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ROYAL ARCHITECTURAL INSTITUTE OF CANADA

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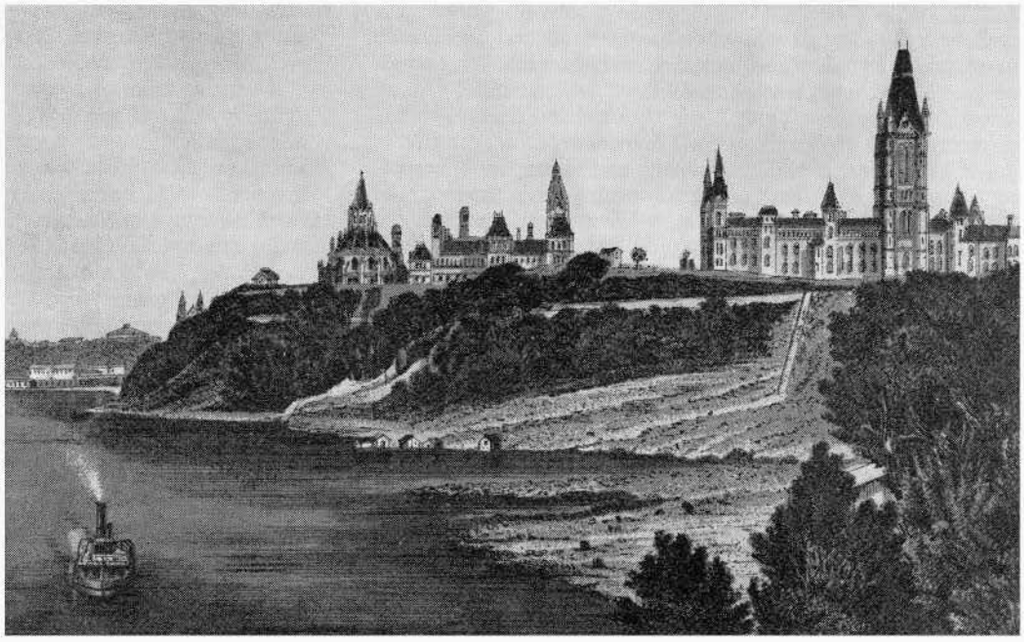
EVERY YEAR LARGE AND SMALL BUILDINGS of architectural and historic value are added to the treasures of the National Trust in Great Britain. We have kept no record of the thousands of pounds spent, this year, out of government funds for the preservation of architectural masterpieces, but only this month the National Trust announced that it had acquired Hardwick and Mottisfont. Hardwick Hall, "more glass than wall" as went the Elizabethan rhyme is known to most students of architecture, and has just been "accepted" by the British Government in part payment of succession taxes by the Duke of Devonshire. The acceptance involved the house and several great works of art including a Rembrandt amounting in all to £1,200,000. The alternative was sale of the pictures, presumably to the United States, and the destruction of Hardwick and the sale of grounds to the private developer.

Mottisfont Abbey is less well known. The Abbey, along with 2029 acres, has been given with an endowment to the nation by Mrs Gilbert Russell. The house was originally an Augustinian Priory acquired by Lord Sandys, Henry VIII's Lord Chancellor, and it was he who converted it into a house. At the dissolution of the monasteries, many religious houses suffered such a fate, but it must have been unusual for the church proper to become a home. In Mottisfont, the nave is the main part of the house. But that is not what makes Mottisfont important to us and fly fishermen wherever they may be. The River Test, one of the great trout streams of the world, flows majestically, through the lawns of Mottisfont. Three years ago we were fishing the Test, and magic names like Ramsey, Stockbridge and Mottisfont became reality. As a soldier in the first war, we saw many houses closed to the public. As an able seaman in the second, we saw St. Paul's after the bombing, but as a tourist we balked at Mottisfont. It was not the Augustinian Priory that unnerved us (we had just been to Blenheim) or the sheer beauty of lawns and yews. It was the fact that we were on the outskirts of a great house whose owner owned a piece of the Test. As a result, we stood in awe even of the lodge keeper – we never saw Mottisfont, but we stood on holy ground.

Grants by labour and conservative governments in England for the preservation of historic buildings show how the British people appreciate their architectural heritage. We, in Canada, on the other hand, show little respect for the little we have. In October, Mr Henry Russell Hitchcock will deliver an address in which he will urge us to save old Toronto. He will be talking about a residue that, monthly, grows less. Today, the fate of the seventh post office – a handsome old building on an equally handsome street in Toronto is uncertain. It is no longer needed by the Bank of Canada, and, presumably, by no one else. The popular view and the Minister's is that the building and the site are worth money, and money must be forthcoming. Posterity may take a different view, but by then it will be too late. Nineteen fifty-seven has been a grim year for our historic buildings. The seventh Toronto post office is more than threatened; the Supreme Court Building in Ottawa has been destroyed to make a parking lot for ten cars, and numerous fine old houses on the St. Lawrence Waterway have been demolished or, shortly, will be so. The fate of the Western Block under a new government is not yet known. The debate on the Block got completely off the track at the Annual Assembly in Ottawa. Quite lost in the discussion were the two essential facts – that the building is a great piece of architecture in a Gothic Revival complex unique on this continent, and that, historically, it has as a building few equals in Canada. Since both of these statements are incontrovertible, all others would seem irrelevant. If the Western Block is demolished or even altered externally, it is clear that we can abandon hope for lesser works of art like the seventh post office in Toronto. Instead, we shall go on spending money on battle fields in the belief that the history of Canada is better told by a meadow with a cairn than by the important, or even the humble, buildings of our forefathers.

Someday, we shall think differently, and another generation looking back on the architectural history of Canada in an album of photographs will realize how irrevocable was the beauty that once was ours.

Parliament Hill
from Lovers' Walk



The photographs in this article are from a 19th century booklet entitled "Views of Ottawa".

Profile of Parliament Hill

BY ALAN H. ARMSTRONG

WHEN THIS NATION has to announce itself by an emblem drawn from its flora and fauna, the maple leaf and the beaver have long been used. When the idea 'Canada' is to be said architecturally to all concerned, the established symbol is drawn from the group of buildings on Parliament Hill in Ottawa. Our bank notes, postage stamps, tourist displays and TV titles have made them the most familiar buildings we own; perhaps on that account they are among the most sacred. The buildings were designed in hot weather just ninety-eight summers ago. A passing note on the circumstances is in order.

In the United Provinces of Upper and Lower Canada in the 1850's, the chief officer of the government was a most active participant in its decisions, so it will be well to begin in his office. The choice of Ottawa as the capital of the Provinces, the selection of Barrack Hill as the site of the legislative buildings and the decision as to whose designs should be built were all made under the personal influence of the Governor. That office was filled from 1854 to 1861 by Edmund Walker Head.

When he came to the Canada's, Head already knew much about government, architecture and North America. His grandfather Edmund had been a merchant in Charleston, S.C. and delegate to the Second Continental Congress. The Hon. E. W. Head had served a term as Lieutenant Governor of New Brunswick, and nearly a decade before that as a Poor Law Commissioner with Lewis and Chadwick. Although not quite fifty when he was made Governor General, Head had already served eighteen years in responsible public posts. To the end of his life, seven years after leaving Canada, he retained a connection in that he was a Governor of the Hudson's Bay Company.

Edmund Head was as elegant, talented and learned as he was experienced. A Colonial Office colleague remembered him thirty years later as unequalled in London in knowledge of languages and art. Head had lived in Europe both as a child and after leaving Oxford; he seems to have spent a good part of the ten years after graduation on sketching trips. Legend has it that Lady Head's sketch of 1856, showing Barrack Hill from the northeast, was a persuasive piece of ammunition for Ottawa as capital. Head managed to combine the arduous duties of a senior public servant with the translation for publication of the 'northern' half of Kugler's "Handbook of the History of Painting" and the preparation of an original complementary volume on the Mediterranean schools. Her Majesty's servants in Canada may not have recognized him as an art historian of some standing when he arrived in 1854, but they must soon have discovered that His Excellency had a mind and taste of his own in these matters.

Of Head's predecessors, Sydenham and Elgin had both considered Bytown as the capital. But M. Sicotte, the Commissioner (Minister) of Public Works a century ago was firmly against this city. Indeed he was shortly to resign because Ottawa was chosen. He had Cumberland and Storm (who were busy on University College in Toronto) make sketches and estimates in 1854 for capital buildings in that place, employing the local brick with stone trim. Within 18 month's of Head's arrival we find the Secretary of Public Works, under the Commissioner's unwilling nose, converting the Toronto estimate to up-to-date prices (£285,656 8s. 11d.) and noting that if Ottawa were chosen the probability was "a part of the Ordnance Lands to be made over" for this purpose. This estimate (suitably pared) was the basis of a legislative vote in the spring of 1857 for government buildings in a seat to be chosen by the Queen.

The story of the choice of Ottawa has been fully told by Dean Gibson of Carleton University in the *Canadian Historical*

Review and elsewhere. Head's part in persuading London is clear enough. Ottawa was an attractive site and the choice least likely to be taken as a mortal affront elsewhere. Anticipating that his recommendation would not gain shouts of glee all round, he delayed bringing back the decision (he was home to become one of Her Majesty's Privy Councillors) until the end of 1857 to announce it personally and to prevent it becoming an issue in the election of that autumn. Even at that, the motion on the Queen's choice at the next session rocked the government and was carried by only five votes.

Once the £225,000 and the choice of city were ratified, there was great pressure to get on with the buildings. The announcement of May 7, 1859 asks for designs and specifications for a central Parliament Building including Library (1st Prize £250, 2nd of £100), a flanking pair of Departmental Office Buildings (like prizes) and a separate Governor General's residence (1st Prize £100, 2nd of £50), with tendered estimates not altogether to exceed $640,000 (no longer sterling). Designs might be entered under any or all of the three headings, provided they be of coursed hammer-dressed local stone and in "plain substantial style". All submissions were to be keyed to pseudonyms and to become the property of the Department. No professional adviser nor jury had to be mentioned in 1859. Not counting time lost in mails, competitors were given 85 days to conceive, render and deliver their schemes.

In early June, while hopeful competitors were bending over their first sketches, Mr James D. Slater, the Superintendent of the Rideau Canal and a qualified Surveyor, was sent up to Barrack Hill to take surface levels on a 50 foot grid. His notes were duly filed in the Department of Public Works. The designers treated the land as if level. There is in fact a difference of 115 feet between the highest and lowest of the three basements.

For want of a permanent capital, the seat of government had been alternating since 1850 between Quebec and Toronto, Parliament and Parliament about. Express railway service between the two had just begun. It was said that civil servants' travel accounts alone would pay for handsome buildings if the shifting about could be stopped.

On one such official trip to Toronto in August 1859, the Deputy Commissioner of Public Works, Mr Samuel Keefer, must have had with him a very large package, for he took along many if not all of the 33 schemes entered in the recent competition. These he showed to Mr John Morris, an architect aged about 40 who was familiar with European practice in such competitions. Morris was employed at the time by a Mr Thomas, but later in the year was to be appointed Clerk of Works on Cumberland's and Storm's University College. Morris seems to have suggested a neat system of judging he'd seen used; you allow a 'modulus' of 10 possible marks for each of ten requirements – fitness of plan, economy of cost, suitability to local materials, to site, to climate, ease of warming and ventilation, of lighting, degree of beauty, adequacy of information supplied, fire safety. The design with the highest total out of 100 points wins. Morris also cubed several of the most promising designs to check the competitor's estimate of costs.

Keefer appears to have adopted this marking method and to have set the Engineer and Architect of his Department, Mr F. P. Rubidge, to applying it to the mass of competition entries. The task cannot have been easy. The 33 schemes for five functional elements under three headings were submitted by 17 entrants from the Canadas and by one from New York. The styles are described as Civil Gothic, Classic, Elizabethan or Tudor, Norman, Lombard, Italian, Venetian and "plain modern". Several contestants entered in more than one style. However, Rubidge applied himself and by August 23, 1859 (three weeks after the closing date) was able to report to his chief. He thought all the designs suffered "owing probably to the limited time (allowed)" and he "could not assert that any one sett of plans so completely answered the requirements" that they should be followed without change. One body of opinion seemed to favour on this site the "sternest architectural style" but Rubidge was against "a gloomy pile . . . on so commanding a situation". Finally, he believed the prize-winner should supply a "working specification" before getting his prize.

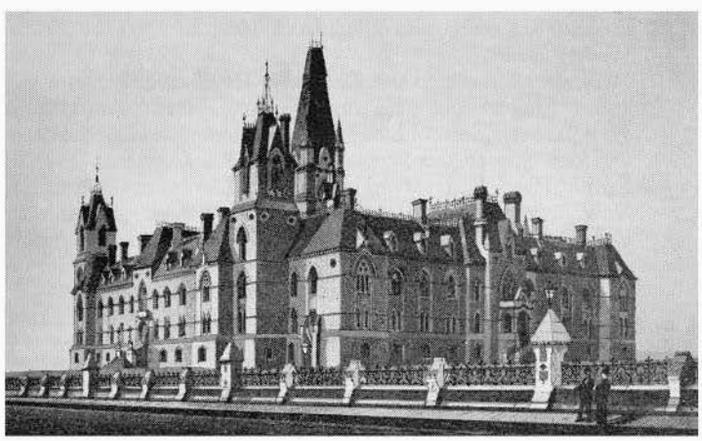
Keefer tried his own judgments on the 'moduli' of what seemed the most promising designs and marked his results in red ink on Rubidge's score-sheet. The technical officer would have given first prize for the Parliament to Stent and Laver's Civil Gothic design and second to Cumberland and Storm's Norman. His administrative chief much preferred Fuller and Jones' Civil Gothic with second prize to the Stent and Laver. For Department buildings they both liked Stent and Laver's Gothic. Classical designs got generally low marks.

A day or two later Keefer minuted the whole package of conflicting opinions directly to the Governor General, noting that the designs had been spread out in Quebec for His Excellency's convenient examination and that nobody liked any of the Government House designs sent in. In explanation of his preference the Deputy Commissioner emphasized Fuller's "great unity of design", that this Parliament building would be "a dignified and appropriate edifice" convenient in arrangement and ample in accommodation. Keefer went on to say that Stent and Laver's Departmental blocks would harmonize with the Fuller centre-piece, being "in the same style . . . though of somewhat different expression". But offices, he thought, should not be built around enclosed courts.

Keefer should have known better. The very same day he got his paper back from Sir Edmund Head with an initialled slip observing that it was "impossible to arrive at a conclusion . . . from the Reports". In any case, said the Governor General warming to his subject, "the principle of estimating merits is erroneous" in that beauty of design and skill in plan are worth far more than the right and safe spacing of ducts and stairs; and certain of the moduli should not have been used at all because they would nullify some original terms of the com-

The Central Building

The Western Block



petition. Could Head now please have comment on the designs that mattered, in terms of the competition, and in terms of the seriousness of each flaw were the design to be built? There was no point in considering any scheme "inconsistent with the locality . . . or not adapted to the shape of the ground".

His Excellency's comments were duly passed around the Department as "worthy of serious attention". Two days later the Deputy Commissioner replied to Head, apologizing for the confusing submission and the inadequacies of the scoring system. Keefer was also sorry "that the exigencies of public service have rendered it necessary" to send Rubidge away so there was nothing to do but to reinforce Keefer's already known judgment, hoping it "will enable Your Excellency to make a satisfactory selection of such as are entitled to the premium and suitable to be submitted for tender". In the previous Report three Upper Canadian firms were in the running; Keefer now assessed their weaknesses, with emphasis on the Norman scheme that Rubidge liked.

All three firms were of recent formation. The work of Cumberland and Storm of Toronto is recorded in the *Journal* and in other places accessible to architects. Thomas Fuller had been in Canada hardly two years when he entered the competition, and in partnership with Chilion Jones in Toronto an even shorter time. Thomas Stent had been in Canada only four years and had formed a partnership with Augustus Laver. Of the three firms, Cumberland and Storm had much the most active practice. It proved fortunate, as we shall see, that the other two firms were relatively free to stay with the big new job in Ottawa. They were both so uncertain of what was wanted that they turned in Classic as well as Gothic entries.

Keefer began in his memorandum to the Governor General with a comparison of the weaknesses of the three romantic designs for the central Parliament Building. The Fuller and Jones Gothic scheme showed "mere errors of hasty composition which can easily be corrected". He thought "its handsome palatial appearance brings it in harmony with the position and scenery". He may have been impressed with Fuller's and Jones' written 'specification' accompanying the design. They said they had inspected the site and on looking up from across the Ottawa River noted the scenery "of the boldest and grandest character" for which a vigorous expression came to their minds. But when they looked at the "park-like" slope up to the edge of the bluff from Wellington Street they changed their minds, because on that front it should be "dignified, elegant and cheerful", tending "more to the Palatial than the Castellated". They said that while there was no direct imitation, the Low Countries and Italy "have afforded suggestions". Besides, this style was cheaper, as had been shown by G. Gilbert Scott at Westminster.

Keefer said of Stent's and Laver's Gothic Parliament in his final report that theirs would be the cheapest to build, as far as one could tell when the competitors had omitted an elevation of their "circular library". But this economy was partly gained by making public galleries overhang the legislative Chambers rather than recede from the Chamber walls as Fuller's did and which was much better. Also of the Stent and Laver design he said "its conventual and collegiate appearance seems to associate it with . . . devotion and learning rather than with purposes of Legislation . . . In itself it is a handsome object, but scarcely suitable to the position, the scenery or the uses." And that disposed of the Stent and Laver scheme.

Of the Norman scheme by Cumberland and Storm Keefer was much more critical: "...however much it might be adapted to the scenery (it) possesses neither truth nor beauty . . . (Its) flat roof and parapet is a trap for the snow . . . The heavy castellated style . . . renders it prison-like and defiant in aspect, and therefore unsuited to become the seat from whence should emanate the laws of a free country." At all events, it would cost too much.

Two days after these remarks were written, they were formally submitted to the Executive Council. On August 29 (four weeks after the competition closed) the Governor General approved a Minute of Council which referred to the reports of Keefer and Rubidge, added that while no submitted design could be adopted "without considerable improvements" the prizes were awarded as follows:

Central Parliamentary Building

First Prize: Fuller and Jones, Toronto *(Semper paratus)*
Second Prize: Stent and Laver, Toronto *(Stat nomen in umbra)*

Flanking Departmental Blocks

First Prize: Stent and Laver
Second Prize: Fuller and Jones.

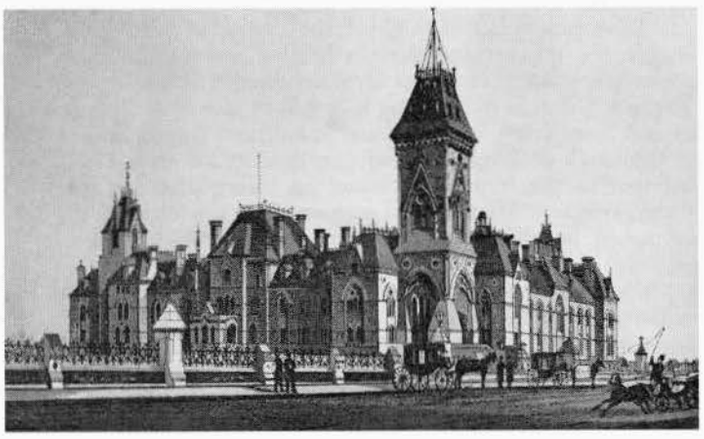
Governor's Residence

First Prize: Cumberland and Storm
Second Prize: Fuller and Jones

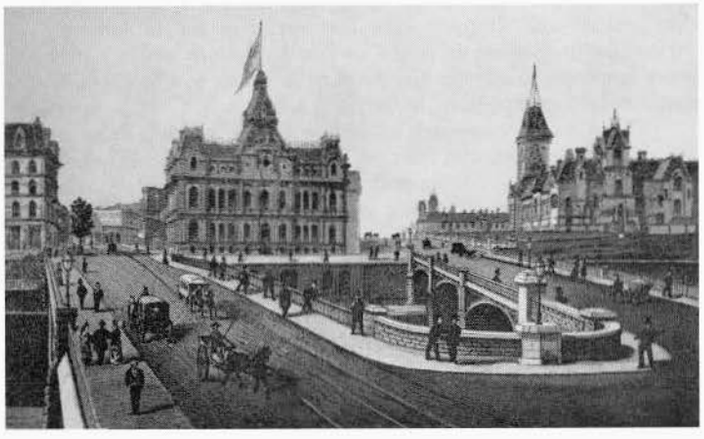
Not a day was wasted. The Governor in Council on September 2 summoned the winners of the first two first prizes "to repair to Quebec without loss of time" to confer with Departmental officers "but without any charge to the government". Less than a week later the Deputy Commissioner had issued the invitation to tender, announcing that drawings and specifications could be seen in his office (Quebec) or at the offices of the architects after October 15 and that the closing date would be November 1. Stent and Laver were already in Ottawa but Fuller and Jones were still to be found in Toronto. Both firms evidently complained right away (but without effect) that, having designed complex buildings in two summer months they were given only about four weeks to make radical changes and prepare contract documents in triplicate. Fuller returned home from Quebec September 8 via Ottawa to have a good look at the site.

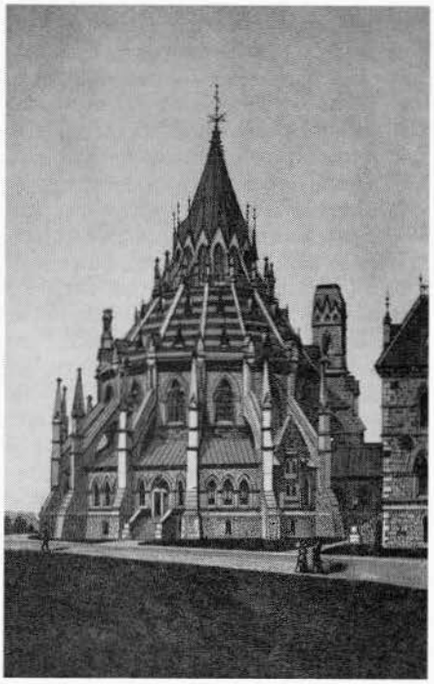
The next day Keefer got off a letter to Fuller and Jones outlining the changes agreed upon. They were to stay within the budget by cutting down the length of their main building, reducing the sizes of the legislative Chambers and narrowing the

The Eastern Block

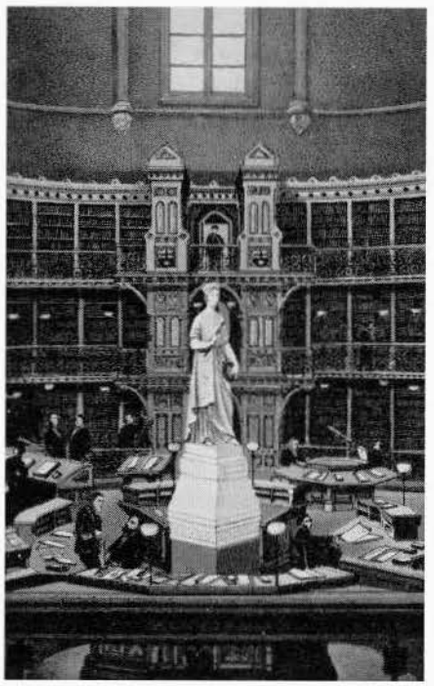


Post Office and Bridges





The Library



Library Interior

corridors to 11 feet. Residences shown for Speaker and Librarian, certain offices and an arcade for the Governor General were to be omitted. The principal floor should be raised further above grade to save excavation of rock. Cheaper finishes were to be used on floors and walls where marble was shown on the prize drawings. The amendments were to be in the Department by October 10 and duplicated by October 15.

It was September 14th before the corresponding instructions, involving even more elaborate changes, were mailed to Stent and Laver. Instead of enclosed quadrangles giving their longer facades to Wellington Street the Departmental buildings were to be redesigned on L-plans with the longer wing facing the square in front of the main building. Because of the known site levels, the facades on Wellington would be three storeys in height to the eaves whereas facades facing the forecourt might be of two principal storeys. Fenestration had all to be altered to accord with Fuller's main building design. Each Departmental block should have a tower at the angle, but there should be differences between them both because of differences of ground form and "to do away with the formality". A good many structural, finish and mechanical amendments were also required, yet the dead-line for receipt of the first set of contract documents was less than four weeks away when the architects received this letter.

Somehow, they carried out the task. We may imagine that every other office lent help to the prize winners to get the thing done. We know that John Morris, although working for Cumberland and Storm on the University at the time, went personally to Quebec in mid-October to deliver Fuller's and Jones' contract drawings and to explain them to the Department and to prospective bidders.

There was a two-week extension on the closing date for the general contract and by that time half a dozen bids were in, including among others that of Alexander Mackenzie, who had spent twenty years on big government jobs (St. Lawrence Canals and fortifications at Kingston) and within another fifteen would be Prime Minister of Canada. A week after the closing date the Department of Public Works reported on the bids to the Executive Council and the next day (November 23, 1859) His Excellency approved a contract with Thomas McGreevy of Quebec for all three buildings on the Hill for a price of $579,000. McGreevy had second thoughts about the job after he got it, and within another week was asking that the two Departmental buildings be given instead to Jones, Haycock and Co. of Port Hope. Contracts were duly signed on December 5th, with McGreevy to complete the main building by July 1862 and Jones and Co. to complete the flanking pair by February 1862. In the next week the architects were advised by letter who would be contractors, and were asked for further design changes, including the removal of the photographic rooms to the top of the Western Block.

Four days after signing the contracts the Department, without asking the approval of the respective architects for the buildings, appointed John Morris as Clerk of Works for both contracts. He was said to be "familiar with this style of work". A week later he was on the job and on December 20, 1859 the first sod was turned by the Commissioner of Public Works (John Rose of Montreal) in the presence of an official party from the City of Ottawa, the four architects and a handful of Departmental officials.

As soon as the tenders were in, both architectural firms had written Rose to suggest that architects' fees should be 5% of the actual cost of the buildings plus travelling expenses for trips occasioned by the Department. The recommendation that went to the Executive Council was for 5% of the outlay up to a maximum of £8250 (which assumed costs somewhere between the Parliamentary vote and McGreevy's low bid) payable in the discretion of the Commissioner with no allowance for extras. This fee basis for the architects was officially approved a couple of days before the building contracts were signed.

Excavation proceeded throughout the winter of 1859-60. Meanwhile the government chose a heating and ventilating contractor whose shop drawings involved considerable alteration to the foundation plans being followed by the excavators. Fuller and Jones came for occasional visits from Toronto and found the Clerk of Works transmitting instructions from the Department to the contractors based on information never given the architects. Hundreds of men came on the job as the spring passed by although good men and good finish stone were scarce.

On Saturday, September 1, 1860 H.R.H. the Prince of Wales (later Edward VII) arrived to lay the cornerstone at the northeast angle of the Legislative Council's Chamber. That there was some doubt about the future of the whole project is reflected in the inscription on the "intended" cornerstone; the same word was duly reported in *The Times*. There were no reservations about the immediate present, however. Contem-

porary accounts tell how "bullocks and sheep were roasted whole upon the government ground and all comers were feasted". On this occasion the architects first established their precedence over the Clerk of Works by having the program altered so that they would be presented to the Prince ahead of him.

The progress of construction and the expanding Departmental requirements can be followed month by month. Extra costs piled up and it was discovered that the schedule of unit prices for extras was omitted from the general contract for the main building. The local limestone was found unsuitable in colour and durability, so Sir William Logan's suggestion to use Nepean sandstone (in a Potsdam formation about 10 miles from the Hill) was adopted at added cost. More subcontracts were signed. By the end of the year the Chief Engineer of Public Works, Mr John Page, was on the job to review progress and especially the arrangements made for progress payments. He noted that the architects are asking for a variety of materials that "might gratify the curious" but would be "at varience with all principles of good taste". Nevertheless, he says that "about two-thirds of the work done by (the architects) has been additional to (their original) contract" and "on this they receive no commission". While extras were to be expected on so big a job on a remote and unfamiliar site, it "would have been judicious to have ascertained the nature and physical peculiarities of the site at an earlier period".

By June of 1861 there were 1000 men on the site, many of them Americans, Britishers and Europeans. As long as Head was Governor the main parts of the work were pressed forward on, but by October 1 the available funds were exhausted and work involving 1,700 men on the site was ordered stopped.

In 1862 the new Governor General, Viscount Monck, appointed a Royal Commission to inquire how the costs had got out of hand and whether the buildings were suitable. On the Commission was an unsuccessful competitor in the design competition, Joseph Sheard. Among the witnesses were unsuccessful bidders for the contract, including Mackenzie. The Commission was told that in Canada buildings must have cornices, gutters, drips and large windows. The architects had been in an anomylous position relative to the Clerk of Works and some sub-contractors and were unable to supervise all that went on. Nonetheless they should be retained to the completion to avoid "great inconvenience". New specifications and contracts were drawn up. The job was completed and the Civil Service began the move to Ottawa in the fall of 1865. The first Ottawa session on the Parliament of the United Canadas opened on June 8, 1866. The central tower was completed a couple of years later, and the library (with its statue of Queen Victoria by Marshall Wood of England) was not opened until 1877. Meanwhile the West Block had been extended (1875) to designs by T. S. Scott.

The group of buildings made a single architectural composition as extensive as the whole depth of the City of taverns, shops and houses which they faced. George Brown told Sir John A. Macdonald in 1864 that the buildings were 500 years in advance of their time but added "at least let us not be ridiculed for a half-finished pile". As late as May 1866, Viscount Monck was predicting to the Colonial Office that Ottawa "will not be the capital four years hence". Yet a contemporary handbook calls the group "one of the noblest pile of buildings yet erected on the Continent of America". Sir Alexander Mackenzie, who disliked Gothic and was not generous in praise for the project, conceded that the buildings "are properly placed in regard to the ground level of each". Recently Prof. Gordon Stephenson called Parliament Hill "probably the grandest Victorian composition extant". With such lack of preliminary site information, with different designers doing the building (and even different contractors) we must ask who was responsible for the visual success of the whole group ?

The records indicate that the prize drawings assumed a level site and that in the few weeks given them to prepare working drawings the architects could not have composed the whole group in the round as it now stands. Fuller and Stent both testified later that they staked out their buildings on the site with Morris, but left to him the setting of floor elevations. To some degree the mounting of the buildings was the result of accident : only after excavation was well advanced did the faulty nature of the bearing rock become apparent and the holes had to go much deeper (especially for the East Block) than was at first intended. Fuller told Monck's Royal Commission that when he undertook to prepare working drawings the "particular site had not been determined upon" and added "I think the site of the building should have been determined before the contract plans were drawn".

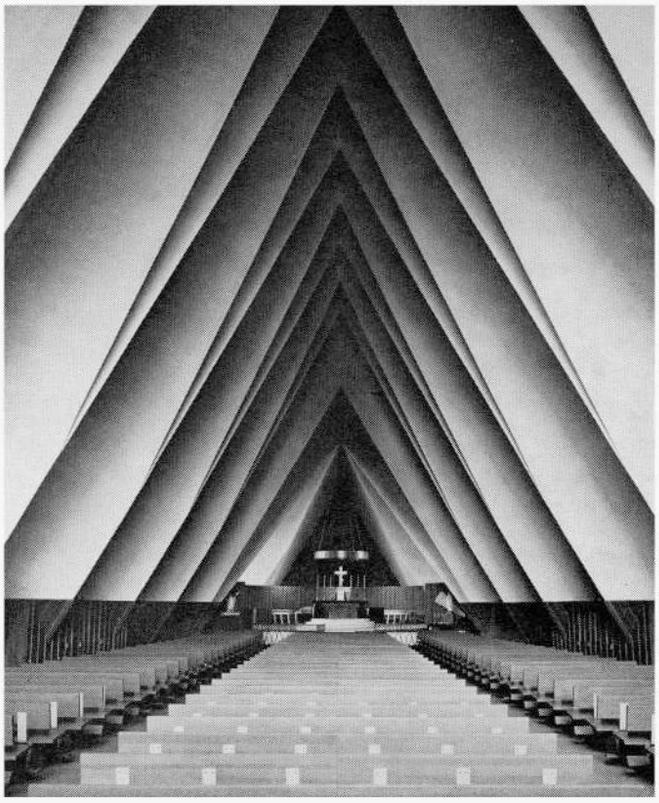
Thomas Stent told the same Commission that from John Morris "we received instructions where to place the buildings". The formal Minute of the Executive Council approving the positions and levels of the three buildings (February 1, 1860) also refers to a drawing in the possession of Morris, although other records show that the staking out was completed at least two months earlier, as soon as Morris came on the job. Morris told the Commission that he had fixed the actual levels of the building foundations at variance from what was shown on contract drawings. Important in this connection were the requirements for heating, ventilating and drainage – and these were outside the terms of reference of the appointed architects. It may be significant that the heating contractor, Charles Garth, was under the impression that at least one of his instructions (to go to Washington to learn from the Americans) came through the Commissioner of Public Works directly from Sir Edmund Head.

This note cannot pretend to settle the mystery of authorship of that relationship of the parts which is the charm of our Parliament Hill. But there is enough evidence to tempt speculation that the project was pushed forward in his term by the most knowledgeable patron of architecture in Canada, Sir Edmund Head. From the documents looked at, it seems likely that his most effective adviser, and perhaps the executant of his over-riding conception, was the Clerk of the Works, Mr John Morris. Arrangements as between the Queen's representative and her Ministers have changed over the century since this work was done. So have relations among architects, their client and clerk of works, and those among architects, contractors and craftsmen. But arrangements impossible to recreate have produced a result which in total effect we can continue to admire.

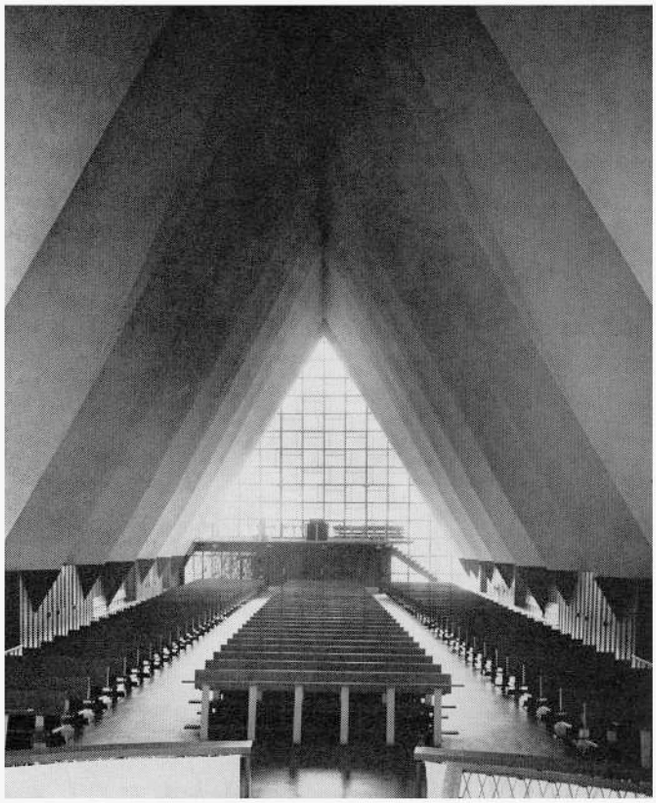
Saint Mark's Church, Bagotville, Quebec

Architect, Paul-Marie Côté
Consulting Architects, Desgagné & Boileau
Structural Engineers, Dauphinais & Bélanger
Mechanical Engineer, John Mackay
General Contractors, Xavier Néron & Fils

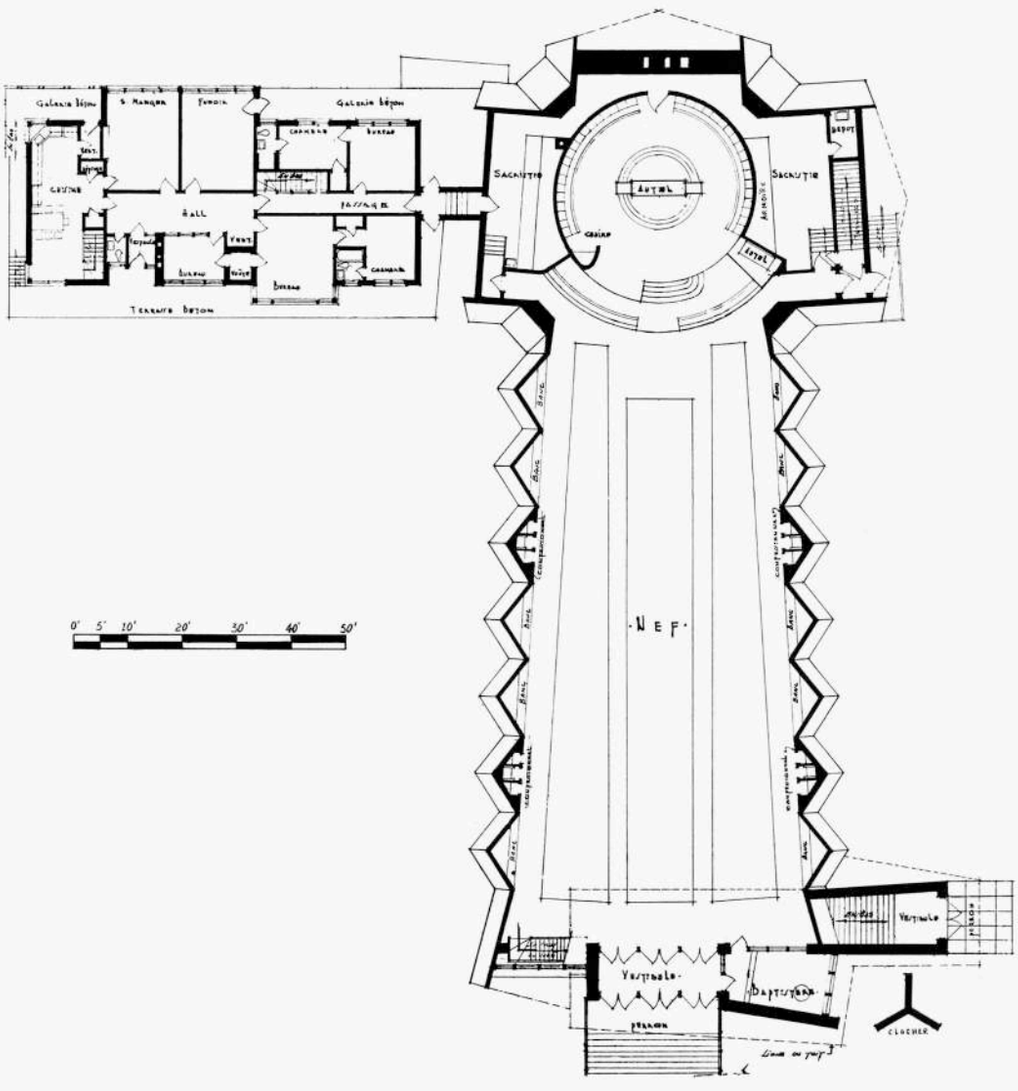
General view of church showing entrances and sacristy



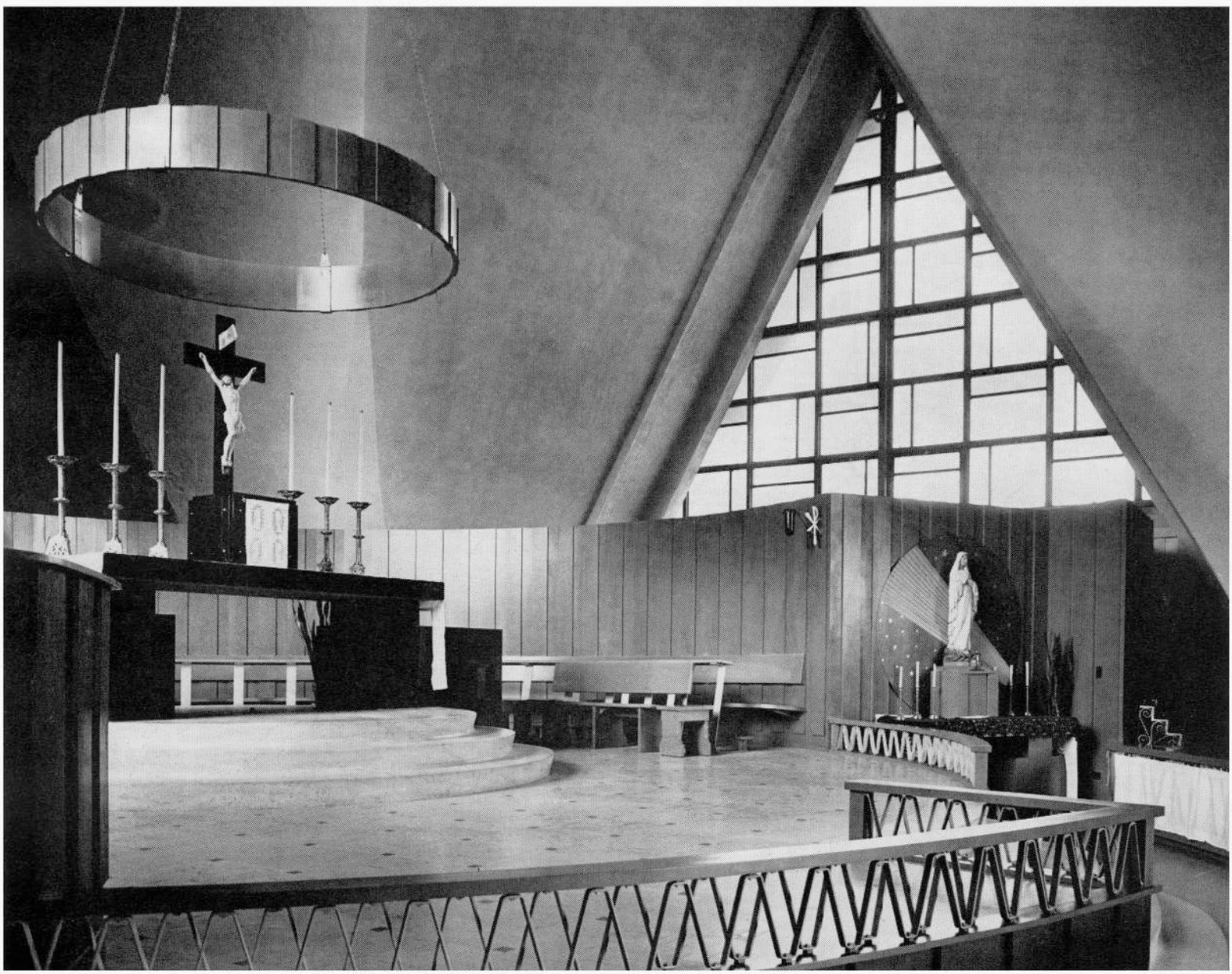
Interior looking toward altar

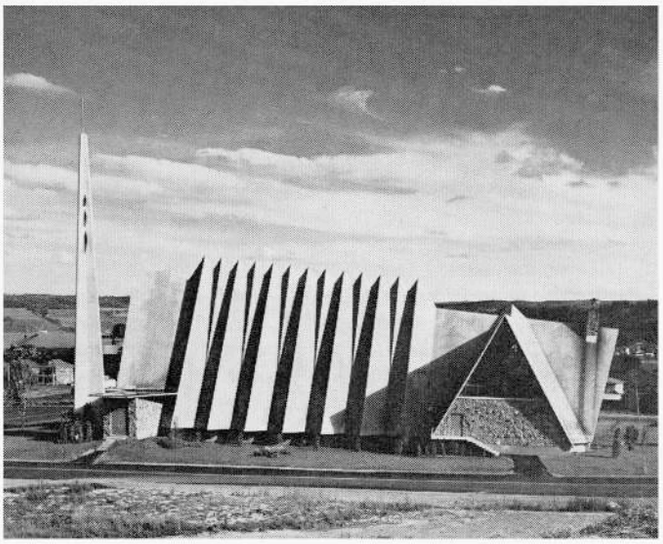


The nave looking toward main entrance



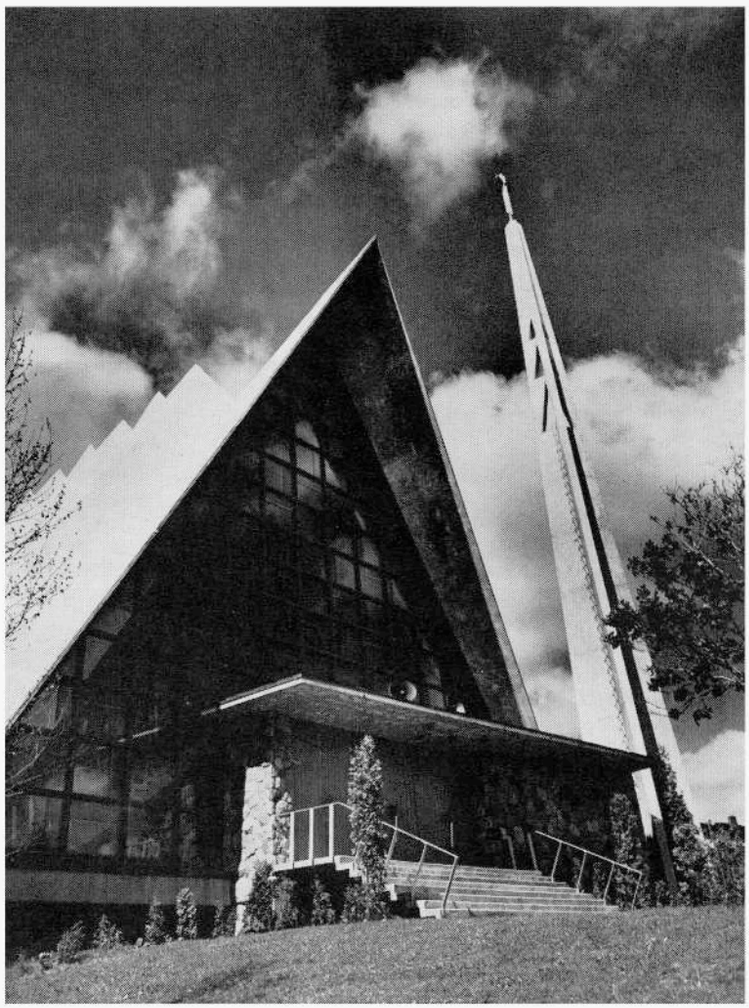
The sanctuary with the altar in black marble





View from the side

The presbytery



The main entrance

Unesco Headquarters

The design of Unesco's Headquarters in Paris is the work of an international trio of architects — Bernard Zehrfuss of France, Pier Nervi of Italy and Marcel Breuer of the United States. They were assisted in the preparation of the preliminary projects by the members of the International Panel of five Architects — Lucio Costa, Walter Gropius, Le Corbusier, Sven Markelius and Ernesto Rogers and also Eero Saarinen who collaborated as the architect's team consultant in the early sketches. Their Y-shaped plan was adopted after the abandonment of a previous project for a skyscraper located at the Porte Dauphine.

L'ESPACE DE TERRAIN alloué à l'Unesco par la Ville de Paris donne sur un demi-cercle. Pour ne pas détruire l'ordonnance des édifices déjà existants, les architectes ont été amenés à donner au bâtiment du Secrétariat la forme d'un Y comportant trois ailes de sept étages dont l'une ferme et complète le croissant. Ces trois ailes incurvées et d'inégale longueur (quoiqu'elles aient l'air semblables) permettent trois façades dégagées. L'ensemble est complété par le bâtiment des Conférences, bas et relié au Secrétariat par une Salle des Pas-perdus, et par un troisième bâtiment carré, isolé.

La forme en Y a été choisie moins par souci plastique que parce que, étant donné le terrain, elle offrait la solution la plus logique pour loger les 1000 employés composant le personnel de l'Unesco.

Le hall d'entrée de l'Unesco se trouve au centre de l'Y; c'est aussi là qu'est le bloc des ascenseurs. Ce foyer, où sont obligatoirement concentrés tous ceux qui entrent et sortent, est destiné à permettre les rencontres.

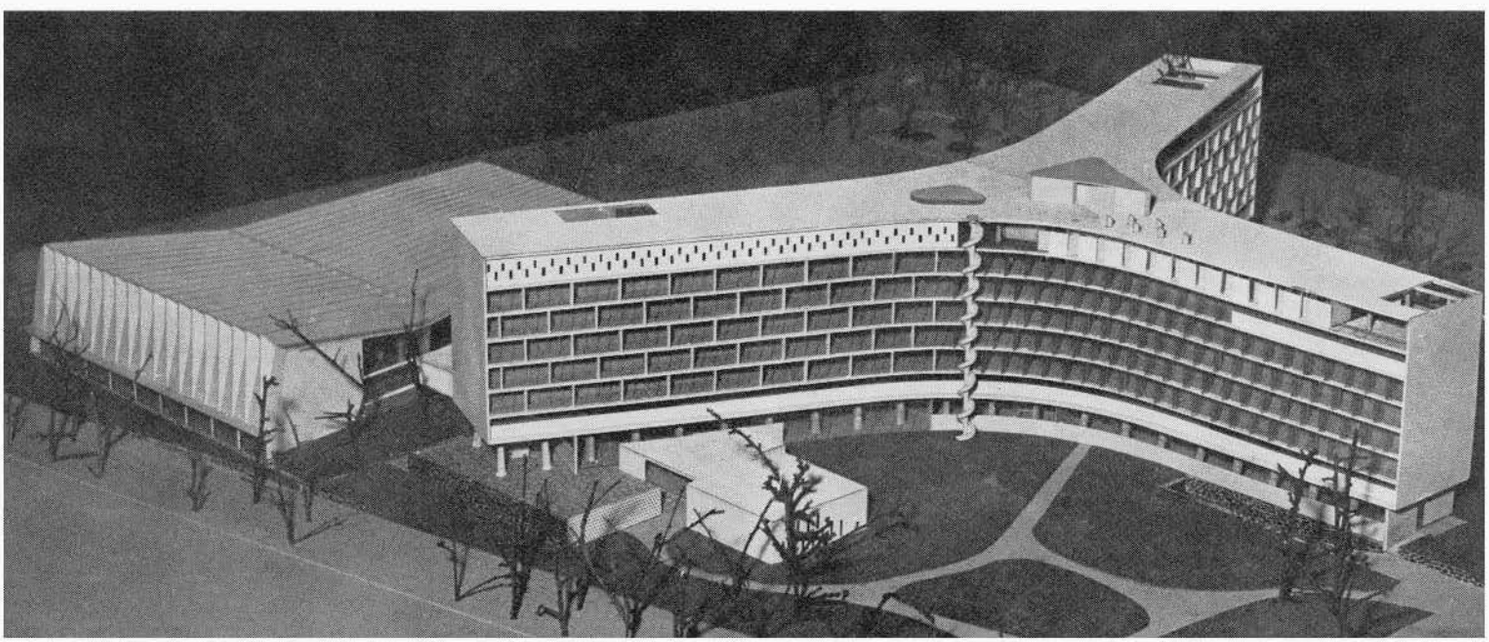
Les bâtiments actuels n'occupent que le huitième des trois hectares du terrain, le reste étant réservé à un jardin, des cours et un parc automobile. Le dessin d'un jardin japonais doit être confié à Isamu Noguchi, Jean Arp prépare le projet d'un gigantesque bas-relief qui serait placé sous les pilotis de l'entrée, Miro travaille à deux grandes mosaïques qui décoreraient les murs du jardin. Du côté de l'avenue de Saxe, on envisage de placer un mobile de Calder, du côté de l'avenue de Suffren, une sculpture monumentale d'Henry Moore. Picasso, lui, a promis une décoration pour le bâtiment des Conférences.

Bien que les trois architectes de l'Unesco aient connu leurs travaux respectifs, ils ne s'étaient jamais rencontrés avant de se mettre à l'œuvre. "C'était, dira Zehrfuss, un mariage arabe . . . "

Choisies ainsi pour un travail d'équipe, des vedettes internationales aurait pu provoquer un désastre, mais les trois architectes s'attaquèrent avec enthousiasme à cette expérience commune. Et, à qui voudrait préciser quels sont les responsables de ceci ou de cela, ils répondent que l'œuvre réalise en somme la fusion complète de leurs talents respectifs. Isoler la contribution de l'un ou de l'autre est impossible, sinon que, Zehrfuss et Breuer s'accordent à le dire, Nervi s'est surtout attaché aux problèmes de structure, tandis que ses deux collègues se sont réservé tous les autres problèmes.

Le choix du béton armé comme matériau principal fut en partie dicté par le fait qu'il s'agit là d'une technique française.

Le maître contemporain de cette technique est incontestablement Pier Luigi Nervi. L'utilisation libre et audacieuse qu'il fait du béton armé en Italie, dans des constructions destinées le plus souvent à des besoins industriels ou à des manifestations publiques (hall d'exposition à Turin, stade à Florence, usines, casino, etc . . .), lui a acquis l'entière estime des techniciens. En opposition absolue avec les termes d'un manuel français d'architecture: "l'aspect est franchement laid si bien qu'on hésite à laisser le béton nu et qu'on le dissimule le plus souvent sous un revêtement", Nervi montre ses structures,



les rend si belles en elles-mêmes qu'elles ne sont plus simplement fonctionnelles mais qu'elles valent d'un point de vue plastique.

Au cours d'une interview donnée dans son bureau parisien, Bernard Zehrfuss insista sur le fait que le traitement du béton armé dans le bâtiment de l'Unesco représente une véritable révolution par rapport à l'utilisation traditionnelle. On n'avait jamais apporté autant de soin à la fabrication du béton brut qui est ici employé pour lui-même, sans qu'il soit question de le traiter ultérieurement. Le matériau est considéré comme susceptible d'être beau par son aspect même sans qu'il soit besoin d'y faire des retouches. On soumet en général le béton coulé à divers traitements, soit qu'on en modifie la surface en le bouchardant, c'est-à-dire en le travaillant à la main ou mécaniquement jusqu'à lui donner l'aspect de la pierre taillée, soit qu'on le frotte pour faire disparaître les traces laissées par les joints des coffrages.

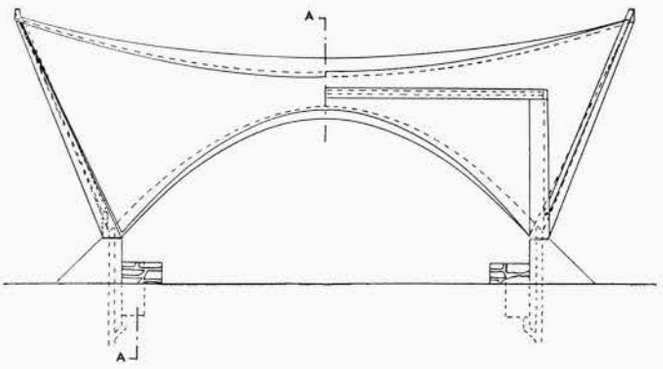
Ici, on a permis au béton de rester exactement tel qu'il apparaît au sortir du moule. Ceci exige qu'on apporte un soin particulier non seulement à la composition du béton lui-même, mais surtout à la technique du moulage, donc à la fabrication des coffrages. Afin de donner vie au matériau en montrant la façon dont il a été travaillé, on laisse apparaître la trace de toutes les planches et de toutes les lattes qui composent les coffrages. La surface du béton est ainsi déterminée avant et non après le coulage, et cette technique ouvre des champs infinis à l'architecte, puisqu'il suffit de modifier la surface interne des moules pour sculpter en quelque sorte la surface du béton armé. On obtient ainsi du béton "imprimé". L'aspect des piliers à l'entrée de l'Unesco illustre particulièrement bien cette technique: les lattes des coffrages ont été taillées en sifflets aiguisés à l'extrême. Le travail du bois fut si minutieux qu'on dut s'adresser à des menuisiers de la marine habitués à une telle précision.

Cette manière de traiter le matériau, le soin apporté à la fabrication des coffrages et au moulage, impressionnèrent l'architecte américain Herbert Bayer lorsqu'il visita les chantiers de l'Unesco: "De tels résultats n'auraient pu être obtenus aux Etats-Unis, où l'on ne dispose pas d'une main-d'œuvre assez spécialisée et où le prix de coffrages ainsi faits à la main et conçus individuellement serait absolument prohibitif."

La façade du bâtiment des Conférences montre comment les reprises de coulage, que l'on dissimule habituellement par un travail sur la surface terminée, ont été ici délibérément accusées. Les marques de reprise n'ont pas seulement été préservées mais utilisées comme éléments décoratifs. On a été jusqu'à laisser les petits trous que font dans le béton les vis des coffrages.

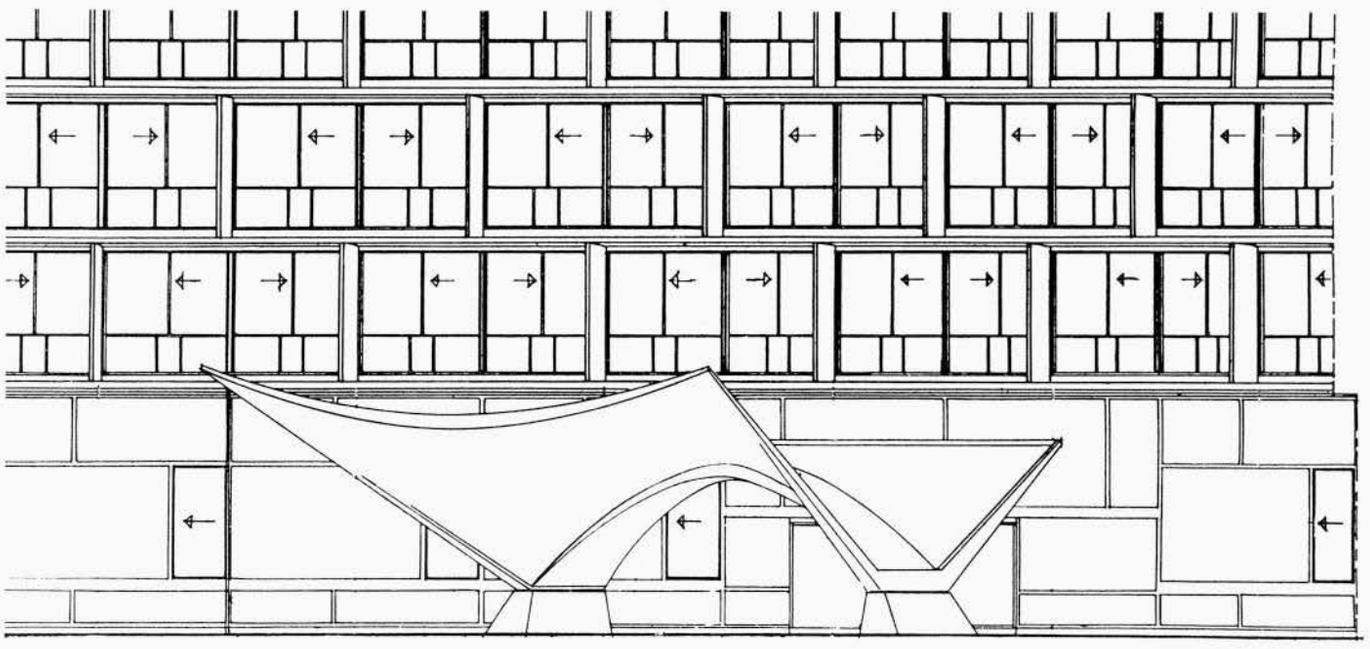
Jamais encore on n'avant poussé aussi loin la recherche d'effets de ce genre; et l'expérience de l'Unesco est pour Nervi lui-même l'occasion d'un nouveau départ. Zehrfuss estime qu'elle ouvre des possibilités nouvelles en ce qui concerne les éléments préfabriqués: un moule préparé selon cette technique, avec tout le soin requis, pourrait servir d'une manière répétée, ce qui permettrait de ne pas dépasser les prix de revient obtenus par l'emploi des méthodes traditionnelles. Rien ne s'opposerait même à ce que l'on étudie les formes des moules avec des sculpteurs.

Zehrfuss signale aussi deux innovations de structure riches de conséquences. Le bâtiment du Secrétariat, long de 15 mè-



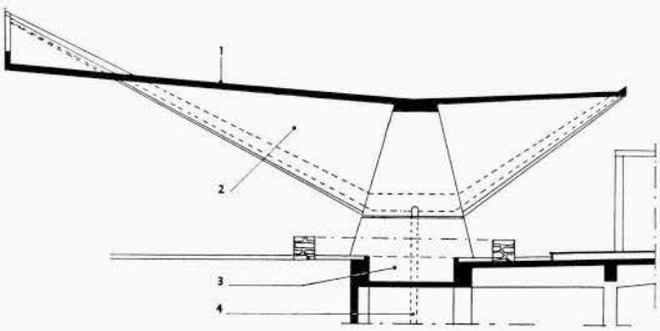
L'auvent sur la piazza, rappelant une cornette de religieuse, est en béton armé. La face inférieure, laissée brute de décoffrage, sera fortement éclairée au moyen de projecteurs dissimulés à l'arrière des murets de pierre prévus de chaque côté. L'étanchéité de l'autre face sera réalisée en matière plastique.

La forme de cet auvent est caractéristique des structures de P.-L. Nervi. En effet, alors que d'autres grands ingénieurs et constructeurs se sont employés à réduire les volumes de béton utilisé en faisant travailler les aciers à des maxima, Nervi a cherché à obtenir les mêmes résultats en faisant travailler les formes mêmes des volumes, ce qui l'a amené à réaliser des structures dont la conception plastique semble très libre, alors qu'elle résulte toujours des efforts exercés.



tres, est soutenu par des poteaux distants les uns des autres de 9 mètres et en retrait de 3 mètres par rapport à la façade, ce qui crée ainsi un porte-à-faux de 3 mètres de large. Ceci permet d'aménager la façade entièrement libre et sans point d'appui, et de disposer bureaux, cloisons et fenêtres avec la plus grande souplesse: le rythme des fenêtres et des cloisons, est en effet, dicté en général par l'emplacement des poteaux de soutènement. L'usage du porte-à-faux constitue une trouvaille de l'architecture moderne, qui, si elle avait été déjà exploitée, ne l'avait jamais été aussi largement.

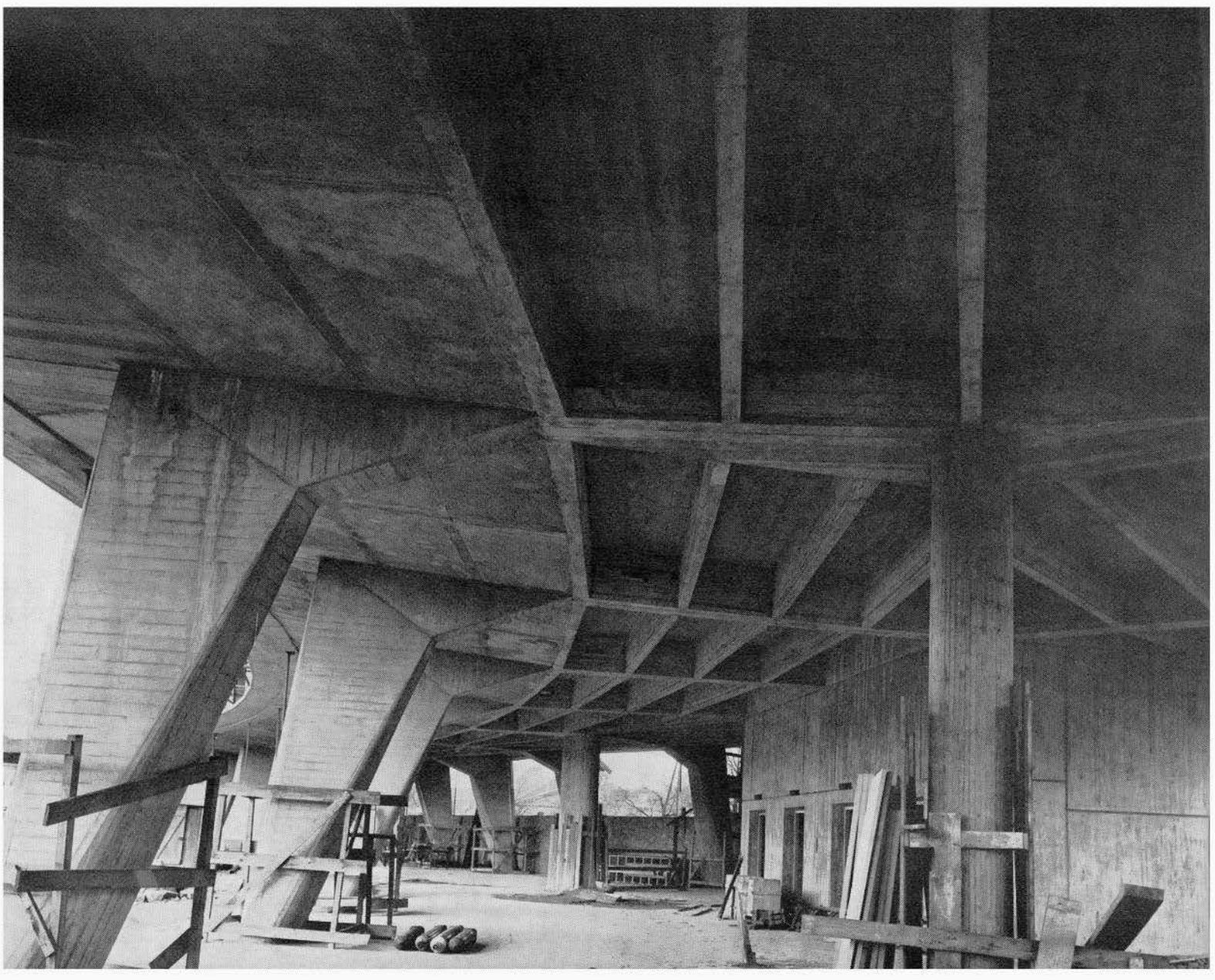
Condensed from an article by Rosamond Bernier in January, 1957, issue of L'Oeil Magazine. Text and photographs are reproduced by kind permission of L'Oeil Magazine and Unesco.



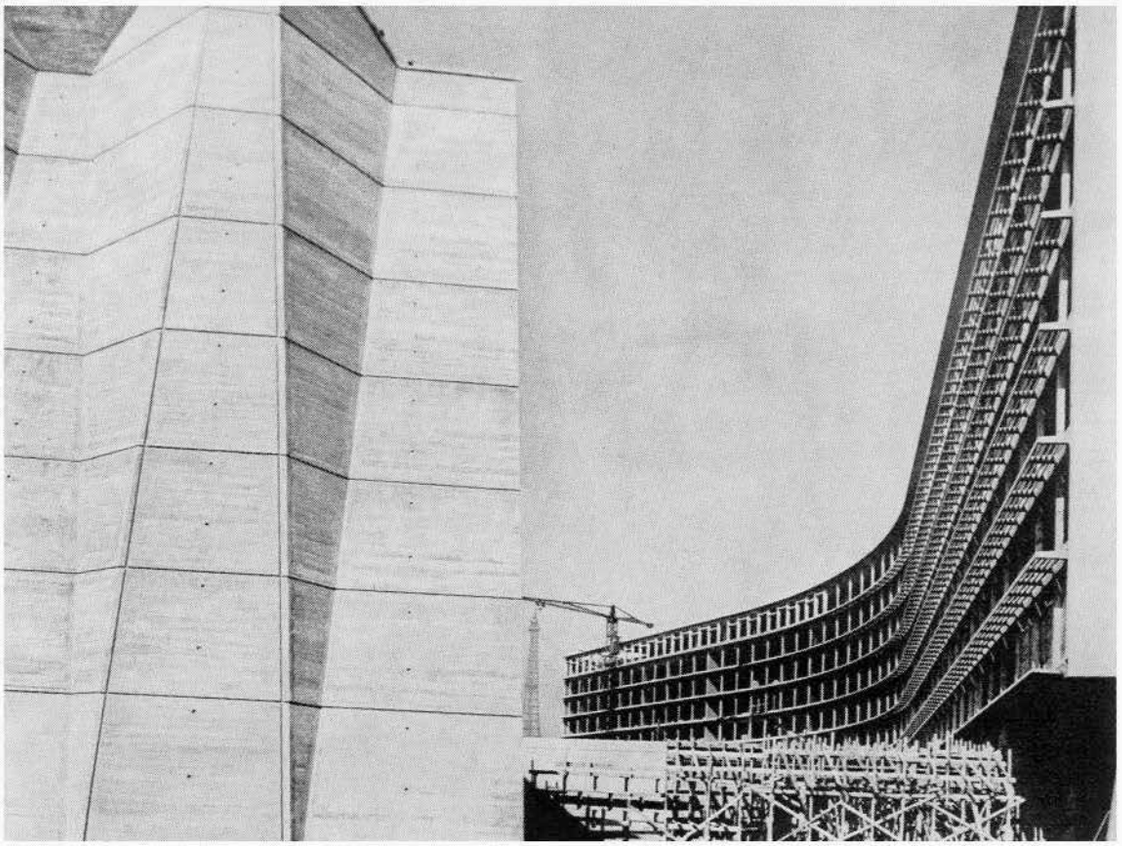
Section through canopy of Conference Building

In the finished building the surface of the supporting columns will be left to show the carefully designed formwork. The cantilever on left is 3 metres and the coffering of the ceiling contains mechanical services. The ceiling itself will be of acoustic material.

The entrance to the Secretariat



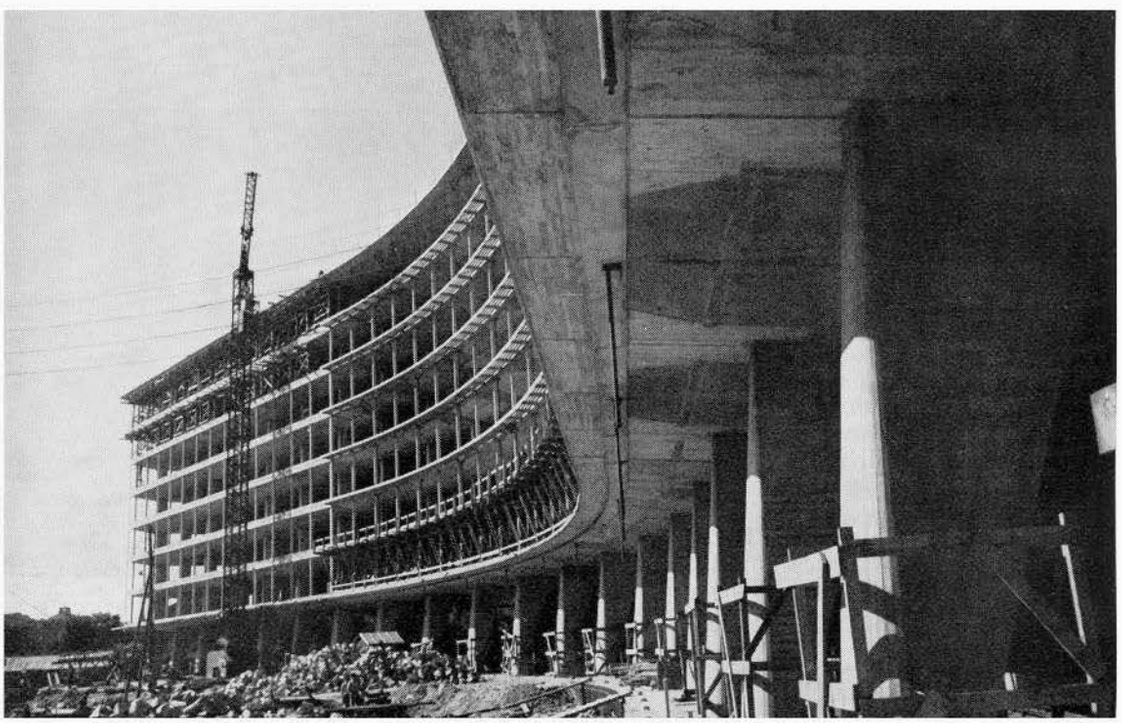
Conference Building on left showing formwork



Conference Building

UNESCO

UNESCO



The Secretariat

A Visit to Säynätsalo

BY HENRY SEARS

The recent announcements of a world-wide competition in Toronto have served to rekindle an interest in city halls and civic centres. In Canada this interest has been concentrated in the larger cities where actual projects have been proposed or discussed. It is seldom one hears mentioned the interesting problem of the "core" of the small town or city. The following is the description of a visit to a small Finnish city with a civic centre designed by Alvar Aalto. H.S.

IT IS THREE YEARS since we journeyed to Säynätsalo. It was a brilliant sunny day during the season of the midnight sun. We drove through the lake country of Finland and the terrain with spiky trees, rocky outcroppings, and sparkling lakes reminded us very much of our Ontario Northland. Säynätsalo had been carved out of a forest wilderness to serve the plywood factory which employed most of its 3500 inhabitants. A competition had been held in 1949 for the design of the town centre, and the winning design was completed two years later. It was to view this group of buildings by Alvar Aalto that we had come to Säynätsalo.

Our first view of the buildings was from the south. We were struck at once by the strong virile forms. The long flat building to the south with its rhythmic vertical mullion pattern was a foil for the lofty complex to the east with its massive overhanging brick masses and distinctive roof profile. Here in a very small town in the midst of wilderness was created a group of buildings not soon to be forgotten.

We climbed the long gracious stairway that separated the two buildings. We rose past the two rows of pleasant shops that formed the lower level and entered the courtyard, the core of the civic centre, "the town square". It was an intimate area, grassed, with small paved areas and a reflecting pool graced by a fountain and a Leger sculpture. To the west over the stepped grass terrace and framed by the two buildings was a fine view of the countryside. Save for that view and the entrance stairway, the courtyard was completely enclosed, on the south by the library and on the other sides by the U-shaped administration building. Here, at the entrance to the "town square", we gained some awareness of the skilful zoning and subtle planning that were the basis of the design. This group of buildings effectively combined into the core of the town the commercial and "civic" elements and yet so segregated them that it prevented undue intrusion of one element on the other, and produced a pleasant interrelationship. The "civic" level was in itself clearly articulated into its various components. The library building was free-standing to the south and the administration building itself was simply zoned with the residence for officials to the west, the offices to the north and east, and symbolically soaring overhead, the council chamber.

We passed under the open trellis and entered the administration building. The pleasantness of the entrance area and the adjacent corridor was accented by the planting in the elegant boxes and the view into the courtyard which was

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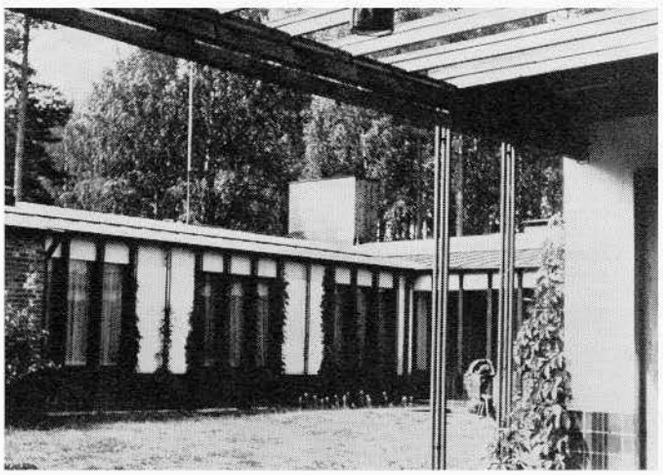

View of courtyard

The principal approach

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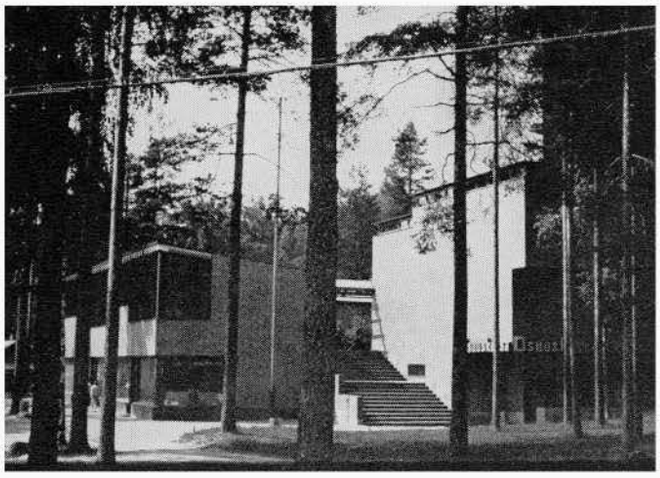

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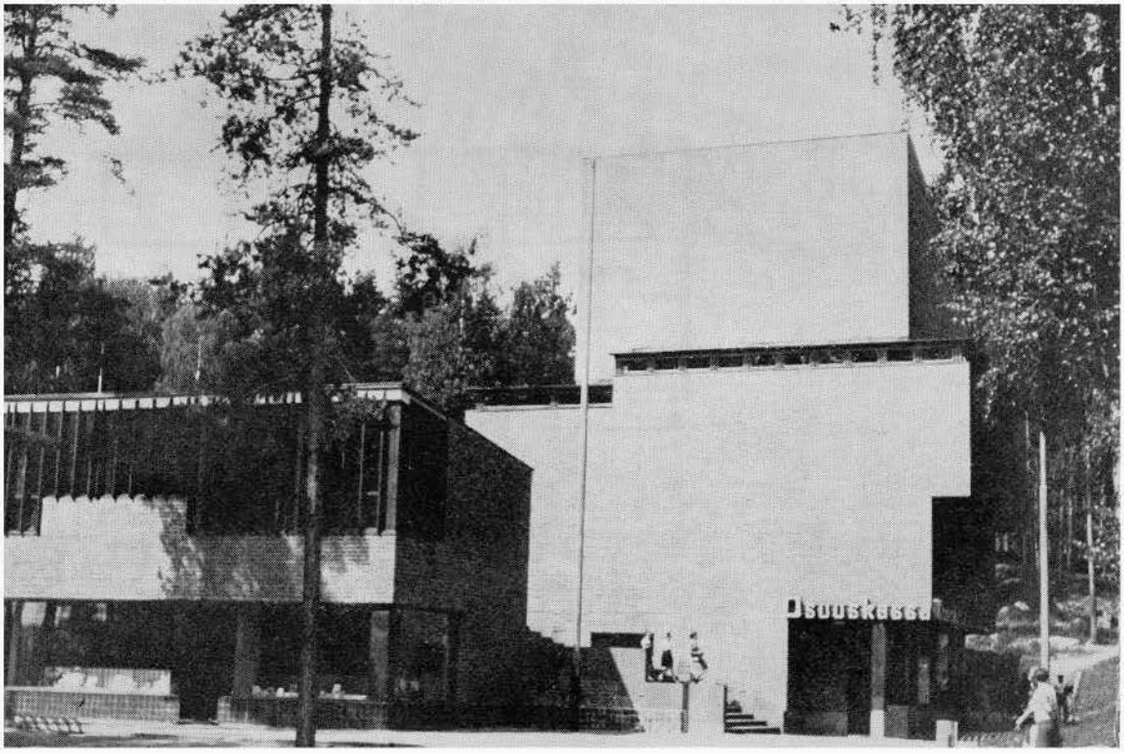

View showing the council chamber on right, library on left

The grass terrace leading to courtyard

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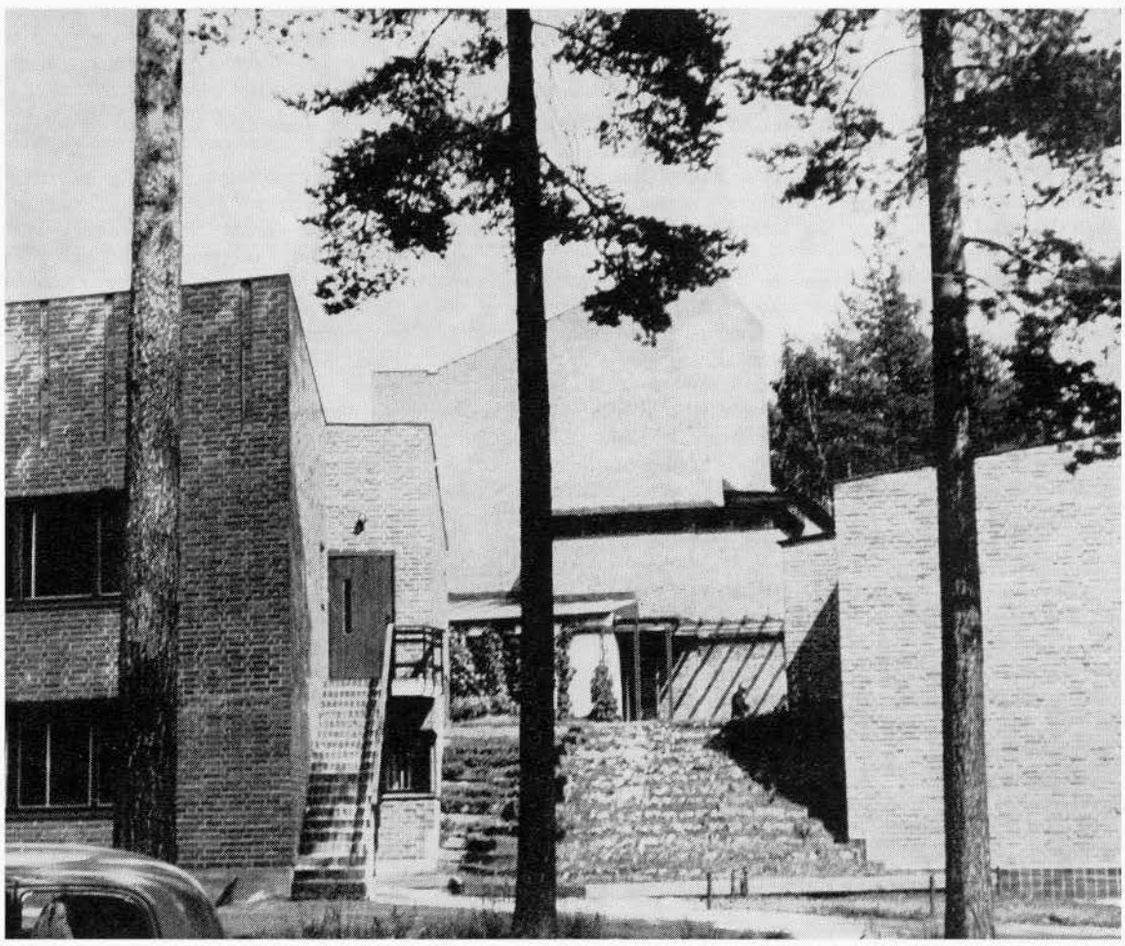
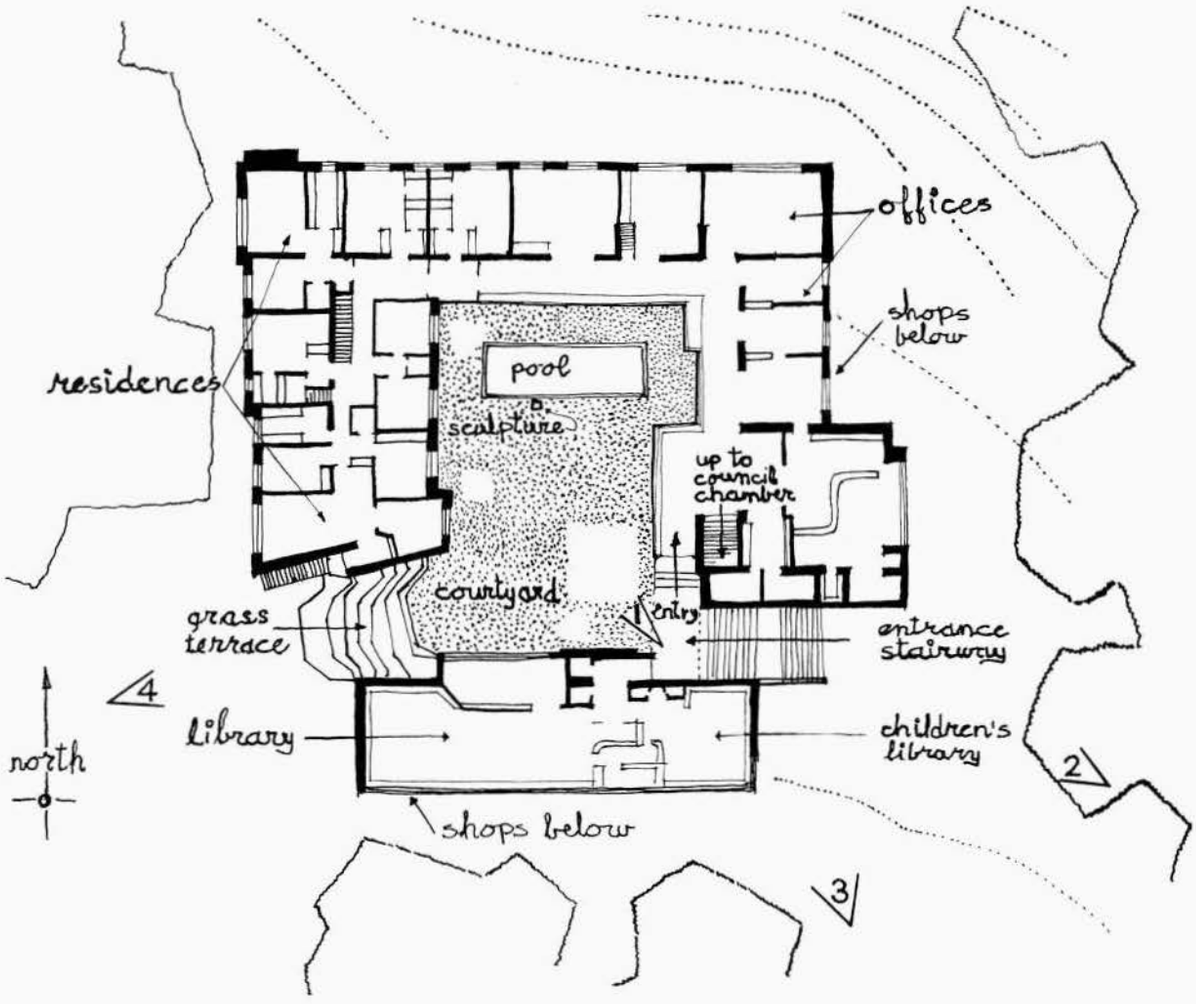




successfully exploited by the glazed screen that formed the outside wall. The texture of the rich brick walls contrasted nicely with the smooth vertical boarding of the doors. There was an atmosphere of appropriateness about everything, the materials and their usage, the intimacy of the scale, and the thoughtfulness of detail.

As we climbed the stairway to the council chamber there was created an air of expectancy. We wound our way up and around the room itself, conscious of its presence but yet isolated from it. There was a tantalizing peek through the glazed slits of the councillor's door and then finally the stairway and chamber merged into one at the spectators' gallery with the council chamber looming ahead, its loftiness contrasting with the low gallery. This simple stately room, the heart of the town, was exciting and yet restrained and dignified. The visual excitement stemmed mainly from the shape of the room with its steeply pitched roof ingeniously supported by its many-fingered spidery trusses. The room was otherwise austere with its simple direct furnishings and its bare brick walls adorned only by a bass-relief map and a Leger painting. The lighting was a subtle blending of natural light from the artfully louvered north window, and incandescent light from the double-cylinder fixtures tenuously suspended at differing heights, creating an overall texture of light and shadow. This room formed a fitting setting for the ceremonial proceedings of a town council.

When at last we left the group of buildings, we departed with the feeling that here was a fine example of the blending of the monumentality of a civic group and the warmth and intimacy of a small town atmosphere. The imposing stairway, the quiet courtyard, the strong exciting forms, the rich materials, all combined to form a group of buildings that somehow seemed appropriate to the civic centre of a small town.

We completed our visit to Säynätsalo with an amusing incident which we feel is worth recording to prepare any adventurous souls who might be induced to make an architectural pilgrimage to this lovely town. Having satiated our aesthetic cravings we found ourselves consumed by another and more material hunger. We searched out a nearby restaurant for another assault on the Finnish language and food. Säynätsalo is by no stretch of the imagination a tourist town, and fortified by our previous experiences in Finland we were prepared for the fact that no one would be able to understand our English or our small quantities of French and German. We also realized that we were not yet sufficiently acquainted with Finnish which has a Central Asiatic base and is completely baffling to non-linguists. However, we had always managed to order without too much difficulty by a combination of menu-pointing and playing charades. Therefore we entered resolutely, but were soon shattered to discover that there was neither menu nor listing of food. Our total effort at linguistics and charades served only to move the waitress to gales of laughter. Finally, in desperation we marched into the kitchen, searched the pantry and refrigerator, selected the most promising items, (including Finnish hot dogs) and handed them for preparation to our waitress who was now helpless with laughter. It was the happy combination of a whole series of incidents such as these (also included — the attempt to obtain water in restaurants; inducing a non-comprehending Finn to loan us a boat to visit Aalto's cottage; a trip to a sauna) as well as the very fine architecture of men like Aalto, Rewell and Bryggman that made our Finnish adventure such a memorable one.

Letter from Aspen

BY J. H. ACLAND

IT WOULD BE DIFFICULT to imagine a more fitting locale for a conference of architectural educators, than Aspen, Colorado. A 'ghost' mining town, quite dormant since the collapse of the mining boom of the 1890's. Aspen has been catapulted into the international artistic consciousness as a centre for music festivals, design conferences, and as the home of the Goethe centennial celebrations. Situated in a pastoral valley with snow capped peaks ranging either side, with bars, hotels and opera houses of a florid nineteenth century decor miraculously rescued from decay by the application of paint, plumbing and swimming pools. This town has an engaging air of utter fantasy. Added to the older core is a spreading flora of brightly experimental modern building. Barnum tents, Bayer folded walls, and Contini space frames jostle cheek by jowl with a dizzying variety of exurbanite palazzi, expressly designed for or by the upper Bohemians. Soaring above it all is the worlds longest chair lift, from which one savours in aerial perspective the illogic of it all. This cultural 'sport' fluorescing in the Great American Desert must be the ultimate Nirvana for all true skibums, aestheticians, theorists and taste-makers. Needless to say, for the participants in the joint ACSA, AIA conference on the teaching of architecture, a smashing time was had by all. Although perhaps there were times when the din of intellectual argument was smothered by the San Carlo trained voices of Mario's singing waiters, and by the heavy insistent beat of that old theme 'keep Colorado green — spend dollars', trainees, leaders and administrators kept the days and nights alive with wordy speculation for a full ten days.

The success of this and the preceding conference at Cambridge, augurs well for the eventual implementation of Bognors ideal of a seminar at say Salzburg where trained educators could meet and then fan out across Europe to complete their own researches. Through the welcome assistance of the AIA and the Fund for the Advancement of Education, there was assembled a wide ranging group of 'trainees', a richly varied panoply of 'experts' in many disciplines, and a representative smattering of administrators. Although it took some two days for the 'trainees' (educators equal in stature to the panel speakers) to find their voices, when they did, the carnage was lovely to behold. A too widely varied agenda for the time available led to what Hastorf the visiting psychologist described as "The most heroic listening I have ever seen". But this was remedied in the later part of the week by the inclusion of more time for debate. A very good conference indeed, and one which, I believe, will have a marked effect upon architectural thinking. Thank heavens, there was a minimum of wordy resolution devising and a maximum of tough critical analysis of the state of architectural design. This bodes well for the future of architectural education.

The opening day devoted to aesthetics, while a somewhat traumatic experience, in that I found myself pitted at a moments notice, against Dean Hudnut and Richard Neutra, provided a fundamental contrast which was to inform much of the weeks discussions. On the one hand, Hudnut stressed the importance of a systematic orderly basis for the arts in philosophic or mathematical concepts of form, whilst Neutra laid his customary emphasis upon the biological constants in the human psyche. A clearer contrast could scarcely be imagined and as the argument raged, trainees and panellists tended to polarize on one side or the other of this dichotomy. The humanistic eternal verities became sharply defined against the scientific methodology of today. Behind Neutra and Milton Horn, the Chicago sculptor, could be dimly discerned the influence of Frank Lloyd Wright, with his insistence upon 'organic' 'human' values, always in sharp contrast to the influence of the Continental rationalists. Along with this contrast in theory developed an incisive distinction between the vernacular work of the 'frame' and 'curtain wall' fabricators and the plastic manipulations of the 'New Baroque'. Later discussions on structure were to show just how much this new spatial ingenuity is the result of an aesthetic trend rather than a cost-conscious drive for economy. It was perhaps unfortunate that insufficient time was alloted to the effects of this growing contrast upon design teaching. However Heck of Utah and Filipowski of MIT did examine in some detail the repercussions upon basic design courses. From the basic design discussion it became very evident that the architects are pressing ever more heavily upon the whole pattern of first year design courses. Possibly this may be the result of an heritage of confusing vocabulary applied to basic design which makes it almost impossible for architects to understand just what has been occuring in basic design. In this respect Heck's insistence upon adequate theory courses to explain and give meaning to the early work was very well taken point. With this the lists were drawn for a fruitful and at times amusing interchange of ideas between the 'formalists' and the 'functionalists'. Whatever the individual likes and dislikes, it was generally recognized that a new spirit is abroad in architecture today. Clearly, no amount of pedantic reiteration of outworn formulae left over from the 'thirties' can explain it, and it was encouraging to find educators from a wide range across the continent, fully aware of the implications of this new esprit.

At this point the technicians were called into the picture. Royston, the Californian landscape architect, in a handsome illustrated lecture, and with immense gusto stressed the need for a disciplined comparative study of landscape forms in

time; a dimension which normally eludes the designer. Hastorf, the psychologist, pointed out that much of the current semantics of architecture are weakened by an arbitrary distinction between imagination and 'science'. To be more than a mere assemblage of 'facts', science must be informed by imaginative creative hypothesis, akin in every sense, to the creative imagination of the designer. This point made a very apt contrast to the approach of the sociologist, Riemer, who, assuming that answers to design could be achieved by a sampling process, was utterly destroyed. Neutra, in an inspiring address, finalized this point in a ringing declaration of the very real responsibility of the designer, to act, choose and create.

An amusing, and informative, dissertation on administration followed by Dean Stirling McMurrin of Utah. Here the problem of choice narrowed down to the necessity for command decisions on personnel at the University level. Shattering to find that one fits neatly into one or other the categories of faculty types. Out of the discussions on history techniques at the end of the week came an impassioned plea, by Shelley of Utah, for the study of history as an exemplar for the vision of greatness. Generally it was recognized that history, whatever be the detail course set up, must provide a vision or aim for the young architect. If architecture is to move beyond mere craftsmanship, then the historian has a clear need to inculcate a sense of the greatness of mans works. These are great days for the historians. After some twenty years of eclipse, the historian again is being asked to contribute to the growth of a new architecture.

Moving on to landscape and townscape, Royston stressed the garden as an element indigenous to American design. Here the free flowing openness of the American landscape was contrasted with my insistence upon the need for closure in the pedestrian piazza. Later Contini was to show how these two concepts could be interwoven in a single whole, as in the Northlands shopping centre, where functional differentiation leads to a most effective sense of urban space. DeMars' witty talk on the Pallio at Siena and the Tivoli gardens in Copenhagen provided excellent visual documentation of this theme.

After this sustained effort to explain the fundamental roots of architecture, the purely technical aspects of building were discussed. An unfortunate inversion, in that Kroeker's very informative analysis of the mechanical plant denied just those environmental skills which are a basic part of the architectural vocabulary of today, and substituted for them the sterile ideal of the completely air conditioned box. However effective be our mechanical ingenuity today, it is questionable whether the building can be interpreted in terms of comfort alone. Harking back to Neutra's biological 'client therapy', he admits that this is only a part of building, and that it is necessary for the designer to add his own creative ingenuity to avoid monotony and boredom.

In contrast, the seminar on structural techniques provided a brilliant summation to the effort of the previous week. Contini, in masterly analysis of the fundamental structural systems, ie, post & beam, suspension arch, shell and truss pointed out how fundamently few old and simple are the engineers devices. He suggested that recent developments in structural analysis, rather than complicating the architects design, have provided just the core of intentive structure which will make possible a new baroque. Polychrone, from the same basic forms, stressed the newness of the structures, underestimating the importance of the historical precedent. Ketchum, describing the shell structures he has built in Colorado, engagingly admitted that they were the result of aesthetic needs rather than cost considerations. I cannot believe that his folded plane and shell structures have solved adequately the necessary unity of the building, but it is an exciting architectural world in which engineers will admit finally to aesthetic bias.

On this theme, I presented a parallel between our change from frame and curtain wall through waffle slab to space frame or shell as a development analagous to that which occurred during the fourteenth and fifteenth centuries. The trend from the discontinuous structures of the early Gothic to full spatial and structural unities of the later Gothic cathedrals parallels closely our search for more structurally unified forms. Always the urge is an aesthetic one, not explicable solely in terms of utilitarian economics.

The seminar on buildings for education, with Lawrence Perkins drawing upon his fund of experience in this field, led to a general discussion of the role of the architect in such work. Opinion from the floor strongly recommended an approach to design which minimizes mechanical gadgetry in favour of plans which through architectural control of noise, light, heat and sound minimize remedial engineering. A horrid picture was drawn of the possibilities of closed circuit television for education. Needless to say, the architects present, fought with might and main against the picture of a sea of young amoebae in serried ranks watching the little screen. Shades of Orwell's 1984. Its closer than we think.

The Queen Elizabeth Building, C.N.E., Toronto, Ontario

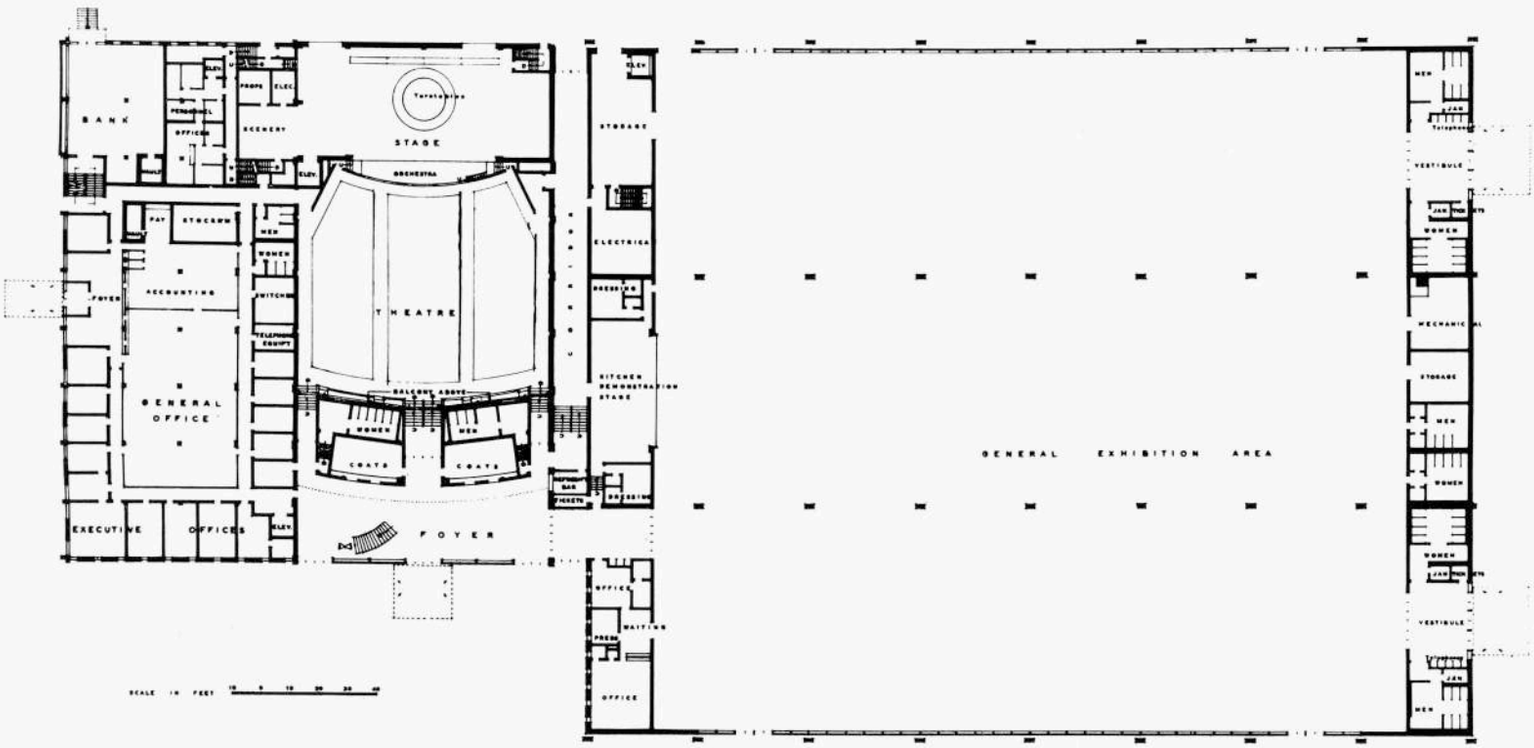
Architects, Page & Steele

Structural Engineers, Hooper & Yolles
Mechanical and Electrical Engineers, Nicholas Fodor & Associates Ltd.
General Contractors, Hughes Construction Co. Ltd.

MAX FLEET

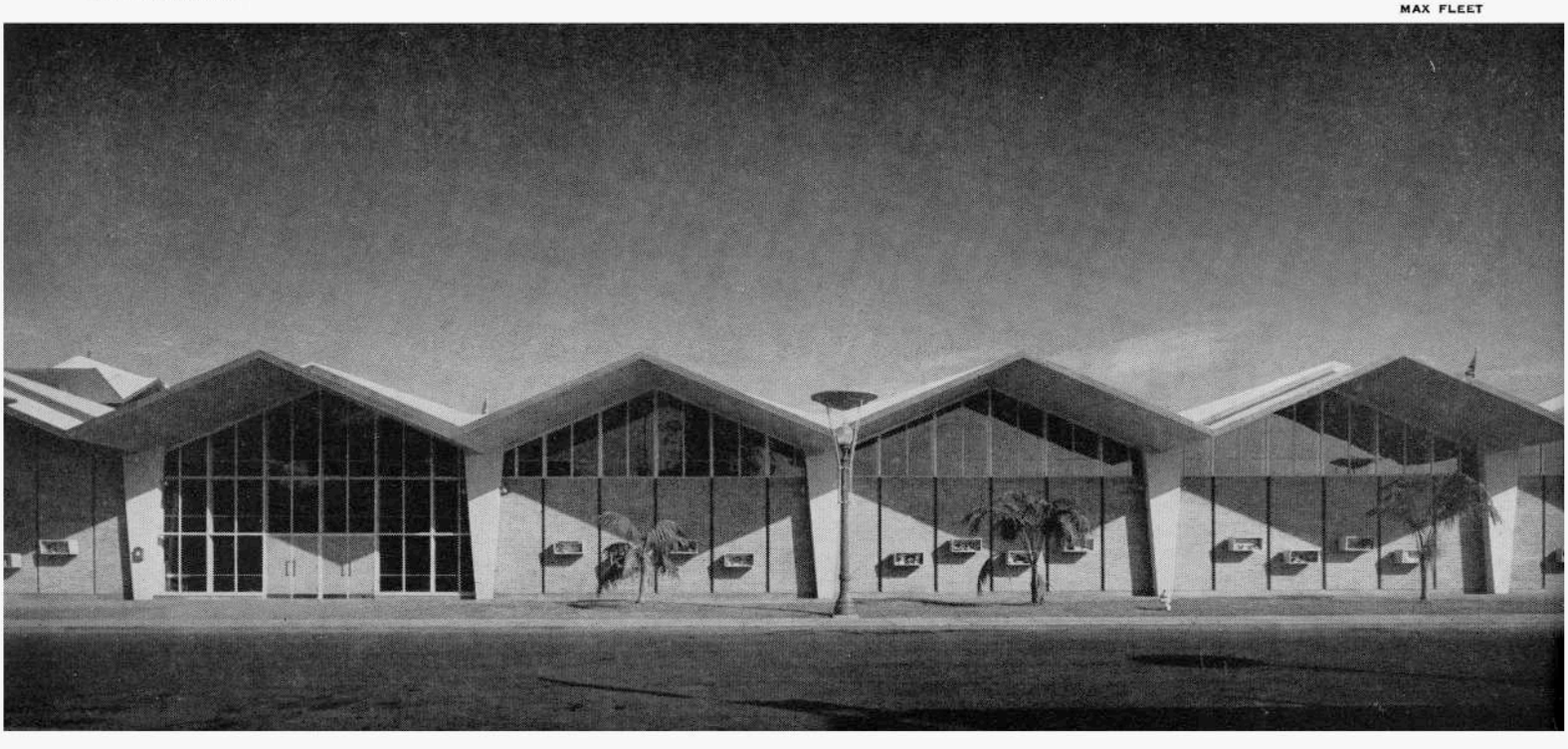
The theatre foyer

Plan of ground floor



South elevation

MAX FLEET



The building consists of two sections. A two-storey block containing the executive offices and theatre, and a one-storey exhibition hall.

The executive offices provide 14,500 sq. ft. of air-conditioned office space on the main floor, for the administration staff of the CNE and for a branch bank. On the second floor are dining room and lounge, with balcony overlooking the main plaza to the band shell and the lake. These rooms are used for social functions for the women's organisations and for the noon-day luncheons given by the directors. The rooms are completely air-conditioned.

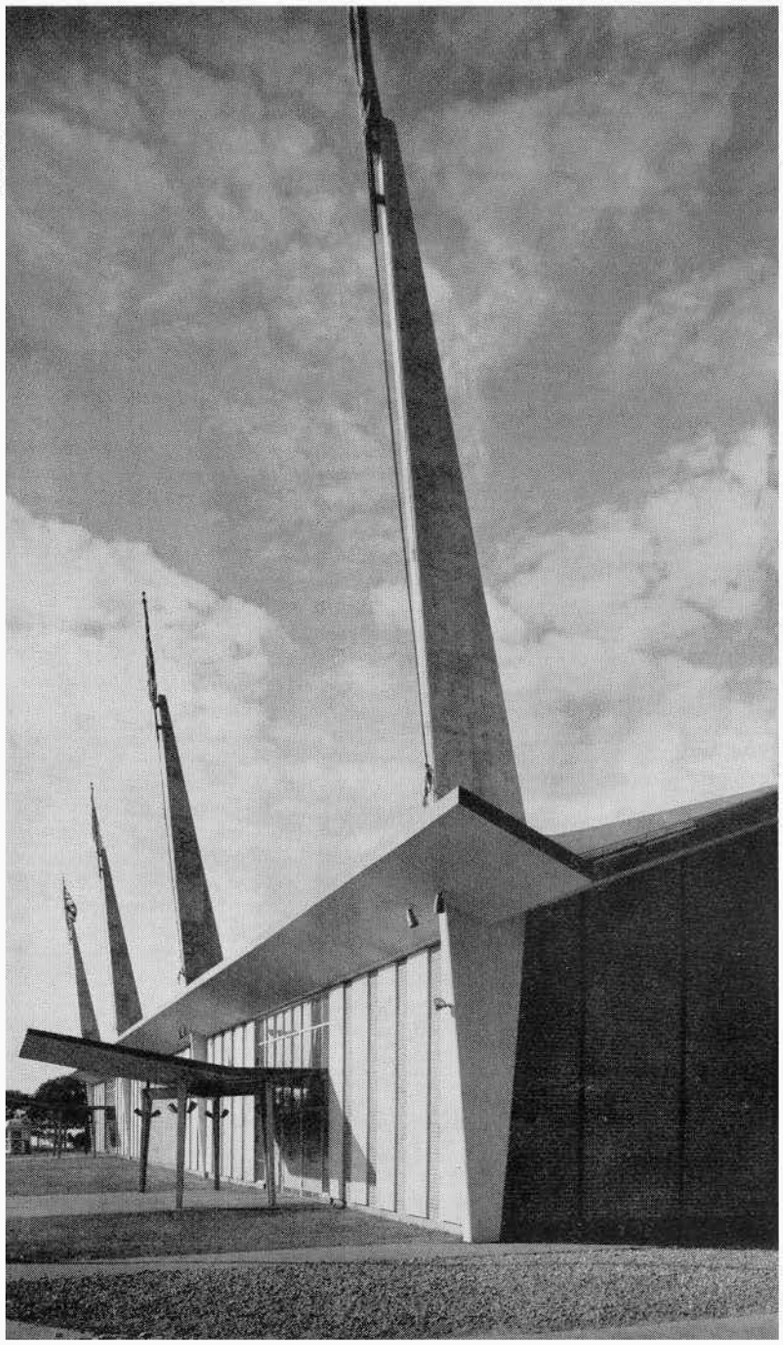
The theatre adjoins the executive offices. It, too, is air-conditioned. With a seating capacity of 1325, a very well equipped stage and dressing rooms, it is one of the best-appointed theatres on the Continent. It is used in connection with the women's activities during Exhibiton and for music, opera, drama, fashion shows, cinema and pageants the year round. Entrance to the theatre is through a beautiful two-storey foyer with one complete wall of glass, and a curved staircase leading to the second floor of the executive offices, and the directors' dining room.

Adjoining the theatre on the east side, is the exhibition hall, with a floor area of 63,000 sq. ft. This hall is mechanically heated and ventilated and has a large stage at the west end for kitchen and fashion displays. The hall is completely equipped with service facilities for telephone, gas, water, drains and electricity to be connected to the display stands.

The structural design of this hall has resulted in a minimum of columns, making for the utmost flexibility. Its construction is of reinforced concrete and the roof over the whole area is of hipped plate design, allowing for large uninterrupted areas and roof overhangs. The exterior walls are a combination of pre-cast coloured concrete panels, brick and glass. They contain display cabinets for use by exhibitors.

There are three relief sculptures on the outside walls and, at the east end, four illuminated concrete columns sixty feet high, topped with flags and adding to the festive appearance of the whole building.

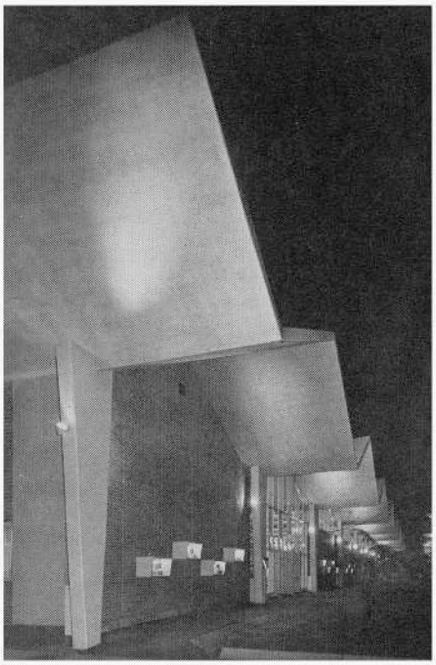
MAX FLEET



East elevation showing entrances to exhibit area

Overall view from south-west

MAX FLEET



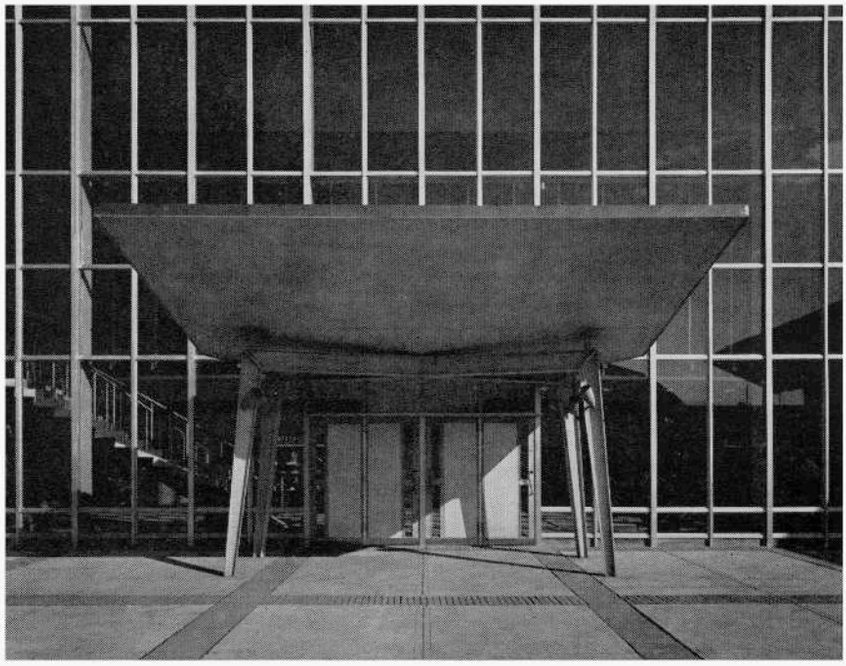
MAX FLEET

Detail of south elevation
Showcases by exhibitors

MAX FLEET

North-west corner

MAX FLEET



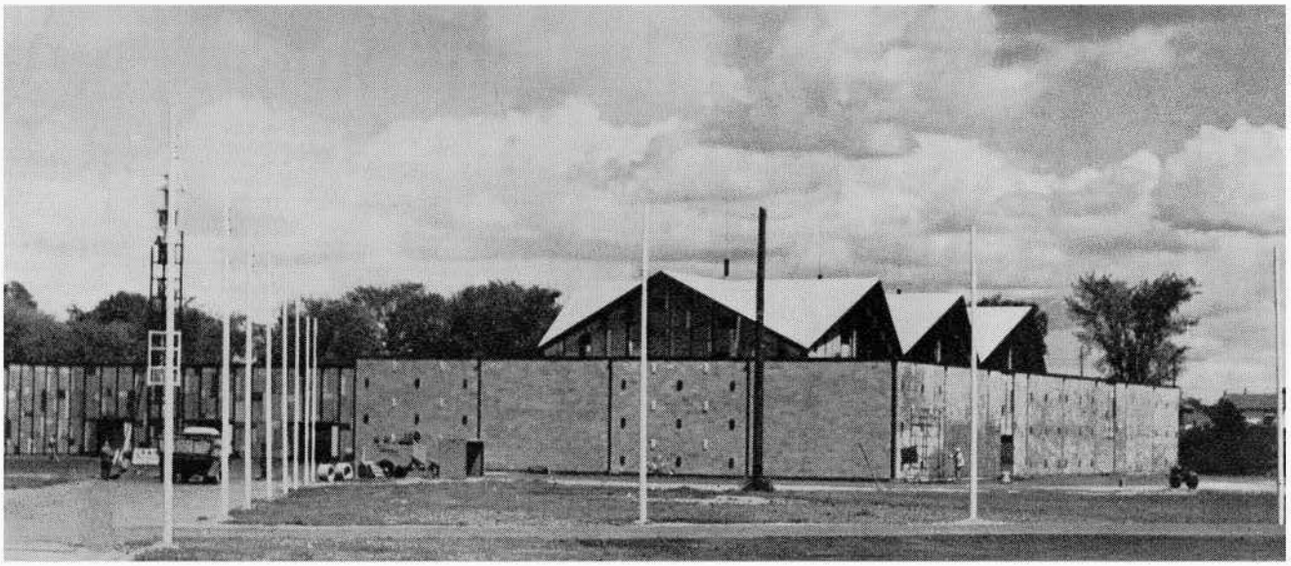
Entrance to the theatre

MAX FLEET

Courtyard in front of theatre

MAX FLEET

Theatre interior

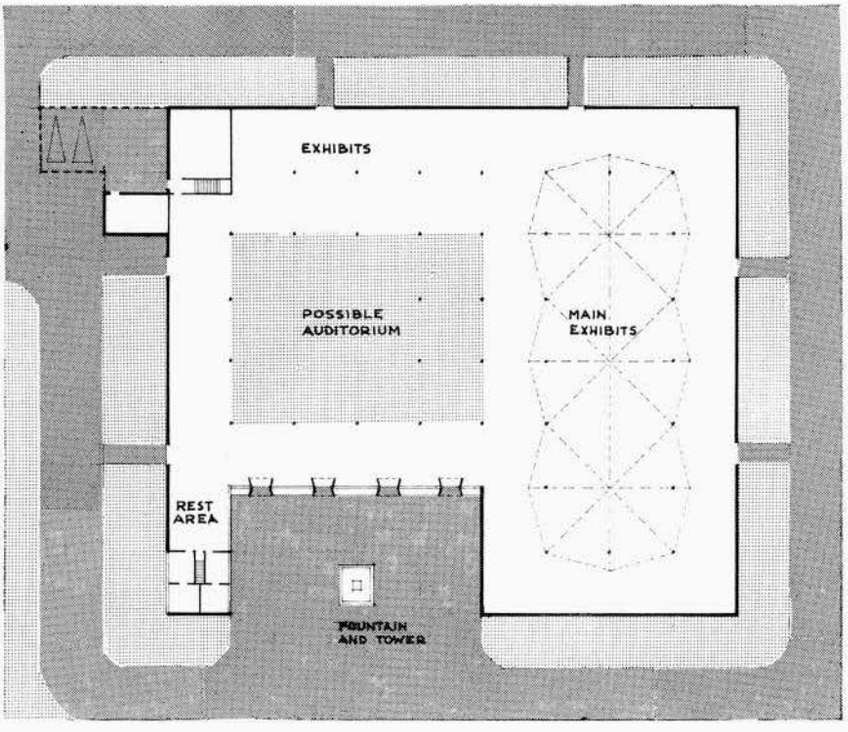


View from main exhibition promenade
showing clerestory to main exhibit area

The H. H. McElroy Educational and Agricultural Building Ottawa, Ontario

Architects, Balharrie, Helmer & Morin

Engineers, Adjeleian, Goodkey, Weedmark & Associates Ltd.
General Contractors, Geo. A. Crain & Sons Ltd.



Area — 40,000 sq. ft. (200' x 200')

Structure — steel frame on pile foundation

Materials — walls: concrete block (cavity insulation)
floors: asphalt
roof: precast concrete slabs
glazing: fibreglas reinforced plastic

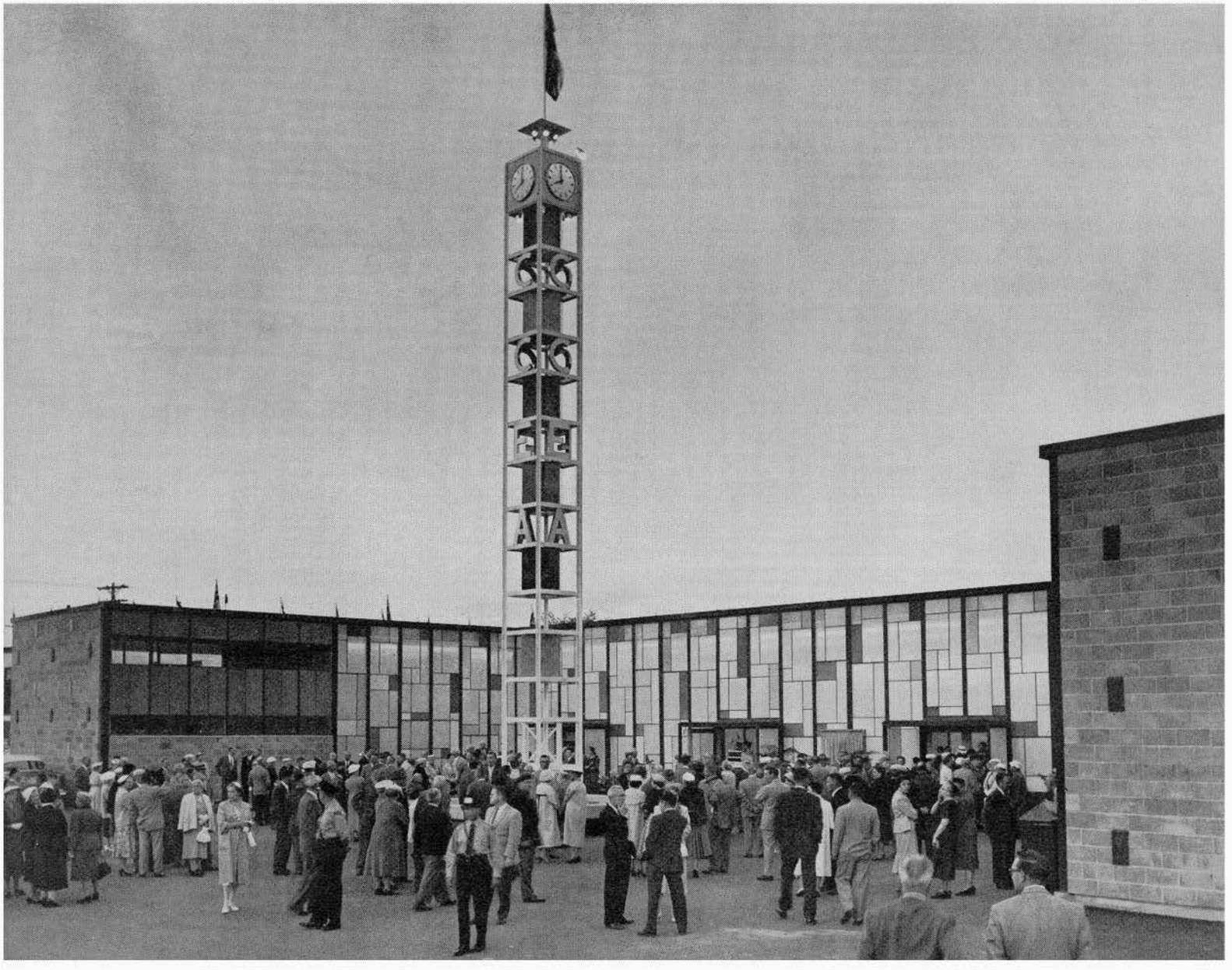
Total Cost — $400,000.00

The building, constructed for the Central Canada Exhibition Association, Ottawa, is for exhibit purposes only and was completed in August, 1957, and dedicated as a memorial to the late H. H. McElroy who, for many years, was manager of the Central Canada Exhibition Association.

The site is on the south side of the Exhibition Grounds, overlooking the Rideau Canal and FDC Driveways.

Entrance court

NEWTON



Canada at Fairs Abroad

THE CANADIAN GOVERNMENT EXHIBITION COMMISSION is the Federal Government agency solely responsible for Canadian participation in exhibitions, fairs and display promotions outside Canada and in all international exhibitions held in Canada. The Commission was set up by Sir Wilfrid Laurier and the Hon. Sydney Fisher in 1901 and it was administered by the Department of Agriculture until June 1918, when it passed under the control of the Department of Immigration and Colonization. In December 1927, it became part of the Department of Trade and Commerce.

The Canadian Government Exhibition Commission is essentially a service organization for the Government. Its work ranges from extensive pavilions at world fairs to comparatively simple window displays. Its headquarters and workshops are in Ottawa with a warehouse and branch in London, England.

The Commission operates through three sections: a design section where artists and designers translate the theme and content of an exhibition into a graphic design and working drawings; a construction section which produces the exhibit from the working drawings; an administration section which looks after all administration details.

When the Government of Canada accepts an invitation to participate in an international trade fair, the Commission works through a committee of the Department of Trade and Commerce. This committee is responsible for advising the Commission on the theme and content of the Canadian exhibit.

In all other types of exhibitions, the Commission is advised on the theme and content either by the Interdepartmental Committee on Canadian Information Abroad or by the department or agency concerned. General prestige exhibits come within this group and are similar in value to the one designed each year for the permanent Canadian pavilion at the Berlin Industries Fair. Exhibits for showing in Canada and the United States are requested by other departments; Health and Welfare, the Travel Bureau and the Department of Labour are frequent clients. The largest project in this group is the "Armed Forces of Canada", a yearly feature at the Canadian National Exhibition in Toronto, the Pacific National Exhibition in Vancouver and the Provincial Exhibition at Quebec. Working with senior officers of the Navy, Army and Air Force, the Commission not only designs and builds the exhibit, but handles the necessary renovations to theatre, chapel, ramps, bailey bridge and shedding, and also organizes civilian labor for the job.

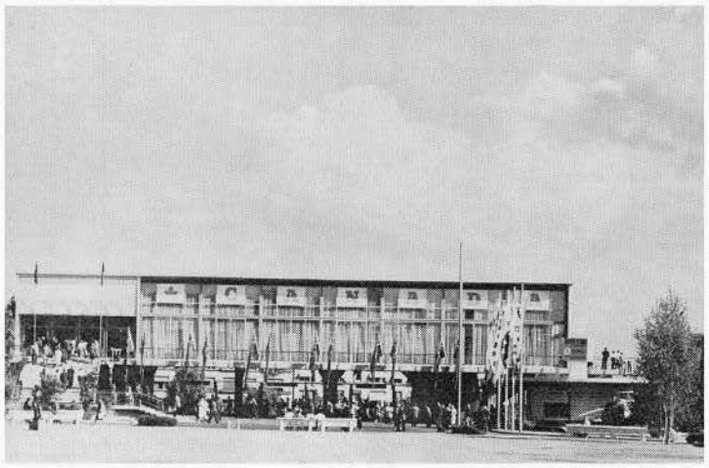
From 1946 to the summer of 1957, Canada has participated in 108 international trade fairs in 12 countries. All of these have been designed and constructed by the Commission. General or special types of exhibitions in which Canada has taken part total 172. General information was featured in 66, government departments in 89, and cultural activities in 17.

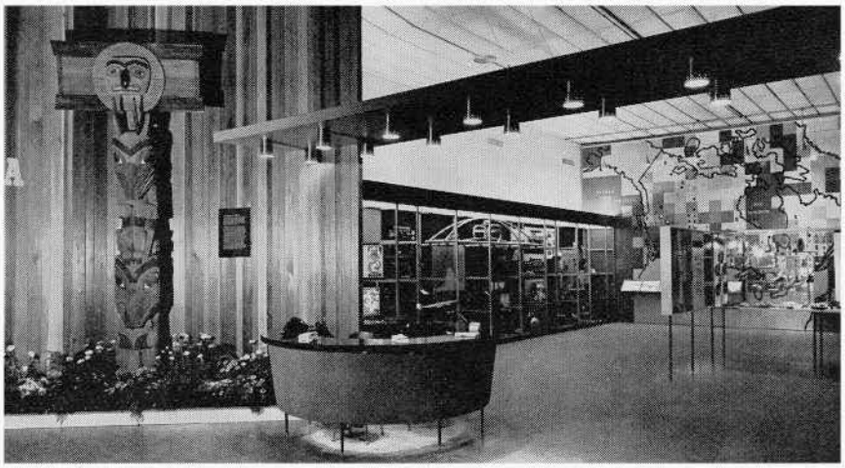
In 1946 the Government of Canada decided to inaugurate the European type of international trade fair in Canada for the purpose of promoting two-way trade and re-establishing contacts between Canadian traders and traders from abroad. These contacts had been almost completely broken by World War II. The Canadian Government Exhibition Commission was charged with the responsibility of planning, organizing and administering a Canadian International Trade Fair. The first Fair was held in Toronto during the first two weeks of June 1948, and annually thereafter until the eighth Fair was concluded on June 10, 1955. The Government then decided that the Fair had served its original purpose and it was discontinued. Future programs of trade promotion abroad, and of information about Canada show every indication of increased effort to make Canada better known and to sell her products throughout the world.

Forty-two nations including Canada, and eight international organizations besides, are busily at work constructing their pavilions and completing plans for the opening on April 17th, 1958, of the Brussels Universal and International Exhibition. This is the first "World Fair" to be held since the New York World Fair in 1939. On October 28, 1954, Canada accepted the invitation of the Belgian Government to participate. Today the building is almost finished. Displays and exhibits illustrating twenty-three phases of the Canadian Story are under construction and plans for operating and manning the pavilion

Comptoir Suisse, Lausanne, Switzerland, 1956
Below, main facade; at right, entrance foyer

COMPTOIR SUISSE





are well advanced.

The pavilion was designed by Charles Greenberg, an Ottawa architect who had experience in developing the architectural work for the Festival of Britain buildings. The consulting engineer is W. Sefton, of Toronto.

The Canadian Story is about Canadian people, what they are and what they are doing. This story is being developed in 23 exhibits, grouped under three main headings. Under the general title of Resources and Industry, displays will show what Canadians are accomplishing in agriculture, fisheries and forestry, in the Northland, in mining, energy, transportation and communications, industry and international trade. The second group, which is described as Information and Education, shows who the Canadian people are, how Canadians govern themselves and the role Canada is playing in International organizations, together with the Story of Canadian education, health and welfare and scientific development. The third group is a cultural one, explaining the accomplishments of the Canadian people in music and ballet, the drama, literature and its media, films, fine crafts and painting and sculpture. In this area will be a library and an art gallery where the pictures of selected Canadian artists will be changed every month except July, when it will become a Salon of Canadian Photographic Art.

Canada's 1½ million cubic feet pavilion at the Brussels World Fair in 1958 will be a striking contemporary building of imaginative design and colour. It will stand among fine old trees, in 10,000 square metres of landscaped grounds sloping downward from front to back. Its location is one of the most commanding on the grounds.

The building has been designed as a white steel frame, partly open to the outdoors, partly clad in glass and in paper honeycomb with masonite facings. The panels are cobalt blue. The structure itself has a frontage of 172 feet, a depth of 195 feet and is 44 feet high, dominated by a tower rising another 30 feet and carrying the word *Canada* illuminated letters facing all four sides.

The Canadian Pavilion is approached over a paved patio which is flanked by a sculptured mural 125 feet long and 10 feet high. The first 40 feet of the mural, which depicts The Canadian People, run outside the building; the last 85 feet are carried into it on the ground floor. Most of this floor lies open to the air on columns 17 feet high. At the inner end of the mural is a cinema theatre seating 250-300 people and running to the back of the building. Off to the left are administrative and work offices. The rest of this level is open exhibition space, except for an area which is one of the most dramatic features of the whole pavilion.

This feature is an open courtyard over which the tower soars 74 feet high. From the floor of the courtyard to the top of the tower rises a gleaming feature of Canadian metals in suspended planes, and through this feature curve the ramps which give access to the main exhibition floor. On this floor is the main exhibition space and, surrounding the tower well, a broad promenade area two storeys high to the roof. In this space hangs a large, illuminated cube bearing the Arms of Canada on its four sides. From both the ground floor and the first floor, at the back of the building, access to the second floor is up a great elliptical staircase. Midway between the ground and first floors, this stair pierces a large observation landing which provides a splendid view across the Exhibition Grounds. From the first floor to the roof, the stairway area is encased in coloured glass. The second floor or top floor is really a mezzanine looking down upon the promenade. In addition to exhibition space, this storey provides a cafeteria with an open-air dining terrace, a lounge and terrace, a library and an art gallery. The grounds surrounding the Canadian Pavilion are roughly square and on them are old trees which, by command of the King of the Belgians, could not be cut down. A uniquely Canadian plan of landscaping has been evolved. The spirit of the Canadian Arctic Tundra, in its brilliant summer colours, will be suggested with glowing shrubs and flowers and glacial pools.

Canadian materials are being used wherever it is logical

1

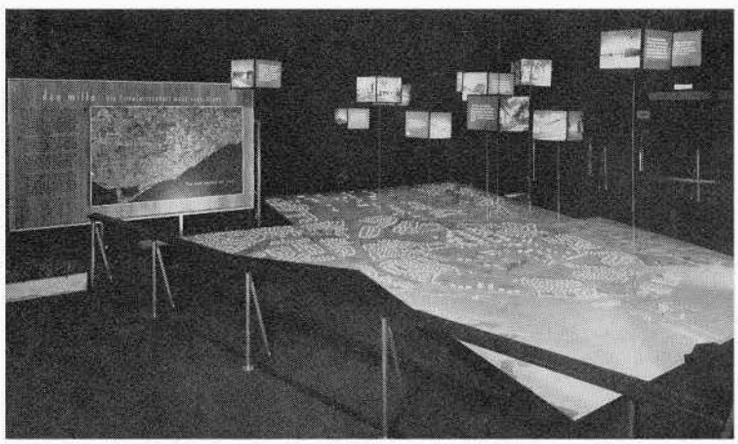
NEWTON ASSOCIATES

1 Small portable exhibit for use by Canadian posts abroad

2 Berlin Interbau, 1957 Don Mills Development

3 Manchester Building Trades Exhibition, 1956

2



WILLY XALLER

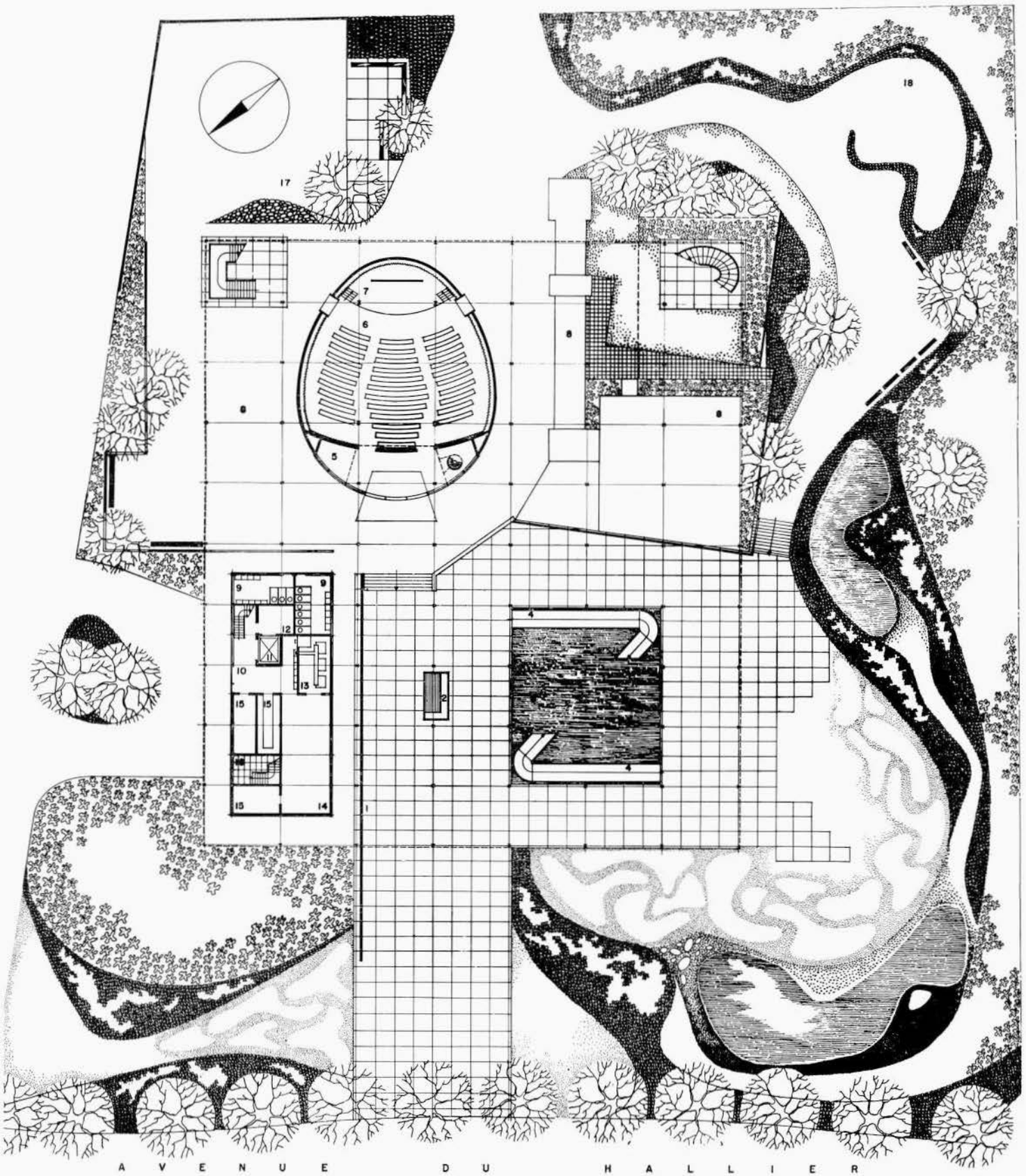
3

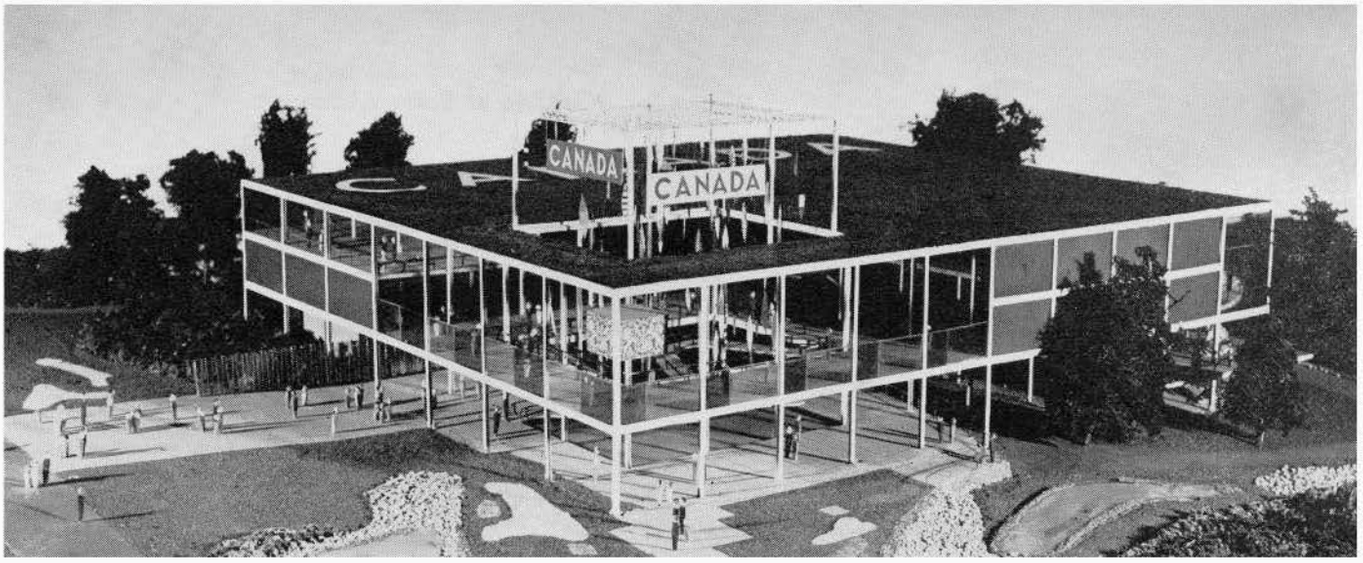
PARK PICTURES

Canadian Pavilion, Brussels International Exposition, 1958

Architect, C. B. Greenberg

Ground floor and plot plan





Model of Canadian Pavilion

to do so, in the Canadian Pavilion and the exhibits. The floors are of Canadian timber. Canadian aluminum is featured in various forms throughout. The lights and fixtures, furnishings and fittings are all Canadian. The exhibits are largely of Canadian materials and are being produced in Canada.

In view of the educational nature of the Universal and International Exhibition, Brussels '58, one of the problems which had to be solved at an early stage in the planning was whether or not groups or firms representing private interests would exhibit in the Canadian Pavilion or on the Canadian grounds. Before any decision was made, important business and industrial organizations were consulted. The story of Canada's industry and trade must be adequately told. Should it be told as part and parcel of the exhibit being prepared by the government?

It was agreed that the overall story of Canada's industrial development would be presented as Group 1 in the Government Exhibit. The business interests concerned cooperated in the working out of these exhibits. This Group 1 (Resources and Industries) covers the field of Canada's raw materials, semi-finished products and end products in terms of their significance, both to the Canadian economy and to the world at large. It is made up of eleven individual exhibits: Agriculture, Fisheries, Forestry, the Northland, Mining, Energy, Transportation, Communications, Industry, and International Trade.

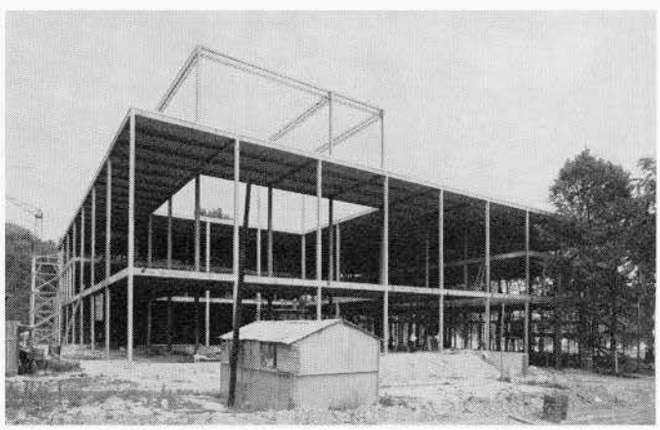
As the plans for the pavilion were developed, they were submitted to an Architectural Committee whose members were: D. C. Simpson of Vancouver and Claude Beaulieu of Montreal, appointed by the Royal Architectural Institute of Canada; E. A. Gardner, chief architect and W. E. Fancott, chief of the Requirements Division, Department of Public Works, and T. C. Wood, chief designer and R. L. Greene, superintendent of Exhibits, Canadian Government Exhibition Commission. Chairman of the Committee was Glen Bannerman, director of the Exhibition Commission.

A Landscape Committee passed on all the landscaping, which was planned by O. Bishopric, landscape architect of the Department of Public Works. The Landscape Committee had the following members: J. Austin Floyd of Toronto, appointed by The Canadian Society of Landscape Architects and Town Planners; Edward I. Wood, appointed by the Federal District Commission; Glen Bannerman, C. B. Greenberg and T. C. Wood, Canadian Government Exhibition Commission, and H. B. Scully, deputy director, Canadian Participation, Brussels, 1958.

The steel contract was let in April 1956 to the Belgian firm of Cockerill-Ougree. The general contract was let September 6, 1956, to Constructions et Entreprises Industrielles, Brussels, the lowest bidder among a number of Canadian, British and Belgian firms. The corner stone of the Canadian Pavilion was laid September 3rd of this year by Baron Moens de Fernig, Commissioner General of the Belgian Government for the Exhibition. The building is scheduled for completion September 1, 1957; decorating is to be finished and all exhibits installed by March 1, 1958; landscaping will be carried out during the fall of 1957 and the spring of 1958. The official opening will be April 17, 1958.

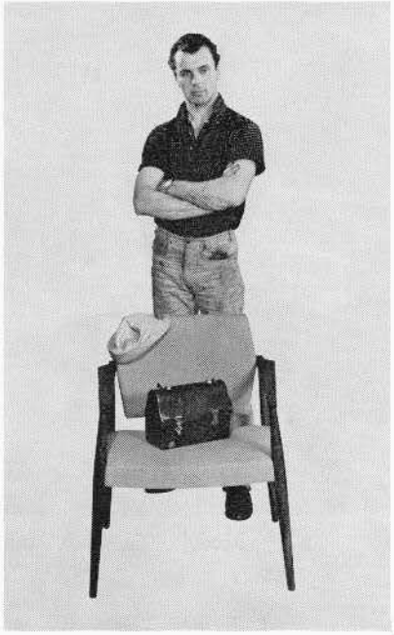
T. C. Wood
Chief, Design Section
Canadian Government Exhibition Commission

Progress photo, July 1957



REMY BAUTERS

1 Mural wall
2 Information kiosk
3 Water court
4 Ramp
5 Foyer
6 Cinema
7 Stage
8 Exhibition space
9 Washrooms
10 Goods receiving room
11 Elevator
12 Machine room
13 Transformer vault
14 Workshop
15 Storage
16 Office entrance
17 Playground
18 Rest area



Entrance panel 6′ high
with orange background

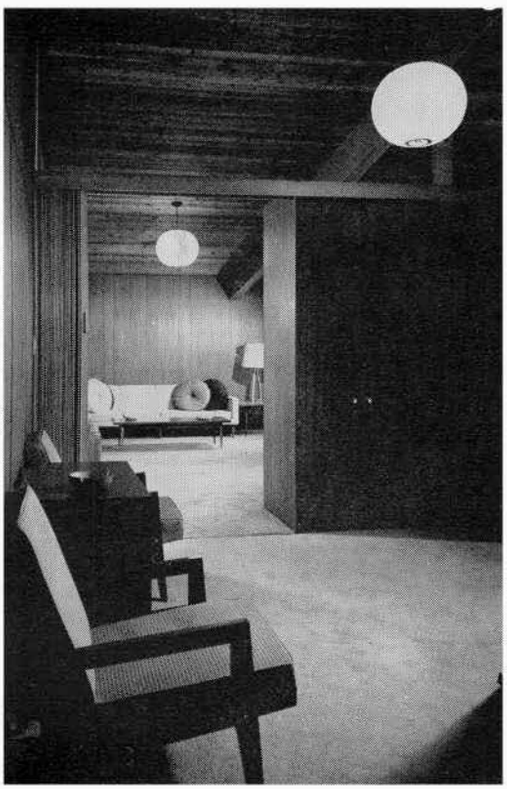
Canada at Fairs Abroad

Milan Triennale, 1957

This display consists mainly of photographs of the accommodations for workers and for visitors in the new town of Kitimat, B.C. The entrance panel, shown at left, presents an Alcan employee, and then follows a series of shots of his quarters. Robin Bush of Robin Bush Associates, Vancouver, had been commissioned by Alcan to do the interior design and furnishings as part of a plan to cut down labour turnover by providing good accommodations. The Milan display explains this story. The presentation was prepared by the National Industrial Design Council at the request of the Department of External Affairs.

Potline Workers Bedroom

Big River Lodge, Kitimat, for Company guests
showing left, hall and lounge; right, dining room



A Comprehensive Anticipatory Design Science

BY R. BUCKMINSTER FULLER

Mr James W. Strutt, Chairman: The theme of this convention is "The Next Fifty Years." This morning we have speaking to us Mr R. Buckminster Fuller, a man who has always concerned himself with the next fifty years.

Mr Paul Tillock, the eminent theologian, has said that the relation of religion to life is one of "ultimate concern". I would like to say of Mr Fuller in his field of scientific design his relation to human beings is just that — one of ultimate concern for the way in which we approach the problems of today for tomorrow.

Mr Fuller is one of the most radical thinkers on architectural problems that this century has produced. Though invariably allied with the geodesic domes he has designed and produced all over the world, his philosophy is too broad and all-embracing to be tied to a particular material or method.

At the risk of distorting Mr Fuller by fragmentation, the University of North Carolina cited him "As a distinguished engineer, mathematician, inventor, designer, mechanic, writer and philosopher . . . he has become one of the most influential and controversial personalities of the machine age." Mr Fuller prefers the term "Comprehensive Designer."

The physical applications of Mr Fuller's ideas are too numerous to mention, with one exception — the seminar he conducted with a number of students at McGill University last fall. I would like to quote the postscript to the report the students have published on the experimental geodesic dome they have constructed under his guidance. It reads: "Although it is difficult to express on paper our sentiments, we of the seminar wish to thank Mr Fuller from our hearts for what he has given to us during the course of this project. We have thoroughly enjoyed working with him and will always look back upon it as a bright spot in our careers. We have met an amazing man, an incredibly hard worker and one made to lead. Mr Fuller thinks more clearly than any person that we have ever met, and we will consider ourselves privileged if even a fraction of his approach to universals has been transmitted to us."

THANK YOU VERY MUCH. I am going to attempt to cover a 30-year period of personal search and experimentation this morning and so I am going to have to build up some speed as I go along. This always seems to involve a very slow start.

I gave as the title of my talk "A Comprehensive Anticipatory Design Science" and I want right at the outset to make clear what that subject means.

In our art of architecture, as we are very familiar with it, we operate in terms of the needs of our locality, of our client, of our country, and before a project actually gets under way, the architect has to have a client developed.

When I speak about a comprehensive anticipatory design science I am talking about an occupation on the part of an individual or a crowd of individuals which is not dependent on any specific client, or possibly of any client ever, because they will not be able to anticipate well enough to fulfill the needs of any potential client.

However, the comprehensive anticipatory design science does by its very name represent an activity in which there is some hope that the exploring and experimenting and the formulating may be successful in the organizing of our resources in such a manner that some day the evolving pattern of man's needs may suddenly discover that the results of the anticipatory design science have been worthwhile; and that is what is taking place over a period of a great many months and years is exactly what is needed.

Now, I did start in on such an exploration in 1927, and when I started in on such an exploration I was not certain from the first estimate of the undertaking that the kinds of results that might accrue would synchronize in man's evolutionary needs for at least a quarter of a century.

It is interesting, then, that during the last five years I found myself being approached under certain emergency needs of national defence and other industrial undertakings, where what I had been developing all over that period was what was uniquely needed for the moment.

So that I find that the possible synchronization of society's evolutionary needs is one which I call a sort of emergence by emergency.

At the very outset I would like to make clear that I understand this subject is one which may be of interest to you; it can't help but be of interest to you because of the fact it is in the world of structures, with which you are uniquely concerned, but one, however, which is somewhat remote due to the fact it does involve such large periods of time, and we do seem to be so far away from what we might call immediate practical affairs.

In the first place, if you don't have any client and may never have any client, you may ask "How are we going to survive?" That might seem to be one of the most important of the original questions.

In 1927, as was any other young man in my day, I certainly was thoroughly impressed with the admonition of my elders and my contemporaries that "You really have to look out for yourself and you have to earn yourself a living."

However, as of 1927 I had completed a vigorous number of years of experience in this new phenomenon of industrial equation and I had started to develop some ideas regarding industrial equation, and I felt there was something operating in our society in regard to phenomenal industrialization that was not too well known but which might be apprehended and which might be very profitably apprehended.

I would point out that it seems to me that the name industrialization might bear the same relationship to man that a coral reef does to the little coral animal. I am sure that the little coral animal is probably unaware of the design of one little form of what we speak of as coral. The coral that we speak of is really a sort of frozen tracer trajectory of the activities of little coral animals.

If all our activities were actually followed by some visible tracer and we were able to freeze the smoke, so to speak, such as in sky writing, and each of us as we moved along left a tracer as skywriters do, we each would get a pattern that would look like coral.

In other words, what we speak of as coral is really not the coral animal at all. He is at the head of this growth, and yet the coral that we speak of forms great coral banks and whole islands and influences the great ocean currents and the thermo balance of the earth and must have some effect on the universe itself.

The effect of that kind of coral was, I felt, somewhat the same as the effect of phenomenal industrialization. That is, we

were giving a part of a newly emerging pattern a separate size and importance, and we tended to see ourselves only as a local coral animal or a local cluster and not possessing any realization of the larger pattern.

And so I attempted to study that pattern of industrialization and began to make certain discoveries. I finally came to the conclusion that there were some things we could say about industrialization, and amongst other things I began to understand that it represented a complete integration of history and man's efforts, and therefore had some quite different relationship in economics to the man than had the agricultural economics with which we are familiar.

By that I mean if you were a hunter or a farmer and you shot something or you grew something and another man shot or grew something else and you have a little excess of what you are growing, it is quite obvious you would trade some of the excess you are not using personally to the other man for something else he was not using.

We have a direct bargain of exchange which you have to arrange for your own apparent survival. In the phenomenon of industry it is very easy to note that men making bolts don't consume their bolts. What they are making is not something they consume personally, directly, and it is inappropriate that a man making bolts will fill his pockets with them and go out and exchange them for a cup of coffee. The bolts do down a line and he uses some and what goes by him goes out in another pattern. Finally the bolts come back fastened together in his car or radio or wherever it may be. It is a part of a complex of assembly and this all relates, as far as I can see, to a pattern of something that went out from man and went clear around the world and came back to him.

I will give you some of the other characteristics of phenomenal industrialization as I began to see it. These are going to be a set of definitions that I felt could be made.

Number 1: I found it appropriate to contrast industrialization to what we are familiar with as crafts, arts and crafts, the arts and crafts as I learned to know them in the building world. I would like you to know I did have vigorous participation in the building world from 1922 to 1927 and I did take part in 240 building operations and I produced the major building materials for those operations.

That is how I happen to know quite a bit about the building world, and when I speak about the crafts then I speak about the kind of abilities workmen have and their unique experience and apprenticeship. They are local in geography and they are local in history. They represent the special abilities of the one man. He can start pretty much from scratch. He might have developed a great deal of his ability on his own in the woods, and he works with tools that one man can handle. He has his box of tools. He deals in the terms of local needs. He deals with the local resources, whatever happens to be locally available.

We do think a great deal in the terms of architecture regarding locally available resources that are appropriate to use.

In contradistinction to that, by my definition industrialization consists of the total resources of the earth and the universe; the total knowledge acquired and communicated by man to date; the total complex of tools that are inter-operative, is a very large pattern.

I began to see that we could even make a distinction in the tools themselves because I could say that the phenomenon of industrialization is physically a complex of inter-acting tools.

Industrial tools are unique in that they cannot be produced by any one man, operated by any one man or used by any one man. It is very easy to get an outstanding example of this by referring to the Queen Mary. It is inconceivable that one man could produce it or operate it. Other examples are giant highways or giant dynamos.

You begin to think about the number of industrial tools and you find they are many in number, and even some of the machine tools that we may think of as being used by one man cannot be produced by one man. It takes hundreds of men to produce a lathe. So that these are the tools, then, that I speak about.

Furthermore, it is a quality of all the industrial tools that none of them operate mystically. None were discovered in the forest the way we might discover an animal or a geographical site or other resources. None of them operate by some mystical god and you do not kneel down before the machine and say "abracadabra".

We can say that all these tools, then, operate to whatever degree of excellence they do operate as an objectivication of all the exact findings of all the exact sciences. You might say that industrialization is a complex of the interactive objectivity of all the exact sciences. It is then, you might say, the integrated exact sciences as effectively applied.

This phenomenal industrialization, inasmuch as it does relate to the unlimited resources and to the total of history, means that inasmuch as man was born locally, and the history of his integration is one of very slow weaving and inter-acting, the pattern of the total resources, the pattern of the total knowledge, moved very slowly. As it first began to integrate total knowledge regarding physical phenomena, those who were conversant with it were very few.

We can see, therefore, that industrialization as a resource was inherently scarce in its beginnings, and it is still relatively scarce, but it is becoming more apparent very rapidly.

Another requirement of industrialization is that it is regenerative. The tool advantage can be invested to make larger tools. One man can work on his lathe to make eight bigger lathes, and then eight same sized men can go to work with those eight bigger lathes and accomplish larger tasks.

At any rate, the phenomenon of industrialization, being self-augmenting and a regenerative phenomenon, has continually surprised men by the magnitude of its integrating and its increasing abilities, whereas it was first applied only to these very remote tasks of war-making. It is gradually coming in more intimately towards our everyday tasks and it is becoming more of our general physical pattern making for high mobility and swift communication in our peaceful times.

The productivity and total capacity of this phenomenal industrialization has become so plentiful because of its self-augmenting that the time is coming when it can be applied without any lessening of the high level of technology of self-protection of societies in defence matters. There is going to be ample increments of this advantage to finally apply, even in highly emergent times, to the everyday arts of living.

Whether we like it or not, then, this enormous new kind of coral reef capacity is in due course becoming available and will be applied by men over the face of the earth to their everyday living needs.

I was interested thirty years ago in what the consequence of this coming on our everyday living might be, and this is the nature of my inquiry and the subject I present to you. I am personally convinced after thirty years of experience with the subject that we will lose nothing of any value whatsoever, nothing of any importance or validity will ever be lost, that we will probably have more access to more enjoyment on the face of the earth as a result, rather than a lessening of our enjoyment.

Men were born with legs and feet. This is one kind of a biological pattern. We were not born with roots like a tree. That is another successful biological pattern. The tree having roots and not being able to move, regenerates, and its kind surround the earth because the winds blow its seed so it moves by being blown and it can only move with each generation.

Man, having legs, belongs to the biological group which can both advance and retreat for its survival and can move around the face of the earth in a time increment of less than a generation.

As a result of the industrialization as it impinges in a large way and becomes available to everyday man in everyday ways, man will go further than he has already in some marked degrees in increasing his range and his frequency of his permitted comings and goings. In other words, the freedom of the individual will be greater increased. That is all. We do not take anything away from him when doing this.

When we look at big buildings we can count the storeys and we can say "That building is ten storeys high." We can imagine

ourselves projected into that size of device. But if there are no familiar items such as trees to translate our comprehension, we cannot tell what size it is. Therefore, I must stay within this range for your imagination.

I am going to start with a sphere twenty feet in diameter and that will be the size of the earth if man could only get around it on his own feet. In making our figures – I have been very careful in these figures, by the way – I am taking the distances which human beings can hike and can continue to hike per day. They must eat and refresh themselves. I would point out that I am supposing something that actually does not exist, and that is a path directly around the world so man can go around a great circle of the earth.

I am now going to have this same man aided by a horse that he can ride. He only has one horse. It is not a pony express, and so his horse must be refreshed too. And the earth immediately shrinks once he has a horse. It shrinks to the size of a sphere six feet in diameter from twenty feet. Therefore we see the man on the horse having a very enormous advantage over a man just on feet.

We are now going to introduce the sailing ship. Sailing ships, unlike the man and the man on the horse, do not have to sleep. It is one of those tools I was talking about, and one of the characteristics of tools is that they do not have to sleep. You lash the tiller and she can keep on sailing, and so the ship can take you around the earth while you are sleeping. And the size of the earth, when you get to the fast sailing ships moving along at an average of ten knots per hour, shrinks to the size of a basket ball.

So we see that inasmuch as ships and horses have been available to man a long time, the men who had the ships had a very much smaller earth to cope with than a man who just had a horse, and certainly the man on his feet.

You can understand the economic advantages that accrued in view of the fact that a ship could carry enormous tonnages due to the displacement of function, to the fact that the ship can enclose as a vessel a great deal of air and have enormous buoyancy and therefore carry cargoes that men could not carry on their backs or on the backs of horses.

So that the ship not only then dealt with a very much smaller world but it was able to do so with an ability to carry a large amount of the resources of the earth from here to there and to become the great integrater of these resources.

We find in our moment in history the steamship and the railroad coming in. The railroad cannot maintain itself any more than the horse can because the railroad is designed for replenishing. So we find again the ship able to make mileage equivalent to the railroad as it goes around the world. Under the railroad and steamship the world shrinks to the size of a baseball, so we see what an extraordinary effect there was on man's economy when the world shrunk from the size of a basketball down to the size of a baseball.

If we bring in our present DC7C type of aircraft – and I recognize that that has to be replenished and I am not talking about refuelling in the air – the earth shrinks again and this time to the size of a golf ball.

If we jump ahead three years and take the size of the earth in the terms of the jet fleets which will begin to be available three years from today, the earth's size will shrink to that of a half-inch marble.

Let us go ahead only seven years, which is not very far, and take into account the extraordinary accelerating speeds we find in airport planning. Incidentally, plans must be made well ahead because they are prodigious undertakings. They, like the telephone companies, have to work at least seven years ahead.

In considering what might be the effects of the coming of the industrialization or high priority abilities to everyday tasks, and particularly the building arts which represent our largest physical undertaking in the old crafts' category, and is the last to come under the effect of this industrialization – as I consider that, suddenly things become very clear.

I am now going to give you some characteristics of industrializations' behaviours, some further characteristics, but before that I would like to define science itself because I have talked about comprehensive anticipatory design science.

What do we mean by science? Like most of you I have read many statements of what science might be, and most of them tend, as far as I can see, to non-validity, to say the least. Whatever the men have been working in, it seems to be something I am not supposed to have.

There is one definition of science which I found extraordinarily satisfactory, and that is one given by Eddington in which he says that science is the attempt to set in order the facts of experience. I thought he was very well fortified by another great scientist who I am sure was unaware of Eddington's statement when he made his definition. This was Mach, the German physicist, whose name we use as Mach number. That is, when we come to the supersonic flight increments, and Mach says, "Physics is experience arranged in most economical order." He is dealing in the same raw stuff as Eddington. The only difference between a physicist and a scientist is that a scientist just arranges experience in order, and a physicist arranges it in the most economic order.

The physicist has discovered in his experience that to date nature disposes the requirement of extraordinary efficiency. Nature will never take the long way around and will always do things in the most economical way.

There is another word I would like to introduce to you because it represents a major concept, and that is the word "synergy", to be related to the word energy. In other words the prefix "syn" instead of the prefix "en" on "ergy". The words are synergy – energy. Synergy is to energy what integration is to differentiation.

Our experience with the word "energy" comes from our tendency to specialize, to become unique functioners in a complex economic pattern of our day because we learn that there is no perfection.

Therefore, any expert can become a little more expert in a special area, and there is a pretty good chance of surviving. So a great many become experts. In terms of becoming experts we study special aspects of nature and special aspects of the physical universe are energy, that is, differentiated behaviours.

Synergy represents the integrated behaviours. The word is not familiar. How many in this room are familiar with the word synergy? Hands, please? One, two. So it is not a popular word. Therefore man does not at the present time feel he has any need for this kind of word or else he would know it. The dictionary meaning is: "Behaviour of whole systems unpredicted by the behaviours of the components of the systems."

I avoid the word "parts" because we have no "things" now any more. So we are trying to get away from the word "parts".

A few years ago the Honorary Chemical Society of the University of Minnesota asked me to speak to them. I asked that audience of chemists if they knew the word "synergy" and all hands went up. Chemists have to know the word synergy. We have a theory of education in which we have the term specialization, which means that we start with some parts and we learn a few of the parts – A and the B and the C, and the figure 1 and the figure 2 and the figure 3, and we learn to put a few of these together and we get some fairly satisfactory kind of results. Knowledge is then said to be a body which we built up around these few things that we are expert in. It is a sort of total atmosphere to a great mystery of phenomena to total life. It is like looking at these things with some blinders on.

You start with some immediate family factors when you get into chemistry.

The chemist has been faced with this kind of dilemma that is post-Darwin. He discovered that he did not come into a classroom where they had a sort of soda fountain with oxygen and hydrogen and so forth and he mixed up his universe as he went along. He found the universe already mixed and operating, and one of the most important parts about it was that in order to be able to carry on an experiment at all he had to take a complex arrangement and then he tried to partially disassociate, tried to separate out, and when he separated out he found that that which he separated out never explained the behaviour of the complex in which it had been.

So he has been so profoundly impressed with the difference that he has not quite known how to develop a philosophy that confronted all of us with this dilemma. However, I will give you a good example of the way in which the chemical energies do provide behaviours unpredicted by the past.

Let me take one of the most important kinds of chemical alloys we have today. It is chrome, nickel and steel, and it was the discovery of chrome, nickel and steel and its gradual uses which suddenly made clear to man that he had a structural stability at heats that permitted the release of energies under magnitudes that made possible jet propulsion. That is, the jet plane is the result of the metallurgy and the structural stability of chrome, nickel and steel, and not really any invention of jet, for jellyfish invented jet long ago.

So this is a matter of chrome, nickel and steel, and the shrinking of the earth from golf ball size to a half-inch marble is in the terms of chrome, nickel and steel. So this phenomenon has very much effect on economics and man. If we take the primary constituents or the secondary and minor constituents of chrome, nickel and steel and we take the commercially pure, individual elements, the chromium, the nickel and the iron, and we take the tension strength per square inch of cross-section as the criteria of the strength of this material, and we take these three, the chromium, the nickel and the iron, we find that the tension strength per square inch of cross-section ranges from thirty to forty to 50,000 pounds per square inch tension strength.

Whether we like it or not this is very typical of our chemistry. It is one of the reasons why, in a sense, all these things at the invisible magnitude, have not been well understood by man. He says, "Some engineer has tested it and if he has done so I will take his word. And this billet has twice the strength of the other one. They look the same." No human being, no matter how great a scientist he may be, can detect the difference of these things in which one is five or ten times stronger than the other.

It is the terms, then, of understanding the whole that we can predict the behaviours of the past. So this becomes the very essence to me of a potential comprehensive anticipatory design science.

I am sure that in due course you will no doubt make this inquiry, for I meet with many students around the country and I know they always ask these questions. "Where are we going from here?" They say, "Are we going to get ourselves into trouble? Are we going to become kind of bankrupt by becoming too sane by being scientific in these matters?" You may say, "We have been enjoying life very much because of the fact that our housing and buildings and so forth, and our arts were never in any way affected by this high technical advantage accruing to the scientist."

I can tell you that from my own viewpoint it seems to me possible that if we did begin to operate in the terms of a comprehensive anticipatory design science in respect to our everyday needs, even as we did, anticipating the fact we might have to defend ourselves some day, that if we did we might develop some new kinds of tools. As industrialization has been characterized by tools, and these are tools that no one man can make or operate or enjoy, I thought we might by this kind of activity develop a set of new instruments and they could be thought of very much as musical instruments which were very gradually evolved, and that as a result of differentiating out in the universe where you heard music being synergetic, a total behaviour which could differentiate into unique new noises could be developed. New and various vibrations could be found. So I thought we might begin to develop in due course a whole new orchestra of instruments.

The kinds of devices which I am going to present to you should not be thought of at all as anything more than instruments. They are not the music. You cannot look at the piano and say, "I don't like that music." It has to be played. So the kind of devices we will begin to discover should be thought of not as architecture but as instruments of a possible new kind of architecture of a world society, which is the way we use it and its synergetic effects. It is the art of living itself which will begin to provide the new architecture of our day. That is the way I hope it may be as I hoped it may be as I undertook my work. Whether you agree with me that that is a reasonable working assumption, I do not know. However, I hope it will comfort you in case you are unhappy.

In our day we have been counselled by our elders, and those of you who are old enough to remember will recall the expression, "jack of all trades and master of none". In our times things have been accelerating enormously. As we entered World War I men knew of a quarter of a million chemical compounds. As we finished World War I we had come to a million. As we came into World War II we had come to two and a half million chemical compounds, and today we are in a very great many millions. No longer are we even thinking of dealing in terms of "what have you in the way of chemical arrangements and structures?" We are discovering the unique functionings and the behaviour characteristics, the kinds of energy involved and the terms of behaviour and the limits of conditions to be met, such as in airplanes, and then you actually invent or discover structural chemistry that will satisfy that particular functioning.

The aircraft industry today is no longer characterized by bins of special alloy materials which will be available. They make the alloys as they go. There has been a very great change in industry. The case, then, of the "jack of all trades and master of none" is a worse case than it ever was, and I would say that when we enter into the area of mathematics – and this is mathematics – we might begin to find we have knowledge that we can understand such as in the case I gave you, for instance, of ballistics being generalized into a set of variables. They can have any kind of a symbol for any of the variables. You can begin to understand, then, how they integrate.

I come now to the tasks of industrialization as they would be applied to everyday living arts. One of the phenomena I discovered right away was the fact that man's first application to ship, as I have spoken to you about, represented an accelerated kind of pattern because man seemingly, finding it necessary to dwell on the land because of his feet and the way he walks around, and the fact he doesn't get along too well in the water, exists pretty much on the dry land. The patterns of relative frequencies have changed from that of a relatively slow pattern of frequency. That is, nature in her great investments of energy has subdivided her behaviours in a way that I was able to discover more or less accidentally and in a way which again made me think extremely well of Eddington's and Mach's definitions.

In 1927 I began to say, "What is it we will be concerned with if we really apply industrialization to the everyday art of living and to the regeneration of man?" I said, "We will have certain things that seem to happen to us. They might be of a lethal magnitude and they might not be. We are all processes and we have to attend to our processes." I wondered if by design we could anticipate all the ways in which the energetic environment tries to destroy man and if we would be able to find ways of shunting various receipts of energy into perfect patterns. We cannot drink all the water when it rises in a rainstorm, but we need water badly in small increments and so we shunt it with an angular shunting into a holding pattern and we valve it into a pattern in proper magnitudes and frequencies. Therefore you have angular and frequency modules of total patterns. This is bringing generalized methods into it.

In the terms of this relative frequency we learn from chemistry some very important matters. For instance, in the terms of bondings of structures we have a single bond of two tetrahedrons, that is a coming together with one vertex, a universal joint. It is a very flexible affair. It is very typical of gases and has a high compressibility. Finally two of these two vertexes come together and we have a hinge. It is still flexible but it is not using anywhere near the same amount of space as it did before. It is no further compressible. This would be typical of liquids. In this degree of frequency it finally gets to a point where it has a limited motion, and those three bonds come up and so you have two tetrahedrons, three vertexes congruent, and we would get a triple bonding, and so forth. This would

be a fixed end in engineering. Under these conditions we are now using very much less space. There is high compressibility and the number of bonds to be freed would be three. If you wanted to get to gases again it would take a lot of energy of investment to get you free. This is a crystalling state or a rigid arrangement.

Now, on the land where man deals essentially with the crystalling state, the relative frequency of energy, due to the fact it takes a little longer to rearrange the earth, is low. When we get into the liquid state we get a very much stepped up frequency, and when you get into the gaseous state then you have a higher frequency again.

I spoke to you before about the size of the earth. Due to the attractiveness of the reduction of the size of the earth as a result of man mastering it with vessels, the liquid estate became an important affair. Three-quarters of the earth's surface is water, and the men who mastered this very large pattern were going to have to deal with the kinds of rates of change and limits on physical conditions and with the changes to their ships.

It happens that a seaquake is the same kind of a quake as an earthquake, but it covers a little more pattern and has little more degree of freedom. It is very much more severe than is a land quake and they come so often that in designing a ship you have to design it for a seaquake every day. Furthermore, what we call an avalanche on the land is a very severe affair but we don't have too many of them and so we don't tend to design for them and we try not to put a house where you are going to have an avalanche. But in the sea you have hundreds of tons of the liquid crashing on your roof every day and you have to prepare for it.

So that is the challenge that man has got to meet if he is going to be able to survive with a controlled environment on the sea in contrast to his having successful controlled environment on the land. Furthermore, when he goes to sea the reason for him getting it to these hazardous conditions is that he will be able to integrate resources. He has to have the safety of his crew taken care of. Then he has to have an increment to make the trip worth while, and his crew is spelled out in the terms of weight and air displacement. Therefore he must have a large increment of cargo carrying capacity in order to make the trip worth while. So that from the very beginning with ships you have a basic weight limit and a designed apparatus in which you can carry as large an increment as possible in order to make the trip worth while, and therefore you have a minimum of weight which can be disposed of to give you the ability to meet these very high magnitude conditions of seaquake and avalanches, and so forth, every day.

As we go into the air with a vessel the frequency of occurrence of high magnitude stresses is greatly accelerated again, so that as men took vessels into the air ocean, the pattern of acceleration and magnitude of challenge was greatly heightened.

When you realize that the phenomenon of industrialization has reached the point with respect to air vessels or aircraft where it is going to give us an earth the size of a pea, then we can begin to realize some of the kinds of abilities that have now been mastered by man in relation to the total resources as they may become available to the structures of the land.

In the present patterning of the structures of this advanced technology, there is something I would like to present to you that I have never had an opportunity to present to an architectural group before. I was very honoured and excited at Cornell this year when I found myself being invited to speak to the nuclear physicists of Cornell University because they are impressed that the kinds of structures I have been discovering actually represent what they have been treating as what they call quasi geometries of the nuclears; quasi because they could not be built. They could not conceive of how you could build them because men in building things always had to put brick on brick. The kinds of models I have been discovering do not need to have brick touching brick and therefore they are constructable and they do seem to be the very structures they are beginning to discover in the nuclears. Therefore, for the moment we are in quite a unique position. Furthermore, some of the most recent of the events in science have brought about what we call a sort of fundamental dilemma in relation to parity, and the scientists seem to discover that the work I have been doing over a number of years seemed to anticipate that dilemma and that I did not fall into the particular mathematical trap that they had. So again in emergency I am being brought into a position of being accredited.

Eighty-five years ago the chemist Van t'Hoff, as a consequence of all the information to date regarding valence and chemical compounds, proposed that all organic chemistry consists of tetrahedronal configurations. He was held askance by the other chemists. In fact he was called a charlatan throughout. However, he lived to be the first chemist to receive the Nobel prize. But he made the optical proof of the tetrahedronal configuration of carbon eighty-five years ago. However, this is organic chemistry and one reason he was held in askance so much was that chemistry was in the terms of the inorganic. It was in the organic that he proved it. In the inorganic there seemed to be no kind of a way of finding a tetrahedronal configuration. In 1913 a man named Werner made the first tetrahedronal discovery in the inorganics, the metals. In 1933, which is certainly very recent — after the ninety-second chemical element was isolated in 1932 — the X-rayed fraction proved the tetrahedronal configuration of the inorganics. It is important information for us to have that nature is dealing in the most economic ways and she finds it appropriate to use the tetrahedronal configuration.

Often I point out to students that architects don't go building buildings out of materials. They say why? I say that it is because they formulate structures of sociable patterns of systems. They formulate structures at visible or sensorially detectable molecules out of infra and ultra sensorially detectable structures. That is, they make structures out of structures but the structures they make them out of they cannot see the configuration in, so they just call them materials. They are making it inside of a universe in which gravity is operating as a structure. We have the macroscopic and the microscopic structures operative, and man formulates only the visible level of the structure and he has become so vain about it to think that this is a sort of area where he reigned and the rest of the universe is sort of amorphous.

So inasmuch as nature is probing all the different ways of building structures, we begin to discover that the kind of structure man can have available to him does come within these categories and he can be economical about it. If he wants to be economical, as he had to be in the case of the vessels of the sea and of the air, then he will probably get into tetrahedronal configuration.

(The speaker thereupon completed his talk with the use of models and slides.)

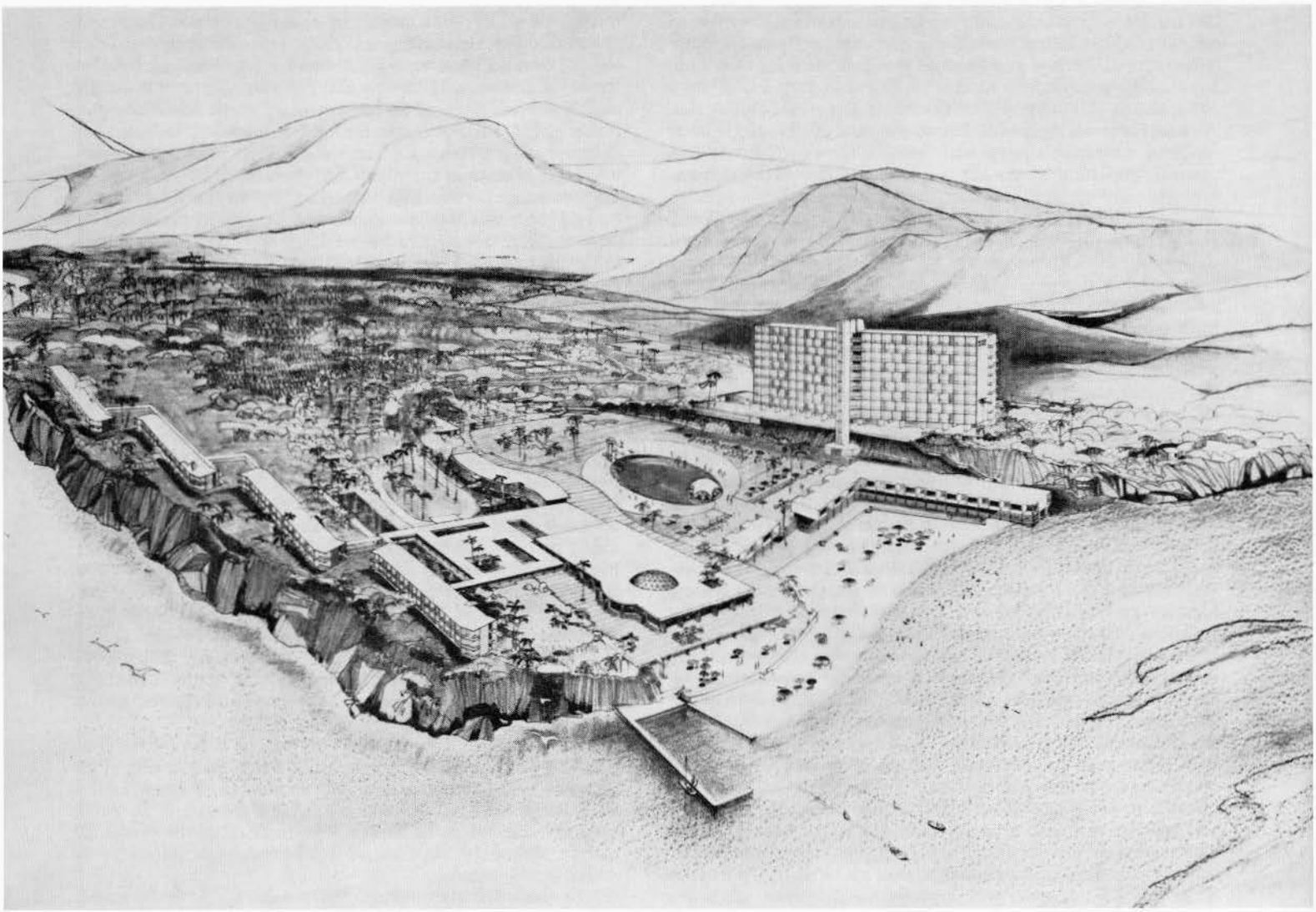
Mr D. G. B. McRae: Mr Chairman, Mr Fuller, ladies and gentlemen, it has indeed been a very stimulating experience to hear Mr Fuller develop the title of this symposium to this Assembly. He has provided us with an intriguing glimpse of what uses may be made in the future of a very old and venerable tool which we have inherited from the past in the matter of structure.

I rather fancy that Mr Fuller has made many of us feel very much the same as some of Brunelleschi's contemporaries must have felt when they first beheld the magnificent dome of Santa Maria del Fiore. There might be very little progress in any of the areas of design unless in the area of structural design we have the Buckminster Fullers who are willing to brave the strenuous hazards required for the experimentation, research and development of novel stuctural systems. We owe a very great debt, I believe, to Mr Fuller and the long line of pioneers in the field of structural development.

On behalf of the Royal Architectural Institute of Canada, sir, its members and guests here, I would like to thank you for coming this morning and addressing us.

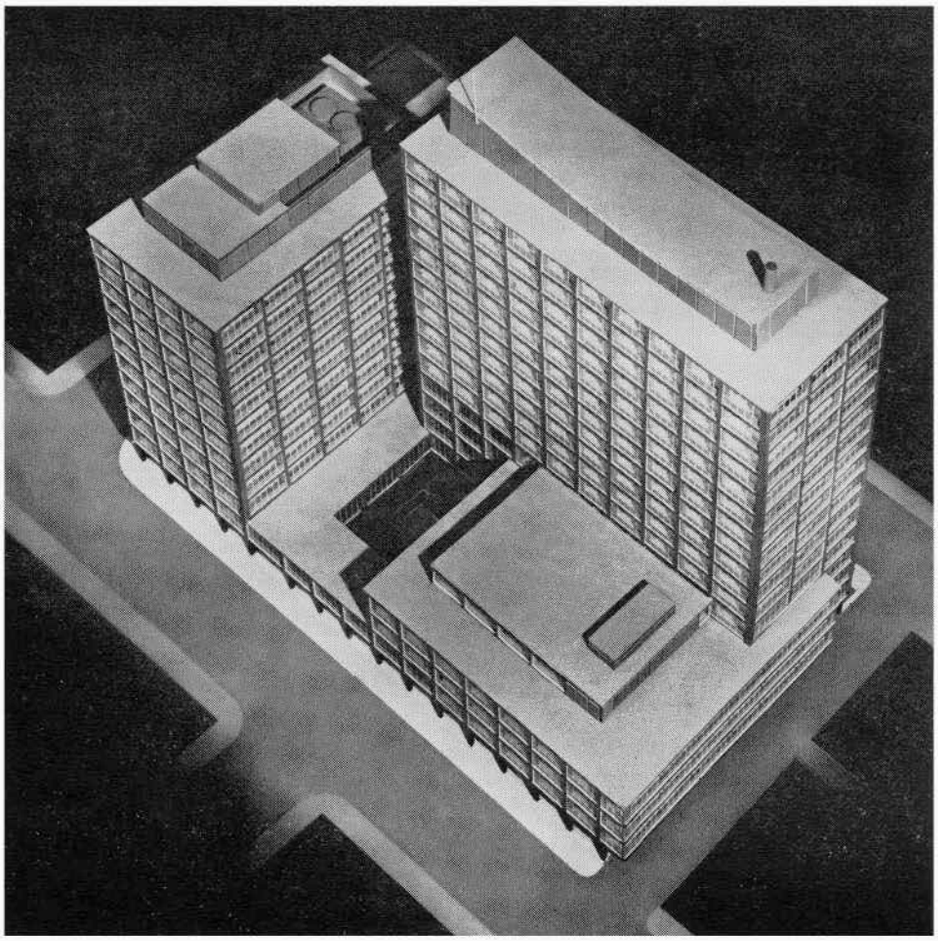
The above was an address given by Mr Fuller at one of the Seminars at the RAIC Assembly held in June.

PROJECTS



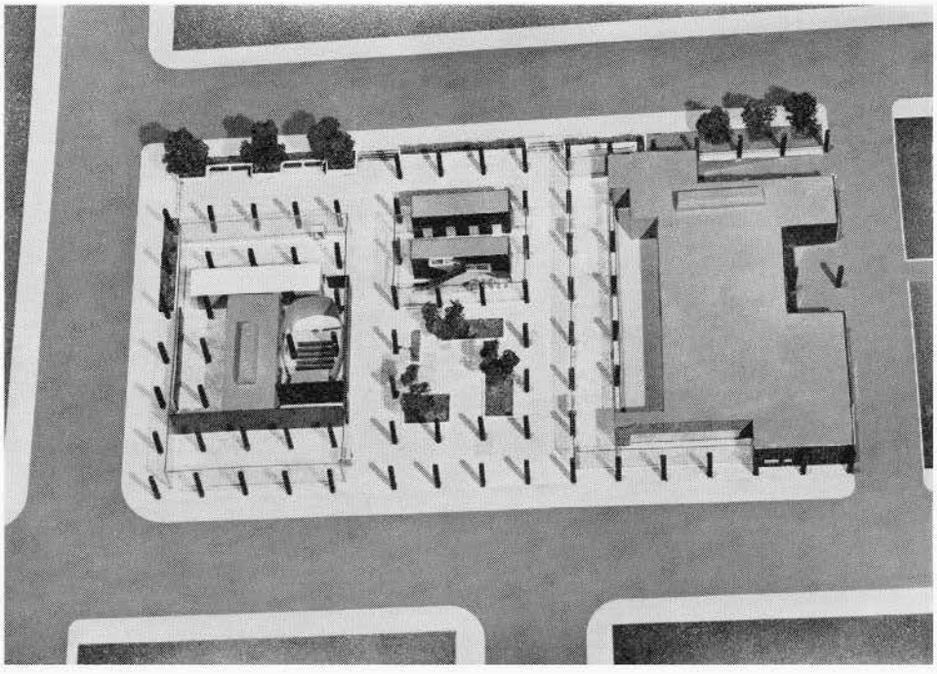
Resort Hotel, Jamaica, B.W.I.

Architects, Wilson & Newton



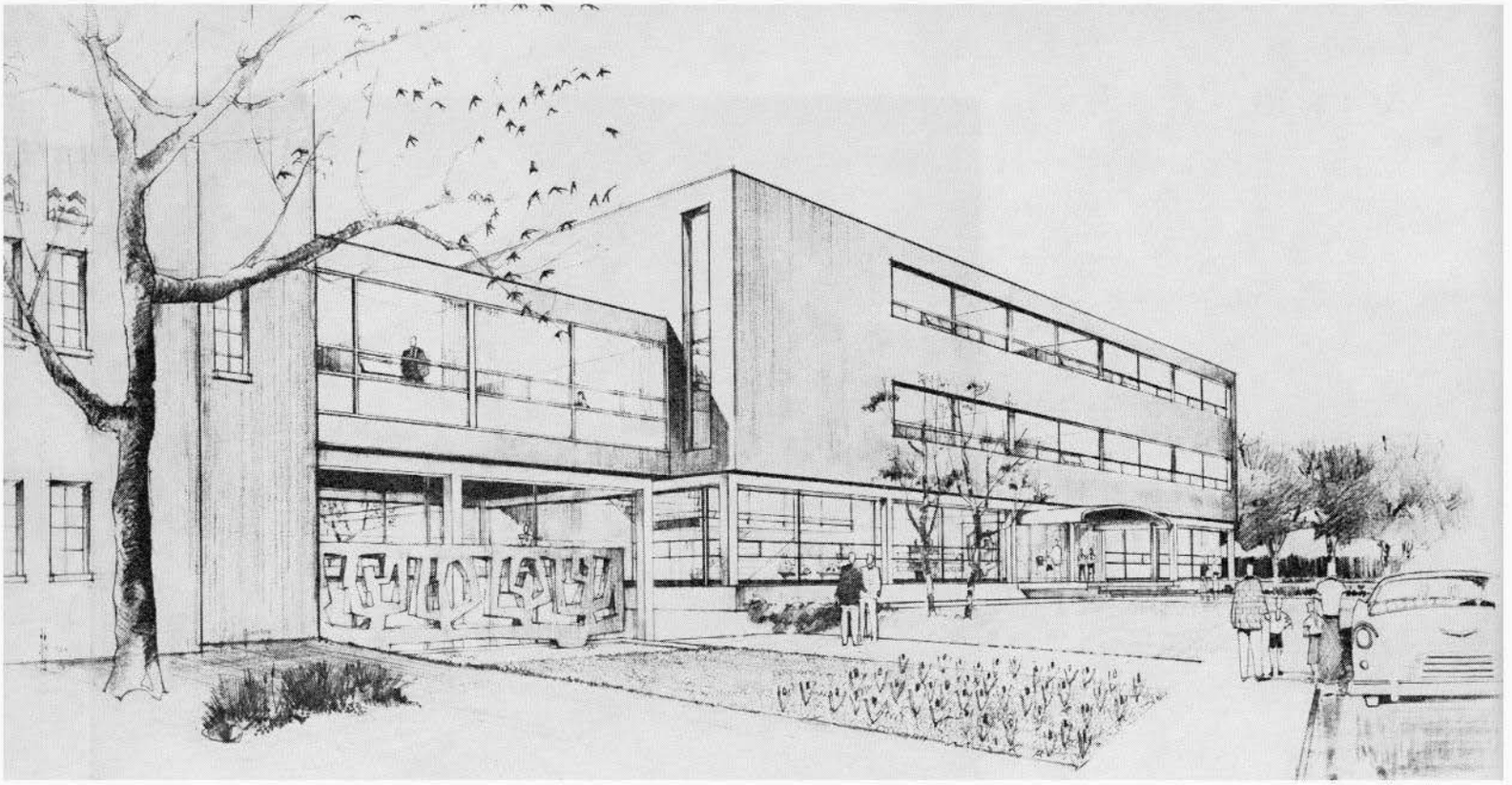
Federal Building, Adelaide St., Toronto, Ontario

Architects, Shore & Moffat



The building will occupy approximately 2/3 of a city block and is bounded on the south by Adelaide Street, on the west by Victoria Street and on the north by Lombard Street. The ground floor measures approximately 160' x 300' and extends upward in twin towers, twelve and fifteen storeys high.

The basic structure is steel with an exterior skin, above the second floor, of silicone anodized aluminum beam and column covers with insulated porcelain enamel spandrels and double glazed aluminum windows. The ground floor exterior is of Canadian black granite while all ground floor window and door frames will be of permanent stainless steel. The centre of the ground floor has been designed as an open landscaped court accessible and visible from all three bounding streets and containing a central glazed block with escalators and elevators to the upper floors.



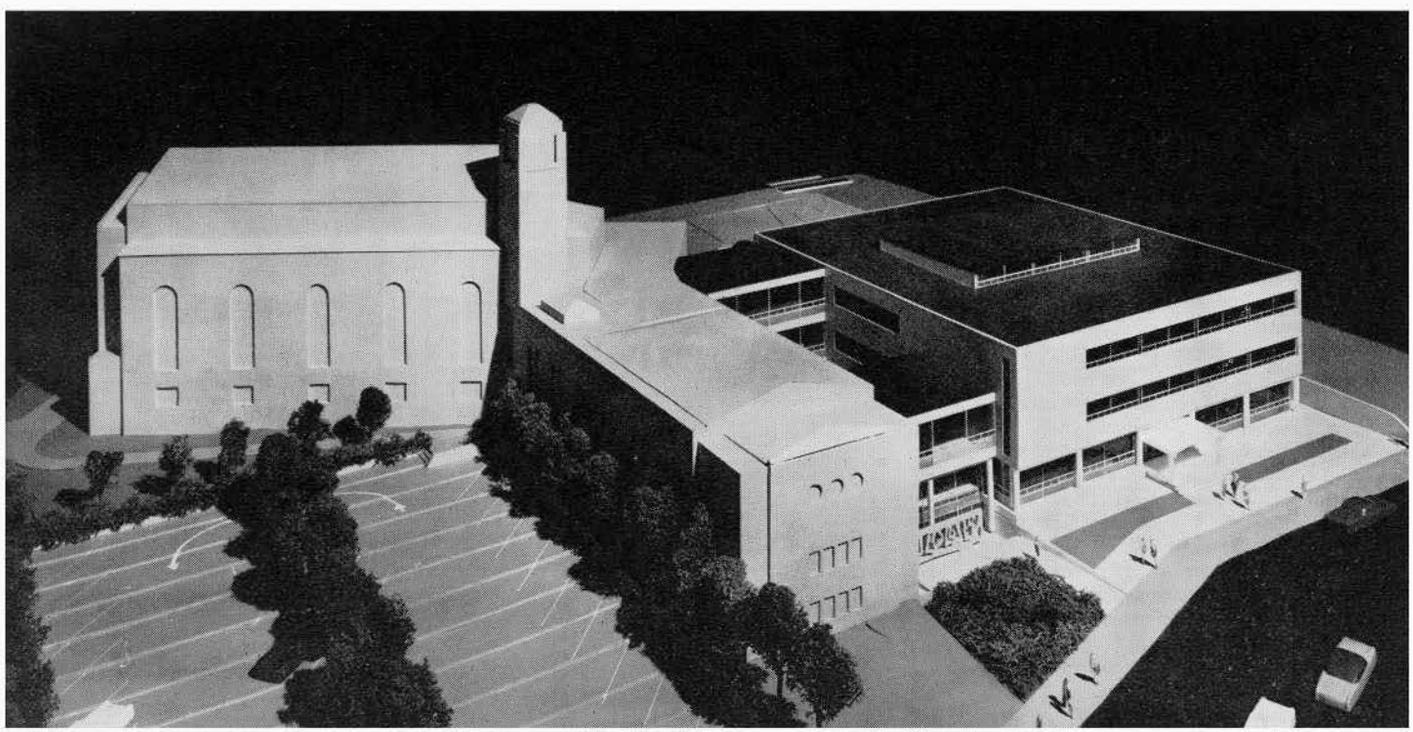
Addition to Holy Blossom Temple, Toronto, Ontario

Associated Architects, Jack Brenzel
John B. Parkin Associates

The new addition provides increased facilities for child education, youth activities and adult social activities. The school occupies the upper two floors, the adult auditorium the lower two. Floors are connected with the existing building by means of two glass 'necks'.

In order to maintain a sympathetic relationship with the existing sanctuary and school, the exterior walls are of exposed concrete. The texture resulting from the concrete mix and the horizontal forming boards is repeated in the new structure.

Existing sanctuary and school with proposed addition
to the right and sunken landscaped parking lot to the left



VIEWPOINT

Zoning is the death of good architecture

My answer to this statement is an emphatic "no". Zoning is one of the basic tools of the planner in his effort to create a visually satisfying and efficient environment. In this aim architecture participates directly both as a contributor and a benefactor.

The important factor lies in the design and application of the zoning ordinance. We see many instances of zoning by-laws based on a mechanistic view of the city; on the concept of the sprawling garden suburb, the uniform dormitory sub-division, or the private financial interests of real estate operators. In this context zoning may often be more of a hindrance than a help to architecture.

However, used creatively, and in the hands of a planner with true executive powers, working within the framework of an integrated master plan, zoning is vital to the creation or maintenance of the successful visual group – that is to urban architecture.

Zoning ordinances should be so framed as to permit and encourage the growth of true neighbourhood units – neighbourhoods of mixed development – mixed as to height and size of the housing units – age and economic level of the inhabitants – and incorporating nearby, places of work, recreation, and education.

Zoning in this sense, as a creative aid to a planned human goal, is vital to architecture.

Raymond T. Affleck, Montreal

Or is it?

There is no reason why, in theory, zoning should impede the creation of good architecture within the confines of sensible restrictions, in fact the challenge offered by such restrictions should serve to stimulate the best of architectural expression.

The principle of zoning as it is known to us today applies predominantly to urban districts, and such rural areas known to be destined to evolve into industrial concentrations. What happened to North American cities before town planning expressed certain basic requirements in terms of zoning can be compared to the unruly upbringing of a child that lacked proper parental guidance during its formative years. A set of zoning regulations is as necessary to the good conduct of a city as are good manners to the social relationship between its inhabitants.

Unfortunately, in practice, by the time even the best intentioned zoning regulations have passed through the political mill and become law, they assume too often the form of straight-jackets which achieve the opposite of what the trained planner who drafted them meant them to do. And that assumes that all planners are good planners!

When such conditions exist, then indeed zoning stifles architectural endeavour and in extremis extinguishes it altogether.

Peter Caspari, Toronto

I cannot speak of zoning and its ramifications in the total Canadian scene. Conditions must, however, be consistent throughout Canada if the visual results I have witnessed are evidence. The misconception of the meaning of zoning from its acceptance in any given area to its implementation are gross. This applies to architects more than any individual in our society. His indifference to the need for a generalized pattern of growth, his responsibilities as a member of the team from inception to final three dimensional realization leaves him in the middle of the chaotic scene.

I have no fault to find with zoning in principle. The blunders and miscarriage of interpretation must be accepted. The fault is not zoning. It is the lack of understanding that the job is not finished until the last structure fits into the general framework which has been provided.

For any of my colleagues passing through Winnipeg, I will gladly provide a conducted tour to one area which exemplifies the lack of consideration better than any I have seen on the North American continent.

A. J. Donahue, Winnipeg

News from the Institute

MANITOBA

General plans for the fall and winter season may be of interest to any Members coming through Winnipeg or any involved in similar arrangements in various Associations.

The MAA are preparing for Monday meetings open to all Members; local and visiting men from a broad section of interests will attend.

The Students' Architectural Society in conjunction with the MAA are in touch with the following men with regards to a series of lectures. They are – Christopher Tunnard, Walter Gropius, Pietro Belluschi, Paul Rudolph and Victor Gruen. At this time, dates have not been finalized.

The third Annual Festival of the Arts will be opened by Students' Architectural Society Open House, November 10th, to which all are welcome.

A very successful report by the delegates to the RAIC 50th Anniversary took place in July. It was agreed that this meeting gave a closer tie between local members and the Institute and should take place annually.

Considerable architectural work of interest is taking place locally. Of specific interest is the Campus Development in Fort Garry, St. John's College, St. Paul's College, along with a new School of Architecture will change the face of the Campus more than any time in the past.

A. J. Donahue, Winnipeg

ONTARIO

The owners of office buildings which were designed and erected before air conditioning was considered necessary, now face the fact that their tenants and staffs are increasingly conscious of the advantages of air-conditioning.

Some of the problems which arise are: –

1. Whether the structure is adequate to support the additional weight of the mechanical units.
2. Whether there is sufficient space available for the equipment without seriously affecting the layout of the building.
3. Whether the ceilings are of sufficient height to allow for ductwork, suspended ceiling and other necessary furring.

Obviously, it is necessary to keep clear of all structural and reinforcing steel when boring the holes for connections and to

avoid the hydro and telephone lines throughout. Occasionally some lines are in the wrong place and in this case the emergency crew is summoned.

For a satisfactory result, the architect makes a complete set of up-to-date floor plans and reflected ceiling layouts advising the owners of the additional space required to conceal the various mechanical units.

At the time of deciding upon the location for diffusers and lighting units, the owners almost invariably want the lighting of the building improved with more modern electric fixtures to replace the older type.

The cost of the operation is staggering when compared with the original cost of the building but the resulting face lifting or should it be "ceiling lowering", proves worth while.

In order to avoid interference with office hours, the work must be carried on during nights and holidays.

Unquestionably the building becomes more comfortable, the work of the staff more efficient, and the building is cleaner.

Therefore, providing an office building has been well designed, well constructed and well maintained, the owners should give favourable consideration to the installation of a complete air-conditioning system.

F. Hilton Wilkes, Toronto

QUEBEC

To the older generation of Montrealers, the slogan "the ale your great-grandfather drank" was worthy of a brew that was full-bodied — a man's drink, if you will — which, if poured vigourously, developed a collar that could match any starched Victorian neckpiece and to cap all was an ale with a nutty brown colour that would make a native Indian from the nearby Caughnawaga reserve look like a pale-face. Montreal's merchant princes of the XIXth Century, whether of French or Scot's decent, had their own particular way of doing business. No doubt they were inclined to be autocrats, but, nevertheless, they could be counted on to produce an article that employed the brain and brawn of Montrealers in such a manner that the end product was a distinctive creation, worthy of the metropolis of Canada and no pale copy of something south of the border.

Need it be mentioned that the *Daily Commercial News* is the least likely medium to start a chain of reminiscences. Yet, it was quite boldly stated under a summary of the news that Molsons (Ontario) Ltd. had engaged a well-known Boston firm of consulting engineers to design another unit to their Toronto brewing plant. Such is the stuff that starts a march down memory lane.

If you will remember, one of the five planks in the 1957 program presented at the Annual Assembly held at the Alpine Inn last February was the development of a sound public relations policy. This phase of the 1957 program is perhaps the most illusive yet most necessary goal for the Province of Quebec Association of Architects to strive for during the year. Public relations, like time and circumstance, does not stand still. We are either improving or slipping backwards in our relationships with the public, the other members of the building team or with one another within the profession. Each member should realize this three-fold duty in our public relations policy and constantly endeavour to promote a positive, friendly attitude in community affairs and particularly in our relationships with engineers, builders and building material suppliers.

The measure of our success will be difficult to ascertain. Your Association has just engaged a full-time executive secretary to replace M. Bernard M. Deschênes who wishes to devote his full time efforts to the practice of law. Our limited budget will not permit in addition the engagement of professional talent to direct our public relations efforts. Under the circumstances, therefore, it is essential that we develop a conscious effort to improve our public relationships in an era when so many media and associations are clammering for attention. Given time, it is our hope that M. Jacques Tisseur, the new executive secretary, will do much to co-ordinate the various phases of the public relations work. Members are invited to discuss such matters with him.

Much can be done to improve matters between the public and the architects of Quebec if we constantly realize that the quality of service we render will be more effective than volumes of committee reports on the subject of a good public relations policy. The Legislative body at Quebec, in their wisdom, passed the Architects' Act in 1891 to govern the practice of architecture — we must be ever worthy of this trust.

These are revolutionary times for the profession. New materials and building techniques are constantly being developed. The competitive spirit of the free enterprise system as developed among the Western democracies shows a marked tendency towards specialization and monopolistic practices which have even infected the construction industry. Building concerns are growing bigger and, having large assets, assume the functions of promotor, realtor, architect, and even consulting engineer in addition to being glorified building brokers. Coincident with this growth has been a fantastic expansion of U.S. control of the Canadian economy. The incidence of these two factors explains in part why many leading Canadian industrial concerns are persuaded to engage foreign engineers and architects. All architects deplore these developments as much as the engineers and builders. We feel that the time has come when members of the building team must get together at regular intervals to discuss their mutual problems and determine how we can serve the Canadian public more completely and more efficiently.

H. A. I. Valentine, Montreal
President of the PQAA

HONORARY FELLOWSHIP

The *Journal* takes pleasure in congratulating Mr Douglas E. Kertland on his election to Honorary Fellowship of the New Zealand Institute of Architects. The following letter which was received by Mr Kertland will be of interest to our readers:

The New Zealand Institute of Architects
Office of the President

39 Johnston St.,
Wellington, New Zealand.

Dear Mr President:

No doubt you have seen my correspondence to your Secretary, but I feel that I would like to write to you personally and thank you and Mrs Kertland for your hospitality.

No words of mine could fully express my feelings at the warm reception you gave me, which I feel came from the heart. Believe me, such genuine feelings of goodwill as you expressed are most warmly reciprocated.

Your Convention was beautifully managed, it was dignified, informative, encouraging and will remain with me a treasured memory.

I hope it will not be long before I will be able to send to your Institute the official greetings which I read to your meeting.

It is with the greatest pleasure that I have to inform you that my Council have unanimously elected you an Honorary Fellow of the New Zealand Institute of Architects and in due course we will be forwarding to you the appropriate Certificate.

You will appreciate that this honour is not lightly bestowed, but we feel that the high measure of your Institute's progress and the contribution to the advancement to architecture which has been made by the members, should be acknowledged by so honouring its President. We hope that you will also feel that this is a personal distinction.

With all good wishes,

Yours sincerely
(signed) *Ronald C. Muston, President*

D. Kertland, Esq., President,
The Royal Architectural Institute of Canada.

COMMUNITY PLANNING FELLOWSHIPS

Honourable Howard Green, Federal Minister of Public Works, has announced that 11 fellowships have been awarded by Central Mortgage and Housing Corporation for post-graduate study in community planning for the academic year 1957-58.

The fellowships, which are in the amount of $1200 each, have been awarded to: J. R. Anton, Ph.D., of Toronto; E. T. Clegg, B.Sc., of Vancouver; H. B. Goldman, B. Eng., of Montreal; K. J. Jones, B.A., of Montreal; T. W. Loney, B.A., of Cal-

gary; R. S. McConnell, M.A., of Edmonton; N. J. Metz, B.Arch., of Montreal; S. H. Osaka, B.Arch., of Montreal; Q. H. Stanford, B.A., of Toronto; R. A. Williams, B.A., of Vancouver; Mrs C. D. Walford, B.Arch., of Montreal.

Mr Goldman, Mr Jones and Mrs Walford will study at McGill University; Dr Anton and Mr Stanford at the University of Toronto; Mr Metz and Mr Osaka at the University of Manitoba; and Mr Clegg, Mr Loney, Mr McConnell and Mr Williams at the University of British Columbia.

The purpose of the fellowships, provided for under Part V of the National Housing Act, is to aid those wishing to undertake professional training in the field of community planning.

The committee of awards consisted of Professor D. L. Thomson, Dean of the Faculty of Graduate Studies and Research, McGill University, chairman; Professor A. P. C. Adamson, Town Planning Institute of Canada; Eric Thrift, Director of the Metropolitan Planning Commission of Greater Winnipeg and Alan Armstrong, Central Mortgage and Housing Corporation.

AMENDMENT TO RAIC BY-LAWS

The members are advised that the existing by-laws of the Royal Institute have been duly amended by meeting of the Council, in accordance with Article XXVI of the by-laws, as follows:

> Article XVIII of the existing By-laws has been amended by inserting after the word "predecessor" in the seventeenth line thereof, the following:—
>
> "—and if the Executive Committee as so constituted does not include at least one member from Quebec and one from Ontario and one from British Columbia and one from the Atlantic Provinces (Newfoundland, Nova Scotia, New Brunswick or Prince Edward Island) and one from the Prairie Provinces (Manitoba, Saskatchewan, or Alberta), the component association in the province or the component associations in the group of provinces not so represented may appoint one of the members of the Council from such province or group of provinces to the Executive Committee, provided that the first appointee from the component associations of the Prairie provinces shall be from Manitoba, the next from Saskatchewan and the next from Alberta and thereafter in that order and the first appointee to be named from the Atlantic provinces shall be from Nova Scotia, the next from New Brunswick and the next from Newfoundland and thereafter in that order, unless otherwise agreed among the component associations concerned and provided further that the aforesaid appointee from the province of the immediate past president and the appointees from the province or group of provinces which would not be otherwise represented on the Executive, shall hold office until the beginning of the next Annual Meeting."

ARE YOU VISITING THE U.K.?

A recent delegation from the U.K. Dollar Exports Council met a number of individual Canadian architects in Ottawa, Montreal and Toronto and was impressed by the opportunities which exist for the U.K. to supply a larger share of Canadian imports of building materials. Steps are being taken in the U.K. to encourage and assist British manufacturers to increase their sales efforts in Canada.

Canadian architects who are visiting the U.K. might be interested to see the latest developments in Britain of building materials and they are cordially invited to get in touch with the Dollar Exports Council, 21 Tothill Street, London, S.W.1. (Telephone No. WHItehall 0074) or the Royal Institute of British Architects, 66 Portland Place, London, W.1. (Telephone No. LANgham 5721). Both these organisations will be pleased to make arrangements for Canadian architects to see recent buildings of note in the U.K. or to meet manufacturers of specified items of building materials.

ANNOUNCEMENT

Jules P. Paivio, MRAIC, has opened an office for architectural practice at 515 Albert Street East, Sault Ste. Marie, Ontario, where he will be pleased to receive trade publications, etc.

John Defries, MRAIC, ARIBA, AAdipl., wishes to announce that he has opened an office for architectural practice at 78 Bank St. Ottawa.

CONTRIBUTORS TO THIS ISSUE

Alan H. Armstrong was raised in Toronto. He studied at the School of Architecture of the University of Toronto, and in the graduate schools there and at New York University. After service in the Navy (partly editing educational material) he entered Central Mortgage and Housing Corporation in 1946. Mr Armstrong was loaned as Executive Director to Community Planning Association of Canada until 1952. He has since served C.M.H.C. as a reviewer of land development and low rental housing schemes, and since 1955 as Adviser on Community Planning. Mr Armstrong is an Associate Member and Councillor, Town Planning Institute of Canada.

R. Buckminster Fuller is the foremost present day example of the American Inventor, a type which extends well back into history and whose talents combine those of the scientist, the practical philosopher, the designer and the promoter. He was born at Milton, Mass., attended Harvard and the U.S. Naval Academy. He has held important posts with the research divisions of great American corporations such as Phelps-Dodge and the Pierce Foundation. He has been visiting professor at a number of major American universities. Perhaps he is best known to many in connexion with the words "dymaxion" and "geodesic." His dymaxion house, car and world map all made history. His geodesic structures have included many types for the U.S. Armed Forces and the great aluminum dome for Ford at Dearborn.

BOOK REVIEWS

ARCHITECTURAL CONSTRUCTION — sub-titled "The Choice of Structural Design", by Theodore Crane, and published by John Wiley & Sons, Inc., New York. 433 pages. Price $10.00.

Professor Crane teaches Architectural Engineering at Yale University, where he has taught since 1924. He has also been an editor of the *Architectural Record.* Appropriately, the book is written as a text for students in architecture and as a reference for practising architects.

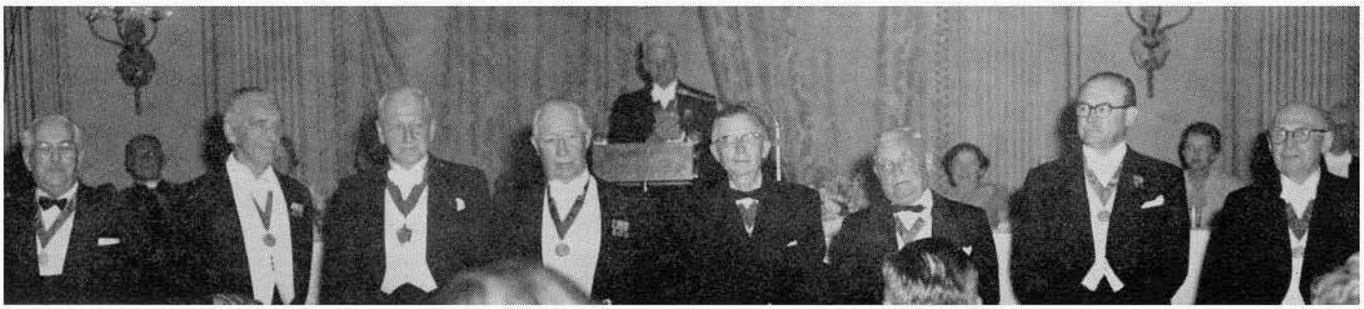
Exactly as described in the sub-title, the book deals, in the words of the author's preface, "with the problem of making an appropriate choice for the structural portions of a building as governed by the geographical location, site conditions, type of occupancy, equipment, and architectural design."

The chapters, and sections of chapters, follow in the order of a rationally developed analytical procedure for determining the type of building frame, foundation, floor, roof and wall construction suitable to meet the requirements of any particular structure, and the many techniques and materials available for each function of frame, foundation, floor, etc., are described and evaluated for particular application.

The first chapter opens realistically enough, with the subject of building codes. One section in particular of this chapter is entitled "Interpreting and Analyzing Code Requirements" and groups a number of headings under which the architect can list the pertinent data gathered from the many and often scattered sections of miscellaneous codes. Other chapters contain data of contemporary interest, such as lightweight steel framing, and pre-cast and pre-stressed concrete framing.

The section of prefabrication, however, is disappointing. It deals only with a few instances of concrete pre-casting and assembly methods. Yet it is entered in the section entitled: wood framing and prefabrication! Chapter 6, on wide span designs limits itself to the well tried formulae with few excursions into the wonderland of structural fancy.

Professor Crane's method is based exclusively on the study of satisfactory precedent, and as a result he provides us with



RAIC Annual Dinner, Ottawa, 1957
An impressive array of Past-Presidents attended the Golden Jubilee Assembly. Left to right: Messrs Gordon M. West, H. L. Fetherstonhaugh, Burwell R. Coon, Forsey Page, A. J. Hazelgrove, John Roxburgh Smith, R. Schofield Morris and A. J. C. Paine. Also present was Mr Percy Nobbs.

handy compendium of the existing, approved materials and techniques. The disadvantage of this method is that it gives no inkling to the student that architectural construction is not at this date a closed system or, that it is an art; that practised intuition can improve on precedent.

Guy Desbarats

TIME-SAVER STANDARDS. Published by the F. W. Dodge Corporation for the Architectural Record. Price $12.00

There can hardly be an architect in Canada who hasn't at one time or another had occasion to refer to this handbook. For many years it has been a standard work of reference and as such it has often been of considerable help but as is the case with most reference books it has also caused its own share of frustration and annoyance.

The publishers of any handbook on architecture and building face a difficult task because of the increasing complexity of the subject and it is further complicated in times of rapid change. *Time-Saver Standards* attempts in one volume to be a "comprehensive source of information on architectural design, engineering method, materials, technology and building practice". To do all this even in 879 closely packed pages is obviously impossible and herein lies the main weakness of this edition as well as its predecessors. No omnibus volume of this kind can really do enough justice to the myriad of subjects dealt with for it to be of real use to the "construction industry professional" who the publishers hope will buy this book. For most of the topics covered by *Time-Saver Standards* there are now publications which deal with them exclusively and consequently more fully. This has to some extent made *Time-Saver Standards* redundant but not entirely. There is still a place for a handbook of this nature provided it doesn't attempt to be all things to all men and doesn't get lost in detail. By concentrating more single mindedly on principles and by possibly reducing its scope *Time-Saver Standards* might well make a particular and needed contribution.

In terms of its value to the practising and student architect the latest edition has not changed substantially. The contents are more logically arranged, the index has been expanded and new sections have been added while others have been changed or deleted. There is not space to discuss these changes in detail here. It can only be said that while some of the new sections are reasonably thorough and helpful most of them are only of passing interest because of insufficient coverage. There are also some sections remaining intact from previous editions in which no effort has been made to bring the subject up to date either in text or illustration.

In spite of what has been said *Time-Saver Standards* fulfills a useful purpose and still holds its place as one of the major works of reference in the field of architecture. While the present edition shows no marked change from previous ones the additions and revisions that have been made are on the whole an improvement.

Hart Massey

Grand Hotel

Towering high above Central Station
Stands a new luxurious hotel.
The outside is a gift to the nation;
It is only the rooms inside which sell.

Travellers, however sentimental,
Who leave their lower berth with regrets,
Will find, as on the Transcontinental,
Suites of comparably equipped roomettes

Each with its chair and sanitation,
And bed which lies concealed during the day;
Not even Provincial Legislation
Can take the right to razor plugs away.

Grandiose viscera of ducts and wiring
Gratify needs suffered unaware,
Enabling guests, when rising or retiring
To regulate the well-conditioned air.

Visitors not sumptuously dining
Feast vicariously upon a screen,
For cameras behind the grill-room lining
Will televise the gourmandise unseen.

Amplification and rediffusion
Stop oratory going astray.
Even the deaf will have no illusion
That the speakers have anything to say.

Lights, dimmed by an electronic blender
Achieve a variety of styles;
Decorating with palatial splendour
A neutral background of acoustic tiles.

Moving belts convey the dirty dishes;
Escalators speed the parting guest;
Elevators wait upon his wishes,
So why should anybody be depressed?

Facilities like these all need concealing;
Nor are they so easy to fit in.
But who would grudge the lowness of a ceiling
Which houses several cubic feet of tin?

Mechanisation is so voracious
That space for guests will soon be sought in vain.
C.P.R. ships have long been far too spacious,
So let's design a hotel like a train.

Peter Collins