architectural design

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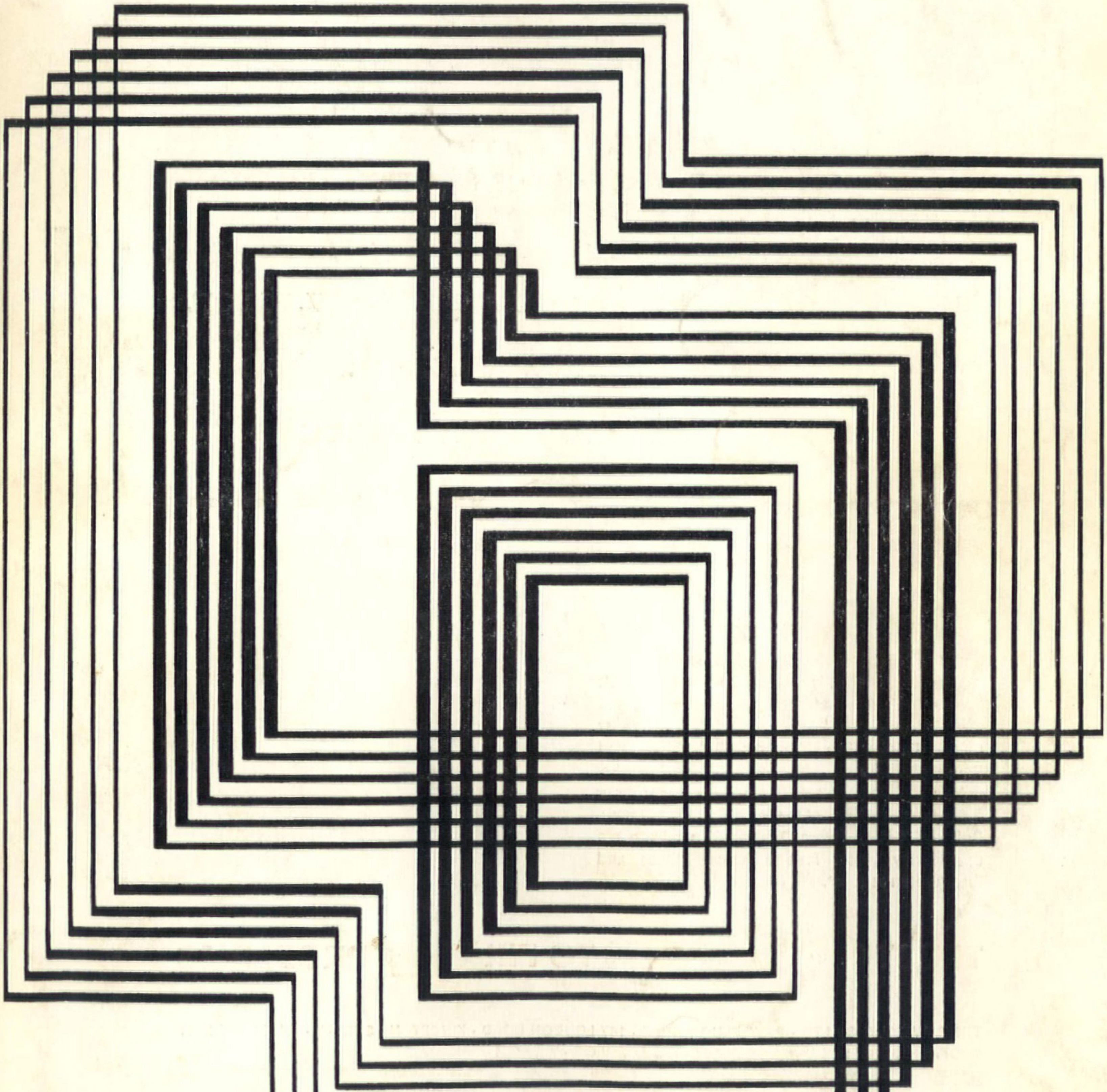

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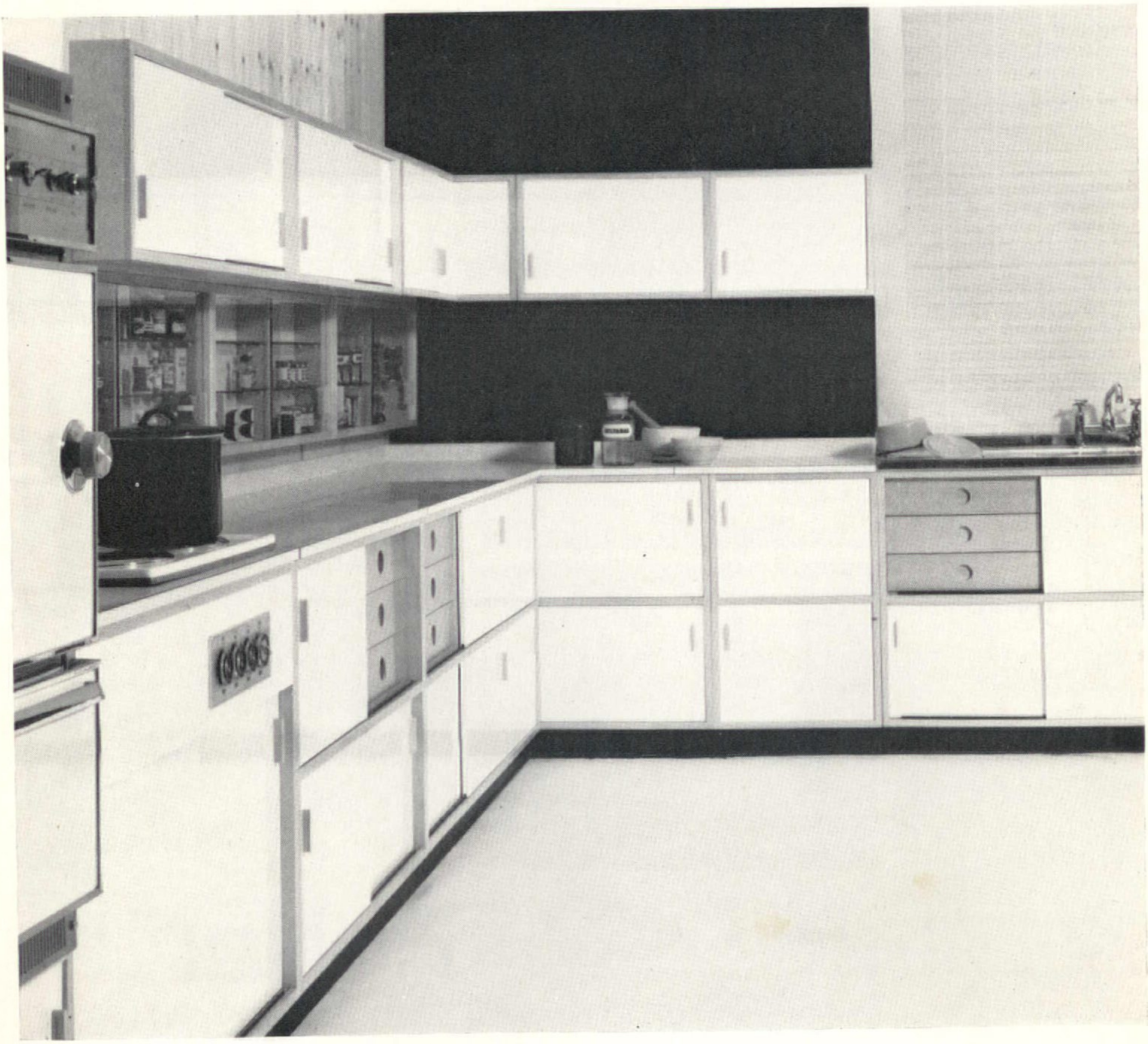

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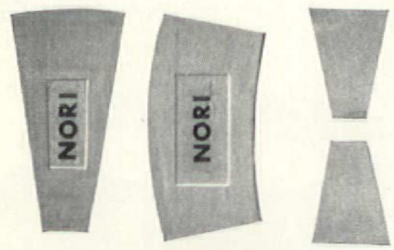

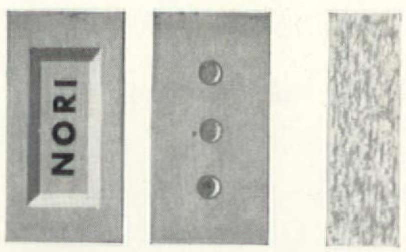

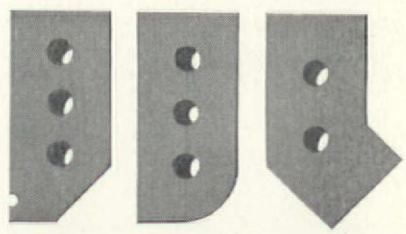

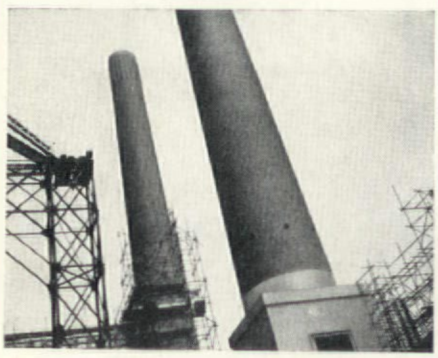

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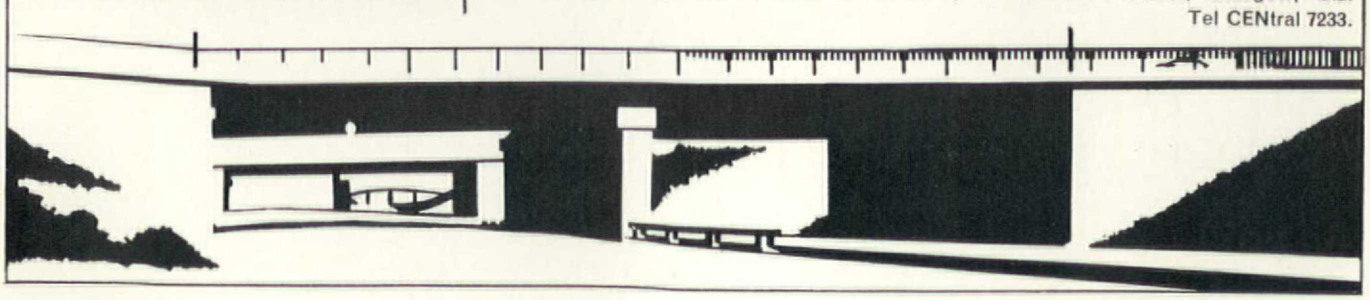
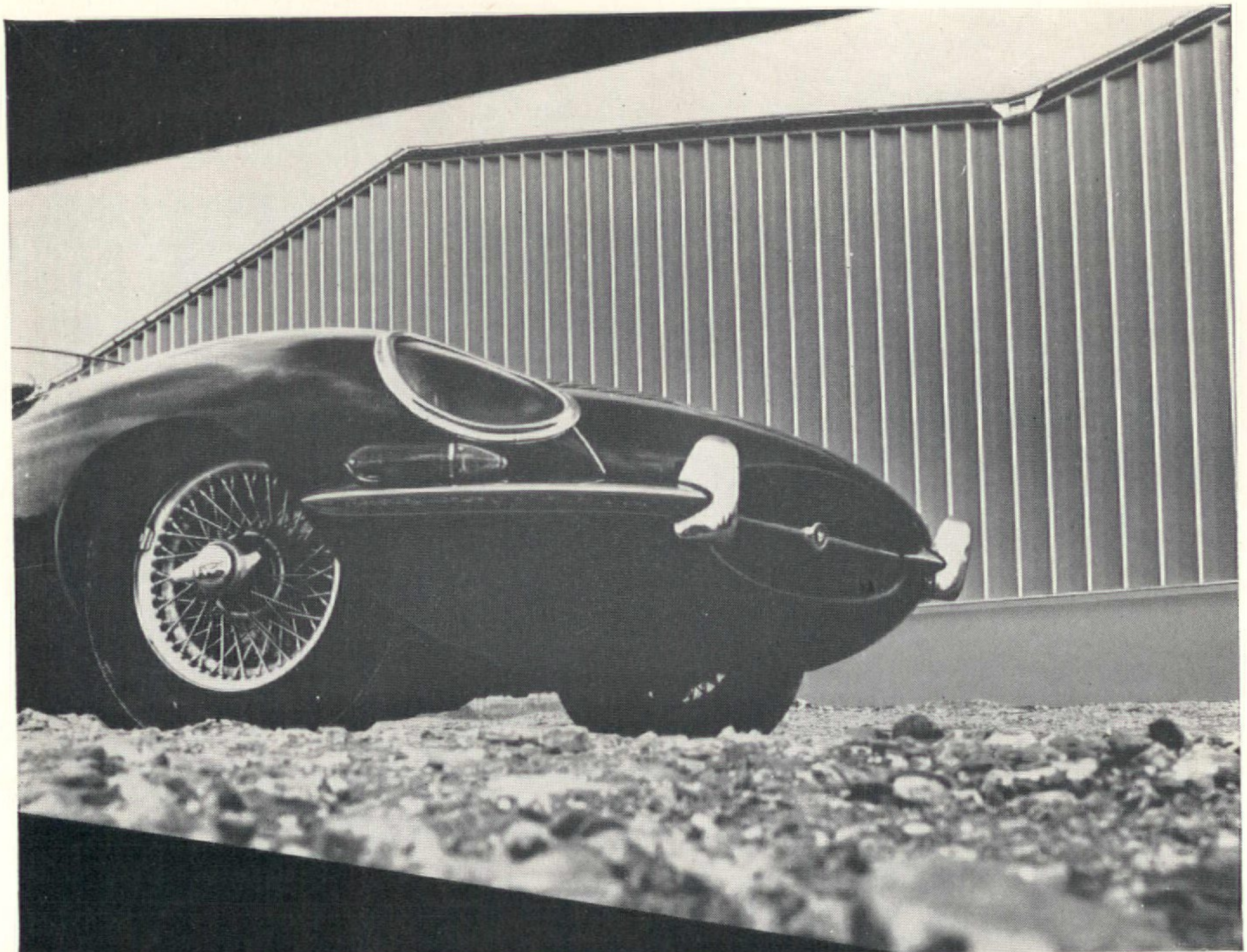
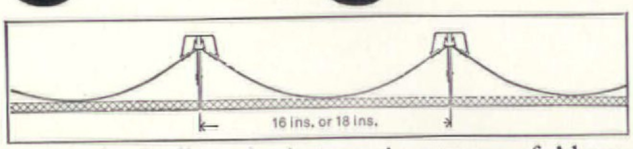




Southerngas store at Botley, Hants
Architects: Sutcliffe, Brandt & Partners, Southampton
Cladding contractors: James Chandler (Lewes) Ltd

Things that go whoosh, go together.



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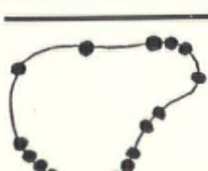

A TOWN CALLED ALCAN

is the title of the continuing series of studies on urban planning which has already introduced the Circuit Linear Town and The Scanner. It is part of a two-way traffic in ideas which we regard as an integral part of our business. We are interested in the problems facing architects and builders because we are well equipped to help in solving them. Our own team of building specialists is backed by the experience of Alcan companies all over the world and by the facilities of Aluminium Laboratories Limited, Europe's leading aluminium research organization. On this page we present one product that has grown from this traffic in ideas.

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dispersing

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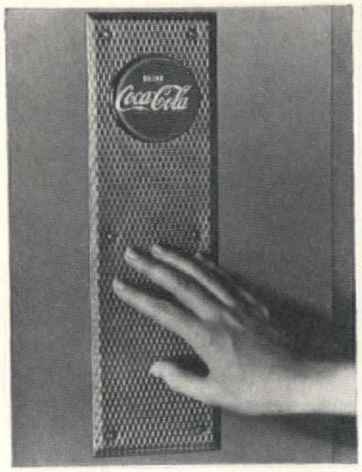
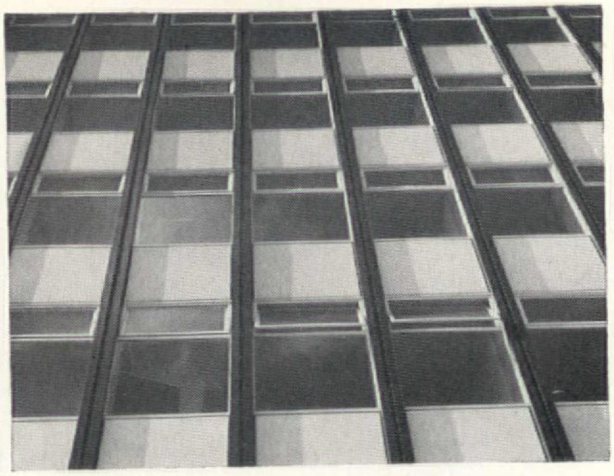
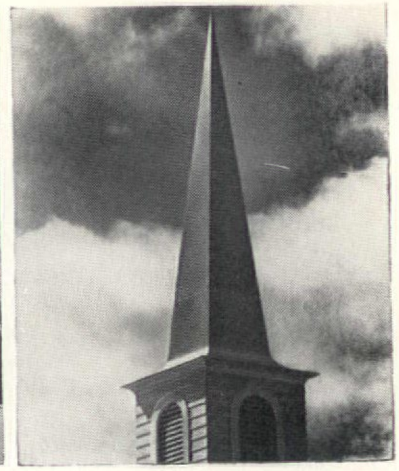
Ruberoid



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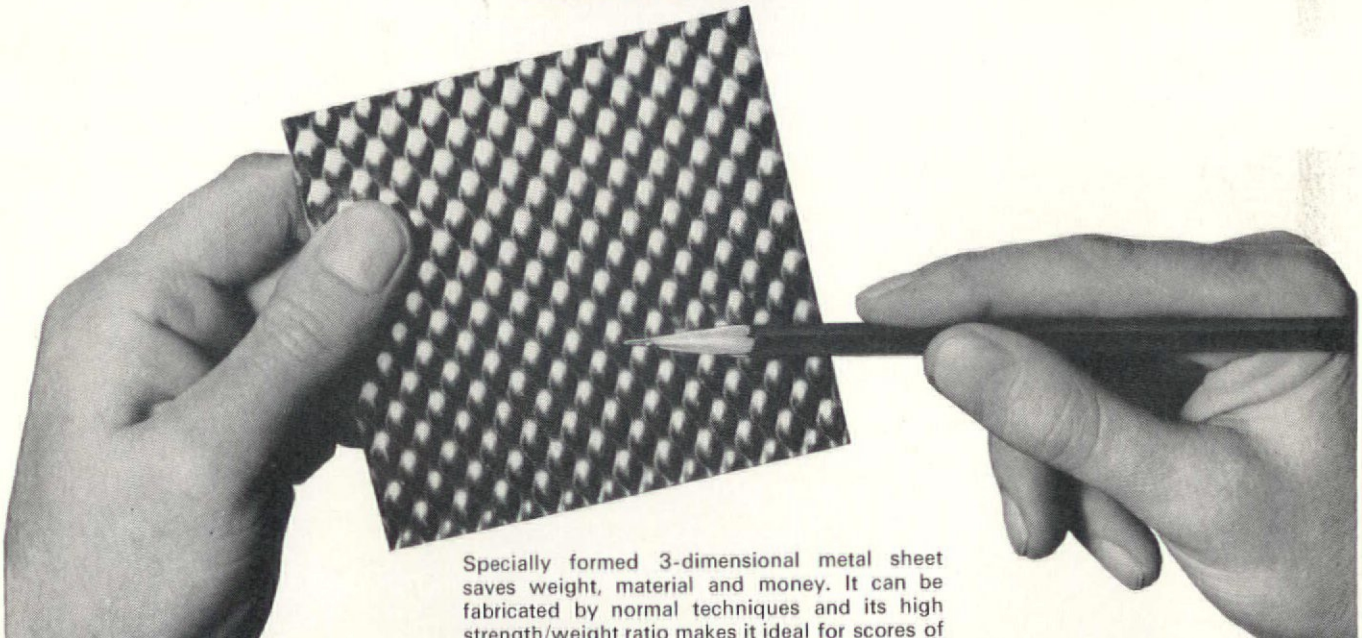

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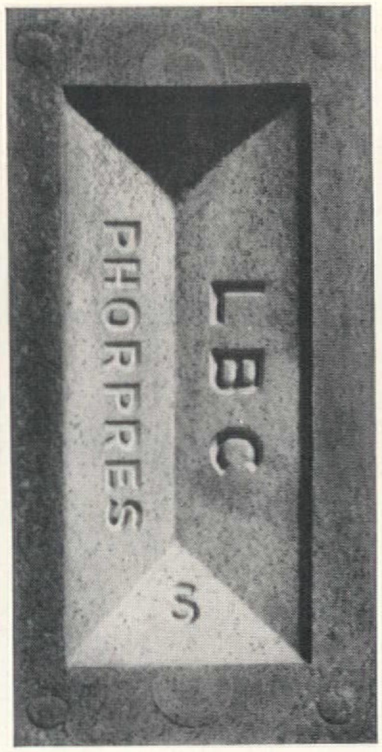
THE TOL OF THE ARCHITECT

Today the architect is under attack. The use of larger components in system building restricts his freedom of design. The growth of the package deal contract displaces his traditional position as leader of the building team.

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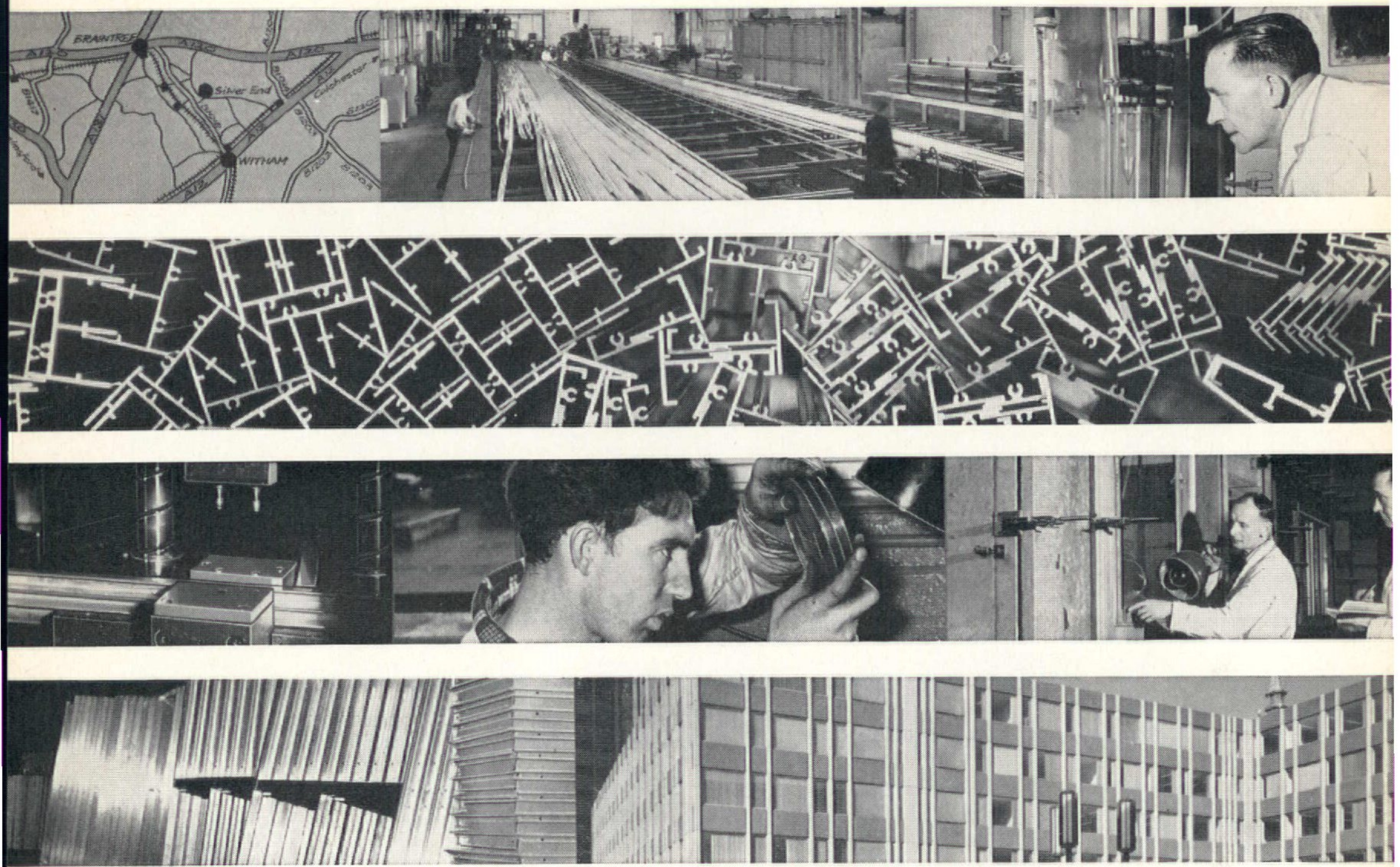
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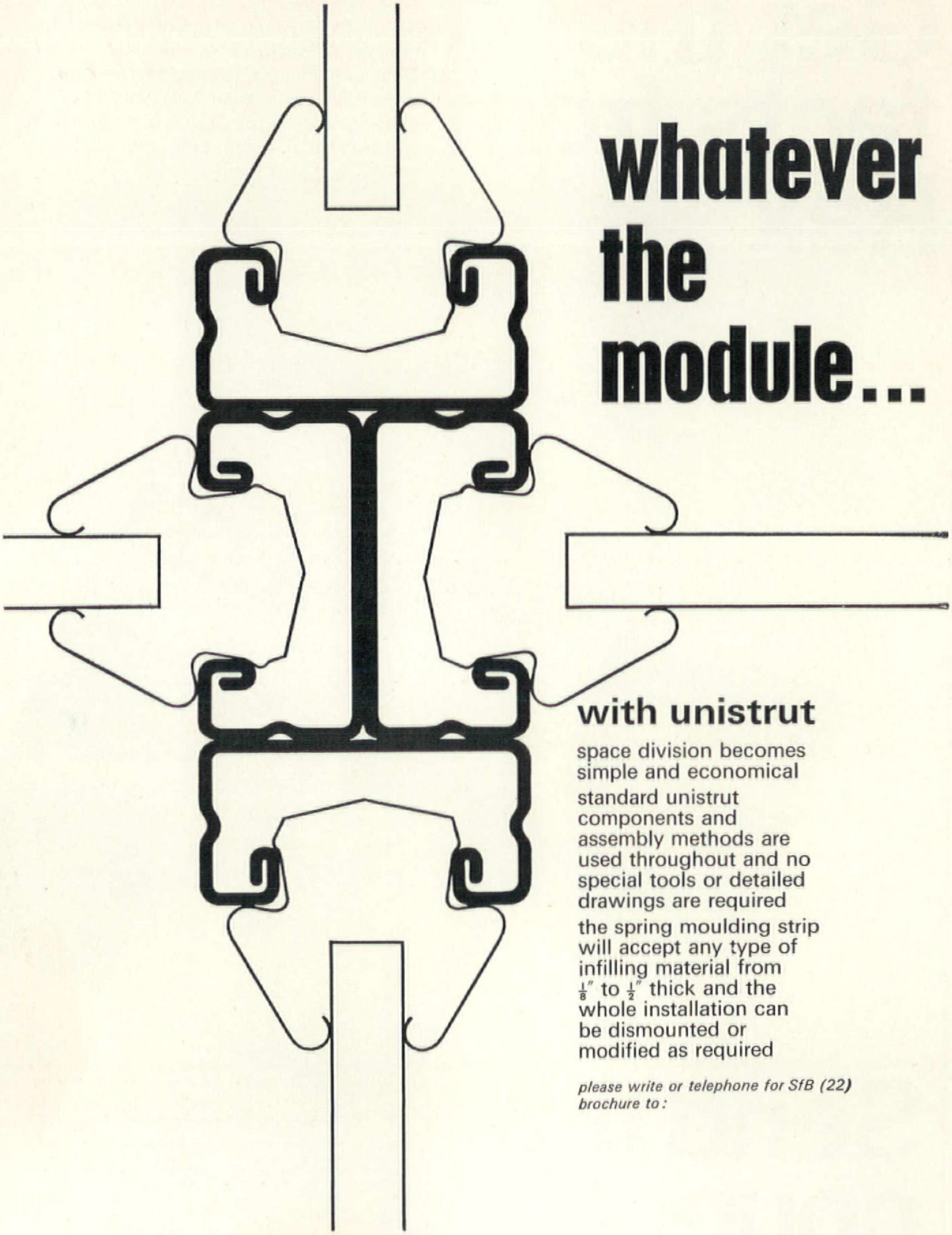

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Firth's new Contract Carpet Ranges cover every requirement of the Architect and Interior Designer and include a wide range of modern and traditional designs as well as colourful ranges of Plain qualities.
All designs have been created in Firth's Design Studio which is also available to create special designs and colourings to suit the style of a particular project.
Illustrated below is one of the new designs from our Showroom Range and one from our Oxford Range.

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The design above, No. 26/X939 is one of twelve modern designs in our Oxford Range in varying colourways available in New Oxford, Super Oxford, Extra Super Oxford, De Luxe Oxford in 27", 36" and 54" Body. 80% Wool, 20% Nylon.

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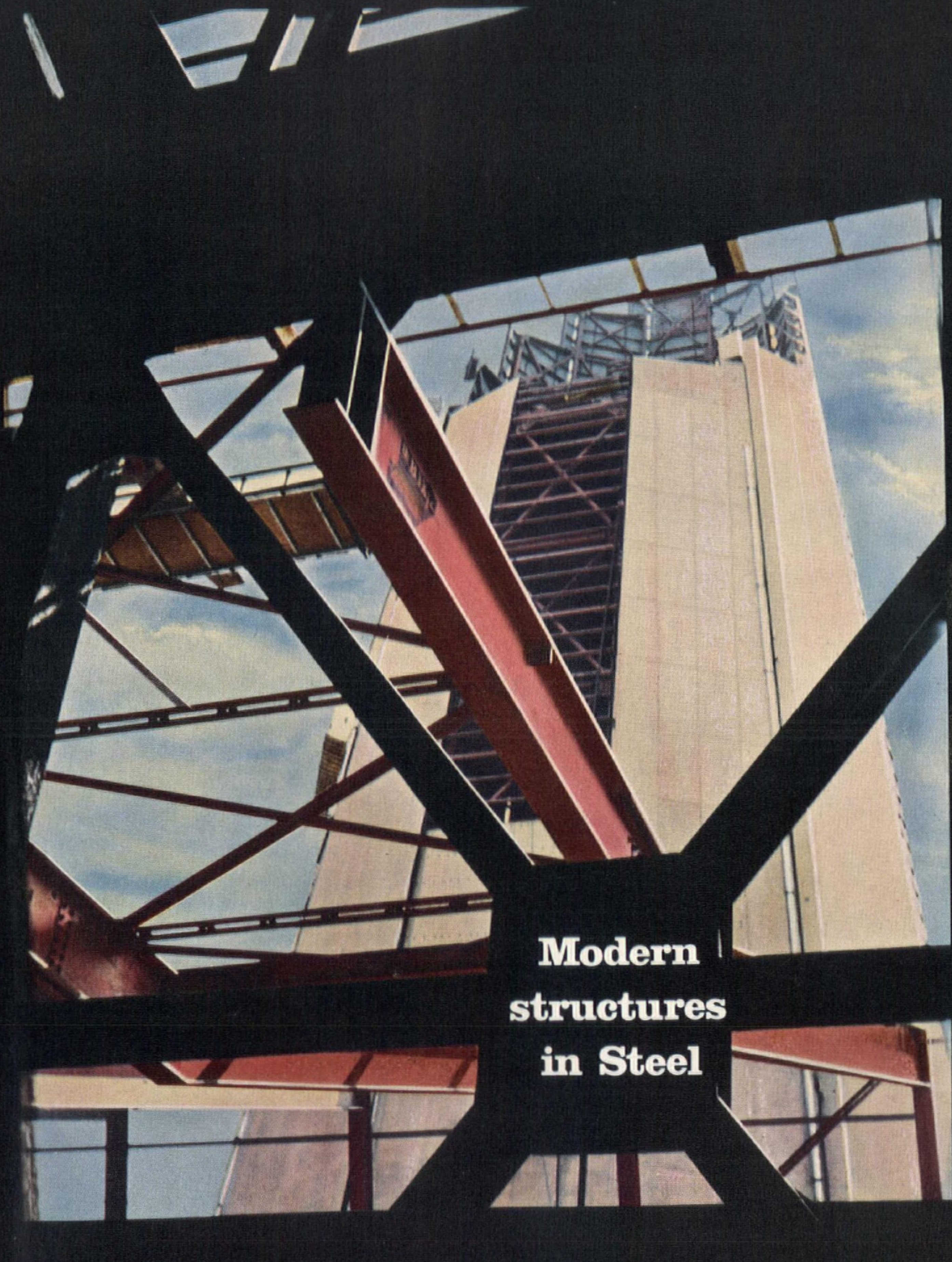
Illustrated is design No. 35/SR931, one of four designs available in two colourways in our Showroom Quality only — a quality created to fill the need for a medium priced, hard-wearing, textured carpet for Showrooms and similar situations. Made in 80% Wool, 20% Nylon in 27", 36" and 54" Body.



Modern structures in Steel

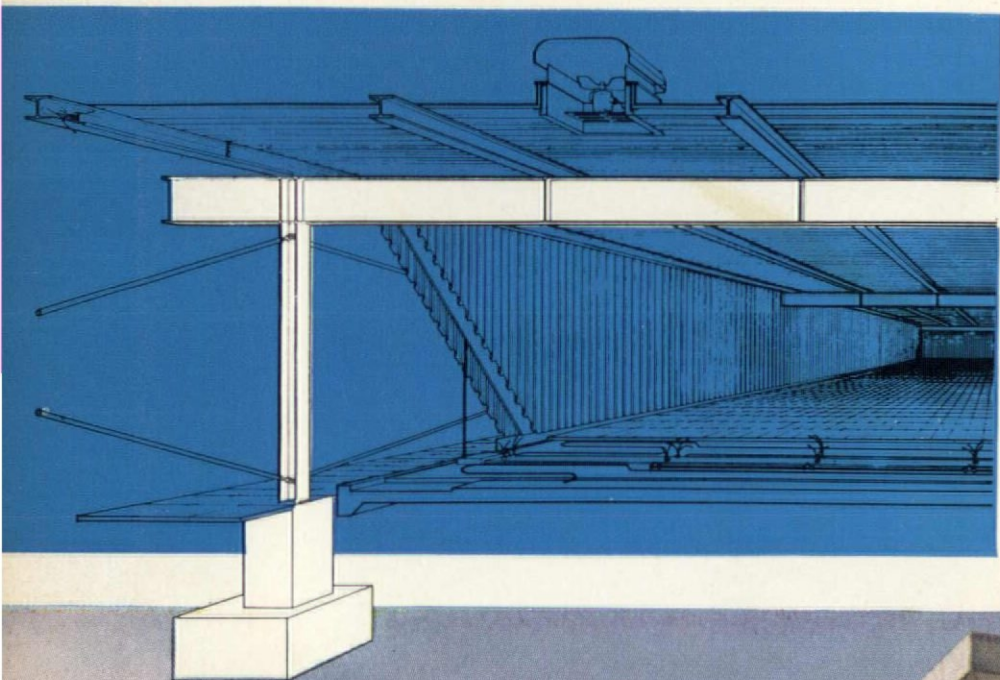
Functional design on a low budget

Steel-framed, steel-clad electronics factory

This remarkably economical project represents something of a break-through in industrial architecture. Its simple yet attractive design heightens the linear nature of the structural material its design group have employed throughout—*steel.* A functional solution was achieved working to a pressing 9-month schedule and a brief which required building cost to be *under* £3.10s. sq. ft. Speed in design and construction work, and provision for future extension and change, were aided by the choice of steel framing and maximum use of standardised elements. Plastic-coated galvanised steel sheet gives corrosion protection and a maintenance-free exterior colour finish to corrugated double-skin wall cladding. Full storey height panels are 12 ft high without intermediate support. Insulated steel deck roofing of similar trough section neatly recesses tubular fluorescent lighting and power feeds to ventilator fans.

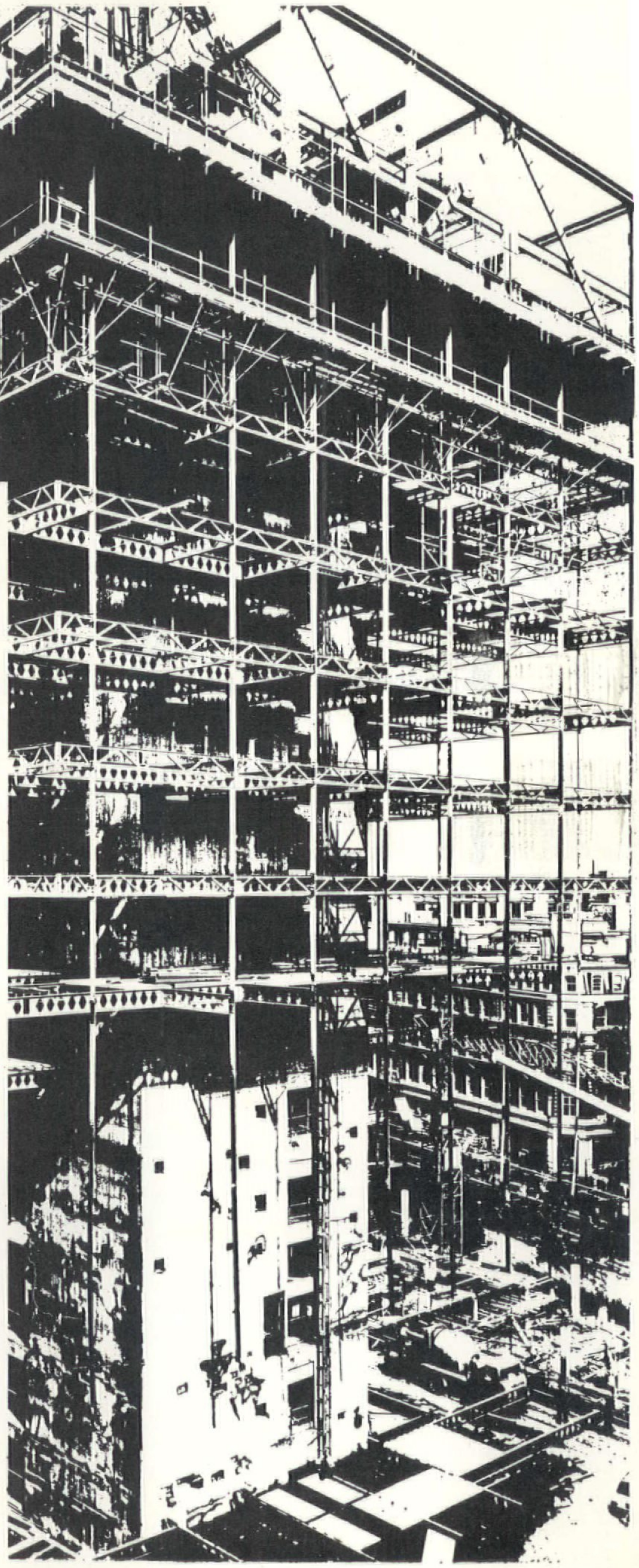
Services: These are integrated within the fabric of the building and along a central underfloor service trench, giving complete flexibility of planning and clean uncluttered interior. **Structural frame:** Steel Universal columns were erected with shop-welded 9-ft cross heads, and centre beam sections were temporarily bolted before site welding to produce continuous beams. Perimeter columns and diagonal tubular steel wind bracings are deliberately exposed as part of the design.

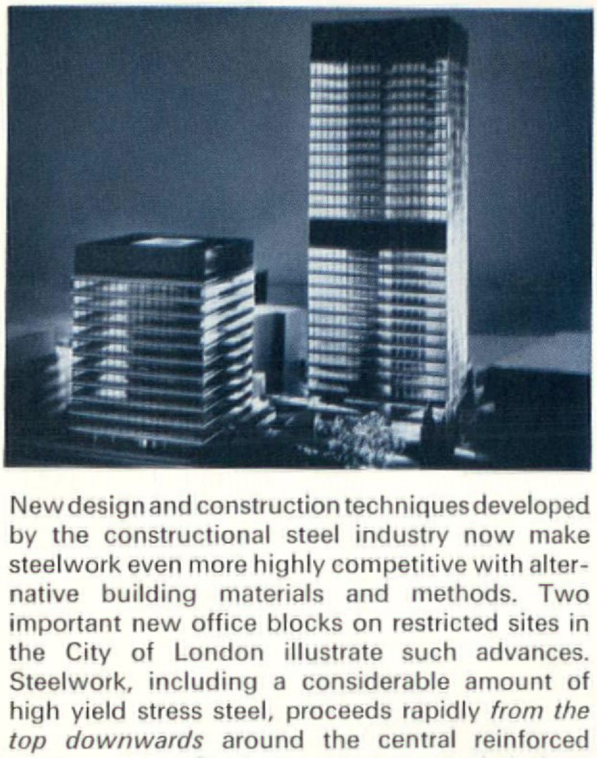
Electronics Factory at Swindon, for Reliance Controls Ltd. Design Group: Architects: Team 4—N. Foster, W. Foster, R. Rogers. Consulting engineer: Anthony Hunt. Quantity Surveyors: G. A. Hanscomb Partnership. Services: G. N. Haden & Sons Ltd.



Steelwork erected fast – from the top down

On restricted sites

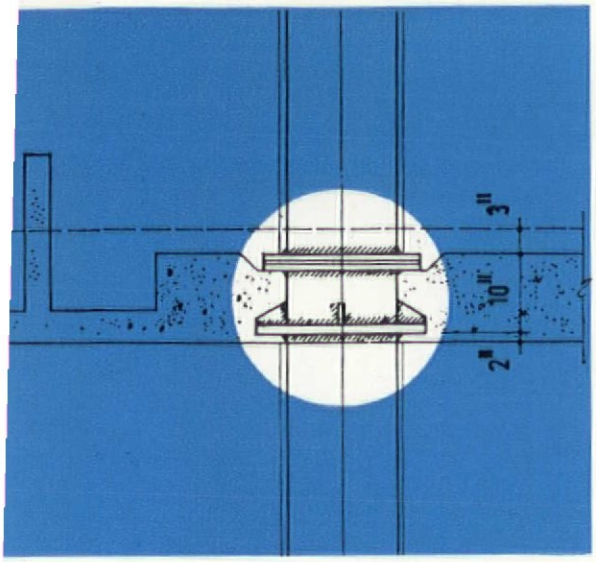




New design and construction techniques developed by the constructional steel industry now make steelwork even more highly competitive with alternative building materials and methods. Two important new office blocks on restricted sites in the City of London illustrate such advances. Steelwork, including a considerable amount of high yield stress steel, proceeds rapidly *from the top downwards* around the central reinforced service core. Steel hangers suspended from umbrella frameworks and regularly spaced on the external elevations support the outer ends of the structural steel floor beams. Diagonal members of the umbrella framework are connected to anchor blocks which are supported on corbels and attached to the core by means of post-tensioned prestressing cables. Important advantages: As there are no vertical columns, full use can be made of valuable floor areas. This structural technique achieves complete freedom of architectural planning with a valuable increase in profit-earning capacity—features previously thought to be incompatible in office buildings of this type. The castellated floor beams save structural weight and conveniently accommodate services. The buildings shown are being erected for the P & O (above left) and The Commercial Union Assurance Co.

Architects: Gollins Melvin Ward & Partners. Consulting engineers—responsible for structural design: Scott, Wilson, Kirkpatrick & Partners.

ngle-storey height steel columns are each connected by inch diameter 'Torshear' high-strength bolts. Welded eel collars further increase column-supporting areas and duce shear intensity within the reinforced concrete floor



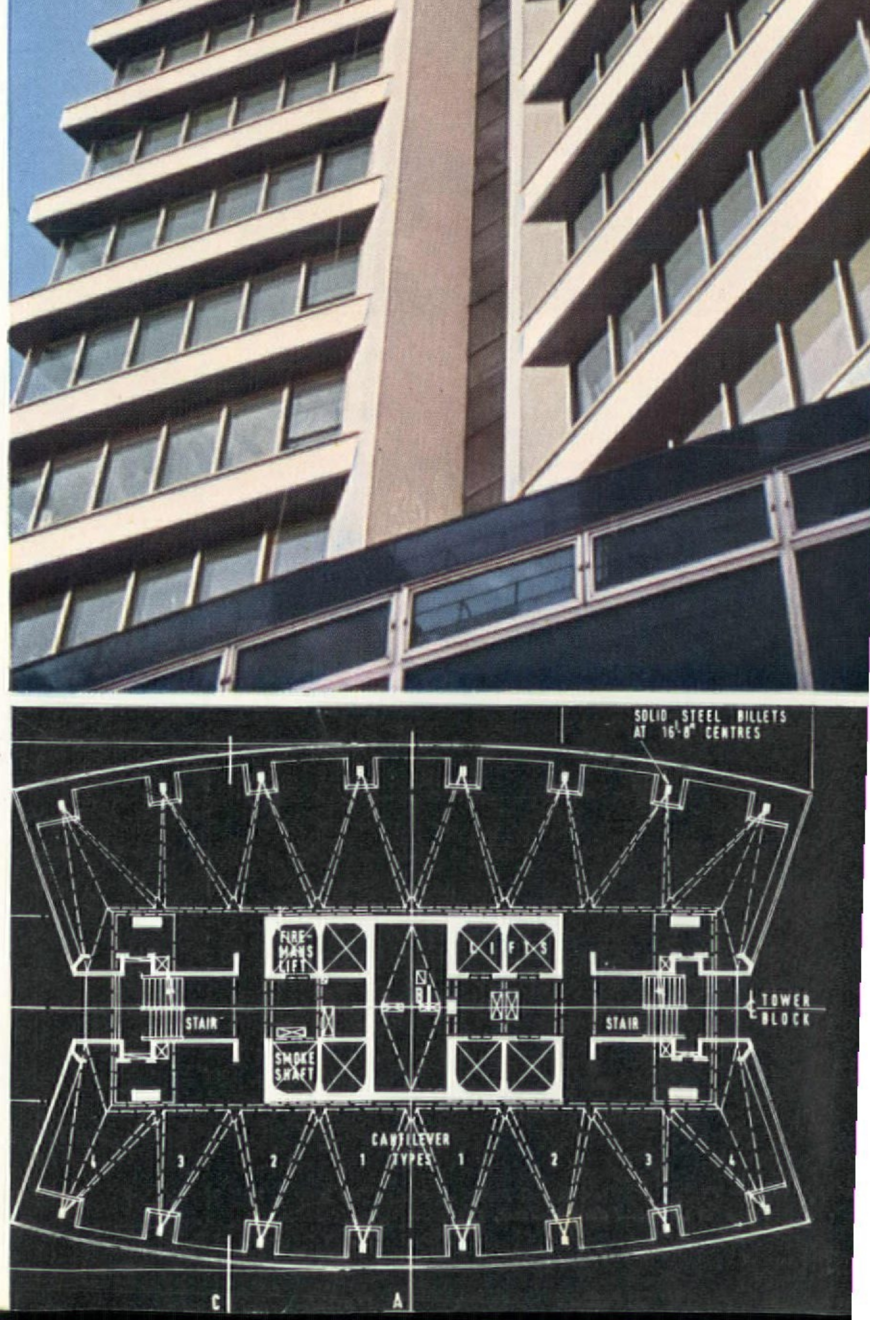
Solid steel perimeter columns

in new 30-storey block

This architecturally imposing 326-ft high office tower forms the main element of Draper's Gardens Development, a major building complex recently completed on a 1-acre site in the City of London for the head office of the National Provincial Bank. Speed of construction and economy, with need for column-free areas at ground-floor and car-parking levels, were factors in deciding the final method of construction—a reinforced concrete central core with solid steel perimeter columns supported on a cantilever slab at 2nd-floor level. Large areas of column free internal space have been provided in the building with maximum flexibility of interior layout, a desirable feature in a development of this type. The solid steel rectangular columns including encasement required only 17% of the cross sectional area of equivalent reinforced concrete columns to carry the principally vertical loads, thus saving valuable floor space and ensuring minimum obstruction. The columns are positioned at 16' 6" centres along the perimeter and are designed with hinge bolted joints within the floor depths.

The most recent studies in fire research have shown that many of these columns have over one hour's fire resistance without any fire protection. This would make it possible for further economies to be achieved in future buildings of this character.

Architects: R. Seifert & Partners. Consulting Engineers: C. J. Pell & Partners.

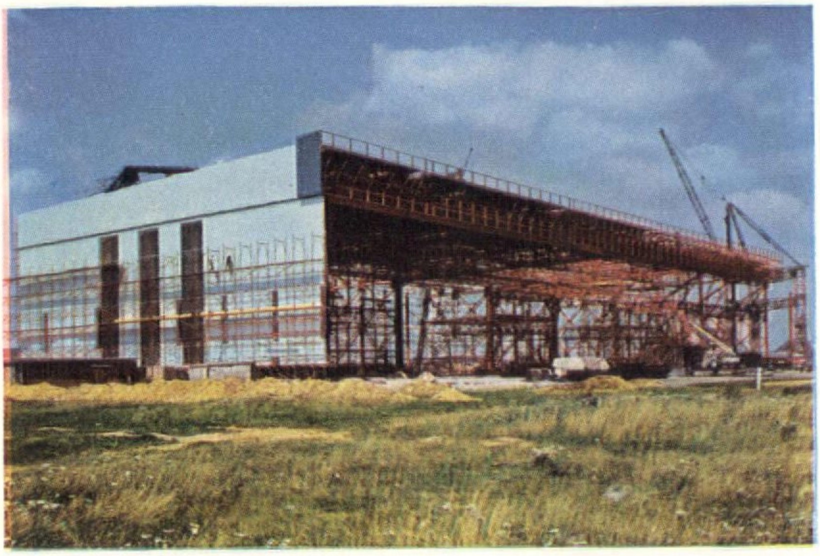


See further examples of steel products on rear page

RAF's biggest hangar

An all-bolted cantilevered steel structure

Over 3,000 tons of B.S. 968 and B.S. 15 steel have been used in the main frames and cantilever units forming the wall and roof supports of this, Europe's biggest hangar, now being erected for the RAF at Brize Norton. High yield stress steel was widely employed because it alone could meet the severe loading conditions economically. Bolted connections have been employed in all tension members using high strength steel friction-grip bolts. The cantilever principle has given the largest possible unobstructed covered area, with a completely clear front door opening. Twelve steel cantilever frames project 154 ft from front stanchions to the door-head girder, permitting an opening height of 50 ft. Two major stiffening frames are provided at one-third points in the rear wall-frame to provide additional longitudinal rigidity. Each of the 12 cantilever frames consists of two interlaced steel trusses 3 ft 6 in apart.



The steel trusses securing the huge roof against calculated uplift wind stresses, and provision of such large clear spans, were only made possible economically by using B.S. 968 high yield stress steel. Three VC 10 jet transports and three giant Belfast freighter aircraft can be accommodated in the service bays of the 1,045 ft long by 214 ft hangar.

Designed in the Directorate General of the MoPBW by W. Sutton, AMIStructE, under the direction of the Asst. Chief Civil Engineer, R. P. Haines, OBE, CGIA, MICE, MIStructE.

British steel goes to Expo 67

Montreal

Steel frame construction has been exclusively employed to carry out the distinctive design conception of Great Britain's pavilion at Expo 67 in Montreal. Structural work was completed on a comparatively modest budget. The project comprises a complex of exhibition halls of rigid frame clear-span construction, a steel-framed administration block, and an adjacent 200 ft-high angular ribbed tower, which has a steel space frame. The tower is capped by a three-dimensional Union Jack sculpture, again framed in steel and devised by F. H. K. Henrion, one of Britain's leading industrial designers. Speed and economy in both design and erection were achieved by selecting steel construction, and savings in dollar expenditure were made possible by large-scale fabrication of structural steel elements in Great Britain.

Rapid design and erection of steelwork Preparation time was severely limited. Final steelwork design for the tower was speeded by a computer programme developed by Manchester University. High yield steel bolts have been employed on tower connections.

Architects: Sir Basil Spence, Bonnington & Collins, Consulting Engineers: Sir Alexander Gibb & Partners.

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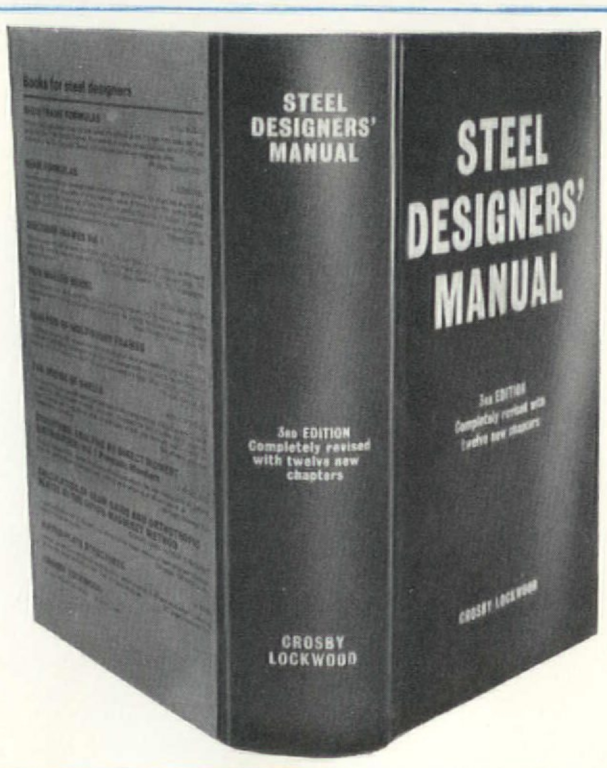

DESIGN IN STEEL

BRITISH IRON & STEEL FEDERATION
STEEL HOUSE, TOTHILL ST. LONDON SW1

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Mk 2 Convertible

Club

Forum

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All in a brilliant selection of colours or black. P.S.: There are matching colours and effects in 'Flexknit' and 'Vynide'. 'Vynide' also comes in many other colours. Send for the pattern card now.

Swivel Chair, Model 858 by Gimson & Slater Ltd.

'AMBLA' ICI

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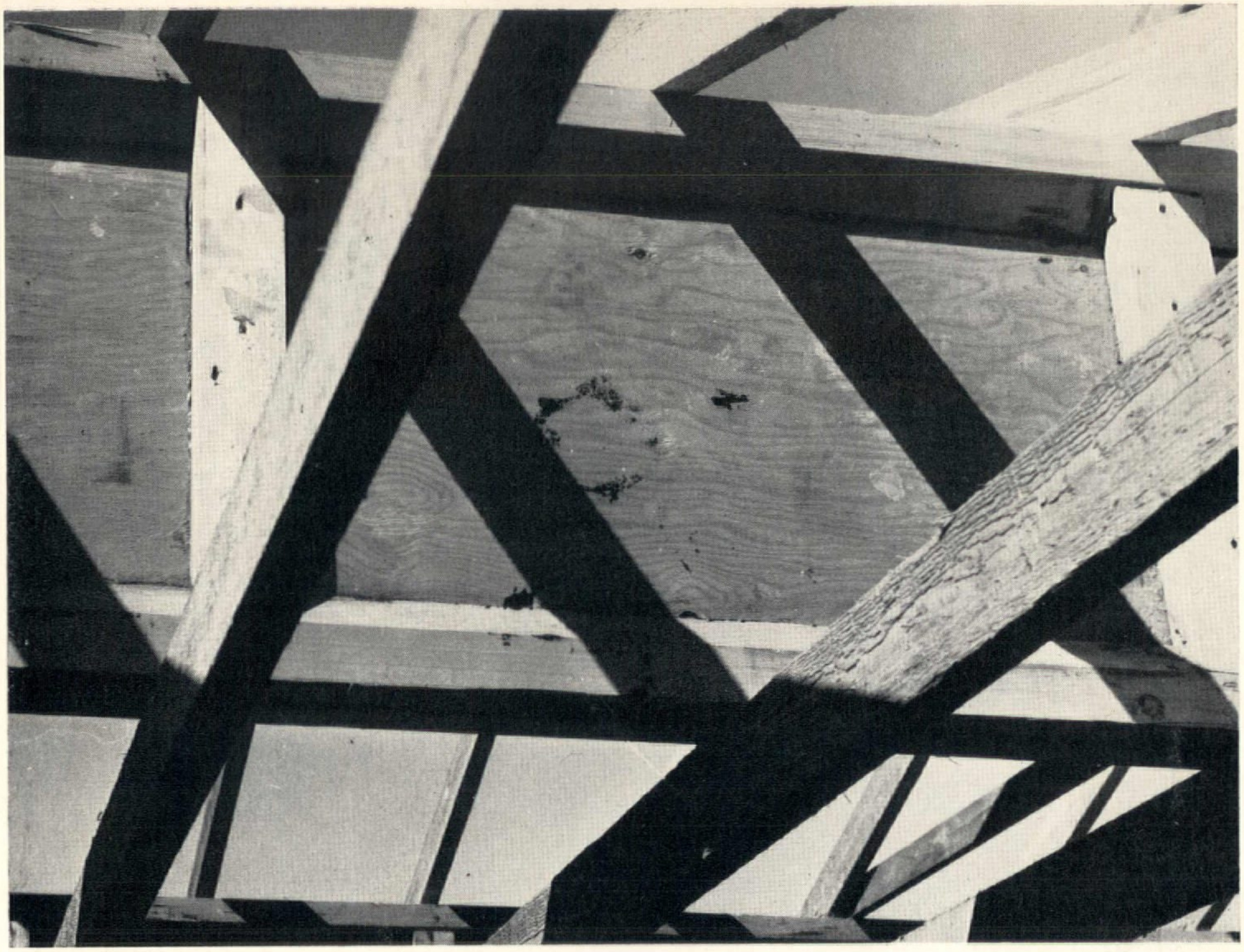

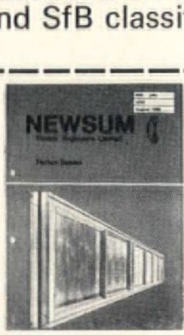

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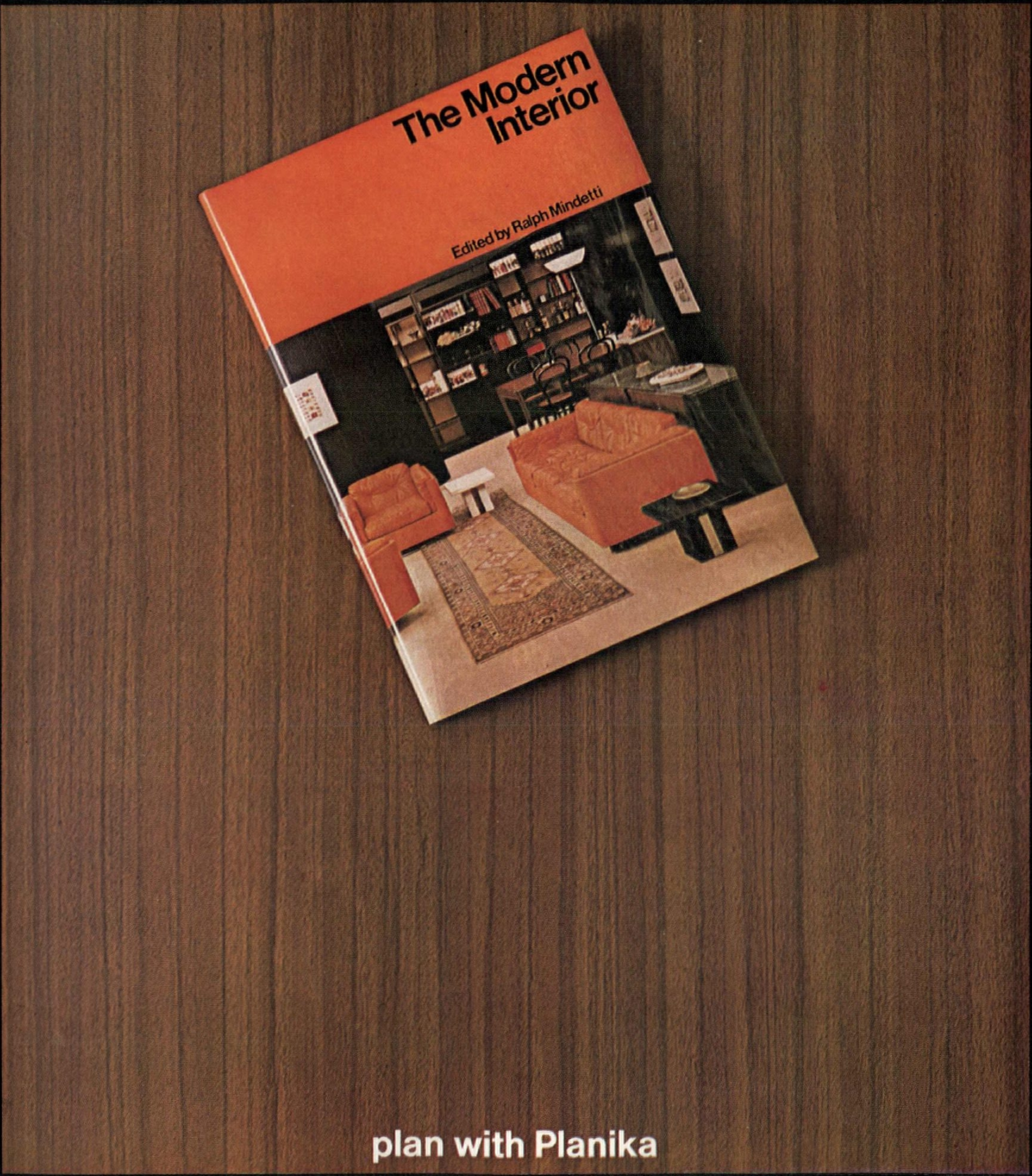
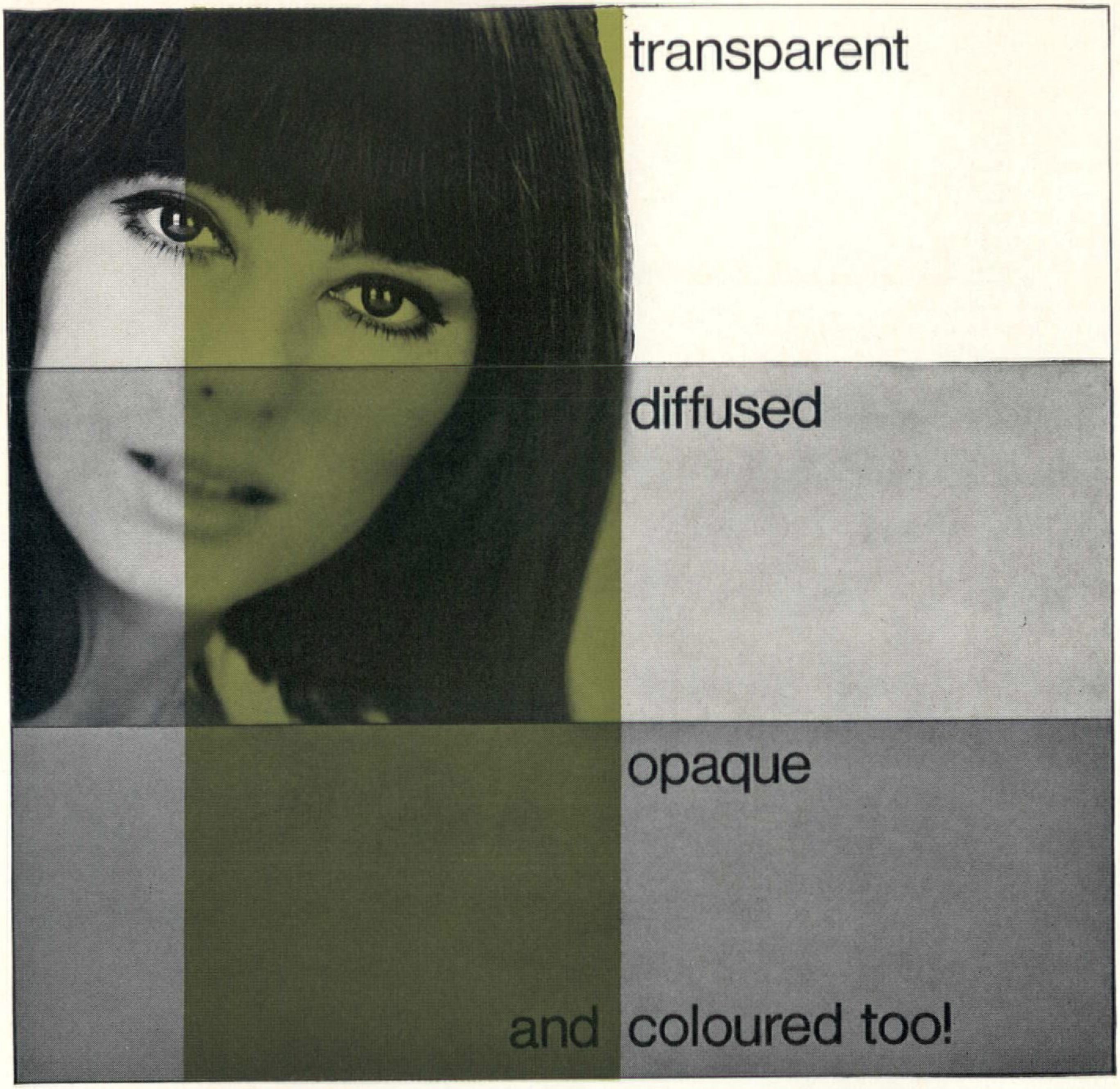

The Modern Interior
Edited by Ralph Mindetti
plan with Planika



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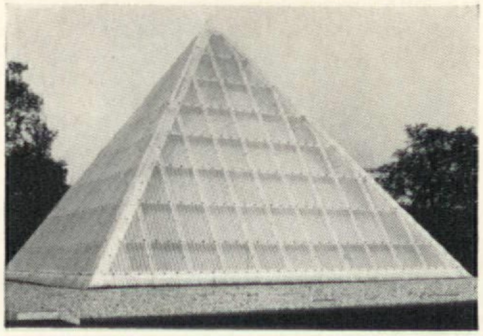

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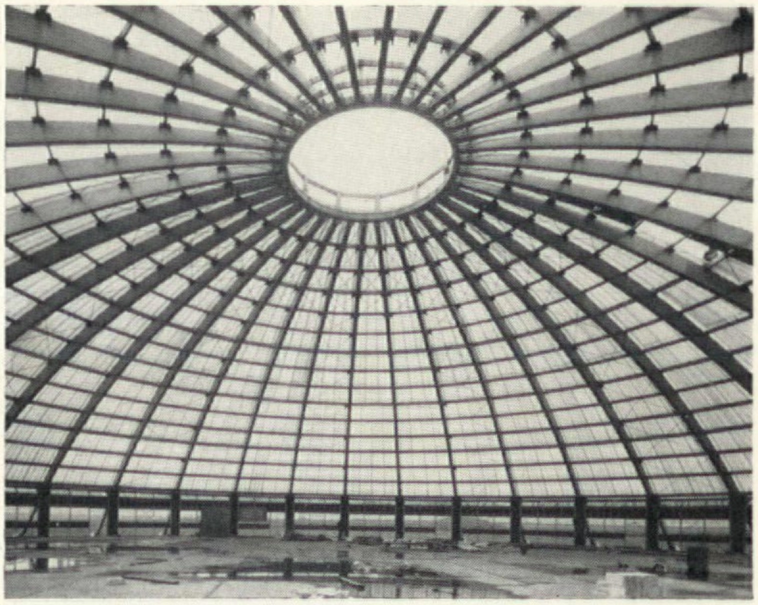

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ANNOUNCEMENTS

Mathews, Ryan and Simpson announce that their partner, Mr Michael Simpson, is returning to South Africa at the end of September next to take up a partnership with Messrs W. Rhodes-Harrison, Hoffe and Partners, Chartered Architects, of Johannesburg. An association between the two firms has been arranged and their names will not be changed.

---

du Bosky and Partners, Chartered Quantity Surveyors of London, Sheffield and Glasgow, announce they have opened an office at 703–704 Van Der Stel Building, Burg Street, Cape Town (P.O. Box 4468 Cape Town), which will be under the joint managementship of Colin Richter (P.A.) and James Garner.

Roy Fawden ARIBA Dip TP has moved his London office to 4 Carthusian Street, Charterhouse Square, EC1 telephone 01-253 6719/0

SITUATION VACANT

Architect specializing in Exhibition, Interior, and Industrial Design to be in charge of project for the Army. MSIA/Des RCA preferred. Main job—preparation of House Style Manual. Must be able to run small design unit in expanding architectural practice. Salary £1800–£2000. Age 30–35. Purcell, Miller & Tritton, 64, Sydney Street, Chelsea, S.W.3. 01–352–4314.

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Appropriate increments may be allowed for approved experience for appointment at Lecturer level.

The equivalent of income tax in the Colony is comparatively low (at present from about £41 to £203 p.a. for a married man with two children on a Lecturer's salary). There is a contributory Superannuation Scheme (5 per cent employee, 12½ per cent employer).

An appointee whose place of permanent home is agreed to be overseas is provided with accommodation at reasonable rental and economy-class air passages (or first-class sea passages of equivalent cost) on first appointment and on leaves.

Further information and application forms may be obtained from the Association of Commonwealth Universities (Branch Office), Marlborough House, Pall Mall, London, SW1.

Applications close in Hong Kong and London on *31 July, 1967.*

Cosmorama

The month in Britain

Michael Manser

Pier Luigi Nervi was awarded the 1967 gold medal of the Institute of Structural Engineers, and Cumbernauld won the Reynolds Memorial Award for Community Architecture ($25,000 and an aluminium sculpture) in competition with twenty other communities in Europe, Asia and America. The Minister of Housing and Local Government reorganized the Board of the National Building Agency, Cleeve Barr becoming its Managing Director and Lord Bourne part-time Chairman.

A conference was announced for June 6th, 7th and 8th at the London Hilton on Quality Control for Quality and Reliability Year and Lord Hughes said (which must have unnerved the politicians) 'A target of 500,000 houses a year by 1970 cannot be achieved by words, by a kind of magic incantation.'

Everyone went off to report on Expo '67, while at home Coventry '68 was announced to celebrate the Diocesan fiftieth anniversary. This will be a conference in June next year entitled 'People and Cities', its membership to be one third religious leaders and one third leaders in society. Speakers include Dr Doxiades and Professor Buchanan.

Not to be outdone, Contemporary Exhibitions Ltd., announced Disposex '68 for disposable consumer goods, promising a rosy prospect of no more laundra-mats, but clothing worn once and washed down the plug-hole.

The Central Electricity Generating Board advertized pulverized fuel ash as ideal for putting on an oil-slicked sea, sealing the tops of reservoirs, and grouting up the nave pillars of Winchester Cathedral.

British Standard 4156, 1967, turned out to be a specification for peat, and the Buchananized corner of Pimlico (an important experiment) received instant trees to make the cul-de-sacs bosky. Albany Prison opened and became the largest new penitentiary since 1867, and West Sussex County Council took a huge leap into the future by giving their Chief Architect a light pen for his IBM computer.

The *Observer* Gardening Exhibition at Selfridges from May 8th to June 16th included a children's garden for 'channelling destruction into construction with unusual ideas and interesting plants. Lots of budgerigars and enterprising garden toys. (Mine never works like that but then we obviously need budgerigars.)

Hugh Morris became President of the Architectural Association, a Craft Centre opened at Earlham Street, Covent Garden, and the RIBA Annual Report proposed a Code of Performance for Architects. At the Ministry of Public Building and Works Mr Prentice appointed Sir Donald Gibson Controller General of all professional and technical staff and services.

Liverpool Catholics consecrated their new Cathedral, and Stansted became the site for London's third airport despite a public enquiry that found it unsuitable.

A daily paper carried an obscure headline 'Snowdon to be preserved for Nation', and in London a house agent's description included a terrifying garden 'attractively laid out with carnivorous trees and hedges'.

The National Building Agency revised the format and content of their Low-rise Housing Appraisal Certificates, and have so far issued new certificates for 16 of the 39 systems approved last year (Wimpey, 5M, Hallam, Belfry, Skarne, Mactrad, Lowton Cubitt, Lesser, HSSB, Lecaplan, Gregory, Trusteel, Simms, Quikbild, Selleck Nicholls XW and Caspon). Five more will follow soon.

The Concrete Society, in addition to their autumn Far East study tour, now offer a Finnish trip in July, £164 all in.

ICI got Royal College of Art Students to collaborate with them in mounting an exhibition, Prospex '67 at the College to show how Perspex can be exploited.

News was received that Professor Ludwig Hilbersheimer died recently in the USA.

CORRECTION

The name of the main contractor on the British Pavilion at EXPO '67 was incorrectly given as Sir Alfred McAlpine in the Turners Asbestos Cement Co. Ltd., advertisement which appeared in May. The main contractors were Robert McAlpine Limited, Montreal.

Expo '70, Osaka, Japan

With the next International World Exhibition almost upon us (at Osaka in 1970, with the theme *Progress and Harmony for Mankind*), the feeling is being generally expressed among architects that if there is to be a British Pavilion, its design should be the subject of a national competition. The Central Office of Information (according to *The Times*, 19.5.67) say that for EXPO '67 'they did not have the time'. We wonder why. Other countries found the time: for example, Germany, whose prize-winning 'tent' by Frei Otto and Rolf Gutbrod has received universal acclaim. In the case of EXPO '70 the Canadian Government already launched a competition some time ago, 6 out of 208 competing firms were chosen to continue to stage 2, and the winner will be announced in July. Meanwhile, here in Britain we are told (according to *The Times*) that our Foreign Office *may have made up their minds in about 2 months* as to whether we should even partake in EXPO '70. Will we once again find ourselves 'without enough time'?

Time off from the Brighton Conference

For the benefit of delegates to the RIBA Conference in Brighton in July, *AD* will be publishing next month a map showing the best 18th, 19th and 20th century architecture of that city, as well as a guide by Sam Lambert to some of the leisure haunts worth visiting. (Intending delegates should also read the article on page 254 of *this* issue.)

Competition for Amsterdam city hall

A two-stage competition for the design of a new city hall being sponsored by Amsterdam City Council is open to registered architects from any country. Further information and entry forms from Mr Chr. Nielsen, City Architect, The City Hall, Amsterdam.

UIA prizes

The following awards have been announced:
Abercrombie prize: Giancarlo de Carlo.
Perret prize: Frei Otto and Rolf Gutbrod.
Tschumi prize: J-P. Vouga.

Transport for new towns

Brian Richards

This year's conference organized by Hornsey College of Art had speakers covering a wide range of factors concerning the use of public transport. At present too little is known, for example, of reasons for people's choice of transport mode or how these might change when they move to a new environment with a properly integrated system of public transport. Yet to date none of the new towns built since the war give an excellent service, or have been designed around public transport from the start. Only by this being done at the outset can public transport be expected to give good service and yet remain economic to run. Of the three schemes discussed, Runcorn and the original North Bucks City (now to be Milton Keynes) showed how this could be done. Only Thamesmeade appeared, so far, to lack any positive approach in its public transport policy, whilst in view of its location in relation to central London, and high generation of traffic which it is likely to encourage, the contrary would be expected. The first two proposals discussed tracked systems of different kinds. Runcorn will have buses on a segregated road system, virtually a track, but a more flexible system than that described for the North Bucks City (already famous for its monorail concept). Still in the future with the arrival of completely automated transport, an elevated tracked system does seem to give advantages from a safety angle. Westinghouse have already operated such a system for over a year at Pittsburgh from a central computer control. In contrast, Thamesmeade will apparently not provide bus-only lanes unless needed later, although no times were given for the journey to work which would show bus-travel to be preferable to that of car-travel to the adjacent factories. Thamesmeade will eventually have surely the longest single spine of high-density housing in the world (2½ miles long) and one hopes to see some really forward thinking in terms of horizontal movement system to serve its length, a real compensation to its inhabitants for living high. The description given of buses meandering through the secondary road system left an unfortunate impression of the scheme being treated like a large housing estate rather than a satellite city of 60,000 people.

One important point was brought out, that of bus operators' dislike of the pedestrian being separated from the bus routes throughout their length, meeting them only at stops and thus creating a 'rigidity' on a system otherwise considered flexible.

The conference emphasized the need for large-scale government investment in public transport, as clearly funds are not to be made available in this country for a road system of sufficient capacity to give the private motorist uninhibited freedom of movement at all times. New types of vehicles and systems will require designing and building, with the provision of special tracks or roads for them to run efficiently on. Only when such systems are thought about at the planning stage can real research be done into how people are prepared to travel, and leave their cars at home.

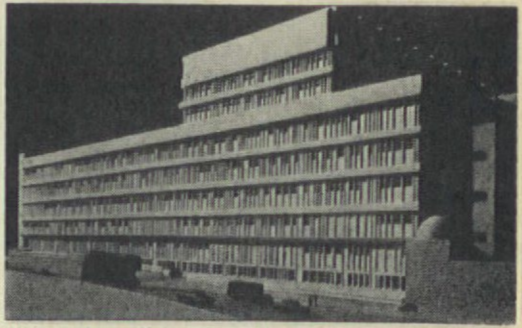
Bristol Royal Infirmary extension, phase 1

John Weeks

The United Birmingham Hospitals are about to start building a brand new out-patient and accident building on Upper Maudlin Street as the start of their total rebuilding programme.

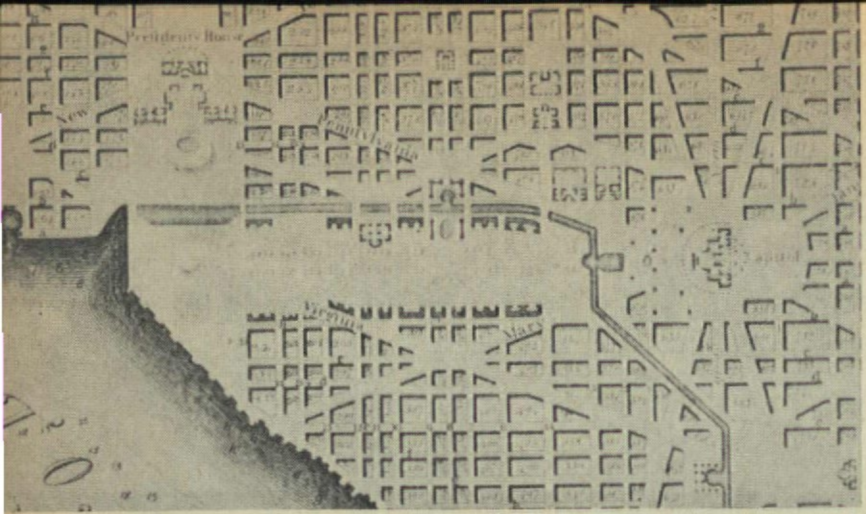
The new building by Watkins Gray, Group I with J. Laing Construction Ltd. as main contractors, will cost some £4½ million and take five years to complete. The building contains an accident and emergency department with seventeen X-ray rooms, theatres and emergency wards together with new out-patient departments, pathology laboratories, research laboratories, lecture theatres and all the rest of the back-up facilities required. The various communications include lifts, conveyors, pneumatic tubes, a 100-line telephone system and, hopefully, closed circuit television.

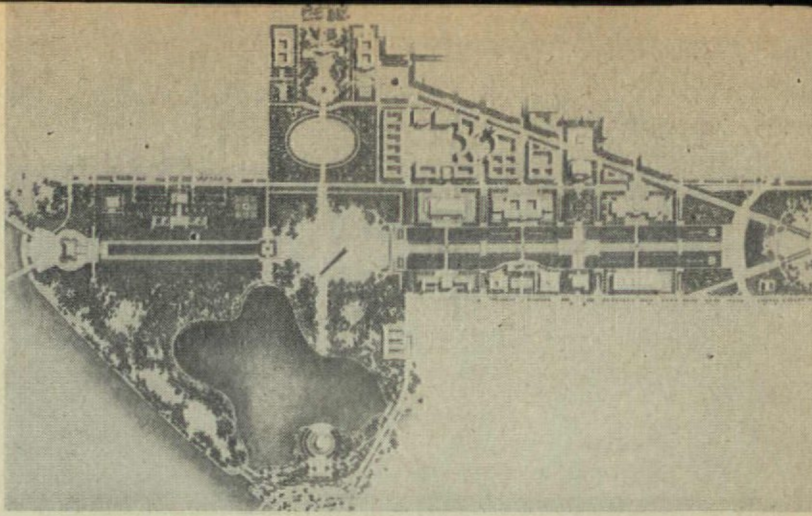
In these layer-cake high-density hospital buildings, the main essential is that the space within them shall be as unspecific as possible in order to deal with inevitable and massive changing requirements in the years ahead; the outside skin of the building which



flickers impartially over the whole block seems to reflect this.

The building is the first part of a comprehensive rebuilding plan for the hospital. Such a plan must be based on a communication network which will ensure that as the new buildings are phased-in, they are connectable in a useful way, and that all units are individually alterable and extendible. It will be interesting to see this plan as soon as it is available.





The Grand Design*

The pomp and the dreams of glory with which l'Enfant vested the capital city, Washington, when in 1789 he designed the Mall and its related avenues, are to be given final form under the ministrations of Skidmore, Owings and Merrill. Successive generations of planners have tinkered with l'Enfant's grandiose and none-too-subtle design and have sought in one way and another to implement it. Each has failed. But the time, it seems, has now come to complete Washington in the grand manner. The plan for the Mall is on the scale of Versailles. SOM, however, have determined not to be too traditional in their interpretation of seventeenth-century ideals—focal points are placed just off the intersection of the main axes, ellipses rather than circles are used to define the main spaces, and undulating reflecting pools are introduced to disrupt the formality. What, someone should ask, are they up to?

*Published by the Library of Congress, Washington, 1967. $1.50.

Manchester education precinct

Nicholas Bullock

The University of Manchester together with the Institute of Science and Technology is the largest of our civic universities. The Education Precinct when fully developed in 1984 will house 26,830 students and a total working population of 43,520 on 280 acres—for comparison, one of the new universities, the University of Kent at Canterbury will have 6000 students on a site 20 acres larger, and the University of California at San Diego will house almost the same number of students (27,500) on a site over three times as large.

Manchester, like over half the universities in England, faces the extremely difficult problem of providing for the growth of a university in the centre of a city. But unlike the first wave of new universities the problems of integrating the university and the town socially and physically cannot be ignored or explored at leisure—university and city are in constant contact. Manchester does, however, start with an advantage: the city and the university have worked together from the start and the recently published report *Manchester Education Precinct* commissioned from Hugh Wilson and Lewis Womersley, is a joint venture. The planners taking advantage of the potential of a university in urban renewal have concentrated on integrating the precinct and the city. 'The precinct could become a meeting ground for town and gown. . . . We see this as a fundamental problem and have tried to keep in mind the need to achieve a degree of city renewal.'

Socially the precinct and the city are to benefit from the maximum possible amount of housing on the site, students will be given lodgings near the university to reduce the load on the city's traffic system and to bring a new pattern of activities to the centre; there will be a shopping centre, restaurants, pubs and university halls, theatres and a conference centre will be shared by the city. The precinct is to be an environmental area in the city's traffic plan, with pedestrian routes along which are to be sited the buildings which the public will use.

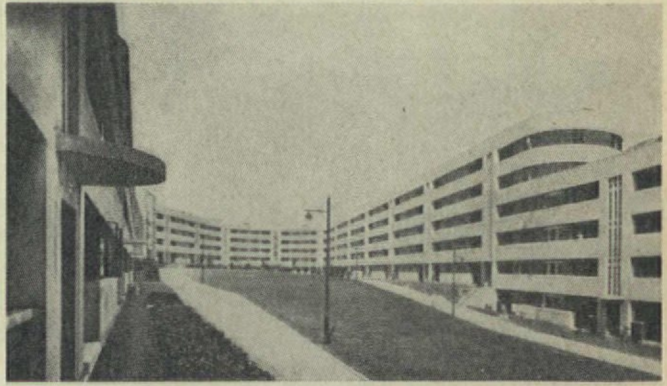
However, in addition to the problem of accommodating the 280 acres of the precinct in Manchester, there is also the difficult task of accommodating the 26,830 students and subsequent expansion of the university on the precinct. Compared to the space devoted to traffic, this aspect of the report seems underpresented. Shortly after the war several universities were offered the choice of moving out of the centre of towns; now, twenty years later the decision to stay does not seem so obviously right as it did at the time. The present plan for the precinct only covers the seventeen years up to 1984 and hardly mentions the problems of expansion after that date, although it is unlikely that student numbers, particularly research students, will remain constant after 1984. The plan is based on the educational advantages of bringing together the different institutions of higher education and there is no mention of moving individual or specialized research institutions out of the centre. One can only hope that the advantages the plan will bring to the city and the university will offset the problems of future growth.

Up the town

Sooner or later one is bored by the soft, lushness of the English countryside and one seeks the hard, vigorous pleasures of the town. The tougher the townscape the better. If you are thinking of a week-end in Manchester, there is now an excellent and lavishly illustrated guide to its architecture—*Manchester buildings**, a special number of *Architecture North West* edited by Dennis Sharp. The historical sections—that is the nineteenth-century historical sections—are a bit sparse, but most of the keystones of Manchester's nineteenth-century architecture are included and agreeably assessed. The commonsense and organizational abilities of Alfred Waterhouse are recognized and positively demonstrated. The Town Hall has been cleaned just in time to herald this reappraisal. But it is in the assessment of early twentieth-century architecture that the guide is most persuasive and useful. Harry S. Fairhurst's warehouse, York House of 1911 (right), is shown and upheld for the cascading glass of its rear elevation—the front is sadly banal and the interiors have been flimsily partitioned; it is moreover, likely to be demolished. Of later vintage, there are illustrations of such oddities and delights as Henry Elder's Essoldo Cinema at Stretford (1936) and Kennet House, Smedley, also around 1936, by the local Director of Housing. This great oval space is less prim today than it looks in the illustrations—is it instead happily used. The building is a surprise—a surprise arising no less out of the quality of the design than out of the sight of this sleek,

curvaceous architecture topped by gaunt chimney stacks belching forth smoke and grime as determinedly as any Victorian back-to-back. If this sort of thing makes you yearn for the country experience, it can be simulated at Heaton Park, with James Wyatt's urbane and well-kept mansion in the centre. Altogether Manchester has a bit of everything.

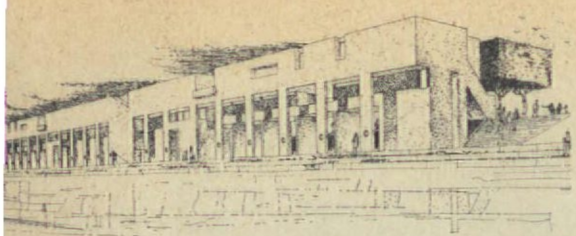
*Price 10s., plus 2s. 6d. post and packing, from Corinthian Press Ltd., 258 Gray's Inn Road, London, WC1.



Gifu city cultural hall

Günter Nitschke

'The right angle and a certain sort of curve', Peter Smithson's summary of Japan's traditional method of composing objects and making spaces, has received a new variation in Junzo Sakakura's cultural hall set, ironically, beside an older building. The juxtaposition shows that not only the curves but even the right angles have become more mechanical, not to say boring. Yet Sakakura does show greater respect for what exists—though it might not be of particular splendour—than the 'young' generation grouped around Kenzo Tange.



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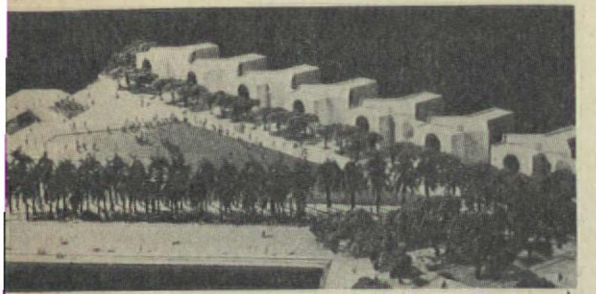

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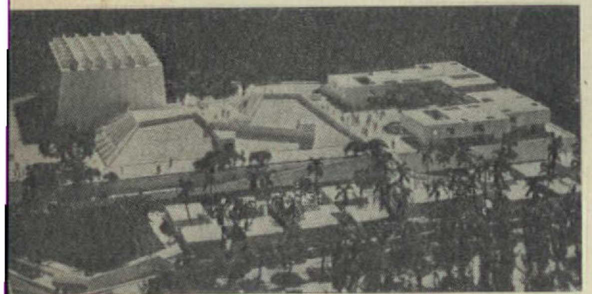

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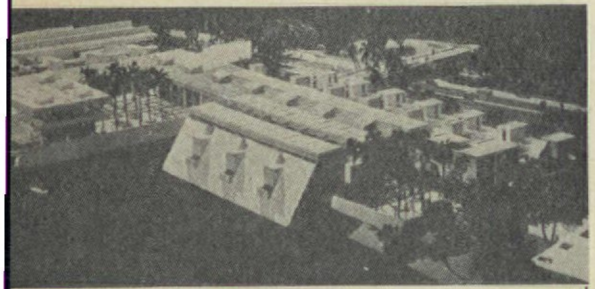

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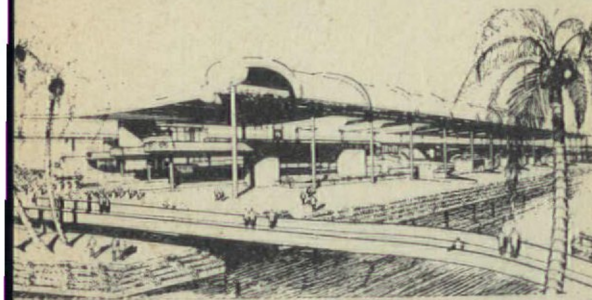

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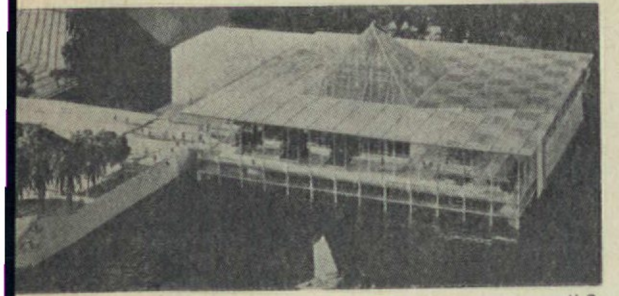

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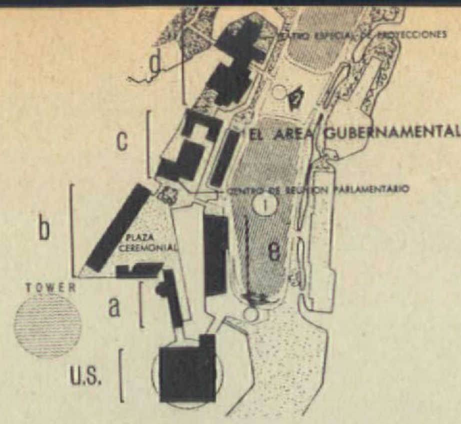
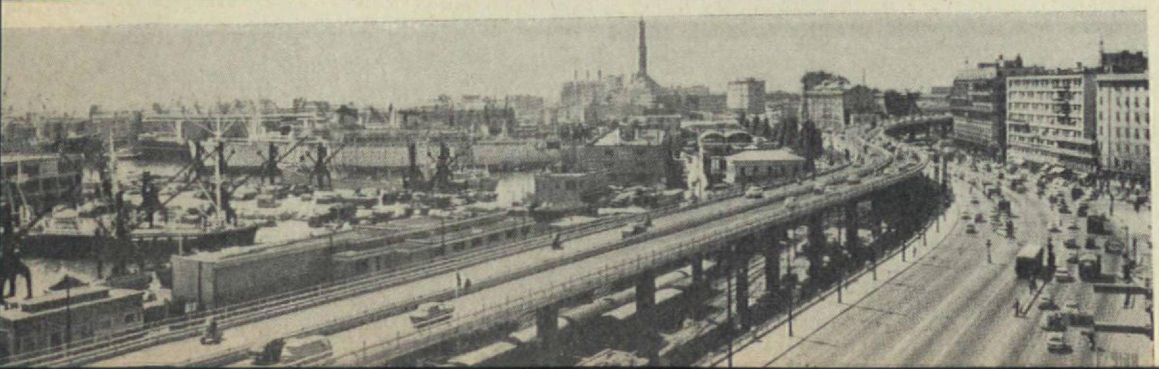


Dr Muscat and the seven architects

To the architects of the glossies, the strain of individualism is endlessly sapping. Each new building, every utterance must proclaim once again and with greater style than before their personal and particular talent. It is hard to pursue some humdrum or ordinary theme. There is no possibility of accepting the direct or the simple solution. Something special and flamboyant in the way of architecture is inevitably asked for—and provided. Louis Kahn has contorted architecture to satisfy those admirers who first applauded the Richard's Memorial Building; and not one of his subsequent buildings has been as articulate or satisfying a statement of his intentions. The strain is bound to tell. Yet applause is, equally, satisfying and, no doubt, a spur. One can only speculate at the core of pride and hunger for fame that sustains such showmanship. Certainly, the showman's life is terribly hard—not only for himself but for architecture.

Brash then is the showman who is prepared to perform not only by himself but in the company of five other gifted performers. Louis Kahn, Jose Luis Sert, Paul Rudolf, Edward Durrell Stone, Marcel Breuer and Harry M. Weese have all been commissioned for Interama, a group of permanent exhibition buildings intended for the use of the countries of the Americas. The site is a 680 acre tract near Miami Beach. The sponser is the State of Florida, under the direction of Dr Irving Muscat. Each of the architects is to build a pavilion or group of buildings that will serve as a trade and cultural centre for the states of America. Louis Kahn has designed the ceremonial plaza and the housing facing onto it (b) for Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama. Sert has designed a special projection theatre and housing and accommodation (d) for Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela. Rudolph is responsible for the bazaar (e) Stone for the pavilion for the USA (u.s.) Breuer for the conference halls and housing (c) for Argentina, Brazil, Paraguay and Uruguay, and Weese for the residential quarters (a) for Haiti, the Dominican Republic and Trinidad-Tobaga. Each of the architects has piously and hopefully proclaimed their need to work together as part of a group. Kahn is most insistent. 'The atmosphere of this mission of talent', he explained, 'was that every man wanted most of all to be one, and we all *were* one.' Whatever their intentions, the talented sextet have prepared designs for a group of isolated and idiosyncratic buildings that are outlets mainly for their own talents or rather preoccupations. Under the circumstances it is surprising that the results are not more freakish. The 'theme tower', a needle-shaped spire with a restaurant on top, designed by Minoru Yamasaki has not yet been published. The design is being revised. One wonders almost at the restraint of the other architects and one wonders further at Dr Muscat's sly purpose in setting the architects in competition. These are not *Weissenhofsiedlung* days.

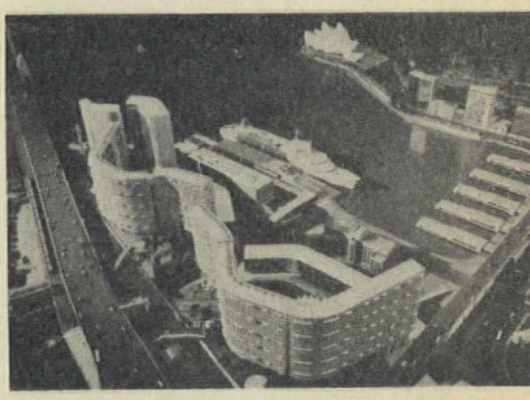
***Architectural Record* 4/1967. *Progressive Architecture* 5/1967.**



Sydney harbour

After Le Corbusier's Algiers housing (1930), after Affonso Reidy's Pedrogulho (1947), comes Harry Seidler's housing for Sydney harbour. But if the prototypes are illustrious, the application of the curved continuous building forms on this particular site is no less carefully considered and appropriate. The site, though it opens onto the grandeur of Sydney harbour, was certainly not without its drawbacks—it was intersected and bounded by elevated roadways and was in close proximity to two of Sydney's most famous landmarks, the harbour bridge and the unfinished opera house. Anything placed on the site must inevitably be judged in relation to these two structures. Seidler's proposals are in their way a triumph, not only has a building form been devised that seems peculiarly suitable to the shoreline of a great harbour, but despite its size (up to 25 storeys) composes unobtrusively with the existing landmarks. The great blocks moreover have been designed in detail to exclude as much as possible of the noise of the motorways from the living environment and have served to create a new sense of amenity between the town and its harbour.

***Deutsche Bauzeitschrift* May 1967**

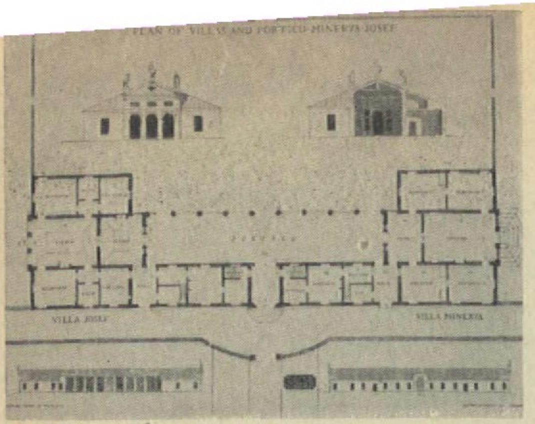


Traffic engineering in Genoa harbour

Once upon a time the *raison d'être* of Genoa was the sea; it was a great maritime city, its citizens and its sailors living in close symbiosis. The whole form of the town was determined by its relationship to the docks and thus to the sea. As trade ceased to be a personal enterprise and became the concern of corporate bodies and businesses the docks were severed from the town, enclosed and encircled by railway lines that would take the goods direct from the docks to the most distant destination without any need to enter into the town. Genoa itself was left high and dry. For generations it has been an odd, forlorn city, facing out onto the Mediterranean but with only the most strictly controlled contact with that great body of water. Not only the docks but the beaches even are most difficult of access. Inevitably it has become a city without real form or focus and one that one would rather pass by. The difficulty, of course, was the old coastal road that was still in its cumbersome way the meeting ground for the men of the town and those who came from the sea. It was clogged with traffic. Now some thoughtful road engineer has overcome this problem. A new elevated highway has been built along the sea-shore over the railway track. Motorists can effectively by-pass Genoa. The solution is so simple and direct that it seems odd that no one thought of it before. The traffic flows. But the real problem of Genoa as a city and its relationship to its surroundings has been grossly overlooked. It has in every way been worsened. Genoa is more effectively than ever cut off physically and visually from the sea.

Photo: *Casabella* 308

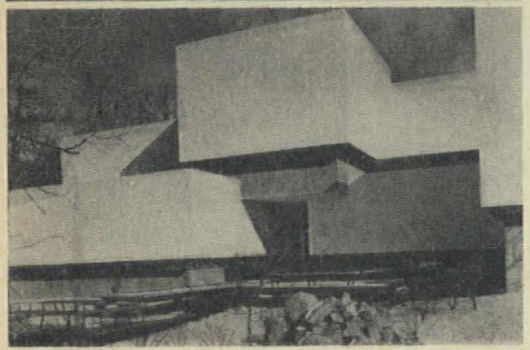

Skin–
the imperfect
membrane



RA summer exhibition

The Royal Academy exhibition of architectural drawings and models was made up this year of fifty-three exhibits, submitted by a wide range of architects. Raymond Erith, Frederick Gibberd and Sir Basil Spence were represented; so was Owen Luder. The intention of the organizers, to show the development of an idea from its initial conception to its finished formulation neither deterred nor inspired many of the exhibitors. The models and drawings were much the same as usual. Luder did attempt a college, but Quinlan Terry's drawing for Raymond Erith for a double villa in Italy 1 seemed in this strange and stagnant setting more surprising even and fresh.

Photo: S.W. Newbery

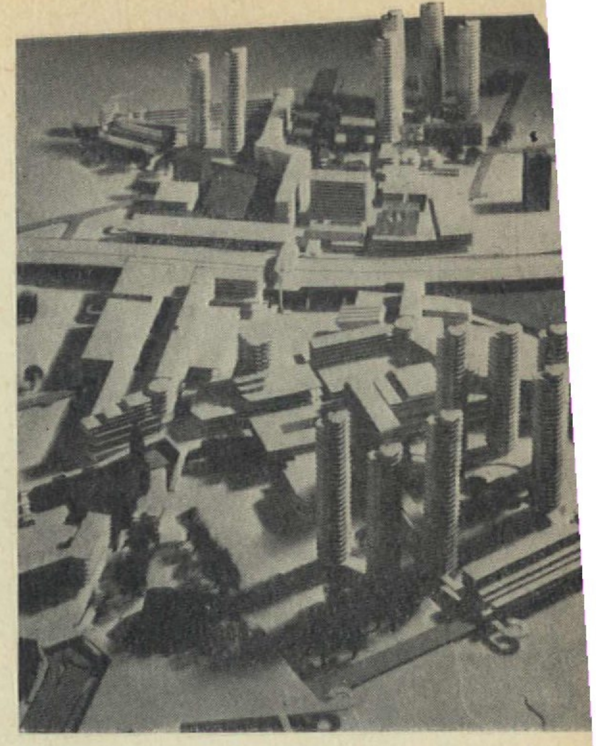


Reynolds Memorial Award 1967

The James F. Lincoln Library at Lake Erie College, Painesville, Ohio, won the 1967 R. S. Reynolds Memorial Award for the US architect Victor F. Christ-Janer.

Brixton town centre*

Laszlo Huszar



The Lambeth planners and their consultants have made a courageous attempt of Swedish dimensions in their proposals to redevelop Brixton town centre across which the southern side of the London motorway box runs at 90ft above ground level.

The answer to the solution of the Brixton town centre is thought to be found in vertical segregation of vehicles and pedestrians and a compact road system with Brixton Road retained as a spine. When the twenty-year project is completed there would be a transport interchange on five levels at the hub of the communication network-underground, the continuation of the Victoria Line, bus and vehicular transport, pedestrians, railways and motorway in ascending order. South of the communication spine the pedestrian deck level is mainly given to commercial uses centring on the proposed Brixton Square. North of the spine is occupied mainly by cultural and social amenities. Residential development of high and medium rise will occur on both sides. Though the communication problem is tackled in a complex and technically impressive manner, it is doubtful if the two halves of the Centre will survive the dominating effect of the spine as an integrated architectural composition.

The Report does not lack wise sentiments, such as *'Brixton will not be redeveloped merely for profitable commercial purposes, but as a centre for the community, serving its civic, business and recreation needs. It will be lively and bustling with its own resident population giving it continuous vitality; a place for human drama.'*

But these sentiments are not supported by comparable arguments in the rather meagre text. Conventional techniques are used to establish the restraint operating on the planner and they make their 60th recommendations where circumstances seem to permit it. They might be tight—so I hope—but the proposals failed to demonstrate this. Brixton's role in the metropolitan pattern of sub-centres is not clearly stated and therefore most of the recommendations dependent on the size of the supporting population (shopping, amenities), are left in thin air, fastened to pious hopes.

It is a pity the planners who dare to make a bold visual statement, did not follow up their own prescription *'any proposal for Brixton must be devised within a metropolitan and regional framework of economic and social functions'.*

The technical studies on transportation and shopping lack credibility. Costing is inadequate and alternative proposals have not been examined for expenditure let alone from the point of view of economic criteria.

My general impression of the report is that a bold architectural attempt has been made with timid planning techniques. The report is well produced, but in spite of Kenneth Browne's excellent sketches the blueprints do not come alive.

**Report by the working party of officers to the Town Centre Redevelopment Committee of the London Borough of Lambeth, April 1967*

Structures sonores

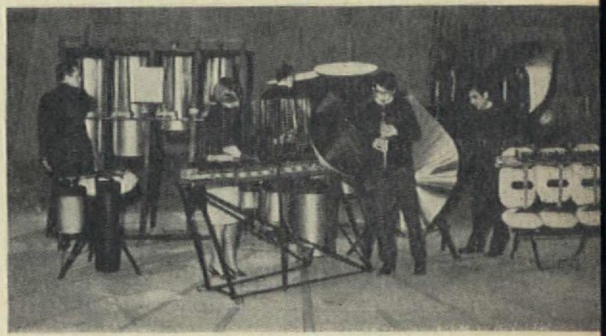
Jasia Reichardt

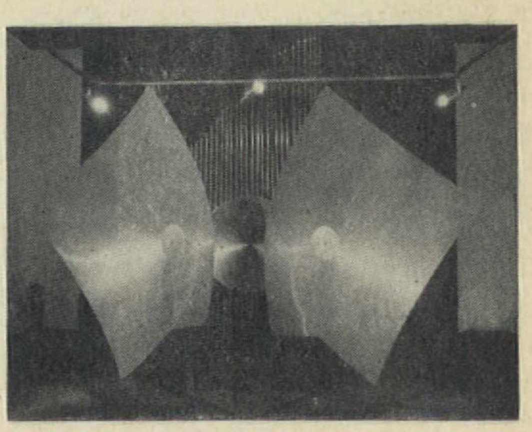
Anyone passing in front of the ICA during one evening early in May might have heard the recognizable music of Vivaldi, although the quality of sound emanating from the gallery would have been quite definitely unfamiliar. The musical instruments on which the Vivaldi adagios were played were among the few new musical instruments invented since the advent of the saxophone. Their creators, the brothers François Baschet, artist, and Bernard Baschet, engineer, started experimenting with new ways of producing sound in 1954, and in collaboration with the musicians Jacques and Yvonne Lasry evolved an entire new repertoire of instruments of which both the sound and appearance are different from anything one is likely to have heard or seen in the past.

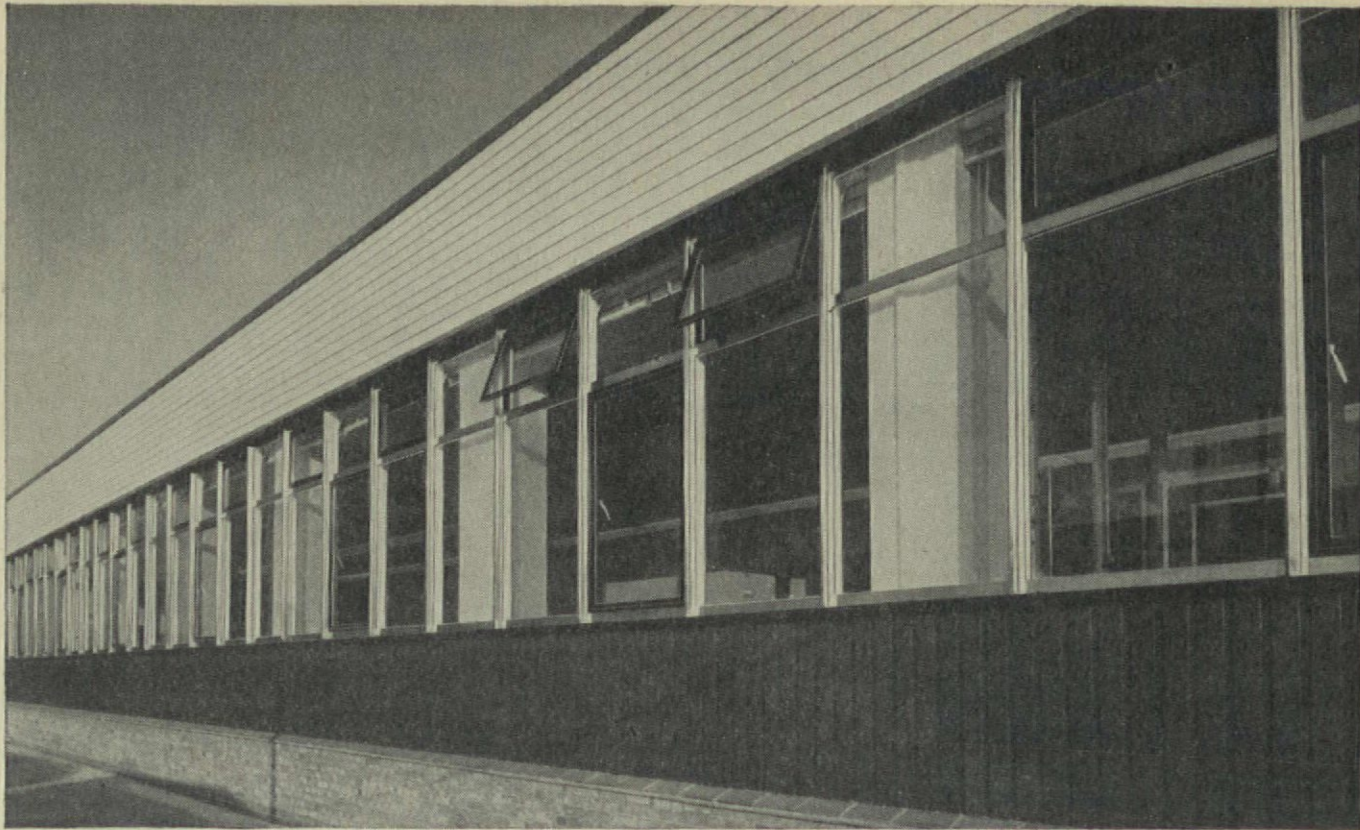
The instruments which are based on the principle of producing sound through vibrating rods, can be divided into two sections—those which involve the stroking of glass rods with wet fingers, and those which provide percussion. The general appearance of the instruments is largely dictated by the forms in metal and plastic which are used to amplify sound, and their outward shape does not readily suggest the sort of sound which is produced. The effect of one instrument is particularly extraordinary, because the vibrations of glass rods amplified through steel sheet that looks like a butterfly wing, produce the sound of nothing less startling than a trombone.

The 'structures sonores', as they are called by the Baschets, are predominantly in the colour of polished steel, brilliant red of the plastic amplifiers, and black provided by the painted framework. The exuberant forms straddle thin spindly legs which suggest the appearance of rather fantastic insects poised precariously on the formal podium of a concert platform. As sculptures, their shape, stance, and vocabulary of materials, suggest quite accurately the Paris school of the 1950s. One could imagine that a Swiss solution to the problem of creating a similar set of sounds would be totally different, as would be the American approach to the same problem.

It is easier to understand how the Baschet brothers have developed their repertoire of sounds and shapes if one knows something about the origins of their inventions. The first constructed instrument was made as a matter of necessity. Setting out on a world tour François Baschet made himself a guitar where the sound box was replaced by an inflatable plastic balloon, with the strings elastically supported on a frame. The guitar took up much less space and produced sound which was indistinguishable from a conventional guitar. What is interesting in the approach to the instruments that the Baschet brothers have created since, is, that despite the fact that they are new, the methods employed in producing sound are not essentially modern. The technique of playing is manual, with the degree of control of volume, tone and timbre, similar to that of the entire range of conventional orchestral instruments. The combination, however, of the method of playing, the sound which is produced, and the appearance of the instruments, provides an entirely new experience. So far the compositions that have been most successfully performed on these instruments, are the improvizations which allow the players to produce whatever sounds they wish within certain set parameters. Their impact, which is quite unforgettable, is due largely to the element of surprise contributed by the extraordinary combination of shape, sound and colour, and simply not knowing what is going to happen next.







Centralised Service Unit & Stores of the North Thames Gas Board, 40/42, New Heston Rd., Heston, Middx. N.T.G.B. Building & Property Maintenance Dept.

Up goes curtain walling

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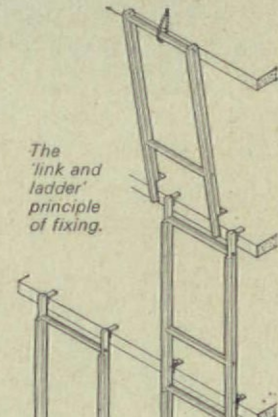

The 'link and ladder' principle of fixing.

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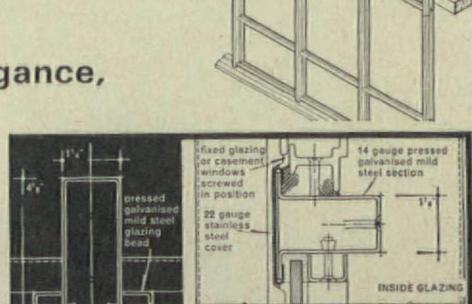

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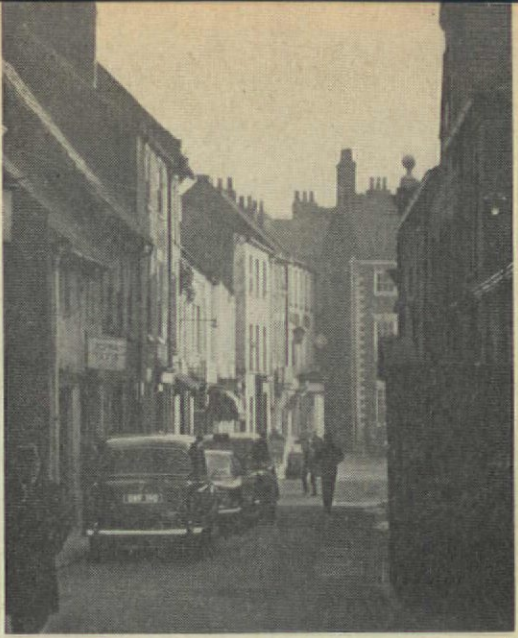


2

Around Britain

Hull and East Riding

Alan Plater

At this point in history, writing about Hull and East Riding seems a superfluous activity. So many thousand words have issued forth from assorted fountainheads in the last year that the attempt to say something new and significant is roughly parallel to seeking fresh truths about the Common Market, Jonathan Miller or Twiggy.

There have been three main publications. The most official, in origin and tone, was the *Yorkshire and Humberside Review* prepared by the Regional Council —or 'Sir Roger Stevens bringing down the tablets' as one local MP described the occasion. Added to this were two locally-based reports on Humberside, one prepared by Anthony Goss for the Hull City Council, the other by Roland Adamson for the architects' glossy magazine *Perspective*.

Happily, space does not allow a GCE O-level comparing and contrasting with appropriate examples; it is enough to single out the one common factor in all three reports, which was the need for a physical link across the River Humber—though whether bridge or barrage is a point of dispute. In brute political terms, there is reason for anxiety on this aspect of the area's future. The Freeze has chilled some of the warm promises of the North Hull by-election—which in itself seems part of an earlier, separate existence—and skilful PRO work by the small but growing town of Immingham on the south bank has helped create an atmosphere in which a policy of apartheid lurks uneasily; and within this, looms the additional temptation of seeing Utopia lying to the south rather than the north of the river.

All the available evidence, geographical, historical and economic, indicates that rivers do not divide, but unite; and there is a growing local awareness that the Humber is the only major estuary in the country still unspanned. Promise of a hovercraft in the spring has caused relatively little dancing in the streets. Indeed, one of the less comical jokes of recent times is the suggestion that a Yorkshire Nationalist Party be formed, provoked only partly by the way Leeds United were cheated out of the FA Cup. Following a brief honeymoon when Whitehall seemed really to care, the locals once more feel that the future depends too much on Treasury officials who probably provide themselves with vaccination certificates if they move north of St Albans.

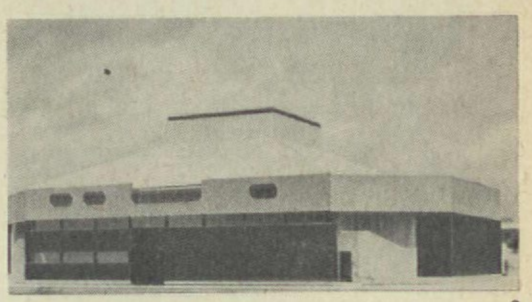
There still remain areas of activity which—nominally at least—are locally controlled, and here the level of achievement is nothing to be ashamed of, apart from the spec. estates which are pretty lousy anywhere. The architectural pacesetters are still found in the University of Hull, with Peter Moro's drama studio **3**—comprising adaptable theatre, television studio, audio-visual centre and related workshops—one of the most eagerly awaited exhibits. Sir Leslie Martin's Middleton Hall **4** provoked the routine public reaction to any windowless building; one eminent citizen compared it with Lenin's tomb, though whether favourably or not is unknown and may well be an ideological rather than an aesthetic point. What is unquestionable is that Martin's work as consultant has done much to give coherence to the inherited clutter of the main academic campus. He deserves a knighthood, if it were not for the obvious problem.

Justice demands that mention be made of Hull City Architect's department, whose work is smiled upon with fair regularity and sweetness by the Ministry and the Civic Trust. The proposed Hull Nautical College and Students Hostels **5** promise well, not least because the scheme plants resident students in the city centre, which should be a useful and timely transfusion. There is frankly little to report from the private sector, apart from the growth of a number of new, young practices, and therein a reasonable hope for the future.

The need for balance also requires that any kind words for official architectural circles be tempered with a lusty swing at the official planners, who do not have any architects on the strength in any case. Here the main tragedy is that of inactivity and the apparent acceptance that the 'development plan' is an adequate blueprint for the future of the city. This is especially saddening with a new and threatening question mark hanging over the Town Docks **1**. These are the oldest of the city's docks, bisecting its centre as a vivid reminder of the area's dependence on the sea for its relative prosperity. Commercially, the docks are now redundant and the city is prepared to buy them with the honourable intention of keeping out office developers and the like. However, the deadly phrase 'public open space' has been mentioned and the popular interpretation is that this excludes water and includes acres of municipal grass and flower beds. Among the more sensible suggestions put forward, a yacht basin and a maritime museum, with real ships floating on real water, seem to merit careful examination. For the moment, this is a space to be watched.

Just as the best English dramatists are Irish, so the most beautiful place in Hull is Beverley **2**, six miles up the road. A small market town, deservedly called near-perfect by Ian Nairn, it has inherited a functional, intricate and subtle linear plan linking the North Bar at one end with Beverley Minster at the other. The essence of the place is that it works, a fact overlooked with sickening inevitability by the planners who have prepared some good tee-square and set-square answers to non-existent problems, all in the sacred name of the motor car. They believe, in what one charitably assumes to be innocence, that this is what Buchanan meant. *Perspective*, under its new editor Richard Swaine, devoted an entire issue to Beverley and in the process calmly and knowledgeably shot the plan to pieces. A public meeting is to follow, the Civic Society has the bit between its teeth, and if some of the local Knights of the Shires can be rightly persuaded, there might still be hope.

The central tragedy is that the 'road improvements' have been conceived not for the benefit of the residents but for through traffic, which in practice reaches a peak with seaside trippers at sunny weekends and, less often, racegoers. The plan, in any case, will be redundant in ten years' time or so when a bypass is constructed. In all the muddled thinking and misguided notions about preservation, a simple fact is overlooked. Beverley is a town which demands to be driven through at ten miles an hour and no more; this makes it safe for the pedestrians and pleasant for the motorist, and might add five minutes at the most to the overall time of the latter's journey. The proposals will speed up the traffic and kill and maim a few shoppers, and waving an abridged copy of Buchanan in the air will not shift the guilt in any way.



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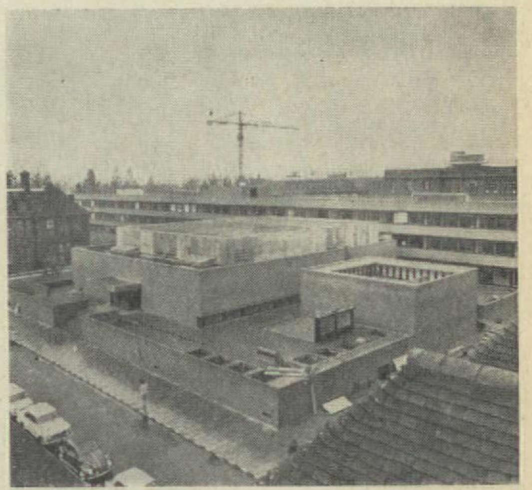

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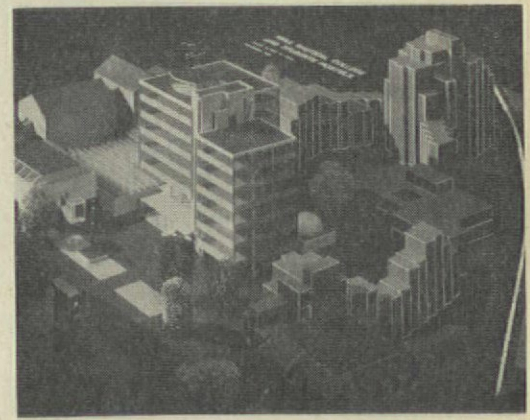

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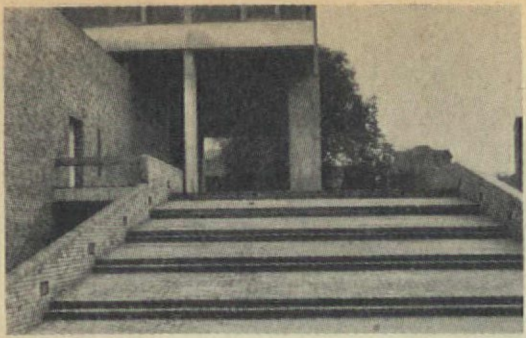
Beverley should not lift one finger to help the motorist who is an ungrateful and selfish beast at the best of times. Too many of our older town centres have been murdered by outside interests; but here the prospect is suicide. It will be difficult even to mourn.

Photos: 1 and 5, City Architects' Department, Kingston-upon-Hull; 4, University of Hull Photographic Department.



Lasdun at Leicester See page 281

Robert Cullen

Only one thing matters, the final result on the ground, not how it got there, or why. The technological brief-making types excuse away their rationalized mistakes devoid of love. Lasdun is not one of these—he loves his buildings and his art.

Leicester University campus has a standard legacy of pseudo-Georgian architecture; it is typical in having had a Consultant (Sir Leslie Martin), unique in having built the Stirling and Gowan Engineering Building and fortunate in having had Lasdun to design a new focal building, the Charles Wilson Building.

The Lasdun building was never intended as a focus: it was conceived by Martin as a low structure, forming part of the square, surrounded by several rather nondescript, modern buildings.

The Robbins Report altered all this and, although construction had started, the accommodation was doubled. Lasdun implied in the Watkins Memorial lecture to the Nottingham, Lincolnshire and Derbyshire Society of Architects that, because of his flexible approach, the increase could be resolved onto the site and literally onto the building under construction. The function, housing community activities, combined with the location between old and new, is better satisfied by the more complex and larger structure than by the original concept. An interesting silhouette provides a point of identity on a rather dull skyline.

Looking from the park at both the Lasdun and Stirling and Gowan buildings, the effect of another tall building is less successful. From within the campus, the full height of the new building is not seen in direct juxtaposition to the engineering block. The base is dominant. The effect from the park is strange—it is difficult to decide whether the building is vertical or squat. The form and character are solid, in spite of the omission of glazing bars in corner windows and the separation from the main tower of the escape stair and flue. The service core and floor to ceiling partitions prevent views through—an effect deliberately sought for and achieved in the engineering building.

The contrast between the two buildings is considerable—one, assertive, light, made of steel, to be seen through, bright, complex, red, white, and patent glazed—the other, restrained, solid, made of grey concrete, natural timber, moulded—and yet, in spite of the differences, there is an affinity between the two. The isolated elements of both create a complexity and lightness in their composition.

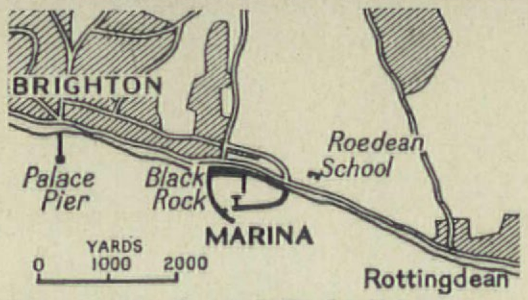
Whether two buildings of this height should have been placed so close together is doubtful, the classicist would probably say certainly not (dominance and all that)—certainly there is an intangible duality, with the trees holding the composition together.

So few buildings of real quality are being constructed that to criticize one of the few is difficult—the commonplace words of approbation all apply. But some detailed design and construction does appear less than perfect. The junction of beams, ventilation louvres and rooflights on low level roofs is unresolved, and many views are obtained of this roof from higher levels. Staining and cracking is apparent; the natural timber needs more seal, and the white walls are no longer white.

Colour is used very sparingly, which is sometimes taken to imply restraint and maturity; but somehow, somewhere, you should be shocked, as you are at Ronchamps when, after the concrete and render, you turn the corner into the red top-lit bell tower—a real touch of drama, lacking at Leicester. The external steps double height columns, entrance hall and internal stair provide a satisfactory flow of space and form when entering the building, but even here there is no drama, no surprise and no colour.

Photo: Ivor Haberfeld

Undercliff Walk, with arrows marking the ending of the sixteen beaches to be replaced by the Marina



The battle of Brighton beach*

Hurry on down to Black Rock and the Undercliff Walk at Brighton before it has been obliterated by the 'improvement' of the so-called 'Brighton Marina' project. To give an idea of the scale of the scheme, of the 106-acre site, 35 acres will be on land, mostly to be reclaimed from popular beaches and a delightful rock-pooled, chalky foreshore. The scheme itself as an architectural design is inoffensive enough in a standard modern idiom if the site were right. But after moving it several times before to accommodate the howl of objections, it has now been moved to a position equally unsuitable, as it edges on Kemp Town, one of the outstanding Regency crescents and town plans in England.

A Bill, with the astonishing blessing of Brighton Corporation in the name of a misguided progress, was passed by the House of Commons with a vote of 99 to 42 on March 13th, 1967, and has been under discussion by a Commons Select Committee since then. The Committee, instead of rubber-stamping the passage of the Bill through the House of Commons, wisely put two serious limitations on the proposed Bill: that the promoters should *not* be given compulsory purchase powers, astonishingly allowed by Brighton Corporation. The Commons Select Committee also ruled that the £13 million 'Marina' project was a harbour and would be subject to the Harbours Act. This means that the Marina's harbour works cannot be carried out without the Minister of Transport's permission. Ironically, the QC for the promoters 'did not accept that the Marina came within the definition of "harbour"', but the Minister did not accept his argument. At the time of going to press, it is due for reconsideration in the House of Lords in June. The Bill proposes to replace the extraordinary amenity of a glorious stretch of white chalk cliffs with a 3½-mile walk at the foot of them, and the surge of tide and smell of spray within ten minutes of the station, with a new township obliterating 16 beaches and extending half a mile out to sea. The township will comprise buildings the height of the cliff, behind which the first half-mile of the Undercliff Walk would be sandwiched, forming a virtual wind tunnel, and an assortment of casinos, boatels (whatever they may be), motels (as if that word were not bad enough), etc. There would also be a car park for over 3000 cars replacing the rock pools of great biological interest to schoolchildren. The boat harbour would be an accessory. Most shockingly the foreshore, breaking all precedent, is to be occupied by this proposed speculative development, apparently on the assumption by the Corporation that potential rates and profit-sharing many years hence is better than the living amenity of a sunlit shore walk.

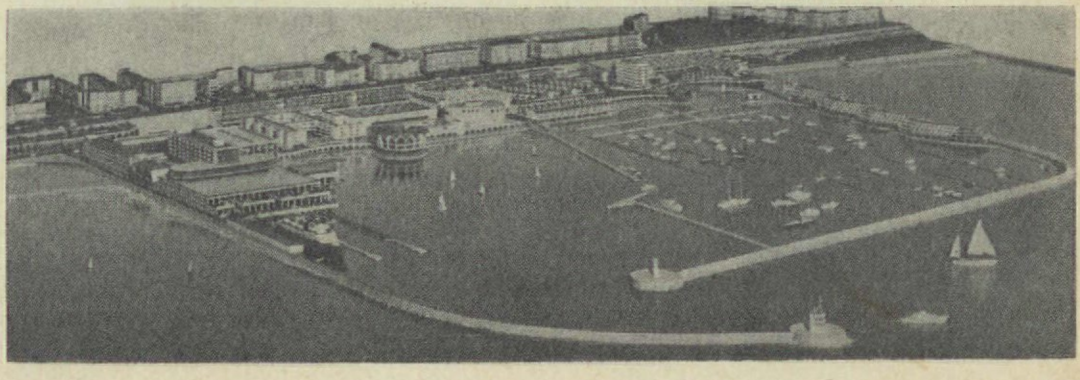
Although the proponents of the scheme have tried to suggest that only a small selfish minority in Kemp Town are against it, in fact 42 MPs voted against it, and it was vigorously denounced by Philip Noel Baker and Jeremy Thorpe, to name two. Lord Holford who, like the objectors, is all for boats in a reasonably scaled harbour, wrote to *The Times* on Saturday, March 11th, 1967, before the official debate in Parliament:

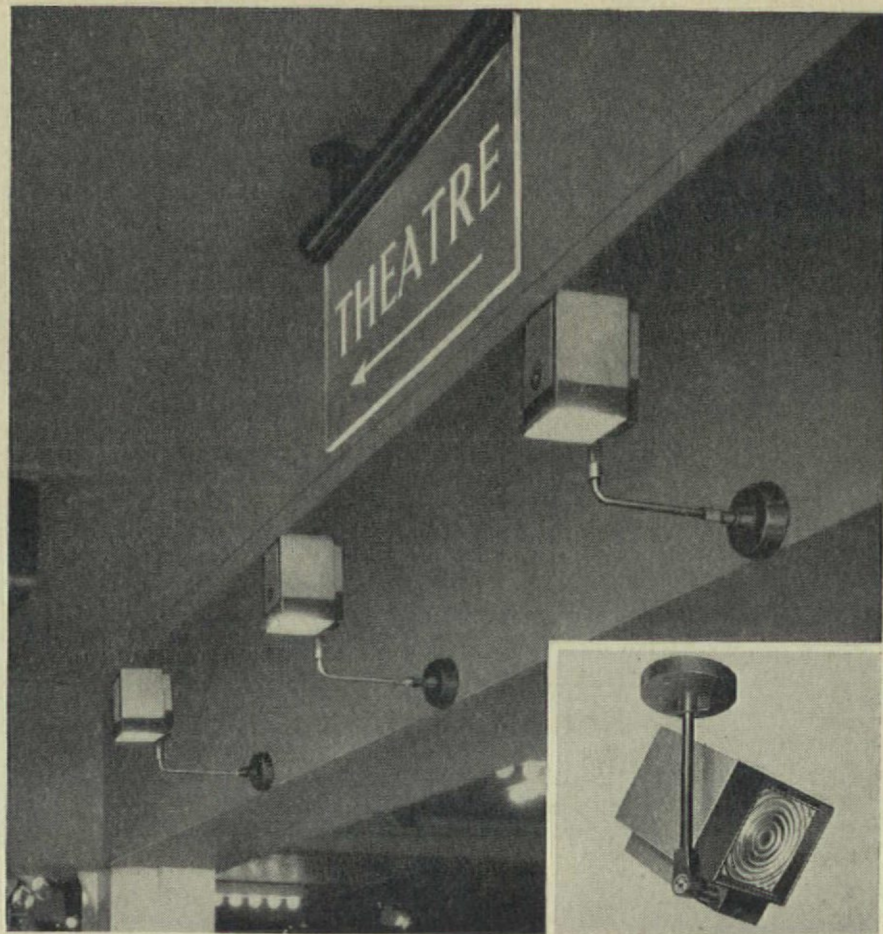
In short the debate in the House of Commons on the Brighton Marina Bill should bring to a head the fundamental issue that concerns the supporters as well as the opponents of the idea of a yacht harbour: has the right basis been found for the combination of private enterprise and public control which appears to be the only way of creating a new and permanent asset to add to the many that Brighton already has?

The bill in its present form does not suggest that this is so.

*See Mervyn Jones' article in the New Statesman, May 12th, 1967 and the A.J. 24/5/67 p. 1201.

Model of the proposed Marina, photo *The Times*, 16.2.67.





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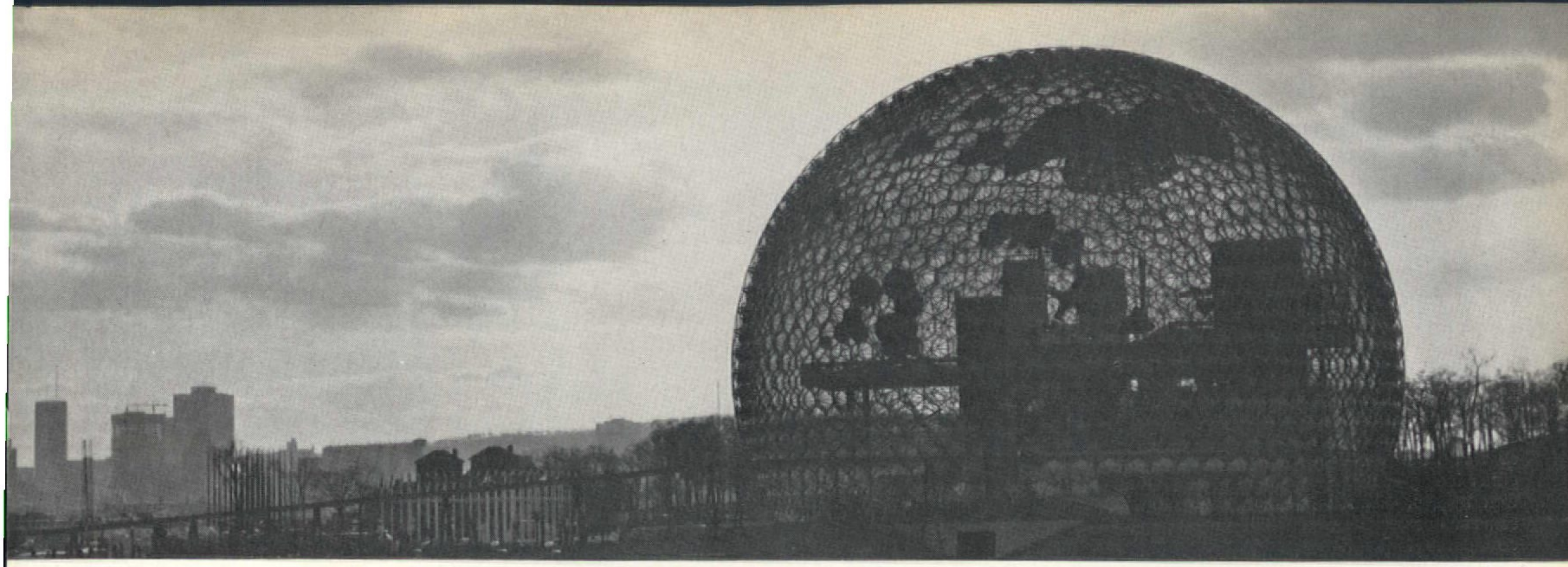

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Expo 67

These brief notes are provided for the immediate guidance of intending visitors. Next month, the whole of Architectural Design *will be devoted to Montreal, and EXPO and its impact on the city will be considered in greater detail.*

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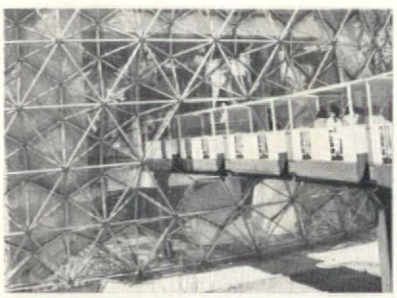
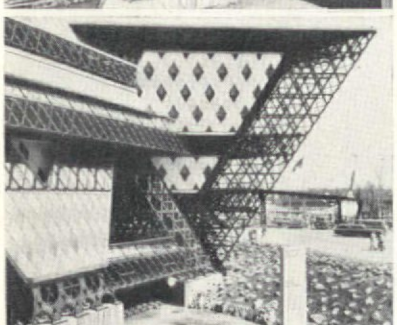
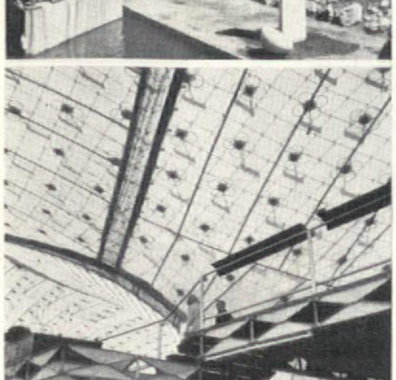






There's no doubt about it: EXPO's a wow! First, there is the site: what could be more exciting than two islands and a peninsula, with the St Lawrence seaway on one side, and docks, grain elevators and the city sky-line on the other! To reach it, a free-ride silver express train from the main entrance to four key stopping points, or the rubber-wheeled new Metro train from downtown to the heart of the site near Bucky's glorious dome. And, once there, a choice of automatically-propelled mono-rail systems, weaving in and out, up and down, and even *through* some of the pavilions (US **2**, Ontario, Man the Explorer); delightful to watch their sinuous movement and bright colour, blue or yellow; delightful to ride in and experience the ever-changing scene. (Unfortunately, too many people have this same idea, and the Minirail queues are interminable, as are the queues for all the restaurants and for all pavilions which insist on a one-way route through their exhibit.)

Then there are the pleasures of the ground-level landscape, beautifully handled, with waterways and lakeside gardens, grouped vending kiosks by Ron Thom and street furniture of exceptionally high standard.

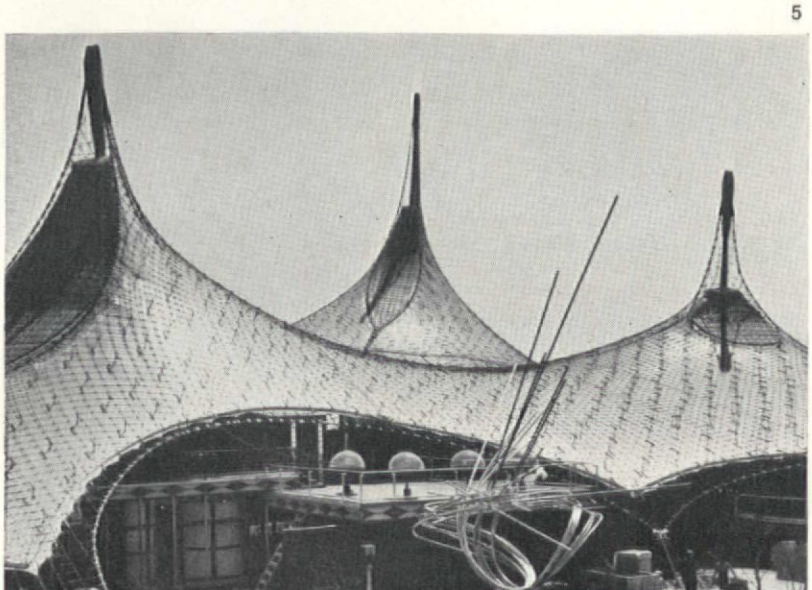
'Terre des Hommes', the exhibition theme, is brilliantly presented in theme pavilions (by the Canadian Corporation for the World Exhibition), each sited focally in different areas: 'Man in the Community', the wooden pyramid group designed by Erikson and Massey on the Cité du Havre; 'Man the Explorer' on Ile Ste Hélène and 'Man the Producer' **3** on Ile Notre Dame, both in rusty steel triangulated space frames building up into truncated tetrahedrons, designed by Affleck, Desbarats, Dimakopoulos, Lebensold and Sise; 'Man the Provider', a group of low buildings on Notre Dame designed by Longpré, Marchand, Goudreau, Dobush, Stewart and Bourke; and the National Film Board's Labyrinth on Cité du Havre, designed by Bland, Lemoyne and Shine. From the point of view of content, these pavilions more or less steal the show. Though one could say that, among the national pavilions, the widely disparate USSR and US come a close second, the one stuffed with space-age hardware the other including a sizable leavening of pop culture. But from the point of view of the exhibition buildings themselves, without a doubt the US and West Germany tie for top place as structures which are not overdesigned or heavy, which are flexible, and which perform with maximum efficiency and weight/strength ratios of the greatest economy of means; while their ratio of surface to enclosure produces miraculous effects.

The 250ft diameter aluminium and acrylic dome by Buckminster Fuller with Shoji Sadao and Geometrics Inc. for the US pavilion, in the distance resembling a ball of marquisite, nearby glistens at high noon like a finely cut diamond; or, against the westering sun **1**, silhouettes the exhibits it encompasses; while at night it glows from within. Inside, the experience of vast transparent enclosure is breathtaking, the metal geometry turned to gossamer.

The West German silvery 'tent' of steel cables and plasticized fabric (by Frei Otto and Rolf Gutbrod), suspended in great catenary curves from steel pylons **5** sweeps up to 120ft at its highest point, throwing a mellow amber light over the great, airy space below **4**.

But what a contrast is the nearby British massive lump of plaster, asserting theatrically that Britannia rules some waves, but outwardly showing no awareness of the present-day world of technology. (Someone should put our COI wise.) The French building is not much better: a many-tiered concrete bastion decorated outside with aluminium fins.

5



Ontario's pavilion by Fairfield and Dubois has something in common with Germany's, being an indeterminate tented structure, tubes and cables with stretched plastic skin, spreading over rocks and spaces and water. It offers too a first-class movie.

Talking of which, the movies *not to be missed* are showing in the Labyrinth, all the Theme pavilions, Canadian National, Switzerland, and Czechoslovakia. No need to queue: seats can be reserved through Reservexpo, at any of 14 information booths provided on the site by Esso Imperial.

Some other national buildings worth noting are: Austria (Karl Schwanzer) for its crystal-like structure based on the tetrahedron; Israel (A. and E. Sharon and D. Reznik) for its intersecting polygons; Africa Place (John Andrews) for its prismatic ply roofs and wind vents; Japan (Y. Ashihara) for its pre-cast post-tensioned interlocking concrete beams shipped all the way from Japan; the Netherlands (W. Eijkelenboom and A. Middelhoek) for its all-enclosing Triodetic space-frame; and Scandinavia for its simplicity outside and in, white steel frame and shiplap infill, collaboratively designed by five architects, one from each of the participating countries.

Last, but not least, comes Habitat (featured in *AD*, 3/67) which has already received enormous publicity, as has Moshe Safdie its architect. That such a controversial and expensive complex should ever have been built is a miracle. It occupies a beautiful site, on the tip of the Cité du Havre peninsula, with views of ships, grain elevators, Montreal's downtown, EXPO and of course the St Lawrence River. But it is unprotected from the icy winter winds which must surely find plenty of convenient places to penetrate (despite wind-tunnel evidence to the contary).

Conceived originally as an architectural antheap, it was never intended to be easily apprehended. The result is, of course, that without signposting it is very difficult to find one's way around. There are also some unsolved problems of overlooking. It is a pity, too, that economy made it necessary to leave the concrete exposed. However, the apartments are spacious inside and luxuriously appointed, with purpose-made kitchen and bathroom appliances, and all the present occupants (which include the PM and EXPO's Commissioner General, as well as the architect and his young family) seem well content.

Liverpool round-house

Robert Maxwell

The novelty of the new cathedral lies in its circular plan form and the simplicity of the space it generates. The conditions of the competition made it clear that one thing must be achieved: the congregation must be associated more closely than ever before with the celebrant of the Mass. A great majority of the 298 competitors responded to this condition by bringing the High Altar forward into view, and no less than 49 submissions had the altar placed centrally in a circular space. To do this raised certain difficulties about the positioning of the 20 cannon stalls, the archbishops' throne and the pulpit, particularly as the conditions also required that the high altar had to be designed so that Mass could be celebrated with the priest either facing or with his back to the people (see *AD*, Oct. 1960, p. 425). The winning design contravened some of these details, which in the event were evidently considered to be less important than the primary symbolism: the assessors fell for what they clearly felt was an overriding expressive quality, identified as the expression of the Kingship of Christ in grand and simple terms. The space of the cathedral, which expands outwards from the High Altar to the periphery of chapels and entrances, also expands upwards to the lantern, with its external continuation in pinnacles and a tenuous 'crown of thorns'.

The result is a statement of staggering simplicity, in which sanctuary and nave focus on the same central point. The selection of this design probably required a greater courage on the part of the assessors than the designer needed to put it forward. The other 297 entries included a fair number of extravagant gestures most of which the assessors passed over in silence, and one superlative gesture by Clive Entwistle which they rejected because it would be difficult to maintain in a northern climate and because it looked like a Burmese pagoda. Their chosen design evidently has sterner qualities, more suitable to a northern English industrial city. There is more than a hint of cooling tower, and the new building has already passed into the local vernacular as 'the Mersey funnel'. The exposed position of the High Altar, which is almost encircled by the congregation, is a distinct departure from orthodoxy, and a courageous one from the point of view of maintaining ancient symbols. Presumably the Mystery remains a mystery even when it is brought into the light of day, and the congregation will be able to participate in a new way.

Even in Sir Basil Spence's very modern God-box at Coventry, the altar is placed in its traditional position at the end of a long nave, where a degree of remoteness and directional lighting combine to maintain the scenic mystery. At Liverpool, on the other hand, many of the congregation will be looking across the centre of drama at the knees of people opposite. Will knees prove a distraction to worship, or will they simply make church-going more attractive to younger people? The Roman Catholic Church has never been insensitive to the theatre of ritual, especially since the period of the counter-reformation. At Liverpool it has decided to bring the ritual to the people, in a way which is inevitably reminiscent of the theoretical ideas of 'theatre in-the-round' which were being widely canvassed during the 'fifties while this competition was being planned.

The courage may pay off. If a generation will flock to the Camden Town round-house to see a psychedelic happening, why should not the unveiling of a mystery draw similar crowds to the Liverpool round-house? At least the novelty at Liverpool is in the action, and not, as at Coventry, in the sideshows.

Inevitably, in this age of the erosion of symbols, the architect has had recourse to a team of craftsmen to enrich and ennoble the symbolism of the structure and of the basic theme. Again, Liverpool scores by the restriction of the decorative elements to a few. John Piper and Patrick Reyntiens have collaborated in the stained glass panels of the main lantern—a spectrum of primary colours with three 'light bursts' punctuating the ring. More coloured glass is used to fill the gaps between main frame and chapels. The floor has a rather effective pattern of radiating stripes in grey and white marble, designed by David Atkins, and the pattern on the altar podium has been considerably simplified from its original form. The organ displays speaking pipes. The baldachino is frankly decorative but is also a liturgical requirement and has been exploited as a discreet means of housing lighting, heating and loudspeakers as well as acoustic reflectors. The over-anxious fault of packing in a whole galaxy of stars, like a command performance, has been avoided, and the building does not cease to dominate the decorative elements.

To attend mass in this cathedral is going to be an interesting and stimulating experience for thousands of people. Can we say that the venture is a success? It certainly looks as though it will attract users and provide satisfied clerics.

At a practical level the building had met its brief. The car-parking is neatly tucked underneath, providing undercover access and a lift for invalids. The roof of the crypt provides a useful podium which is capable of accommodating many thousands for outdoor services on feast days. Inside, the seats are comfortable, the acoustics are electronically amplified, there is underfloor heating by coils, and warm air from grills below the windows, and a good view of the action.

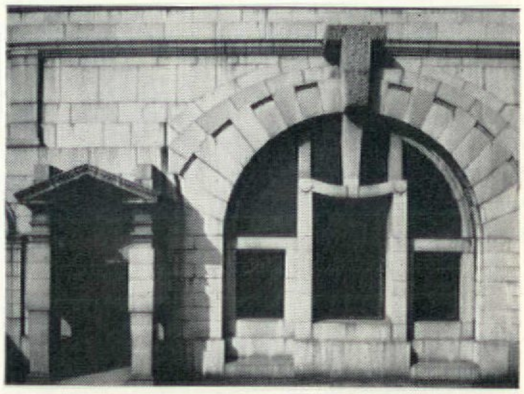
In the construction a strong practical sense is evident, and there has clearly been a close collaboration between engineer and architect. The roof covering of sheet aluminium is secured to the pre-cast concrete infill panels by a layer of foamed polyurethane, which provides both insulation and adhesion. The pinnacles are formed of pre-stressed concrete, cast within plymol tubes, and linked together by steel tracery to damp down oscillation: the tracery is technically necessary, but is also used to provide the appearance of a symbolic crown of thorns, surmounting the lantern. Similar ingenuity has been used to allow the formwork for the lower ring of structural buttresses to be re-employed to form the main roof ribs. All this is highly competent. And this within a budget which compared to that of the original scheme and was realistic and attainable. The design, indeed is economical in several ways. The circular wigwam is an economical volume, and the use of a ring of chapels to provide walls to the main space is a further economy. The clerics have a bargain.

Sense, certainly; sensibility, no. Even if one accepts the situation, with its requirements for obvious symbolism, there is a literalness of symbolism here which is ultimately vitiating to the quality of the architecture. For example, the three 'sun-bursts' in Piper's glass lantern are disposed at roughly equal intervals around the circumference, which is carried by 16 vertical ribs. The ribs run through the sun-bursts in a free, pictorial way, and there is no geometrical link between the 3 and the 16, nor are the sun-bursts related directly to the main axes of the building. It is hard to resist the impression that the artist's design, the craftsman's technical solution, and the architect's control, have not sufficiently overlapped. The free design has been rather off-handedly tacked up.

This lack of formal precision and control may be traced in many details. The floor is circular but the construction demanded straight ties, so the structural rings are faceted to a polygon. The transition occurs at the main ring beam and is not managed very skilfully. The chapels are intended to stand out as individual entities with particular roles and shapes, and to blend into a rich plastic undulation. Their shapes have turned out to be half-hearted, and each one is flattened to a uniform frame at the junction with the main space, as if the designer feared they might get uppity: the result is a loss of the tension and juxtaposition which might have exploited the ambiguity of their relationship with the nave, and again the formal quality sags. On the outside, the relative tones and colours of structural ribs and chapel walls jar uncomfortably. The structural members are dominant, but they have been faced with near white mosaic, so that they look cardboardy and flimsy, compared with the firmness of the Portland stone, which is itself merely a facing for brick and concrete. The metallic grey of the aluminium sheathing goes with neither.

The lantern is unexpectedly dark and smoky because of the concrete rib-work, which gives a kind of industrial weight; this emphasizes the 'crankiness' of its juncture with the main roof, and contradicts the upward surge of the ribs.

Finally, the proportions are graceless. Comparing the finished result with the original drawing, the design has stayed constant in principle, but details have thickened. The ribs are thicker, and the proportional rise to the first and second ring-beam levels is now by equal stages (no doubt because of the practical point about re-using the shuttering). Indeed the whole design falls uneasily into three very equal storeys—chapels, main roof, lantern. In this context the main roof suffers from the other two, and the volume of the main space hardly registers on the outside. The lantern looks unexpectedly bulky, and at odds with the pins and wire structure above it, but when viewed from inside, diminishes by foreshortening to practically nothing. The space and the form have been grasped and stated rationally, but the emotional control which should blend everything together into something greater is sadly lacking. As a cultural artefact, then, the cathedral will only be redeemed by its role and its functional grace. Artistically it is undermined by its tastefulness. When one thinks of the noble chuckiness of the west front at Wells or Westminster, or even the Boston Stump (actually much smaller than the lantern at Liverpool), it is clear that all we have at Liverpool is a mere ornament. The qualities which are missing, however, are present as a perennial reproach in Lutyens' crypt. Go and study the transition of square to circle in the turret staircase for an object lesson in combining grace with strength, which is what Sir Frederick most conspicuously does not do.



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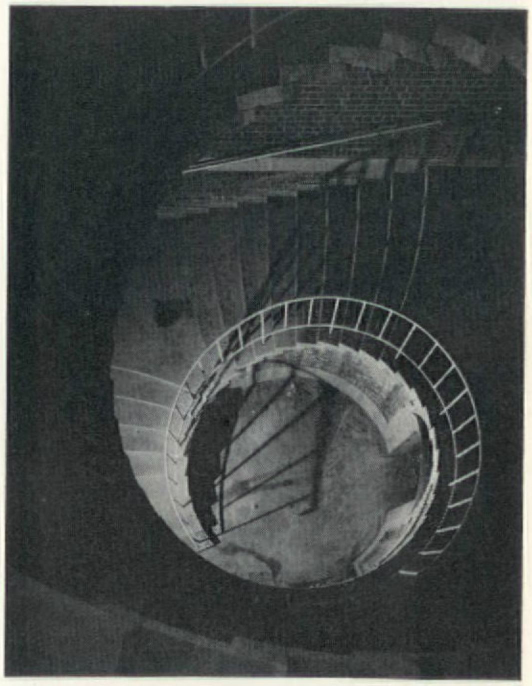

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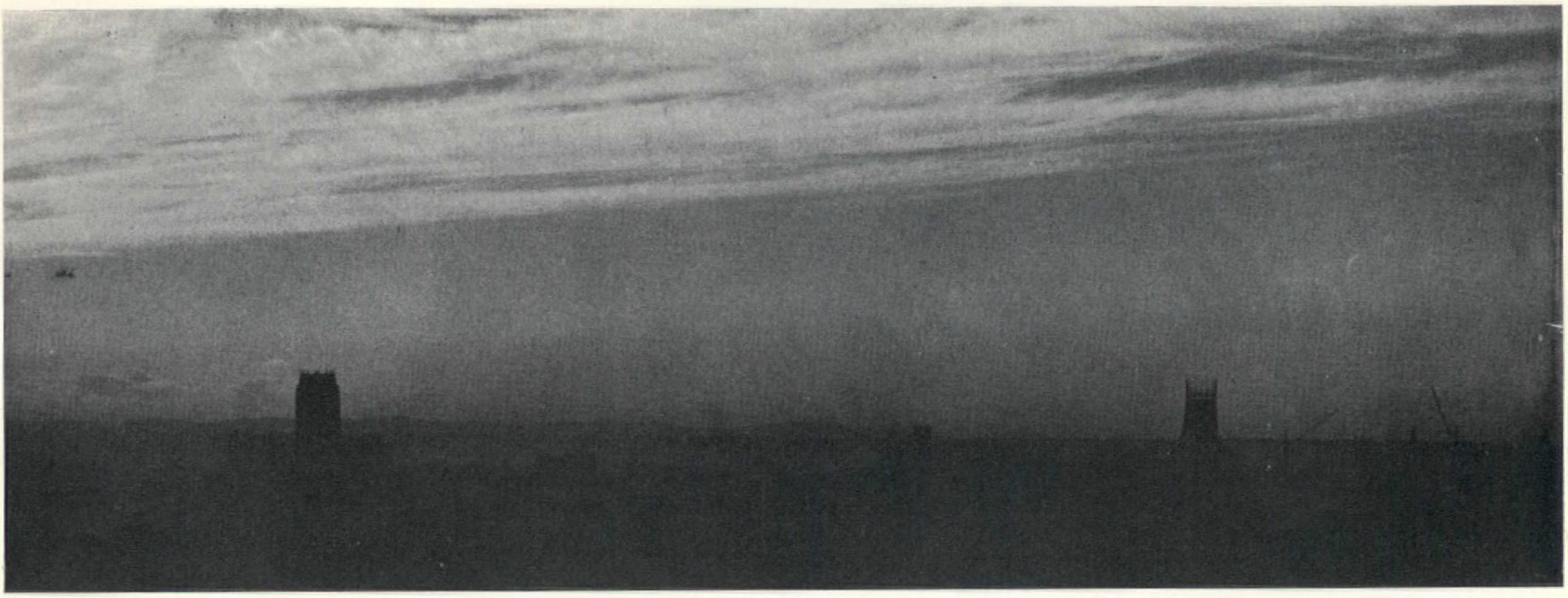
1 & 2
East court entrance and Turret staircase to the crypt by Sir Edwin Lutyens.

Photos: Henk Snoek

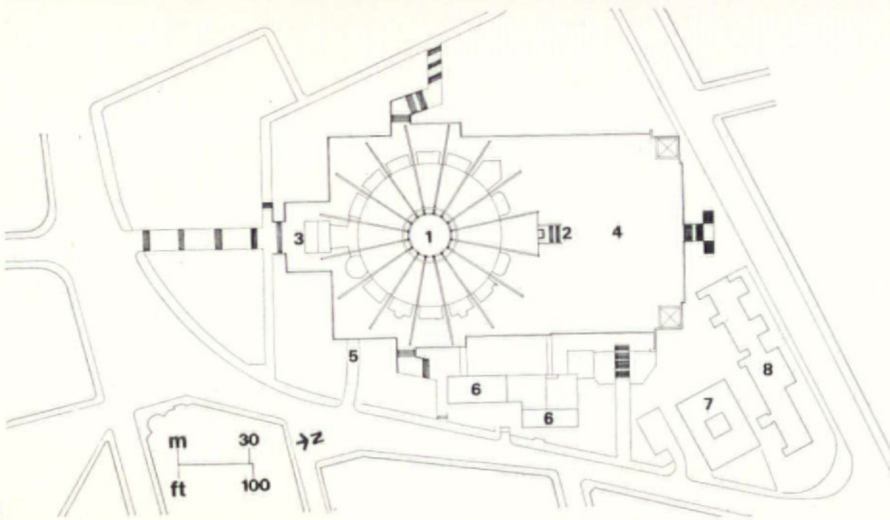


1

Metropolitan Cathedral of Christ the King, Liverpool

Frederick Gibberd and Partners

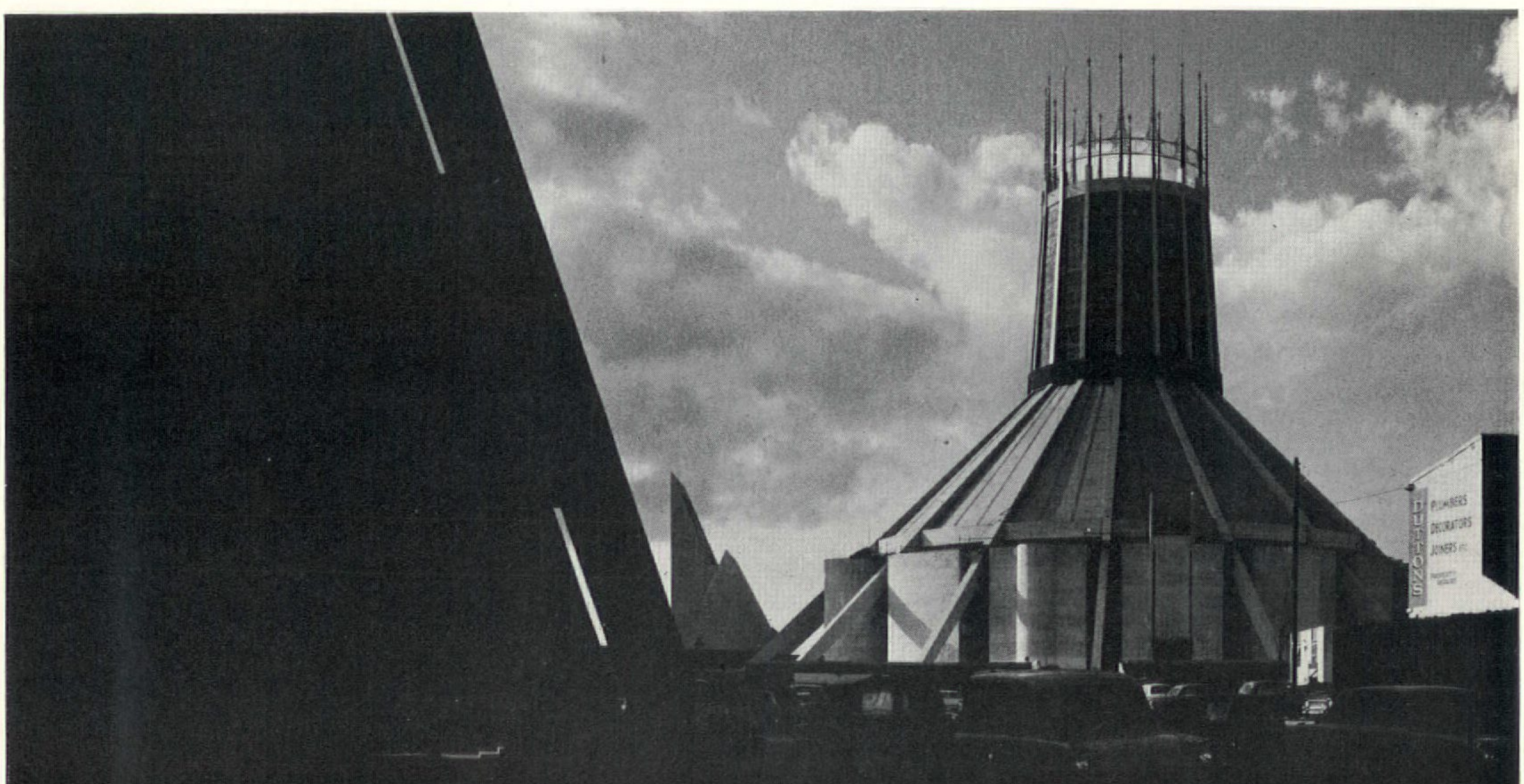
Consulting engineers: Lowe and Rodin
Acoustic consultants:
H. R. Humphreys and Hugh Creighton



Key:
1 cathedral
2 outdoor altar
3 main entrance
4 Lutyens' crypt
5 service road
6 presbytery and convent
7 chaplaincy
8 existing offices

2

1
The Liverpool skyline, with Gilbert Scott's Anglican cathedral complemented by the new Catholic cathedral
2
Site plan
3
View of the cathedral from the east, with Denys Lasdun's sports centre in the foreground (see p. 275)
Photos: 1 John Mills, 3 Henk Snoek



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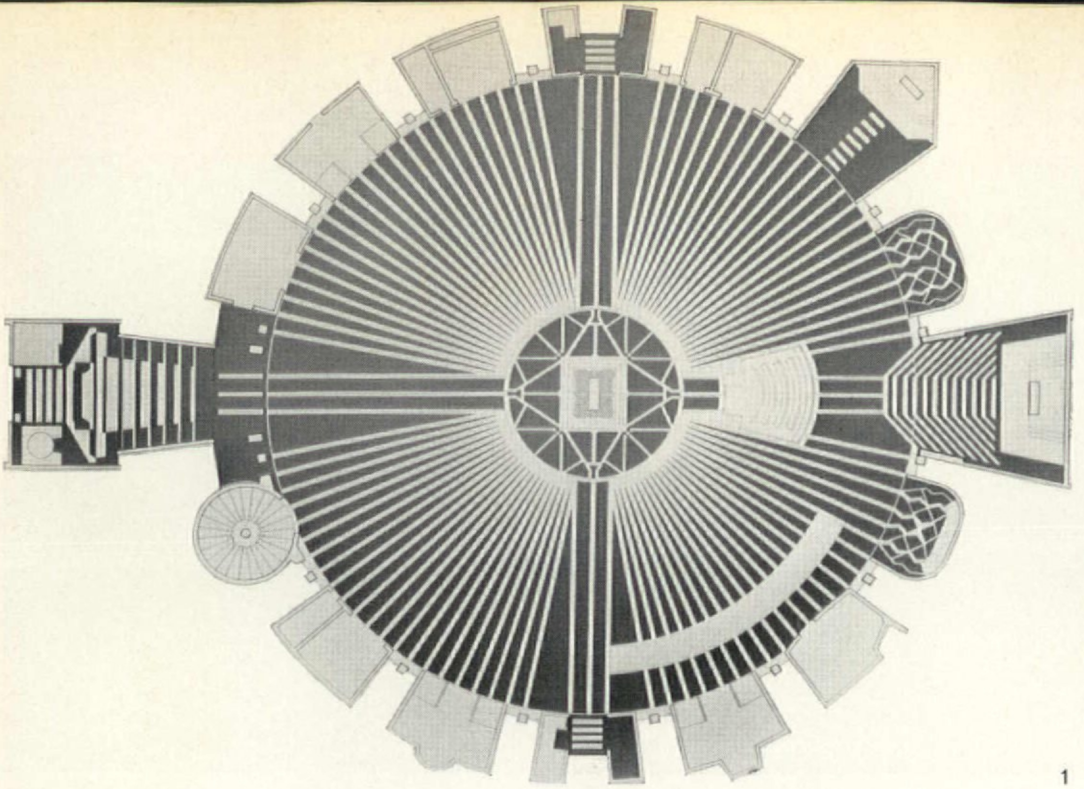
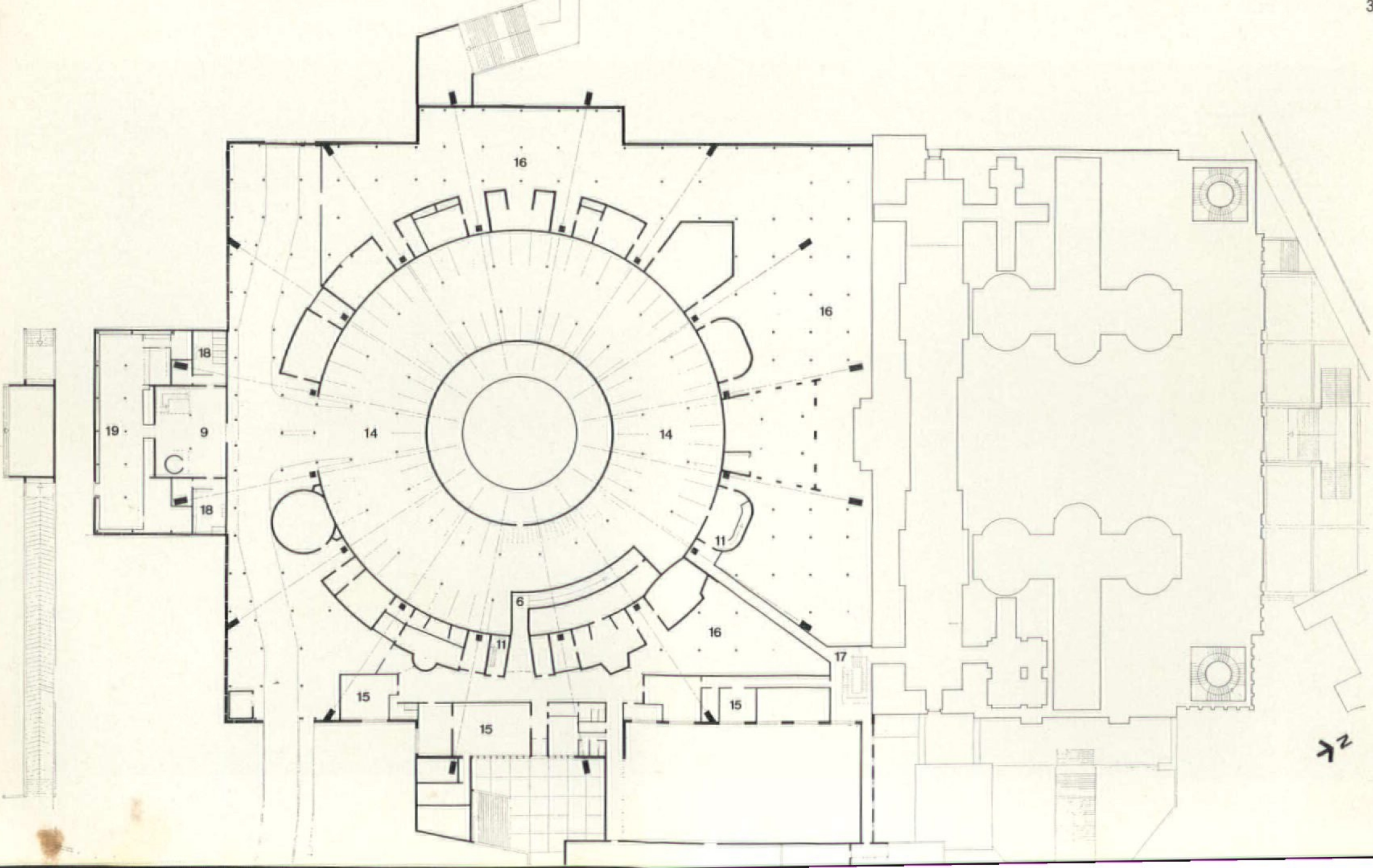


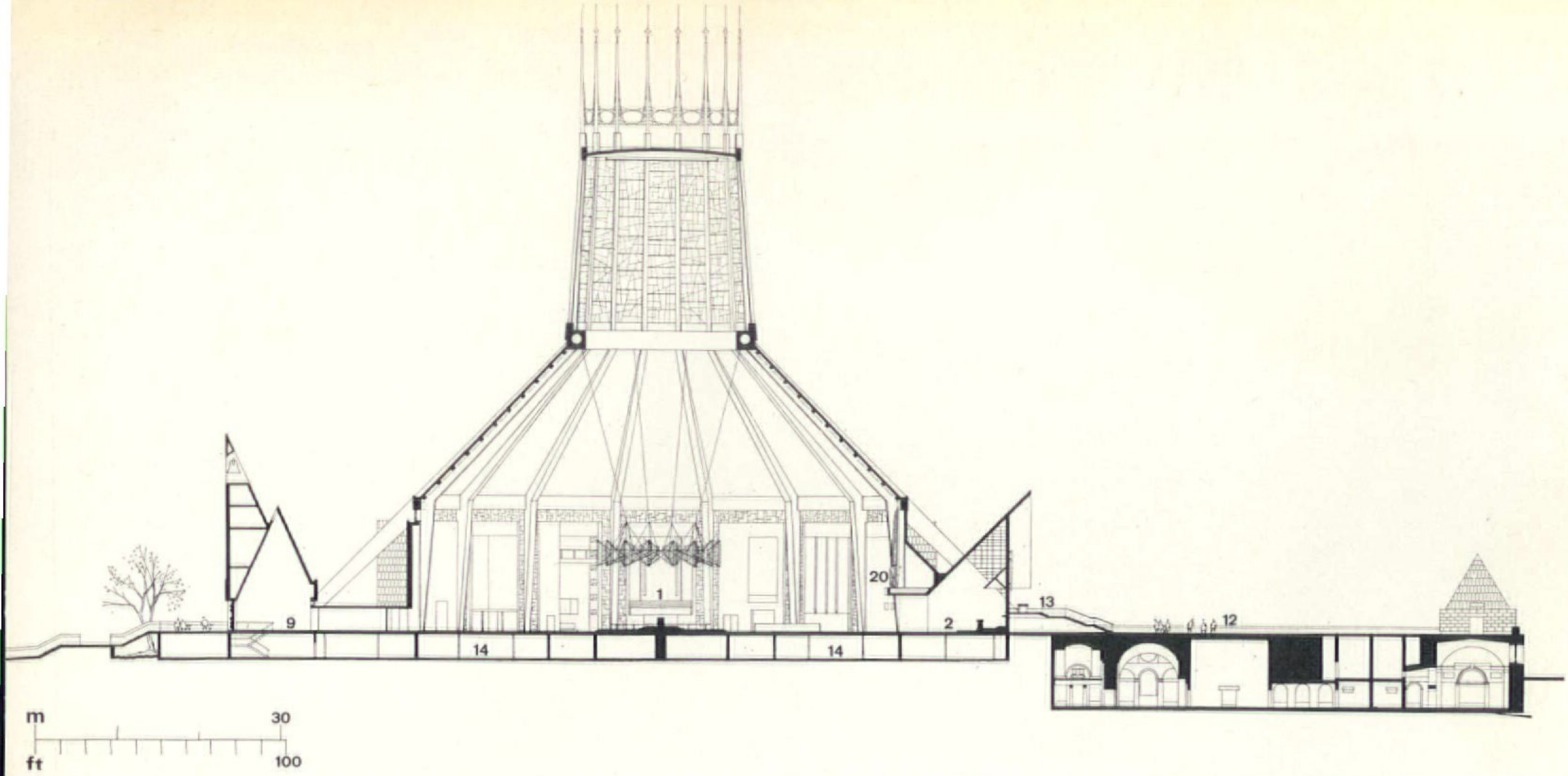
1

1
The design of the sanctuary floor, by David Atkins, echoes the sixteen concrete frames of the structure of the cathedral. From the edge of the sanctuary, lines of white marble radiate to the outer wall of the nave and the pattern extends into the Chapel of the Blessed Sacrament and the two towers on either side and into the Lady Chapel
2
Section
3 & 4
Basement and ground floor plans
Key
1 sanctuary
2 Blessed Sacrament chapel
3 Lady chapel
4 baptistery
5 choir
6 ramp from sacristy
7 side chapel
8 confessional
9 main entrance porch
10 east and west porches
11 stair to sacristy
12 roof of Lutyens' crypt
13 external altar
14 parking garage
15 sacristy
16 store
17 stair to crypt
18 lavatories
19 tea room
20 organ

The history of the cathedral begins in 1853 when Pugin was commissioned to prepare designs for a Gothic cathedral. The building was abandoned when only the Lady Chapel had been completed and it now serves as a parish church. In 1928 Sir Edwin Lutyens was appointed architect for a new site at Brownlow Hill but World War II stopped work, with the crypt almost completed. As the cost of building Lutyens' design after the war was prohibitive, an open competition was held for a new cathedral, to link with the existing crypt and with a cost limit of £1,000,000.
The competition was won by Frederick Gibberd in 1960. Some eighteen months were spent on developing the design, building began in September 1962 and the formal opening was in May 1967.
The plan of the cathedral was developed as a solution to the functional problems posed and the character of the environment in which the cathedral is situated.
The requirements were clearly stated in the conditions of the competition. In particular, it was stressed that the trend in liturgy is to associate the congregation ever more closely with the celebrant of the mass, that the cathedral was being built to enshrine the high altar, and that the ministers at the altar should be clearly in sight of the people.
The solution found to this requirement was to place the altar in the centre of the building and surround it on three sides with the congregation: in this way it was possible for two thousand people to be within eighty feet of the sanctuary steps. The circular plan form is a natural grouping in which there is a sense of physical proximity to the centre of activity and a relationship of person to person which emphasizes the communal aspect of worship.
The difficulty of a circular plan, that it lacks direction, is overcome by a principal north to south axis through the building, formed by an entrance porch and bell tower at one end and the most important chapel, the Chapel of the Blessed Sacrament, at the other. At right angles to this principal axis a secondary one is formed by east and west entrance porches.
The liturgical significance of the Chapel of the Blessed Sacrament is underlined by its position at the termination of the main axis and its relationship to the sanctuary is established by the clear view between the high altar and the tabernacle built into the rear wall of the chapel.
The choir is placed behind the altar, in the space between the sanctuary and the Chapel of the Blessed Sacrament and the organ in a gallery over the entrance to the chapel. With this arrangement the choir have a clear view of the sanctuary, at which they themselves are worshippers and all sound comes to the congregation from the same source; the organ itself has a

3





2

position of prominence worthy of its unique form and one which reinforces the main axis without competing with the sanctuary.
The baptistery is a self-contained building placed adjacent to the main entrance porch, from where a glimpse is obtained of the font but opened up to the nave so that its area can be extended. The prominence of the building in the external views is a reminder that Christian life begins with baptism and proceeds to the altar, symbolized by the tower rising behind it. The centrally-placed font is on a line radiating from the high altar.
A requirement of the design was that there should be a Chapel of the Blessed Sacrament, a Lady Chapel and eight small chapels, each dedicated to a different saint. Each of these chapels is complete in itself, as an independent design, standing in the spaces between the main structural frame and to them are added the other small individual buildings such as the baptistery and porches, so that all sixteen perimeter spaces are filled: the buildings thus take the place of walls. In order that the shape of the buildings should be crystal clear and that the structural frame itself should be articulated, they are separated from the frame by coloured glass.
The circular plan form is developed in section to a cylindrical nave space which extends into a conical roof, which is again extended upwards into the tapering cylinder of a coloured glass and concrete tower. The tower is the means of lighting the sanctuary, placed directly beneath it. It is a spatial extension of the sanctuary, the interior thus being one total space in which the most significant space is over the most important religious place.
For structural reasons the circular plan was adjusted to a polygon which is formed by sixteen concrete trusses which, linked by three ring beams, form the structural frame holding together the walls, the roof and the tower. Externally the building exactly reflects the internal space; the tower is not an arbitrary object but an extension of the sanctuary: the dominant external form is over the dominant internal object, the high altar.
As with the Gothic cathedral, the structure was regarded as a challenge and full use made of modern techniques; the load imposed by the wind at any given velocity was assessed by means of a model at the National Physics Laboratory and a model was tested to destruction there. New techniques and new types of equipment were devised and factory methods used both on and off the site. The site itself was laid out as a number of factories for producing prefabricated components and the whole erection was geared to a huge tower crane standing on the foundations of the

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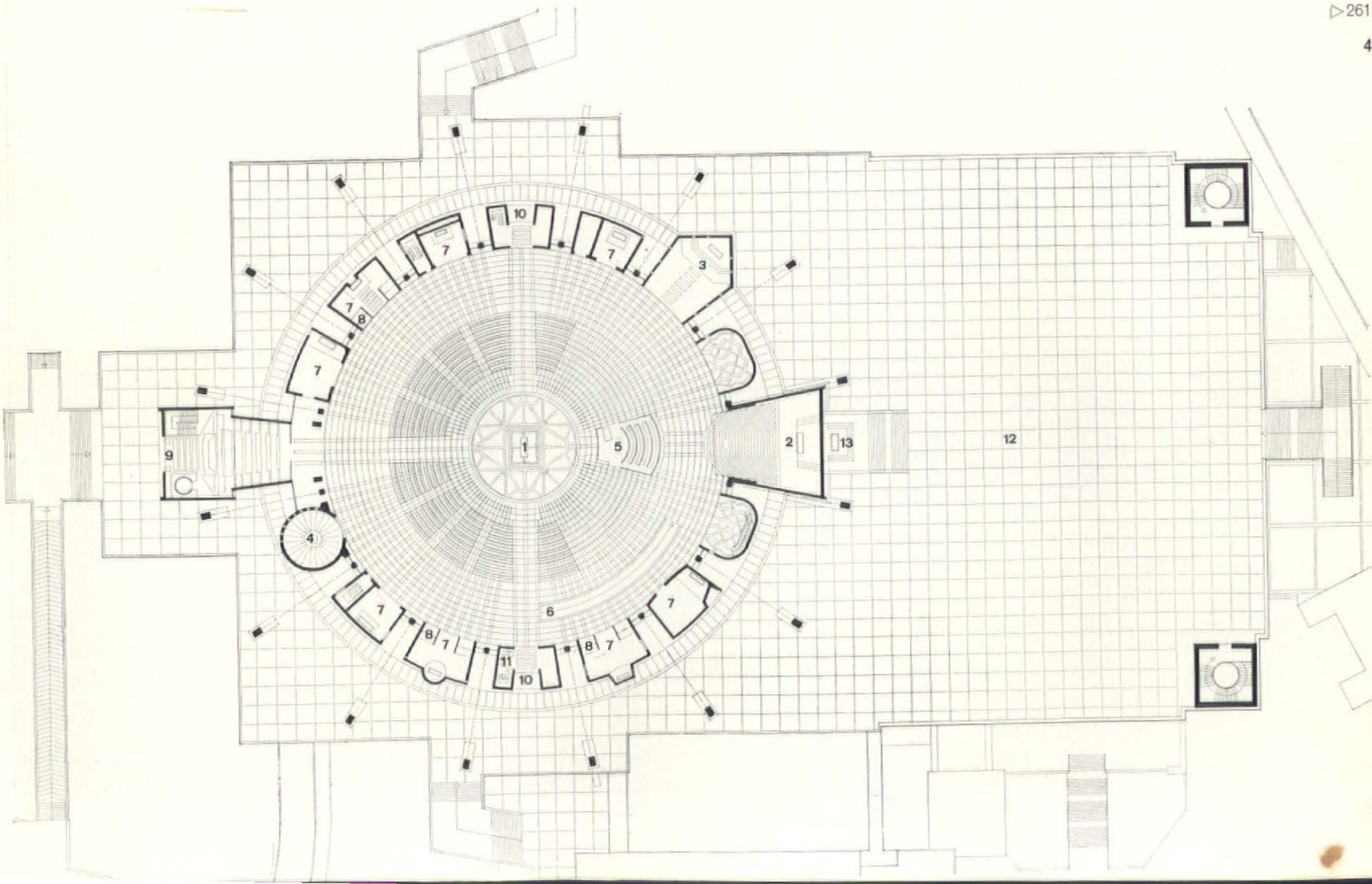
4



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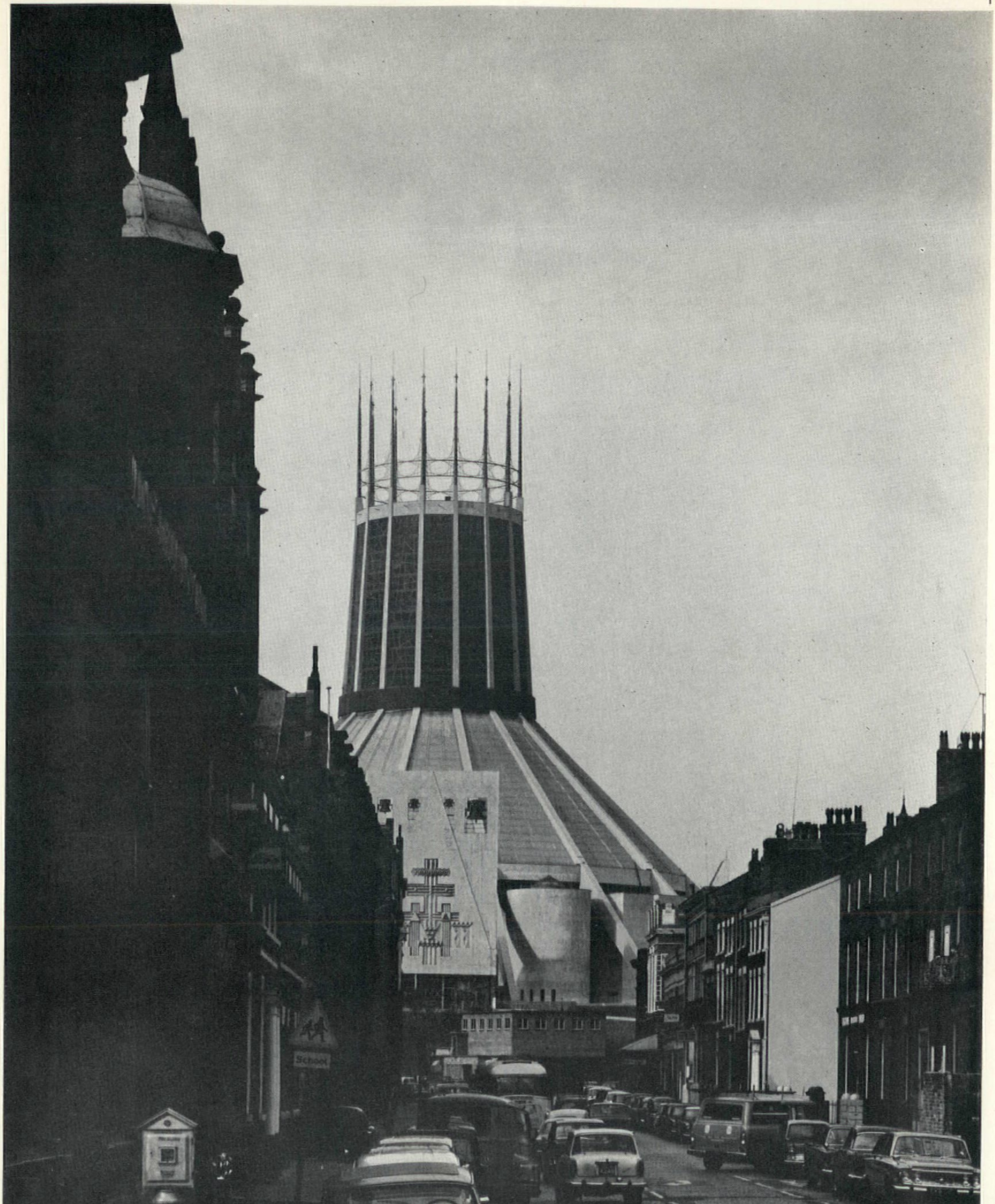

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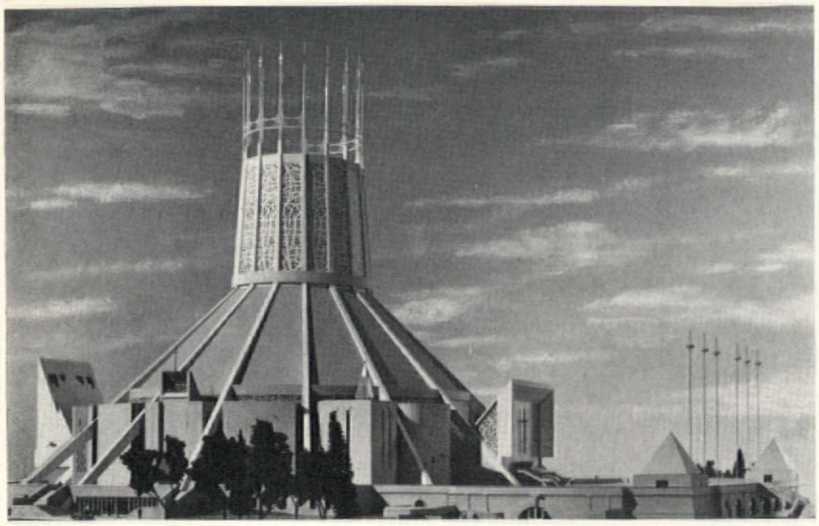

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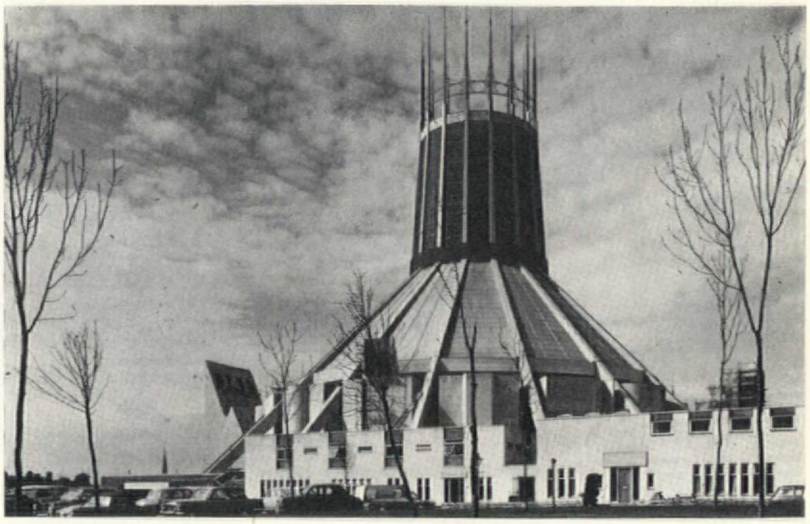

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high altar and progressively increased in height as the building grew up around it—the crane acted as a giant hand over the whole area of the circular nave. The building consists of three basic and independent types of structure: an *in situ* reinforced concrete frame which holds together the main body of the cathedral; the sixteen loadbearing brick or concrete perimeter buildings; and the flat slab of the podium, supported by concrete columns or loadbearing brick walls. The main structural frame is designed as a continuous *in situ* reinforced concrete construction, largely in compression, both to reflect the total space of the cathedral and to give an exceptionally long life—members in tension or joints between small members can be a source of weakness.

The frame is formed by sixteen reinforced concrete members, each in the shape of a boomerang, which make up the drum and the conical roof and which extend above in the shape of the tapering tower.

As such a structure has considerable bending moments at its change of direction, the sloping cone members are carried down into the ground in the form of flying buttresses. This has the effect of considerably lightening the structural frame and making the building more elegant.

The resultant structure places a tall tower, weighing over two thousand tons and subject to great wind pressure, over a vast space, supported by structural members which diminish to a few square feet when they enter the ground.

The horizontal and diagonal thrusts are restrained by two concrete rings placed around the top and bottom of the roof cone. These rings transfer the load from the sloping ribs partly into the vertical legs of the main frames and partly into the buttresses.

The roof cone is formed by precast concrete purlins spanning between the main ribs supporting precast concrete slabs, on which the roof covering of sheet aluminium is secured by an insulating layer of foamed polyurethane. ▷262

1
View towards the main entrance porch and bell tower, Looking north down Hope Street

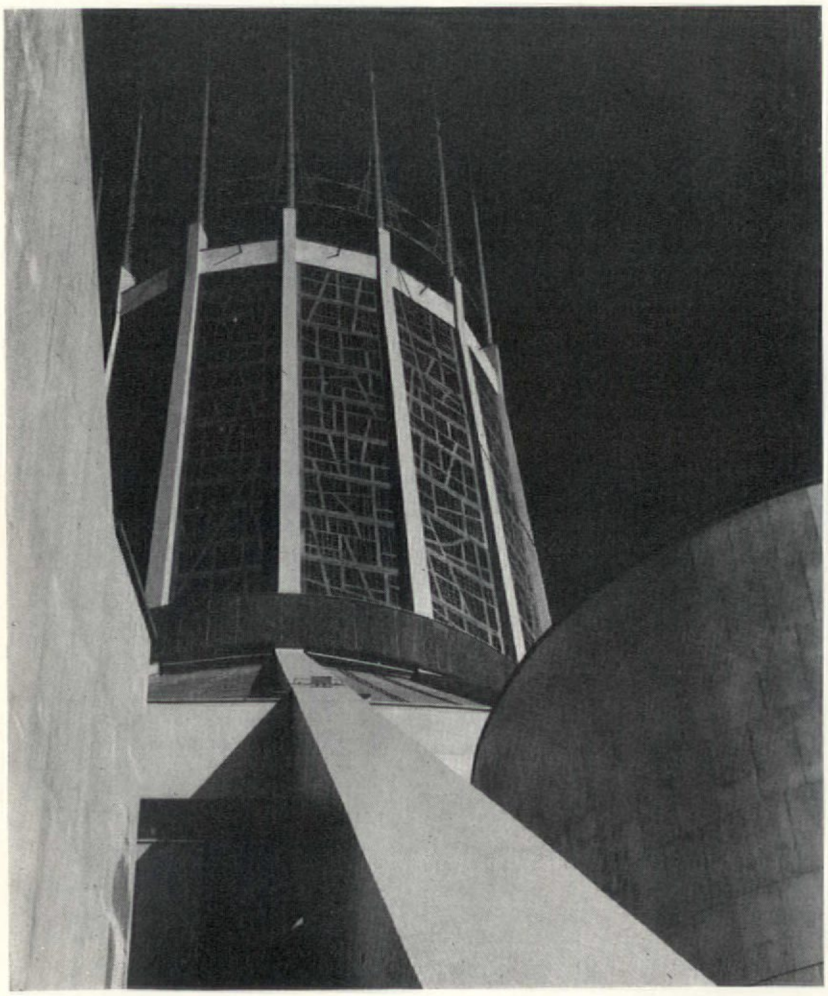
2
Design model seen from the east

3
General view of the completed cathedral from the east with the cathedral house and convent in the foreground

4
The line of a flying buttress, continuing up to the ring beam of the tower and then rising up as a vertical column. The main ring beam is clad with dark granite slabs, the chapel walls are faced with Portland stone, the buttress with mosaic

5
View from the north, showing the cathedral rising over the existing Lutyens crypt. The tower of the Anglican cathedral can be seen in the distance

Photos: Henk Snoek



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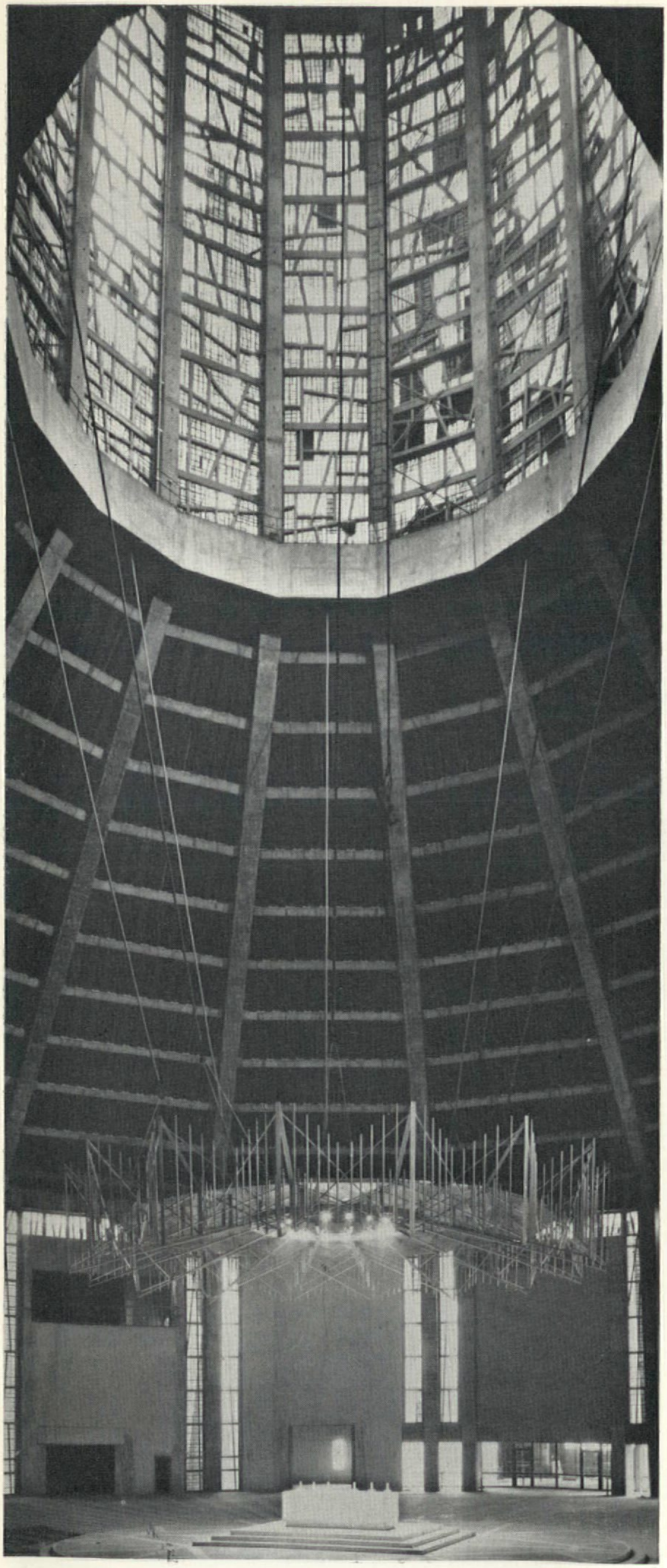

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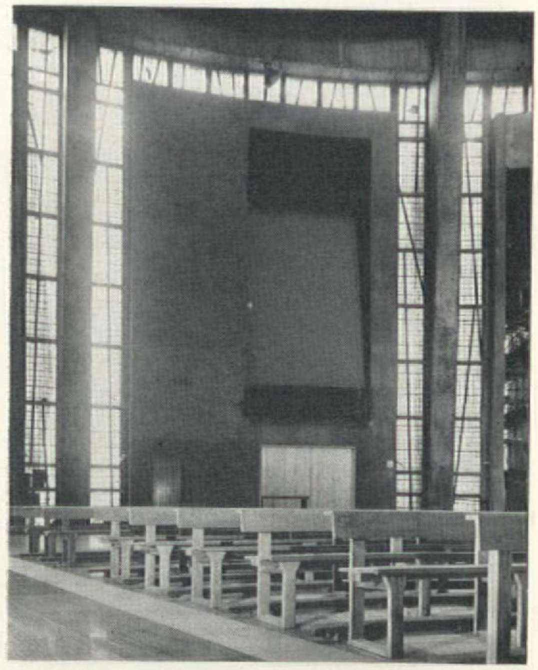
The main frame has a constant width from foundations up to the main ring beam, but the depth varies with the amount and direction of the force and direction. The base of the tower (the top of the lower ring beam) is some 126ft above nave floor level and the external diameter is 78ft which diminishes about 11ft to the top. The structural ribs diminish both in width and depth to reflect the taper of the tower and they are joined at the top by a prefabicated ring beam and shallow domed roof. The infilling of the tower is by precast rectangular panels (156 in all), consisting of a reinforced concrete outer frame within which coloured glass is cast (see opposite).

As the atmospheric conditions of Liverpool are uncertain, the structural frame is clad externally in a white mosaic, which will be washed clean by the rain. Internally the concrete is cast against smooth shuttering and left in its natural state.

The ribs of the tower are extended upwards in the form of pinnacles to a total height of 290ft. The pinnacles, apart from being an economical means of gaining height, arose from the desire to dissolve the silhouette into the northern atmosphere. The pinnacles are prestressed concrete posts, cast within plymol tubes, linked together by steel tracery to damp down oscillation, and surmounted by steel crosses and finials. The steel is protected from corrosion by an outer casing of synthetic resin.

The heating system is fed from the crypt boiler house and underfloor coils supply the main source of heat within the nave space and chapels. These are supplemented by warm air grilles beneath the nave windows and within each chapel. Special heating elements are provided on the baldachin and at the base of the lantern, to prevent down draughts.

Full mechanical ventilation is provided to the car park beneath the nave, and to the sacristies.



2

1
View of the lantern tower of coloured glass, with the aluminium baldachin suspended over the sanctuary. The sanctuary, 54ft in diameter is raised 10in above the floor; in its centre is the high altar, a block of flawless white marble from Macedonia. The baldachin, suspended some 30ft above the altar, was required for liturgical reasons, but it also provided a convenient method of housing lighting, heating and loudspeaker equipment and a means of suspending an acoustic sounding board of plywood over the area.

2
A view of the interior showing one of the side chapels that form the enclosing walls of the nave. Only two of the eight small chapels have been completed, the remainder having temporary altars.

Photos: 1 John Mills, 2 Henk Snoek.

The Cathedral glass

Patrick Reyntiens

The original suggestion for the glass in Liverpool Cathedral was to employ a basic unit, or series of basic units, of design in coloured glass, which would be able to be repeated throughout the cathedral, giving a recurrent formal pattern and a schematic colour system. The effect might have looked rather like the church of St Joseph at Le Havre, Auguste Perret's last church, which is constructed in a latticework of trabeated concrete beams infilled with glass by Marguerite Hure, whose design is a severe and uncompromising composition in a highly restricted colour range.

It is open to doubt whether this treatment would have been appropriate to the structure of the new Roman Catholic Cathedral. In any case the idea did not appeal to John Piper and me when asked if we would undertake all the glass in the church. We had never worked together on a formal idea: John Piper's design for the Baptistry window at Coventry shows the aptness and expressive force of a freely executed design in a largely geometric setting.

The main lantern design was finally agreed to be a colossal trinity in colour, a variant and an extension of the burst of colour and light in the Coventry window. The drum was to be encircled by a total spectrum the height of the lantern within which would be inserted three glowing effulgences of light: yellow to the north, red to the west, and blue to the east, with the spandrels top and bottom, enclosing the effulgences, in the remaining colours of the spectrum. Thus between the red and the blue effulgence which are brilliant and dazzling, there is a passage of dark purple; between the blue and the yellow effulgence, a barrier of dark green and between the yellow and the red effulgence there is a barrier of very dark amber. The whole lantern was designed so that at no place in the cathedral, except right in the sanctuary, where few people can penetrate, can the whole of the colour scheme be seen at once. At most one can see parts of two effulgences separated by their intermediate colour.

The lantern is divided into sixteen bays, each bay of stained glass measuring 12ft wide by 66ft high. Each panel of glass (they varied between 4ft and 8ft in height, and no two of them were exactly alike in dimension or in design) consisted of a 6in deep concrete frame cast integrally with an internal latticework of 4in × 4in concrete ribs.

The method of casting was to make up the mould on a heated table which had detachable sides and two eccentric electric vibrators underneath. Expendable expanded polystyrene slabs were placed on the table to fill the spaces between concrete ribs. Because of the enormously powerful vibration necessary for casting, a steel frame was devised which clamped to the table and from which the reinforcing (accurate to $\frac{1}{8}$in) was suspended in the mould at the correct height. Handjacks from the steel frame compressed the polystyrene, preventing it floating on the concrete during vibration.

The concrete structure of each panel was covered with an inch-thick outer skin of a special formula epoxy resin, which adhered to the concrete (which previously had been washed free of laitence,

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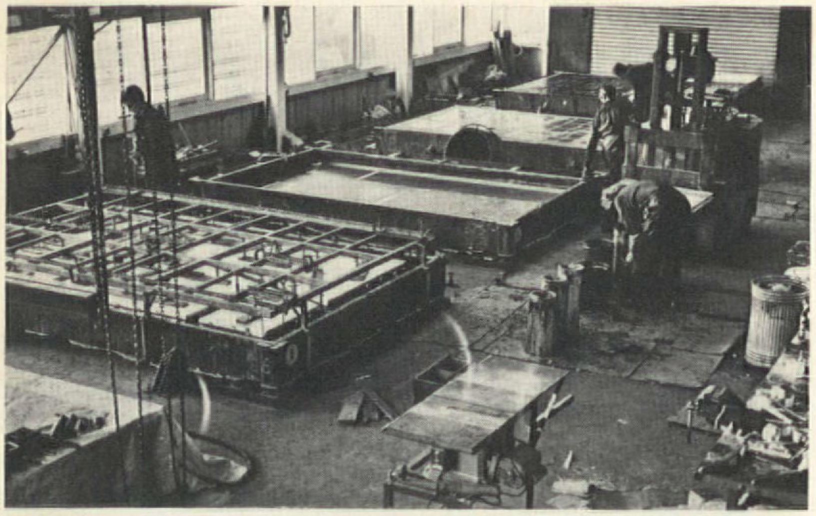
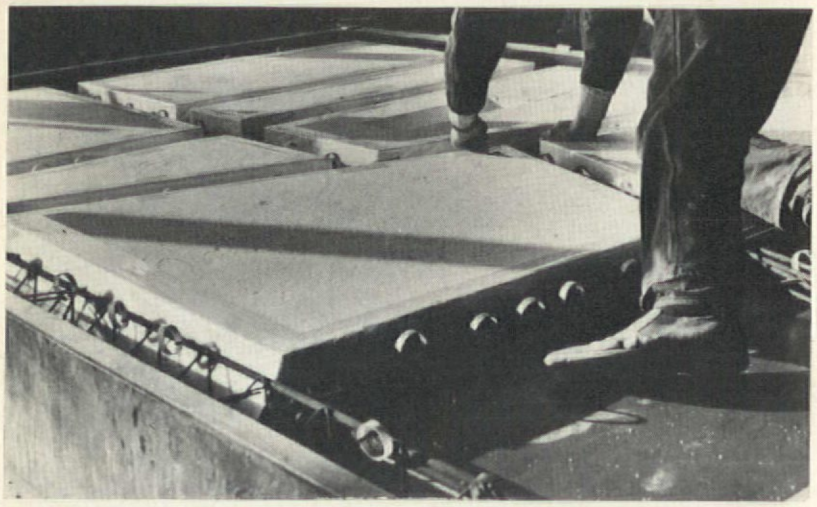
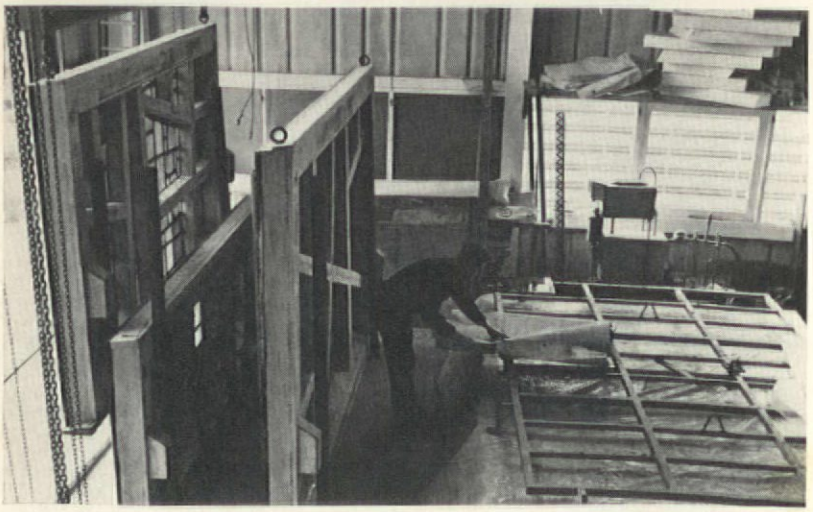
Area of blue glass in the three colour trinity encircling the lantern, by John Piper and Patrick Reyntiens Most of the glass was supplied by the Compagnie St Gobain (factory of St Just) and Claritude Ltd, London. *Photo: John Mills, colour block courtesy Claritude Ltd*







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wire-brushed clean, and thoroughly dried out) and was physically bonded to it by protruding fibreglass rings which were half in the epoxy layer and half in the concrete, secured to the reinforcing. The glass used in the windows was inch-thick slab, *dalle-de-verre*, specially imported from France and Germany. The slab, when it had been cut to the right shape was placed on a pattern on top of the infilling between the ribs of the concrete. Thus the glass never touched the concrete, it became part of the outer skin of one-inch thick epoxy resin.

Each piece of glass was cut the right shape by hand and kept throughout in the right relationship with its neighbours (i.e. the right way up, the right way round, the right shape, the right size, the right position, and entirely free from grease, washed with Teepol, rinsed twice in pure water, and dried in hot air ducts, handled all the time in rubber or plastic gloves so that the glass would be entirely free from sweat, dirt and grease, and could stick to the epoxy really efficiently). Some hundred and fifty slabs of glass, each one weighing about 10lb, were cut to shape every day, and put into position.

The total production time for each panel was about five days, and the panels were being produced, at the height of the production period, at the rate of five a week. During the preliminary stages of the whole job, the question of fixing had to be examined very carefully. Movable nib-moulds had to be specially manufactured and fitted to the casting-tables to cast very heavily reinforced nibs protruding on the inside of each panel to take its weight. Cast into the concrete at each corner were bronze seatings for the securing screws, and cast iron lifting-lug seatings were attached to the reinforcing at the top of the panels.

The structure of the lantern had to be cross-braced against wind pressure and suction. The bracing bays were different to the others, having smaller vertical intervals between panels, with the addition of steel diagonal tie bars on the inside of the glass running the whole vertical length of the window. It would have been appropriate had these bracing bays been reduced to three, and situated in the darkest parts of the total design, i.e. between the effulgences, because the designers were worried that the transoms across the glass, being more frequent, might interfere with the general flow of the design. In fact there had to be four bracing bays, but the situation was mitigated to a large extent by the designers stipulating that the horizontal divisions between glass panels were to be staggered. Thus no bay's divisions are equal to any other bay's, and no horizontal division ever produces a carry-through with its neighbour, so that at no place is there the beginning of a carry-through of transoms in the lantern.

The intermediate 4in × 4in ribs were never allowed by the designers to settle into any predetermined pattern, but were purposely designed in counterpoint to the colour whilst always conforming to the engineer's specification. Any coincidence of colour change and rib would have been altogether too banal, and therefore none occur. At the same time the line of demarcation between areas of glass was reduced to a minimum.

The specification accorded with the design in another way; it was laid down that in the interior of the epoxy joints, there should be fibreglass rovings at a minimum of 9in intervals from side to side and from top to bottom of each panel. This meant that all the joints between the pieces of glass and between the areas of colour had to be straight. These joints, together with the joints running between changes of colour, were sufficient to keep to the engineer's specification and to make use of the full size of the *dalle-de-verre* (10 × 20cm) in cutting the glass wherever possible. The fibreglass rovings were inserted in the epoxy resin during laying. They were passed under the rings embedded in the concrete that have been described above. The placing of these rings was a task calling for extreme exactitude in the reinforcing maker's shop. The apex of the fibreglass ring had to coincide with the predictable position of the joints running through the *dalle-de-verre*, and this had to be foreseen and allowed for.

The decision to have stained glass in the lantern meant that the individual panels not only had to be the largest and heaviest panels of stained glass in the history of architecture, but the most accurate as well. They had to be built to withstand the greatest wind-pressures, vibrations, to survive a journey by lorry of some 250 miles, to be able to support their own weight of two tons when suspended, and to withstand any handling at either end of their journey. In spite of having to allow for all these contingencies, the general design was not, in the end, modified significantly. There seems to be some definite connection between the workings of a tolerably sensitive eye, and the conclusions it draws for purely aesthetic reasons, and the exact and calculated work of an engineer.

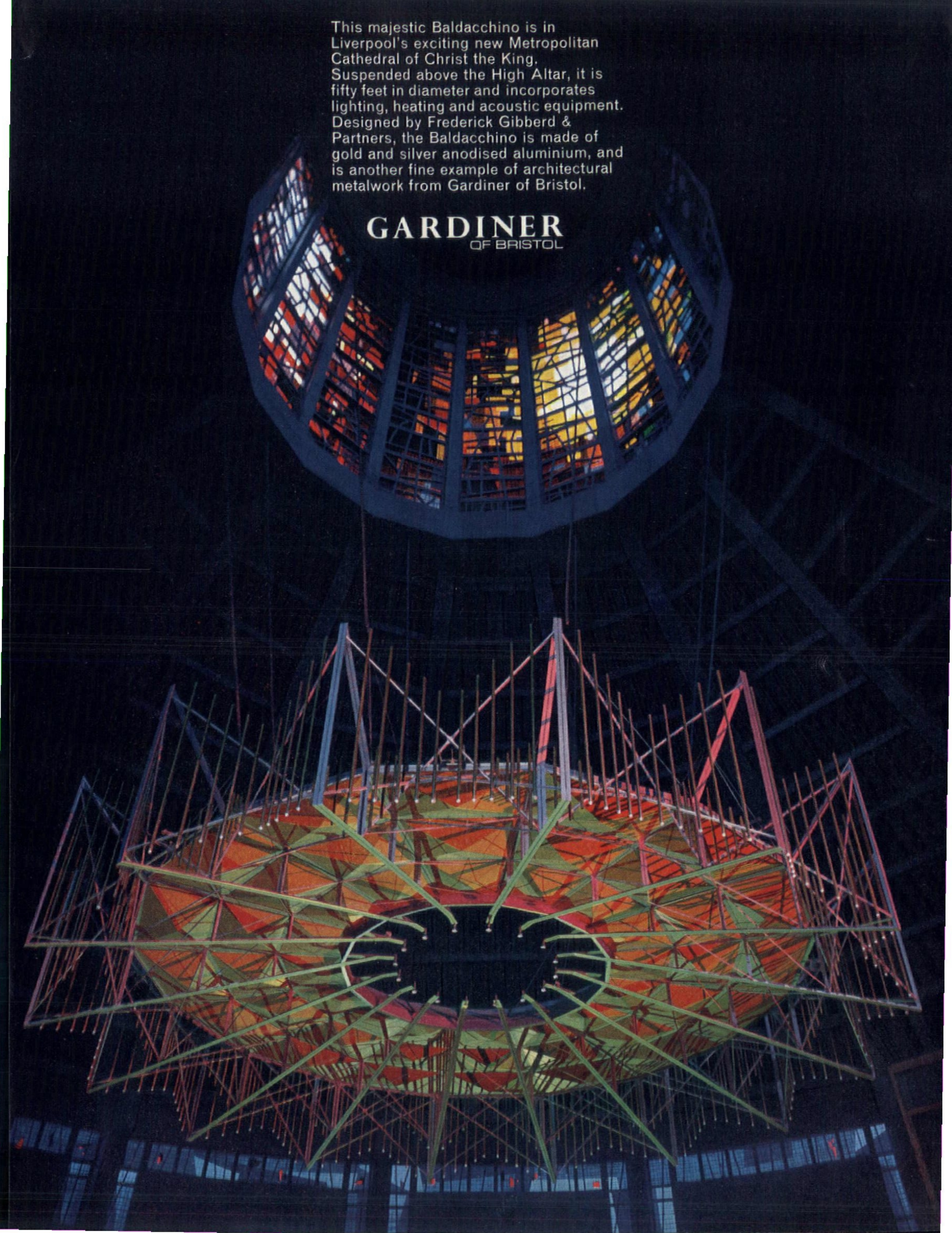
The intervals of the ribs that spanned the inside area of the panels were measured and checked by the engineer on the full-scale cartoons, but the initial decision as to where to put them was taken by the designers for purely aesthetic reasons.

The manufacture of the panels was not done without testing. Three panels were made first of all, the first one to find out if the method we had thought out did in fact work. It did. The second panel we tested to find out the pattern the labour would fall into, and the way six men would dispose themselves in the most efficient way round the casting table. The third panel was made as an experiment of timing. From the studio being completed to the final panel being made was under 18 months, the actual making of the whole tower of Liverpool Cathedral took less than a year.

There was one more test to be made. That was to test a panel to destruction. The last experimental panel was laid face-down on four points at the corners and four tons of wet sand was wheel-barrowed on top of it. The panel, though there were cracks in the glass and the epoxy (these were not, significantly, at the line of juncture of the glass and epoxy) did not break in half as we had expected it to. Indeed when we jumped on it, it gave a very little and creaked a bit. As someone said at the time, rather like jumping on the Great Bed of Ware.

←

Illustrations showing: the casting tables in the workshop, the nearest table with a steel frame to support the reinforcing in the mould; expanded polystyrene moulds, the reinforcing and rings to anchor the fibreglass rovings; squeezing epoxy resin between *dalle-de-verre* slabs; three finished panels with moulds removed revealing the coloured glass bonded in epoxy resin—itself bonded to the concrete rib-structure


This majestic Baldacchino is in Liverpool's exciting new Metropolitan Cathedral of Christ the King. Suspended above the High Altar, it is fifty feet in diameter and incorporates lighting, heating and acoustic equipment. Designed by Frederick Gibberd & Partners, the Baldacchino is made of gold and silver anodised aluminium, and is another fine example of architectural metalwork from Gardiner of Bristol.
GARDINER
OF BRISTOL

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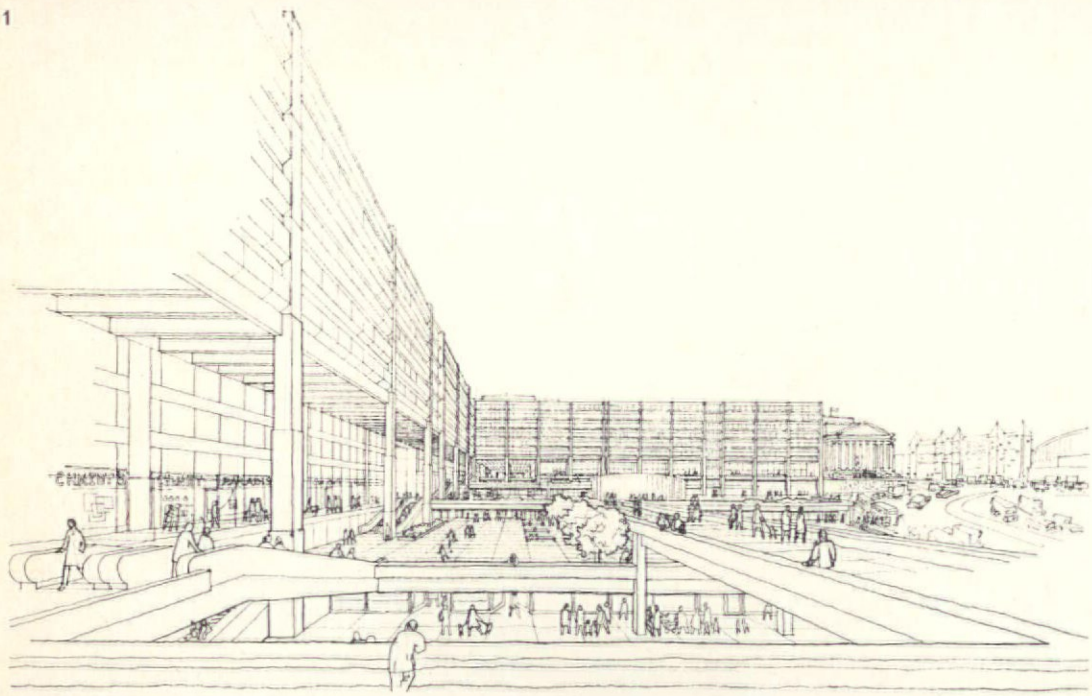

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Civic and social centre, Liverpool

Colin St. John Wilson

In 1965 the architect was commissioned to prepare a layout plan for the whole site of the civic centre and a detailed design for the construction of the first phase.

The essential nature and broad requirements for a civic and social centre were set out in Report No. 8 prepared by the planning consultant (Mr Graeme Shankland) in conjunction with the city planning officer.

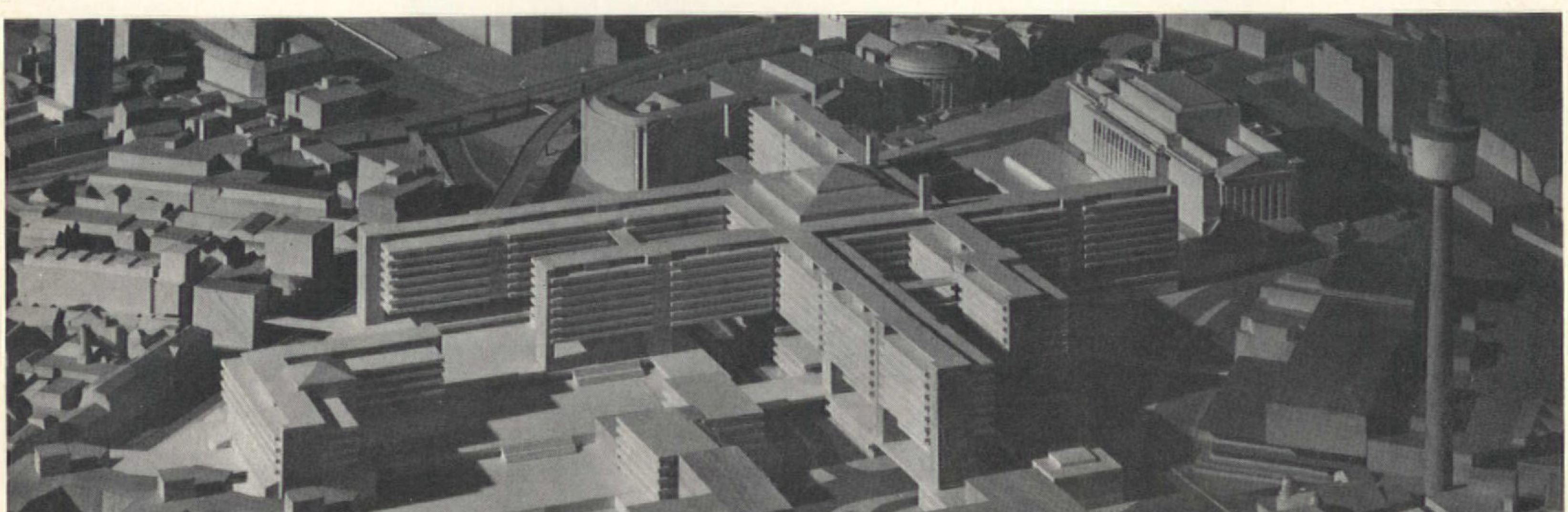
The elements of the accommodation are as follows: Municipal offices comprising a present staff of approximately 4500 distributed in 22 departments together with the public reception hall. ▷266

1
Model of the civic centre (phase 1) from the north-east showing Lime Street station in the foreground, to the left the five towers of the Strand Street development

2
Perspective of the proposed civic centre as seen from Williamson Square bridge

3
Model of the civic centre (phase III)

Photos 1, 3 *John Mills*



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Cultural and entertainment facilities, shopping, hotel, a recreational swimming pool, licensed premises, restaurants and cafés.

Car parking provision for 750—1000 cars

The replacement of the city's Law Courts by a centralized legal precinct.

The creation of a cultural centre based upon St George's hall which will be freed from its present service as Courts of Law.

In order to establish a detailed programme of requirements the architect and the Organization and Methods Team in the Town Clerk's Department carried out a thorough survey of all Departments between July 1965 and March 1966.

From these studies a list of criteria specifying performance requirements was drawn up. The most significant of these are:

The first requirement both for the convenience of the public and the greater efficiency of the organization itself should be to achieve a proper centralization of building. (There are 43 buildings at present).

The public reception area for information and interview should take the form of a central and easily identifiable hall.

This reception hall should be sufficient for all public business.

Every department should be connected directly to the public reception hall.

Since the reception hall could be sufficient for all public business the department office wings should be freed from the necessity for security corridor planning and should be laid out as economically and conveniently as their various operations require.

Furniture, filing and storage equipment must be related dimensionally throughout the building so that the interchange and replacement of pieces can be economic and rapid.

In order to control temperature, external traffic noise and atmospheric pollution the building should be air conditioned. This provision will also enable great flexibility in the distribution of a wide variety of work spaces in a building of deep cross-section.

The form, structure and service distribution of the building must make possible the expansion of the building. This expansion should be permissible in two ways—either by extension of an existing wing (growth of an old department) or the growth of a new wing connected directly to the reception hall (birth of a new department).

With the exception of those rooms which have a proper claim to being totally enclosed in the interest of confidential business the office floor planning should be as open as possible with working groups being defined by open screens.

The offices for municipal departments must not only be as efficient as possible in their own right but must also contribute to the urban advantage of the community by providing (as a by-product of their basic form) direction, shelter and identity to various recreational activities in the Civic Centre.

The segregation of pedestrians from vehicular traffic should permit the establishment of uninterrupted pedestrian routes across the site both north-south and west-east. Thereby connecting the primary sectors in the area.

These cross routes should be protected from the weather.

They should promote and afford access to those recreational and cultural facilities which constitute the social component of the building complex.

Before a summary of the net area of office space could be completed certain investigations into rates

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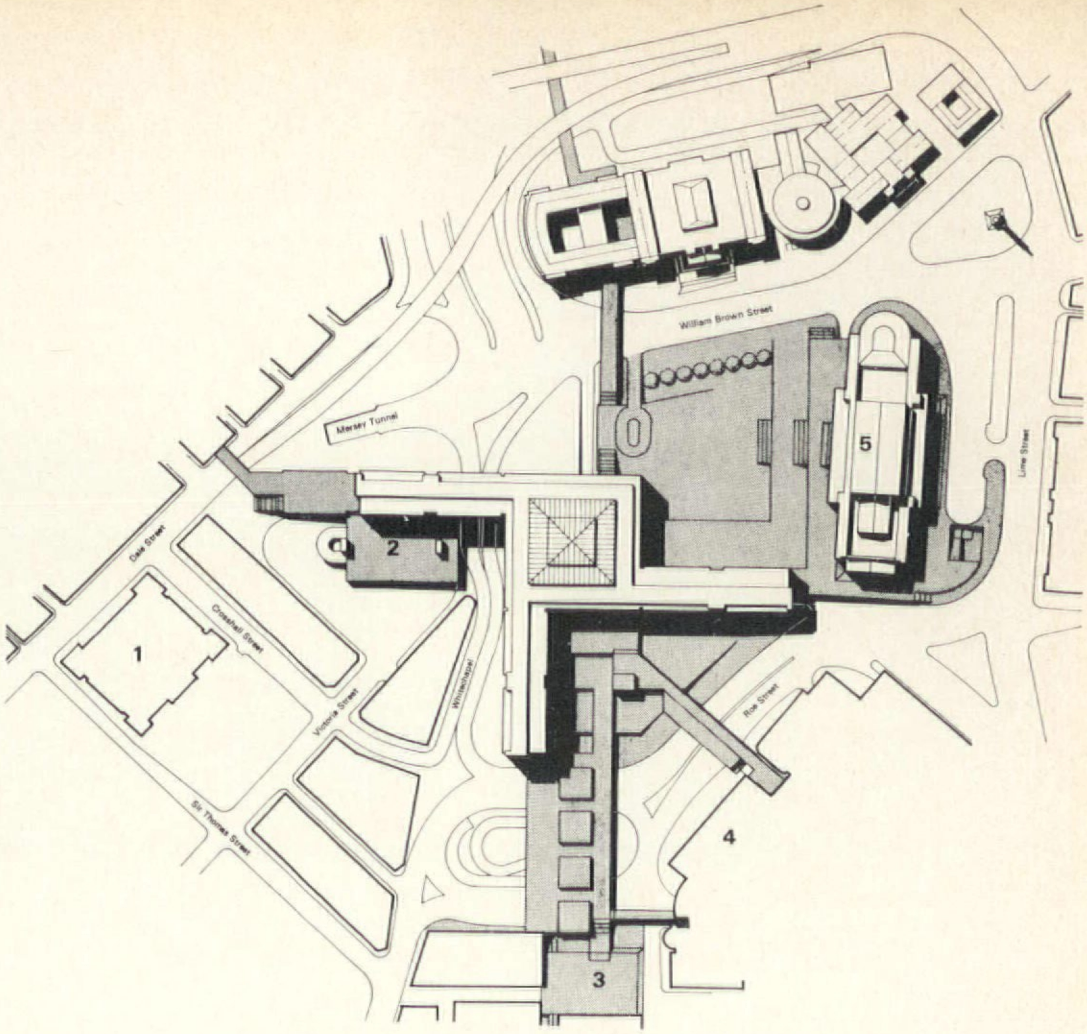

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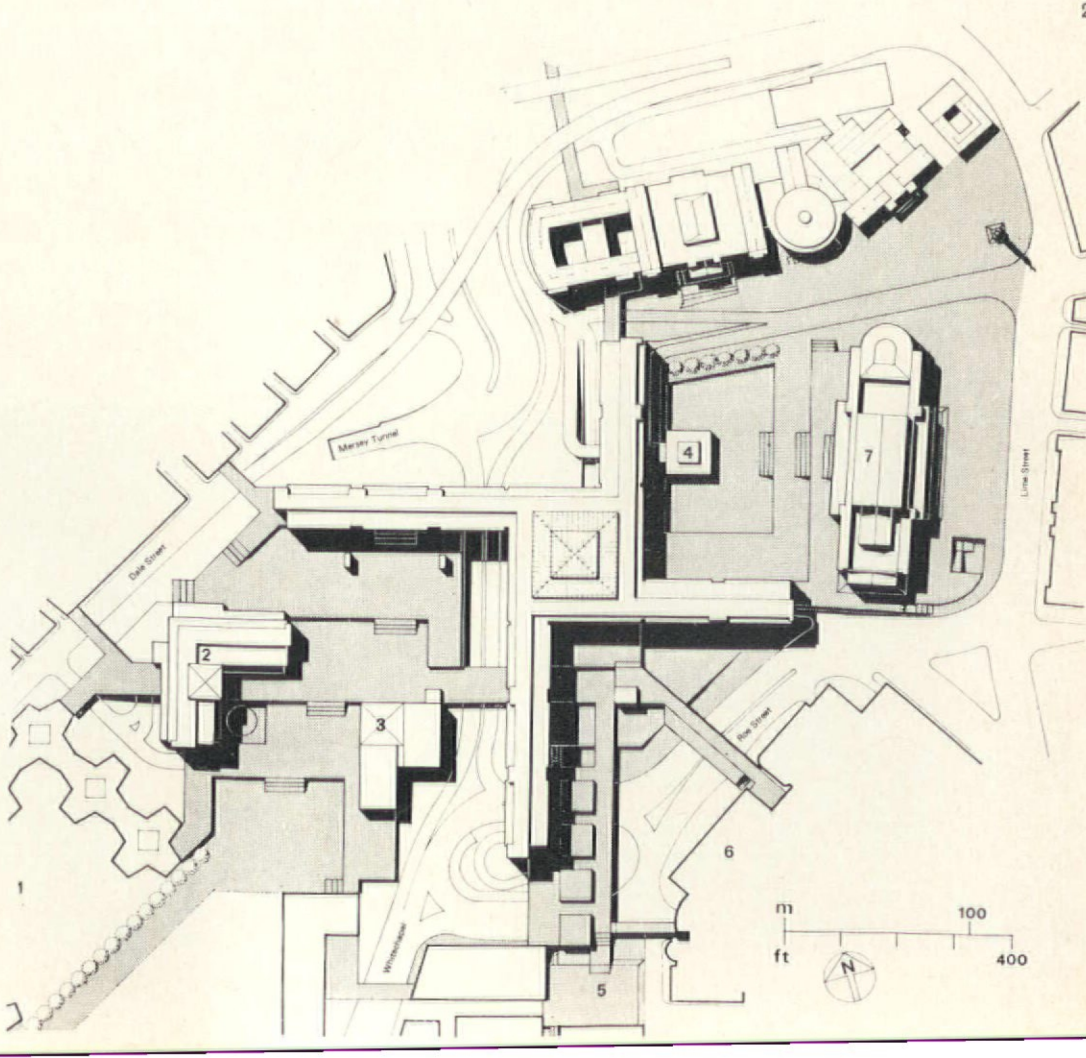

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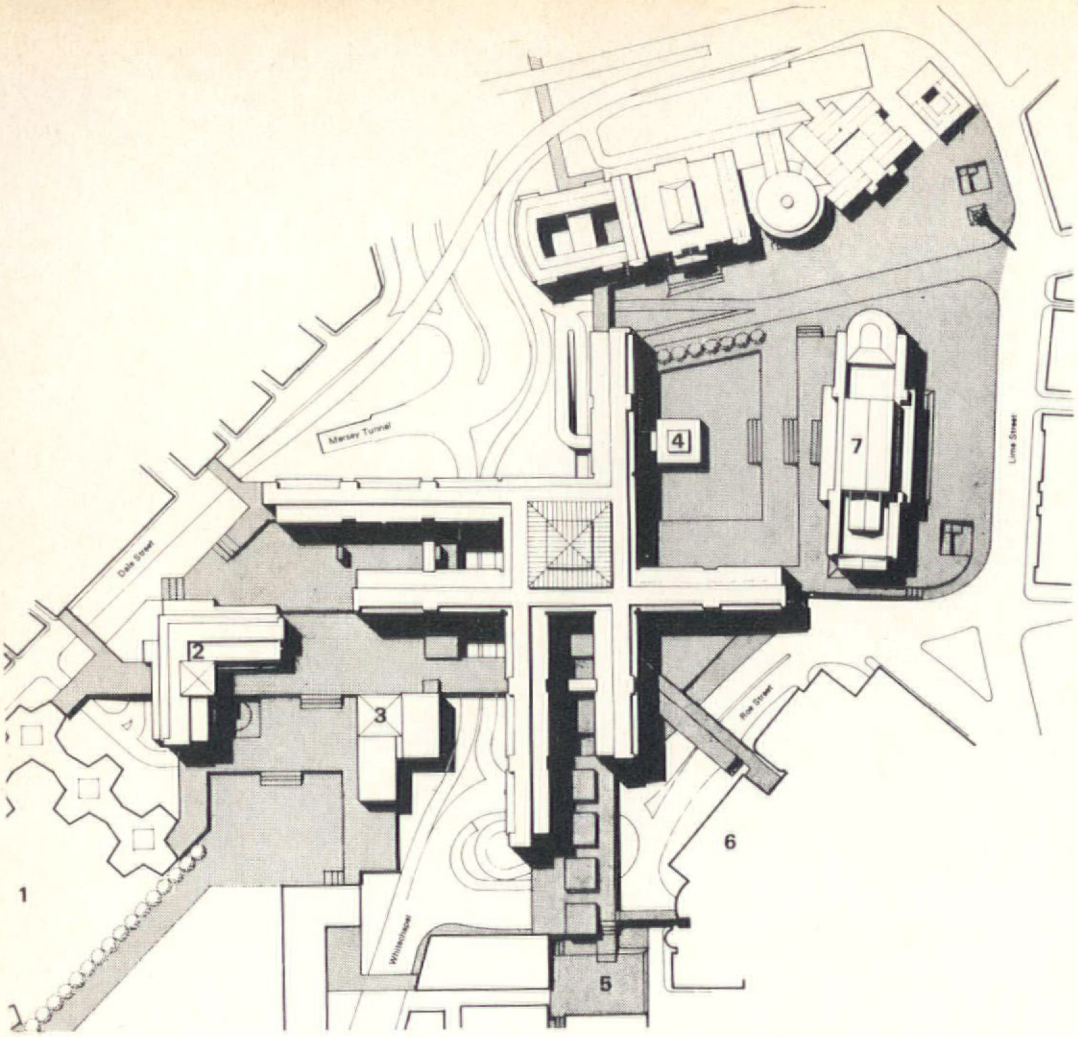

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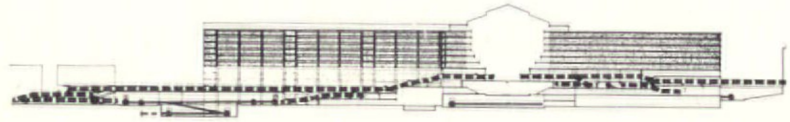

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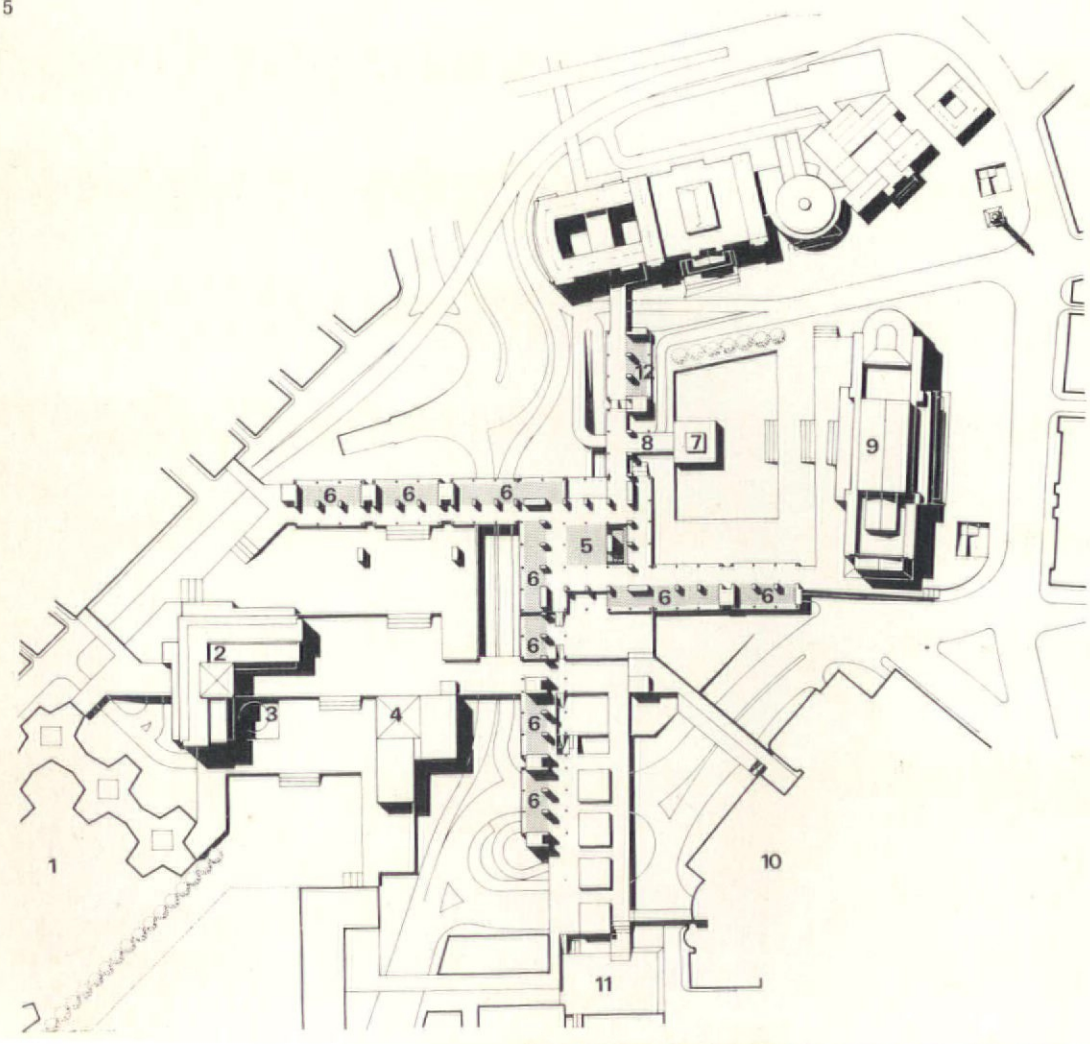

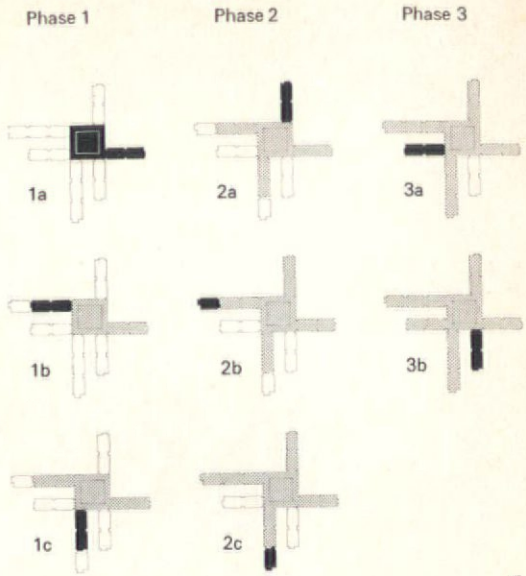

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1
Site plan (phase I)
1 municipal offices
2 car park
3 Williamson Square
4 Ravenseft
5 St George's Hall

2
Site plan (phase II)
1 Temple Victoria
2 legal precinct
3 hotel
4 council chamber
5 Williamson Square
6 Ravenseft
7 St George's Hall

3
Site plan (phase III)
1 Temple Victoria
2 legal precinct
3 hotel
4 council chamber
5 Williamson Square
6 Ravenseft
7 St George's Hall

4
North-south section showing pedestrian and vehicular circulation

5
Plan at pedestrian level (phase II)
1 Temple Victoria
2 legal precinct
3 judge's arrival point
4 hotel
5 public reception hall
6 shops, pubs, etc.
7 council chamber
8 Vip access
9 St George's Hall
10 Ravenseft
11 Williamson Square
12 registrar (marriages)

6
Phasing diagram

7
Model of the Civic Centre at the completion of phase II; the Temple Victoria pedestrian precinct appearing in the left foreground

8
Model of the Civic Centre at the completion of phase II, including the commercial development of the St. John's precinct

Photos: 7, 8 John Mills

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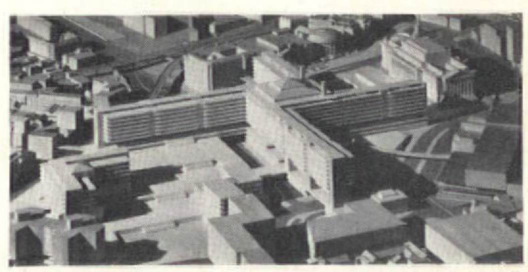

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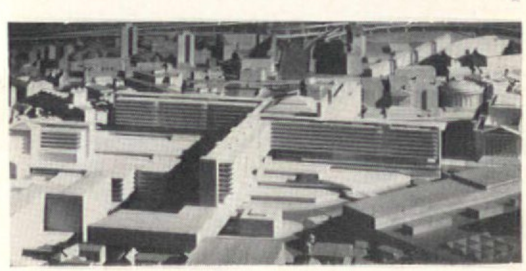

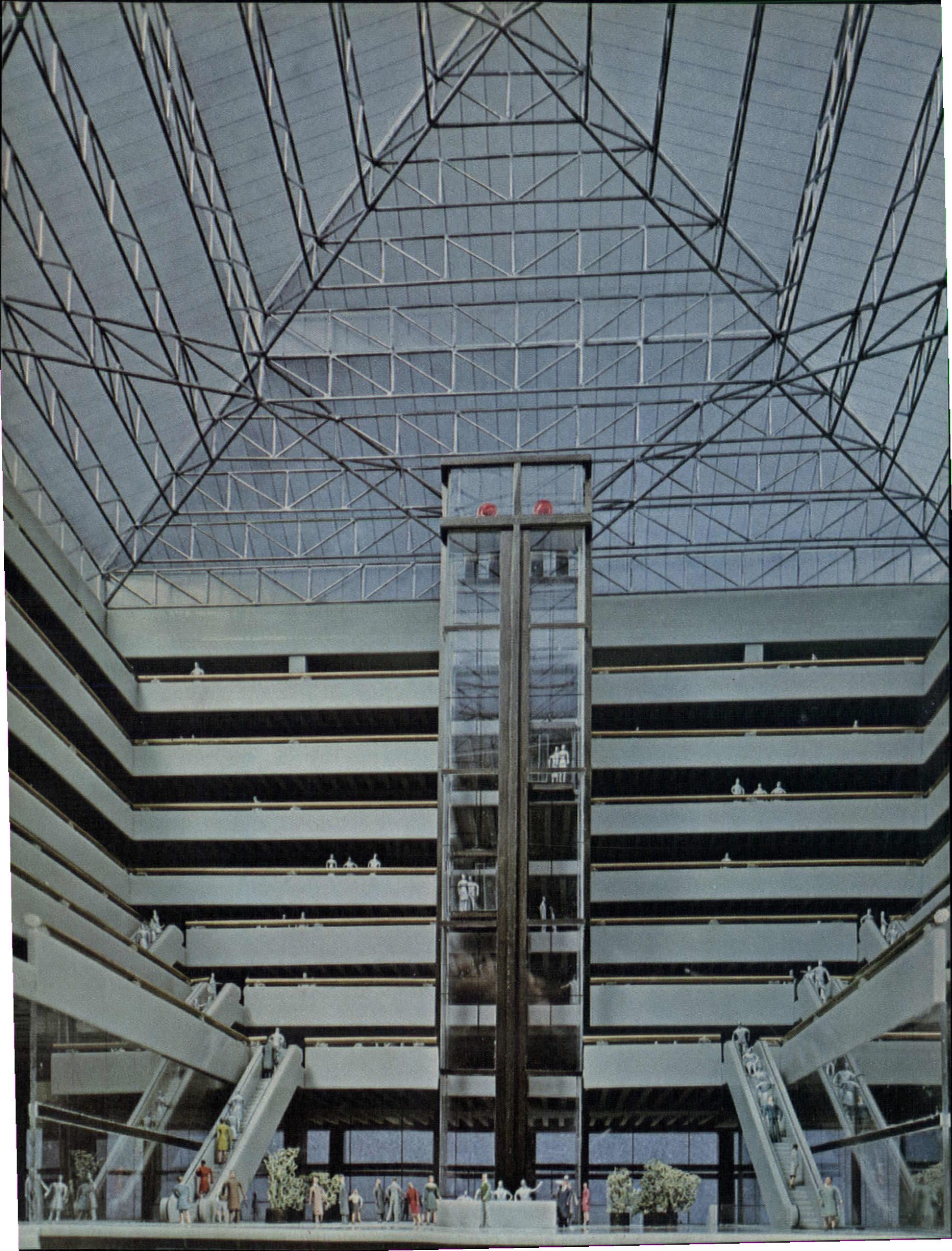

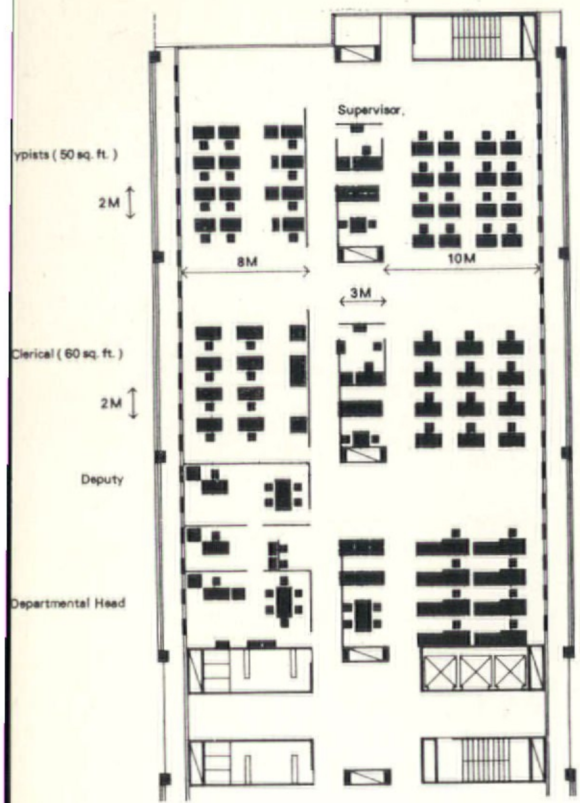

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Opposite:
Model of the public reception hall looking towards the glass-enclosed lift tower

1
Plan showing typical office layout, all set on a modular grid, with suggested work positions for different staff categories

2
Model of the concourse surrounding the public reception hall

3
Model of the public reception hall, from which all departments open

Photos: opposite, 2 & 3 John Rawson

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of increase in staff together with prognostications of further rates of expansion were necessary.

The target agreed upon for the year 1975 was fixed at the figure of 5000 members of staff corresponding to approximately 550,000 sq ft net and a schedule of accommodation was drawn up accordingly.

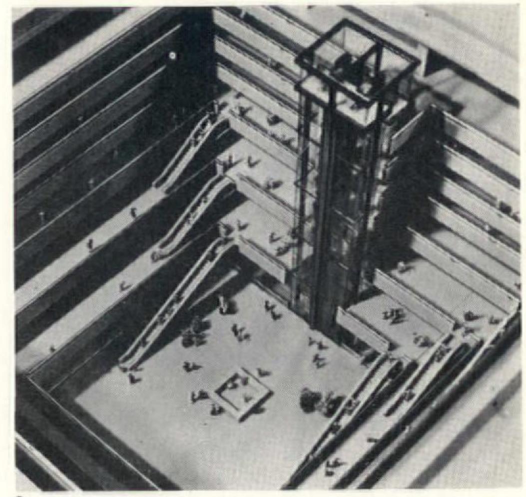
The present rates of expansion indicate that allowance should be made for further expansion. However, since the nature of expansion cannot be predicted in either its timing, quantity or type (growth of an old department or birth of a new) nor could it be taken for granted that accommodation for 5000 could be achieved in the first phase of building it became clear that one characteristic of the form of the building should be the potential for ordered growth at a variety of points.

The frequency of movements of staff (and of documents) between each section within departments and between departments themselves was recorded. In order to arrive at the optimum grouping of sections and departments to minimize such travel an original research study was made which involved the writing of a computer programme in collaboration with members of the Cambridge University Mathematical laboratory.

The site for the principal buildings for the new Civic Centre is situated in a prominent position occupying to the east and north the whole of the frontage to St John's Lane and overlooking the Kingsway Entrance to the Mersey Tunnel. It stretches south along the improved Roe Street adjoining the proposed St John's Precinct to Williamson Square, and north west across Whitechapel and Victoria Street to the existing Municipal Offiices and Dale Street.

The total area of property involved including minor streets and part of Queen Square is 13 acres of which a considerable proportion is in the freehold ownership of the City Council.

The topography of the site takes the form of a shallow valley running approximately along Whitechapel with principal access points for pedestrians on the east-west axis at approximately level 70·00 O.D. (St George's plateau) and 65·00 (proposed pedestrian bridge across Dale Street) and on the north-south axis at approximately 65·00 (main floor of the College of Technology) falling to 28·00 at Williamson Square. If the desire-lines joining the points are drawn an important pair of cross-routes is established which



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will (on the west-east axis) connect the office sector of Dale Street with the cultural area of St George's Hall and (on the north-south axis) the shopping area of Williamson Square to the headquarters of the College of Technology and the Picton Group.

The point of intersection of these routes overwhelmingly claims the right to house the communications centre of the whole complex. Furthermore the topographical valley-section at this point allows the various elements demanding space in the centre to be disposed vertically over each other.

Access to the site by public transport will derive largely from setting-down points in Williamson Square; however, there will also be important bus-stops at the point of connection with Dale Street. If the station for the inner rail loop is accessible on the St George's Hall side of Lime Street then a major entry-point to the site will be created for train passengers.

Official and private cars will principally enter the site from Dale Street along Sir Thomas Street. There will be covered car-parking space for approximately 750 cars.

Service vehicles will enter the site from the slip-road and exit along the present line of St John's Lane entering Roe Street alongside St George's Hall.

Peak-time buses will be sited between the service yard and the tunnel entrance and will join the gyratory via a slip road on the line of Whitechapel.

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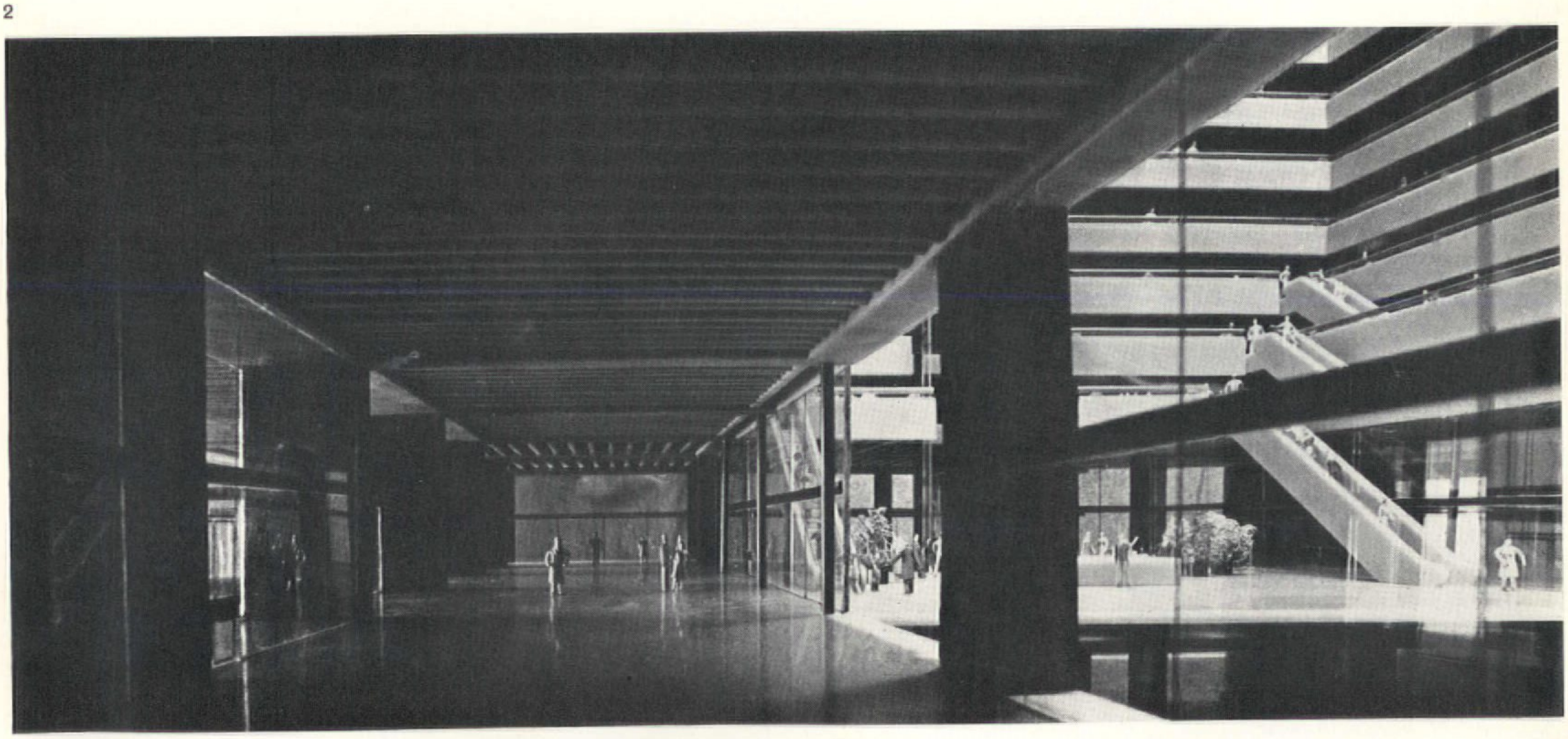
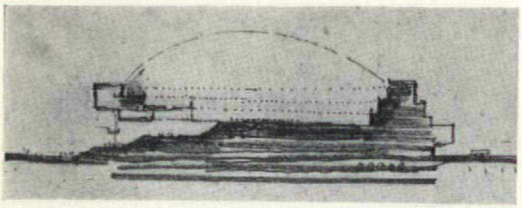


National Library study, British Museum, London

Sir Leslie Martin, Colin St. John Wilson



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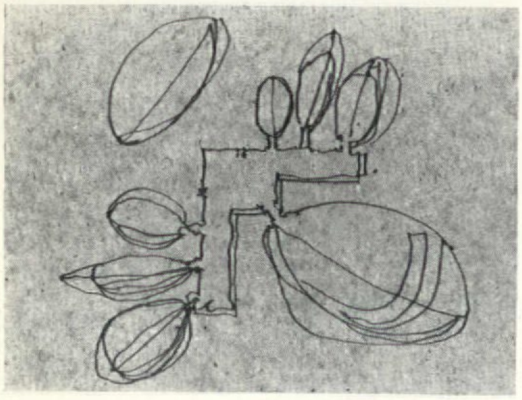

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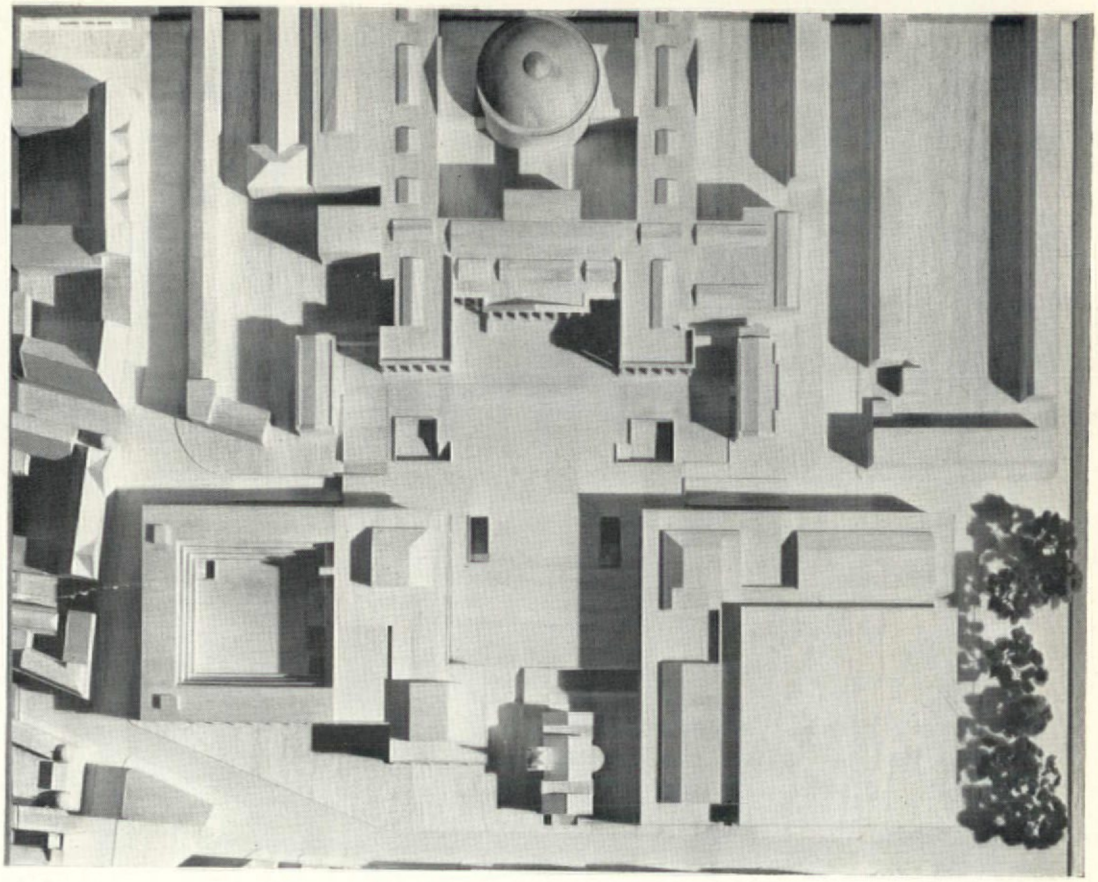

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In 1962 the architects were commissioned to make a study of the requirements for a new National Library on a site (lying to the South of the British Museum) which had been allocated for this purpose in the County of London Plan in 1951.

Much has been written in the field of popular journalism to suggest that the electronic 'breaking down' of books into a form of computerized storage that permits information retrieval by direct dialling will render unnecessary present methods of reading and bookstorage. This is a half-truth that certainly has some bearing upon sectors of knowledge (particularly the sciences) in which future books may well be written in a special fashion that would make such electronic 'filleting' feasible. But for the kind of material stored and consulted in a national collection of manuscripts, maps, music, prints, oriental books, state papers, periodicals and rare books these methods are not applicable; this view is held unaminously by experts in the three largest national libraries. (The Library of Congress, Washington; the Lenin Library, Moscow, and the British Museum itself.)

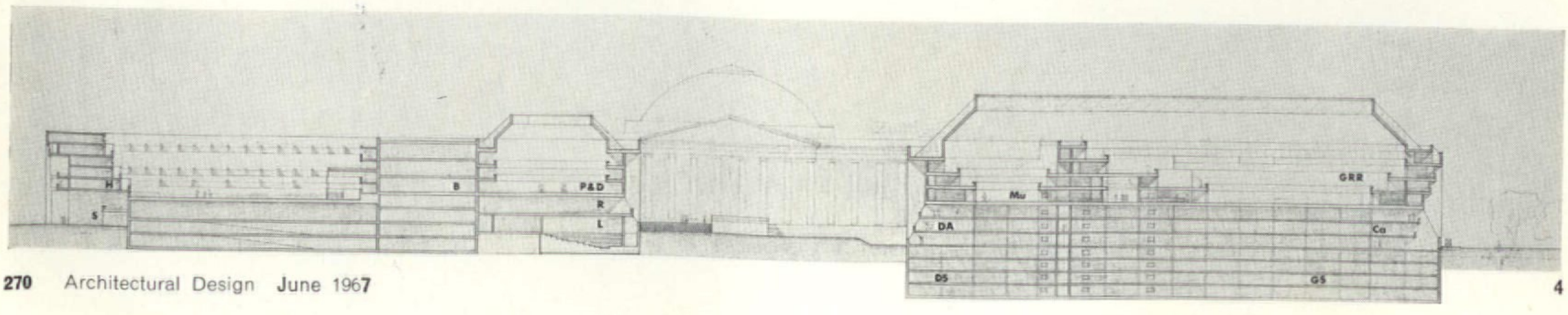
In the 1951 designation the whole area was assigned to library uses. However, revisions to the brief now propose that some 20 shops and 106 flats (approximately one-third of the present residential population) should be housed on the site. The scheme was presented to the Trustees and accepted in principle in October 1964 with a view to construction commencing early in the 'seventies. Only the site block model was published at this time and this was of a rudimentary nature. The most developed aspect of the design relates to the structure devoted to the reading rooms in which a great number of specialized reading and storage requirements were resolved in a plan of great simplicity. This is the subject of the illustrations shown here.

The library building has been located to the east of a large place completing the present southern forecourt of the British Museum and comprises the main group of reading rooms, clustered around the catalogue hall. To the west, the Department of Prints and Drawings, (a permanent exhibition of the history of the book, etc.) and certain subsidiary functions, (lecture theatre, restaurant, bindery) are linked to the housing group with shops at street level. The place is defined to the north by the portico of the British Museum, and the church of St George completes the southern edge, at the same time permitting a clearly marked pedestrian entry to the site from Bloomsbury Way. It is intended that the level of the cornice of the British Museum portico should be respected as principal datum for establishing the height of buildings around the place.

The library itself provides reading-space for approximately 2500 readers and a bookstack capacity of 10,000,000 volumes so disposed that the subsequent installation of further stacks (in some such form as the 'Compactus' system) will permit a phased expansion which could ultimately be extended to take in some of the space at present allocated to car park.

The library may be entered by foot from the new place, by foot or taxi from Great Russell Street or by car from the park in the podium.

The body of readers are distributed in a series of reading rooms, all at the same floor level and grouped around the main catalogue hall, and it is this relationship which is the key to the anatomy of the building. The one exception to this rule is the public reference reading room which is introduced as a facility for the general public and to which admission is made without ticket. Ticket-holders ascend directly by escalator or lift to the prow of the main catalogue hall and from this vantage point it is possible to orient oneself immediately to all of the principal parts of the building: in such a large building this immediacy of grasp is essential. The procedure for obtaining a book will be based upon a computerized dialling system (similar to the Bibliofoon installation in Delft) in the catalogue hall which is synchronized with an indicator-light system for the staff working in the stacks and a mechanical book handling network which conveys the book direct to the delivery point in the reader's particular section. The general reading room in the department of



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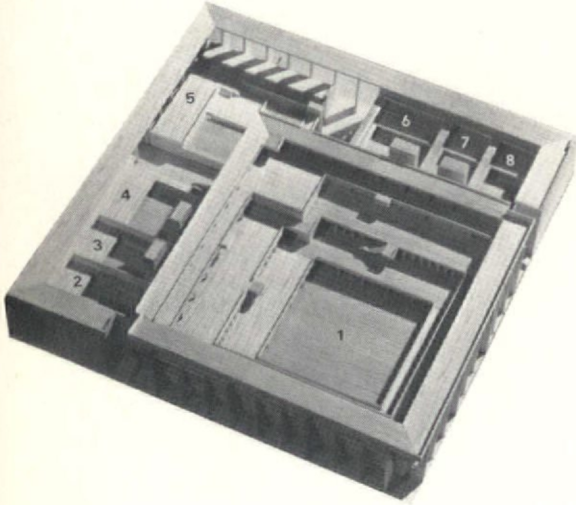

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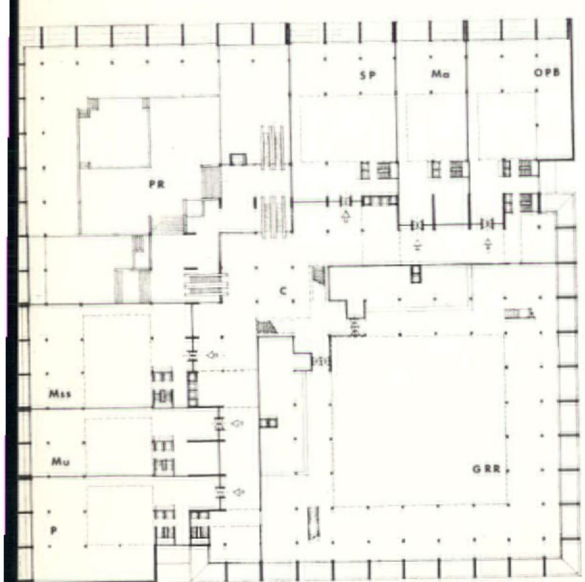

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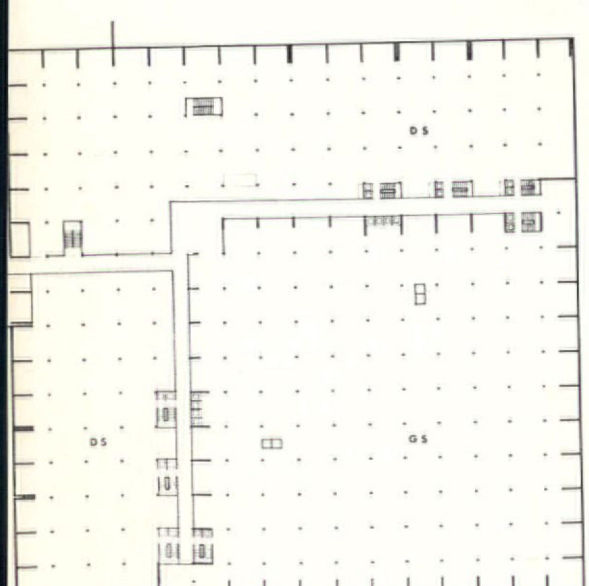

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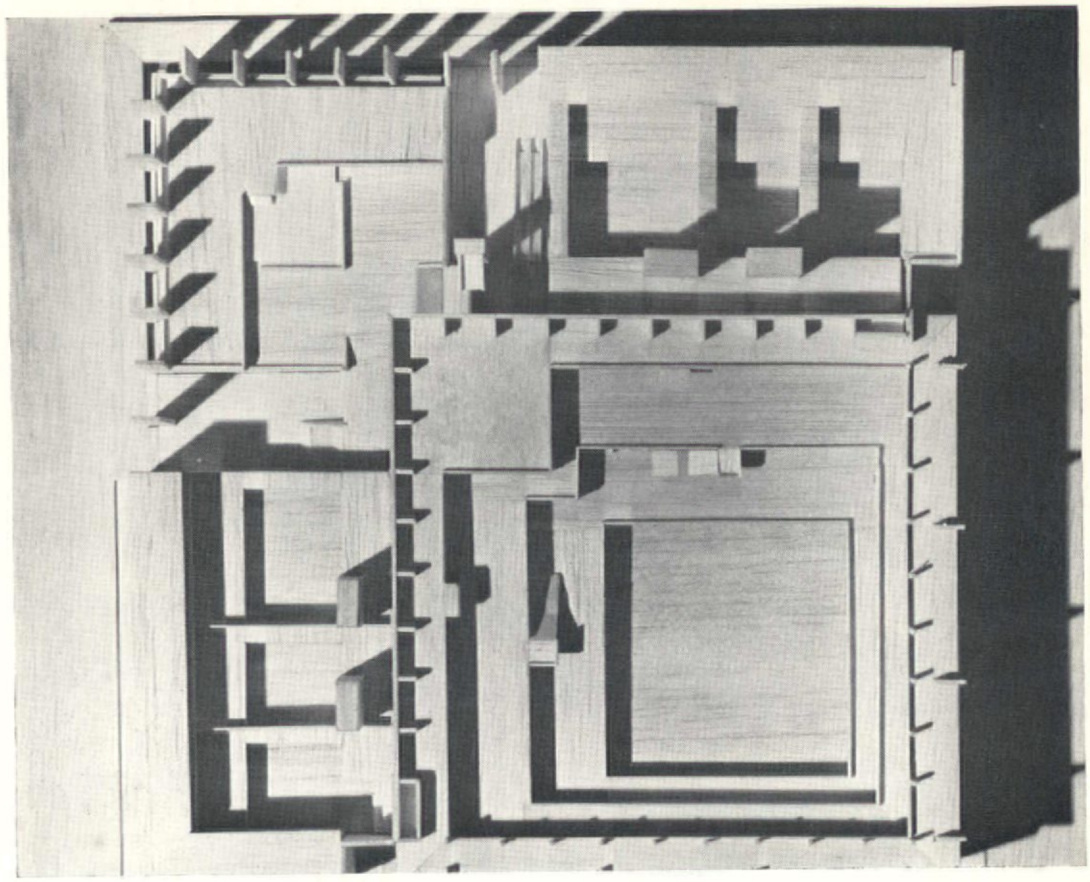

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printed books is embraced on two sides by the L-shape catalogue hall each arm of which is enclosed in turn by three selfsufficient sub-libraries. The north-south arm serves the periodicals, music and manuscript libraries, and the west-east arm serves the maps, state papers and oriental printed books libraries. Each of these sub-libraries has its own control and information point, its reading-room and its podium stack, with administrative offices and service rooms distributed on the perimeter where some natural light and a view can be ensured. Within the general reading room of the Department of Printed Books a further series of six subject reading areas are disposed on two set-back terraces which bridge over the catalogue hall and a further terrace which houses the rare book section with its special-care reading room and carrels. This series of terraces is completed by a final gallery level (directly accessible by lift from the main entrance hall) from which members of the public may obtain a view across the 'valley' section of reading terraces in both directions.

It is hoped that all these reading terraces may be grouped within a single volume under one roof which will afford both natural and artificial light.

It should be repeated that work so far achieved does not attempt to show a fully developed architectural solution. It is claimed however that certain objectives have been achieved. On the issue of siting it has been shown that a new traffic free place can be made on a scale which befits the British Museum itself and brings St George's into a new and altogether more significant relationship to its surroundings. On the internal issue of a service to readers it is claimed that a highly efficient and comprehensible organization of parts has been defined while some area of flexibility to permit expansion in the stacks and service areas has been provided.

1
Early ideogram for the reading room in the form of a single volume with terraces on a stack podium.

2
Topological diagram showing the relationship of catalogue hall to special departmental libraries and the Department of Printed Books

3
Model showing the proposed development to the south of the present British Museum

4
Section through the shops and housing development, the Department of Prints and Drawings and the Department of Printed Books

- S—shops
- H—housing
- B—bindery
- P & D—prints and drawings
- R—restaurant
- L—lecture theatre
- Mu—department of music
- DA—dept. administration
- DS—dept. stacks
- GRR—general reading room
- Ca—cataloguing and administration offices
- GS—general stacks

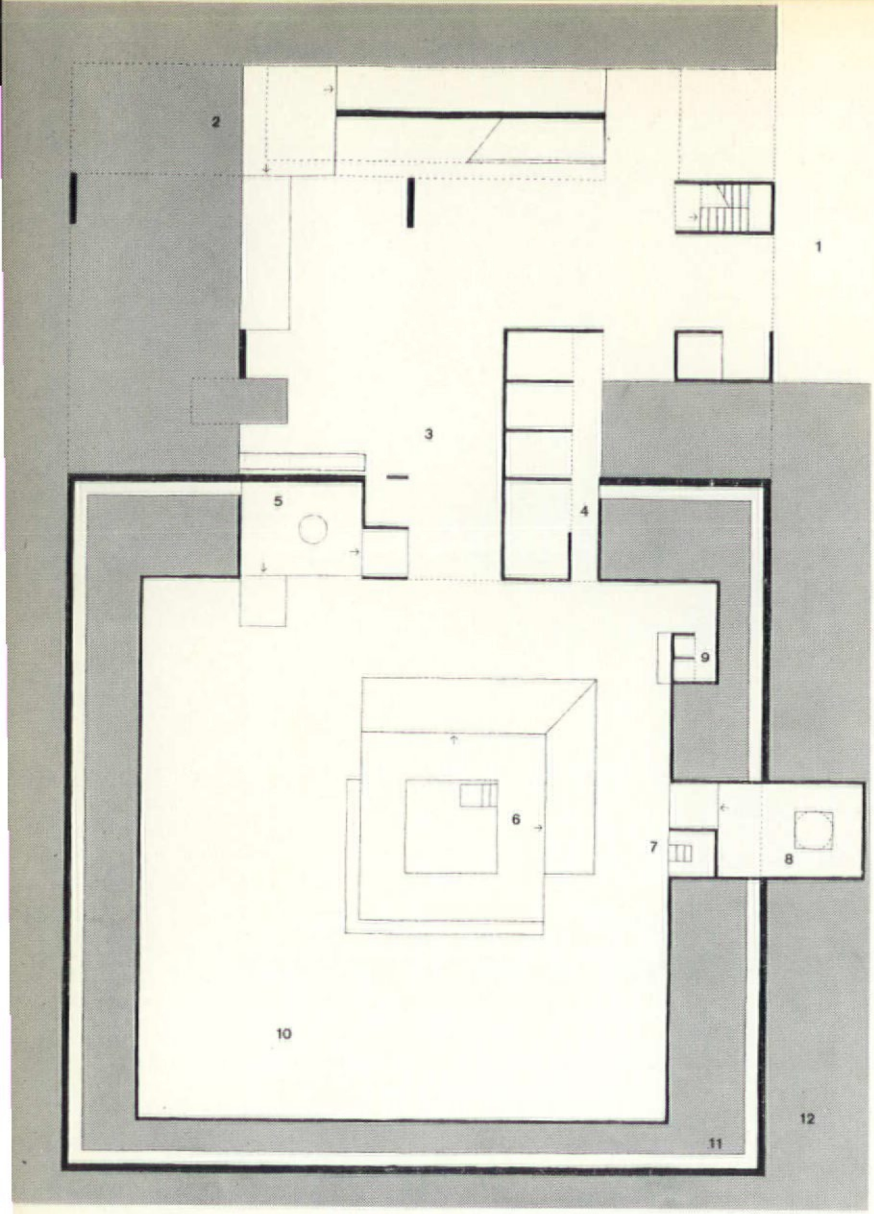
5
Model of the Department of Printed Books

1 general reading room
2 periodicals
3 music
4 manuscripts
5 public reference library
6 state papers
7 maps
8 oriental printed books

6
Top view of model of the Department of Printed Books

7 & 8
Plan at level 111,00 showing the catalogue hall, the general reading room and the departmental libraries, and typical plan at storage level

- PR—public reference library
- SP—state papers
- Ma—maps
- OPB—oriental printed books
- C—catalogue hall
- Mss—manuscripts
- Mu—music
- P—periodicals
- GRR—General reading room
- DS—departmental stacks
- GS—general stacks



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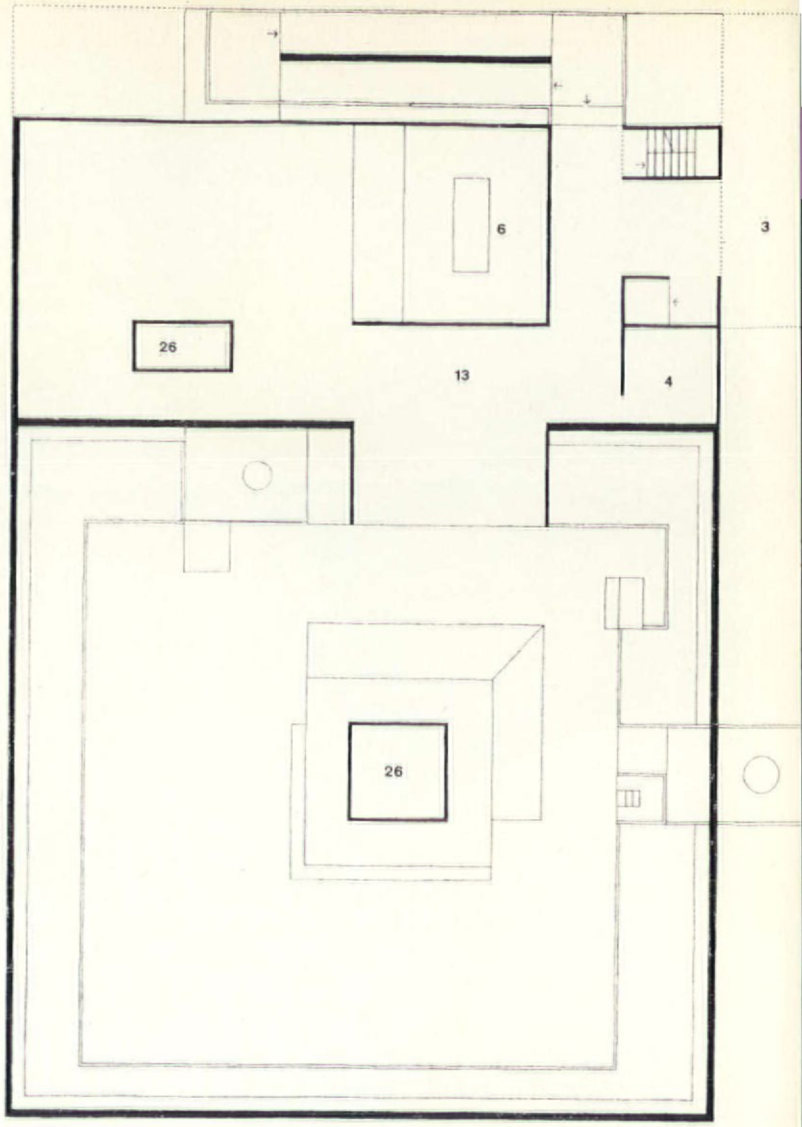


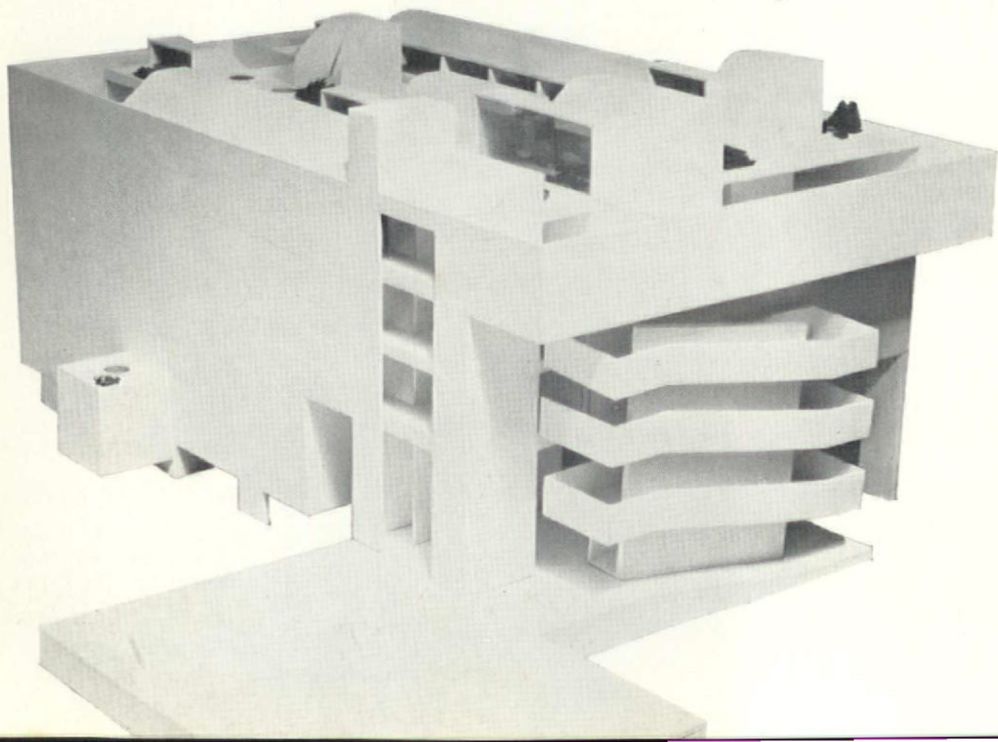
2

Le Corbusier hospital chapel, Venice

Atelier Jullian
Jullian, Oubrerie, Botta, Pozzana, Petrilli, Petrilli

A finalized version of the plans for the Venice hospital, originally conceived by Le Corbusier, was illustrated in *AD*, May 1966; these plans have since been revised and the chapel designed in detail. The chapel is shown on this and the following two pages.

5



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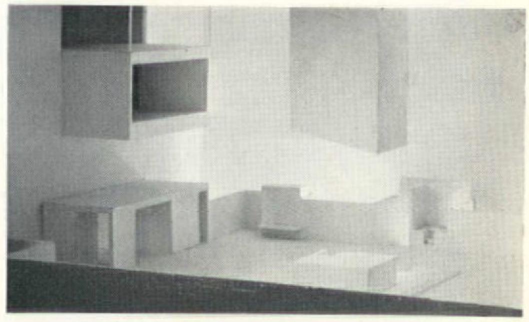


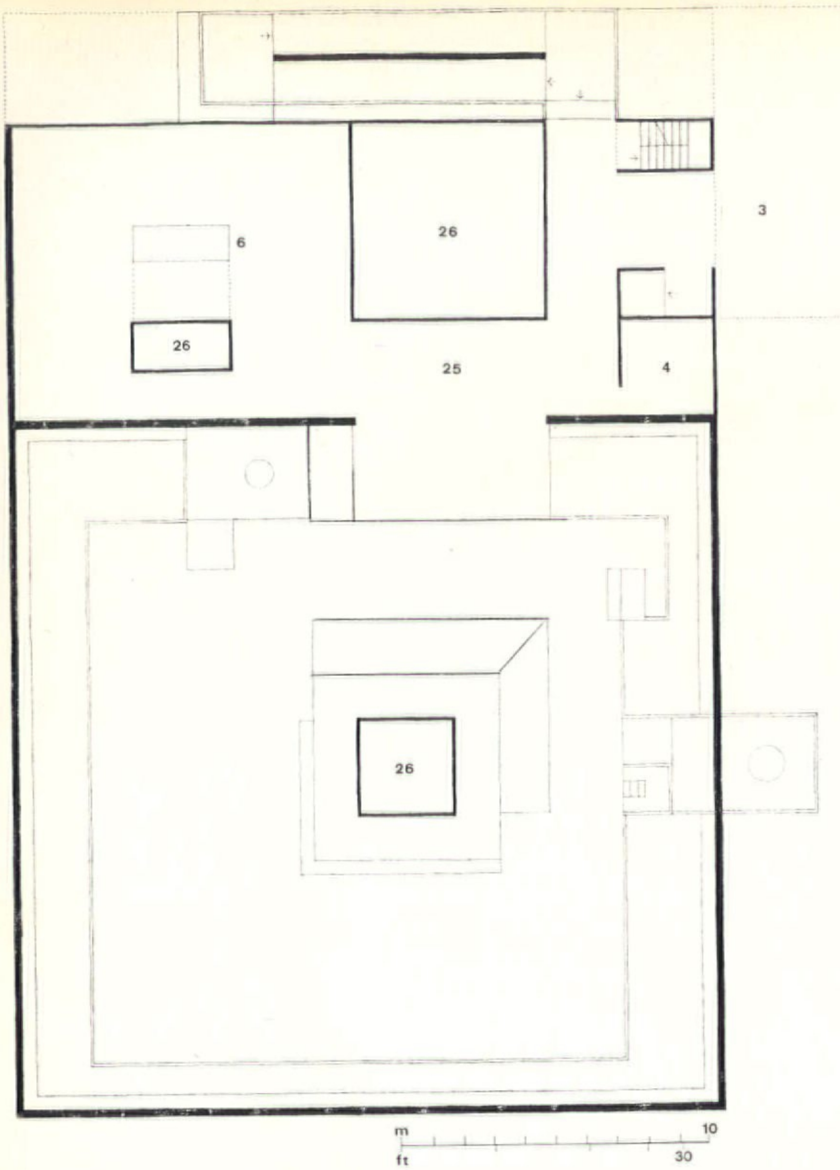
1, 2, 3 & 4
Plans of chapel at level I, II, IIa and III

1 quayside
2 gondola landing stage
3 entrance
4 sacristy
5 baptistry
6 altar and pulpit
7 throne
8 chapel of the Blessed Sacrament
9 confessionals
10 assembly area
11 window cleaning walkway
12 lagoon (shaded)
13 nuns' chapel
14 entrance hall
15 parlour
16 servant's room
17 bedroom
18 kitchen
19 living-room
20 door to monks' quarters
21 refectory
22 cells
23 washrooms
24 garden
25 patients' chapel
26 void

5
Model of the proposed chapel from the south, with the quayside connecting it to the hospital in the foreground

6
Model of interior of main chapel

7
Photomontage of Venice with the finalized version of Le Corbusier's hospital superimposed in its position, just east of the railway station. The chapel, illustrated on these pages, juts into the lagoon, almost separate from the hospital building proper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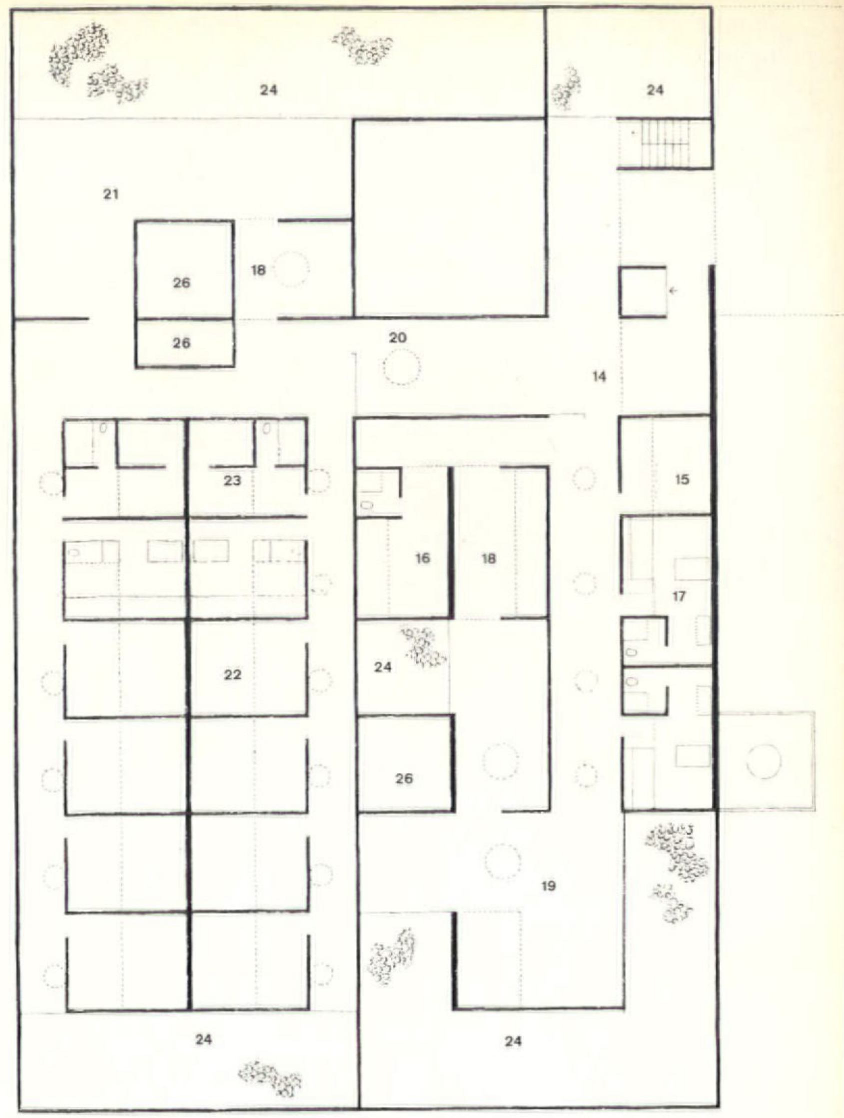
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4

7

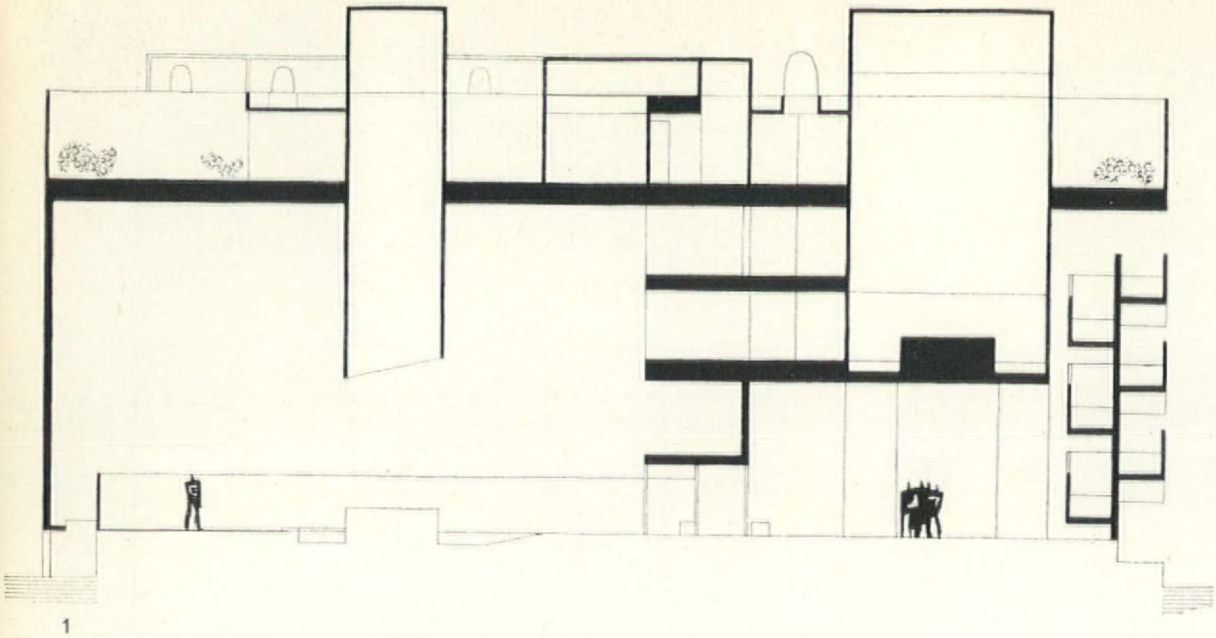
◁273

1
North-south section through the main and subsidiary chapels, looking east

2
South-north section, looking west

3
West-east section, looking north, through the main vestibule and the subsidiary chapels

4
East-west section, looking south, through the main chapel and the chapel of the Blessed Sacrament



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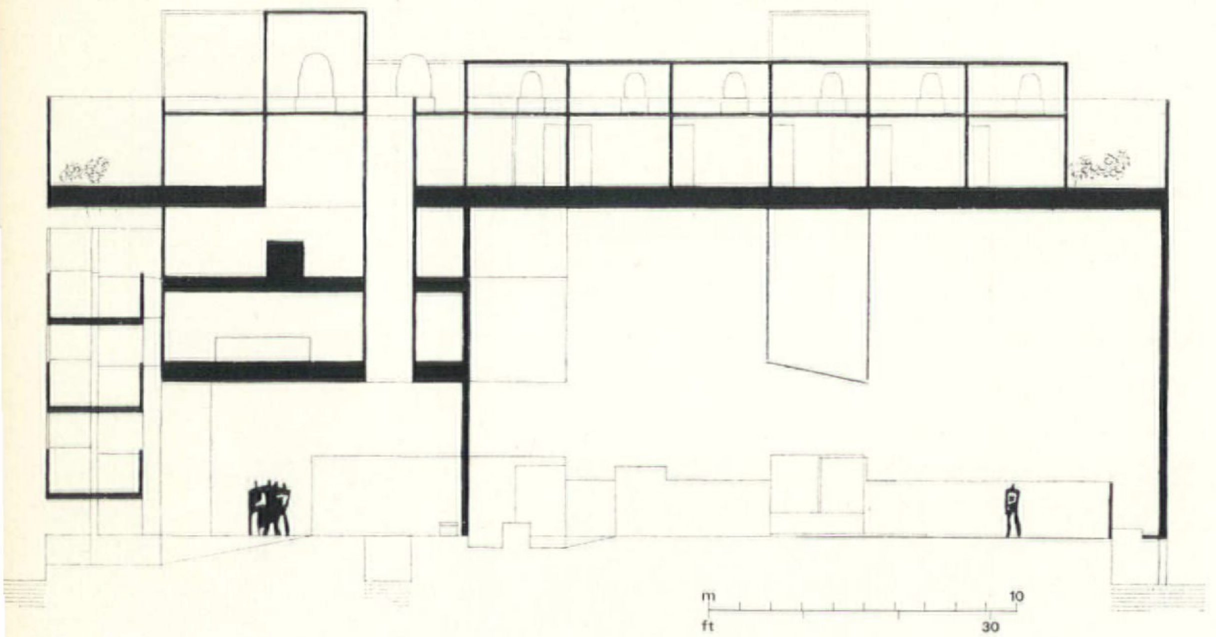

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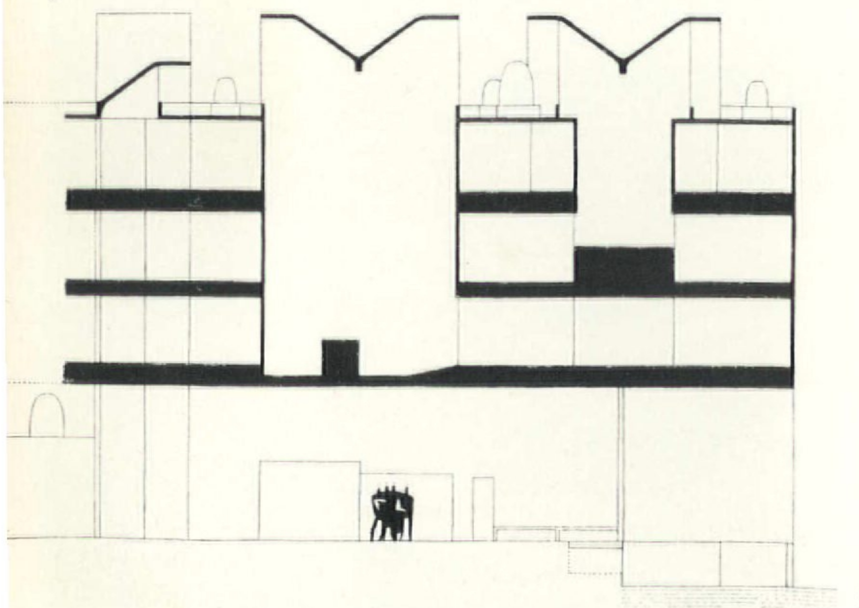

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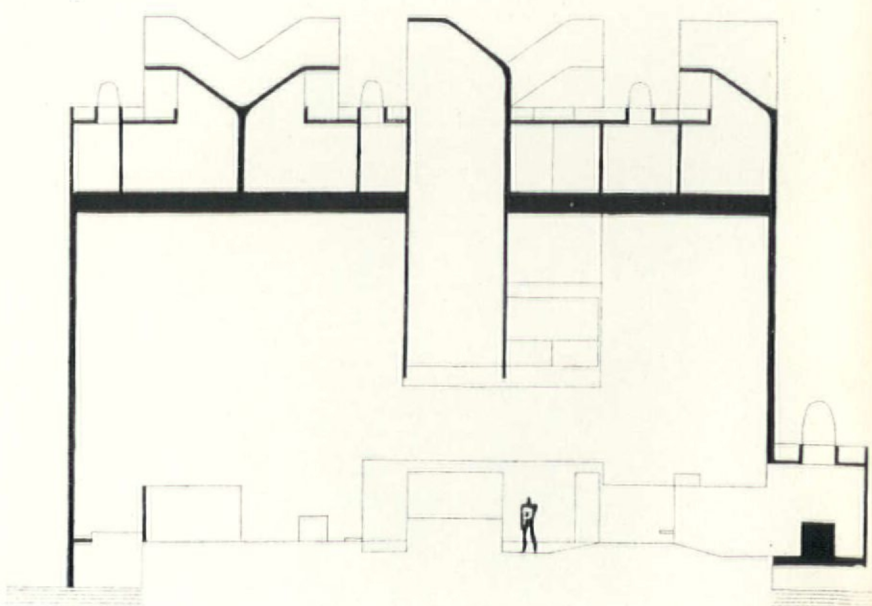
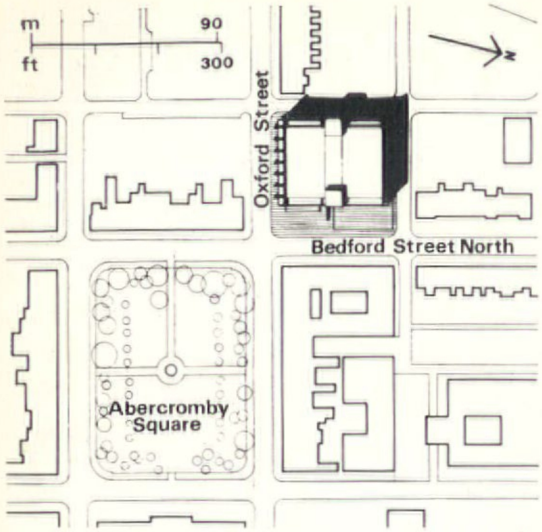
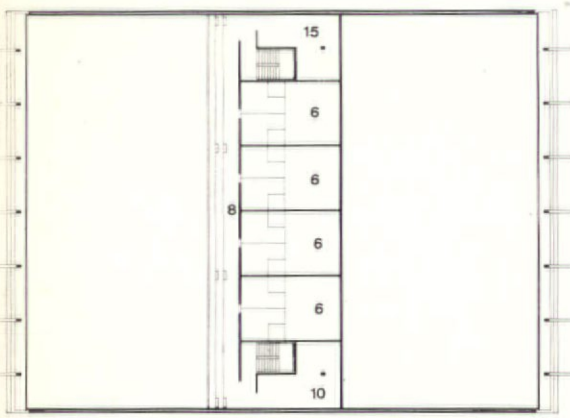




1

Sports centre University of Liverpool

Denys Lasdun & Partners
Architect in charge: Stefan Kuszell
Assistant architects:
C. Baden-Powell, W. Ungless, R. Kwok
Structural engineers: Ove Arup & Partners



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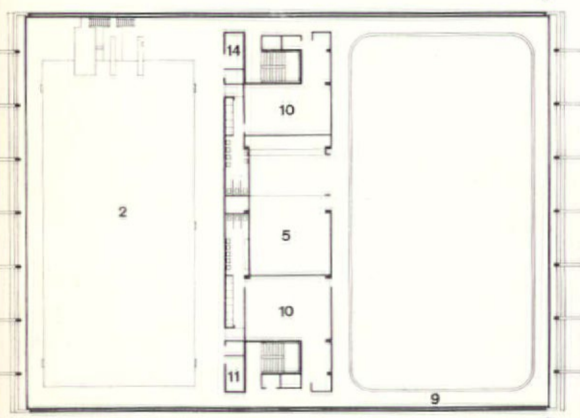

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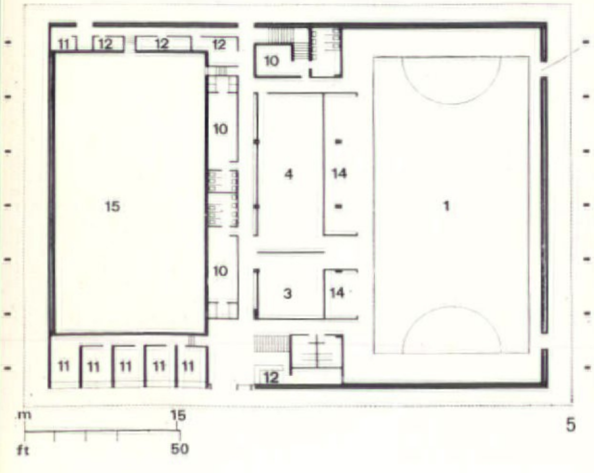

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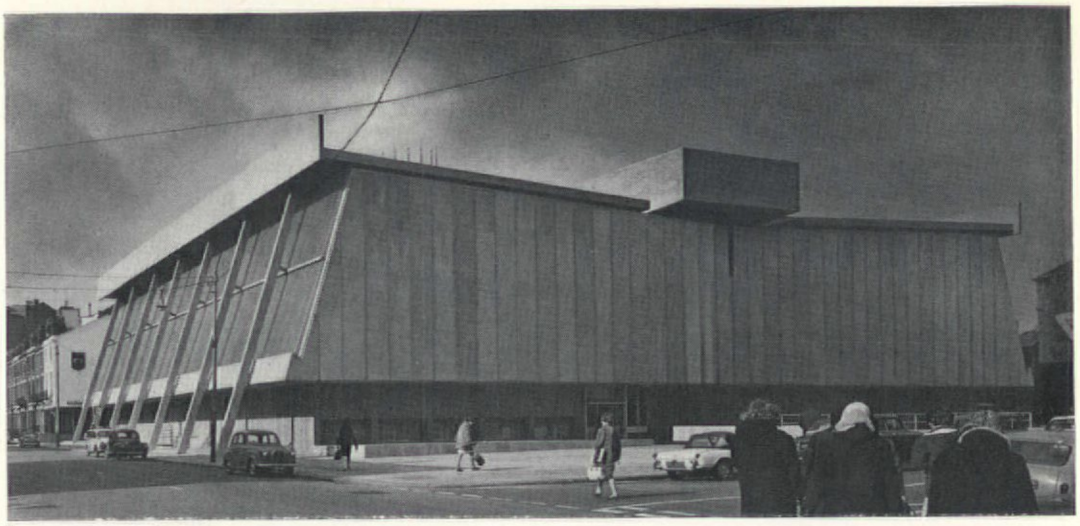


2

The sports centre provides covered sports facilities for the newly formed sub-department of physical education which, besides organizing classes in physical education, provides physical recreation facilities for students through university clubs within the Guild of Undergraduates. The facilities provided are:

A six-lane swimming pool, 110ft × 48ft, ranging in depth from 12ft 6in at the maximum to 3ft 0in at the shallow end. The pool has a five-metre fixed diving board with spring boards at one and two metres. There are two underwater viewing windows and a gallery overlooking the pool seating 150 spectators.

A sports hall 120ft × 64ft marked out for basket ball, tennis, net-ball, and badminton. At one end the hall is provided with gymnastic equipment and the hall can be sub-divided by nets to permit various activities being performed simultaneously. At first-floor level the hall is surrounded by a dual purpose gallery providing access to the climbing wall and facilities for use as a running track. The climbing wall, a pattern of reliefs in concrete and brick, was devised by Donald Mill. There are four squash courts.

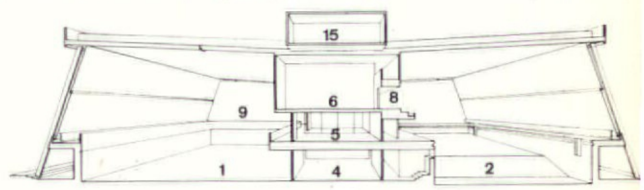
General activity rooms are used for weight training, fencing, various forms of dancing, judo, wrestling, and other forms of fitness training.

The structural system derives directly from the planning concept. The core of the building containing squash courts, general activity rooms and changing rooms is a three-dimensional system of reinforced concrete floors and walls, two storeys in height, supported by a series of reinforced concrete columns arranged in pairs. The structural core provides the overall stability necessary for the large spatial envelope enclosing the swimming pool and large hall, in addition to providing the central support for the main uni-span roof structure. ▷276

Key

1 sports hall
2 swimming pool
3 training rooms
4 studio
5 dojo
6 squash court
7 buffet
8 swimming pool gallery
9 climbing wall
10 changing rooms
11 offices
12 porter
13 service rooms
14 store
15 plant rooms

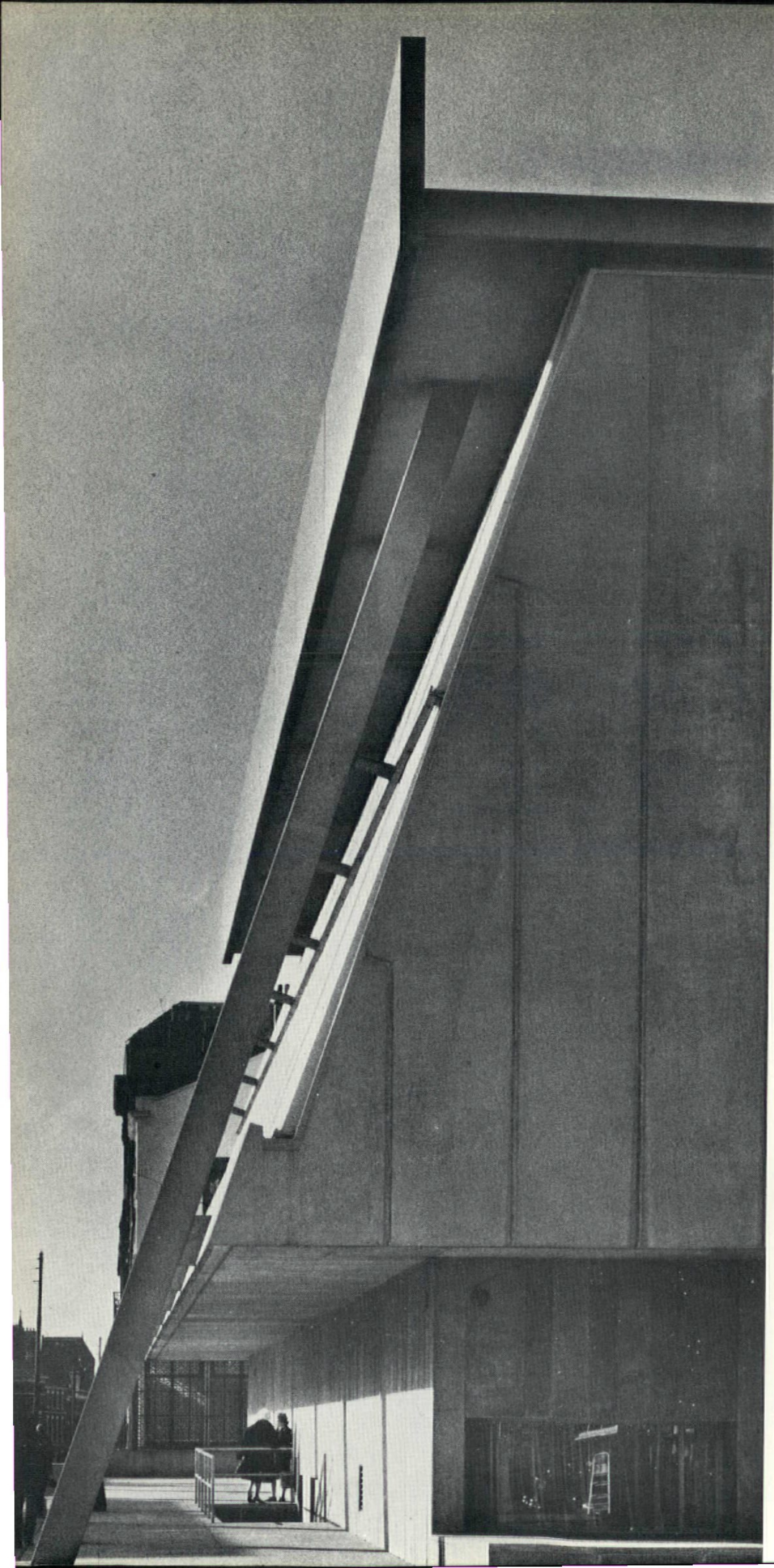
all photos except construction view:
Richard Einzig



6

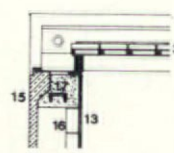
1
Site plan
2
Main entrance façade from the east
3, 4 & 5
Second, first and ground floor plans
6
Section
7
The building under construction from Abercromby Sq

7



◁275

The swimming pool has been designed as an independent suspended structure within the building. It has a continuous expansion joint round the pool at first floor slab level to isolate its structure from any movement of the building which could otherwise cause possible cracking. Heating is obtained from the university's central boiler house and district heating mains. The swimming pool hall is heated by a low pressure hot water system with embedded floor panels and concealed radiators, while the remainder of the building is heated by thermostatically controlled forced-flow convectors and radiators. With the exception of the sports hall, the main areas of the building are mechanically ventilated, the system incorporating electrostatic filtration.



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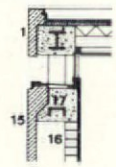

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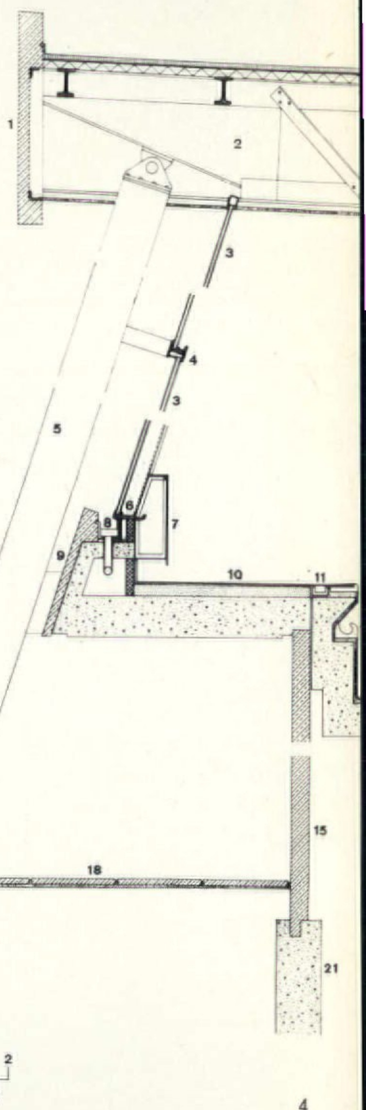


4

1
Detail of the south-east corner

2
Plan of jamb of Profilit screen walls

3
Section through slot window in screen wall

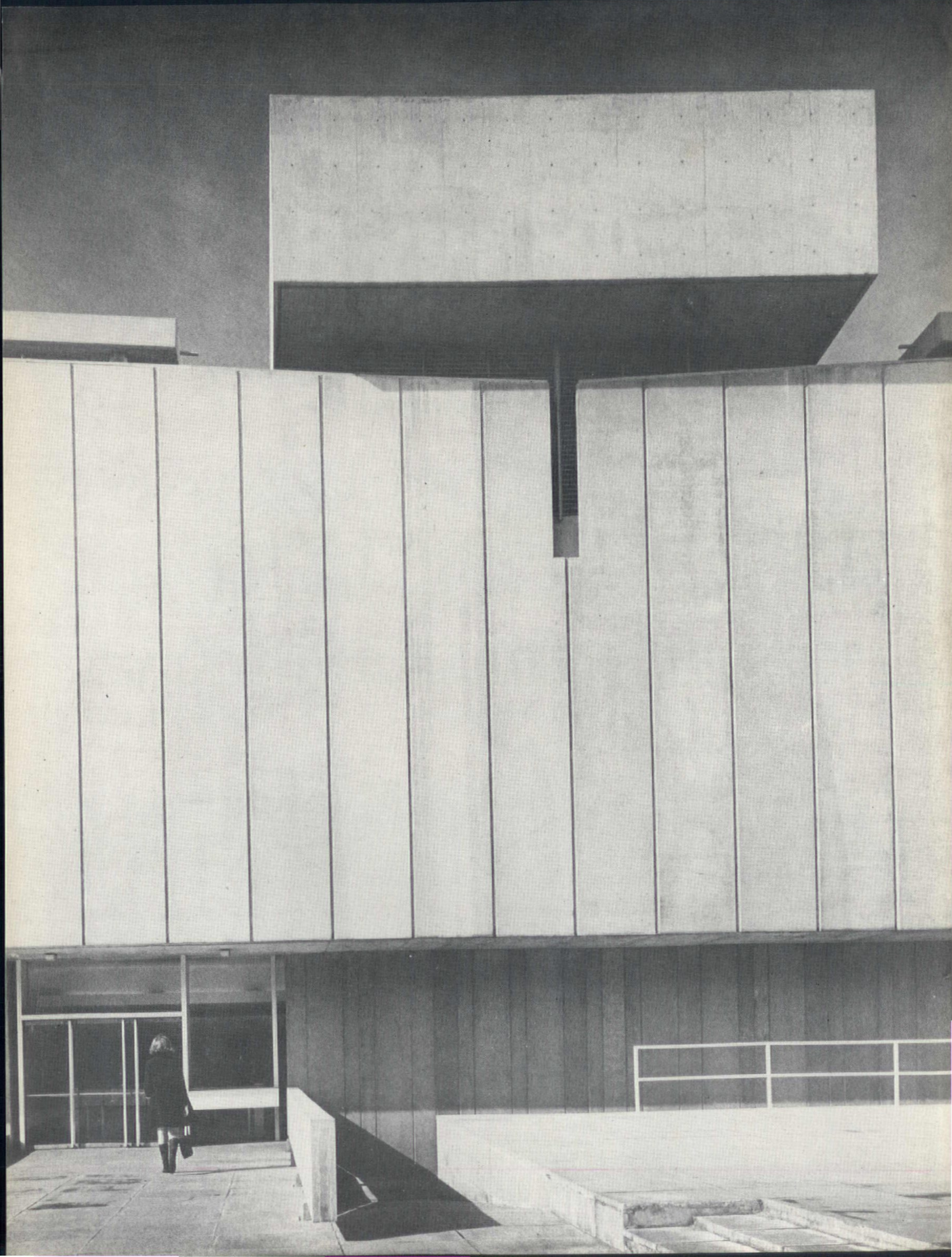
4
Section through the external wall of the swimming pool hall

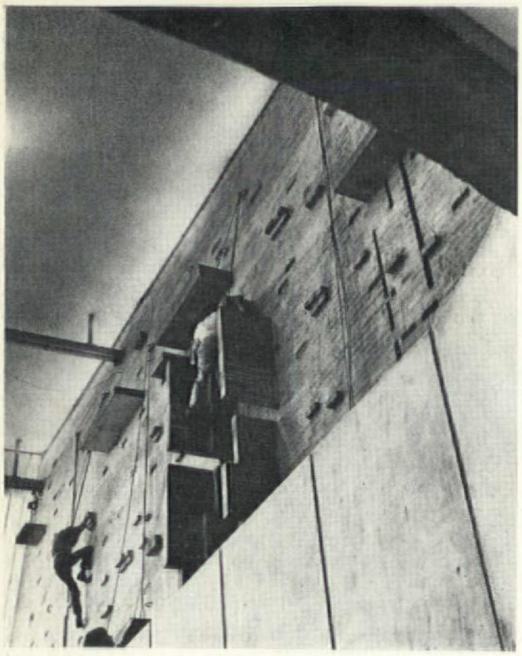
1 p.c. concrete fascia
2 steel trusses 18ft 3in c/s
3 double glazing
4 6in × 5½in r.s.j. mullion
5 p.c. column
6 condensation channel
7 radiator cover
8 rainwater channel
9 p.c. concrete fascia
10 non-slip ceramic tiles
11 surface water channel
12 non-slip nosing
13 glazed tiles
14 scum channel
15 p.c. concrete unit
16 brickwork
17 r.c. beam
18 paving slabs
19 m/s shoe
20 column base
21 p.c. concrete unit

5
Main entrance

1

5 →





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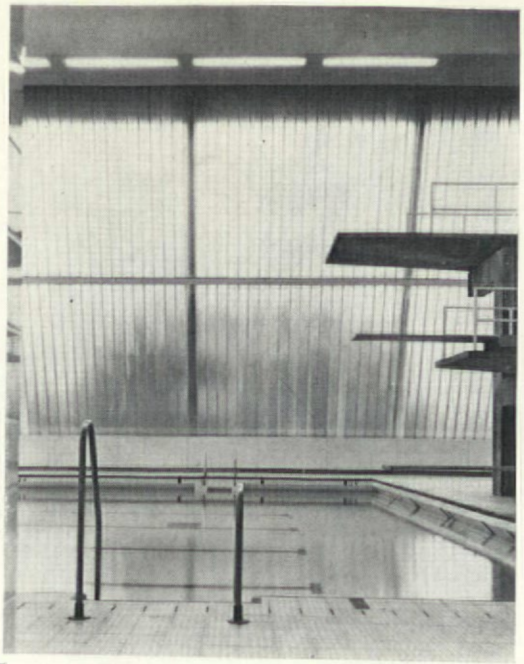

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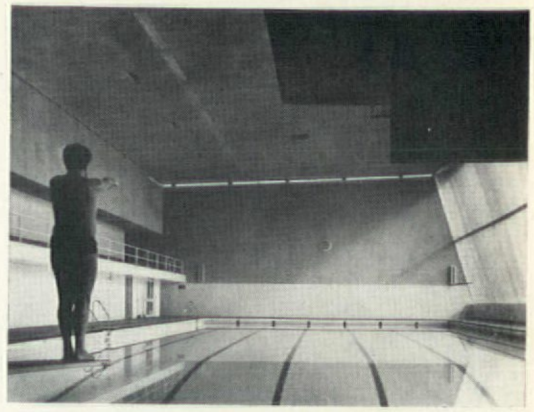
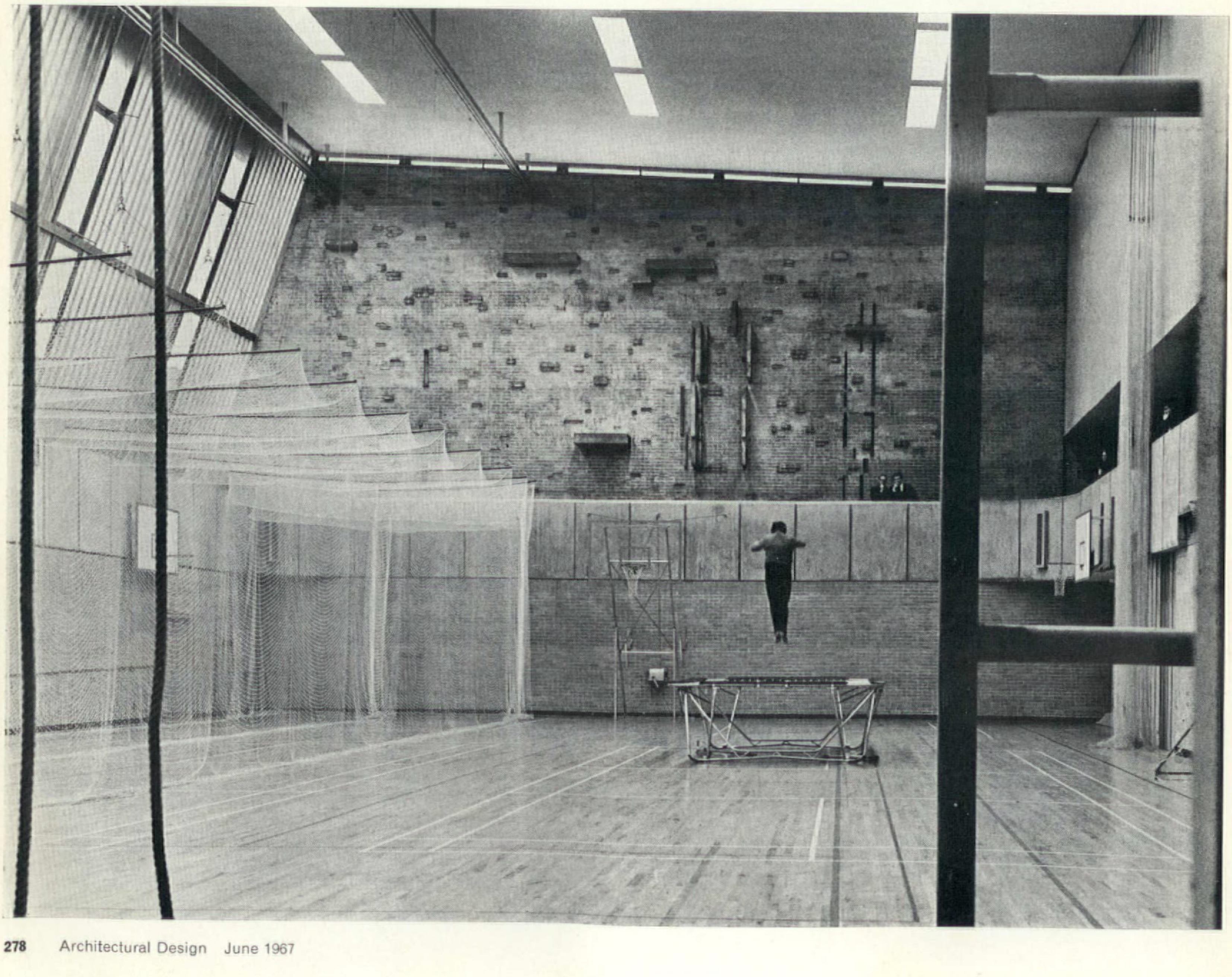
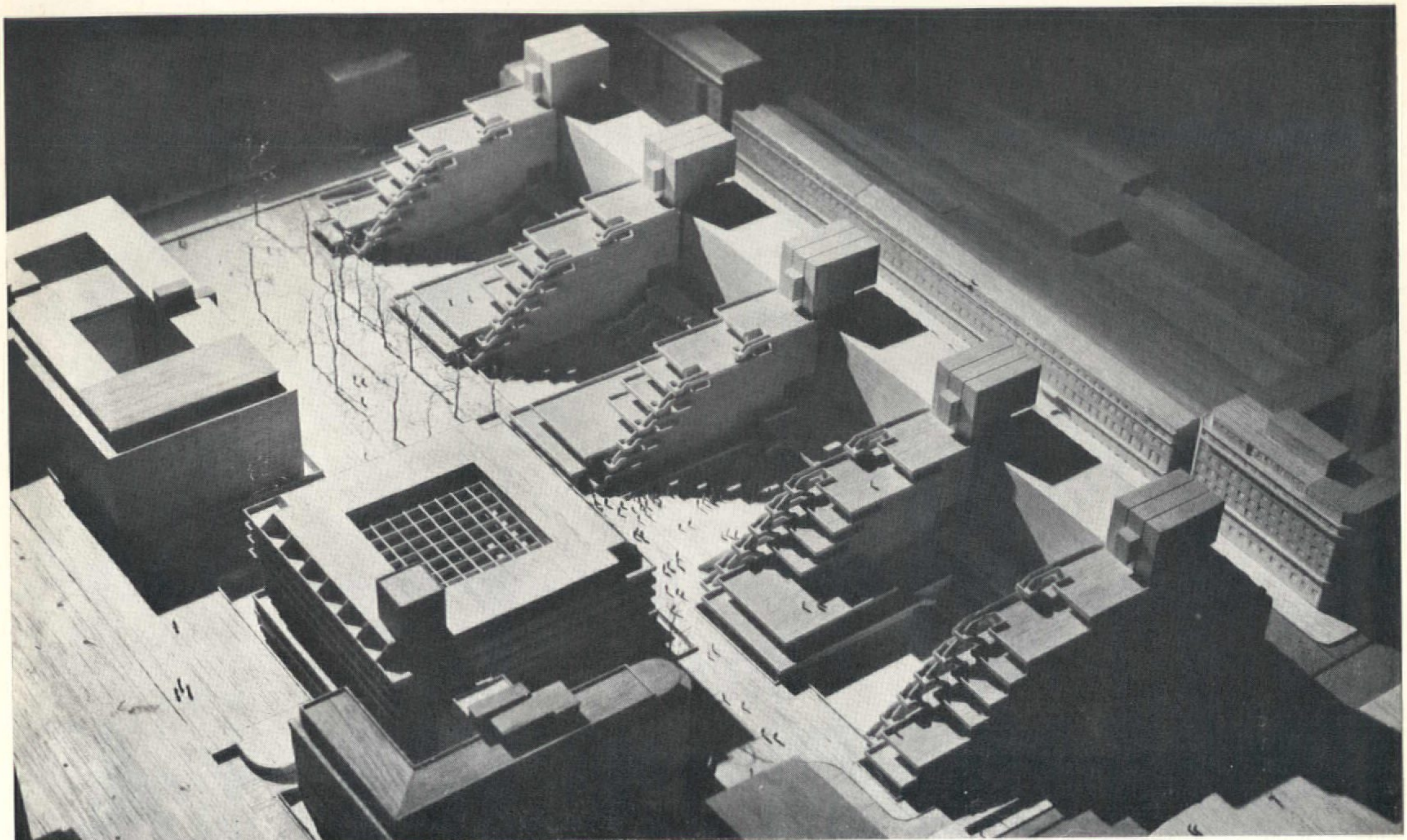


3

1
Detail of climbing wall in sports hall
2
View across swimming pool
3
Swimming pool hall
4
Sports hall looking towards the climbing wall

4





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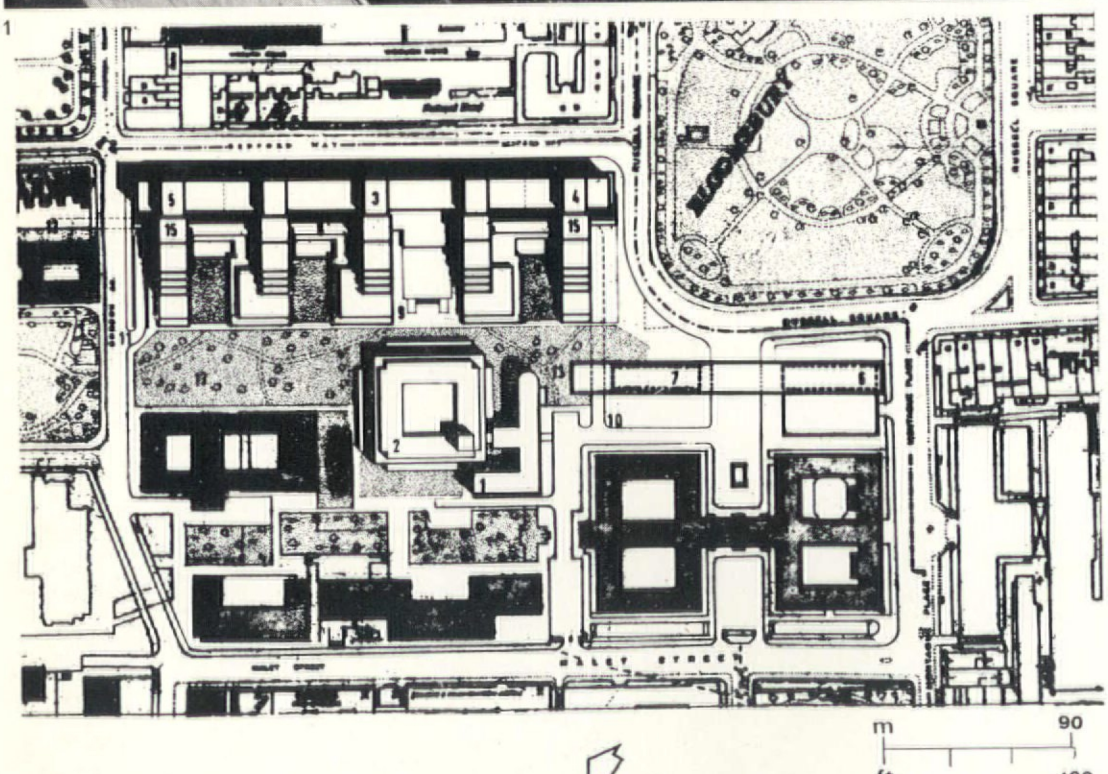


2

Redevelopment for University of London

Denys Lasdun and Partners

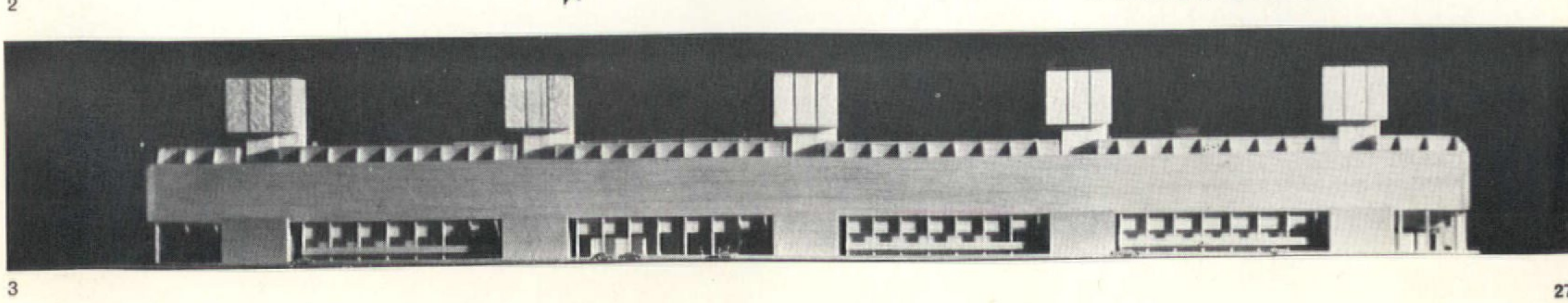
The area to be redeveloped consists of two sites to the north of the existing University Senate House. The larger, site block D, will provide accommodation for the Institute of Education, the Law Institute and future university accommodation as yet unallocated. The smaller site will be developed to provide a large extension to the existing School of Oriental and African Studies.

The following formative architectural proposals (designed in 1965–66), have been developed from Sir Leslie Martin's outline plan of 1959, the principal planning criteria being: ▷280

1
Model of proposed University of London development around Woburn Square

2
Site layout
1 existing S.O.A.S.
2 S.O.A.S. extension
3 Institute of Education
4 Law Institute
5 temporary I. of E.
6, 7 other development
9 entrance to I. of E.
10 ramp entry to car park
11 temporary ramp exit
12 final service road
13 Woburn gardens
14 new garden
15 additional accommodation

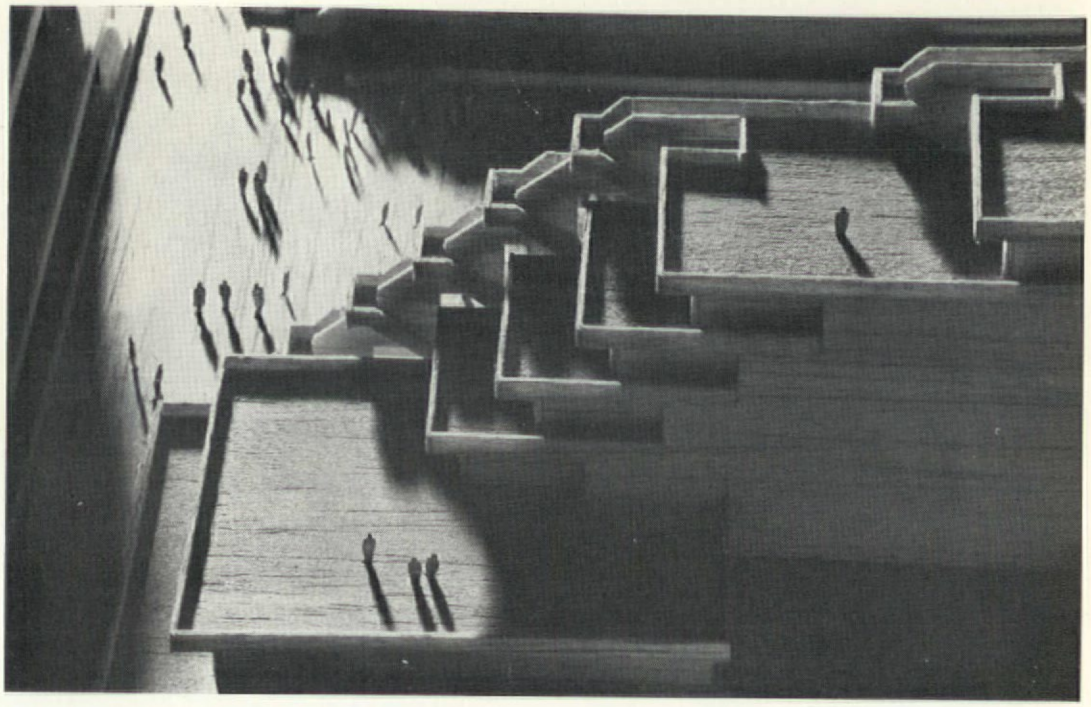
3
Elevation proposed for Bedford Way
Photos: 1 & 3, Ivor Haberfield



3

◁279

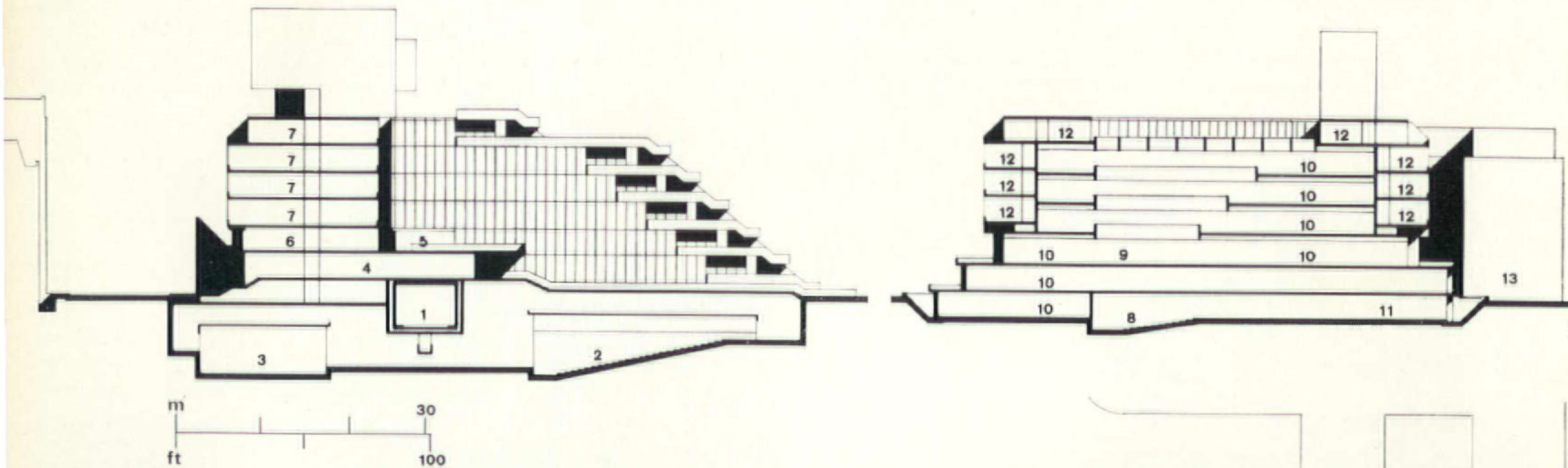
To limit through-traffic in the area
To reorganize access service roads and to provide adequate car parking facilities
To respect the scale of the older buildings in the area that are to be preserved
To add to pedestrian convenience by creating first floor access routes bridging streets.
The spine of block D separates the noisy thoroughfare of Bedford Way from the university precinct, and the terraces of the winged blocks are orientated to the south and towards the heart of the university precinct, forming amenity spaces integrated with Woburn Square.
The wings contain specialized accommodation at lower ground, and ground floors, comprising large rooms such as refectories, library reading rooms, students' union and teachers' centre. The accommodation on the first to fifth floors consists of standard-sized small teaching rooms 12ft wide related to the teaching divisions in the main block along Bedford Way. There are two teaching divisions per floor in the main block and since these vary in size they can be accommodated in the 'buttress' forms shown. One large and one small theatre are planned at the lower levels beneath the main entrance.
The project is designed for staged growth.
The new building for the School of Oriental and African Studies is planned on seven levels and provides accommodation for a large library; arts accommodation in the form of tutorials, lecture rooms and specialized accommodation; together with a lecture theatre, gymnasium and squash courts. The library is an independent organization separated from the arts accommodation and entered at ground floor level under control.



1

1
Model showing terraced wings proposed for the Woburn Square precinct
2, 3 & 4
Cross-section through site
Fourth floor plan of spine block, and first-floor plan of extension to School of Oriental and African studies

1 service road
2 large theatre
3 small theatre
4 entrance hall
5 pedestrian walkway
6 central administration
7 teaching and lecture rooms
8 lecture theatre
9 reading room
10 flexible stack
11 large rooms
12 small rooms
13 existing S.O.A.S. building
14 court over car park
15 roof terraces
16 access and service core



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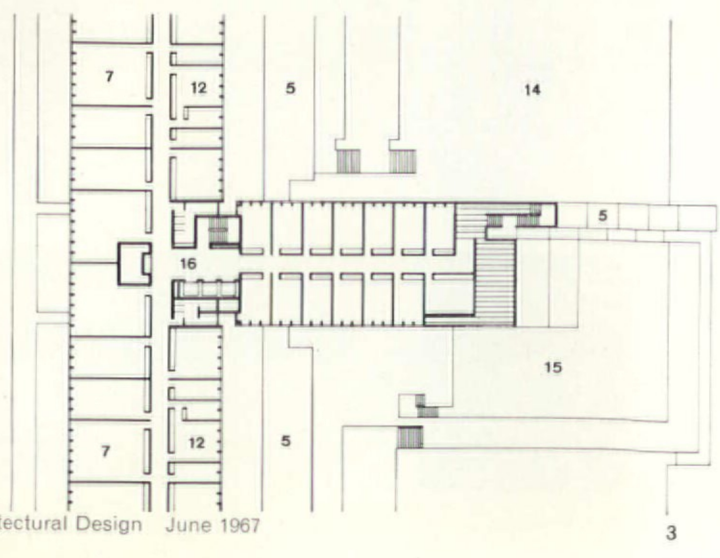

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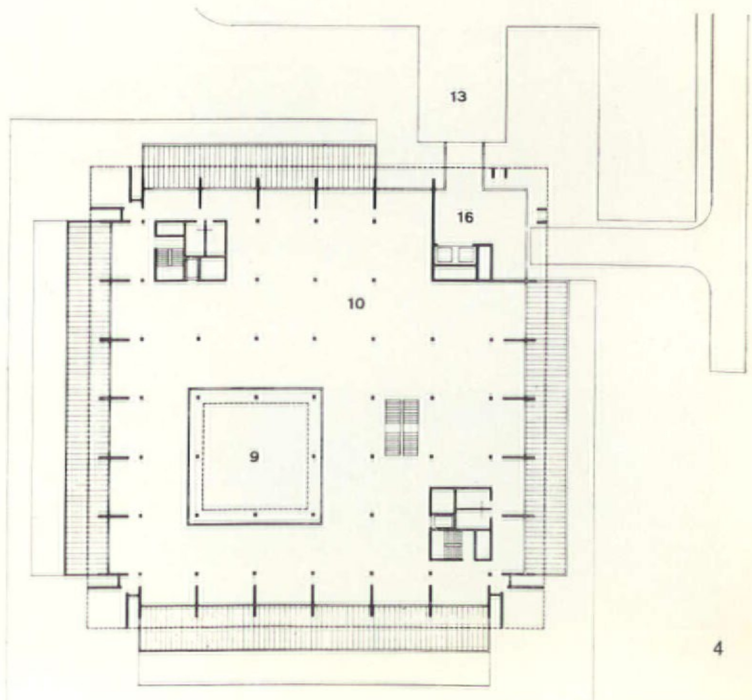

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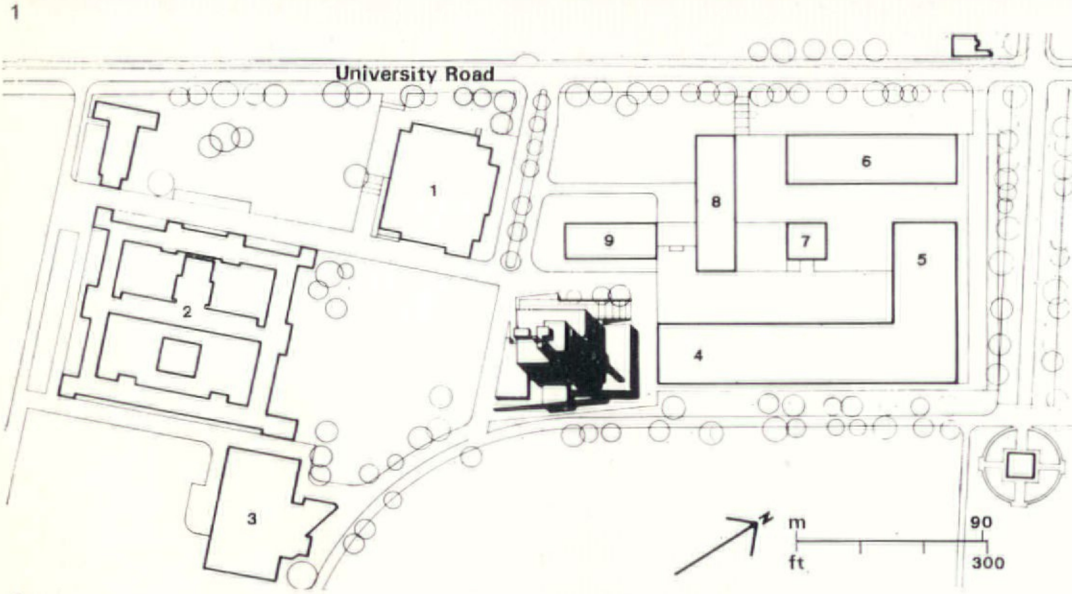

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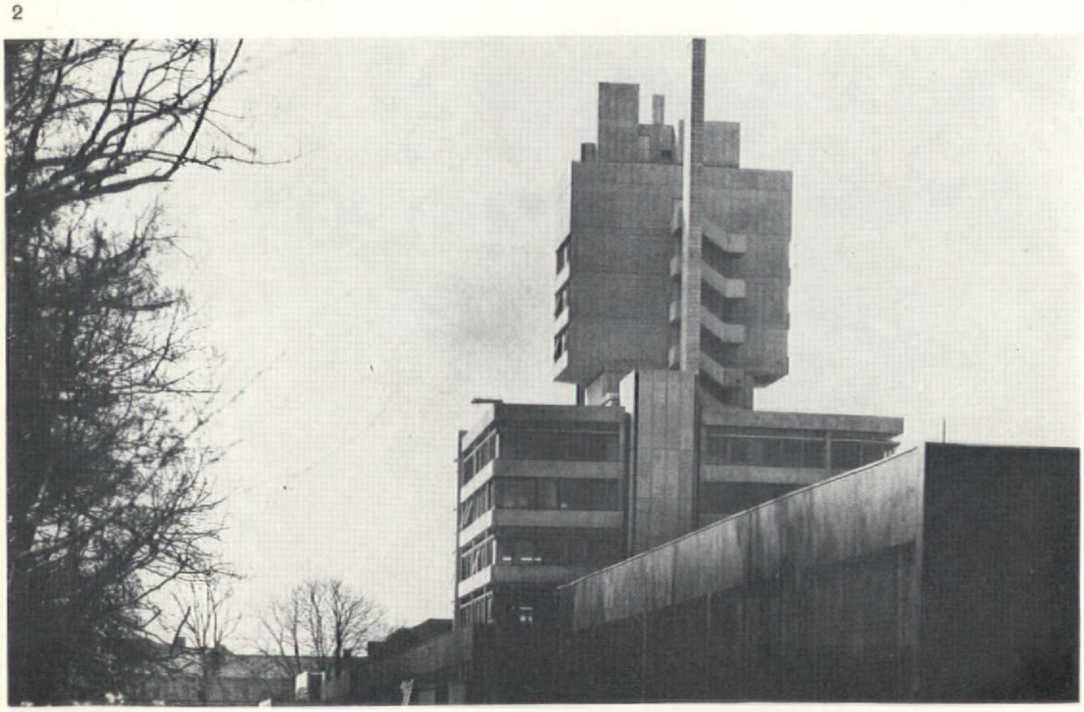


3

Charles Wilson building, University of Leicester

Denys Lasdun & Partners

Associate in charge: Harry Pugh

Assistants: T. Holzbog, A. J Matthews, T. Elson, M. A. Roseberg

The site allocated to the new social building in the university development plan is at the centre of the teaching and administrative area. It adjoins Victoria Park along its south-east boundary and is at the head of the main entrance into the university from University Road.

The main function of the building is to serve 2750 lunches per day for academic staff and students. In addition it has common rooms, coffee bars, a large general purpose hall for examinations and physical education and other subsidiary accommodation.

Advantage was taken of variations in level of the site to locate the food storage, preparation and cooking area at a lower ground level to which service access is gained from the south-east, while the main entrance is at a higher ground level and is approached from the west.

The whole of the structure of the main part of the building from the ground level to the tenth floor is in reinforced concrete. Although the central core and its continuation as the tower above are *in situ*, all the perimeter columns, beams, staircase walls and ducts up to the sixth floor are pre-cast, in order to achieve a higher and more uniform standard of finish. The pre-

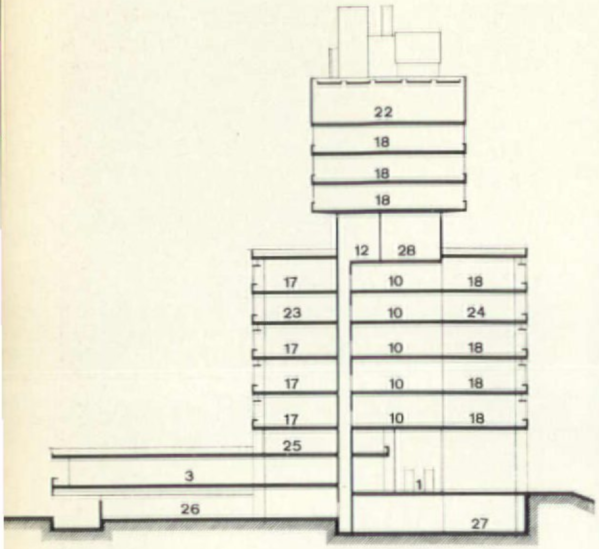
▷284

1
View of the Charles Wilson building from the east, across Victoria Park, with J. Stirling's engineering building on the extreme left

2
Site layout

1 Percy Gee building
2 administration
3 engineering building
4 physics building
5 Bennett building
6 Adrian building
7 lecture theatre
8 chemistry teaching
9 chemistry research

3
View from the north-east, with a part of Sir Leslie Martin's science buildings in the foreground
Photos: 1 & 3, Richard Einzig



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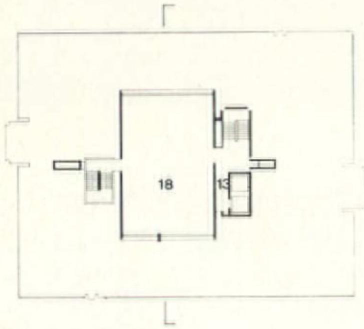

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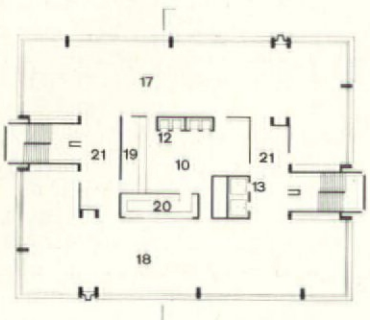

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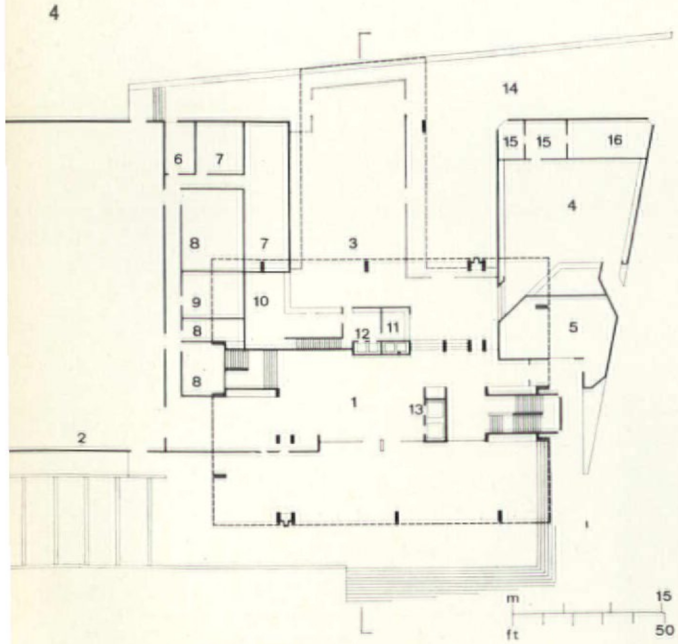
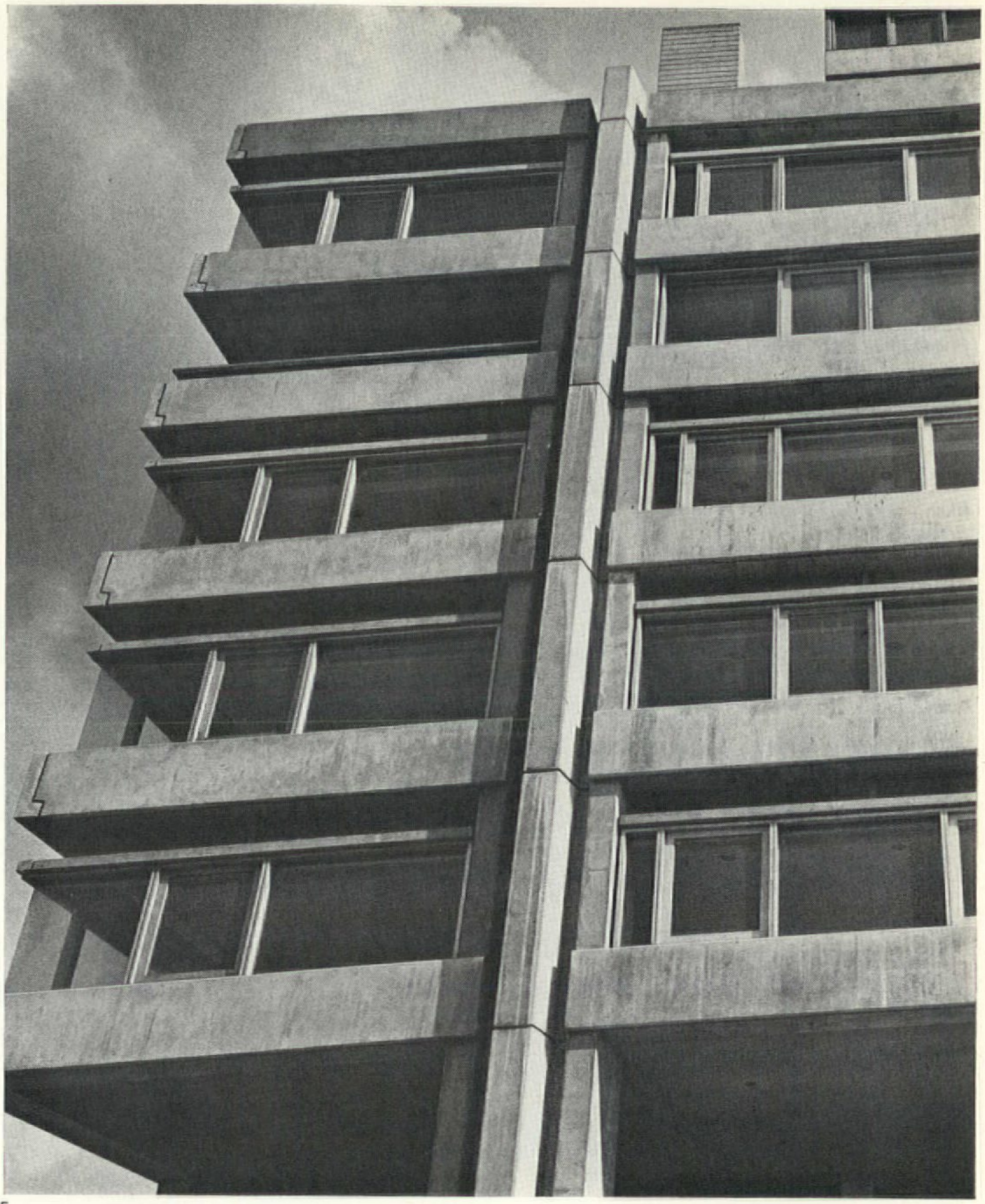




5

1, 2, 3 & 4
Section, seventh floor plan (typical of eighth, ninth and tenth floors), second-floor plan (typical of first, third, fourth and fifth floors) and ground floor plan

1 entrance foyer
2 general purpose hall
3 snack bar
4 university bookshop
5 branch bank
6 P. E. instructor's office
7 changing rooms and showers
8 storage
9 weight training room
10 servery
11 kiosk
12 four food lifts
13 two passenger lifts
14 terrace
15 offices
16 book-store
17 self-service restaurant
18 common room
19 service counter
20 coffee bar
21 vestibule
22 music/exhibition room
23 *A la carte* restaurant
24 committee room
25 administrative offices
26 main kitchen area
27 boiler house
28 cold water storage

5
Details of precast duct and spandrel panels

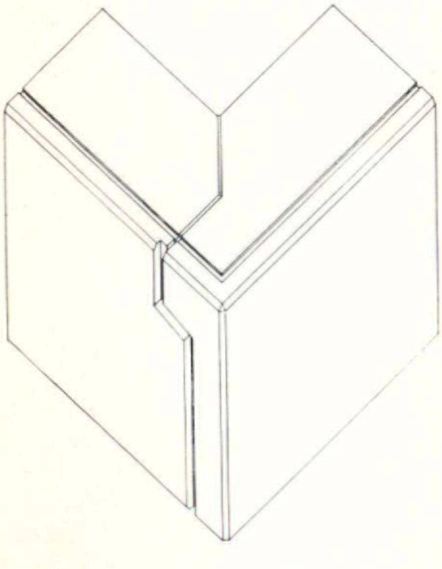
6
View from the south, with the podium of J. Stirling's engineering building in the foreground

7, 8 & 9
Diagrams illustrating junctions between precast units

Photos: 5 & 6, R. Einzig

6

7



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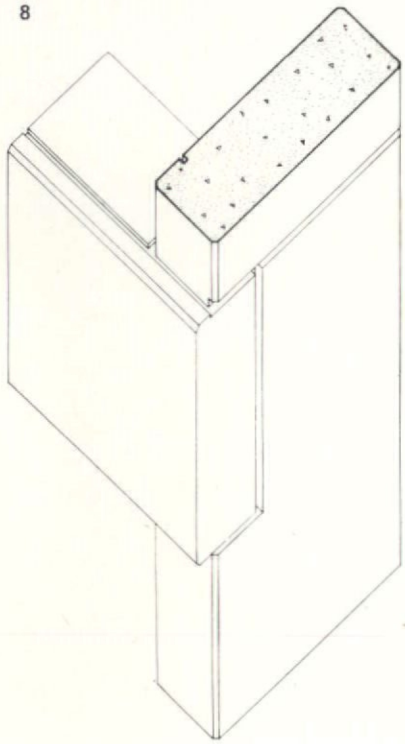

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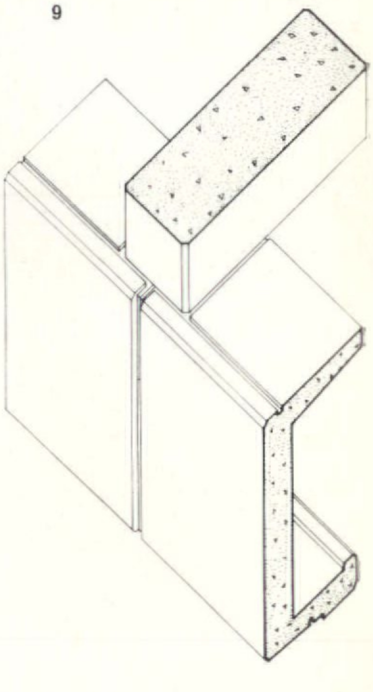


◁281

cast units were manufactured at a works a few miles from Leicester and were delivered to site as required for erection by mobile crane direct from transporters. Plywood-lined timber moulds were used throughout and in spite of the units being up to 50ft long and weighing up to 10½ tons, a high degree of accuracy was obtained, tolerances being half those laid down in the then draft Code of Practice. The seating of beams on columns was made with a thin bed of Certite mortar and at each floor level the columns are spliced one above the other with dowels, the holes for which were filled by pressure grouting. The joints between units were sealed with polysulphide rubber compound. The windows of the first to fifth floors were designed so that they could be fixed and glazed from inside, and this, combined with the pre-casting of the structural elements, eliminated the need for external scaffolding.

The walls of the general purpose hall and adjacent areas extending beyond the perimeter of the structure of the upper floors, together with the bookshop and bank, are in load-bearing brickwork. The metal deck roof of the general purpose hall is supported on pre-cast concrete beams which are seated on pre-cast concrete pad-stones and grouped in pairs to form roof lights across the width of the hall. The roofs of the ground floor snack bar and bookshop are metal decking supported on light-weight steel joists.

Ceilings in common rooms and restaurants are acoustic tiles and in the entrance foyer, ground floor snack bar and staircases are sprayed plaster Pyrok.

Walls of common rooms and restaurants are partly Columbian Pine boarding and partly plaster. The general purpose hall and the entrance foyer are fairfaced brickwork. Walls in the kitchen and servery areas are tiled.

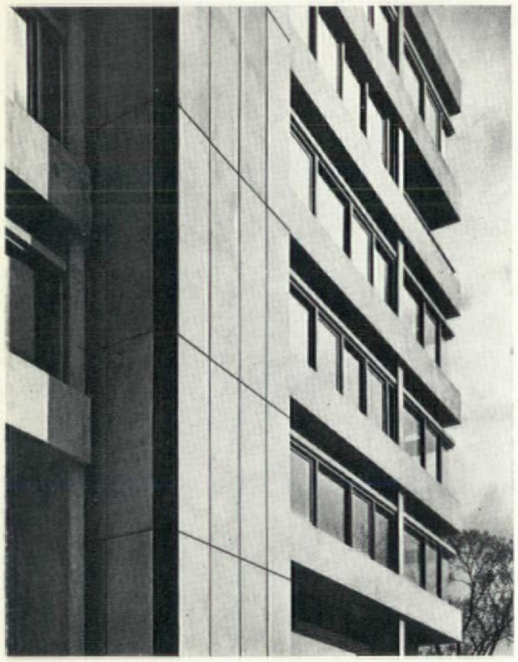
Floors in common rooms and restaurants are mainly hardwood strip or block and the entrance foyer has brick paving. Staircases, kitchen, serveries and cloakrooms have quarry tile paving.

Windows in common rooms and restaurants are Columbian Pine and afromosia, and elsewhere are painted steel.

Heating is by low-pressure hot water from oil fired boilers, the boiler house under the entrance foyer serving both this and the adjacent physics building. The general purpose hall, the ground floor snack bar and the tenth floor music room are mechanically ventilated, as also are the kitchen and serveries.

Kitchen and servery equipment is mainly heated by gas, although some items are heated by steam generated by an electrode boiler.

A high tension transformer provides the electrical supply and the general purpose hall, entrance foyer and staircases have battery operated emergency lighting.



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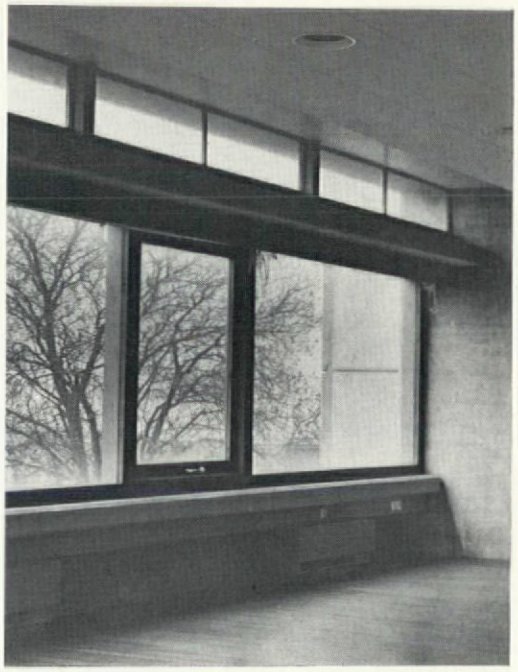

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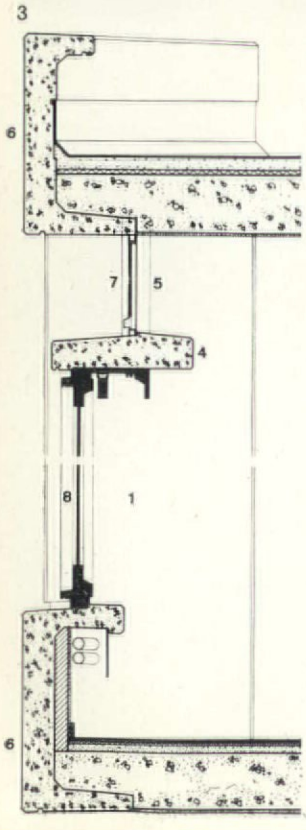

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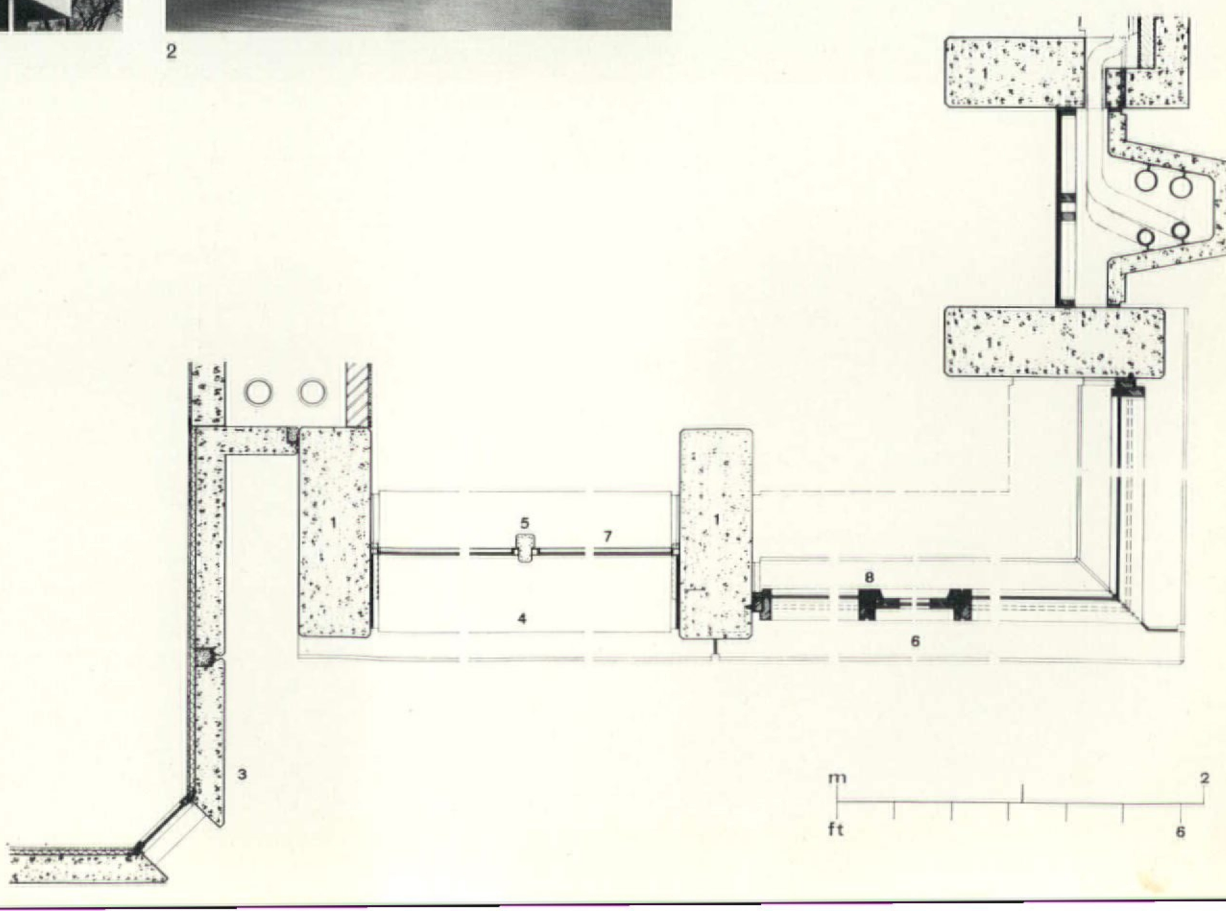


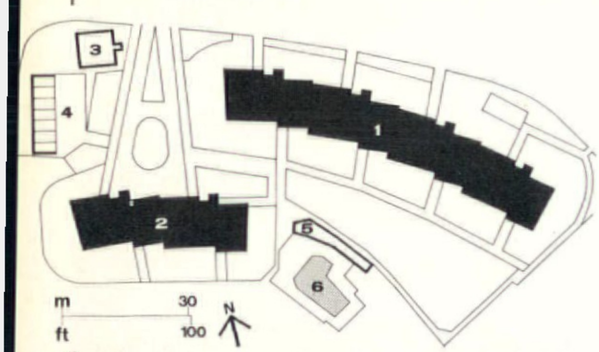
1
Exterior view of staircase and spandrel panels
2
Interior of typical window
3 & 4
Section and plan showing typical details of perimeter cladding and walling for the first to fifth floors—plans of the staircase, the service duct, the clerestorey windows, the main windows and at under cill level.

1 3ft 9in × 1ft 3in precast column
2 precast units to form duct
3 precast stair wall units
4 precast transome
5 precast mullion supporting transome from above
6 precast beam 3ft 6in deep
7 steel window with permanent ventilator and fixed glazing
8 timber window

Photo: 1, R. Einzig; 2, G. Richards


Charles Wilson Building
University of Leicester
Architects: Denys Lasdun & Partners
Main contractors
Johnson & Bailey Ltd
Cambridge 59694
Nottingham 82655

1



2

3

Southwood Park flats, Highgate, London

Douglas Stephen & Partners

Architect in charge: Robert Maxwell

All photos Sam Lambert

Southwood Park was commissioned in 1962 by Ross Hammond Investments Limited. The agents were Edward Erdman, and the original brief drawn up by them asked for a mixture of bachelor and family flats, fitted kitchens and bathrooms, spacious bedrooms without fitted cupboards, and a high standard of privacy, both as regards access and within the flats, and a relationship to the extensive gardens of Southwood Court, which formally occupied the site.

The architects investigated different degrees of site coverage, from dispersed patio-type housing to a single high block. Both extremes proved more costly than the middle course of adopting a relatively concentrated formation, the height being controlled by planning zones and height restrictions. By adopting a standard floor arrangement for each unit of lift access it was possible to accommodate the form of the building to an irregular site while maintaining a degree of regularity and repetition.

The selected design provided 74 dwellings arranged as 14 studio flats with double height living-rooms, 28 three-bedroom and 30 four-bedroom family flats, and two five-room penthouses with roof terraces. The density on a four-acre site was fixed at 240 habitable rooms (60 per acre), the studios being rated as two-room dwellings, although they were subsequently agreed by the Local Authority to rate as one-room dwellings. Privacy of access was insured by arranging the family flats as through spaces on either side of a lift access point to which the studio flats also backed. All flats have large private balconies facing south-west towards the gardens, and the bedroom windows all have similar aspects facing north-east. Kitchens, as working rooms, were grouped in the garden aspect, and bathrooms were all internal and ventilated.

The use of eye-level strip windows in the bedrooms insures privacy and conceals bedroom furniture, while allowing wide views towards the north-east.

In 1964 a controlling interest in the development was acquired by the Real and Leasehold Group and some modifications were made to the design. The garages which are uniformly distributed at ground level, were enclosed with up and over doors, and an ambitious swimming pool was added to the garden amenities.

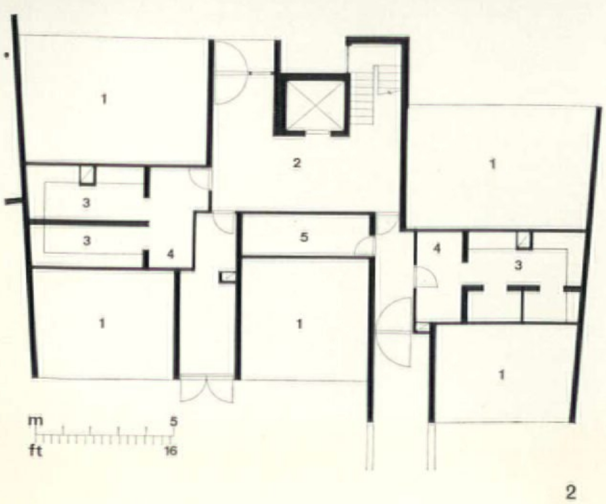
The contract went to Tersons at approximately £½million and practical completion was reached in phases throughout 1965 and early 1966.

1
Eight-storey block from the main entrance

2
Site plan
1 five-storey block
2 eight-storey block
3 caretaker's house
4 garages
5 clubroom and changing rooms
6 swimming pool

3
South elevation of eight-storey block

1



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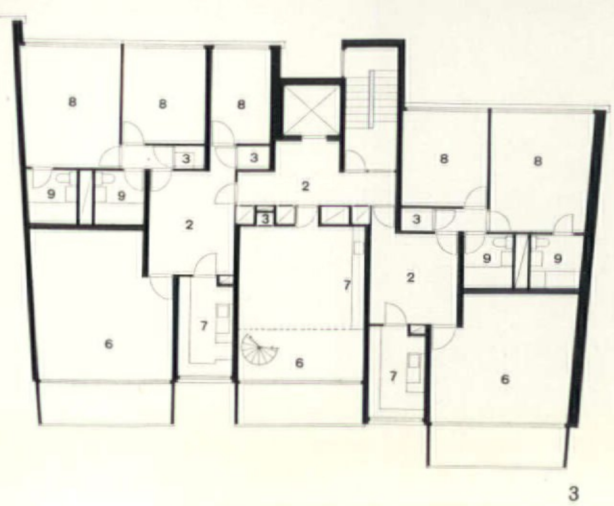

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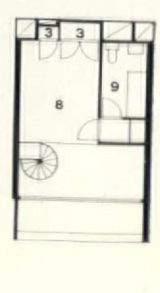

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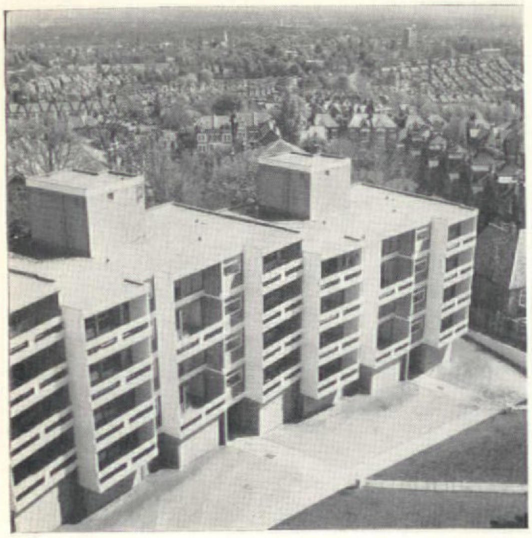

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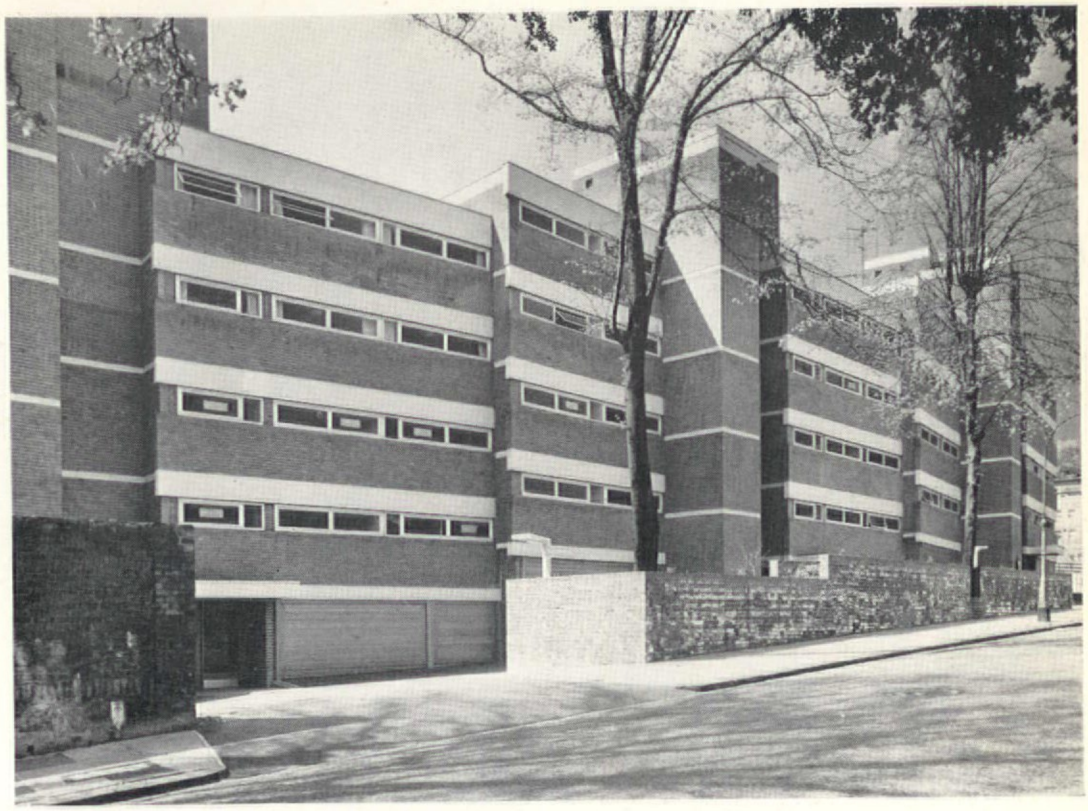


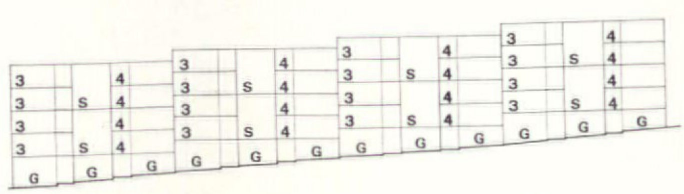
6

7

1
Detail of the south façade of the five-storey block
2
Ground floor plan of typical planning unit of which both the five- and eight-storey blocks are composed
3 & 4
Typical floor plan of planning unit for the five- and eight-storey blocks, with upper level plan of the studio flat alongside
5
South façade of the five-storey block, overlooking the garden, seen from the roof of the eight-storey building
6
Five-storey building seen from the street
7
South elevation of the five-storey building, with the swimming bath terrace and the stairs leading up to the eight-storey building on the extreme left
8 & 9
Diagrammatic sections through the five- and eight-storey blocks showing the disposition of garages and various flats of three, four and five bedrooms and studio arrangement

Key to plans

1 garage
2 hall
3 store
4 pram store
5 meter room
6 living room
7 kitchen
8 bedroom
9 bathroom



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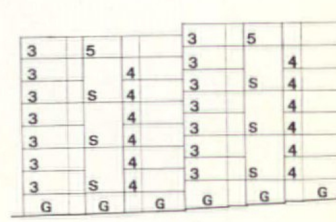

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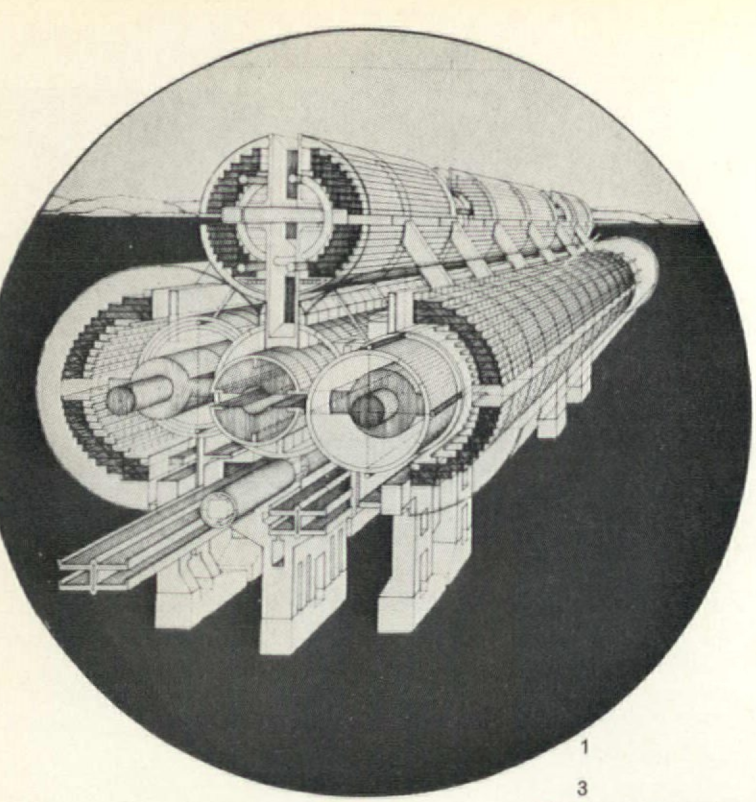

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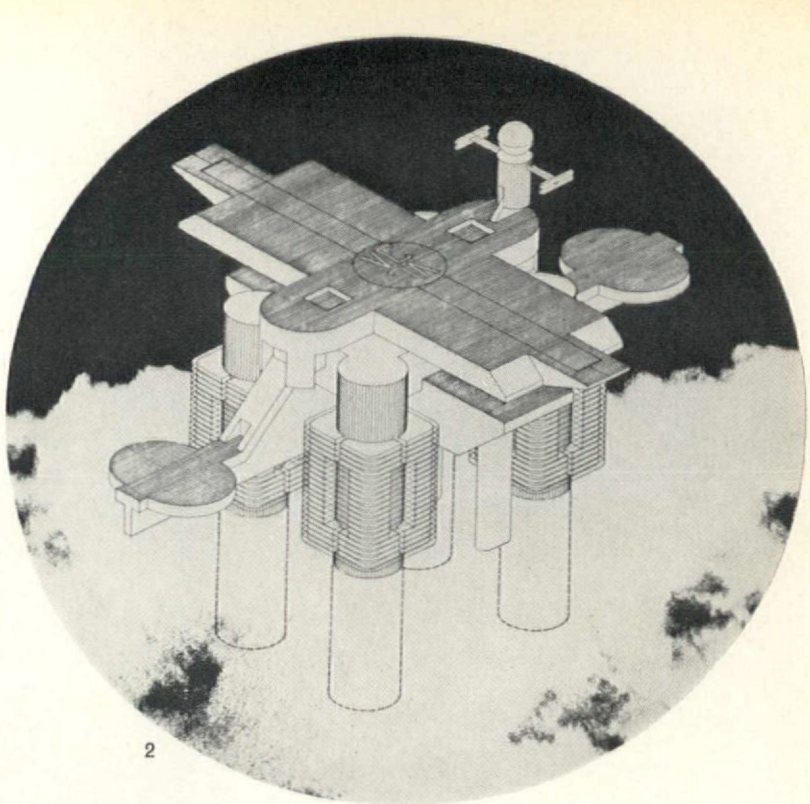


2

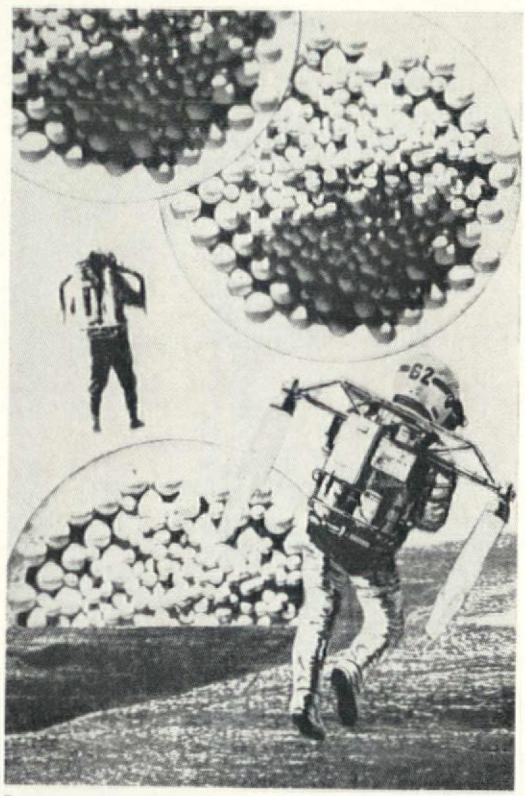
The mechanistic image

R. J. Abraham and F. St Florian

Both Austrians, in their early thirties, teaching at the Rhode Island school of design: the careers of R. J. Abraham and Friedrich St Florian are curiously parallel to that of their compatriot Hans Hollein (see *AD*, June '66) as are the preoccupations and technique of much of their work. Along with Hollein's associate Walter Pichler and the work being done by the current students at Graz (where both Abraham and St Florian trained) there is a strong Austrian Futurism in the making. The gestures are international in instinct: 'architecture has to plug-in and plug-out' (Abraham).... 'The rocket belt and the use of air cushions as a structural support will soon render much of architecture invisible' (St Florian). The exhibition of their work in March this year at the National Institute of Architecture in Rome, under the title 'Experimental Architecture' shows their presentations as a curiously national transmutation of machine parts, collages of a large photograph, using a small object in a landscape (much in the manner of Eduardo Paolozzi). In this case the message is clear: that these symbols of technology are relevant to the large-scale environment in a way that architecture should be. The drawings reinforce the mechanistic nature of the images. English and Japanese work of a similar nature has already left behind this delight in the big mechanical symbol, but then it never had the elegance of the Austrian work. These manipulations are beautiful. Hollein has already been transplanting some of this elegance back into reality in his Retti shop and *Selection '66* furniture exhibition. One hopes that in the process the instinct behind the statements will not be forgotten.

Peter Cook

3



1
Megabridges. R. J. Abraham 1965

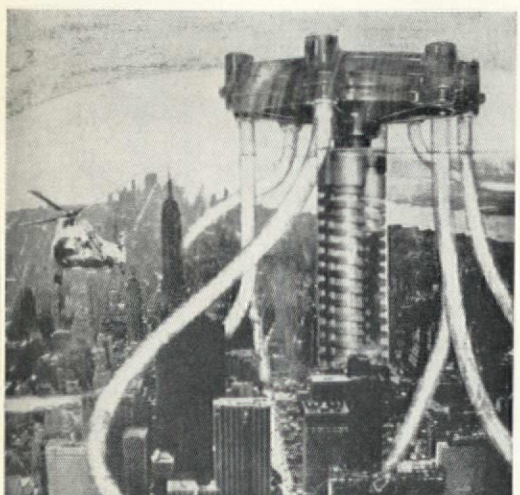
2
Interchange, transformation of short-range airborn transport to vertical low speed systems. F. St Florian, 1966

3
Air-ocean environment, developed in an artificial earth-crater and grown until it reaches a programmed capacity. It then becomes independent, controlled by light. R. J. Abraham

4
Urban interchange. R. J. Abraham 1967

5
Section through crater-environment on the moon. R. J. Abraham, 1967

4



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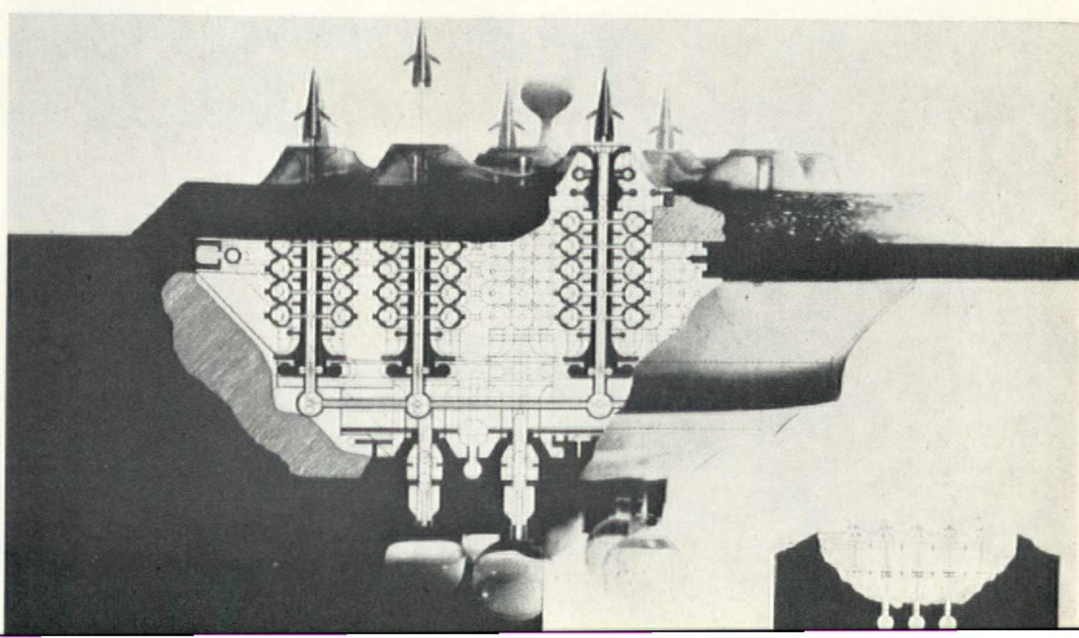

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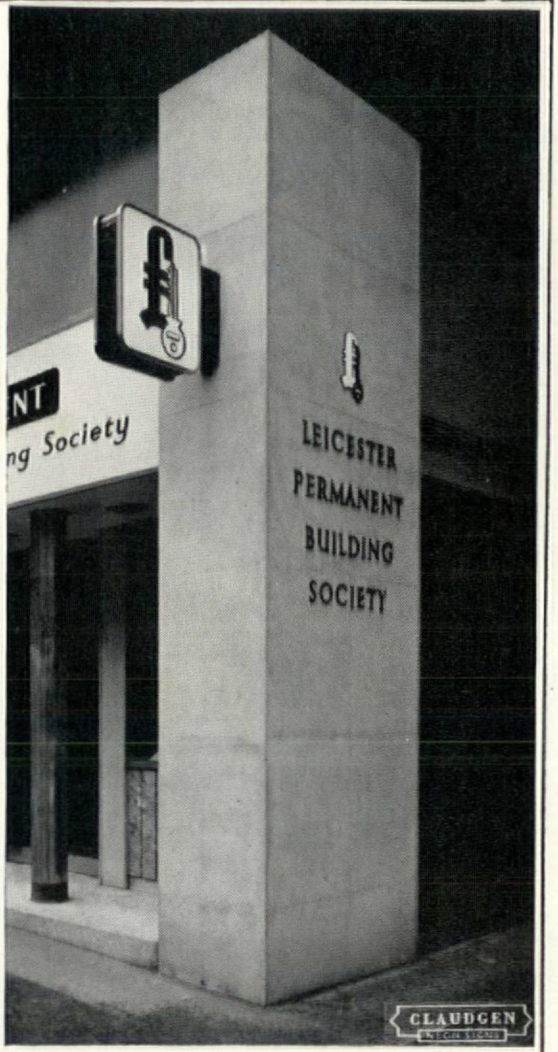

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BUILDING
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Map guides **7** Prague

17th, 18th, 19th and 20th century buildings

Published by Architectural Design 26 Bloomsbury Way, London WC1

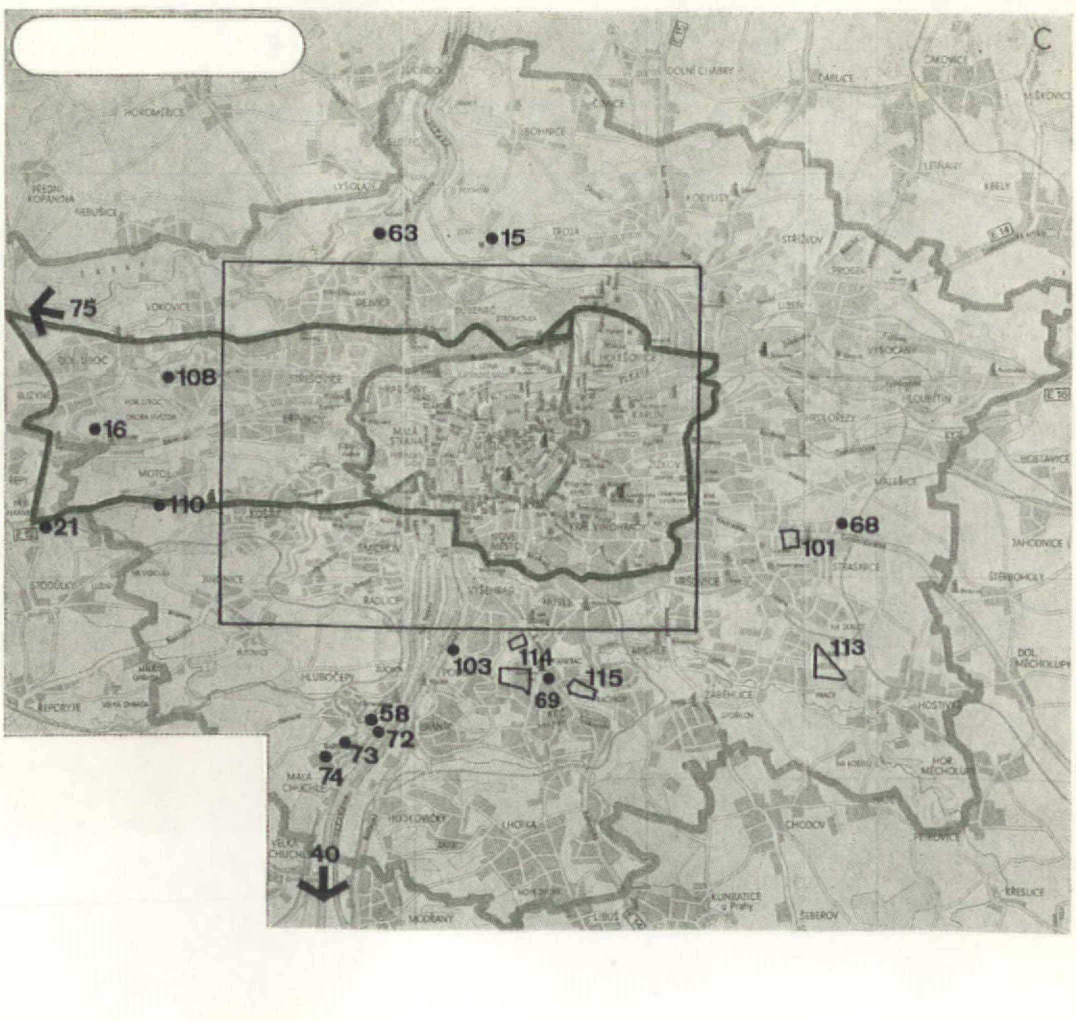
The selection of buildings was made by Brian Knox, author of *The architecture of Prague and Bohemia* (Faber)

Map by permission of Kartograsické Nakladatelství, Prague

Previous maps: 1 London, 2 Helsinki, 3 Copenhagen, 4 Rome, 5 Milan, 6 Stockholm

Outer area

The central area (the part surrounded by the rectangle) is shown overleaf



North wing of Town Hall
The old one destroyed in 1945; three competitions so far, no result

Central area

The outer area is shown overleaf

◀ over

76 **'Černá růže' shopping arcade** 1932
Oldřich Tyl
Much the best of the ubiquitous arcades round Václavské náměstí

77 **Steel stockyard, formerly 'Ferra'** 1932
Josef Kříž
Neat, two storeys, concrete frame and brick infill

78 **Hotel Tatran, formerly Juliš, Václavské náměstí 22** 1932
Pavel Janák
Shops, offices and cinema

79 **'Vltava' café and offices, formerly Merkur** 1934
Jaroslav Fragner
Eight storeys, effect of horizontal slabs

80 **Industrial Art Building, Národní třída 36** 1935
Oldřich Starý
Eight storeys of glass, glazed internal court

81 **School** 1935–7
Evžen Linhart
Four impressive long bands of window

82 **Flats, Letohradská 60** 1935
Evžen (Eugene) Rosenberg

83 **Flats and shops (for Zemská banka)** 1936–7
Richard Podzemný
Seven storeys, heavily cut into by balconies, strong expression with limited means

84 **Flats and shops ('Molochov')** 1936–7
Josef Havlíček
Endless seven-storey wall

85 **Ministry of the Interior** 1938
Kamil Roškot
Use of tiles on the Pensions Institute scale

86 **'Bílá labuť' store** 1938
Josef Kittrich, Josef Hrubý
Biggest of all the glass shop fronts

87 **Sv. Jan Nepomucký, Košíře** 1938
Jaroslav Čermák
Big plain concrete box of character

88 **Flats** 1938–9
Vít Obrtel

Post War

101 **'Solidarita' housing** 1947–9
František Jech and others
Tiny two-storey terrace houses

102 **Hotel International** 1952–6
František Jeřábek
The one sizeable monument of its period remaining

103 **Swimming baths, Podolí** 1955–65
Richard Podzemný
Roof of covered bath elegantly seats spectators at the outdoor one

104 **Polish Centre (interiors)** 1958
Karel Prager

105 **Restaurant from the Brussels Exhibition** 1958
František Cubr, Josef Hrubý, Jaroslav Pokorný
Re-erected here in 1960

106 **Technical schools** 1959–66
František Čermák and others
Big complex in coloured glass

107 **Poliklinika** 1960–2
Richard Podzemný
Six storeys heavily mullioned

108 **Chemical Research Institute (Ústav makromolekulární chemie)** 1961–2
Karel Prager
Attractive concave shapes clothed in dark green glass

109 **'Invalidovna' experimental housing with school and shopping centre** 1963–5
Josef Polák and others
All shapes and sizes, from 12-storey point blocks downwards, built from standard units

110 **Motel, Motol** 1963–5
Jindřich Pulkrábek, Alena Šrámková

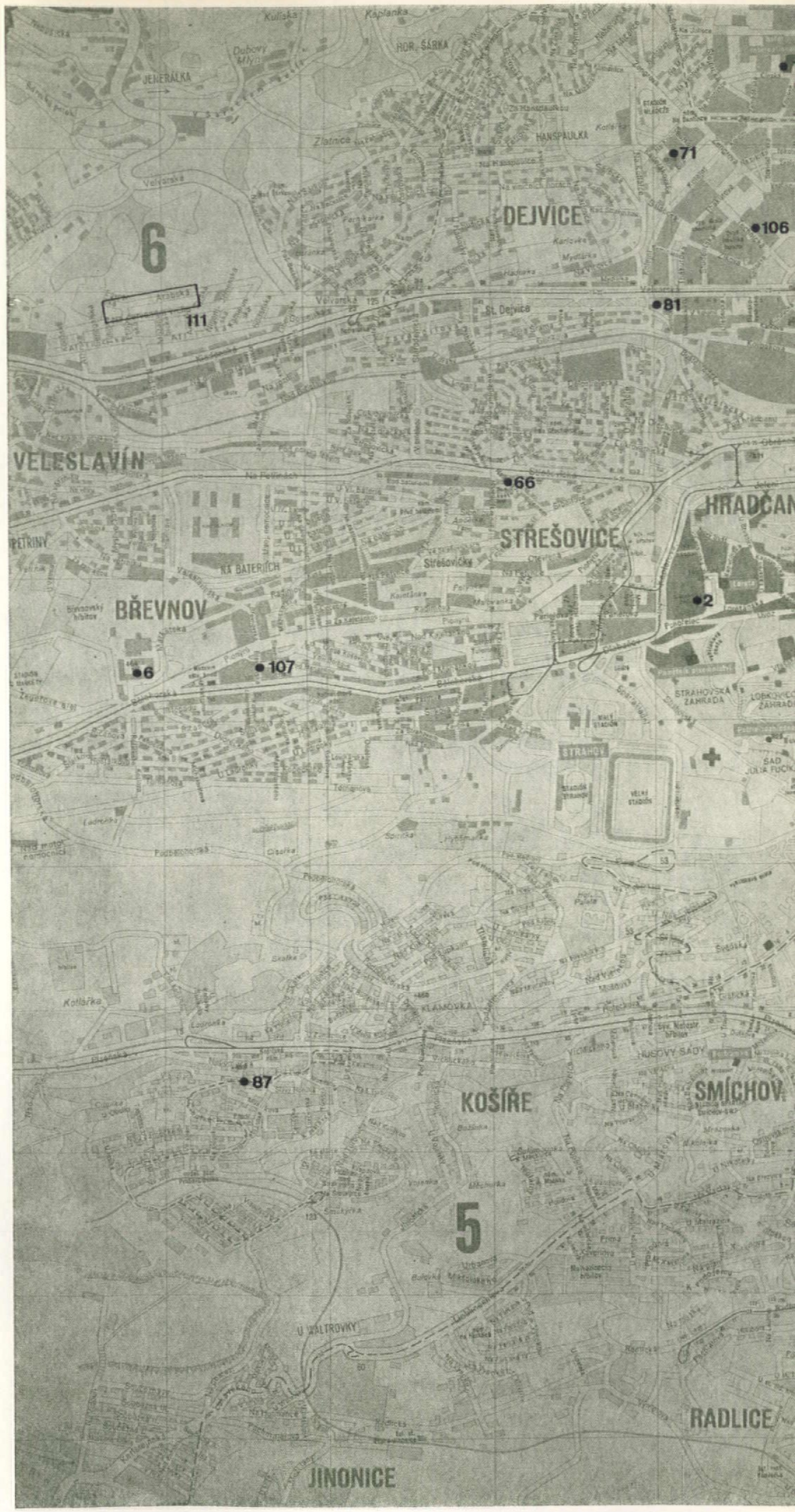
111 **'Červený vrch' housing** 1964–5
Jiří Klen and others
13-storey point blocks along the skyline

112 **Picture gallery in the Hrad** 1965
Josef Hrubý
Modest but effective museum design

113 **'Zahradní město' housing** 1965–7
G. Čelechovský and others
One of the biggest schemes; condition of some of the early blocks is instructive

114 **'Pankrác I & II' housing** 1965
Jiří Lasovský and others
Two ambitious schemes, mostly eight and 12 storeys

115 **'Michelská' housing** 1965
Adolf Véle and others
Effective use of 14-storey point blocks at end



Three sites to watch

A **New Parliament building**
Karel Prager
Demolition began 1966

B **New building in Národní třída**
Bohuslav Fuchs with Kamil Fuchs
At last, the first work in Prague of the famous Brno architect and planner

C

Buildings

1650–1850 Capital of Hapsburg Bohemia

The essentials

1 **SV. Ignác : nave** 1665–78
Carlo Lurago
chancel, façade 1686–99
P. I. Bayer
Characteristic and assertive Jesuit arrival

2 **Černín palace** 1668–87
Francesco Caratti, completed Abraham Leuthner
The Colossal order used with barbaric emphasis

3 **Sv. František** 1679–88
J. B. Mathey
French architect, crisp detail

4 **Lobkowicz palace** 1703–7
G. B. Alliprandi (perhaps to plans by D. Martinelli)
Appearance of Borromini detail, Fischer von Erlach planning; top storey added 1769

5 **Sv. Mikuláš : nave** before 1703–13
Christopher Dientzenhofer
chancel dome 1737–52
Kilian Ignác Dientzenhofer
First Prague church to show Guarini's influence; some believe nave perhaps by Giovanni Santini

6 **Sv. Marketa, Břevnov** 1708–15
Christopher Dientzenhofer
Grandest and least altered of his churches

7 **Clam-Gallas Palace** 1713–19
J. B. Fischer von Erlach
Arrival of the Viennese palace, staircase and all

8 **Sv. Jan 'na Skalce'** c.1730–c.1740
Kilian Ignác Dientzenhofer
Typical use of concave octagon and drumless dome

9 **Sv. Mikuláš (Staré Město)** 1732–7
Kilian Ignác Dientzenhofer
His other favourite large church plan

10 **Sylva-Tarouca Palace** 1743–51
Kilian Ignác Dientzenhofer
His one palace of Viennese pretentions

11 **Tylovo divadlo (Tyl Theatre)** 1783
Anton Haffenecker
Halfway to neoclassicism

12 **Celnice (Customs House)** 1808–11
Georg Fischer (plans probably by J. F. Jöndl)
Outpost of neoclassical Berlin

13 **Platejz** 1817–25
J. Hausknecht
First large apartment block

14 **Karlín : town plan** 1817
First city extension since 1347; a few houses remain of c. 1820

Lesser buildings that escape the guidebook

15 **Troja** 1679–95
J. B. Mathey (from 1685)
Looser planning, dramatic sculpture

16 **St Mary of Victory, Bílá hora** 1704–29
Typical Bohemian pilgrimage church in a cloister, marking Hapsburg victory of 1620

17 **Sv. Trojice** 1713
(Possibly Oktavian Broggio)
Baroque use of late mediaeval hall church plan

18 **Villa Portheim, Smíchov** 1725
Kilian Ignác Dientzenhofer
His own modest, carefully detailed house

19 **Invalidovna** 1731–7
Kilian Ignác Dientzenhofer
Part of NE wing of projected 9-courtyard hospital

20 **Sv. Kateřina** 1737–41
K. I. Dientzenhofer and F. M. Kanka
Unusually monumental (access through Ke Karlovu 11)

21 **Sv. Kříž, Stodůlky** 1743–54
Kilian Ignác Dientzenhofer
His skill compressed in a tiny chapel

22 **Pacht Palace, Náprstkova 3** c.1760
Josef Jäger
Pretty informal courtyard and staircase

23 **MacNeven O'Kelly Palace** 1780
Ignác Palliardi
Latest rococo

24 **Rohan palace : interiors** 1807
L. Montoyer
façade 1838
V. Kulhánek
'Empire' fuss inside, severity to the street

25 **Letohrádek (pavilion) Královska Obora** 1809–20
Georg Fischer and J. F. Jöndl
Early neogothic

1850–1914 Centre of the Czech Revival

26 **Sv. Cyril a Metod, Karlín** 1854–63
Ignác Ullmann
Best of the gothic revival churches

27 **Academy of Sciences, ex Savings Bank (Česká spořitelna)** 1858–61
Ignác Ullmann
As in London, Italian Renaissance seemed to some more appropriate for secular buildings

28 **Schools (Vyšší Dívčí Škola)** 1866–7
Ignác Ullmann
First big scale revival of 'sgraffito' decoration

29 **Maternity hospital (Zemská porodnice)** 1867–75
Josef Hlávka
One of the few gothic secular buildings

30 **National Theatre** 1868–81
Josef Zítek
Proudest monument of the Renaissance revival; look at the east side's open gallery

31 **Gröbe Villa** 1870–2
Antonín Barvitius
Italianate villa on splendid terraced site

32 **Dům Umělců (ex Rudolfinum)** 1876–84
Josef Zítek
Concert hall with confident colossal orders

33 **Sv. Václav, Smíchov** 1881–5
Antonín Barvitius
Bastard ecclesiastical Renaissance, and they knocked down a wing of Dientzenhofer's house for it

34 **Smetana Museum (ex waterworks)** 1883
Antonín Wiehl
More sgraffito, adapted to pretty site

35 **National Museum** 1885–90
Josef Schulz
You can't miss it; and only half the space is actually used

36 **Valter palace** 1891
Bedřich Ohmann
Exceptionally pretty rococo revival town house

37 **Exhibition buildings ('Sjezdový palác)** 1891
Friedrich Münzberger
Large scale use of cast iron

38 **'Wiehl House', Václavské náměstí 40** 1894–6
Antonín Wiehl
Painted decoration by Ales and others

39 **Store (ex Peterkův dům), Václavské náměstí 12** 1899
Jan Kotěra
His first major work and a 'Sezession' showpiece

40 **Church, Stěchovice** 1900
Kamil Hilbert
The one important 'Sezession' church in the area, 17 miles south up the river

41 **Main Station (ex Františkovo nádraží)** 1900–11
Josef Fanta
'Sezession' in intention, brutal in effect

42 **Sucharda House, Slavíčkova 6/8** 1904
Jan Kotěra
Picturesque part timber house for a sculptor; studio (to west) rebuilt as second house

43 **Obecní dům** 1906–11
Antonín Balšánek and Osvald Polívka
Death throes of the Sezession

44 **Kotěra House** 1908–9
Jan Kotěra
Almost as severe as Loos; now very shabby

45 **Offices (ex Urbánek) and concert hall (Mozarteum), Jungmannova 30** 1909–13
Jan Kotěra
Elegant and original use of brick surfaces

46 **Hlávka Bridge (north part)** 1909–12
Pavel Janák
Massive concrete and robust sculpture

47 **Printing works (ex Štenc), Salvátorská 8** 1909–11
Otakar Novotný
Another brick front of Dutch elegance

48 **'U Černé mátky Boží' building** 1911–12
Josef Gočár
First appearance of Gocár and his 'cubist' architecture inspired by pictures from Paris

49 **House, Podolí** 1912–13
Josef Chochol

50 **Flats, Podolí** 1913
Josef Chochol
The most emphatic 'Cubist' demonstration in Prague

Since 1918 Capital of Czechoslovakia

51 **Pharmacological Institute, Hlavův ústav** 1920–1
Alois Špalek
Maximum light for medical research

52 **'Legiobanka' offices (now a ministry), Na poříčí 24** 1921–3
Josef Gočár
A sort of expressionist architecture

53 **Government offices, Emauzy** 1924–9
Bohumil Hypšman (Hübschmann)
The most ambitious official project of the time, not unworthy of Mussolini

54 **Remodelling of Hrad courtyard** 1925–8
Josip Plečnik
Ingenious adaptation by the Ljubljana architect

55 **Former Veletržní palác** 1925–8
Oldřich Tyl, Josef Fuchs
Huge rather formless block with lots of window

56 **Former Stýblo building, Václavské náměstí 28** 1926–8
Ludvík Kysela
Glass taking over more of the façade

57 **Astra building, formerly Lindt, Václavské náměstí 4** 1926–8
Ludvík Kysela

58 **Restaurant and terraces, Barrandov** 1927
Max Urban
Curvilinear concrete

59 **Elektropodnik Offices** 1927
Adolf Benš, Josef Kříž
Best of the big glassy offices; Wright-type galleried hall

60 **Faculty of Law, Prague University** 1928–9
Jan Kotěra
Planned in 1914, built long after his death

61 **Church of the Sacred Heart** 1928–32
Josip Plečnik
Simple plan, ample space, excellent materials and detail

62 **'Dům obuvi', formerly Bat'a building** 1928–30
Ludvík Kysela
Victory of the glass screen

63 **Baba** 1928–33
Pavel Janák (plan), Josef Gočar, Oldřich Starý, etc. (houses)
Rambling group of good villas

64 **City Waterworks** 1929–31
Antonín Engel
What public authorities wanted

65 **Sv. Václav, Vršovice** 1929–30
Josef Gočár
Ugly stepped box designed for internal lighting effect

66 **Müller house** 1929–30
Adolf Loos
Severe as ever, ingenious half-storey planning

67 **'Mánes' Exhibition building** 1930
Otakar Novotný
Neat two-storey adjunct to ancient tower

68 **Špála house, Černokostelecká 127a** 1930
Otakar Novotný
Very sharply detailed small brick villa

69 **Housing, 'U zelené lišky'** 1930–2
František Libra, Jiří Kan
Antonín Černý
Bohumír and Ladislav Kozák
Five-storey blocks

70 **Trades Union Council, former Pensions Institute** 1930–3
Josef Havlíček, Karel Honzík
Grand tiled cross-plan offices, Prague's modern monument

71 **Schools (formerly French)** 1930–3
Jan Gillar
Relaxed group of three separate blocks, could have been planned yesterday

72 **Swimming pool, Barrandov** 1930
Václav Kolátor
Concrete wrapped round the rocky site

73 **Villas, Barrandov** 1930–3
Max Urban, Vladimír Grégr, etc.
Not the overall quality of 'Baba', but some good ones

74 **Film studios, Barrandov** 1931–3
Max Urban
Too imposing for comfort

75 **Airport, Ruzyně** 1931
Adolf Benš
Modest glass and tile buildings threatened with replacement

▶ over

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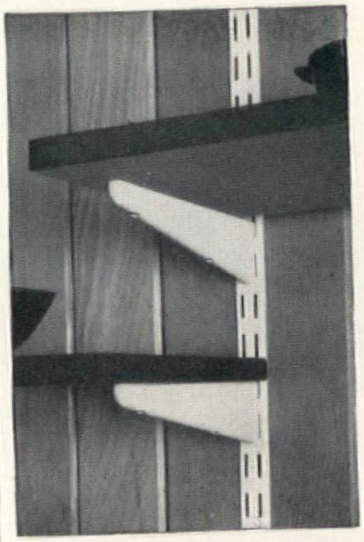

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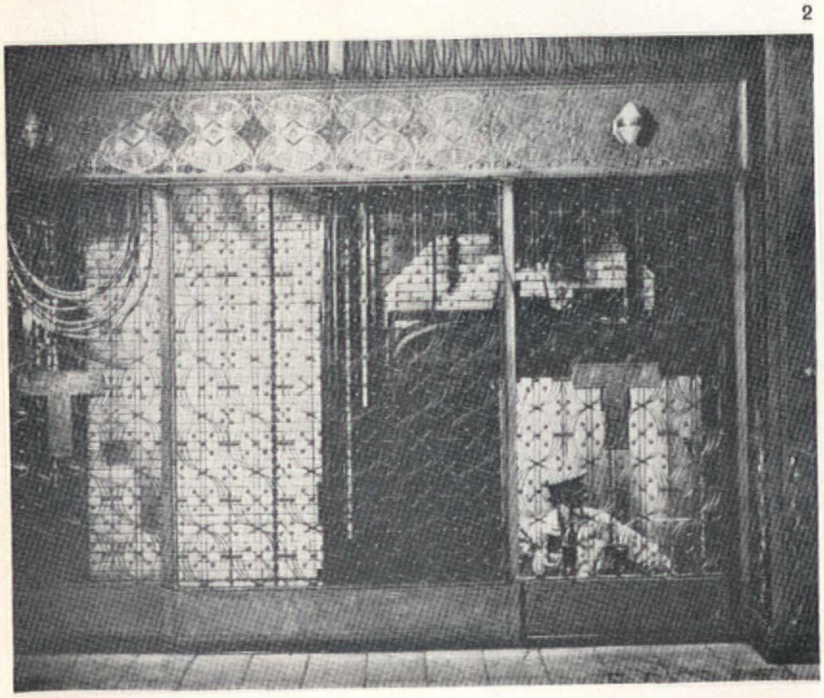
SSoC

Product analysis 13
Lifts, escalators, pedestrian conveyors

Alexander Pike

1
2



The techniques of incorporation and integration of services in buildings have received little attention and investigation by architects and it is often difficult to assess whether technical advances are the cause or the effect of the development of innovations in architecture. The long view of history may facilitate these assessments, but until this can be achieved the broad picture of the impact on architecture of the technology of services remains blurred.

In the case of passenger conveyors, the origins of the modern passenger lift can be traced to 1853 when Elisha Otis invented the first lift with a built-in safety mechanism, a device which he demonstrated at the Crystal Palace, and which immediately removed the fear of the effects of failure impeding the use of hydraulic hoists for carrying passengers. Four years later, Otis delivered the first passenger elevator to a department store in New York, an event for which later developments have led to his nomination as the man responsible for the development of high buildings. However, the early hydraulic lifts possessed severe height limitations, and although it may be argued that the availability of the greatly improved electric lift at the turn of the century led to the development of the skyscraper, it is equally possible that increasing land values led to a demand for higher buildings which encouraged lift makers to improve the speed and control systems of their products.

For whatever reason, designers of lifts for tall buildings became preoccupied with the necessity for faster movement and larger car capacity, until it became obvious that beyond a certain speed other factors were more critical. At this point the other components of duration of journey, the acceleration and deceleration times, speed of opening and closing of doors, entry width, etc., assume greater importance as determinants, and control mechanisms become complex.

Apart from the use of escalators where heavy volumes of pedestrian traffic justified their expense, the electric lift was employed with little modification to the basic principle until the fairly recent introduction of the paternoster.

Standard passenger lifts

The four basic forms of passenger lift are:

Gearless variable voltage controlled electric.

Geared and variable voltage controlled electric.

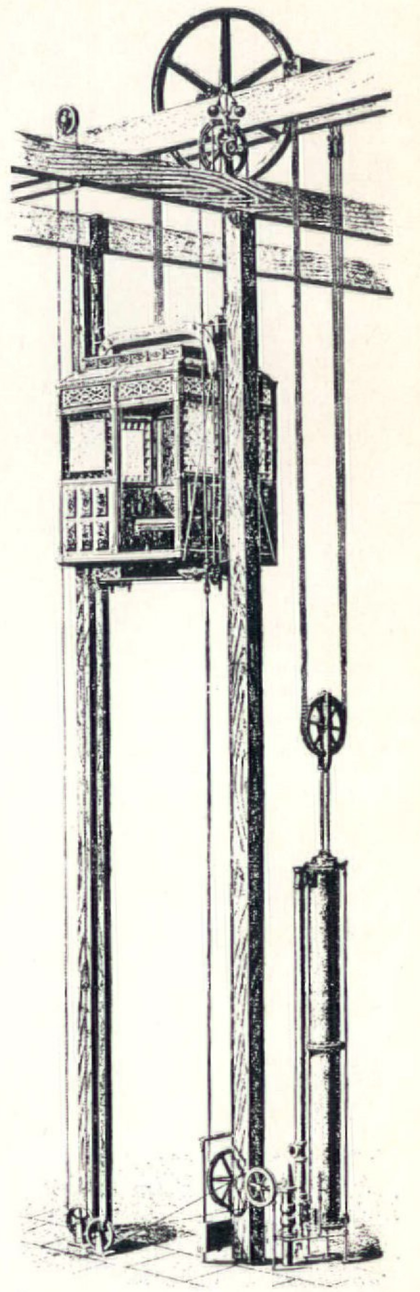
Geared and rheostat controlled electric.

Electro-hydraulic.

Each of these have varying characteristics, and their suitability for differing applications will immediately eliminate one or more from consideration for any given project. Normally, however, at least two alternatives will deserve further investigation.

Geared lifts employ a fixed ratio worm reduction gear between motor and grooved pulley. This method is satisfactory for lift speeds up to 350 feet per minute. The variable voltage type has better levelling characteristics and smoother starting and deceleration, which may justify its higher price over rheostat controlled lifts.

In gearless lifts the pulley is driven directly by the motor, but without the gear reduction ratio it is necessary to use a more expensive motor which can be run at much slower speeds. This system is always used for very fast lifts, and in some very high buildings speeds of 1400 f.p.m. have been attained, although 500 f.p.m. is considered suitable for buildings up to 16 storeys. 295▷



3

1
To display his confidence in his own safety device Elisha Otis at the Crystal Palace in 1853, cut the rope from which his lift was suspended, thus allaying the fears associated with passenger-carrying lifts

2
Ornamented grille to the lifts in the Chicago Stock Exchange designed by Louis Sullivan

The early, slow moving lifts were normally encased in a cage which was frequently used as a device for ornamentation, and at the same time gave passengers the sensation of movement through the building. The present use of high-speed lifts prohibits this and designers totally enclose the lift car and shaft, a feature which often gives rise to complaints of claustrophobia from passengers. There are many cases of lifts in medium-height buildings where the high speeds cannot be used to full advantage, and where cars and shafts with less visual obstruction could enhance the experience of travelling in the lift

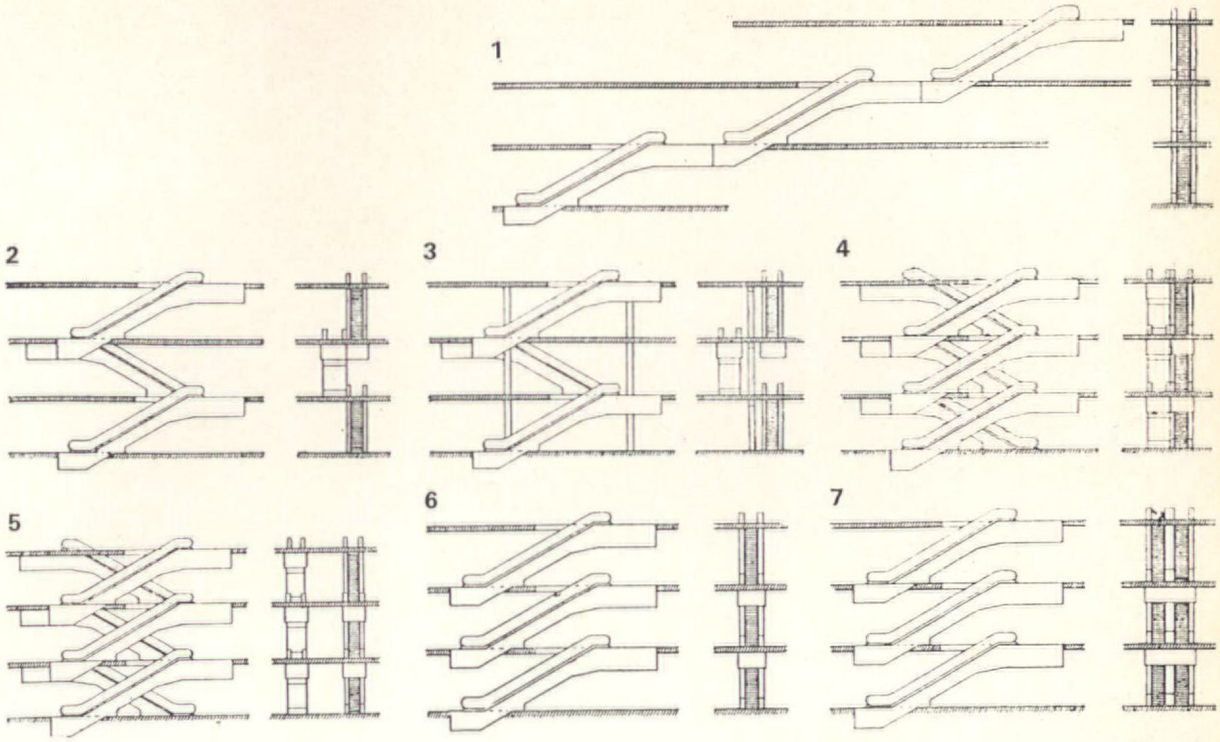
3
The early form of hydraulic lift, in which water was withdrawn above a piston to make the lift ascend, the water being released for descent. This type of lift was smooth and quiet in operation

Photos: 1, 2 & 3 *Arkitektur* 12, 1966

In the Bradbury Building (1893), Los Angeles, by George Wyman, the lifts make a positive contribution to the architecture

Arcadia Northrop Architectural Systems

Above
The *Speed Ramp* erected at the Merrion Centre in Leeds, manufactured by Richard Sutcliffe Limited. The system shows obvious advantages over escalators
Right
Some alternative forms of arrangement of escalators, 1, 2, 3 and 6 are all one-way operation and are designed for reversal of flow. The remainder are suitable for continuous two-way operation
J. & E. Hall Ltd.



◁293
Electro-hydraulic lifts are suitable for lengths of travel less than 60ft, although successful results with travels up to 80ft have been reported from abroad. Developments in the design of aircraft landing gear and missile landing mechanisms have given this section of the industry the opportunity of producing a wide range of components of advanced design for the reliable control of oil hydraulic circuits.
Although it is possible to design electro-hydraulic lifts to run at 125 f.p.m., and American examples have run at 200 f.p.m., speeds of 30 to 60 f.p.m. are more normal.
Therefore, for lift travels of less than 60ft any of the three latter alternatives can be chosen. Up to this distance the variable voltage controlled lift offers potentially higher speeds than the rheostat type, but these can seldom be exploited adequately.
In this range the electro-hydraulic lift can be considered for reasons of smoothness of operation, reduced capital and running costs, and levelling accuracy. One manufacturer specifies a standard levelling accuracy of $\pm\frac{1}{4}$in, and it is claimed that better accuracies are experienced in day-to-day working.
For travel distances between 60 and 150ft the variable voltage lift provides improved performance at greater cost than the rheostat type, and choice will depend on economic considerations. For distances greater than 150ft the speeds necessary will usually demand the provision of gearless lifts.

Control mechanisms

The simple operation of pressing a call button (or, in modern installations, placing a finger near a proximity switch) belies the complexity of the control mechanism of a modern automatic lift. A typical sequence is for the lift to start from ground level in response to calls from upper floors and from passengers in the car. On the upward journey it will stop in accordance with the demands of these calls, answering the highest down call before reversing. On the downward journey it will stop to pick up passengers who have made calls from lower floors and to allow car passengers to alight. When the car is full it will continue on its journey without stopping for other calls but will return for them on completion of the cycle.
During this cycle each of the calls made are registered in the control mechanism, recorded and dealt with in a logical sequence. In very high buildings groups of cars must be brought under one control, complicating this sequence by interlinking to such an extent that quite large electronic circuits are required. Added complexity arises from variations in demand throughout the day and the programming device must alter for the morning up peak, normal up and down travel, evening down peak, and night service.

Paternosters

Some continuous lift or paternoster installations have now been in service for over 20 years and have proved to be very satisfactory. The demands made on normal lifts to increase speeds, with consequent elaboration of control, have led to a multiplicity of parts, especially electrical contacts, with greater probability of failure unless expensive precautionary devices are incorporated. It is claimed that the paternoster has such a simplified electrical and mechanical control system that these disadvantages are overcome. Experience has indicated that once passengers have become accustomed to the principle, demands are made for increased speeds, and it is now considered practical to increase the speed from 60 f.p.m. to 80 f.p.m.
The continuous operation of this type of lift provides a very high capacity (a maximum of 540 or 700 persons per hour, according to the speed) constant readiness for use, short waiting periods, simultaneous movement in each direction, low maintenance and running costs and freedom from breakdown.

Pedestrian conveyors

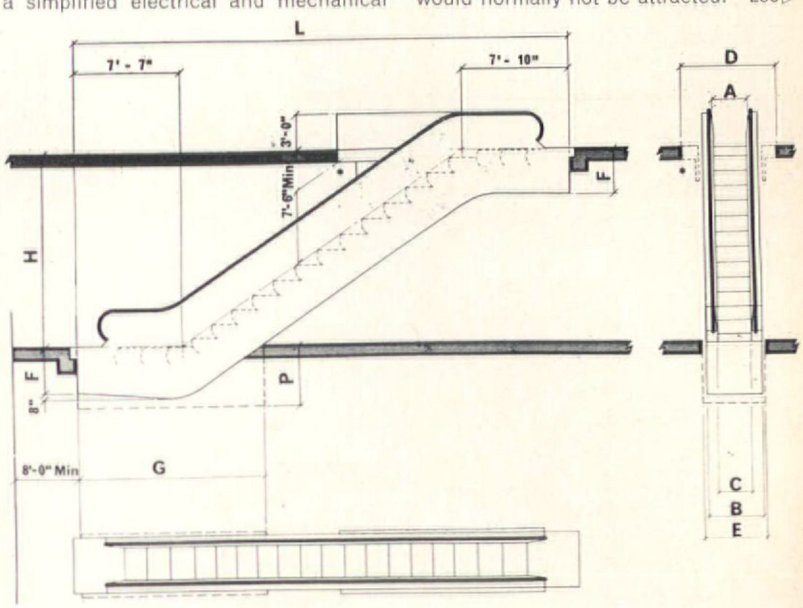
The scope of mechanical aids to movement, hitherto confined to vertical circulation, has been expanded by the recent introduction of horizontal and inclined passenger conveyors. These can be employed for transporting heavy rates of pedestrian traffic and the inclined versions are particularly suitable for use in situations where it is necessary to carry pedestrians to higher or lower levels to which they would normally not be attracted. 296▷

ESCALATOR DIMENSIONS

CAPACITY PERSONS PER HOUR	TYPE	A	B	C	D	E	F	G	P
6000	3/35	32"	4' - 0"	24"	7' - 0"	4' - 2"	3' - 6"	13' - 10"	4' - 9"
7000	4/35	40"	4' - 8"	32"	7' - 8"	4' - 10"	3' - 6"	13' - 10"	4' - 9"
8000	5/35	48"	5' - 4"	40"	8' - 4"	5' - 6"	3' - 6"	13' - 10"	4' - 9"

SITE DIMENSIONS

TRAVEL HEIGHT	H	9' - 0"	10' - 0"	11' - 0"	12' - 0"	13' - 0"	14' - 0"	15' - 0"	16' - 0"	17' - 0"	18' - 0"	19' - 0"	20' - 0"
LENGTH	L	28' - 4"	29' - 9"	31' - 2"	32' - 7"	34' - 0"	35' - 5"	36' - 10"	38' - 4"	39' - 9"	41' - 2"	42' - 7"	44' - 0"



Above and right
Escalators, although occupying more space than lifts, can deal with higher capacities of passenger traffic. An escalator 4ft wide can carry approximately 8000 people per hour. Although dimensions vary from one manufacturer to another the differences are slight. Here, dimensions for a 35° reversible escalator are fairly typical
Marryat and Scott Limited

◁295

Due to their shallow incline these types of conveyor occupy more space than escalators, but offer certain advantages which favour their use in many situations. The flat bed of a low-pitch incline does not deter the elderly and infirm, and invalid chairs, prams and shopping trolleys can be accommodated without inconvenience.

The first installation of this type in Britain was erected at the Merrion Centre in Leeds in 1964, carrying people into the main shopping precinct. Manufactured by Richard Sutcliffe Limited under licence from the Stephens-Adamson Manufacturing Company of Aurora, Illinois, USA, this version is 66ft long, rises approximately 9ft and has a 42in wide belt capable of carrying a maximum of 7200 passengers per hour. It is of the 'slider bed' type which employs panels of resin bonded plywood under-surfaced with galvanized steel sheet and top surfaced with highly polished stainless steel. This minimizes friction against the passenger carrying belt which consists of a synthetic fibre carcass backed with silver hard cotton duck and faced with a layer of Grade A rubber, deeply grooved in the direction of movement to offer grip to footwear and make contact with the safety combs.

An alternative method of support, more suitable for longer installations, is the 'roller bed', whereby the belt is carried on continuous close pitched rollers, the length of which corresponds to the belt width.

The Glideway passenger conveyor manufactured by J. & E. Hall operates on a different principle and claims to eliminate the discomfort caused by the hard rollers on the roller bed type and high horsepower motor necessary to overcome friction on the sliding bed type. The J. &. E. Hall system employs a treadway rigid across its width, supported by carrying rollers at the extreme edges only, so that the centre passenger carrying area is free from hard and uncomfortable supports. Where long installations are necessary, the treadway can be in separate units with sections held in reserve for immediate replacement.

Lift design

Architects are frequently faced with the problem of estimating the amount of space likely to be required by lifts at a stage in the design when the plan form and height of the building have not been determined. They complain that although a knowledge of the basic principles for calculation could be of use in arriving at an economic building solution at this point, lift makers prefer not to divulge methods of calculation, on the plea that no basic formula can be given which will provide a common answer. Unfortunately, the basic formulae† for these calculations are complex, and most manufacturers introduce modifications to give an empirical basis for calculation. These produce varying results from different manufacturers, who are acutely aware of the embarrassing situation created, and anticipate that architects may look forward to more assistance on this subject in the future if work proceeds as planned with the revision to the British Standard.

In the meantime, architects must seek design solutions from as many makers as possible, asking for the basis of calculation and assessing the results by comparison. Over a long period adoption of this procedure will obviously involve the maker in a considerably waste of time and unprofitable contacts, and it is in the interests of both architect and manufacturer that a system for rapid preliminary analysis of requirements is evolved.

Most manufacturers will say that before commencing a study of lift requirements certain data are necessary:

The number of floors to be served.

The distance of travel between highest and lowest landing.

The area of each floor.

The number of occupants of each floor.

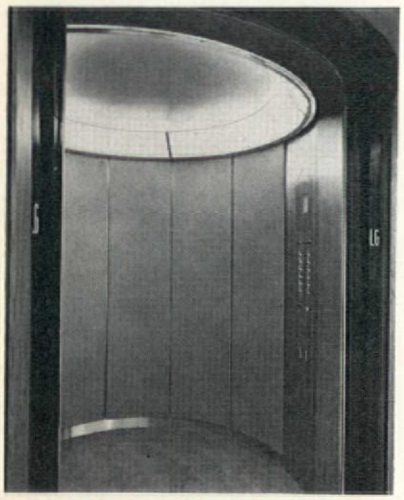
The position of communal facilities such as canteens.

The nature of any goods, trolleys, etc., to be accommodated.

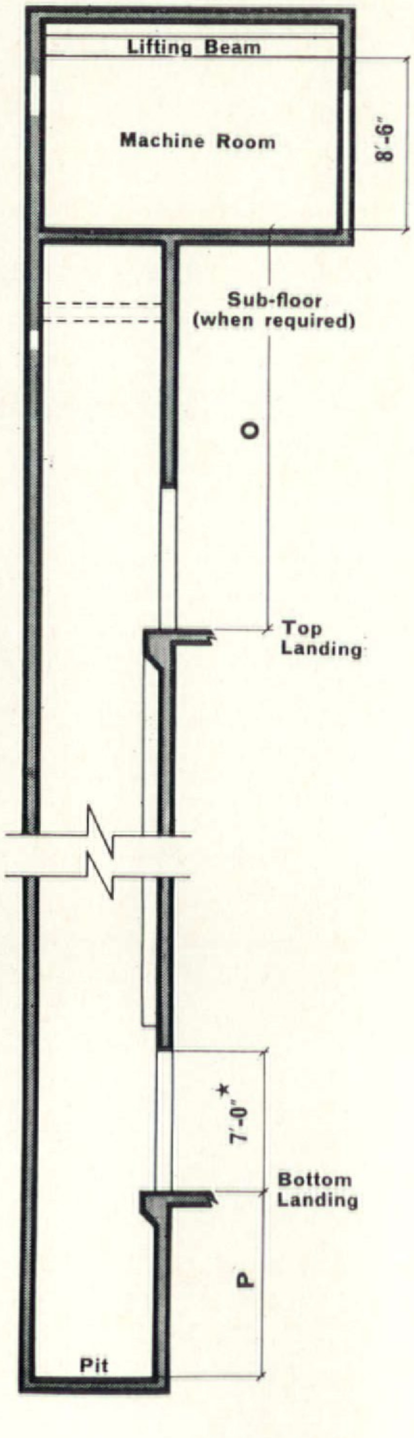
The building type, e.g. shop, office, hospital, school, warehouse, factory, etc.

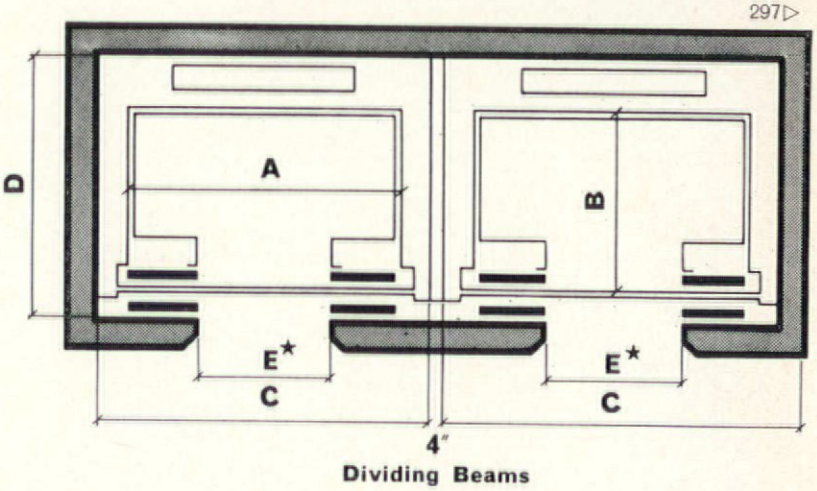
Unless there are any peculiar or exceptional determinants a rough basis for calculation of 250 persons per lift will often be found to give good results.

297▷



Circular, freestanding lifts in the Board of Trade Building, Victoria Street, London, by Otis Elevators Ltd., designed for high capacity and a particularly advantageous ratio of door opening width to the overall width of the lift





For Office Buildings, Hotels, etc.

Persons Per Car	Load Lb	Speed fpm	Platform Width A	Platform Depth B	Lift Well Width C	Lift Well Depth D	Entrance ★E	Pit P	Head-Room O	Approx. Machine Room Floor Area Sq. Ft.
10	1500	500	6'-0"	4'-0"	7'-4"	5'-10"	3'-0"	9'-3"	20'-0"	320
13	2000	500	6'-4"	4'-8"	7'-8"	6'-6"	3'-0"	9'-3"	20'-0"	360
16	2500	500 700	7'-0"	5'-0"	8'-4"	6'-10"	3'-6"	9'-3" 10'-9"	20'-0" 24'-0"	400
20	3000	500 700	7'-0"	5'-6"	8'-4"	7'-4"	3'-6"	9'-3" 10'-9"	21'-6" 24'-0"	440
23	3500	500 700	7'-0"	6'-2"	8'-4"	8'-0"	3'-6"	9'-3" 10'-9"	21'-6" 24'-0"	470

For Department Stores, Concert Halls, etc.

23	3500	500	8'-0"	5'-6"	9'-4"	7'-6"	5'-0"	9'-3"	21'-6"	470
26	4000	500	8'-0"	6'-0"	9'-5"	8'-0"	5'-0"	9'-3"	21'-6"	480

★ Dimensions give clear lift entrances.

right
Standards for lift shaft dimenstions are laid down in BS 2655, Part 3, 1965. Figures given here relate to Table 5 which gives outline dimensions for intensive traffic passenger lifts
Marryat and Scott Limited

† Commonly used formulae for traffic analysis are quoted in *Electric Lifts* by R. S. Phillips, M.I.E.E., published by Sir Isaac Pitman and Sons.

◁294

Problems of lift manufacture

Lift manufacturers consider that lift making consists of four distinct sections:
Assessment of the requirements of the building, and detailed design.
Manufacture of the equipment.
Installation.
Servicing and maintenance.

To the basic performance specification must be added the type of service required, the waiting interval. The waiting interval is calculated normally through the round trip time divided by the number of cars in the group.

The round trip time is defined as the estimated total of the running time, door opening and closing time and passenger entering and leaving time, allowing for accelerating and slowing for an average number of stops in one complete trip. Of these factors, two can only be approximated:

The average number of stops in a round trip is calculated as a mathematical probability from the knowledge of the building population.

From a study of how long the average passenger takes to enter and leave a lift car.

The other factors are those over which the manufacturer has control and in which the cycle can be speeded up by design methods.

In spite of wide differences in appearance of the product the economics of the lift industry are dependent on a high degree of standardization, and makers strongly recommend that the layout of lift shafts should conform to the dimensions and recommendations of BS 2655, Part 3. Part 1 of the same standard deals with design specifications and it is generally felt that many problems associated with the tendering would be solved by adherence to the standards.

Manufacture

In order that pre-planning may be carried out the manufacturer requires certain basic information at a fairly early stage:

Complete sets of $\frac{1}{8}$in scale drawings.
The anticipated building completion date.
Details of the finishes and materials to be used for car doors, architraves, push and indicator plates.

The architect normally prefers to defer decisions on the finishes until he is in a position to decide the overall finishes within the building so that detailing is consistent, but this can often mean that the manufacturer is late with delivery of certain of these items due to the length of time necessary for their manufacture.

Installation

Cost of lift installation is approximately 20 per cent of the total cost and represents the labour involved in the erection of equipment on site. Manufacturers find that there is a lack of understanding about the damage which can be caused by operations of other trades such as plastering, tiling, floor laying, etc. This is particularly important when one considers the high cost of the equipment involved.

Servicing

Customer satisfaction with any lift installation is dependent on the efficient operation of the equipment with 'out of service time' being kept to a minimum. Assuming that the quality of the original design and standard of manufacture of equipment is high, the best way to achieve satisfactory servicing is to have routine inspections carried out by qualified maintenance engineers. This servicing is aimed at the prevention of irregular running and stoppages, and is normally not sufficient to deal with problems as and when they arrive. Normally this work should be carried out by the original maker as he has the technical knowledge to overcome the problems involved and is also in a better position to anticipate difficulties and take early action to prevent breakdown.

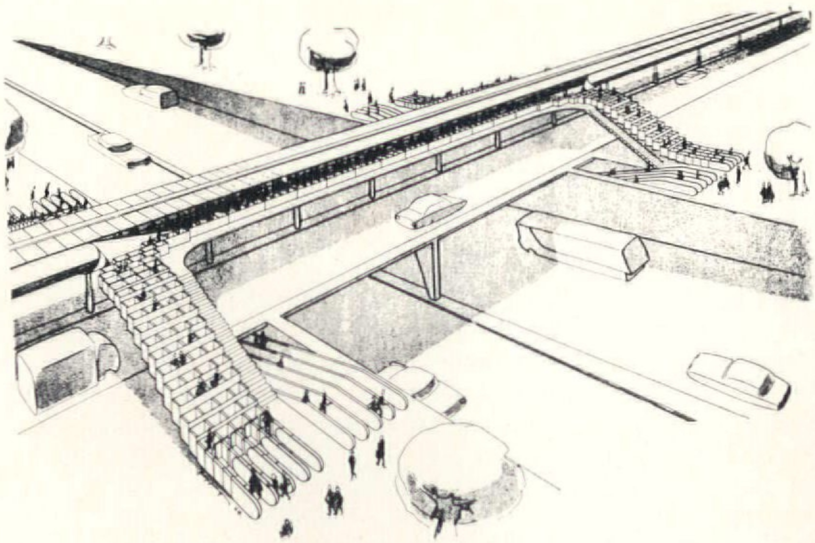
The National Association of Lift Makers summarizes the problems of lift making and proposes the following points to alleviate these problems:
No standard formula can be quoted when considering lift requirements as no two lift makers are alike.
Performance specifications should be superimposed on British Standards.
To promote standardization and thereby reduce costs, British Standard layouts should be adhered to.
Consideration should be given in large buildings for lifts exclusively for the handling of goods.
Contract conditions should be standardized.
Reasonable time should be allowed to submit tenders.
To improve overall efficiency more pre-planning is necessary.
Detailed design requirements in any contract, including finishes and colours are necessary at an early stage.
Greater cooperation is required between the interested parties.
The importance of reducing preventative maintenance to ensure maximum lift efficiency should be understood.
An effort is required to educate the public in the use of lifts to reduce 'out of service' time.
The necessity of improving contract conditions.
Consideration of the position of the fixed price contract under existing circumstances is urgently required.

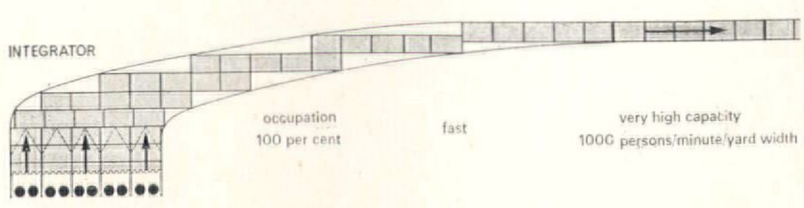
Future development

The replacement of relays by static switching has led to a reduction in machine room space and greater reliability. Research is being conducted into methods of converting AC to DC by electronic methods, and there is the possibility that the development of the linear induction motor may one day eliminate the need for rope suspension.

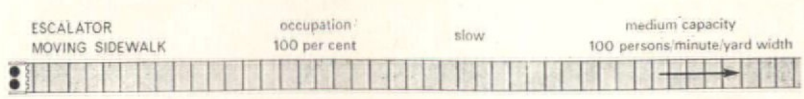
Right

The Battelle Continuous Integrated A new invention by the Institut Battelle in Geneva may prove to be a contribution to the solution of the problem of fast pedestrian movement in cities. It uses what is termed an integrator, consisting of a series of parallel escalators with a capacity as high as 600 passengers per minute. These are divided into a series of compartments which, as soon as they reach the appropriate level, begin to move sideways at an increasing speed, whilst still retaining forward motion. As soon as the sideways speed reaches approximately 20 miles per hour the forward motion is stopped. At this point passengers will be travelling parallel to, and at the same speed as, a continuous moving belt onto which they may step quite safely. The procedure is reversed at the alighting point. It is claimed that the Battelle system can handle extremely high capacities and occupies very little space in comparison with an underground railway, for example.





Right: the principle is shown here applied to an elevated transporter, but is equally suitable for underground systems



Right: comparison with standard pedestrian conveyors or escalators

Some lift manufacturers

**Barron & Sheppard Ltd.*, 315 Kennington Road, London, SE11.
**Becker Equipment and Lifts Ltd.*, Turnlift Works, Alperton, Wembley, Middx.
Bennie Lifts Ltd., Queen's Walk, Peterborough, Northants.
Electro-Lifts Ltd., Bell's Ironworks, Joseph Street, Bradford 3.
Ellis & McDougall (Lifts) Ltd., 185–7 Broomloan Road, Glasgow, SW1.
**Elliston, Evans & Jackson (London) Ltd.*, 24 Ray Street, London, EC1.
Evans Lifts Ltd., Prospect Works, Abbey Lane, Leicester.
Express Lift Co. Ltd., 9 Greycoat Street, Westminster, London, SW1.
E. A. Foulds Ltd., Albert Works, Colne, Lancs.
W. J. Furse & Co. Ltd., Traffic Street, Nottingham.
G.H.P. Lifts Ltd., 80 Grosvenor Road, London, SW1.
**Gimson and Co. (Leicester) Ltd.*, Vulcan Road, Leicester.
**J. & E. Hall Ltd.*, Dartford, Kent.
**Hammond & Champness Ltd.*, Gnome House, Blackhorse Lane, London, E17.
The Hoisting Appliance Co. Ltd., 35–43 Hornsey Road, London, N7.
Industrial Machine and Equipment Co. (Brimpex) Ltd., Yorktown Industrial Estate, Camberley, Surrey.
G. K. Jensen & Co. Ltd., Cardinal House, 39–40 Albermarle Street, London, W1.
George Johnson Ltd., 227 St John's Hill, London, SW11.
**Keighley Lifts Ltd.*, Dryart Works, Keighley, Yorks.
Kone England Ltd., Wellington House, Messeter Place, London, SE9.
Henry Lowe (Lifts) Ltd., Falcon Works, Royton, Lancs.
**Marryat & Scott Ltd.*, Wellington Road South, Hounslow, Middx.
Marshall Conveyors Ltd., Derby Road, Stapleford, Nottingham.
McGhee & Murray Ltd., 57 Green Coat Place, London, SW1.
Oakland Elevators Ltd., Mandervell Road, Oadby, Leicester.
Otis Elevators Ltd., St Clare House, 30–33 Minories, London, EC3.
Penrose Lifts Ltd., 106 Weston Street, London, SE1.
Pickerings Ltd., Globe Elevator Works, Stockton-on-Tees.
**Platt-Schindler Lifts Ltd.*, 6–9 Upper St. Martin's Lane, London, WC2.
Porn & Dunwoody (Lifts) Ltd., Union Works, Bear Gardens, London, SE1.
James Ritchie & Son Ltd., Aberdeen Works, 34 Surrey Lane, London, SW11.
S. & L. Shields Ltd., 354 Hillingdon Street, London, SE5.
Shorts Lifts Ltd., Reliance Works, Saltaire Road, Shipley, Yorks.
Southern Lifts Ltd., 108 South Street, Eastbourne, Sussex.
**Richard Sutcliffe Engineering Systems Ltd.*, Horbury, Yorks.
A. G. Stevens Ltd., South Potteries, White Hart Lane, London, N17.
A. & P. Steven Ltd., 181 St James's Road, Glasgow, C4.
Titan Lift Co. Ltd., 23–27 Pancras Road, London, NW1.
Vaughan Lift Engineering Ltd., 47–51 Featherstone Street, London, EC1.
Wm. Wadsworth & Sons, Ltd., High Street, Bolton, Lancs.
W. Walker (Lifts and Cranes) Ltd., 159 New Kent Road, London, SE1.
Whitbread Engineering Ltd., 10–18 Sandgate Street, London, SE15.

*The cooperation of these firms and the National Association of Lift Makers in the preparation of this article is gratefully acknowledged, and in particular the assistance of Mr B. P. Hutton of Marryat & Scott Limited, and Mr M. C. Dunlop of Becker Equipment & Lifts Limited.

On a Fisholow sink, this often overworked word comes shining through

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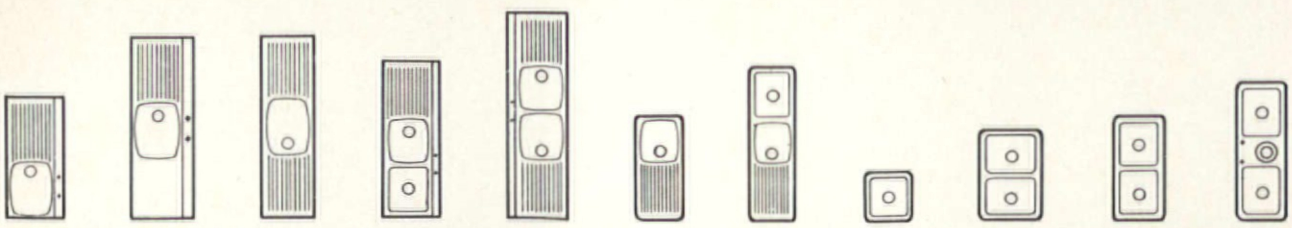

Write for full particulars and price list of the complete range of stainless steel and vitreous enamel sinks made by **FISHER-BENDIX LIMITED**

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Trade notes

Alexander Pike

To obtain additional information about any of the items described below, circle their code numbers (W1, W2 . . . etc.) on the Readers' Service Card inserted in this magazine.

W1 Miniature fluorescent lighting fittings

Victor Products (Wallsend) Ltd, G.P.O. Box 10, Wallsend, Northumberland. Wallsend 628331

Two new fittings use double 12in 8w lamps. The standard fitting is designed so that the complete unit can be removed *in situ* for servicing and incorporates features to prevent theft. The bulkhead fitting is weatherproof, dustproof and protected against corrosion. Both fittings employ polyester-resin filled, low-loss control gear.

W2 Fluorescent lighting fitting 4

C. M. Churchouse Ltd, Linchfield Road, Brownhills, Staffs. Brownhills 3551

The Litex range of fittings employ an extrusion formed from Sigmal, an aluminium alloy with non-corrosive and heat-conductive properties to meet the need for lighting equipment on exposed exterior sites. The diffuser has a smooth flat surface ideal for lettering. Available in a variety of lengths from 12in, 8w (£5 5s *6d*) to 6ft, 85w (£16 0s *0d*).

W3 Fluorescent light fitting

Tulgrace Lighting (Hercrete Ltd.), 64 Hanworth Road, Hounslow, Middlesex. 01-570-9615

The FR8 fitting is a re-entry type diffuser designed to fit into a recess of only $\frac{3}{4}$in. Seven standard module sizes ranging from 2ft × 1ft to 6ft × 2ft, vary in price from £8 17s *3d* to £23 10s *0d*. The diffuser has opal sides and is available in an opal or prismatic base.

W4 Ventilating unit 2

Sound Attenuators, 19 Chiswick High Road, London W4. 01-994 4795

Suitable for domestic and commercial premises in areas of excessive noise, the Dove ventilating unit is designed to bring clean fresh air silently into a room, while at the same time keeping out noise and dirt. It incorporates a centrifugal fan handling 90 c.f.m. and is speed controlled, graduated in five stages down to 10 c.f.m. The silencer has an acoustic performance equivalent to that of a 4$\frac{1}{2}$in brick wall and an electric or hot water heater is available as an extra to temper incoming air. Designed by John Prizeman. Size, 36in × 18in × 5in.

W5 Warm air curtain 3

Mercian Electric Co. Ltd, 66 Stratford Road, Sparkbrook, Birmingham 11.772 4289

Intended for doorways, shops, banks, hotels, public buildings, etc., the unit will give alternative settings of 9, 6, or 3kW or cold air. The self-contained circuit includes a contactor, thermal cutout and control switch. Length 41in, height 15in, width tapering from 9in to 4$\frac{1}{2}$in. Price for both 400/440v, 3-phase or 230/250v, single phase is £80.

W6 Cavity wall ventilator

Argosy Engineering Ltd, Hertford Road, Barking, Essex. RIPpleway 1081

Available in aluminium or galvanized steel, the Argosy cavity wall ventilator is supplied as a complete unit which is simply built into the wall. No air bricks or cavity linings are needed and there are no loose grilles. An insect screen is fitted.

W7 Space heaters

Thermal Efficiency Ltd, Bilton Road, Bletchley, Bucks. Bletchley 4301

Two new models of 300,000 and 500,000 Btu's/hour have been added to the Liscotherm range. Substantial cost savings arise from the new burner design. Both models have louvred adjustable nozzle outlets. Providing 20ft and 90ft throw respectively with vertical and horizontal adjustments. Noise levels on test indicated 65 dBs at 6ft.

W8 Boilers for tall buildings

Allied Ironfounders Ltd, Planet Works, P.O. Box 2, Corporation Road, Audenshaw, Manchester

The Triton range of oil or gas fired boilers is suitable for central heating and indirect water supply and has been designed to cope with the extra pressure of installations in very tall buildings. It claims to provide a steel boiler in the cost range of cast-iron models.

W9 New rubber flooring

The Harefield Rubber Co. Ltd, Bell Works, Harefield, Middx. Harefield 2123

Formulated from man-made polymers and fibres in conjunction with high grade natural rubber, the new flooring is claimed to have improved resistance to heel indentation and scratch marking, increased tile stability, new lie-flat qualities and many other advantages. It has a semi-matt surface avoiding excessive gloss, harsh reflections and offering a non-slip surface. Available in fifteen colour variations.

W10 Coir matting

Wiltshire Carpets Ltd, Highworth, Swindon, Wilts. Highworth 541

Anchor matting is manufactured in France by a process whereby the coir fibres are held firm in a backing of vinyl chloride, which is impermeable to water and unaffected by acids. It can be cut to size with a knife leaving edges which do not fray or unravel. Available in three colours, natural, anthracite, and red/black, in rolls 12yd and 39in or 78in wide. Thickness $\frac{3}{4}$in.

W11 Floor levelling compound

Evode Ltd, 450–452 Edgware Road, London W2. AMB 2425

Evo-Stik floor levelling compound is a blend of cementitious powders which when mixed with water is poured onto the sub-floor. Trowelling to the required thickness (normally $\frac{1}{16}$in) is cut to the minimum and trowel marks quickly flow out. Under normal conditions, the screed dries hard enough for foot traffic in 90 minutes and floor-coverings can be laid after 24 hours. Coverage is 4lb to the sq yd at a cost of 1s *9d*.

W12 Plastic eaves filler strips

Expanded Rubber & Plastics Ltd, Mitcham Road, Croydon, Surrey

Plastazote eaves fillers for use with plastic aluminium asbestos or steel corrugated roofing sheets are expected to replace polystyrene and polyurethane fillers because they are semi-rigid, unbreakable and impervious to moisture. They have sufficient flexibility to provide an effective seal between the contours of the eaves and roofing sheets.

W13 Roofing finish

Camrex Ltd. Camrex House, P.O. Box 34, Sunderland. 70811

Camrex Roofex is manufactured from epoxide resins and is designed to provide economical protection for flat and low pitch roofs. It gives continuous protected coating without joints and is claimed to be competitive in price with built up felt roofing and in performance with the asphalt and pitchmastic roofings. Applied thickness approximately $\frac{1}{8}$in.

W14 Plastic cladding

Allied Structural Plastics Ltd, Dunstable, Beds.

Aspect Shiplap siding is made from white rigid PVC and has an effective cover width of 4in. Available in 16ft lengths, the planks, which interlock firmly, are secured with hidden clips. The weight including fittings is approximately 12oz per foot. Price £1 4s *0d* per 16ft plank.

W15 Pipe flashings 5

D. Anderson & Son Ltd, Stretford, Manchester. Longford 4444

Offering weatherproofing and avoiding the need for purpose-made units and special skill or tools in fixing, Pipeflash collars are manufactured in neoprene, and accommodate circular roof projection from 1$\frac{1}{4}$in to 4$\frac{3}{4}$in diameter. Prices from £1 10s *6d* to £2 4s *0d*.

W16 Aluminium horizontal sliding windows

E. D. Hinchliffe & Sons Ltd., Tipton, Staffs.

Available in any size up to a maximum height of 5ft and an overall width of 9ft, factory glazed, supplied with surrounds of soft wood or cedar. Sliding tracks and glazed sashes are of extruded aluminium, fully weatherstripped.

W17 Panic bolt

G. D. Peters & Co. (Engineering) Ltd., Windsor Works, Slough, Bucks. Slough 23201

Breaking with tradition the new PJ67 Panic Bolt has the rod movement fully concealed within the door stile. Suitable for single exit doors of up to 3ft wide × 7ft height, with stiles as narrow as 1$\frac{3}{4}$in. It can also be used with double or multiple doors of similar stile width.

W18 Background music system

The Minnesota Mining & Manufacturing Company, 3M House, Wigmore Street, London, W1

The Cantata 700 system employs transducers which convert whole surfaces into sound sources, so that there is no localized centre from which music appears to come. The transducer is screwed into a solid surface and connected to an amplifier. In use it then causes the whole surface to vibrate and broadcast music. It is suitable for most solid surfaces such as wood, glass, plastics, metal acoustic tiles, and similar materials. Bricks and concrete are less suitable.

W19 Auditorium seating

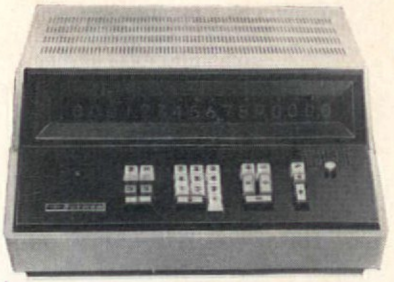
Rank Audio Visual, Woodger Road, Shepherds Bush, London, W12. SHEpherds Bush 2050

A new loose leaf catalogue covers the full range of theatre, cinema, lecture room, church and stadium seating manufactured by the company giving detailed specifications, scale drawings and graphs for calculation of spacing, riser height and desk widths.

W20 Electronic desk calculator 1

Broughton and Co. (Bristol) Ltd, 6 Priory Road, Clifton, Bristol 8

The Busicom 161 gives square roots and fourth roots in split seconds, has a fully automatic decimal point, and enables numbers to be automatically powered to any desired index. Working capacity, automatic constant factor and storage/memory register, each with sixteen digits. Price £398.



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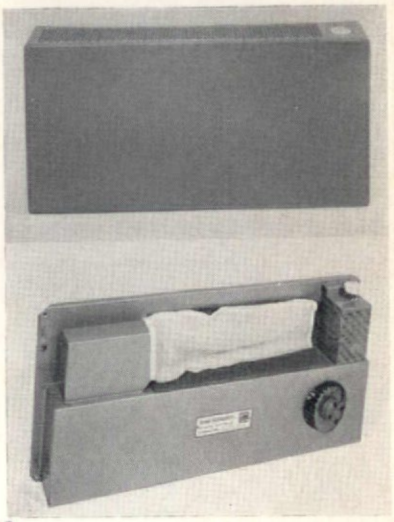

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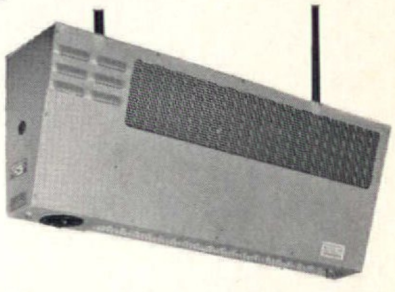

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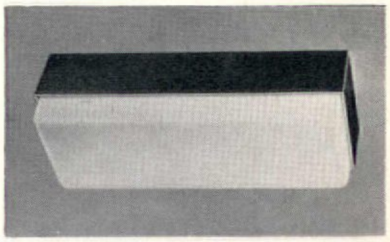

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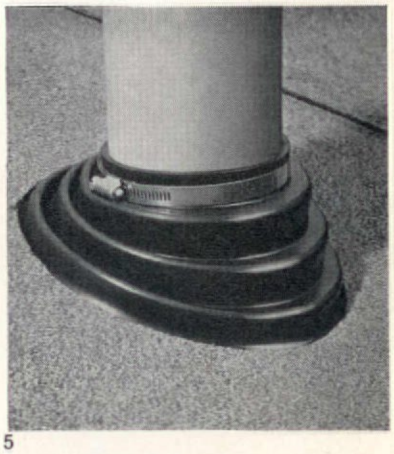

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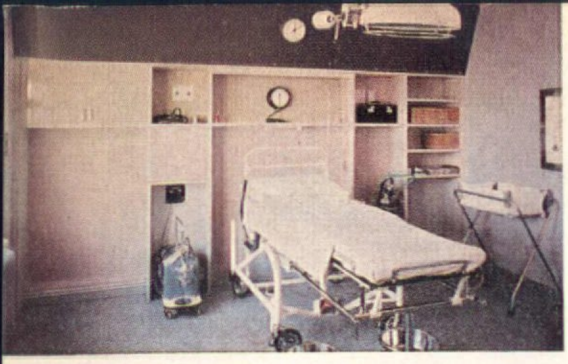
W21 Lettering stencils

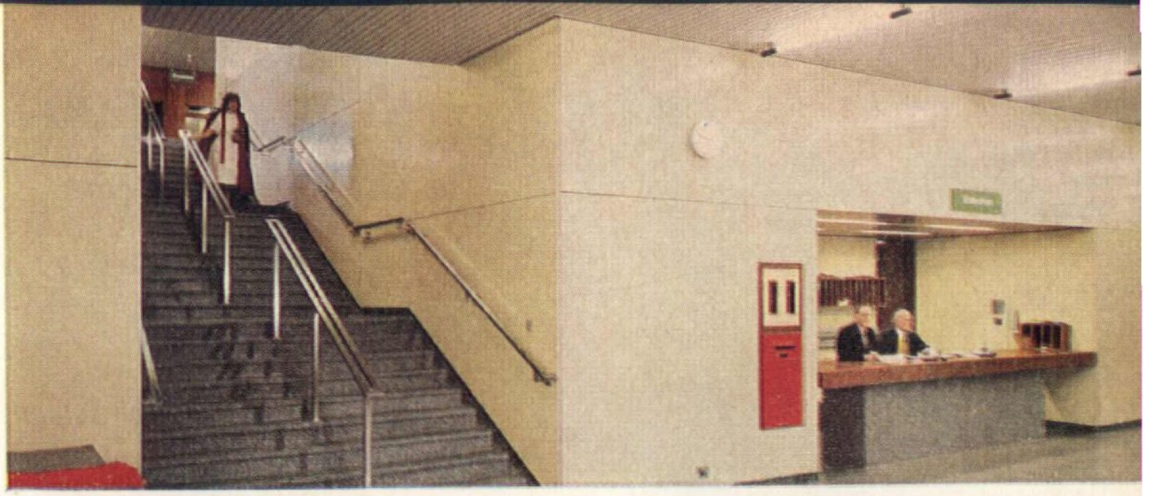
Standardgraph Sales Co. Ltd., 3 Market Square, Bromley, Kent. (01) 464-4222

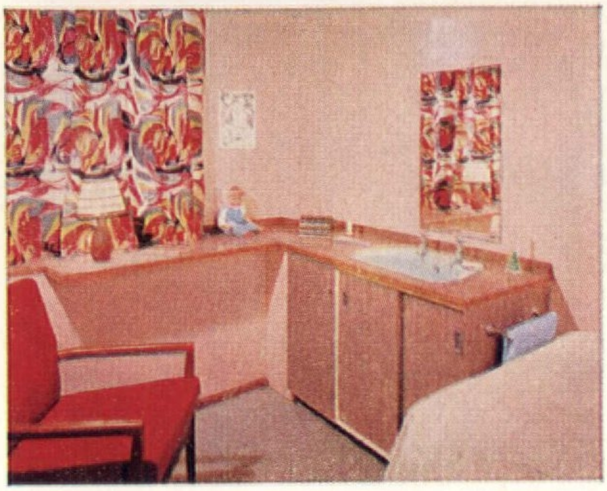
The new range of Standardgraph lettering stencils offer wider cutouts so that their use is not restricted to stencil pens. The new stencils enable the same pen to be used for ruling, drawing and stencilling. Available in eight sizes from $\frac{5}{64}$in to $\frac{3}{8}$in, prices from 12s *6d* to 19s *6d*.

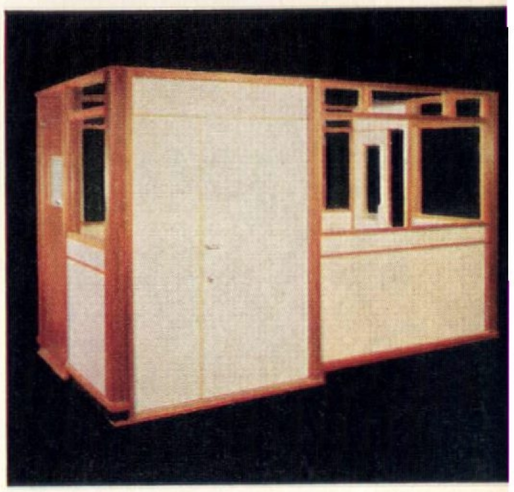
"Look, this hospital can't waste money. There must be a surfacing material that cuts out maintenance, gives maximum hygiene – and still looks cheerful?"

The professional decorative laminate









They're talking about Arborite...

Top left: Delivery-room bedhead unit at Cambridge University Maternity Hospital. (*Architectural adviser to Cambridge University: B. A. Calinescu.*)
Bottom left: Changing Cubicles.
Top right: Reception Hall. Both at Hull Royal Infirmary. *Architect: Yorke, Rosenberg & Mardall. Builder: Trollope & Colls Ltd.*
Centre: Nurses' Study-bedroom at Queen Mary's Nurses' Home St. Bartholomew's. *Architect: James Knowles, FRIBA, FRICS, AMTPI.*
Bottom right: Ward Cubicle with Arborite Laminlight Door. *Shapland & Petter Ltd. (Barnstaple Devon).*

The simple answer to their problem is Arborite decorative laminate. Obviously. Arborite is the perfect cladding for walls, doors and working surfaces in hospital wards, surgeries and laboratories. Because it's tough. Durable. Easy and hygienic to maintain. And that's not all. Arborite's wide range of colours (51 of them plain colours), woodgrains, marbles and exciting graphic patterns make hospital interiors warm, cheerful and attractive in appearance — ideal surroundings for both patients and staff. Altogether, Arborite has many special advantages in a variety of applications that make it the architect's natural choice for modern hospital interiors.

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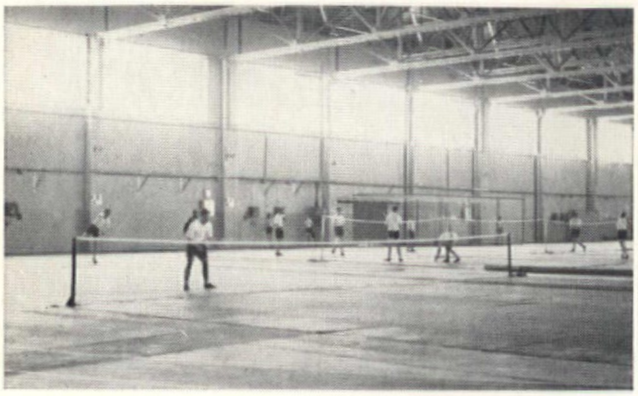

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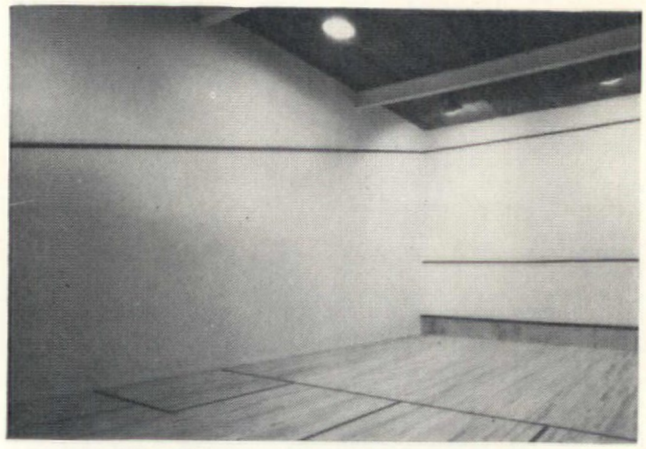

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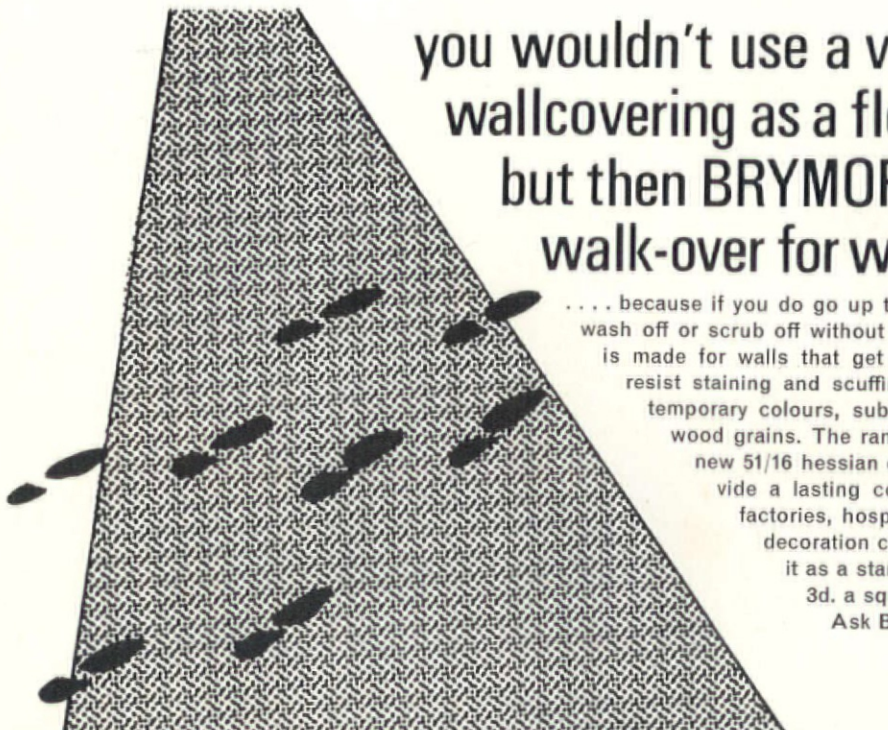

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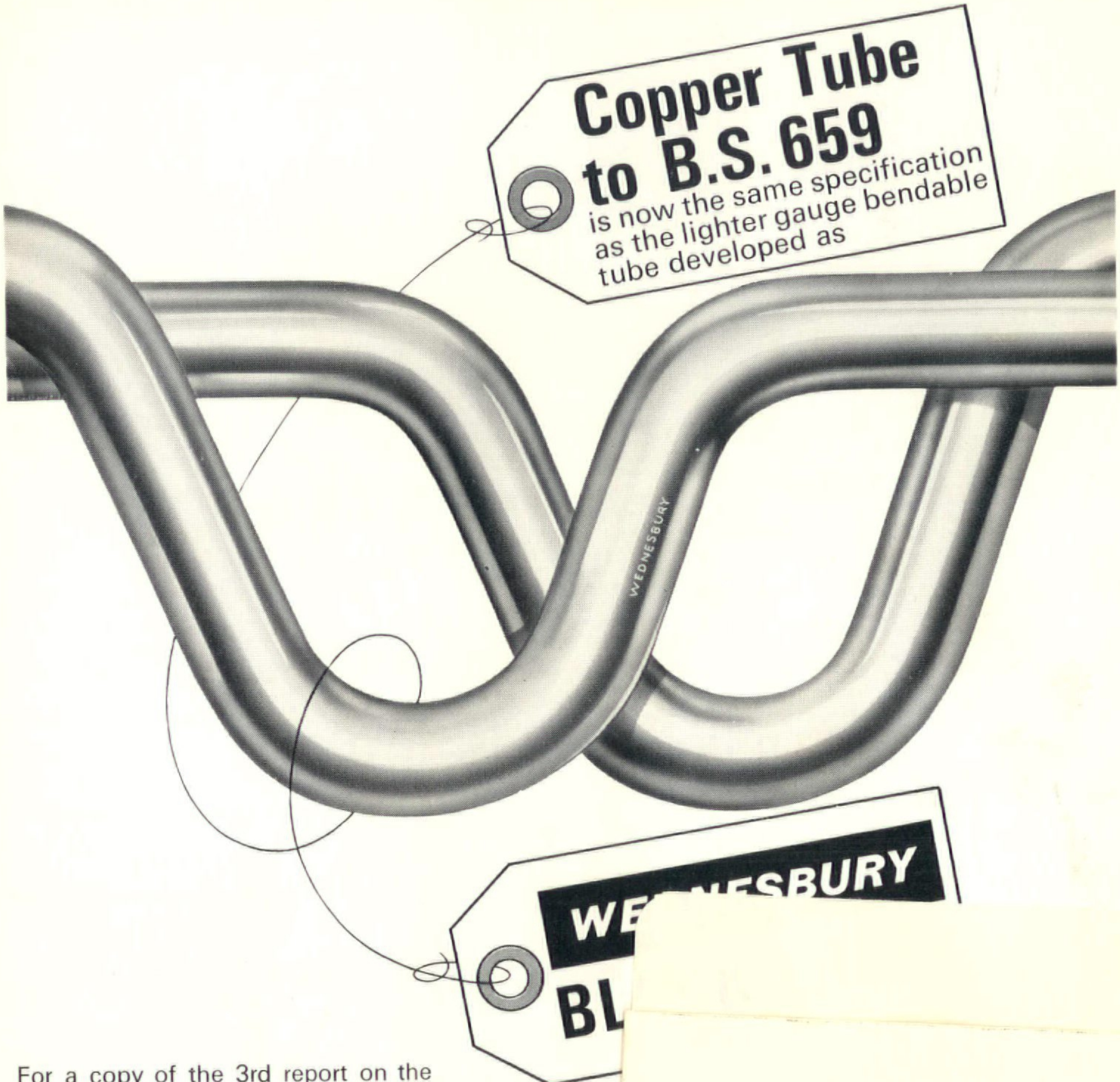
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