts);
- 5 être adapté à la construction par étapes suivant le financement actuel et possible;
- 6 éviter le gigantisme dépersonnalisé;
- 7 se construire sur les gens et l'exploitation de leurs institutions et facilités existantes.

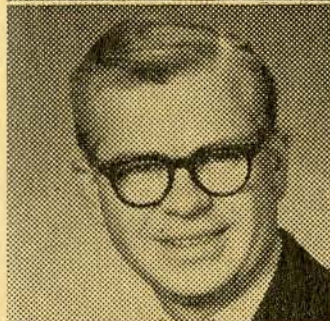
Prises ensemble, ces propositions demanderaient une dépense d'un milliard en 25 ans. Le capital nécessaire à réaliser ces propositions s'élèverait à 4 ou 5% de l'investissement public et privé total projeté pendant 25 ans.

La tradition européenne des places publiques couvertes ou découvertes n'existe pas en Amérique du nord. Mais depuis peu, le centre d'achat devient l'équivalent des "galleria" européennes. On propose un complexe galleria comme moyen de réaliser certains buts: un débouché du centre ville vers le lac, le raccordement du centre ville et du port, la provision d'une place publique couverte, les voies couvertes pour piétons, le prolongement et le développement de l'University Avenue comme point de mire.

Toronto a tourné le dos sur son aménité principale; le bord du lac. Il faut rétablir les liens et rapports entre le lac et le centre ville. Donc, University Avenue serait prolongée jusqu'au lac pour devenir l'axe entre Queen's Park et le lac. Parallèle à cette avenue, une galleria couverte de 3000 pieds de longueur sur 120-150 pieds de largeur serait un immense foyer transparent reliant les centres de transport, les hôtels, facilités commerciales, boutiques, etc., par le mini-rail. En face de cette galleria et raccordé par des passages pour piétons



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serait un palais de verre, le "Crystal Pyramid", comprenant deux immeubles et une place couverte. En bas de la galleria, un pont surélevé pour piétons la relierait aux appartements gratte-ciels construits sur une série d'îles. Entre l'université proposée, où se trouve actuellement la CNE, et la galleria seront des immeubles résidentiels et commerciaux.

Afin de réaliser un système de transport approprié à la vie en gratte-ciels en banlieue, tout développement futur doit offrir des accès protégés, donc il faut une planification précise, un volume suffisant pour employer la fabrication en série, un dessin intégrant les éléments fabriqués en série et un système flexible. Ces nouvelles communautés satellites en gratte-ciels, ("Pro-To-City") sont basées sur trois critères: définir le nombre de résidents nécessaires à l'autonomie économique, employer les nouveaux systèmes de construction, exécuter en blocs d'unités assez grands pour faire des économies par la fabrication en quantité. Tout stationnement est souterrain, chaque unité donne sur un paysage ouvert, les rues sont reliées par des ponts aux écoles, magasins, etc. à l'intérieur, la toiture est en terrasses de différents niveaux servants à diverses récréations. Tout un quartier peut être traité fonctionnellement comme immeuble simple, à part les services sociaux, la vente au détail et l'industrie, car les habitants travailleront ailleurs. La proximité des routes ou du métro est également prévue.

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Une Nouvelle Approche au Logement Urbain au Canada

Anthony J. M. Collins, FRICS, AIArb

Le reportage de la conférence sur le "Systems Approach to Building", publié par Architecture Canada au mois de juin a attiré l'attention de toute l'industrie de la construction. Le manque de logements nécessite la mise en oeuvre de nouvelles techniques sans délai et la profession pourrait se trouver bien placée pour aider à cette réalisation.

Les solutions possibles sont basées sur deux facteurs: le coût initial d'un logement et le coût du transport. D'abord, il incombe aux politiciens de résoudre le problème du coût de terrain et du financement avant que le problème entier puisse être résolu. Nous traitons ici des capacités de l'industrie de construction et des propriétaires publics et privés.

Pourquoi l'industrie n'a-t-elle pas fait de progrès dans la fabrication en série?

Il n'y a pas eu et il n'y a toujours pas de garantie d'un marché régulier pour de grands éléments préfabriqués dans la construction de logements. Du point de vue économique, le succès en Europe de la construction à étages multiples est dû au travail en équipe, à la continuité des

travaux et à l'usage répétitif, où 75% d'un immeuble d'appartements typique sont constitués d'éléments fabriqués en usine ce qui réduit le coût physique de 15% à 20% ainsi que le coût de financement. Les usines fonctionnent, les travaux continuent à longueur d'année et les arrêts de travaux sont supprimés à cause du système de construction relativement simple.

Quant à la main d'oeuvre, nous avons le choix entre l'accroissement de la force ouvrière ou la mécanisation. Les méthodes courantes traditionnelles exigent la formation d'ouvriers spécialisés sur chantier; si cette formation ne continue pas, la mécanisation est inévitable. Les usines peuvent être mécanisées également; un petit nombre d'ouvriers non-spécialisés peut produire en usine ce que toute une équipe d'ouvriers spécialisés serait obligée de faire sur chantier.

Deux projets dans deux pays nous montrent l'étendue de la systématisation dans les procédés de construction. En Angleterre, "Morris Walk" a été créé par une équipe composée de propriétaires et de tous les entrepreneurs, conseils, spécialistes et architectes. Sept immeubles de dix étages, 47 de trois étages ont été construits. (Voir Fig. 7) Les panneaux en béton ont été fabriqués en usine à 120 miles du chantier et transportés par rail et route. L'installation sur chantier a été exécutée par 15 ouvriers et une grue de 85 tonnes au taux de deux habitations par jour; le coût – en dessous de \$10,000 par habitation. Le projet a été complété en 27 mois.

Hoje Gladsaxe près de Copenhague a été créé par une équipe semblable mais l'emplacement en fit plutôt un "dortoir" en banlieue. Des 173 acres disponibles, 123 ont été consacrés aux espaces verts, 10 aux immeubles, et 40 aux stationnements, routes et terrasses pour piétons. Densité, 122 personnes par acre – cinq blocs d'immeubles à 16 étages, deux à 9 étages, dix à 3 ou 4 étages avec un immeuble de 10 étages pour étudiants (Fig. 10) 15% des habitations ont été mis de côté pour les gens de revenu modeste et subventionné. Les éléments sont plus petits que ceux du projet anglais, le transport a été effectué par route (Fig. 11) et l'assemblage par grue à chariot (Fig. 12). Coût – \$22 million.

Figs. 14 à 21 indiquent d'autres adaptations de la Systématisation des procédés de construction. Le prochain article examinera en détail divers systèmes développés et évaluera le rôle de l'architecte dans l'application de cette systématisation.

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Les Graphiques M.P.C. Randle Iredale

L'efficacité du dessin dans notre culture technologique exige la coordination de tâches effectuées par beaucoup de spécialistes dans le cadre inflexible d'argent/temps. Par contre, le procédé

créatif dépend de l'intuition et de la découverte de nouveaux rapports entre paramètres d'un problème qui paraissent lutter contre les demandes de temps/argent. La présentation graphique des opérations du projeteur par la Méthode de Programmation Critique met en évidence l'élément créateur. Notre usage de la MPC exige l'emploi d'une équipe de spécialistes ("T-men") qui connaissent et comprennent les rôles de tous les autres spécialistes, tels que sociologues, etc. Nous sommes en pleine révolution cybernétique ce qui rend surannés nos talents traditionnels mais qui nous permet de faire face aux nouveaux problèmes et à faire de nouvelles synthèses. La présentation graphique par la MPC appliquée à l'architecture est exigée par cette révolution. Toutefois, la nature du procédé de dessin n'est pas suffisamment tangible pour être présentée logiquement. Le format développé par notre bureau reflète notre philosophie de dessin et la réalité du procédé de dessin. Nos services sont divisés en sept activités: 1) programme; assemblage de tous les paramètres nécessaires – nous croyons que la solution d'un problème est inhérente dans la programmation des renseignements – de là, à la découverte des systèmes répondant aux activités spécifiées; 2) la "synthèse", soit les "schématiques" – les systèmes sont choisis, les conflits identifiés et une synthèse est effectuée par l'interaction des spécialistes; 3) le "dessin" – développement de systèmes mécaniques, structuraux, etc, suivant des concepts sortant du procédé de schématisation; 4) les documents de soumission sont préparés. L'approbation des marchés, la surveillance de la construction et son achèvement constituent les trois dernières étapes.

Dessin S. 1: Nous avons développé un format standard qui simplifie le dessin du diagramme et les problèmes de communication et qui rend la gérance plus facile. Dessin S. 2. Tous les participants peuvent reconnaître les descriptions verbales des activités (cases supérieures), la durée des travaux (cases inférieures); la marge gauche identifie les participants responsables. En haut, le client, puis, les spécialistes groupés sous l'appellation "architecte"; après, les spécialistes en génie et enfin l'entrepreneur.

Dessin S. 3. Dans les limites de ce format, le chef du projet peut développer une programmation sans l'aide des programmeurs ou autres spécialistes. Par le raisonnement du procédé de dessin nous avons gagné une plus grande participation créatrice de nos conseils spécialistes, de nos "T-men"; nos estimatifs et le contrôle des frais internes sont améliorés. Les documents sont produits à temps mais le plus important c'est que la dépendance linéaire des spécialistes n'existe plus et les tâches sont effectuées concurremment sans conflit. Le représentant du client suit la même discipline que nos employés et les changements et l'approbation définitive du client sont également simplifiés.

A study and proposals for the future development of the city and region of Toronto, by Fuller-Sadao/Geometrics, Architects, Engineers, Planners commissioned by The Toronto Telegram and CFTO-TV



*Project Toronto, Galleria, general plan
Projet pour Toronto, Galleria, plan général*

The Report

To be prepared for the future, Toronto must consider its relation to and its position in the whole of North America. Toronto is situated on the northern fringe of the two largest conurbations in North America: the Great Lakes megalopolis (Chicago-Detroit-Cleveland-Pittsburgh) and the East Coast megalopolis (Boston-New York-Washington-Philadelphia). . . .

Metropolitan Toronto's growth has been quite consistently high since World War II, with an average yearly increase of 50,000 to 60,000; more than half of this growth has been due to immigration . . . During the last 12 years, Toronto's suburban townships of North York, Etobicoke and Scarborough more than tripled in size while the city itself did not grow. . . . The need for a special image and the question of city organization and function (downtown vis-a-vis suburbs) are the real issues for Toronto's future development, not the increase in numbers of people.

Changes to the city will have much more to do with style of life than with population expansion. . . . Fifty years ago, the average individual related basically to his family, his neighborhood and his job; these were generally stable institutions, and his relationships with them were direct and personal. . . . Today his life style is neither simple nor stable. Things in general have gotten bigger, more complex and mechanized – and have proportionately moved further and further away from direct individual control . . . What he has created, among other things, is a degree of mobility which 50 years ago would have been called nothing short of fantastic . . . The media, especially television, make him very early a resident of the world at large.

The relevance of all this planning the future of Toronto, or any other city, is in terms of attitudes. People today are conscious of "what's happening". When reacting to and evaluating their own environment, they have the whole world to compare it to. . . . Witness widespread student demonstrations and protest movements.

Currently, Toronto is one of many North American cities which act as regional service centers. Functioning in this capacity, it probably serves about 10 million people. . . . All service cities suffer a constant "brain drain" as top flight students and professional people gravitate to the larger cultural and market concentrations. . . . In order to break this cycle and change the "provincial" image, service cities need to discover a specific identity, a particular extra-regional function which will give them separate definition. . . .

Toronto has a unique situation to exploit in establishing world prominence. As Canada's largest heartland city, it is part of the world's greatest technological capability; and it is also, in the context of Canada, free of major

restrictions on open discussion and cooperation with all other countries.

Education is one of the great growth industries of the future, and it may well be Toronto's best means for achieving its extra-provincial and extra-Canadian role. The University of Toronto is already firmly established as a prestigious, traditional kind of institution. It is unlikely that it will change drastically, and, as its suburban campuses take on larger numbers of undergraduates, it will become increasingly oriented to honors and graduate work and its image more academic and scholarly.

Very important and absolutely relevant to the future of education is the educational-industrial relationship for research and development. This kind of joint effort is already fairly common. One example which might be cited is that of the electronics industries which have located around Boston and San Francisco due to the presence there of Harvard and MIT in one case and Stanford and the University of California, Berkeley, in the other. York University, with its affirmed purpose of relationship to the community, is probably the most reasonable spot to develop a liaison between university and industry.

An idea which should be very carefully considered, is an entirely new kind of teaching/research university. Our proposal is that a large, downtown site, perhaps that which currently houses the CNE, should be developed with an international institute for research and education in present and future urban technology. The institute, by virtue of its location in Canada, can draw students, faculty and researchers from all over the world, irrespective of political alignment, and can offer easy access to US and Canadian technological personnel and know-how. If Toronto is willing to take planned, centralized action to implement such a project, it can thereby begin to realize a specialized international role that will contribute to solving worldwide urban problems, and help Toronto attain its "window on the world".

The contemporary North American city is not the compact, relatively manageable entity that it was 50, or even 30, years ago. The affluent classes are now in the suburbs, and core cities are heavily populated by poorer groups and ethnic minorities. . . .

The core city of the future will not be a general metropolitan service center in the traditional sense. Staples and necessities of all kinds will be acquired through suburban facilities, and the downtown will tend more and more to provide specialties. Downtown will be heterogeneous and the suburbs homogeneous.

Interestingly, Toronto has done something with its suburbs that very few other North American cities have had the foresight to do. Most US cities find their fringe areas developed with low-rise, low density housing. In Toronto, "an unusually large number of high-rise apartments poke above

the flat . . . landscape ten miles or further from downtown reflecting good transportation."

Although local control of separation of land uses is carefully applied, at the speeds at which broad patterns are perceived, a definite scale is missing. The current pattern is not one that produces distinct and distinguishable local nodes of contrasting activity. It does not generate any physical delineation in greater scale than that of the independent development of each separate land parcel, so there is little of the cumulative effect which is the essence of a comprehensible and visually impressive city organization.

In a sense, all communities stand at a crossroads at every stage in their development; year by year important choices help to shape future patterns. From time to time, however, there is an identifiable moment in which a city is confronted with major alternatives. Toronto is currently faced with this kind of a choice.

The criteria used as guidelines in planning the proposals took these facts into account along with other salient factors. These are the principal criteria:

- 1 Proposals must involve significant physical construction.
- 2 They must represent striking concepts designed to place Toronto in the forefront of the world's major urban centers judged by international standards of excellence.
- 3 They must incorporate elements which guarantee a meaningful impact on cultural development as well as on physical patterns.
- 4 The physical aspects of the proposals must be adapted to the area's special climatic conditions and must be responsive to current trends toward environmental control over large, enclosed spaces and improved access to bodies of water.
- 5 The proposals must be amenable to staged construction within the framework of existing and anticipated financial resources.
- 6 The proposals, particularly for community development, should take into account the need for construction consistent with a human scale and avoid depersonalized gigantism.
- 7 The proposals must build on and make maximum use of the area's strengths: its people, their institutions and existing facilities.

In combination, the proposals may require an expenditure, primarily from private sources, of roughly a billion dollars for completion over a twenty-five year period – an average of forty million dollars per year. . . .

The combined capital expenditure for the proposed projects amounts in dollar terms to a two or three percent addition to Toronto's existing capital stock. It represents only about four or five percent of projected total annual public and private investment over the coming quarter of a century.

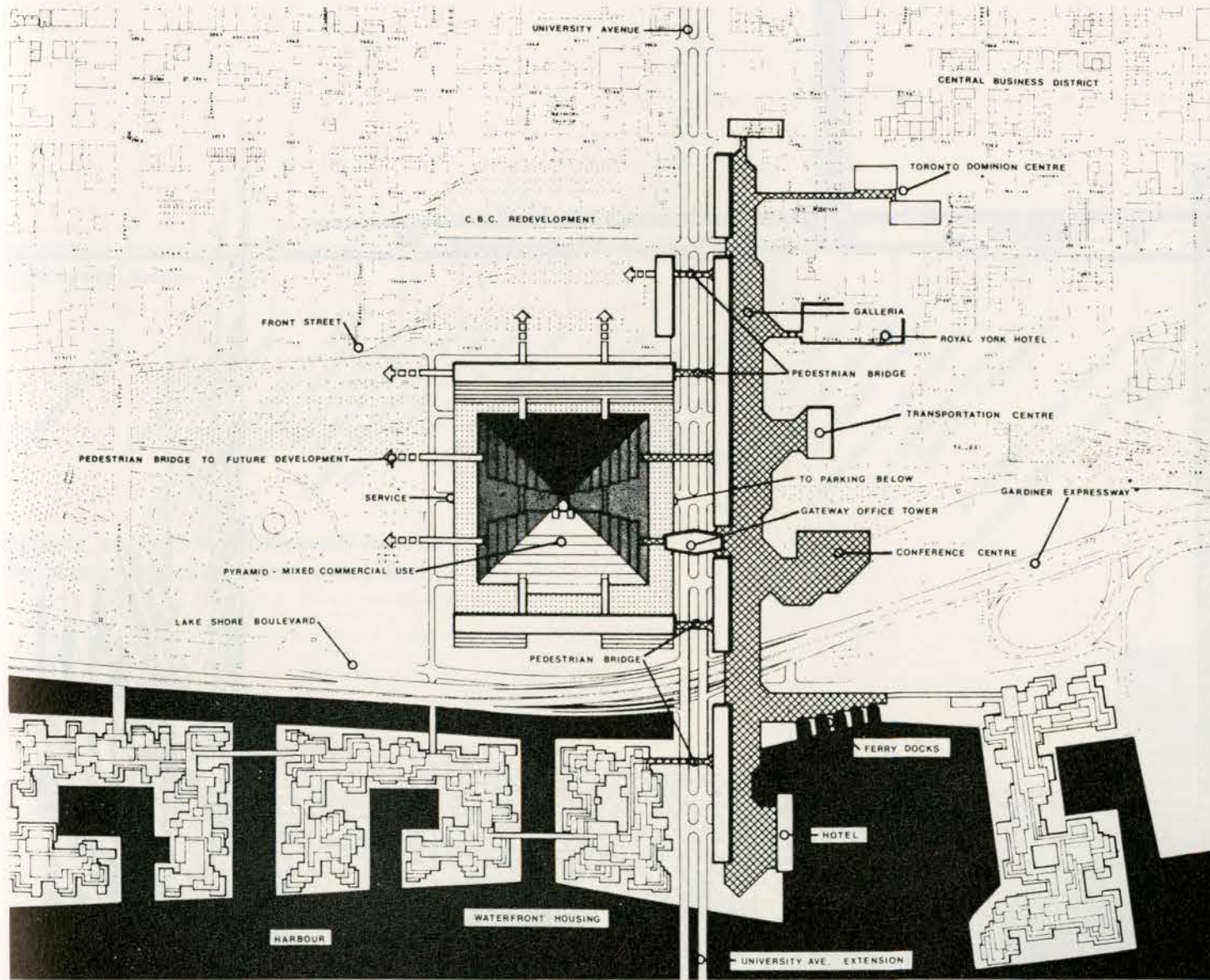
North American cities, unlike those of Europe, have not concerned themselves with the creation of large-scale, multi-functional civic spaces for urban social and cultural interchange. The tradition of such spaces has existed in Europe for hundreds of years.

In the mid 1800's the technology necessary to build wide-span structures was developed. This meant that large, high spaces could be enclosed, and the piazza could come indoors. Out of the capability to clear huge volumes of space came new kinds of public buildings, e.g. the famous Crystal Palace built in 1851 for the Great Exhibition in London.

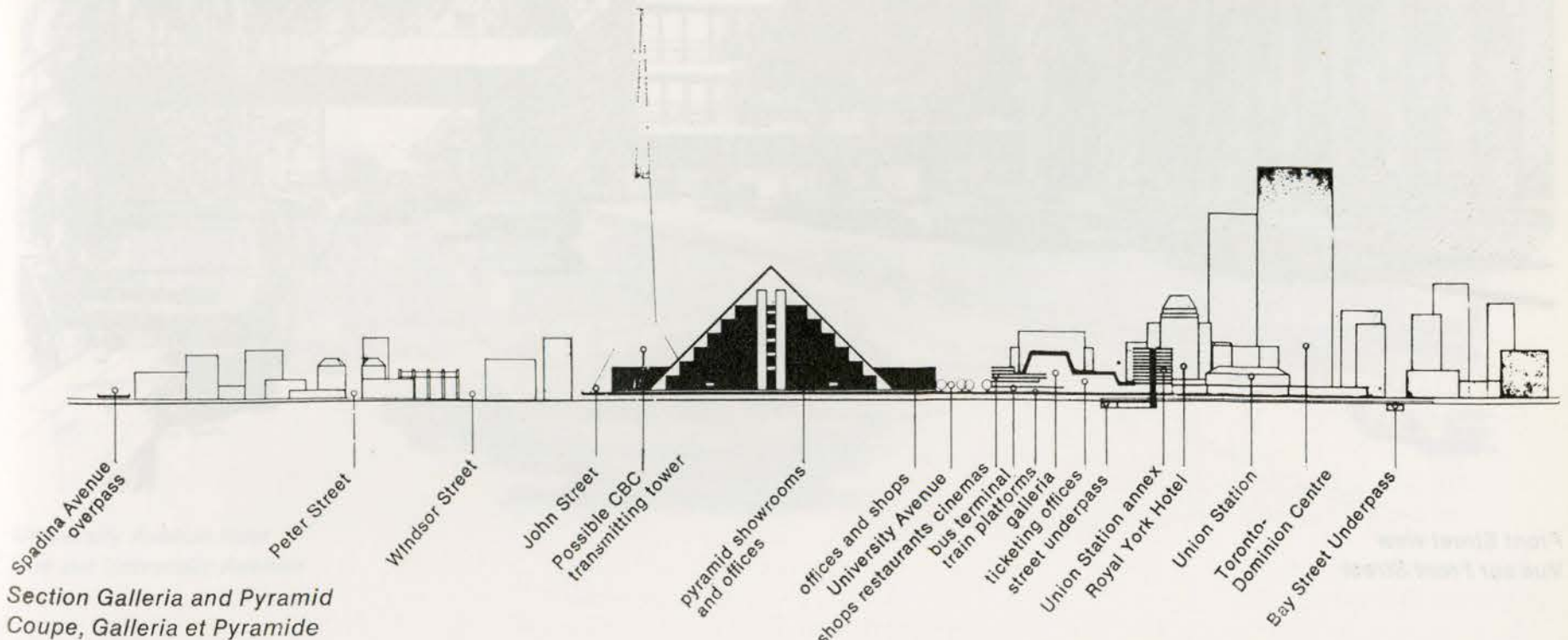
In North America, the idea of civic space in the European sense never took root.

Today, the galleria tradition of 19th century Europe is reappearing in 20th century America as the covered shopping mall. Place Ville Marie in Montreal, the largest one in a center city location, contains, in this case underground, restaurants, specialty shops, cocktail bars, drug stores, places to walk and sit, and connections to transportation facilities. Toronto's Yorkdale is another well-known example. . . . People today are mobile. . . .

If climate is a problem, many more people are in a position to move away to escape it. Northern cities have begun to see the enclosed civic space as a way of countering the movement out. . . . In the future, it may, in fact, become indispensable for downtown developments in cities in northern climates. . . . This is one of the major reasons why the new City Hall Square is less than entirely successful as a year round active civic space. . . . The only reasons to be in the Square are to stroll or sit in the summer and to skate in the winter; more than this must be happening in civic space for it to function in an effective and dynamic way and be used naturally and continually, rather than as a setting for scheduled events.



Detail plan of Galleria
Plan détaillé de Galleria



Section Galleria and Pyramid
Coupe, Galleria et Pyramide

The Galleria complex is proposed as a means of realizing several goals:

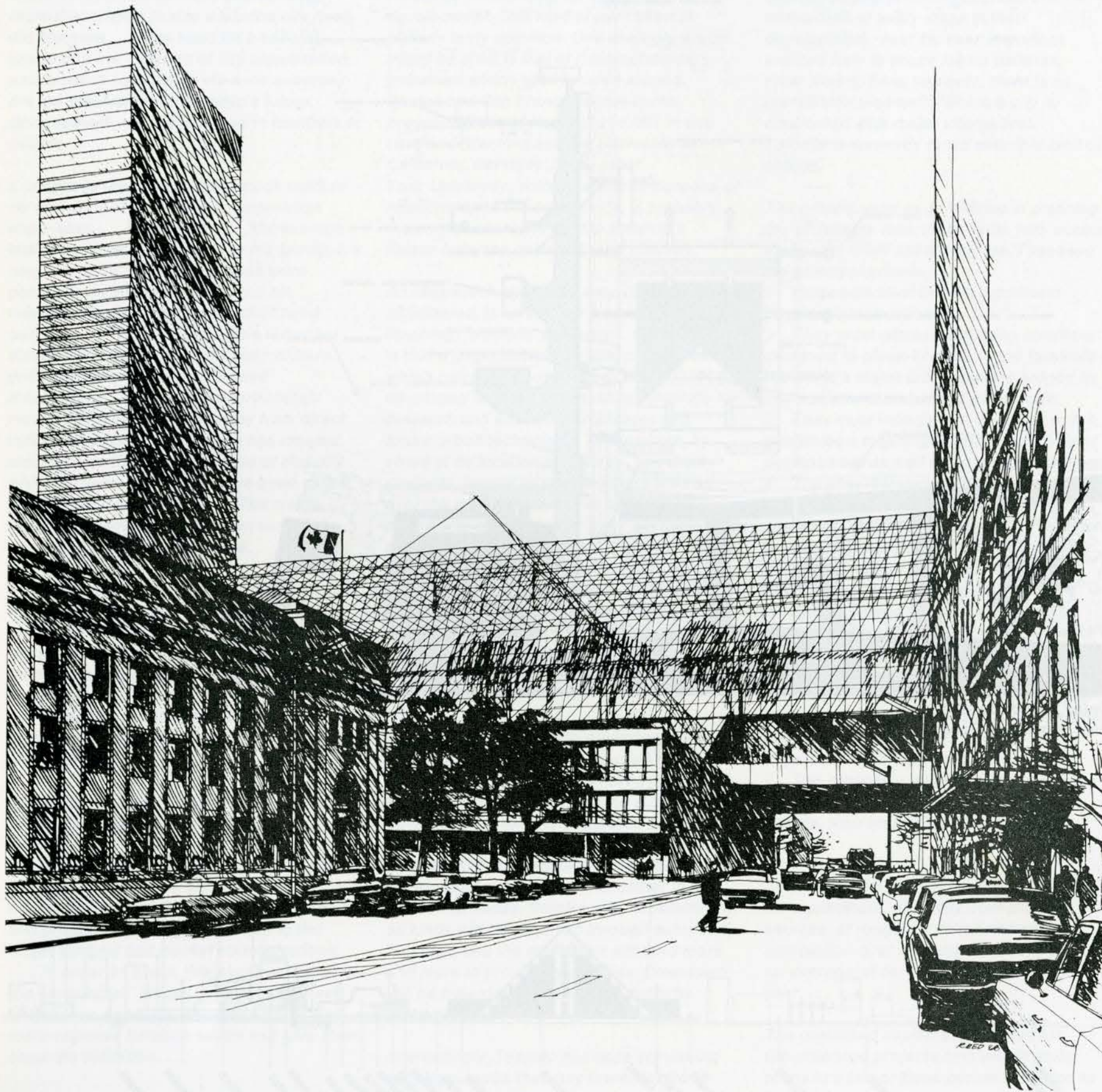
- 1 Downtown window on the lake
- 2 Strong link to new harbor and waterfront developments
- 3 Provision of a major covered "city square"
- 4 Undercover pedestrian connection of downtown centers
- 5 Extension and reinforcement of University Avenue as the only grand scale downtown street (and thus its strongest orienting spine).

Toronto, like many North American cities, has turned its back on its topographical

genesis and prime scenic amenity: the lakefront. The downtown has become isolated by the visual and organizational barriers of the railway tracks, the Gardiner Expressway and industrial plants. In fact, when moving around in the downtown, one is totally unaware that Toronto is a waterfront and not a prairie city.

In considering the physical character of this connection, there are two essential urban design goals that must be achieved. If the development is to be really successful, it must directly relate the downtown to the lake; and it must make a strong, clear communication and visual link between downtown and new waterfront facilities. . . .

Within the core city, the only thoroughfare of substantial civic scale is University Avenue. It was conceived as a wide, baroque style boulevard which would offer impressive vistas and a visual link between landmarks, thus serving as an orienting axis. Unfortunately, the original conception was not carried through, and the broad expanse of University narrows and diverges south of Queen Street and finally expires at the railroad yards. . . . University should be extended all the way to the lake, and it should make a powerful axial statement in a clear line from Queens Park to the water. . . .



Front Street view
Vue sur Front Street

In order to clear the tracks, the new University Avenue will rise from Wellington Street, overpass Front Street, and crest out over the CP-CNR site before dipping down to underpass the expressway. Thus, viewed from Queens Park, the avenue in the distance will rise to meet the skyline. . . .

We propose to parallel the University Avenue extension with an enclosed, climatically controlled galleria 120 to 150 feet wide and 3000 feet in length.

This would be about the same cross section as the famous Great Exhibition in London of 1851, but half as long again. . . .

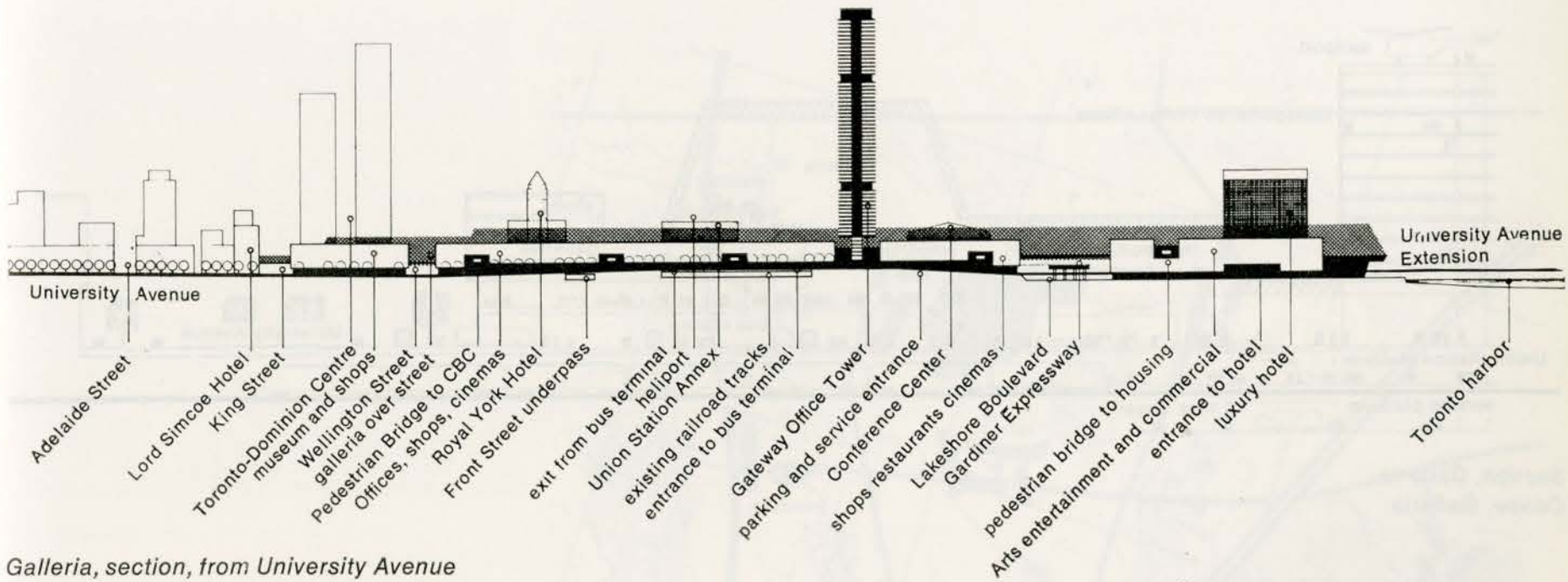
The Galleria will act as a great transparent foyer, linking the downtown to the lake and connecting to the transportation center to the major hotels, to Toronto Dominion Center, to a convention center, to commercial facilities, to an office complex and to new waterfront housing. It is filled with cafes, restaurants, boutiques, film houses, art galleries, specialty shops, tourist agencies, and bus, train and airline terminals. . . .

Across University Avenue from the Galleria, but connected to it by pedestrian sky walks, is the Crystal Pyramid and supporting services. The pyramid, 800 feet to a side and 400 feet high, is a solar glass enclosure of

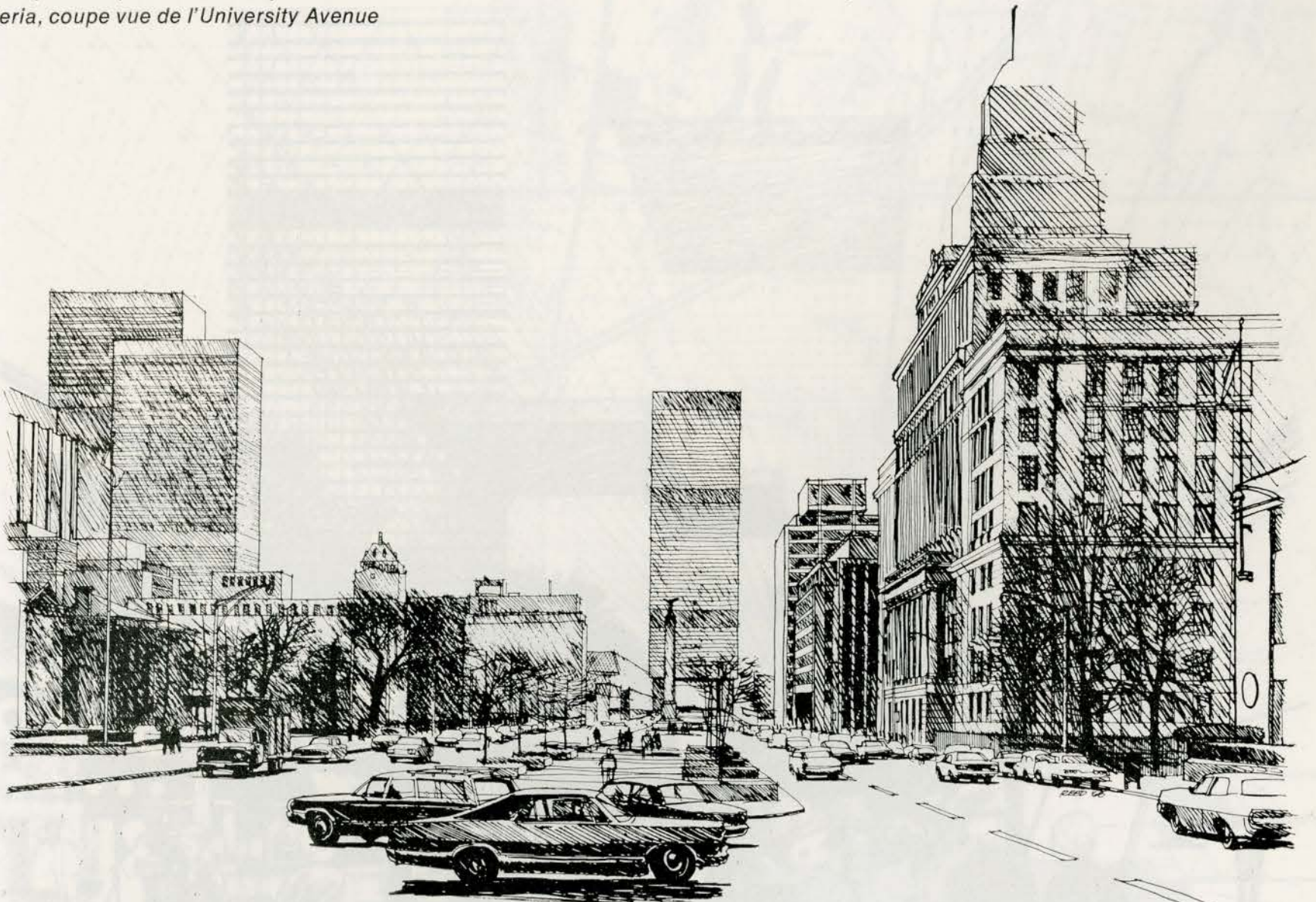
what is really two buildings which flank a covered open space. . . .

Within the Galleria complex, there would be an auxiliary light transportation system, such as a minirail, to speed the circulation of those going to more distant portions of the complex. . . .

At the waterfront end of the Galleria, a raised pedestrian bridge gives access to new high density waterfront apartment development. The apartments are built on a series of islands created by extending and enlarging the existing ship berths between University and Bathurst.



Galleria, section, from University Avenue
Galleria, coupe vue de l'University Avenue



University Avenue view
Vue sur University Avenue

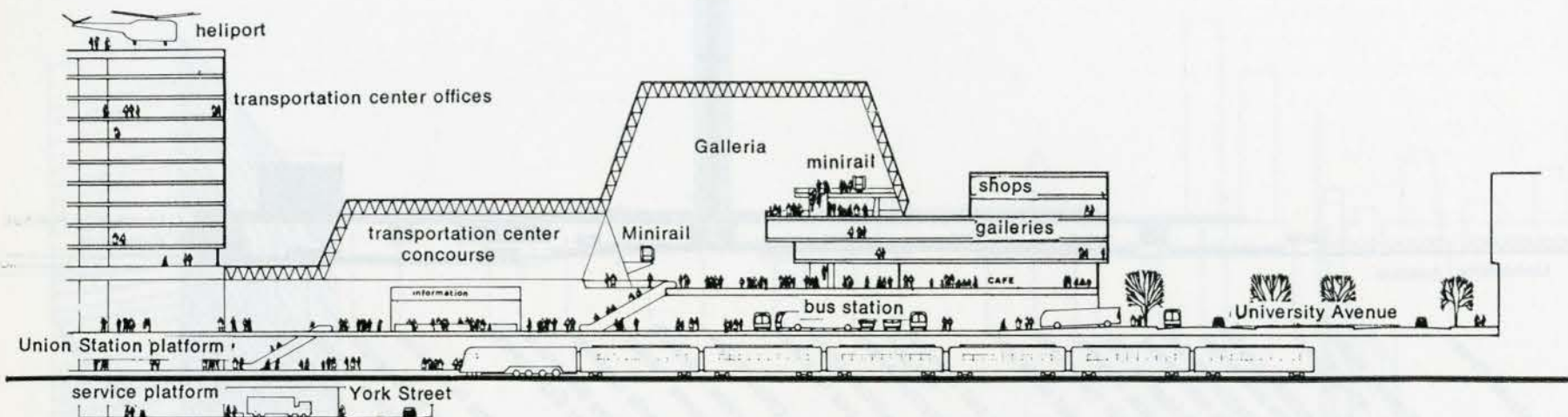
The proposal does not specify a particular design for the waterfront housing, but we envision it as an intensive development (about 200 persons per acre) containing mixed apartment units, each unit having its individual terrace with a view to the water....

Rather than being land based, however, these are built upon specially designed floating platforms.... The production of such floating units has already been investigated and established as technically and economically feasible.

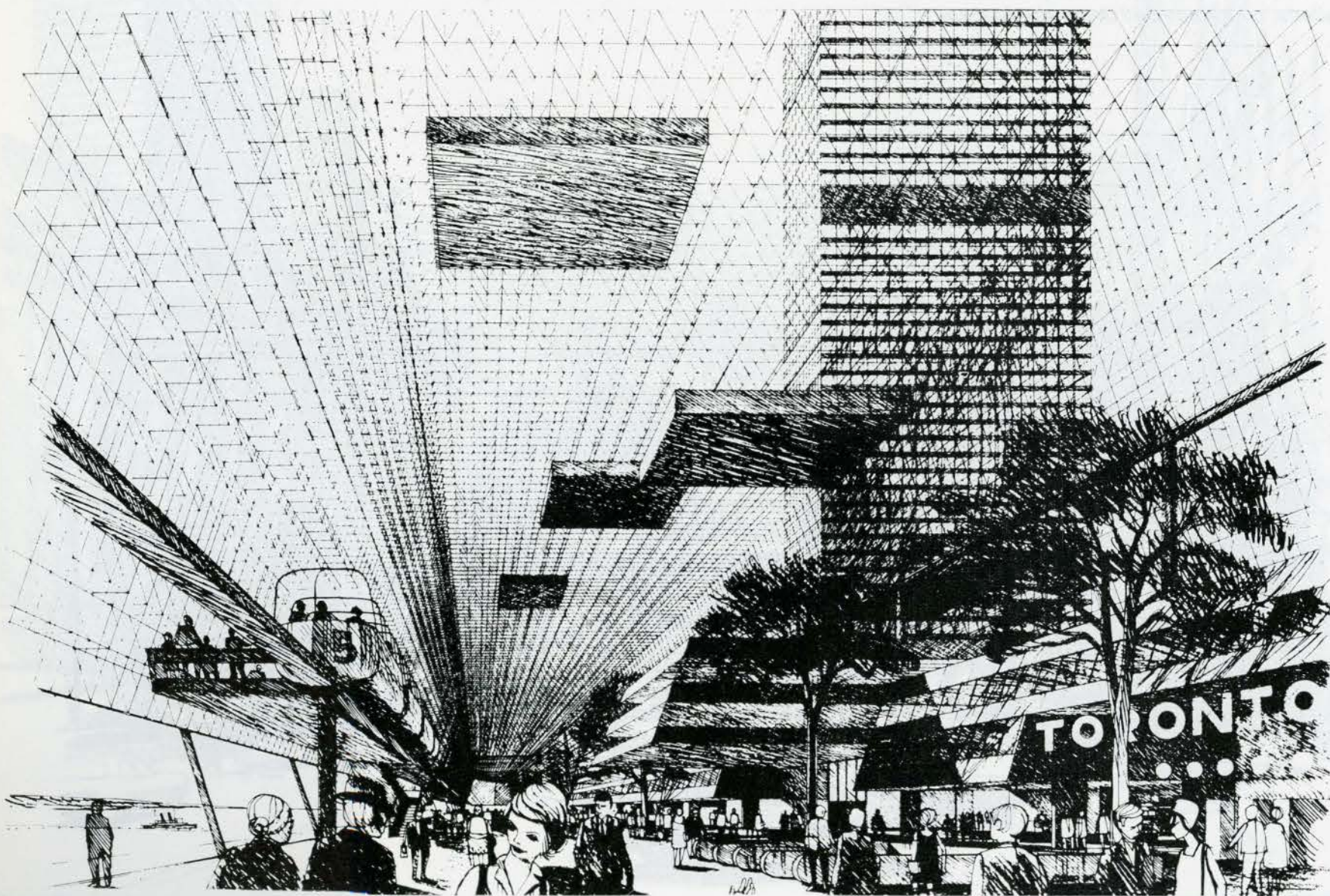
The existing CNE site should be considered for the siting and establishment of a second in-town educational and research center, perhaps an international institute for urban technology....

The campus would be a good natural terminus to the total westward development and ideal complement to it. The balance of CP and CNR property between the Galleria and the CNE site will accommodate residential and commercial uses. These, coupled with the waterfront apartments, would provide housing for faculty and students of the new university and office and research space for university spin-off commercial activities.

The island airport, to the south of this area, is scheduled for termination due to unecomonic operation. It is our feeling that the permanent closing of this airport should be carefully reconsidered. Short takeoff and landing aircraft are being developed and will probably be in common usage in the near future.



Section, Galleria
Coupe, Galleria



Galleria, interior view
Galleria vue intérieure

Toronto has already established a precedent for building high-rise suburban housing. However, these developments are usually in response to such circumstances as high land costs and small-scale environmental factors rather than programmatic decision. The potential of high densities for providing greater amenity and convenience with little increase in cost is not usually fully exploited because of preoccupation with these non-programmatic constraints. . . .

For high density apartment living to have meaningful advantages vis-a-vis other forms of housing, future developments must offer protected convenient access to the daily

destinations of the residents. This access should be independent of the vagaries of the climate, free from winter cold and snow and summer heat, humidity and insects. . . .

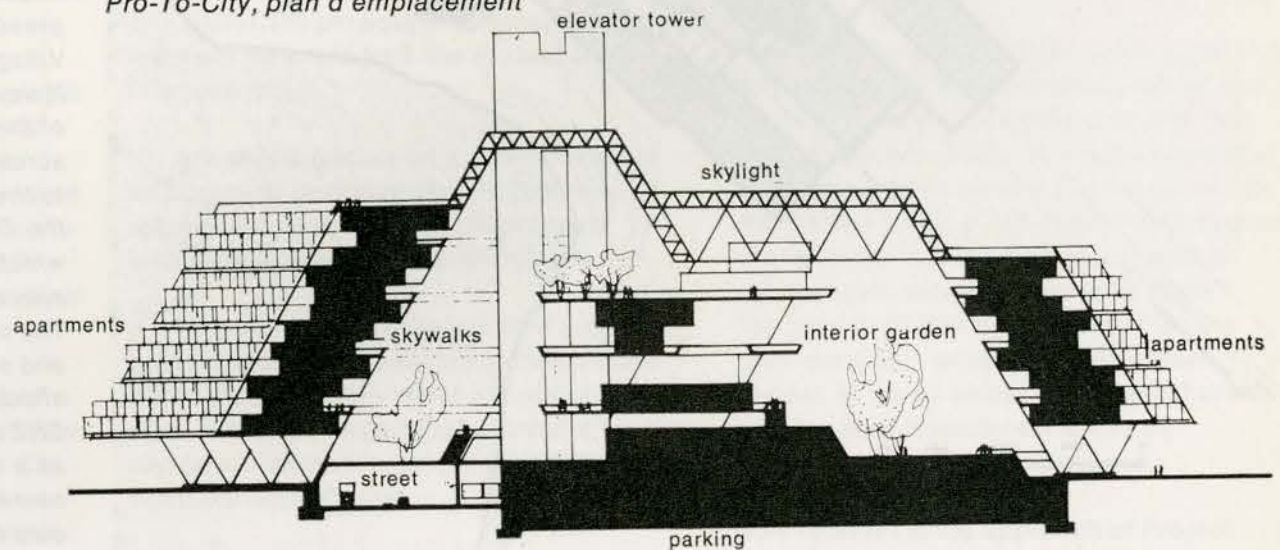
Provision of such increased amenity without substantial increase in unit cost requires many things: first, precise planning to realize the full potentials of existing technologies; second, sufficient volume to enjoy the economies of mass production; and third, design which integrates factory produced assemblies into a flexible system capable of great variation in internal arrangement and conformation to widely differing site conditions. . . .

Because it is part of Project-Toronto and because of its prototypic implications, we are calling this proposal for new high density satellite communities Pro-To-City.

The program for Pro-To-City has focused on three major criteria: first, to define the number of residents needed to support, autonomously, an economic scale of facilities such as supermarkets, service stores, nurseries and primary schools; second, to utilize the advances made in the last decade in building construction systems and processes; and third, to organize implementation in blocks of units large enough to generate quantity production economies.



Pro-To-City, site plan
Pro-To-City, plan d'emplacement



Section
Coupe

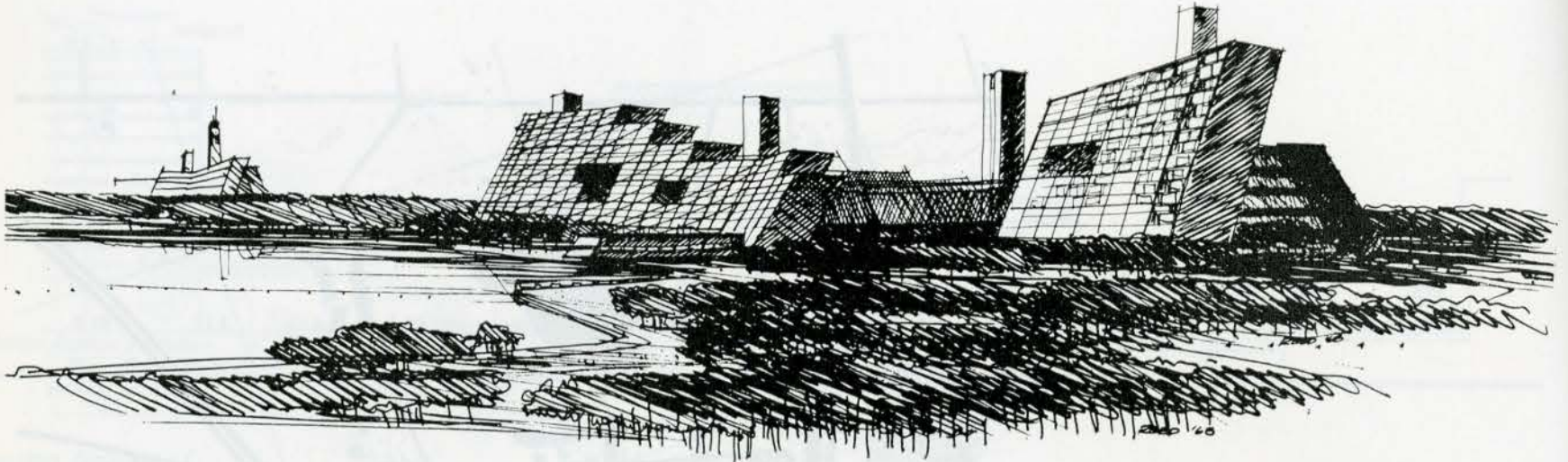
Because the megastructure constitutes a neighborhood entity, some new advances in aesthetics and road safety can be realized. All parking is underground, so that one major contemporary eyesore, the parking lot, is removed from view. . . .

The dwelling units all have frontage directly overlooking the open landscape. . . .

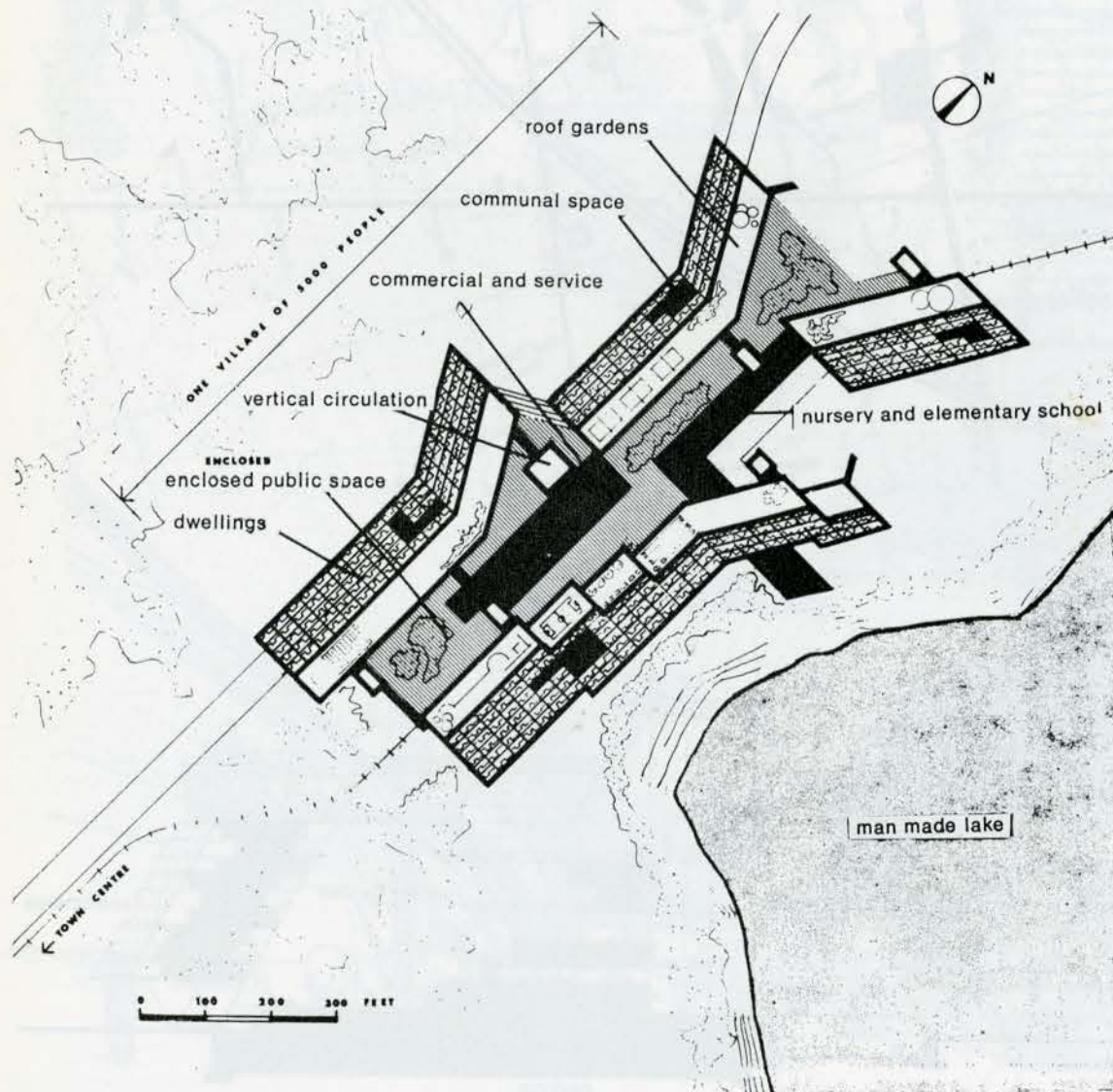
These streets are connected by bridges to the schools, shops and other community facilities, which are in the interior portion. The many roof levels of the structure are terraced and landscaped for various kinds of recreation. Some contain tennis courts; others provide nursery or play areas.

A whole neighborhood can be treated as a single building functionally and all mechanical services, including water, sewerage and waste, power, and heating and air conditioning centrally provided.

Pro-To-City is a satellite city, intended for location on the fringes of major metropolitan areas. It is, therefore, not completely self-contained in terms of urban social services, retail facilities or industry. It is assumed that the majority of the daily work force would be involved in some kind of commutation, therefore, proximity to major road access and/or transit, and projected nearby industrial development, are designated.



Pro-To-City general view
Pro-To-City, vue générale

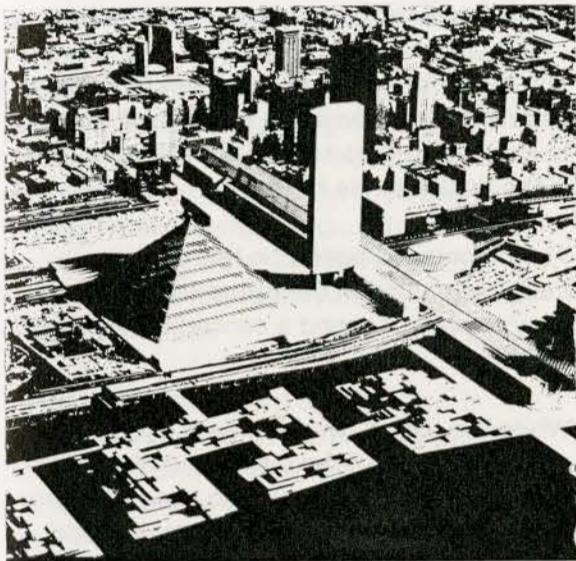


Village plan, Pro-To-City
Plan du village, Pro-To-City

Toronto is hoping to host the 1976 summer Olympics. In order to do so, the city will have to "outbid" other interested cities in offering more than adequate facilities to house the Games. Basic requirements for the athletic and related events are: 1) a stadium seating 80-100,000, 2) an indoor arena for 15-20,000, 3) a swim stadium for 10,000.

In addition to regatta and sailing courses, presumably on lake Ontario, an Olympic Village for 4,000 to 8,000 athletes is needed. It would be possible, with the redevelopment of the island airport, to assemble sufficient acreage to locate the Olympic facilities close to the CNE grounds, also accommodating the Olympic Village and necessary parking, which, if adequate, should total about 15,000 spaces. We believe this would be a mistake. The congestion would be difficult to handle and adjacent land uses would be adversely affected. . . . It is our strong feeling that the CNE and stadium complex should be treated as a mutually supporting facility in a single new location, and that the best location is outside the central city area.

Project Toronto



Comments

by Douglas Crashley, Chairman of the Toronto Planning Board, Member of the Metropolitan Toronto Planning Board and of the Redevelopment Advisory Council.

On the Fuller Report suggestions for:

- a Use of the Canadian National Exhibition grounds as an International Institute for research and education in urban technology.
- b Use of Downsview Airport as, firstly, an Olympic site and subsequently a new Canadian National Exhibition.

a Downsview site is a Canadian Forces base with large investments in installations. It also houses De Havilland Aircraft of Canada. Neither of these are planning a move. York University is adding a Department of Urban Planning which could serve this function.

b There is an ideal site for the Olympics in the form of Stage 1 of the December 1967 Waterfront Development Plan, "A Bold Concept", providing there is (i) enough land, (ii) a short connection by rapid transit to the new Transportation Centre in the CN-CP Development, thereby acquiring access from the site to: Gardiner Expressway, GO System, Subway, Air Terminal, Long Distance Rail, Taxi & Local Bus, Possible Island Airport, thus far ahead of Downsview site; (iii) the first stages of the Harbour City (potential - 50,000 people) can form the Olympic Village; (iv) the Rapid Transit link, the Village, the sports facilities and parking will all have full re-use values after the Olympics.

On the Fuller Report suggestions for:

- a Pro-To City
- b Residential communities floating in the harbour - same standard system as Pro-To City.
- c Extending ship berths north thereby bringing harbour "right up to Gardiner".

a Pro-To city provides the answer to many high-density problems - exciting environment - no slabs, outside living areas - terraces, interior day-lighting from the transparent roof over the spine, but can it be built to rent at competitive rates?

b Islands of residential high-rise in the harbour are most desirable and are a feature of "A Bold Concept", Buckminster Fuller's structural system is subject to the comment above.

c Mr Fuller, on the CFTO interview on his proposals, stated that this was not one of his recommendations.

On the Fuller Report suggestions for:

- a Extension of University Avenue south ending in cul de sac in harbour
- b Gateway Tower
- c 3000 foot Galleria
- d Crystal Pyramid - Fuller Report

a There have been many suggestions in the past for the extension of University Avenue. The structural problems of over the tracks and under the Gardiner and presumably under Lakeshore Road contained in Buckminster Fuller's scheme are formidable. The CNR-CPR proposals which should be released soon will help the evaluation of this proposal.

b A terminal feature on a main avenue is an accepted design objective. It is most appropriate in this case. This proposal involves no new structural technique.

c The Galleria is exciting in that it adds great character to pedestrian connections. While 3,000 feet may seem excessive for a start, it is to be hoped that at least a section can be completed in conjunction with the Transportation Centre.

d The Crystal Pyramid requires an engineering and economic appraisal. □

Comments

by Gerald Hodge, Associate Professor, Department of Urban and Regional Planning, University of Toronto

"Tell it the way it is," a major rallying cry of young people today, has special significance for architects and planners who are prone to "tell it the way it should be." Here is a demand that plans for our cities see the situation in its own terms; *it asks that they be relevant to what is*. How relevant is *Project Toronto* to the way it is?

Project Toronto comprises three projects involving "significant physical construction", to use their terms, "designed to place Toronto in the forefront of the world's major urban centers." These three projects with no apparent interrelation or integration, are (1) a galleria complex, a controlled environment, to better relate the downtown core to the lake and harbor activities; (2) three satellite communities, "pro-to-cities", about 15 miles from downtown; and (3) an Olympic/CNE complex also on the fringe of present urban development.

Of what relevance are these three projects to existing conditions of urban poverty, social and cultural turbulence, and alienation - of which Toronto has its share? Mention is made in the report of Toronto's role as a reception center for overseas and domestic immigrants, but not of their living conditions or the cultural milieu they create.

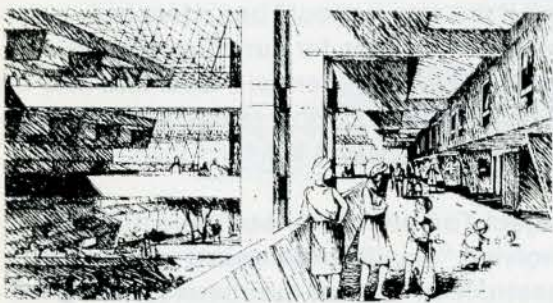
In what way are these three projects relevant to the dozens of square miles of 40-50 year old housing that is obsolete now and will continue deteriorating for another 40 years because we have neither the resources nor institutions to cope with them? And how are they relevant to the pressing problem of providing housing at reasonable costs? The cost of \$6,000 per inhabitant for the "pro-to-cities", while a lot better than Habitat '67, is no better than present urban development in such new towns as Bramalea, Don Mills, or Ajax.

How relevant is the approach of Project Toronto to organizing this region when the activity patterns of people indicate a life

space covering up to 25,000 square miles abetted by the two-car household and including the two-house family? The report pays only lip-service to the new complexity and diversity of urban life.

And is it relevant to lump Toronto prospects for future growth in with the "second-grade mid-western metropolitan centers"? Toronto's future is locked into Canada's future; it is a national city playing vital nation-serving roles, something its US regional counterparts (e.g., Buffalo, Cleveland) cannot do.

Finally, does the scheme give itself away as irrelevant for today (much less tomorrow) when in "making visible the present environment", in McLuhan's terms, we find the content of the past environment, viz., "(the galleria) would be about the same cross-section as the famous Great Exhibition in London 1851, but half as long again." □



Comments

by Dennis A. Barker, Chief Planner and Executive Director, City of Toronto Planning Board

Unless I have misinterpreted Mr Fuller, he is saying the City or Urban Regional is essentially a "marketable product" in terms of the population's sophistication in what they expect from their environments. Mobility has made it possible for more people to be selective, and just as they shop around for the best deal on consumer goods, they are now able to shop around for the City or Community of their choice. I agree, and support the underlying philosophy that it's a new product that we must be seeking, not the same old product wrapped in fresher or more colorful wrappings – "A Sense of Image" – perhaps uniqueness.

Project Toronto translates the ideas and lessons of Expo '67 into a physical form that could be the first step in the development of that new product – I think all planners should applaud Mr Fuller's answer to the question – "How do we implement" – "That's your problem not mine." Technology affords us the opportunity to move mountains, move 20-storey buildings, build on water, etc. – surely we are not at the outset, going to ask how much, what by-laws, what zoning, etc. Mr Fuller doesn't say it must be in the precise physical form that has emerged after

three months' study, but he challenges Toronto to look at itself in its World and North American Context, and its unique location factors, and he says you really should respond to that potential – and who can challenge that ideal. For me the significant points made in *Project Toronto* are the following:

"The need for this sort of special image and the question of city organization and function (downtown vis-a-vis suburbs) are the real issues for Toronto's future development not the increase in numbers of people."

"Planning, based upon statistical projection, making the assumption that numbers are the only dynamic, is likely to merely produce more of the same. In point of fact, changes to the city will have much more to do with style of life than with population expansion."

"People today are conscious of 'what's happening'. When reacting to and evaluating their own environment, they have the whole world to compare it to."

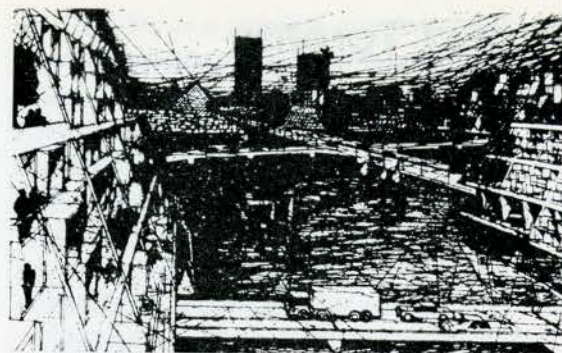
"In order to break this cycle and change the 'provincial' image, service cities need to discover a specific identity, a particular extra-regional function which will give them separate definition."

"Education is one of the great growth industries of the future, and it may well be Toronto's best means for achieving its extra-provincial and extra-Canadian role."

"The current pattern is not one that produces distinct and distinguishable local nodes of contrasting activity. It does not generate any physical delineation in greater scale than that of the independent development of each separate land parcel, so there is little of the cumulative effect which is the essence of a comprehensible and visually impressive city organization."

"History offers abundant evidence that growth is, in and of itself, no guarantee of quality, especially in the interior of the North American continent. Example after example in the American midwest attests to the fact that greater size may merely mean more of the same."

I believe Mr Fuller's *Project Toronto* in effect poses the simple question to Toronto – more of the same or?. The emergence of Waterfront Plans, Railroad Redevelopment Plans, *Metarts*, and *Project Toronto* offers the opportunity for Toronto, in more current language, to "sock it to them". A failure to respond now will be a misunderstanding of Mr Fuller's message. □



Comments

by A. J. Diamond, Architect, Head of Graduate School of Design, Faculty of Architecture, University of Toronto and Associate Editor, *Architecture Canada*

The report provides an overview of Toronto's situation and potential – for anyone wanting to know, in précis form, about Toronto, this is the document to read.

The planning is based on this overview. Further, implicit in the approach, is a *Project* view of planning, and a centrality concept of cities.

While the report overview as a guide to the characteristics of the city is a useful document, it is dangerous to base specific planning proposals on such a foundation. After all, the funding of proposals, and the strategy of implementation are design issues too. For example, the galleria may also be achieved by connecting many, small galleria, owned by many, rather than one super galleria which could not be implemented under present land ownership patterns.

The construction of large projects, when not a result of a comprehensive goal system, (which would include the distribution of activities on optimum trends for the metropolitan area) are of doubtful value.

The provision of an axis for Toronto is evidently an important item in the plan. This, in the broad context of physical and social planning in the last third of the twentieth century, can hardly be sustained as an important priority: A visual axis was once a device for comprehensibility. Now there are more appropriate devices to achieve that aim in a contemporary condition where cities cover wide areas.

Fuller once said "North American cities face their past, and back into the future." Clearly the success of this scheme of his will be dependant on whether it prevents Toronto from doing that. As a stimulus it is of inestimable value. The fact that it has been sponsored by an enlightened private source (John Bassett, Publisher of the *Toronto Telegram*) is tremendously encouraging. If therefore it creates public concern, and raises expectations which demand satisfaction, it must be applauded. That the scheme itself is not as advanced as might be expected will then no longer be important. □

A New Approach to Urban Housing in Canada

Anthony J. M. Collins, FRICS AIArb.

Mr Collins practiced as a chartered quantity surveyor in England and gained Canadian experience with the contracting

industry in Vancouver. He is now head of the specification department of Dobush, Stewart, Bourke, Longpré, Marchand and Goudreau, Architects, Montreal

The recent national conference on the "Systems Approach to Building" organized in Ottawa by the Department of Industry as a part of the BEAM program with the co-operation of the RAIC, the ACEC and the CCA, as reported in the June issue of *Architecture Canada*, has attracted the attention of the entire construction industry to this new technical development in North America.

This, and a subsequent article show in greater depth some of the already proven possibilities of a "Systems Approach" to urban housing. At the same time it will show the important role that the architectural profession has to play in developing the new technique and that any fear of design limitations leading to drab city skylines is unfounded. The already chronic housing shortage for the young family, who can no longer afford to buy a home in the large urban centres, demands that the industry should implement these new techniques without further delay in order to accelerate housing production and to lower costs. It is felt that the profession may be in a special position to act as a catalyst for this new development in Canadian urban housing.

The Housing Shortage

With the certain need to more than double our present housing accommodation from

some 5½ million dwellings to 12 million dwellings long before the end of the present century (which is now only 32 years ahead of us) it is more and more evident that for a number of reasons these needs will not, indeed cannot be met, unless we radically change the present processes of building.

The chronic housing problem is concentrated in the urban areas with Canada's three largest cities already in the grip of a cost escalation which places family housing beyond the reach of some 80% of their populations. Therefore before going further, one is advised to read Wylie Freeman's article on the economic background to all this, published in the April issue of *Architecture Canada*.

Quite aside from being able to afford the initial purchase of a house at all, the added consideration of transportation cost to the place of employment, relative also to the time involved in getting there from the family home, cannot be ignored. A home located on the city's perimeter because of reduced land values, means an added expense of perhaps even as high a figure as \$1,000 a year to the family budget in order to travel to work by the family automobile. Our cities have either neglected to provide rapid transit facilities at all, or have concentrated them in the inner urban areas, thus implementing the

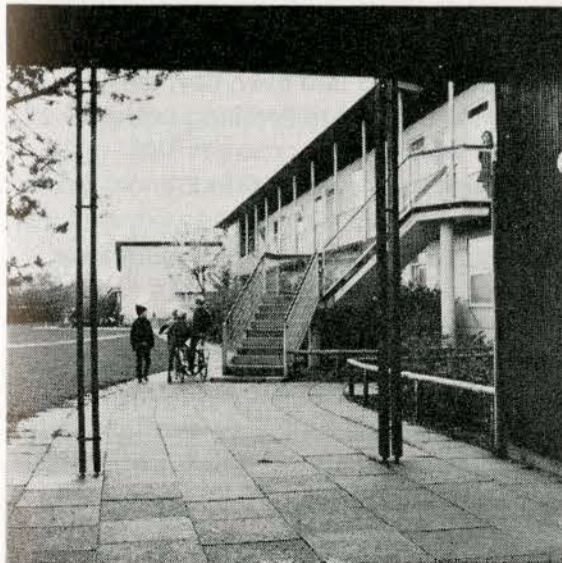
- 1
An early scheme of low-rise apartments for family living, Denmark. Architect: Eske Kristensen. P. E. Malmstrom, Copenhagen, Denmark
Un premier projet de maisons familiales de deux étages
- 2
Low-rise apartments for large families completed in 1967, Sweden. Ohlssen & Skarne, Stockholm, Sweden
Immeubles d'appartements peu élevés pour familles nombreuses, achevés en 1967

additional chronic city problem of mass *individual* transportation by the automobile. A new look needs to be given to facilitating more economic housing construction in or near the more central parts of the city.

The greatest failure in meeting present day housing needs is clearly the provision of housing for *the family*, (Figs. 1 & 2). How are we to provide housing which the young families can afford after their first child is born, when the need arises for accommodation for a period of 20-25 years of three and eventually perhaps four bedroom size. The "squeeze" is most evident for the size of accommodation because large private multi-storey apartment developments generally force the family out to look for a private owner-owned house (which it usually cannot afford). Rental accommodation in the private domain has not generally been *family* orientated. Adding to this problem we have the forecasted need by 1980 (CMHC and the Economic Council), of 255,000 housing completions a year. At present we are only achieving (if we are lucky) from 150,000 to 160,000 such completions.

A Basic Solution

It is not the object of this article to dwell on the need for legislated land reforms to



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Setting a floor slab section into position. England. Wates Ltd., London
Mise en place d'une dalle de plancher.

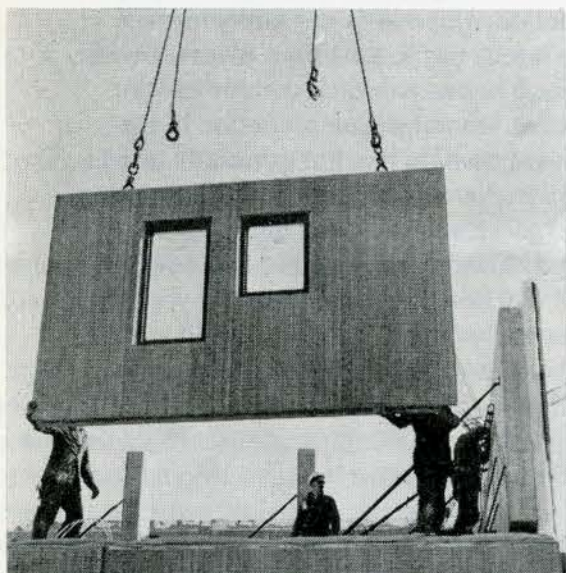
4

Lowering a complete concrete insulated wall sandwich panel. The windows are installed, glazed and painted, Sweden. Ohlsson & Skarne

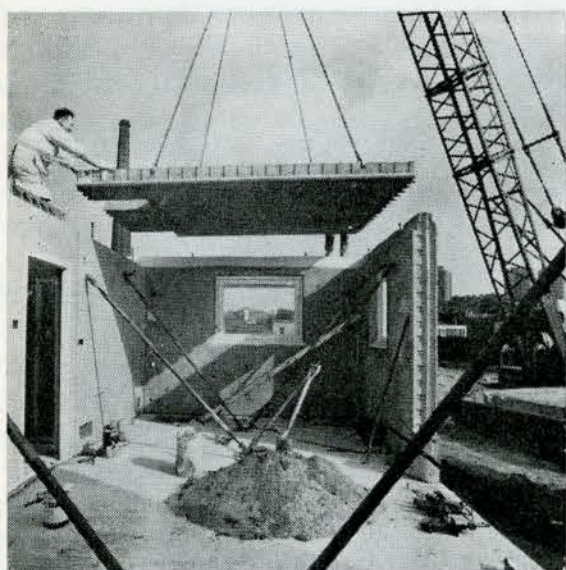
Descente d'un mur en béton revêtu de panneaux isolants. Les tenêtres ont été posées vitrées et peintes



3



4



5

5

Illustrating the hollow section floor slabs; the end wall prepared for services; temporary bracing, and door frames and windows installed at the element factory, England.

Department of Architecture & Civic Design of the Greater London Council

Illustration de la partie vide du plancher.

Préparation du mur du fond pour la pose, renforcement temporaire et installation des encadrements de portes et fenêtres, faits à l'usine de préfabrication

eliminate the speculative rise in land values which are having such a detrimental effect on the housing needs of such a large segment of the Canadian population. It must however be noted, in passing, that the politicians will have to solve the problem of urban land cost and its financing, before the *whole* problem can be solved.

Instead, we are concerned in these two articles to give an insight to developments entirely *within the capabilities of the construction industry*, and the *building owners* both in private and public sectors, which will go a long way to alleviate some of the pressures of increasing demand and increasing cost.

Mass Production

The developments over the first half of this century, particularly in the U.S.A., in the techniques of mass production, started by the automobile industry and brought to a fine "art" by the aviation and subsequent space-age industries, indicate an obvious route to lower costs and more rapid delivery. Why has the construction industry been unable to move into this field?

It would seem that the "on again/off again" phasing of consumer demand is a root cause of the problem. There has been and still is, no *guaranteed regular market* for large component elements in the housing field. Internal fixtures, such as kitchen appliances, bathroom plumbing hardware and the like, are universally marketed, but such considerations as whole walls, whole floor or roof slabs, whole staircases, etc. have not yet been developed.

The Economics

The European scene, particularly in Scandinavia but throughout almost all of the some 25 nations that make up that sub-continent, has for 20 years developed highly skilled technology in the science of component building, taking it to the point where 75% of a typical apartment building is factory produced for site assembly, (Figs. 3, 4 & 5), leaving only 25% for site labor and this largely confined to foundations, site layout, landscaping,

painting and decoration and mechanical and electrical connections.

One cannot emphasize too greatly that the whole key to this success in Europe has been:

- 1 Teamwork
- 2 Continuity of work
- 3 Repetitious use

From these achievements, we can show that a completed multi-storey, multi-unit dwelling in actual physical cost, is reduced by some 15%-20% in the case of industrially developed dwellings, as against traditionally built ones which are still being constructed in the same area.

As the structure of a high-rise apartment building amounts to approximately 25% of its total cost, a saving is immediately apparent in the general contractor's (structure erection) costs if pre-fabricated units are used. The effect on the total cost of the building is not so obvious. However, we must realize that the structural costs include significant factors which give savings in other areas of work. For instance, the plastering and drywall trades (aside from minor spackling) are completely eliminated and many services are cast-into the concrete at the factory. Erection is fast, accurate, uninterrupted by climate and with simultaneous erection of pre-fabricated façades, the whole building structure is completed very quickly, is dry and can be temporarily heated, allowing a much earlier entry of finishing trades. It is not unusual in a structure with 12 or more storeys, that a temporary waterproof layer is laid over, say, the 7th floor slab, allowing finishing trades to enter and work in the dry before the upper storeys are even erected!

Thus better and faster working conditions, reliable quality and accurate fast time schedules, bring considerable overall benefits compared to the traditional building system and a convincing overall economy is the result. The quoted 15%-20% saving has been proved in Denmark, where skilled labor is earning less than \$3.00 per hour. Needless to say, it is essential when designing the building to be aware of and to build into the design, the economies which can be obtained by using different finishing procedures. It is

A typical kitchen assembly, where all the manufacturers (cabinets, sinks, ranges, refrigerators) use a standard 10 cm (4") module to enable complete integration, Denmark. P. E. Malstrom

Pour l'installation de l'équipement de cuisine tous les fabricants (placards, éviers, cuisinières, réfrigérateurs) utilisent l'unité modulaire standard de 10 cm (4") permettant une précise intégration



6

also essential to take advantage of the standardization of the structural components, to extend this to such items as kitchen cabinets, (Fig. 6), which for example, can now be completely manufactured in one piece, be spray-finished at the factory, trucked to the site, crane hoisted into the dwelling and be merely hung on the prepared concrete wall.

The physical cost is not the only saving, but the huge (and often not realized) financing costs which mount daily until the dwellings are occupied, are also slashed. Both erection and completion (at differing stages of the construction echelon of course) are quite usual at a rate of five dwellings per day on a single multi-storey apartment building. Thus what may have taken nine months to build above a foundation can be achieved in six.

For Canada, a further significant factor is that the factories can go "full blast" for twelve months of the year. If site erection can be achieved during winter months by the development of simple but highly necessary human requirements, such as electrically warmed gloves, the structural construction is so relatively simple that even erection and full cladding can proceed in the worst part of the year without costly temporary coverings with large wasteful heated areas, (or a total shutdown for several weeks).

The Labor Problem

It must be recognized that in order to

The "Morris Walk" scheme, Greenwich, London. Department of Architecture & Civic Design of the Greater London Council
Le projet "Morris Walk" à Greenwich, London

increase our ability to build homes at a greater rate per annum than the 162,000, which is the best we have achieved so far, we have two alternatives. One is substantially to increase the labor force; the other is to mechanize. Since the present traditional method also requires a considerable percentage of site skilled labor, a huge problem faces educational government and the industry in continually training large quantities of unskilled manpower. If we can neither obtain additional manpower or cope with the necessary training programs, the switch to mechanization will be inevitable, (whether it is economic or not).

A factory can be greatly mechanized. A crew of some 20 men can produce in two shifts enough concrete units to supply 9 dwellings. Similarly, the factories assembling complete millwork units, complete façade units (assuming non-concrete), complete plumbing and drainage stack assemblies (one or two storeys high), and so on, can concentrate *limited* skills on a production line basis to do a satisfactory job, against the more wasteful site process where skilled labor is expected to be able to cope with *all* the differing work which is part of its particular trade.

Housing Schemes

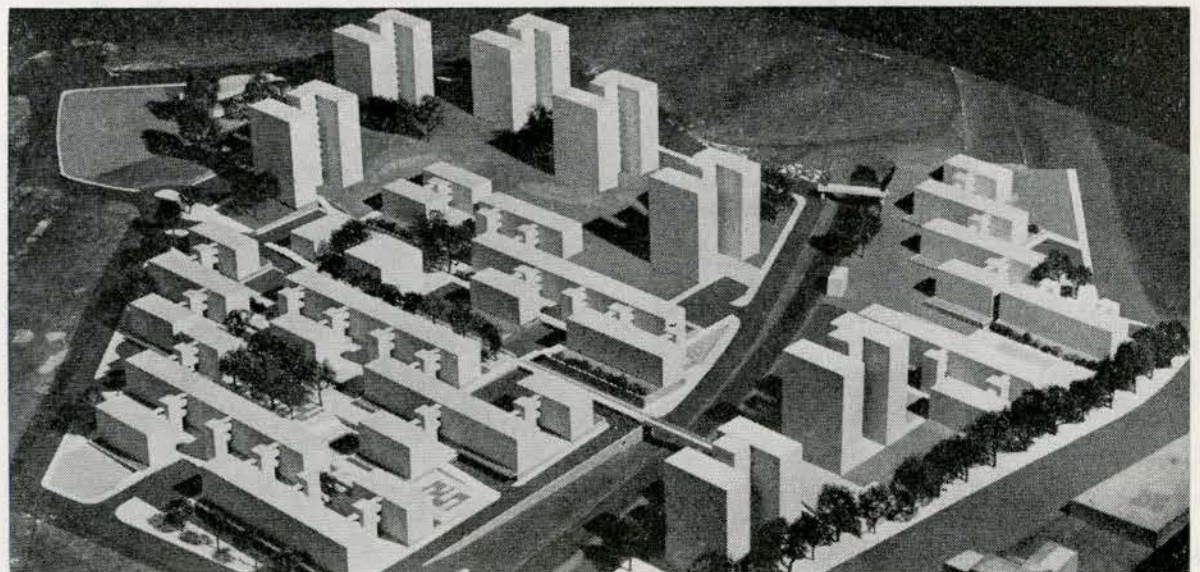
If we examine two widely differing housing

schemes in two different countries, we may be able to better understand the scope of the "systems building" approach to housing.

"Morris Walk", London, England:

A team was created by the Architectural Department of the owners, the Greater London Council, in which were represented the contractors, engineering consultants, specialists, the owner's architects and the Danish consulting engineers of the system selected. The site development consisted of 562 dwellings at a density of 110 persons or 33.8 dwellings per acre. Seven blocks were built of 10 storeys containing 40 units each, and forty-seven were built of 3 storeys containing 6 units each. The ancillary buildings included tenants and old persons clubrooms, works accommodation and two taverns. (Fig. 7.)

The concrete units were made at a factory 120 miles from the site, transported by rail to within the last mile, where they were re-shipped by road. The units were made in steel moulds with a controlled maximum tolerance being obtained of 2 millimetres on all the dimensions and in the plane of the unit. Site erection was carried out by 15 men and one 85 ton mobile crane achieving an erection rate of more than two dwellings per day. The value of the whole contract was approxi-



7

A view of part of the "Morris Walk" development from adjoining Maryon Park
 Vue du Parc Maryon sur une partie du groupe "Morris Walk"

A comprehensive housing scheme must include all necessary social and educational amenities. The Hoje Gladsaxe development on the outskirts of Copenhagen P. E. Malstrom

Chaque centre d'habitation doit comprendre des aménités sociales et scolaires.

Le groupe Hoje Gladsaxe se trouve en dehors de Copenhague

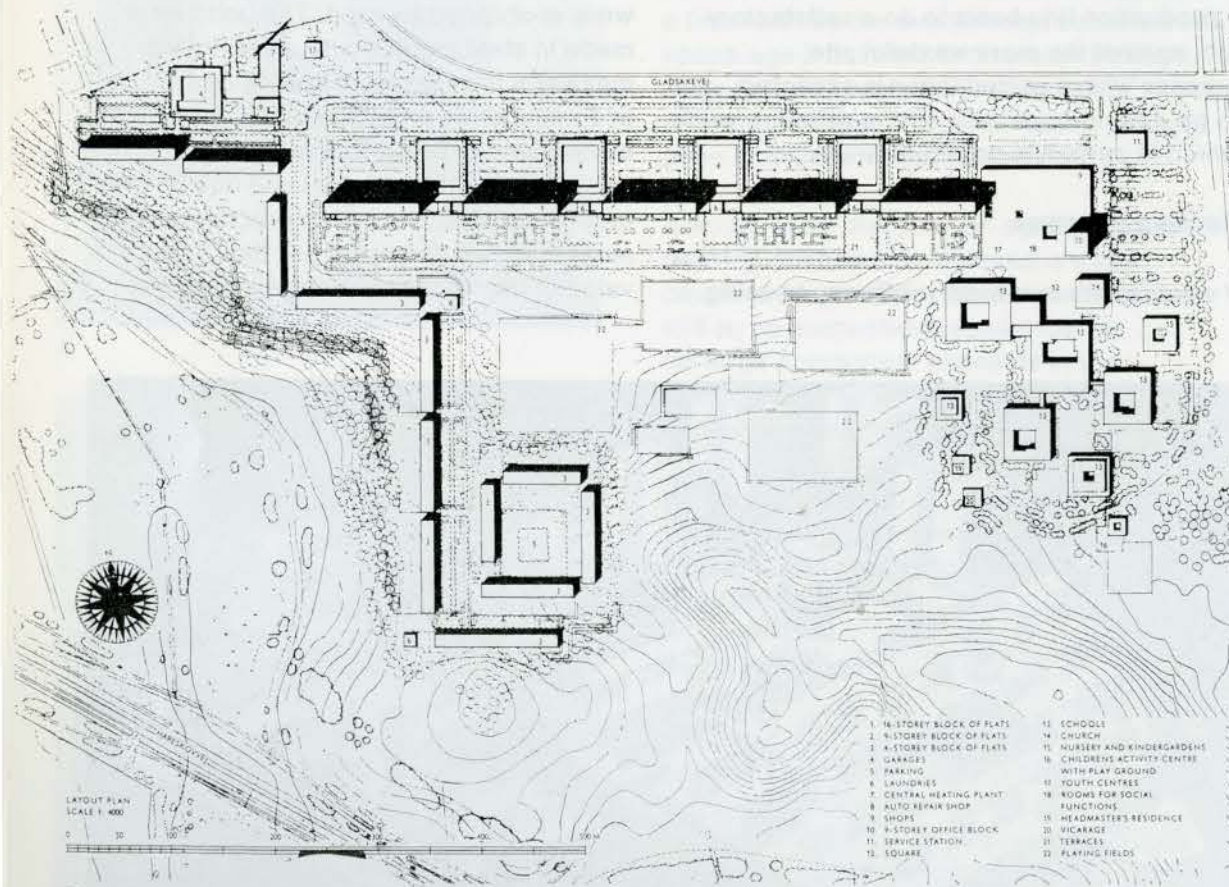


mately \$5.7 million or less than \$10,000 per dwelling. Occupancy of the first 120 dwellings was attained within 15 months and the whole scheme completed in 27 months. The contractors were Taylor Woodrow-Anglian and the scheme was designed in the Department of Architecture and Civic Design of the Greater London Council. The architect was Hubert Bennett, ARIBA. (Fig. 8.)

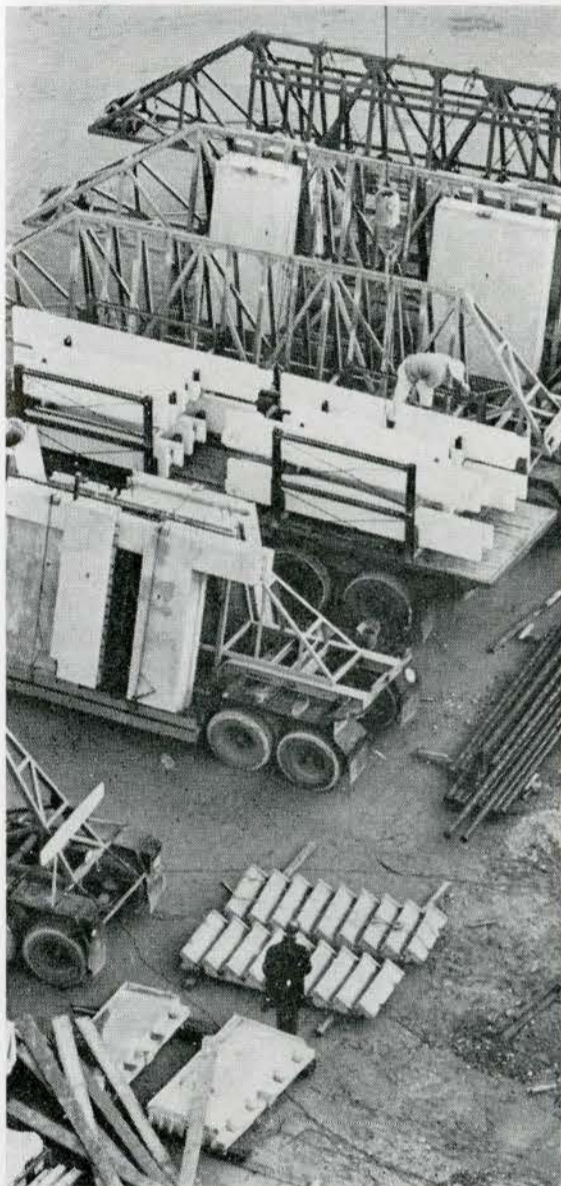
Hoje Gladsaxe, near Copenhagen, Denmark: A team was similarly created as in the UK development incorporating the owners, three architectural firms, three engineering consultants, landscape architects, and other consultants. The site development was in a different context, being more of a satellite dormitory complete with all facilities, located in open country on the periphery of the Copenhagen urban area. From the 173 acres which were available, no less than 123 were allocated for a public park (and therefore cannot properly be considered part of this development); 10 acres were allocated for the buildings and 40 acres for parking, roads and pedestrian terraces. The whole scheme comprised 1921 dwellings with a density of 122 persons or 38.4 dwellings per acre. The blocks were developed as five of 16 storeys, two of 9 storeys and ten of 3 to 4 storeys, with a special single 10 storey block for student housing. Parking accommodation was provided on the basis of one car per dwelling and other ancillary buildings include laundries, a district heating plant, shops, a service station, schools, a church, a nursery, youth centres and some special residences. (Fig. 9.)

The project is interesting not only because the owner (a local government authority) set aside 15% of the dwellings for low income families and subsidized their rents, but also because the room breakdown of each dwelling, puts a special emphasis on family needs. The breakdown approximately is as follows, (kitchen, bathroom and storage room are not included in the room computation, which is enumerated for living and sleeping space only):

- 1 room - 280 dwellings
- 2 room - 280 dwellings
- 3 room - 684 dwellings



10
Special trailers convey concrete elements to the site from the central factory. Three or four trailers are assigned to each tractor unit
Transport des matériaux par remorques de l'usine au chantier. Trois ou quatre remorques sont nécessaires pour un transport

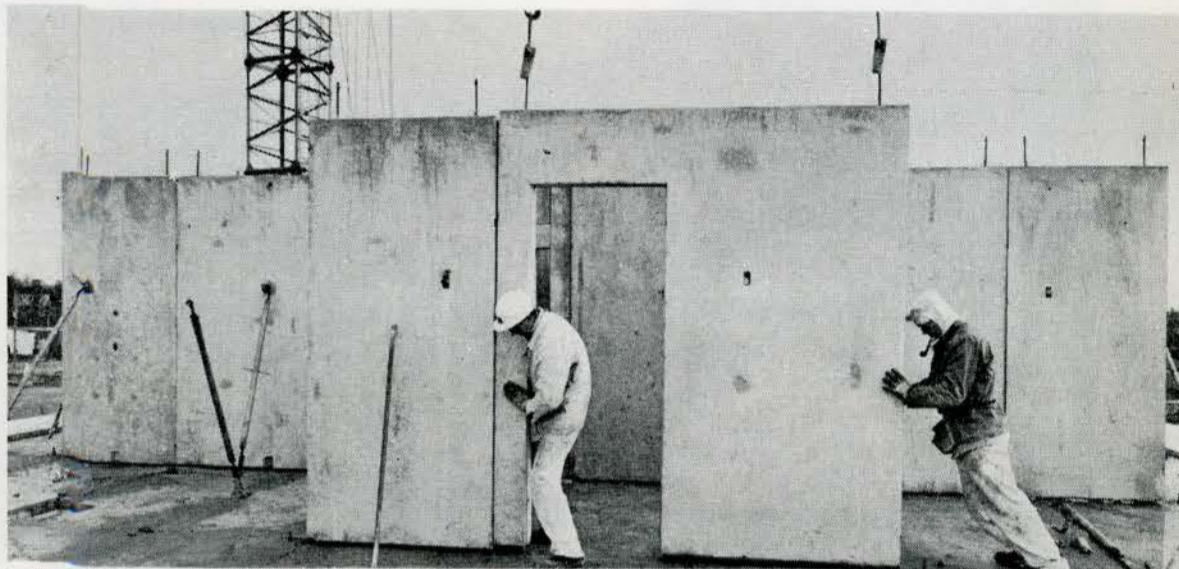


10

4 room – 497 dwellings } – over one third
 5 room – 180 dwellings } of the total.

The structures, built on the Jespersen system, use smaller component modules than the previously described scheme. The cross walls again carry the load, prestressed by cables in the horizontal joints where stability is desired under wind loading in the 9, 10 and 16 storey blocks. The façades are of light wooden framing, ready painted, complete with windows, glazing and 4" mineral wool insulation, being erected in panels of 55 square feet area. Delivery to the site of the concrete panels was by road trailer (Fig. 10) and assembly was by tower cranes on rail tracks. (Fig. 11.)

11
Erecting load bearing walls on the highrise Hoje Gladsaxe scheme. Note the self-aligning bolts factory cast into floor units for accurate wall setting
Montage d'un mur d'appui au chantier Hoje Gladsaxe. Les boulons sont enfoncés dans le sol pour faciliter une mise en place précise des murs



11



12

The value of the whole contract was approximately \$22 million, but the cost per dwelling is not available, due to the many ancillary buildings. The contractor was J. P. Christiansen and the architects were Agertoft & Juul Moller; Hoff & Windinge; and Poulsen (Fig. 12.)

To close this first article, let us look at a few more schemes than those already mentioned and gain an insight into the variety of elevational and aesthetical design which can be achieved, using a "systems approach" to urban housing. (Figs. 13 to 18.)

In a second article on "Systems Building" for urban housing, which will appear in the next issue, we will look in detail at some of the various systems that have been

12
Part of the completed Hoje Gladsaxe development. The façades are lined with balconies with pre-fabricated wooden window/wall units behind
Partie terminée du groupe d'immeubles à Hoje Gladsaxe. Des façades avec rangées de balcons, unités de fenêtres et murs en bois préfabriqués au fond

developed showing their differing techniques and we will evaluate the architect's role in this new approach to urban housing.

The material for this article was written in May of this year, before the recent "Report" of the Canadian Technical Mission on the use of Pre-fabricated Concrete Components in Industrialized Building, September 1966 was published in June 1968 by the Department of Industry. Readers wishing to gain further knowledge on this subject are advised to obtain copies of this 280 page report from the Materials Branch of the Department of Industry, Ottawa.

13
Woodford near London. The 604 dwelling scheme includes underground garages, shops and a meeting hall for the community. Wates Ltd
Woodford près de Londres. Ce groupe de 604 logements comprend des garages souterrains, des magasins et un lieu de réunion pour la communauté

14
Family housing at Ballerup, Denmark. Danish law requires cross-building ventilation through each dwelling, with all living rooms facing a southern aspect. P. E. Malstrom
Habitations familiales à Ballerup. La loi

danoise exige une ventilation transversale dans chaque appartement et des salles de séjour faisant face au sud
15
Pre-cast concrete façades incorporate factory installed windows, glazing and the typical Middle-East roller blind, Israel. P. E. Malstrom
Façades en béton armé, incorporation des fenêtres, vitrerie et mise en place des jalousies.

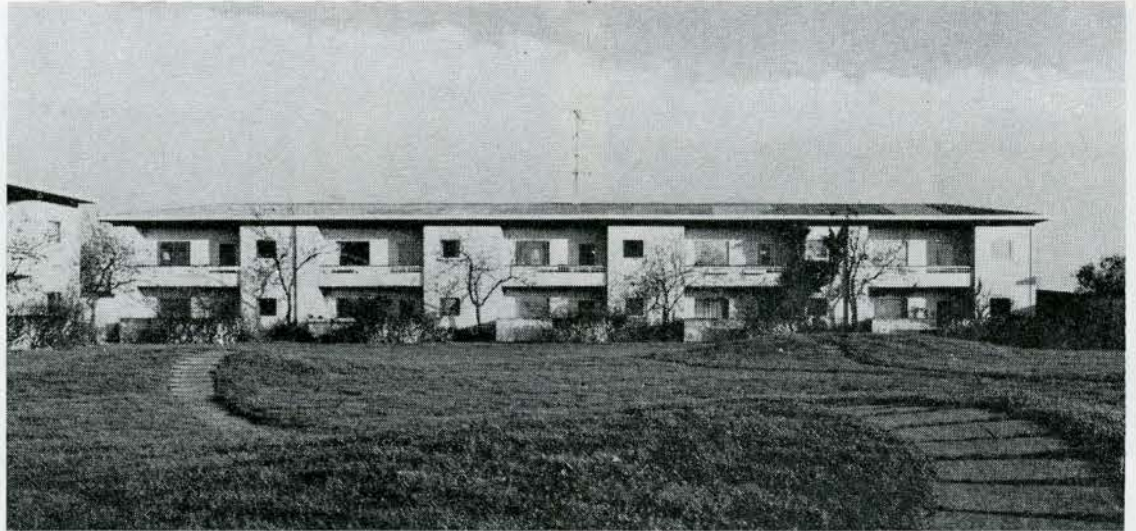
16
Part of the same scheme shown in Figure 1 relating buildings to the landscaping. Partie du même groupe de construction comme figure 1

17
A timber clad scheme at Craigshill, Scotland, near Livingstone. The structure factory made components. P. E. Malstrom (floors and cross walls) are all of concrete
Maisons d'habitation en bois à Craigshill près de Livingstone. Les planchers et murs de refend de cette structure sont tous en béton armé et préparés à l'usine de préfabrication

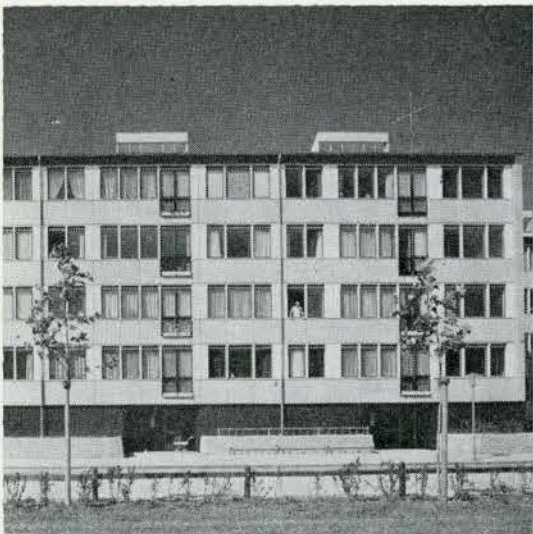
18
One of eight 22-storey blocks totalling 80 dwellings per block, erected at Lambeth in London. Wates Ltd
Ce groupe d'immeubles de 22 étages totalisant 80 logements se trouve à Lambeth, Londres



13



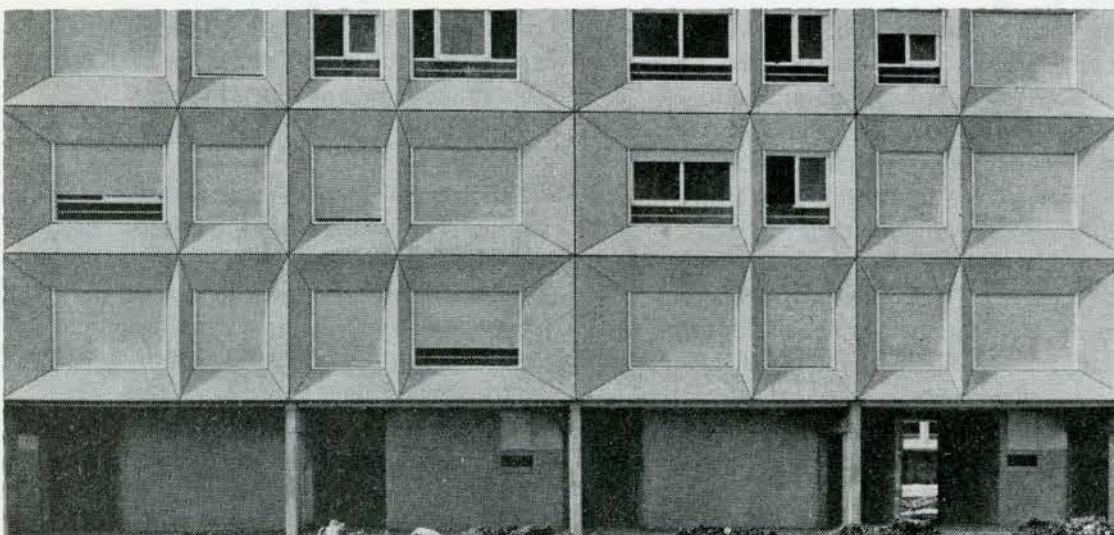
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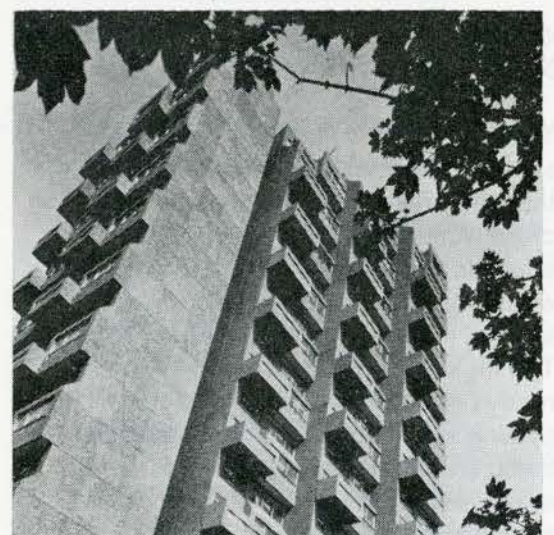
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18

Construction dust is part of construction. Even the most careful sealant mechanic can't keep it out of every joint.

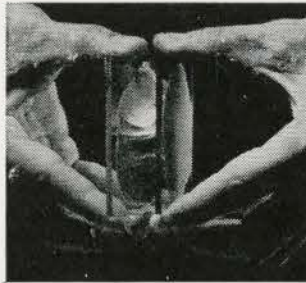
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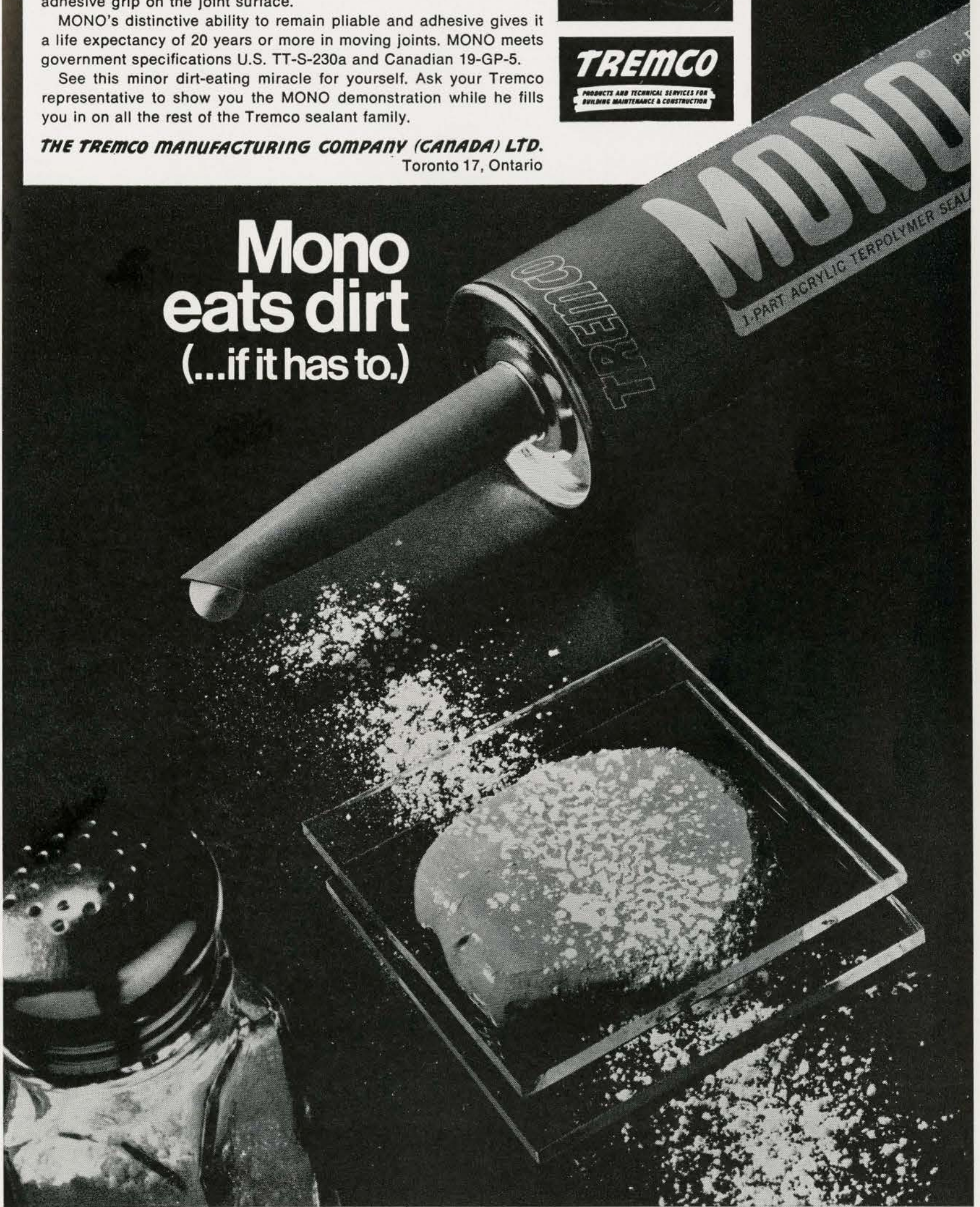
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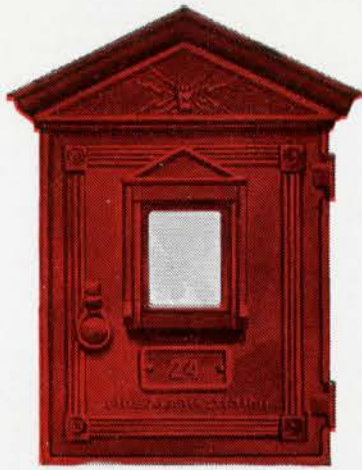
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BELLEVILLE, ONTARIO

Randle Iredale, MRAIC

Mr Iredale is a partner in the Vancouver architectural firm of Rhone and Iredale. In this article he relates his firm's experience with the Critical Path Method of scheduling which they have been using as a process device for the past three years

Massive and complex systems are the tangible manifestation of advanced technology. With increasing technology the large commitment of time and money required is inflexibly committed to fixed schedules. Effective performance of the design function within this technological culture requires the co-ordination of tasks undertaken by many specialists within an inflexible framework of time/money.

The creative process, in contrast, depends upon intuition and the discovery of new relations between the parameters of the problem in a way that appears to be in conflict with the inflexible demands of technology, time and money.

The graphic display of the design process given by critical path method scheduling provides some opportunity to discover where creativity exists, a more exact insight into its nature and the possibility of finding means of nurturing it in our massive complex technological culture.

Underlying our use of CPM is a concept of what I call T-shaped men. The complexity of our systems has forced upon us a degree of specialization unthought of even twenty years ago. A joint creative input of an ever increasing group of specialists is required in environmental design. Sociologists, economists, statisticians, accountants, computer programmers and

others are joining the electrical, mechanical, structural, plumbing and acoustic engineers we have so recently accepted as part of the design team. These specialists to act effectively in the design group must have not only a great depth of specialized knowledge in their own area but also an overview allowing them to interact creatively. The T-shaped man, a specialist with an overview.

Our failure as architects to effectively engage these experts in the creative process leaves us designing the highly personal, capricious building which decorate the decadent end of the "great man" oriented industrial epoch.

We are now launched upon a new industrial revolution, the cybernetic revolution. We and the professions who work with our brains are in the position of the hand weaver at the time of the industrial revolution. The thinking machine will make obsolete many of our skills, forcing us to cope only with new problems which are not yet programmed and thereby discovering the new synthesis beyond machine skill.

This philosophy commits us to the use of CPM not only for its value in current projects, but because it provides a framework for rationalizing of the design process. The graphic presentation used in

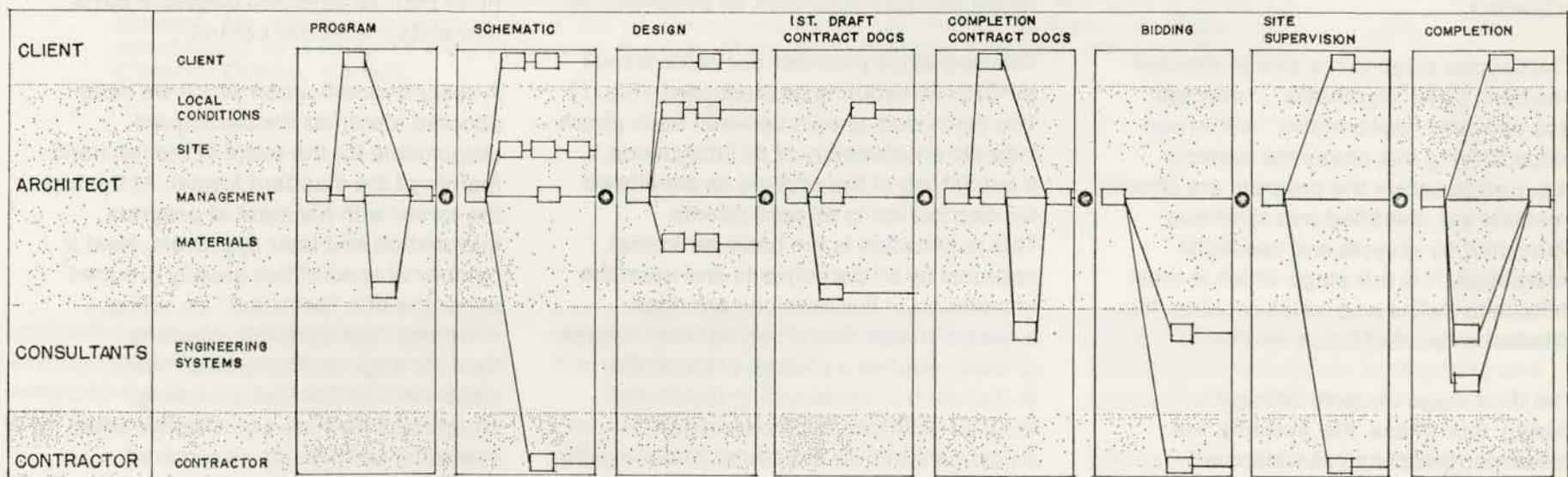
critical path method scheduling is an architect's method, understandable and manipulatable in graphic terms.

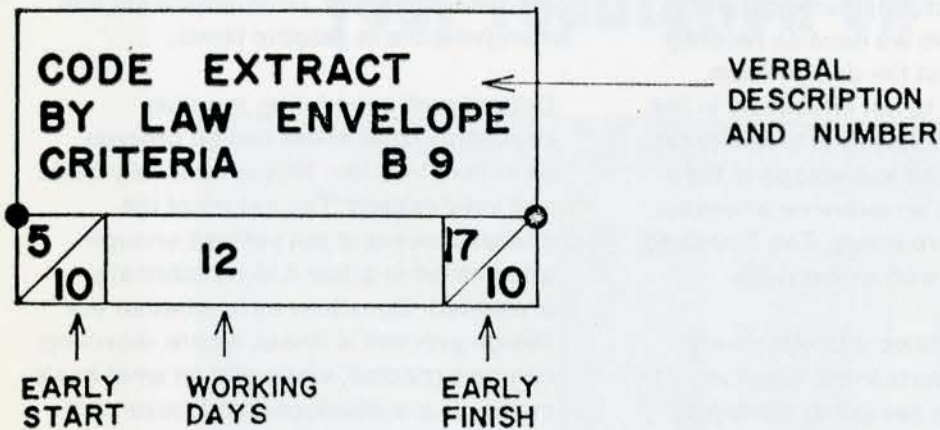
Critical path scheduling is not as commonly used in the design process as in construction. This is for a very basic and valid reason. The nature of the design process is not yet well enough understood to allow it to be rationally presented. Questions as to whether the design process is linear, where recycling can be expected, when and on what basis concepts are developed and frozen are as yet unanswered.

We have developed over the past two to three years a basic format which reflects our design philosophy and the reality of the design process as nearly as we have been able to discern it.

For basic scheduling, quality control, cost accounting and administrative purposes we have divided our services into seven activities. These are:

Program in which we attempt to assemble the full parameters which are reasonable inputs into the design. These are divided into internal requirements which are the spaces which will house the client's activities, their relation and character, the time and money available and environmental requirements including heat,





2

light, power, acoustics, etc., for each activity. The program also includes the external parameters such as site, weather, building zoning and other codes and soil tests. We tend to agree with Christopher Alexander (*Synthesis of Form*) that the solution to the problem is inherent in the program information. The process from this point on involves the discovery of systems to satisfy the activities for which the environment is being created and the solving of conflicts between requirements through the discovery of the interlocking synthesis. (See *The Next Development in Man* by Lancelot White for a dissertation on replacement of opposites such as hot and cold by the concept of heat as a process.)

The second stage in the design process has been titled "synthesis", "concept" and currently "schematics" within our office. During this phase the systems required to satisfy the program are chosen, conflicts are identified and synthesis attempted by recycle and specialist interaction. It is this stage which is most difficult to define and which requires the greatest amount of future research.

The third stage we term "design". During this phase the systems are developed (mechanical, electrical, structural, building envelope, acoustic, foundations, circulation, etc.) in line with the program requirements and the concept developed during schematics.

Contract documents are then prepared. Because of the completeness of the design phase we have reduced the effort for this segment of the work from the 50% of total effort normally allotted to 30%. The 20% of effort gained is put into design and schematics so that 40% of the total effort is expended through the program schematics and design phase. No design development is undertaken during contract documents. This stage is limited to the converting of information into a form suitable for communication to the building site.

The three final phases are bidding, construction supervision and completion which includes feed back on performance.

This sequence provides our basic format for CPM Scheduling as illustrated. (Fig. 1) The black dots shown between each phase indicate an assembly of all information, a publishing of the scheme as developed for distribution to all participants. This publication is the basis for formal approval by all participants and upon the completion of the revisions provides a design freeze. Recycling between stages of work requires a change order similar to that used in construction distributed to all participants and involving an adjustment in time schedules and budgets.

In using the critical path method scheduling system we have developed a standard format which simplifies the

design of the diagram and simplifies the problems of communication, as all participants become familiar with the format. The use of the standard format also facilitates management by exception making visible all variations from the norm. Using this system we find that for small projects not more than one hour is required to establish the events and their interdependency and for larger projects approximately one or two days.

We use the precedence system in preference to the older arrow diagram because of the much greater ease of diagramming and logic it provides. I understand the computer programming required for the precedence system is rather more complicated but, as it is available, I would rather load the machine than the men.

In the precedence system activities complete with description, duration, and early and late start are used rather than activity arrows with I.J. nodes for start and finish time etc. used in the older system. (Fig. 2)

Our standard event box contains a verbal description of the activity which must be sufficiently descriptive to be recognizable by all participants and in the lower boxes the duration and the start and finish dates. We try to split events which would take more than 10 days into definable parts to maintain effective control.

A second modification which we have adopted identifies the participant responsible for the event in the left hand margin of the standard format. At the top, the owner with his input of program information and later approvals. Next a number of specialities usually grouped under the title "architect" i.e. siting, materials, management, planning. Next the engineering specialities, electrical, mechanical, plumbing, structural with slots available for other specialist consultants as required. Finally, contractor or construction department which provides input on construction procedures throughout the design process. (Fig. 3)

products are finished in form, as is glass and wood. But for *in situ* concreting the producer, the placing contractor, and the builder are involved in the actual manufacturing process, so that the quality and performance of the finished concrete will depend on their combined knowledge and decisions. Dependence on specifications alone is never adequate. In fact, a meaningful specification for concrete for a given job cannot be properly developed without a thorough technical knowledge of the materials and processes concerned.

Selection of a suitable admixture for a particular job may present problems, not least of which is whether one is in fact necessary. Alternatives should always be considered. For any one type of admixture, there are usually many brands on the market, each with more than one basic ingredient. As was true with set-retarders, this means different side effects. The chemicals are usually complex and sometimes variable in composition, and the formulas are changed often with no warning to the user.

At the very least, the building designer should be aware of these general considerations. He should also be aware of the plant adjustments required to accommodate the use of an admixture: handling, storage, preparations, and dispensing. For example, special storage is required where an admixture is sensitive to temperature; and many chemical admixtures, contrary to casual information, form colloidal suspensions rather than true solutions. The consequent danger of coagulation and settlement may be avoided by a system of stirring. Dispensing equipment must be essentially fool-proof and frequently calibrated.

Every mix design requires modification when an admixture is to be included. Most concrete admixtures of the organic chemical type are influenced by cement type and brand, aggregate grading, water-cement ratio, and temperature. Thus, there should be assurance that the admixture to be used has been properly tested. Test data supplied by the admixture manufacturer or test data involving other materials is not adequate. The tests must be made in the plant on the materials to be used.

Today, after years of evolution, excellent performance specifications have been developed

for concrete admixtures. Early selection was based on limited field performance, and resulted in specification by brand name. Consequent abuses, therefore, led to attempts to specify such material requirements as chemical composition. The present performance specifications are those required and referenced in the Canadian Standards Association Standard for Concrete Materials and Methods of Concrete Construction, A23.1-1967. The essential features of these specifications, in addition to requirements on the specific effect claimed for the admixture, are that the admixture does not adversely affect other properties of the concrete. By a series of corresponding tests it is thus possible to evaluate an admixture on a performance basis.

Concluding Statement

Admixtures can be used to advantage in modern concretes. They are used for "curative" or "preventive" purposes, for example, air-entrainment; they are used as "aids," for example acceleration of hardening; and they are used for purely money-saving purposes, for example water-reducers. The full list of benefits is impressive for both producer and consumer of concrete. As has also been noted, however, these benefits are contingent on proper use and knowledge of side effects and other hazards. An admixture cannot compensate for inferior materials or bad practice. In most cases there are alternatives worth consideration on economic as well as quality counts.

Admixtures in every-day concreting operations will continue to have an important place in concrete technology. Their successful use depends upon proper diagnosis and correct prescription for each situation. This, in turn, requires not only a basic knowledge of concrete technology, but also recognition that an admixture requires modification of procedures. It also implies recognition of the essentially chemical nature of admixtures and the processes they are involved in. The architect or builder need not become an expert on admixtures, but it has become evident that it is to his advantage to be familiar with their type, nature, and general effect.

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Admixtures in Portland Cement Concrete

by E. G. Swenson

UDC 666.972.16

Most of the concrete produced in Canada, whether precast or cast *in situ*, is made with an admixture. Perhaps the best known admixtures are calcium chloride and the air-entraining agent, both of which are associated with cold weather construction problems. The use of set-retarders and water-reducers has become very extensive in recent years; and in the increasingly sophisticated and specialized processes and products of concrete demanded by industry today there is a growing use of such lesser known admixtures as corrosion inhibitors, expansion producing agents, and colour pigments.

The building designer has not usually felt the need to concern himself with details of concrete composition, leaving this to the specialist and to the concrete manufacturer. He has been content to specify certain minimum requirements such as compressive strength. Today, however, more is demanded of concrete than ever before, and it is being used in an ever-increasing variety of structural forms and functional situations. It is required to perform under severe environmental conditions, and is further faced with a high degree of competitiveness, with attendant emphasis on mass production and job scheduling. These developments have made it necessary for the building designer and the builder to know the full capabilities and limitations of their material.

Owing to these very developments, the concrete admixture has found more extensive application. Its purpose is to modify one or more properties of either the plastic mix or the hardened state of concrete. It thus makes possible certain adaptations of products and pro-

cesses not always readily attainable by other adjustments. It is the "fifth" ingredient in concrete, an addition to the four basic components: portland cement, water, sand and stone. Concrete specifications today recognize the uses and functions of these agents, and they have become an integral part of concrete technology and practice.

Although it may solve a particular problem, an admixture may at the same time create other problems that must be anticipated. Like drugs, admixtures produce side effects that can be beneficial, harmless, or harmful, depending on the situation. The concrete producer may be aware of these, but he may not know whether they can be tolerated in the structure. The architect and builder should therefore become knowledgeable about the nature of admixtures, their advantages, and the problems connected with their use. This is particularly important in *in situ* concreting where the concrete is actually manufactured in place.

Workability of Plastic Concrete

The earliest use of a concrete admixture was probably in connection with improvement of mixing, placing and finishing properties of the plastic mix. This is an important consideration for the architect, for it makes possible the reduction or elimination of bleeding, segregation, honey-combing and other unsightly surface defects that can result from harshness of mix. Most of the admixtures used, whether air-entraining agents, set-retarders, or water-reducing agents, will improve workability. Although considered a side effect, the improvement of workability is often the primary reason for their use.

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Air-Entrainment and Durability

Canadian winters produce cycles of freezing and thawing that can damage ordinary concrete in a relatively short time, especially if it is also exposed to the de-icing salts commonly used on pavements and sidewalks. Concrete with small discrete air bubbles entrained by an air-entraining admixture will resist such severe conditions. Because no general alternative has been established and because the improvement in durability is so great, all concrete specifications now require air-entrainment if the concrete is to be exposed to continuous or frequent wetting.

Air-entraining agents that produce proper air-void systems in the cement paste are formulated from such organic materials as wood resins, sulphonated hydrocarbons, and synthetic detergents. Specified dosages of the proprietary agents to produce the normally required 5 to 7 per cent air are in the order of 1 per cent by weight of the cement. The strength loss to be expected from the air can usually be compensated for by reduction in water-cement ratio through improved workability.

It has been established that air-bubble spacing should be in the order of 0.008 inch for optimum durability. The air-pressure meter and other such apparatuses are useful for quality control purposes but measure only total air. The determination of the type of air-void system requires a microscopic procedure not normally possible.

Accelerators

Cold weather concreting in Canada is associated with extensive use of the inorganic admixture calcium chloride. Contrary to some lingering opinions, it is not effective as an anti-freeze and is therefore not a substitute for cover or enclosure with heat, which are required for below-freezing temperatures. It is effective in maintaining satisfactory strength-gain of concrete at low temperatures at or above freezing.

In normal dosages of 1 to 2 per cent by weight of the cement calcium chloride accelerates time of set of plastic concrete as well as rate of strength-gain. In practice, a decrease in time of set may be required or desirable for earlier finishing of floors, reduction of form pressures, or quick-setting in spray-type processes. As an accelerator of strength-gain it can provide for early application of load and reduced curing period.

Unfortunately, calcium chloride has a number of side effects that are generally deleterious. These effects are not large, however, and they can normally be accommodated if provision is

made for them. They are associated mainly with corrosion of reinforcing steel, drying shrinkage, creep, heat evolution and resistance to sulphate attack. Triethanolamine is an organic accelerator used in formulations to compensate for set-retarding properties of other admixtures. In this connection it is used in some air-entraining and water-reducing admixtures.

There are alternatives to accelerators, for example increased fineness of cement and elevated temperature, and these are often preferable from the point of view of both quality and cost.

Set-Retarders

In recent years the problems of hot weather concreting have been recognized as requiring special codes of practice. Premature stiffening and hardening can create difficulties in discharging, placing, and compacting fresh concrete. Set-retarding admixtures are now used extensively in such situations, particularly in ready-mixed concrete where long hauls in hot weather are involved. They extend the plastic period without subsequently affecting strength gain significantly. Practical alternatives do exist such as protecting aggregates from excessive temperatures by cover and precooling concrete with ice in the mix water.

A set-retarder may be useful in other situations: preventing unsightly "construction joints" by ensuring that the concrete in one "lift" remains plastic long enough for the next lift to be intermixed with it. It may help to reduce maximum temperatures in mass concrete by extending the time over which the heat of reaction is given off. It finds use also in grouts, pumped concrete and other processes.

Set-retarders used in Canada derive mainly from two sources, salts of lignosulphonic and hydroxy carboxylic acids. Some use is made of detergents, sugars, and, more recently, of silicones. Dosages range from 0.2 to 1 per cent by weight of the cement, overdosages being an obvious hazard. Concretes have been reported to remain unhardened after two weeks because of apparent overdosage.

Set-retarding admixtures provide a bonus by acting as water-reducers and workability agents. The lignosulphonate type tends to reduce bleeding and entrain air, whereas the hydroxy carboxylic type has the opposite effect. Either may be beneficial or detrimental, depending on the job requirements; and both types tend to increase the rate at which the concrete will stiffen, i.e. will lose "slump," an undesirable characteristic. A potential problem with these admixtures is that their presence in

concrete is not easy to determine, especially quantitatively.

Water-reducers

The water-reducing properties of most chemical admixtures are interesting for two reasons. By lowering the mix water requirement they make possible an increase in compressive strength for a given cement content and slump. This also makes it possible to reduce the cement content for a given strength and slump. The latter is an attractive economic feature, cement being the most expensive ingredient of concrete. "Cement-stretching" can be carried too far, however, so that the quality of the concrete may be adversely affected, for example, in the areas of absorption, permeability, durability. An alternative to using the water-reducer is vibration compaction of low-slump concrete.

Water-reducers are marketed as such, although their basic ingredient is the same as that for set-retarders (lignosulphonates or hydroxy carboxylates). They are formulated so that the set-retardation properties are reduced or eliminated. They therefore possess the same side effects as set-retarders.

Other Admixture Types

Damp-proofing and water-proofing admixtures are intended to reduce water penetration of the larger pores in concrete. They include soaps, butyl stearate, mineral oil, and asphalt emulsions. Much uncertainty remains regarding the value and the hazards involved in their use. Some advantage is claimed in concrete block and brick manufacture where no-slump mixes are used. Generally, impermeability and low absorption characteristics of ordinary concrete can be achieved by attention to good concreting practices.

Corrosion problems with reinforcing steel are normally avoided by adequate cover of concrete, but they may be increased by the presence of calcium chloride or by carbonation. Corrosion-inhibiting admixtures are in limited use in the precast industry. Examples are: sodium benzoate, stannous and ferric chlorides, and sodium nitrite.

Bonding new concrete to old is an ever-present problem. Modified mortars made with bonding admixtures such as polyvinyl chlorides and acetates, acrylics, and butadiene-styrene co-polymers can be used in these situations.

The types of admixture discussed thus far are the so-called chemical admixtures, which are distinguished from the mineral powder type such as fly ash. Chemical admixtures are added in very small quantities, in the order of

1 per cent by weight of the cement, whereas the mineral powder type is added in quantities from 10 to 50 per cent by weight of the cement.

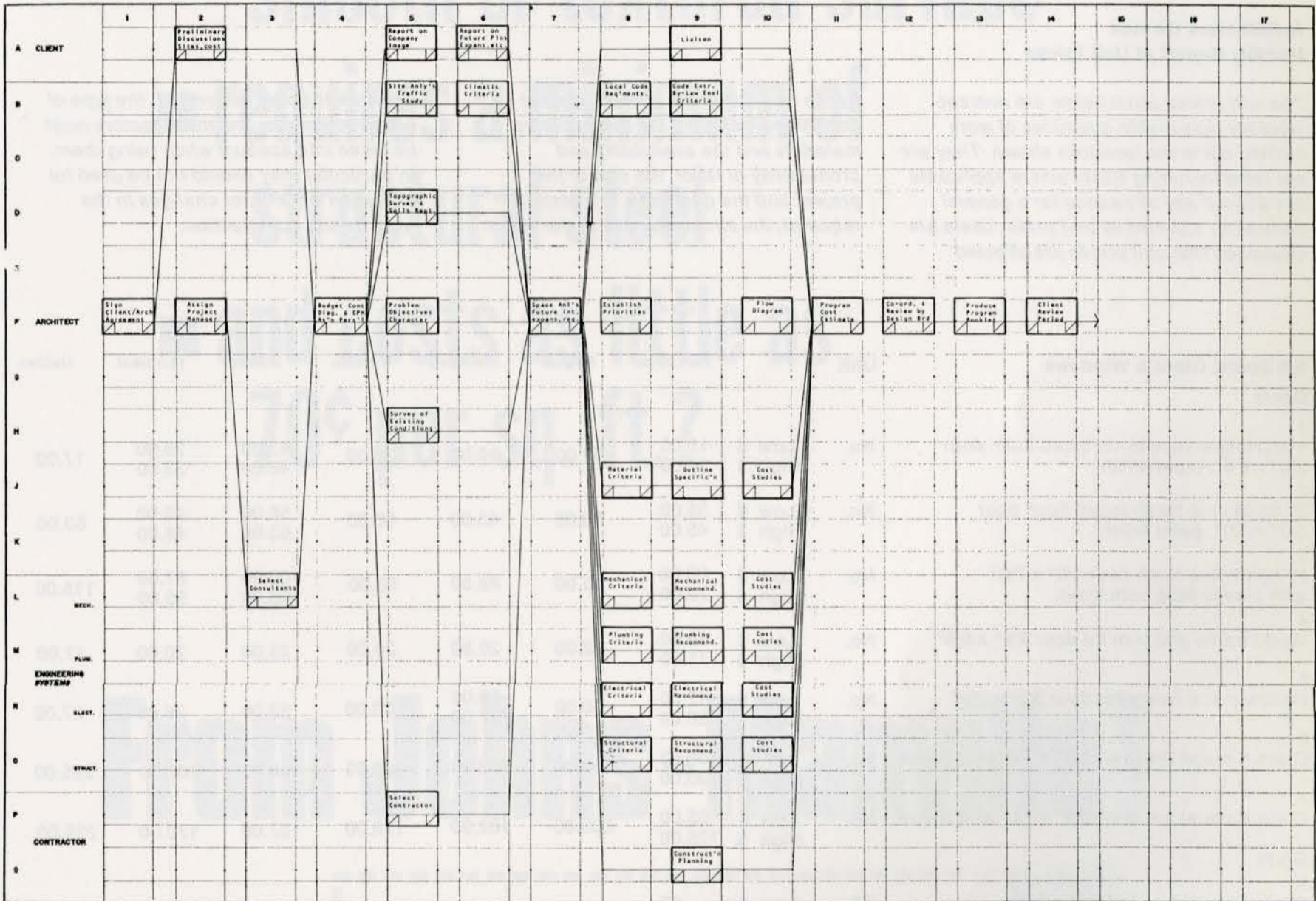
Fly ash and pozzolanic materials such as volcanic ash and calcined shale and clay are used as replacements or substitutes for part of the cement. They have some cementitious value at later ages and thus can contribute to ultimate strength and impermeability. They are used to reduce heat development in mass concretes, to reduce bleeding and segregation, to improve workability, to reduce excessive expansion caused by alkali-aggregate reaction, and often simply to reduce the cost of cement. As they are added in relatively large proportions and because they are inorganic in nature, their effects are less complex and the possibility of side effects is smaller than is the case with organic chemical admixtures. Integrally added colour pigments of the metal oxide type belong to this type of admixture. Dosages of iron or chromium oxides, for example, may range from 2 to 10 per cent by weight of the cement.

The admixture types considered here do not constitute a complete list, but they represent the main ones. The factors discussed serve to illustrate the growing complexity of modern concretes and the need for the designer and builder as well as the manufacturer to be aware of the potentials and hazards of admixtures.

General Applications and Problems

The requirements and problems encountered in the use of concrete admixtures vary considerably with manufacturing and placing processes. In precast plants there is single control of all materials and operations from the selection of component materials to the final curing of the product. Problems can thus be reduced to a minimum. There is extensive use of accelerators to reduce curing periods, water-reducers to cut costs, and retarders to provide homogeneity of large elements. On-site concreting also involves a single authority and therefore good control.

The ready-mix concrete operation poses a problem in that the producer loses control when the job contractor takes over. This divided authority can lead to difficulties such as those having to do with the effects of admixtures. The designer or builder may be the heir to unsatisfactory consequences if proper measures are not taken to ensure the necessary quality control. With precast concrete the architect and builder may not find it necessary to be concerned with any detail of concrete composition or with ancillary properties, because the



3

Working within this format a critical path network that bears a credible relationship to the reality of the work undertaken can be developed by the project manager without assistance from programmers or other specialists. The procedures for calculating the start and finish dates and defining the critical path are covered in other publications. In most of our networks these can be done by hand rather than computer.

We have found many advantages to the use of even a rudimentary CPM network in running our projects. Through the rationalization of the design process we are gaining greater creative involvement

on the part of our specialist consultants. While we for years paid lip service to the principle of involving all specialists at the earliest possible stage of the work it was not until the program stage had been rationalized through the use of CPM that we were specifically able to assign our consultants tasks and obtain their input at this stage.

The participation of our specialists with an overview, the T-men, is being facilitated. A new lighting system was developed in the Hudson's Hope School by Bill Haggert our electrical consultant in response to the prefabricating needs of the construction group and Bogue

Babicki provided a structural response to demands for speed of erection and economy by the owner with a high structure for a downtown office building.

The rational approach involved has also greatly improved our construction cost estimating and the control of internal costs with much less time lost in recycling and general design thrashing.

The network becomes part of the architect/consultant agreement when we use outside consultants and has aided not only the production of documents on time but has through the rationalizing of the decision-making process saved our

consultants most of the common losses involved in late revisions to match architectural drawings.

Most important the schedule removes the linear dependence of the ever growing number of specialists involved in the project and allows concurrent effort on many tasks at one time without conflict.

As well as upgrading the quality of our service to the owner, the system has offered an ancillary advantage in bringing the owner's representative under the

same discipline as the rest of the design team. The owner's time for checking and approval of each stage of the work is sufficiently defined that late approval or changes in the program requirements by the owner are visible and the obtaining of owner approval of adjustments to time schedules and design budgets is simplified.

The rational analysis demanded by this type of scheduling raises many questions. Study is required into the nature of architectural specialities. Is our use of site, materials, planning and management

as architectural specialities reasonable? How restrictive is the difficult recycle between program, schematics and design to the process? And most difficult, what are the real activities going on within the neat little boxes and what dependencies between these events are as yet undiscovered.

Most important, we are beginning to discover the nature of the design process — where is creativity and which part of the work can be passed on to computers and what kind of program will be required. □

Architecture Canada Monthly Report of Unit Prices

The unit prices given below are average rates for reasonable quantities of work carried out in the locations shown. They are net rates including waste where applicable but without any allowance for a general contractor's overhead and profit. Users are cautioned that unit prices are affected

by the location of the project, market conditions including the availability of materials and the availability and productivity of labor, the size of the project and the quantities of materials required, the circumstances under which

the work is being performed, the type of construction etc. and these factors must be taken into account when using them. In particular they should not be used for alteration work or for changes in the work during construction.

5.8 Doors, Glass & Windows

Unit		Vancouver	Regina	Winnipeg	Toronto	Ottawa	Montreal	Halifax
Doors								
1								
1 3/8" Hollow core birch faced flush door 2'6" x 6'6", paint finish	No.	Low \$ 15.00 High \$ 17.00	32.00	20.00	33.00	43.00 48.00	28.00 33.00	17.00
2								
2" Solid core birch faced flush door 3'0" x 7'0", paint finish	No.	Low \$ 35.00 High \$ 45.00	50.00	43.00	50.00	56.00 63.00	40.00 48.00	53.00
3								
2" Solid core flush door 3'0" x 7'0" with plastic face both sides	No.	Low \$ 60.00 High \$ 75.00	95.00	89.00	93.00	100.00 108.00	87.00 95.00	115.00
4								
Wood frame and trim for door 2'6" x 6'6"	No.	Low \$ 10.00 High \$ 13.00	22.00	20.50	24.00	23.00	20.00	17.00
5								
Hollow metal frame for door 3'0" x 7'0"	No.	Low \$ 17.00 High \$ 20.00	40.00	29.00 37.00	33.00	33.00	26.00	27.00
6								
Class A metal fire door 3'0" x 7'0" and frame	No.	Low \$ 100.00 High \$ 130.00	220.00	162.00	128.00	166.00	200.00	225.00
7								
Class B metal fire door 3'0" x 7'0" and frame	No.	Low \$ 95.00 High \$ 125.00	200.00	162.00	128.00	187.00	170.00	225.00
Glass								
8								
24 oz. Sheet glass in windows	SF	Low \$.45 High \$.55	1.00	.85	.65	.52	.85	—
9								
32 oz. Sheet glass in windows	SF	Low \$.55 High \$.80	1.60	1.00	.90	1.25	1.00	1.00 1.30
10								
1/4" Polished plate glass in entrance screens	SF	Low \$ 1.20 High \$ 1.50	2.40	1.50	1.40	2.34	1.85	1.55 1.90
11								
1/4" Polished Georgian wired glass in interior screens	SF	Low \$ 1.90 High \$ 2.20	3.50	2.25	2.85	3.44	2.60	2.30 4.30
Windows								
12								
Industrial steel sash with horizontally pivoted opening lights	SF	Low \$ 3.50 High \$ 4.00	2.50	6.00	1.95	2.55	2.50	2.00
13								
Residential wood casement window	SF	Low \$ 4.00 High \$ 5.00	3.50	5.25	3.10	2.65	2.60	2.30 2.50
14								
Fixed aluminum window with satin etch and lacquer finish	SF	Low \$ 3.75 High \$ 4.50	4.50	5.90	2.50	2.85	2.80	—

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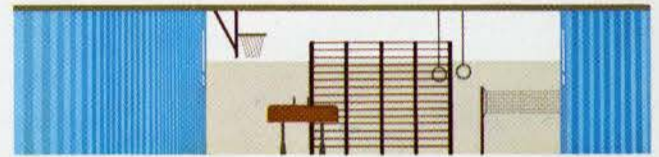
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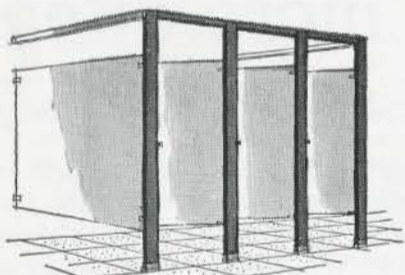
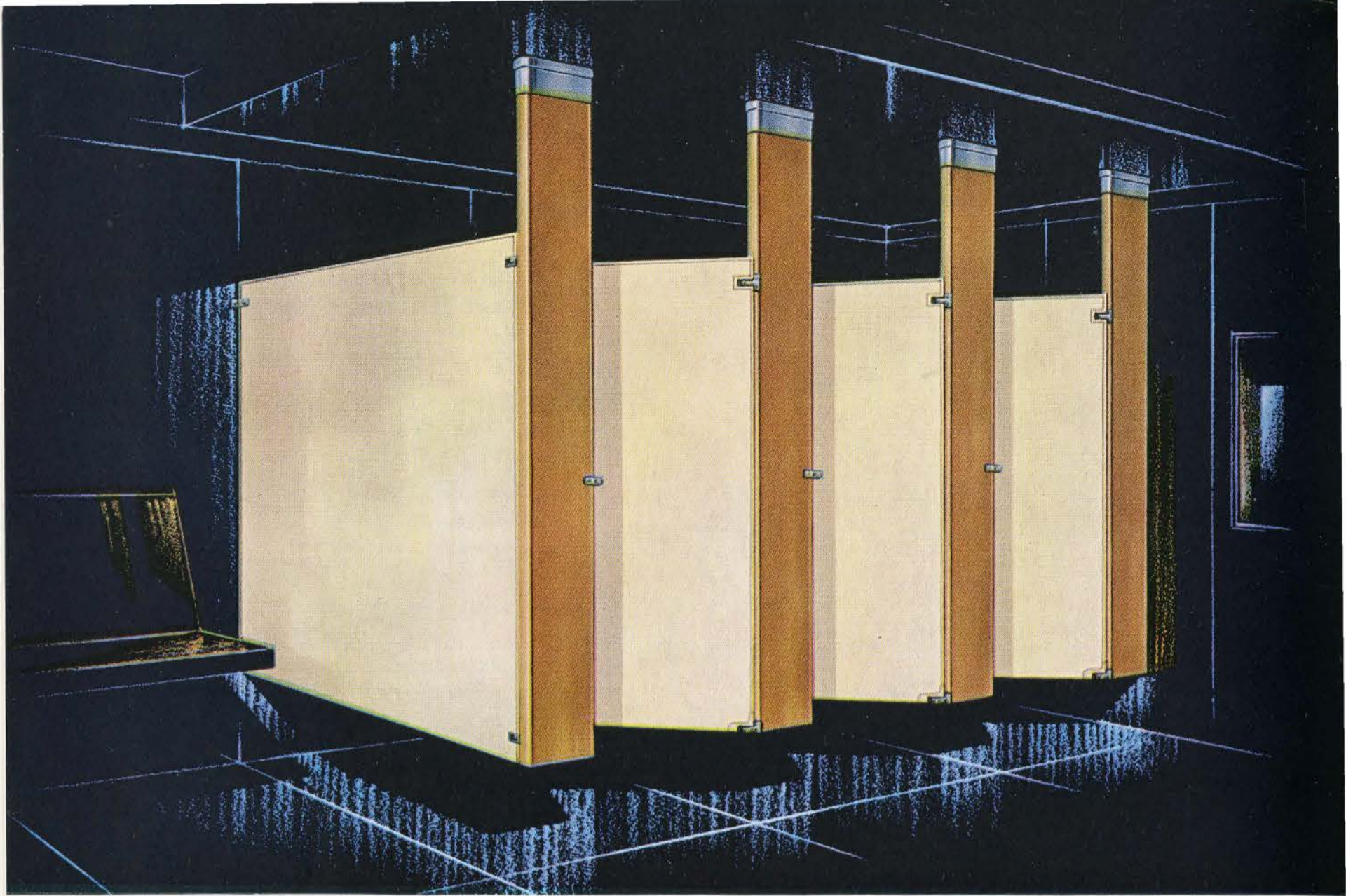
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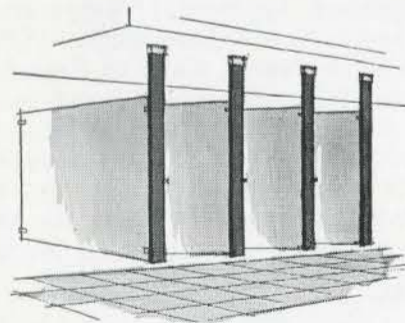
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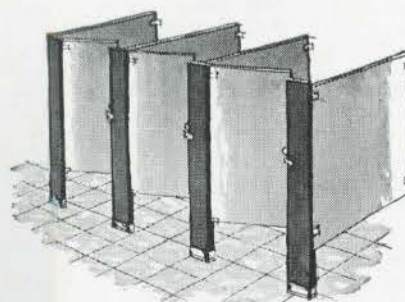




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The Critical Consequences of Tradition on Architectural Education

Gerald M. McCue, AIA

"The Roles of Architectural Education", the address to the RAIC Assembly by the Chairman, Department of Architecture, UC, Berkeley

A discussion of architectural education frequently gives too strong an emphasis to the form of the program. Perhaps those whose interests are directed toward physical form are apt to believe that the route to solution lies through the formal translation. A recent example of this emphasis is the Princeton Study, sponsored by the American Institute of Architects, which treats in detail a recommended form for architectural programs but only briefly deals with their objectives and content. In order to help balance the lack of dialogue about the roles of architectural education, its objectives and strategies, we should concentrate on these issues today.

Recently an article charged that professional schools have failed to provide the skills needed for practice, that they are behind the social sciences and other university disciplines in the depth of their studies and in their grasp of the major intellectual developments of the age and that they have failed as centers of higher learning and as centers for continued education for the profession. This particular article by Harrop Freeman in the Journal of Legal Education was directed toward the law schools but most of these criticisms seem perilously appropriate for architectural schools. Such criticisms frequently arise from the fact that practitioners and educators have failed to find common objectives. Often they do not understand one another; the practitioner fearing a lack of understanding of the realities of practice by the teacher, and the teacher claiming a lack of sympathy by the practitioner for the purposes of education. Unfortunately, discussions between the two groups tend to center on details which relate to the differences in their points of view, such as specific course requirements, rather than upon the seeking of agreement of prime objectives. It is not unlike the design of a project in that there can be little agreement on the detailed solution if there is no agreement on the essential purposes and objectives for the design.

There are several different objectives for professional education illustrated by the criticism of the law schools. These objectives are not necessarily mutually

exclusive, not without congruences, but they are sufficiently different as to require separate consideration.

Study and advance of the discipline

The basic academic objective for any teaching department should be the study and advance of its discipline. For architecture this would mean the study and extension, through research, of the body of knowledge concerned with the man-made physical environment, particularly structures for human habitation and their relation to human life style. The emphasis in this objective would be upon the codification and extension of the body of knowledge and only secondarily upon its application: an objective which sounds so familiar, one is tempted to believe that this, the educational objective of the academic discipline of architecture, is at least one of the objectives of every school. This has not been true, however, for taken in its literal sense, there have been few schools in the world that have followed this as one of their prime objectives.

For the most part, architectural schools have concentrated their interest upon what the professional does, rather than upon the substance of the body of knowledge that he should know. The emphasis has been upon the process of application rather than upon content and this tradition has now brought us to a point when its consequences are critical.

Failure to advance the academic objective has become a limiting factor of the effectiveness of the entire field, reducing the importance of the architectural profession in society. All university students, for example, know of the contributions to general knowledge of the academic disciplines such as economics and physics and of selected professional fields like medicine and engineering. Presently, however, architectural teachers have not organized the substantive knowledge of their field in order to make it available for study by the entire university community. Because of the traditional concentration on preparing individuals solely for the professional practice, there has been little scholarly

Schools Ecoles

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development of substance. The lack of codified knowledge has not only failed our responsibility to the university at large, but now fails our own professional student who seeks greater depth of understanding, and who seeks a better factual basis for decision-making than in the past.

The lack of written theory and its continued development through research is also the primary reason that the schools have little to offer the experienced professional practitioner and have little more to offer this generation of students than the last.

If the academic objective were extended to its logical conclusion, the field of architecture, like other bodies of knowledge, would become part of the academic fabric of the university. Students from many disciplines would find interest and challenge in only certain of its subfields, others would combine a minor study in architecture with the discipline of their major interest and some would commit the majority of their study and life's career to practice in the profession. It is essential that architectural programs change their role to that of serving the university rather than only their own majors. Unless there is progress toward this objective it is doubtful that architecture should rightfully maintain a place in the university.

Improvement of the physical environment

An objective which should logically be joined to that of study and advance of the discipline is the improvement of the man-made environment. It remains critically important that architecture should be a professional school dedicated to the actual improvement of the physical environment. The academic aims of codification of knowledge and research are basic, but should be considered supportive of the central need for educating persons who will actually seek to implement improvement. The need for both professional and academic objectives will also strongly affect the directions for research. Evaluative and predictive techniques of analysis will be required for assessing measurable circumstances, as in the social sciences, but this will not be enough. A major research

emphasis must also deal with hypothesis for improvement over present conditions and the theorizing as to methods for bringing the known knowledge and techniques into application. Architecture must confront the real problems of society and not merely laboratory abstractions which offer more definitive results. The discipline must provide study and research in the methods of application of the knowledge and the design and decision-making process must be considered part of the basic academic concern. Further, the schools must seek to develop policy and strategy whereby improvements in environment can be made available to an increasingly larger segment of society.

One problem arises, however, for if the discipline of architecture truly accepts the improvement of the environment as a prime objective, then the schools should take a neutral position with regard to who makes the improvement. The schools should not be concerned whether the persons who make decisions based upon the theories of the field of architecture are designers, social scientists, public officials, material fabricators, constructors, or related design professionals. If the knowledge is valid, useful, and public, then it should be available for all regardless of the changing social structures which might, at different times, find different groups most effective in delivering improved products through these theories. This position is little short of heresy today, for although improving the physical environment is an objective in most schools, it is normally meant to be made by the "right" group, the present profession.

Service to and improvement of the profession

Architectural education as a service to, or improvement of, the profession is generally accepted by both the practitioner and the schools, but with a good deal of disagreement as to the relative importance of this objective to those previously mentioned. In fact most of the dialogue between the schools and the profession about architectural education is a matter of interpretation of intent within this objective only. Taken in its broad view the intention of this objective is to provide the best educated persons who will be attracted to the professional practice of architecture so that their actions will bring credit to their peers and through these means contribute to the improvement of the profession. In its narrowest sense, it can mean little more than providing vocational training for potential employees prepared to perform the practical day-by-day secondary skills needed by the present practicing professional. Most schools do either a good or bad job in the eyes of the individual professional depending upon whether he takes the broad or narrow view of the intent of only this one objective.

In the past the schools' limited objective of service to the profession has resulted in a

disservice. The concentration on the skills needed to be a junior technician during the period of first employment has prevented the breadth of theoretical study which would better serve the architect at the height of his professional career. The emphasis on what an architect does, as opposed to what he knows, has prevented an accumulation of knowledge which would permit each generation to learn rapidly from the past

The emphasis on providing the minimal level of practical ability to permit entry into the labor market of the profession and to pass the professional registration has limited the depth of study of our sub-disciplines to such an extent that the students can know no more than the practicing professional. The lack of systematic search for new theory creates a vacuum which fails to provide for the continued education of the experienced professional. These circumstances are almost unique to architecture and are hardly a service to the profession.

Service to the individual student

A part of each of the objectives should be the role of architectural education as a service to the individual student. Deserving to be the prime objective for every architectural school, each of the objectives mentioned before must relate to the students' own abilities and ambitions.

If architectural education is aiming for the students' future, then for what future? Would it be wise to project a specific future or a range of possible futures and train the student for this eventuality? It would seem a better policy to assume that a precise projection of the future is not achievable and that the objective is not to "train" the student but to prepare him; to provide study in the areas of knowledge and methodological skills of our field and thus prepare him for any future which he might choose.

If there is an increasing trend for other disciplines and specialists to act jointly with architects, the important question is concerning the architect's personal role. Aside from leadership, what is the nature of his own discipline? There is also a serious question as to how much he needs to know of each of the disciplines with which he collaborates. If greater expertise is required in each of the disciplines which are participants in the interdisciplinary design process, then an architect with less than adequate ability in any discipline will not be very effective. The architect must therefore become more rigorous in his own primary discipline of design synthesis. He must have the skills and methodology to be the most effective person in problem-solving involving the resolution of social and technical issues juxtaposed with human values. He must be the most capable person for making value judgments not subject to formulation. He must be the person with the ambition to improve the physical

environment, for these are his roles, his discipline, and his ideals.

It is important to distinguish clearly between the architect's ability to synthesize design determinants developed by many disciplines as opposed to the architect himself being interdisciplinary. The number of relevant fields from which the architect is called upon to incorporate determinants and the individual skills of which he should be master is expanding rapidly. It is apparent that in the future architects must have an impossible breadth of knowledge or must specialize to some degree. There are difficulties in either alternative as an only choice in that if students are required to spread their efforts over many areas, their education cannot be anything but superficial. However, the necessity for narrow specialization is not satisfying to the students who seek as broad an area of general competence as feasible. The best answer to these difficulties would seem to be to withdraw from the traditional posture of a standard curriculum for all students which has been prepared to meet a future which is uncertain.

The best strategy for the students' own interest and ultimately for all of the other objectives is to provide the opportunity for depth of study in all or any of those factors which we now know to be relevant determinants to the design process. Students will assemble these factors or subdisciplines into new combinations; some will specialize, some will remain generalists. It should be expected that many will reduce the amount of study in areas which are traditional in favor of current interests and which favor their own abilities.

This strategy would permit a wide variation in the particular skills among the graduates. It would change the educational concept from producing a uniform product trained for a specific role to the implementing of personal capabilities and interests for the role that the student seeks.

It should be the aim of the schools to provide analytic and scholarly preparation, not practical knowhow; they must aim at a keen strategist capable of independent work, someone who can move freely in the field. We must not seek a common denominator. □

Computers and Practice

The Editors:

The article "Computer Applications and the Small Architectural Practice" (May 68) should be of interest to the profession, if only because the acquisition of knowledge on computer use may soon become survival training for architects. The conclusions reached by the authors would, however, obviously require critical appraisal by anyone planning to embark on the automation of any part of his practice.

Our own investigations indicate that at the present cost of computer equipment and trained personnel, an architectural firm needs average yearly gross revenues approaching the 1/2 million dollar mark before the use of computers justifies itself economically. At that stage, accounting, project cost and time control, specification writing and possibly even the storage of retrieval of design information can be handled with greater efficiency through the use of computers. Computer use is no substitute for organization however. The operations of an architectural practice must be thoroughly rationalized *before* it can make effective use of computers. Since most small practices suffer most from lack of organization, their need is usually less for consultants advising on the use of computers than for plain management consultants.

*Banz-Brook-Carruthers-Grierson-Shaw,
Architects, Toronto*

On Our Surroundings

The Editors:

In order to prevent others saying later "no one spoke up", I hasten to put some of my observations in writing. It will be a critical, that is carefully considered, look at one particular aspect of Profile '68. Why is it that the event took place in such a monument to "non-architecture" and nobody voiced any protest during the proceedings? Are we too polite to embarrass our hosts, even if our

fair criticism might be of benefit to the public and therefore to ourselves? We, or at least some of us, deplore the crass commercialism of our present culture of which the convention quarters are an epitome, and yet we wine, dine and have good fun when architectural Rome is on fire just like any other, non-architectural convention. If it really did not bother us, why go through the then phoney exercise of honoring those who produce work of

excellence. Let it be known that, in the selection of the site for future assemblies the architecture of the facilities will at least be one of the factors that will be considered. The writer is well aware of at least some of his own shortcomings, but feels that we should nevertheless strive for perfection and clarification of the real issues facing our culture and profession.

Ir. E. H. Grolle, MRAIC, Regina



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Practice Notes

The partnership of Kemble-Webber Architects, 413-718 Granville Street, Vancouver, BC, has been dissolved. Alex Webber is now practicing at 2-659 Clyde Avenue, West Vancouver, BC. Telephone number 922-3421.

Kennedy Smith Associates have announced an expansion and change in the structure of their firm. The firm will now be known as Architects Consortium – Kennedy Li Simonsen Smith, 903 Lindsay Building, 228 Notre Dame Ave., Winnipeg, 942-1104. Partners will be Anthony Kennedy, Daniel Li, Ove Simonsen, David Smith.

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B. Arch. from India, presently working in U.K. seeks employment as assistant. Eight years experience after graduation. Conversant with building supervision and preparation all types of drawings, particularly perspectives. Write: Sawney, 84 Constantine Road, Hampstead Heath, London NW 3, U.K.

Architect, B.Arch., M.Arch. (University of the Witwatersrand, Johannesburg, ARIBA, with knowledge of industrialized building and computer techniques in architectural design, presently research and development architect using systems engineering techniques, seeks position with a progressive firm. Write: R. I. Manners, Lowcroft, Drive Spur, Kingswood, Surrey, England.

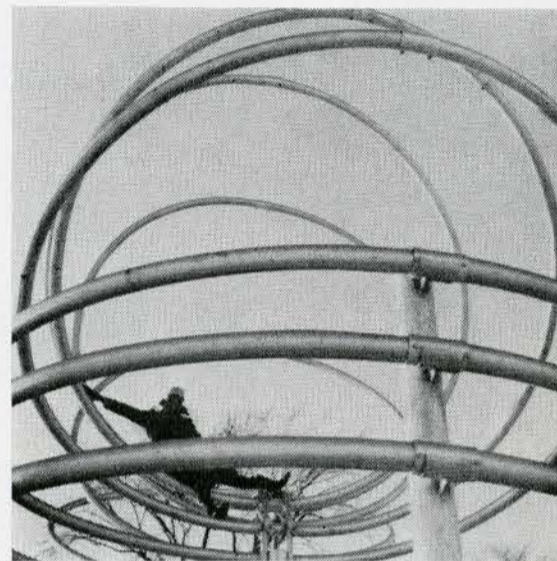
Swiss Architectural Technician, 29, presently working in Ireland, seeks employment with Canadian Architect. Experience in design, specifications and site supervision for factories, schools and housing schemes. Resume and samples available, Walter Zbinden, 20 Fitzwilliam Square, Dublin 2, Ireland.

Third year student at University of Bristol qualifying summer of 1968 for B.A. in Architecture (equivalent to intermediate standard RIBA) wishes to gain 12 months experience in architect's office commencing August or September 1968. Write N. A. Chapman, 107 Hampton Rd, Redland, Bristol 6, England.

Graduate architect of University of Belgrade Yugoslavia, eligible for registration with Ontario Association of Architects, married, 31 years old, five years experience in designing industrial buildings, apartments and family dwellings including engineering and price estimation, looking for junior position in architect's office. Contact: Josip Pajovic, 142 Mavety Street, Toronto 9, Ontario.

Employment sought in design starting this summer by graduate (B.Arch 1968) from the University of California. Two years construction, 1½ years promotional and working drawing experience. Willing to accept responsibility. Write: Andrew Youngmeister c/o Gerald M. McCue and Associates, 631 Clay Street, San Francisco, California 94111, USA.

Graduate Architect B.Arch (Dacca), 1967, seeks position as architectural assistant. Previous positions with McDonald Layton & Costain Co Ltd, Amman & Whitney Int Ltd, and Louis I. Kahn. Write Ajazur Rahman III-A/22 Quaid-E-Azam Road, Mohammad Pur-Dacca-7, East Pakistan.



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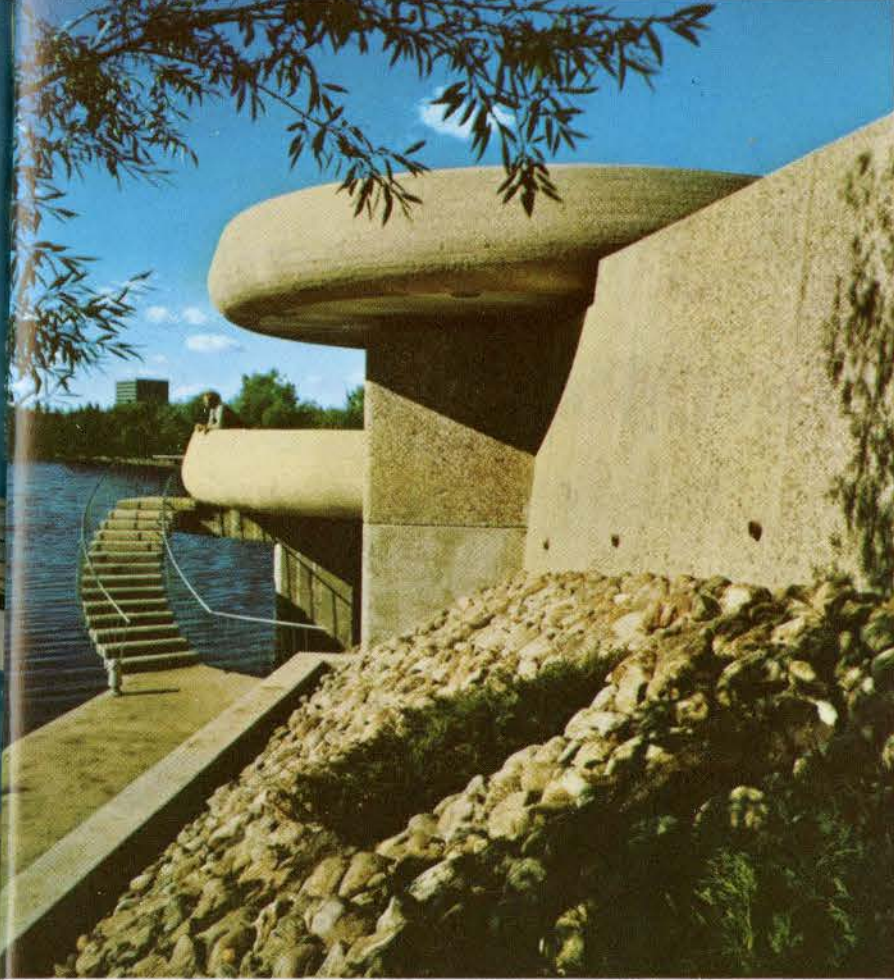
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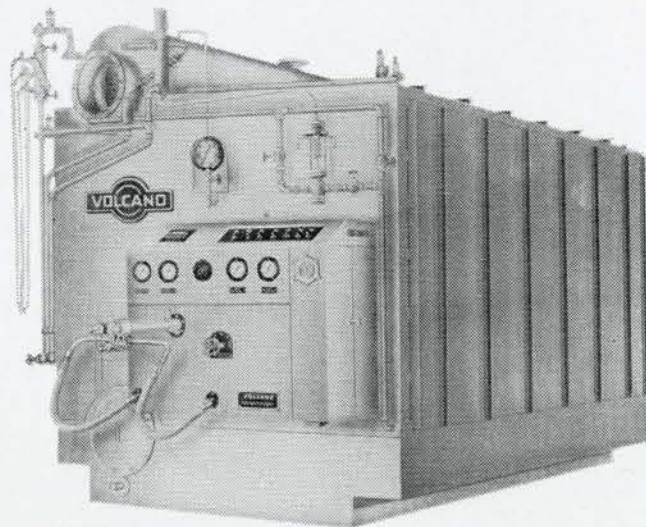
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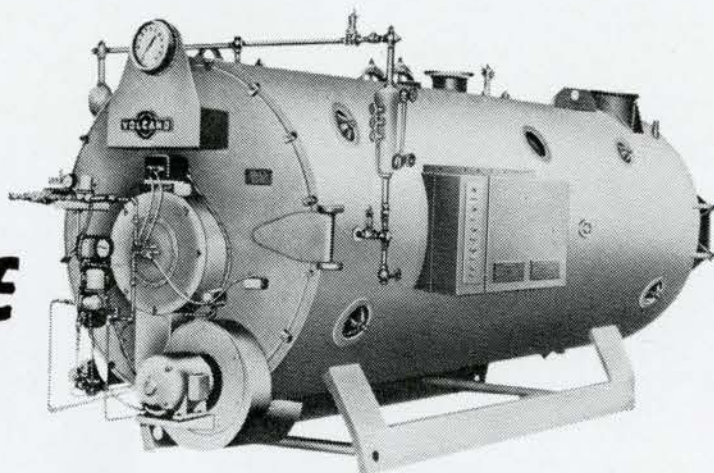


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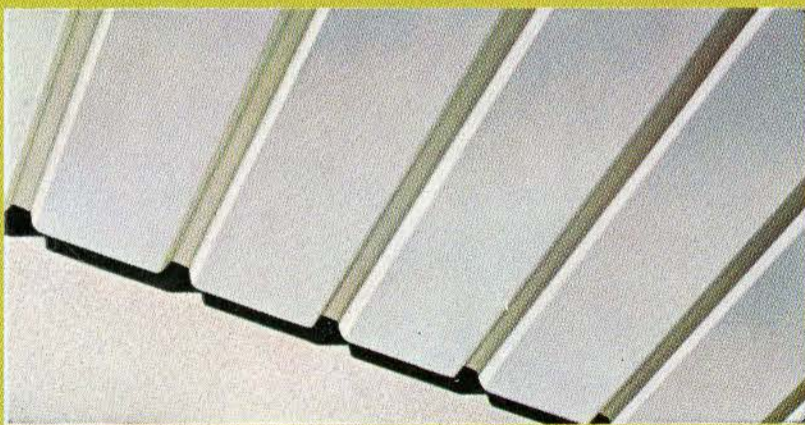
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