Seminary Marie-Reine-du-Clergé, Lake St John. (See page 254.)

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PLANNING FOR 1967 CENTENARY, (Chairman to be appointed)

A Tale of Two Cities

One could write a book about the people, mostly English, who have said scurrilous things about Toronto, even in the eighteenth century when there was nothing to criticize except the site, which someone called a frog pond. Mrs Jameson, in 1838, found it "most strangely mean and melancholy – a little ill-built town – some government offices in the most vulgar style imaginable"; and John Galt, ten years earlier, while staying at our best hotel, was inspired to say "Everyone who has been at Dover knows that it is one of the vilest haunts on the face of the earth, except little York in Upper Canada". One of these days, we shall get out a book, beautifully printed and bound in green leather, which will symbolize the envy of visitors for the privileges and manifest advantages we enjoy living in the Queen City. We shall dedicate it to the Mayor of all the people.

Our collection of rude things said about Toronto has broadened, in recent years, to include other Canadian cities. Samuel Butler's "Oh, God, Oh, Montreal!" is, of course, a classic known to every schoolboy. We seem to remember that Sir Hugh Casson was not complimentary in his recollections of Winnipeg; particularly was he opposed to bill boards, gaps like missing teeth in the urban scene (something one doesn't see in Bath) and hydro poles. These are all horrid things of which Winnipeg has no monopoly, but they are, as someone said, only the cheap setting to a precious stone. We have learned to distrust the casual visitor to any of our cities, or to Moscow for that matter. Was there not a very distinguished Englishman who, seeing the fishing shacks on the bay at Hamilton in winter, thought they were privies and commented on the hardiness of the people in the ambitious city. But Winnipeg is fortunate in that, generally speaking, the seekers after truth have seen past the "setting" to the essential Winnipeg within.

Our favourite was a young English poet who, half a century ago, wrote a book in which he said – "Winnipeg is the West . . . a new city; a little more American than the other Canadian cities, but not unpleasantly so. The streets are wider and full of bustle, which keeps clear of hustle. The people have something of the free swing of Americans without bumptiousness; a tempered democracy, a mitigated independence of bearing. The manners of Winnipeg impress the stranger as better than those of the east, more friendly, more hearty, more certain to achieve graciousness, if not grace. There is, even, in the architecture of Winnipeg, a sort of *gauche* pride visible." Rupert Brooke has written the thank you note to a kind and generous host for making our Annual Assembly so delightful an occasion.

Il y aurait tout un volume à écrire sur les personnes, surtout des Anglais, qui ont tenu des propos injurieux à l'endroit de Toronto. Déjà au dix-huitième siècle, alors qu'il n'y avait rien à critiquer, quelqu'un a qualifié le site de mare aux grenouilles. En 1838, Mme Jameson a trouvé que c'était "une petite ville d'aspect étrangement misérable et triste, mal construite, faite de quelques bâtiments administratifs du style le plus vulgaire qu'un pût imaginer." Et John Galt, dix ans plus tôt, alors qu'il logeait à notre meilleur hôtel, a pu écrire: "Quiconque est passé par Douvres sait que c'est l'un des endroits les plus excécrables de la planète, honneur qu'il partage avec la petite ville d'York, au Haut-Canada." L'un de ces jours, nous publierons un livre, édition de luxe sous reliure de cuir vert, qui représentera la jalousie de nos visiteurs à l'endroit des privilèges et avantages manifestes dont nous jouissons, nous qui vivons dans la ville-reine. Nous en offrirons la dédicace au maire de tout le peuple.

Notre recueil de propos désobligeants sur Toronto s'est accru au cours des dernières années de commentaires sur d'autres villes du Canada. Tous les écoliers de langue anglaise connaissent le "Oh, God, Oh, Montreal!" de Samuel Butler. Nous croyons nous rappeler que Sir Hugh Casson n'était pas tendre pour Winnipeg dans ses souvenirs; ce qui l'avait choqué c'étaient les panneaux-réclame, un décor urbain où il y a des vides, (chose que l'on ne voit pas à Bath), qu'il assimilait à une machoire où il manque des dents, et les poteaux des lignes électriques. Ce sont là des choses affreuses dont Winnipeg n'a pas l'exclusivité; elles ne sont que la monture sans valeur d'une pierre précieuse. Nous avons appris à ne pas nous fier au visiteur qui ne voit nos villes qu'en passant car un simple coup d'oeil est parfois bien trompeur. Mais Winnipeg a eu la bonne fortune d'être visitée par des pèlerins de la vérité qui ont su voir, au delà du décor, l'âme véritable de la ville.

Nous aimons surtout un jeune poète anglais qui, il y a un demi siècle écrivait "Winnipeg, c'est l'Ouest . . . une ville neuve; un peu plus américanisée que les autres villes du Canada, mais d'une façon qui ne déplaît pas. Des rues larges, une grande activité, cependant on n'y a pas l'air affairé. Les gens ont quelque chose de la désinvolture des Américains, mais sans suffisance; une démocratie, mais tempérée, une indépendance d'allure, mais atténuée. L'étranger a l'impression qu'on a de meilleures manières à Winnipeg que dans l'est du pays, qu'on le reçoit avec plus de bienveillance, plus de cordialité; qu'on y fait les choses avec plus de complaisance sinon avec plus de grâce. On devine même dans l'architecture de Winnipeg une sorte d'orgueil un peu gauche." C'est à Rupert Brooke que nous devons ces réflexions; nous les faisons nôtres et les offrons en remerciement à notre hôte qui, par son amabilité, a rendu si agréable notre Assemblée annuelle.

E.R.A.

MILNE STUDIOS

THE NEW PRESIDENT OF THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Mr Harland Steele (F)
Toronto

MR HARLAND STEELE (F) of Toronto, was elected President of the RAIC for 1960-61 at the Annual Assembly in Winnipeg June 1-4. He succeeds Mr Maurice Payette (F) of Montreal.

Mr Steele was born and educated in Toronto. He received his architectural training at the School of Architecture, University of Toronto, winning an Ontario Association of Architects Scholarship in 1922 and a RAIC Medal for Design in 1925, when he graduated with honors. He then spent a year at the Ecole des Beaux Arts at Fontainebleau, France, where he won a Massachusetts Institute of Technology Scholarship which enabled him to travel in Europe.

On returning to Toronto in 1926, he entered practice with Mr Forsey Page under the firm name of Page and Steele, and in the years which followed the firm has been responsible for many public, municipal and office buildings in Toronto, London and elsewhere, and a large number of schools throughout Ontario.

Mr Steele is a Past Chairman of the Toronto Chapter of the Ontario Association of Architects and after several years membership on the Provincial Council was elected President for the years 1946-47. In 1948 he was elected a Fellow of the Royal Institute and appointed to the RAIC Council. Since then he has served the Institute as Honorary Secretary, Honorary Treasurer and Vice-President. He was Chaiman of the Architectural Advisory Committee of Ryerson Institute of Technology in 1957-58 and is presently serving as a member of the Ontario Association of Architects School Room Planning Committee.

Institute News

Advance Report on the Assembly

The General Assembly met twice during the June 1-4 Convention of the Royal Institute at Winnipeg, and these were some of the practical accomplishments which resulted from the Convention:

1. The Report of the Committee of Inquiry into the Design of the Residential Environment was presented to the General Meeting on June 2, discussed at a special meeting that day, approved by the General Assembly on June 4 and a resolution was passed which authorizes the Institute to take speedy action to commence the work of implementing the Report.

2. The Assembly received statements from members of the Institute and from A. W. Purdy, of Calgary, Chairman of the Manufacturers and Suppliers Section, Canadian Construction Association, and endorsed the formation of a joint RAIC-CCA Committee on Building Materials which has the objective of providing a permanent, close relationship between the architect and supplier.

3. The General Assembly approved a resolution that the Institute should appoint a special committee, representative of all Provincial Associations, on Planning for the 1967 Centenary. The Chairman and membership of the committee is expected to be announced shortly.

4. The President announced a plan to administer an Institute Trust Fund to enable contributions by members of the Institute, on a tax exempt basis, to the Institute. Details will be announced shortly.

5. The Assembly expressed satisfaction with the May 1 upward revision by the Federal Government on fees paid to consulting architects by the Department of Public Works. The meeting received a report from E. A. Gardner, Chief Architect, Department of Public Works, concerning the implication of the recent change.

6. The Annual Assembly adopted a resolution advocating that the RAIC should restore proper working relations between private architectural firms and various governments throughout Canada; and to work toward removing the root causes for the exclusion of private architects from the design of government architecture.

7. The Institute agreed to undertake a study in respect to a suggested uniform minimum fee schedule and a suggested code of ethics for adoption by Provincial Associations.

8. Following submission of a resolution, the Institute agreed to undertake a study into the desirability of the architectural profession establishing active liaison with other professional bodies in Canada.

9. The Executive Committee of Council took a decision to initiate a study into the demand for additional architectural training facilities in Canada.

10. The Council of the Institute ordered that a study be made into the feasibility of having Council meet more frequently each year to discuss the business of the Institute.

Chancery at Canberra

Mathers and Haldenby, Toronto, have been awarded by the Federal Department of Public Works the commission for the design of the Canadian chancery at Canberra.

Joint RAIC-CCA Committee on Building Materials Endorsed

The General Assembly of the Institute in session at the 1960 Convention in Winnipeg endorsed a recommendation that the Royal Institute and the Manufacturers and Suppliers Section of the Canadian Construction Association join forces to establish a committee of architects and suppliers with the object of providing closer relations between the profession and the building industry in the future.

Appearing as a representative of the Canadian Construction Association in Winnipeg, was Mr A. W. Purdy of Calgary, Manager of the Calgary Branch of the Canada Cement Company, and Chairman of the Manufacturers and Suppliers Section of the CCA. The CCA expect the following advantages to flow from a co-operative effort with the RAIC:

1. Manufacturers and suppliers will be guided in their selling approach to the architectural profession.

2. Suppliers will conform to standard methods in the description of products to the design profession.

3. Joint action at the local level between chapters of architects and builders' exchanges will provide permanent association.

Following the RAIC Assembly at Winnipeg the Management Committee of the Canadian Construction Association met at St Adele, PQ, on June 6th and unanimously endorsed the proposal to establish the joint committee. The CCA adopted a resolution of the Manufacturers and Suppliers Section and urged immediate action on the following program:

1. Adoption of a policy proposing local product demonstrations by industry groups, round table conferences, plant tours, technical sessions and social gatherings. The CCA hope that regular meetings will be held to discuss building materials and techniques.

2. Publication of a complete list of manufacturers' films and slide sets for distribution to Provincial Associations, chapters, schools of architecture, technical colleges, etc.

3. Publication of a booklet describing the acceptable method of preparing product brochures, technical bulletins and advertising with a view to assisting the architectural profession in securing product information.

4. Establishment of a sales training course at a school of architecture, the courses to be of several days' duration and to be held in early September or during the Christmas recess.

It is expected that the Institute office in Ottawa and members of the staff at Construction House in the National Capital will work closely together in the preparation of a brochure describing in detail the aims and objectives of the new committee. The RAIC membership on the Committee is expected to be announced before the end of June.

Fee Schedule Revised on Federal Public Works Dept Commissions

As a result of a Treasury Board decision made on April 28, 1960, the Minister of Public Works has informed the Royal Institute that effective May 1, 1960, a new scale of fees has been established applicable to members of the Institute who undertake the preparation of plans and specifications on projects for the Federal Department of Public Works.

The new ruling results from presentation of an RAIC brief to the Minister of Public Works on April 30, 1959, followed by lengthy negotiations.

The significant feature of the new schedule is the fact that the Department will pay the costs of any inspection on all *projects* without limit on the tender price.

The new scale will be as follows: —

(a) For office buildings, post offices, customs and immigration offices and for school buildings — 5½%.

(Continued on Page 271)

FUTURE ISSUES

July
The 1960 Assembly

In Preparation
Urban Renewal, Vancouver
Motels
Schools
O'Keefe Theatre, Toronto
Houses
Airport Buildings

FROM THE EXECUTIVE DIRECTOR'S DESK

FIRST THOUGHTS FROM WINNIPEG

A virtual guarantee of success for the 1960 Assembly at Winnipeg this month was the enthusiastic initial reunion of School of Architecture graduates from the University of Manitoba prior to the Institute Convention. The westerners and their wives flocked in such numbers that we can happily record the second largest RAIC Assembly on record . . . 229 architects and 108 wives. This figure exceeds the Golden Anniversary celebration at Ottawa when 215 registered but it is still far below the 300 mark established at the 1958 meeting in Montreal.

The 1960 program offered varied and interesting fare for the delegates, but it permitted little leisure for contemplation or idle reminiscences. The Committee of Inquiry report on the Residential Environment was submitted and approved with due regard to the significance of the document, and the broad implications of its thirty-two recommendations.

Members were kept busy rotating between RAIC Committees, many of which had been either newly established or reactivated during the past year. In retrospect, there may have been many architects who were unable to enjoy the pleasures of "seeing" the City of Winnipeg or indulging in the quiet satisfaction of a chat with an old friend.

Fragments of leisure are important to a successful Assembly schedule and must be provided in future. Certainly, a strength of the Royal Institute is its ability to bring architects from all provinces together in a spirit of unity and fellowship. Perhaps, another year, it may be possible for more committees of the Institute to meet during the course of the year, although neither the time nor money for this alternative is readily available. Another year, too, it may be well to shorten the seminar presentation and cover a single subject more exhaustively.

Council members, in their two meetings during the Assembly, expressed a desire that steps be taken to bring the Council of the Institute, or a representative cross section of it, together more frequently, since for the past three or four years the governing body of the RAIC has met only at convention time. A Council resolution with this object in mind is under study by the Executive Committee.

In making preparations now for Quebec City in May of 1961 and Victoria, B.C. the following year, the RAIC Assembly Planning Committee will be analyzing the contents of forms completed by Assembly-goers who offered their "Convention Comments" after returning home from Winnipeg. In planning its annual conventions the Institute recognizes the fact that no other event during the architectural year provides a better opportunity to promote the cause of architecture to the general public and draw closer together architects who are separated by long distances and by divergent interests.

PREMIÈRES RÉFLEXIONS SUR WINNIPEG

L'un des facteurs qui ont assuré le succès de l'Assemblée annuelle à Winnipeg a été le conventum des diplômés de l'Ecole d'architecture de l'Université de Manitoba qui a précédé l'Assemblée. Il y a eu une telle affluence que nous avons réalisé la seconde assemblée la plus nombreuse de la vie de l'Institut, soit 229 architectes et 108 épouses. Ce chiffre dépasse les 215 inscriptions aux fêtes du Jubilé de l'Institut à Ottawa, mais il est encore loin des 300 obtenues lors de l'Assemblée de 1958 à Montréal.

Le programme de notre dernière Assemblée était intéressant et varié mais il laissait peu de loisir pour la réflexion ou l'échange de souvenirs. Le rapport du Comité d'enquête sur les conditions de l'habitation a été présenté et approuvé avec toute l'attention que méritait un document de cette importance dont les trente-deux recommandations sont appelées à avoir de vastes répercussions.

Les membres ont été fort occupés à participer aux séances des divers comités de l'Institut. Plusieurs de ces comités venaient d'être créés ou avaient repris vie au cours de la dernière année. De nombreux architectes n'ont peut-être pas pu visiter la ville de Winnipeg ou causer agréablement avec les amis qu'ils n'avaient pas vus depuis longtemps.

Il est indispensable qu'il y ait des loisirs au cours d'une assemblée: il faudra en assurer à l'avenir. L'Institut royal tire sa force en partie de ce fait qu'il peut réunir des architectes de toutes les provinces dans un esprit d'unité et de camaraderie. Il faut espérer que dorénavant un plus grand nombre de comités de l'Institut pourront se réunir pendant l'année, bien qu'on ne dispose immédiatement ni du temps ni de l'argent qu'il faudrait à cette fin. Lors d'une autre Assemblée, il faudrait peut-être aussi présenter plus brièvement le sujet de la journée d'étude et approfondir davantage un seul sujet.

Les membres du Conseil, au cours des deux séances qu'ils ont tenues pendant l'Assemblée, ont exprimé le voeu que le Conseil de l'Institut ou un groupe représentatif du Conseil se réunisse plus fréquemment car depuis 3 ou 4 ans, les dirigeants de l'Institut ne se réunissent qu'au moment de l'Assemblée annuelle. Le Comité exécutif étudie présentement une résolution ayant cette portée.

Le Comité d'organisation de l'Assemblée annuelle de l'Institut, pour préparer les Assemblées de Québec en mai 1961 et de Victoria (C.-B.) l'année suivante, analysera les "Commentaires sur l'Assemblée" qu'ont présentés, à leur retour chez eux, ceux qui y ont assisté. L'Institut reconnaît qu'aucun événement de l'année n'offre, autant que l'Assemblée annuelle, l'occasion de faire valoir la cause de l'architecture auprès du public et de réunir des architectes que séparent des distances infranchissables et des intérêts différents.

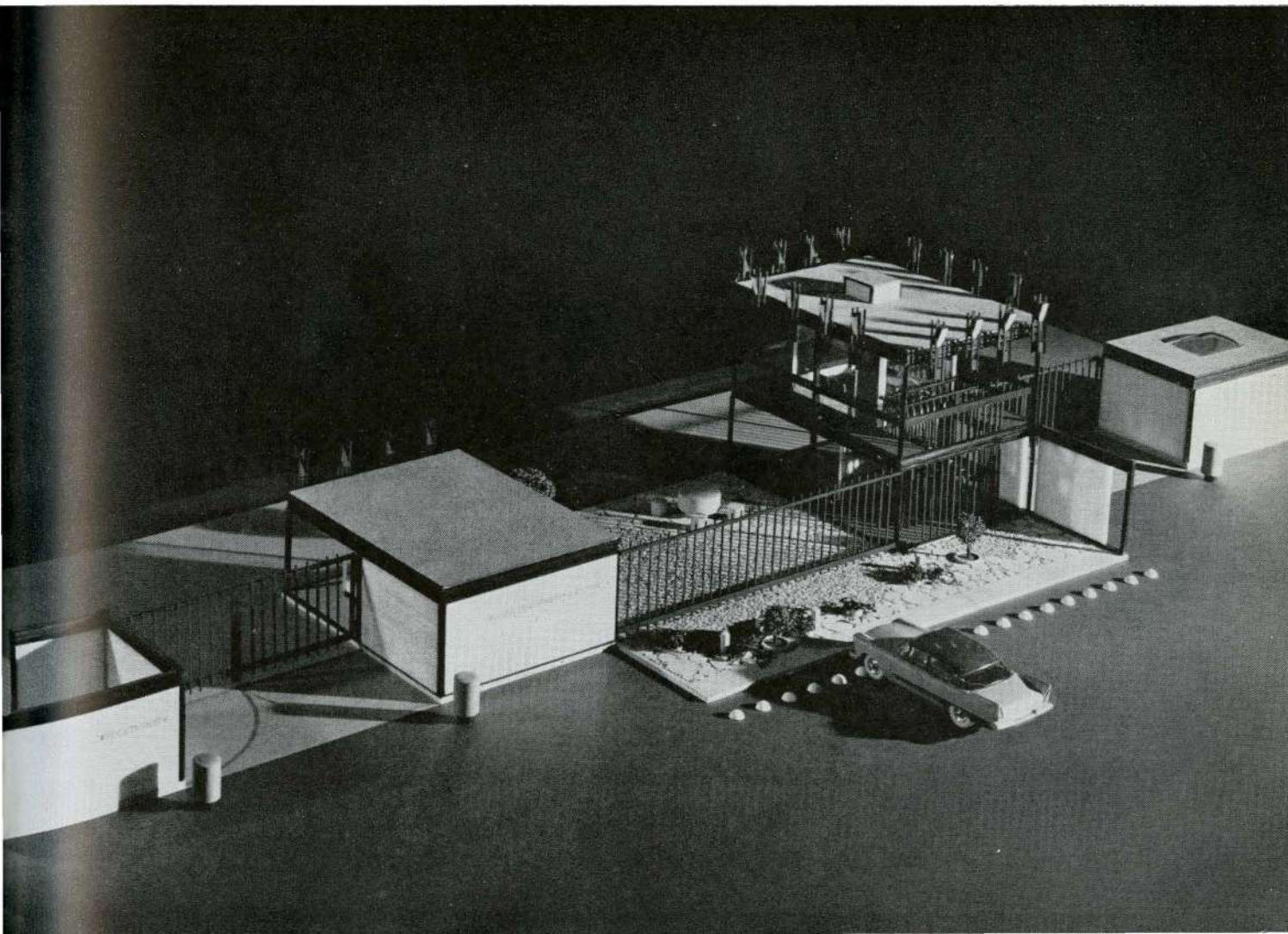
Journal RAIC, June 1960

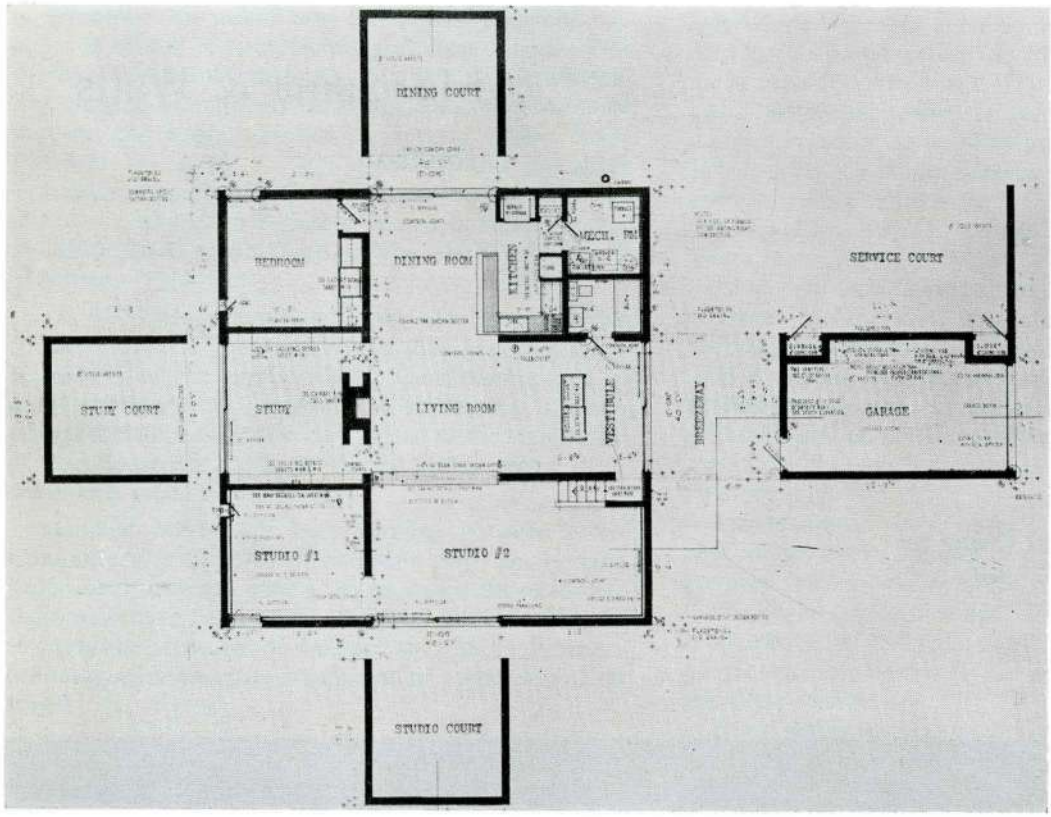
Three Projects by Moriyama & Watts

Toronto

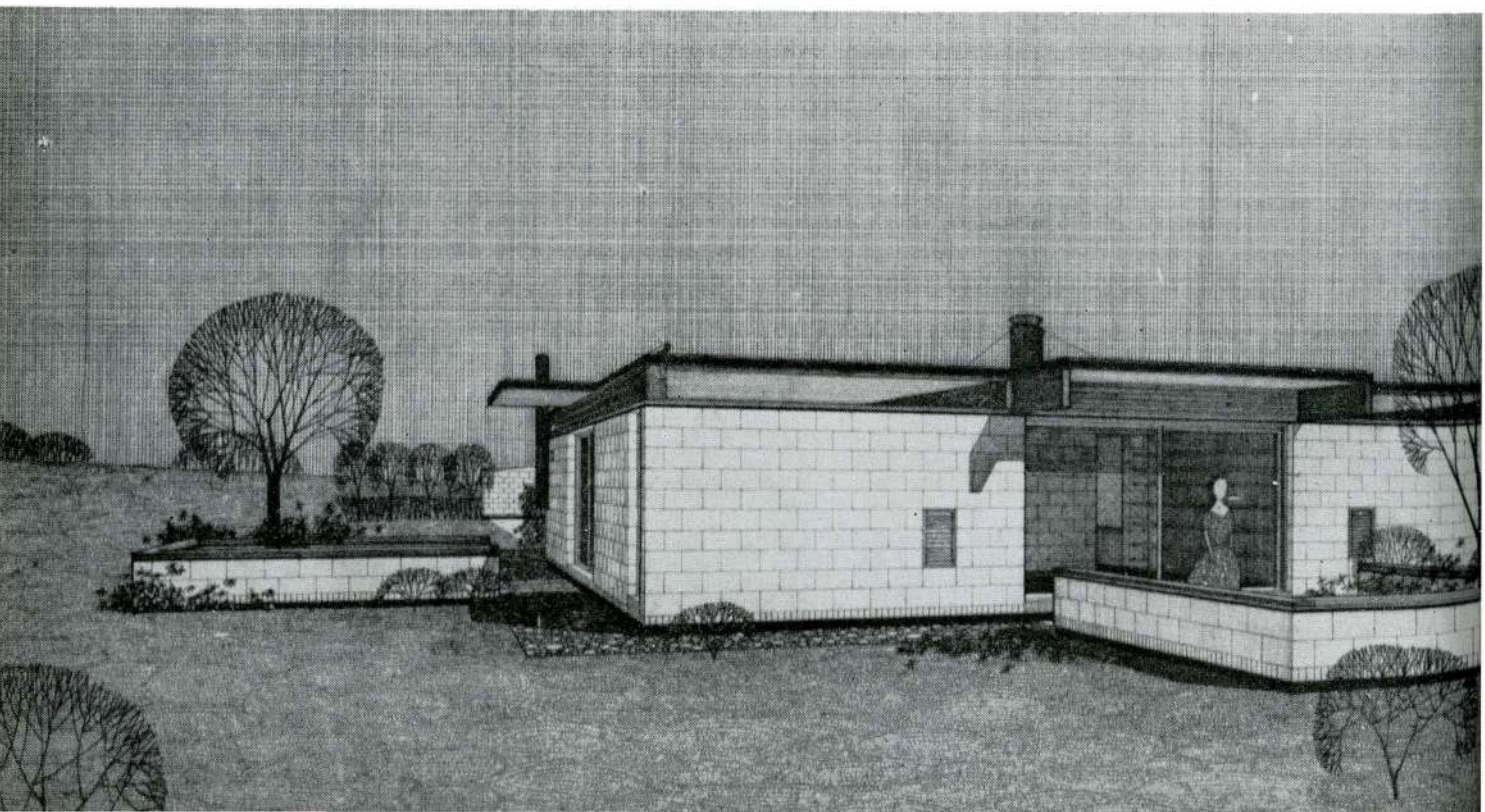
A Used Equipment Centre for George W. Crothers Ltd, Leaside, Ont.

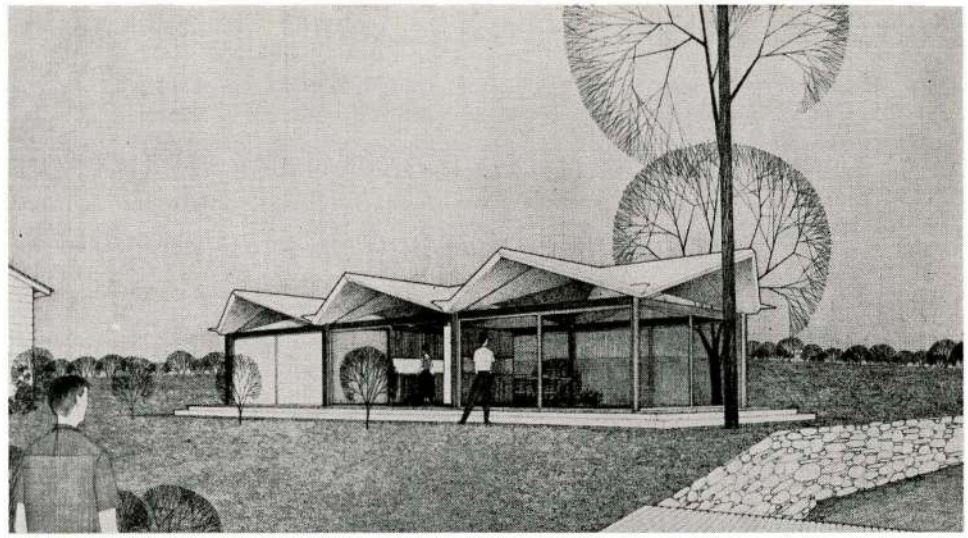
All Steel Construction



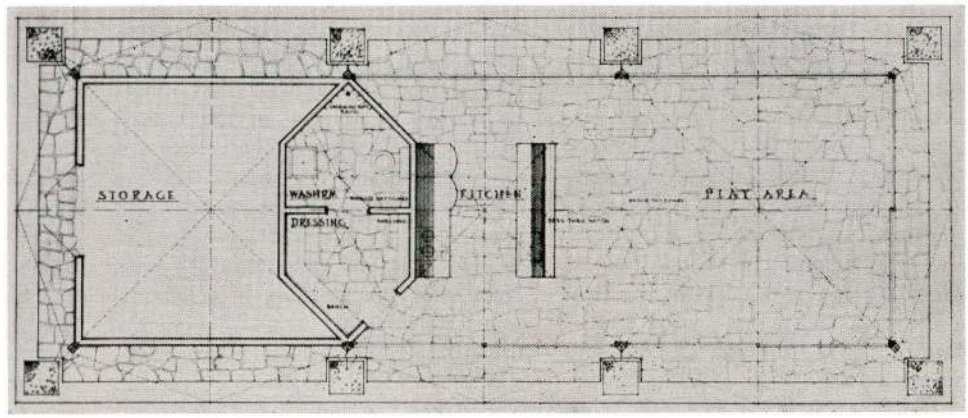


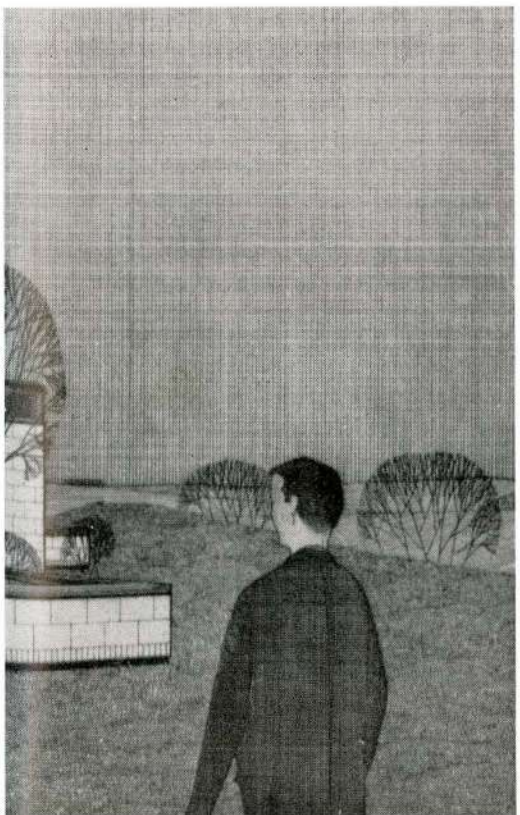
A Studio House for a Bachelor, near Aurora, Ont.

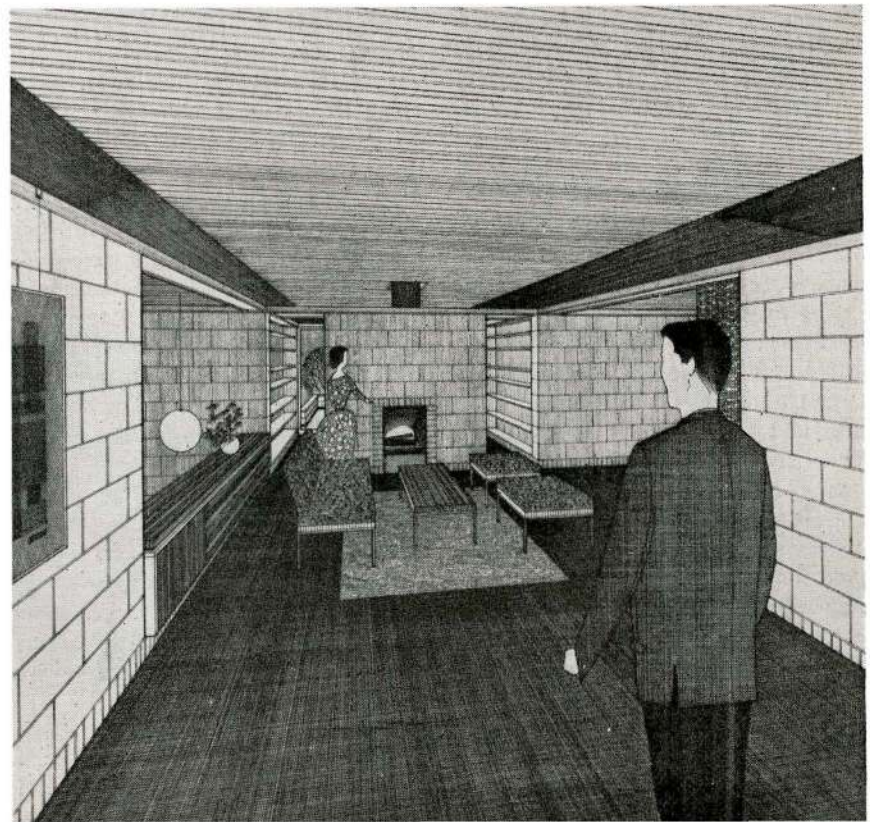




A Cabana on Lake Couchiching







Church Building and Architecture

A TWO DAY CONFERENCE IN VANCOUVER

"The Church, now more than ever, needs the talents of the architect"

THE role of the architect in the design of churches was emphatically reaffirmed during the two day Conference on Church Building and Architecture held in Vancouver last month. In assessing the proceedings, it is impossible to overlook the central feature of the Conference, which appears to over-ride its other accomplishments, that the Church now more than ever needs the talents of the architect. The urgency of this need was repeatedly and forcefully stated by authorities within the Church itself. This point emerged frequently throughout the Conference proceedings, particularly in the keynote speeches delivered on the first day by American visitors Dr Edward S. Frey and Dr Scott T. Ritenour, both of whom are senior officials in the field of church construction in the United States for the Lutheran Church and the National Council of Churches respectively. The point that they constantly made in their formal addresses and in subsequent discussions was that the work of the architect was too often hampered by the inability of church groups to convey their needs clearly and accurately to the architect. While this cannot be construed as a victory for the architects, the Conference undoubtedly succeeded in achieving more widespread awareness and appreciation within this community of the necessity of obtaining professional architectural advice in all phases of the execution of church building programs. Thus the architects can justly claim a major advance in the field of public relations. In a letter to architect participants in the Conference, AIBC President Bill Leithead said: "This Conference was in the highest traditions of good public relations and I trust it will be the forerunner for many similar types of community architecture".

More than 230 delegates representing nine religious denominations registered for the Conference on Monday, May 16th. In addition to more than 50 architects in attendance, others connected with the church included members of building committees, Christian education directors, superintendents, and the clergy, many coming from Vancouver Island and from various points in central and northern B.C.

This Conference was the first of its kind to be held in Canada, although similar conferences have been held in recent years in the United States and in Europe. There seems little doubt that the success of the Vancouver event will prompt future regular meetings of this type, perhaps elsewhere in Canada, as is now customary in the United States. The Vancouver Conference was efficiently organized by a hard-working and energetic committee of fourteen, headed by Vancouver architect F. Walter Scott, and including eight other local architects working in collaboration with church officials. Behind the organizing committee and acting as co-sponsors of the Conference was the Vancouver Council of Churches and the Vancouver Chapter of the Architectural Institute of British Columbia. Vancouver architects played an important part, both in organizing the Conference and as participants in the proceedings.

An excellent exhibition of church projects by local architects was arranged, including drawings and models, examples of church millwork, new materials, stained glass, etc., which attracted the interest of many people throughout the session. Two lengthy bus tours were arranged, each conducted by architects, which gave delegates a glimpse of 19 churches in the greater Vancouver area. Judging by some of the remarks following the tours, this first-hand observation and comparison was an education for the architects as much as for the church people.

It is difficult to establish the specific accomplishments of the Conference: no pronouncements were made, no particular conclusions reached, no startling predictions heard; there was, however, a definite sense of satisfaction amongst all those present that many problems had been aired (if not solved) and that the groundwork was laid for progress at the "working level" between the architect and the building committee. Dr Frey preferred the title "program committee" instead of the more common "building committee", and both he and Dr Ritenour emphasized the significance of the work of this group in the building process.

The frequent lack of communication between the committee and its architect, and between the committee and the congregation which it represents, was cited as the most urgent and difficult problem facing the church in embarking on a building project. Functional needs are more or less easily stated, but needs arising from the manner and spirit of worship of the congregation are less easily translated into architecture. It is here, so the church experts claim, that the ideal collaboration between architect and client breaks down and the resulting building fails in its true purpose, which is "a tool and symbol" for the objectives of the church. Dr Frey put it this way: "A building program is an act of practical theology and is therefore a religious act. Most building programs do not begin on this premise. We must see to it that what we believe gets said in what we build".

Vancouver architect Peter Thornton, well known for his many excellent church designs, echoed these thoughts in his address to the Conference entitled "The Role of the Architect". He confirmed that building committees were often unable to give their architect the right kind of information and guidance and were too inclined to impose preconceived ideas of form and style on the architect. This all too common situation was deplored by several speakers who urged that the architect be given the confidence and support of the congregation and the necessary freedom to enable him to translate the clear and detailed needs of the congregation into a building for worship. Dr Frey said that the argument of tradi-

tional versus contemporary style was "superficial" and that architectural style was a "result" not a "starting point".

The second day of the Conference dealt with more immediate and tangible aspects of the problem of church design. This was particularly true of the three workshop groups which enabled the architects and their "clients" to thresh out many of their difficulties. The writer spoke briefly to the Conference on the subject of acoustics in church design and planning, and in a general way tried to impress his audience that the "auditory aids to worship were no less important than the visual". Professor Ira Robinson of the Department of Community Planning, University of B.C., moderated a very vocal panel of experts who dealt with the position of the church in the community. The experts included a sociologist, a planner and a church official. This discussion ranged far and wide, and was one of the few program items to run overtime, largely due to an enthusiastic response from the floor. It was pointed out that the church is the most "voluntary" of all community institutions, and is therefore in some respects more vulnerable to the numerous problems associated with urban growth and decay in our modern cities. Apparently the church, unlike many other institutions, at present lacks any solid body of evidence or research data which would help to determine its physical and social relationship to the community. The number of churches building gymnasiums, social halls and the like, thus duplicating other similar community facilities, was criticized. The impact of the automobile on church planning, site development, attendance, etc., was briefly discussed. Unfortunately time did not allow these and other similar problems to be adequately covered.

The workshop discussion groups produced some of the more provocative and useful discussions of the entire Conference. In one of the three workshops the subject "Building for Worship" raised the question of architectural style and character in the contemporary church. Some pointed and valuable criticism was directed at the architects for often failing to evoke, through architectural forms and spaces, the "religious feeling". Many people seemed satisfied with the quality of interior spaces but said that external expression was often very weak and seemed to depend on the Cross as a means of identification. Again, the church people themselves were berated for not properly informing the architect of their needs, with the result that the final design is arbitrary and unsure of itself – a reflection of the architect-client relationship.

There was much talk of modern forms and traditional architectural qualities in the Church. Of all the internal spatial qualities, one sensed that the most wanted and admired attribute of the church interior was a sense of upward-seeking space. Someone severly criticized several of the churches he had visited on the tours as having the opposite effect on him, which he felt was opposed to the desired religious response. The Gothic churches were inevitably cited as superb examples of this lofty, strongly vertical, kind of space.

Such was the lively and informal, sometimes awkwardly expressed, but always stimulating discussion of a difficult topic. In some ways these groups were the most meaningful and worthwhile aspect of the Conference.

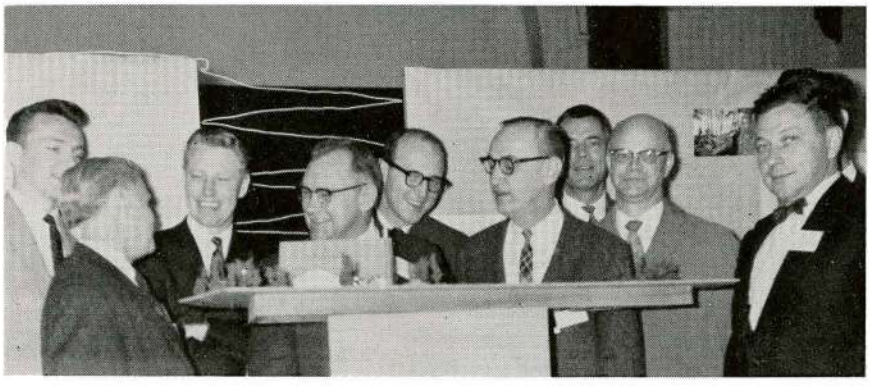
In an excellent luncheon address, Dr J. R. Leng, Secretary of the Committee on Church Architecture of the United Church of Canada, described the present status of church architecture in Canada and indicated the direction which progress must take. He spoke of the "restrictive" factors in church design, and some of them are worthy of note:

1. The ever-present lack of funds.
2. The failure of the architect to recognize his relationship to the congregation and the congregation's failure to recognize its role in communicating its requirements to the architect. A full "reciprocal understanding" of requirements and function is necessary.
3. Church design is suffering from "stereotype-ism". Designs are running to pattern. The architect too often stresses space, or light, or structure, and achieves a "picturesque eclecticism" with repetition of "worn out ideas frequently transplanted from abroad".
4. Planning authorities are dictating to the church.
5. The failure to use good art in church architecture. Art forms are often in poor taste, vulgar and cheap. Hence, we must re-evaluate the role of the artist.

As Dr Frey said in his opening address of the Conference, "Building for the church is an unfamiliar task in our time". In spite of the unprecedented volume of church building in Canada in recent years – Dr Leng estimated $4-5 million in the past 4 or 5 years and predicted an equal expenditure in the next 4 or 5 years – there is ample evidence of a need for careful and searching evaluation of the requirements of the church in the immediate future. The role of such conferences as this, bringing church people and architects together, was enthusiastically stated by all those attending the Vancouver Conference. As Bill Leithead indicated, a similar pattern might well be followed by architects elsewhere in Canada, not only with respect to the Church, but also considering other community institutions such as hospitals and schools.

C. A. Tiers

Left to right: Norman Jones, Prof. John Berry, Pacific University, Portland, Oregon, Bob Harrison, Chairman Vancouver Chapter, AIBC, Rev. Dr. E. S. Frey, F. Walter Scott, Conference Chairman, Dr. Scott T. Ritenour, Douglas H. Miller, Rev. H. West, Prof. Ira Robinson, UBC.



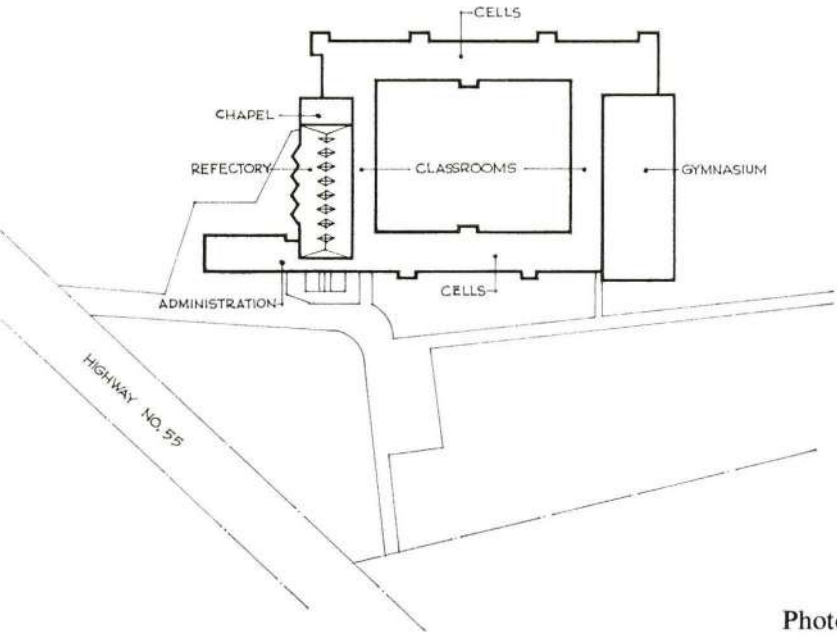
Seminary
Marie-Reine-du-Clergé

St-Jérôme, Lake St John, P.Q.

Architect
Jacques Coutu, Chicoutimi, P.Q.

Engineering Consultants
Structural, Dauphinais & Bélanger
Mechanical, W. J. Mackay
Electrical, Jean-Julien Fortin

General Contractor
Bouchard & Gravel Inc.



THE SEMINARY, designed with a large sheltered rectangular court framed by the classrooms and students' rooms, is located on a beautiful site overlooking Lake St John. Accommodation is for 175 students. Construction is concrete with exposed concrete block partition walls, relieved by small painted and varnished wood surfaces. The gymnasium and other sections devoted to non-study activities are close to the out-door games area of the court. The chapel and refectory are conveniently centralized, while separated from other services. The building is air conditioned and illumination is designed to harmonize with the nature of the building and blend wth the interior shapes and colours.

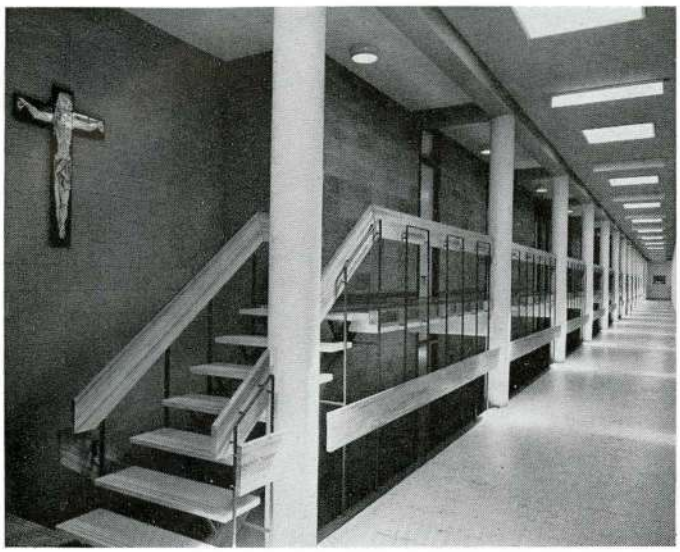
Photos by Narc Ellefsen, Chicoutimi

Left

Main Entrance

Right

Occasional light effect is obtained by maximum lighted sacristy and darkened chapel atmosphere.



Top left

End view of cell wing. Cells are 8′ x 10′. Two storey and split-level arrangement with central corridor gives full use of basement.

Top right

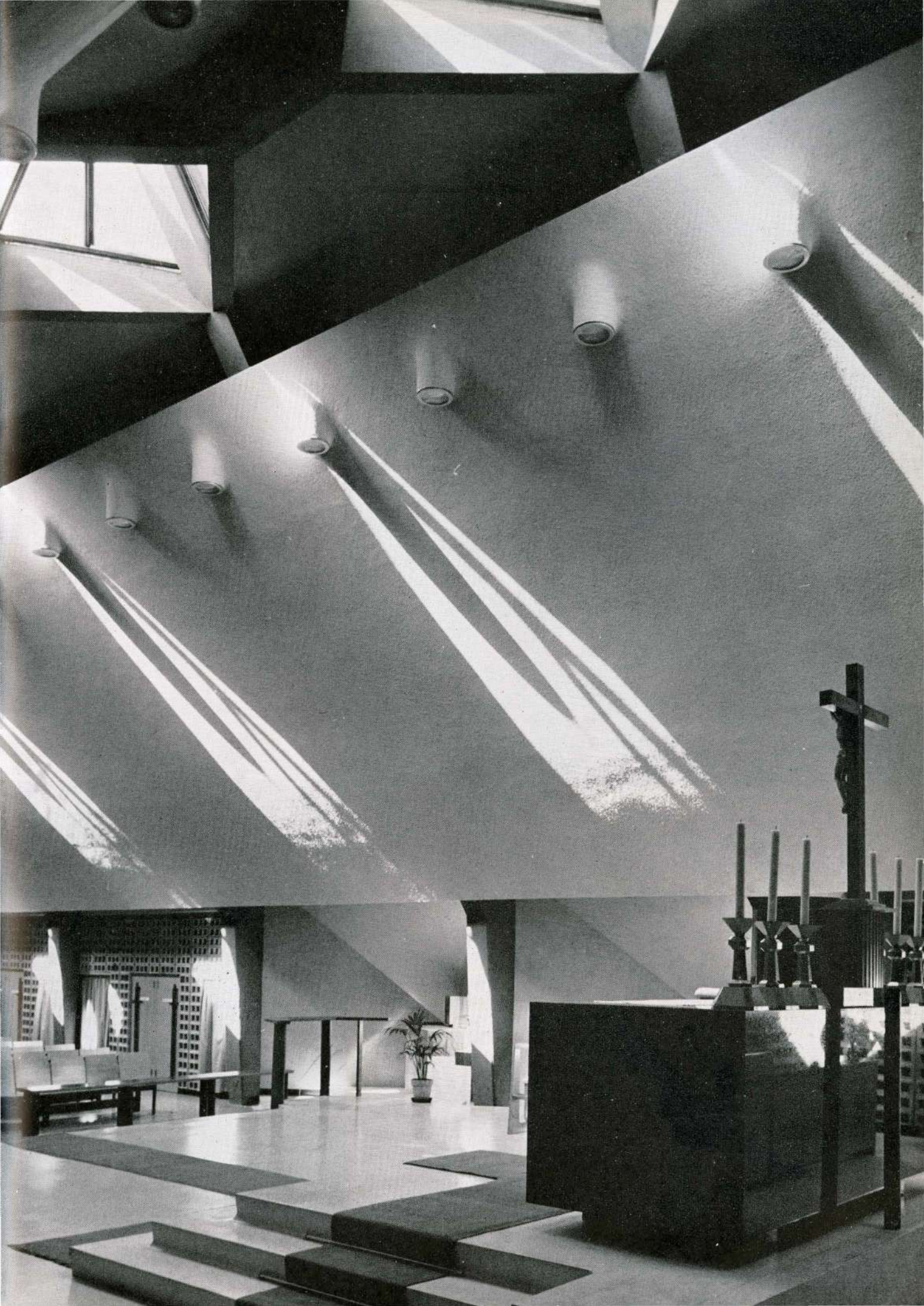
Main entrance hall with view of Lake St John through window.

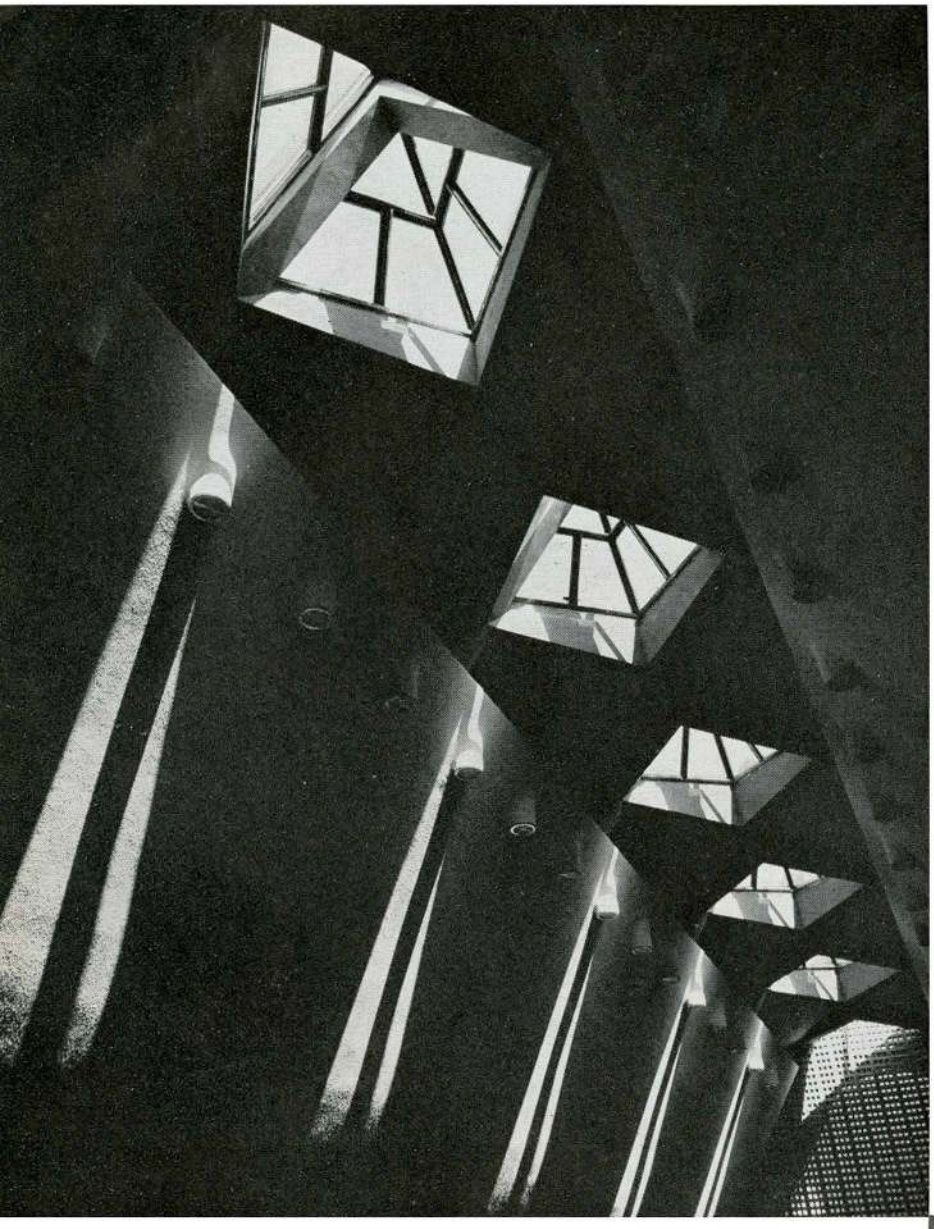
Left

Main entrance and cell wing from exterior terrace overlooking Lake St John.

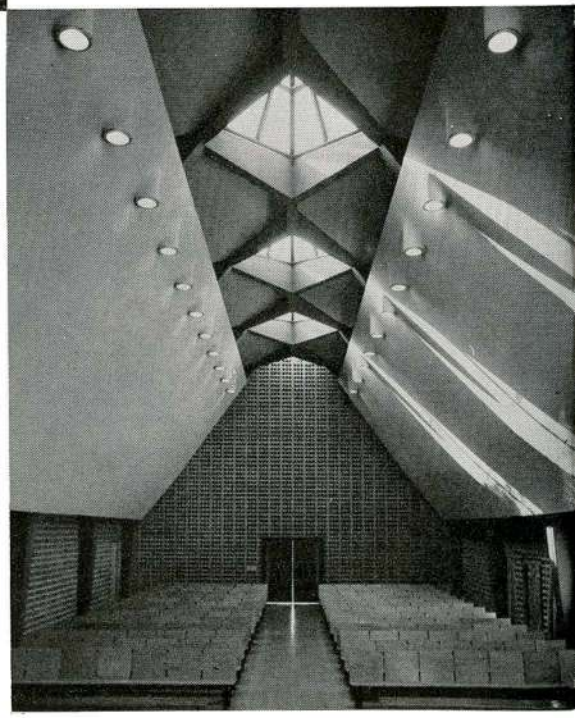
Right

Ceiling is white stucco panel over dark blue-green concrete frame and yellow concrete slab. Confessionals are triangular and in exterior cantilever boxes. Altar is Lake St John brown granite.



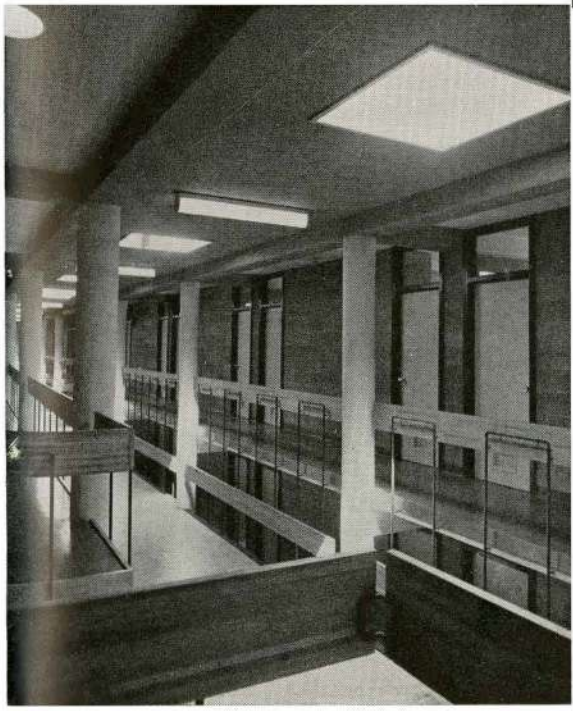


Roof of chapel.



View of rear end of chapel. Organ pipes are located at the back of the concrete block claustra wall, with good acoustical effect.

The Altar



View from top level passage of cell wing.

Structural Sandwich Panels In Housing

by R. E. Platts

Research Officer, Northern Building Section, Division of Building Research, National Research Council, Ottawa.

PREFABRICATION HAS DEVELOPED more rapidly in providing housing for the Canadian North than for the rest of Canada, because of the brief northern construction season and high costs of transportation, labour, and overhead. During the past decade military, governmental, and commercial projects in the North have come to rely on framed stressed skin prefabricated units for almost all housing. Recently structural sandwich types of stressed skin systems have been used in northern housing, and these also show some promise for housing in general, offering maximum strength-to-weight ratios with given materials.

Following the success of sandwich construction in aircraft, beginning with the famous British Mosquito bomber, many American and some Canadian companies have developed and tested sandwich house systems during the last twelve years. Problems of bonding and costs have been common, but some well proven sandwich constructions are reported to have given lower costs than site-built wood-frame housing. The marketing of sandwich constructions is reported to have been restricted by the interpretation of municipal building codes by local inspectors who lack information about sandwich engineering and history. The N.R.C. Division of Building Research is engaged in studies of northern housing and of house prefabrication in general. This work includes an evaluation of the potentialities of sandwich construction and an appraisal of its performance characteristics. It is hoped that the information so far obtained and now reported will assist others in their assessments of sandwich constructions.

THE STRUCTURAL SANDWICH

Structural sandwich construction can provide the maximum strength and rigidity possible in panel form with given materials. The system uses any relatively strong sheet material for "skins", fully bonded to a light "core" which is sandwiched between them. True "stressed skin" action is achieved, with the skins taking the direct stresses as the panel is compressed or flexed, and the core taking the shear and preventing buckling of the skins. Since the load-bearing skins are at the extreme distance from the neutral axis, the sandwich provides the greatest section modulus obtainable from the given skin material, and thus the highest efficiency in either column or beam action.

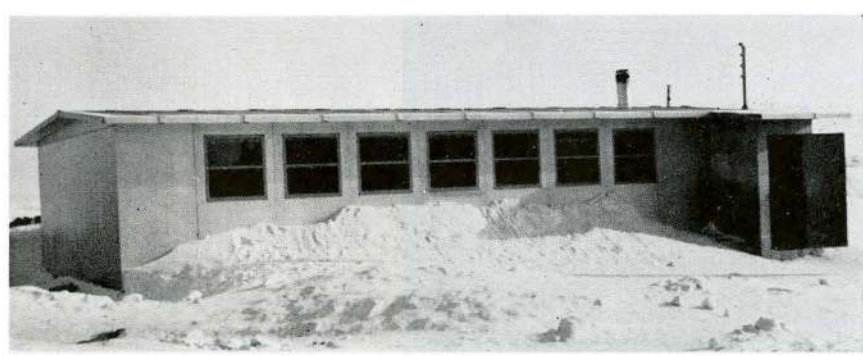
The efficiency of the sandwich action can be shown by considering as an example a sandwich panel 2-in. thick, with ⅛-in. tempered hardboard skins. Weighing only 1.7 lb/sq ft, this panel can be used as a load-bearing wall comparing with conventional stud frame walls weighing over 8 lb/sq ft. Further, such a sandwich can incorporate the necessary wall structure, the interior and exterior finish, vapour barrier and thermal insulation in one unit using just three materials. The conventional frame wall may use an assembly of nine separate materials for the same functions. In bending, a 4-in. thick sandwich with ¼-in. plywood skins can span 12 ft and carry 50 psf with a deflection of less than 1/300 of the span. Much less wasteful use of resources is clearly possible with sandwich construction. Materials, production techniques, and applications are already well developed.

MATERIALS

Skins

The structural performance of the sandwich depends on the three components – skins, cores, and adhesives; failure in any one means failure of the whole. The choice of materials is of vital importance. Skins for structural sandwich manufacture can be one of several proven sheet materials that have been developed in the past three decades. Exterior grade plywoods have remained to the fore in stressed skin and sandwich applications. Usual thickness is ¼-in. but kraft overlaid plywoods and single veneers ⅛-in. thick have been successfully used. Dimensional stability is good. Surface grain checking presents maintenance problems, but scored or overlaid surfaces go far to correct this difficulty. Oil-treated hardboards ⅛ to ¼-in. thick are often used as sandwich skins, giving fair dimensional stability, strength, and a good painting or coating surface. Their low elastic modulus makes them more applicable as wall panels than as panels in bending.

Sheet aluminum is being increasingly used in sandwiches, in thicknesses of 1/50-in. and more. Hardboard backings between aluminum skins and the core are usually necessary to improve dent resistance. Acrylic lacquers, chemical treatments, colour anodizing and baked vinyl coatings are used for



COURTESY DBR, NRC

Northern Sandwich Panel School

colouring the skins. Stainless steels, porcelainized steels, and asbestos boards form sandwich skins for curtain wall construction.

Paper plastics—high pressure laminates of phenolic impregnated krafts—are proving promising as sandwich skins. Some developers in the southern United States are reported to offer these materials at prices lower than hardboards. Their modulus and dimensional stability are reported to compare with tempered hardboards; strengths are higher. Fibre-reinforced plastics are used in some sandwich panels. They can provide compound curved surfaces and meet wide design variations, but costs are usually too high for housing panels. Reinforcing fibres are glass, synthetic fibres, asbestos, jute, sisal; these are bonded and coated with polyester or epoxy resins. Working stresses can be 20,000 to 30,000 psi, at only one quarter the weight of steel.

Adhesives

Adhesives have held the key to most sandwich panel advances. In general, animal and vegetable glues are too prone to moisture attack to be suitable for structural sandwich use. The development of plastic resin adhesives has, however, allowed the development of structural sandwiches as dependable building systems. The phenol formaldehydes are the oldest and remain one of the most common waterproof structural adhesives for woods. They need high temperatures and pressures for thermosetting, however, and this rules out their use with many sandwich core materials. Resorcinal formaldehyde is equally waterproof, can cure at room temperatures, but is usually higher in cost. It is often used to modify phenolics for wood-skinned sandwiches. Urea formaldehydes are inexpensive but not totally waterproof; they are sometimes used in well protected panels. Like all thermosetting plastics, these adhesives are relatively free from creep tendencies.

Metal skins can be strongly bonded with the new epoxy resins. Flexibility of the bond is poor, and nitrile rubbers or vinyls are used as elastomers to modify the epoxies and phenolics in order to give a strong and more resilient bond. Shear strengths up to 5,000 psi can be obtained. Curing time is slow; at least one half to one hour is needed, so production speed is limited.

Increasingly used as structural sandwich adhesives are the neoprene-phenolic rubber-resins, which are water resistant, resilient, and combine the lowest structural adhesive cost with ease of high speed panel fabrication. They will bond metals, hardboards, and other skins to most core materials, and can be free from shear creep at most sandwich stress levels. Their initial pressure-sensitive tack, followed by age thermosetting, allows very fast pinch-roll panel production.

Cores

Core materials should be lightweight and yet have the strength and modulus necessary to stabilize the faces and to carry the distributed shear loads. Paper honeycomb cores have been thoroughly investigated and developed, and offer a wide range of design features as well as good dependability. These cores are usually made up of kraft paper strips bonded together to form polygonal cells normal to the plane of the sandwich, closely resembling a true honeycomb. The paper is nearly always impregnated with phenolic or sometimes polyester plastic resins, giving it good wet strength and resistance to rot or fungus. Strength/weight ratio is very high; creep tendencies are small; cost is reasonable. Because the thermal insulation provided by honeycomb oriented normal to the panel plane is only fair (k value over 0.45)*, expanded plastics, silica, or micas are sometimes used to fill the honeycomb cells to provide better insulation. Disadvantages of the honeycomb are adhesion difficulties and their lack of support against local denting or puncturing of skins. Since only thin paper edges are usually in contact with the skins, the area of bond of core-to-skin is small. Adhesives must be chosen that will wet out and "fillet" at the junction of paper and skin in order to effectively increase the bond area.

**The "k value" is the coefficient of thermal conductivity expressed in Btu/sq ft/hr/in. of thickness. The usual range of k for insulating materials is 0.25 to 0.35, with the lower numbers indicating better insulating ability.*

If mechanical properties only are to be considered, balsa wood is one of the best low density sandwich cores. Its high variability in properties and defects, however, calls for careful inspection and more than half is usually rejected before fabrication. Foamed plastics offer versatility and low cost but have some disadvantages. Foamed polystyrenes are the least expensive and most commonly used. The extruded foam polystyrenes have generally given way to the bead foam types; these are available in larger boards or

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Closing in Stressed Skin Northern House

can be foamed in the mold. The biggest advantages of the foamed polystyrenes are their high strength/weight ratio, resiliency, excellent thermal insulation, and high resistance to water vapour transmission and water absorption. Their disadvantages are due to their being thermoplastics: their strength properties decrease with higher temperatures, becoming very poor above 180°F., and they are subject to creep. The creep problem does not usually affect panels in column loading, and shear creep in panels in bending has been effectively limited by light wood edge frames used as shear webs. Potentially, the foamed polystyrenes allow economic sandwich fabrication even at fairly low production volume, requiring inexpensive low-pressure low-temperature bending, and offering foaming-in-mold to any shape. K values are about 0.24.

Polyurethane foams are promising materials for sandwich cores. They offer foaming-in-mold between skins, and often need no adhesives, themselves bonding to many skin materials. They allow higher strength and elasticity modulus than the polystyrenes, but cost almost twice as much. Closed cell polyurethanes, which give lower water absorption and water vapour transmission, have been developed only recently. Since the polyurethanes are thermosetting foams, they are stable at high temperatures and can be free from creep. Recent developments with inert gas-blown polyurethanes have achieved k values as low as 0.12. Usual polyurethanes give k values of about 0.24.

Other sandwich core materials have special uses which are limited by their high cost and fabrication difficulties. Foam glass, foam phenolics, and calcium silicates are used in sandwich panels that require higher fire ratings, but these foams are too brittle to allow some skins to be stressed under load without core fracture. The use of resilient adhesives to overcome this disadvantage usually offsets the fire-resistant advantages of the core itself.

SANDWICH PANEL DESIGN

These are the materials usually used in structural sandwiches for housing. Structural sandwich panels may be designed with them for almost any given application, by choosing the materials according to their separate and combined properties. Skins are chosen to take the required loads within given deflection limits, and to withstand environmental conditions. Cores must provide the strength and elasticity to stabilize the skins and to carry shear stresses, as well as to furnish thermal insulation and vapour resistance as needed. Adhesives must bond the whole panel and maintain the bond under all expected conditions for a dependable service life.

Sandwich design parallels beam or column design to some extent, with the skins representing the flanges and the core representing the web of an "I" beam or "H" column. Considerations of the elastic stability of skin and core and the effects of shear distortion of the core become rigorous in exact sandwich design, and simple approximate methods are usually used, followed by tests on mock-up panels. Many types of structural sandwich panels have been subjected to a considerable program of severe laboratory testing. Some very light sandwich constructions have now given over twelve years of service as complete house shells, with no defects reported.

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Wall Assembly of Sandwich Northern Unit

FACTORS IN SANDWICH SUITABILITY

Four service factors become more important in sandwich design than in conventional practice and only full consideration of these factors will permit dependable sandwich panel house design. These factors are – condensation within the panel, differential movement of the skins, sound transmission, and fire resistance.

The sandwich inherently forms a vapour trap between inner and outer skins, since the skins themselves, the finish coating, or the adhesive layers usually form vapour barriers of about equal permeance on both panel surfaces. Accordingly, condensation control in sandwich construction usually involves minimizing rather than preventing condensation within the panel, so that the amount of winter condensate is kept within limits and can be removed in summer drying. Low permeance skins and cores are desirable, and the joint details should be carefully designed to provide good sealing on the inside and adequate "breathing" to the outside.

Differential dimensional change of sandwich skins can produce bowing in the same manner as bimetallic strip curling. Because the skins are an appreciable distance apart and continuously supported, the bowing is not usually critical except in the initial erection of the panels. The panel will bow in a smooth undistorted compound curve; the core will prevent skin "oil-canning" or other unsightly wrinkling. As an example, an aluminum skinned sandwich 4 ft square and 3-in. thick, will bow smoothly about ¼-in. when the skin temperatures are 100°F apart. At this extreme condition, the deflection/span ratio is only about 1/200 and is in no way unsightly.

With skins of most fibrous materials, bowing can result from unequal skin movement caused by unequal skin moisture contents. Surface coatings on fibreboards or "hardboard" do not affect their final equilibrium moisture contents at given humidities, but coatings greatly change their rate of moisture absorption, to the point where weeks of wetting may be required to cause troublesome moisture contents. Impregnants – oils or resins that "wet out" the fibrous boards – can reduce the moisture-absorbing capacity of fibreboards to some extent, allowing decreased equilibrium moisture contents and greatly decreasing the rate of dimensional change.

High sound transmission can be a problem in a sandwich house: the lightweight panels are not as effective

as heavier panels in reducing sound transmission. Resilient floorings or carpets and sound absorptive surfaces can be used to reduce the over-all noise level. Tight door seals, storage areas arranged between living and sleeping areas, and other means can reduce the sound transmission.

Fire safety will be less than that of plastered conventional construction. Although flame spread will depend on the choice of skin and finish (as in any panel) the question of fire resistance is very important in sandwich design, especially if heat softening cores such as thermoplastics are used without reinforcement. Other core materials give fair heat resistance. The thermoplastics themselves can be satisfactory for housing use, if panel edge frames are used to maintain adequate stressed skin strengths in the wall, floor, or roof panels for reasonable times when exposed to fires. This solution is practicable and inexpensive.

JOINT DESIGN

The success of any panel assembly depends directly on the joint design. Panel joints must satisfy many requirements, including the most difficult one of simplicity. The joint should provide for alignment of bowed panels during assembly and maintain the alignment during subsequent movement. Thermal bridging should be avoided. Joint sealing should restrict vapour penetration from the inside and wind and rain penetration from the outside. Racking resistance must be adequate, assembly should be simple and rapid, and sometimes subsequent disassembly must be practicable.

To provide positive panel alignment, joint details are usually variations of tongue and groove, spline, offset lap, or batten types. Joints often incorporate compressible gaskets of synthetic elastomers in order to allow wide assembly and service tolerances and to provide good sealing. Mechanical fasteners are designed to compress these gaskets during the assembly of the panels. The fasteners can be nails or screws, but are usually bolts, inset cam hooks, or wedge-locked pins.

Where desirable, true continuous joints can be provided only by adhesives. Structural adhesives used for this purpose are the synthetic resins discussed previously. They must, of course, be catalyzed to cure at 70°F or less, and must usually be good gap fillers to perform satisfactorily under rough field application conditions. Portable radio frequency units are now used to "field cure" some adhesives. Final joint treatment entails protecting the raw skin edges and sometimes the application of coverings to accent the joints. Battens have traditionally been used but pressure-sensitive plastic or aluminum tapes are now being used with reported success.

SOME STRUCTURAL SANDWICH COSTS

The final and dominant criterion in evaluating new house shell systems is that of cost. Can their present or potential costs compete with conventional structures, which use the cheapest available materials, to provide reasonably low first costs? Reported costs of several proven sandwich panels are lower than the cost of corresponding conventional wood-frame house shells; potential costs should be considerably lower.

Perhaps the best known sandwich is the now common flush door, with wood veneer skins on paper honeycomb or wood grid cores; these retail at from 40 to 50¢ per square foot. Adding an insulating core and allowing for finishing costs indicates a sandwich wall panel cost of under 65¢ per square foot. Some builders in the southern United States use 8-ft high flush doors to form a complete house shell, and they report considerable savings. More significantly, in a recent sandwich house development, a large American prefabricator has estimated a cost in place of 80¢ per square foot for his panels. A Canadian prefabricator estimates his prototype sandwich panels in place at two-thirds the cost of conventional frame walls. Recent development in cores and adhesives should result in still lower panel costs.

POTENTIAL DEVELOPMENTS

Sandwich construction offers the advantages of reduced shop labour, reduced and simplified materials handling, and potentially lower costs to the house manufacturer, with the disadvantages of much more critical shop control and testing requirements. These advantages and those of reduced weight and transportation costs (a sandwich house can weigh less than one-third as much as a conventional wood-frame house) will mean that advances in sandwich housing will come mainly through the house manufacturer or prefabricator. Progress in house construction advances slowly, partly due to the complexity of the industry, its financing and marketing, and partly due to the restrictive effect of the many varied municipal building by-laws. Activity in sandwich production, testing and application is increasing, however, and as information on durability and suitability becomes better known, sandwich housing may well earn a larger share of the Canadian market.

Elliot Plaza

A Shopping Centre at Elliot Lake, Ont.

Architect
Jerome Markson

Assistant Architect
Gaston Korulis

Structural, Robert Halsall

Heating, Fred Taylor

Plumbing and Electrical, J. H. Ross & Associates

Builder, Woodview Development Ltd

Photos by Max Fleet

Construction is exposed steel frame with glazed brick or stucco panels on the first floor, and asbestos panels painted royal blue on the second floor. The basement is only partially excavated because of the high cost of blasting solid rock, upon which the building is placed.

The building is sited at one end of a central shopping area which is composed of a ring of stores and other buildings around the perimeter of a large parking space.

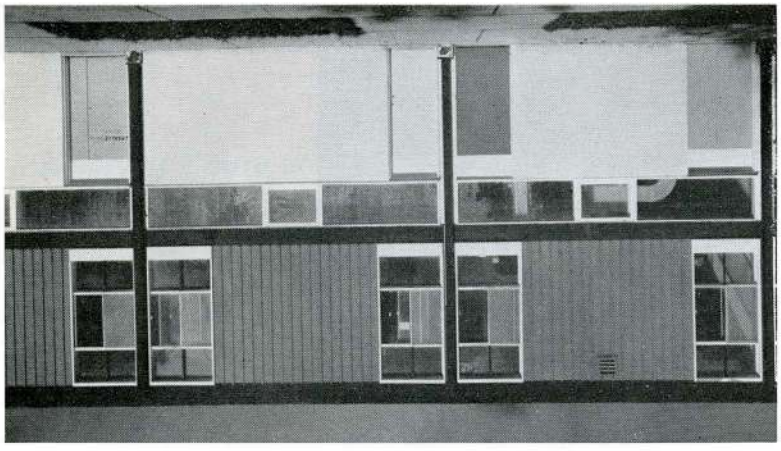
Cost was slightly inflated due to the relative remoteness of the town site and the high cost of blasting.

The fact that many of the buildings in the commercial centre are of varying sizes, heights, and generally broken up in appearance suggested a simple repetitive unit.

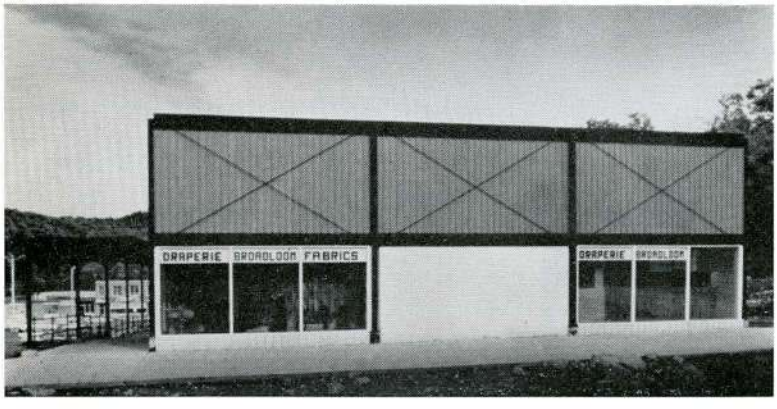
Night

Under the Canopy

Day



Rear Elevation



End Elevation

Entry to Two Storey Office Section

Design, Durability and Workmanship

"Quality in Building: How Does One Get It"

AN ADDRESS BY W. G. RAYMORE AT THE ANNUAL MEETING OF THE ONTARIO ASSOCIATION OF ARCHITECTS

MAY I SAY how honoured I am to be asked to speak at this luncheon. At the outset I want to comment on the presence of so many of the ladies, who lighten and enhance what would otherwise be another bull-session of the building team. I feel disposed to present my apologies to you, ladies, for speaking on so mundane a subject as that advertised. I would rather, at your command, do verbal battle with the House of Dior for its latest indignity offered to womankind, and in so doing assure you of the grave concern of the gentlemen here with this matter, among whom the architects especially are dedicated to the preservation of the natural amenities in our physical environment. As one of those who deal in specifications, I would be pleased to hurl in the teeth of M. Yves St Laurent, the master of Dior, the best known specification in the world of haute couture – 35-21-35, one specification which has never been accused of ambiguity in any court of law! However, there is some suggestion that I speak a language that is well known to another large group of guests of this luncheon – the exhibitors, on whom we lean so heavily for the consummation of our works of art. And this is why, in part, Quality in Building – and how one gets it – is to occupy us for a short space of time.

The trouble in trying to be serious about anything after lunch has been crisply stated by Oscar Wilde, who said that "after a good dinner, one can forgive anybody, even one's relatives". In the building industry forgiveness, is, unfortunately, something that should be dispensed with caution, since it is seldom mentioned in the contract.

Shortly after I said I would speak on the topic of "Quality in Building", I was interested, and a little bemused, to review some chapters in the book entitled *The Canadian Construction Industry,* which appeared as part of the report of the Royal Commission on Canada's Economic Prospects. The book was compiled by earnest, hardworking people of the head office staff of the Royal Bank of Canada with the assistance, they said, of personnel in various branches and supervisory departments across the country. At least two rather remarkable statements having a bearing on our topic are contained therein. I quote: "The question of the quality of the product produced by the Canadian construction industry is difficult to assess and we have made no attempt to evaluate this rather nebulous subject".

I imagine it may come as something of a shock to us as architects, who are charged with the regular supervision and inspection of work at the site, to know that what we have been looking for has been a nebulous thing that has little, if any, substance and reality. But let us proceed; there is more in a similar vein. I quote again: "We uncovered no general or wide-spread complaints about the quality of non-residential construction put in place since 1945".

It is not remarkable, it seems to me, that bankers and bankers' assistants should have failed to uncover any complaints about building quality in the non-residential building field. After all, one has to know *what* to look for, as well as *where* to find it. If there were complaints, they were made long before the gatherers of statistics appeared on the scene; they were made in fact, at the time the designers and supervisors of the construction program were doing their job, whether they were architects, contractors' superintendents, or foremen. Because the quoted portions of the Report speak comfortably to the Canadian people on the subject of building quality is no reason why any of us can afford to relax our vigilance in this important part of an architect's work.

What are the dimensions of quality in building? I ask the question, believing that there is nothing nebulous about quality, the Royal Commission's report notwithstanding. I suggest for your consideration at least three elements; namely, *design, durability,* and *workmanship.* These interlink and interfuse one another, but each may be viewed separately, I think, with profit.

There are few who will deny that we as architects are best able to impart to buildings that frequently-elusive quality, Delight. True, some of our self-appointed critics among the public think of us as aloof and unknowable highbrows, defining the term "highbrow" in much the same way as A.P. Herbert did – namely, "one who looks at a sausage and thinks of Picasso". As architects we are alleged to look at a goldfish in a bowl and think of a client!

The point of view on architectural quality obviously varies with person, time, and place – as for instance in the matter of "togetherness". In the subway it is called congestion and overcrowding; on a night club dance floor it is called the intimate touch, and the public pays handsomely for it. Nonetheless most people will admit, if pressed, that they have not given much thought to Architecture, and that they are willing to give the architect a chance to speak his piece, and to attempt to understand him. This aspect of architectural quality in design we shall not dwell upon at length, for we do not have the time. But there is another dimension of design for which we are responsible as architects, and which we cannot by-pass. I refer to that form of design in which we select materials and put them together to achieve our purposes, aesthetic and practical, a task that deserves no less care than our pursuit of Delight.

When we brought the outdoors to the inside of our buildings, or pushed elements formerly found on the inside to a new position on the exterior; when we raised our buildings off the ground on stilts, or pushed them farther into the ground or higher into the sky, we added new problems in their assembly for which historical building cannot furnish answers. I am convinced that the introduction of a single new factor, either of material use, an environmental element such as temperature or moisture, or a difference of the habits of the occupants, involves us as designers in a cycle of analysis and research, testing and appraisal that goes far beyond our commitments as designers – let us say – twenty-

five years ago. This is a challenge to all segments of the building industry, but exceptionally so to the architect, for it is with him that the idea originates. One can hardly say that there has been complete success in this field of design, and that the battle of modern architecture has been fought and won on this front.

The second aspect of Quality in Building must surely be *durability*. There are few architects, constructors, or clients who do not instinctively desire that their buildings should outlast them by many years, and in the case of the owner, an additional hope that the first cost will be the last substantial charge against his pocketbook. Not even the specious arguments for early obsolescence, an idea having some currency in varying forms over the last twenty-five years, can erase the conviction that the huge capital expenditures in construction estimated to approach 7½ billion dollars in Canada in 1960, is a charge that society can bear only if our buildings pay their way for many years to come. There is nothing in the past to suggest that we may discard them quickly as an old garment, nor that society can afford, or will be prepared to give, a larger proportion of its accumulated capital to building.

In spite of our desire for durability and permanency one cannot quickly forget the words of Lord Bryce on his first visit to Manhattan in reply to the official greeter who, in showing him the mushrooming skyline announced excitedly, "And they say it will last for centuries", to which the scholarly but absent-minded (or hard-of-hearing) ambassador murmured, "What a pity"! As a comment on undisciplined urbanism his Excellency's remark may prove to be too true to be good.

I have listed *workmanship* as the third ingredient of quality in construction, and, in what is alleged to be a machine age, I would include both craftsmanship of the hand and of the machine. It is hardly likely that the content of the term workmanship will be the same for the architect, the mechanic, and the consumer. There will be a heavy overtone of the aesthetic in it for the architect, to the good workman some sense of accomplishment, and to the client the pride of ownership probably submerging more worthy feelings. All three of these will agree however, that the work should look as if it had been conceived with intelligence and even feeling, and executed with care. This does not inevitably mean the slickness of stainless steel on the one hand, or the subtlety of hand-carved wood on the other. It means simply that all who had a part in the design, production, and manipulation of the material have combined to produce something that can give to each a feeling of satisfaction, that the recognized highest standards of the trade involved have been maintained, that there is nothing skimped, shoddy, or unfinished.

I think that we might ask ourselves at this point: "What are the conditions of present day building that militate against the accomplishment of these objectives – good design, durability, and workmanship." To anyone familiar with the composition of the industry and its operation in shop and field these seem to be obvious weaknesses:

First – The ready access of individuals to the various trades as workmen, in too many cases without prior training. In this connection one is not reassured, in our search for quality, by the reported address to the Canadian Construction Association last month in Calgary by a Federal Department of Labour official who said that more young men are entering construction trades today by the back door than through the front door of apprenticeship training. There must be a great more to making a building mechanic than carrying a box of tools and a union card.

The second disquieting condition is the apparent ease with which foremen, contractors' superintendents, or others without any building experience whatever, but with a little capital, may suddenly appear as entrepreneurs in the contracting field, and one must add, as suddenly disappear in insolvency leaving behind a trail of unfinished construction and sadder and, one would hope, wiser creditors, architects, and owners.

Thirdly, there is the intensive competition among bidders and their sub-contractors for building contracts. Competition has been cited regularly as the great stimulator, and the producer of efficiency of operation in the commercial and industrial world, but we must realize clearly that competition in price is present only when values in quality are comparable. We must realize also that contracts won at the expense of the contractor's profit can result only in a cutting of the building's quality below that contemplated by the drawings and specifications. As a result, the price set on each unit of work in the field or in the shop is so low as to require a cut-back in time and material quality. Under these conditions there are few real bargains in the true sense of that word for the owner in building construction, and the architect should not hesitate to tell him so. In our hope to offset the effects of these unhealthy conditions I have no illusions that we shall change human nature by our admonitions, or that we should if we could alter the bases of operation of free enterprise in the building field. Whatever we do to realize the quality in our buildings that we desire will be done in spite of these adverse conditions.

What to do? The methods are clear, I think, though the end by no means simple to achieve. They are, to state clearly what we want on behalf of the client, and *then see that he gets it*. The first has to do with a clear and unequivocal statement in the drawings and specifications, and the second means adequate supervision at *every* level of responsibility in the building team.

I do not intend to say anything about the drawings, for in spite of occasional mutterings from some people who use them, I think we do them rather well, so far as making our statement is concerned. But for specifications, the mutterings sometimes develop into a small-sized roar. Although we speak fairly intelligible English, our pens at times appear to lack the same fluency – if we can believe our readers.

We need to define standards of quality in materials and the ways of putting them together, and we have some of these standards, of course, from the Canadian Standards Association, a great many more from the American Society for Testing Materials and also from the Canadian Government Specification Board, the U.S. Federal Specifications and others. I want to digress for a moment, if I may, to suggest to the ladies, who are having rather a dull time, that they also may read some of these with profit. For instance the CGSB list includes specs for (of all things) beef kidneys, hot water bottles, and cranberry sauce; the U.S. Federal list shows gingham, ready-to-cook rabbits, and – applesauce! And both governments play it with a straight face, the reason being that specifications must exist for practically anything these governments buy.

When one thinks of writing specifications for the myriad materials of the building industry, the prospect is appalling. Yet anyone who has tried to describe clearly and without ambiguity even the simplest of these materials and the manner in which it should be used, and who has followed his specification into the field, must realize the urgency in fulfilling this part of the architect's work. So urgent indeed has been the need to take counsel together on this matter that the problem has been met recently by the only reasonable way in which a solution could be found for it, namely the formu-

lation of specifications by the collective efforts of all elements of the building fraternity – architects, engineers, general and sub-contractors, fabricators, and material producers. As you are doubtless aware, this organization is the Specification Writers Association of Canada, paralleling the Construction Specifications Institute in the United States. The SWA is now six years old, has over 500 members in Chapters in Toronto, Montreal and Ottawa, with expectations for Hamilton and London. Its purpose is to consider the means of classifying materials as to quality, to determine what are the acceptable standards of their use by the trades concerned, and to incorporate these quality standards in specifications, which, it is hoped, will be as free of faults as it is possible for fallible human beings to make them. Recognizing that few can have both exceptional depth and breadth of competence in the technology of building, the SWA has sought out those persons who have through training and experience indicated the greatest awareness in their field, and drawn heavily on their knowledge.

The interdependence of the elements of the building team is no better shown than in our reliance as architects on primary material suppliers, and on the ingenuity of fabricators who use these primary materials to evolve new building components. It is obvious that all the efforts to produce new materials or new ways to use them are not likely to be successful, but each architect here cannot but be appreciative of the enterprise and hard coin of the realm that goes into these efforts by forward-looking producers.

An example of the urge to advance technology in a single field is that of the glass industry. Those architects who have clients, such as school boards who clamour to have the room conditions behind their great expanses of glass made livable, are glad to know that the producers are hard at work to evolve a glass that will, by internal chemical change, reduce heat gain and glare as the need arises. Whatever may be the current status of the idea of "togetherness" in the world, there is little doubt that variants of it are now being practised profitably by the units of the building industry.

Discussions continue between the CCA and the RAIC on the Standard Documents. The OAA and the Specification Writers Association have a joint-committee to consider if the setting up of a testing authority is feasible for the products we use. A more recently formed joint-committee of the RAIC and CAA is considering the manner in which the program now pursued in the United States by the Producers' Council may be made effective in Canada. The committee's investigations will cover sales instruction to representatives of producers, the furnishing of visual aids to all who can or will use them, and an inquiry into the best way to make the producers' literature of maximum value. All of these combined operations are evidence of a realization that no segment of the building construction field lives unto itself, or can afford to do so.

After we have written the perfect set of specifications, perfect in its clarity and completeness, and accompanied by drawings of the world's most exciting building, we are only half-way through our problem. The trial of strength is now transferred from the office to the field. Until drawings and specifications have reached their final test and confirmation in supervision, the job is not finished. I know of nothing more difficult or wearing than supervision in the field, unless it be trying to capture clients. The explicit instructions that we hand out in drawings and specifications must be underlined in our regular appearance on the site. The business of giving and receiving instructions must seem to be a one-way street to the contractor and his subs, who are usually on the receiving end (but not always!). And of course we must do it with all the skills of diplomacy, which has been defined as "the art of letting someone else have your way".

Out of what is the trying experience of supervision at the site, nonetheless frequently come heartening episodes to lift the spirit. There are usually enough tradesmen who know where they are going, and plug ahead doggedly in spite of minor discouragements, including the architect's visits. I have been heartened to find representatives of material producers on the job prior to installation to make tests beyond those called for, and to add their supervision to my own. I have been heartened also by the casual remark of these same producers that the year's guarantee means nothing to them; for, if their product has been properly installed and still fails, they are quite prepared to replace it two, three, or more years after completion. These people are obviously in business with the intention of staying there, and I submit, my brethren, that they are the kind of people that should be encouraged at every possible turn, for we and our clients need this type of ally.

I do not want anyone to think that I have drawn here a picture of the typical job, for we have our disappointments, but a good luncheon has, as Oscar Wilde suggested, drawn some of the sting out of my words, and if I can't forgive some people, I can at least ignore them for the moment.

In the organized eavesdropping that I practise on the building industry in the name of architectural research, I frequently stumble on what appears to be profound truth on building policy. Where these pearls are not forthcoming naturally, I sometimes, by questioning, irritate the oyster into disgorging his treasure. Most of these pearls of advice to architects are given in hope, sometimes in sorrow, rarely in anger, and I am going to pass some on to you as a means whereby we may see ourselves as others see us.

This came from a sub-contractor:

"Inspection must be done thoroughly and conscientiously by the architect to the best of his ability. Any relaxation of quality standards in what is accepted in the field, no matter how innocently done, deals a blow at the cause of fair pricing and fair bidding, for subs or generals do not forget!

From a general contractor:

"Competition is said to weed out the weak and incompetent. This is true in bidding only if everyone bids on the same interpretation of the documents, and with the intention of giving what is asked for. If you want to keep honest men in business as contractors, say what you want clearly, and see to it, as far as you are able, that all successful bidders are compelled to honour their obligations to the last letter of the contract."

And from another source:

"There is no difficulty in our present way of working together that cannot be solved by men of good will. There is every need, however, for all honest men in the building industry to close ranks, if from no higher motive than that of ensuring their own economic survival."

I particularly like the last one given – probably because I agree with G. B. Shaw that quoting oneself adds spice to the conversation!

And so, after the smoke has blown away, and the shouting subsides, there remain – good design, good material, good workmanship – these three; but the most important element of each is the integrity of the performer.

Ottawa Builders' Exchange

RESULTS OF THE COMPETITION FOR A NEW OFFICE BUILDING

Peter Dickinson Associates, Toronto, Ottawa and Montreal have won the competition for an office building in the National Capital for the Ottawa Builders' Exchange. Second Prize was won by Balharrie, Helmer and Morin of Ottawa and an honorable mention was awarded to Schoeler and Barkham of Ottawa. The competition was open to architects maintaining an office in Ottawa and Hull.

The Board of Assessors was as follows: H. Gordon Hughes, Chairman; Cliff Alexander, President, Ottawa Builders' Exchange; Ian B. MacLennan, Arthur H. Taylor and C. Maxwell Taylor, who was also Professional Adviser.

Report of the Jury

The response to the competition was most gratifying, with 29 entries of which the majority were of a high calibre.

In arriving at its decision the Jury considered the problem included the definite possibility that high buildings might be built on either side up to the lot line, and those entries that attempted a solution emphasizing side lighting and concerned themselves unduly with developing a long narrow building, set themselves a difficult task. Careful consideration was given to the adequate handling of the parking problem on a long narrow site, and any solution that provided the client with the maximum width of building and consequently maximum parking space was a serious contender.

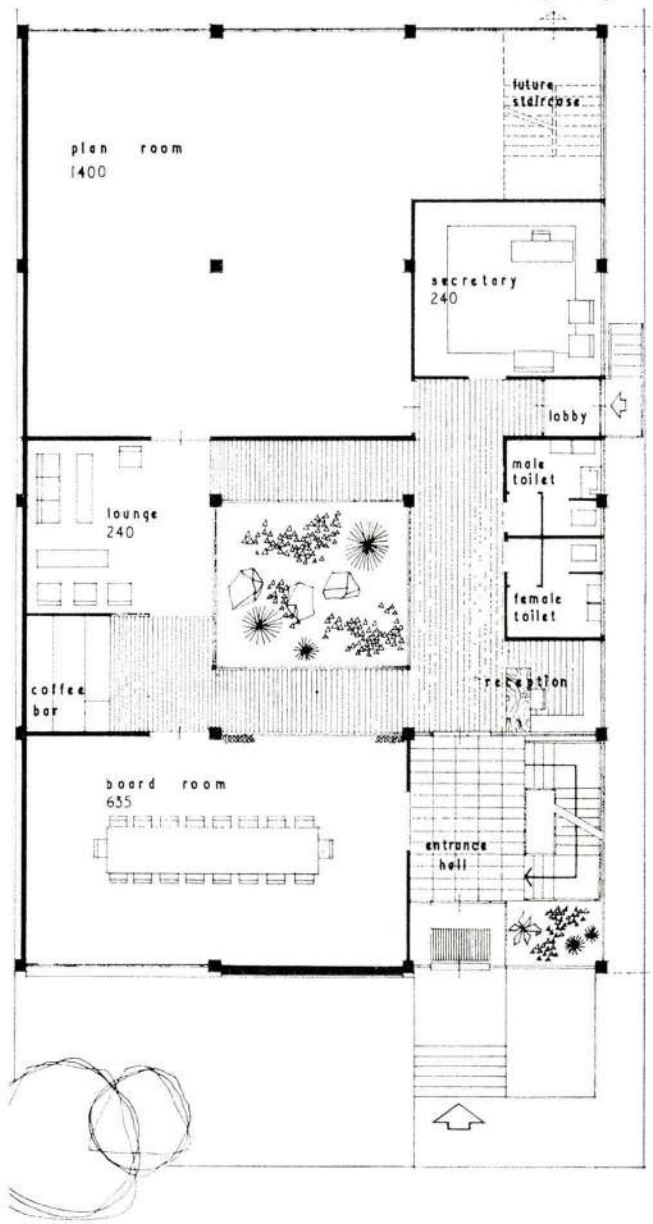
Cost was a factor that was emphasized in the conditions, and cubic contents were checked and those projects that had 10′-0″ or less floor to floor height were increased to 11′-0″ in order to obtain a uniformity of cubic contents. The proportion of rentable floor area to total cubic contents of the building was a consideration.

The Winning Design

The introduction of a court as a main feature in this solution brings to the building a feeling of openness and charm that entices one's curiosity to seek farther. If, in the future, additional stories are added, this area will probably be roofed over and special lighting will be required. Certainly, this light court can be flexible in size and provide the lounge and reception area which is not shown.

The secretary's desk would be better located controlling the entrance as well as having access to the plan room. The close proximity of the two stairs is also criticized. The second stair might well be included to the rear of the building when future additions are considered. The location of the future elevator is not ideal as it opens into the owners' area and could be easily relocated in the entrance lobby. The second floor toilets over the throughway will cause difficulties in locating the stack and keeping pipes from freezing.

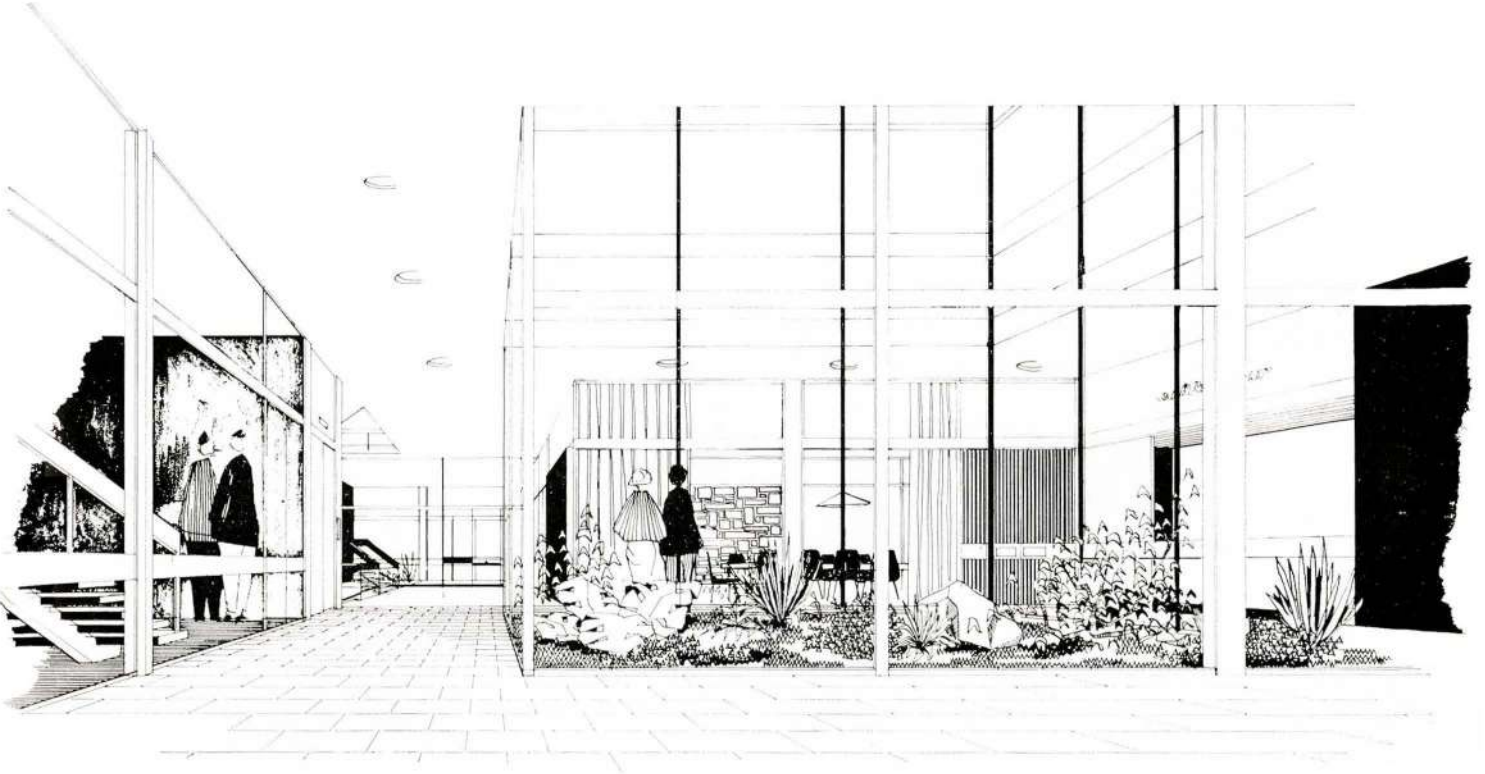
First floor plan



THE WINNING DESIGN

PETER DICKINSON ASSOCIATES

View from Plan Room towards Main Entrance



View from Bronson Avenue

SECOND PRIZE

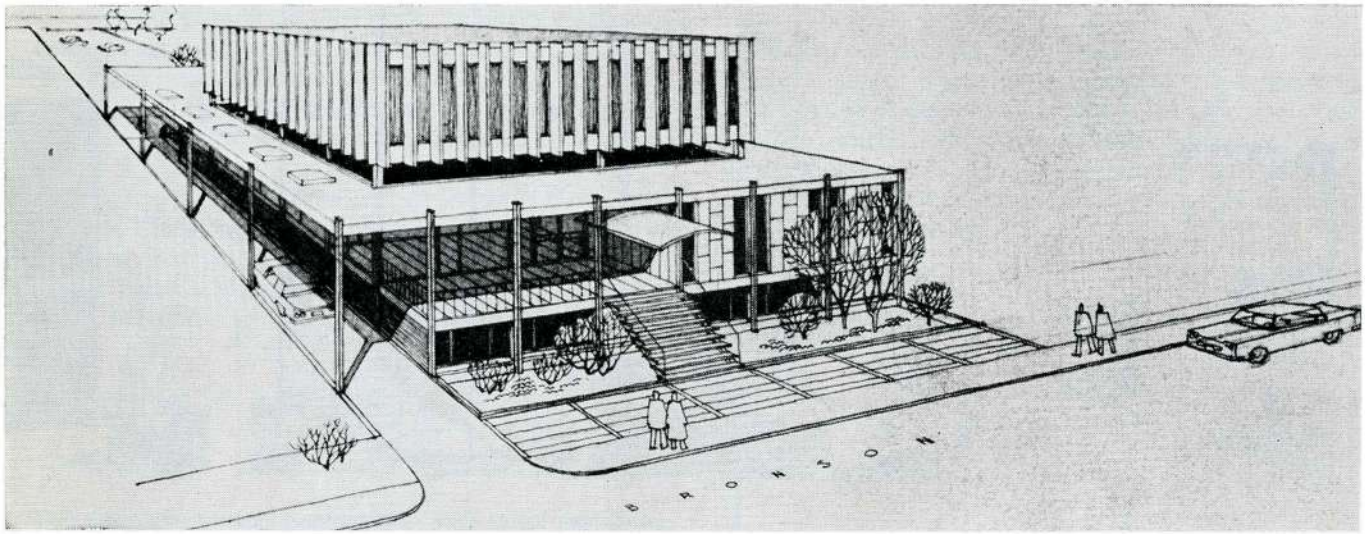
BALHARRIE, HELMER & MORIN

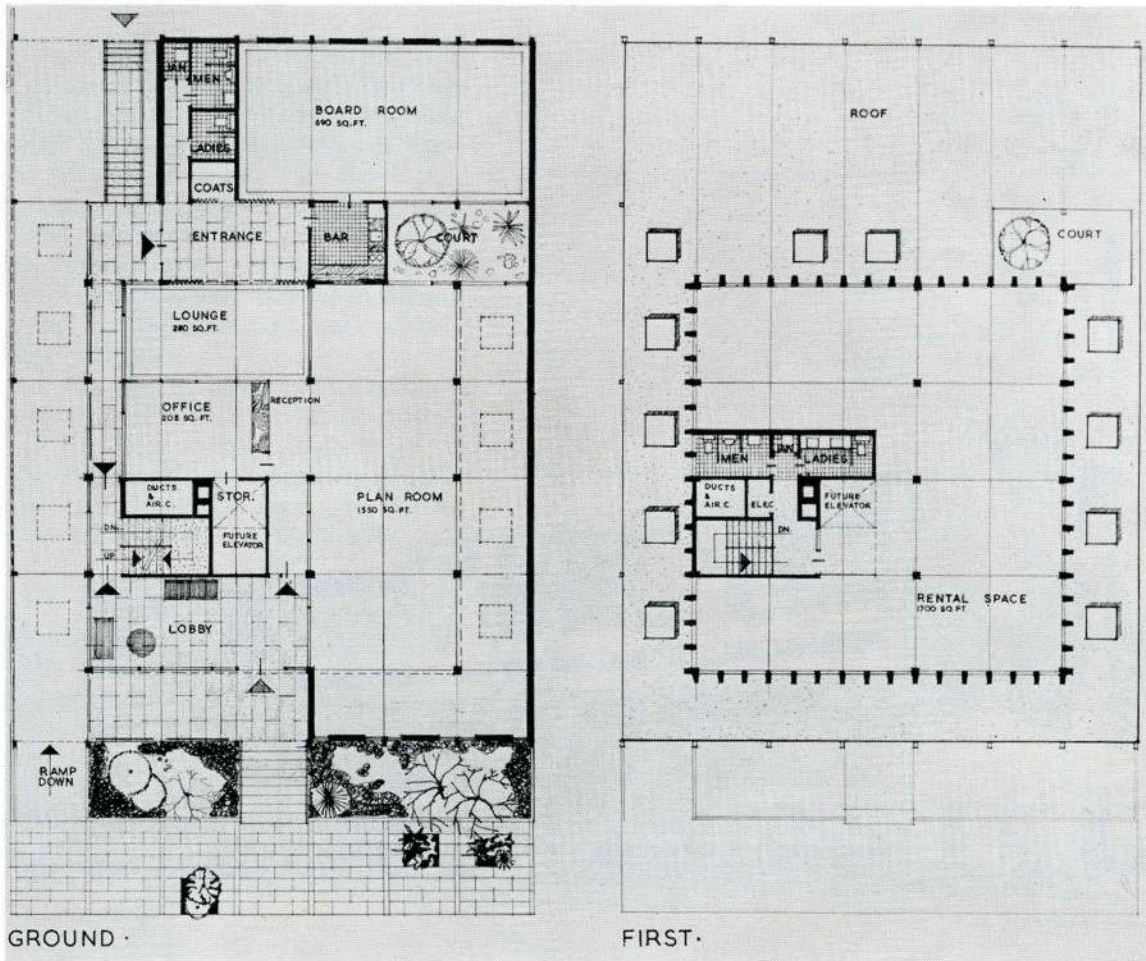
Second Prize

This entry provided good space relationships and control with an attractive feeling of open space. The clear storey lighting around the perimeter gives the plan room interest, but might have proven to be relatively expensive. The small court provides an interesting feature for both board room and plan room.

The plan forces tenants occupying the basement space to go up to the ground floor from the parking area and then down again. This could easily be rectified by including direct access down from tenant parking area.

View from Bronson Avenue





HONORABLE MENTION

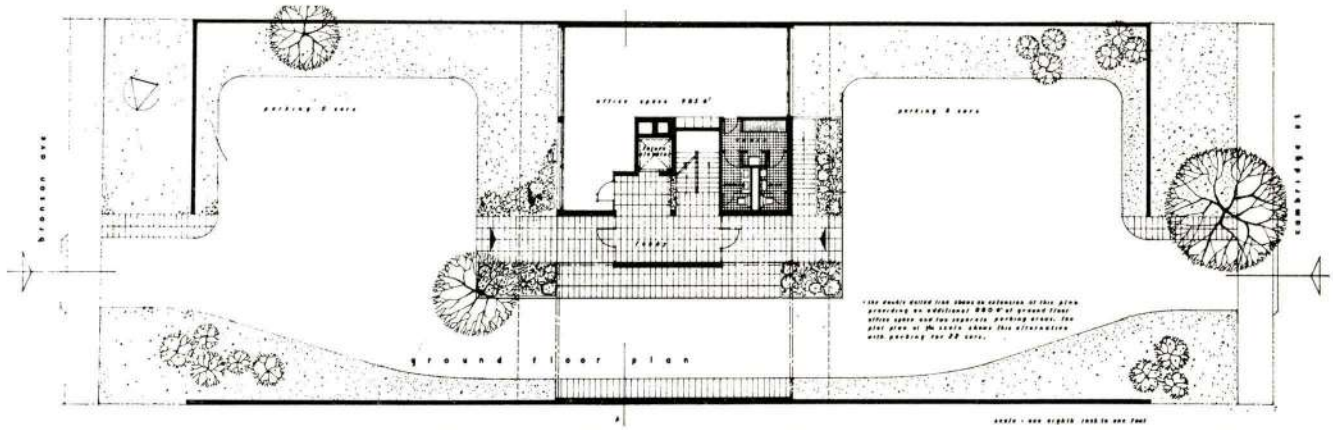
SCHOELER & BARKHAM

Honorable Mention

The jury was very attracted by this design and its competent plan. The fact that pedestrians would have to walk through a carpark to reach the building, could be overcome by moving the building forward on the lot. The feature of walled courts, front and rear, could be most attractive, and a bricklayer's delight.

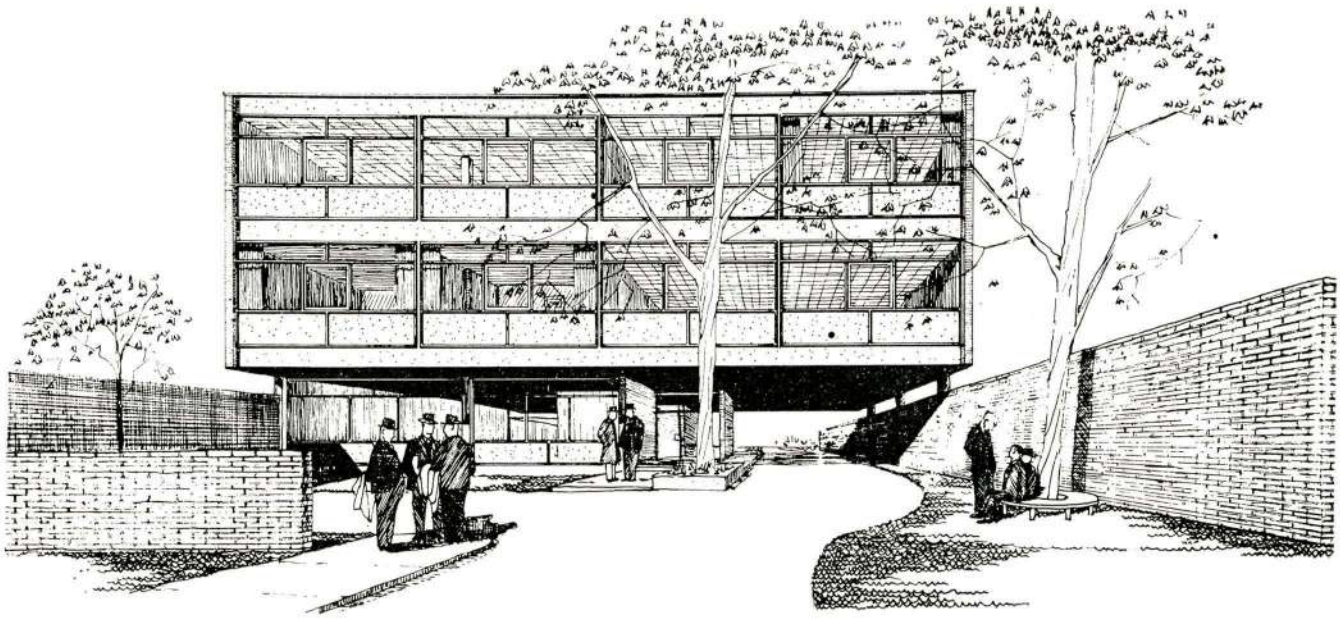
The floating quality of the building has great charm, but the owners have to walk up one floor to reach their premises, while the possibility of increasing the ground floor area, as suggested, would produce a situation where one parking lot may be crowded and the other relatively empty. There is a criticism that the minimum size lobby at the second floor is niggardly compared to that on the ground floor.

H. Gordon Hughes
Chairman of the Jury



OTTAWA BUILDERS' EXCHANGE OFFICE BUILDING

View from Bronson Avenue



Architectural-Legal Problems

A PANEL DISCUSSION AT THE ANNUAL MEETING OF THE ONTARIO ASSOCIATION OF ARCHITECTS

THERE are specific reasons why some architectural-legal problems are submitted to boards of arbitration and others to courts of law, a panel of the Ontario Association of Architects agreed. Questions of fact can often be best settled by arbitration, whereas problems affecting legal interpretation of wording is best left to the courts.

Trained judges are often better at determining "who is telling the truth", whereas arbitration boards tend to become conciliators, giving something to each side to effect a reconciliation.

The panel consisted of Gordon S. Adamson, Robert Drummond, John D. Arnup, Q.C., and Royce Frith. Chairman was Eric W. Haldenby.

Frequently cases go from arbitration boards to courts because "arbitrators have a secret yearning to be judges and write lengthy judgments." Lawyers, examining these written opinions, find legal holes in them and take the whole matter to court. As protection against this, an arbitrator should merely state that he has considered all the evidence and exhibits and then state his award without further amplification.

A second question considered was the position which arises when materials delivered to a site and not yet incorporated into the job are seized by creditors of the supplier. As things now stand this is difficult to avoid because such materials may have passed through many hands en route to the job and creditors may exist anywhere along the line.

Mr Frith summed up the panel's view: "The supplier should be forced by the architect to make a statutory declaration that all titles to the goods are clear. This will force him to check all the way back to the manufacturer – a cumbersome process. But it is the only way for the architect to protect his client, and it will lead to the introduction of speedy methods of supplying proof of freedom from encumbrance."

He warned that a statutory declaration is only as good as the man making it and that other proof should be obtained in support wherever possible.

The panel considered the problem of the architect's right in Ontario to file a lien on the basis of work done on plans. The law is, it was said, that a lien for plans cannot be entered unless superintendency of building operations has been started. Provided superintendency has taken place, liens both for plans and the superintendency can be entered.

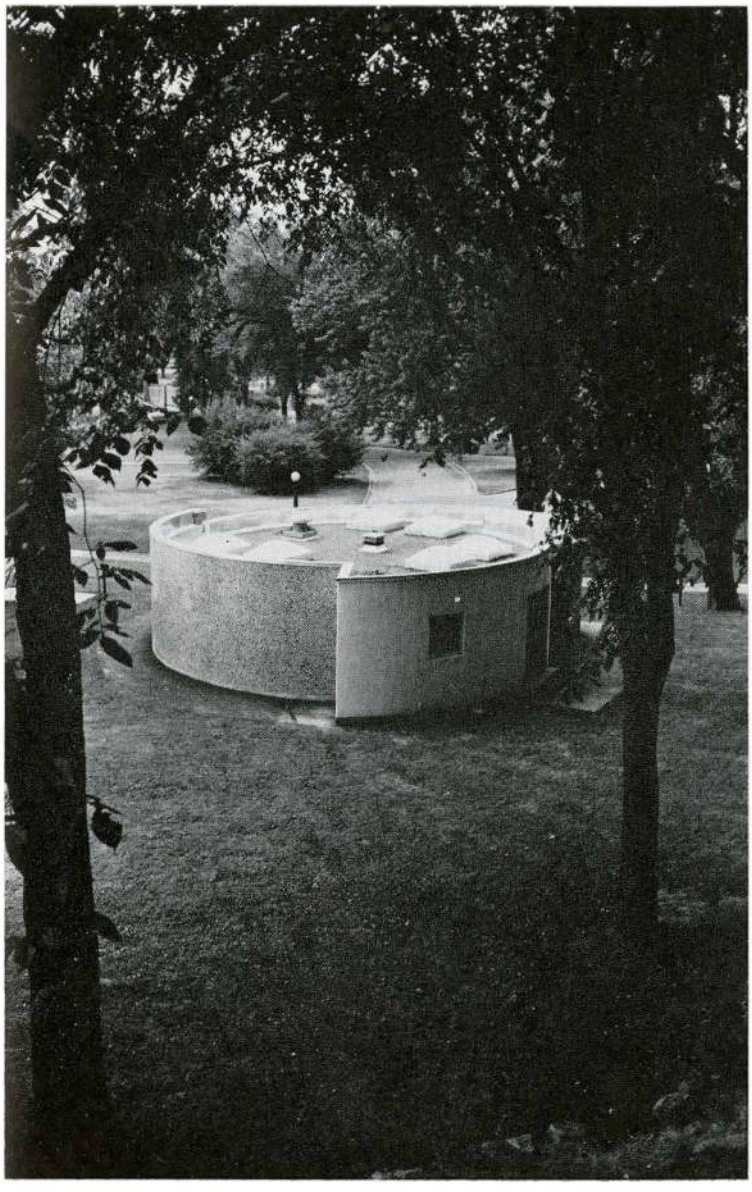
Is the Quantum-Meruit Law in Ontario sufficient safeguard for architect's services? The panel felt it was not. One reason is that the Quantum-Meruit Law provides for payment of professional services up to the value of the work to the recipient, even if the work is not completed. But who can say what value architect's services are if the work is abandoned? Architects were advised to insist on an owner-architect contract.

Corporations which pose as architects were considered and it was pointed out that Ontario Law was changed in 1953 to provide that corporations cannot legally pose as architects, though they may have architects on their staffs. If a corporation itself poses as an architect its directors are liable to imprisonment. In addition, if a corporation provides plans and specifications for a building valued at more than $10,000 the employees who carry out the work, as well as the directors, are liable.

What about an architect's liability for the cost of "change orders"? Mr Adamson said he felt that "an architect who signs orders without getting his client's signature is looking for trouble." A number of minor changes, up to a specific value agreed to by the client, might be made to avoid holding up the job.

What is the position of the architect who incorporates a manufacturer's specifications into his own plans? Here the law is that if an architect incorporates someone else's plans and provides them as being his own, he himself is liable. If a consultant has been retained, then if the consultant is in error, the architect can claim redress from him. But if free manufacturer's drawings are incorporated, the manufacturer is not, as a rule, guaranteeing accuracy, and the architect is responsible.

"I doubt if any of us would put our stamp on a drawing prepared by someone else", observed Mr Adamson.



PARK ARCHITECTURE

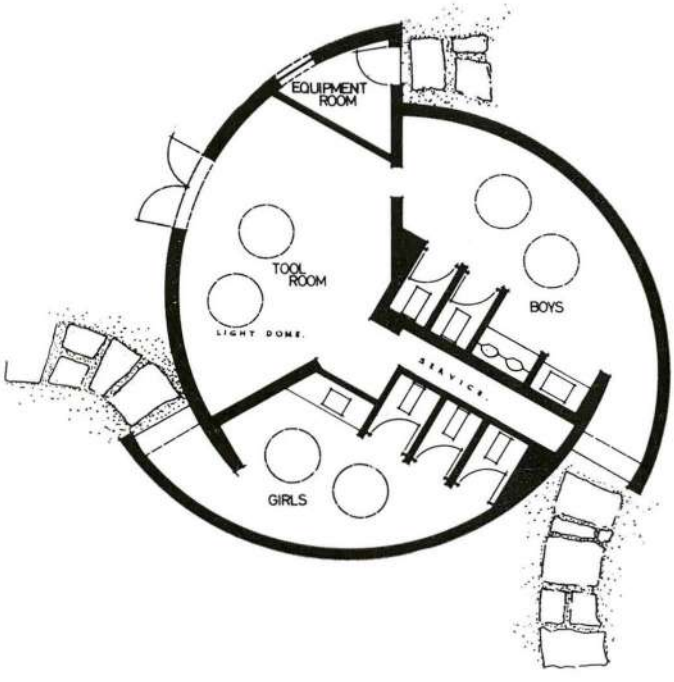
Comfort Station

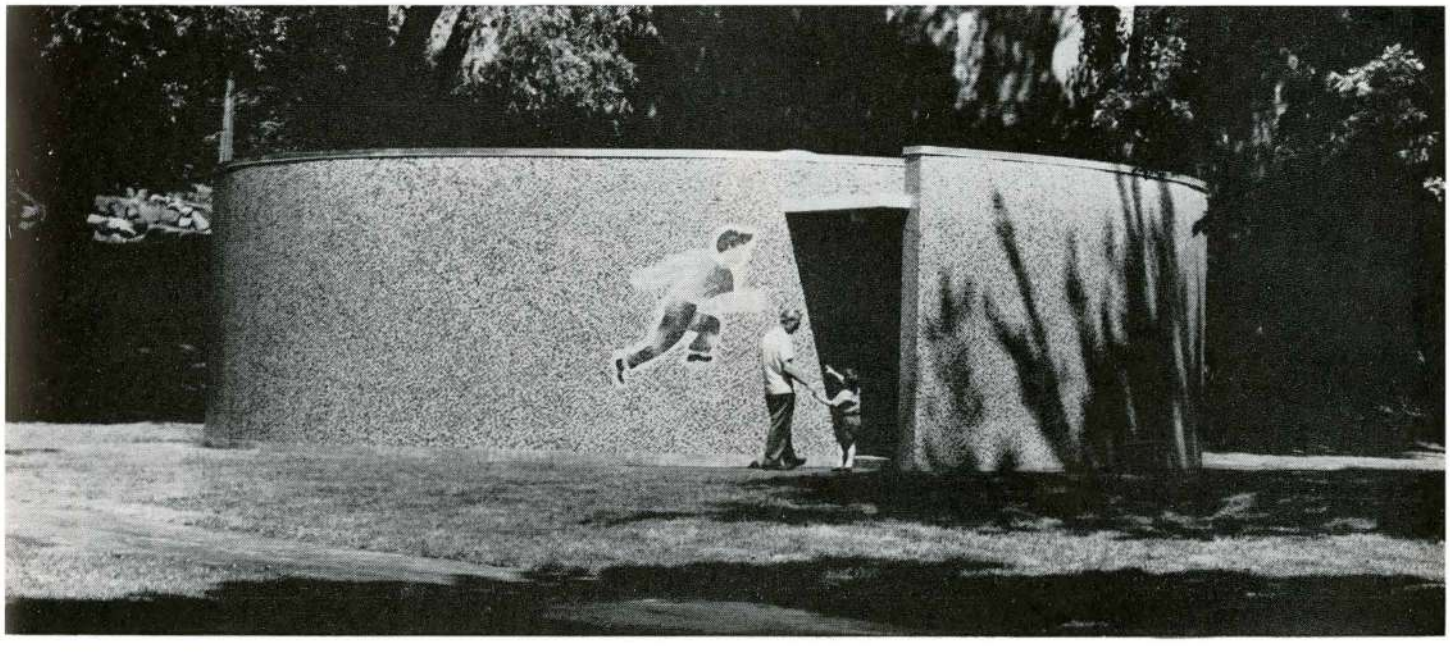
Strathcona Park, Ottawa

Architect
W. E. Fancott, Ottawa Office,
Green Blankstein Russell & Associates

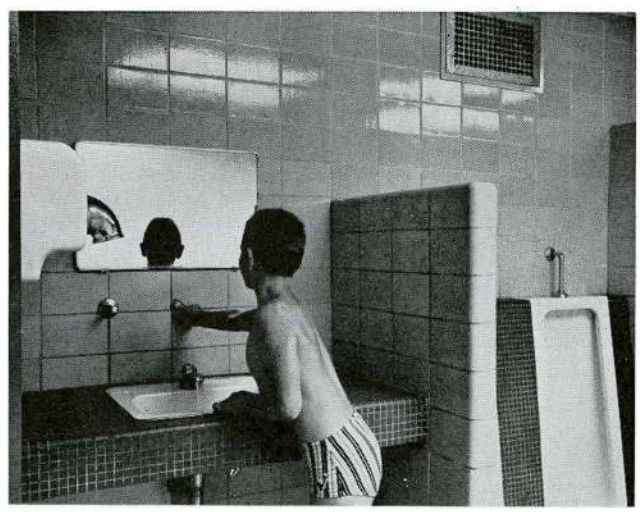
General Contractor
P. E. Brule Co. Ltd, Ottawa

Photos by Lingard, Photo Features Ltd





The building is located at the north end of the National Capital Commission's Strathcona Park. The cost, $24,300, was shared by the Commission, which uses part of the structure for storage of Park Maintenance Equipment, and by the City of Ottawa, which has use of the equipment room. Construction is block with glass tile facing on the outside and glazed terra cotta on the inside. Floors are terrazzo and the ceiling plaster. Fixtures and installations were designed to be as vandal-proof as possible. Extract ventilation is provided through the service areas. The girl and boy figures were designed by the architect.



Viewpoint

"In cases of disputes in the construction industry, do you feel that you have a moral obligation to all parties concerned or is there any justification for being biased in favour of the client?"

The services provided by the architect are defined in the Standard Form of Agreement Between Client and Architect. Up to the signing of the construction contract between the contractor and the owner, the architect acts as adviser to, and wholly in the interests of, the client. After the signing of the construction contract he continues as adviser to the client but has the additional responsibility of interpreting the conditions of the contract with entire fairness between the owner and the contractor.

This judicial function is not specifically mentioned in the client and architect agreement and may not be realized by many clients. It is, however, referred to in the general conditions of the construction contract which is signed by the "owner" and is therefore agreed to by the "client". Also, there is no contractural relationship between the architect and the contractor, but since he also signs the construction contract with the owners, he agrees to the same general conditions clauses and recognizes the status of the architect.

Since the architect is paid by the client, the question of "moral obligation" may naturally arise in deciding on questions as to the performance of the work or the interpretation of the contract documents. It is the duty of the architect to make his decisions in accordance with the contract and "let the chips fall where they may" regardless of the source of his remuneration.

From a legal standpoint it would be unfair to rely on "moral responsibility" in matters which might be very important or when large sums of money may be involved. The general conditions of the construction contract protect the interests of the contractor in case of disagreement with the decisions of the architect or if he feels that the owner is being favored. They provide that should the contractor hold the architect's decisions to be at variance with the contract documents, he shall carry out the architect's instructions with regard to the disputed work. They also provide that any excess costs due to this cause shall be decided by arbitration. In other words the architect's decisions are subject to arbitration.

I have no knowledge of any actions being taken by a contractor due to this "moral obligation" factor. If this is generally true, and I believe it is, it is a tribute to the high calibre of the membership of the architectural profession.

H. H. Madill, Toronto

By referring to the Standard RAIC Document No. 12 now used by (I hope) the majority of registered architects, the answer is simple and quite definitely answered in Paragraph 2 of Article 9 of "The General Conditions of the Contract", quote—"The architect is in the first instance the interpreter of the contract and the judge of its performance. He shall use his powers under the contract to enforce its faithful performance by both the parties hereto."

Also the general conditions are to be read into and form part of the (contract) agreement as mentioned in Article 4 of the Standard Form of Agreement between Contractor and Owner, which reads in part, "and the aforesaid specifications and drawings are to be read into and form part of this agreement and the whole shall constitute the contract between the parties and it shall enure to the benefit of and be binding upon them and their successors, executors, administrators and assigns."

If, as the first quoted paragraph states, as it does that the architect "shall use his powers under the contract to enforce its faithful performance by both parties thereto" (both owner and contractor), this should leave no opportunity for bias or favor towards either party.

I believe this has been the ethical policy of architects generally, and if not, then they assume the role of an unjust judge, unworthy of the confidence of both owner and contractor.

Until a construction agreement is entered into by owner and contractors, the architect is undoubtedly morally bound to design economically and well to the limit of his ability. He is the owner's trusted employee, responsible only to him within the limits of safe design and governing regulations.

'Tis true the owner pays the architect for supervision and many other duties during the construction period, but once the contract agreement is executed, the architect must morally become a neutral agent, interpreting the true meaning and intent of the drawings and other contract documents and use his best endeavors to enforce the honorable discharge of the responsibilities of those who entered into the contract agreement.

Our own office follows the practice of requiring all of the work to be carried out to the entire satisfaction of the architect. I feel strongly that the practice of some owners to insist it be written otherwise, that is, work to be carried out to the satisfaction of the owner and architect, weakens the case for all concerned. Both parties are human beings, therefore neither party, owner or contractor, can be assumed to be completely unbiased by their own interest and sometimes wishful thinking. If the owner party should be biased then it is fair to assume that the minds of the interested parties did not and are not likely to fully meet, in which case the architect's authority is weakened, arguments arise and delays are inevitable.

The answer is simple – the honest architect has a moral obligation to all and has no justification for being biased in favor of the client.

H. Claire Mott, Saint John

I have taken the liberty of rewording the question, as follows, in order that I can be sure that I understand it.

"Do you feel that you have a moral obligation to both parties to a particular contract, or is there any justification for being biased in favour of the client?"

The idea that the architect should be the interpreter but not the final arbiter, of the drawings and specification "as to their true intent and meaning" is, I believe, common to all English-speaking countries. It is written into the RAIC standard form of contract.

The contractor is usually quick to realize the advantages to him of a well administered contract. The owner is sometimes surprised and pained at first to find his architect apparently siding on occasion with the contractor. The architect often finds himself at odds with his client.

The responsibility of interpreting the contract calls for a broad mind, good judgment, and the willingness sometimes to act in a manner contrary to self-interest: but it would be hard to exaggerate the difficulties which would result from the architect abandoning his admittedly uncomfortable position.

The fact that owners and contractors are willing that the architect should assume this responsibility is, I think, a compliment to our profession, and a valuable contribution to the contractual system.

The scarcity of court or arbitration cases resulting from construction contracts which are administered by architects is a testimonial, not only to the capacity of the architect, but to the sometimes qualified confidence of the parties to the contract in the architect's integrity. This may sound like an objectionably self-laudatory statement, and I would not like to say that the architect is without self-interest, because a moment's thought would reveal the chaos with which he would have to deal as the result of each party interpreting the contract to his own advantage, without a third party to take an unbiased position.

R. Schofield Morris, Toronto

The problems of dispute in the construction industry is one that unfortunately appears to be constantly on the agenda. The position of the Architect in our industry does not permit bias in favor of anyone – be he the client, contractor, or the contractor's sub-contractors, or in the interpreting of his own work. The architect must constantly interpret the contract documents on a project and the execution of the work on an equitable basis fair to all parties. His decisions may require confirmation in Court and a biased decision in favor of any party would soon be detected.

An Architect, on occasions, frequently has adjectives appended to his title – some of which could not be printed. Who, therefore, is in a position to judge the validity of the terms used and especially when an architect is considered biased. This is one of the hazards of our profession. As a rule, it is possible to resolve these differences after reasonable discussion with the parties concerned. Should either of the parties be unreasonable, of course, the difficulty would remain and the opinion of the party against whom the decision has been made would not change. The architect, therefore, would dismiss the criticism as being unfounded. The architect's position in disputes in this industry is such that he alone, providing he maintains his professional stature, can make the unbiased decisions required.

The architect must not shy away from criticism, but should take the matter in hand and attempt to resolve difficulties immediately. He cannot neglect his responsibilities to any of the parties in a contract. The owner must be made aware that after an award of a contract the relationship of the architect to himself is changed to that of interpreting the contract between the owner and the contractor. Similarly, the contractor must be made aware that the architect intends to see that he will carry out his responsibilities and insist that the contractor perform in accordance with the contract.

The architect, therefore, to retain his professional status in the industry has a moral obligation to all parties to see that the terms of the contract are being met, and without bias or favor to either.

H. K. Black, Regina

Disputes in the construction industry are covered in Article 10 and Article 29 of the Standard Forms of Construction Contract for Stipulated Sums and Cost Plus Contracts respectively.

In so far as the architect is the arbiter of the contract and judge of its performance, he is naturally involved when it comes to disputes, in so far as they invariably affect timing of work and this frequently involves work of other trades than those party to the contract. The disputes are internal to the industry and affect trades. A general contractor is not a tradesman, and he is hog-tied frequently by disputes within his own industry. The architect has no control whatsoever in these disputes and becomes an "innocent bystander" who is frequently put to much trouble and anguish by the turn of events. The word "bias" is described in my dictionary as "a mental predelection or prejudice."

I would conclude that frequently there is great justification for the architect to be "biased" in favour of the client but add, that such are labour agreements, that he might quite as easily be biased in favour of the general contractor whose interest is to serve the client, get the job done, and incidentally get paid for it. The above viewpoint should be amplified. "All parties concerned" is ambiguous. Does it mean all parties disputing, or those parties bound by the owner's contract agreements? One can have a moral obligation and still be powerless to do anything. Such is usually the case except to see that the work is protected during the time of the dispute.

Francis J. Nobbs, Montreal

CANADIAN
BUILDING DIGEST

DIVISION OF BUILDING RESEARCH • NATIONAL RESEARCH COUNCIL CANADA

Rain Penetration of Walls of Unit Masonry

by T. Ritchie

UDC 699.82:69.022.3

In many parts of Canada heavy wind-driven rains occur periodically and it is not uncommon in such storms for the rain to strike the wall of a building and pass through to the interior. This has happened in many buildings of unit masonry with walls of brick, stone, or block and the result has been not only inconvenience to the occupant, but a condition that often is difficult and expensive to correct, and which may lead to premature decay of the materials.

The problem of rain penetration of unit masonry walls, like many other problems in building, has a long history. The architect-president of the United States, Thomas Jefferson, in his writings of 1782 mentioned the problem of damp walls resulting from condensation of water vapour on cool surfaces and also from rain penetration.* It is generally believed, however, that the problem has become more common in recent years (since about 1920) than it was before, probably as a result of changes in methods of construction and in the materials used. In many countries the wide-spread use of renderings such as stucco on unit masonry walls indicates that rain penetration is a problem. The widespread occurrence of the problem is also indicated by the number of countries in which it is being studied; these include the United States, Canada, Great Britain, France, the Scandinavian countries, Germany, and South Africa. Undoubtedly the most comprehensive investigations of the problem so far reported have been those of the U.S. National Bureau of Standards. Studies were started there in the 1930's and have revealed that of the many factors that affect the resistance of unit masonry to rain penetration the properties of the units and mortar are particularly important.

Several factors have a bearing on the problem: the degree of exposure of a building is important; low buildings or those in sheltered locations obviously are less likely to be affected than high buildings which are freely exposed to wind and rain; the properties of the masonry materials used and the care with which the masonry was designed and constructed also have an important influence on the resistance to moisture penetration.

Means of Entry of Rain

During a rain storm the air pressure at the outside surface of the rain-wetted wall is usually higher than that at the inside surface. The rain falling on a wall is forced through the wall by this pressure difference, provided that there are pathways within the units and mortar, or between them, which the water can follow, and provided that the storm lasts long enough for the water to reach the inside of the wall. In low buildings (two stories or under) much protection from rain is derived from a wide overhanging roof; this is therefore a valuable feature. In higher buildings the amount of protection afforded by such a roof is less, and it probably should be expected that regardless of the type of roof some part of the wall of a high building will be wetted in a storm.

"Structural" cracks in masonry walls, caused by differential movements of parts of the building, are a means of entry of rain into the wall. Another means, which is fre-

*". . . with us it is only through the northern and eastern walls of the house, after a north-easterly storm, this being the only one which continues long enough to force through the walls. . . . In a house, the walls of which are of well-burnt brick and good mortar, I have seen the rain penetrate through but twice in a dozen or fifteen years."

quently more important, is penetration through masonry which is free of structural cracks, but which contains unbonded areas between unit and mortar.

In most instances of rain penetration of brick walls leakage takes place between the brick and the mortar; only under unusual circumstances does rain pass through the brick or through the mortar. The same situation usually applies to stone masonry. In some other cases, however, units are used which are sufficiently permeable to moisture that when exposed in a wall to heavy rain, leakage takes place through the units. With such highly permeable units, therefore, it is customary to apply stucco or other rendering to ensure resistance to rain penetration.

Lack of Bond in Brick Masonry

Unbonded areas between brick and mortar, which usually are the cause of leakage in brick walls, may result from faulty construction techniques in which insufficient mortar is used to form the joint, or from an unsuitable combination of brick and mortar. In the latter case a "tight" bond between the brick and mortar is not obtained when they are brought together in the construction of the brickwork.

The bond that develops between brick and mortar depends on their properties, in particular the rate of water absorption (or "suction") of the brick and the water retention property of the mortar. When placed on a high-suction brick, mortar quickly loses its moisture to the brick and becomes stiff and non-plastic. This change in the mortar may take place before the next brick can be set in the mortar bed, in which case the mortar is not sufficiently plastic or "adhesive" to bond well with the brick. Some mortars resist loss of moisture better than others. Such mortars may remain plastic long enough so that good bond is developed when the next brick is placed in the mortar.

The interaction of brick and mortar when they are brought together in the construction of the brickwork therefore determines the completeness of the bond between them. If the bond is incomplete, rain penetration through the unbonded areas is a possibility.

Improvement of Bond

Since the bond between brick and mortar is so important to the "tightness" of the wall, everything possible should be done in the construction of brickwork to obtain an intimate contact between brick and mortar, with no unbonded areas at the interface. If, for example, bricks with a high suction value are to be used (by the standard test, more than 25 grams of water absorbed when the brick's bedding surface is dipped in water for one minute), the bricks should be wetted before they are laid. This reduces the suction and so produces a better condition for bonding with mortar. Similarly, with high-suction bricks, it is best to use a mortar of high water-retention value, i.e., of high capacity to resist loss of moisture to an absorbent brick. To achieve as good a bond as possible, any mortar should be used as wet as possible; mortar of stiff consistency when laid produces a poor bond with the brick.

The bricklayer's method of constructing brickwork also affects the bond; better bond between brick and mortar is obtained when a short, rather than a long, mortar bed is laid out in advance of the work. In this way, by the time the last brick has been placed, the mortar is still plastic and has good bonding properties, whereas a long mortar bed would have lost its plasticity and the last bricks set in it would be poorly bonded. The bricklayer should not move or shift bricks after they have been set in the mortar since the movement will break the bond between brick and mortar and produce a crack at the interface. Full mortar joints are necessary; incompletely filled joints allow easy penetration of rain.

The resistance of brick masonry walls to rain penetration is improved if the mortar joints of the newly built masonry are tooled to form a concave surface. Other types of mortar joint tooling, or joints which are raked-out or flush-cut, do not provide as much resistance to entry of moisture as that given by concave tooling.

Influence of Building Design

Failure in the design of a building to provide for the accommodation of differential movements between its parts may lead to

cracking of the masonry. Rain may then enter where the masonry has "opened up" as a result of the stresses placed on it. The cracking of masonry walls in which concrete floor and roof slabs are embedded, for example, has been attributed in many instances to "working" of the concrete (caused by its initial shrinkage or later movements due to changes in temperature and moisture content), which stresses the adjoining masonry to failure by cracking.

Expansion or contraction of walls may also be a cause of cracking. In the latter case, a familiar example is that of cracking from "drying shrinkage" of the units. Certain types of masonry units shrink an appreciable amount on drying, and if this shrinkage is restrained severe stresses which lead to cracking may be set up in the wall. The provision of "control" joints may therefore be necessary to accommodate the movements safely.

The combination of unit masonry and the structural frame of a building sets up a difficult situation with regard to the prevention of rain penetration. The thickness of the masonry at columns and spandrel beams is usually reduced and thus is more vulnerable to moisture penetration than the remainder of the wall. In addition, differential movements between frame and masonry are a possible source of cracks in the masonry. A flashing in the wall at spandrel beams, for example, has sometimes provided a "cleavage plane" for the relief of stresses in the masonry resulting in cracking of the wall.

Parapet walls are frequently a source of entry of rain when they have not been isolated from the wall below by proper flashings. If such "damp-proofing" is omitted, rain may permeate the parapet wall and then pass downward into the masonry below. On this account, carefully installed flashings at the base of the parapet are necessary. In addition, due to the severe weathering conditions to which the parapet wall is exposed, its top and back surfaces should be protected by suitable coverings.

Common sources of leakage can be avoided by providing drains of adequate capacity and by eliminating surfaces adjacent to masonry which run water onto the masonry. Carefully applied and complete caulking around windows and doors is also necessary for protection against rain penetration. In short, careful design of the building and the installation of proper flashings and caulking are required to ensure satisfactory performance when wind-driven rain strikes.

Cavity Walls

A special type of masonry wall construction, called "cavity wall", designed to prevent moisture penetration has been used extensively in some countries, particularly in Great Britain where severe exposure of buildings to rain is common. In recent years many buildings have been constructed in the United States of this type of wall and they have performed well against heavy rain. A cavity wall consists of two walls which are separated by a continuous vertical air space, but which are bonded together by metal ties. The principle of operation of a cavity wall is that in a storm rain may penetrate the outer part of the wall but it will then flow down its inside face without being able to cross the cavity to reach the inner wall.

The metal ties are usually designed with a "V" crimp in the middle so that water cannot pass along them to the interior. Water which flows down the cavity strikes a metal flashing at the base and is directed out of the wall through drains. In cavity wall construction, therefore, the brickwork of the outer "skin" of the wall is not relied upon to prevent moisture penetration. The rain which is expected to penetrate the wall is controlled in its movement and is directed out of the wall at the base. Careful construction of a cavity wall to avoid "bridging" of the cavity by mortar or other material which can transmit moisture, obviously is necessary for it to perform satisfactorily. Properly designed flashings over wall openings must be provided, as well as vertical diverter strips in the cavity at door and window jambs.

Treatment of Damp Walls

Direct penetration of rain through masonry is only one cause of dampness on the inner surface of a wall. Other causes of dampness are: condensation of water vapour on a cool surface, defective drains or pipes within or near a wall, defective flashings, lack of

caulking around wall openings, and the rise of ground moisture into the wall from "wicking" action. The possibility of other causes should therefore be investigated before attempting to correct an existing problem of dampness.

Most of the rain which penetrates unit masonry passes through unbonded areas between unit and mortar. These usually cannot be seen and the wall appears perfectly sound. Some penetration may also occur through the units if they are sufficiently permeable, but the amount is usually small in comparison with the leakage through the interface. To overcome leakage between unit and mortar it is necessary to "plug up" the openings. This may be done by brushing a paste of portland cement and fine sand into the mortar joints; some of the paste is carried into the openings and closes them. Another method is repointing which requires that the mortar be removed to a depth of about $\frac{1}{2}$ inch from the joints and replaced with fresh mortar tightly packed in the opening so that it bonds well with the units and the original mortar.

Walls of permeable units require treatment additional to that of the mortar joints. The treatment required depends on the permeability of the unit and on the severity of exposure. For units that are highly permeable and in a severe exposure condition stucco may be the only treatment that will overcome rain penetration. In other cases, painting the wall or applying a colourless "waterproofer", such as a silicone material, may prevent penetration. These treatments will have to be renewed periodically.

It should be emphasized that an essential part of the treatment for damp walls is the filling of structural cracks, renewal of caulking around windows, and the repair and correction of faulty drains and flashings.

Summary

Rain penetration of walls of unit masonry is a common problem, which may arise for several reasons. When units and mortar are not completely bonded together penetration may occur at the interface. In addition, when permeable units are used, leakage may take place through them. Structural cracks form yet another path for rain penetration.

In the design of a building consideration should be given to the possibility of stresses being set up in the masonry from differential movements of various parts of the building. When possible, the movements should be accommodated without stressing the masonry, in order to avoid cracking. Suitable design of a building for rain resistance also calls for the provision of adequate flashings and of complete caulking at wall openings. In construction of the masonry, particularly brick masonry, steps can be taken to obtain complete bonding between unit and mortar and thus prevent interface leakage.

Cavity wall construction affords a means of obtaining resistance to rain penetration and walls of this type have come into extensive use where severe exposure to rain has caused leakage problems in solid walls.

Treatment of a masonry wall affected by rain penetration requires "plugging" of the openings between mortar and unit, and in addition, often a treatment of the face of the unit. For very permeable units it may be necessary to apply stucco; in other cases paint or colourless water-repellent coatings may be sufficient. Filling of structural cracks, renewal of caulking, and repair of defective drains and flashings are a necessary part of the treatment of damp walls.

This is one of a series of publications being produced by the Division of Building Research of the National Research Council as a contribution toward better building in Canada. The Division has issued many publications describing the work carried out in the several fields of research for which it is responsible. A list of these publications and additional copies of this Building Digest can be obtained by writing to the Publications Section, Division of Building Research, National Research Council, Ottawa, Canada.

Continued from Page 239

(b) For workshops, warehouses, stores buildings, hangars, garages, etc. – 5%.

(c) For laboratories and hospitals and scientific buildings generally – 6½%.

(d) For dormitories, apartments, multiple dwellings, nurses' homes, and such accommodation for hospital staffs, school staffs or institutional staffs – 5½%.

(e) For alterations and additions to existing buildings – 7% on the value of the alterations within or to, the walls of the existing building and 5½% on the value of the new additions made outside the walls or above the roof of the existing building.

(f) On projects, up to $2,000,000.00, the fee as set forth in Section (a), (b), (c), (d) and (e) will apply. Over $2,000,000.00, the fee will reduce by ½ of 1% and will hold up to $5,000,000.00 in value of cost of project. Over $5,000,000.00, the fee will reduce again by ½ of 1%.

(g) *The Department will pay the costs of inspection of the work or construction in the field. Such costs will be the wages paid to inspectors at rates which must be agreed to by the Department before the inspectors are hired. All inspectors will be hired by the architects and be responsible to them and the architects will be responsible for the inspectors' actions.*

(h) Travelling costs, room and meals and such other costs as are approved by the Department, will be paid to the architects by the Department. All travelling must be approved by Department before the architect undertakes same, otherwise no travelling costs will be paid to the architects. Accounts for travel must be presented for payment within two weeks of the travelling being completed.

(i) The architects will provide the Department with 25 complete sets of blueprints of all working drawings and 30 copies of the specifications suitably bound so that tenders may be called by the Department. If more copies of plans or specifications are required, the Department will pay for them at costs to be agreed upon by the architects and the Department.

(j) The architect will turn over to the Department, upon completion of the construction of the project, all original drawings of the architectural, structural, mechanical and electrical portions of the work corrected to "as built". The final payments of the fees to the architect will not be made by the Department until the plans are delivered in satisfactory condition to the Department.

U of T Scholarships & Prizes

The following Scholarships and Prizes have been awarded students of the School of Architecture of the University of Toronto.

Fifth Year

Royal Architectural Institute of Canada Medal, E. Kayari.
Toronto Architectural Guild (Gold Medal), T. Kapsi.
Anaconda American Brass Ltd Scholarship, G. G. Milne.
Colonna of Canada Ltd Prize, G. G. Milne.
George T. Goulstone Fellowship in Architecture, E. Kayari.
The Jules F. Wegman Fellowship, T. Kapsi.
Murray Associates Scholarship, P. Cooke.

Fourth Year

American Standard Products (Canada) Ltd, Scholarship, S. Irwin.
Canadian Pittsburgh Industries Ltd, Scholarships, First, J. Brunon; Second, S. Irwin
Argo Block Company Ltd, Scholarship, P. Nightingale.

Third Year

Ontario Association of Architects, Prize, T. F. Teshima.
Toronto Brick Company Scholarships, First, B. G. Gates; Second, P. M. Barnard.
Queenston Quarries Ltd, Scholarship, B. G. Gates.
Colonna of Canada Ltd Prize, M. J. McMordie.

Second Year

Booth Brick Company Prize, J. M. Plumb.
Atlas Asbestos Ltd Prizes, First, S. E. Sota; Second, J. G. Sykes.
Colonna of Canada Ltd Prize, S. E. Sota.
Ontario Association of Architects Scholarship, Shared, J. M. Plumb, A. Zdanowicz.

First Year

Turnbull Elevator Company Ltd Scholarship, W. G. Mohaupt.
Colonna of Canada Ltd Prize, Shared, W. G. Mohaupt, F. C. Carter.

The Rome Scholarship in Architecture

Mr Taivo Kapsi has been admitted to the final stage competition for the Rome Scholarship in Architecture and is the first student of the School to achieve this distinction.

The Rome Scholarship was founded in 1913 to enable a young architect of conspicuous talent to study in Italy. Not more than ten candidates from the Commonwealth are selected by a jury in London for admission to the final design competition. The winner will spend one year, with the option of a second year, at the British School in Rome.

A Sheppard Award of Merit for industrial advertising has been won by the Ontario Association of Architects for their series of advertisements on architectural services currently running in the Financial Post. The awards are given annually by the Industrial Advertisers Association of Montreal. Citations were given to the Ontario Association of Architects public relations counsel Hugh Newton of Toronto, and to the advertising agency concerned, Goodis, Goldberg, Dair Ltd, Toronto.

The firm of Moriyama and Watts has been dissolved, and Mr Raymond Moriyama is carrying on the practice under the name of Raymond Moriyama and Associates at the same address, 106 Yorkville Avenue, Toronto.

Positions Wanted

Employment in Canada wanted by Indian architect. Graduate of School of Architecture, Birmingham, July 1959, and at present employed with leading firm in New Delhi. Harbans Singh Grover, 3 Double Storeyed, New Rajinder Nagar, New Delhi, India.

Summer employment in architectural or planning office wanted, preferably in Ottawa. Graduate in architecture of Sir J. J. School of Art, Bombay, 1955; Leeds School of Architecture and Town Planning, 1957; employed as architect-planner Bradford, Yorks., 1958 and with London County Council since Oct. 1959. R. N. Master, ARIBA, AIIA, 12 Nevern Place, London, S.W.5.

Housing Design Council 1960 Awards Competition Announced

The Canadian Housing Design Council has announced details of the Council's 1960 Awards to be presented to builders and designers of single family houses.

Awards will be made on a regional and national basis. The objective is to encourage the improvement of housing design by focusing public attention on the best houses being built in Canada and provide recognition of their builders and designers. The awards take the

form of certificates identifying the house, the builder and designer.

Eligible to compete for the 46 regional and 10 national awards will be any builder who has constructed at least four houses during any twelve-month period from January 1955 to December 1959. Any number of entries may be submitted by each builder.

For the purpose of this competition, houses fall into two classifications — those having 1150 square feet or under, and those having between 1150 square feet and 1500 square feet. Awards are aimed at the best designed houses in the low and medium price range.

Closing date for this series of awards by the Canadian Housing Design Council is September 9, 1960, by which date all entries are required to be received at the Council's offices in Ottawa.

Judging of regional awards will follow immediately after the closing date. A panel of judges will meet during September and October in Halifax, Montreal, Toronto, Winnipeg and Vancouver, and will examine entries from each area. Winning entries will be announced in each region on completion of judging.

Winners of the 46 regional awards qualify automatically to compete for the 10 national awards to be determined by a panel of judges meeting in Ottawa in mid-October.

Entries will include floor plans of the house and photographs of the exterior and interior. Generally, the designs will be judged for their good proportion, simplicity of treatment and architectural character. In the interior lay-out convenience in relationship of rooms, the efficient use of space and the adequacy of storage space will all be considered. Exterior forms of the house will be judged on the shape of the house as a whole, its siting on the ground, the design of windows and doors and the appropriate use of materials.

The schedule of judging and presentation of awards is as follows:

Regional awards: Ontario, at Toronto, September 13-17; Prairies, at Winnipeg, September 19-22; British Columbia, at Vancouver, September 26-29; Quebec, at Montreal, October 4-7; Atlantic, at Halifax, October 11-14.

National awards, judging, at Ottawa, October 18-21. Judges will be Eric R. Arthur, J. W. Strutt, S. A. Gitterman, Campbell C. Holmes, Mrs A. Davidson Dunton and Mrs Jean Boucher. Presentation of the national awards will take place in the Capital November 28-30.

Obituary

HAROLD LINDSAY, MRAIC, died in Weston on April 13, 1960. He was born in Prestonpans, near Edinburgh, Scotland in 1895 and came to Canada at the age of ten. He received his early education in Weston, Ontario and on leaving high school apprenticed with Darling and Pearson, the outstanding architectural firm of that day. In 1916, he went overseas with the Signal Corps and served until 1919 when he returned to Weston.

In 1936, he and James Govan and William M. Ferguson formed a partnership and in 1946 this partnership was enlarged to take in B. Kaminker, S. H. Maw, J. B. Langley and P. M. Keenleyside.

Harold Lindsay, in his lifetime, worked on many buildings but his personal achievements are probably best exemplified by the main pavilion of the Toronto Western Hospital, the Hospital for Sick Children in Toronto and the Westminster United Church in Weston (of which he was a member). It is a tribute to the foresight and thoroughness with which he built that the Toronto Western Hospital Pavilion erected in 1936 has withstood the test of time so well and is as up to date as it is today. His work on the Sick Children's Hospital endeared him to all the members of that large staff. He had the rare knack of talking to each in his own language and the still rarer knack of listening attentively.

In his personal and professional life he followed the highest precepts of his religion. Sham, humbug, hypocrisy and ostentation were foreign to his nature. He acted the golden rule towards his professional brethren, his associates and his clients committed to his care; he bore success with humility and the affection of his friends without pride. In the last years, his health failed but never his cheerfulness or kindliness. Towards the end, he faced the inevitable day of sorrow and grief with the courage that befits a man.

He is survived by his wife, one brother, one sister, a son and a daughter.

Letter to the Editor

Editor, RAIC *Journal:*

"Art in Public Buildings"

I was particularly interested in the editorial in the *Journal* in February since it related to a field in which I have a continuing interest.

It is appreciated that this subject of "Art in Public Buildings" crosses a much wider field than that taken in by Federal buildings. It relates also to provincial, municipal and to a certain extent, buildings which are constructed by private interests and into which the public must go in their day to day private affairs.

The Federal services have recognized the part that can be played by art in various forms in buildings. Decorative carving, both in and out of buildings, has been done and murals have been used, where some local interest, happening or person has proved the subject matter.

Contemporary design of buildings has not made it easy to use decoration on the exterior of our buildings. Repetitive units, machine production of parts, and materials used have all mitigated against the decorative treatment of our modern day structures. Expanses of glass and metal do not seem to give the background the artist desires for his work.

The proposal to include in each project a fixed percentage of the cost of the building for decorative works hardly offers a workable solution. The same percentage in the small project can be inadequate and can be wasteful in the multi-million dollar undertaking.

The acceptance of the need for decorative work in and around our buildings is the first requirement. If the government authority will accept this policy, then the method obviously is co-operation and collaboration between the architect of the building, the painter and the sculptor and the landscape architect. With these all working on the project from its inception, we should produce a related work. If they do not act in this manner, we get the result of adding to or applying ornament and decoration to areas of a building never planned for or intended for the purpose.

In this busy, rushing world in which we live we lose sight of the fact that planned effort, study and assessment all take time. We do not seem to think this important, as is demonstrated by the high praises given to speed of erection of the prefabricated monotony of the newest of our buildings rising in the cities across the country today.

We could achieve more gracious and interesting places to work and live in if we were not in such a hurry to complete our construction in a day. We would encourage the artist, we would bring forward craftsmen in our construction and would enjoy the results of our efforts over the years.

Let us, in our profession, do all we can to encourage more pleasant offerings in our design of public buildings and their maintenance as places of public interest.

E. A. Gardner, Chief Architect Department of Public Works, Ottawa

INDUSTRY

Johns-Manville Decrobord

Canadian Johns-Manville have announced a new line of ceiling tiles and wall panelling which do three jobs in one application. They form a wall or ceiling structure, insulate and decorate all at the same time. Known as Decrobord, and made from strong insulating fibreboard with a flame resistant, attractively printed surface, the wall panelling is available in four tasteful three-color combinations. The wall planks measure 16″ in width, ½-inch thick, and are eight feet long. These planks also feature the J-M "Lightning Joint" which provides a neat and simple installation and hides all nails or other fasteners. Decrobord ceiling panels, also ½-inch thick, are supplied in 12-inch squares which also feature the Lightning Joint. They too are available in four attractive color combinations to harmonize with Decrobord walls or for independent installation.

These, and other J-M lines of wall and ceiling materials, are described in full-color brochure (IB-65C) available from J-M dealers or from Canadian Johns-Manville Co. Ltd, 565 Lakeshore Rd E., Port Credit, Ont. If French language brochure is required, ask for IB-65CF.

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New "Thinline" Versatile Wall

Robertson-Irwin Ltd of Hamilton have supplemented their recently-introduced "Boldline" Versatile Wall with new "Thinline" Versatile Wall. "Thinline", has virtually all the characteristics of "Boldline" but features more slender lines that not only satisfy a greater variety of design requirements but actually help to reduce costs. It is therefore said to be a practical curtain wall for one-storey buildings (schools, laboratories, offices) as well as for multi-storey commercial buildings. Details from Robertson-Irwin Ltd, P.O. Box 100, Hamilton, Ont.

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Improved Water and Sewage Works

Concrete in water and sewage works is exposed to the most severe conditions: weathering, freezing and thawing, saturation with water and chemical corrosion. Owners reports and studies of 35 installations contained in a 20-page Master Builders Company publication document the outstanding high performance obtained under actual operating conditions through the use of Pozzolith concrete. Discussion includes factors to be considered for proportioning of concrete for severe exposure conditions to produce low permeability and high durability. For a free copy of Bulletin MBR-P-5, write The Master Builders Company, Ltd, Toronto 15, Ontario.

Vent-A-Ridge Louver Line

Vent-A-Ridge, a continuous ridge vent that controls condensation and temperature in attic spaces, has been announced by Canadian Gypsum Company. One linear foot of Vent-A-Ridge offers 18 sq in. of net free ventilating area that provides a natural escape route for unwanted warm, moist air. The product is flexible and can be adjusted to the pitch of almost any modern roof. The new ridge vent also is said to reduce installation costs. It does away with the cutting and framing of openings required by other louvers made of aluminum, Vent-A-Ridge comes in 8 ft lengths. Vinyl connecting plugs and snap-on caps join lengths together. Vinyl plugs seal ends.

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Heavy Duty Electric Unit Heaters

A stainless steel finned sheath heating element is the heart of the new line of heavy-duty electric fan-forced unit heaters for industrial, commercial and retail establishments introduced this month by Markel Electric Products, Ltd, Fort Erie, Ont. The capacities of this new line of Markel Unit Heetaires (Series 600) range from 2 KW to 10 KW with 208, 240, 480 and 575-volt in single and three-phase types, with either built-in or remote thermostat controls. Units are designed to be either suspended from the ceiling, or wall, or used as portables. The elements consist of helically-coiled nickel-chromium alloy resistance wire embedded in magnesium-oxide, enclosed swedged into stainless steel sheaths to which are permanently braised stainless steel fins. One or more thermal cutouts offer complete protection to both motors and elements if air supply is cut off. Cases are finished in high corrosion-resistant electrically baked synthetic enamels, in an attractive desert tan color.

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New Holophane Lighting Booklet

The Holophane Company, Ltd announces a new 24-page book about Holophane mercury vapour lighting for industrial plants. This new book reviews eight case histories which demonstrate Holophane LOBAY & HIBAY prismatic glass reflectors with color corrected mercury vapour lamps. Each case report covers an actual installation. It includes analysis of illumination data with references to mounting heights, spacing, lamps, footcandles, etc. Comparisons with other types of lighting systems are tabulated. The book is free on request from: The Holophane Company, Ltd, 418 Kipling Avenue South, Toronto 18, Ont.

New Curtis-Allbrite Troffer

Curtis-Allbrite & Lighting Ltd has developed a new eye comfort troffer. The product comes in two sizes, 1 x 4 and 2 x 4, for two or four-40 watt rapid start lamps. Reflectors are aluminum etched and Alzak processed after forming to provide 43° crosswise shielding with T12 lamps. Louvre fins are etched and Alzak processed with parabolic section for rigidity and low brightness quality. They provide 36° lengthwise shielding. Because of hidden springs and safety chains, the V-bar louvre assembly can be quickly removed and replaced without tools. For easy access to ballast and service, the steel wire channel can also be easily removed without tools. For complete details write the company, 195 Wicksteed Ave, Leaside, Toronto 17.

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New Electrovert Durajoint Types

A new and improved series known as Durajoint Types 20 and 21 have recently been added to the line of products manufactured by Electrovert Ltd of Montreal.

Durajoint Types 20 and 21 are suited for sealing control joints of masonry constructed with either notched sash blocks or brick, or both. The design provides for complete embodiment in the mortar and maximum flexibility in coping with movements. The cushion-like function and the positive seal effected by these products is designed to ensure watertightness and eliminate masonry cracking as well.

Durajoint Types 20 and 21 have a 2000 psi tensile strength, 350% min. elongation, – 55% min. low temperature, 70 Shore "A" durometer hardness, 0.15 max. water absorption. Write the Company at 3285 Cavendish Blvd, P.O. Box 1200, Montreal 28, for descriptive literature.

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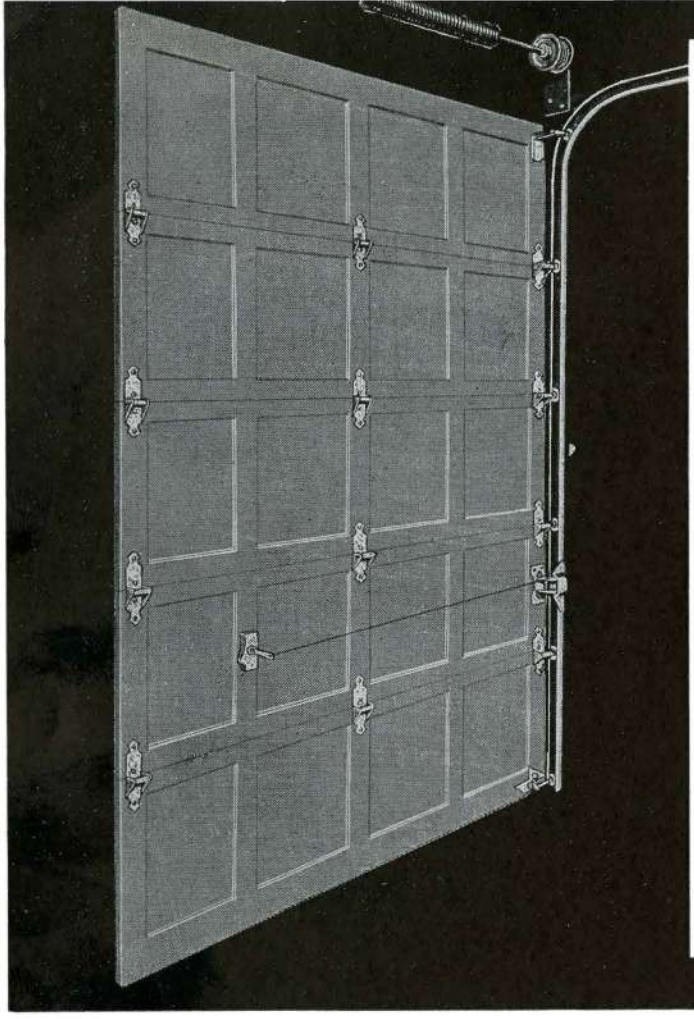
New Honeywell Thermostat

Honeywell has introduced to the domestic market a newly designed thermostat, the Diamond Jubilee Round, which retains the basic appearance and characteristics of the original round, but incorporates a number of changes to make it more attractive and functional. The dial is 40% and the numerals 20% larger than on earlier models, and the set point scale plate is located at the top, with the thermometer scale at the bottom for easier reading.

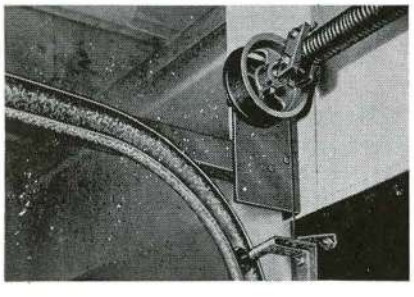


SECTIONAL OVERHEAD DOORS

45 years of engineering experience, coupled with a sound knowledge of Canadian requirements and months of research, have been employed to produce a completely new line of overhead sectional doors. Advanced design principles, combined with modern machinery, have contributed greatly to the true hallmarks of service and quality products.

DESIGN FEATURES

Track Hanger is fully adjustable to suit any ceiling condition.



The newly designed shaft-support bracket features a cartridge held ball-bearing. The top roller bracket is now adjustable to allow the proper setting of the top roller in relation to the door and track curve.

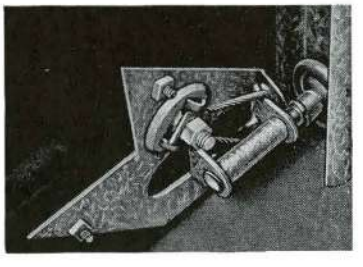
All connections are bolted for ease of initial installation and replacement of parts that may be damaged by traffic.

All major hardware components are standardized and fully interchangeable.

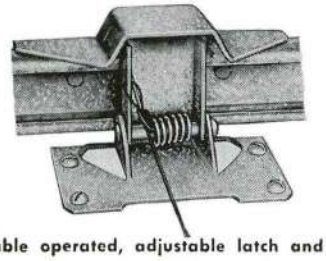
The hardware is galvanized to obtain a high degree of corrosion resistance — painting is therefore unnecessary.

All doors are designed so that an operator may be added anytime in the future without any modifications to the existing door.

All doors are supplied with a sufficient number of trusses where design and size call for reinforcements.



Bottom Roller Bracket with cable clamping device allows cable adjustment at floor level.



Cable operated, adjustable latch and latch-keeper may be mounted at any convenient position on the track without drilling of holes.

Richards-Wilcox
CANADIAN CO. LIMITED
LONDON, CANADA

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