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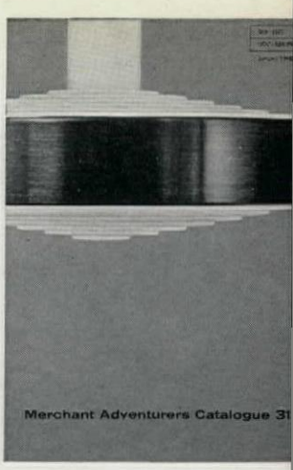

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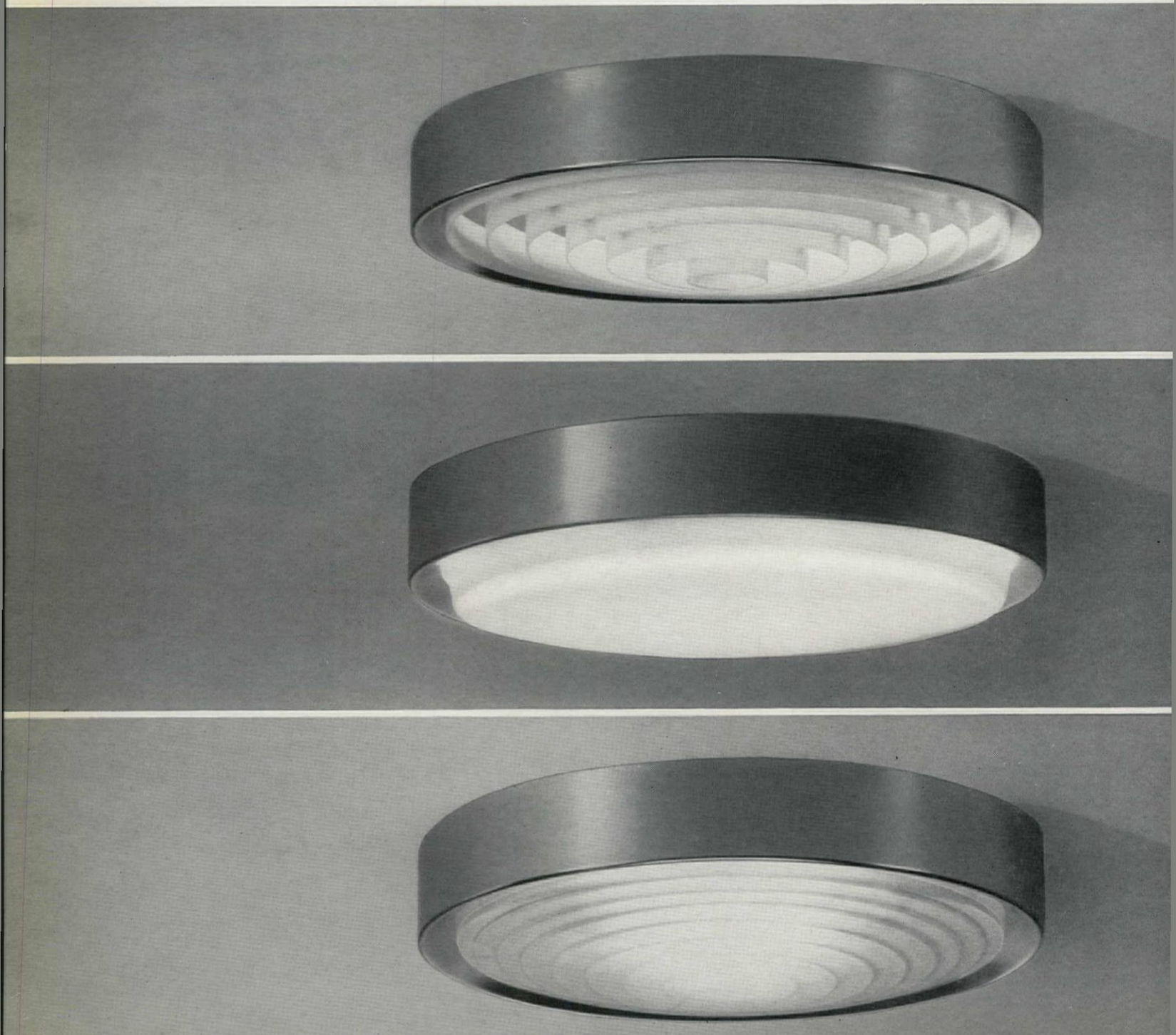

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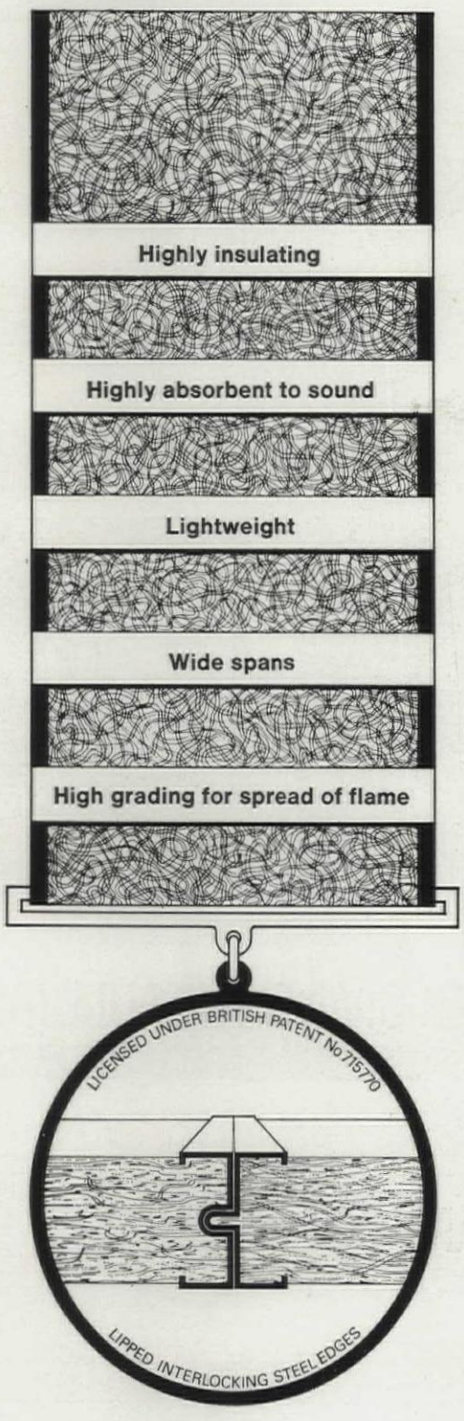

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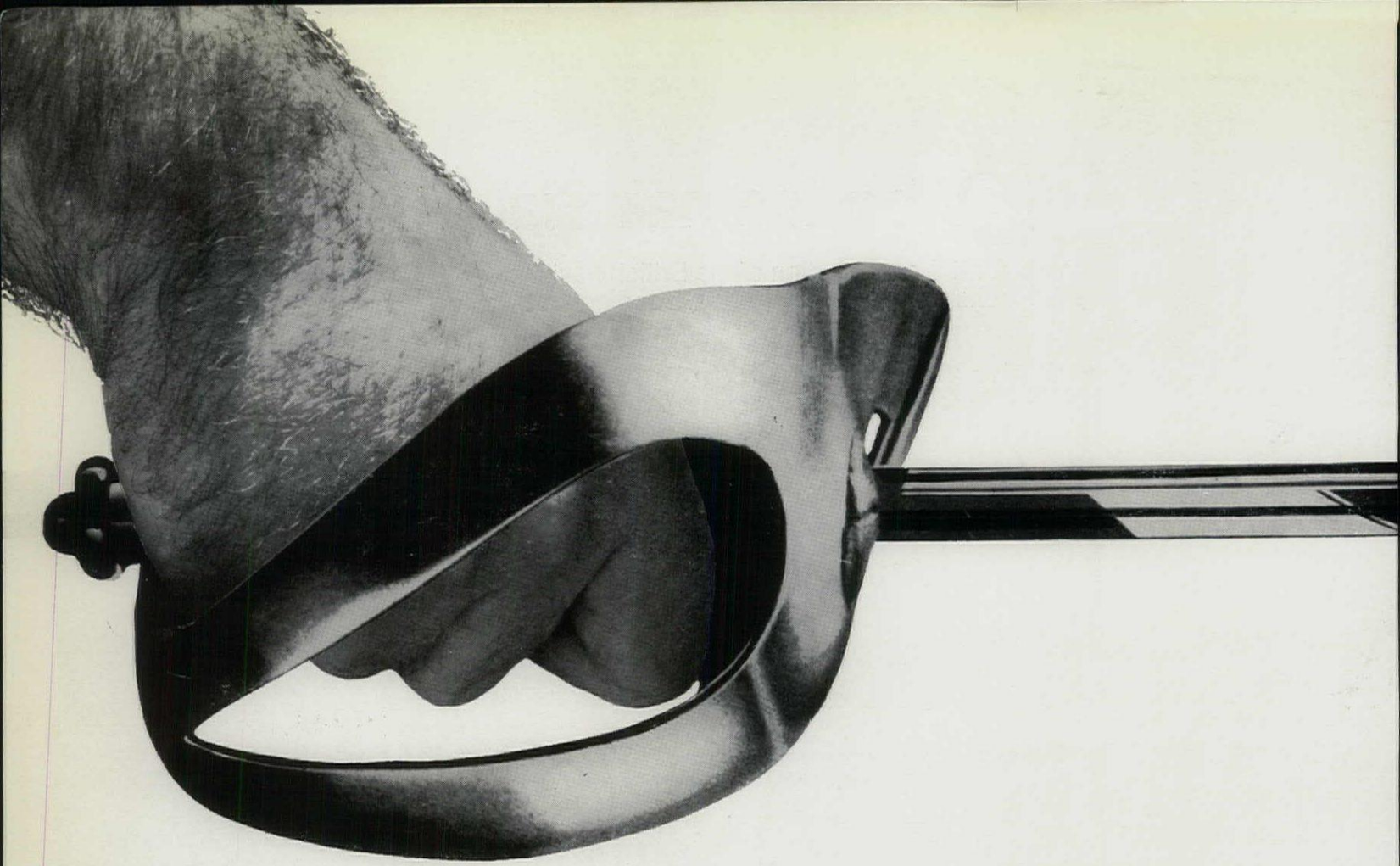

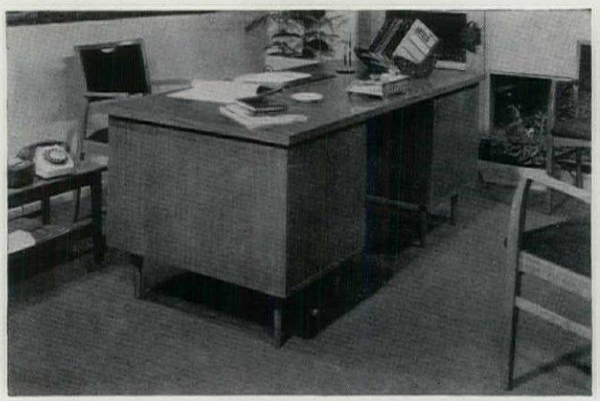

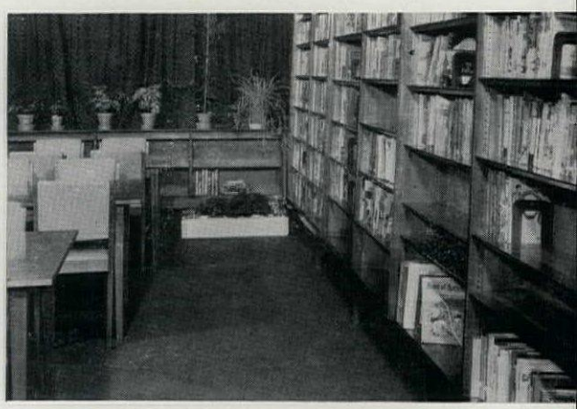

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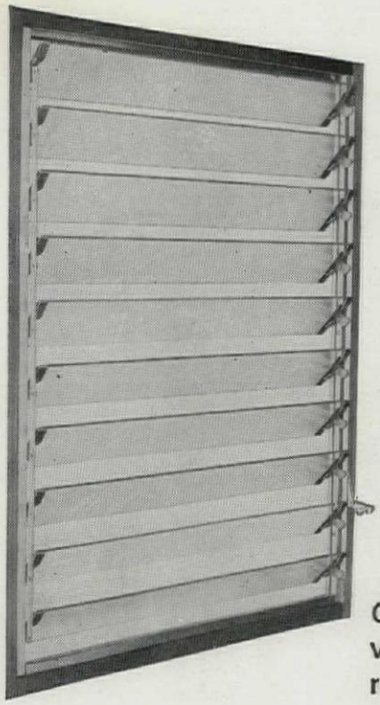

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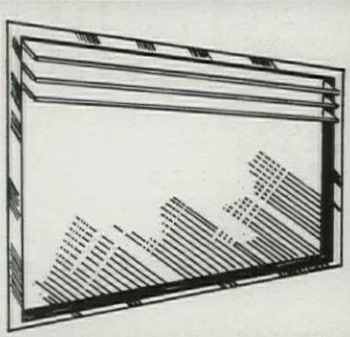

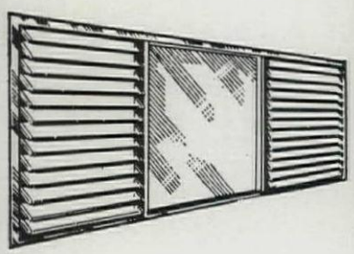

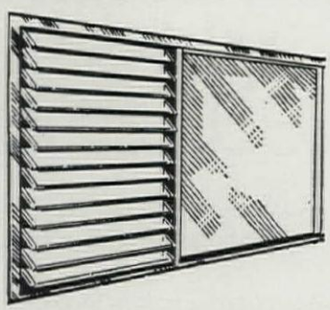

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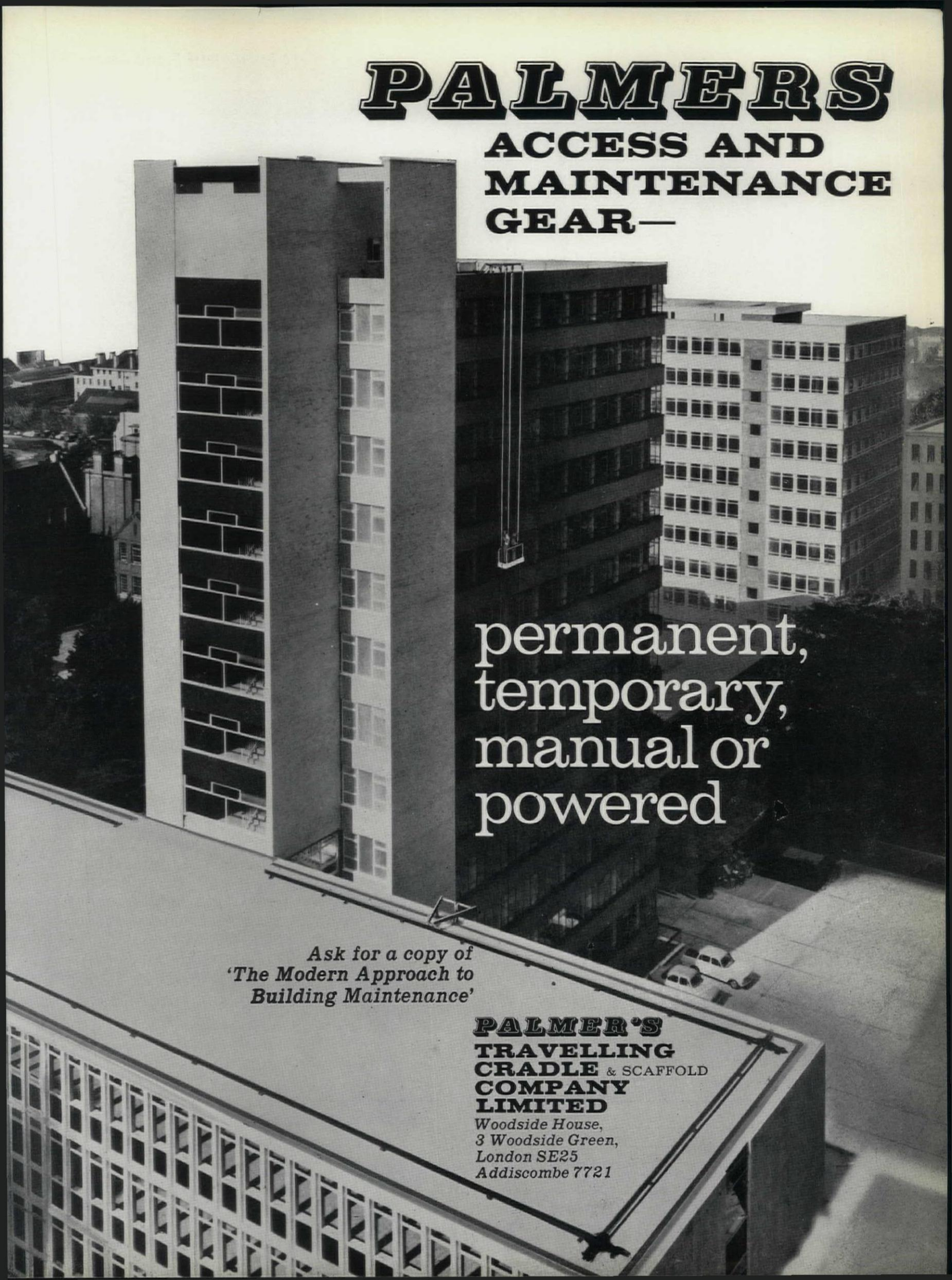
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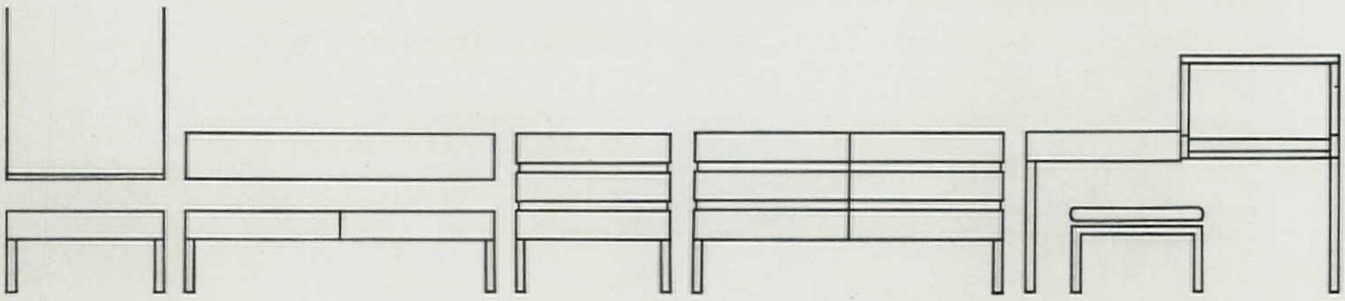
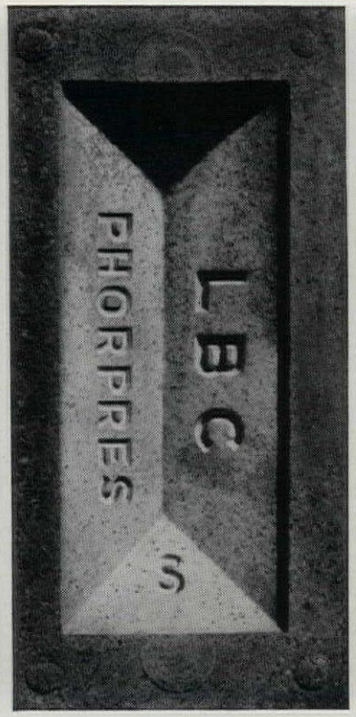


THE TOOL OF THE ARCHITECT



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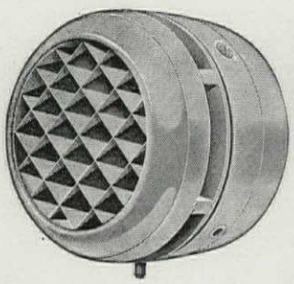

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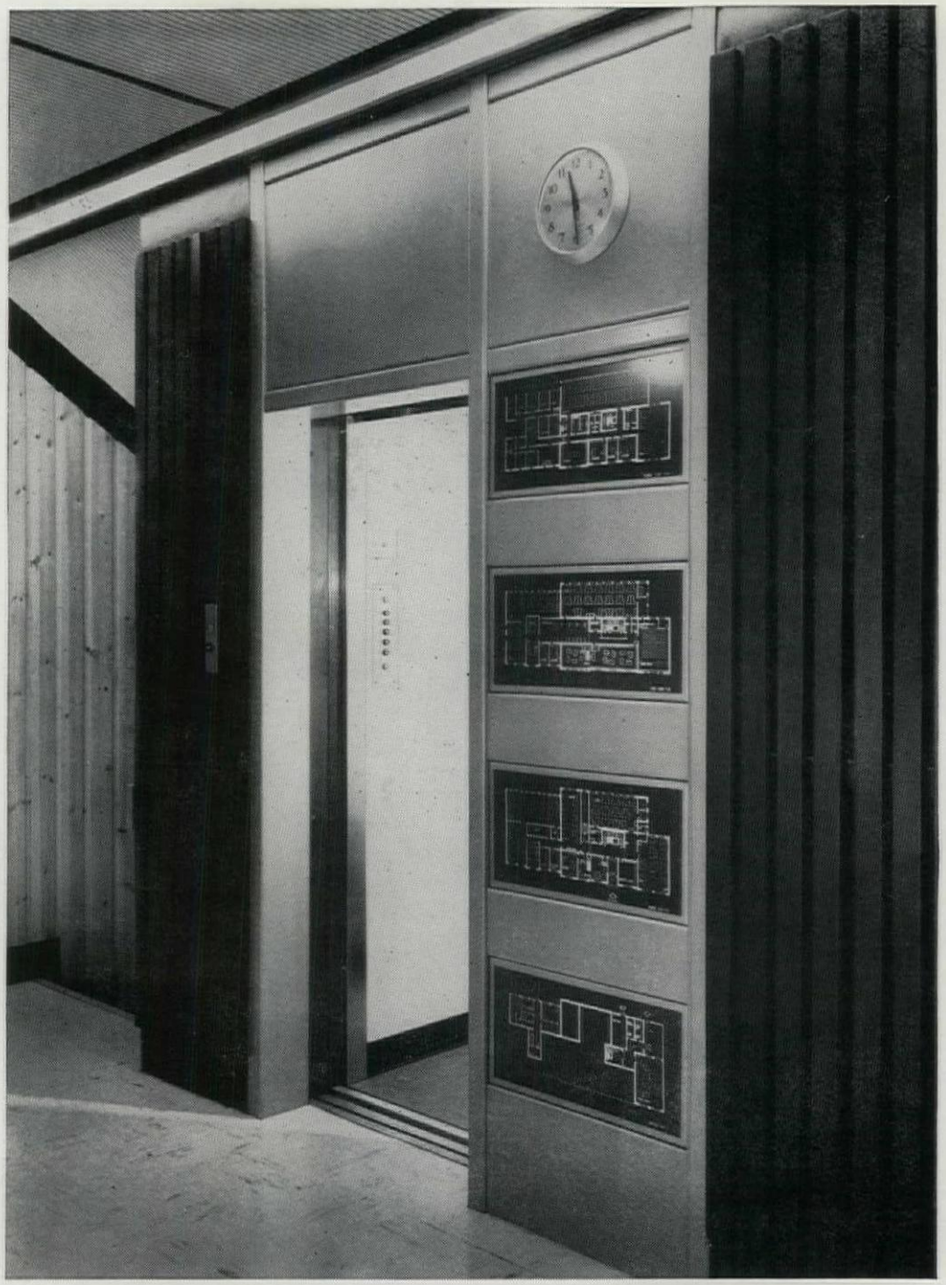

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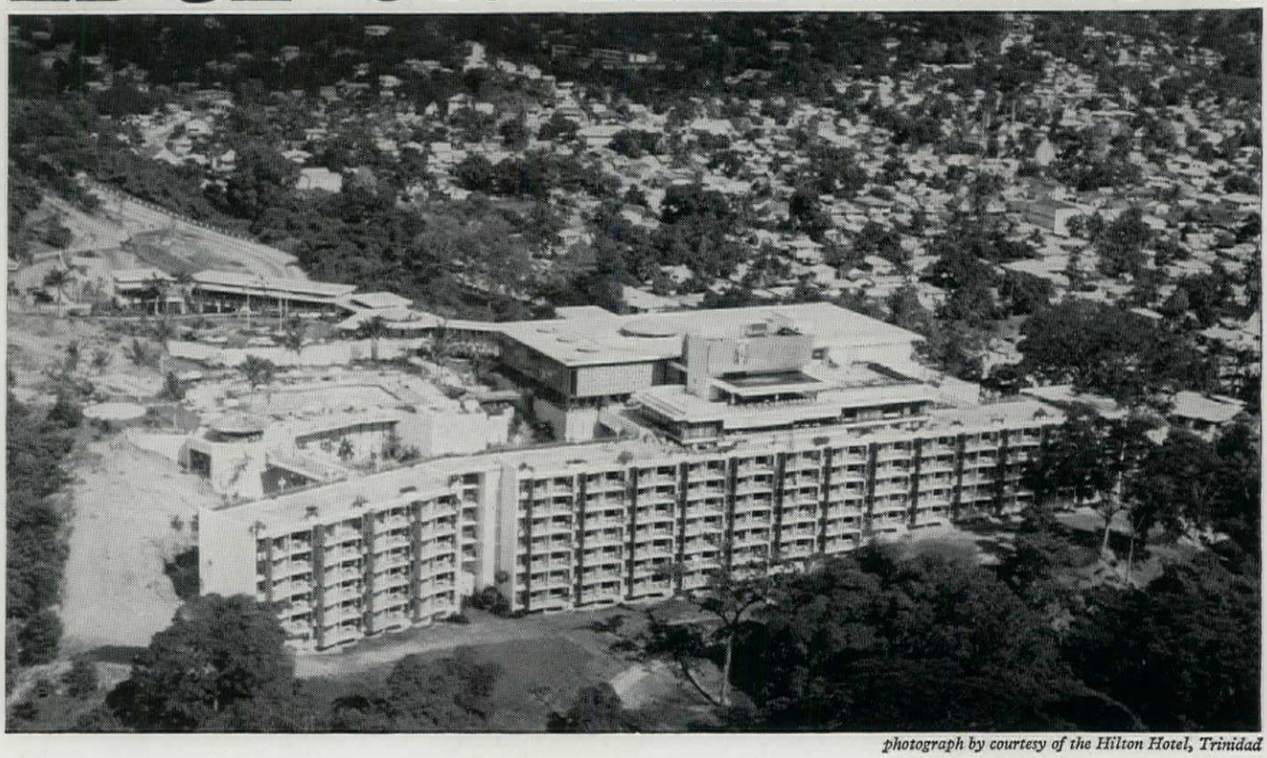

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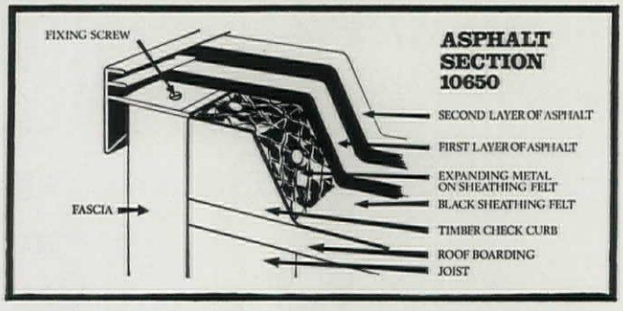

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'A Town Called Alcan'

(2)

notation

The observant layman's code for his environment

Our first broadsheet on Notation introduced an original, detailed code which could be applied to any landscape or complex of buildings—in this case an imaginary village known as Long Lent. Gordon Cullen here deals with the desirable features which should be preserved when the development is undertaken. Alcan's business is, of course, the making and selling of aluminium. The traffic in ideas between industry, planners, architects, sociologists and builders is nevertheless an important part of this business.

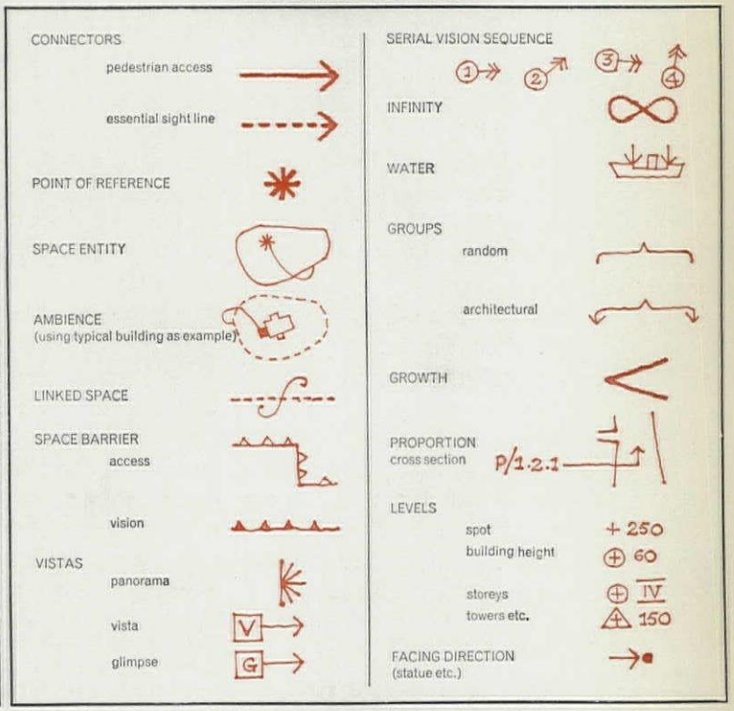
Architectural Consultants:
Alun Jones, Ward and Partners.

For a reprint of this study, and previous 'A Town Called Alcan' studies—unofficial and sponsored solely by Alcan—write to Alcan Industries Ltd., Banbury, Oxon.

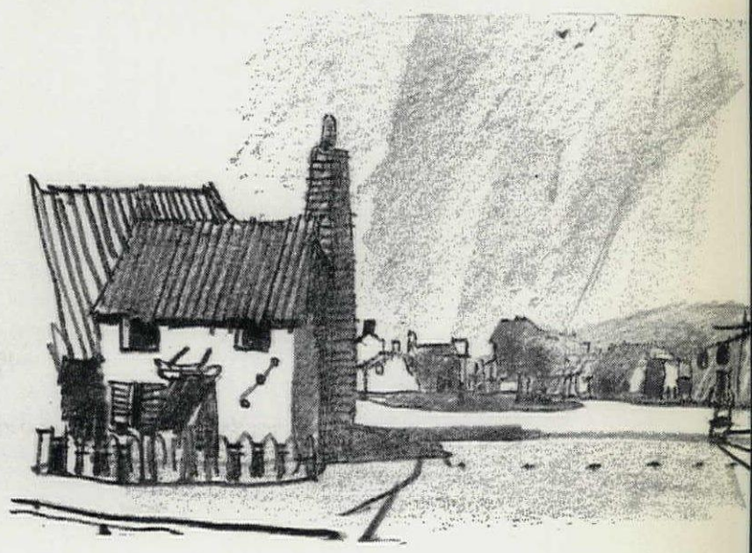
SCALES

Primary divisions →	H humanity	A artifacts	M mood	S space
Secondary divisions ↓	Scales	Scales	Scales	Scales
RANGE	COMMUNITIES (1-) croft (2-) hamlet (3-) village (4-) estate (5-) town (6-) county town (7-) suburb (8-) city (9-) megalopolis	STOCK OF PARTS (1-) sky (2-) water (3-) land (4-) plants (5-) animals (6-) objects (7-) structures (uninhab) (8-) structures (inhab) (9-) complexes	STIMULI (1-) touch size (2-) texture (3-) colour (4-) pattern (5-) key (6-) tempo (7-) rhythm (8-) meaning (9-) intellect	CLAUSTRO (1-) exposure (9-) enclosure
USE	EMPLOYMENT (1-) work (9-) leisure	TENURE (1-) natural life (2-) commercial value (3-) (4-) positional value (5-) (6-) group value (7-) (8-) preservation value (9-) canonisation	CONDITIONING (1-) factory (9-) fairground	WHERE AM I? (1-) here (9-) there
BEHAVIOUR	ZESTS (1-) conventional (9-) revolt	STYLE (1-) functional (9-) romantic	PASSION (1-) propriety (9-) outrage	FORMALITY (1-) formal/axial (2-) axial/sloping (3-) asymmetrical (4-) logical complex (5-) continuous persp. (6-) random complex (7-) overlapping (8-) osmotic (9-) irregular
RELATION	ASSOCIATION (1-) opting in (9-) opting out	LOCATION (1-) hidden (numinous) (2-) glimpsed (3-) recessed (4-) merged (5-) particular (6-) incident (7-) closing (8-) blocking (9-) axial feature	FOILS (1-) simple (9-) complex	SERIAL VISION (1-) known (9-) unknown

INDICATORS



Above are the Scales and Indicators of a detailed system of notation, which we have called the HAMS Code, and which can be used for any existing mapped area—or to indicate the visual features of a proposed plan. The HAMS Code covers all densities of population, and human as well as physical attributes. Below are views of the Long Lent church (St. Moribund's) and the High Street, as they appeared in our earlier broadsheet.



Hams Code at Long Lent

In our previous broadsheet on this subject a system of notation (HAMS Code) was outlined and this is reproduced on the first page of the present issue. In endeavouring to explain the application of this system to practical affairs we assumed a village called Long Lent which was about to be ruined by insensitive, end-gaining development. We now assume a development plan drawn up in sketch form and this has been annotated so that the intention behind the sketch can be conveyed to the local agency who will carry out the work. This leaves the planner free to solve fresh problems elsewhere.

Bearing in mind that more damage has been inflicted on our villages in the last ten years than in their whole previous history it is clear that some effective system will have to be quickly evolved—which, whilst being a rough sketch in some respects, has to be dead accurate in others. It can be rough in the sense that the number and density of new houses considered permissible in a certain situation need not be precisely fixed. It must be accurate in the sense that the view of a church tower from a significant place may be a matter of inches.

By adopting a code such as this the overall considerations are taken care of although, perhaps, the general level of the development in detail may not be as brilliant as it would have been with the individual attention of the planner. Yet the overall decisions such as the essential nature of the village, the relationship of village to landscape, the impact of the village on the traveller at its various entrances, the amount of expansion it can take before it loses its identity and the internal organisation of its scenes are woven into the sketch plan.

Appraisal

The village is bounded by the river to the south and west, by elevated ground to the east and by Lent Park and the common to the north. It would clarify the scene if these natural features were to be emphasised in the development of the village. By this is meant:

1. Building up the northern end of Longbridge to form an edge to the village at the river crossing.
2. Creation of a focal point to the north of the village based on the entrance gates to Lent Park, the public house and the meeting of the roads.
3. Ensuring that the Parish Church continues to command the extensive water meadows to the west and that the Tithe Barn continues to look out over the two hills to the east.

This respect for the natural features of the village means that it would be difficult to expand concentrically from the centre since this would inevitably cut off the two major monuments from their hinterland. Taking into account also the proposed creation of points of interest on the northern and southern extremities the development lines now appear to be fairly clear. The village centre remains dominant but two subcentres would be created, one at either end, situated at the psychologically significant points of entry and the new housing would push out from these to the centre but leaving the centre itself untouched.

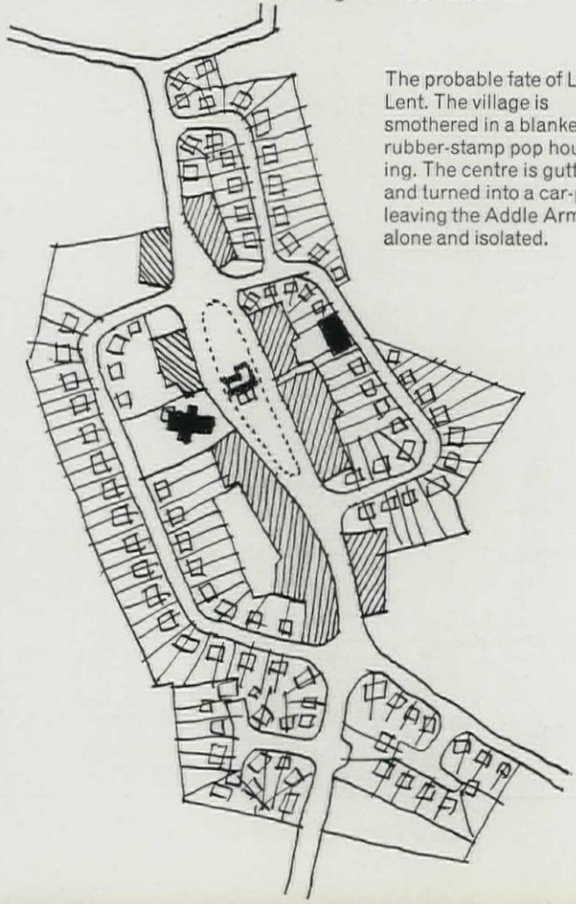
This pattern suggests that more land than is actually earmarked for building could, at some future date, be developed but when this is completed the natural capacity of the village to expand will be over.

Coming now to the detailed layout the major preoccupation will concern the main road sequence from river crossing in the south to the park gates at the north. This is a continuous sequence and now all village. Whilst the proposed focal points could take one of several forms, square, crescent, etc., it does seem that in order not to overload the scene the existing device, an island of building set in a widening of the road, might be exploited. This would give a long, sinuous route with three islands but due to the winding of the road they would be visually separated.

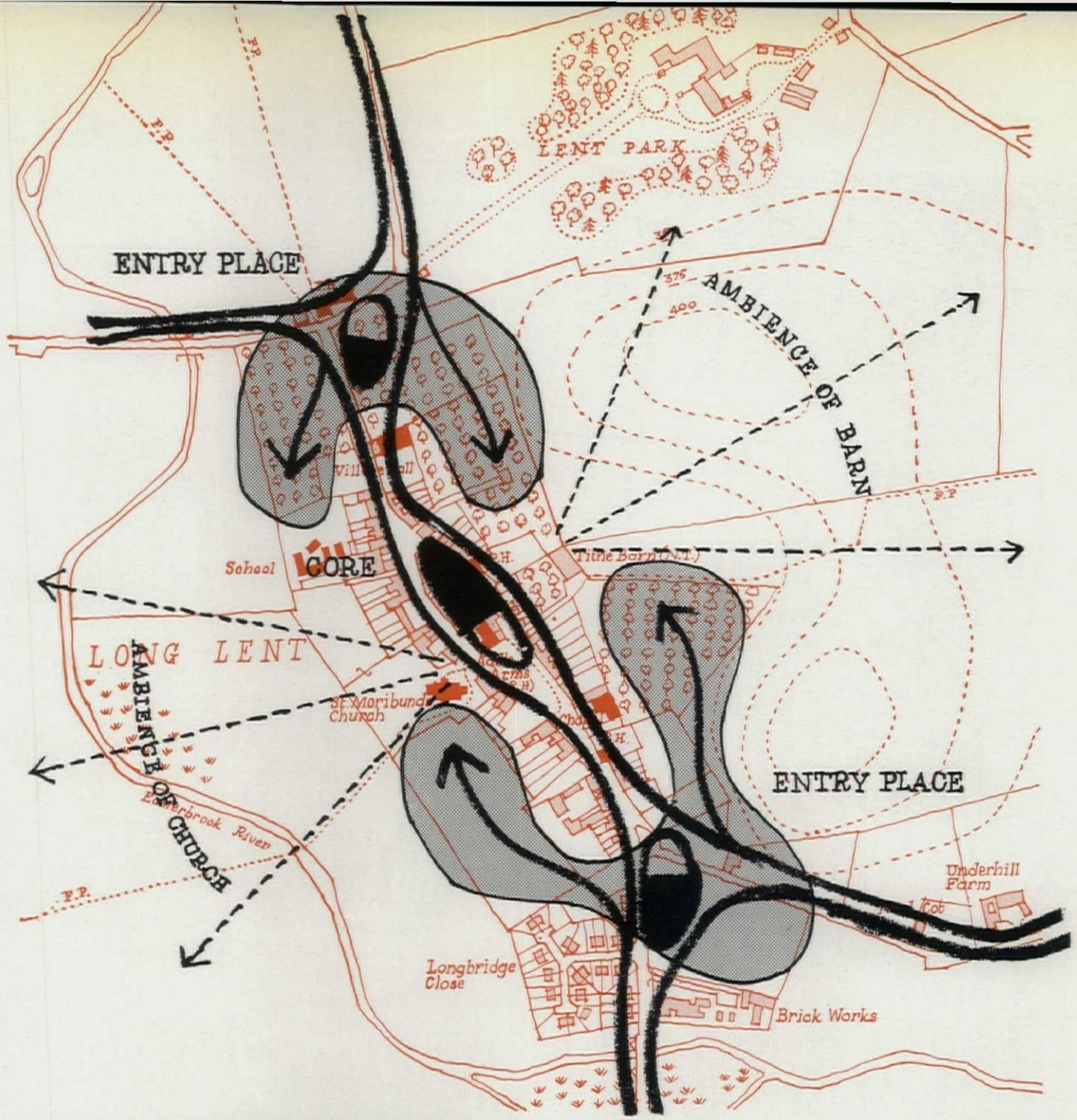
Whilst considering these subcentres it should be possible to take the opportunity to clear up one or two unfortunate situations. The most intractable of these is the entrance from Longbridge between the council housing and the petrol station. By forming a new island the present housing can be allowed to sink back, encouraged by planting, to its proper scale whilst the main road would be flanked by more appropriate building.

So much for the general disposition. All this can be expressed in a rough sketch, opposite, but unless this plan is invested with meaning its benefits would be largely lost. In annotating the village it will be found easier to take it in three sections: 1. The Lent Park entrance; 2. St. Moribund's area, and 3. The Longbridge entrance area.

Below is a plan showing the normal treatment of villages of this kind. There is no need to give illustrations.



The probable fate of Long Lent. The village is smothered in a blanket of rubber-stamp pop housing. The centre is gutted and turned into a car-park leaving the Addle Arms alone and isolated.



Supplementary Indicators

ATTACHMENT	H 7
CONTINUITY BETWEEN TWO POINTS	
CONTINUITY SCALE IN OPERATION	S 5
SIMILARITY ESTABLISHED	
NARROWS	
SOCKETED VISTA	
VERTICAL ANGLE VISTA	30

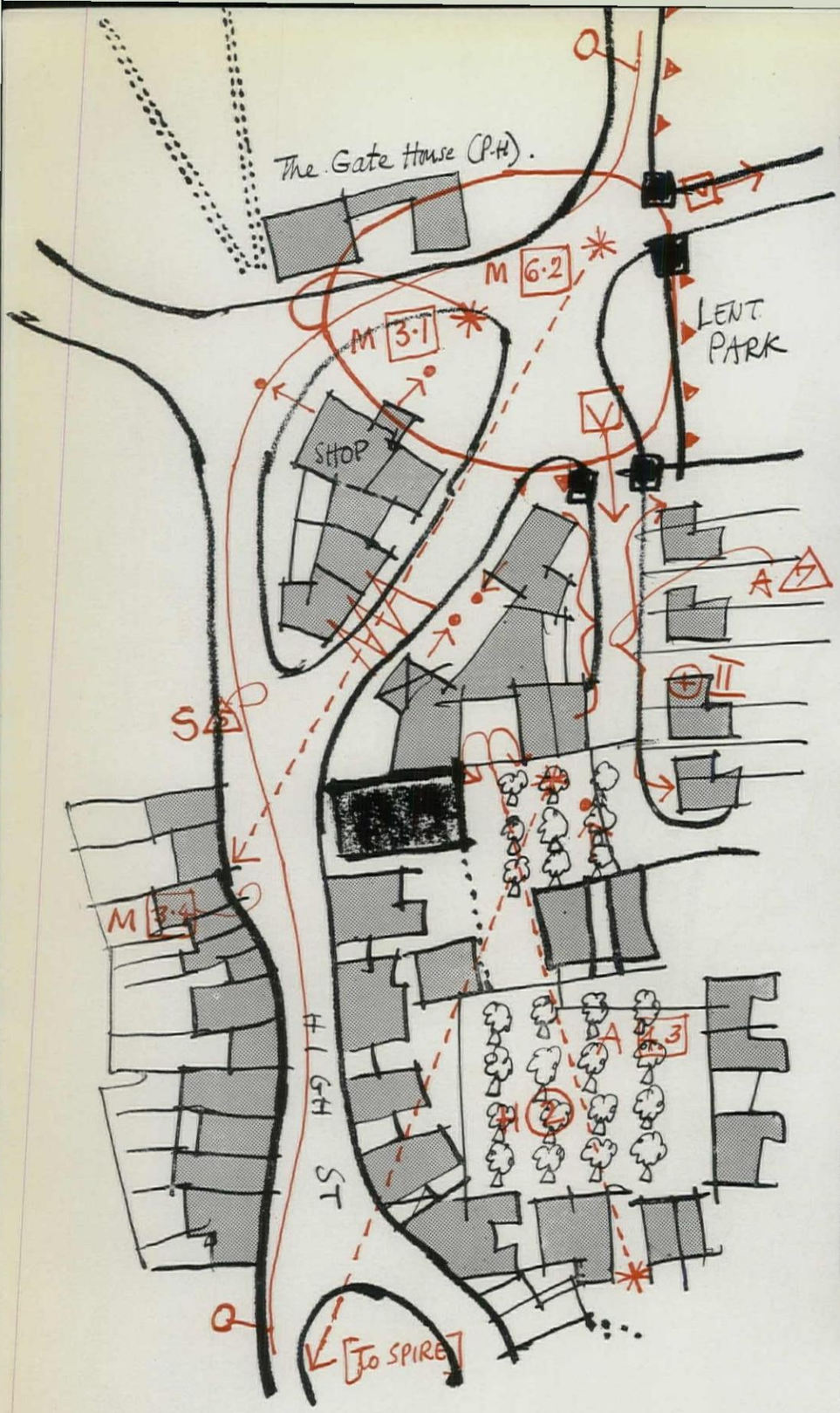
On the left are indicators we have used which are additional to those contained in the first broadsheet. The first is simply the distinctive squiggle used when any two items are to be joined.

It is desirable sometimes to establish a particular length or extent which should be read as one dimension, thus a sinuous facade consisting of many separate buildings may have a collective value and it is then necessary to define the beginning and the end of this. Any particular value can be loaded onto the line in the usual way.

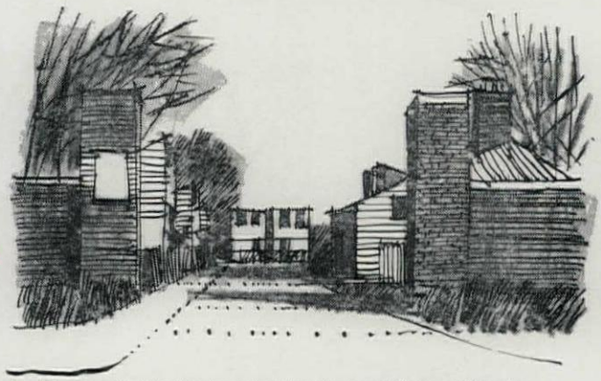
It is also desirable, at times, to draw attention to a kinship or relationship between two things which, for various reasons, may not be obvious from the plan, for instance a street frontage and the internal facade.

Finally there are two useful vistas, first the socketed vista. This is a view which, whilst being precise in its target, is absorbed in it as, say, in a clump of trees or a black hole. The vertical angle is self-explanatory.

Whilst the refinement of the Scales has not yet been taken very far, the implications will easily be guessed. For instance, M 2, used in the St. Moribund's area annotation, suggests a quality of mood not as strait-laced as propriety, but not rakish, i.e. urbane.



View of entry place looking south from public house showing gates to Lent Park to the left and entrance to new housing ahead.



Looking south into the housing development from entry place.

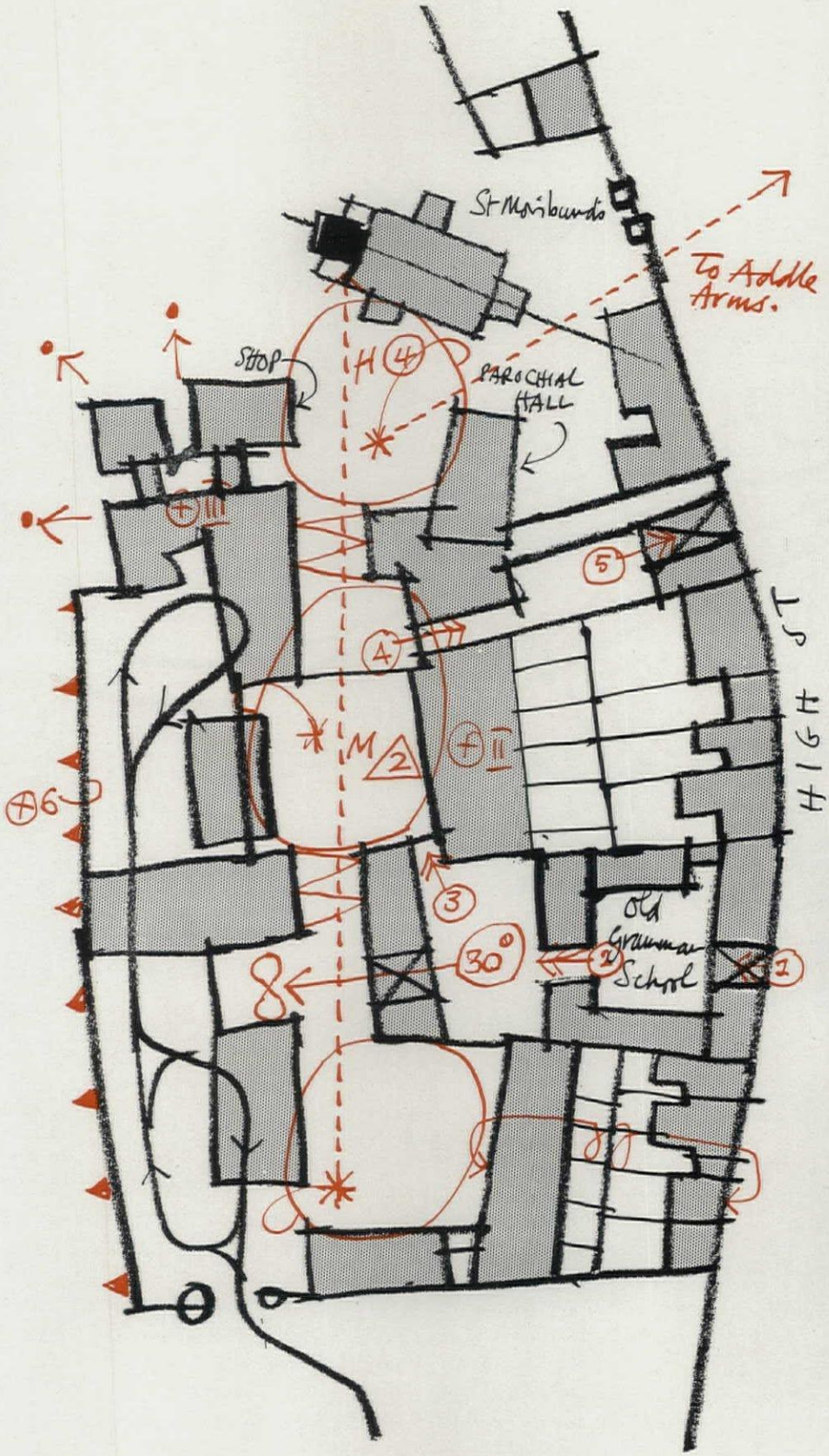
View showing cottages in High Street seen through narrows.

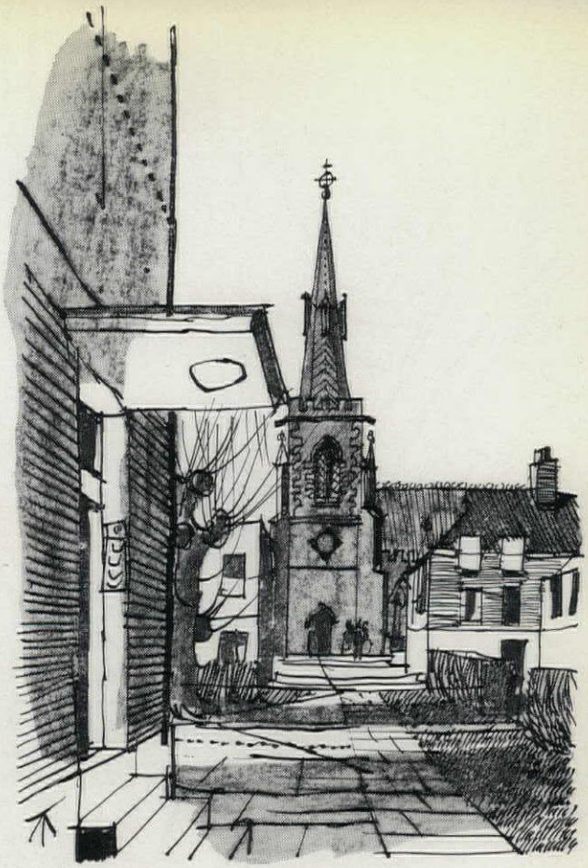
The entry place looking north to public house showing new shop on the left.

1. Entrance place at Long Lent Park. The intention here is to create a distinctive entry place, ⊛, to the village based on the gates of Lent Park and the public house reinforced by the new island and entrance to the new housing development. The tempo of the place is suggested as a casual grouping of buildings held together by walls and with broad, grassy verges and trees, M 6·2. The mood is somewhat sophisticated bearing in mind the blind arcades to the whitewashed brick public house and the noble stone gateway whilst the overall colour value would be white and stone, M 3·1.

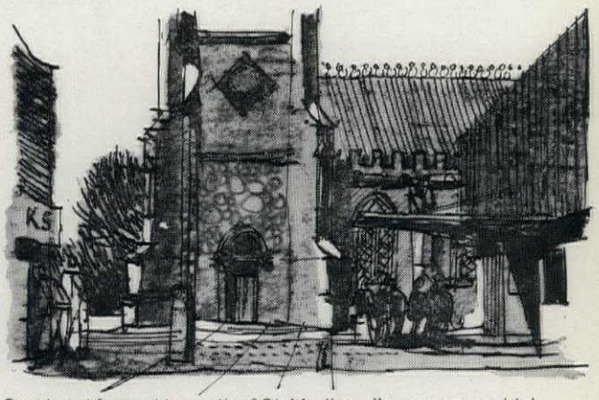
From this entry place the eye explores in three directions, out to Lent Hall, down to a blocking building in the new housing area, V→, and through the gap in the road to a glimpse of ochre-coloured cottages in the High Street, M 3·4. All these views are framed in gateways or narrows, ⋀⋀, so that the entry place retains its integrity.

The housing development is arranged round the existing fruit trees and a residents' association will deal with the husbandry of the tree and the disposal of the fruit thus providing a practical meeting ground for social intercourse, H(2), out of what is usually a no-man's land. The total length of the development is broken into two pieces in order to keep the scale down. The reader will discover further indications, for instance the line of continuous perspective from the central core to the gates, ⚲—⚲.

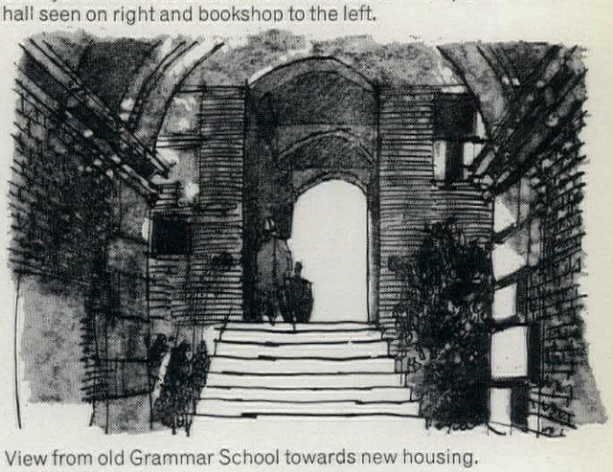




St. Moribund's tower exploited as focal point of the development.

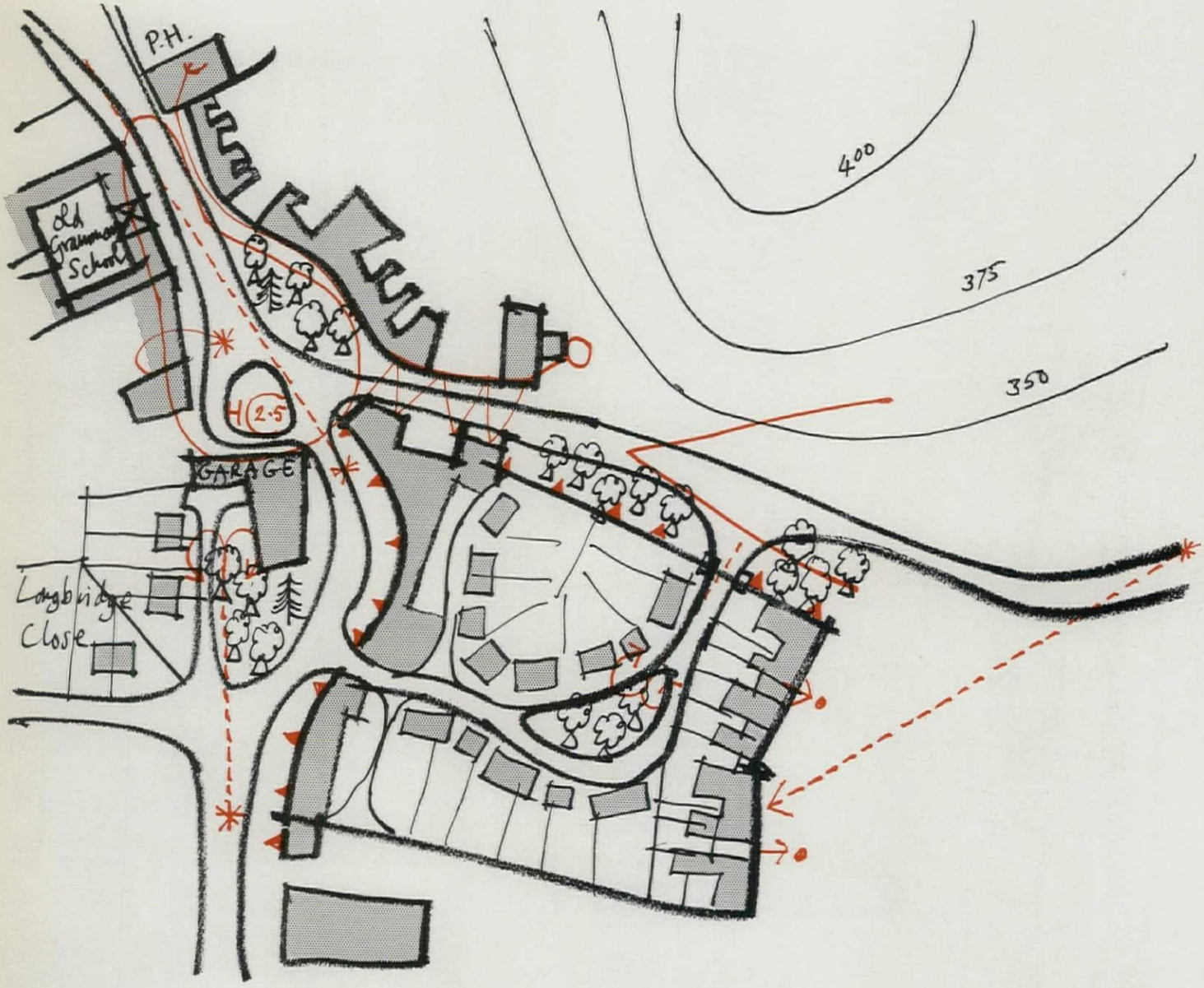


Courtyard formed to south of St. Moribund's—new parochial hall seen on right and bookshop to the left.



View from old Grammar School towards new housing.

2. St. Moribund's area. The intention here is to form a more urban type of housing, M(2), focusing onto the tower of the church and connected to the High Street by pedestrian ways. Car access is from Longbridge Close at the southern entry place and there is garage space to the west of the site enclosed by a wall which forms the edge of the village seen from the meadows, ▲▲▲▲. This is softened by planting deciduous trees. Taking the courtyard of the old Grammar School into the scheme we get four interlinked spaces which are given meaning by being focused onto the church tower, - - - →. The sequence of serial vision, (1)→→, is obviously important here penetrating from the High Street into the meander of courts. The urban nature of this development implies a certain rapport between the High Street elevations and those of the internal courts in scale, ↷ ∞ ↶, intricacy and colour. The character of the spaces varies one from the other, and that close to St. Moribund's has a new Church Hall incorporated so that it has a more public nature, H(4).

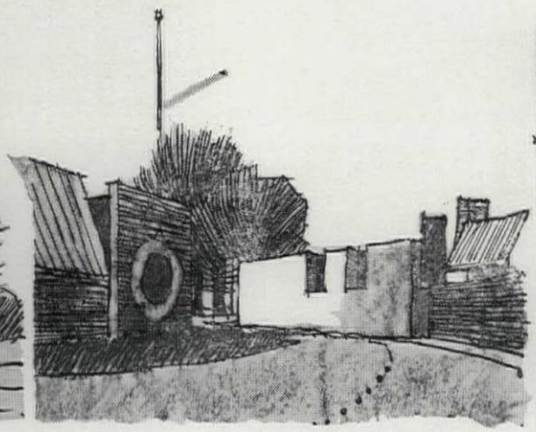


3. The southern entry place. There are two approaches to the island at the south of the village. Dealing with the Longbridge approach first it has already been noted that this is a poor entrance to the village and the remedial measures proposed involve first, screening the backs and flanks of Longbridge Close by building a modest terrace of colour-washed houses facing the river and second, diverting the entrance road to the east. This will have the following effects. It will allow the somewhat raw council houses to retire gracefully on a cul-de-sac screened by trees, x--, shorten the entry road, put the garage on the central island so that it takes its place as a focal building, H(2·5), in the village and lastly it manoeuvres the traveller into a position whereby he is able to command the village High Street on curving into the entry place, ---→.

The new development to the east of this new road is introvert and discreet behind a wall, ▲▲▲▲, so that the approach to the urbane entry place is parklike and reserved. The approach along the second road runs past Underhill Farm at the foot of the hill which at this point is quite steep. The traveller has the hill to his right with arable land to the left. As the hill is neared the eye is contained by the new development which faces outward, →•, to greet the traveller. At this point the road changes direction and a constriction, <, is revealed between the hill and the wall of the development which gradually narrows to a crisis point, ^^^. This debouches into the entry place. In order to achieve a smooth transition the building line from the cottage to public house is intended to be a single sinuous curve, ∫∼∫, whether it be wall, fence or facade of building.

Entrance to Long Lent from east showing constructions between hillside and wall to housing.

Looking north to Longbridge Close from southern entrance.



Development around central island, service station to the left and blank wall of garages of housing development to the right.

Revealed view up to Addle Arms from the southern entry place.

Forthcoming attractions

The next exercise in this series is concerned with the shopping centre of a medium-sized town. One might think that the incidence of development on this scale was so low that the use of a Code would be unnecessary. Consider however how much of this kind of work is carried out by unskilled draughtsmen. Consider the volume completed in the last five years. Consider, too, that a system of notation is a way of passing on precise opinions about a particular situation. The advice may not be taken but this is a way of giving it.

The development area is situated in the centre of an industrial town of 55,000 which lies somewhere on the 53rd parallel. At the centre of the area there is an old building known as Muffingilders Hall and our story revolves around the fortunes of this structure.

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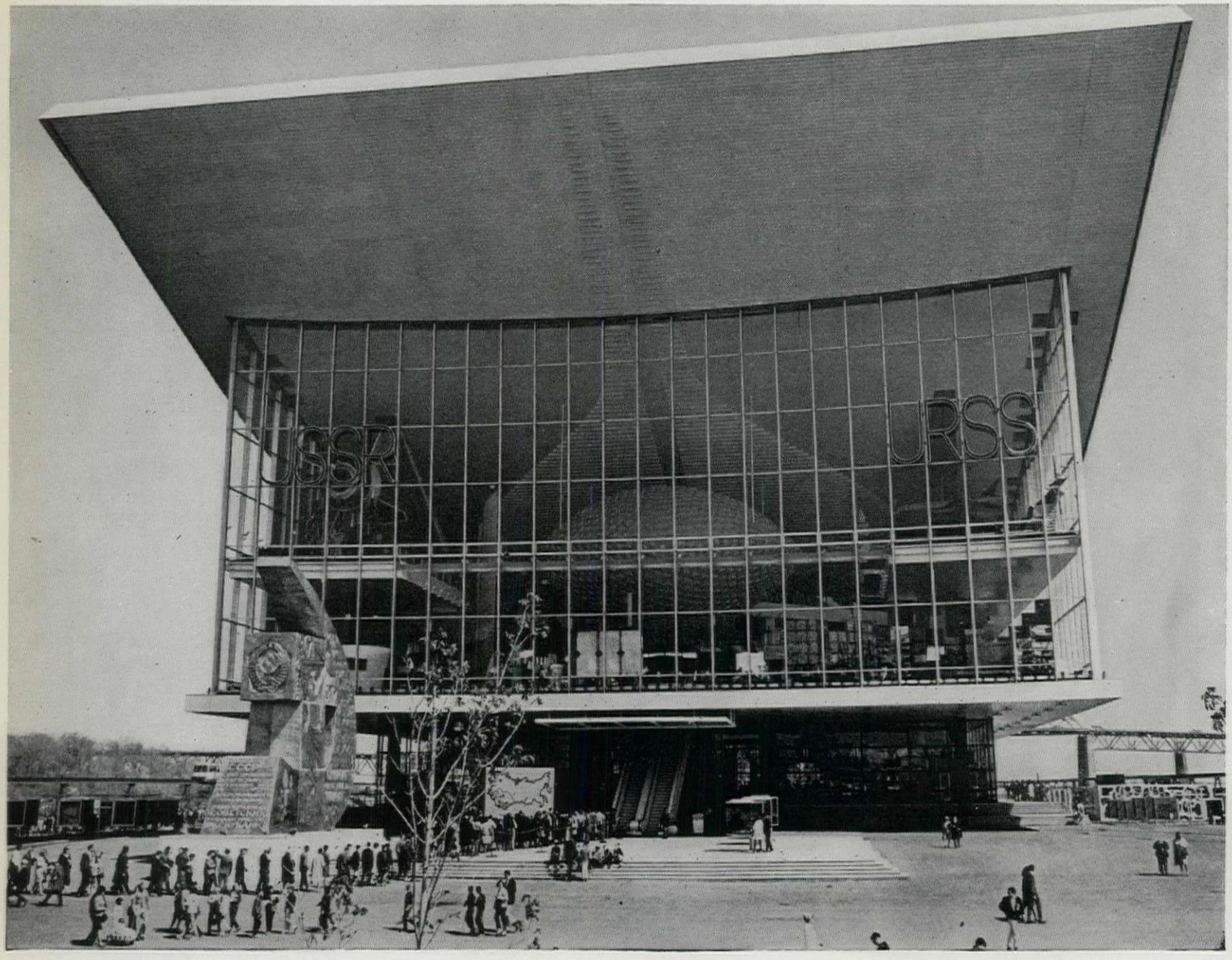

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ALCAN

Nikolaus Pevsner receiving the medal from Lord Esher, President, RIBA.

Gold Medallist, 1967

The award of this year's Royal Gold Medal for Architecture to Professor Nikolaus Pevsner (see AR, February, 1967, page 93) is doubly welcome to THE ARCHITECTURAL REVIEW *because it is an honour given to one of the* REVIEW'S *own editors; but for the same reason an article by the* REVIEW *itself on the achievements that earned Professor Pevsner the award would not be appropriate. Instead, the presentation of the medal at a ceremony at the RIBA on June 20 is celebrated herewith by an anthology of extracts from the many tributes to Professor Pevsner that appeared in the Press after the award was announced or were paid at the presentation ceremony.*

THE TIMES

Professor Nikolaus Pevsner . . . is that rare person, a scholar and historian who at the same time shows sensitive aesthetic judgement and minds passionately about buildings; a combination of qualities the more remarkable because dry-as-dust expertise, concerned with facts rather than feelings, is most often associated —justly or not—with German scholarship, and Professor Pevsner was born and educated in Germany.

But he came to England more than thirty years ago and has long been, in manner and attitude, more English than many Englishmen. The traditionally German qualities he retains are his unrelenting capacity for hard work and the value he puts on exactitude of detail. Both are exhibited to the full in the publications for which he is most widely known: his *Buildings of England* series of architectural county guides which, through Penguins, he has been bringing out county by county since 1951. He is not only the founder and editor of the series but has personally written every word of all but a few of the twenty-seven volumes so far published and some part of the remainder.

They are a fascinating mixture of learned information and pertinent—often faintly ironical—appraisal, and have done a great deal over the years to sharpen the public's architectural perceptions and arouse its interest in historic buildings. A mention in Pevsner has become the established criterion of the beauty or value of a building.

The *Buildings of England* volumes were among the first guide-books to take nineteenth - century architecture seriously. This is a period on which Professor Pevsner has done important pioneer work and his interest in it is reflected by his present chairmanship (in succession to the late Lord Esher) of the Victorian Society, which has led the way in the latterday re-appraisal of Victorian buildings.

The Royal Gold Medal is usually given by the RIBA to a practising architect, but can also be given for 'promoting the advancement of architecture,' a Victorian form of words which admirably fits Professor Pevsner's multifarious activities as broadcaster, lecturer, writer, editor and critic. . . . It is an illustration of his courage and pertinacity that some of his most important writing was done, and his most valuable projects conceived, during a hard and discouraging period of his life when working with pick and shovel clearing bomb-damage was the only use that could be found for his talents in the early years of the war.

ARCHITECTURAL CORRESPONDENT

DESIGN MAGAZINE

The Royal Gold Medal for Architecture . . . is specifically for 'promoting the advancement of architecture.' It is an award he rightly deserves, yet Pevsner's work has been even more significant, for he has had an enormous influence on the understanding and enjoyment not only of architecture but also of fine art and design, both historical and modern.

At first sight it is difficult to understand why Pevsner should be such an influential figure in the development of twentieth century design. There is no problem in understanding his importance. He is a brilliant, imaginative and open minded scholar whose painstaking attention to detail has never stood in the way of his ability to give an overall shape and meaning to his subjects. For the layman his skill is still most apparent in his *An Outline of European Architecture* and his Penguin *Buildings of England*.

But it is the extent of his influence which is less understandable. How is it that he manages to write best sellers on subjects which until fairly recently were entirely a minority interest?

His manner is dry and precise, both in speaking and writing. He allows no pauses for intellectual digestion, no time for the irrelevant, the merely amusing or interesting. There are no re-statements, no heroics, no emotional special pleadings. He offers only scholarship, presented in a way least calculated to create an army of disciples.

I first met Pevsner two months ago. But I first heard him about 12 years ago when he was Slade Professor of Fine Art and I was a first year student at Cambridge. In my experience there were only two lecturers who consistently drew capacity houses—and one of them was Pevsner. In the period just before lunch we flocked to hear him on fine art, and just before dinner (both unpopular times) we flocked to hear him on architecture.

It was at these lectures that I. as an historian, first met medical and engineering students, geographers and potential estate agents. Yet I think these lectures were probably among the least *enjoyable* I have ever attended. They were difficult to follow and, unless you were in the first few rows, difficult to hear; they were so constructed that it was impossible to let one's mind wander for a moment without the risk of losing the thread of an entire lecture, or even series of lectures; they contained nothing except a string of facts; and they were accompanied by some particularly unimpressive slides. It was tough, hard work. But we could not avoid the self imposed compulsion to go and hear Pevsner, and the way he taught us to look at and analyse Cézanne's *Women Bathers* or Michelangelo's ante-room to the Laurenziana library in Florence indirectly gave us an objective approach to contemporary design which opened out an entirely new world for us.

What is the source of his influence? Although the way he writes is pithy, sharp and even staccato, his prose is always well rounded and expressed with the greatest simplicity and directness, to an extent which is meaningful to both laymen and experts. A tall, gangling man with keenly critical eyes peering through rimless spectacles, he talks fast with always a suggestion of wit and amusement as if he were about to annouce some amazing discovery. One never knows from the start of a sentence how it is likely to end, but on looking back at its close one realises that for all its surprises and turns it has logic and clarity. He is, therefore, an entrancing man.

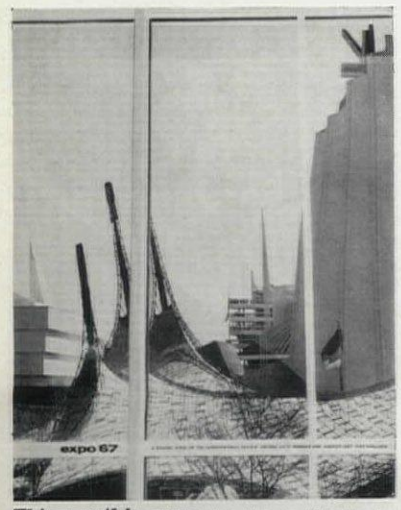
He has done more than make architecture, fine art and design comprehensible to a large public. He has aroused an enormous interest and feeling for them because he has helped people to care about them in a direct and personally involved way. In all three cases, Pevsner has given them a functional or social importance above and beyond their purely aesthetic significance.

He has been able to do this because, for all his apparent severity, he is really a passionate and dedicated man who champions his subjects with deep intensity. Listening to him, you suddenly realise that he gets very excited, but with that remarkable capacity to remain rational, factual and logical. He feeds information at you as if it were all marvellous. And of course, as Pevsner always so clearly demonstrates, marvellous it is even if you had not noticed before. But, once noticed in the Pevsner way, it is difficult to forget.

As an historian he has recently acknowledged the decline of the Modern Movement and the rise of what he calls the Post-Modern Movement. Clearly he is not yet convinced by the 'personality cult' approach to design and architecture which he sees as the heart of the new movement, but as chairman of the Victorian Society he does not take a limited view of the meaning of functionalism. But the fact remains that, while there have been many protagonists of the modern movement, none has given it such a sense of intellectual coherence as

acknowledgments

COVER: Malcolm Lewis. GOLD MEDALLIST, 1967, page 79: *The Times*. VIEWS AND REVIEWS, pages 80–85: 1, Eric de Maré; 4, *Building with Steel*; 5, *Concrete Quarterly*; 9, 10, *Country Life*. FRONTISPIECE, page 86: Malcolm Lewis. MULTI-LEVEL CITY, pages 89–96: 1, 2, 4–9, Richards Arphot; 3, Canada Wide Feature Service; 10–14, Malcolm Lewis. SITE, LANDSCAPE AND TRANSPORT, pages 98–107: 3, 13, 15, 17, 21, 23, Malcolm Lewis; 8, 14, 16, 19, 22, 24, 25, Richards Arphot; 9–12, 18, 20, Clem Shepherd. THE NATIONAL PAVILIONS, pages 108–128: 1, 3, 4, 8–12, 15, 18–21, 26, 36, 37, 39, 41, 42, 46, 51, Richards Arphot; 2, 5, 7, 13, 16, 17, 23, 27, 28, 30, 33, 38, 47, 48, 50, 52, Malcolm Lewis; 22, 24, 25, COI; 34, 35, Kokkyu Miwa; 44, Studio Lausanne; 49, International Press Service. GERMANY, pages 129–135: 2, Avedissian; 3, 4, 5, 7–10, Malcolm Lewis; 6, Clem Shepherd. THEME AND PERMANENT BUILDINGS, pages 136–142: 1, 2, 4, 5, 7, 9–13, Richards Arphot; 3, Malcolm Lewis; 6, Chris F. Payne. HABITAT, pages 143–150: 1–7, 9, 10, Richards Arphot; 8, Malcolm Lewis. EXPO AND THE FUTURE CITY, pages 151–154: 2, Richards Arphot; 3, Clem Shepherd. DESIGN COMMENTARY, pages 155–166: 1, 9, 10, 11, 16–18, 22, 24, 29, 31, 34–37, 40–42, 44, 45, 47–49, Richards Arphot; 2–5, 7, 12, 25, 27, 28, 30, 32, 46, Malcolm Lewis; 14, 15, COI; 20, René Delbuguet; 21, Kokkyu Miwa; 33, International Press Service; 38, 39, 43, Clem Shepherd. STOP PRESS, pages 167–168: 1, 2, 8, 9, G. J. Nason; 3, Inland Waterways Association; 4, 5, 10, Nairn Arphot; 6, 7, CDA.



This month's cover *shows some of the towers and spires of Expo's national pavilions reflected in the tinted glass walls of the Australian pavilion: from left to right, British, German, French, British. Photograph by Malcolm Lewis.*

THE ARCHITECTURAL REVIEW

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Pevsner. As Philip Johnson has so charmingly put it, 'He is the only man who can say "functionalism" with a straight face.' CORIN HUGHES-STANTON

THE ARCHITECTS' JOURNAL

Few people have done more to reveal the glories of English architecture to the startled eyes of the English. His Penguin Guides have added a dimension to the pleasure of going to the country: village spotting must surely now vie with bird watching as a popular sport, educating the eye of the sportsman so that—one hopes—he will never itch to build a bungalow on the downs or *chichify* a cottage in the green belt with bogus diamond panes. ASTRAGAL

SIR JOHN SUMMERSON

There was a time, still within living memory, when all, or nearly all, architectural history in England was written by architects; and not only by architects but by the biggest and busiest architects. George Edmund Street, in mid career, wrote classics on Italian Gothic and Spanish Gothic; Sir Thomas Graham Jackson found time to write about nearly everything west of Suez; Sir Banister Fletcher *did* write about everything east of Suez *and* west of Suez; John Alfred Gotch settled down in early life to the Elizabethans and in old age reached Inigo Jones; Sir Reginald Blomfield wrote wisely on the French, fluently on the English Renaissance. 'What cycling holidays were here, what ponies and traps, what walking tours! Then there was Sir Albert Edward Richardson, perhaps the last of his great kind, roaring round in a motor car in the 'twenties. All marvellous men—four out of the six I have named were Royal Gold Medallists; the other two were presidents of this institute (RIBA).

These men held sharp pencils in their hands. They sketched. They sketched what they wrote about and they wrote about what they sketched. And what they sketched got into their heads and got from their heads into their fingers and from their fingers into their buildings. It was a game—what a game it was!—and all one game.

But somewhere about 1934 the game came to an end. That was the year of Blomfield's *Modernismus*. The MARS group was in session. At least two, possibly three and it could be four, buildings in the modern manner had actually been built in England. Architectural history, as cultivated, was arraigned. It was found soft. History, like architecture, must now be functional, must clarify, explain. So here was a question, and a good question: what in history or form was the modern movement? And precisely as the question arose came a book, *Pioneers of the Modern Movement from Morris to Gropius* by Nikolaus Pevsner; a book adroitly topical, starting in England and, since Gropius was then working in this country, ending in England; a book deft in its omissions, agile in its allusions, startling in its erudition, and accusing in the almost futurist stab of its last sentence. A book crystal clear and, above all, *professional*.

Professional. This word I underline because it is the superb professionalism of Nikolaus Pevsner's work which has always been to me, and I think to many others, the greatest stimulus and challenge. It is, I know, this professionalism of the school in which he was trained, the professionalism of a discipline which until the early 'thirties was unpractised in this country. But it is also a professionalism of a personal kind, flexible and protean. The great professional, like the great dandy, is the one who can afford to be unprofessional—to wear odd socks, to miss a trick or two if thereby something is gained in discovery or communication. This is great professionalism and this is the kind of professional that Pevsner is; and that is why, in honouring him as a scholar, we are also honouring him as a bringer of the riches, the entertainment, the wisdom of architectural scholarship to more people probably than any man alive.

I think we shall be able to distinguish . . . two Pevsner images, always separate but continually walking in and out of each other. The first image is that of Pevsner the academic, the international art-historian; the author forty years ago of an innovating survey of mannerist and baroque Italian painting; the author in 1940 of a classic study of academies; and the editor since 1947 of the Pelican 'History of Art,' whose volumes year by year roll on towards us, the *wagons-lits* of world art hitched to the ever locomotive present.

But the other image, the more endearing one, is Pevsner the discoverer of, and expositor of, English architecture. I can never make up my mind whether the Englishness of English art is or is not a pure invention of Pevsner's, part of some private mythology. What is certain is that the artifacts of this pattern have become to him the kind of obsessional provocation that the world's oceans are to Sir Francis Chichester. In *The Buildings of England* he describes our cathedrals and churches and castles, our country houses and villas, our flash new centres and lay-about old side streets; our shrines, follies and hovels; our theological colleges and high schools for girls; our cooling towers, shot-towers, hunting towers and water towers; our pithead baths; our pin manufactories, tin mines, windmills, water mills, tide mills, clubs, pubs, cemeteries, cottage hospitals, banks, banqueting houses, tithe barns, disused railway stations and obsolete pillar boxes—with a perception, originality and gaiety which never flags.

He has invented indeed a special dialectic of his own, one in which close and reasoned argument—on things which are worth close and reasoned argument—is succeeded now by staccato note-taking, now by casual, speculative play—the whole thing is a literary arabesque hitherto unknown. It is an amazing performance. RIBA, JUNE 1967

SOCIETY OF ARCHITECTURAL HISTORIANS (PENNSYLVANIA)

Dr. Pevsner established his reputation as a teacher and scholar at a university founded by King George II. Equally coincidental was the fact that at this university in Göttingen he specialized in the history of English art. But the coincidence resulted in his bringing to all those who speak the English language the beneficial stimulus of erudition related to their cultural heritage. More important, it brought them the refereshing stimulus of his many fertile ideas, causing him to be even more influential, perhaps, as an editor, and as the supervisor of graduate research, than as a writer, though the products of his literary talent have been prolific.

It is undoubtedly as an editor that he has been most influential in North America, notably as one of the editors of THE ARCHITECTURAL REVIEW, and as editor of the Pelican History of Art. Indeed, it is singularly appropriate that in the same month that he celebrated his sixty-fifth birthday, the Alice Davis Hitchock medal was awarded for yet another authoritative monograph published in this series. The series is still incomplete, and several more volumes by American scholars will doubtless merit eventually the same distinction. But this is an appropriate opportunity to pay homage to the scholar who undertook so energetically the onerous task of bringing this project to fruition. Officially, having reached the age of academic retirement, he can henceforth devote all his energies to such work; and we wish him the long life and good health necessary for him to witness the triumphant completion of the multifarious research projects he has so courageously initiated during the last quarter of a century. SAH JOURNAL

VIEWS AND REVIEWS

marginalia

THE PHILISTINES IN BALDOCK

As these words are written, Simpson's Brewery, the beautiful building that adds so much distinction to Baldock High Street, 1, is being demolished. Long efforts by the Georgian Group—with somewhat half-hearted support from the Ministry of Housing and the Herts county planning officer—have failed to save it, and the depressing thing is that the initiative over its destruction was taken by the Baldock urban district council, the very body who should be on the watch to safeguard the valuable buildings in its area.

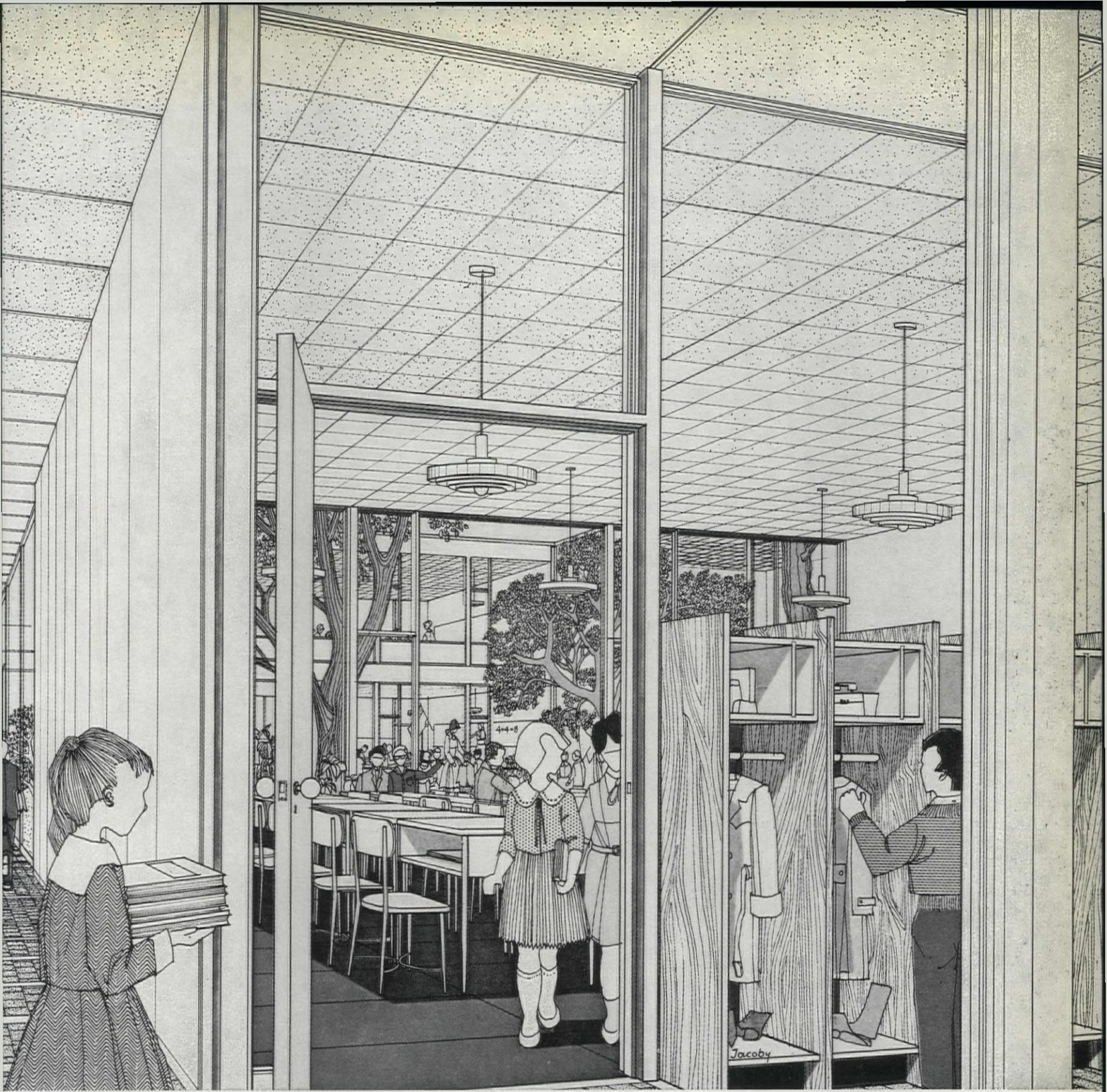
The council acquired the brewery in order to demolish it and use the site for housing, knowing that it was listed by the Ministry as a building of historic and architectural interest. This demonstration of philistinism comes at a time when a new Civic Amenities Bill is before Parliament—a bill which places even more of the responsibility for safeguarding good architecture on the local authorities.

Attention was drawn to the value of the building in THE ARCHITECTURAL REVIEW as long ago as July 1957 when it was illustrated in a special issue on the functional tradition in early industrial buildings.

THE WHOLE WEN

The newly published Ordnance Survey one-inch map which accommodates the whole of Greater London on one sheet, instead of chopping it among four, is so practical and admirable for ordinary use—the print is clear enough and the colours bright enough for the roads to be clearly discernible,

1, *Simpson's Brewery, Baldock—now being demolished. See note above.*



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AT 55

even in built-up areas—that one wonders why it was not produced before. For architects and planners it can have, of course, some fascination of a different kind than mere weekend convenience: for here, spread out on a single piece of paper, is depicted the whole story of the expansion of London and the arguments over the Green Belt—from Hemel Hempstead to Chipping Ongar in the north, from Woking to Wrotham in the south. It is remarkable how successful the Belt has been in certain sectors: the Knockholt—Downe—Cudham area of the London borough of Bromley should not be in London at all; Epping Forest still plunges far into the built-up Essex suburbs; and the military commons hold Woking in check. But equally striking is the success of developers along main transport routes in thickening up the arms of the stellar pattern of built-up London: Watford—Rickmansworth, Grays—Thurrock, Dartford—Gravesend, Uxbridge—Denham. Maybe that is a rational pattern for the future, as the *Weekend Telegraph* study suggested: arms of rapid transit, built up in linear formations, with wedges of greenery thrusting deep between them. The most alarming aspect of the one-inch map is to see how far this stellar pattern has become broken down into general suburban sprawl *beyond* the Green Belt. The part between Sevenoaks and Tonbridge, around Hildenborough, is actually off this map, yet it is now much more part of London in character than Knockholt is. A whole area of rapid, even rabid, unplanned growth has been allowed by a county which has wasted countless hours in obstructing and cosseting Eric Lyons's *planned* Span village because that was inside the proposed extension to the Green Belt.

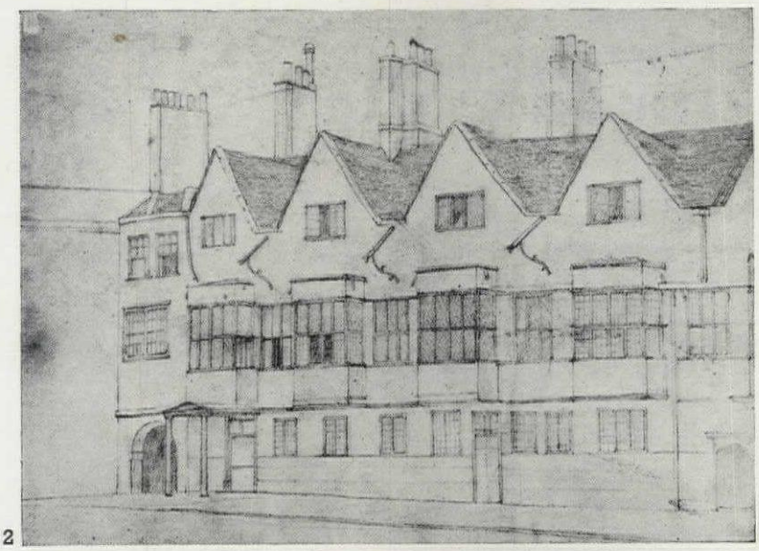
THE OLD PALACE

Architectural History, the annual journal of the Society of Architectural Historians of Great Britain, specializes in the publication of original source material. It has surpassed even its usual high standard of scholarly 'scoops' in its ninth volume (1966), which consists entirely of 'Views of the Old Palace of Westminster,' edited by Howard Colvin, of whose monumental *History of the King's Works* the 142 plates here collected form an indispensable offcut. Copies are obtainable at 45s. from the journal's Honorary Editor, Frank Jenkins, at The School of Architecture, The University, Manchester, 13.

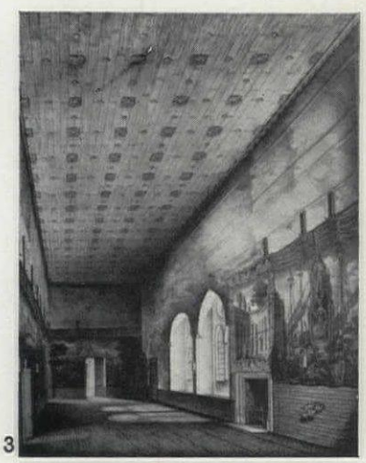
In 1785 the Palace of Westminster was still very largely medieval in layout and in detail; its gradual rebuilding by Wyatt and Soane over the next fifty years culminated in the great fire of 1834, which spared only parts of St. Stephen's cloisters and chapel, together with Westminster Hall. Yet it has to be admitted that St. Stephen's and the Hall were also the only parts, except possibly the Painted Chamber, where the monarchy had dared to express its temporal might, instead of diplomatic parsimony. The ramshackle accretion of chambers at Westminster must have appeared strangely quaint to the eyes of foreign ambassadors when compared with the architectural splendours of overmighty subjects, from John of Gaunt at Kenilworth to Wolsey at Hampton Court.

Colvin's architectural tour, conducted with his usual effortless control, is, nevertheless, full of surprises and excitements. Starting appropriately with the Water Gate at the foot of New Palace Yard, he begins with a delightful sixteenth century office block backing onto the river, 2. Did its familiar bay windows influence Barry and Pugin in their range on this spot, just as their attached Big Ben echoed the nearby siting of Edward III's campanile? The plates then record the wings which flanked the north front of Westminster Hall: the Receipt of Exchequer (basically twelfth century) on the east, the Court of Exchequer (thirteenth century plus 1569–70), Queen Elizabeth's Chamber (1565–7) and the Augmentations Office (1536–7) on the west. Then, skirting Kent's committee room block on the west side of the Hall (Colvin excludes work later than 1660), the plates record St. Stephen's cloister and chapter house on the east side in their converted state as dwelling houses and the adjoining St. Stephen's chapel in its gutted state (only its undercroft was retained by Barry). Finally there was the cluster of buildings to the south of the Hall, entered from Old Palace Yard, which formed a curious zig-zag of interconnected rooms alternately aligned east-west and north-south. No illustrations evidently survive of the long-destroyed Court of Wards (east-west across the end of the Hall) or of the Court of Requests (north-south at right-angles to it). Of the Painted Chamber (east-west), 3, the old, i.e. pre-Soane, House of Lords (north-south) and the Prince's Chamber (east-west) a great deal is recorded however, all three surviving basically intact from the palace of Henry III, even down to wall paintings and headless statues.

The heroes of the volume are the early nineteenth-century antiquaries. Carter, Capon, Smith, Billings, Buckler and Mackenzie were the chief of these, the first three working before the fire in an atmosphere of mutual hostility between them and Wyatt, who was demolishing and remodelling almost faster than they could draw. Smith's letter to James Wyatt of 1809, quoted by Colvin, deserves to be read for its rapier-sharp insolence, unequalled by any preservationist since. Soane by contrast saw to it that his own assistants recorded what they destroyed. Of the antiquaries, William Capon (1757–1827), scene-painter and decorative artist, is no doubt the least known name to the general reader, but his drawings, while lacking the exquisite softness of Buckler, have a structural and spatial authenticity (as in 2) superior to any of the others—quite apart from the indispensability of his great coloured ground plan of the whole precinct.



2, *sixteenth-century building in New Palace Yard, Westminster.* 3, *the Painted Chamber in the old House of Lords.*



4, *monorail recently installed at Blackpool Pleasure Beach. See 'Revolutionary Blackpool.'*

REVOLUTIONARY BLACKPOOL

Since Reyner Banham's article on monorails (AR, August, 1964) there has been no shortage of talk about their use in Britain, Buchanan himself having been consultant to the French Safege system. It has been left to Blackpool Pleasure Beach Ltd., who were in the Fun Palace business long before Joan Littlewood, actually to install one (to a Swiss design) and to run it commercially. Since last summer a mile-long continuous track has carried four 105 ft. trains, 4, each consisting of fifteen four-person carriages. By providing a seductive panorama of the beach it is hoped to improve crowd flow on the ground. Up to 4,000 passengers per hour can be carried at speeds of up to 12 ft. per second—though the many varieties of curve have kept speeds down. The carriages of glass fibre and aluminium have to withstand high sea winds; some are totally enclosed, other are largely exposed. The track is carried on a galvanized steel frame at 25–35 ft. centres. After a running-in period the system will become fully automated.

INDUSTRIAL BOOKLIST

Rex Wailes's Industrial Monuments Survey (discussed in detail in AR, June 1966), which has now reverted to the sole sponsorship of the Council of British Archaeology, has undoubtedly quickened response to the subject among local authorities. For long Staffordshire blazed the way with its own archaeology officer. Reports have recently come from two other counties of surveys carried out as part of Mr. Wailes's nationwide project; they are a fascinating contrast in form and content. *Industrial Archaeology in Bedfordshire* (obtainable from Shire Hall, Bedford; no price given) has not much to report compared with many other counties, but it does it impeccably in this survey by Geoffrey Sands of the county planning department (planning officer, Peter Laws). Typographically and pictorially alluring, it covers easily and simply, without talking down, both the familiar windmills and watermills of a largely non-industrial county and also the local specialities such as the straw hat industry of Luton and the noble airship hangars of 1917-27 at Cardington.

Industrial Monuments in Hertfordshire (6s. plus postage from the County Record Office, Shire Hall, Hertford) is both more and less than this. It is a report by Mr. W. Branch Johnson on his two-year appointment (1964-6) as consultant on industrial monuments

to the county council. His work has been superb in the circumstances: his report is packed out with detailed information on this varied county's rich hive of industries. His survey was often barely in time: impressive breweries at Watford and Hertford were demolished in 1965 and 1966; and the finest of all, Simpson's of Baldock, this year (see page 80). Mr. Branch Johnson meticulously traces the physical evidence of the industries of papermaking, silk, smokeless gunpowder, Hitch's patent interlocking bricks, herbs, fireworks, sheep-dip and so on. He is strong on gas and water supplies and excellent on all forms of transport (seven out of ten cross-country branch railway lines in the county are now closed).

But this Hertfordshire report is shoddily reproduced: poor paper, crowded type, only eight illustrations, a ludicrously perfunctory cover. Then we read in Mr. Branch Johnson's tactfully worded introduction that he could not have done the survey at all if he had not been taken for 4,768 miles by a *volunteer* driver; i.e. the county did not provide the one essential for his work—a car. He has done the county proud and one can only hope they are grateful.

The other father-figure of industrial archaeology besides Rex Wailes is Kenneth Hudson, who edits the invaluable magazine *Industrial Archaeology*. He has now written a *Handbook for Industrial Archaeologists* (John Baker, 15s.), which gives eighty-four pages of practical advice on how to set about the subject. The price is a little excessive and as a pocket guide it would have fitted the pocket better in a soft cover; but the book is good enough to surmount these barriers. Mr. Hudson's six chapters take in order: the range of materials for study and what the priorities may be; background preparation for fieldwork; how to describe and record; how to prepare reports and articles and have them published; the organizations, national and local; and a guide to further reading. It is all basic stuff, but anyone in so new a subject will learn something from Mr. Hudson, who did so much to invent it.

YORK CONCRETE

As a follow-up to the AR's 'Pre-Corb' article (October, 1966) on the use of *béton brut* in 1913–17 at Erith Oil Works, *Concrete Quarterly* has illustrated an even earlier example, 5: the Tempest Anderson Hall designed in 1912–13 by E. Ridsdale Tate as an extension to William Wilkins's York Musuem of 1829. Unlike the Erith architects and engineers, Tate was not prophetic in his architectural forms; his reason for using rough shuttering in 'courses' was precisely to make the ferro-concrete of his pilasters and triglyphs look as like Wilkins's Grecian stonework as possible. He used the American Kahn system of the Trussed Concrete Steel Company (now Truscon), which had previously supported the lush splendours of Central Hall, Westminster. David Lloyd has spotted a second, possibly earlier building in York which is probably by Tate—it stands close to All Saints, North Street, which he restored; here the concrete has wooden battens nailed to it to simulate half-timber.

WEST MIDLAND CANALS

The Birmingham Canal Navigations Study Group has been set up under the wing of the Inland Waterways Association to focus public attention on possible uses and improvements for the extensive network of urban waterways in the West Midland conurbation. The Birmingham and Fazeley Canal, for example, cuts very close to Birmingham's centre; and recent proposals by the city architect for canalside housing show glimmerings of awakening to the possibilities. The Group's attractive address is Worcester Bar, Gas Street Basin, Birmingham 1.

CONSERVATION SPECIALISTS

Efforts are now being made to meet the serious shortage of architects with specialized knowledge of restoring historic buildings, now the older generation of academic architects is passing away. A Standing Joint Conference has been set up on the recruitment and training of architects for the care of old buildings; the Dean of Gloucester is its chairman, Mr. Donald Insall is its honorary secretary and it can claim to represent all the major bodies working in this field: the Ministries, the GLC, the RIBA, the Church of England, the amenity societies, the National Trust. The Conference insists that it is 'concerned not only with cathedrals, parish churches and great houses, but also the everyday conservation and improvement of existing property.' It keeps a register of specialist architects and of students seeking employment.

The Conference can also give details of all specialist courses available: a two-year postgraduate course at the Institute of Archaeology, London University; a six-month international course at the University of Rome; the SPAB's annual Lethaby Scholarship; the short courses at the Institute of Advanced Architectural Studies at York; and the short annual course given by the SPAB. There are also some day courses. The Conference address is 83, London Wall, EC2.

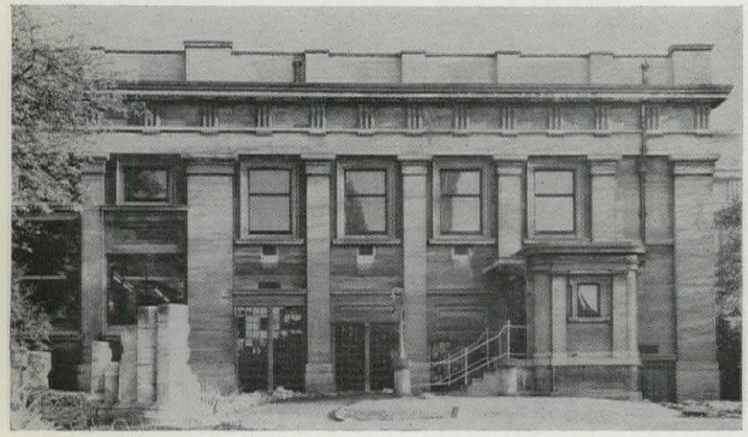
THIS CITY NOW

Professor A. J. Diamond, as well as Mr. Arnold Rockman, was responsible for organizing the exhibition with the above title at the Art Gallery of Ontario, noticed in the May AR.

LANCING COLLEGE

The roof of the music school at the above, of which a picture appeared in the May AR, is covered in zinc, not in aluminium as stated in the caption.

5, *Tempest Anderson Hall, York*, 1912–13, *by E. Ridsdale Tate. See 'York Concrete.'*



correspondence

THE CELEBRATION OF DEATH

To the Editors.

SIRS: I have read with interest the article, by Mr. Peter Bond, in your April issue on the subject of crematorium design. As one who has had first-hand experience of cremation over nearly thirty years, I feel that I must make some comment on his suggestions.

Mr. Bond's thesis is that a new cult should be introduced into cremation in this country which will centre on the factual committal of the body to the cremator and that this 'religious' act would necessitate a new approach to the design of our crematoria and, one assumes, considerable modification of the 200 crematoria at present in operation. This new 'celebration' is needed, he says, because there is at present no separate rite for cremation, nor do crematoria have any dominant pattern which can be clearly recognized as having a ritualistic purpose. This presumes that it is necessary to have a special form of service for differing methods of disposal of the dead. As each method—earth burial, sea burial, entombment and cremation—has as its end the dissolution of the body, it seems logical that the form of funeral service can be the same for all, with minor amendments of wording at the committal to allow for the different media used. If some special form of service is required for those who do not subscribe to a religious faith, this could be achieved without the major changes envisaged by Mr. Bond.

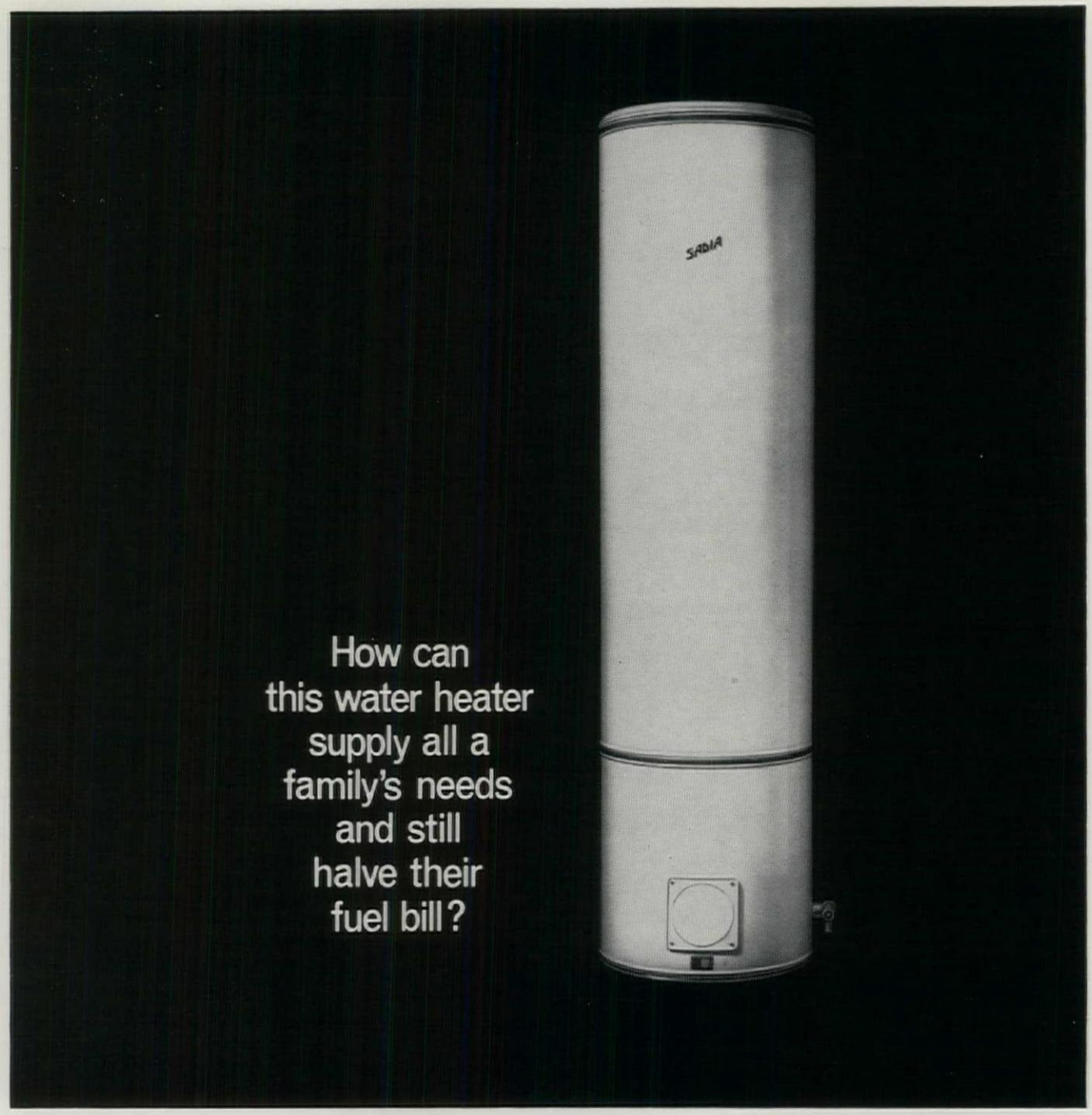
I contend that our crematoria do have a dominant pattern which is common to all—a chapel with a catafalque in an obvious position, and a minister's rostrum, with some simple method of concluding the committal by removing the body from the chapel or screening it from the view of the mourners. After the committal, the mourners are then able to leave the chapel with the knowledge that the cremation proper will take place at some time during that day. They have the same trust in the cremation authority as they have had in the funeral director who treated and coffined the body, and a similar trust to those who choose burial and walk away from the open grave knowing that it will be filled in and the burial completed while they return to their homes.

There are rituals which include the token filling of the grave, and in the Anglican committal service for burial this is reduced to the sprinkling of soil on the coffin. At many of the Indian cremation services which now occur in the London area it is part of the service ritual that the next-of-kin should see the coffin ignited. This derives from the custom of the next-of-kin igniting the funeral pyre. However, my experience of this presence at the committal is that it is a harrowing and emotional occasion, which, if it were not an expected duty, would be better avoided—fainting, hysteria and similar outbursts are not unusual and are most distressing for relatives and for staff. I am certain that the consensus of opinion would be that mourners are happy to leave their dead at the chapel-committal in the care of the crematorium staff. Further, very few people take the opportunity of being present to witness the final strewing or burial of the cremation ashes after the cremation has been completed, and the chief reason given for this is that the occasion would be upsetting. I cannot visualize anyone wishing to stay by the cremator for a period of 75 minutes as suggested by Mr. Bond.

His suggestions of a processional walk from the cars to the chapel and then from the chapel to the committal-room are likely to cause greater distress to aged and infirm mourners than present arrangements do, and they go against all present trends which have reduced walking distances to the minimum.

In Scandanavian practice, the body may be brought to the crematorium several days before the cremation service and the cremation proper may not take place for several days after the service has been completed. I would agree that new forms of ritual and liturgy will arise in connection with the disposal of the dead, but if the service is to be one of prayer and meditation and based on considerations of the spirit and not of the dead body, there is no necessity on any religious or aesthetic grounds for the final committal of the body to be part of such liturgy.

As the architect must also be concerned with the practical considerations of his theories, I think that Mr. Bond's assessment of the design of the committal facilities and the chapel leave many difficulties for the superintendent who has to operate the scheme. In theory his three cremators would serve one chapel with services at half-hourly intervals. This is on the assumption that a cremation can be completed in 1¼ hours. The assumption is false. No superintendent can tell how long a coffin and its contents will take to cremate as he knows nothing of the exact nature of the charge and only the act of cremation will provide an answer. Some cremations take up to two hours to complete and this immediately creates a difficulty of timing. To be safe it would require that a fourth cremator and committal room should be available. Consideration of the need for maintenance and provision for emergency repairs would also make a fourth



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chamber desirable. Most of our larger crematoria have two chapels and these are in full use at peak times in the year. Such crematoria would require to have eight cremators. At the crematorium for which I am responsible we have two chapels and undertake 2,500 cremations per annum; these are easily dealt with on the same day of the service using only three cremators. To implement the ideas put forward it would be necessary to have eight cremators housed in a much more extensive building and with many more staff.

The fact that cremation in this country has risen in usage from 3 per cent of deaths when I first entered the service to nearly 50 per cent today is indicative of the satisfaction of the general public with the arrangements now provided. People seem to welcome the simple ritual now in use. If there is a need for more ceremonial then the Churches are the appropriate places for this and the present committal arrangement at the crematorium can close the ceremony.

Yours, etc.,

P. W. CRIBB

(A Crematorium Superintendent)
Feltham, Middlesex.

Mr. Peter Bond, the author of the article referred to, replies as follows:

How very encouraging it is to find a person with considerable qualifications taking the trouble to contribute so usefully to the present discussion. In the first part of his letter Mr. Cribb gives entire support to my thesis of direct committal. I agree that the service for all four means of disposal should be the same, but at present cremation practice differs in one all-important particular. In each of the others the final climax of the service in which the mourners are involved is truly the end of *all* human contact with the body, which either plunges into the sea, is lowered to its final resting place in a grave or is sealed in a tomb. With cremation, the coffin merely passes from the view of the mourners *to be handled by others later*. Thus the mourners are prevented from satisfying their need to feel they have accompanied their deceased as far as is humanly possible. The distress which this feeling of abandonment produces in many is further compounded by the mourners being presented, at one of the most profoundly real and true moments of their lives, with the theatrical pretence of a false committal.

The practice of direct committal would eliminate these fundamental disadvantages of present-day practice, and yet does not confront people with a strange and unfamiliar procedure since it is precisely the same as that found in earth burial. The very fact of the mourners being involved in ceremonially leaving the chapel to go to a committal point will leave them in no doubt that the consummation of the service is true to the words spoken.

My article did not seem to be the place for technological ramifications. There are, of course, a number of solutions to the problems raised by Mr. Cribb, and which was chosen would depend on many things. For instance, the plan diagram I showed could be used as it stands for those crematoria, of which there are many, requiring a two-cremator provision. The third court would provide the emergency requirements. For a building which needs three cremators to be operational a fourth court, as suggested by your correspondent, or a duplicate cremator in the centre court, would answer the problem. To have put these forward, however, would have obscured the real answer which will arise from a complete review of the principle and design of the cremator, given this requirement of direct committal, which it has never before been called upon to answer. For example a relatively minor modification to the cremator in the centre court would permit the use of my diagram as a basis for a three-cremator requirement as described in the article.

It is obviously premature to go into costs at this stage for, until a period is set aside for the development of the idea I have submitted, the actual costs will not be known. It is conceivable that the end result may be cheaper than present crematoria. Not only could technological research lead to the possibility of needing only one cremating device for each chapel, but also, if people were to derive a true and deep satisfaction from the ceremony itself, it might not be necessary to lavish considerable sums of money on finishes and effects.

My intention was to present the concept of direct committal in as simple a way as possible, yet with a sufficiently tangible proposal as could readily be assimilated by the general public. If what I have suggested finds general support, the solution of outstanding problems is a matter of routing familiar to any designer. What we are concerned with ultimately is whether or not something like three million people a year, in this country alone, are able to draw the deep satisfaction from the ceremony which I feel sure is their need and am certain is their entitlement.

BELLOT

To the Editors.

SIRS: At Quarr Abbey, described by Professor Pevsner in the April AR, and at Bellot's earlier buildings at Oosterhaut, the Dutch influence and especially the example of Berlage appear so strong that one might consider Bellot's particular style of brick decoration and construction as having no precedent in French churches.

As evidence to the contrary, I submit the example of a small church, 6, at Masny (Nord) by Emile Boeswilwald (1815-96) published in 1864. Boeswilwald was a pupil of Labrouste and joined Violet-le-Duc in his fight against officialdom. The church was known to Viollet-le-Duc and Boeswilwald was coincidentally *inspecteur-diocésian* of the Sarthe, to which department the mother church of Bellot's order at Solesmes belongs.

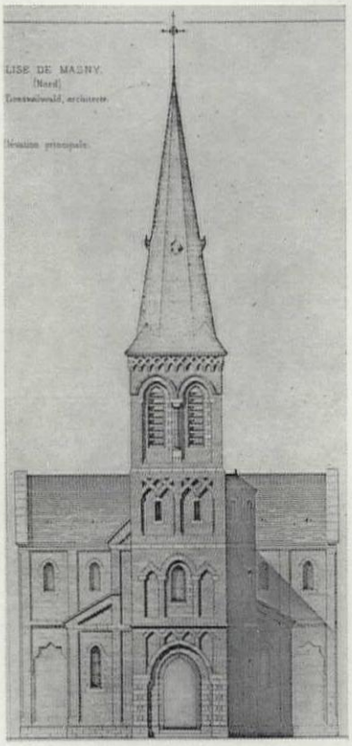
A. de Baudot, architect much later of the famous concrete church of St. Jean-de-Montmartre, described Boeswilwald's church in his book *Eglises de bourgs et villages* in 1867 as follows: '*L'eglise de Masny est presque entièrement montée en briques, selon l'usage du département du Nord—l'architecte a su profiter des qui offre l'appareil de la brique au point de vue décoratif, quand cet appareil est étudie avec soin et avec la connaissance des effects a prodiure.*'

Unfortunately, the nave at Masny, being small, is not vaulted, so that it is impossible to make a comparison of its structure with the fine, unorthodox vaulting at Quarr

Yours, etc.,

DAVID B. STEWART

London, W.1.



6, *church at Masny, Northern France, by Emile Boeswilwald. See letter from David B. Stewart.*

MODULAR ROCKERY

To the Editors.

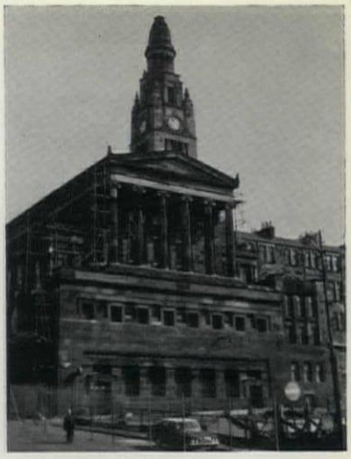
SIRS: Your article on 'Modular Rockery' in the February AR was of great interest to me as I once lived at Rockville, in the lodge house 'with its indescribable 2 ft. square window patterns'; they in fact expressed the line of the stair. Since that time I have had an interest in the life of James Gowans and in recent months I have traced a section of railway stations built by him for the Dundee to Newtyle Railway Company.

The enclosed photograph, 7, shows Lochee station in Dundee and you will recognise immediately the same design vocabulary that was illustrated in your article. The 2 ft. module is expressed everywhere, binding together Gowans's usual mosaic of stonework; the latticed corners, the typical heavily bracketed eaves and gables, and even the timber and wrought iron, all show signs of his unmistakable touch. His confidence in his own peculiar personal style is to be admired, since without inhibition the same design philosophy was applied, *in toto*, to all the elements of his buildings. Lochee station typifies his approach and concern for the overall design, however crazy, and gives grounds for regret that this exuberance is not around any more.

Yours, etc.,

JAMES C. HAGGART

Edinburgh.



8, *the Greek Thomson church in Edinburgh with the buildings which obscured the lower storeys cleared. See letter from Derek Fuller.*

THOMSON REVEALED

To the Editors.

SIRS: I enclose a photo of the current view of the Greek Thomson church in Glasgow, which has not been visible for the last hundred years or so. When the multi-storey monster now going up alongside is complete, it will probably be another hundred years before it is seen again.

Yours, etc.,

DEREK FULLER

Glasgow.

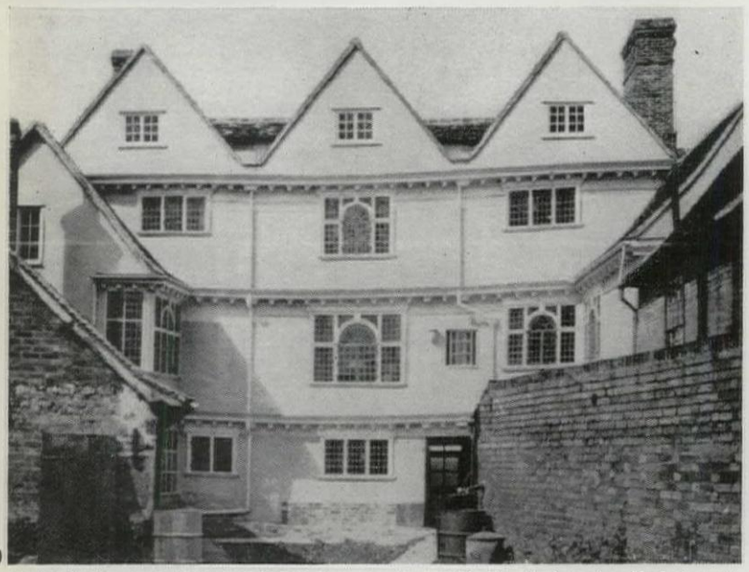
ALAHAN

To the Editors.

SIRS: In the pages on Alahan in your March issue you say that, according to the experts, the church is supposed not to have been vaulted in stone, and Professor Pevsner in a recent broadcast confirmed this, referring to Professor Krautheimer's authoritative

7, *Lochee station, Dundee, by James Gowans. See letter from James C. Haggart.*

9



10

The Coffee Tavern, Hadleigh, Suffolk: 9, *before restoration and* 10, *after. See letter from Hugh Maxwell.*

volume on *Early Christian Byzantine Architecture* in the Pelican History of Art. But what about the evidence of the crack in the corner in the back of the squinch which shows so well in photograph no. 5? It looks to me very much like the sort of crack that would result from movement in the walls caused by the spreading tendency of something above. And it would seem that it must have been a pretty heavy something to produce a crack as big as that, actually cracking stones themselves (certainly the bottom moulded stone in the colonnette-corbel course, possibly others too?). I don't know how these old people would have made a timber dome, nor what they would have covered it with, but I should think myself a poor carpenter if I could not make some sort of foundation ring which would have spread a great deal less than that; and what for goodness sake is a 'cane' dome? Having woven it in basket work do you daub it with clay?—but again, I would think there would have to be quite a fair foundation ring.

One can't develop much of a theory from one photograph and little idea of scale, and I gather that the corner shown on the left in photograph no. 5 is the best preserved; indeed the two corners on the entrance side are missing altogether (though the wall stands between them—is this significant?). But I would suggest that that crack in the back of the squinch is at least consistent with there having been something pretty heavy above which thrust outwards in all directions.

Yours, etc.,

JANET B. GNOSSPELIUS

Liverpool.

REINSTATEMENT AND REPAIR

To the Editors.

SIRS: Why does one's heart sink at the sight of these two photographs which recently appeared in *Country Life* in an article celebrating 90 years of the Society for the Protection of Ancient Buildings? Here, you might think, is a record of a most praiseworthy enterprise. Through the initiative of the SPAB a dying and mutilated building of considerable historical and architectural interest has been, with affection and skill, knowledgeably restored to life. And yet in the process, and with the best of intentions, the point of it all has somewhere got lost. The kiss of life has become the kiss of death. William Morris's original plea—'against restoration,' and for distinguishing between 'reinstatement' and 'repair,' has, in this case at Hadleigh, Suffolk, been forgotten—ironically enough by the very organization he set up to remember it. Those responsible have forgotten, or omitted to grasp, the fact that in architecture, as in life, history must always be allowed to be seen being made.

Yours, etc.,

HUGH MAXWELL

London, SW7.

KIRRIEMUIR

To the Editors.

SIRS: In the Stop Press section of the March AR, the points made, under the heading 'SOS,' about the charming little township of Kirriemuir are significant, even though your printed location is inaccurate. Kirriemuir is in the county of Angus, not Perthshire, and the 'superb mountain road' mentioned in 'Opportunity' runs between Cock Bridge, not Lock Bridge, and Tomintoul.

Yours, etc.,

V. SCOTT

Hoo, Kent.

TEACHER SEMINAR

To the Editors.

SIRS: The reviewer of *The History, Theory and Criticism of Architecture* in your May issue complains that it is 'a parsimonious piece of editing, as we are given only the bare bones of the papers at the seminar, with none of the combative discussion that surely followed them.'

Please grant the editor of the volume in question space to refer Mr. N. T. (as his parsimony in giving us only his initials forces me to call him), and any of your readers who may be interested, to the November 1964 issue of the *American Institute of Architects Journal*. There they will find a ten-page account of the seminar, with verbatim quotations from the discussions, compiled by

Yours, etc.,

MARCUS WHIFFEN

Arizona State University.

LIGHT FITTINGS

To the Editors.

SIRS: I have been taken to task for implying, in my notes on recent light-fittings in Design Review (AR April 1967), that the fittings reviewed in photographs 14 and 15 (made by Rotaflex) employ sheet metal techniques only in manufacture. In fact wall fittings 15 are made entirely of melamine and nylon mouldings, and the louvres and the base of the spike fitting 14 are also of plastic. The cowl or shield of this fitting is a pre-coated pressed sheet aluminium section.

Yours, etc.,

RONALD CUDDON

Bromley, Kent.

PAINTINGS IN CHURCHES

To the Editors.

SIRS: I am compiling a handlist of post-war paintings in churches in Britain and I would be most grateful of any help (e.g. photographs, measurements, literature, press cuttings, correspondence or records relating to commissions or briefs given to artists) which your readers might be kind enough to give me.

Yours, etc.,

(REVEREND) T. DEVONSHIRE-JONES

Portsmouth College of Technology,
Hampshire Terrace,
Portsmouth.

book reviews

VICTORIAN TRUTH

VICTORIAN ARCHITECTURE. *By Robert Furneaux Jordan. Penguin Books.* 12*s.* 6*d.*

Furneaux Jordan's pocket book on Victorian Architecture has elsewhere been labelled a 'popular history.' The preface suggests that he fears the subject may become *too* popular. Perhaps echoes of shots in the opening battle for the Foreign Office and St. Pancras, rumours of mods wearing uniforms once worn on the Modder River, have disturbed the peace of Wiltshire (where, according to an introductory note, he now lives).

'What *is* this Victorian lark?' he seems to be asking. Are people sentimentalizing the Victorians, as they in turn romanticized the Georgians ('filth, cruelty, stench . . . lice-ridden wigs with pox-ridden wearers . . the *Victory* had several whores on board'). If so, let them remember the horrid truth behind Victorian architecture: 'Victorian Realpolitik paved the way for the bombs . . . the Age's main contribution to architecture is the slum . . . Victorian England was not unlike the United States today.' And, for the Portobello Road mob, a reminder that Victorian samplers were often stitched by 'little girls, sore-eyed and constipated, stitching beneath the hard correction of the rod.'

Strong stuff, and guaranteed to rouse dedicated neo-Victorians to fury. But if this immensely readable and provoking book makes them look twice at certain ewe-lambs, it will do nothing but good. And there is a splendid collection of unhackneyed photographs. There are signs of haste as well as indignation: 'Bloomfield' for 'Blomfield,' 'Sir Edward Lorrimer' for 'Sir Robert Lorimer,' 'Kinmell' for 'Kinmel'; 'Oak Hill Park, Ohio' for 'Oak Park, Illinois.' Dates are sometimes misleading: the Great Queen appears to have died in 1902; for Leeds Town Hall, Jordan gives 1868; *Buildings of England* 1853–58; for the National Gallery, Jordan 1838; B.'s of E. 1832–38. And Holloway College was built as a college, not as 'a millionaire's mansion.'

He tells the old stories of Barry and the Houses of Parliament, Scott and the Foreign Office, Pugin and his eccentric clients with gusto; makes the point that Victorian buildings looked better when clean (the City is beginning to prove this), and stresses the influence of the non-architects, Morris and Ruskin. For Furneaux Jordan, as for Ruskin, it is often 'a moral issue.' The sort of people for whom Ashridge and Belvoir were built were 'fortunately eliminated'; Barry 'loved a lord'; Sir Gilbert Scott 'bowled up to the Bishop's Palace with postillions and an outrider.' Norman Shaw's clients were rich and often vulgar; Lutyens was 'a dead-end kid' who built 'unreal dream houses in Surrey . . . a gesture from a world where there were still impeccable maids . . . hunters in looseboxes . . . Peter Pan in the Nursery Wing.' . . . 'It all died as it should have died in August, 1914.' In fact, many of these dream houses are still lived in with much appreciation, and well kept-up, though without the maids and the hunters. In an Age 'so perverse and contradictory' which could

produce the Crystal Palace and the Albert Memorial, Scott's Hotel and Barlow's roof at St. Pancras; the Sheerness Boat Shed (not unlike Lord Llewelyn Davies's new *Times*), Jordan is usually on the side of the engineers. But he does like some High Victorian architecture: Manchester Town Hall, Street's hall at the Law Courts, Butterfield cottages, Pearson churches. His history, as will already have been gathered, extends from Regency carry-over buildings to those of the Victorian-Edwardian sunset ('all jingoism, Kipling and Imperialism') winding up with Gropius and the Bauhaus. The author is still under the spell of those dear old with-its, the Pioneers of the Modern Movement. Philip Webb and Mackintosh may be admired as in the mainstream to Dessau, but not Shaw and Voysey. Why, asks his Preface, are we interested in Victorian architecture? Is it no more than the swing of Fashion's pendulum? Or is it because people who notice their environment are realizing, a hundred years after St. Pancras, that solidity, self-assurance, craftsmanship, even eccentricity are virtues in architecture? No one, including the author, seriously disputes that there are 'good' Victorian buildings and that the reasons for keeping them are as valid as for good Georgian or Norman buildings. The question, not yet really answered, is whether, in addition to any intrinsic merit, they have not acquired new virtues of scale and contrast to the sort of buildings that are likely to go on going up in our cities. If Mr. Furneaux Jordan were to spend a day in Tesco and Golden Egg emporia and round Route 11, might he not forget Realpolitik, snobbery and jingoism, and agree there is a case for conserving some 'bad Good,' even 'good Bad' Victorian buildings, as a relief to the human eye increasingly assaulted by soul-less blocks? For it looks as if the Bauhaus days, like those of Lutyens' dream houses, have gone 'and left not a wrack behind.'

PETER CLARKE

SCIENTIST'S VIEW

BUILDING ECONOMY. *Design, Production and Organization: a synoptic view. By P. A. Stone. Pergamon Press.* 42*s.*

We should all congratulate Dr. Stone for having at last found the time to put together in a single book the summa of his unique experience as the principal economist of the Building Research Station and that of his numerous colleagues who have contributed to making building economics (or building economy?) a respectable subject. Reading Stone's book was indeed a great pleasure. The subject was familiar, but being presented in a comprehensive way, unsuspected links and relationships were revealed. Stone's book belongs to that category of publications which can only be appreciated through the painstaking assimilation of the body of the work and not from either the introduction or the conclusions. The objectivity of the author and the thoroughness of his approach lead inevitably to very general, almost vague, conclusions. This is not a book that leads the reader, gently but firmly, through carefully selected facts on to clear-cut policy options. The difficulty, I am afraid, is in the subject and not in the way Stone has treated it. I am simply warning the reader who might expect to find easy (and probably false) answers to complicated (and certainly real) problems. It is all there all right, but it swings between and around a large number of alternatives, assumptions, considerations, local conditions, etc. This is the taste of true life and Stone has the merit of not hiding it.

Perhaps the weakest points are the scanty and not altogether correct references to Continental practice (somebody, somewhere, will be horrified to learn from pages 202–3 that our National Building Agency 'has been set up to provide somewhat similar services (to the Omnium Technique d'Habitation)'), and to the problems of developing countries, which could have been missed out altogether. Architects will enjoy statements such as 'repetition is, of course, essential, but repetition does not necessarily entail monotony. Even on the same site repetition, if properly used, can have pleasing results' (page 136), or that 'the minimum area of enclosing surface to volume is given by the sphere but this is not a very practical shape for a building' (page 208). Personally, I think the gem is 'changes in design usually have some effect on appearance, if not on the way the building functions' (page 218) which I can only attribute to the dry humour of the scientist.

The habitual readers of Stone will not be surprised to find that the book is complemented by a masterly bibliography of 118 titles, quite the best selection I have seen so far in the English language on this vital and multifarious subject.

DUCCIO TURIN

ARABIC INFLUENCE

THE EARLY ISLAMIC ARCHITECTURE OF THE EAST AFRICAN COAST. *By Peter S. Garlake. Oxford University Press, in conjunction with the British Institute of History and Archaeology in East Africa.* 95*s.*

Arab colonization spread down the East African coast soon after the Hijra. In the centuries which followed, the East African trading ports waxed wealthy and formed independent states. By the twelfth century they were linked not merely with the Red Sea but also with Persia, which dominated the India trade and controlled forts from Ormuz to Aden. Wood and ivory passed through the ports and their merchants built luxurious houses, mosques and even palaces. The arrival of Vasco da Gama brought a new suzerainty to the region, which contributed to the eventual decline of the Arab towns. Today most of them are deserted hunting grounds for the scavenger and the archaeologist.

This book was the result of two years' work in East Africa on a Nuffield Foundation Research Studentship under the Director of the British Institute of History and Archaeology in East Africa, Mr. H. N. Chittick. The author was new to the history of the East African coast and the architecture of Islam, and the work he carried out in this time is a remarkable achievement. Many of the sites along the coast were previously unsurveyed, and the author publishes extensive drawings of some of them.

Nevertheless, considering the potential interest of the subject, this is a disappointing book. Instead of the fascinating photographs of ruined mosques, tombs and houses which one might expect to find, there are sixteen tiny unattractive plates. The text is laboured and the drawings of buildings in plan, and details of them in elevation and section, are in a working-drawing technique which is unattractive in itself and hardly conveys the quality of the buildings. For some inexplicable reason, as the author himself admits, 'a rectangularity has been assumed in most plans illustrated here which did not in fact exist,' and it should be noticed that 'because of the impossibility of taking all dimensions in incomplete and ruinous buildings' the drawings are to some extent conjectural.

It is a great pity that the survey does not include all the sites in the area under discussion. In particular it must be a matter for regret that the author has not visited sites south of the Kilwa islands, and only a few to the north in Somaliland. One feels that some effort might have been made by organizations sponsoring and financing research to ensure that this pioneer study was more complete. Who knows what the author might have found that would have altered the conclusions he has reached in this book? Indeed, research further afield was really necessary if such a study were to discriminate between the significant and the incidental. In an endeavour to avoid omitting important clues, the author has been forced to incorporate an immense amount of detail which makes it difficult for the reader to reach conclusions for himself. Nevertheless, if the reader is patient the book is rewarding. The great palace of Husuni Kubwa was comparable in the thirteenth century with the finest structures of its kind in the Arab world. Mosques are often extremely pleasing in their simplicity. And the domestic architecture is interesting as a series of developments of the late Hellenistic house, retaining all its formality and grace.

It was a curious idea to exclude the decorated pillar tombs, with their curiously phallic forms, which survive in so many of the sites, on the grounds that they are 'not architecture.' Indeed, the author's idea of what is architecture is highly debatable, beginning with Vitruvius's 'utility, firmness and delight' he says: 'delight—is only truly possible by creative design and is missing in all the coastal architecture.' If there is such a thing as 'architectural snobbery,' this is surely a good example! The author goes on to cite buildings which he considers to be the work of artisans, comparing them with buildings which he considers the work of architects. The great mosque at Kilwa is the work of an artisan because it is 'a conjunction of a series of independent units, not a unified whole.' As the author is a relative novice in the history and archaeology of East Africa he is forced to say that he is only able to give 'a relative idea of date' to the buildings—yet he makes the categorical statement that 'influence from outside East Africa is rare'—later he admits that he has not the necessary knowledge to assess the extent of external interference.

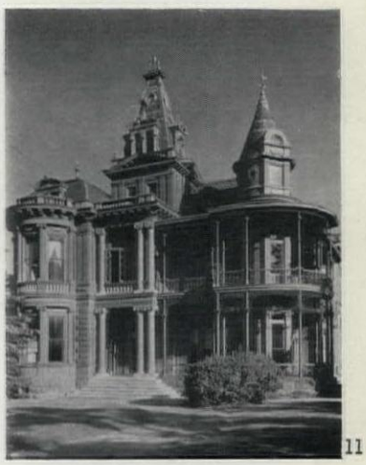
There are many aspects of the layout of this book and of the assumptions and judgments of the author with which one might quarrel, so I will limit myself to a further two. The first is the irritating use throughout of the terms 'classic,' 'mannerist' and 'neo-classic.' I doubt whether these terms, used of Islamic architecture, are meaningful. The closest that Creswell comes to them is the term 'semi-classic,' which he uses in the sense of 'derived from the classical world.' While this book deals primarily with early Islamic architecture, the author frequently extends his field into the nineteenth century. It seems a great pity that he has chosen to avoid all mention of the extensively carved woodwork doors of Zanzibar and the adjacent mainland. One would at least like to know whether there is any evidence that they are a late introduction from outside. If not, they might surely have been briefly discussed.

R. B. LEWCOCK

HOMES ON THE RANGE

TEXAS HOMES OF THE NINETEENTH CENTURY. *Text by Drury Blakeley Alexander. Photographs by Todd Webb. University of Texas Press (for the Amon Carter Museum of Western Art).* 112*s.*

This book puts on record the wide variety of domestic architecture that the State of Texas can show, though it is fast disappearing. There is no identifiable Texan style, but a succession of imported styles, the principal ones being the simple frame houses of the first colonists, the square gabled

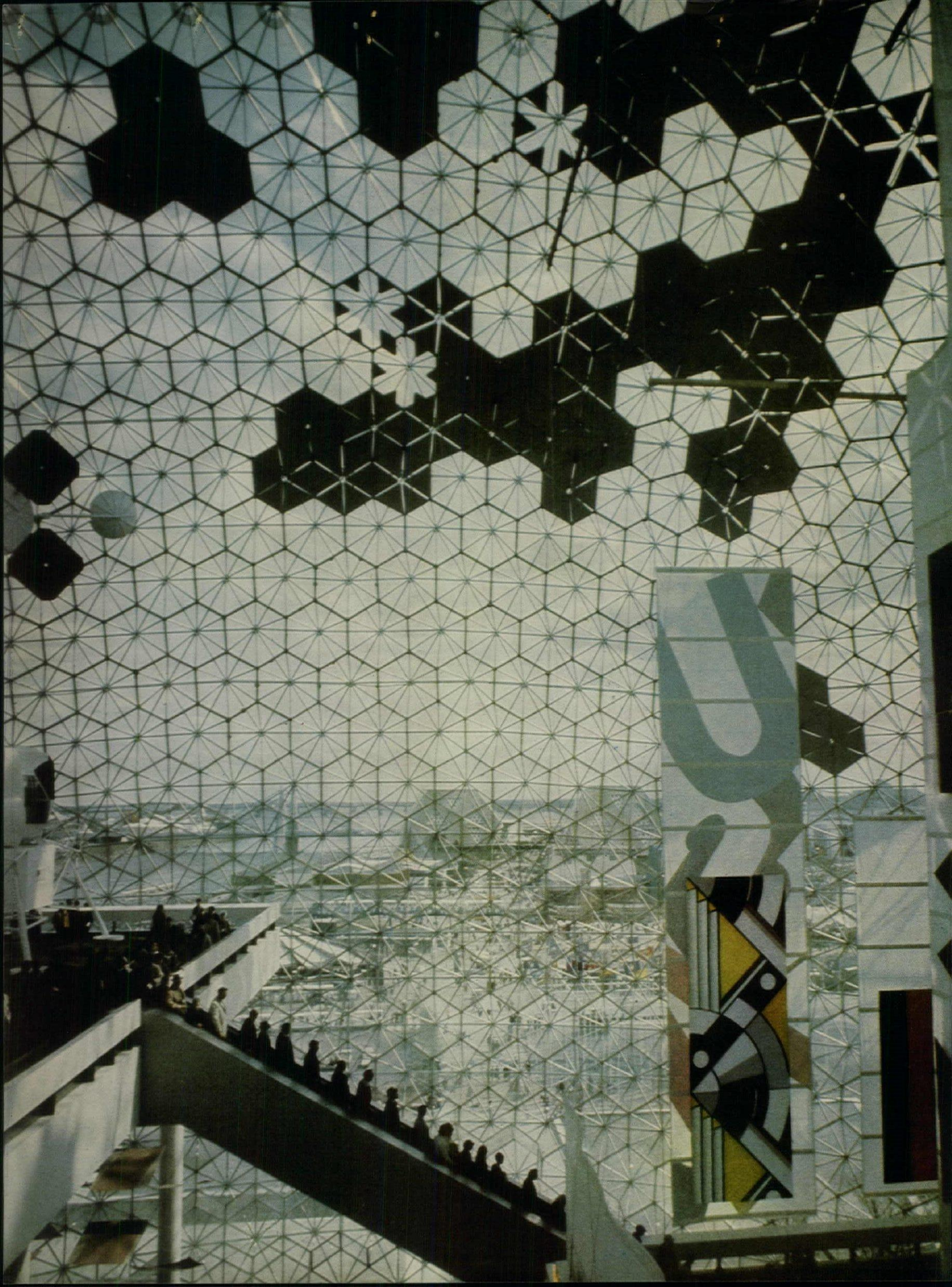


11

12

11, *the exuberance of late nineteenth-century Texas architecture: a house in Austin of* 1893; *architect, James Wahrenberger.* 12, *the house at Austin built for Col. House in* 1891; *architect, Frank Freeman.*

houses of the mid-century German immigrants, the more sophisticated Greek Revival mansions of the period before and after the Civil War and the highly eclectic—often fantastic—villas of 1860–1890. Some of these, with their picturesque composition and lavish use of fretted timber ornament and ironwork, are splendid specimens of their kind. Some are of more individual interest like the house in Austin, built for President Wilson's adviser Colonel House in 1891 by Frank Freeman, a New York architect influenced by H. H. Richardson.



Expo 67

THE ARCHITECTURE OF SUCCESSIVE INTERNATIONAL EXHIBITIONS IS PART OF THE HISTORY OF MODERN ARCHITECTURE ITSELF. THEY HAVE BEEN A LABORATORY FOR ARCHITECTURAL EXPERIMENT, A PROVING GROUND AND A SHOW-WINDOW IN WHICH IDEAS, STRUCTURES, STYLES AND PERSONALITIES HAVE FIRST BEEN PRESENTED TO THE WORLD. LANDMARKS IN ARCHITECTURAL HISTORY IDENTIFIED WITH SUCH EXHIBITIONS ARE TOO MANY TO BE LISTED. THEY INCLUDE THE EIFFEL TOWER AND COTTANCIN'S VAST MACHINE HALL (PARIS, 1889), THE ART NOUVEAU EXPERIMENTS OF VAN DE VELDE, SAARINEN AND OTHERS (PARIS, 1900), LE CORBUSIER'S ESPRIT NOUVEAU PAVILION (PARIS, 1925), MIES VAN DER ROHE'S PAVILION AT BARCELONA (1929), LARGE PARTS OF THE STOCKHOLM EXHIBITION OF 1930 (GUNNAR ASPLUND), IN WHICH MODERN ARCHITECTURE WAS DISPLAYED FOR THE FIRST TIME AS A COMPREHENSIBLE ENVIRONMENT RATHER THAN AS ISOLATED BUILDINGS, AALTO'S FINNISH PAVILIONS, REVEALING HIS VIRTUOSITY IN TIMBER (PARIS, 1937, AND NEW YORK, 1939), NERVI'S EXHIBITION HALL AT TURIN (1949), AND LE CORBUSIER'S PHILIPS' PAVILION AT BRUSSELS (1958). MONTREAL'S EXPO 67 IS THE FIRST CLASS-ONE INTERNATIONAL EXHIBITION SINCE BRUSSELS, AND ONCE AGAIN IT CONTAINS SEVERAL WORKS OF ARCHITECTURE THAT ARE LIKELY TO BE REMEMBERED AS PIONEERS OF THEIR KIND OR AS MARKING THE EMERGENCE INTO PUBLIC VIEW OF SOME NEW AESTHETIC CONCEPT OR STRUCTURAL IDEA. MORE IMPORTANT, FOR THE FIRST TIME IN SUCH A BIG EXHIBITION EXPO ILLUSTRATES DEVELOPING IDEAS ABOUT ENVIRONMENT, ABOUT WAYS OF USING SPACE AND ABOUT MOVEMENT WITHIN IT, REFLECTING THE PRESENT DAY EMPHASIS ON THE ENVIRONMENTAL ASPECTS OF ARCHITECTURE AND PLANNING. AMONG EARLIER EXHIBITIONS ONLY STOCKHOLM 1930, THE SOUTH BANK EXHIBITION AT THE 1951 FESTIVAL OF BRITAIN AND LAUSANNE 1964 MADE ANY ATTEMPT TO DO THE SAME.

IF THE SITE AND THE WAY IT IS LANDSCAPED AND LAID OUT, TOGETHER WITH OTHER ASPECTS OF ENVIRONMENTAL DESIGN, ARE MORE SIGNIFICANT AT EXPO 67 THAN ANYTHING ELSE, THERE ARE MANY OTHER THINGS WORTH OBSERVING: THE PICTURE THAT IT—LIKE OTHER EXHIBITIONS—GIVES OF CURRENT STANDARDS AND OBJECTIVES, THE NUMEROUS SOLUTIONS TO PLANNING AND STRUCTURAL PROBLEMS (WHICH ARE—OR SHOULD BE IN AN EXHIBITION—MADE ALL THE MORE CHALLENGING BY THE TEMPORARY NATURE OF THE BUILDINGS), THE WAY DETAILS OF ALL KINDS ARE HANDLED AND THE COMPETING EFFORTS OF VARIOUS COUNTRIES TO SHOW OFF THEIR ACHIEVEMENTS AND IDEAS, USING ARCHITECTURE AND THE TECHNIQUES OF DISPLAY AS A MEDIUM. A SURVEY OF WHAT IS BEST, AND A CRITICAL ASSESSMENT OF WHAT IS MOST CHARACTERISTIC, IS THEREFORE ALWAYS WORTH MAKING, AND

Opposite: distant panorama of the Expo grounds seen through the transparent walls of the US pavilion—a building which, in addition to showing off the potentialities of Buckminster Fuller's technique of dome construction, makes a real contribution to exhibition design in its interior. It has liberated itself from the fixed and familiar pattern of propaganda, industrial and product displays, and creates, in a far more relaxed way, a succession of images designed to build up atmosphere rather than offer information. As a totality, it is a work of art in its own right.

'THE ARCHITECTURAL REVIEW' HAS A LONG TRADITION OF DEVOTING SPECIAL NUMBERS TO THESE MONSTER EXHIBITIONS WHEREVER THEY TAKE PLACE. THE PRESENT IS SUCH A NUMBER, THE CONTENTS OF WHICH ARE OF COURSE CHOSEN FOR THEIR ARCHITECTURAL AND RELATED INTEREST. THIS IS NOT A SURVEY OF THE EXHIBITION AS SUCH—AN EXHIBITION'S ORGANISERS AND THE PUBLIC THAT VISIT IT ARE LOOKING FOR MANY THINGS BESIDES ARCHITECTURAL ACHIEVEMENTS AND EXPERIMENTS; TO THEM ARCHITECTURE IS ONLY INCIDENTAL. THIS SURVEY IS SIMPLY WHAT ONE EDITOR OF 'THE REVIEW', EXPLORING THE EXHIBITION, CONSIDERED WORTH PUTTING ON RECORD IN THE CONTEXT OF 'THE REVIEW'. IT LOOKS TO SOME EXTENT BEYOND THE EXHIBITION, BEING INTRODUCED BY A GLANCE AT CURRENT DEVELOPMENTS IN MONTREAL ITSELF, WHOSE RELEVANCE TO EXPO—AND EXPO'S RELEVANCE TO THEM—ARE DISCUSSED IN THE ARTICLE THAT FOLLOWS.

EXPO 67: ORIGIN AND STATUS

According to the convention signed by 31 *countries when the International Exhibitions Bureau met in Paris in November,* 1928, *the world is divided into three zones: European, American and other. No country is allowed to hold a Class-One exhibition more than once in fifteen years, countries in the same zone may not hold such exhibitions more than once in six years and, whatever the zone, such an exhibition may not be held more than once in two years.*

The last Class-One exhibition (which is defined as one where the invited countries build their own pavilions) was that held in Brussels in 1958—*the subsequent New York World Fair was of a more commercial kind organized outside the convention agreement. When the International Exhibitions Bureau met in* 1960, *to decide where the next Class-One exhibition should be, it had two applications before it: from Canada, who wanted to hold one in* 1967 *to commemorate the hundredth anniversary of Canadian Confederation, and from the Soviet Union, who wanted to hold one in the same year to commemorate the fiftieth anniversary of the Russian Revolution. The decision was put to the vote and the Soviet Union won. Two years later, however, the Russians decided not to go forward with their exhibition plans, Canada reapplied and in November,* 1962, *was granted the right to hold a Class-One exhibition in* 1967.

Montreal (the seventh largest city on the North American continent and the second largest French-speaking city in the world) was chosen as the site, and the exhibition, described and illustrated on these pages, based on islands (partly man-made) in the St. Lawrence River opposite the city, is the outcome of this sequence of decisions. It is the main event of Canada's centenary year, but the centenary of Confederation is also being celebrated all over Canada by building and improvement schemes and events and entertainments of many kinds.

J M Richards

MULTI-LEVEL CITY

Towards a new environment in down-town Montreal

Montreal can justly claim—in this year of 1967—to have the most dynamically growing down-town area of any city in the world, and since the city is, because of Expo, on show for the summer, an examination of its newest developments—in the way of planning, building and transportation—can appropriately be included in this special issue.

There is indeed a direct link between these developments and Expo—or, rather, two links, ideological and organizational. The ideological link is that the significance of the new Montreal, with its separation of levels and its sheltered pedestrian network, is the contribution it makes to a controlled urban environment, while at Expo too the most interesting items are interesting because of the ideas about environment they bring forward: the Buckminster Fuller geodetic sphere, the Habitat housing, the indoor-outdoor tented structure of the German pavilion, the widespread use of public escalators, the experiments with monorail and other elevated transport systems and the overall landscape control.

The second link between long-term development in the city and the short-term phenomenon of Expo lies in the extent to which the impetus of Expo was responsible for bringing any number of ambitious schemes for improving Montreal to fruition at the same moment. Montreal's elaborate new highway system might have taken many more years to reach the stage it has if Expo had not set a short-term target, and the need to handle as smoothly as possible the crowds expected to flock to Montreal on account of Expo inspired the remarkable achievement of building the whole of the long-projected 16-mile underground railway system (officially called the Metro) in only three years. This system—Montreal's first subway—was opened to the public in October 1966. It extends under the St. Lawrence river to a station within the Expo grounds and terminates on the farther shore. Though some of the station architecture is a little on the flashy side, the standard of design achieved in the trains, escalators, direction-signs and booking-offices is first-rate.*

The only defect of the Metro system from a town-planning point of view is that the main interchange point has, for political reasons, been placed too far to the east for its own pattern to coincide with the present development pattern of the city, though the future direction of growth may of course rectify this.

The visitors to Expo will appreciate the up-to-date transportation system with which Montreal has now been equipped, but they will be there at the wrong time of year to value fully the benefits of Montreal's other major contribution to city planning: the extensive system of sheltered pedestrian streets which allows comfortable shopping, strolling and central area inter-communication even in the depth of the Canadian winter. In the extent and ramifications of this system Montreal has been a pioneer; no other city has anything like it. What began as an experiment has become a resounding success; so much so that the danger should be noted of its very success leading town-planners to neglect the need to co-ordinate well designed surface circulation with the circulation spaces provided beneath the surface. It would be a tragedy if the eventual end-product of the imagination and enterprise shown in Montreal was the acceptance of a city-centre so anti-human as to drive its pedestrians underground.

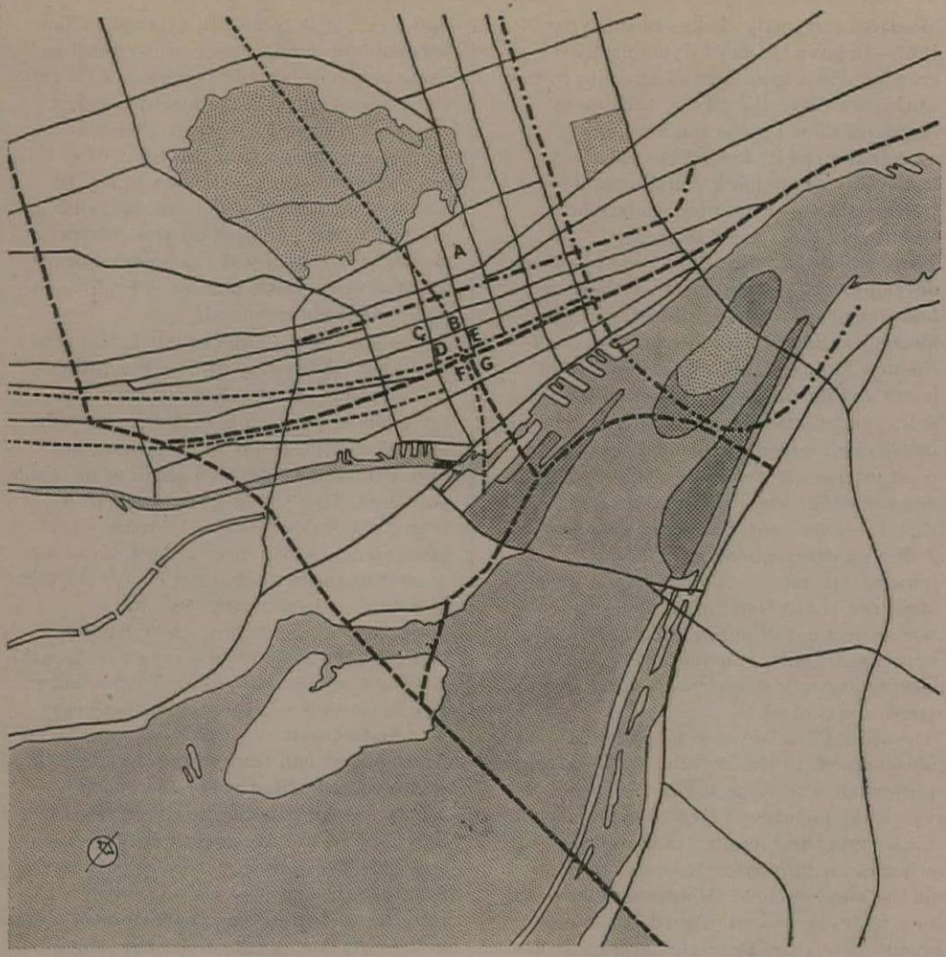
As long as this is borne in mind, Montreal is a model that many other cities will do well to study. That it has achieved this pre-eminent position is to some extent due to business enterprise and foresight, but also, it must be said, to a series of fortunate accidents. The first of these was that a large area of down-town Montreal (amounting to 22 acres), hitherto not built on and in an ideal situation for development as a new business centre, was in the possession of one owner—the Canadian National Railways, whose president Donald Gordon saw the opportunities it presented. It was Gordon and his technical advisers who first conceived the idea of multi-level development and from whose initiative the sheltered pedestrian network—which is Montreal's contribution to urban design—may be said to have grown. It centred on the main-line railway station (Central Station) whose concourse was expanded into the vast multi-level development that now exists as a result of Gordon calling in Zeckendorf, the American property developer. Zeckendorf foresaw the role the area might play in the business future of Montreal, especially in relation to the tendency of the city's financial centre to shift westwards which was already taking place. Zeckendorf also had the initiative to ask his town-planner Vincent Ponte and his architect I. M. Pei, while laying out the 7-acre site he had decided initially to develop (now the Place Ville Marie), also to prepare a master-plan for the whole 22 acres.

On the strength of this, the owners of adjoining properties called in Vincent Ponte when their turn came to develop, with the result that the whole down-town area, though redeveloped in the ordinary North American way wholly by private enterprise, and in separately owned sites, has followed—if not a comprehensive plan (because each successive enterprise was a separately conceived development programme)—at least a consistent town-planning objective.

This consistency of aim was the second fortunate circumstance; the third was that this burst of activity coincided with the regime of a go-ahead mayor of Montreal, Jean Drapeau, whose election promises of 1960 included the construction of the underground railway system and who was chiefly responsible in getting Expo 67 for Montreal. The city government itself has thus played its part in Montreal's recent dynamic development in spite of the—to European eyes—strangely passive role of the city's planning authorities.

The centre of Montreal is a natural case for intensive vertical development since it cannot spread outwards, being compressed

* By way of contrast to the others, one of the Metro entrances (in Place Victoria) is adorned with one of Guimard's *Art Nouveau* iron arches from the Paris *métro*.



Diagrammatic map showing the site of central Montreal between its mountain and its river, leading to the highly concentrated development described in this article. The newly integrated transport system is also shown: the railway beneath the mountain, the elevated highways and the recently built Metro—all connected to the sheltered pedestrian network below the new down-town buildings. The principal buildings are identified by letters and the site of Expo 67 by the dark tint.

key
A, McGill University
B, Place Ville Marie
C, Imperial Bank of Commerce
D, Hotel Champlain
E, CIL Building
F, Place Bonaventure
G, Place Victoria

green areas
expo site
main streets
subway
express way
railroad

between its river and its mountain. The other geographical fact that has determined the particular form the new central area development has taken is the slope of the ground, which drops between 150 ft. and 200 ft. This made practicable the multi-level underground element in the first building operation, and has been followed in successive schemes, endowing Montreal with four miles (eventually to be expanded to six) of sheltered pedestrian and shopping promenades interconnecting beneath the new down-town buildings.

When all necessary connections have been made, on the completion of schemes now in progress, this pedestrian network and the buildings rising above them will have direct access from the Metro, from the low-level main-line railway station and from underground car-parks, including that below Place Ville Marie, which is entered from street level at the northern end of the piazza that is part of the building.

Although these successive building projects are the work of different developers employing different architects, each, as explained above, took the town-planning advice of Vincent Ponte. The first project, financed by Zeckendorf—which triggered off the whole enterprise—was Place Ville Marie, now usually referred to simply as PVM. I. M. Pei was Zeckendorf's architect; the executive architect was his partner Henry Cobb. PVM is a 48-storey cruciform building, powerfully enough designed to serve visually, as it now has to, as the focal element in the whole down-town development. A large part of it is occupied by the Royal Bank of Canada—a fact of some importance because the decision of the bank to become the tenant of much of the building at the time construction was only just beginning was the first sign that Zeckendorf's initial enterprise was to be justified economically.

PVM's cruciform tower stands at one corner of a 4-acre piazza under which, at four different levels, are half a mile of shopping promenades—partly lit artificially and partly from a sunken court at each corner of the piazza—two levels of car-parking (capacity, 1,200 cars) and, below these, the Canadian National railway tracks and platforms. In addition to the car-parks (accessible, as already described, directly from street level) there is a system of underground service roads giving access to the basements of the PVM building.

These promenades, lined with shops, extend beyond the piazza in several directions, with connections to the basements of the new Queen Elizabeth hotel and the Royal Bank's banking hall. Although the shops have for the most part no rear access (stock deliveries having to be made from the public promenades in the early morning or late at night) they have been highly successful commercially and all were occupied within a short time of the completion of the building. This was no doubt partly due to the comfortable shopping conditions they provide, especially in winter weather, but far more important is their integration into the transport system: a bus station as well as the Canadian National main station (bringing commuters from the northern suburbs via a tunnel under Mount Royal) being already incorporated in the building, the Metro being due soon to be connected to the building's network and the Canadian Pacific (Windsor) station being close by—so is St. Catherine Street, traditionally Montreal's main shopping street, though now losing its status and become, for much of its length, seedy and garish—thus pointing, incidentally, the contrast between the anarchic old and the coherent new.

The only matter for regret is that the highly significant (from the social and urban design point of view) pedestrian network beneath PVM has not been made more evident in the building's external form and expression.

The newly created Metro with its own mezzanines has added another mile to the network of underground pedestrian ways, to connect with the lower levels of one of the main department stores and other adjoining buildings, and these will be extended and linked together, and presumably used for shopping purposes (some of these mezzanines, for example at the McGill station, are at present somewhat empty and forbidding) as new building schemes are completed.

Several of the most prominent of the completed buildings in the area are the direct result of the Royal Bank of Canada's decision, taken in 1958, to move into PVM, since several others—for instance the Imperial Bank of Commerce—decided also to move from the old financial quarter in the St. James's Street area into the new centre, and thus arose the cluster of new tall buildings that has become the most striking feature of down-town Montreal.

Not all of these new buildings are distinguished architecturally, but fortunately for the total effect some of the most prominent are also the best. The most beautiful of all, the Imperial Bank of Commerce, is a little way removed from PVM—south-west of it on the far side of Dominion Square, and therefore also on the far side of the Sun Life building, the classically embellished four-square building of the 1920s that for a long time dominated the centre of the city but is now completely hidden in the distant view.

The Imperial Bank of Commerce is a slender glass-walled tower of outstanding elegance by the late Peter Dickinson, completed in 1962.

Also in Dominion Square, and unfortunately in a very prominent position, is another tower block nearly as high: Montreal's newest railway hotel, the Champlain, of

Some of the buildings that have contributed to the dynamic transformation of down-town Montreal: 1, *the barely complete Place Bonaventure, left (architects, Affleck, Desbarats, Dimakopoulos, Lebensold and Sise), with Place Victoria (Moretti and Nervi) in the distance.* 2, *looking down Peel Street towards the Imperial Bank of Commerce (architect, Peter Dickinson), with the Hotel Champlain (architects, D'Astous and Pothier) at the far end.* 3, *air-view showing the cluster of tall buildings, the highest being the Place Ville Marie, left (architect, I. M. Pei), and the Imperial Bank of Commerce, right. It was taken (when Place Victoria, in the distance, was still building) from a point on the extreme left of the map on the facing page.*

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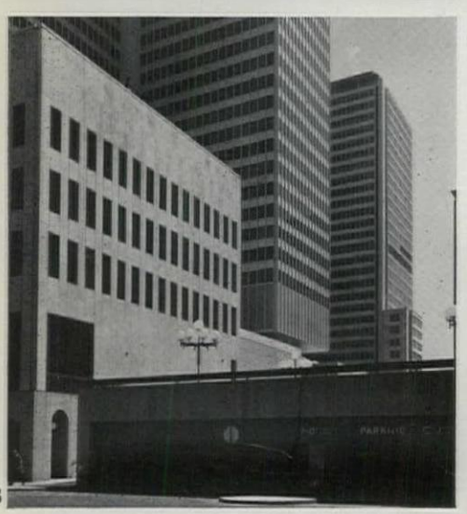

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Place Ville Marie, the focal point of Montreal's new down-town development. 4, looking from the north towards the open side of the PVM piazza and the entrance to the car-park beneath it. 5, closer view of the car-park entrance and piazza. 6, on the piazza, looking across one of the sunken courts which light the shopping promenades towards the foot of the PVM building. 7, at piazza level—PVM building on left; CIL building (architects, Skidmore, Owings and Mervill) beyond. 8, steps up to the piazza from the west. 9 (facing page), Place Ville Marie from Dominion Square—the forty-year-old Sun Life building on the left; the Queen Elizabeth Hotel on the right. The associated Canadian architects of the PVM development were Affleck, Desbarats, Dimakopoulos, Lebensold and Sise.

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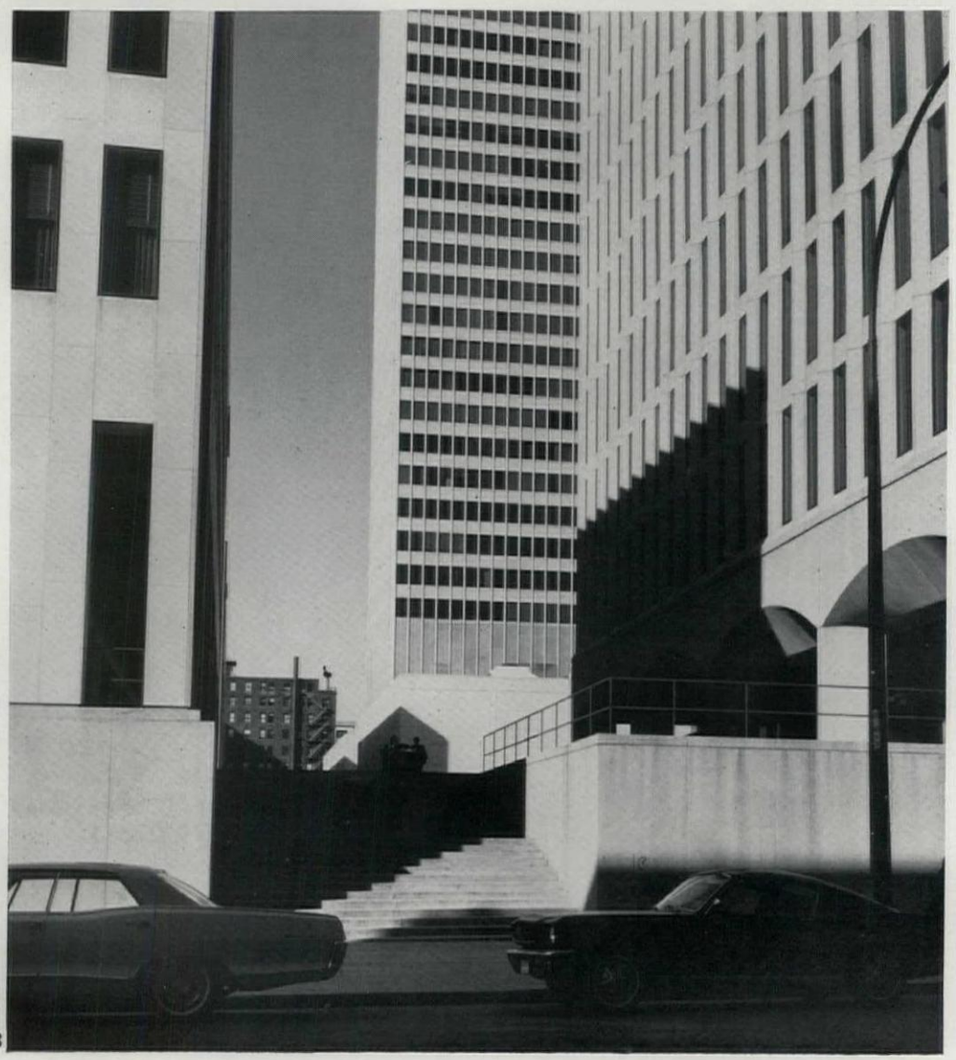

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LA GALERIE DE BOUTIQUES
SHOPPING PROMENADE


CLAIRE-FRANCE
INFORMATION

11


EXIT

13

14

On the facing page, various levels of the sheltered pedestrian and transport network beneath the new central area of Montreal. 10 *and* 11, *the shopping promenades below the Place Ville Marie piazza.* 12, *escalators leading down to the promenades from one of the main lobbies of the PVM building.* 13 *and* 14, *Metro stations, the latter taken at mezzanine level, where pedestrian galleries will eventually be lined with shops and will link up with the other shopping promenades. Escalators connect this mezzanine with the platform level, bottom right.*

vulgar and eccentric design quite out of keeping with the modern spirit in which the central area development as a whole has been conceived. The clients were the Canadian Pacific Railway and the architects D'Astous and Pothier. It has, however, the merit, in common with several of the other new buildings, of being a real tower—visible right down to the ground. It shares a small paved piazza with a new office building (by John C. Parkin) not yet complete, which piazza is connected to the raised green centre of the square by a footbridge.

North-east of this separate new development —back, that is, in the direction of PVM— is another new hotel, the Queen Elizabeth, undistinguished without and garish within. It faces, in fact, the PVM piazza, the third side of which is closed by the lower IBM building (like the PVM building designed by I. M. Pei), the fourth side, facing north-west, being open, with the entrance to the low-level garages beneath it.

Adjoining the Queen Elizabeth Hotel is the rather dull new Canadian National Railways building above the company's own Central Station and linked underground, as already described, to the bus station and the underground shopping promenades beneath the PVM piazza.

Immediately to the north of the PVM development is another very elegantly designed glass-walled tower, the CIL building, by Skidmore, Owings and Merrill.

Further to the south, and on the point of completion as these words are written,* is perhaps the most significant development of all: the square concrete-walled block, covering six acres, known as Place Bonaventure and designed by the Montreal firm of architects, Affleck, Desbarats, Dimakopoulos, Lebensold and Sise. This building lies south of PVM and the Central Station, over the railway tracks and also over the new trans-Canada highway—part of the recently completed main road system which passes below ground at this point. Further south still are other sites waiting to be developed, so Place Bonaventure is in a sense the hub of the whole of the rebuilt central Montreal as it will appear in a few years' time. It also provides an essential link with the rest because one of the Metro stations is in its basement and an underground passage will provide the connection between the Metro system and the pedestrian network beneath PVM. It is only to be regretted that the connection between the two is not stronger.

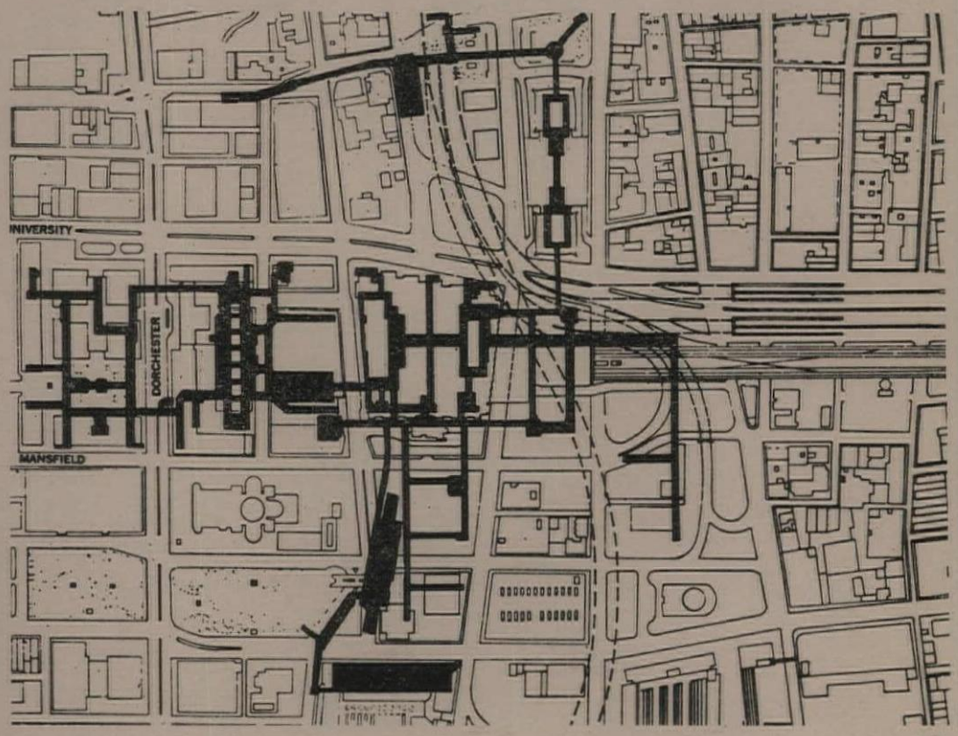
The Place Bonaventure architects planned a bridge connection between their own main pedestrian level and the PVM and Canadian National developments, crossing the intervening street (Lagauchetière), but this was rejected by the city authorities.

The pedestrian level of Bonaventure will provide sheltered shopping promenades similar in style to those underneath the PVM piazza, but in this instance above ground and therefore without the implication that traffic segregation can be achieved only by submerging the pedestrian. Nevertheless Place Bonaventure still, regrettably, relies on artificial light except for a rare glimpse of the outside world at the corners.

There will be a slightly greater length of shopping promenade here than the half-mile of the PVM development. The remainder of the building is planned for multiple commercial use. On the level above the shopping promenade is a cavernous galleried hall for trade exhibitions, served (another example of skilful multi-level planning) by motor traffic by means of a long ramp rising alongside the railway lines. Above this

* It is hoped to illustrate it in a later issue of the AR.

The extent of the sheltered pedestrian network on completion of the building projects now under way. On the right, the railway lines leading to the Central Station, the 'air rights' over which provided the starting-point of the whole development described in this article.



are five floors of wholesale trade showrooms, then a couple of floors of offices connected with the trade centre activities, and, occupying the two upper storeys, a hotel planned round a roof-garden. The building's deliberately weighty architectural character—obtained by boldly ribbed concrete inside and out—creates an interesting contrast to the glass-walled office towers nearby, though it arises of course principally from the use of the building which required uninterrupted wall-space inside on all the upper levels.

A little to the east of Place Bonaventure, across some acres still to be developed, and nearer the old financial centre of the city, is Place Victoria, a glass-walled 47-storey tower, designed by the Italians Luigi Moretti and Pier Luigi Nervi.

This is a distinguished building with an unusual outline derived from its tapering corner columns (see AR, June 1966), and with a 6-storey block alongside. The tower contains, besides offices, a restaurant and the Montreal Stock Exchange, its own basement shopping promenade—in this case on two levels. Detailed design here does not quite compare with the admirably restrained and well thought-out detailing below PVM. The intention is, as a further stage of the Place Victoria development, to build a second tower and a second 6-storey block of the same design, and when these have been completed to link the below-ground shopping promenades that already exist in the first part to Place Bonaventure and the extension to the latter which is now under consideration. Through Place Bonaventure the Place Victoria development will therefore eventually be connected to the whole protected pedestrian network. Already Place Victoria has its own subway connection to the Metro.

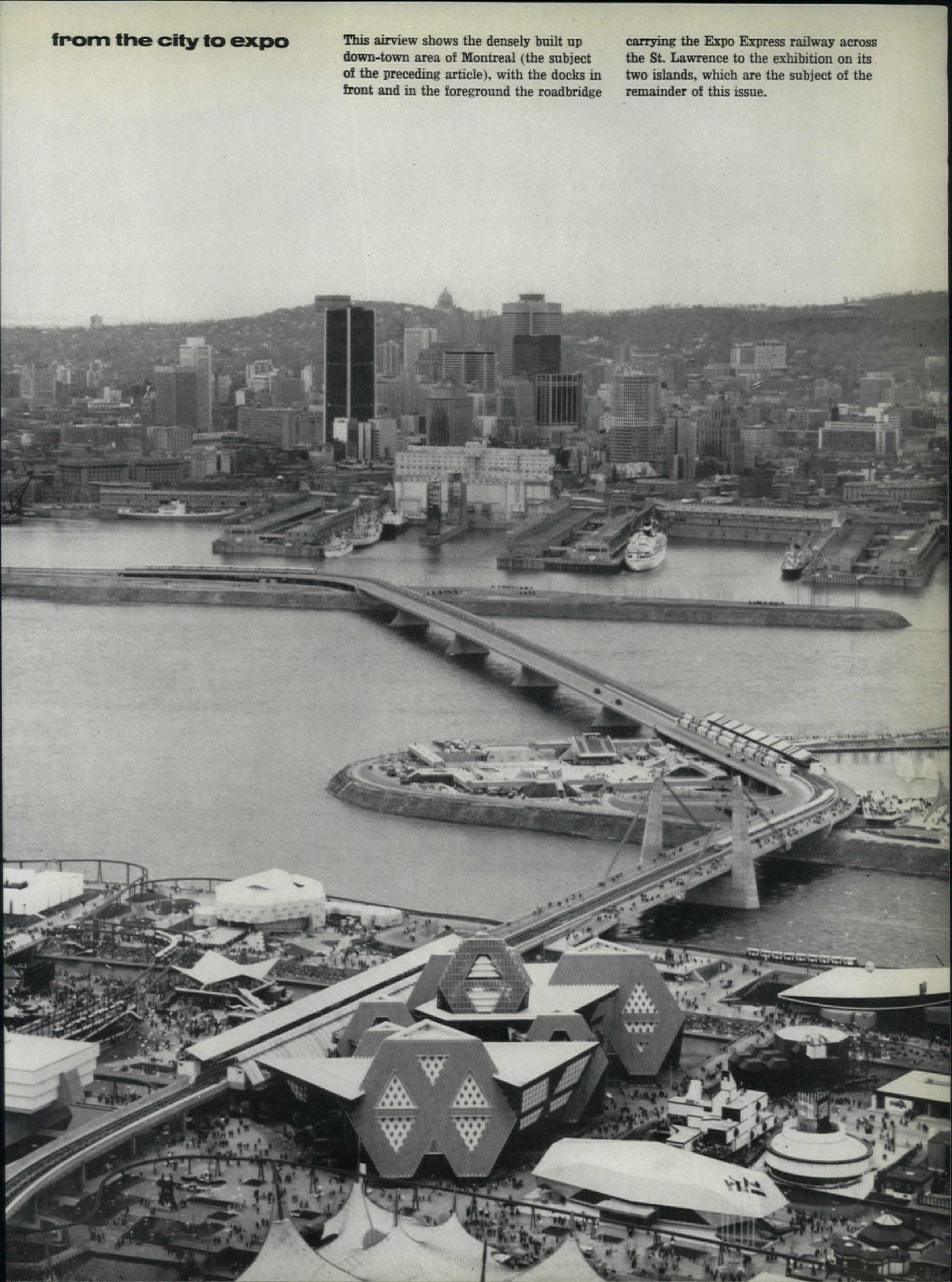
By the foregoing series of accretions the dynamic new down-town area of Montreal has grown from nothing in a dozen years. There are plans for extending it in several other directions, especially north-westwards from PVM, where McGill College Avenue now leads to the grounds of McGill University on the lower slopes of Mount Royal. This extension is chiefly being promoted by the department stores already established there. They have been sensible enough again to appoint Vincent Ponte as planner and the I. M. Pei-Cobb partnership as architects, but the first design that has resulted is something of a disappointment in that it creates a strong axis—in the form of a wide boulevard—along the present McGill College Avenue, culminating in symmetrically disposed tower blocks on either side. The present down-town development gets its dynamic character from the informal arrangement of its cluster of towers, and to change this, admittedly fortuitous but in practice effective, composition into an example of axial *Beaux-Arts* layout is likely to result in something duller as well as something out of keeping with the rest.

It is intended to continue the system of shopping promenades throughout this new development, and the extent of this central area pedestrian network will then (by about 1972) add up to six miles, connecting together about 100 of the 185 acres that the down-town area covers. It will be served by six Metro stations as well as the two main stations and give sheltered access to more hotels and theatres as well as to the whole down-town cluster of office towers.

Already this new conception of multi-level under-cover circulation, so eminently suited to the severe Canadian winter, has influenced developments in other Canadian cities; for example the vast new Dominion Bank building (by Mies van der Rohe) in down-town Toronto, due for completion this year, has extensive shopping promenades in its basement, and these will eventually link up with developments on adjoining sites, creating a pedestrian network similar to Montreal's though not so fortunately integrated with the city's transportation system.

from the city to expo

This airview shows the densely built up down-town area of Montreal (the subject of the preceding article), with the docks in front and in the foreground the roadbridge carrying the Expo Express railway across the St. Lawrence to the exhibition on its two islands, which are the subject of the remainder of this issue.



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expo 67
SITE

Expo occupies two islands in the St. Lawrence River, opposite Montreal, together with a peninsula that projects, parallel with the islands, from Montreal's dock area but is linked to the city by the new expressway road system. The peninsula, previously known as Mackay pier and now part of the area called Cité du Havre, contains the main entrance to the exhibition, the administration building, theatre and art gallery (all to remain permanently), trade and broadcasting centres, two of the theme buildings and Habitat—the experimental housing project. It also contains the terminal station of Expo Express, the high-speed (and high-level) electric railway that carries visitors to and around the exhibition—see under Transport, page 107. A parallel road-bridge also leads across to the two islands on which most of Expo is sited.

These islands are to a large extent artificial. One small island, the Ile Ste. Hélène, already existed and was used as a public park. This has been extended at either end. On the southern extension are many of the exhibition buildings and on the (slightly larger) northern extension is the exhibition's amusement area, call La Ronde. The original park has not been encroached upon.

The second, wholly new, island, the Ile Notre Dame, lies between the first one and the St. Lawrence Seaway, the ship-canal from the Great Lakes which emerges into the river at this point. The Ile Notre Dame, laced with waterways, is wholly given over to Expo, though it has a lake, surrounded by a park, at its southern end.

It had been hoped to obtain the material for making the new islands by dredging the river bed, but rock was found too near the surface and much of the material (9 million tons out of a total of 15 million) had to be brought in trucks from the mainland. A lot of it came in fact from the excavations for the new underground railway. The total area occupied by the exhibition is one thousand acres. It makes a first-rate site for the purpose: within reach of the city centre without being confused in it; with water penetrating and surrounding it; with the shipping on the St. Lawrence Seaway visible from one side of it and, from the other, exhilarating views across the river of the clustered towers of down-town Montreal.

1 (facing page), air view of the two islands on which most of Expo is built. On the left, Ile Ste. Hélène with the wooded park in the centre, which formed the original island, and at the far end (beyond the Jacques-Cartier high-level road-bridge) the La Ronde amusement area. In the centre, the newly made Ile Notre Dame. On the right the St. Lawrence Seaway.
2, close-up air view of part of the southern half of Ile Notre Dame showing how the island is interlaced with waterways. The mini-rail can be seen weaving its way among the buildings, sometimes on land, sometimes over water. The pavilion in the foreground is that of the Province of Quebec.
3 (below), from the Expo Express station at the southern tip of Ile Ste. Hélène. Left to right: group of theme buildings ('Man the Explorer'); the US pavilion (in the distance); the Scandinavian pavilion; the giant metal sculpture commissioned from Alexander Calder to symbolize Man.

expo 67
LANDSCAPE

Expo's achievement—and it is a substantial one—lies as much in the totality it creates as in the design of individual buildings. No international exhibition of this kind, dominated by buildings whose main object is to attract more attention than the building next door, can expect to be anything but incoherent; yet Expo has a surprising degree of unity, the result chiefly of skilful landscaping, of the use of water threading its way through every section of the site and of the overhead transport lines similarly providing every view with a common element. More than anything, however, this admirable coherence is due to the consistent treatment of every incidental detail throughout the exhibition. Street-furniture, steps, railings and other kinds of trim, information and sales kiosks, mini-rail and express stations, planting and the handling of materials where land meets water and where buildings make contact with both, are all designed to a remarkably high standard and without showmanship except where this is needed. Credit for this must be given first of all to Colonel Edward Churchill, the exhibition's director (a military engineer) who, together with the chief architect, Edouard Fiset, showed, one was told, not only a flair for the right decision but a willingness to give full backing to designers and fight their battles for them when the decisions had been taken. Credit must next be given, of course, to the designers themselves: three firms of landscape architects, each responsible for one area—Harper and Lantzius for the Cité du Havre, Project Planning Associates for the Ile Ste. Hélène and Ile Notre Dame and Sasaki and Strong for La Ronde. D. W. Graham designed the park at the south end of the Ile Notre Dame and all the landscaping was under the general direction of R. G. Calvert. Villa and Macioge were responsible for street furniture and lighting. Hart Massey designed the mini-rail stations. The illustrations on the four following pages are intended to give an impression of the overall style and standard of design throughout the exhibition grounds and the kind of environment they help to create.

A variety of standardized outdoor furnishings: 7, telephone-point, covered by a transparent plastic dome; 8, telephone-points on the side wall of the Telephone pavilion, in brightly coloured plastic enclosures; 9, tented information kiosk and pole-mounted clock; 10, grouped light-fittings (Dutch pavilion in background); 11, hardwood seat spanning between triangular precast concrete supports; 12, notice-board and low railing at top of the steep grassy bank of the island—distant view of down-town Montreal. A coloured band at the top of the board identifies the section of the exhibition.

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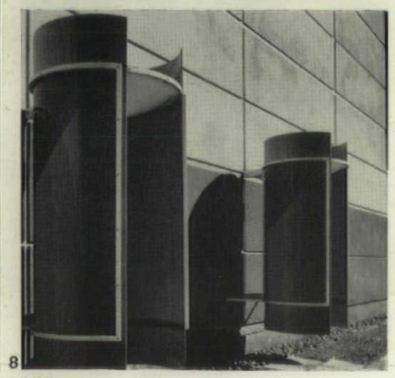

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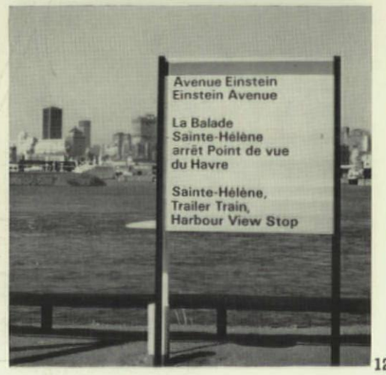

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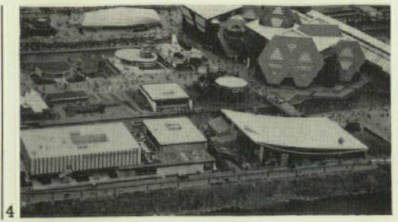
1, Expo stadium
2, main gate
3, administration
4, art gallery
5, Expo theatre
6, International trade centre
7, Labyrinth
8, Man and the Community
9, Habitat
10, Place des Nations
11, Holland
12, Belgium
13, Switzerland
14, Austria
15, Scandinavia
16, Man the Explorer
17, Japan
18, Iran
19, USA
20, Park
21, Aquarium
22, Sky ride
23, Garden of Stars
24, Cuba
25, Marina
26, Canada
27, Atlantic Provinces
28, United Nations
29, Christian pavilion
30, Greece
31, Israel
32, Italy
33, Czechoslavakia
34, Venezuela
35, Morocco
36, Russia
37, Man the Provider
38, Arab pavilions
39, Burma
40, Ontario
41, Western Provinces
42, Quebec
43, Monaco
44, Haiti
45, France
46, Yugoslavia
47, Great Britain
48, Man the Producer
49, Germany
50, European Communities
51, Australia
52, Mexico
53, Africa Place
54, Thailand
55, Kaleidoscope
56, Gyrotron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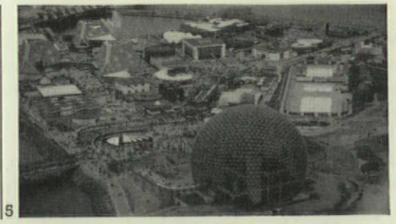
Expo from the air:
4, part of the western bank of Ile Notre Dame, with the Czech and Italian pavilions; 5, the Ile Ste. Hélène with US pavilion in foreground; 6, the southern end of Ile Notre Dame, with the Province of Ontario and Canadian pavilions.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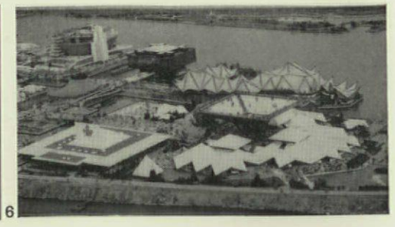
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CITE DU HAVRE

ILE SAINTE HELENE

LA RONDE

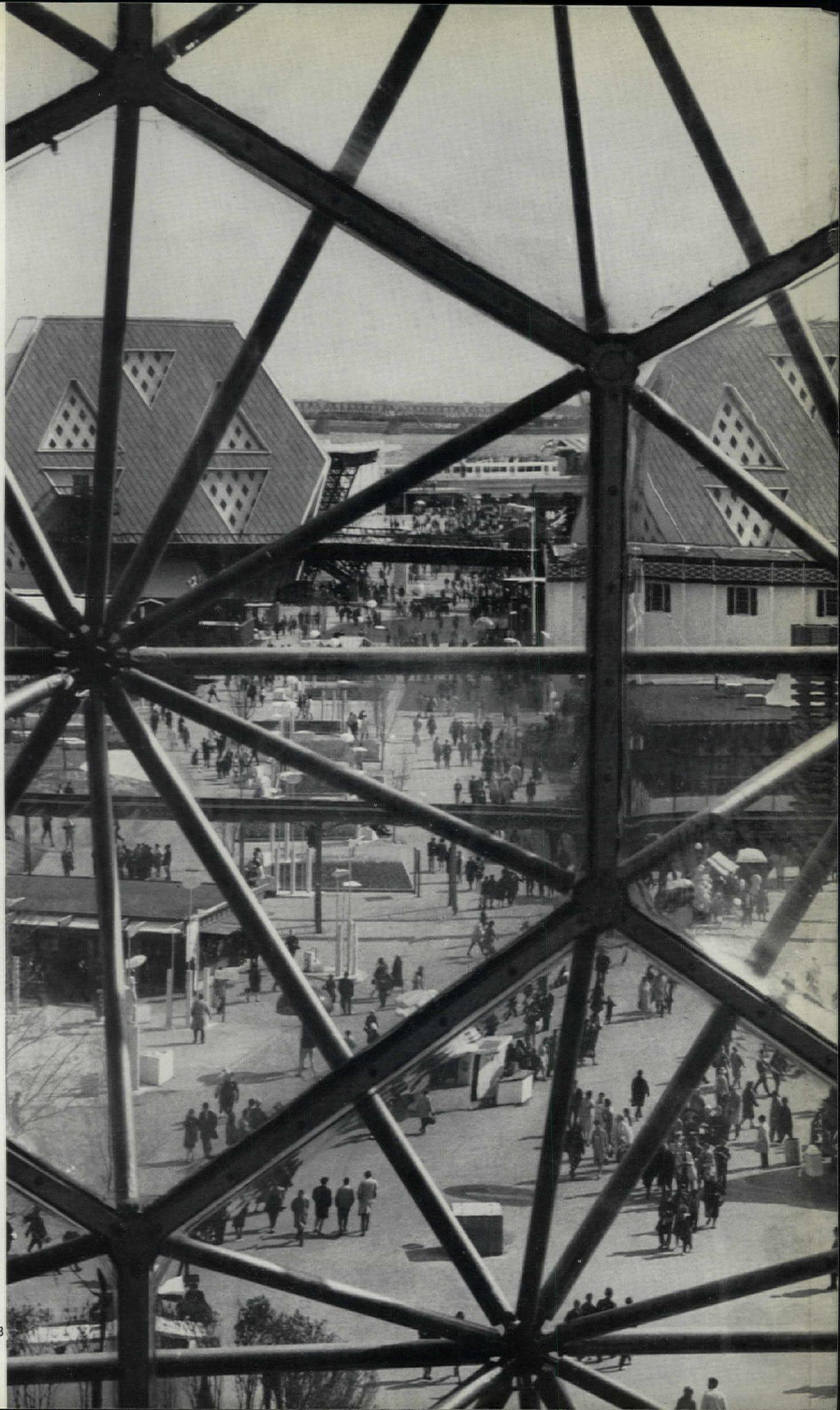
ST LAWRENCE RIVER

ILE NOTRE DAME

ST LAWRENCE SEAWAY

0 1 mile

13, part of the Ile Ste. Hélène section of Expo seen through the tubular space-frames that form the wall-structure of the spherical US pavilion. The view is on the same axis as that in 3, but in the opposite direction—looking south down an avenue which passes between two of the Theme ('Man the Explorer') pavilions. Closing the avenue is the elevated Expo Express, with a train just leaving the Ile Ste. Hélène station.



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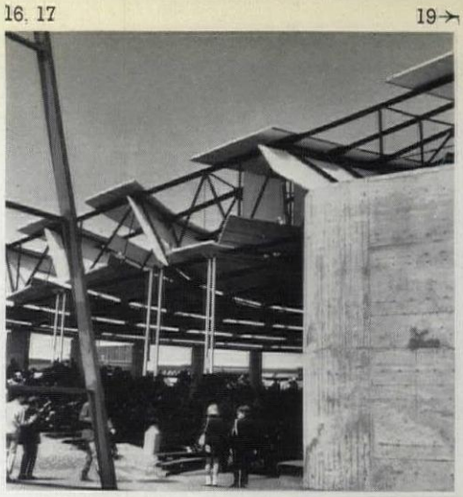

No part of Expo is far away from water. 14 (facing page), the lake and its fountains at the southern end of Ile Ste. Hélène. On the farther shore, from left to right, Swiss, Austrian and Persian pavilions; Telephone pavilion; one of the Theme buildings. 15, another use of stretched canvas: roof over entrance turnstiles, leading into Expo from the Metro station on Ile Ste. Hélène. 16 and 17 (above), one of several music auditoria; in this case open at the sides but protected by an adjustable steel and plywood roof. 18, one of the Expo Express stations, roofed with a striped canvas awning. 20, Expo Express at one of its terminal stations at La Ronde, showing the canvas roof over a frame of welded steel trusses and stretched wires, with light fittings incorporated. 19, another transport variation: the ski-lift type skyride that takes visitors across the lake and back in La Ronde, the amusement area. In the distance: the Gyrotron—described on page 139.

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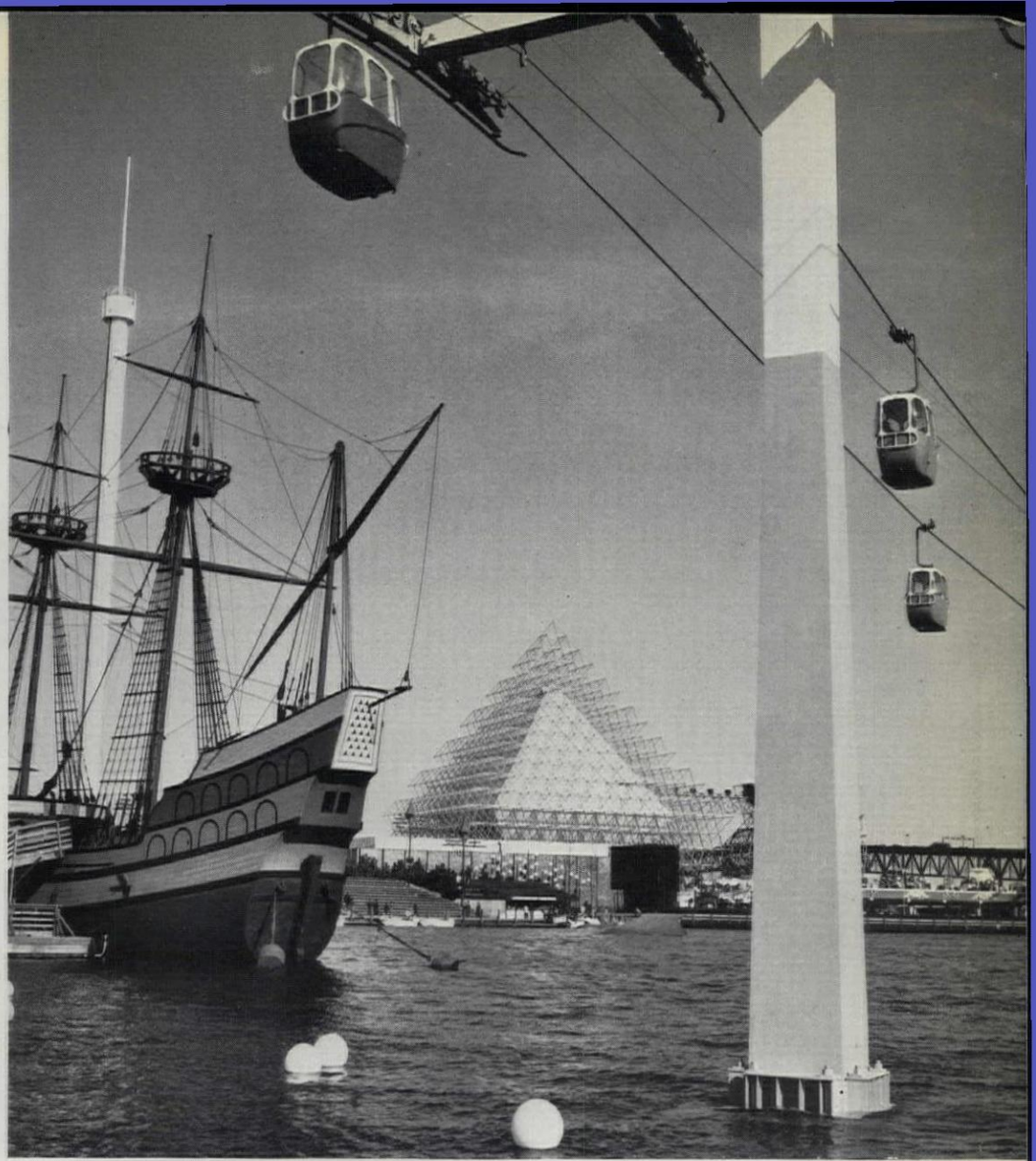


The mini-rail that loops around the exhibition islands. In 21, besides sections of two mini-rail loops (one with a train in transit) can be seen in the foreground some of the trackless trailer trains. 22, typical mini-rail station. 23, mini-rail from below, on the Ile Ste. Hélène.

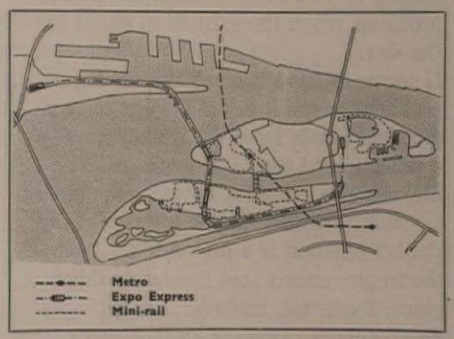
21 ↑

22

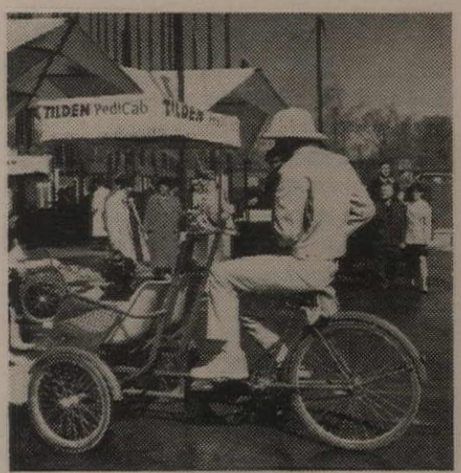
23 ↓

expo 67

TRANSPORT



Above, map showing Expo's three main transportation systems: the Expo Express, starting by the main entrance on the Cité du Havre peninsula and finishing at La Ronde; the Metro, crossing under the river from central Montreal to a station on Ile Ste. Hélène and continuing to the farther bank; the mini-rail in three separate loops on the two islands, one common to both islands. 24 (below), the pedicab, seating two, that can be hired by the hour. 25, the miniature goods vehicle, serving the pavilions, shops, restaurants, etc.



Expo transport serves two purposes—getting people there and getting them round; and although the exhibition contains many interesting transportation ideas, executed to a very high standard of design, a weakness is that the two purposes are not very fully integrated. The only point at which Montreal's own transport services reach right into the exhibition grounds is the Metro station on the Ile Ste. Hélène. Bus services, starting in various parts of the city, take visitors to the main entrance, where they can transfer to the Expo Express, the high-level electric railway that crosses the water to the Ile St. Hélène, then to the Ile Notre Dame and then makes a long loop back to its other terminus at La Ronde, on the farther end of the Ile St. Hélène, where there is another public entrance, making a total journey of 3½ miles.

The Expo Express provides the main link between the four sections of the exhibition, and a highly efficient one, but it would have been that much more useful if it had started in the city itself. Planned like this, it would have been worth keeping as a permanent contribution to the city's transportation system; in fact its construction was only agreed to by the city on the understanding that it would be demolished when Expo was over so as not to compete with the Metro—it has now been sold to Toronto. Within the exhibition grounds there is no close link between the Metro and the express; arriving by Metro and wishing to continue by Express—for example to the Ile Notre Dame or to La Ronde—the visitor has a longish, and it would seem unnecessary, walk.

Within the exhibition also are two independent mini-rail systems—one larger than the other—operating as three separate loops. The smaller one is similar to that seen at the Lausanne exhibition of 1964—in fact the identical vehicles are in use. The mini-rails are slow-moving, being intended for sightseeing rather than for transportation (and therefore do not contribute much to the question of the future of mono-rail systems as urban transport). For the same reason the stations are a fair distance apart, but there is a station close to each of the Expo Express stations, allowing in this instance convenient interchange. They are fully automatic; that is, the trains glide along by remote control with nobody in charge—a fact that seemed at first to arouse some nervousness among the public, and it is notable that the fast-moving Expo Express is also automatic but in this case a man sits doing nothing in the driver's cab in order to reassure the public.

The contribution the two mini-rail systems do make to environmental design is in their relationship to buildings. Normally the view from them is an outside and an aerial one (in some places they are as high as 32 ft. above the ground), but at certain points they enter and pass through buildings. In the Ontario building in particular the mini-rail winds its way in and around it in a highly imaginative way; it also passes right through Buckminster Fuller's United States sphere. In addition it permits views from unexpected levels and angles, adding a new dimension to the apprehension of architecture.

Besides the public transport systems listed above, the sky-ride at La Ronde and water-borne craft of various kinds, there are trailer trains making fixed circuits of the exhibition pathways and two forms of small vehicle: so-called pedicabs that can be hired by the hour, holding two people and operated by a cyclist, and small, impressively compact cars for the transport of goods, etc., which, although petrol-driven and not electric, may still offer some lessons in connection with short-distance town transport.

architecture at expo:

THE NATIONAL PAVILIONS

The buildings that the participating nations erect for their own use are traditionally the focus of architectural interest at international exhibitions. Comparison of one nation's efforts with another's is a popular, as well as an architect's pastime, and although the diversifying effect of this kind of competition for national prestige completely negatives any attempt at unity of design, such exhibitions tend to be remembered—as much as for anything else—for the national pavilion that made the most impressive, or the most original, showing.

Nevertheless one had thought that perhaps, in view of the current distaste, at least among intellectuals and in the professions, for the kind of chauvinism that national rivalry in design leads to, and in view of the tendency nowadays for the part to be judged more in relation to the whole, Expo 67 might prove to be the last great exhibition conceived in these terms. One is continually made aware at Expo of the old-fashioned character that its self-assertive, unrelated national pavilions, whatever their individual merits, contribute to a scene otherwise possessing remarkable unity in its landscaping and quality in its overall design. However it is already clear that the next international exhibition—at Osaka, Japan, in 1970—is to follow the same pattern; indeed the preliminary plans suggest that its layout will be more conventional than Expo's. These inconsistencies must no doubt be accepted as a reflection of the nationalism that still dominates the political world, though it is to be hoped that the spirit behind, for example, the European Common Market will soon be reflected in such enterprises as international exhibitions. There are just one or two indications at Expo that this spirit is in the air: the five Scandinavian countries have combined to build themselves a single shared pavilion and Africa Place, a unified structure planned round a courtyard, provides under one roof exhibition space for sixteen of the newly emergent African nations. In addition, the several Canadian pavilions, federal and provincial, are treated as a group, and though individually designed are reasonably well related.

Apart from these, the national pavilions at Expo must be looked at as isolated representations of their own countries' architecture. They do not of course necessarily represent that architecture at its best, if only because they are subject to the vagaries of patronage and to various forms of bureaucratic control; Britain, for example, possesses more live architectural ideas than are seen in the design of the British pavilion. And yet if one accepts that the official view of what is good architecture is as much part of a country's architectural scene as the ideas current among architects, one must regard a country as fairly represented even when the first has resulted in a brake being put on the second.

The national pavilions at Expo illustrated on the following pages are those that have come out—whatever the factors that have influenced them—as the best buildings.* Comparing Expo with earlier international exhibitions—especially with the most recent one at Brussels—the principal matters for comment are: that, as at Brussels, the West German pavilion stands out as the most impressive†; that the Latin American countries are greatly missed—they hardly appear at Expo except for Cuba and Venezuela and an unfinished effort by Mexico, whereas on previous occasions they have contributed some of the most ebullient and sophisticated architecture, especially Brazil; that Spain, too, is missed, after having produced one of the best pavilions at Brussels; that otherwise the image the different countries project is surprisingly consistent from exhibition to exhibition—one of sober modern taste from Switzerland and Holland; one of highly professional expertise, though somewhat on the heavy side, from Czechoslovakia; one of unusual interest and vigour, but within predictable limits, from Japan; one of naive belief in the charms of historical revivalism from the other Asian countries, which vary however from the endearingly toy-like gilded temple of Siam to the boringly insensitive building put up by Nationalist China—and so on. To the countries remembered from past exhibitions Canada must of course be added at Expo, and the Canadian pavilions are of a commendably high quality, inside and out.

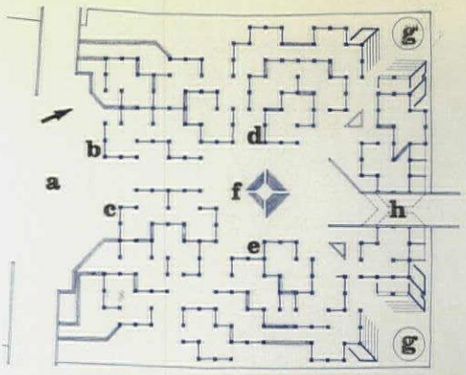
A defect common to many of the best, as well as the worst, of the national pavilions is that they do not have a sufficiently temporary character, thus denying themselves an appropriately light and spontaneous quality as well as presenting demolition problems when the exhibition closes in October.

It seems to have become the regular practice for the internal display to be in different hands from the architecture—a reflection of the high degree of professional expertise nowadays achieved in exhibition design. The interior of the British pavilion is a first-rate example of the improvement that has lately taken place. Expertise, however, has its disadvantages; there is an increasing tendency for it to become an end in itself, and in many of the national pavilions at Expo the ingenious display techniques that the experts have thought up attract attention to themselves rather than to the message they are supposed to put across

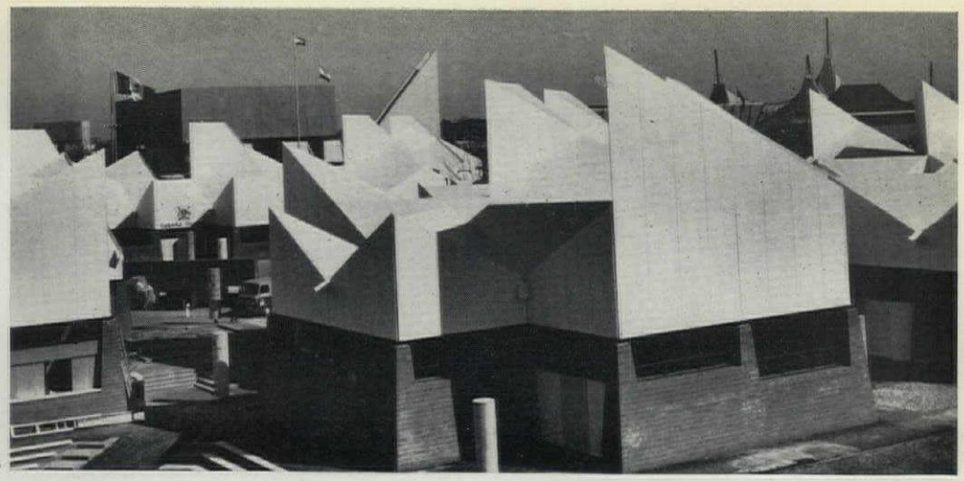
Another interesting development is that the techniques of exhibition design have now become completely international. All techniques seem to be in use by the designers of all countries; for example the latest and most complicated fashions in cinematic projection appear at Expo again and again. This has the advantage that the architectural chauvinism exemplified, as mentioned above, in the competing styles of the buildings themselves exists much less inside them, but of course it tends to defeat their purpose. One's impression is that the sightseeing public, wandering through one national pavilion after another, all employing similar devices and tricks of the designer's trade, easily loses its awareness of which pavilion it is in at any particular moment. Ingenuity thus becomes self-defeating, which is a problem that the pavilions in historical-revival style do not have to face, and the most successful pavilions become those—of which the United States in the best example—that rely less on elaborate techniques of presentation and more on the creation of atmosphere by means of a few cunningly chosen and dramatically placed images. The United States pavilion gains enormously by not over-reaching itself as well as by relating its fully three-dimensional interior display to its inspiringly translucent exterior.

*Some others are included on pages 155-166, where there are critical notes on these and other of the Expo buildings.

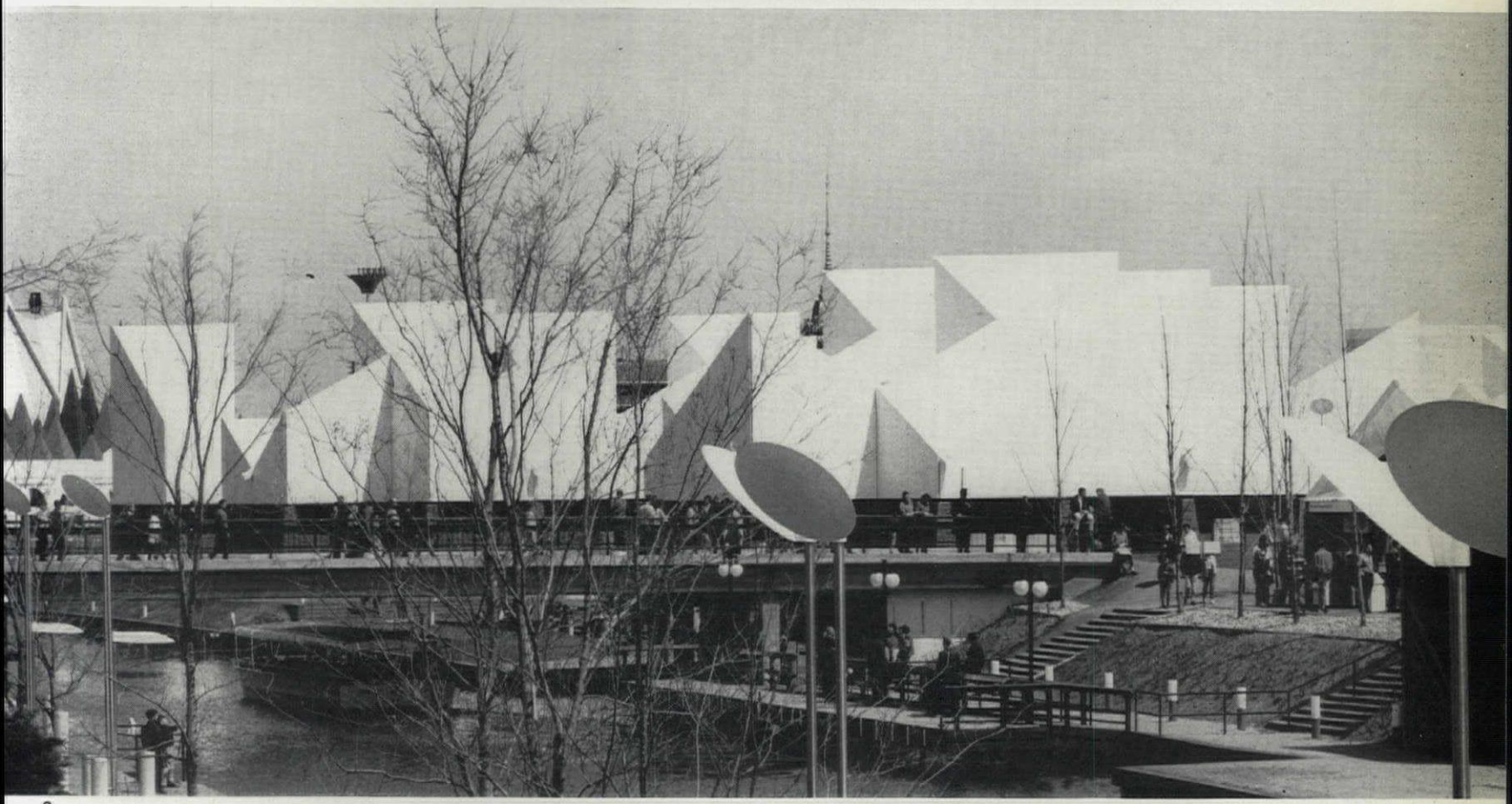
†For this reason it has been singled out for special treatment in this issue and is the subject of a critical article by Robin Boyd on pages 129-135.



plan of Africa Place: key
a, activities area
b, Council of the Agreement
c, Economic and Customs Union
d, French speaking African countries.
e, English speaking African countries
f, seating area
g, performance area
h, bridge (administration under)



1



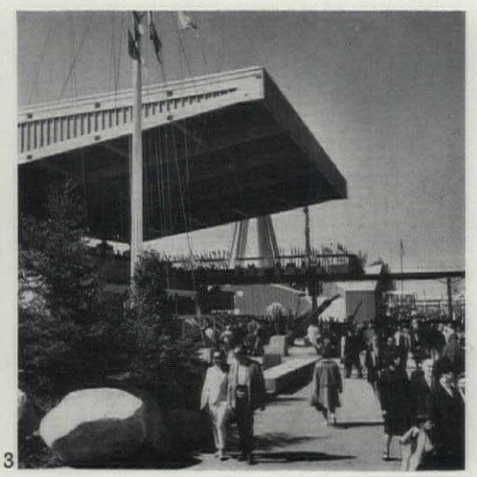
2

AFRICA PLACE

Combined pavilion for a number of African countries: a sequence of interconnecting cells with triangular ventilator roofs of stressed skin plywood covered with a white neoprene membrane; tile bases, 1. It occupies the centre of Ile Notre Dame, facing one of the canals, 2. See also page 155. Architect, John Andrews.

ATLANTIC PROVINCES

Combined pavilion for the eastern provinces of Canada, at the south end of Ile Notre Dame, Four main exhibit areas including a seafood restaurant. Outdoor exhibits, sheltered by cantilevered timber roof, 3, are related to the provinces' maritime activities, 4. See also page 155. Architects, Duffus, Romans, Single and Kundzins; Ojars Biskaps.



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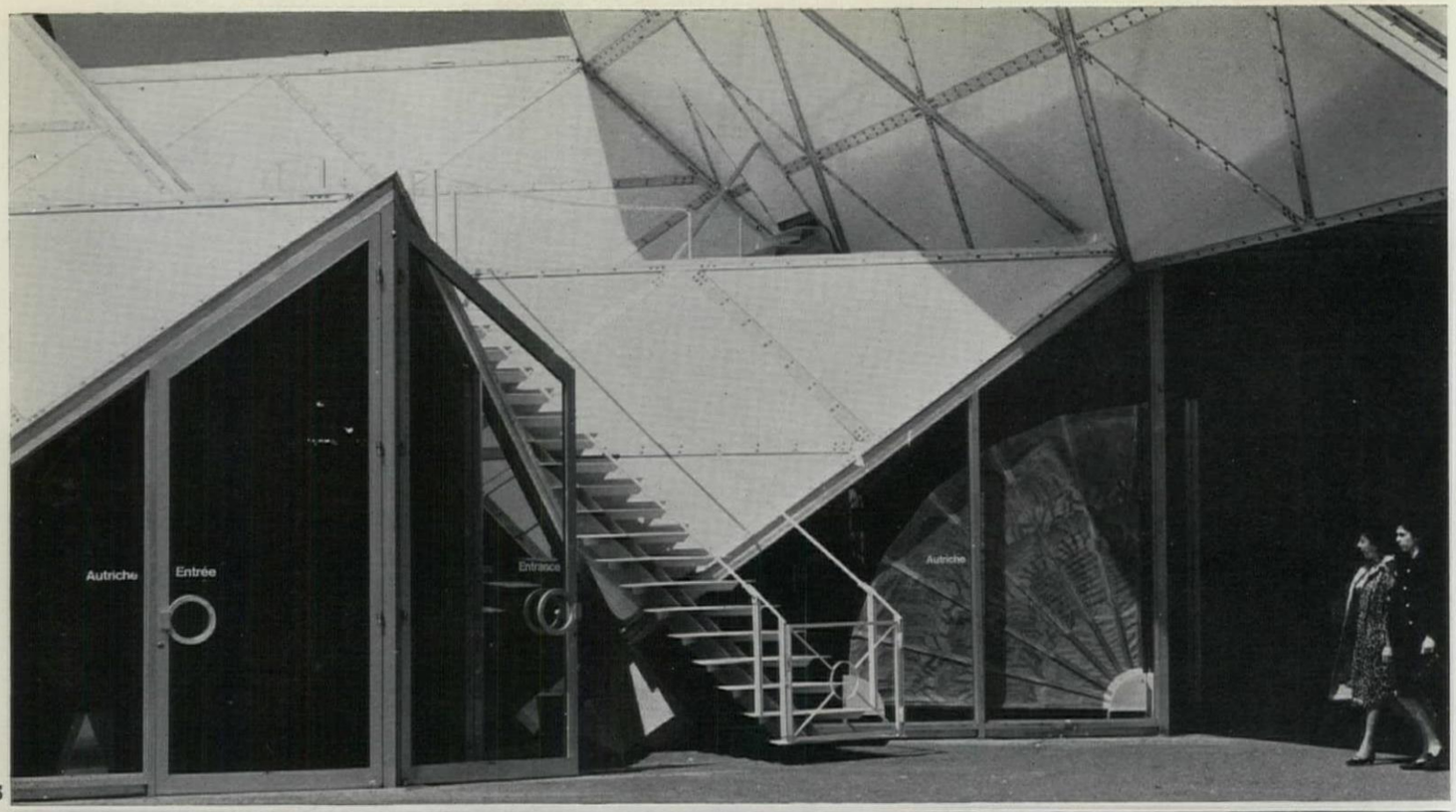
4



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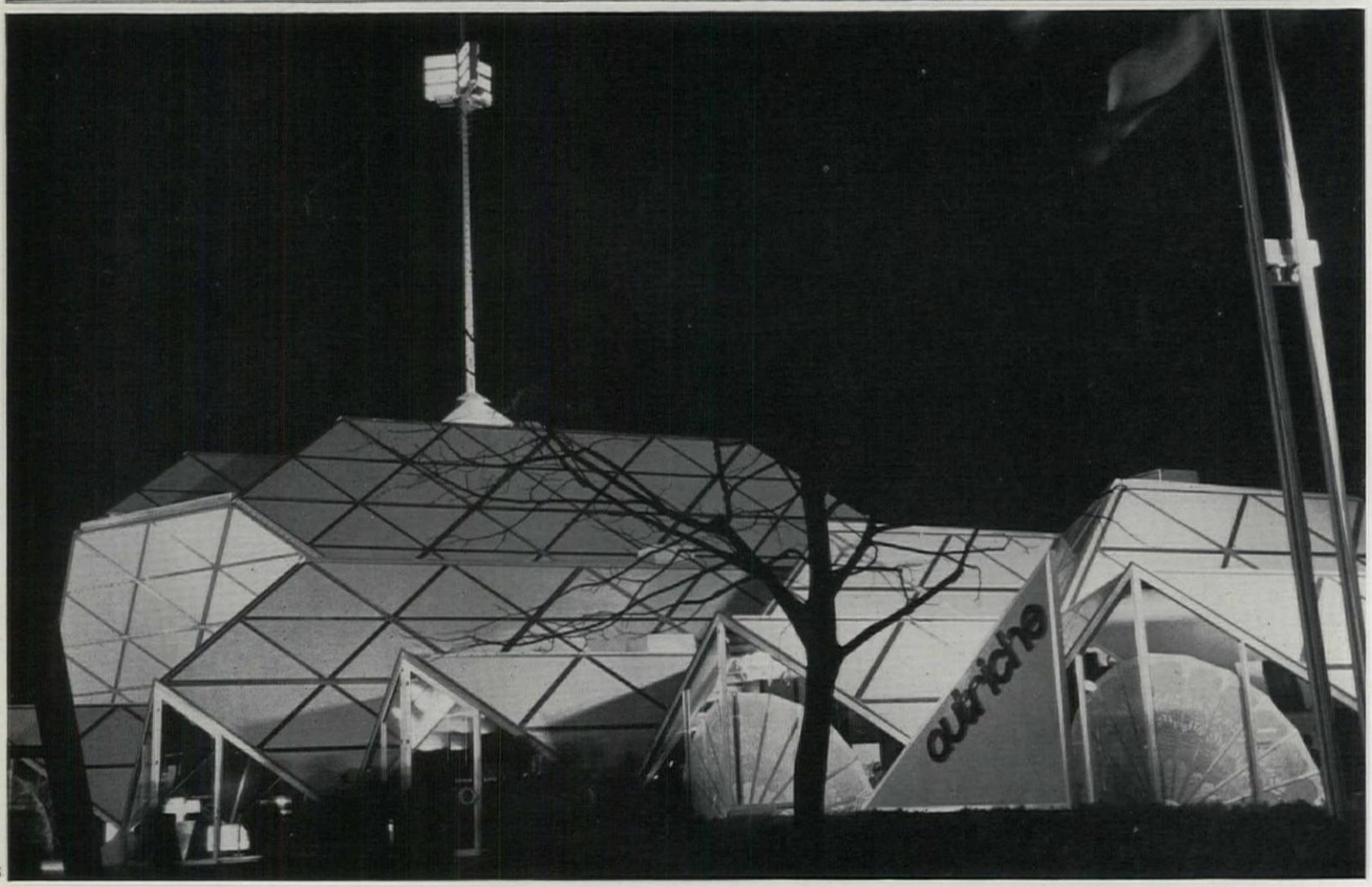
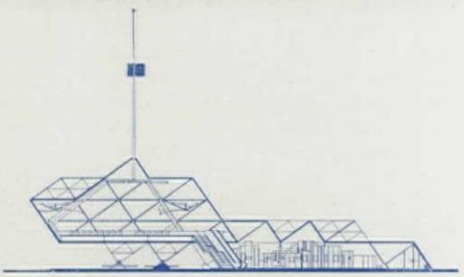


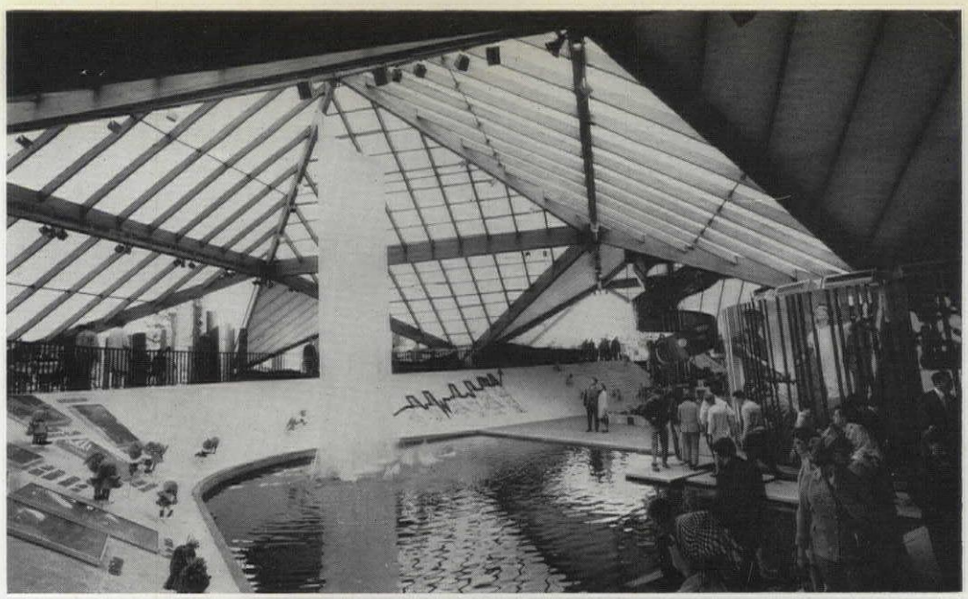
6

AUSTRIA

One of a row of four national pavilions (Holland, Belgium, Switzerland, Austria) in the southern part of Ile Ste. Hélène, backing on to the lake. All in aluminium: frame of extruded sections with infill of triangular panels, 5. A cinema occupies the upper-level space, 6, which is largely open underneath—see section on right—and tied down by reinforced concrete pad foundations. See also page 155. Architect, Karl Schwanzer.



section through Austrian pavilion

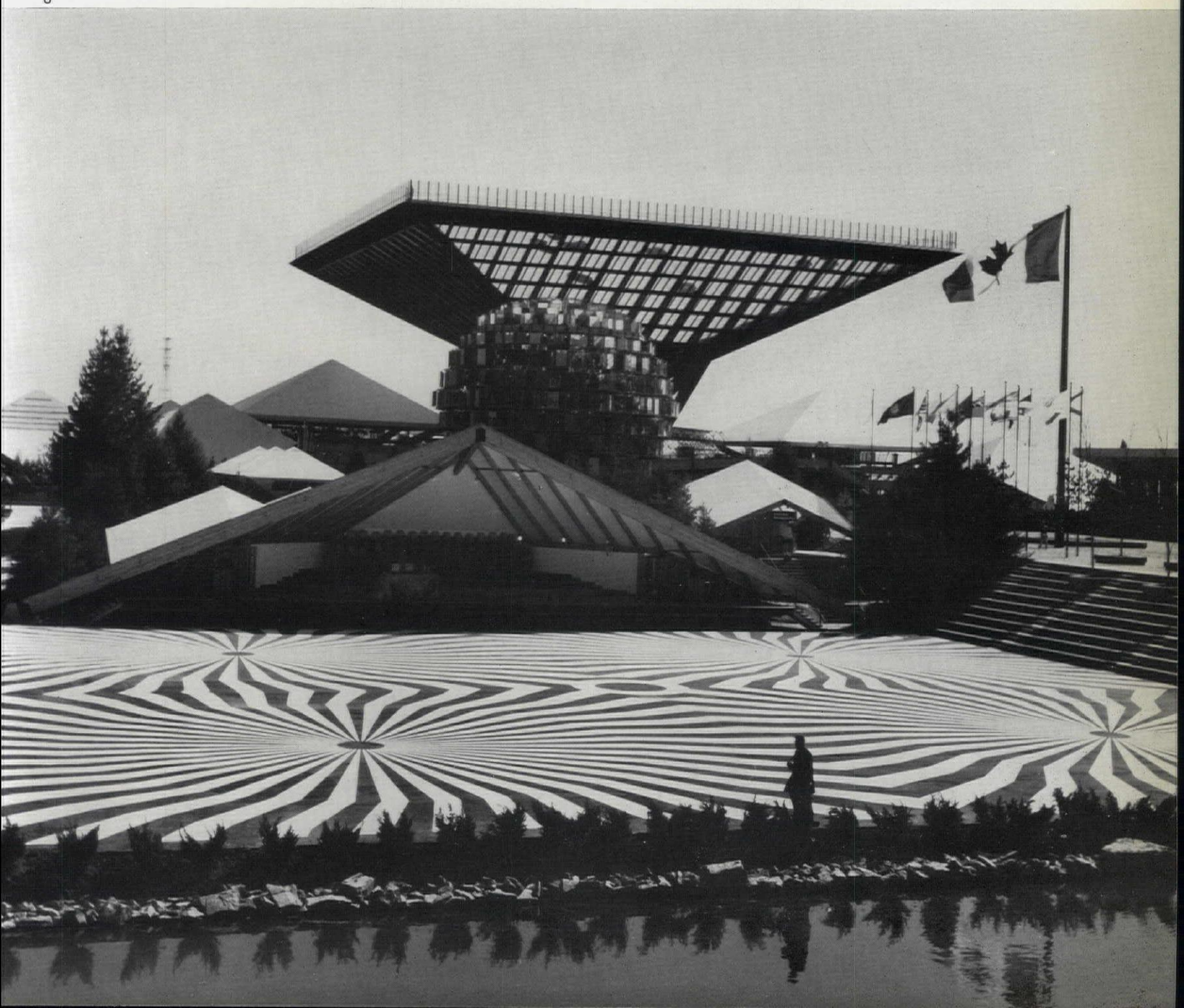


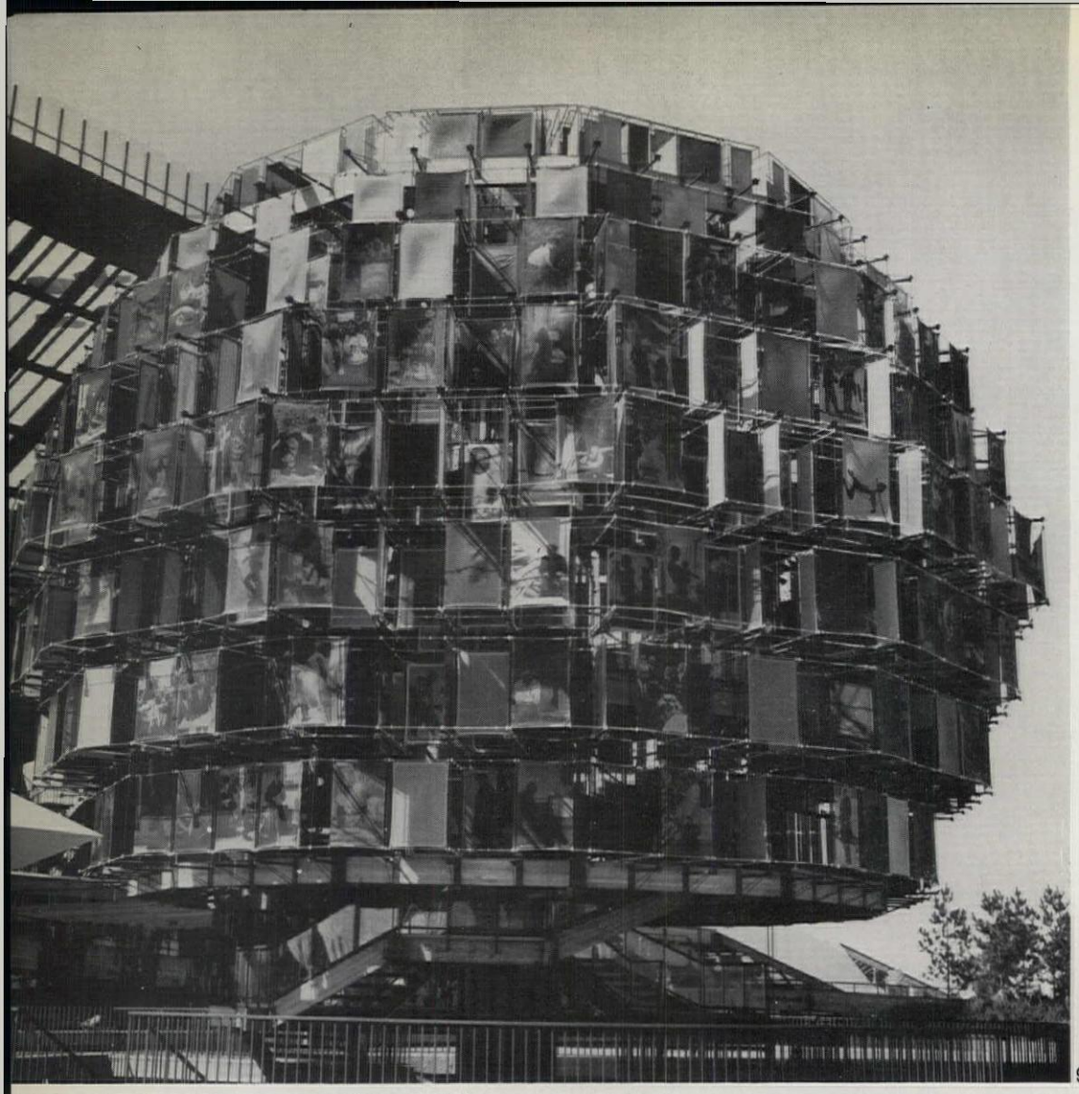
7

CANADA

A complex of buildings representing Canada, flanked by those of the separate Canadian provinces, terminates at the south the built-up area of Ile Notre Dame. The part of the island still further south is laid out with a lake, parkland and waterways. The Canadian pavilion is dominated by an inverted pyramid, round which are grouped low, triangular, tent-like exhibition spaces, of laminated timber and translucent polyester fabric, 7. The central pyramid (seen in 8

8





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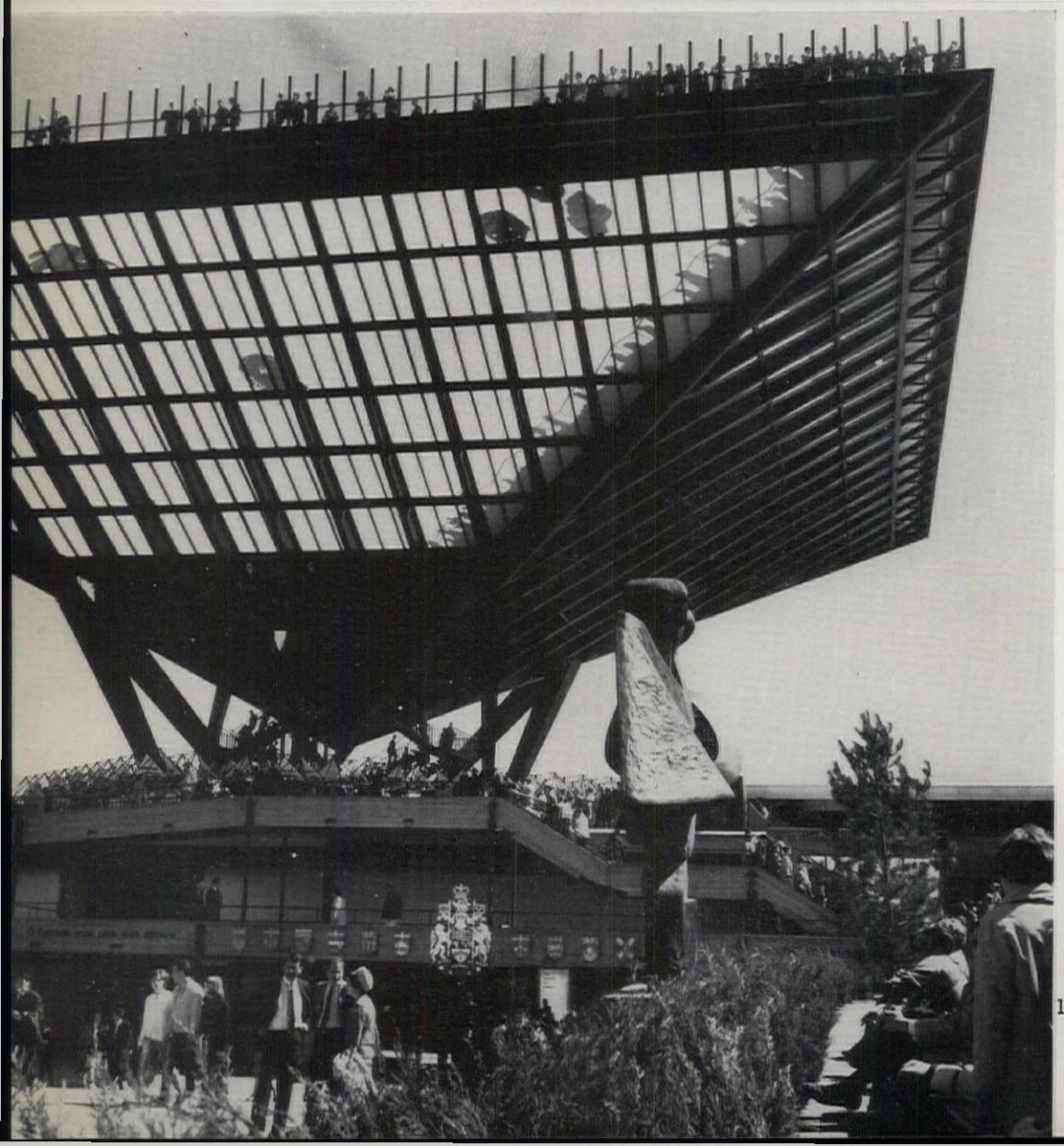

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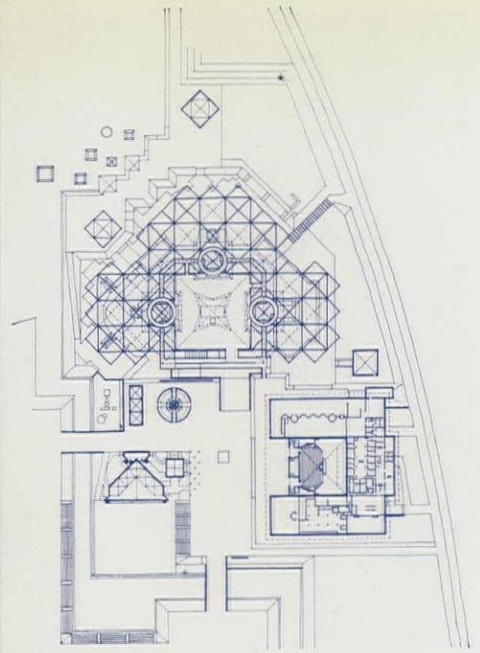
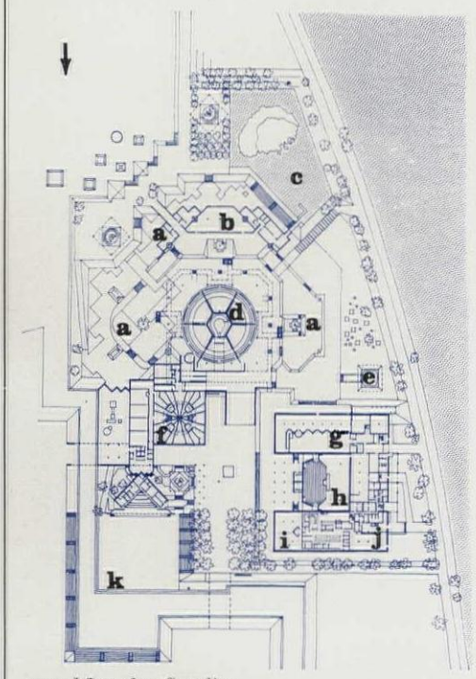


upper level plan



ground floor plan, Canadian pavilion
key

a, exhibition areas (Katimavik over)
b, exhibit theatre
c, The Sea
d, cinema
e, sanctuary
f, The People court
g, fine arts gallery
h, theatre
i, café
j, restaurant
k, activities stage

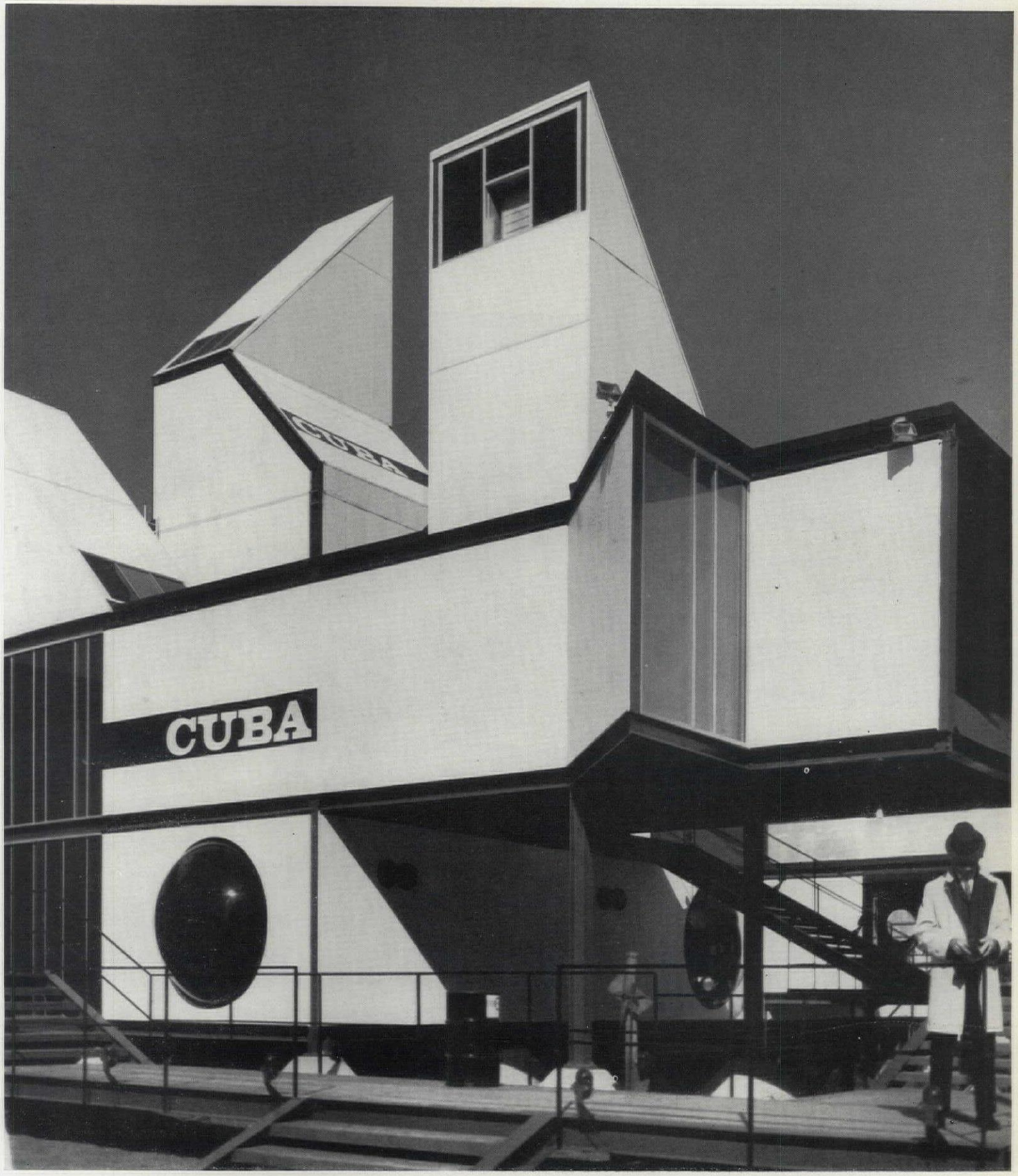
CANADA: CONTINUED

from the north, across the patterned floor which serves as auditorium for the concert-stage contained in one of the laminated timber pyramids) is nine storeys high and has stairs, lifts and escalators leading to a viewing-gallery round the rim. It is called the Katimavik—Eskimo for meeting-place. 9, the 60 ft. high People of Canada section in the form of a stylized maple-tree with leaves of coloured transparencies of Canadians at work and play—they can be viewed from inside by 300 visitors at a time. 10, the Katimavik from below. At its base is a cinema with seats on a turntable. There are also an arts centre, with theatre, and a children's centre, as well as restaurants, etc. See also page 156. Architects, Ashworth, Robbie, Vaughan and Williams; Schoeler, Barkham and Heaton; Z. M. Stankiewicz.

CUBA

In the centre of Ile Notre Dame, a building of complex form with in fact (except for the downstairs restaurant) only one large internal display space, reached by outside stairs, the rest of the geometry, 11, accommodating ventilating machinery and film projection

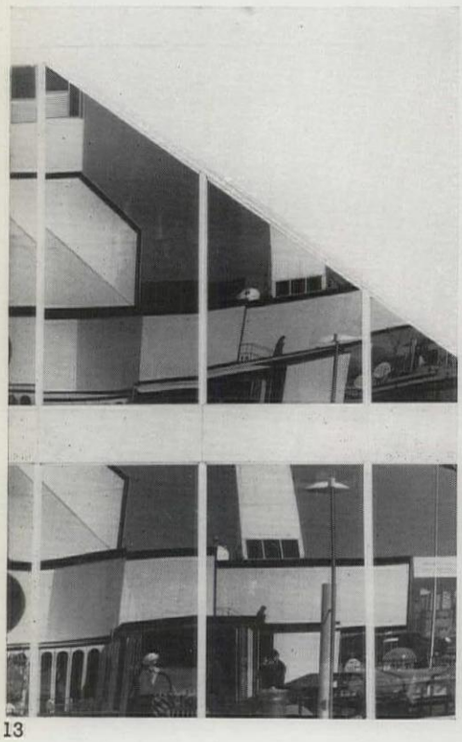
11



12

CUBA: CONTINUED

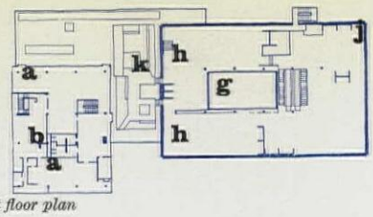
apparatus for several outdoor screens. Winner in a competition. Exposed steel frame; panels of vinyl-covered aluminium sheet; coloured glass in windows. 12, from the bridge that leads across the canal towards the German pavilion. 13, the Cuban pavilion reflected in the glass walls of the Canadian National Railways pavilion. See also page 156. Architects, Baroni, Garatti and Da Costa.



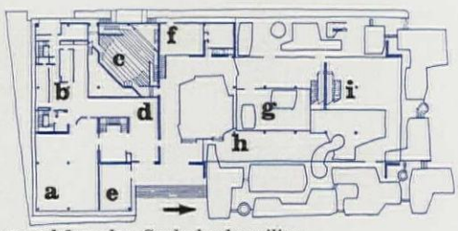
13

CZECHOSLOVAKIA

The outcome of a competition. Consists of two differently treated buildings sited between one of the canals on Ile Notre Dame and the channel separating it from Ile Ste. Hélène. The exhibition section, 14 (with Italian pavilion in distance, right), has a glazed lower floor and a windowless superstructure walled with glazed ceramic tiles separated by black anodized aluminium strips. The restaurant section, left in 15, is steel framed and fully glazed. The two are linked by open terraces at different levels. 16, part of the ground-floor historical display in the exhibition section. Above, the display (wholly artificially lit) is mainly industrial; there is also a cinema showing films with various advanced techniques. See also page 156. Architects, Miroslav Repa and Vladimir Pycha.



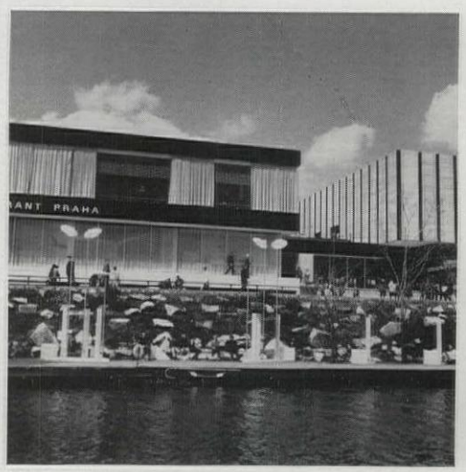
first floor plan



ground floor plan, Czechoslovak pavilion

key
a, restaurant
b, kitchen
c, cinema
d, snack bar
e, shop
f, information
g, court
h, exhibition area
i, escalators and stairs
j, diapolyecran
k, terrace

14

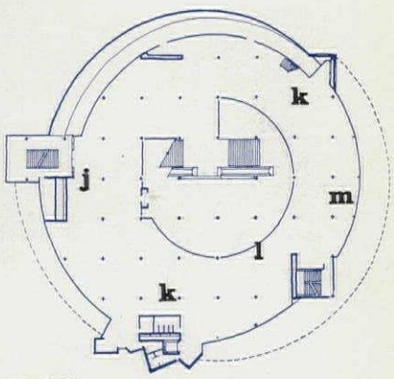


15

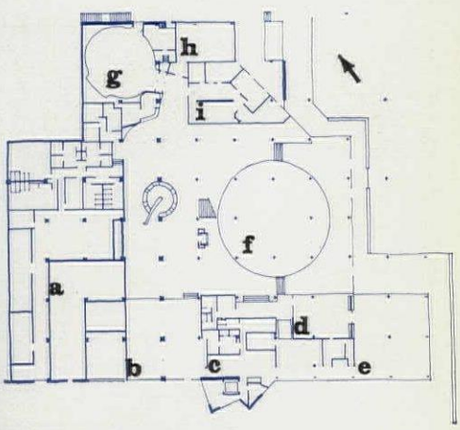
16

FRANCE

The largest pavilion at Expo, with a central well, 17, running nearly the full height with stairs and escalators surrounding it. The structure is steel, with aluminium fins, screens and balcony parapets, 18 (tower of British pavilion in distance), the steel structure having a rectangular grid—see plan—unrelated to external walling. Art gallery on upper floors. See also page 156. Architect, J. Faugeron.



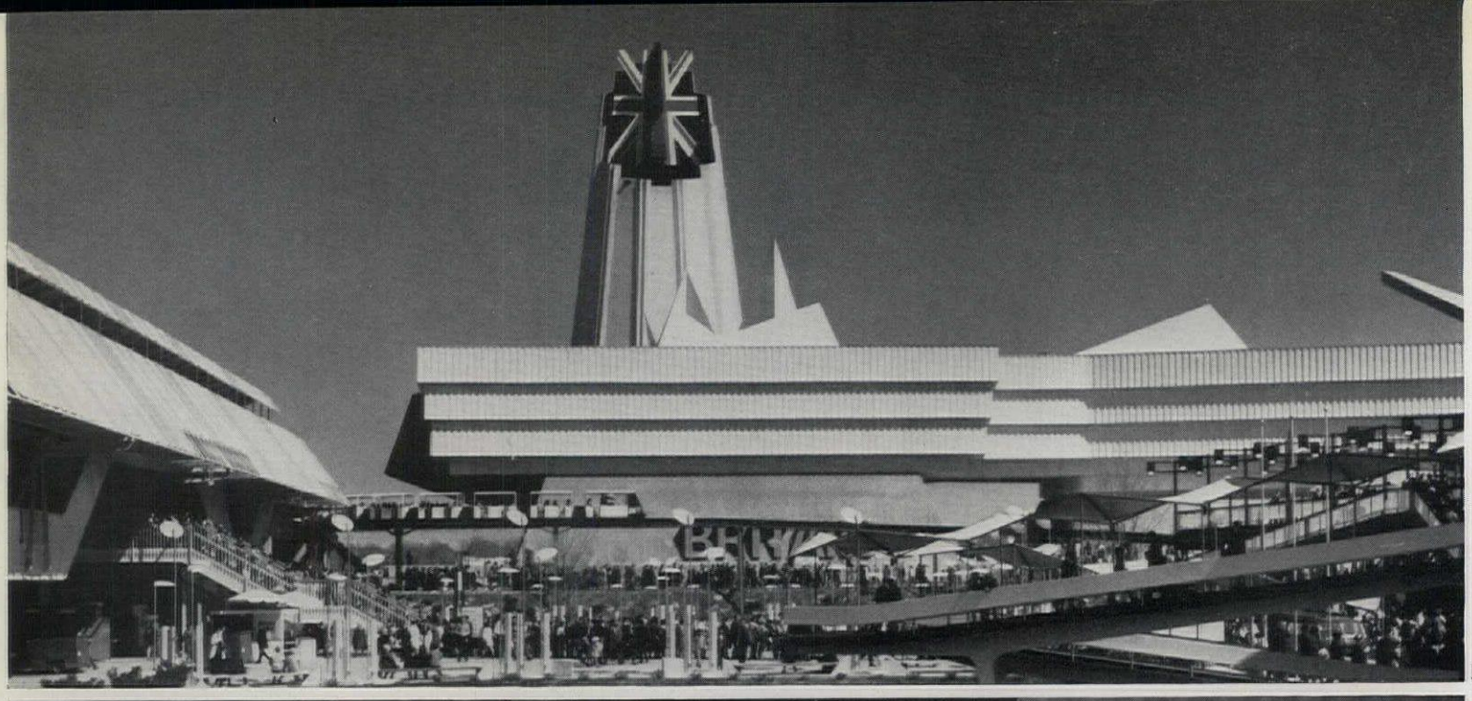
upper level plan



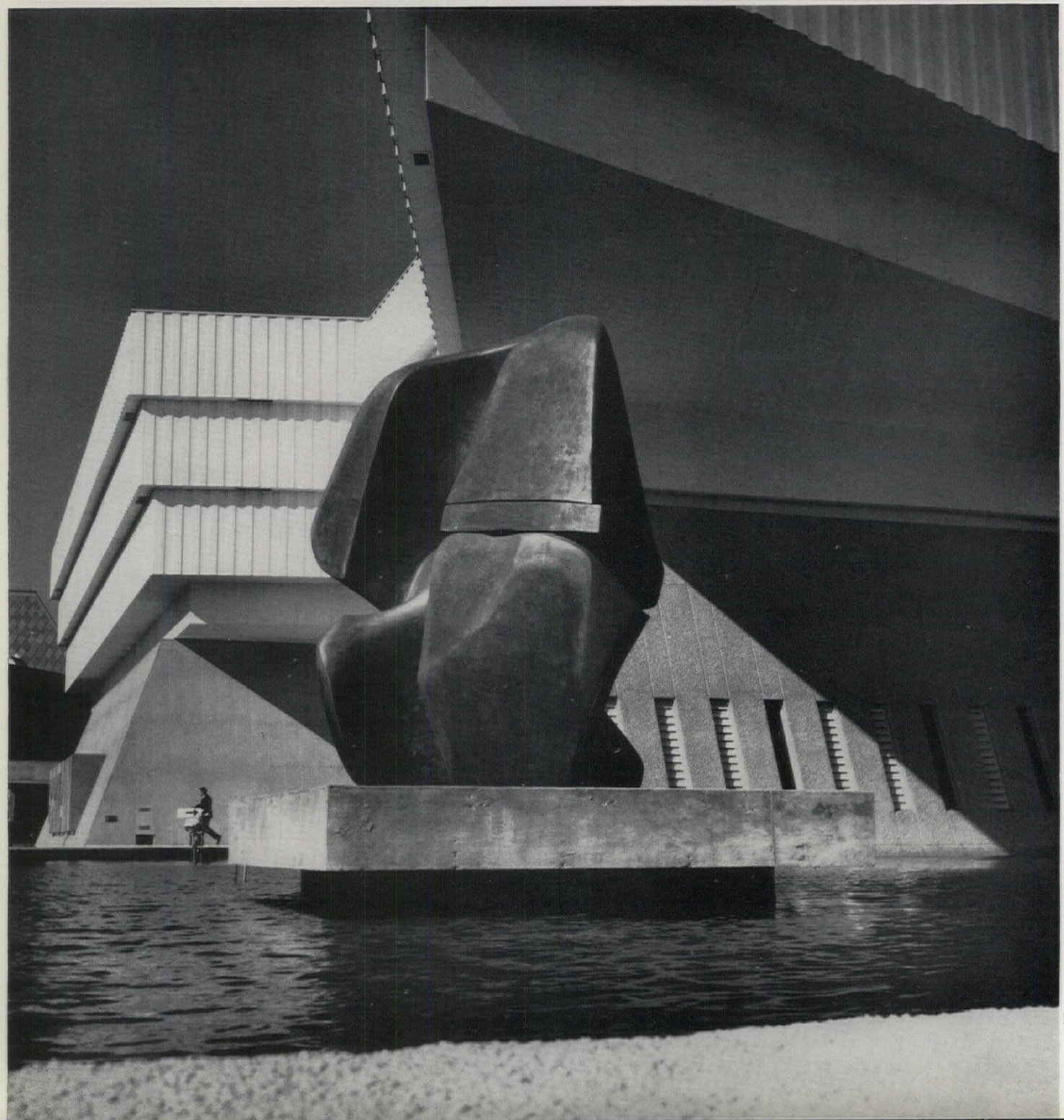
ground floor plan, French pavilion

key

a, mechanical services
b, brasserie
c, kitchen
d, bar
e, restaurant
f, pool
g, cinema
h, conference
i, administration
j, external staircase and terrace
k, exhibition area
l, open core
m, escalator



19



20

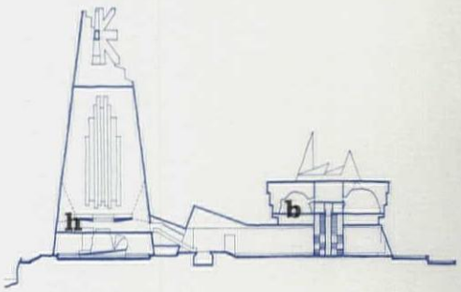
21

22

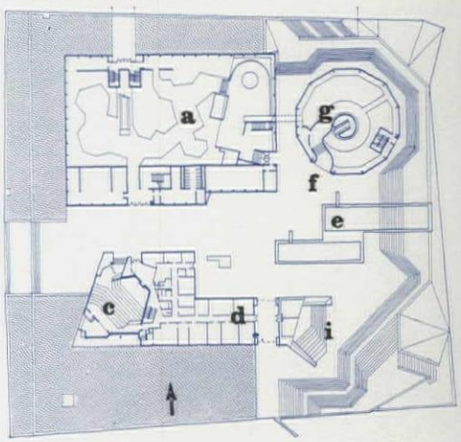
GREAT BRITAIN

At the farthest edge of Ile Notre Dame. On a raised platform surrounded by water are three connected buildings (see plan), including a conical tower containing the entrance. The lower buildings (seen from the centre of the island in 19, with Expo Express station on left and mini-rail station on right) are of concrete block and asbestos sheet. The tower has a steel frame clad in asbestos and is crowned by a three-dimensional union jack designed by F. H. K. Henrion. 20, a Henry Moore sculpture in one of the moats. 21, near foot of tower: sculpture by Stephen Sykes. The one-way exhibition galleries are linked by bridges and escalators. In order, the sections are: Shaping the Nation, 24, an historical résumé designed by Sean Kenny, making vivid use of cinematic techniques; The Genius of Britain, 23, designed by Beverley Pick (the photograph is taken looking up the tower); Britain Today, 22, designed by James Gardner; Industrial Britain, 25, designed by Theo Crosby, and Britain in the World, designed by Mario Armengol. See also page 157. Architects, Sir Basil Spence, Bonnington and Collins.

23
24



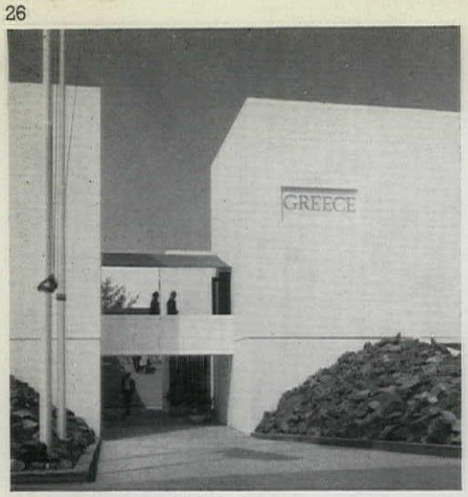
section through British pavilion



ground floor plan

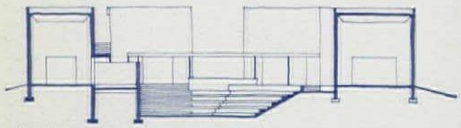
key
a, Britain today
b, industrial Britain
c, cinema (Britain the world over)
d, administration
e, fountain and water sculpture
f, entrance
g, shaping the nation
h, genius of Britain
i, exit

25

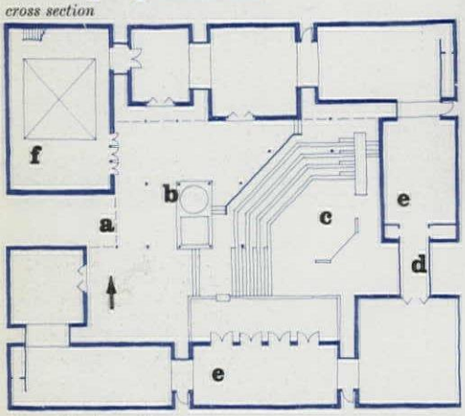


GREECE

On the western shore of Ile Notre Dame: a sequence of top-lit galleries at first floor level, surrounding a courtyard which is entered beneath a bridge, 26. Construction is concrete blocks. 27, gallery displaying antique sculpture. See also page 157. Architect, Nicholas C. Chryssopoulos.

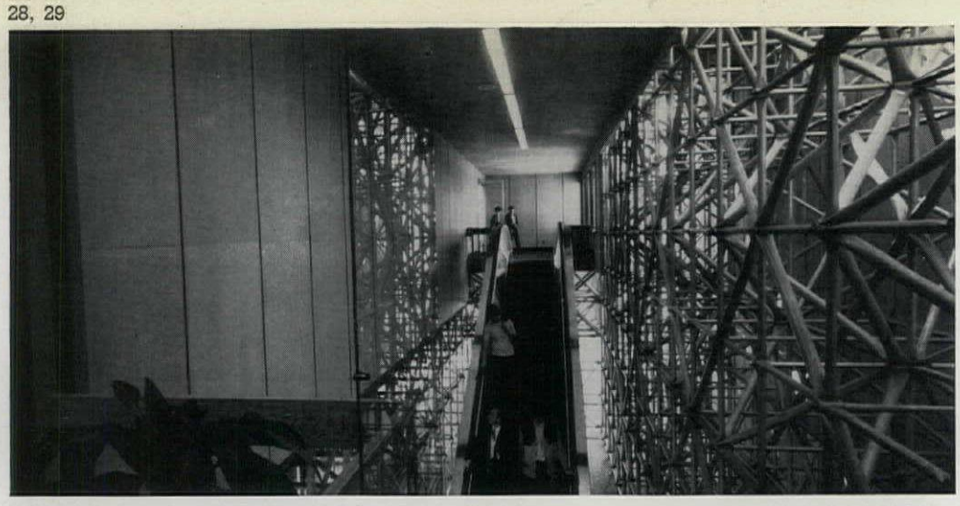


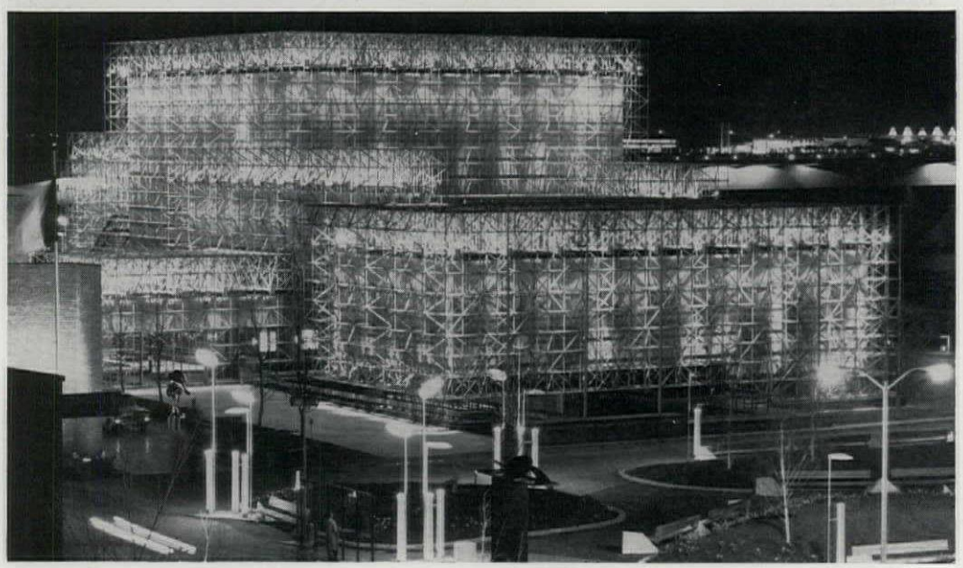
cross section



plan of Greek pavilion

key
a, entrance
b, pool
c, amphitheatre
d, bridge
e, exhibition area
f, theatre

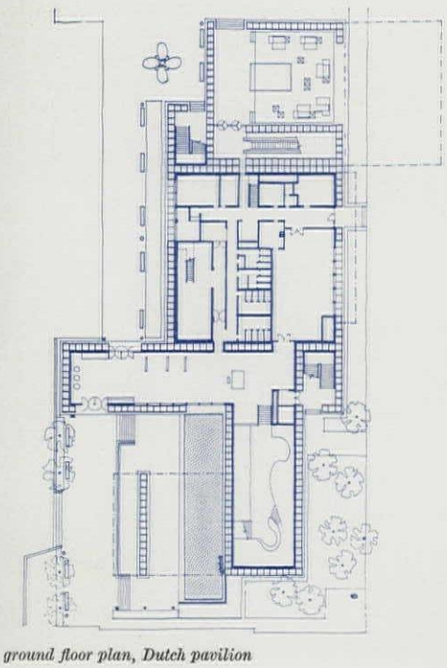




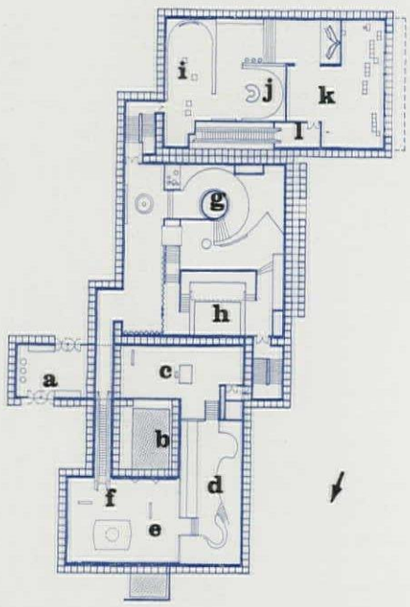
HOLLAND

On the western shore of Ile Ste. Hélène, backing on to the lake: a space-frame structure of tubular aluminium joined by grooved connector hubs, so that no welding or riveting is needed; one wing cantilevered 45 ft. over the lakeside walk. Exhibits on two floors connected by escalator, 28. 29, at night, showing the effect of the illumination from within the aluminium framework. See also page 157. Architects, W. Eykelenboom and A. Middelhoek.

key
a, entrance
b, wave pool
c, historical
d, traditional Holland
e, land reclamation
f, escalator
g, A Bird's Eye View (film)
h, gateway to Europe
i, Dutch Industry (film)
j, industrial and social
k, House of Orange-Nassau
l, exit

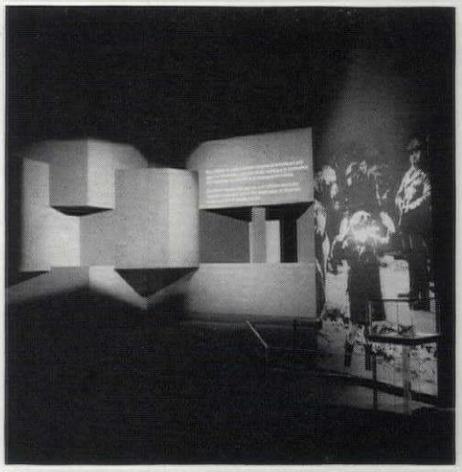


ground floor plan, Dutch pavilion



upper level plan

30



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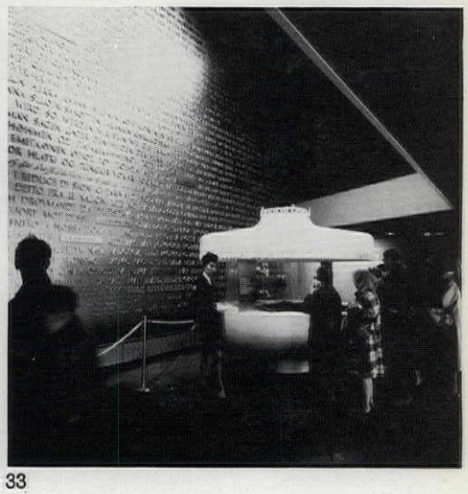
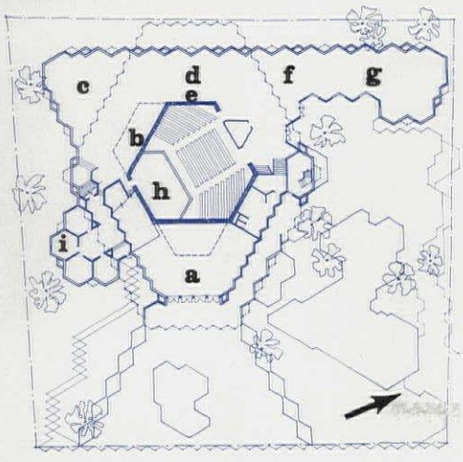
32



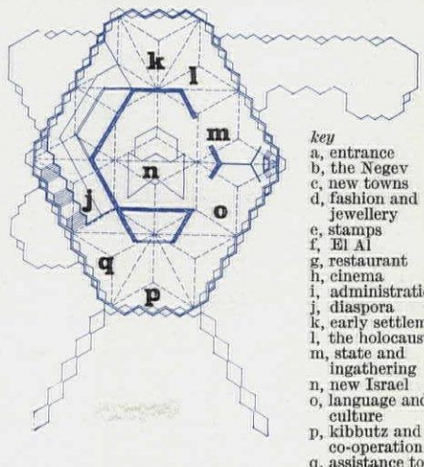
33

ISRAEL

A hexagonal building on the western side of Ile Notre Dame with a continuous flow of (mainly historical and cultural) displays taking the visitor on a circular course, rising and descending round a central cinema seating 250. The building has a light steel frame, with walls composed of cube-shaped moulded reinforced fibreglass panels, designed to be easily demountable. 30 shows the exterior at night and 31 and 32 different points in the sequence of interior displays; 32 also shows the boarded ceiling. 33, the entrance hall, with showcase containing a fragment of the Dead Sea scrolls and gilded wall with relief legends in all languages. See also page 158. Architects, A. Sharon, D. Resnik and E. Sharon.



ground floor plan, Israeli pavilion

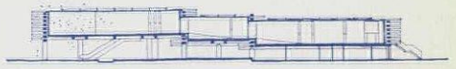


key
a, entrance
b, the Negev
c, new towns
d, fashion and jewellery
e, stamps
f, El Al
g, restaurant
h, cinema
i, administration
j, diaspora
k, early settlements
l, the holocaust
m, state and ingathering
n, new Israel
o, language and culture
p, kibbutz and co-operation
q, assistance to developing countries

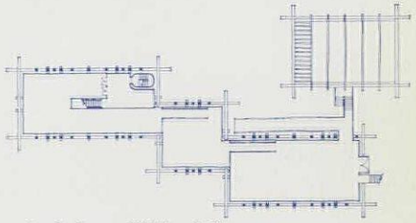
upper level plan

JAPAN

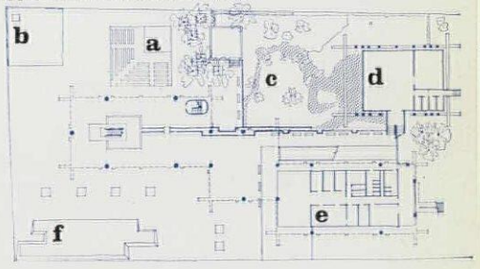
Three rectangular exhibition halls, staggered in plan and raised on in-situ reinforced concrete columns, giving views from inside the building (which stands on the western shore of Ile Ste. Hélène) across the river to the skyline of central Montreal. The superstructure consists of square precast, prestressed beams, cantilevered 24 ft. in two directions, made from wooden forms and bound in metal at the ends. Alongside is a separate single-storey restaurant, and enclosed by the two buildings is a Japanese garden. One-way circulation internally, with the galleries approached by escalator (seen in the view from the south, 34). At the far end visitors descend a ramp, seen in the background in 35 (facing page), which shows the restaurant, left, and the garden, right. See also page 158.
Architect, Yoshinobu Ashihara.



section through exhibition halls



upper level plan, exhibition halls

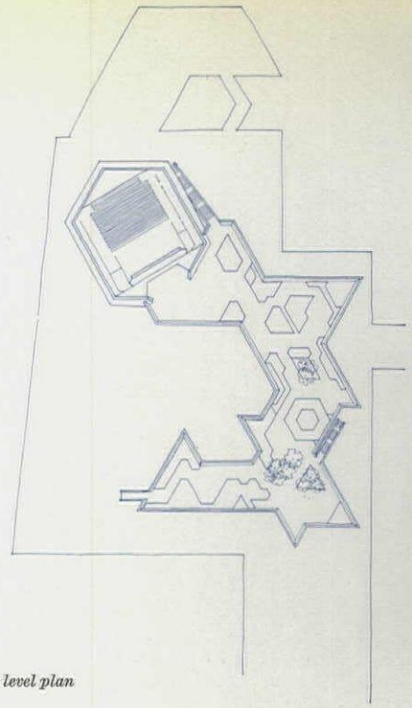


ground floor plan, Japanese pavilion

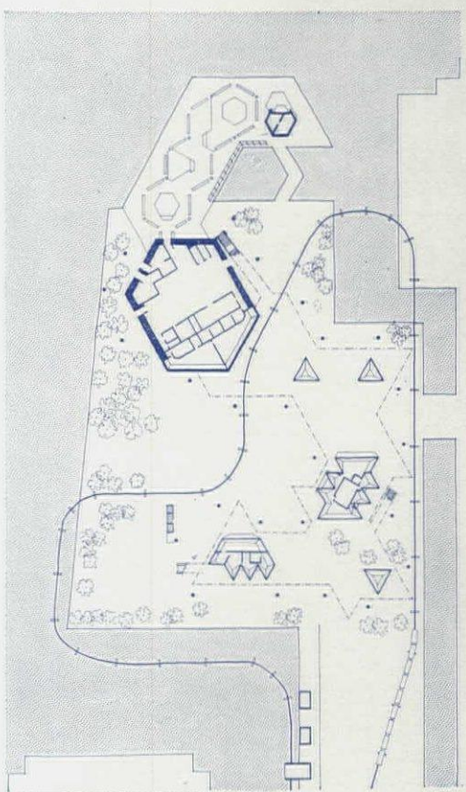
key
a, activities area
b, sculpture
c, garden
d, restaurant
e, administration
f, auto display

36

37



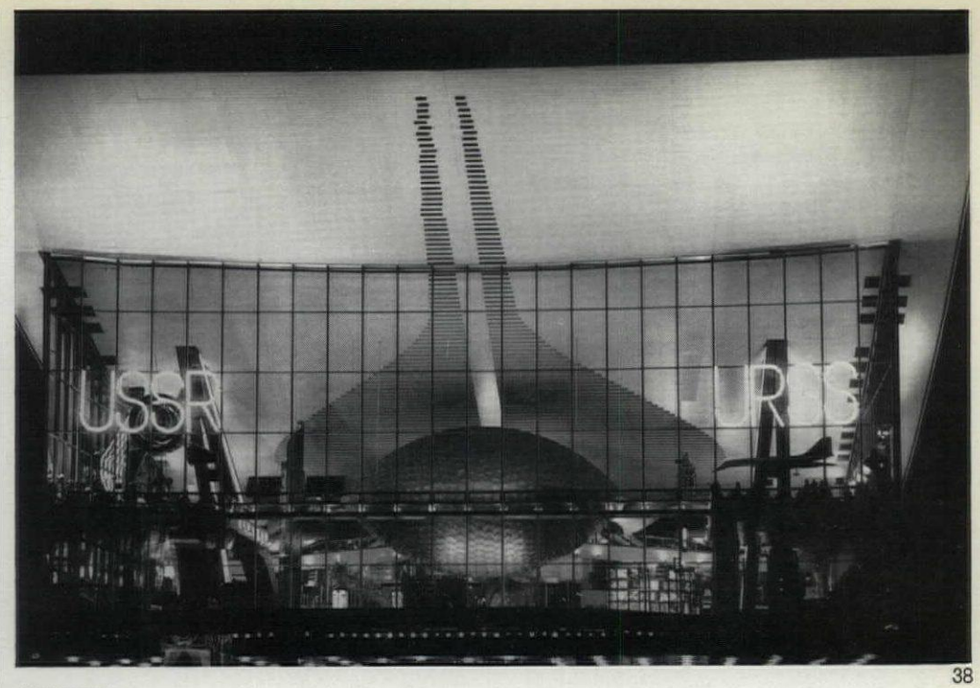
upper level plan



ground floor plan, Ontario pavilion

ONTARIO

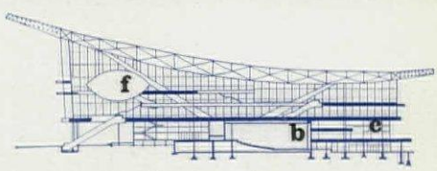
Part of the complex of Canadian pavilions at the southern end of Ile Notre Dame: surrounded by water, across which the exhibition area with its tent-like roof, 36 (facing page) is approached by bridges. The structure consists of tubular steel booms with opaque vinyl-coated fibreglass infill panels. The booms contain the electric wiring. The pavilion is penetrated by the mini-rail, 37, which photograph also shows the incised waterside landscape of granite blocks and fir-trees. There is a theatre seating 570. See also page 158. Architects, Fairfield and Dubois.



38

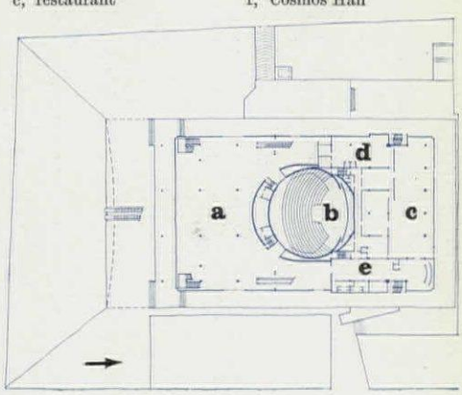
RUSSIA

A large rectangular box somewhat separated from the other national pavilions at the northern end of Ile Notre Dame, near the footbridge that connects it to the Ile Ste. Hélène. It is entered at one end beneath a canopy created by the overhang of the upward curving roof. The building is completely walled in glass, with a brise-soleil on the western face only, and is therefore most dramatic when it is seen lit from within at night, 38. A large aluminium sculpture stands in front of the entrance, 39. The steel structure was prefabricated in Milan; also the lightweight aluminium roof which is supported at four points only by paired legs, 40, taken down through the interior to reinforced concrete foundations set into the rock 26 ft. below. Exhibition floors, framed in aluminium, are supported on steel columns. Cantilevers are suspended from the roof by steel ties behind the face of the aluminium windows. Within the building in 38 can be seen the egg-shaped Cosmos Hall in which space-flights are simulated. See also page 160. Architect, N. V. Posokhin.

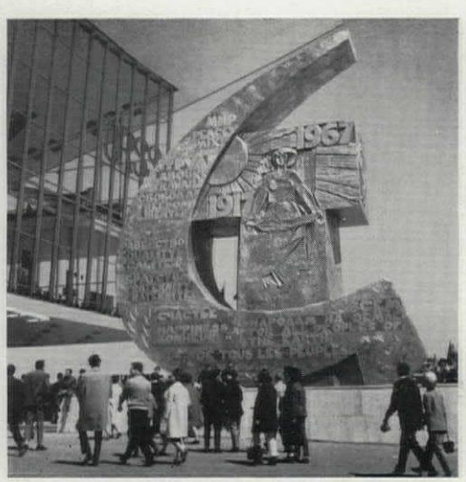


long section through Russian pavilion

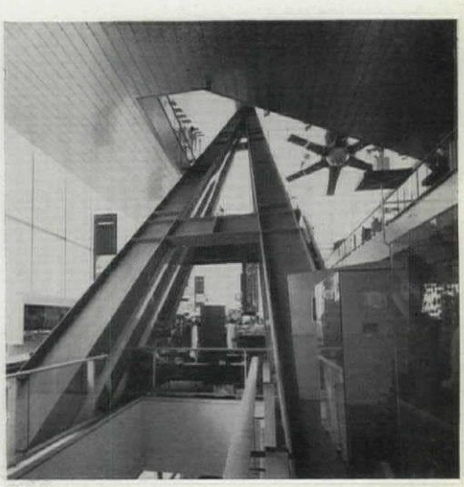
key
a, exhibition area
b, auditorium
c, restaurant
d, kitchen
e, administration
f, Cosmos Hall



ground floor plan, Russian pavilion



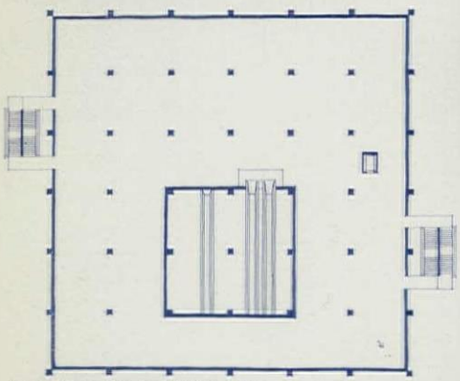
39



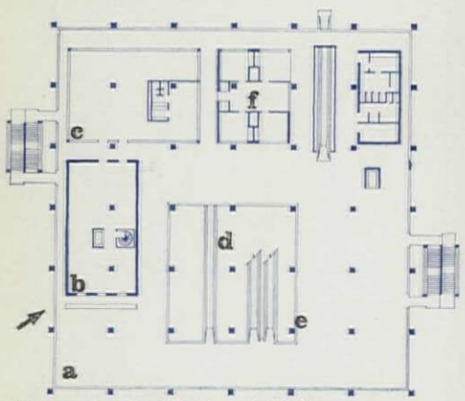
40

SCANDINAVIA

On the eastern shore of Ile Ste. Hélène, near the Expo Express station and the main group of theme buildings: a pavilion shared by five countries (Norway, Sweden, Denmark, Finland, Iceland) in courtyard form with two floors above an open ground area—entrance by escalator. Within the courtyard covered escalators, 41, lead from the first floor (restaurants) to the second (exhibits). The structure of the building, 42, is of Scandinavian precast elements: an exposed steel frame, made in Sweden and painted white, and lightweight concrete walling and roof slabs; timber fascia beams; ground area paved with Norwegian slate. 124, timber industries exhibit in the Finnish section. See also page 160.
Executive architects, Erik Herlow and Tormod Olesen.



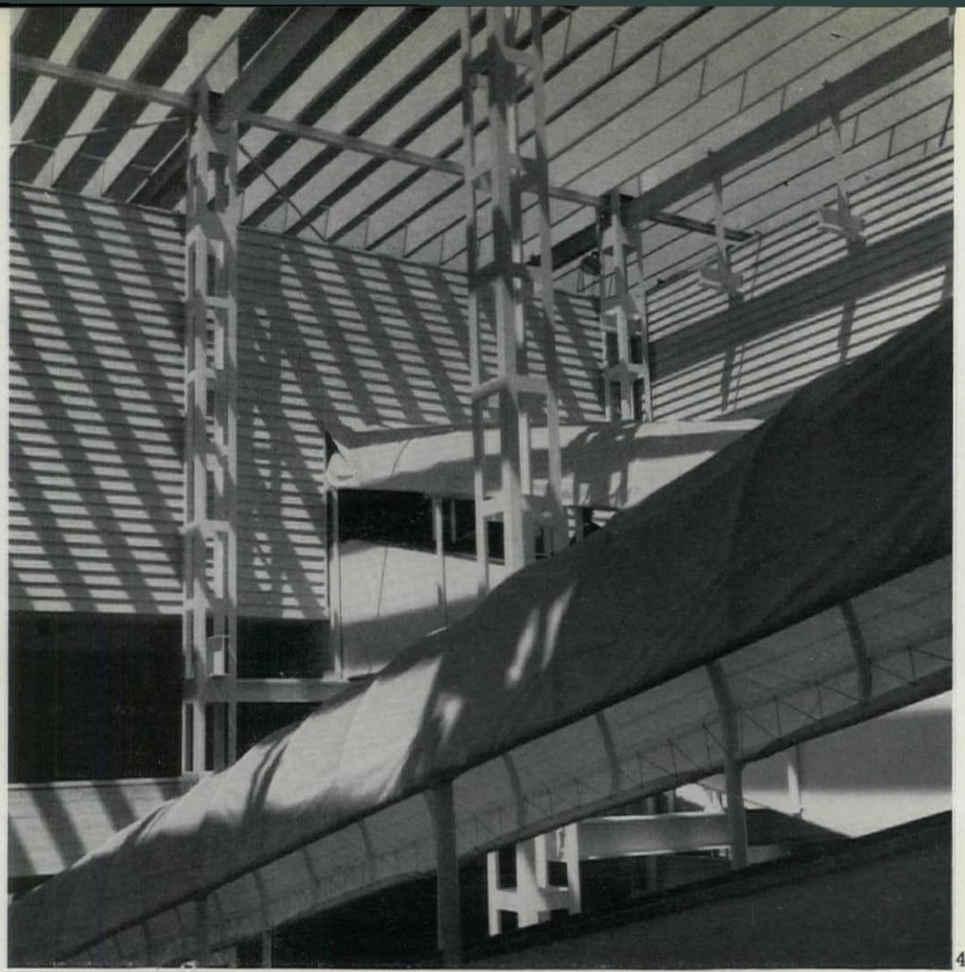
second floor plan (exhibition level)



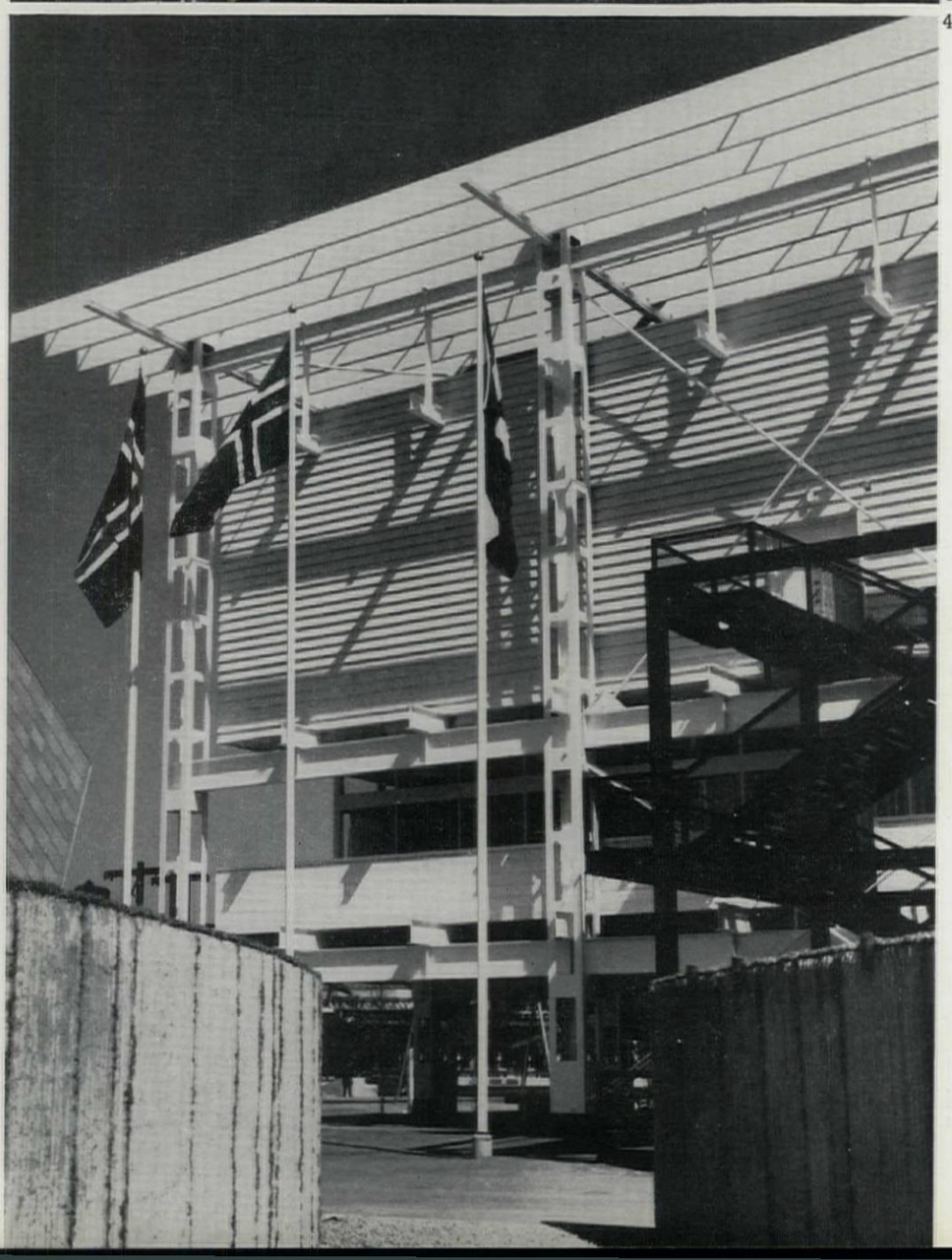
first floor plan, Scandinavian pavilion

key
a, outdoor restaurant
b, kitchen
c, restaurant
d, travelator
e, information
f, offices

43



41



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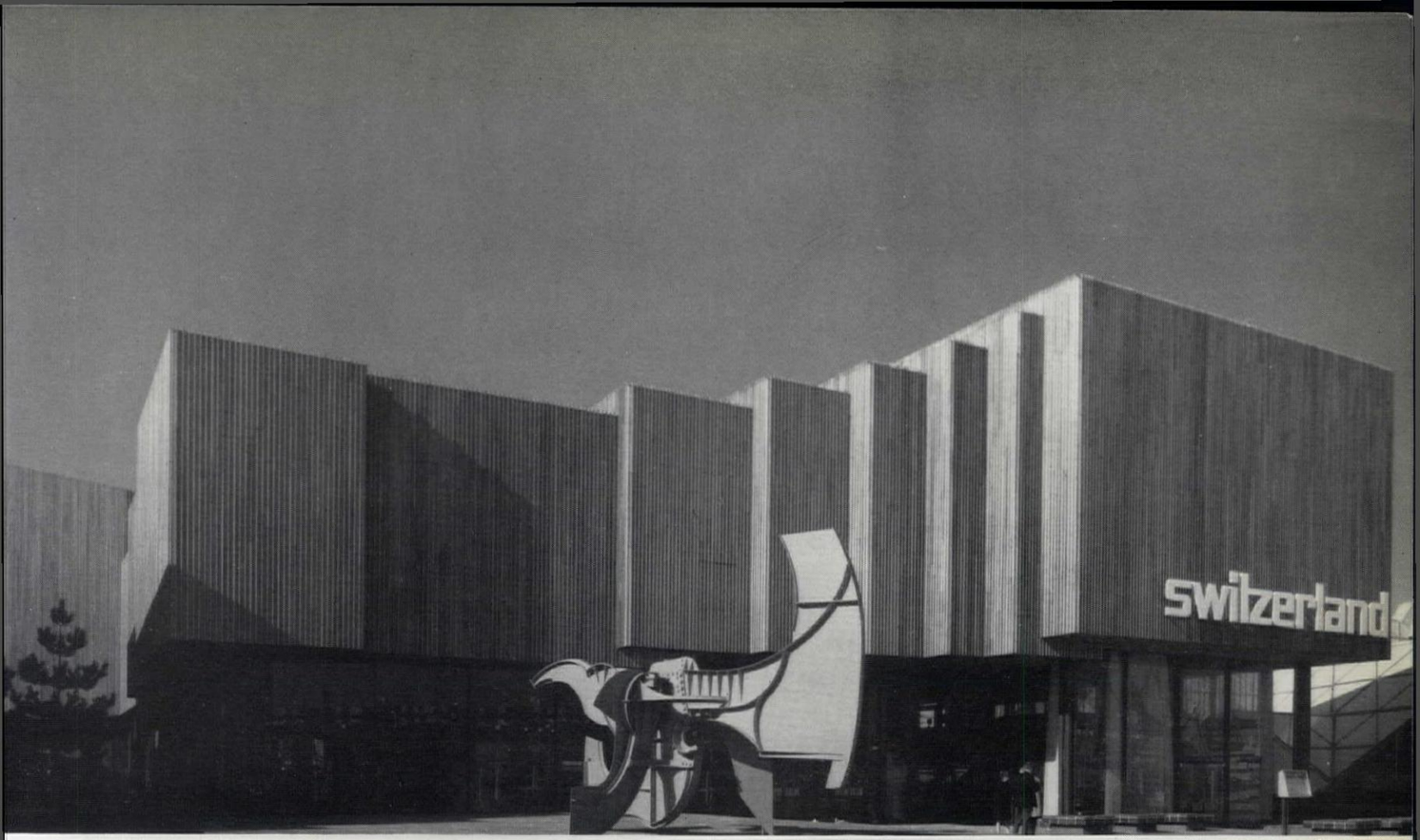
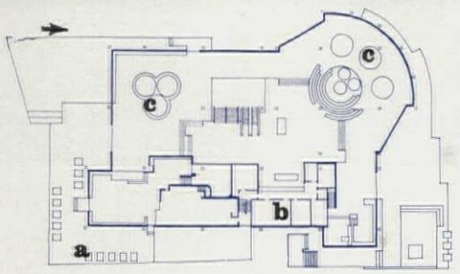


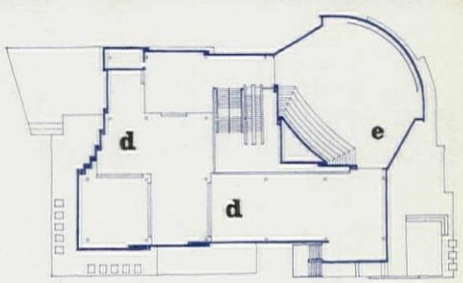
44

SWITZERLAND

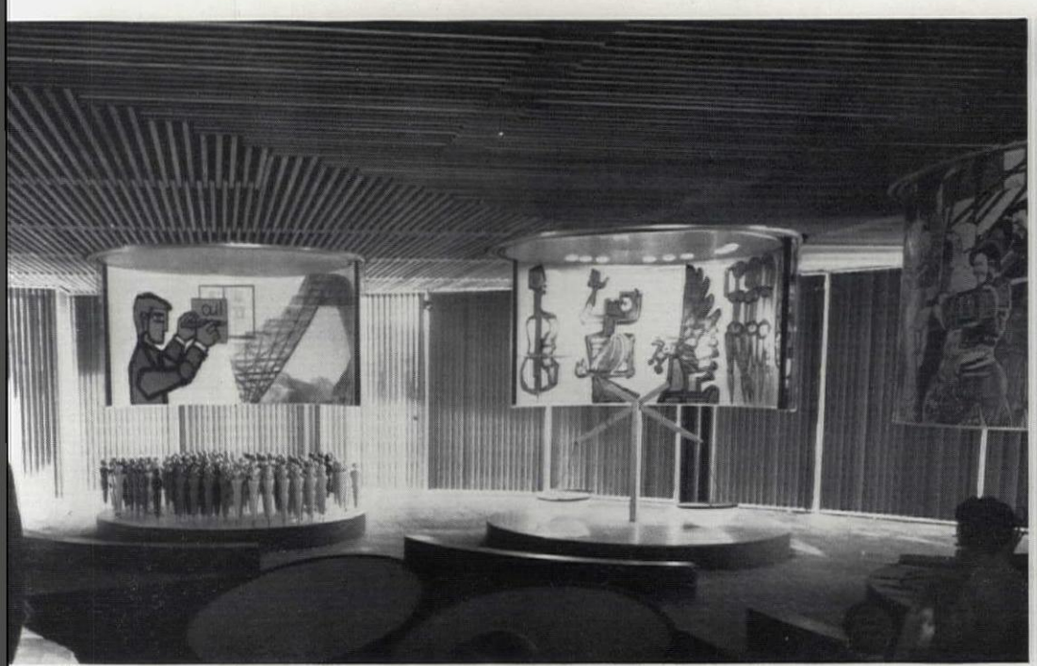
One of four national pavilions standing in a row north of the lake on Ile Ste. Hélène: a steel-framed building, glazed on the ground floor and walled with vertical boarding in red cedar above, 44. The steel frame has columns consisting of four tubes, 46. The main exhibition area is on the upper floor. A cinema projects from one corner: in the opposite corner is a restaurant. 45, the 'rotovision' display, surrounded by seating, with revolving drum-shaped screens depicting aspects of Swiss life. See also page 160. Architect, Werner Gantenbein.



ground floor plan, Swiss pavilion
key
a, restaurant
b, administration
c, rotovision
d, exhibition areas
e, cinema



first floor plan



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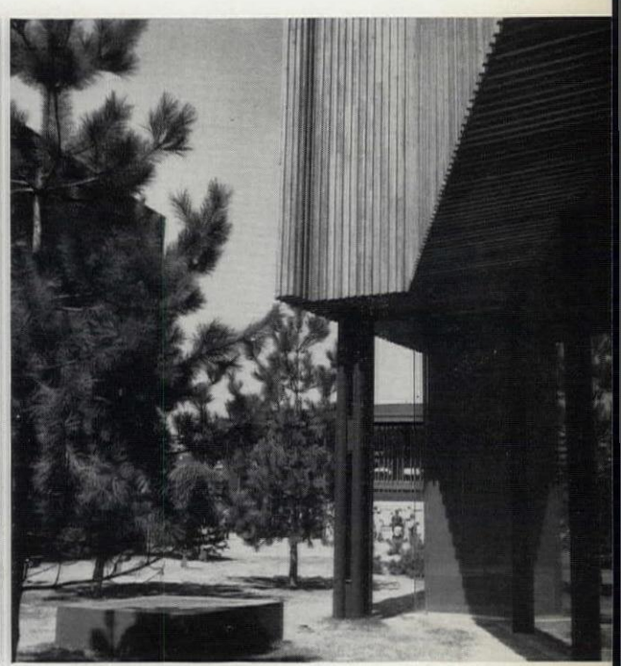
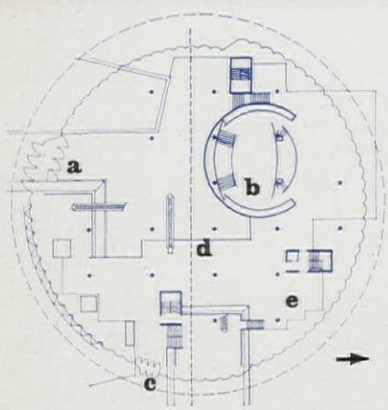


46

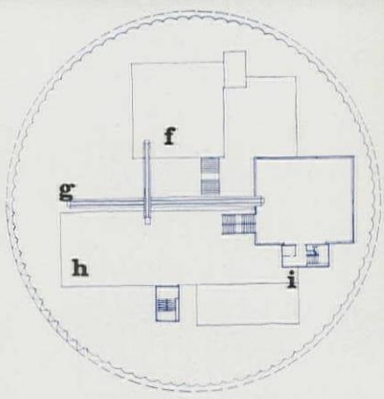
49→

47

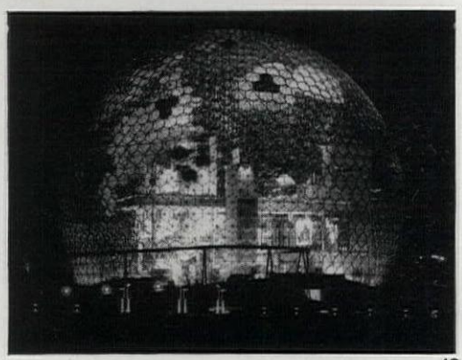


ground floor plan, US pavilion

key
a, entrance
b, theatre
c, exit
d, line of mini-rail over
e, American Spirit
f, American Painting Now
g, 125 ft escalator
h, Destination Moon
i, emergency stairs and lift



upper level plan

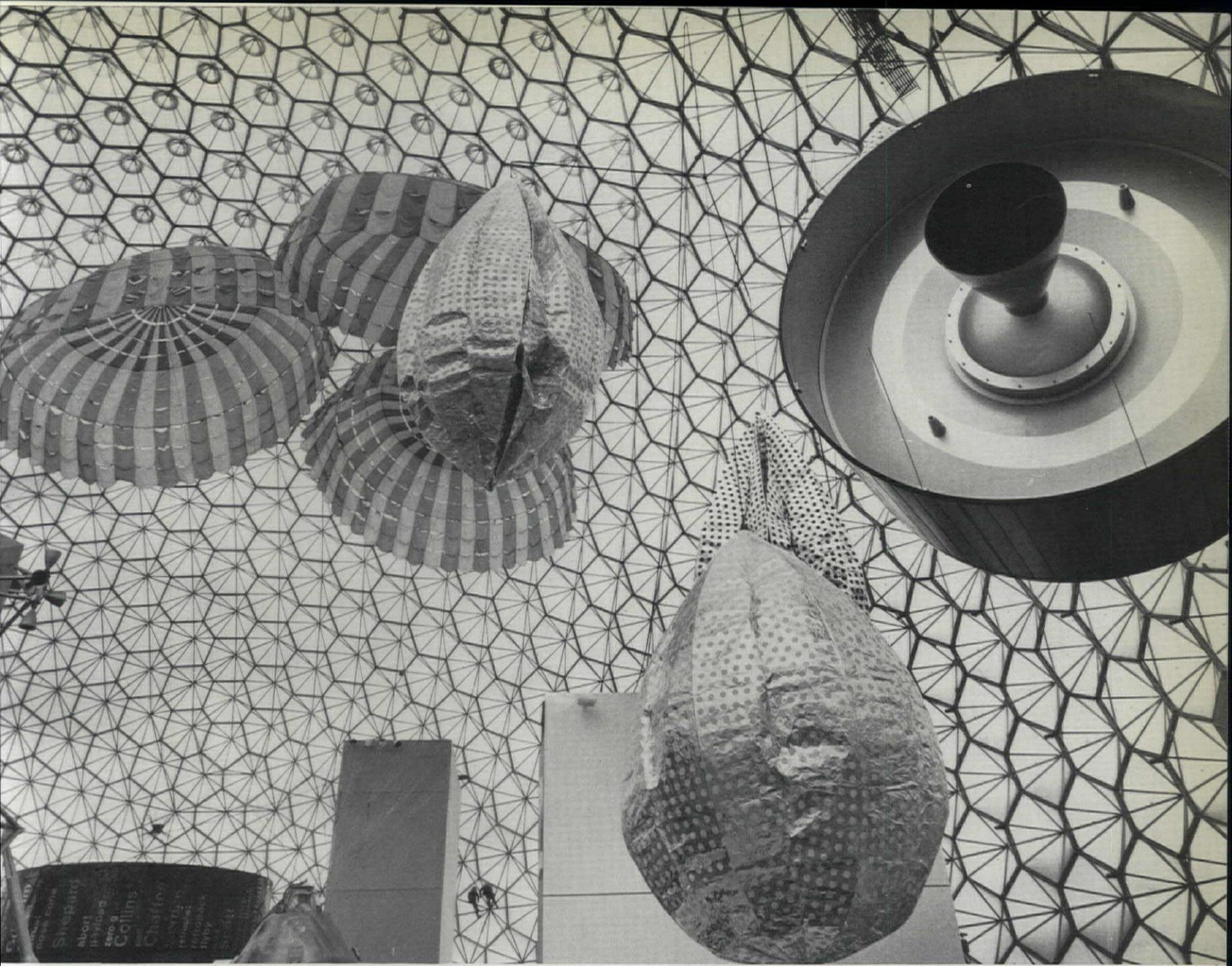


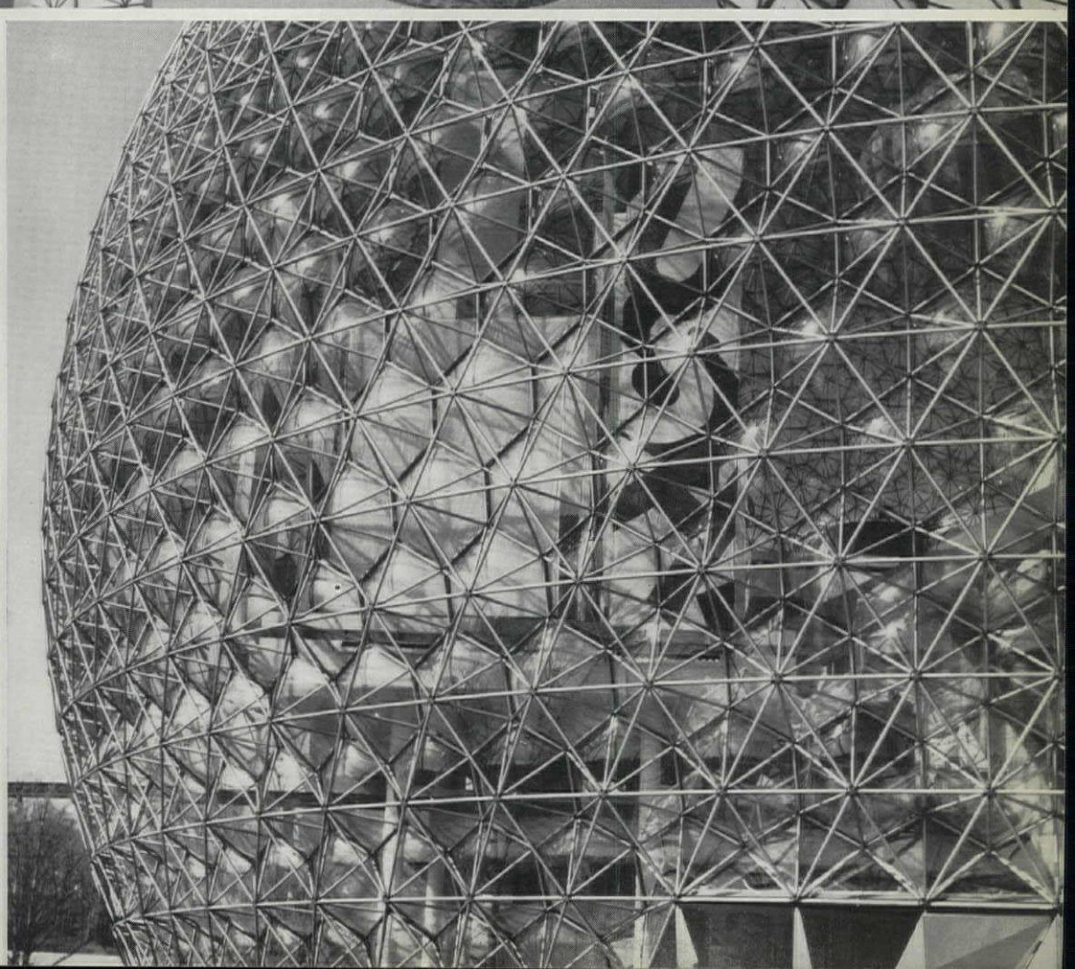
48

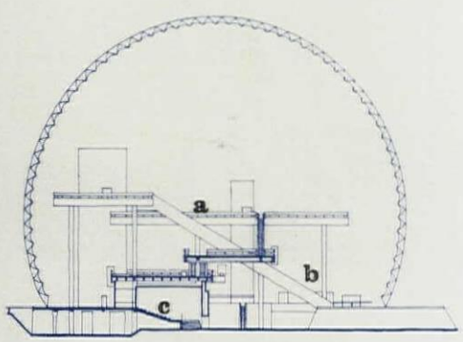
USA

Three-quarter sphere, 250 ft. in diameter, of triangulated steel construction, on rising ground at the northern end of the exhibition area of Ile Ste. Hélène; that is, backing on to the park and near the end of the footbridge leading across the water to Ile Notre Dame, from which 46 was taken. The transparent acrylic skin allows the interior stages and the exhibits they carry to be seen through it and for their illumination to be seen from outside at night, 48. The mini-rail passes right through the sphere. 49 (facing page), aeronautical exhibits suspended within the structure. 50 and 51, close-up of the structure showing tubular space-frames welded to cast-steel hub connectors. The acrylic panels are domed and slightly coloured green-bronze to obviate glare. There are 1,900 of them, some 250 at the top being pierced to give ventilation and capped with similar domes to

50, 5







section through US pavilion

key
a, exhibition platform
b, 125 ft. escalator
c, theatre

USA: CONTINUED

keep out rain. Sunlight in the interior is controlled by triangular fabric shades, grouped in units of 18 and drawn to cover sections of the acrylic surface, or retracted, by 261 motors set by a computer programme to follow the movement of the sun as it changes through the season. 52, one of the freestanding platforms, connected by escalators (see section above) which carry the exhibits. At the top of the picture, part of the aeronautical exhibit; below, history of the film industry. See also page 160 and frontispiece. Architects, R. Buckminster Fuller, Fuller and Sadao.

Robin Boyd

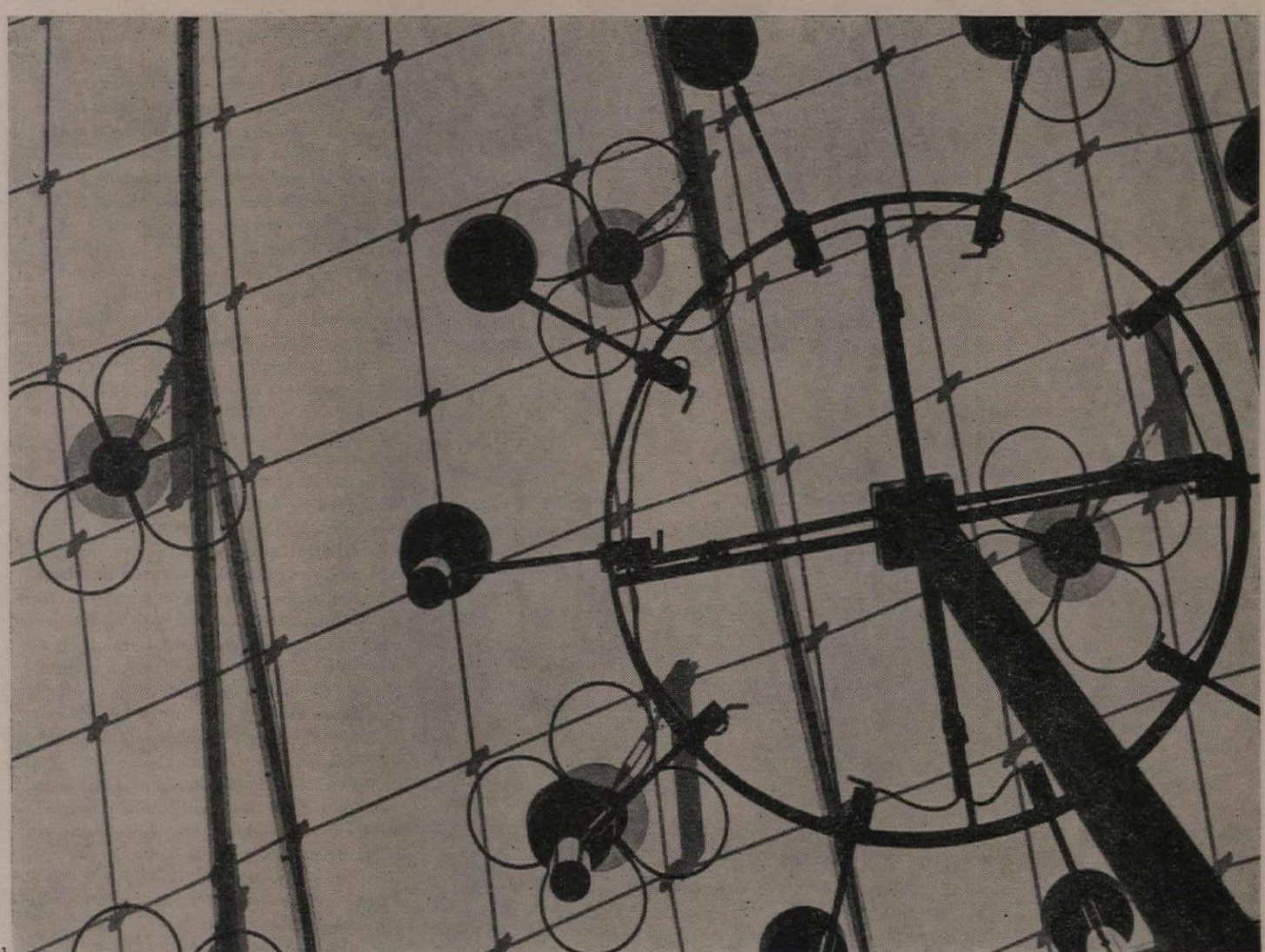
GERMANY

Because of the interest its tent-like roof-structure has aroused, the German pavilion at Expo has been made the subject of this critical appraisal by Mr. Robin Boyd.

Below, 1, is a close-up of a portion of the roof showing the quatrefoil rosettes that spread the load where hangers from the steel mesh support the plastic membrane.

Much the most invigorating form in this great garden of aesthetically-motivated shapes is Frei Otto's little man-made alps for West Germany. This can be said without forgetting or disparaging Buckminster Fuller's beautiful almost-sphere for the USA. The Otto tent looks keen, brave and potential while the Fuller sphere, some earlier difficulties with the welding now forgotten, looks sophisticated, final and suitably self-assured to represent American know-how.

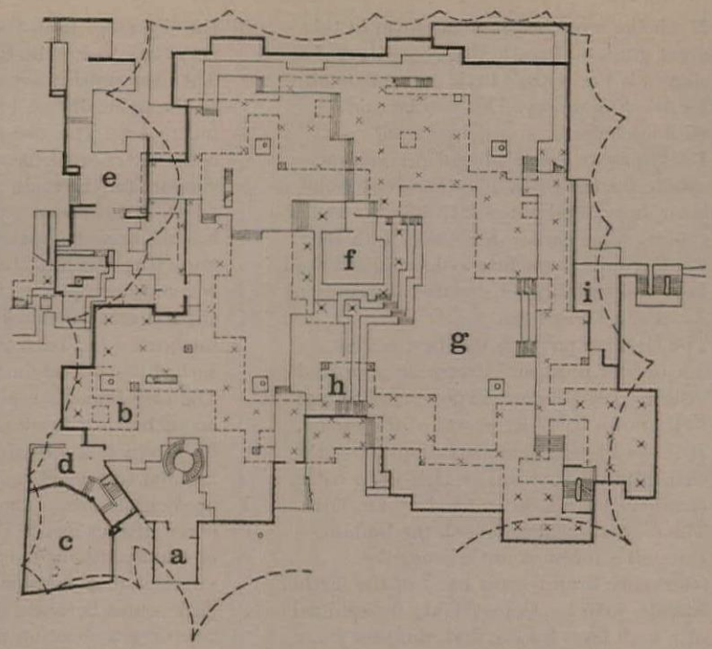
The German pavilion will be the first magnet for most architecturally involved visitors. Long before Expo opened it was well known by illustrations of the model. It is the biggest demonstration yet of the extrardinarily personal relationship with tensile construction enjoyed by Dr. Otto. The pilgrims will approach the building through a forest of antic geometry (Germany is on the far bank of the farther island), with hopes justifiably maintained at a high level by the first glimpses from a distance. Yet as they suddenly come close by it at a turn in the road there may be for some of them a sense of being let down. The first impression is of a diminutive scale. The advance pictures of the model and some of the announced dimensions—for instance, the height of the highest mast: 130 feet—led to expectations of a much bigger visual treat. In the event one actually looks down from the approach road on to the lower edges of the tent and, because of the decline of the site away from the road, no craning is necessary to see the highest pinnacle. Then the finishes are sometimes unfussed to the point of looking tentative and incomplete. The sweeping steel mesh which is the exterior surface as well as the support for the main plastic membrane, which hangs about a foot below the steel, has the honest unprecision of any normal reinforcing that expects to be covered by concrete. It exhibits joints and slightly erratic curves. The plastic membrane has been made with a similar sort of rustic disdain for an elegant finish. The membrane is a polyester fabric coated on each side. Its width is strictly limited by production technique and it had to be tailored to a giant, and only semi-predictable, form. Understandably the fit is not always Savile Row, and the miles of seams, although separately coated, are vulnerable at every stitch-hole. These wide dark seams between the strips of the translucent sheeting were allowed to occur wherever they wanted to, and they bear no apparent relationship to the equally strong overlaid pattern formed by the hundreds of points where hangers from the steel mesh penetrate and support the membrane. Each of these points is marked by a load-spreading quatrefoil rosette about two feet across. In places also there are puckers in the plastic, so that all in all the surface of the great convoluted canopy has from below something of the look of a giant-size rose-pattern wallpaper stuck to



1

Right, plan of German pavilion (the dotted line represents the spread of the roof-structure).

Key
a, entrance
b, information
c, auditorium
d, gallery
e, sculpture court
f, pool
g, exhibition area
h, library
i, terrace



2, the roof of the German pavilion under construction, with the steel mesh being attached to the main cables. At the top, the fabric already in place; in the distance, one of the steel masts.

a ceiling in haste by Father.

At *Interbau* in Berlin just ten years ago a large part of the visual delight to be found in Frei Otto's twisted, bulging tents over the refreshment section came from the purity of form revealed by the surface of the white canvas membranes, sans steel mesh, trimly seamed like racing sails.

Was the scale of the Expo tent too big to permit a single membrane of canvas to do the job? The answer is that it was not too big for canvas in fair weather, but Montreal's snow might have loaded it to the ground. All the steel mesh and the rosettes are unquestionably needed. Nevertheless, especially round the low perimeter where no great spans are encountered, they seem to be making a mountain out of a molehill of a problem, an unnecessary to-do in providing fairly minimal shelter against Montreal's often fearsome weather. There is just a suggestion that they are demonstrating a principle which is really more applicable to much bigger problems. It is also clear from a purely artistic standpoint that either the steel mesh or the membrane alone, or better still a seamless miracle fabric all in one piece, would do more justice to the magnificent form of the building.

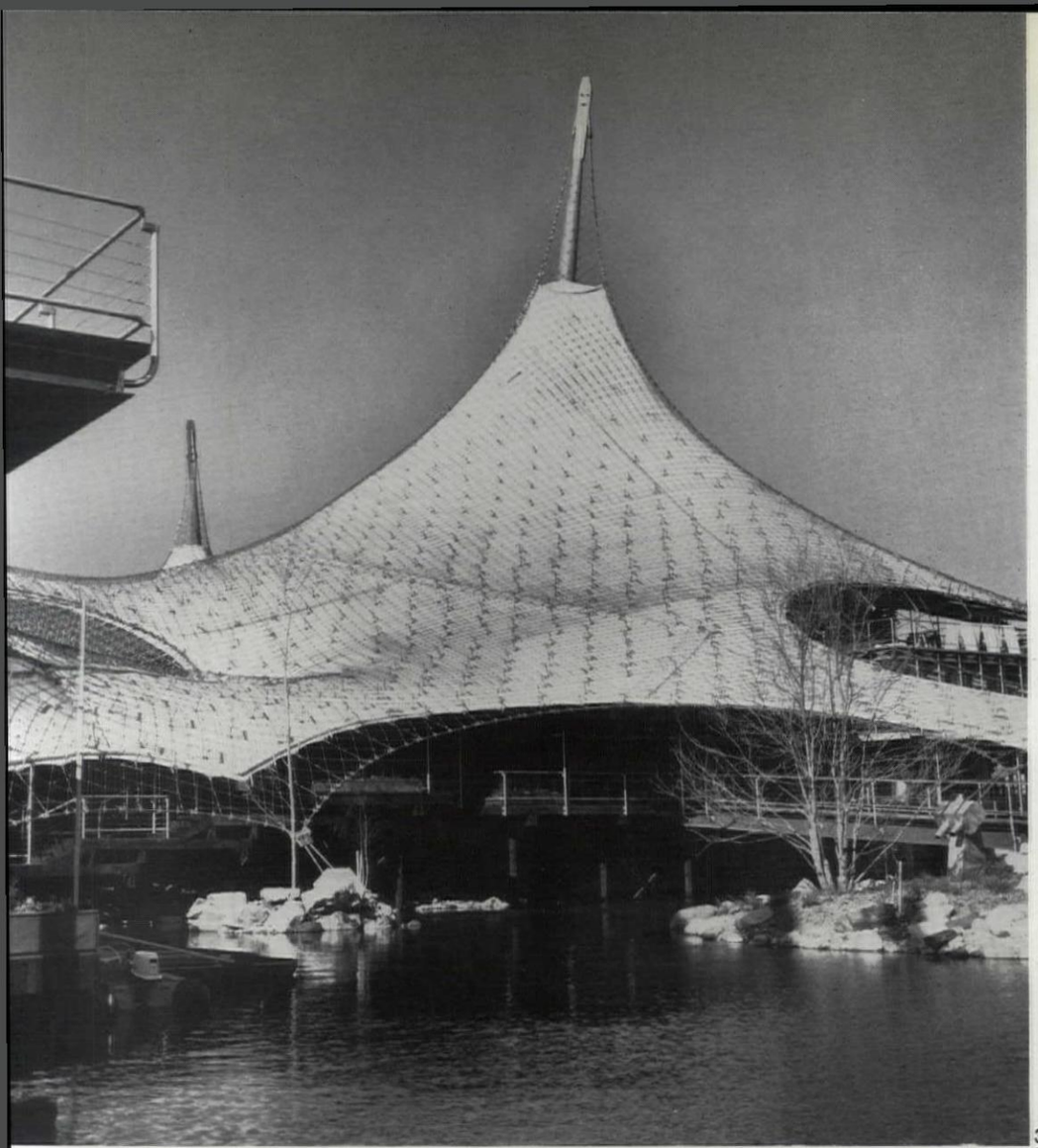
For it is a magnificent tent. The complaints above have been recorded largely to acknowledge lay criticism. When prejudiced eyes grow accustomed to Father's wall-papering job, the logic, orderliness and consistency of the always exciting design is appreciated. We are familiar with the Otto style of torturing a continuous membrane into tension by alternately propping it up on posts and pulling it down into funnels. At first impression the posts and funnels of the Expo tent are quite arbitrarily irregular in height and disposition. In fact they obey a sort of free-hand geometrical discipline. Four main outward-tilted masts form a rough square in plan. The shortest mast is on your left as you enter, and the heights of the other three grow by regular steps taken clockwise. A second smaller square extends diagonally out of one lower corner by the addition externally—around a theatre area—of three more small masts. An eighth mast, erected nearby on an island, supports what amounts to a separate small tent over a play area, connected by a narrow neck of the plastic membrane to the main tent.

Around all this the perimeter line dips with the guy cables and retreats into bays between them, giving the overall plan-shape something of the look of a map—a likeness which a few suspicious East German eyes were quick to note. Why, it was a map of Hitler's Germany! Complete with Denmark (the semi-detached tent on the island) and, with a wide stretch of inflamed imagination, the whole of East Germany!

Politics aside, the pavilion may have heat problems as the Montreal summer warms up. Frei Otto, judging from his experience of Montreal's 1966 summer, thinks not. He is providing artificial cooling only in comparatively isolated areas including the restaurant, and in a pit of cooled air round the central pool. Otherwise he is

GERMANY

Irregular tent-like roof suspended from eight steel masts. Steel cables and mesh carry a translucent plastic membrane. Exhibition areas disposed independently beneath the roof on steel and timber stages. 3, the roof spreading over a lake, with one cable attached to concrete base on island. 4, the edge of the roof membrane, again showing one of the concrete attachments (Expo Express and tower of British pavilion beyond). 5, attachment to foundation in the lake. 6, the roof-structure plunges down through the exhibition area to create an outlet for rainwater, which discharges into a pool below. The surrounding circular stair leads to offices. 7 (overleaf), the pavilion from the lakeside garden. Architects, Rolf Gutbrod and Frei Otto.

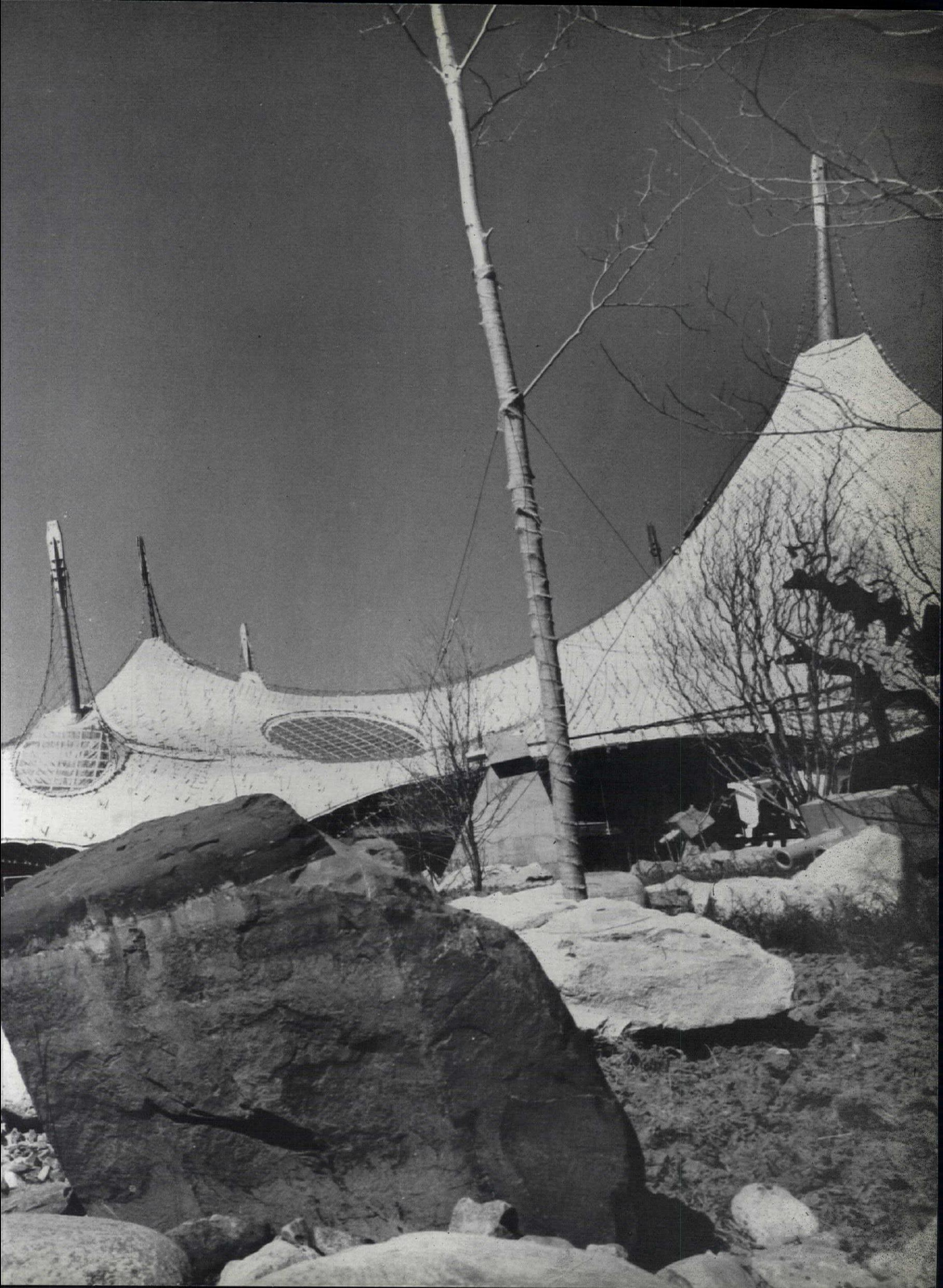


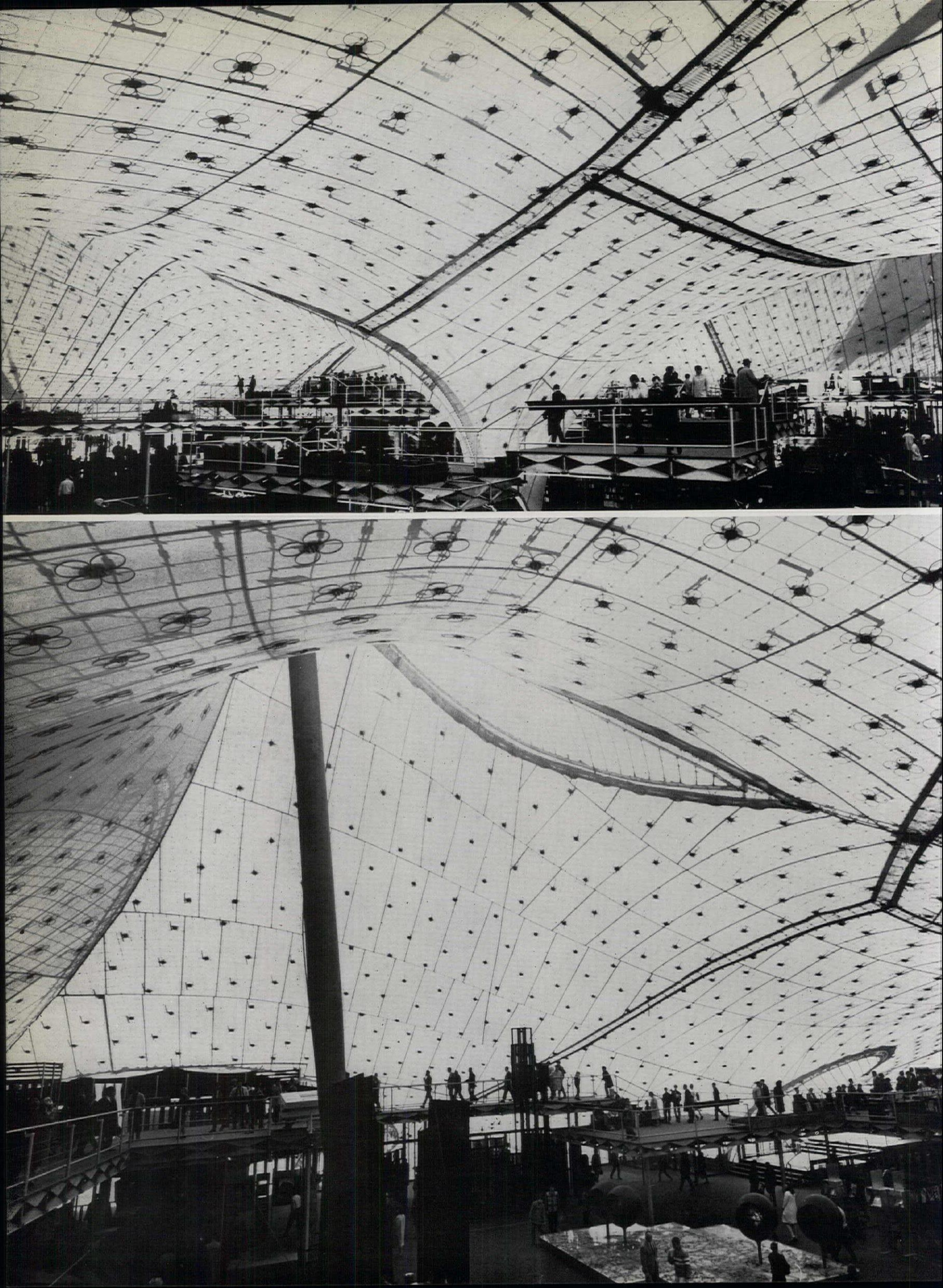
3

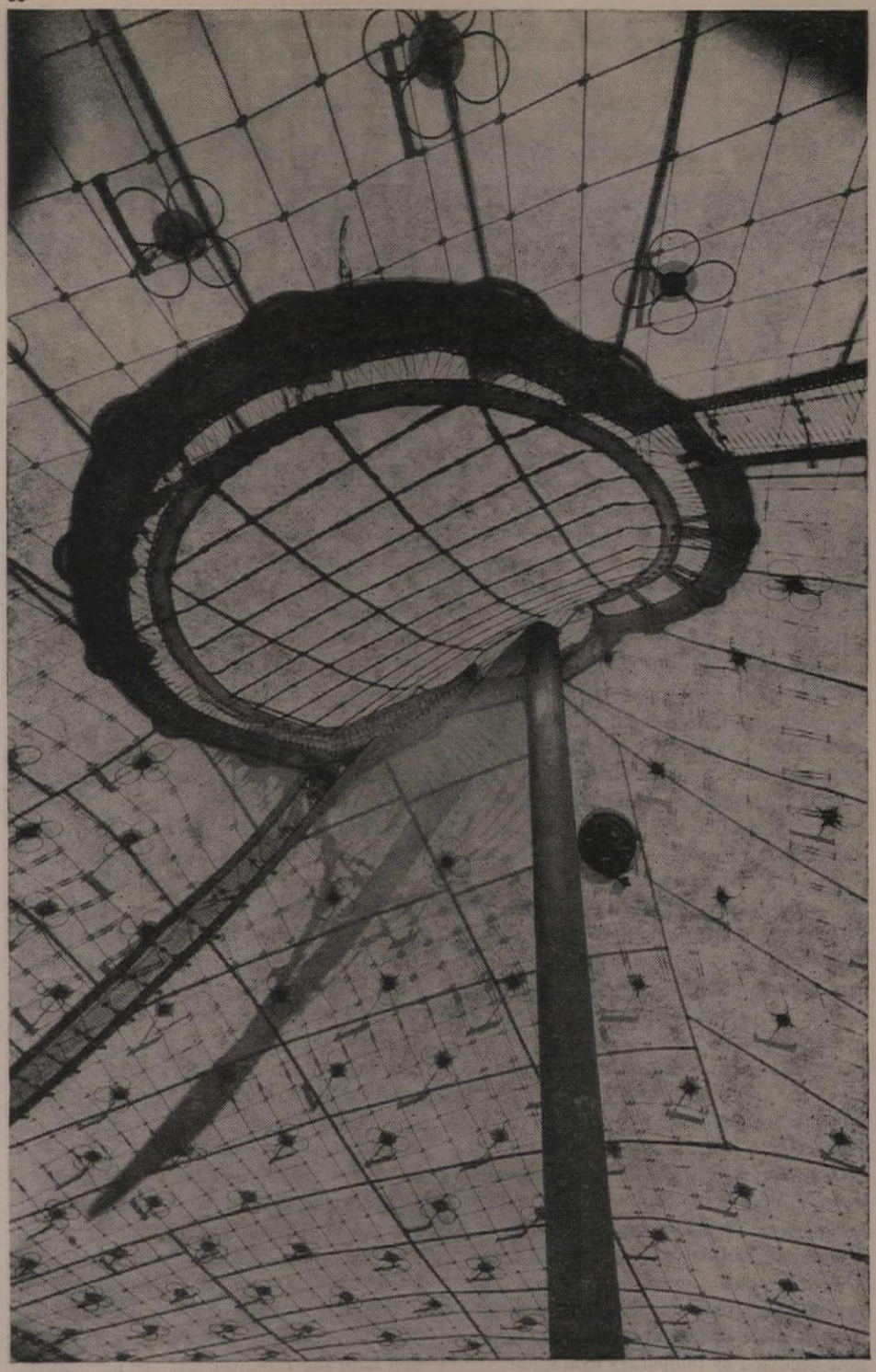
4

5

6







8 and 9 (facing page), inside the German pavilion showing the patterns made on the translucent plastic roof by the wire mesh from which it is suspended and the rosettes, formed out of bent steel rod, which spread the load from the hangers. In 8 can be seen another of the funnels that remove rainwater. Exhibition areas are independent concrete and timber platforms surrounding a pool, disposed at various levels and supported on modular steel columns and trusses. 10 (above), one of the windows set into the roof-membrane where it is suspended from the masts.

relying on cross-ventilation. Around the perimeter the plastic membrane hangs as a flap. It will be rolled up like a blind on hot days to let the breezes through. The cost of air-conditioning the whole of the enveloped space baulked even West Germany. Thus the design is, literally as well as figuratively, open-ended. It could be expanded to cover the whole Expo site, if requested, without losing its integrity, unity or composure.

The casualness of the mesh and membrane mixture, the tilt of the masts against the tension, and the open-endedness, all contribute to a fair-like character that is thoroughly appropriate, despite Expo's pretensions to seriousness. The authorities asked pavilion designers specifically for architecture of an unfamiliar mien. In many other pavilions they were presented with shapes much more unfamiliar than a tent. Yet these others, which are often quite frantic, still look more ordinary than an Otto tent. The obviously temporary quality is also very fitting for a show which will last only six months. All the pieces were made in Germany, including the steel mesh: in strips some twelve feet wide. When this pavilion has done its Expo job it can be dismantled, rolled up, and returned to Germany. There is something disturbing—actually aesthetically disturbing—about some other pavilions done in massive brick and concrete for only six months' life. Almost before their mortar had set, three months before they were seen by the public, tenders were being called for their demolition.

The pride of the German pavilion is of course the interior space. It is a big volume, lofty under the posts but sucked downwards where the big off-centre funnel dives into a decorative pool. It changes continuously and engagingly as the visitor walks among the exhibits on the many-stepped platforms. These are sometimes elevated on Meccano-like frames and sometimes drop to the ground, as by the central pool. Near the top of each mast a pair of guy-cables is pulled apart by the tension, and transparent sheeting replaces the translucent plastic in the eye-shape so created, allowing a blurry view of the sky. Then suddenly there comes a spatial surprise. Partly outdoors and partly under the extended corner tent are two domes, housing a small cinema and an upper-level viewing gallery respectively. These are deliberately complementary structures to the tent. Each dome is made of light timber battens pinned together like a pantograph's members and then distorted into a hump. The spacing of these compressive battens matches the spacing of the tensile cables in the tent. 'I am a student,' Frei Otto remarked when he pointed this out. 'I am learning. I wanted to see what happens when the two matched structures—tensile and compressive—come together in the one building.'

He has learnt and demonstrated quite a lot more about tension in this biggest of his works. The prehensile details at cable ends are especially noteworthy. But has Dr. Otto gone now as far as he can on this line pending the arrival of the miracle membrane? The German pavilion has been hailed in many places as something of an epoch-marking event. All levels of the press love it. To the intelligent Montreal magazine *Parallel* it demonstrated the immediate practicability of computer-calculated, adaptable, demountable shelters for a new urban order. To *Life* magazine it was thoroughly sensational: 'a major architectural innovation . . . a lasting influence on the planning of stadiums and exhibition halls of the future.' Yet while the structural components amply justify journalistic superlatives, the flappy, flimsy, impermanent reality of the sewn polyester membrane quite forcefully reminds the visitor to the pavilion that the new tensile epoch is not quite here yet. It is still waiting for the chemists.

architecture at expo:

THEME AND PERMANENT BUILDINGS

In the same way that an international exhibition is expected to leave behind it ideas and experiences that will influence future architecture, so is it also expected to leave behind some actual buildings as its permanent legacy to the city that gave it house-room. Expo 67 is no exception, and on the Cité du Havre in particular (the peninsula—see page 100—on which the main exhibition entrance is sited) are a number of buildings designed to remain after Expo closes, for the benefit of the citizens of Montreal. Outstanding among these is Habitat, the experimental housing project made out of standardized precast concrete units.* It is quite irrelevant that, built on this relatively small scale (158 dwelling units), Habitat is costly and that one can point to faults in the way prefabrication has been used. One of the purposes of a great exhibition is to demonstrate ideas that may not, at that stage, be economically viable, and to open people's eyes to possibilities they are not aware of. Habitat does this admirably; a lot will be learnt from it, including lessons about how to improve the planning and construction system it employs; and as a visual contribution to the exhibition scene it is superb. Not only will the present pyramid of houses stay, but it is intended to build more houses over adjoining land now occupied by temporary exhibition buildings. This will be a chance, if economics allow, to develop the Habitat system more realistically, and it will also be important for Montreal because, although the city owes its position to its river, it is cut off from it by docks and industry. The occupants of Habitat are the first citizens of Montreal—except for a few in distant suburbs—to live beside their own river.

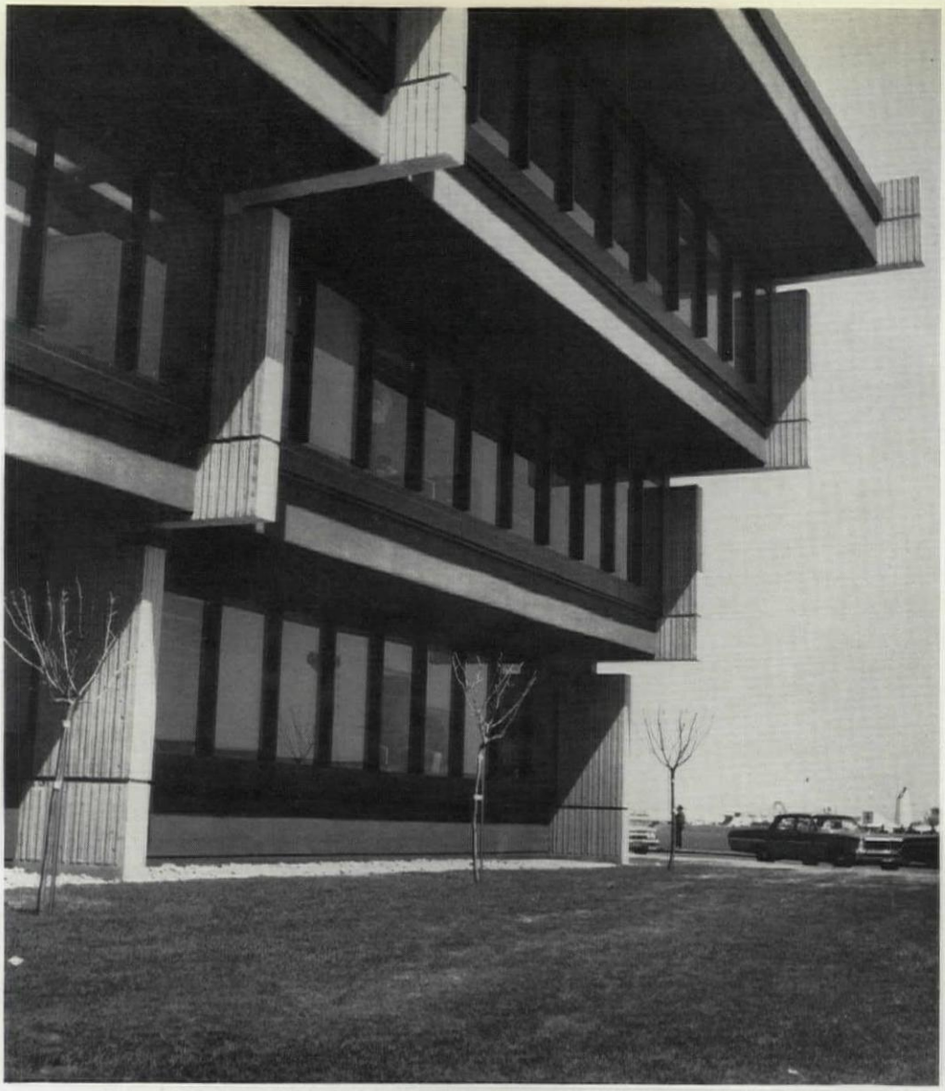
Other buildings on the Cité du Havre that are to remain permanently include the theatre, the art gallery and the exhibition's administrative offices. The last (see opposite) is one of the best designed buildings at Expo. Its future use is not yet determined; it may provide offices for the St. Lawrence Seaway administration. On the two islands, only some of those at La Ronde, the amusement area at the end of the Ile Ste. Hélène, are designed to be permanent; notably the aquarium and dolphin pool (see page 138). The marina and some of the amusements will also remain. There have been pleas that buildings elsewhere on the islands should be kept, but this is a sentiment that goes with the pride and enthusiasm of an exhibition's opening and may not last, though there will certainly be offers to present buildings to the city inspired by the wish to save the cost of demolition. What the city needs, however, is not more buildings but open space.

Outstanding among the temporary buildings—in bulk as well as architectural interest—are the five theme pavilions, containing (in some cases rather sketchy) displays illustrating different aspects of the theme of the exhibition: Man and His World. Apart from the art gallery and such buildings as the agriculture pavilion (both of which link their contents to the main theme), the principal theme buildings are the very successful timber pagoda on the Cité du Havre (see page 142) devoted to Man the Provider—this has one of the best arranged interiors—and two groups of interconnected steel framed buildings, of similar tetrahedral design, one on each of the two islands. They are devoted to Man the Explorer and Man the Producer and are illustrated on pages 140-141. A number of other buildings—apart from the national pavilions shown in the preceding section—are architecturally interesting and are shown on the following pages along with those mentioned above. There are also of course a great many minor buildings—far more than can be shown here—some very well designed and all excellently related to the landscaping and street furniture which have already been noted as outstandingly good. The smaller buildings like cafés, sales kiosks and groups of shops have been discreetly positioned with the help of changes of level so that the commercial element—which must be present in an exhibition of this kind—never obtrudes.

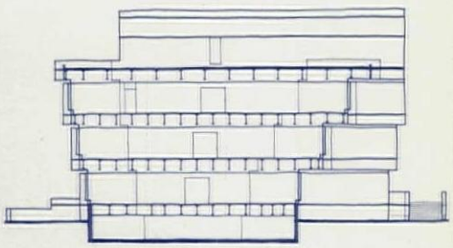
*See pages 143-150 of this issue.

ADMINISTRATION

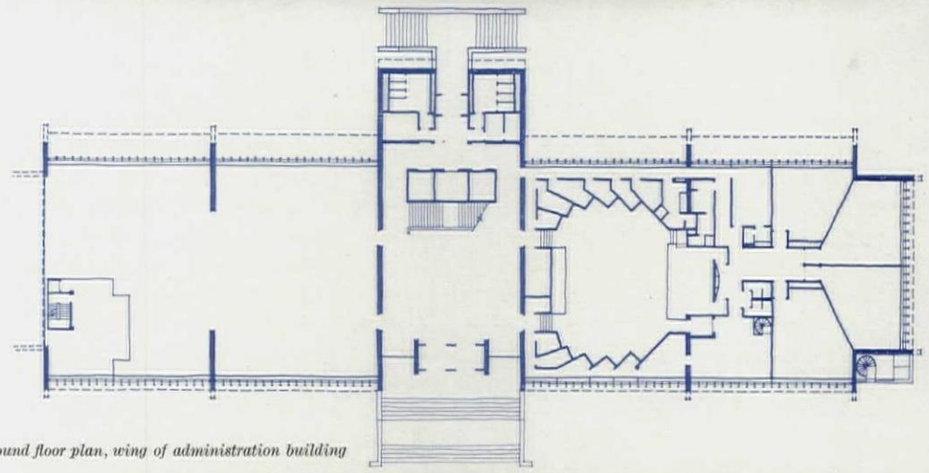
Three-storey permanent office building at the base of the Cité du Havre peninsula (and just outside the exhibition grounds), planned as three independent wings—the plan below shows the ground floor of one of them, containing an auditorium; the space is otherwise open for subdivision as required. Upper storeys oversail, 1, to protect the windows against glare. Entrance and staircase hall in centre of each wing, 2, with external and internal cast concrete sculpture, 3. These were made by the sculptors first carving negative moulds out of styro-foam with electrically heated wires, and were then cast as part of the normal building operation. See also page 162. Architect, Irving Grossman.



1

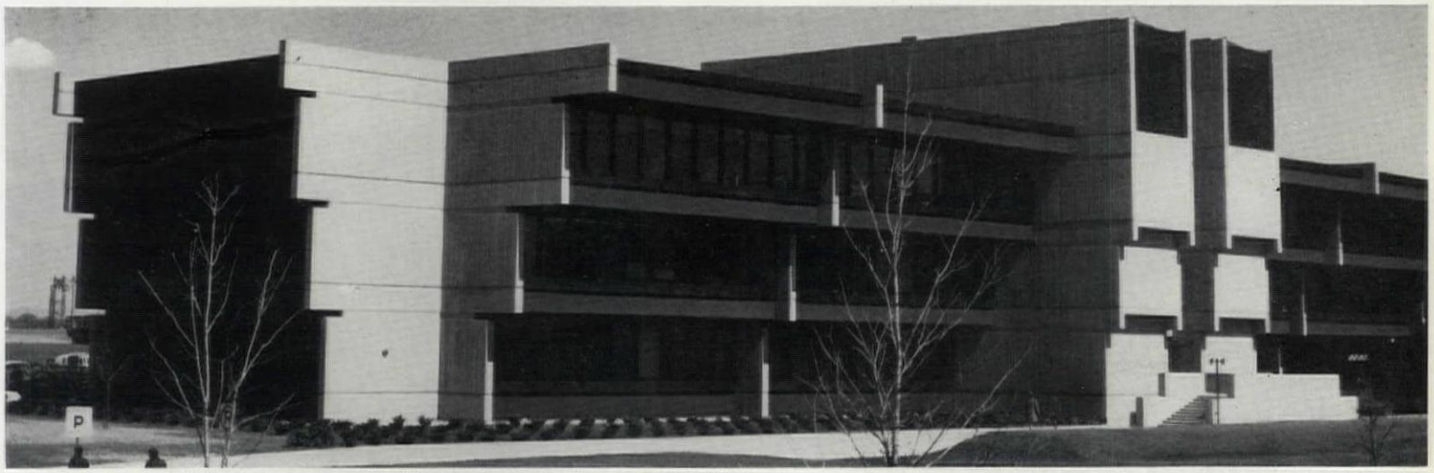


cross section through administration building



ground floor plan, wing of administration building

3



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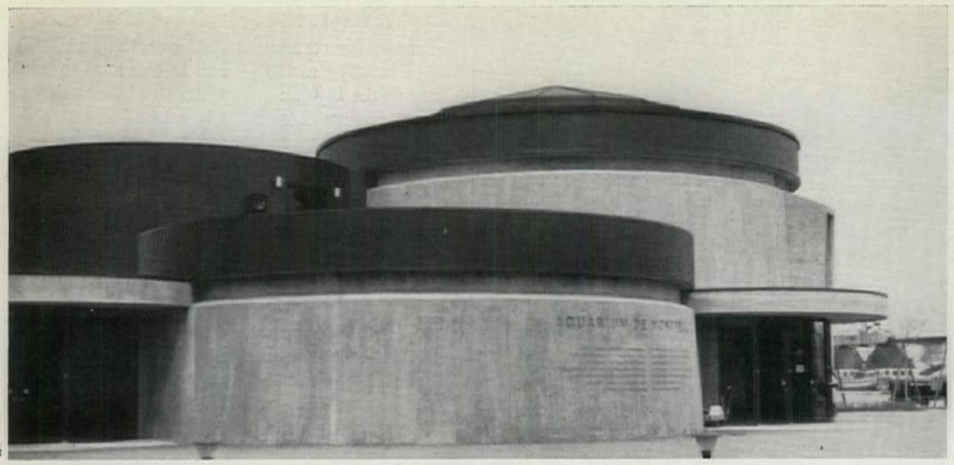
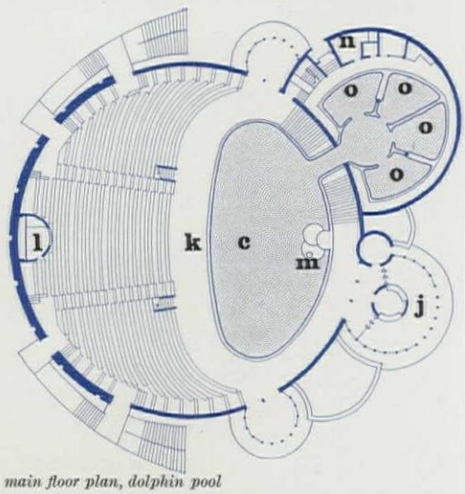


4

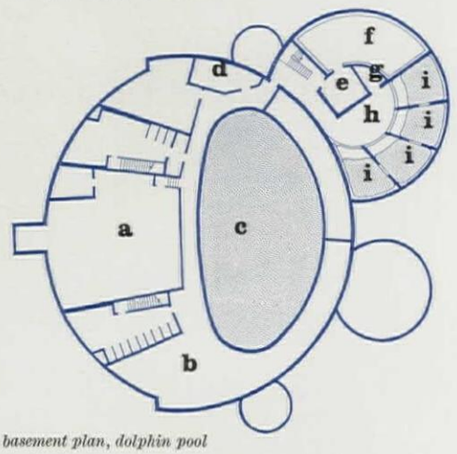
5

AQUARIUM AND DOLPHIN POOL

Permanent buildings in the La Ronde area: concrete with bronzed aluminium trim. 4, and axonometric drawings below, the aquarium. 5 and 6, the dolphin pool: an arena where dolphins perform in a raised elliptical tank. Shell-concrete roof. See also page 162. Architect, George F. Eber.



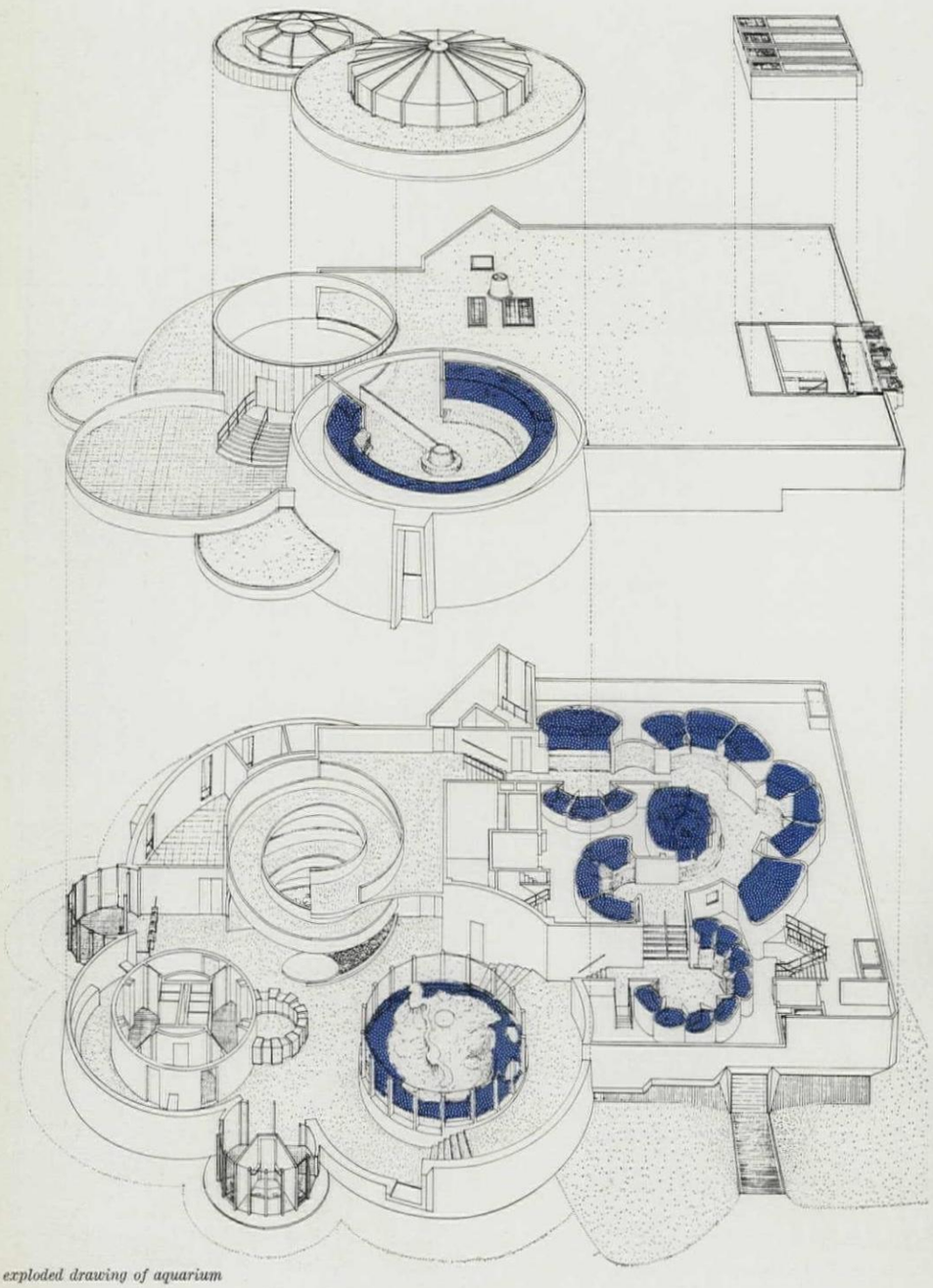
main floor plan, dolphin pool



basement plan, dolphin pool

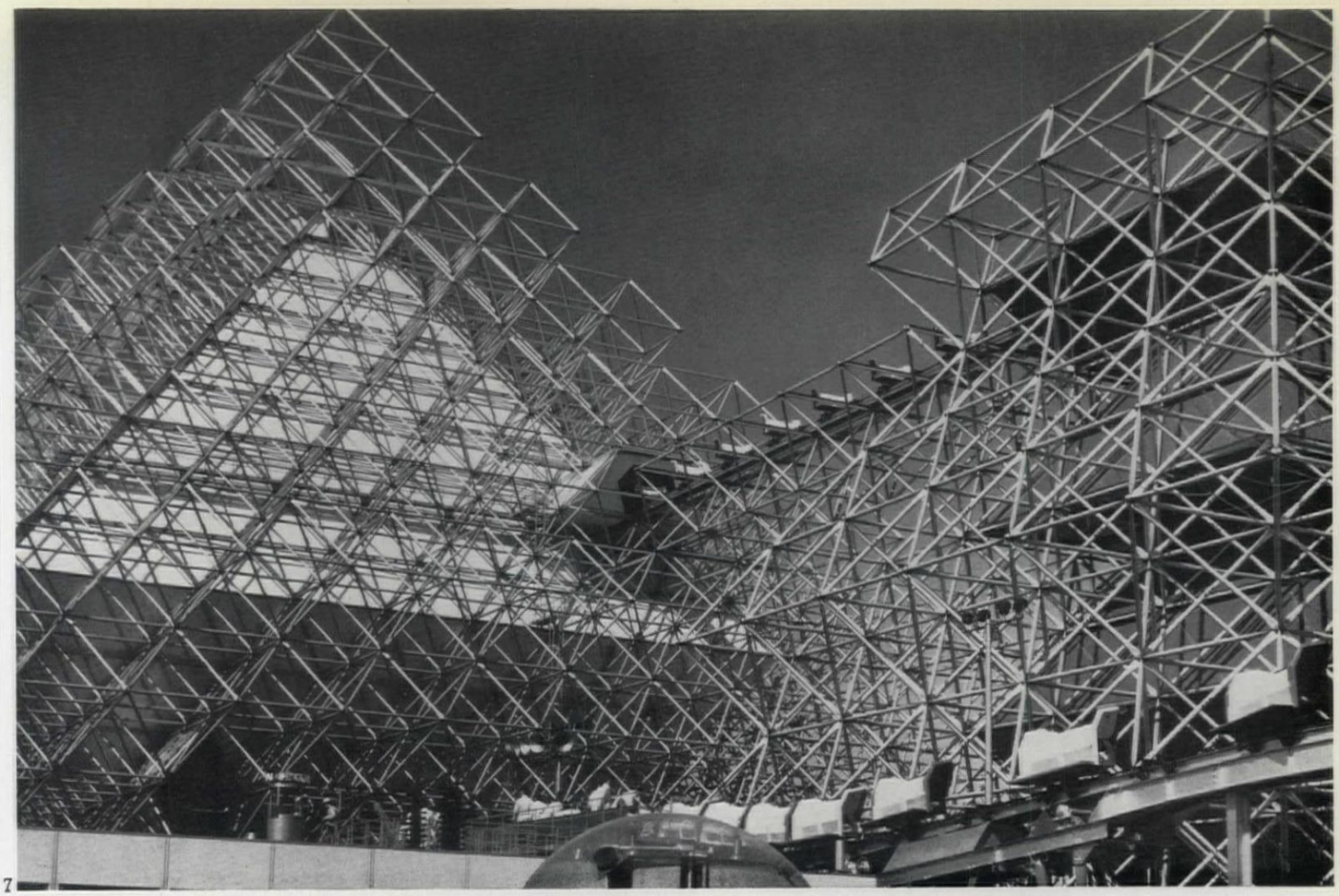
key

a, mechanical
b, storage
c, show pool
d, dissection
e, cool room
f, freezer
g, morgue
h, hospital work area
i, isolation tanks
j, entrance
k, arena
l, projection booth
m, stage
n, diving locker
o, holding tanks



exploded drawing of aquarium

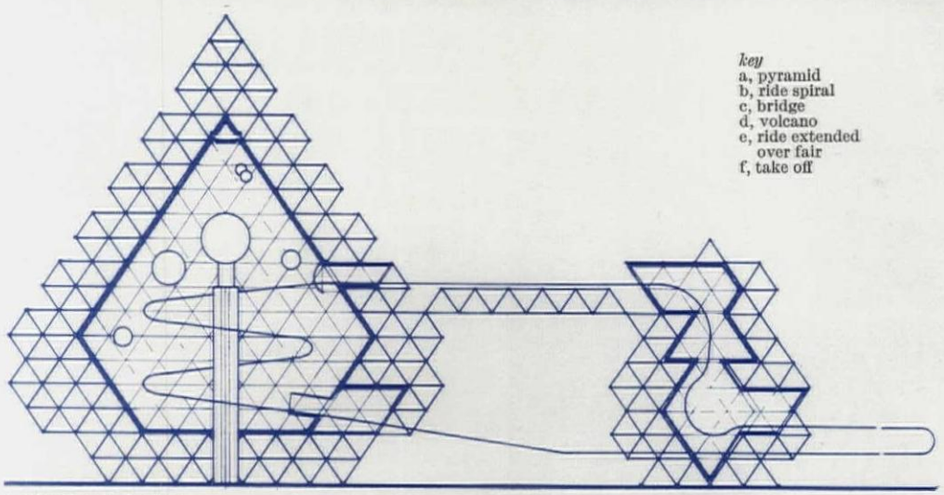
6



7

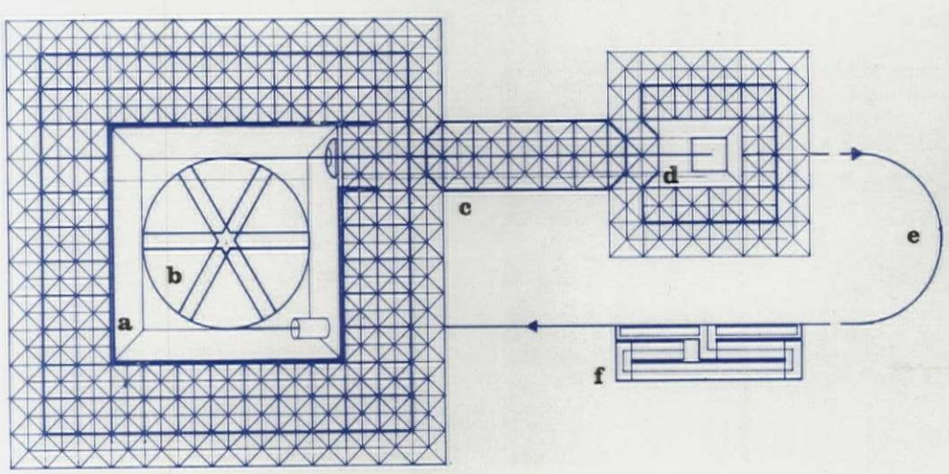
GYROTRON

In the La Ronde amusement area, near the Expo Express terminal station. Linked pyramids of aluminium tubular structure, using 900 tubes of standard length (16 ft.) and diameter (6 in.) but varying wall thickness, assembled in octohedrons. Theatrical ride for visitors begins in core of larger pyramid, bridges across tubular structure, 7, to smaller, pyramid and returns at lower level. Core clad with panels of honeycomb paper bonded to aluminium sheet. Connections of tubular structure have friction-grip bolts, 8. See also page 164. Designers, Sean Kenny and Boyd Auger.



section through Gyrotron

plan of Gyrotron at bridge level



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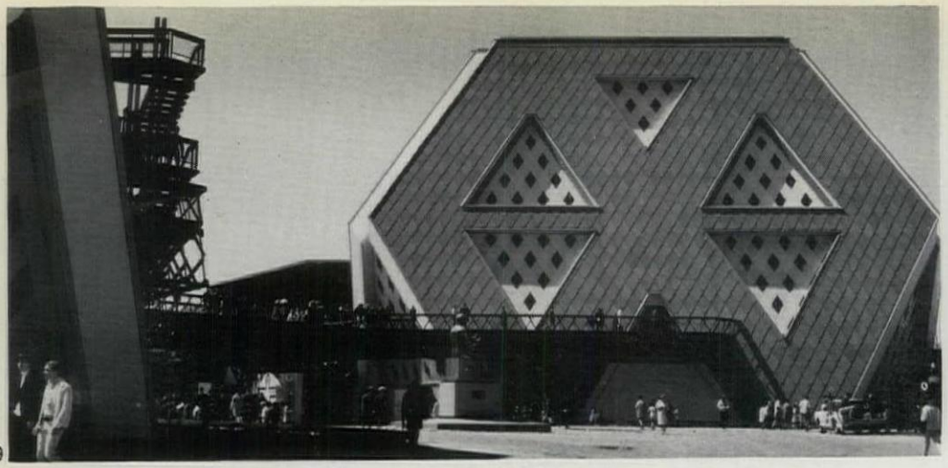

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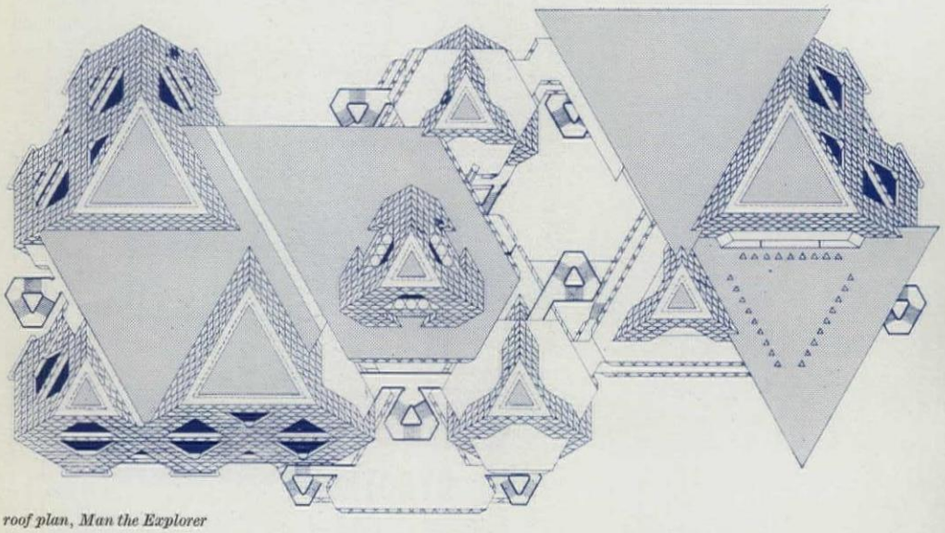
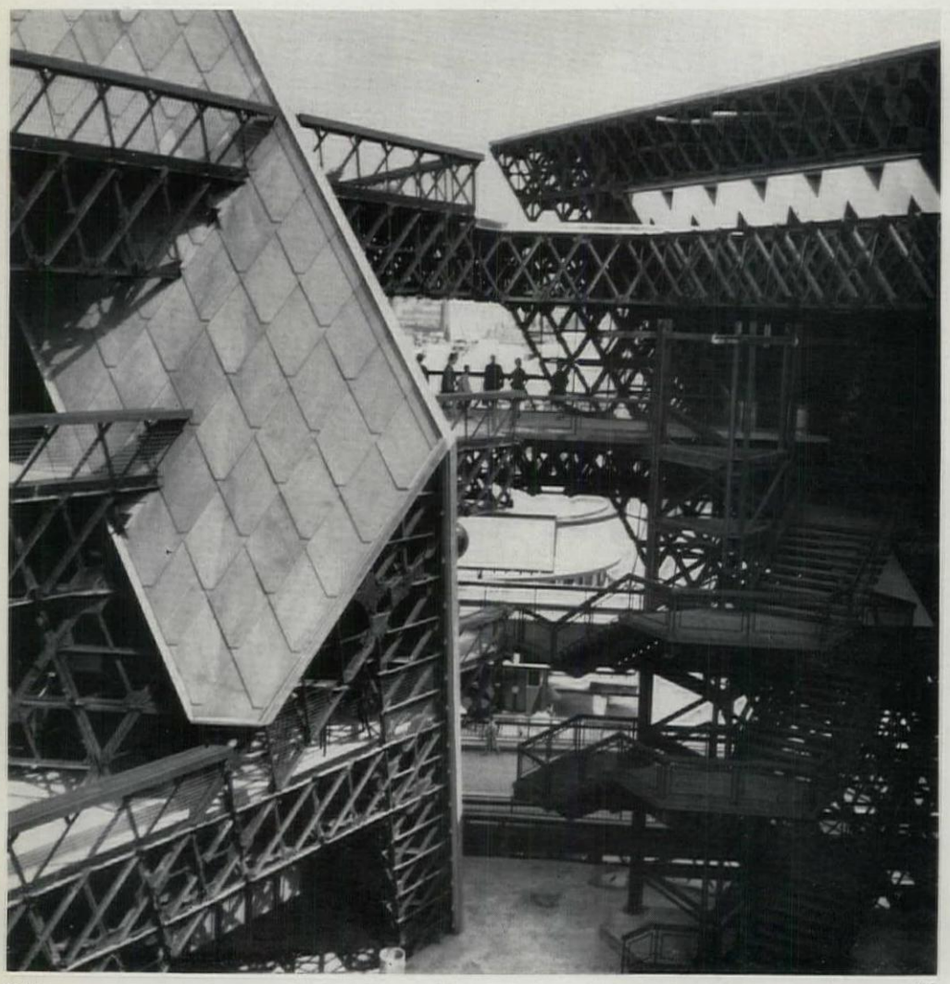


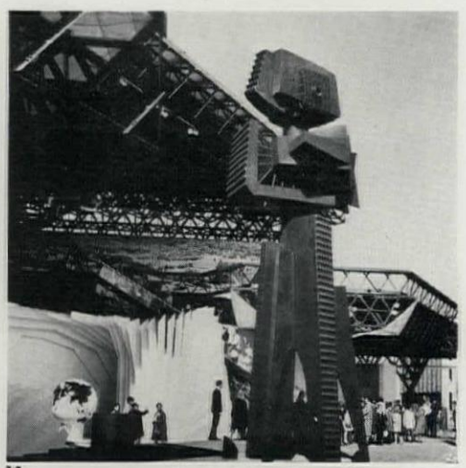
roof plan, Man the Explorer



10

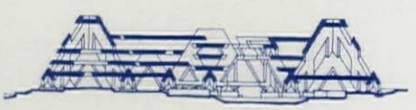
THEME BUILDINGS

The main Theme buildings on the two islands are variations of the same structural idea: grouped tetrahedrons of pre-rusted steel, partially clad with wood-fibre insulation board finished with stained plywood shingles. One group, Man the Explorer, dominates the south-eastern part of Ile Ste. Hélène and another, Man the Producer, is sited alongside (and integrated with) the Expo Express station on Ile Notre Dame. Each truncated tetrahedron is linked with the others in the group by steel bridges and galleries, as shown in 9—part of the group on Ile Ste. Hélène bisected by one of the main avenues (see also fig. 3, page 99, and fig. 13, page 103). The steelwork consists of angles forming openwork trusses, designed to be extendable in any direction according to requirements. It provides variable free spaces within the main outlines of the structure (10, part of the group on Ile Notre Dame), which can be decked over at any point or enclosed to provide exhibition areas. Vertical circulation is by external steel stairs or by escalator. 11, steel sculpture in front of the group on Ile Ste. Hélène. 12 (facing page), the exposed steel structure inside the group on Ile Notre Dame, which bridges over one of the canals. See also page 166. Architects Affleck, Desbarats, Dimakopoulos, Lebensold and Sise.

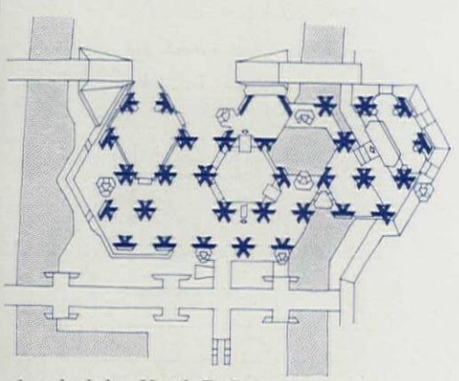


11

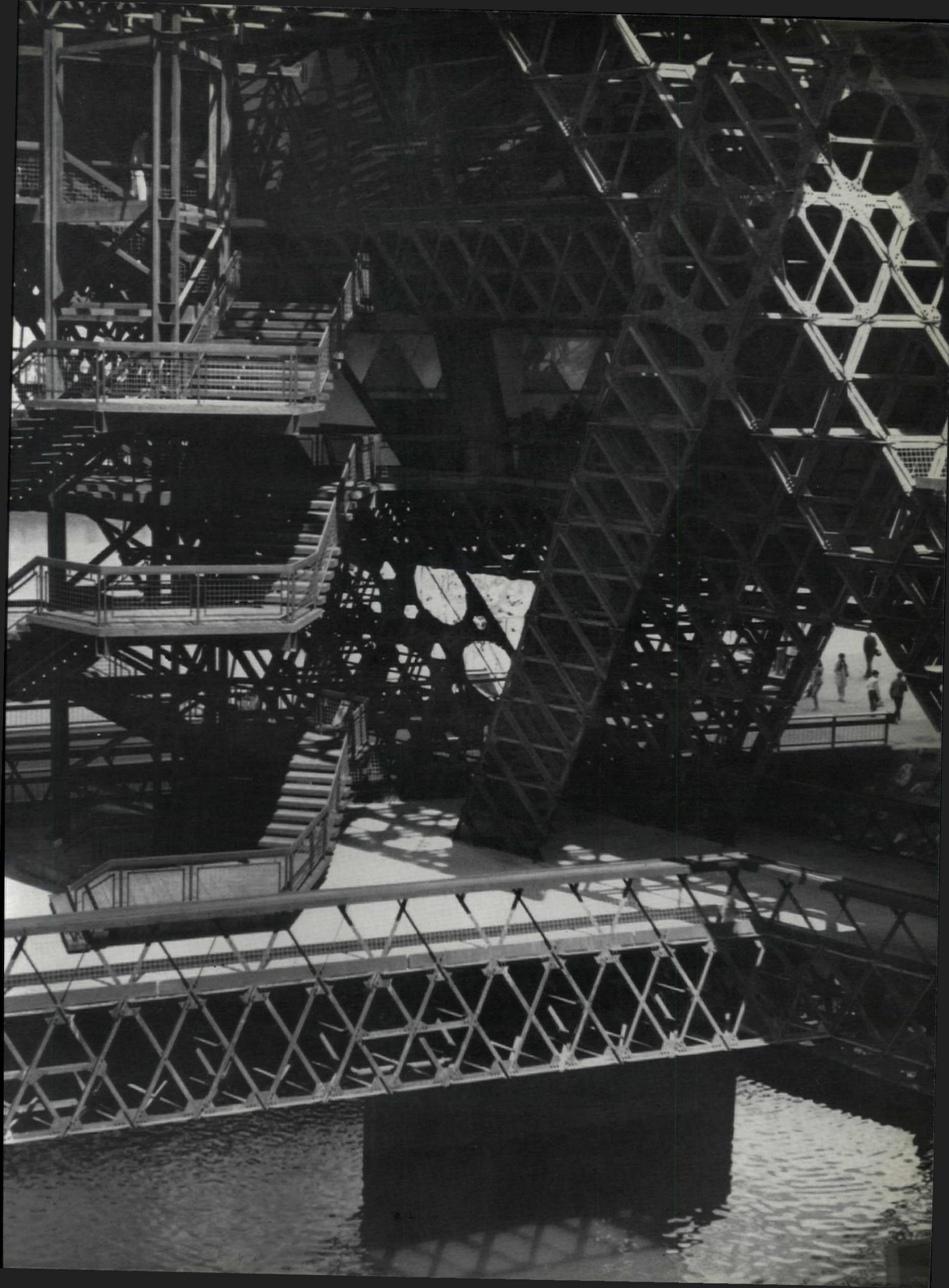
12→

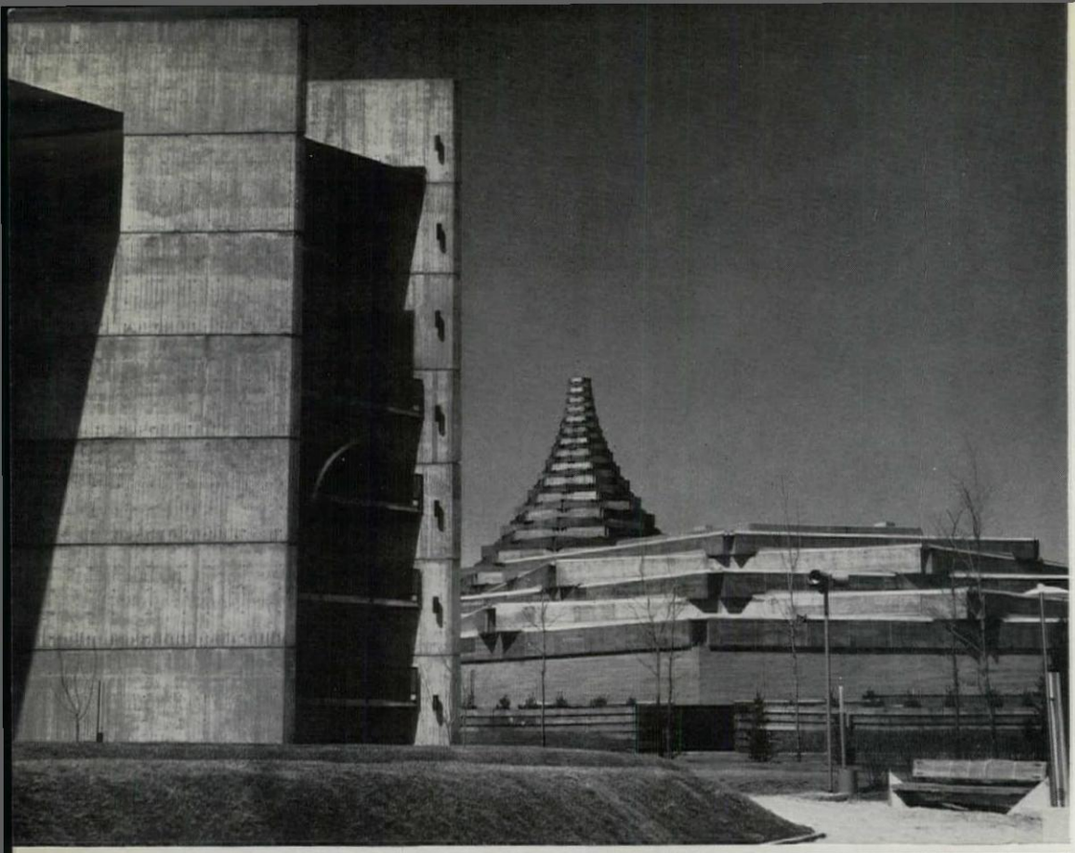


section through Man the Explorer

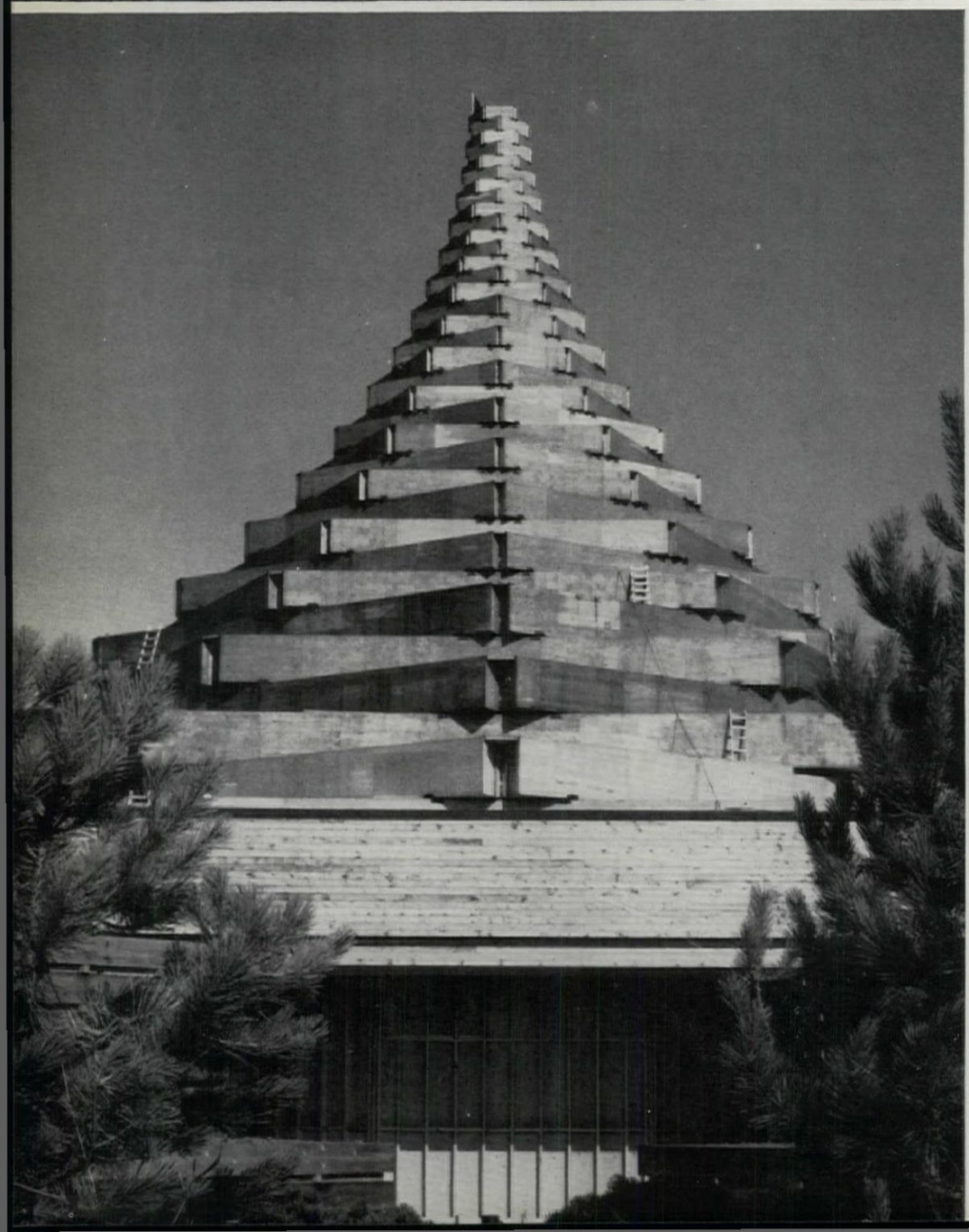


lower level plan, Man the Explorer





13

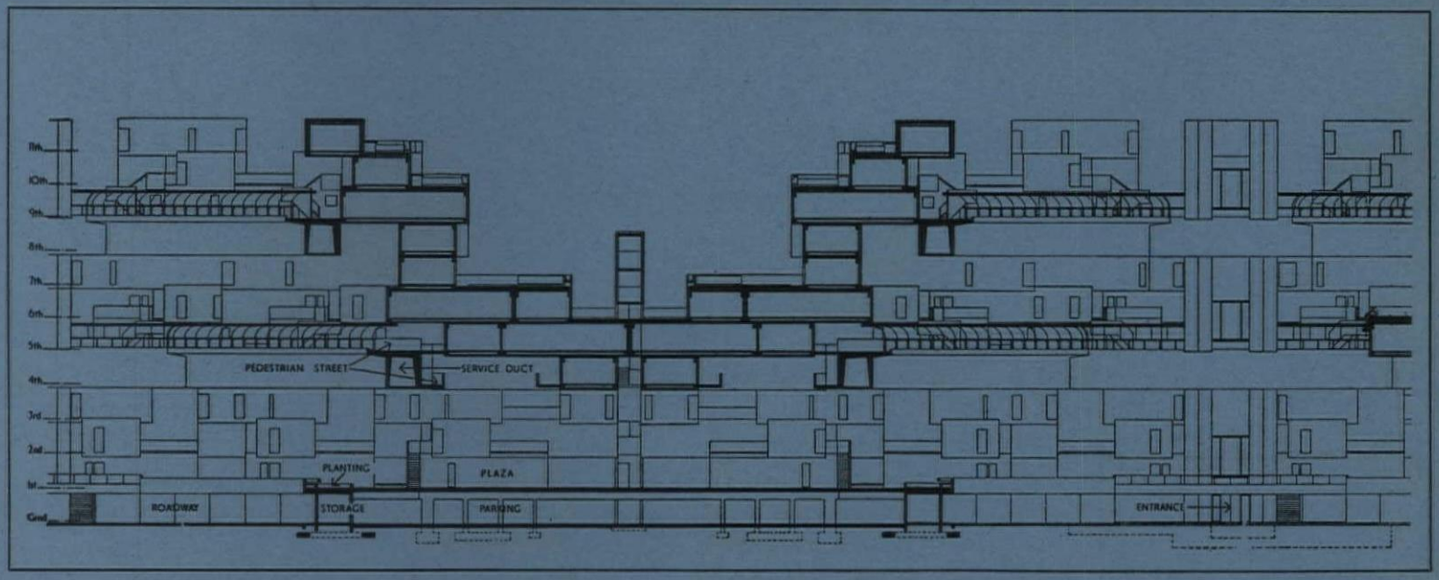


14

THEME BUILDINGS

The building devoted to Man in the Community, on the Cité du Havre peninsula, alongside Habitat: a pagoda-shaped spire, 14, made of baulks of timber so placed as to allow rain to penetrate to the garden within, and a lower hexagonal building (right in 13) linked to it, housing exhibition galleries. See also page 166. Architects, Erickson and Massey.
On the left in 13 is part of Labyrinth (see page 151), another theme building housing a cinematic programme on the story of Man, devised by the National Film Board of Canada. Architects, Bland Lemoyne and Shine.

HABITAT



typical section on centre line of escape staircase

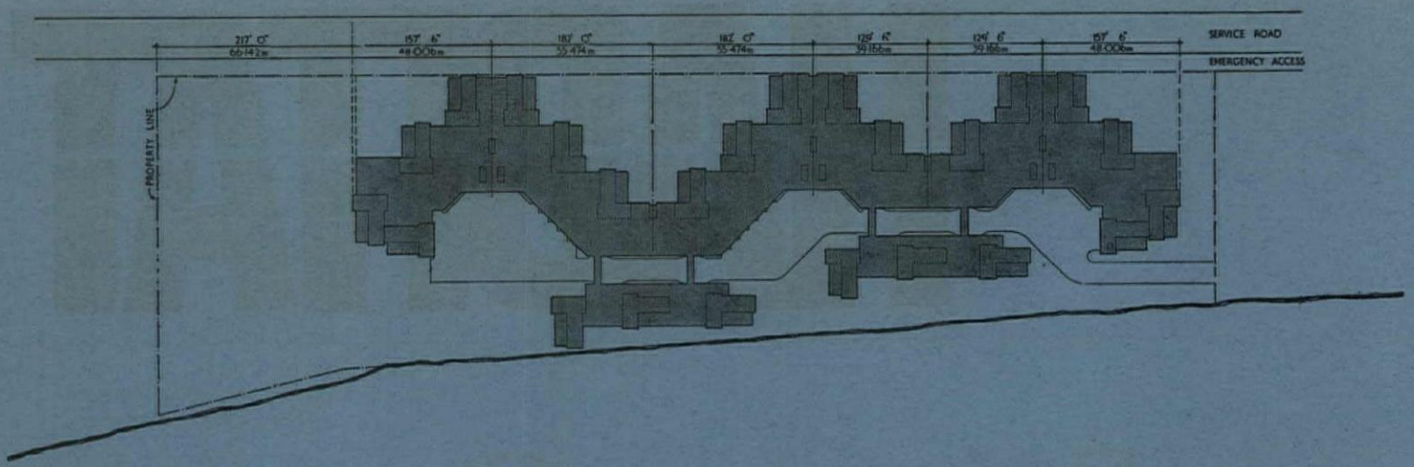
Expo's experimental housing project, known as Habitat and designed by Moshe Safdie, can be praised for a number of things: as a visually stimulating exhibition item; as a means of opening the visitor's eyes to possibilities in the way of planning, designing and constructing dwelling houses and showing him how many alternatives there are to what he is used to; as a means of testing the validity of new prefabrication techniques. The fact that tested on this scale (158 dwellings) Habitat is meaningless economically—that the cost of each house as built puts them in the luxury class—does not matter in this context. The purpose of an exhibition (see also page 136) is to make experiments that would not be economically justified in other contexts.

Regarded thus as a pilot exercise, the Habitat houses have already demonstrated some of the things that will need restudying if the experiment is going to make a real contribution to housing technique—apart from the need to rationalize the economic basis: the architect's first calculation was that a programme of at least 5,000 units (say 2,000 houses) would be needed if the budget was to be balanced, but he has already brought this down to less than half. From the point of view of planning the chief fault that has shown itself is the lack of privacy—too many of the roof terraces and even living and bedroom windows are overlooked at close range. From the technical point of view—although a full analysis has still to be made—the chief defects seem to be that the full degree of prefabrication originally intended, with all services incorporated and decorations completed before the concrete boxes were hoisted into place, has not proved practicable in practice and that the rate of fixing the precast box-unit is slower than the rate of casting them, making an economic flow of work difficult; also the enthusiasm for the infinite number of ways in which the boxes can be arranged to make dwellings of different plan-form and sizes, seems to have led to almost every one being designed differently, thus diminishing the advantage of standardizing components.

There are also question marks about the design of the access spaces in relation to the very severe Montreal winter, and about the much wider question of whether prefabrication experiments can nowadays best concentrate on such heavy materials as concrete when any number of materials far lighter to assemble have become available. However this was still an experiment worth making; it may well lead to useful developments and it has certainly resulted in one of the outstanding successes of the exhibition.

Habitat consists of 354 of the standard precast concrete boxes on which the whole structural concept is based. These boxes, cast in a temporary factory alongside the site, are 38 ft. 6 in. long, 17 ft. 6 in. wide and 10 ft. high. As much as possible of their equipment, services and finishes (including a one-piece fibreglass bathroom) were incorporated in the box before the whole unit, weighing about 85 tons, was lifted and swung into place by crane. The units are combined to form dwellings of various sizes, of either one or two storeys and with from one bedroom (600 sq. ft.) to four bedrooms (1,700 sq. ft.).

The units are built up as a series of steps, to a total height of twelve storeys, so that



HABITAT

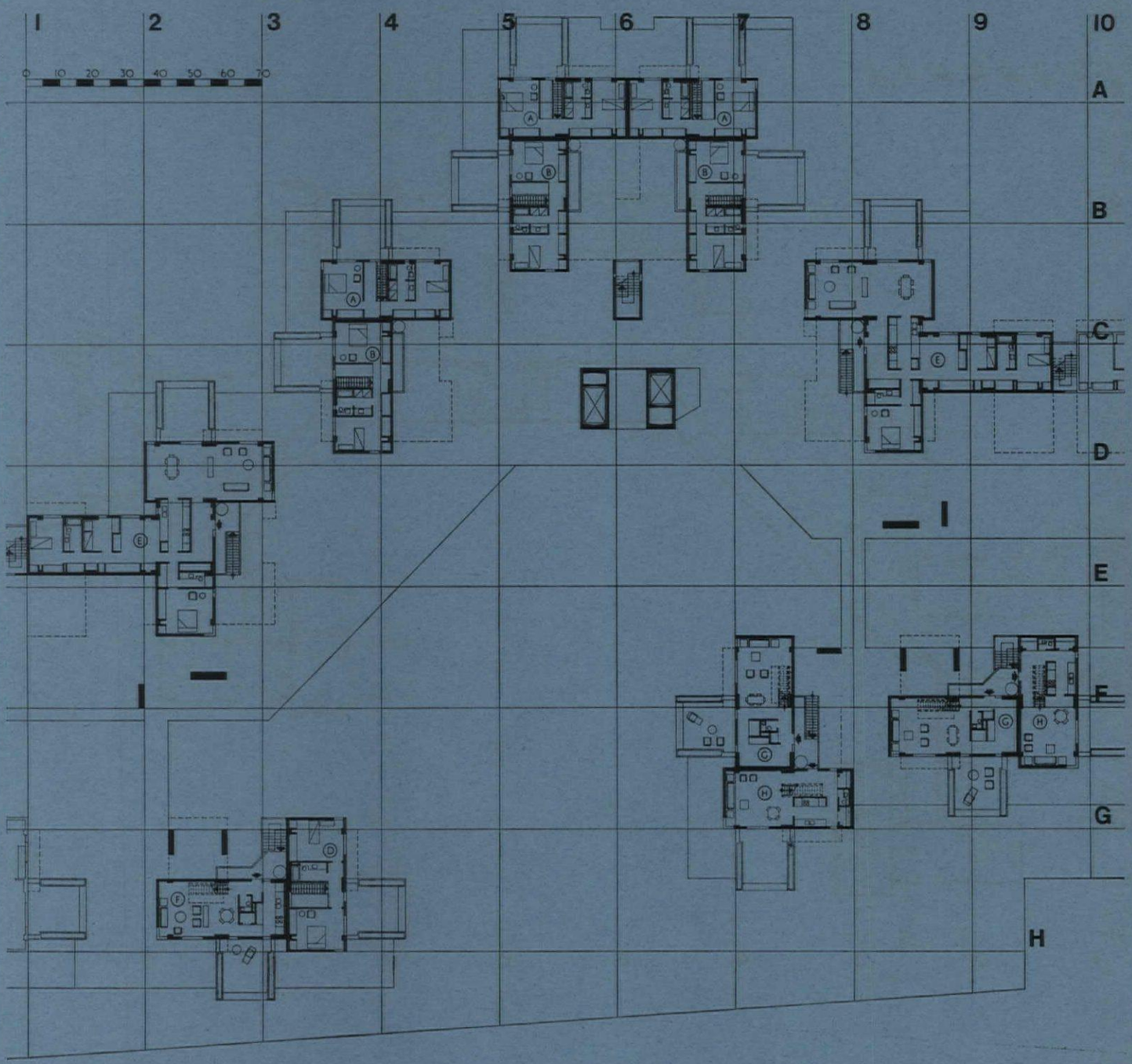
above, site plan

below, part first floor plan (pedestrian circulation tinted)
key
1, lifts
14, entrance canopy under
15, lighting to ground floor
16, planting
17, bench seats
18, opening in plaza
19, expansion joint

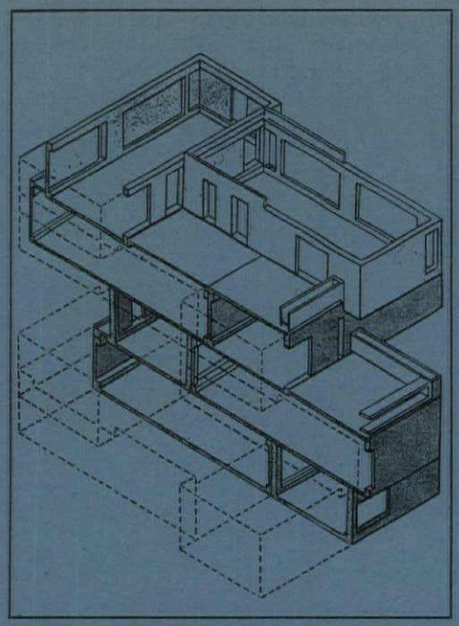
key to letters in circles
A, B, two-bedroom apartment on two levels
C, two-bedroom apartment on one level
D, four-bedroom apartment on two levels
E, three-bedroom apartment on one level
F, three-bedroom apartment on two levels
G, H, two-bedroom apartment on two levels
J, three-bedroom apartment on two levels
K, four-bedroom apartment on two levels
L, three-bedroom apartment on two levels
M, four-bedroom apartment on two levels
N, O, two-bedroom apartment on one level

each dwelling has a terrace-garden (and some have two) on the roof of the dwelling below. The other building elements required to connect and serve the units (roofs to each box; internal stairs for the two-storey dwellings, lift-shafts, escape stairs, street-decks, the parapets of the terrace-gardens and so on) are also designed as standard reinforced concrete elements. External concrete surfaces are sand-blasted, and have an impressively uniform finish though a somewhat drab one except in the brightest weather.
The pyramidal arrangement of the dwellings creates a protected area in the centre, partly occupied by a platform from which the lower dwellings, and the lifts to the upper dwellings, are entered. Openings in the groups of units allow outward views. Here, in a fully developed scheme would also be shops, etc. Beneath the platform is a car-park and at the same level a service road. At three of the upper levels are concourses, where the lifts stop and where decks connect all parts of the scheme. Dwellings not at concourse level have an external access stair, or sometimes a stair shared by one other dwelling. Access to each dwelling is therefore simple enough, though goods deliveries are likely to involve a discouraging amount of stair-climbing. The spaces enclosed are

part second floor plan: this and the other plans are shown in relation to a 35ft. square planning grid



agreeable, and the whole mass, lacking vertical facades, provides an interesting example of the edgeless building and the merging of indoor and outdoor spaces. Internal spaces are conventional but (in spite of a poor impression, given by a, for the most part, low standard of furnishing in the 25 dwellings on public exhibition for the duration of Expo) are on the whole satisfactory. They are much improved in the instances where, in some of the two-storey dwellings, the boxes have been arranged to give a partial double-height living-room. The dwellings are centrally heated and air-conditioned. Terrace gardens are watered and fertilized from a central source.

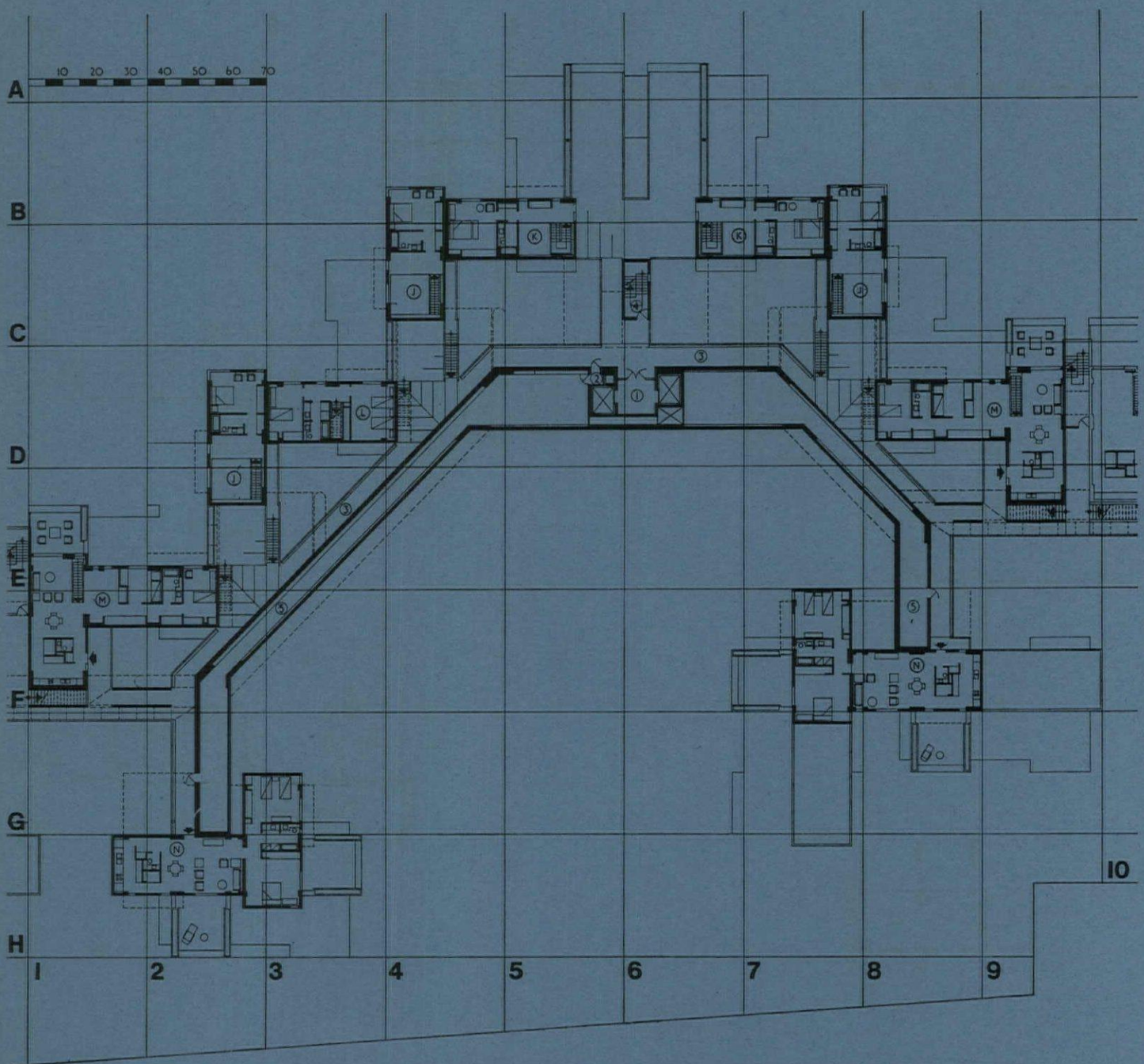


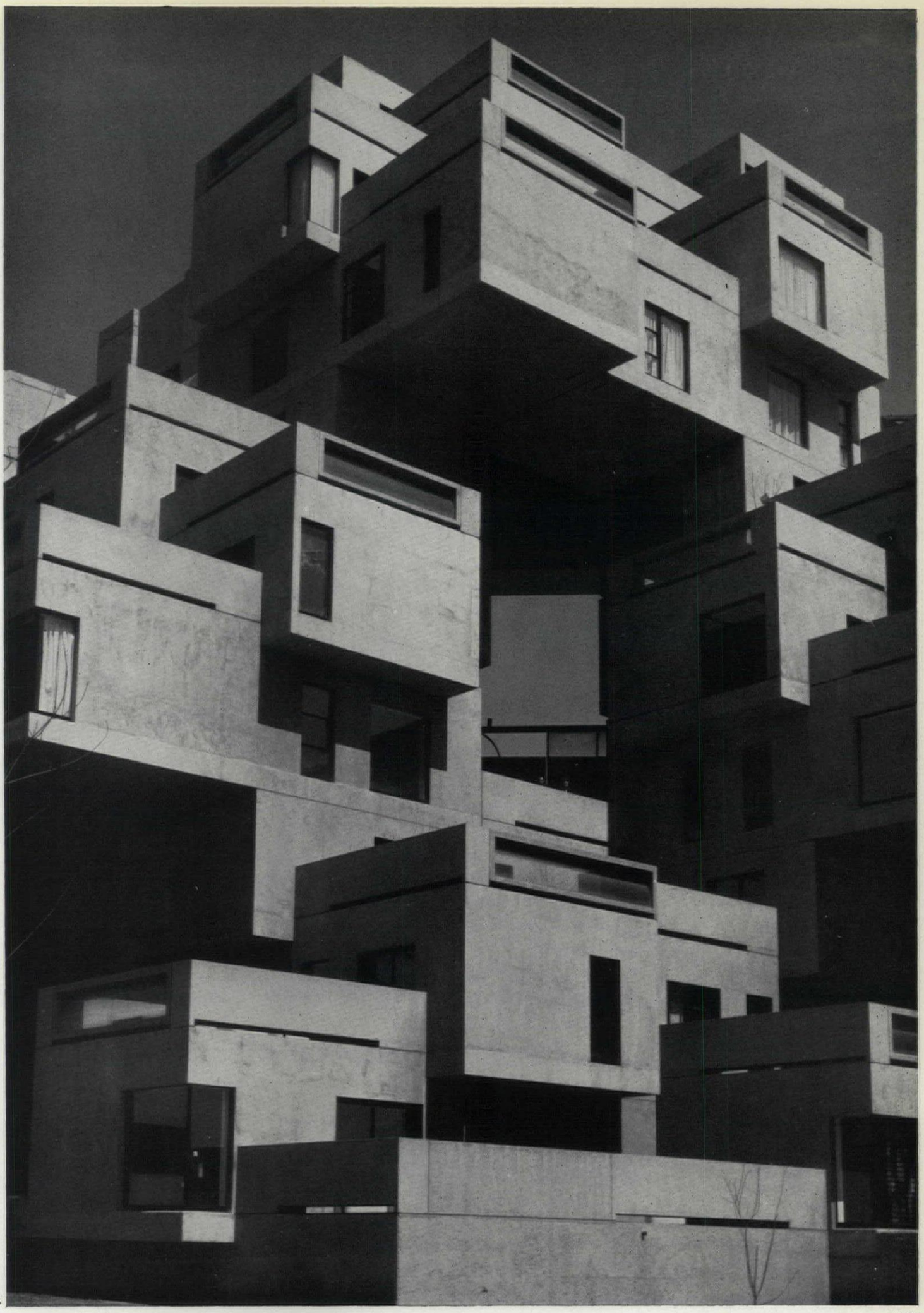
axonometric showing how identical precast units interlock

HABITAT

1, (facing page), close-up of half a dozen storeys of Habitat, showing staggered arrangement of dwellings and roof terraces allowing glimpses of sky between.

part fourth floor plan at level of service duct
key
1, lifts
2, duct
3, pedestrian street
4, escape staircase
5, mechanical services duct





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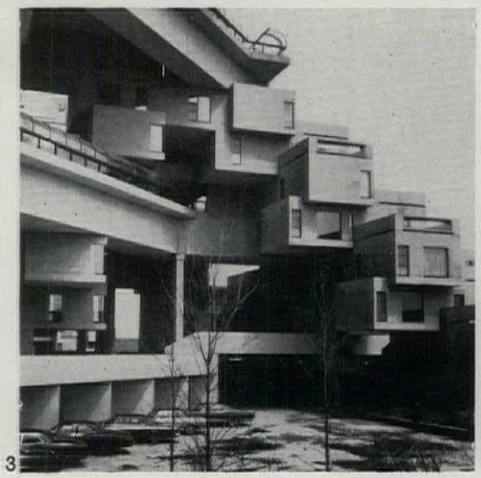
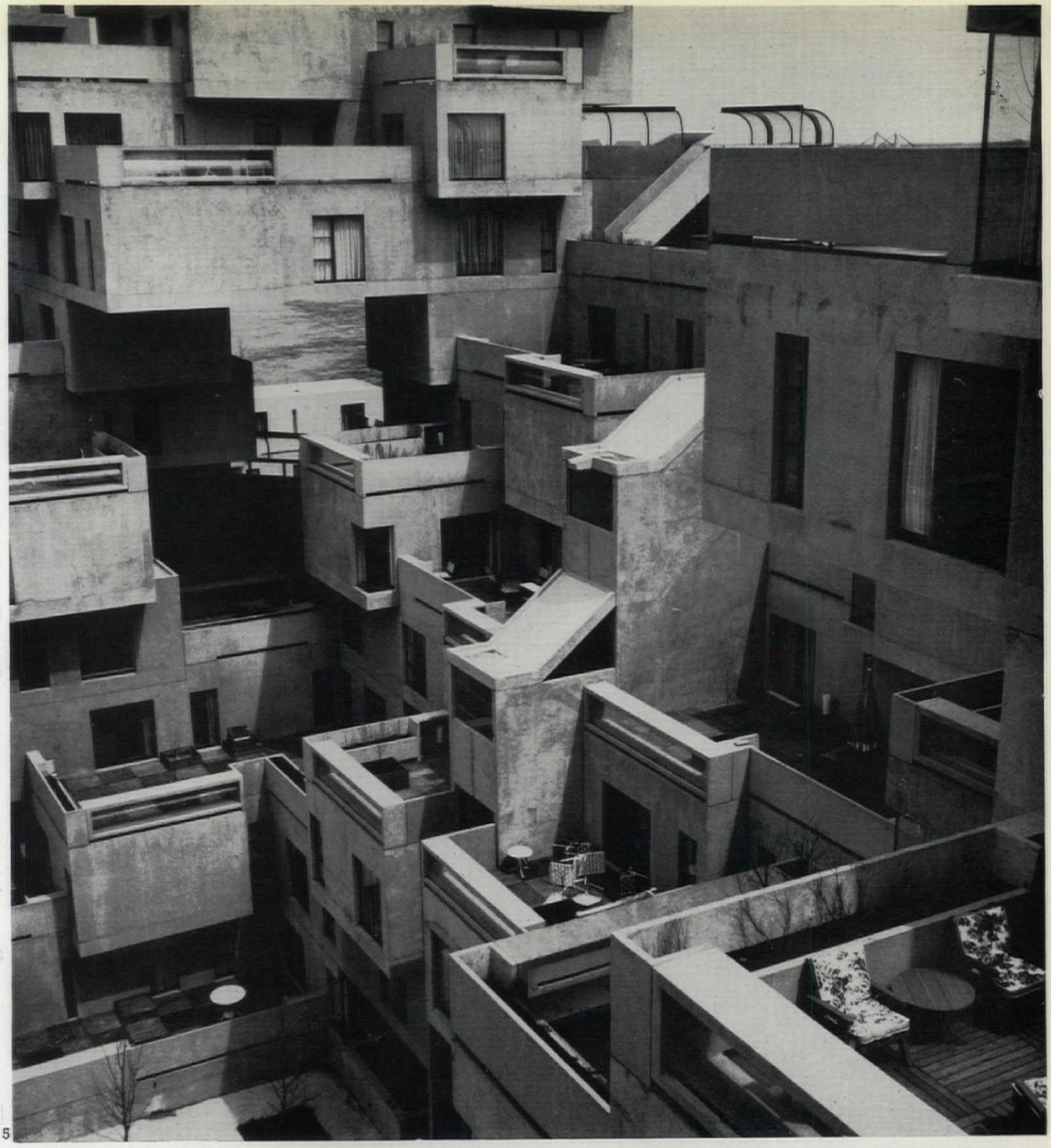


3

4

HABITAT

2, the entrance to Habitat from the south, looking into the central covered space. 3, the low-level garage and service yard with the main pedestrian platform (the covered space seen in 2) overlooking it. 4, from the east: lift-tower and escape stairs on left; access galleries at every third storey on right.



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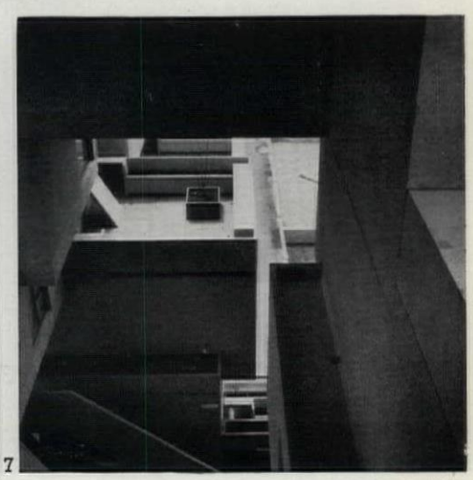
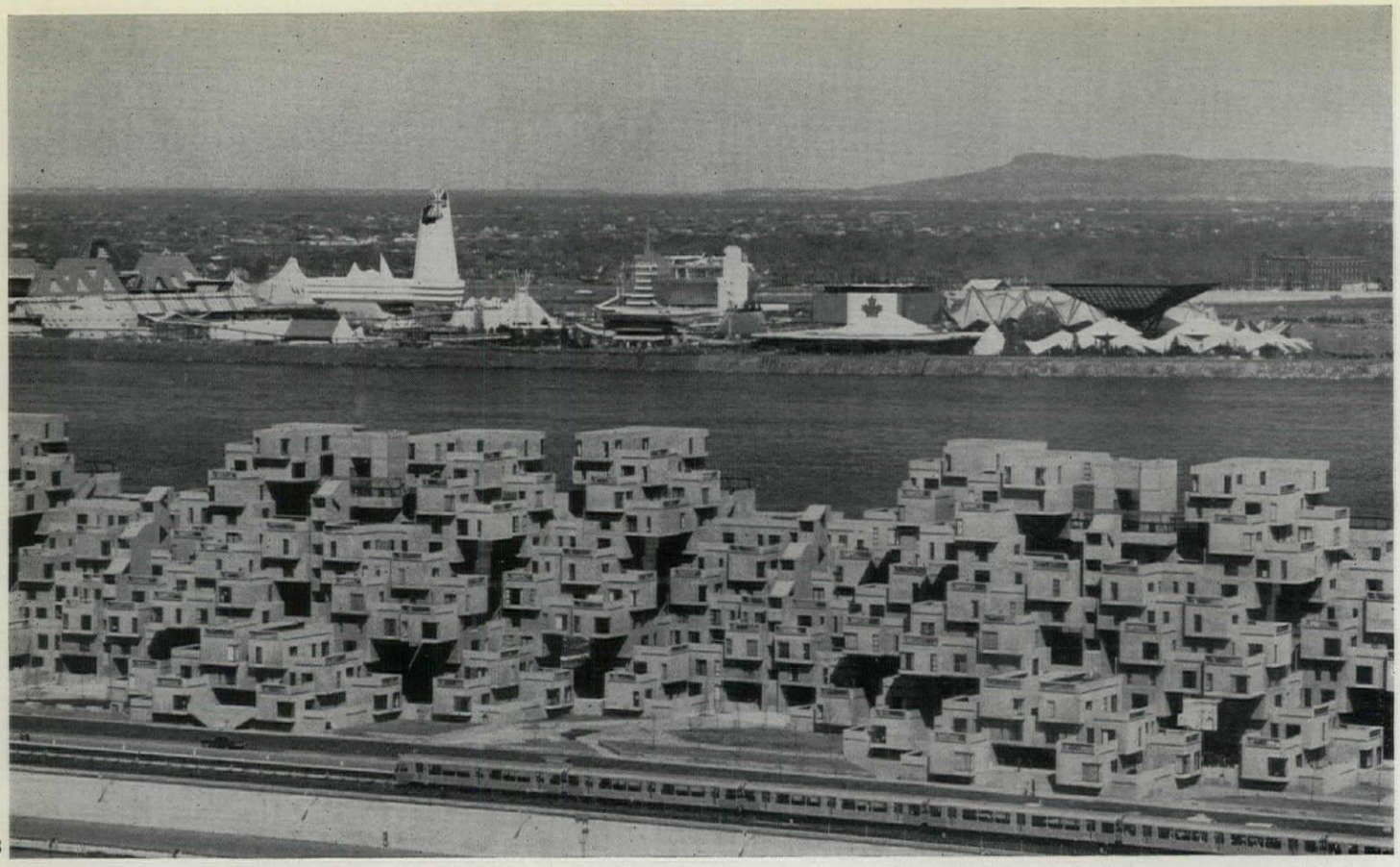


7

5, looking down from one of the roof-terraces, showing how each terrace occupies the roof of the dwelling below. 6, at deck level with steps to gallery that links across to the next group of dwellings. 7, one of the many glimpses down and through the groups of dwellings that the Habitat layout permits.



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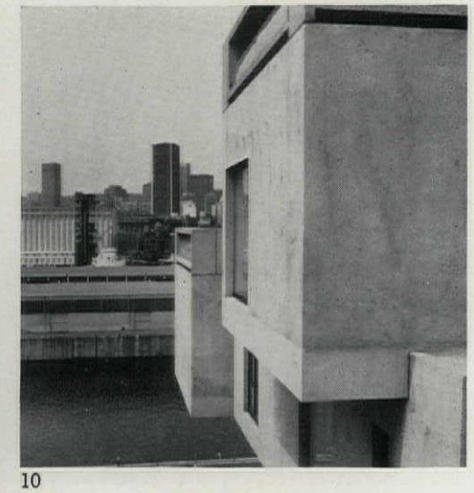

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HABITAT

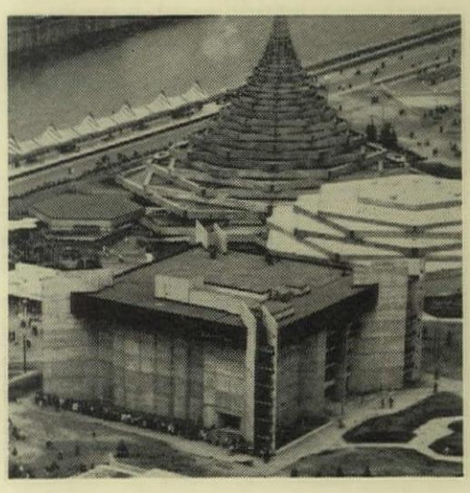
8, Habitat from the west, looking right across the peninsula on which it stands to the Ile Notre Dame, on the far side of the St. Lawrence. In the foreground is the Expo Express. 9, Habitat with the river and exhibition beyond, showing two of the access galleries protected by curved transparent weather shields. 10, looking past one of the dwelling units to the towers of down-town Montreal. Architects, Moshe Safdie and David, Barott and Boulva.

Jeremy Baker

EXPO AND THE FUTURE CITY

Since Expo's greatest achievement is the environment it creates and the ideas about environment it puts into circulation, this special issue includes the following account (contributed by a young English architect temporarily resident in Montreal) of the background from which Expo's approach to exhibition design arose and those aspects of it that relate to the design, construction and control of the urban environment.

1. *Labyrinth, the pavilion on the Cité du Havre peninsula dedicated to the story of Man—which is shown in various arrangements of simultaneous films prepared by the National Film Board of Canada. Architects, Bland, Lemoyne and Shine.*



The building of Expo involved three quarters of a billion dollars, to be spent in a little over three years. Since this was an international project and since all Canadians were subsidizing a major part, the decision-making had to be not only swift but visible to the public. As soon as it was decided that the site of the exhibition should be Montreal, there was a kind of frenzy to decide what form it should take. There were almost no precedents in North America. The only recent comparable event was the New York World's Fair, and that had been so depressing that all discussions on Expo began with the strong negative idea that, whatever Expo was like, it would be nothing like the commercialism of the New York fair.

SETTING THE STYLE

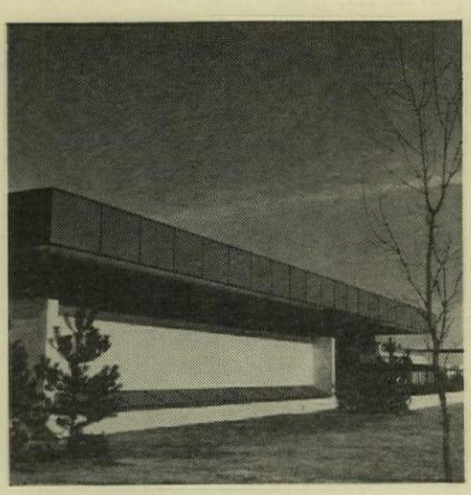
The first reports were produced within Expo and by a conference of the Province of Quebec Association of Architects. A number of people busied themselves uninvited by any official body, and in the background there was always the figure of the imaginative and decisive Mayor Jean Drapeau. Expo asked Dean Burchard of MIT to report on administration, and his main conclusion was that a group of creative people should take part in a formal seminar on the nature of Expo. Among those invited were Dr. Penfield, the Montreal neurological surgeon, Dean Frank Scott, of the McGill law faculty, Jean-Louis Roux, of the *Theatre du Nouveau-Monde* and Ray Affleck, one of the leading Canadian architects. The meeting was chaired by Dr. Davidson Dunton, vice-chancellor of Carleton University. The broad range of people invited to the Montebello conference, as it came to be called, was a significant first step. For once, the planning of an urban environment was brought back into the stream of the general culture, and so Expo was almost programmed into making a serious contribution to city design. The theme that emerged from Montebello, 'Man and his World,' seems at first so vague that it was no great achievement to have proposed it. But, as Jean-Louis Roux said, what it meant was 'Man, as opposed to corporations' and 'Man as opposed to nations.' Some attempt would be made to identify and expound major problems on a world-wide scale, with the minimum intrusion by the nationalistic and 'private enterprise' systems. The most visible results of this have been the Theme pavilions, but it was also due to Montebello that Labyrinth was begun, and it was the Montebello attitude that made Expo initiate the Habitat housing experiment. Although the Theme pavilions may appear slightly superficial, this does not invalidate the basic aims. In contrast, the very idea of national pavilions forces everyone into attitudes of rivalry. Nevertheless it can be said that, owing to the Montebello conference, Expo has a core of idealism that its predecessors have not possessed. One assumption continued by Montebello was that Expo would be deficit-financed, there being no way in which its scope and cost could be judged on a profit-and-loss basis. Ray Affleck said that this deficit-financing was probably the most powerful factor in shaping Expo. If you can imagine a fun-loving nationalized industry, then that is the Expo corporation. (Perhaps the early days of the BBC were like this). The expected deficit allowed the leaders to take risks, and it allowed them to give Expo that important didactic quality which would have been impossible with ordinary commercial practice. Besides the Montebello conference, other groups were employed in gathering data and ideas, such as the Stanford Research Institute of California, who projected attendance figures using the histories of all the previous world fairs. It is a tribute to the mass-appeal of Expo that in the event the SRI forecasts proved to be a stunning underestimation.

CRITICAL PATHS

Two main benefits arose from all this report writing. First, the Montebello report had an 'inspirational' effect on those at Expo. The executives who were taken from the ordinary world of the army, diplomacy, business, suddenly found themselves trying to discuss the most important problems of the twentieth century.

Secondly, Montebello gave Expo a group philosophy which permeated all levels of the staff. Since everything was done at such a speed, and since everyone was new to the job, it was essential for there to be something to give cohesiveness to the administration. The more technical decision-making involved the comprehensive use of critical path. CP, as such, is nothing new, but no previous civilian use has been as complicated as that at Expo. The facilities for 400,000 people to spend the day had to be constructed in a building period of three years, on a series of unconnected sites, none of which had anything to commend them except the possibility of their visual appeal when they were finished.

Out of the total Expo budget, the Expo corporation had direct control of (only) $200 million, and in a job of such an interlocking nature, wide powers were clearly needed. The powers of the corporation were therefore augmented so that CP schedules were required of all the participants, as well as the corporation having the normal fair rights to tear down or modify any project that was not expected to live up to its schedule. The CP was divided into four levels; first, seven geographic areas; secondly, the individual large contracts, such as a pavilion or a service facility; thirdly, the subcontractors to each prime contract; fourthly, the suppliers; and this last was used to indicate which materials Expo should purchase before the letting of the contracts. Data for the whole system was reported in each week, from which the computers produced four reports. The most important of these showed only those activities whose slippage had increased that week, together with their identifying data from the CP; i.e. this was genuine 'management by exception.' Not only was the design included but also the creativity leading up to the finalization of the concepts; e.g. the meetings, reports and visits from outside critics. In the initial stages, block-time was allocated to unformulated contracts so that the planners were aware of their time limits. The first CP was all block-time, with a fiinshing date and nothing else. Subsequently, block-time was replaced by realistic time, using accurate construction durations. As each item was completed it was removed in the next updating of the CP, so that theoretically on the last day the CP reverted to its initial blank state.



2, Operations Control pavilion, on the eastern side of Ile Ste. Hélène.

OPERATIONS CONTROL

The same sense of control which was so successful in producing Expo on time, has been translated into a form of benevolent despotism for the running of Expo. On the Ile Ste. Hélène is the Operations Control pavilion, to which all divisions of Expo report any changes or defects in their plans. When crises are reported to Operations Control, it decides which other branches of Expo should be informed, and so acts as a clearing house for all information. A 'situations room' is equipped with screens listing all the daily activities of Expo; tv monitors are linked to 16 cameras fixed at key positions on the site, and to four mobile camera-teams that can be directed to any trouble spot. In addition to crisis management, Operations Control distributes all types of information to anyone at Expo that it thinks should be informed: say, a sudden rush of visitors on account of a change in the weather, or a cancellation in the World Festival programme. All the transit facilities are part of this network, and an overloading of a car-park or of a particular bus-service leads to information being given to the police and transit authorities for action to be taken. In addition, this facility of crowd control has, in the event, also turned into something like party-giving on a huge scale. Should the situations room see a bottleneck on the site, the gallant Expo Band is ordered into action to siphon off some of the crowd; or if an area of the site looks dull, then a mobile pop group can be driven over there to liven up the proceedings.

COMPUTER POWER

The other half of the Operations pavilion is given over to the computer services. There are seven computers in the building, including a huge datanet 625, and there is an IBM system /360

model, 50 on-line in the Canadian pavilion. Some idea of the size of the centre is gained when you walk into the computer room, and find two /360 model 30's casually left around in one corner. The largest of the computer equipment is used for LogExpo, the central room-finding service. With as many as 125,000 visitors at any one time needing accommodation with access to Expo, it was obvious that the usual booking methods would be inadequate. LogExpo is a one-step booking service that has records of all available accommodation kept in random access devises. An office in downtown Montreal is equipped with three cathode tubes, each of which displays three selections for each request typed into the system. Although the system response-time is measured in nanoseconds, the total response time is however measured more prosaically in weeks because of clerical work delays.

One of the smaller computers handles the Expo master-scheduler, which keeps a continuously updated list of all events, whilst another handles the information system linking all the pavilions. Still another computer handles the electronic information display boards which are dotted around Expo and which put out every kind of information, from lost children to notices about concerts in a particular pavilion. The computer runs a background programme of information about the day's activities, which is obtained from the master scheduler, but the situations room can override this with messages of its own in the event of some emergency. ReservExpo is the agency that handles all the tickets for the events on the site; e.g. a film-show at the Russian pavilion. When an enquiry is made for a particular performance, the /360 model 50 either types out the appropriate tickets, or prints a 'house full' notice. In between doing this, the computer talks to visitors about Canadian politics. Some idea of the control that Expo has over the entire enterprise can be gained by realizing that every day the computer centre produces a financial report covering every Expo corporation activity, and that of the concessionaires. This report covers all possible breakdowns of the visitor count, the cash flow, parking figures; these and other statistics are shown with estimated profits against budgets and forecasts, and trends drawn for the future. The only time the visitor is consciously aware of all this computer activity is either when he obtains accommodation with his one letter to LogExpo, or when he makes use of one of the information services on the site. There are, however, hidden benefits of the computer systems, such as the rapid response of Expo to any form of crisis. This is the important but negative side of the picture; the positive side is that such a complex programme of activities as occurs at Expo can happen at all.

3, information display board: one of several in the exhibition grounds, all electronically controlled from the Operations Control pavilion.

TRANSIT AND TECHNOLOGY

The two technologies that the visitor is mainly involved in are the transits all over the site, and the film/education/information systems that occur in almost every pavilion. The transits themselves will not be unfamiliar to anyone who went to the Lausanne fair or to the Seattle site. There is the skyride wire rope system which takes the visitor silently above La Ronde from nowhere to nowhere, and there are the three minirail loops. Although the mechanism for the minirails is not new, the way they are planned has provided a new form of entertainment. They twist inside and around the pavilions, go under waterfalls, and provide amazing and continually changing views of the site.

The interest here is not in the technology of the transits themselves (which also include the Expo Express and the Metro), so much as in the interface that the Expo planners have arranged between one transit and another. To arrive at the Place des Nations station at the top level, and to take the escalators that swing out over the lake to the pedestrian plaza, and then to the minirail station below, from which you zoom out over the lake towards the Japanese pavilion, all this combines to give some picture of what it would be like to use a total city transit interface. Unfortunately, this idea has not been taken far enough. Moshe Safdie, when he was working in

4, interchange between transit systems: the Metro station on the Ile Ste. Hélène with mini-rail station alongside it.

5, *Kaleidoscope: the colour pavilion sponsored by various Canadian chemical companies, on the Ile Notre Dame. Architect, Irving Grossman.*

6, *us.*

the planning team, developed a scheme in which all levels of transit would be accessible at nodal points, but this was never carried out. As built, there are never more than two transits joining at each point; but in view of the size of the crowds at these places, complete interface might have been so enormous as to be inconvenient.
Another way in which the Expo transits could be further developed is in orienting the visitor, both on the ground and in travelling. At present, the minirails do little to make the site more legible, even though they show you everything. If a city ever used Expo mass transit as a model, the concepts of the layout would have to be altered to provide the incidental benefits of a comprehensible city.
Perhaps the most dramatic technological development that one sees at Expo is the 'total environment'; i.e., the use of multi-media, embracing film, art, music and sound of many kinds. This occurs in a number of places, with good examples in the Czechoslovak, Italian, CP-Cominco and British pavilions. What began as a rather irritating nightclub style of decoration, or was simply a happening, has reached here the status of an art-form in its own right. Multi-media presents useful information in a way that no other method could, and is important because it is so powerful, and creates such involvement for the spectator. The Italian pavilion has an example of what is now the 'conventional' multi-media space—all sounds and colours and a lot of movement and fun, but that is all. Sean Kenny takes the concept a stage further in the British pavilion, with his 'Birth of Britain'; here is the presentation of an historical atmosphere, the richness and terror of the middle ages (the fact that the floor is moving helps to disengage you from normal responses). The most developed use of multi-media is in Labyrinth and in Kaleidoscope. The latter is more stunning; with its use of film and mirrors and sound; one is overwhelmed with waves, girls, colour, cities, trees.
Labyrinth, however, not only has a theme of its own, but it has created a new space without even the use of film. Connecting its two film display spaces (there isn't an existing word to describe them) is a series of meditation galleries. They have none of the recognisable hardware of spaces; no walls, no ceilings, no views; this is true software space, in which, without any physical change, the whole atmosphere can be made terrifying, exciting or contemplative. The architectural significance of this is two-fold. First the effects are just too powerful to ignore; when you have got used to the excitement of a software space, it is impossible to be thrilled any more by the conventional space system. It is a difference in the scale of excitement. Secondly, as the *New York Times* film critic Bosley Crowther said, 'the nature of the architectural surround is becoming more and more a factor in the compound of this nameless medium.' Similarly, a conventional space, however well designed, cannot compete with the thrills and effectiveness of the software spaces. These suggest what might happen when the limit has been reached with what can be done with the standard methods of designing interiors. In the same way that the new spaces are multi-media, so they are multi-purpose. The fun life has merged into the education system, and it is perhaps the influence of Expo that the medium has suddenly developed along didactic lines. To see Montrealers queuing up to learn about public health in Teheren at 9 o'clock on a Saturday night is to realize the potentials of the new methods. It makes you revise your ideas of what constitutes 'entertainment.'
Expo offers lessons about the purpose of a city, the co-ordination of a city, and the actual technology that can be used to achieve new ends. The difference between Expo and a normal city is a result of the powers that the central authority has taken for itself. It means that 'The city is a total system,' in which for example all transit facilities are under one control. The fact that Expo was set up from zero means that the usual administrative divisions were not present; although branches were created, they were all under control of the Expo corporation. In a normal city there is no one on the side of 'us.' At Expo the ultimate authority is concerned with 'our' environment; 'Total environment presupposes a total system.'

architecture at expo:

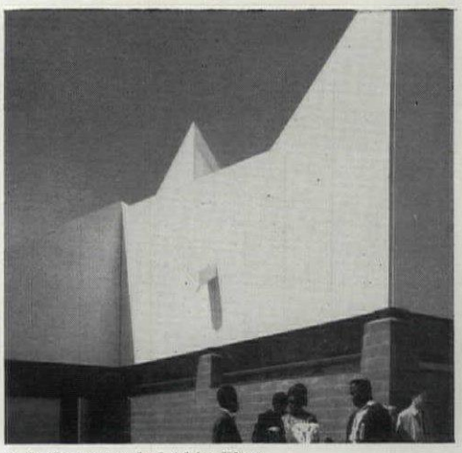
J M Richards

DESIGN COMMENTARY

The following notes are designed to serve both as a check-list of the buildings at Expo that are worth the visitor's attention from the architectural point of view and as a critical commentary on them—choice and comment being of course personal to the author. The more important of the buildings listed below are more fully illustrated on pages 108-128 or on pages 136-142 of this issue.

NATIONAL (AND CANADIAN PROVINCIAL) PAVILIONS

Africa Place (see also page 109).
A group of the newly independent African countries (Cameroon, Chad, Congo, Dahomey, Gabon, Ghana, Ivory Coast,



1, *in the courtyard of Africa Place.*

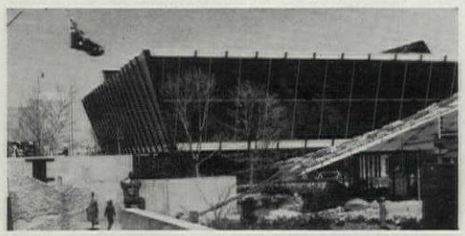
Kenya, Madagascar, Niger, Ruanda, Senegal, Tanzania, Togoland, Uganda and Upper Volta) very sensibly combine to present one display: a 'village' of identically composed pavilions, clustered round a square. Brick walls; high triangular white roofs based on the idea of a ventilation funnel, but the flat, low ceilings disappointing inside when one expects dramatic spaces reaching up into the pointed roofs. Most successful at a distance. Internal display conventional; clerestory lighting system effective.
Architect, John Andrews (Toronto).

Atlantic Provinces (Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland). See also page 109.
In its unpretentious way one of the most agreeable pavilions; workmanlike and straightforward with a boldly cantilevered timber roof, from beneath whose overhang

2, *Atlantic Provinces, from the terrace of the Canadian restaurant.*

the mini-rail train dramatically emerges. Terraces project and objects, large enough to stand up to their setting, lie around outside: anchors, a working boat-builder's yard. Convincing nautical atmosphere.
Architects, Duffus, Romans, Single and Kundzins; Ojars Biskaps (Halifax, Nova Scotia).

Australia
Rectangular steel and concrete building with outward-sloping tinted glass walls: an insensitive design, crude in conception and execution; timber roof-structure also crude and heavy. Improves when lit from inside after dark. Interior, by Robin Boyd, more interesting and imaginative. The



3 (*top*), *the outside of Australia, the glass walls of which provide the cover of this issue.* 4 (*above*), *inside Australia (upper floor), with talking chairs.*

one-way circulation takes the visitor up a carpeted ramp (after treading on an obligatory shoe-cleaning device) to a spacious first floor, which recognizes that the first thing the visitor, half-way through a day at an exhibition, wants to do is to sit down; furnished simply with armchairs which, when sat on, emit recorded lectures on Australia, Models of Canberra and Snowy Mountains hydro-electric project.
Architect, J. C. Maccormick (Commonwealth Dept. of Works, Canberra). Canadian associate architects, John B. and John C. Parkin (Montreal).

Austria (see also page 110).
Good exhibition architecture in the sense of being gay and obviously temporary: a structure composed of triangular aluminium panels framed in extruded aluminium sections; not, however, in practice, as simple to manufacture as the use of such

5, *Austria; Persia in background on right.*

geometrical units suggests, requiring 60 variations in panel size and too much cutting and fitting. The fact that it was designed to suggest the Austrian mountain landscape and doesn't, to the casual visitor's eye, in the least do so is not important. Ground-floor interior shared by rather gloomy display space and restaurant; upper floor a cinema with revolving seats and images thrown on walls all round.
Architect, Karl Schwanzer (Vienna). Canadian associate architect, Henri S. Labelle (Montreal). Engineer for aluminium structure, N. S. Becessy (of Alcan Co.).

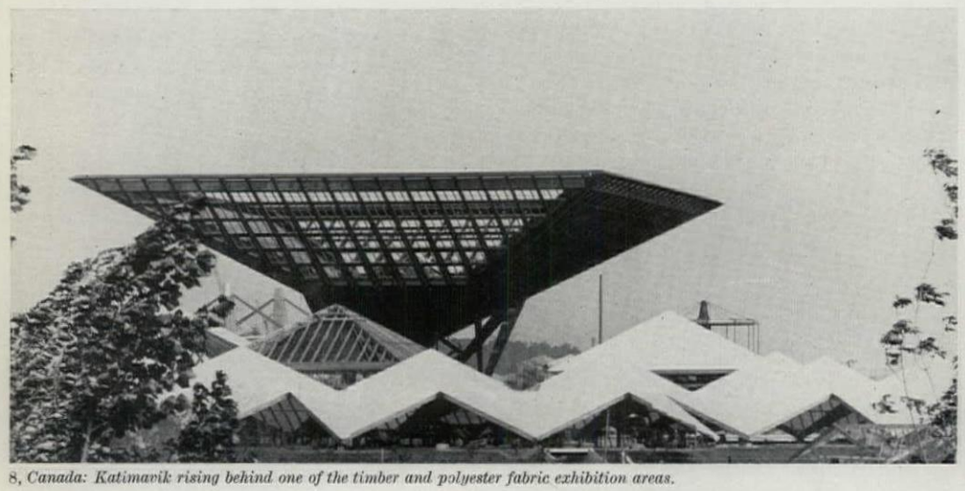
Behind and to the right of the Austrian pavilion can be seen part of the Persian —an ambitious and rather obvious building with bright blue tiles outside (that at least add contrast of colour to the scene) and a very dull inside.
Architects, Abdul Aziz Farman Farmaeian and Parviz Moayed-Ahd (Teheran). Canadian associate architect, George Eber (Montreal).

Belgium
Dullish brick and bronze building, with a fairly conventional story well told inside

6 (*above*) *and* 7 (*below*), *Belgium: outside and in.*

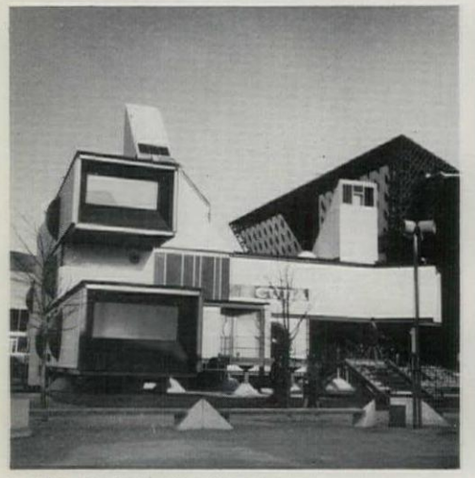
without too many display-designer's gimmicks. One of a row (with Holland, Switzerland and Austria) backing on to a lake, and constituting the least imaginative piece of siting at Expo and the most reminiscent of the boringly laid out exhibitions of the past—an arrangement these four good bits of architecture only just survive.
Architect, René Stapels (Brussels). Canadian associate architect, George F. Eber (Montreal).

Canada (see also pages 111–112)
A very impressive group of pavilions, making imaginative use of its water-bound site at the end of the island. The inverted glass pyramid powerfully closes the distant view, and it is immaterial whether the symbolism of the form is understood. Even more successful architecturally is the exhibition space behind it, sheltered by a sequence of tent-like timber and canvas roofs; though the circulation is so complicated that there are some dead spaces. Unfussy display; well used levels; an invigorating atmosphere of part indoors, part out. Note the agreeable texture of the brick paving.
Architects, Ashworth, Robbie, Vaughan and Williams; Schoeler, Barkham and Heaton; Z. M. Stankiewicz (Ottawa). Landscape architects, D. W. Graham and Associates.



8, *Canada: Katimavik rising behind one of the timber and polyester fabric exhibition areas.*

Cuba (see also pages 113–114)
One of the best pavilions at Expo: three-dimensional Pop-art at its freshest and most stimulating—it is a constant wonder that Cuba, a country for the time being so culturally isolated, should be able to produce architecture with so clear an awareness of trends and aspirations elsewhere. Push-and-pull geometry simply achieved by white walls within an exposed steel frame. The inside, within its own terms of reference (direct political and social propaganda), well and economically done, with photo-montages and film projection—all in black and white, except for coloured glass in the windows. External cinema screens project films after dark.
Architects, Baroni, Garatti and Da Costa (Havana). Canadian associate architects, Gagnon and Rousseau (Montreal).



9, *Cuba, showing outdoor cinema screens.*

Czechoslovakia (see also page 114)
The Czechs take these occasions very seriously, which perhaps explains a recurrent defect in their representation at exhibitions, evident again at Expo: a heaviness and absence of humour. Otherwise a highly professional, expert display contained in a sophisticated steel-frame structure that looks, perhaps, too permanent, though it is in fact demountable. The compulsory one-way circulation unsuitable for so large an exhibit; several narrow bottle-necks hold up the crowds. Film-shows not to be missed. Restaurant nicely differentiated from the rest. A minor point externally: the entrance steps are unconnected with the sitting terrace that also faces the public walkway, resulting in an unintended path being worn across the grass.
Architects, Miroslav Repa and Vladimir Pycha (Prague). Canadian associate architect, Jean A. Gélinas (Montreal). Interior designers, Frantisek Cubr, Zdenek Pokorny and Josef Hruby.

10, *Czechoslovakia: restaurant section on left.*

12, *Germany: Frei Otto's tent, partly overlapping its landscape of lakes and rocky islands.*

11, *France: aluminium fins, pylons and balconies.*

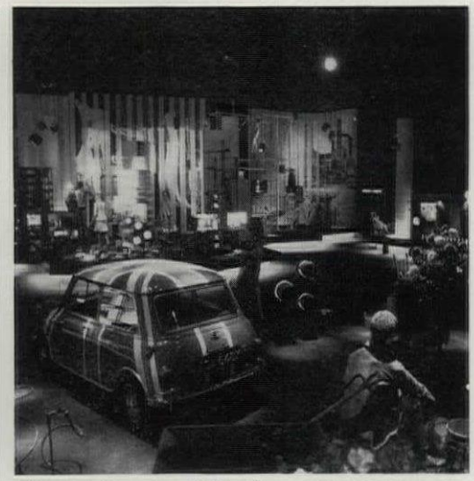
France (see also page 115)
Ambitious and overcomplicated inside and out. A gigantic but bewildering exterior, composed of aluminium fins, panels, balconies and masts, leading the eye in all directions at once and quite unrelated to the steel structure. Inside, the towering central space impressive at first glance, but the interior displays again too elaborately and wastefully dramatized.
Architect, J. Faugeron (Paris). Canadian associate architect, André Blouin (Montreal).

West Germany (see also Robin Boyd's appraisal on pages 129–135)
The work of architecture at Expo that is likely to be longest remembered. Looks as temporary as it is and exploits the opportunity an exhibition offers of taking

theoretical experiments a stage further in practice—in this case Frei Otto's experiments with suspended structures. More development still needed (see Robin Boyd), but useful lessons no doubt being learnt and certain achievements—in relation to this limited purpose—indisputable: a delicious sense of being both indoors and out; the quality of the light (it is notable that after dark the translucent membrane becomes quite opaque); the adaptability to the site. The landscaping of very high quality and the displays inside—on a series of steel and timber platforms, at various levels—well contrasted with the structure.
Architects, Rolf Gutbrod (Stuttgart) and Frei Otto (Berlin). Canadian associate architects, O. Tarnowski and George F. Eber (Montreal). Consulting engineer, Fritz Leonhardt (Stuttgart).

Inside, each of the five sections (by a different designer) has its own good qualities. Sean Kenny, in the first, uses the fashionable cinematic, kinetic art technique seen in several of the more sophisticated Expo pavilions, and uses it well, except that the very dark entrance is—literally—a stumbling block and, though no doubt meant to assist the creation of atmosphere, a distraction. The other sections reach a very high professional standard with the common professional fault of clever display techniques drawing too much attention to themselves. Humour is not absent. The one-way circulation system works in spite of some narrow bottle-necks.
Architects, Sir Basil Spence, Bonnington and Collins (London). Canadian associate architects, Bland, Lemoyne, Edwards and Shine (Montreal). Interior designers, Sean Kenny; Beverley Pick; James Gardner; Theo Crosby; Mario Armengol.

13 (*above*), *the raised platform between the different sections of the British pavilion, with arrows added to help visitors find the entrance at foot of tower.* 14 (*below left*), *F. H. K. Henrion's three-dimensional union-jack being hauled up the tower.* 15 (*below right*), *Britain Today by James Gardner—crowded but lively.*

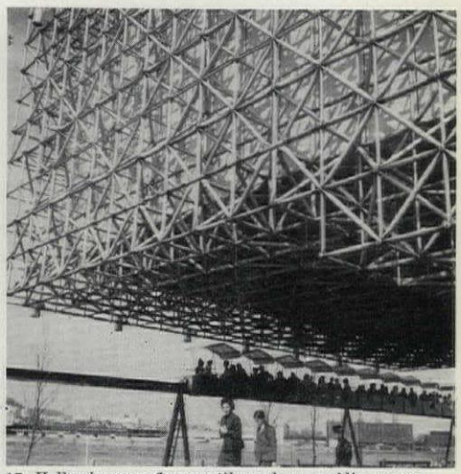


Great Britain (see also pages 116–117).
Unexpectedly old-fashioned looking exterior, lacking the inspiration of a design—like the German—derived from structural disciplines. It looks, that is, like a shape designed for its own sake, with the means of construction decided afterwards. It stands up well on its water-bound platform (though the intended symbolism of this and of its broken-off tower does not really tell), and its height achieves the purpose of being prominent in distant views, especially because of the eye-catching three-dimensional union jack on top—a brilliant piece of design by F. H. K. Henrion. A defect in planning; the entrance is at the back of the site, invisible from the public avenue.

Greece (see also page 118).
A modest pavilion of some charm, the result of a competition held in Greece and won, by a happy chance, by a Greek architect practising in Montreal. A one-way circulation system that works very well: entered at the top of steps on the far side of a trellised, amphitheatre-like courtyard; thence through a sequence of galleries linked by a bridge across the entrance to the courtyard. Interior display, conventional but cultured.
Architect, Nicholas C. Chryssopoulos (Montreal); associates, Ian Martin and J. A. Stinson (Montreal).

16, *Greece: the courtyard with entrance at top of steps.*

Holland (see also page 118).
The idea of a building suspended within a cage of aluminium tubing a good one; very effective at night; somewhat lacking in clarity by day. The space inside well used; the actual display informative, though not up to the very high standard Holland has achieved at previous exhibitions, and with too much whimsicality in parts.
Architects, W. Eykelenboom and A. Middelhoek (Rotterdam). Canadian associate architect, George F. Eber (Montreal).



17, *Holland: upper floor cantilevered over public avenue; mini-rail beyond.*

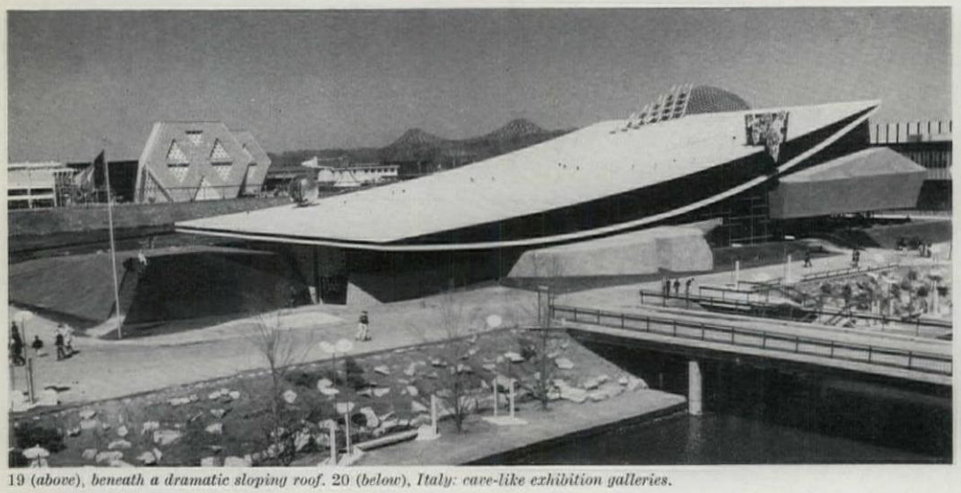
Israel (see also page 119).
A simple but effective exterior that does derive its form (cf. Great Britain) from its construction and is designed for re-erection. A 30 deg./60 deg. grid determined the points of support and the dimensions and

18, *Israel: cuboid fibreglass walling.*

intersections of the cuboid fibreglass wall and roof panels—identical and devised as stacking units to save shipping space—on steel frame with timber ceilings. Only four interior columns. One-way internal layout, taking visitors by stages to the upper floor and down again without apparent effort; theatre occupying core. The story is an historical one, but told without bombast or too much solemnity.
Architects, A. Sharon, D. Resnik and E. Sharon (Tel Aviv). Canadian associate architects, Rosen, Caruso and Vecsei (Montreal).

21, *Japan: cage of prestressed beams over an open ground floor.*

individually wrapped to protect the surface and packed in a wooden crate. Well related separate restaurant pavilion overlooking the usual, and charming, Japanese garden. The interior (one-way, beginning on first-floor level reached by escalator) well managed but less characteristically Japanese than the interiors that have been such an attraction at previous exhibitions—a development, however disappointing, no doubt justified by the wish to emphasize Japan's Western-style industrial achievements.
Architect, Yoshinobu Ashihara (Tokyo). Canadian associate architects, Affleck, Desbarats, Dimakopoulos, Lebensold and Sise (Montreal).

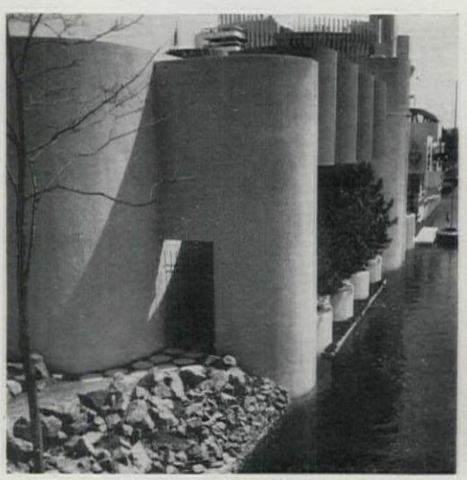


19 (*above*), *beneath a dramatic sloping roof.* 20 (*below*), *Italy: cave-like exhibition galleries.*

Italy
Too small for the monumental character it assumes; inside, tortuous and gloomy (owing to cave-like modelling, under-lighting and low, heavily textured ceilings) but displays spaciously planned without too much salesmanship—emphasis on history and culture. Some of the objects shown overpowered by the setting devised for them. First section with well controlled cinematic technique (less confusing than the British). Partial one-way circulation, making it easy to lose one's way.
Architects, F. Piro, A. Antonelli, M. Greco and Mrs. S. Rossi (Rome). Canadian associate architects, Papineau, Gérin-Lajoie and Le Blanc (Montreal). Interior designers, B. Munari, L. Ricci, C. Scarpa, E. Vedova.

Japan (see also pages 120–121).
A spectacular building, because of its typically Japanese concrete-that-looks-like-timber construction: of overlapping post-tensioned reinforced concrete beams, 60 ft. long but, perversely, cast in Japan and brought to Expo by ship, with each beam

Monaco
A sequence of cylindrical enclosures, close to the waterside, through which the visitor descends, finding them, however, almost wholly (but refreshingly) empty. He ends in a larger cylinder, pleasantly protected by a canvas roof, housing a cinema from which he emerges through a stony garden.
Architects, Papineau, Gérin-Lajoie and Le Blanc (Montreal).
Alongside (and also seen in the photograph)



22, *Monaco, with a glimpse of Haiti beyond.*

is the rather fussily designed pavilion of Haiti the inside of which is, for the most part, one large bar.
Architect, Denis Lamarre (Montreal).

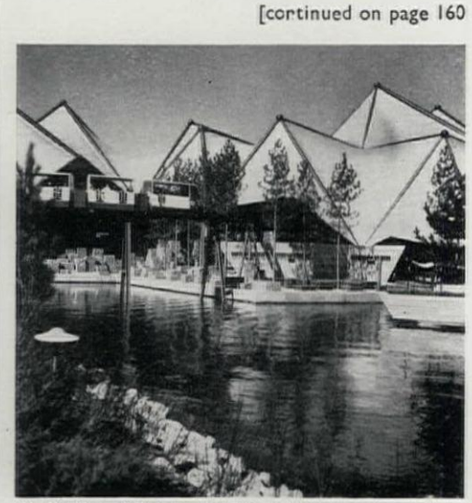
Morocco
The best of the Arab nations' pavilions, fairly conventional internally but with an impressive and well handled background panorama. The exterior, like the others, is traditional and somewhat cardboardy, but not too pretentious.
Architects, Cardwell, Ross & Anderson (Quebec).

23, *Morocco and Ethiopia.*

Beyond the arcaded tower in the photograph (which stands between the Moroccan and the Tunisian pavilions) is the tent-shaped Ethiopian pavilion—an attempt at local colour but too coarsely done to be as effective as, say, the Thai or the Burmese pavilions in the same genre.
Architect, Jacques Benoit-Barnet (Montreal).

Ontario (see also pages 122–123).
From the point of view of the integration of architecture and landscape, one of the best pavilions at Expo; also highly successful in its exploitation of the mini-rail, which weaves its way imaginatively in and out of the structure. Tent-like roof-system made of tubular steel booms a little stiff and heavy. Landscape of roughly squared granite blocks also serves to define and wall in other display areas; still other boundaries formed by waterways.
Architects, Fairfield and Dubois (Toronto). Landscape designers, Sasaki and Strong (Toronto).

[continued on page 160



24, *Province of Ontario: tent-like roofs, water, rocks and trees.*

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25 (*above*) *and* 26 (*below*), *Province of Quebec, outside and in.*

Quebec
Rather forbidding and ungay outside, due to the bleakness of its siting and the gloomy tinted glass in which the structure is clad—effectively as opaque as the concrete-walled British pavilion. Accessible only by lift, which however has glass walls and rises excitingly through a lift-well in the form of an illuminated showcase. Inside the building, well thought-out displays on various levels, monumental in scale—also the best views, through the outer glazing, over Expo to the skyline of Montreal.
Architects, Papineau, Gérin-Lajoie, Le Blanc and Durand (Montreal).

Russia (see also page 123).
Vast but uninteresting glass-walled building that could have been at Brussels (1958) or even Paris (1937) except that Russia had not then accepted so modern an architectural idiom. The design Russian, though prefabricated in Italy and erected by Italian labour. Little attempt at a sympathetic relationship to the site. Interior packed with scientific-industrial goods, of deep interest no doubt but with no imagination as regards display. Upper levels reached by long escalators, restricting flow of crowds though adding to the drama.

27, *the Russian pavilion, close to the river-bank.*

28, *the vast interior of the Russian pavilion, crowded with hardware.*

Drama also (though rather crude) in the penetration of the V-legs that support the roof right through the building down to their anchorage in the ground. The pavilion at its best at night when its inside sparkles brightly through its transparent envelope.
Architect, M. V. Posokhin (Moscow).
Canadian associated engineers, Beauchemin, Beaton and Lapointe (Montreal).

Scandinavia (see also page 124).
A joint effort by five countries: Sweden, Finland, Denmark, Norway and Iceland. Designed (with surprisingly coherent result) by a committee composed of one architect from each, with the Danish member acting as executive architect. A crisp, white-painted building with external steel frame, looking inwards to a courtyard, trellis-roofed and filled by hooded escalators connecting first floor (restaurants) with second floor (exhibition space)—the ground floor is open but the space not interestingly used. Alongside, charming maze-like sculpture garden. Displays in the top-floor exhibition space well designed though not

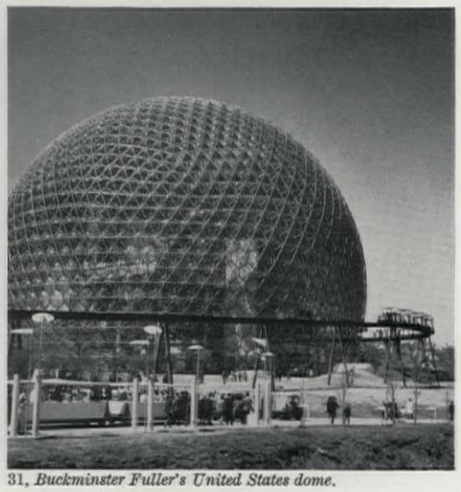
29, *Scandinavia: mini-rail in foreground.*

up to the superlative standard set by the Scandinavian countries at previous exhibitions.
Architects, Gustaf Lettström (Stockholm), Jakko Paatela (Helsinki), Erik Herlow and Tormod Olesen (Copenhagen), Otto Torgersen (Oslo), Skarphédinn Johansson (Reykjavik). Canadian associate architect, R. V. Chadwick (Montreal). Garden architect, Sven-Ingvar Andersson.

Switzerland (see also page 125).
A civilized unaggressive pavilion of the kind Switzerland can always be relied on to contribute to international exhibitions. Good plan and section, well detailed. The timber battened walling introduces a colour that makes an attractive foil to the other colours round. The interior serious, interesting, unexciting. Intelligent use of three-dimensional statistics.
Architect, Werner Gantenbein (Zurich).
Canadian associate architects, George F. Eber (Montreal) and George Banz (Toronto).

30, *Switzerland: part of Austria on right.*

United States of America (see also pages 126–128).
Along with the German pavilion, the architectural sensation of Expo. Buckminster Fuller's goedesic dome



31, *Buckminster Fuller's United States dome.*

construction (in fact almost a sphere), has the perfect chance to display its potentialities—and takes it. It sits as lightly on its grassy mound as a bubble, reflects and admits the light, mysteriously suggesting its contents which are silhouetted at night, when the sphere acquires a magical luminosity. The members of the triangulated steel space-frame are welded, not bolted, which may create demolition problems. The mini-rail passes right through the middle: a delightful idea, both from the point of view of the rider in it and the spectator below it, though it may give

[continued on page 162

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The architects for the offices of Flowers' Brewery were Messrs Wood, Kendrick & Williams, Stratford-on-Avon.

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32 (*above*), *mini-rail penetrating the wall of the United States dome;* 33 (*below*), *exhibition platforms connected by escalators.*

some spectators a moment of unease when he sees it puncture, though with no ill result, the membrane-like surface. The vast interior space beautifully used, with tiers of platforms connected by escalators and bridges, creating their own contrasting geometry. The actual exhibits conceived in a relaxed, undemanding spirit, and concerned chiefly with images and atmosphere—a refreshing change from the unrelenting salesmanship found in other pavilions. The scale subtly right for the size of the sphere.
Architects, R. Buckminster Fuller, Fuller and Sadao (Cambridge, Mass.). Interior design and display, Cambridge Seven Associates (Cambridge, Mass.). Canadian associate architects, George F. Eber and Walter J. Mace (Montreal).

Venezuela
A trio of cubes, painted in bright colours—different on each side—like a child's

34, *Venezuela: cubes in contrasting colours.*

building-blocks: highly effective as exhibition architecture, because of their scalelessness and in contrast with fuss elsewhere—also their static quality enhances the effect of the mini-rail trains sliding by. Curtain walls of solid aluminium plate. Interiors cannot be reported on because still not open two weeks after the start of the exhibition.
Architects, Carlos Villanueva and Eduardo Trujillo (Caracas). Canadian associate architects, Erickson and Massey (Vancouver).

Western Provinces (British Columbia, Alberta, Saskatchewan and Manitoba). Looks almost silly at first glance—a truncated shingle-covered cone with some little trees growing on top. Only after a visit inside is it understood that these are the tops of tall Douglas firs reaching up to and beyond the full height of the cone's hollow interior. The exhibits among the best devised of their kind, with few gimmicks—the only gimmick being a highly successful one: the entrance by vibrating lift which claims—and seems—to take you 3,000 ft. down into a mine. A lot of well-shown information on mining, farming and forestry compressed into tunnel-like passages before you emerge at the foot of the giant firs, splendid in their contrasting scale.
Architects, Beatson, Stevens Associates (Calgary).

35, *Western Provinces of Canada.*

36, *administration building, near the exhibition entrance.*

THEME, PERMANENT AND OTHER BUILDINGS

Administration Building (see also page 137).
Just outside the exhibition grounds and part of the permanent development of the Cité du Havre. One of the best works of architecture to come out of Expo: vigorous but unpretentious. Planned as three wings, each of which could operate independently—office space with no structural subdivisions that can be partitioned as required. Stepped profile to protect windows from direct sunlight, with degree of stepping varied according to orientation: 7 ft. 6 in. on south facades; 2 ft. 6 in. on north and east. Spacious three-storey entrance halls, robustly detailed, with interesting use of concrete sculpture poured in situ.
Architect, Irving Grossman (Toronto).

Aquarium (and Dolphin Pool) (see also page 138).
Adjoining buildings in the La Ronde (amusement) area, sponsored jointly by the Alcan Co. and the city of Montreal and to remain as one of Expo's permanent contributions to the amenities of the city. Ingenious multi-level planning, using interpenetration of cylindrical shapes, well expressed externally in concrete with bronze-coloured aluminium trim. The aquarium will serve serious scientific purposes as well as providing entertainment.

37, *dolphin pool (left) and aquarium, at La Ronde.*

The Dolphin Pool consists chiefly of a stepped arena, seating 900 and focusing on an elliptical glass-walled pool in which the dolphins perform. Out of public view are

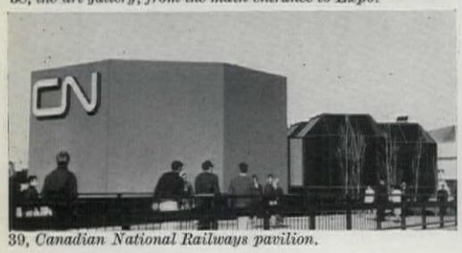
[continued on page 164

other pools which are the dolphins' living quarters. The helically curved shell-concrete roof of the arena developed as a set of spirals, rising towards the centre and rotating in the same direction. Impressive behind-the-scenes installations.
Architect, George F. Eber (Montreal). Structural engineers, Blauer Horvath Associates (Montreal).

Art Gallery

One of the permanent buildings in the Cité du Havre section, covering (together with the temporary Industrial Design and Photography pavilions) the Man the Creator segment of the Expo theme. Simple and four-square, with a central staircase hall lighted on each side by a recessed window combined with a cantilevered balcony; galleries top-lit.
Architects, Gauthier & Guité and Gilles Cote & John Bland (Montreal).


38, *the art gallery, from the main entrance to Expo.*



39, *Canadian National Railways pavilion.*

Canadian National Railways

A cluster of chamfered cubes in steel and dark glass housing a variety of cinematic exhibits in its sequence of air-conditioned cells. Entrance and exit not clearly differentiated. Has the right temporary exhibition look.
Architects, John B. & John C. Parkin (Toronto).

Christian Pavilion

Promoted jointly by eight Canadian Christian denominations; one of the more successful of the miscellaneous pavilions of this kind, though its architectural character oddly reminiscent of Japanese Shinto temples. The triangular-roofed exhibition hall approached through an enclosed courtyard. Interior dull.
Architects, D'Astous and Pothier (Montreal).


40, *Christian pavilion: entrance on right.*

European Communities Pavilion

Built of steel to emphasize the part the steel industry has played in unifying the economies of European nations. An oversailing faceted polished roof, dashingly shaped, covers a two-storey exhibition area

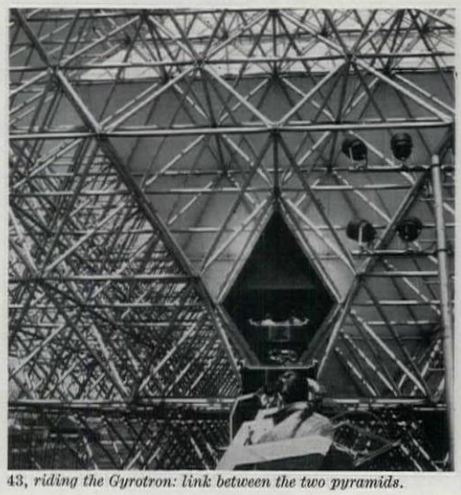

41, *European Communities: burnished steel roof.*

with ramped one-way circulation and a cinema.
Architects, Crivelli, Serafini-Pozzi and Bowenter (Rome).

Garden of Stars

The music-hall and cabaret theatre beside the lake at La Ronde, seating 1,500. A plain, straightforward building but with some refinement of profile compared with the more lumpy buildings of similar purpose in the Cité du Havre.
Architect, Max Roth (Montreal).


42, *Garden of Stars at La Ronde.*


43, *riding the Gyrotron: link between the two pyramids.*

Gyrotron (see also page 139).

The dominating structure at La Ronde: a pyramid of aluminium tubes within which (and within a smaller linked pyramid) is a ride designed to create the illusion of space travel followed by a frightening plunge to the inside of the earth. Supposed to accommodate 3,000 people an hour. The ride cannot be reported on since it was closed during the first fortnight of the exhibition while some technical defects were overcome but is said not to live up to its pretentions. Visually, however, it is an exciting-looking structure with a festive air of fragility, whose stresses were only calculable by computer.
Designers, Sean Kenny and George Djurkovic (London). Structural engineer, Boyd Auger (London). Canadian associates, De Paoli and Borek (Montreal).

Habitat

The experimental, prefabricated housing project—a permanent structure; perhaps the starting point of a larger similar development. As is stands, one of the undoubted popular successes of Expo, fully described and commented on elsewhere (see pages 143–150).
Architects, Safdie and David, Barott, Boulva (Montreal). Structural consultant, A. E. Komendant (Montclair, New Jersey). Structural engineers, Monti, Lefebvre, Lavoie, Nadon and Associates (Montreal).

International Trade Centre

For businessmen visiting Expo; contains banking facilities, trade enquiry bureaux and a club—sponsored by the Canadian


44, *one of the entrances to Habitat.*

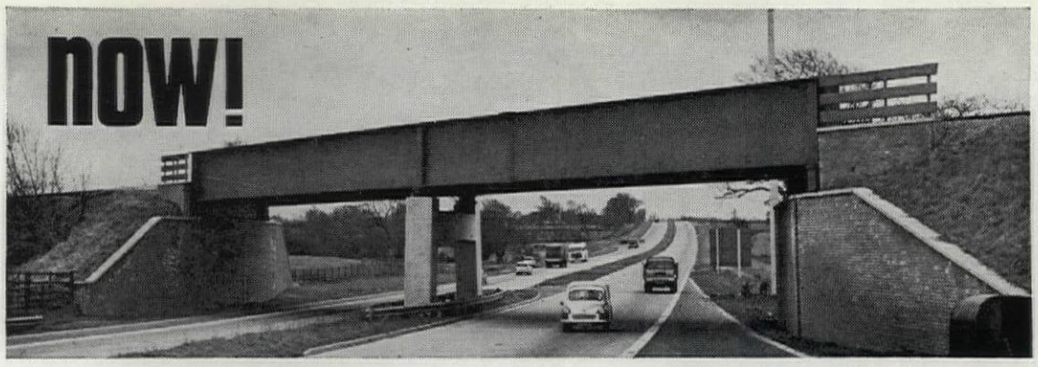

45, *International Trade Centre.*

Bankers' Association. A light timber-framed building; one of the best (except for the administration building) of those grouped—somewhat haphazardly—near the main entrace on the Cité du Havre.
Architects, D'Astous and Pothier (Montreal).

Place des Nations

A setting for ceremonies and special events, alongside the Expo Express station on Ile Ste. Hélène, in the form of a square enclosed space surrounded by blocks of tiered seats, stages, a speaker's tribune, band terraces, etc., with reception halls and restaurants beneath the raised portions. Emphatic geometry contributes the right degree of formality. Demountable concrete

[continued on page 166



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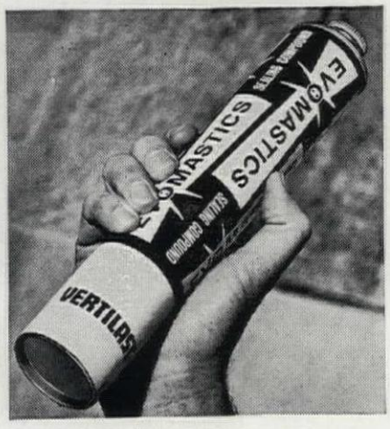

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EVOMASTICS

46, *Place des Nations, from the Expo Express station.*

elements linked by laminated timber walkways, crisply detailed. Holds 7,000. *Architect, André Blouin (Montreal).*

Theme Pavilion: Man in the Community (see also page 142).
On the Cité du Havre. A successful exhibition *tour-de-force* consisting of a pagoda of overlapping baulks of Western Canadian timber linked to a lower building of similar construction. Contains an unusually elegantly designed covered water-garden difficult to find the way into

47, *timber pyramid forming part of Man in the Community.*

and a long series of exhibition galleries (one-way circulation) nearly as difficult to find the way out of. Seriously and clearly mounted displays dealing with problems of health, leisure and social relationships. *Architects, Erickson and Massey (Vancouver).*

Theme Pavilions: Man the Explorer and Man the Producer (see also pages 140–141). Buildings of similar design and construction that dominate their areas of the two islands: bulky structures in the form of truncated tetrahedrons that at first glance appear clumsy and utterly wrong in scale, but whose architectural merits become apparent on longer acquaintance. When only the fully clad walls are visible, they do nevertheless, remain unfortunate in scale because of the large size of the stained plywood shingles used. These (regrettably) conceal a fascinating series of steel space-frames, forming walls, roofs and floors (if such a complex piece of geometry can be said to have such conventional components). Where the space-frames (which are of pre-rusted steel) are exposed, particularly within the hollow centres of

48, *rusted steel and plywood shingles: part of Man the Explorer.*

the structure, they create highly satisfying interpenetrations of space, heroic in scale, though some of these areas give the impression of being exposed because they are unfinished rather than because they are so designed. The structural system is infinitely extendable. Weight of steel enormous (because, it is claimed, of the live loads the pavilions were required to take) and a refreshing under-employment of space—far more of the space provided by the decks is used for circulation than is enclosed for exhibition purposes. A one-way circulation system confused by ease of access by exit stairs. The planning of Man the Producer is most skilfully related to the levels and approaches of the Expo Express station adjoining it. The exhibits fairly conventionally presented, except for a brilliant device in the Man the Explorer building where the visitor walks on a glass floor with natural specimens in an illuminated space beneath.
Architects, Affleck, Desbarats, Dimakopoulos, Lebensold and Sise (Montreal). Structural consultants, Eskenazi and Baracs, de Stein and Associates (Montreal).

United Nations Pavilion
Under the auspices of the World Federation of United Nations Associations. A drum-like film-theatre and exhibition hall mounted on a rectangular platform bearing a vivid demonstration that there is nothing so decorative as massed flags (122 in this instance), with which the architecture is sensible enough not to try to compete. *Architects, Eliot Noyes and Associates (New Canaan, Connecticut). Canadian associate architects, Donaldson, Drummond and Sankey (Montreal).*

49, *flags of the United Nations.*

Contractors

British Pavilion, Montreal Expo. *Architects:* Sir Basil Spence, Bonnington and Collins. *General contractor:* Robert McAlpine (Canada) Ltd. *Sub-contractors: Steelwork:* Redpath Brown Ltd. *Asbestos cladding:* Turner Asbestos Cement Co. *Air-conditioning plant for VIP lounge:* De la Rue Frigistor Ltd. *Flagpoles:* Sparlight Ltd. SHAPING THE NATION: *Designer:* Sean Kenny. *Display contractor:* City Display Productions Ltd. *Revolving platform:* Hall Stage Equipment Ltd. THE GENIUS OF BRITAIN: *Designer:* Beverley Pick. *Display contractor:* City Display Productions Ltd. *Mezzanine platform:* Redpath Brown Ltd. *Carpet:* Templeton Ltd. *Floor tiles:* Marley Ltd. BRITAIN TODAY: *Designer:* James Gardner. *Display contractor:* Frank W. Clifford Ltd. *Carpet:* John Crossley & Son. INDUSTRIAL BRITAIN: *Designer:* Theo Crosby. *Display contractor:* Beck & Pollitzer Contracts Ltd. *Carpet:* Debron Ltd. *Assistance with perspex sheet material:* Imperial Chemical Industries. *Industrialized building system:* Richard Thomas & Baldwin Ltd. BRITAIN IN THE WORLD: *Designer:* Mario Armengol. *Display contractor:* City Display Organization. *Turntables:* Hall Stage Equipment Ltd. *Floor tiles:* Armstrong Cork Co. *Lighting:* Atlas-Tungsten Iodine Lamps Ltd. *Casting of aluminium figures:* Morris Singer Ltd. MISCELLANEOUS: *Special lighting fittings:* Strand Electric Ltd. *Carpet underlay VIP lounge, admin block, section 3:* Duralay Ltd. *Furniture:* Hille of London Ltd. *Door furniture:* Modric Ltd.

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S.O.S.

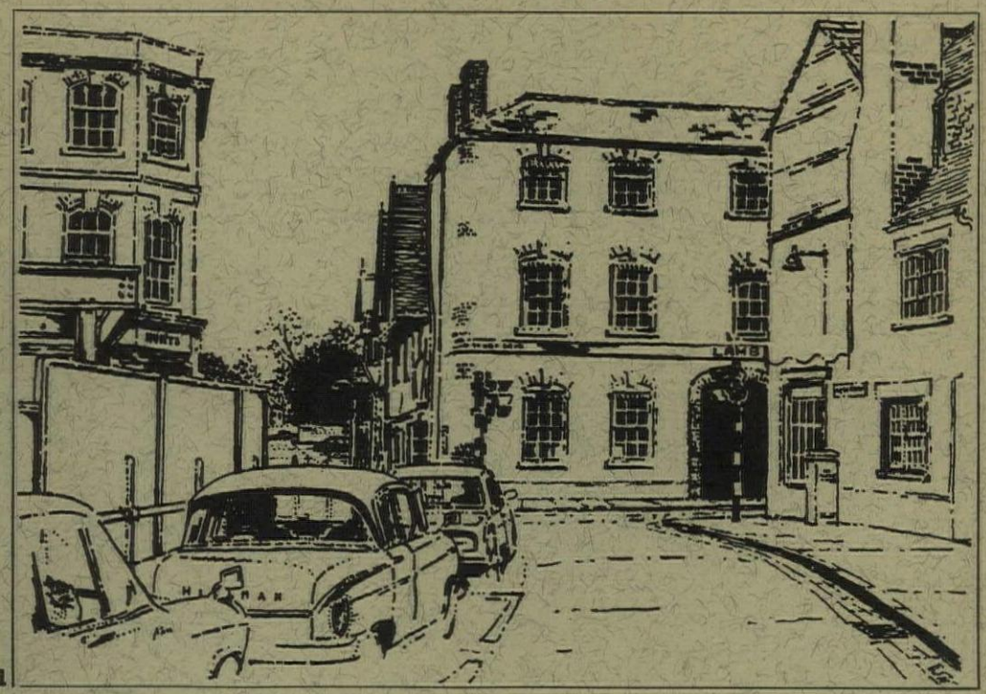
WALLINGFORD, BERKS
The northern exit from Wallingford's admirable town centre; the Lamb Hotel, 1 and 2, now empty. If it goes, it will be a triple loss; as a town amenity, as a good Georgian building, and as an essential narrowing to the view.

2

CAUTION

MIDLANDS CANAL
The photograph, 3, and quotation come from a recent publication of the Inland Waterways Association:
'This attractive scene is in an industrial Midland town . . . it shows how a canal can look if some thought is given to the subject.'
From a magazine which has pushed the canal cause for a quarter of a century, and wished the IWA nothing but goodwill, could we say that this is just how a canal will look if *no* thought is given to it, and the existing municipal gardening standards of roundabouts and civic centres are carried through to this 'new recreational amenity.' Stagnant water and dead cats is at least an honest death; this new kind of prettying-up is no better than embalming.

PORTSMOUTH, HANTS
Strange bedfellows on either side of Comper's wonderful church of St. Philip, Cosham. To the east, council flats which are a dead null of unexpressiveness, 4, making the pre-war western neighbour



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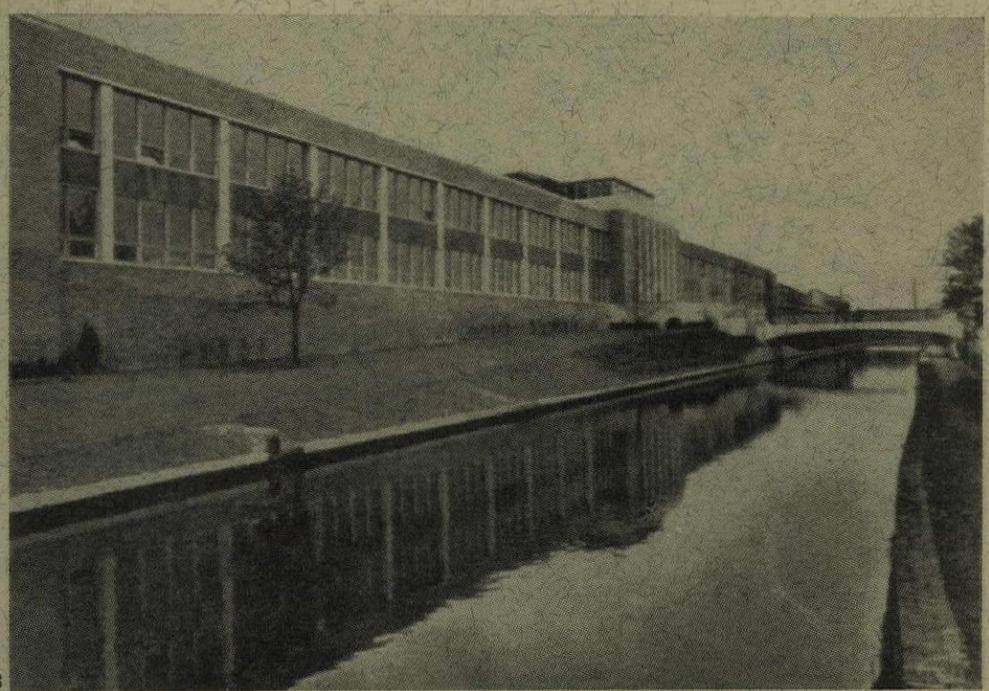

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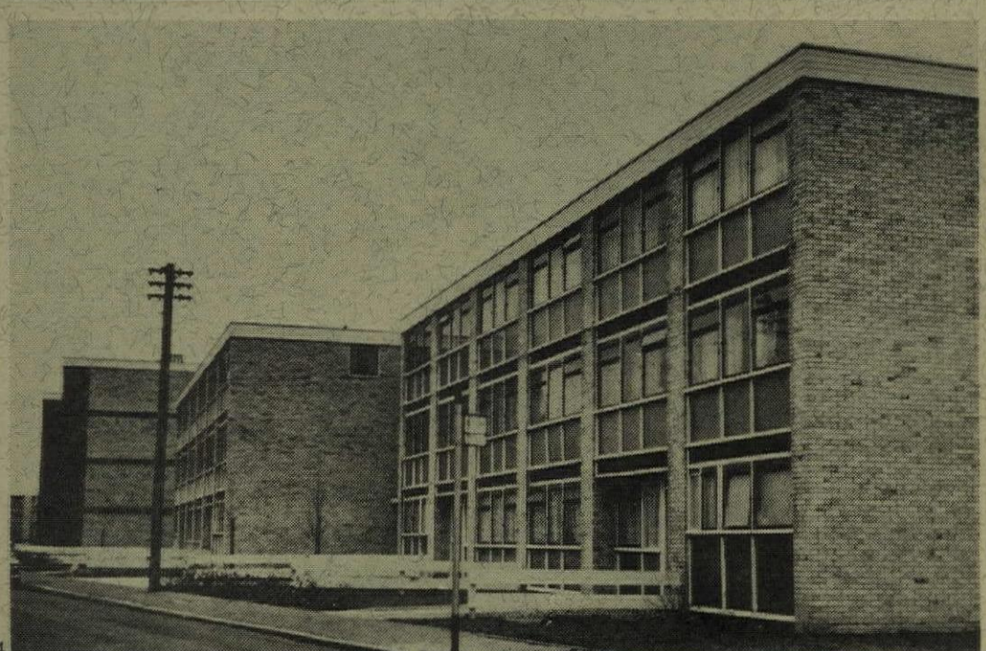


4

5

almost a marvel of personality, 5; at least it has bow windows—a Portsmouth trademark—and a scroll or two. If this is what forty years of the modern movement does then we need another revolution.

OUTRAGE

EXETER AND PLYMOUTH

Designs as mixed as 6 and 7 could be fun if they had been done a hundred years ago in Ohio by designers who had never seen a qualification form. They would then have had the necessary *joie-de-vivre*. These specimens are: 6, the George Street Baptist Church, Exeter, and, 7, the Unitarian Church, Plymouth. They were put up very recently, and are due to the highly qualified firm of de Soissons, Peacock, Hodges, Robertson and Fraser.

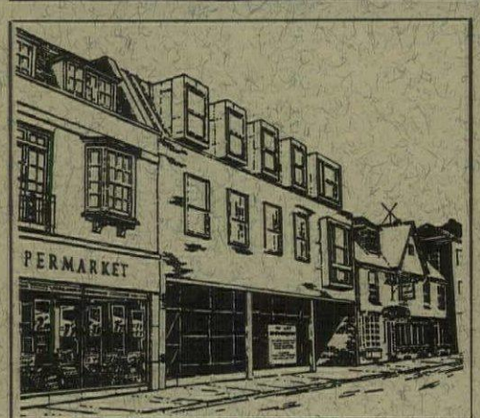
EDINBURGH

Another fringe attraction for Festival visitors, 8; this is the southern edge of the city, near Colinton. The contrast between the dignity of the centre and the stagnant meanness of the outskirts gets more apparent every year.

BERMONDSEY, LONDON

A shot of new flats, 9, which employ a putting-people-in-pigeonholes aesthetic that one would hope was long dead. What on earth can be the feelings of the pigeon—sorry, person—in the x'th floor of the flats or the y'th window of the maisonettes?

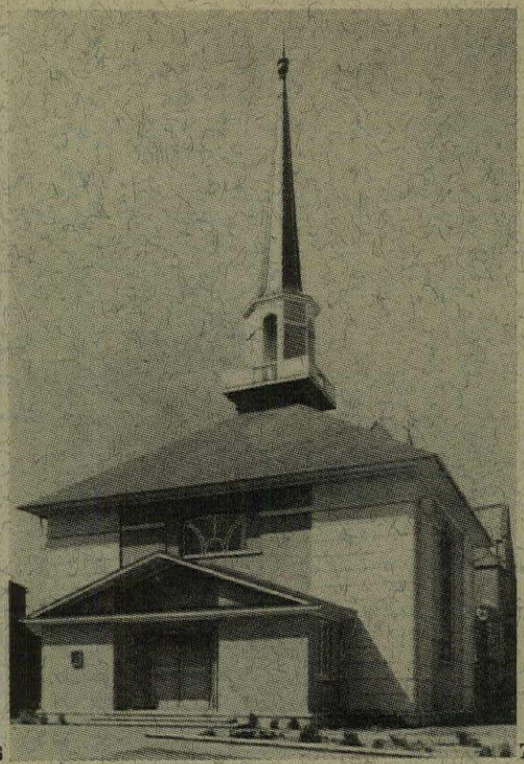
CREDIT



10

PETERSFIELD, HANTS

An upturn in design at last, 10, in this cornice-ridden town. Designers are now looking at the spirit rather than the letter of the old streets—compare with the recent Olde Supermarket on the left-hand side.



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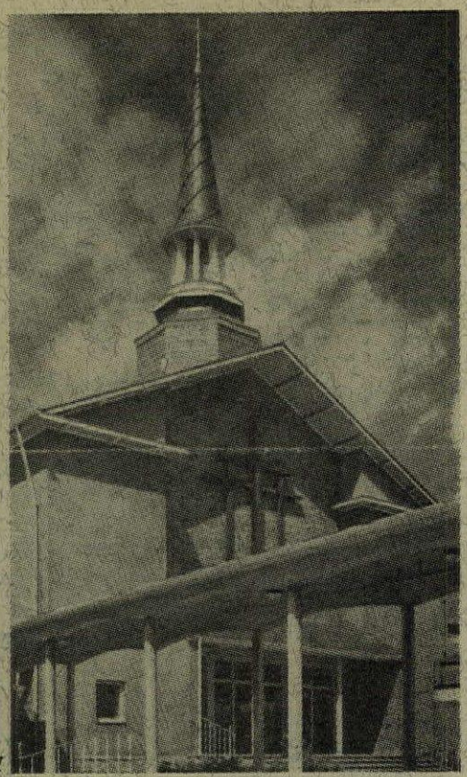

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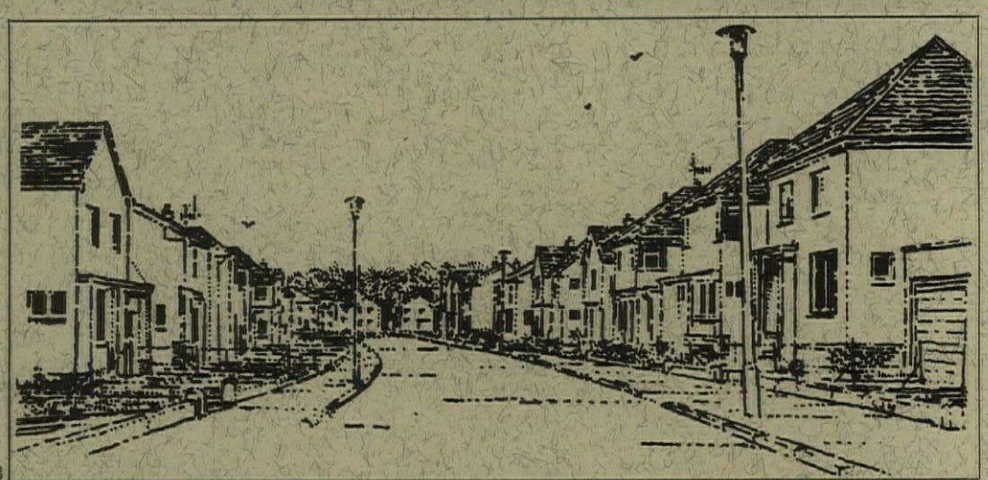

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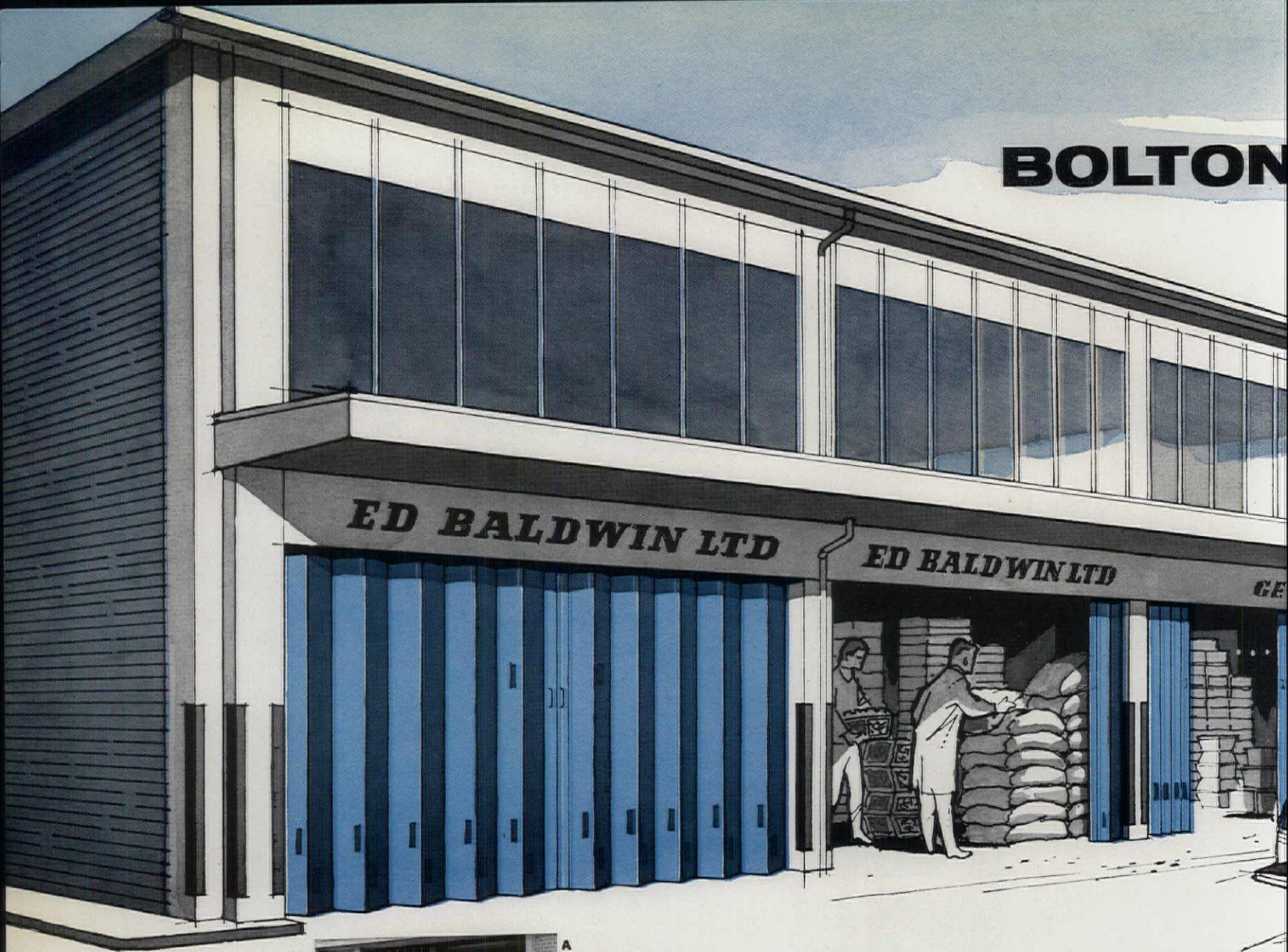
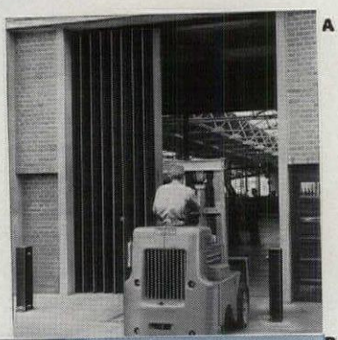




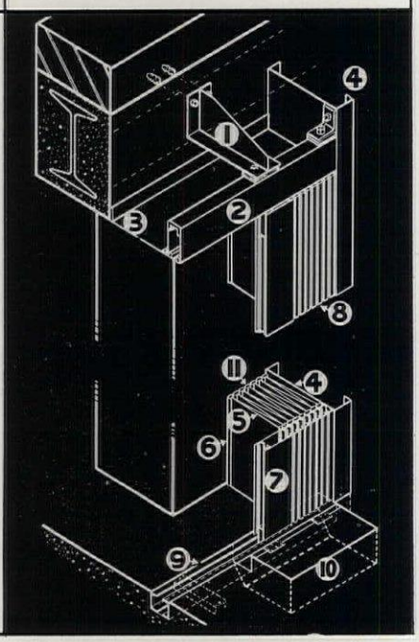
A *A factory installation of Bolton photo-cell controlled Shutter Doors.*

B *Bolton Shutter Doors installed in BEA Freight sheds, N. Ireland.*

C *Bolton Electrically operated Shutter Doors at Shoreditch Fire Station.*
Architects: Architect to the Greater London Council, Hubert Bennett, F.R.I.B.A.

This isometric drawing shows the ideal fixing for Bolton Shutter Doors. Suspending the box track from the inside face of the lintel allows the doors to bunch clear of the opening by folding behind the walls. The cover plate (3) and the end panels (4) make the installation draught-resisting.

1. Welded mild steel suspension bracket.
2. BOLTON patent, totally-enclosed box-type top track.
3. Mild steel cover plate for the exclusion of draught.
4. Mild steel end panels.
5. 16's gauge (1.63 mm.) mild steel shutter leaves, Sherardised against corrosion.
6. Non-ferrous hinging strip.
7. Rigid front to accommodate locking arrangement.
8. Steel pickets on which the door is built.
9. Self-cleaning bottom track, built up from rolled steel channels.
10. Mild steel sump-box with hinged lid to facilitate cleaning out.
11. Shutter leaves rolled round $\frac{1}{8}$" (3.2 mm.) diameter wire reinforcement to give great vertical strength.

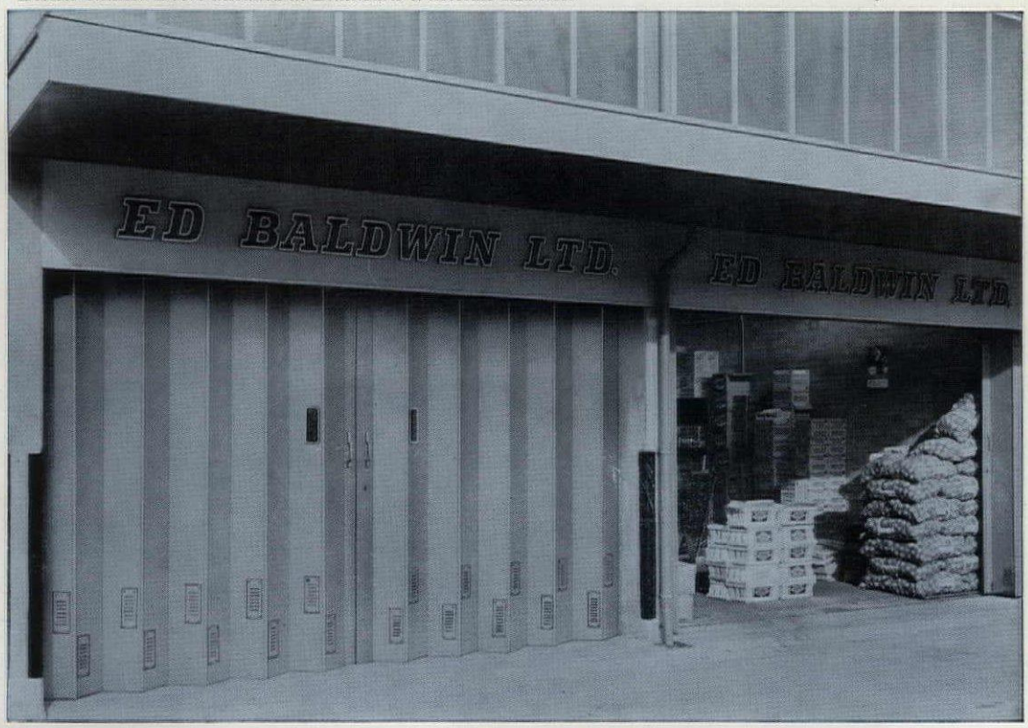


SHUTTER DOORS ARE BUILT TO LEAD A BUSY LIFE - AND LAST!

Bolton Shutter Doors installed in Blackburn Wholesale Market.

Fruit market.... fire station.... freight sheds.... factory.... four typically busy situations for which Bolton Shutter Doors have been selected. In some of these they will have to withstand rough, heavy usage - they're built to! In others they must provide instantly easy operation - they're designed to! The basic reasons why Bolton Shutter Doors satisfy so many needs are shown in the detail drawing. There are many variations - from standard sizes to purpose built doors accommodating overhead cranage or other special requirements. Sherardising is the standard finish: you can also have Stelvetite leaves or cellulosed leaves and they can all be fitted with vision panels up to 2′ 6″ deep. Bolton Shutter Doors can be power operated, and control methods vary from simple push button to remote radio.

Whatever your closure problem, a Bolton Shutter Door is the answer. Write for full information under ref AR663



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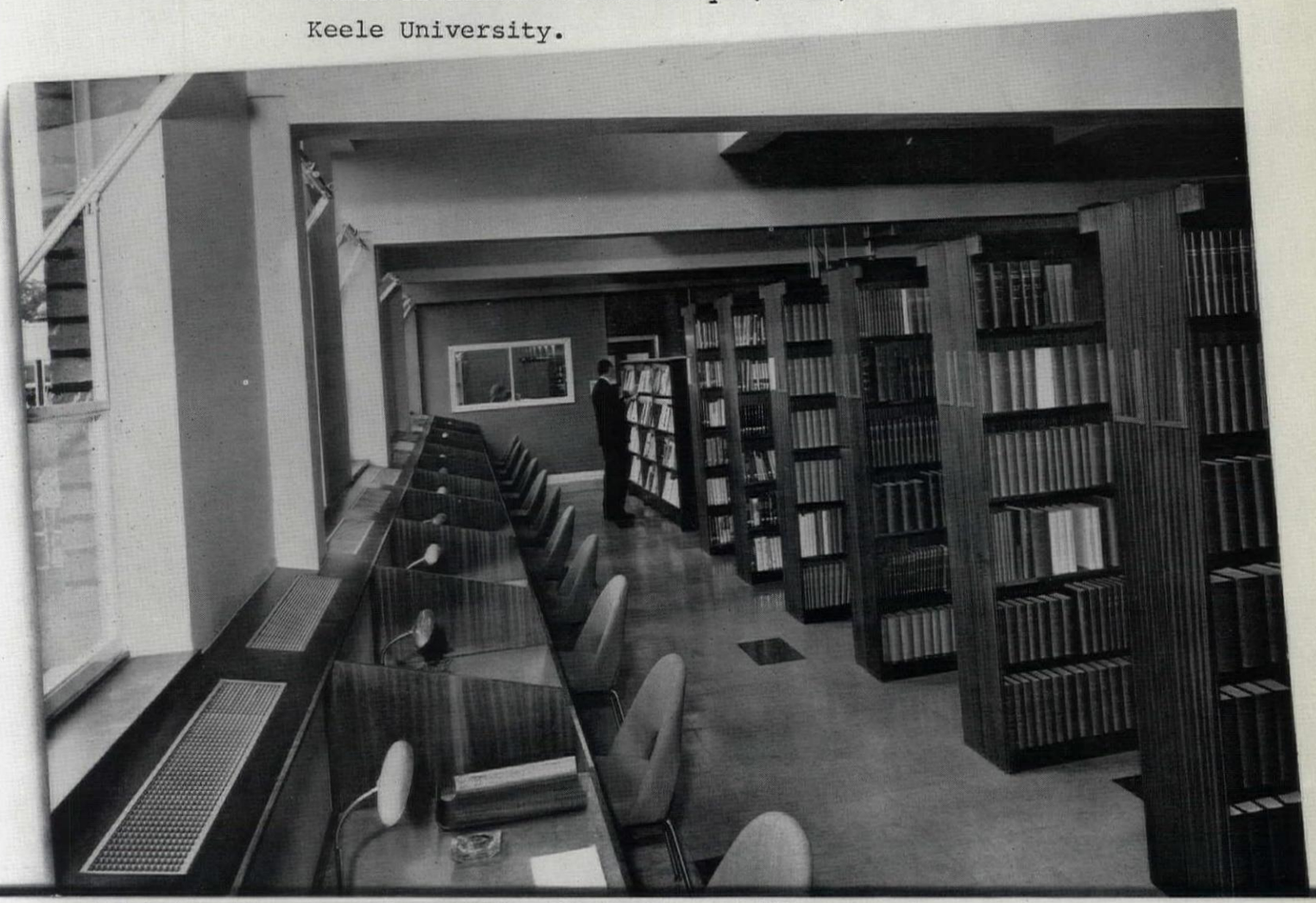

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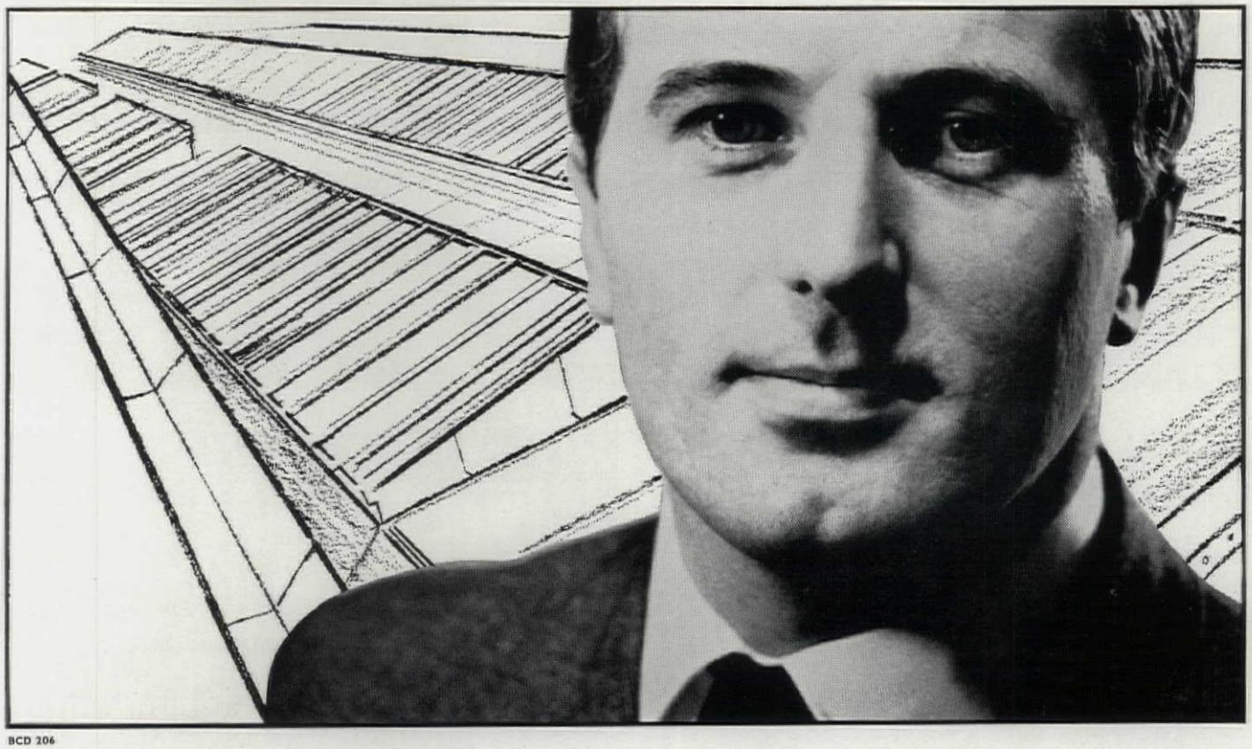

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