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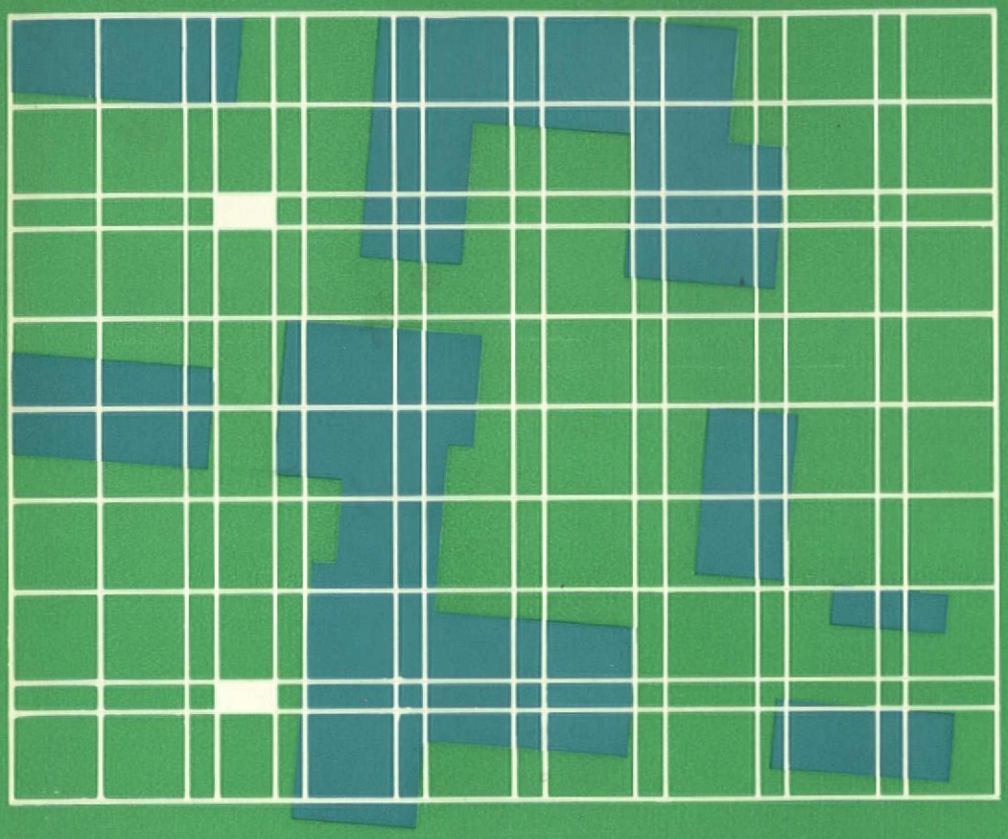

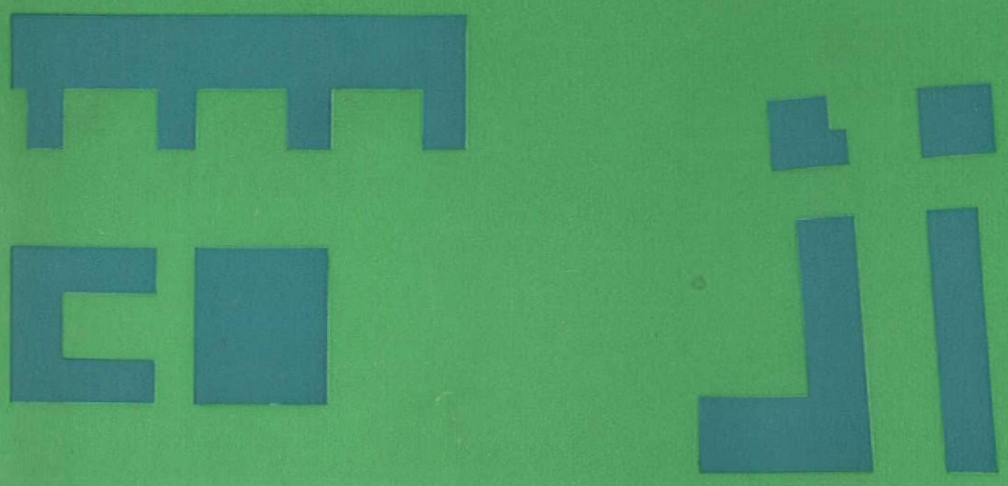

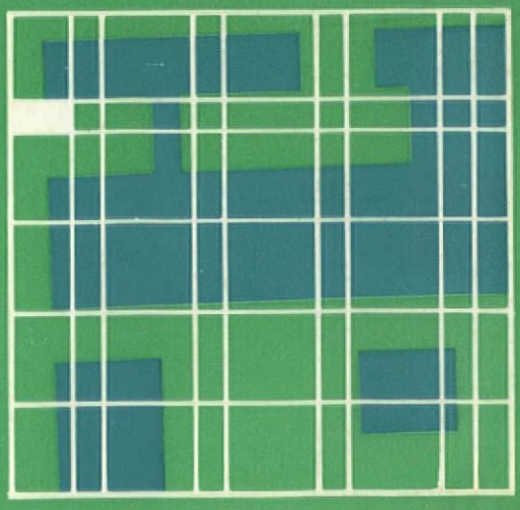



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Book notes

The tropical gardens of Burle Marx
P. M. Bardi. Architectural Press. £5 5s.

The name of Roberto Burle Marx resounds internationally due to his landscape artistry, particularly the early work contemporary with Rio's Ministry of Education and Oscar Niemeyer's baroquiana.
Now we are shown the complete artist that he is—painter, lithographer, designer of fabrics and jewellery, stage designer, decorator and animator of fêtes and festivals—all this in addition to the wizardry with nature. In the '50s, Prof. Bardi (director of S. Paulo's Museum of Art) organized a Burle Marx exhibition, which later toured the USA and came to Europe. Unfortunately it bypassed Britain. So we need the Professor's book to make good the deficiency. Marcel Gautherot's superb photography does full justice to the subject, with wonderful shots, in both colour and black and white, of exotic natural forms adopted or cultivated by Marx, in his Brazilian designs and his recent work for Caracas, where the Parque del Este, an enormous project, is currently being developed. For those who would emulate as well as admire, the botanical names are included of the grasses and plants that form his palette. And the perceptive notes by the author are printed in English, German and Italian.

Harry Seidler 1955–63
Horwitz Publications Inc. £A5 15s.

Seidler is considered by many to be the most important architect practising in Australia, and this is the second book dealing with his work. Introduced by Reyner Banham, it is lavishly illustrated, and the text is in English, French and German. We are brought up to date with the architect's development from a brilliant designer on the domestic scale to the equally good designer of large-scale work—multiple dwellings, industrial, commercial and communal buildings and urban development—and it is obvious that, to quote Banham 'the qualities of the architecture remain the same, notably the austere and reticent surfaces of materials as found, but the intricacy of the three-dimensional planning is greatly increased.' Seidler contributes an essay on 'architecture' which explains his attitude.

Decorative Art. No 33
Studio Year Book. 50s.

Once again the hardy perennial is with us with its assorted beautiful photos of interiors, furniture, soft furnishings, pottery and glass. Maybe it is a useful crib book for people needing ideas for their new homes. But it gives no idea of prices or availability. (True, addresses of sources are listed at the beginning if one wants to find out.) Nor can it be depended upon to show only the most recent designs; some chestnuts seem to pop in every year. Another fault is the lack of informative text or, in the case of some of the interiors, the absence of plans. The introduction by Christopher Read is in English, French and German.
The book seems to suffer from a lack of expert guidance.

Furniture in Britain today
Dennis and Barbara Young. Alec Tiranti. £3 5s.

Most of the above criticisms do not apply to this book which is quite excellent. It is a catalogue of the best modern furniture available today with the names and addresses of both the designers and the manufacturers. All that is lacking is the prices. Brief text is in English, French and German.

continued on page AD7



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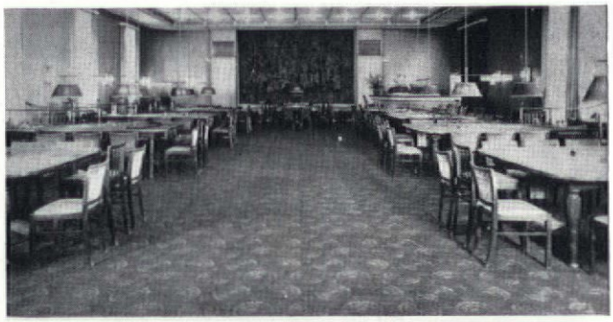
(Top illustration) Casino Lindau, Western Germany. Royalty Telstar design.
(Centre illustration) Draffens Store, Dundee, Scotland — Fashion Department. Royalty Telstar design.
(Bottom illustration) Altona Bowl, Melbourne, Australia. Royalty Mosaic design.







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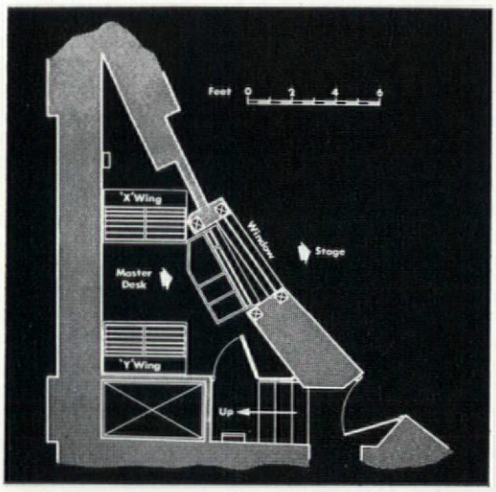

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Book notes

continued from page AD5

Picasso's Guernica—the genesis of a painting

Rudolf Arnheim. Faber & Faber. 95s.

Dr Arnheim's reputation rests on his brilliant studies on the film and on visual perception—his by now famous double 'Art and Visual Perception' and 'Film as Art'. Arnheim seems to be capable of being an *uomo universale* in an age of specialization, writing with aristocratic discretion on only those subjects which deeply interest him.

Now after a long pause, he offers the world a study of Picasso's Guernica, a painting with which Arnheim is obviously deeply involved on a personal level.

Arnheim analyses all the 61 drawings and sketches that were the preliminaries in one way or another to the genesis of this picture—as well as some other epic mythological works of Picasso to which the Guernica is clearly related; in particular Picasso's etching Minotauromachy of 1935, in which the 'bull man' and the wounded horse first make their appearance upon the stage of Picasso's imagination. The final 'bull' remains for Arnheim and for all who have ever known the 'Guernica'—an ambiguous symbol; a potential symbol of terror whose face remains detached, defiant and calm in spite of the carnage that surrounds him. The question still remains and Arnheim cannot elucidate the riddle. Is the bull the detached brutality of the unexpected air attack or is it the symbol of the indomitable spirit of Spain?

Arnheim's study ends with photographs of the five last recorded stages of the picture in which the most modified elements are the wounded horse and the dismembered soldier in the foreground. The book is well printed and illustrated on non art paper and includes a fold-out reproduction of the picture in its back cover. 'It would be very interesting,' Picasso is reputed to have said, 'to preserve photographically, not the stages, but the metamorphoses of a picture.' This in the case of Guernica has now been done.

Architect's working details

Revisited by Michael Devereau. The Architectural Press. 36s.

Revisited is the word used, and the title immediately possesses rather worrying literary associations. Nevertheless this is an extremely welcome book and well worth possessing at the price. It may not be an exact guide as to how not to do it or even how to do it, but it is a useful commentary on techniques that have been used between the years 1951 and 1957; five years since completion being the qualifying age for a detail to be included in this revisiting survey. This survey covers a range of details which were first published as technical details in the Architect's Detail Sheets of The Architectural Press, Vols 1 to 5. As Lance Wright so pertinently remarks in his foreword to this book, 'Unfortunately our notion of function tends to be somewhat ahead of our technical ability to supply it.' So this is a first attempt at a feedback system for architects. The only trouble is like so many other technical works the format is too literary. Architects are busy men and it would be preferable if this sort of information could be simply provided in 'data or note' format consistent for every detail.



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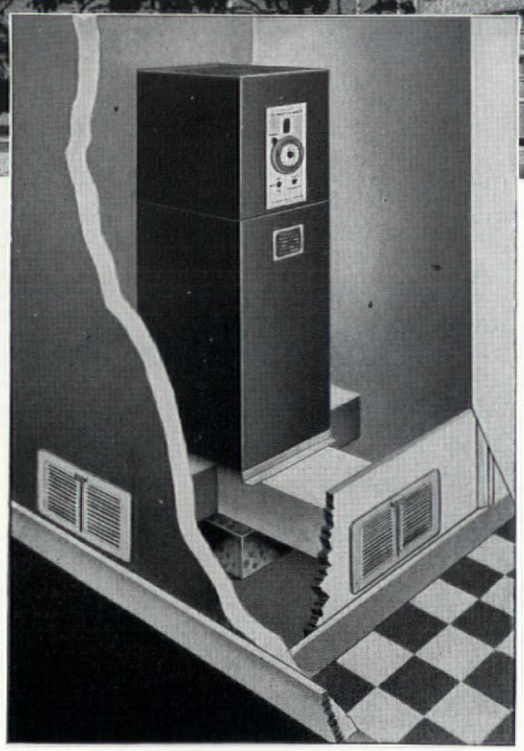

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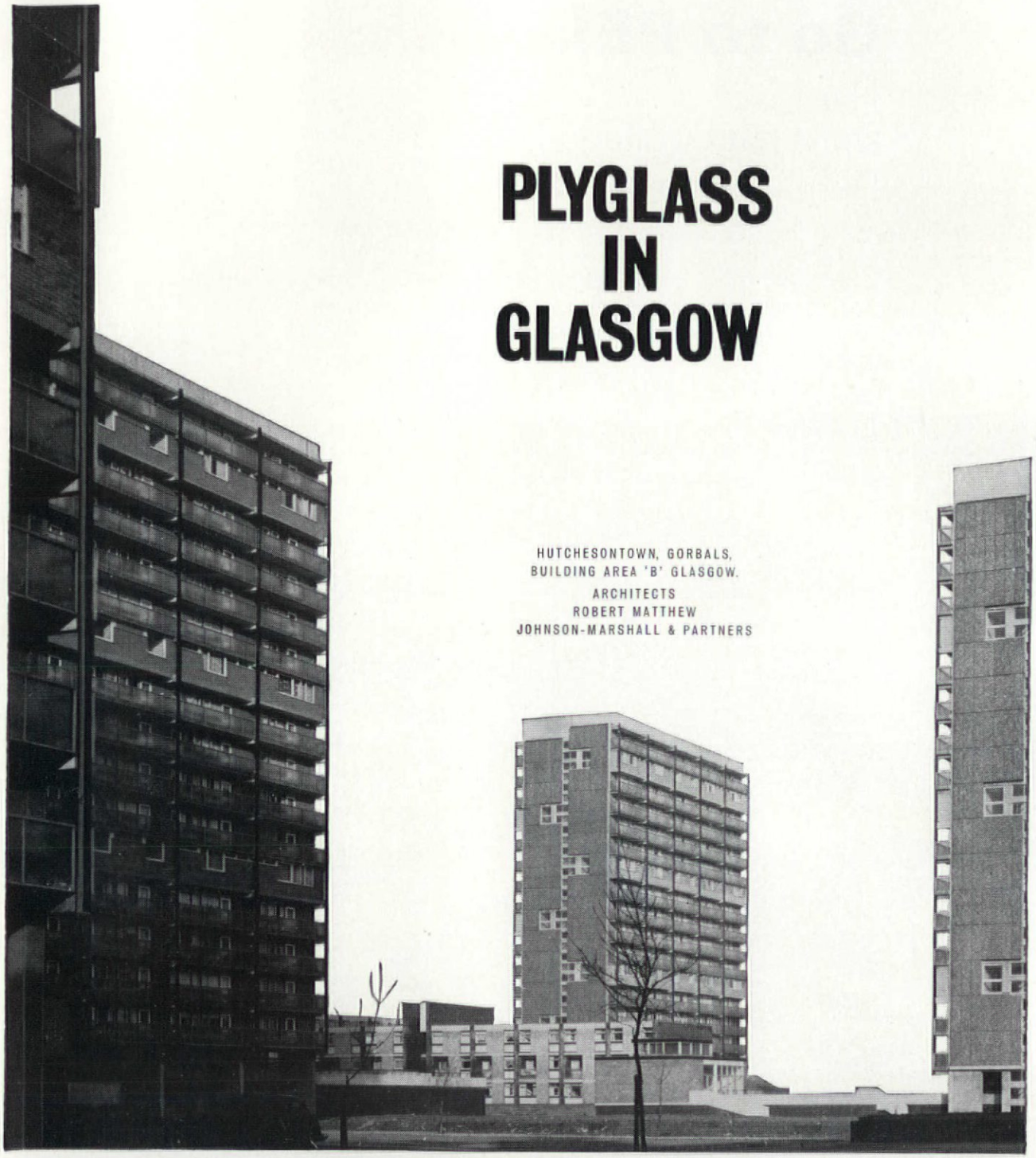

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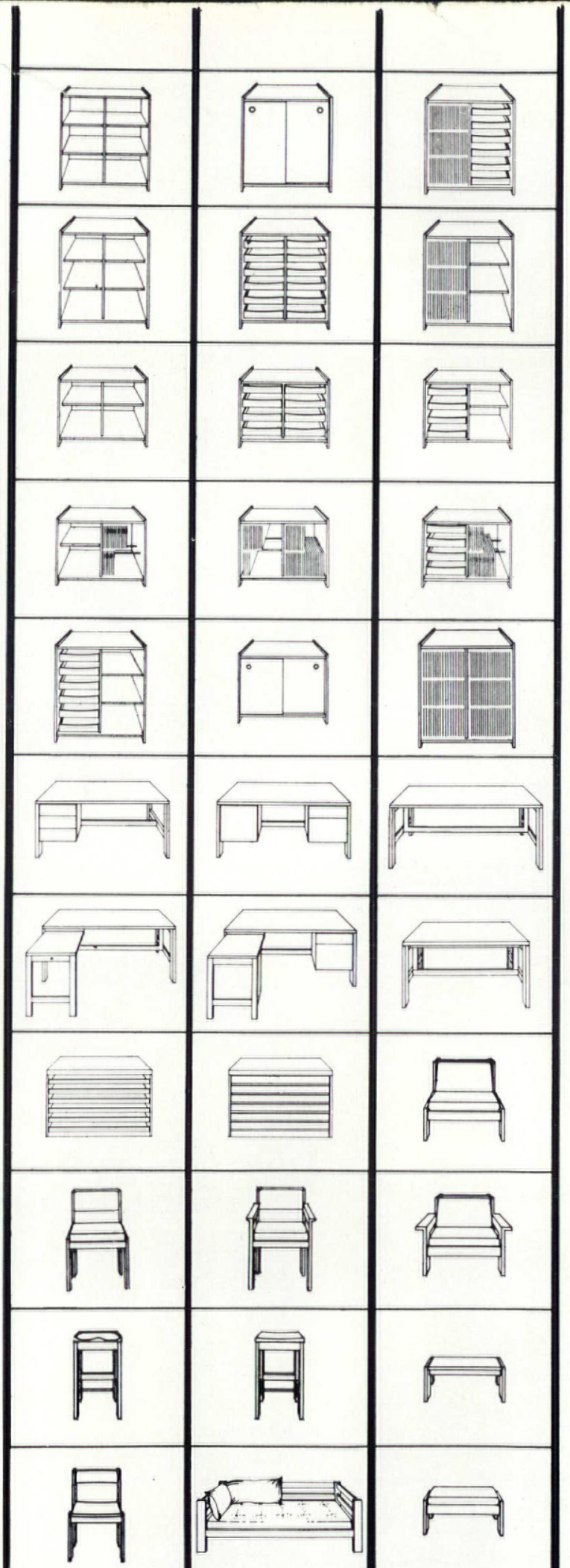

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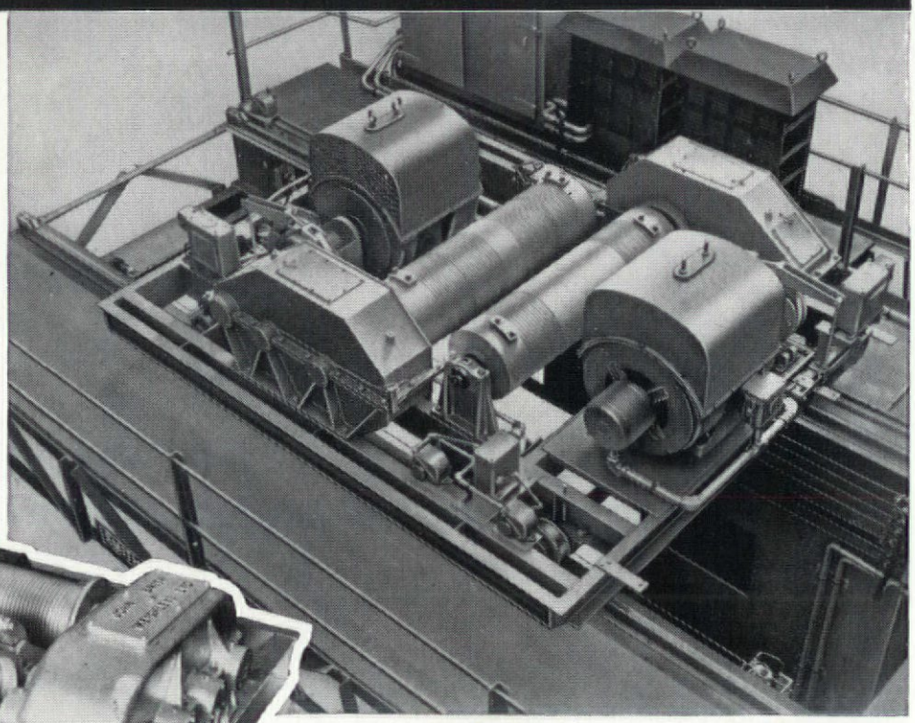

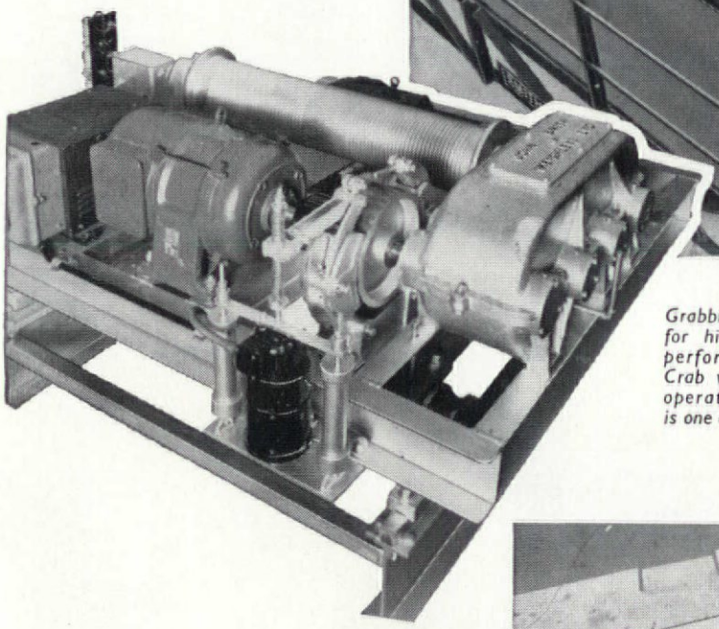

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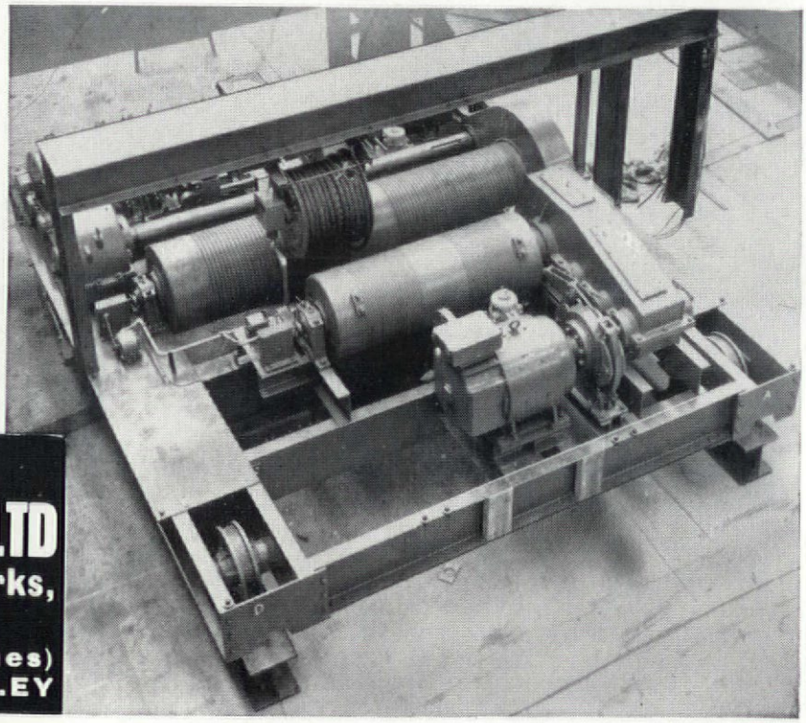

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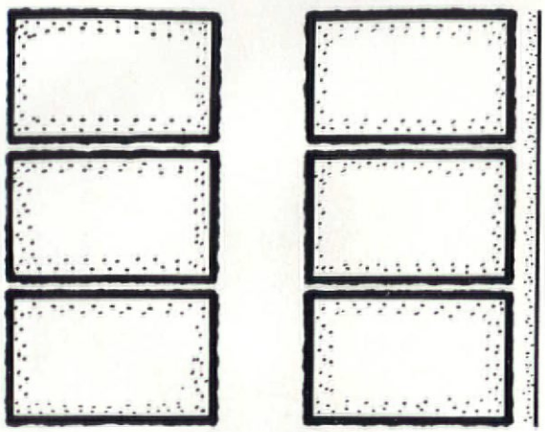

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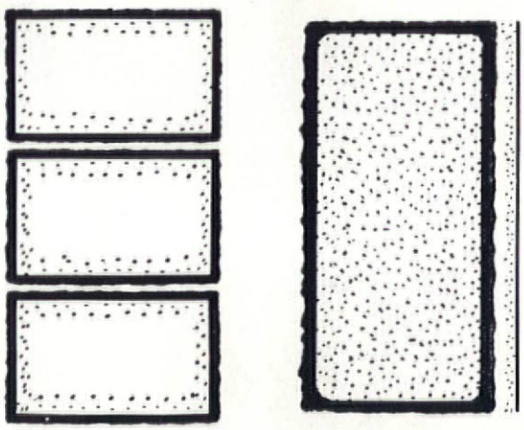

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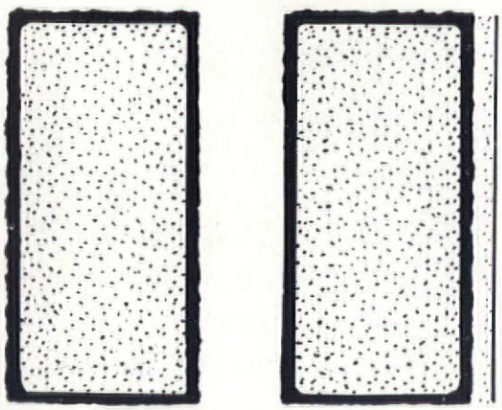

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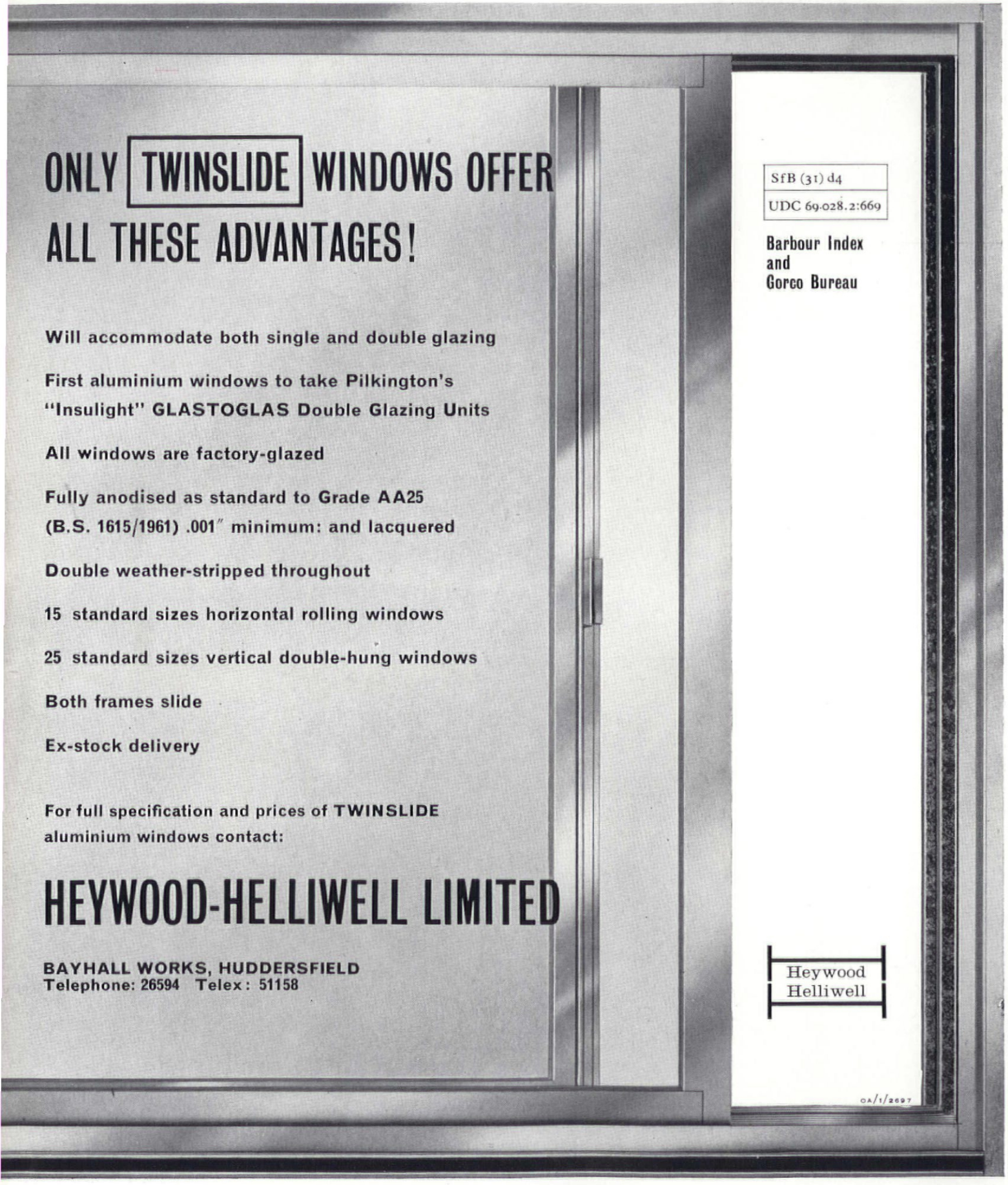
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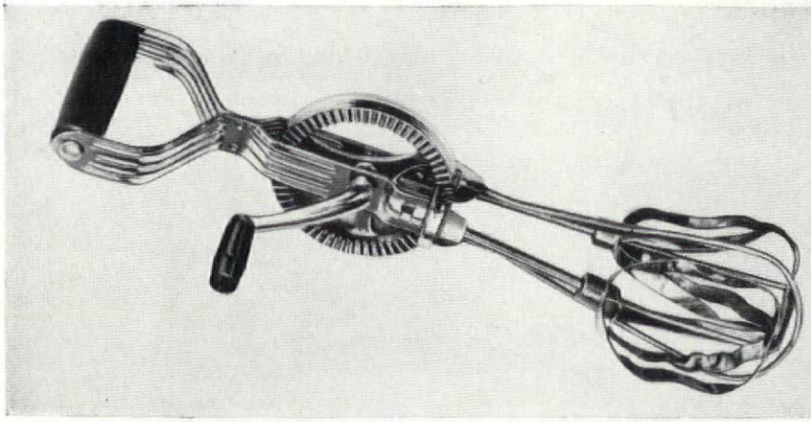

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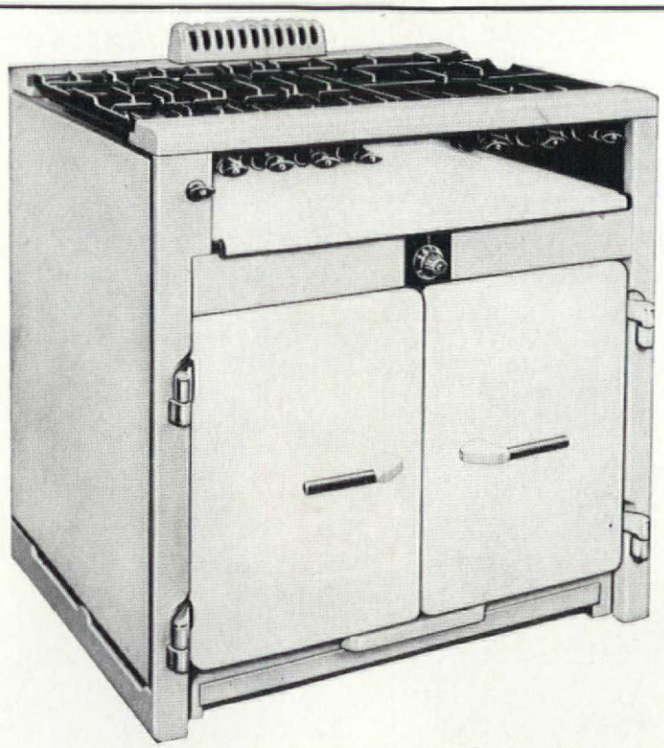
Modern kitchen engineering has put the Stratford Range in a class of its own. Everything essential for easy handling, perfect work, and high efficiency throughout. Clean lines, flush back-to-the-wall fixing, with forward venting oven flue, give the maximum output in the minimum floor space. Each range is a complete, compact unit, with self-contained flues, to let you fit any number together in line or as central suites. There are two sizes. No. 5127 has a 21″ wide oven, and five boiling burners (or four, if a grill section is included). It is 27″ wide, overall. No. 5136 has a 30″ wide oven, and seven boiling burners (or four, if a grill section is included). It is 36″ wide, overall.

Robust vitreous enamelled cast iron and angle iron framework, with vitreous enamelled sheet steel panels and linings. Top bars and burners vitreous enamelled black. Oven adequately insulated to 1″ thickness (fibre-glass and aluminium foil), two burners and front-reading Regulo control. Drilled ring boiling burners, with Venturi to give maximum flame stability at all gas rates, and safety taps. All burners, bars, and oven fittings are quickly and easily removable for easy cleaning and maintenance.



The Stratford Range No. 5136—Finish: Structure, Radar Grey vitreous enamel. Panels, White vitreous enamel. Top bars and burners, black vitreous enamel.

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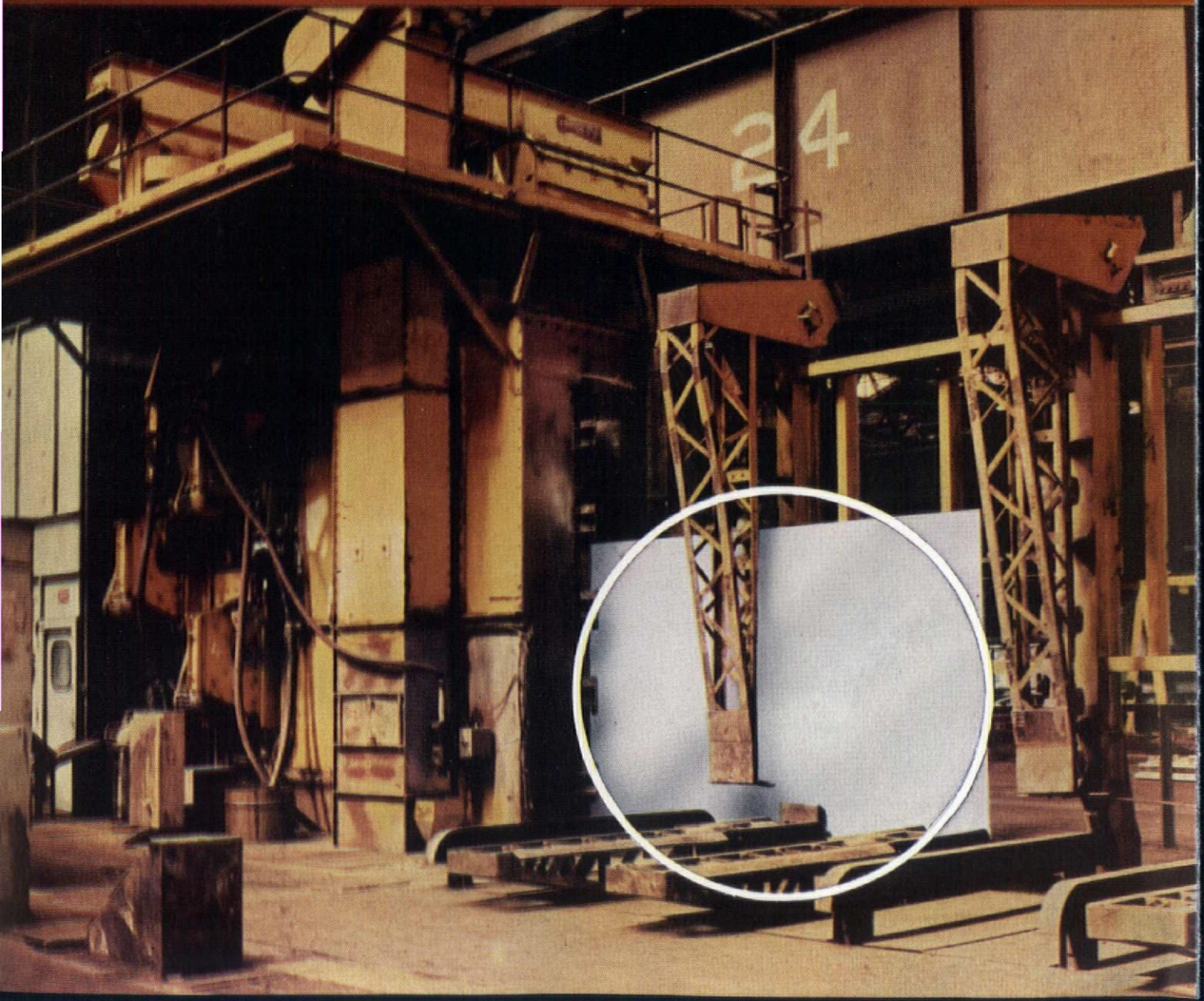
Steel

THE CONQUEST OF CORROSION

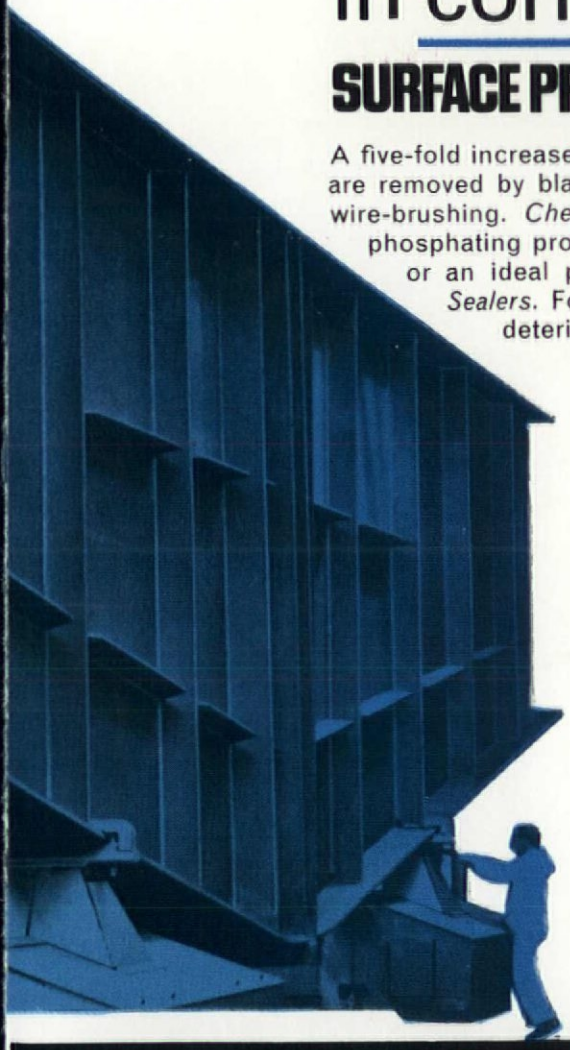
Important developments in corrosion control and new methods for effective protection of steel against rust and corrosive attack are featured inside this special 4-page inset. Below : Automatic abrasive blast-cleaning of steel plate. Investment by British steelmakers and suppliers in modern, automated pre-treatment plant like this assures delivery to industry of steel protected to the highest standards.



steel strengthened by new ideas and advanced techniques in corrosion control

SURFACE PREPARATION : the key to better protection

A five-fold increase in the life of painting schemes can result when rust and millscale are removed by blast-cleaning or pickling, rather than by ineffectual weathering and wire-brushing. *Chemical Surface Treatments,* such as the wide variety of modern phosphating processes, can also be used to give steel either a rust-inhibiting film, or an ideal passivated surface, in readiness for further protective treatment. *Sealers.* Following metal spraying a sealing coat can be applied to prevent deterioration of the metallic coating. A polyvinyl butyral etch-primer containing phosphoric acid is generally used for this.





BLAST CLEANING OF LARGE FABRICATIONS

Automatic plants for grit- and shot-blasting have now been developed to deal with large steel fabrications such as these prefabricated bridge units. Their size and high throughput permit quick low-cost treatment of steel structures up to 17 ft deep, 6 ft 6 in wide and 125 ft long. Sprayed anodic metal coatings such as zinc and aluminium are immediately applied to the cleaned and roughened steel surface. Further paint coats follow under ideal controlled shop conditions with the complete assurance of film consistency, maximum protection and life of coatings in service.



Steel—Brilliantly cleaned Sodium hydride dip process de-rusts, de-scales, de-sands, without metal loss. This clean passivated surface is ideal for protective coatings. (Free test cleaning offered by D & H Metal Treatments Ltd)



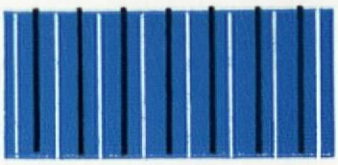
Cathodic and Anodic protection New electronic current regulators now *automatically* control impressed current in cathodic systems protecting ships' hulls. *Anodic Protection* can also be used to passivate steel, making it the anode in protective circuits.

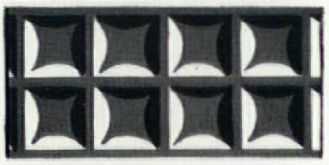


Plastic-Coated steel sheet—has been punched, formed, lock-seamed, spot-welded and cadmium-plated on reverse side, for this rust-proof electronic control panel.

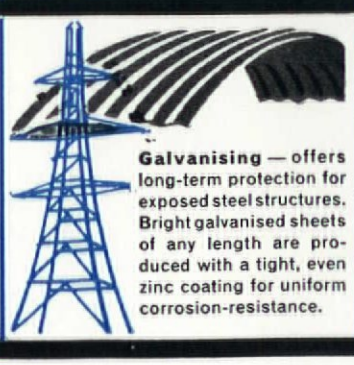


Sherardising—barrel zinc-coating—for protection of small steel components, fasteners, washers etc.





Rust-free cladding Steel panels are being increasingly used by architects for external cladding in corrosive atmospheres. Vitreous enamel panels (left) ensure lasting colour finish. (Right) Stainless steel sheet, in 18/8 or 18/10/3 quality, is now available in a wide variety of finishes and patterns.



Galvanising — offers long-term protection for exposed steel structures. Bright galvanised sheets of any length are produced with a tight, even zinc coating for uniform corrosion-resistance.



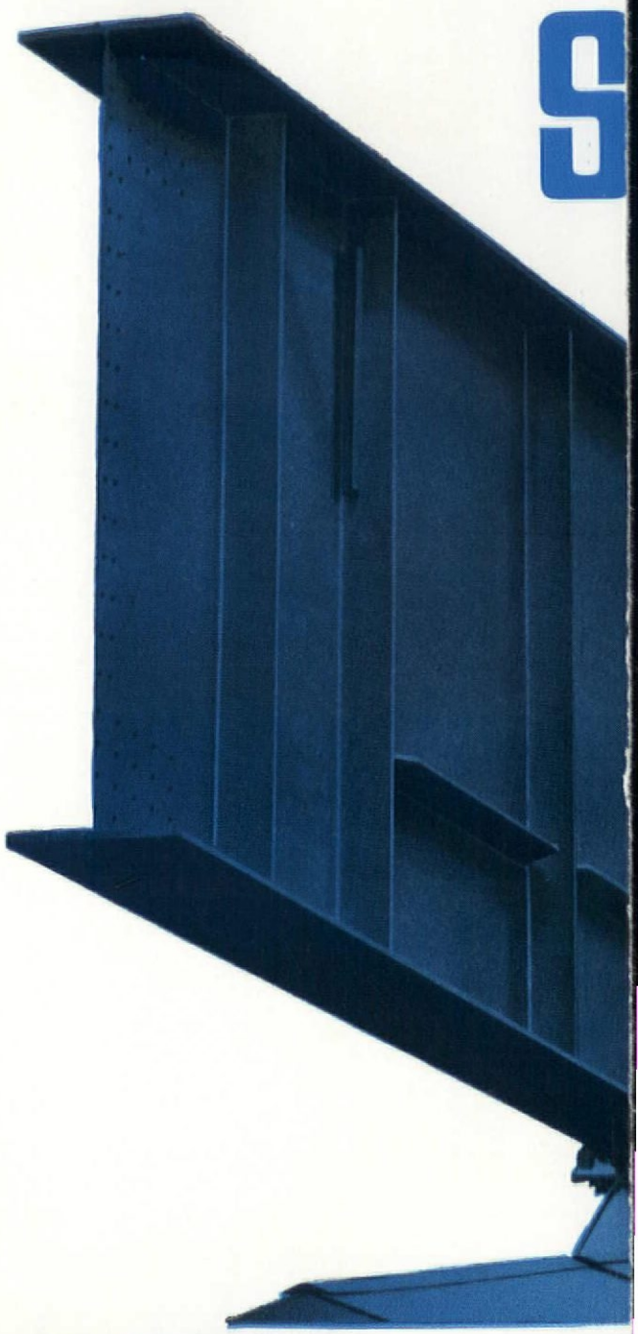
Insulated joints To defeat galvanic bi-metal corrosion, fastenings can employ special electrically insulating gaskets, washers, sleeves with stainless steel, or zinc-coated steel (Sherardised or galvanised) nuts and bolts.

For further information please turn to **back page** of this inset

New improved steels and steel products, rapid progress in corrosion technology, further development of successful new methods for steel protection—all these together mean effective and economic solutions are at hand today for every type of corrosion problem.

Most structural steelwork is unexposed and requires no special protection. But elsewhere, where steel is employed, means now exist for an efficient defence against rusting or corrosive attack, thus further extending the vast range of potential uses for steel, increasing its durability and scope for imaginative and practical engineering design.

Steel-users are already reaping the benefit of the British steel industry's major investments both in research, and in the installation of new plant for the abrasive blast cleaning and anti-corrosion treatment of mill products and large steel fabrications.



DESIGN TO BEAT CORROSION

Before it begins—this is the right time to stop corrosion. Future maintenance needs are management problems to be faced *at the design stage.* Exposed areas should be readily accessible for future maintenance if needed. Uncluttered joints and smooth surfaces discourage corrosive deposits. Box-section girders can have welded-in bulkheads near ends to inhibit internal corrosion of structural members.

Special grades of stainless or low-alloy steels may be used to combat corrosive attack where special protective coatings or paint systems are impractical.

Threaded bi-metal contacts should be avoided. Dissimilar metals should preferably be welded or brazed, or the joints electrically insulated.

FOR TOP PROTECTION

The designer can now make better use of steel than ever, with so many new and proven corrosion-resisting finishes. Electro-deposition of metallic coatings, Sherardising, zinc- and aluminium-spraying, hot-dip galvanising, vitreous enamelling, to mention just a few. Plastic coatings now give lasting protection to steel and fabricated steel products, preventing rust, resisting chemical attack, providing tough, durable colour decoration. Special primers or electro-zinc plating make a suitable base for newly formulated paint systems, and also protect steel during transport, storage, fabrication or erection. Metallic flake pigments reduce permeability of coatings and a sealer is now available containing stainless steel flake.

MORE AND BETTER COATINGS

Modern calcium plumbate paints, used in conjunction with galvanising or other zinc coatings, react to create an excellent bond for protection of exposed steelwork. Zinc-rich paints based on epoxy resins, chlorinated rubber or polystyrene actively inhibit rusting by direct electro-chemical action. New sprayed moisture barriers or adherent brushed wax coatings are impervious to liquids, or resist condensation, high humidities, and severely corrosive atmospheres. Increasing advantage is being taken of the barrier properties of micaceous iron oxide in the finishing of large structures. Modern paints based on media such as coal-tar epoxides, polyurethane and vinyl co-polymers, and on coatings such as Neoprene and Hypalon, can now give enduring protection and decoration to steel in a great variety of hostile situations.



Plastic-coated—for good. Steel fabrications can be given tough, smooth, adherent nylon or PVC dip-coatings—preventing corrosion, reducing maintenance. *PVC-coated steel gutter bracket combines corrosion resistance with strength. Nylon-coated railings, garden and street furniture cannot rust, keep their appearance and colour.*



Primed and rust-free steel
Blast-cleaned and primed or metal-sprayed plates and sections of all kinds can now be supplied by rolling mills, steel stock holders and steel fabricators.

Prefabrication Primers
Newly-formulated quick-drying priming, sealing, or rust-inhibiting coatings permit rapid handling of treated steel by automatic plant. Protected steel can later be welded, flame-cut without fume hazard.

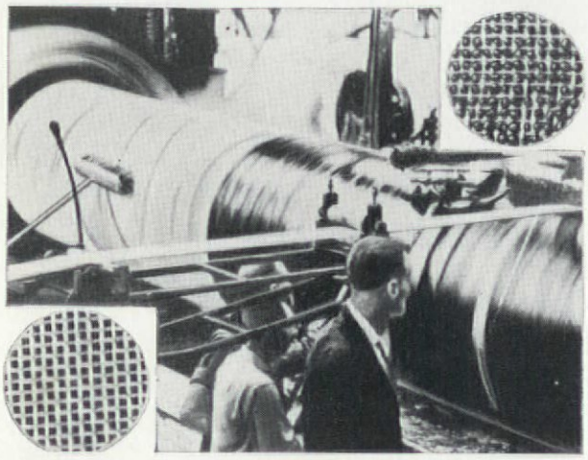


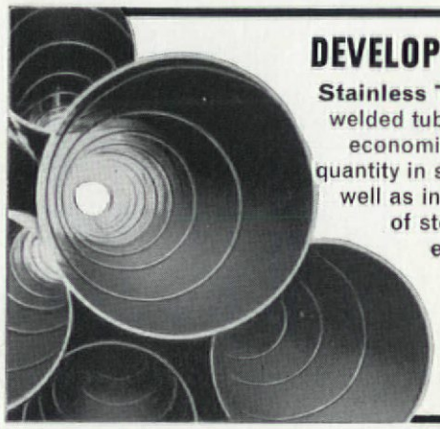
New solvent-free epoxy coatings. Tough, thick corrosion-resistant linings can now be sprayed. One-coat application to a thickness of up to 10 normal coats is safe in enclosed areas, unaffected down to 0°C, up to 100% r.h.

HIGHER CORROSION RESISTANCE FOR STEEL PIPELINES

Stronger Protection for Buried or Submerged Steel Mains. Seamless steel pipes are now being treated with plasticised coat enamels, which are reinforced with glass-fibre and thermoglass inner and outer wraps. Mechanical strength of seamless bitumen/asbestos anti-corrosive sheathings is now greatly increased by embedded woven glass-cloth wrappings. Corrosion-resistance remains unimpaired by sharp blows and harsh treatment during transit or laying operations. This newly-introduced woven glass reinforcement is applied at the same time as the hot bitumen/asbestos mastic, and embedded just below the surface of the seamless pipeline covering.

Low-cost Plastic Clad Service Pipes. Plastic-clad water and gas service pipes now combine the strength of steel with the durability and economy of an inexpensive extruded corrosion-proof PVC sheathing, which also possesses high impact strength, excellent ageing properties and electrical resistance.





DEVELOPMENTS IN SPIRALLY-WELDED TUBING

Stainless Tubing. Spirally-welded tubing is now being economically produced in quantity in stainless steel, as well as in standard grades of steel. Strength and endurance remain high in piping installations facing exacting conditions of corrosive attack.

Internal or external PVC coatings are now applied to strong, light, spirally-welded steel piping for applications where high corrosion-resistance is required, either against hostile environments or corrosive fluids.



EXPERT ADVICE TO COMBAT CORROSION

The British steel industry provides a valuable advisory service to industry on all problems of corrosion prevention and control, through the Corrosion Advice Bureau, Dept. (A), British Iron and Steel Research Association, 140 Battersea Park Road, London SW11

REFERENCES

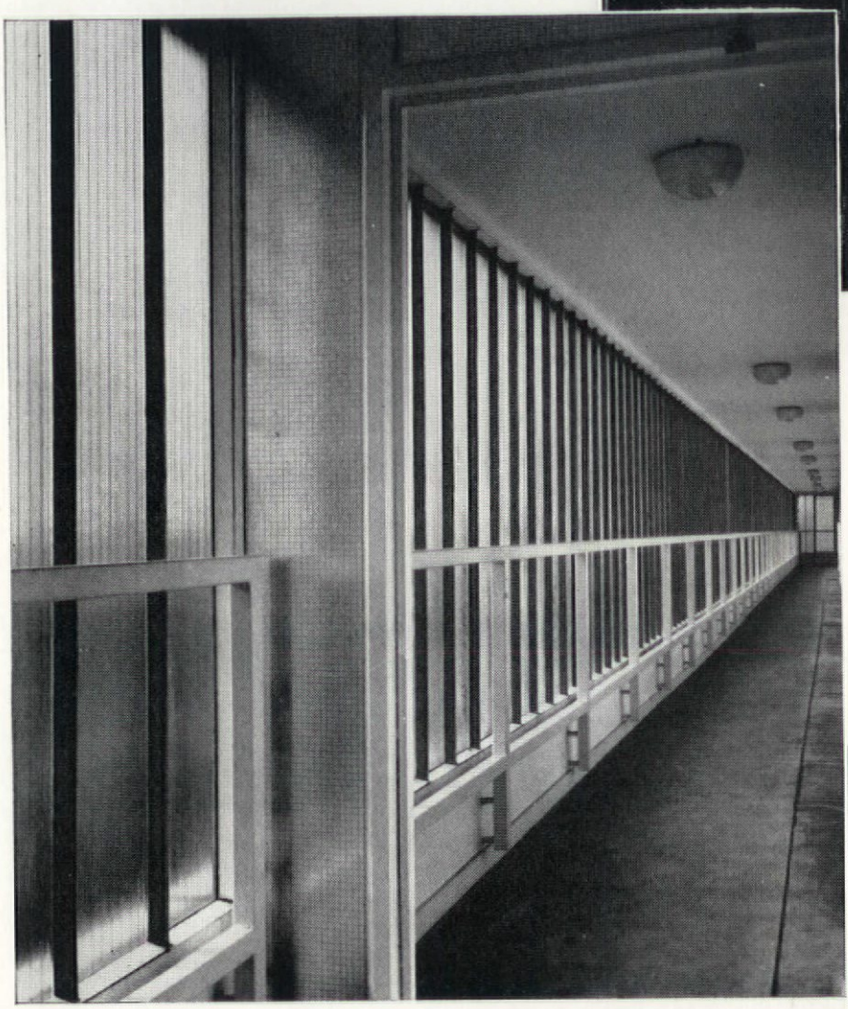
INSIDE: Left-hand page. WELDING — PRIMED AND METAL-SPRAYED STEEL — Metalife Liquid Metals Ltd, Harrogate. SPRAYED SOLVENT—FREE EPOXIES — Perivale Paint Products Ltd, Perivale, Middx. NYLON AND PVC COATINGS — Plastic Coatings Ltd, Guildford, Surrey. **Right-hand page** GIRDER — Tees Side Bridge and Engineering Works Ltd, Middlesbrough. SODIUM HYDRIDE CLEANING — D. & H. Metal Treatments Ltd, Staines, Middx. **Back page** SPIRALWELD STAINLESS STEEL TUBE — Welding Technical Services Ltd, Kings Norton, Birmingham 30.

Steel strong in new ideas

BRITISH IRON & STEEL FEDERATION STEEL HOUSE TOTHILL STREET LONDON SW1

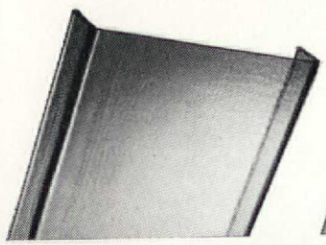
Continuous walls of Light



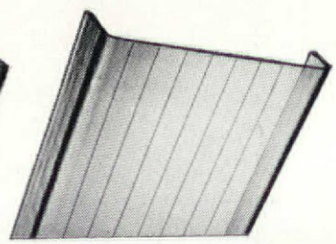


'PROFILIT' GLASS

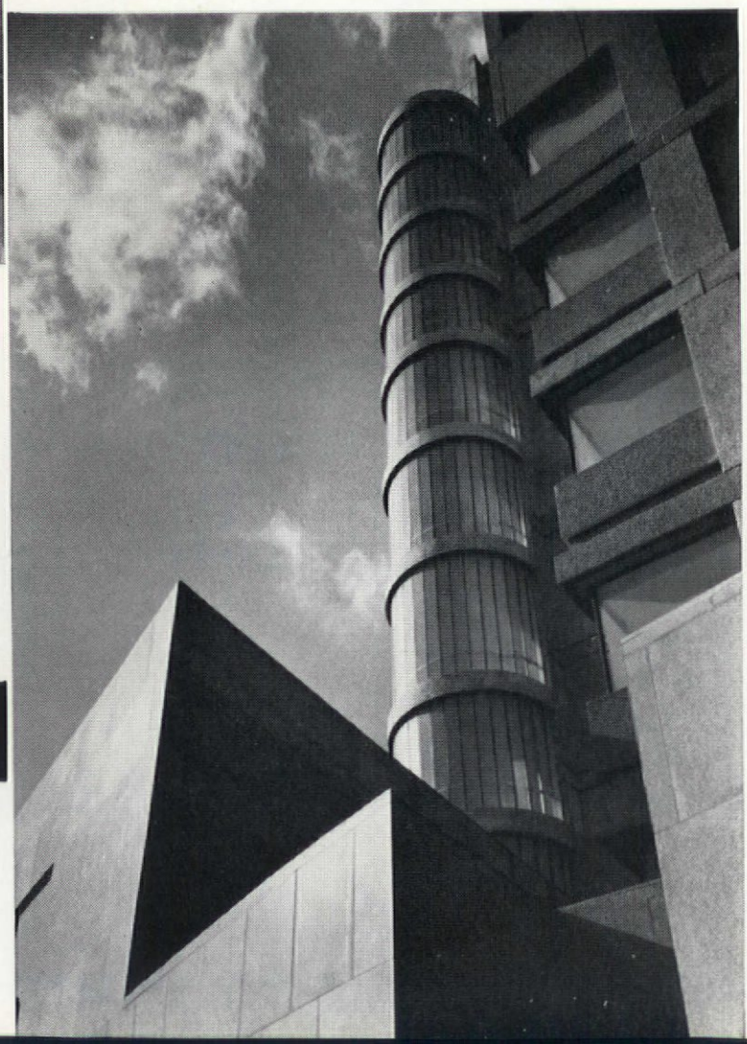
'Centre Heights', Swiss Cottage, N.W.
Architects: Douglas Stephens & Partners.
Contractors: Tersons Ltd.



Profilit Cast



Profilit Wireline



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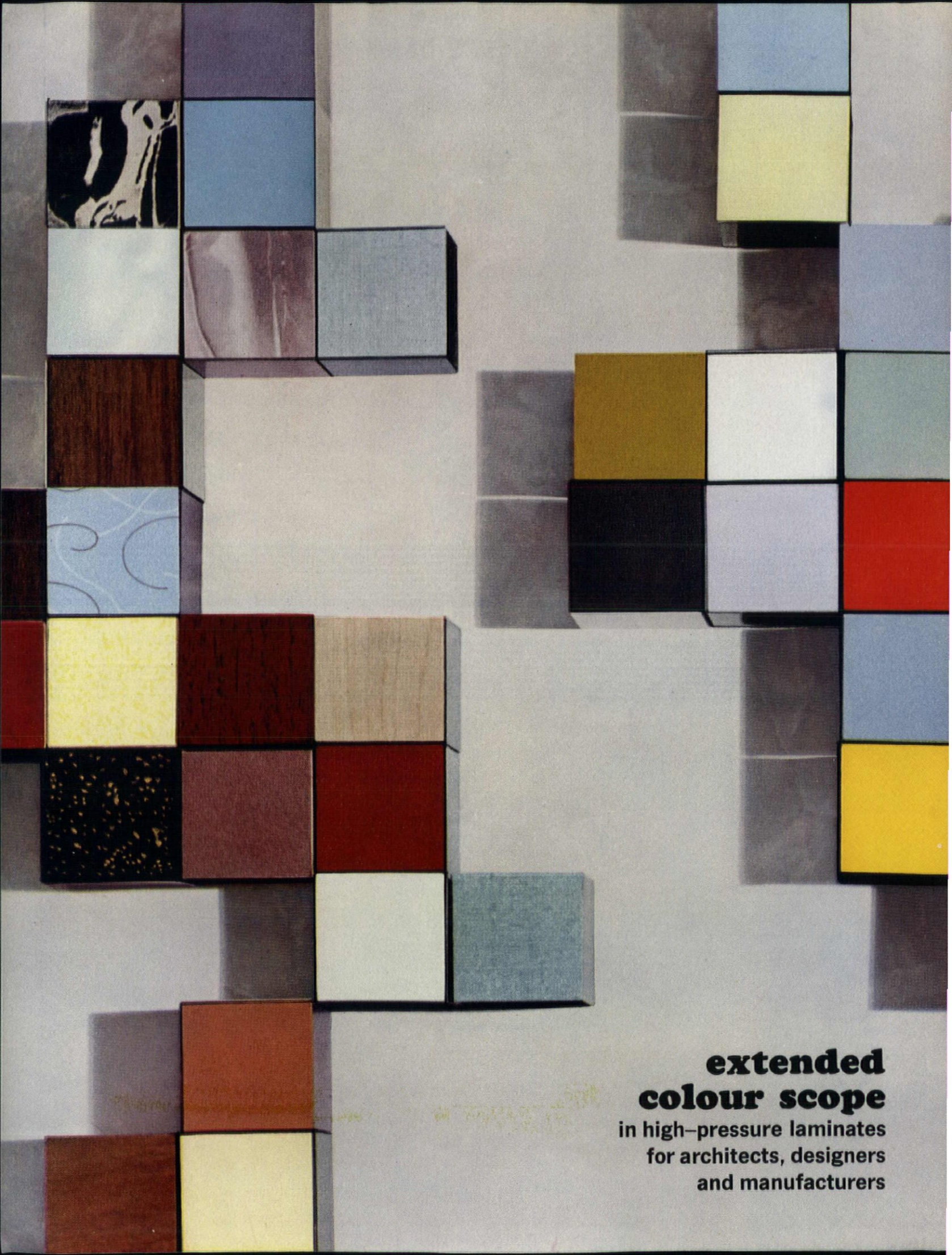

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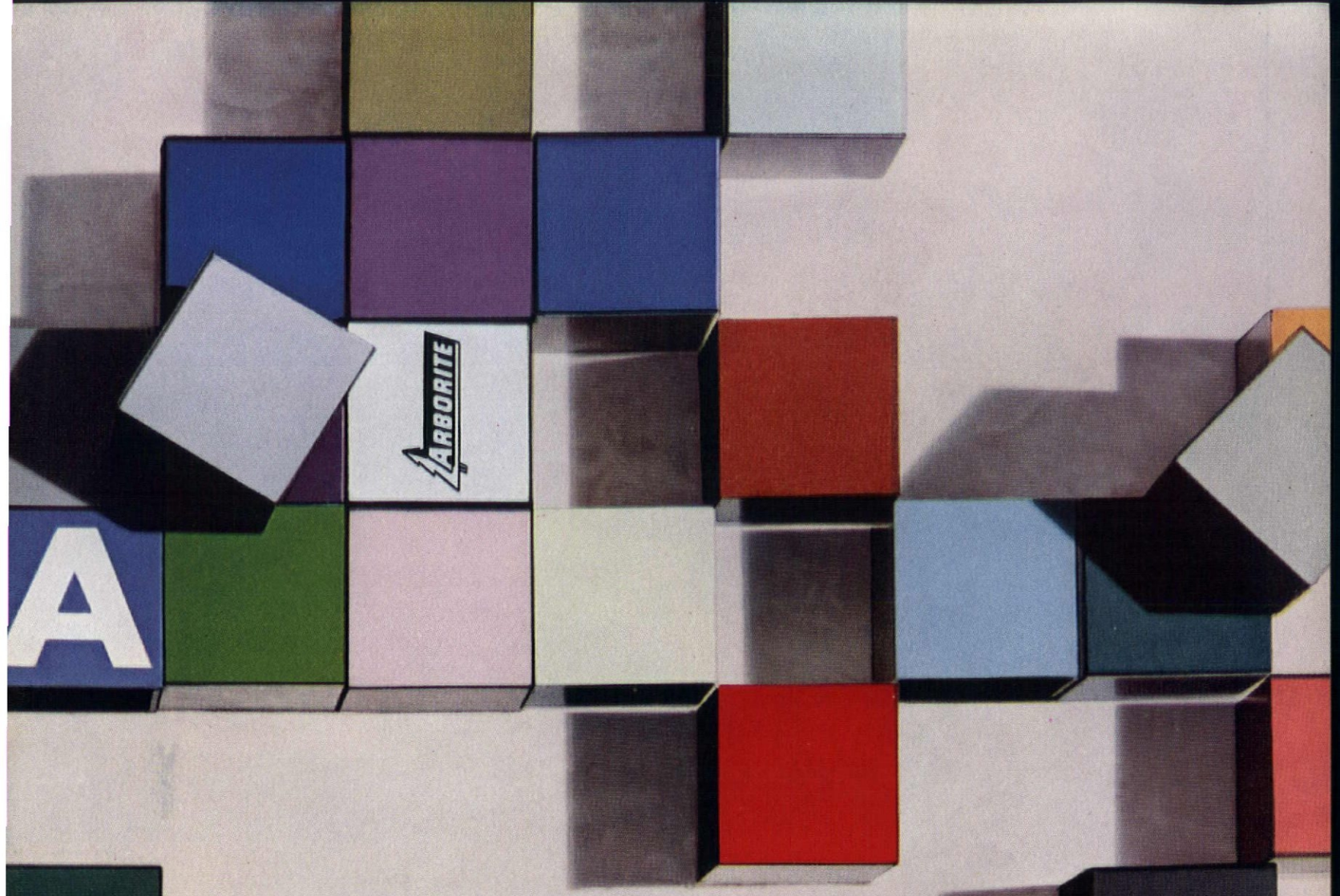

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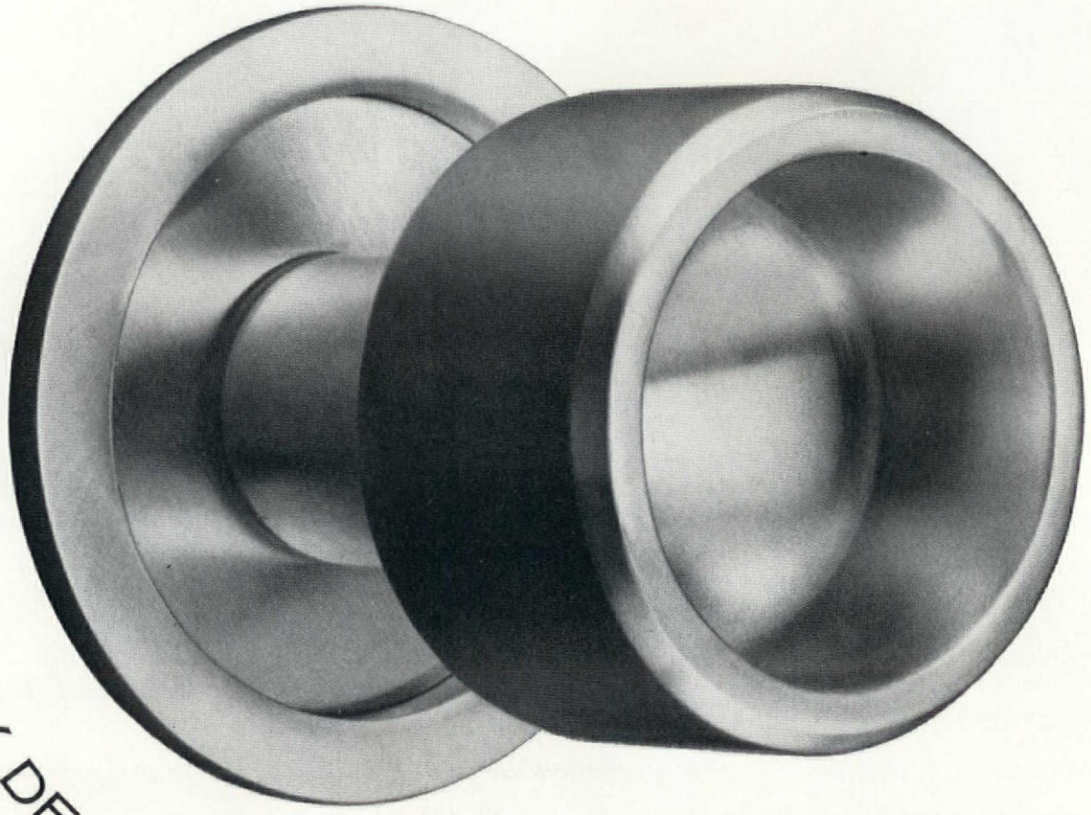

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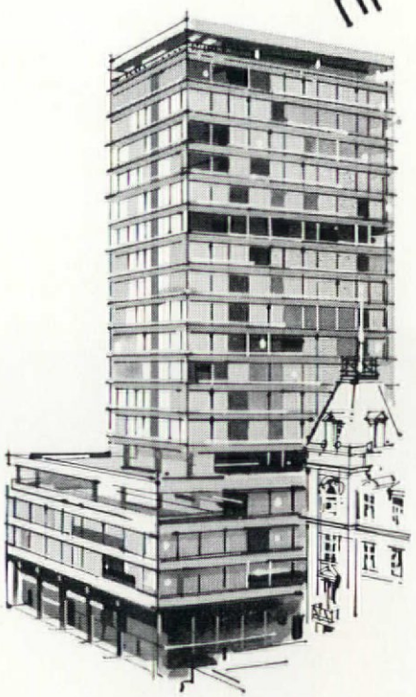
See our exhibits at the Building Centres, London, Birmingham, Manchester and Glasgow. All details can be found in the Barbour Index, File No. 53 and the Gorco Bureau File, No. 44/3.



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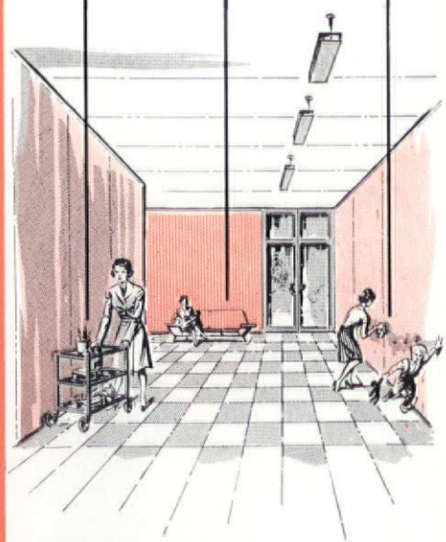



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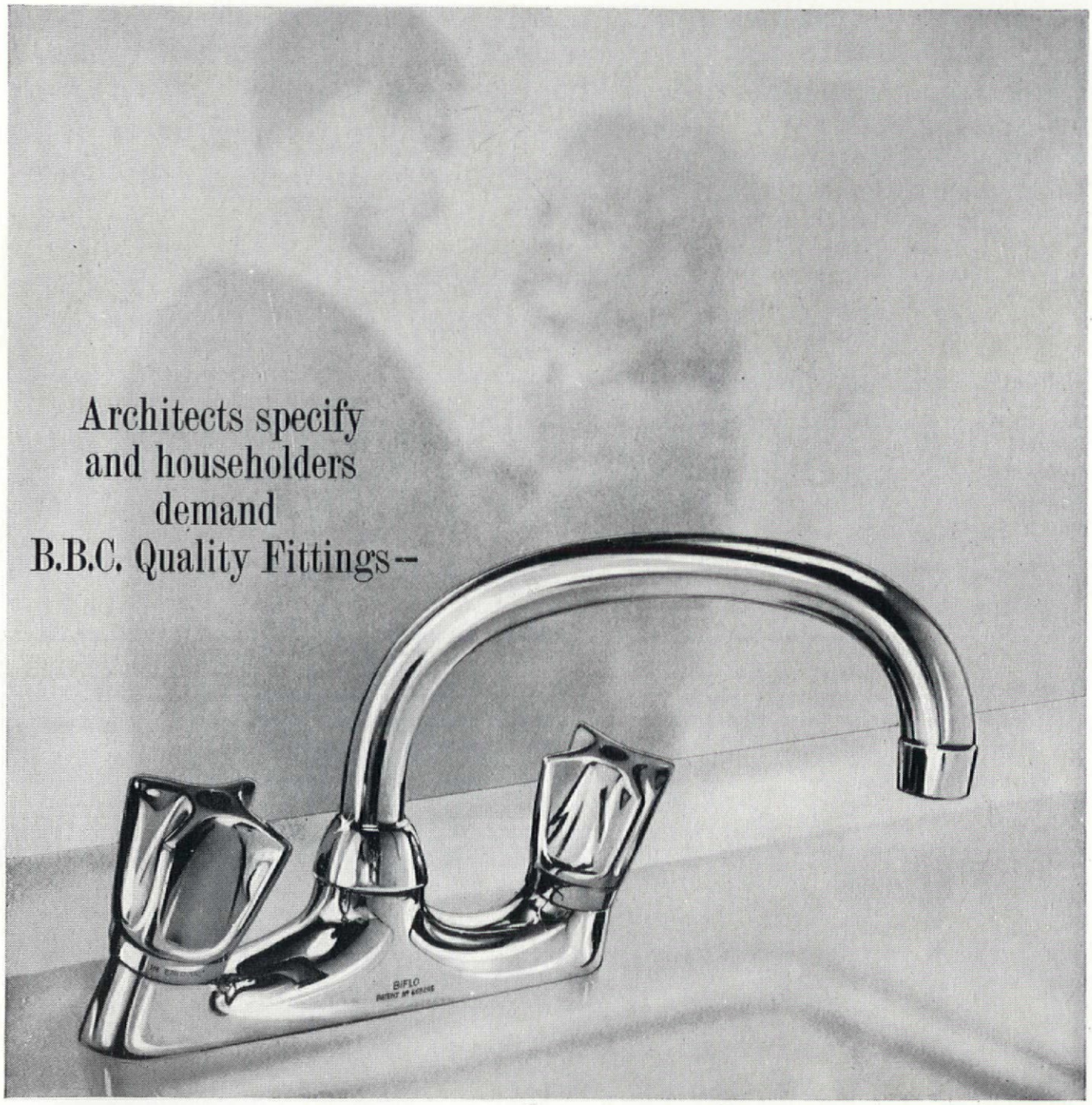

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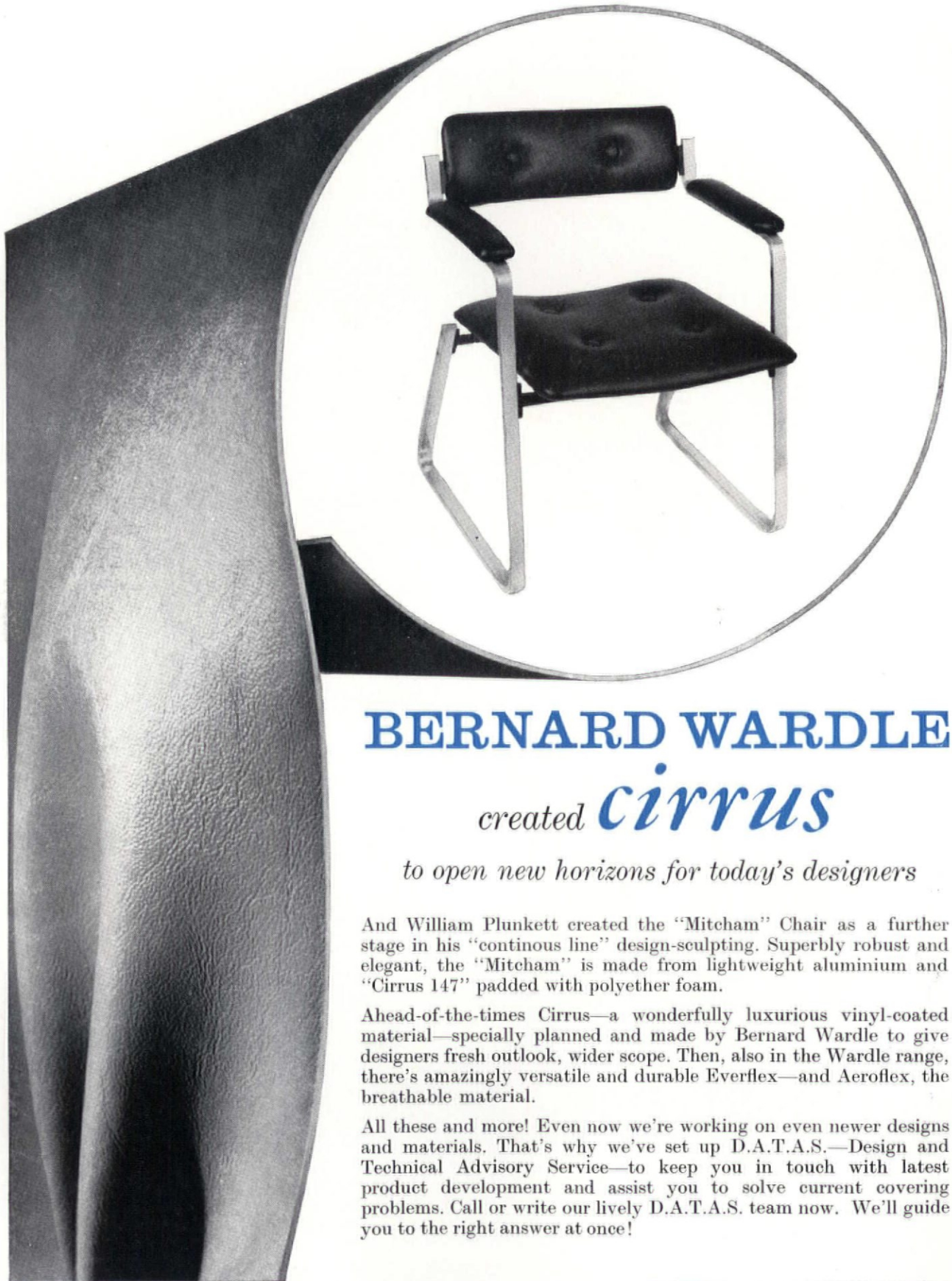

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Ahead-of-the-times Cirrus—a wonderfully luxurious vinyl-coated material—specially planned and made by Bernard Wardle to give designers fresh outlook, wider scope. Then, also in the Wardle range, there's amazingly versatile and durable Everflex—and Aeroflex, the breathable material.

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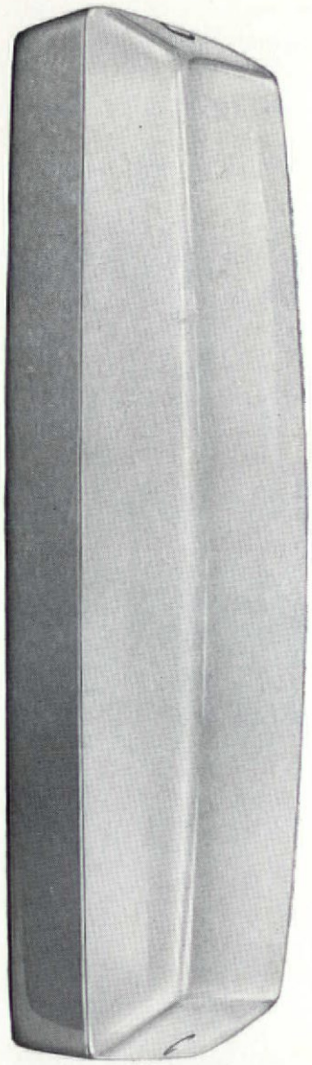
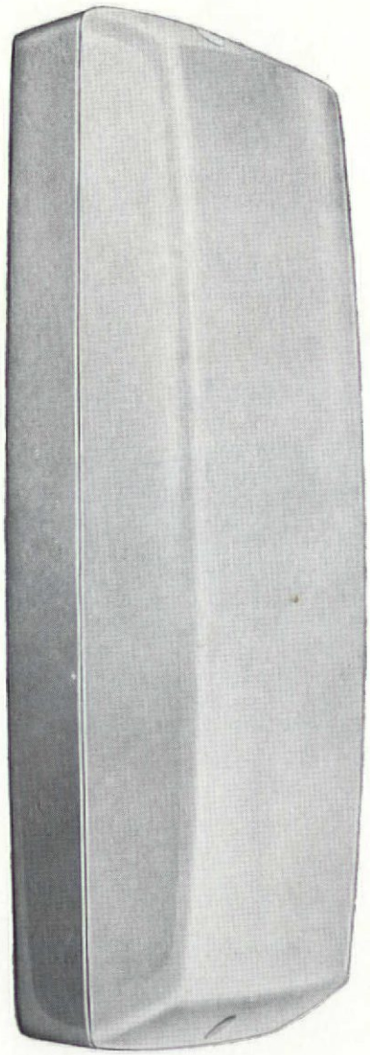
SFB. 8
for one 8w. Tube







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The exclusive features of these new fittings are fully described and illustrated in Leaflets 25/c and 27/c available on request.

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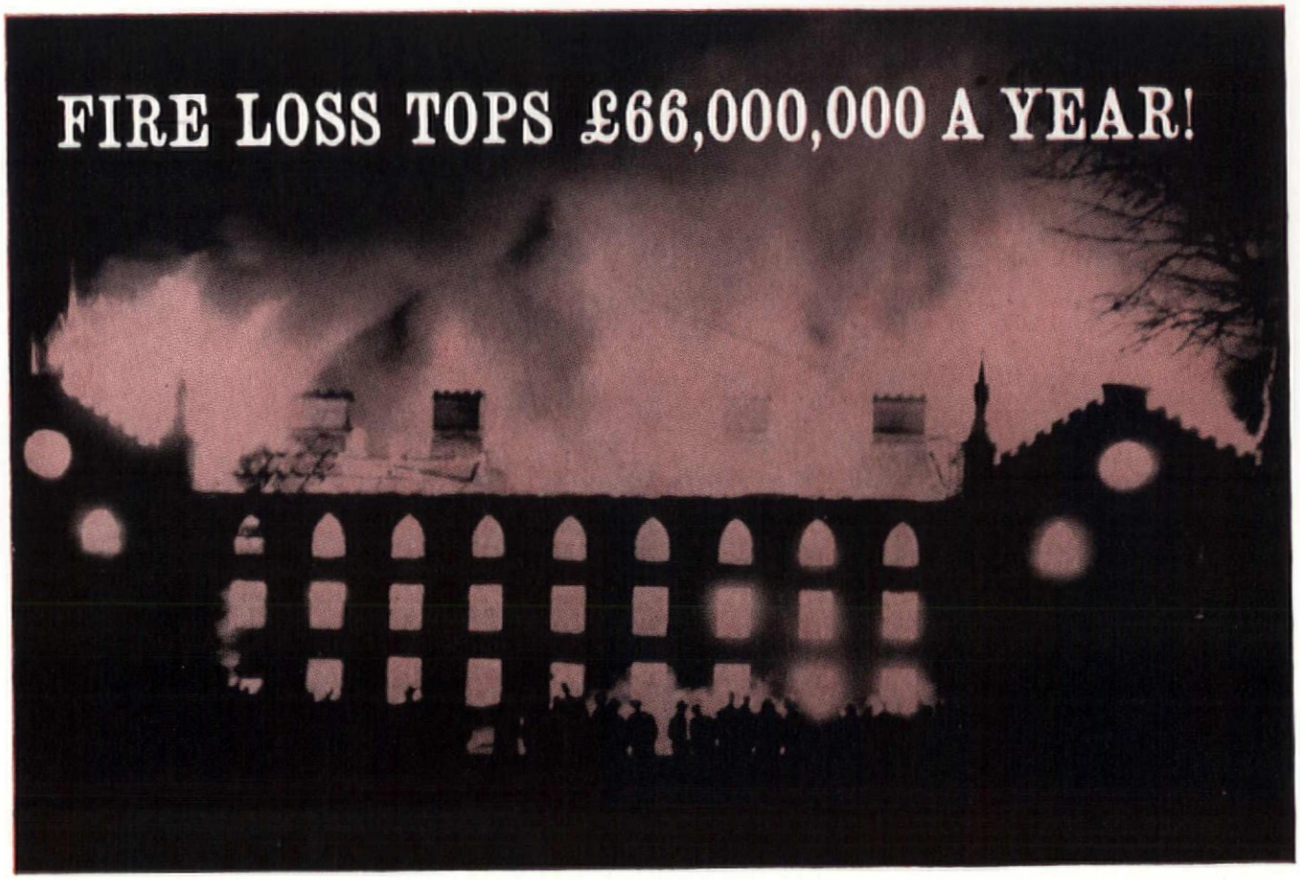

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The Bolton range includes Fireproof Doors suitable for every kind of industrial and commercial situation. The fire resistance of Bolton Shutter Doors has been officially tested . . . for full details and copy of the test report write now for leaflet AD536.

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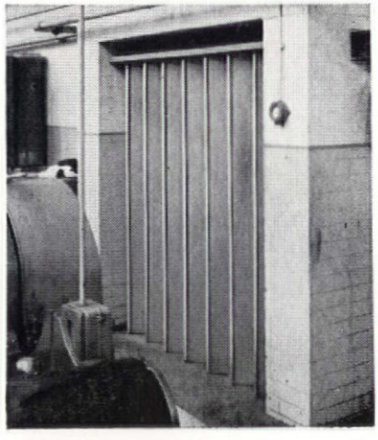

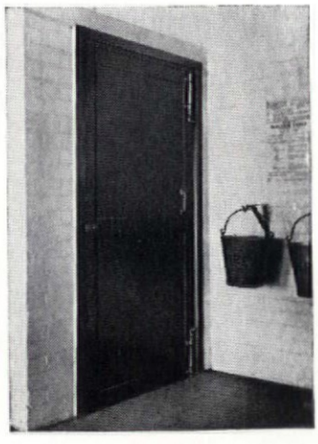

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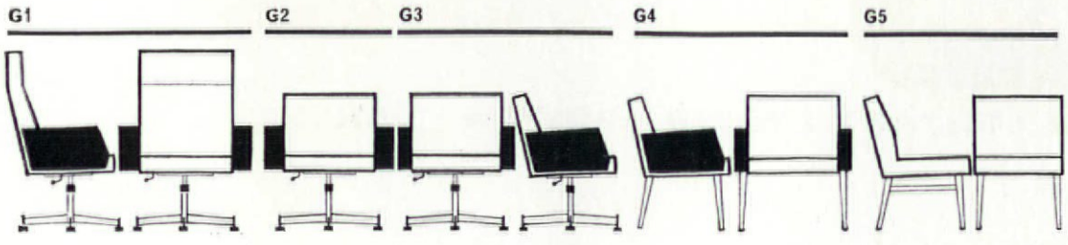
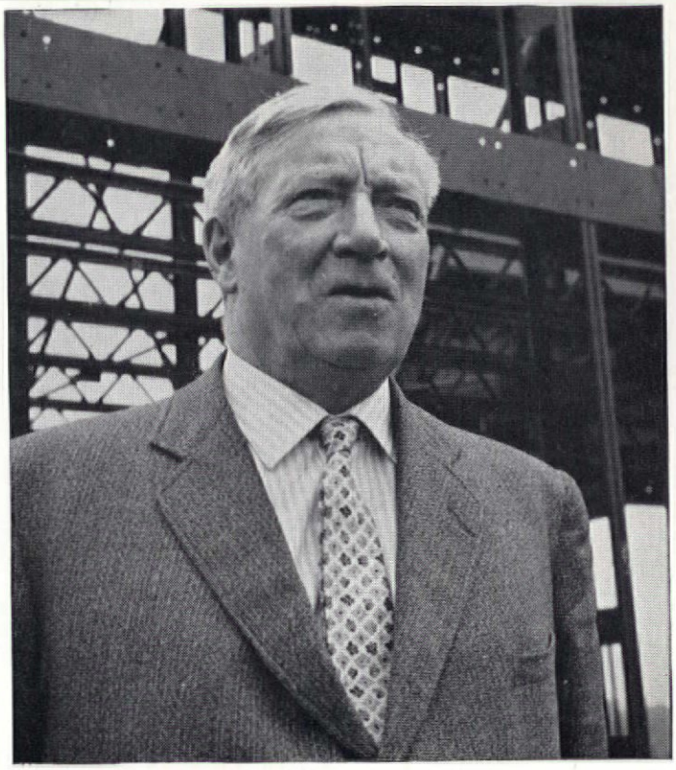


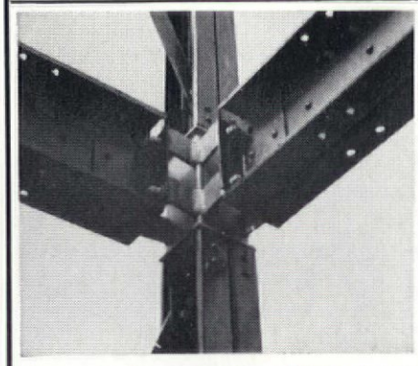
CHAIRMAN, TRUSTEEL CORPORATION (UNIVERSAL) LIMITED



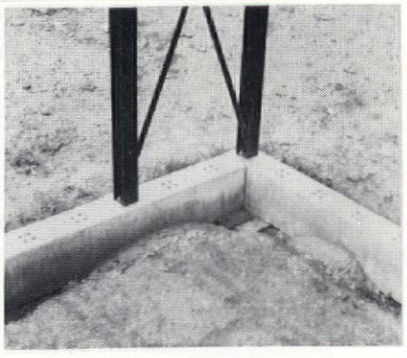
G.J.Sell tells why new, advanced 3M Trusteel makes all other industrialised building systems appear old-fashioned

3M Trusteel is the world's most flexible industrialised building system.
3M Trusteel is a completely new 'open' system based on the use of a modular lightweight steel frame.
3M Trusteel allows architects freedom of design provided that the basic modular discipline is observed.
3M Trusteel is designed primarily for use in permanent low rise housing of one, two, three and four storeys.
3M Trusteel uses dry construction techniques, and the majority of components are made in the factory under controlled conditions.

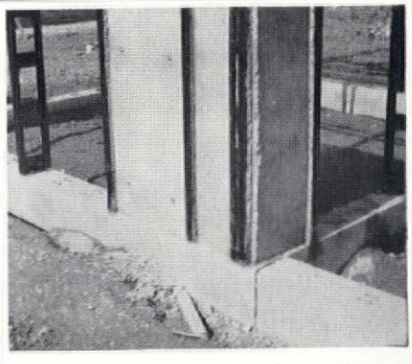
For these reasons **3M Trusteel** is helping to shape the building trends of the future.



Intersection of main stanchions and main beams showing use of 2-way connector unit.



Precast concrete ground beams and braced panel of steelwork.



Demonstration corner section of concrete party wall as used on interlocking 'L' shaped plans.

for further details write

3M Trusteel Trusteel Corporation (Universal) Ltd, Gate House, The High, Harlow, Essex.

Telephone: Harlow 21511



Weyroc vermiculite-surfaced board — specially developed to combine low surface flame spread characteristics with constructional requirements — is the only wood chipboard having one side factory-surfaced with a non-combustible, integral vermiculite membrane, giving Class I surface spread of flame when tested in accordance with BS.476: 1953.

Taking many paints well without affecting its Class 1 rating, this Weyroc board is eminently suitable for ducts, wall and roof linings, cases for high temperature radiators and many other building applications where boards having low surface flame spread are required.
Write for full information and data sheets.

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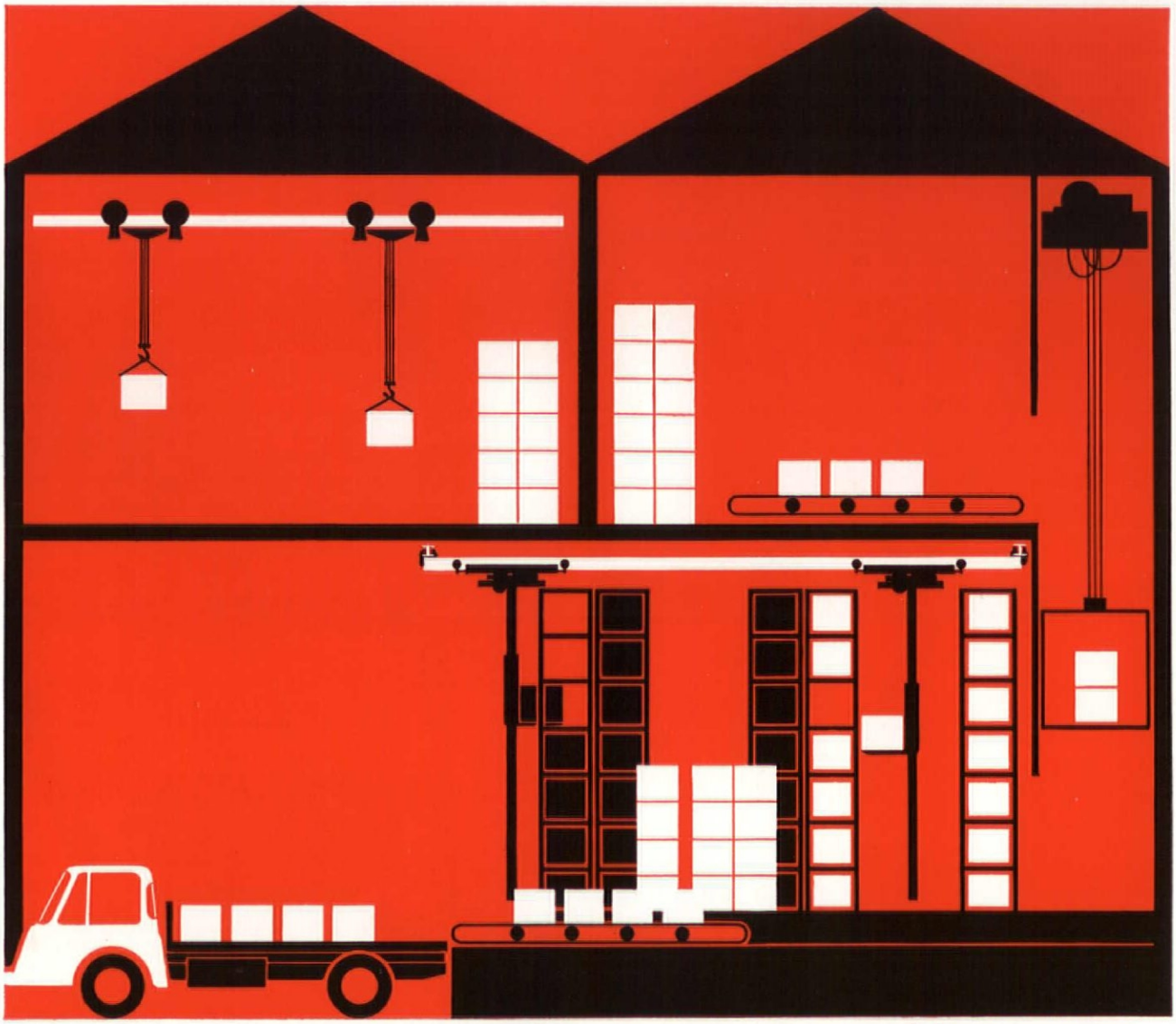
AP218



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Lumenated Ceilings offer a standard range, and design and manufacture any type of ceiling to special requirements. Heating, ventilation and sprinkler outlets can be incorporated. Ceilings can be integrated with demountable partitioning. Advisory Service. Please write for full information.

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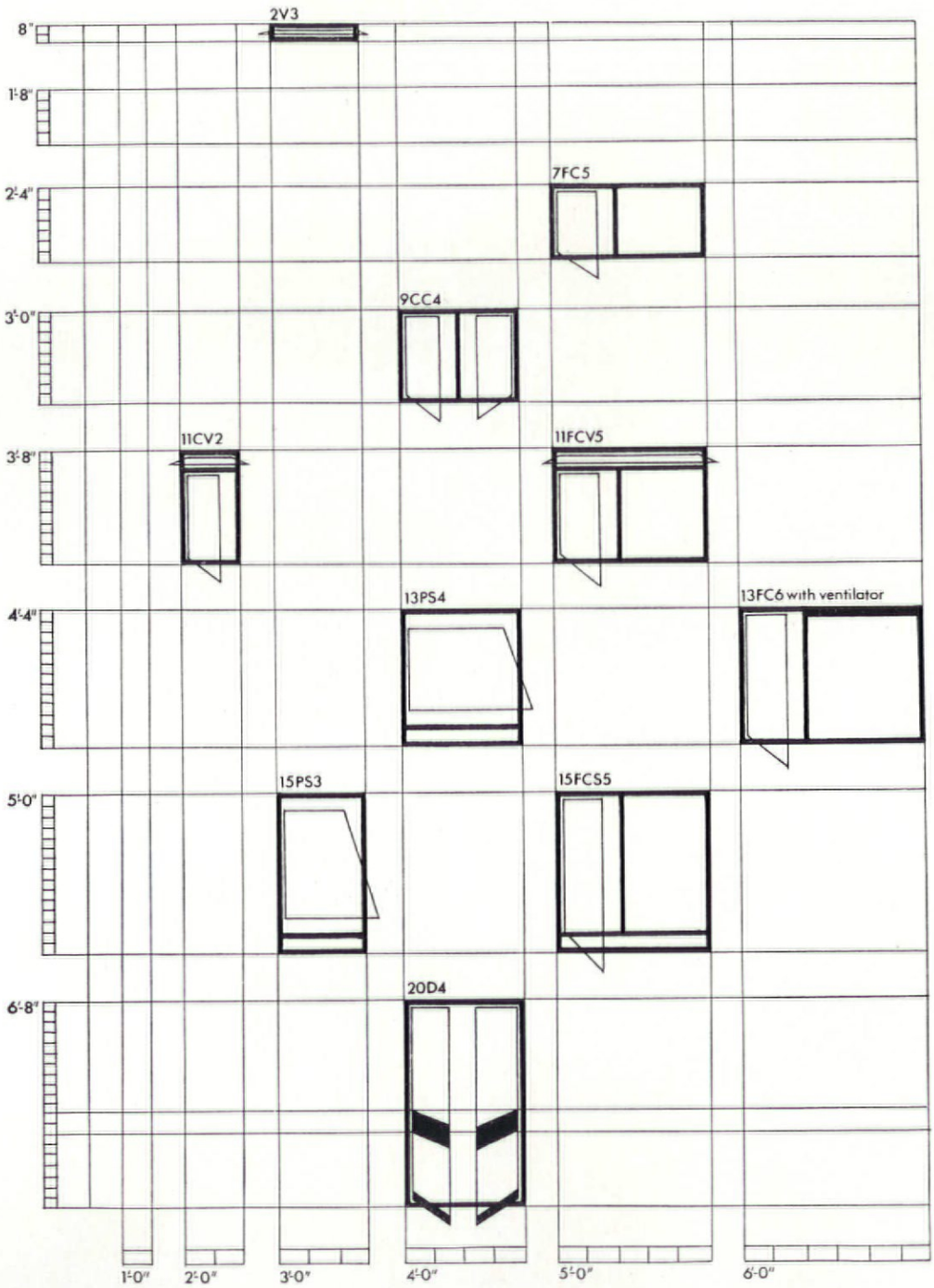


Now modular co-ordination comes to standard steel windows!

It's the new Module 4 Range

What's new about the Module 4 Range brought out by the Metal Window Association? It's new in that it is modular, conforming to DC1 and DC2 recommendations. There are new shapes. New designs. 135 basic types with coupling members, to give an almost infinite number of combinations.

Tough, rust-free, low-cost. Nowadays standard steel windows have some potent advantages. They're tough. Hot-dip galvanizing keeps them rust-free. Once painted they do not need washing or other maintenance. The whole range can now be weather-stripped to conserve heat.

February 1965 is the first delivery date. So you can start specifying them now. If you would like to know more about the Module 4 Range, write for a data sheet.

The Metal Window Association Ltd., Dept. No. **J.3** Burwood House, Caxton Street, London, S.W.1

MODULE 4

N.B. The Module 4 Range conforms to the 1962 RIBA Council Recommendation on the use of the 4 in 10 cm module for industrially produced building components as described in RIBA Industry Note 3.

AND NOW! GLASTOGLAS – A NEW TYPE OF 'INSULIGHT' DOUBLE GLAZING UNIT



FOR MODERN WINDOWS SPECIFY THE NEW 'INSULIGHT' GLASTOGLAS OR 'INSULIGHT' MK VI METAL EDGE

With the addition of the new Glastoglas unit to the Mk VI metal-edge Pilkingtons make their "Insulight" range of double glazing units today's most up-to-date, with the most efficient type of units for all sizes of window, for repetition work in stock sizes or for the "one-off" special window.

THE NEW GLASTOGLAS UNIT IN STOCK SIZES FOR EASY FITTING

The new Glastoglas unit is constructed by a method which has proved its advantages and reliability over ten years of use in the United States. Two panes of 24 oz. sheet glass are spaced at a nominal 3/16 inches and the edges are fused together to make a permanent seal. The result is that the unit is one continuous piece of glass—sealed for life. No special frames are needed. It fits most standard single-pane type frames (minimum rebate depth 7/16 inches). No special glazing techniques are needed either. Glastoglas units will be available from stock in a range of sizes from 10″ x 16″ to 32″ x 38″ and 18″ x 39″ to 50″ x 70″. Purpose-made units can be made when a minimum quantity of 200 units of the same size is required. Please submit enquiries.

MK VI METAL EDGE FOR LARGE SIZES AND PURPOSE-MADE UNITS

For sizes larger than 50″ x 70″, for one-off purpose-made windows where the added clarity of Float or Plate glass is required, or where the added strength of thicker glass is needed specify the "Insulight" Mk VI metal edge. These are made by special techniques, which Pilkingtons have developed, to give a triple seal and have a metal-sheathed edge to give complete protection. Mk VI units are available up to a maximum superficial area of 88 square feet in 1/4 inch Float or in larger sizes in 3/8 inch Clear Plate.

Mk VI units, which are purpose-made to individual order, can also be supplied with combinations of specialised glasses, e.g. incorporating "Antisun" heat-absorbing glass or various types of obscured glass.

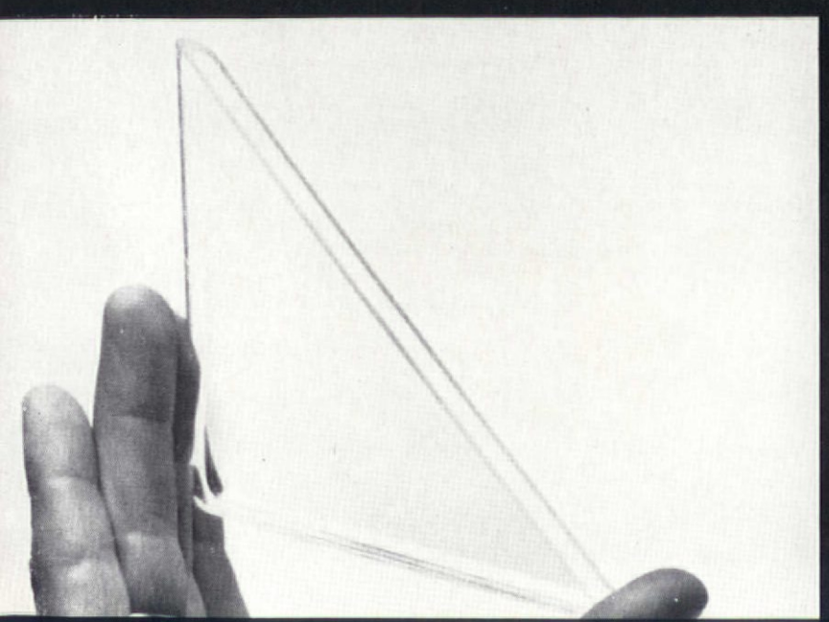
Both types of unit are efficient insulators. Glastoglas has a nominal 'U' value of 0.62 Btu and Mk VI units have values down to 0.52 Btu, dependent on the width of air space. For full technical details and any guidance needed on the selection of types for a particular use please telephone or write to your nearest Pilkington office or depot.

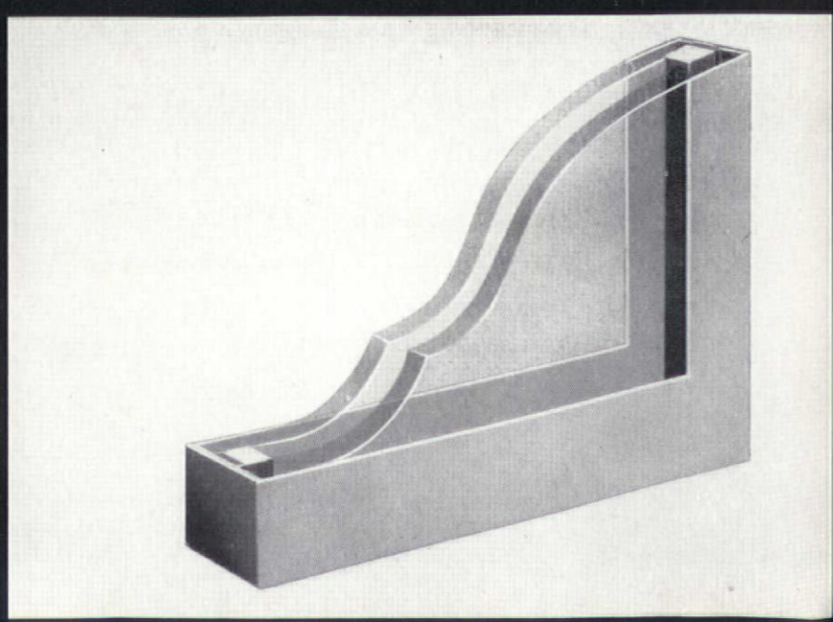
"Insulight" is a registered trade mark of Pilkington Brothers Limited. Supplies will be available through the usual trade channels.

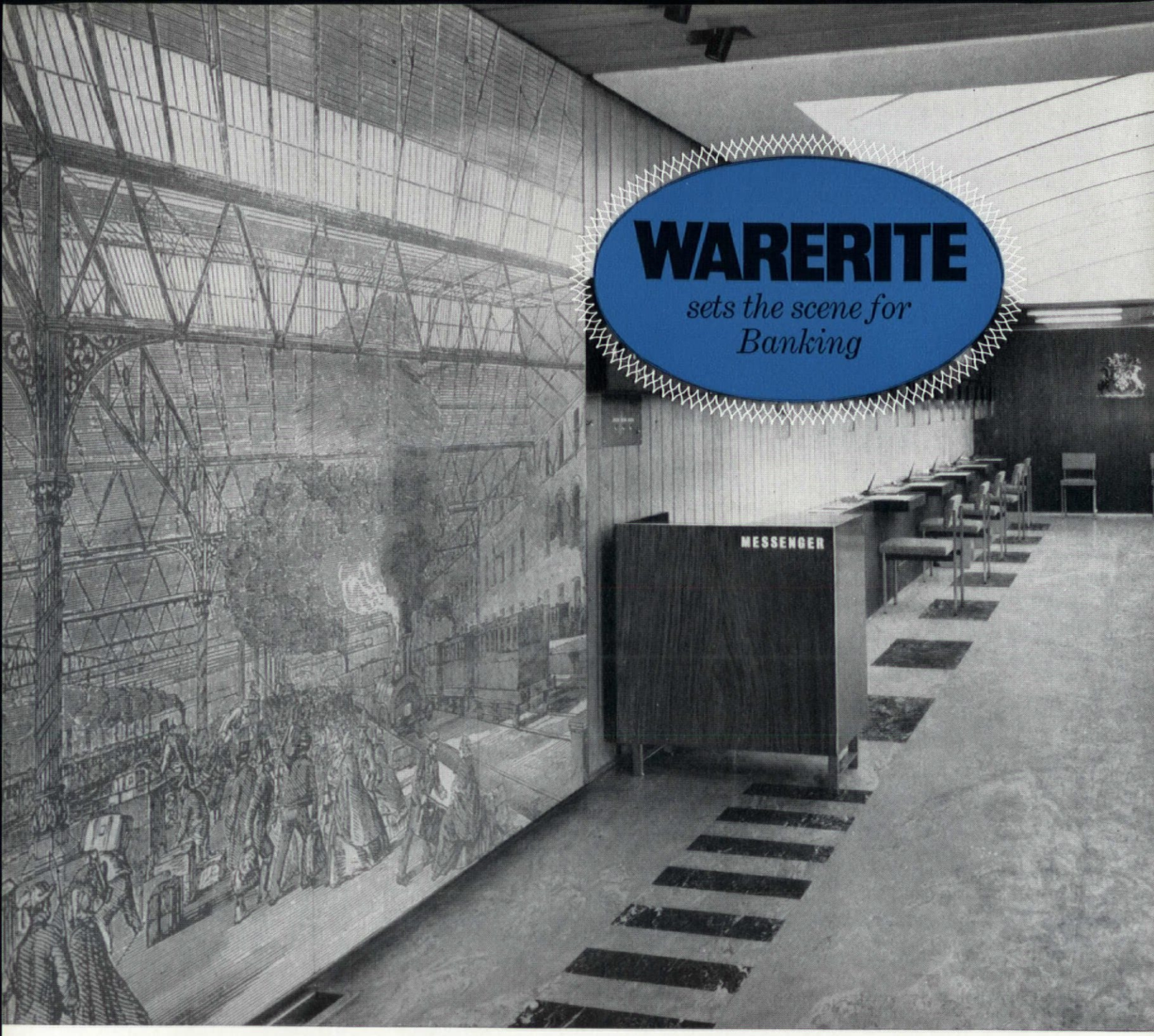
PILKINGTON BROTHERS LIMITED

St. Helens, Lancashire Telephone St. Helens 28882

London Office & Showrooms: Selwyn House, Cleveland Row, St. James's, SW1 Tel: WHItehall 5672







This mural in Lloyds Bank, Victoria, has been given permanence and protection against wear and tear. It is incorporated in WARERITE laminate. The smooth, super-hard melamine surface will keep it looking clean and attractive for many years to come. Any design, mural or photograph can be incorporated in WARERITE. Full information can be obtained from our Special Design service.

For originality of decor combined with resistance to hard wear, choose WARERITE—the surface that looks after itself!

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Descriptive literature is available from WARERITE Distributors or from Bakelite Limited.

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W345/1

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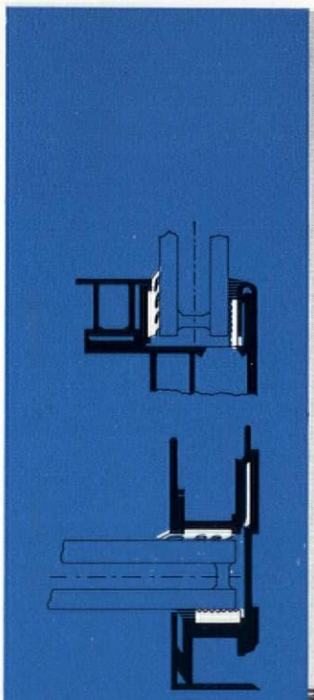
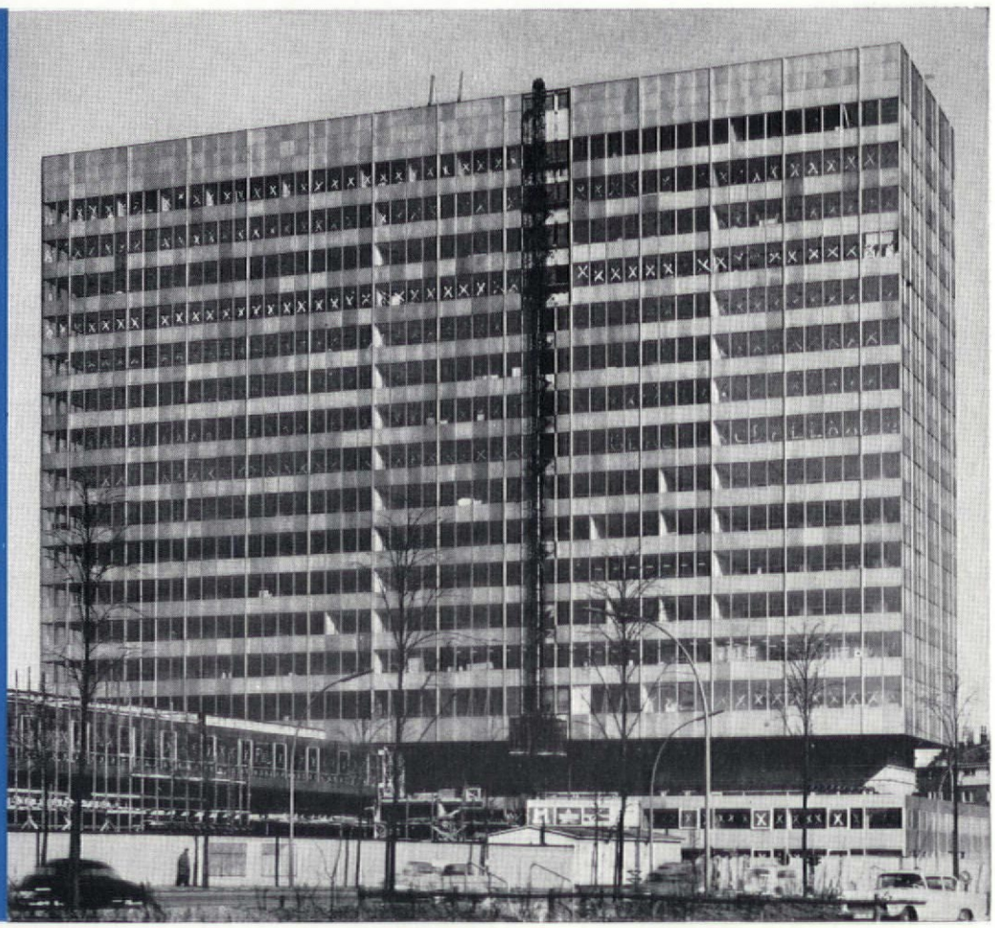
This prominent new administration building in Hamburg is permanently sealed against the weather with 85,000 feet of Neoprene gasketing. Even with its 2,000 windows, the 18-storey 'Deutscher Ring' can withstand wide variations in temperature because Neoprene seals let both metal and glass expand and contract freely. For the architect, preformed gaskets made with Neoprene provide a design freedom unhampered by gasket considerations, and a neat finished appearance. For the contractor, they mean easy installation. For the client, they save construction time and material, and they require no maintenance during the life of the building. For a seal that won't crack, dry out, harden, soft or set, architects throughout the world are specifying Neoprene—the synthetic rubber which is highly resistant to sunlight, oxygen, ozone and ageing. To find out more about these versatile, permanent building gaskets, just complete and post the coupon below—or look at file No. 384 in the Barbour Index.



MULLION SECTIONS
Neoprene gaskets are shown in white



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AD12/64

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"TURNALL" Asbestos Ceiling Panels

Symbol Nos.: PCIB. 21 (Plain) PCIB. 121 (Perforated)

"TURNALL" Asbestos Ceiling Panels are manufactured from the same material as the well established IB. 121 "TURNALL" Asbestos Insulation Board. They are ideal for ceilings in almost any type of building, but are especially suitable for offices, shops, schools, domestic housing and hospitals. Intended primarily for suspended ceilings, they can also be easily fixed direct to the undersides of floors and roofs.

"TURNALL" Asbestos Ceiling Panels are light yet strong, non-combustible, durable and economical. When used with glass-fibre or mineral wool a very high degree of acoustic control can be achieved, a fact confirmed by official tests (see below).

Full details of "TURNALL" Asbestos Ceiling Panels (Plain and Perforated) are available in T.A.C. Publication B.103. Data Sheet B.C.S.5 gives details of Patterned Perforated and Striated Ceiling Panels.

Specification

COMPOSITION: Asbestos fibre and Portland cement.

MATERIAL CLASSIFICATION: Non-combustible in accordance with B.S.476/53, "Fire Tests on Building Materials and Structures", and manufactured in accordance with B.S.3536/62, "Asbestos Insulating Boards and Asbestos Wallboards."

STANDARD SIZES PLAIN: 2 ft × 2 ft, 2 ft × 2 ft 8 in., 2 ft × 3 ft, 2 ft × 4 ft, 3 ft 4 in. × 3 ft 4 in. and 4 ft × 4 ft.

PERFORATED: 2 ft × 2 ft.

THICKNESSES: $\frac{3}{8}$ in. and $\frac{1}{2}$ in.

DIMENSIONAL TOLERANCES:

Length + 0 in. — $\frac{1}{16}$ in. Width + 0 in. — $\frac{1}{16}$ in. Thickness + 0·05 in. — 0·05 in.

THERMAL CONDUCTIVITY: 0·80 Btu in/ft² h deg F.

MODULUS OF RUPTURE: 1,300 lb/in². with grain, 1,500 lb/in². across grain.

DECORATION: Water based paints may be directly applied, without prior treatment. Chlorinated rubber based paints may be applied without priming, gloss paints however require suitable priming.

Sound Absorption

The following details form an extract from the National Physical Laboratory's Report on "The Measurement by the Reverberation Method of the Sound Absorption Coefficients of "TURNALL" Asbestos Ceiling Panels (Perforated) S.1397/58." Copies of the complete test are available on request.

Materials as tested (special 10 ft × 10 ft in area).

"TURNALL" Asbestos Ceiling Panels 24 in. sq. by $\frac{3}{8}$ in. thick, perforated $\frac{3}{16}$ in. dia. holes at $\frac{1}{2}$ in. centres.

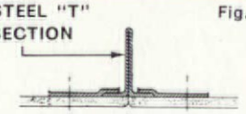
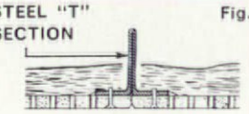
1. Panels on 1 in. thick bitumen-bonded glass-fibre mat on 2 in. by 2 in. vertical battens at 24 in. centres on wall.
2. Panels with backing layer of 0·045 in. asbestos paper on 2 in. by 3 in. thick vertical battens at 24 in. centres on wall.

Reverberation Absorption Coefficients (to nearest 0·05) for frequency bands in region (c/s)

	125	250	500	1000	2000	4000
1.	0·15	0·40	0·80	0·60	0·25	0·15
2.	0·15	0·55	0·45	0·20	0·20	0·40

Fire Protection

Figs. 1-4 show the periods of fire protection which are afforded by "TURNALL" Ceiling Panels when used with or without glass-fibre or mineral wool backing.

1 hour's protection	2 hours' protection
STEEL "T" SECTION Fig. 1  $\frac{3}{8}$" "TURNALL" ASBESTOS CEILING PANEL (PLAIN)	STEEL OR ALUMINIUM "T" SECTION Fig. 3  $\frac{3}{8}$" "TURNALL" ASBESTOS CEILING PANEL (PLAIN)
STEEL "T" SECTION Fig. 2  $\frac{3}{8}$" "TURNALL" ASBESTOS CEILING PANEL (PERFORATED)	STEEL OR ALUMINIUM "T" SECTION Fig. 4  $\frac{3}{8}$" "TURNALL" ASBESTOS CEILING PANEL (PERFORATED)

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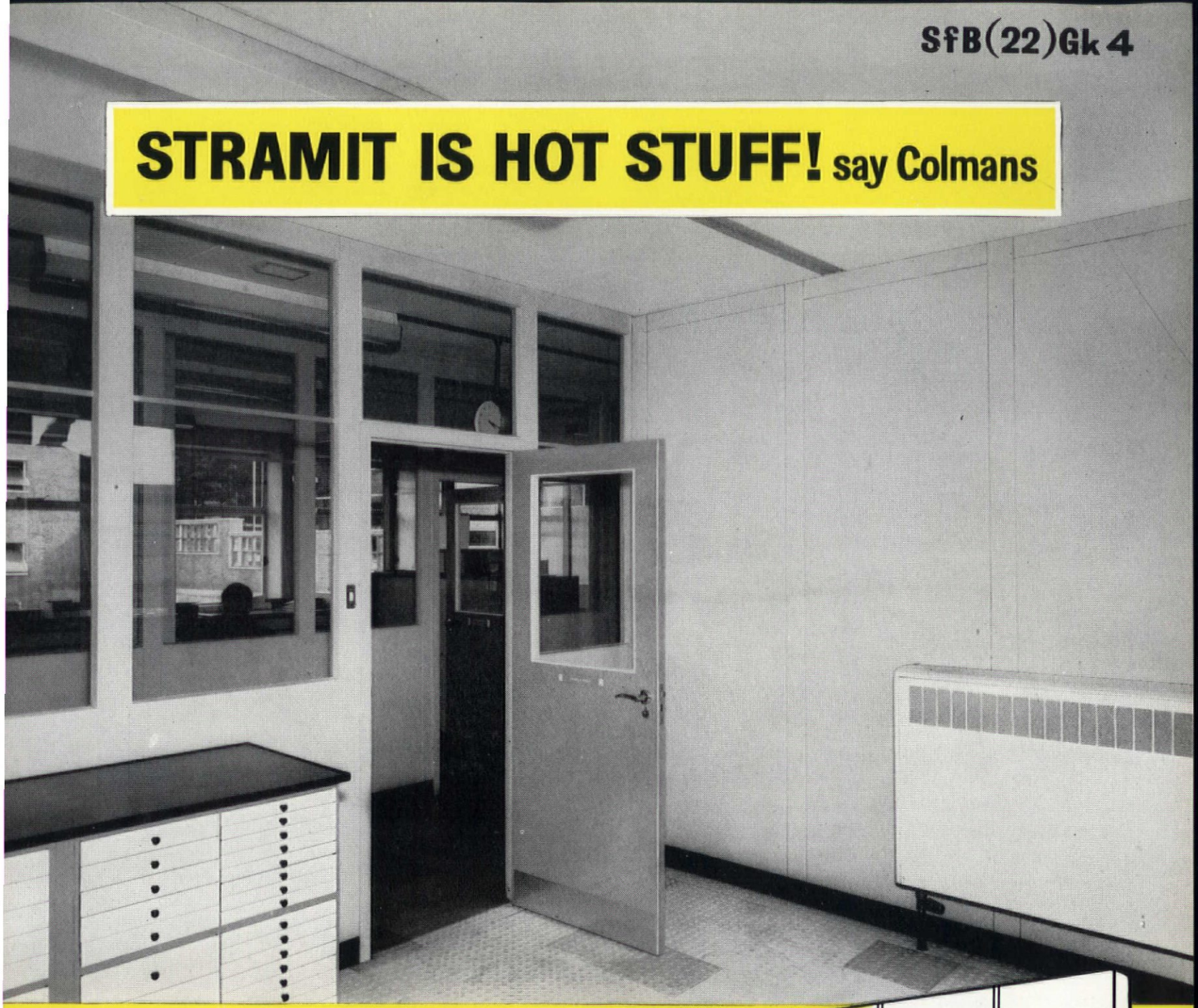
Barbour Index File No: 415
Gorco Bureau File No: 16/2

STRAMIT IS HOT STUFF! say Colmans



When Colmans, of mustard fame, installed office partitioning in their new cereal department at Norwich, they chose Stramit "Movaflush"—for obvious reasons. As manufacturers of high-quality products only the best quality partitioning was good enough for them. By specifying Stramit they ensured that these light, airy offices would also possess a high degree of thermal and acoustic insulation as well as a high resistance to spread-of-flame in the event of fire. By specifying Stramit "Movaflush" they also ensured that the partitions could be easily dismantled and re-erected to suit future accommodation requirements.

Stramit "Movaflush" partitioning is made up from unit panels each of which is composed of Stramit framed on all edges with timber and faced on both sides with $\frac{1}{8}$" thick first-quality hardboard. Vertical edge-timbers are grooved to ensure strong connections, and all hardboard edges are bevelled to form a neat V-joint finish.

The hardboard provides an ideal surface for whatever form of decoration is required. Gaily decorated, or softly blended into the existing colour scheme, Stramit "Movaflush" partitions can be as attractive or as unobtrusive as you wish them to be.

STRAMIT 'MOVAFLUSH'

-THE EASY-TO-ERECT PARTITION

Ask for Technical Brochure STC 1004 (or see Barbour Index File 225: Gorco Section 21/7)

STRAMIT BOARDS LTD.

COWLEY PEACHEY, UXBRIDGE, MIDDX.

Telephone: West Drayton (WE3) 3751 (10 lines)

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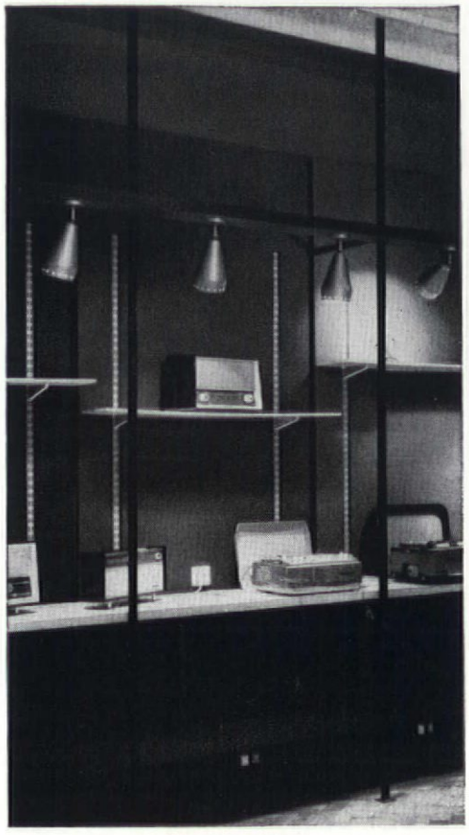
Here's an architect who's designing a room with SPUR. And there's plenty of room for designing—with SPUR, the precision-built shelf support. Finished in Willow Grey or Frost White, all-steel SPUR is happy with any decor, and never out of place in any situation.



SPUR is one of the neatest shelving systems there is. A few SPUR steel uprights fitted to a wall, several cantilever brackets which slip into any of the slots on the uprights—and that's all there is to it. But that's a lot in terms of shelf space. And it takes a lot in terms of weight.

Take a ward, a library, a laboratory. Take a showroom, a storeroom, an offbeat boutique or a new-town departmental, take any room, with any amount of room —or practically none at all and SPUR gives that room loads of shelf space for loads of things—whatever their shape, whatever their size, whatever their weight. For SPUR fits in comfortably-anywhere. Become shelf-interested in **SPUR**

Please send me information on SPUR. **SAVAGE & PARSONS LTD, WATFORD, HERTFORDSHIRE. WATFORD 26071**

NAME

COMPANY

ADDRESS

5123

BUILT-UP FELT ROOFING

by

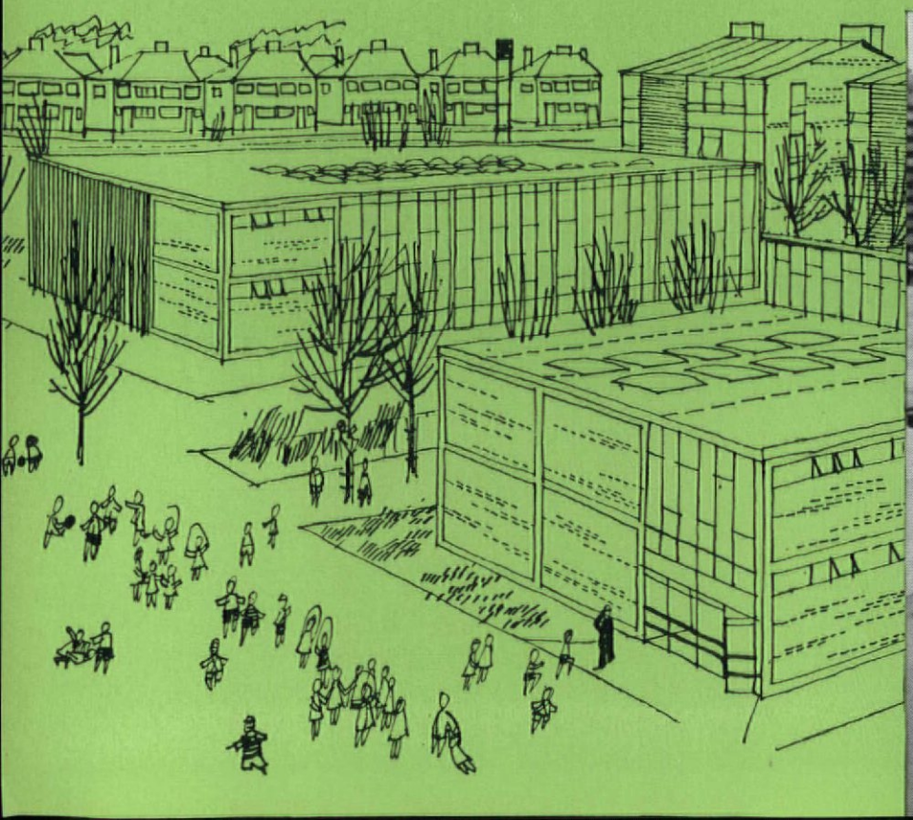
PERMANITE

WITH LIGHTWEIGHT INSULATING DECKS

PERMANITE Built-up Felt Roofing Systems incorporating Woodwool or 'Stramit' decks meet the modern demand for economical, lightweight insulated roofs.

For further information and technical literature write to the Head Office of Permanite Limited, 455 Old Ford Road, London, E.3.

PERMANITE LIMITED, based on LONDON, BIRMINGHAM, MANCHESTER & PORTSMOUTH



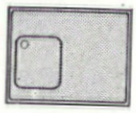




18/8 Stainless Steel Sinks & Worktops

Unrivalled Design, Range, Price

TYPE A



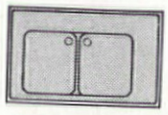
Ref A8(L)



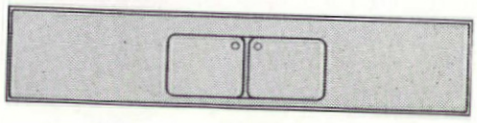
Ref A16(R)

Ref.	Length (ft ins)	Bowl size (ft ins) length × width × depth	Prices each for various widths* 2/0⅜ & 1/11⅝	1/10½ & 1/9⅝	1/7¾
A8	2/7½	11¾ × 1/1⅜ × 6	£7 10 0	£7 5 0	£7 0 0
A10	3/3⅝	11¾ × 1/1⅜ × 6	£8 4 0	£7 18 0	£7 10 0
A12	3/11¼	11¾ × 1/1⅜ × 6	£9 4 0	£9 0 0	£8 9 0
A12X	3/11¼	1/3¾ × 1/1⅜ × 6	£9 10 0	£9 4 0	£8 14 0
A14	4/7⅛	1/3¾ × 1/1⅜ × 6	£10 15 0	£10 0 0	£9 6 0
A16	5/3	1/3¾ × 1/1⅜ × 6	£11 10 0	£10 13 0	£10 3 0
A18	5/10⅞	1/3¾ × 1/1⅜ × 6	£11 17 0	£11 10 0	£10 15 0

TYPE B



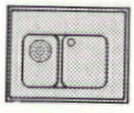
Ref B10(L)



Ref B30(R)

B10	3/3⅜	2/3½ × 1/3¾ × 6	£11 0 0	£10 13 0	£10 7 0
B12	3/11¼	2/3½ × 1/3¾ × 6	£12 0 0	£11 14 0	£11 5 0
B14	4/7⅛	2/3½ × 1/3¾ × 6	£12 15 0	£12 10 0	£11 10 0
B16	5/3	2/3½ × 1/3¾ × 6	£13 12 0	£13 5 0	£12 15 0
B18	5/10⅞	2/3½ × 1/3¾ × 6	£14 10 0	£14 2 0	£13 10 0
B20	6/6¾	2/3½ × 1/3¾ × 6	£15 10 0	£15 0 0	£14 5 0
B22	7/2⅝	2/3½ × 1/3¾ × 6	£16 15 0	£16 8 0	£15 5 0
B24	7/10½	2/3½ × 1/3¾ × 6	£18 0 0	£17 10 0	£16 10 0
B26	8/6⅜	3/4⅛ × 1/3¾ × 7	£23 0 0	£22 15 0	£21 15 0
B28	9/2¼	3/4⅛ × 1/3¾ × 7	£24 10 0	£24 0 0	£22 5 0
B30	9/10⅛	3/4⅛ × 1/3¾ × 7	£25 10 0	£25 0 0	£23 15 0

TYPE C



Ref C8(L)

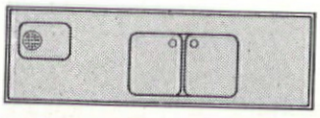


Ref C20(R)

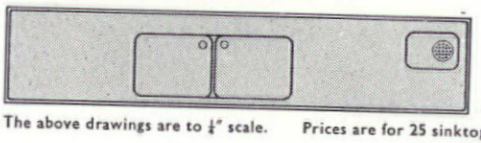
C8	2/7½	11¾ × 1/1⅜ × 6	£9 16 0	£9 12 0	£9 6 0
C10	3/3⅝	11¾ × 1/1⅜ × 6	£10 10 0	£10 3 0	£9 12 0
C12	3/11¼	11¾ × 1/1⅜ × 6	£11 5 0	£11 0 0	£10 10 0
C12X	3/11¼	1/3¾ × 1/1⅜ × 6	£11 10 0	£11 5 0	£10 15 0
C14	4/7⅛	11¾ × 1/1⅜ × 6	£12 2 0	£11 17 0	£11 5 0
C14X	4/7⅛	1/3¾ × 1/1⅜ × 6	£12 8 0	£12 3 0	£11 10 0
C16	5/3	1/3¾ × 1/1⅜ × 6	£13 2 0	£12 15 0	£12 5 0
C18	5/10⅞	1/3¾ × 1/1⅜ × 6	£14 5 0	£13 5 0	£13 0 0
C20	6/6¾	1/3¾ × 1/1⅜ × 6	£15 0 0	£14 15 0	£13 18 0
C20S	6/6¾	1/1⅜ × 1/3¾ × 6	£16 5 0	£16 0 0	£15 3 0
C22S	7/2⅝	1/1⅜ × 1/3¾ × 6	£17 12 0	£17 3 0	£16 7 0
C24S	7/10½	1/1⅜ × 1/3¾ × 6	£18 15 0	£18 5 0	£17 10 0

The slop sink on C8–C20 is 9¼ × 1/1⅜ × 7¼, on C20S–C24S it is 11⅜ × 1/3¾ × 7¼ and on these three models is always to the left of the main bowl.

TYPE D



Ref D20(L)



Ref D30(R)

D20	6/6¾	2/3½ × 1/3¾ × 6	£19 2 0	£18 12 0	Type D is in widths of 2/0⅜ and 1/9⅝.
D22	7/2⅝	2/3½ × 1/3¾ × 6	£20 7 0	£20 0 0	
D24	7/10½	2/3½ × 1/3¾ × 6	£21 12 0	£21 2 0	
D26	8/6⅜	3/4⅛ × 1/3¾ × 7	£26 12 0	£26 7 0	
D28	9/2¼	3/4⅛ × 1/3¾ × 7	£28 2 0	£27 12 0	
D30	9/10⅛	3/4⅛ × 1/3¾ × 7	£29 2 0	£28 12 0	

The above drawings are to ¼" scale. Prices are for 25 sinktops delivered to a London address. Rinsing bowls to partly cover the Type C slop sinks are available.

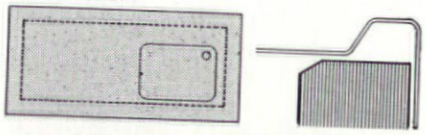
Design
Evolved in Sweden over decades ensuring excellent appearance, coupled with ideal functioning, ease of installation, and sound, rational construction. Surfaces are flat for better hygiene, appearance and useful work-space. Outlet is backset giving improved cupboard space below sink. Surface cannot chip; withstands heat up to 800°C; is kind to crockery, and quiet due to complete undersealing. Fabricated from 18/8 Swedish stainless steel, 19-20 SWG, and equipped with 1½" BS outlet, stainless steel chain, plug and overflow. Tapholes provided if required at no extra cost.

Ranges of Sizes*
Over 400 models, from 2/6 to 10/0, available in five widths (widths 1/11⅝ & 1/10½, minimum quantity 75).

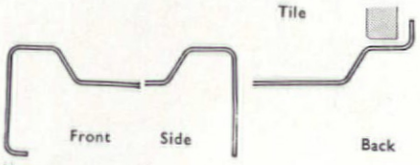
Exceptionally Low Prices
Approximate Examples:
3/3 × 1/8 sink with rectangular bowl £7 10 0.
5/3 × 1/8 sink with rectangular bowl £10 0 0.
10/0 × 2/0 sink with double bowl only £25 100.
Quantity Guide:
100 sinktops, listed price minus approx. 15%.
5 sinktops, listed price plus approx. 20%.

© GEC ANDERSON LIMITED JAN 64

Installation
Requires perimeter support only, giving easiest possible installation and cabinet construction.



Edge details, shown below ½FS, are designed to ensure proper installation. The side detail can be supplied at the back on request.



Uses
Wash and worktops in kitchens; for home, restaurants, hospitals, schools and the distributive trades.

Specials & Worktops
Other standard types and combinations are available and any special sink top can be made to order.

Tops without bowls, for use as worktops are also available.

Properties
Unaffected by all normal household chemicals and foodstuffs.

Bowls
All sizes of bowls, with flat rims, are available separately.

Delivery
8-12 weeks according to quantity.

Ordering
Please state:
1 Quantity and Ref.
2 Bowl Position (where applicable): Left (L), Middle (M), Right (R).
3 Width required.
4 Tapholes (to B.S. or your specification).

Example
Required: 28 sinktops 5/3 long by 2/0⅜ wide with single bowl on the right, without tap holes.
Order: 28 A16 (R) 2/0⅜ wide.

Further Details
For additional information please contact:
GEC Anderson Limited
Drawings showing principles of cupboard design are available, and 1" scale drawings of sinktops are prepared for enquiries relating to a specific project.

G E C Anderson Ltd

89 Herkomer Road Bushey Watford Hertfordshire BUShey 1826

KENCO



The long-life polyester range

The long-life polyester range has a finish that adds a touch of luxury and gives a scratch and acid resistant surface that stays bright and shining without polishing! What's more, the entire units, *inside and out*, have this long-life polyester finish.

The new 'Royal' Range

The new 'Royal' range has the same polyester finish, but it has in addition the attraction of cross-rails in natural polished beech. All three finishes are available in a wide range of harmonising colours. Words alone can never do justice to the polyester and 'Royal' ranges—you *must* see their high-gloss finishes for yourself. Plan your dream kitchen *today*.

★ *Sturdy construction from ¾" laminated blockboard and finest seasoned timber ensures maximum strength and durability.*

★ *Only special, water-resistant glues are used in the construction of these units.*

★ *All doors in cellulose range are available with either plain or attractive reeded finish.*

★ *All cabinets are finished in white. Drawer fronts and doors available in white, cream, blue, yellow, red, green, turquoise, coffee, grey and black. Also in combinations of these colours.*

★ *Recessed construction gives adequate knee and toe room—ensures comfortable working conditions.*

★ *All sinks units are approximately 36" high and can be supplied complete with 'Leisure' or other top-quality sink tops in vitreous enamel or stainless steel.*

For further information:

COOKLIN KITCHEN FITMENTS LIMITED

GREAT WESTERN TRADING ESTATE · PARK ROYAL ROAD · NW10

64 DESIGNS



FOR '64 DESIGNERS

Today's leading designers know the value and appeal of stainless steel sinks and more than ever are specifying from the "PLAND" range—it's so comprehensive! There are 64 sizes and designs in the domestic range alone while our commercial range is equally vast. The right sink for every kitchen is detailed in the "PLAND" catalogues—make sure you have them at your elbow by sending us your name and address.

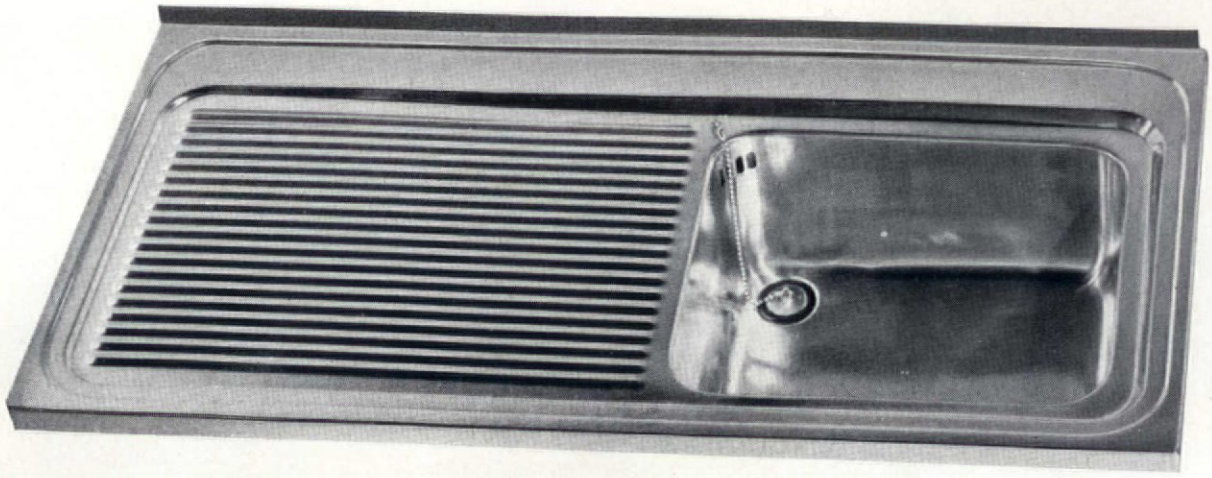
PLAND

(REG. TRADE MARK)

THE STAINLESS STEEL SINK CO. LTD

Head Office: Ring Road, Lower Wortley, Leeds 12

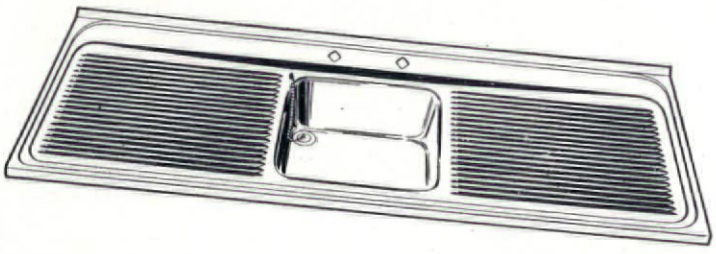
Phone: Leeds 630494



Type ERO.3S 42" x 21" single drainer, handed

Olofström

A COMPLETELY NEW RANGE OF SINK TOPS FROM SCANDINAVIA



Type ERO.3S 63" x 21" double drainer

a wide range of further designs will shortly be available

- In bright high-grade stainless steel (18% chromium, 8% nickel), and incorporating all that is clean, attractive and efficient in Scandinavian design.
- All bowls die-drawn from one-piece stainless steel, with outlets in back corners to give more room for plumbing and cupboards etc.
- Strong and rigid. No wooden frames needed. The multi-grooved drainers give added strength and resistance to surface damage.
- All sinks made to standard U.K. specified sizes, and fitted with standard British waste and chromium-plated chains and plugs.
- Special satin finish, supplied with removable plastic film to give protection during delivery and installation.
- Fully sound-proofed by a thick layer of tough plastic foam sprayed on all undersides.

Olofström

FROM SWEDEN'S LARGEST MANUFACTURERS

The manufacture of stainless steel products by Svenska Stålpressnings AB (the Pressed Steel Company of Sweden), makers of the Olofström range, is based on more than 30 years' experience. The Company pioneered the manufacture and the eventual standardization of stainless steel sinks in Sweden, where it is now the largest as well as the longest-established manufacturer in this field.

Further details from : Sole stockists and distributors in the U.K.

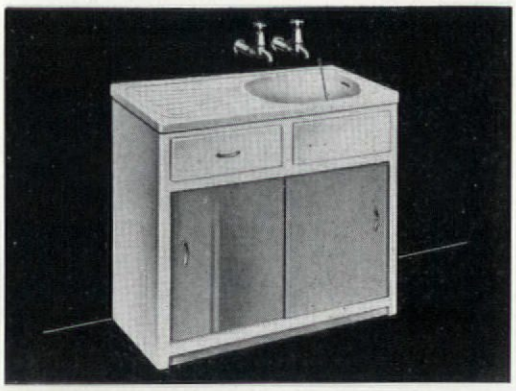
INTERNATIONAL MARKETING DIVISION
OVERSEA BUYERS LIMITED

Monotype House
Fetter Lane, London, E.C.4 · Telephone: Fleet Street 0701

1	2
3	4
5	6
7	8
9	10

Sanitary Fireclay Technical Bureau (1) (2)
57 George Street, Leeds 1

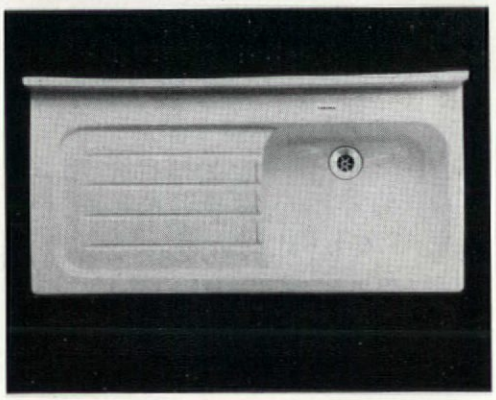
Members
Adamsez Ltd.
Doulton Sanitary Potteries Ltd.
Wm. Harriman & Co. Ltd.
J. & R. Howie Ltd.
Johnson Fireclay Co. Ltd.
S.G.B. (Dudley) Ltd.
Shanks & Co. Ltd.
Shaw Knight & Co. Ltd.
Shaws Glazed Brick Co. Ltd.
John Slater Stoke Ltd.
Southhook Potteries Ltd.
Steel Bros. & Sons Ltd.
Twyfords Ltd.
Valson Enamelled Sanitary Fireclay Co. Ltd.
Porcelain Ceramic Glazed Sinks. Available in 5 Colours
Single Drainer
Size 18″ × 30″ × 9½″
„ 18″ × 36″ × 9½″
„ 18″ × 42″ × 9½″
„ 21″ × 42″ × 9½″
Double Sink
Size 18″ × 36″ × 10″
„ 21″ × 42″ × 10″
„ 21″ × 48″ × 10″
Double Drainer
Size 21″ × 42″ × 9½″
„ 18″ × 48″ × 9½″
„ 21″ × 48″ × 9½″

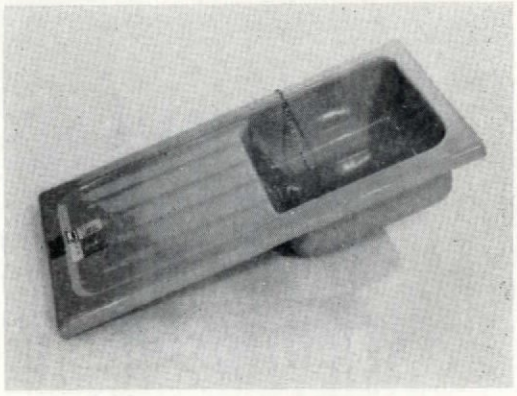




Sarena Sinks Ltd. (3) (4)
39–57 Islington Park Street
London N.1. Tel.: Canonbury 3333

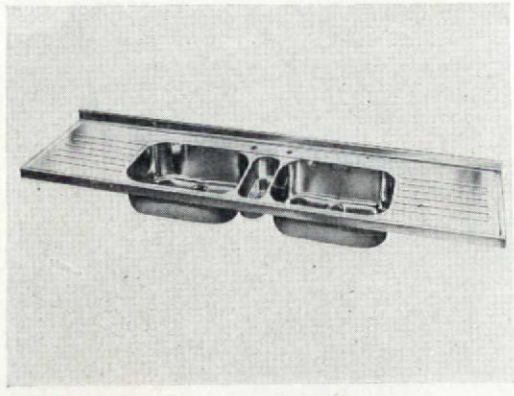
Laminated Plastic Reinforced with Glass Fibre
Colours: White, Cream, Powder Blue
Single Drainer
Size 18″ × 36″ Bowl 13½″ × 15″ × 7½″
„ 18″ × 42″ „ 13½″ × 18″ × 7½″
„ 21″ × 42″ „ 13½″ × 18″ × 7½″
Double Bowl
Size 18″ × 54″ Bowl 14″ × 20″ × 8½″
and 14″ × 12″ × 8½″
Double Drainer
Size 21″ × 63″ Bowl 14½″ × 18″ × 7½″
„ 18″ × 54″ „ 13½″ × 18″ × 7½″

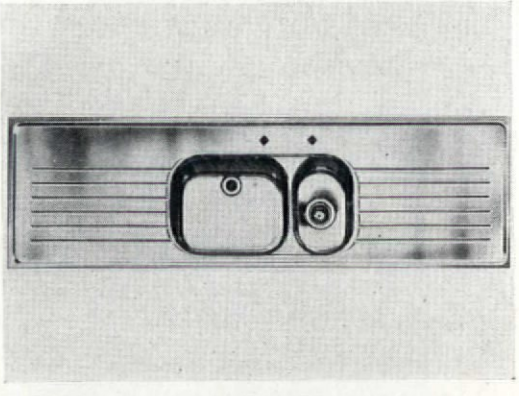




The Stainless Steel Sink Co. Ltd. (5) (6)
Ring Road, Lower Wortley, Leeds 12
Tel.: Leeds 63–8711

Single Drainer
Size 18″ × 36″ Bowl 14″ × 17″ × 7″ Wt. 13½lb.
„ 18″ × 42″ „ 14″ × 17″ × 7″ „ 15½lb.
„ 21″ × 42″ „ 14″ × 20″ × 7″ „ 16½lb.
„ 21″ × 42″ „ 15″ × 21″ × 8″ „ 17½lb.
Single Bowl Double Drainer
Size 18″ × 54″ Bowl 14″ × 17″ × 7″ Wt. 20lb.
„ 18″ × 63″ „ 14″ × 20″ × 7″ „ 22lb.
„ 21″ × 54″ „ 14″ × 17″ × 7″ „ 20lb.
„ 21″ × 54″ „ 14″ × 20″ × 7″ „ 21lb.
„ 21″ × 63″ „ 14″ × 20″ × 7″ „ 23½lb.
„ 21″ × 63″ „ 15″ × 21″ × 8″ „ 24lb.
„ 21″ × 72″ „ 14″ × 20″ × 7″ „ 27lb.
„ 21″ × 72″ „ 15″ × 21″ × 8″ „ 28lb.
Double Bowl Sinks
Single Drainer. Extra Bowl 14″ × 9″ × 7″
Size 21″ × 54″ Bowl 14″ × 17″ × 7″ Wt. 28lb.
„ 21″ × 54″ „ 14″ × 20″ × 7″ „ 29lb.
„ 21″ × 63″ „ 14″ × 20″ × 7″ „ 32lb.
Double Drainer
Size 21″ × 72″ Bowl 14″ × 17″ × 7″ Wt. 34lb.
„ 21″ × 72″ „ 14″ × 20″ × 7″ „ 35lb.
„ 21″ × 84″ „ 14″ × 20″ × 7″ „ 39lb.
Double Bowl Double Drainer
Size 21″ × 72″ Bowl 14″ × 17″ × 7″ Wt. 36lb.
„ 21″ × 84″ „ 14″ × 20″ × 7″ „ 43lb.
„ 21″ × 96″ „ 15″ × 21″ × 8″ „ 53lb.
Slop Bowl Sets
Size 21″ × 42″ Bowl 14″ × 17″ × 7″ Wt. 23lb.
and 14″ × 5″ × 5″
Double Drainer
Size 21″ × 63″ Bowl 15″ × 21″ × 8″ Wt. 34lb.
and 14″ × 5″ × 5″
Double Bowl Double Drainer
Size 21″ × 84″ Bowl 15″ × 21″ × 8″ Wt. 46lb.
and 14″ × 5″ × 5″





Twyfords Ltd. (7) (8)
Stoke-on-Trent, Staffs.
Tel.: Stoke-on-Trent 23411

Enamelled Fireclay
3 Colours Available
Size 18″ × 36″ Bowl 13″ × 17″ × 7½″
„ 21″ × 42″ „ 14″ × 20″ × 8½″

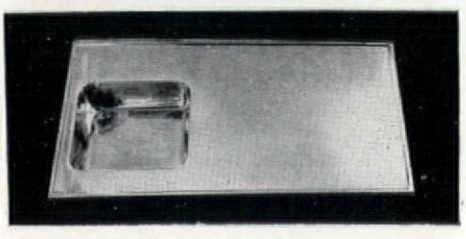


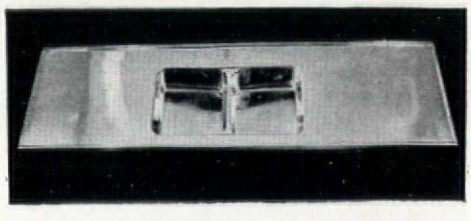


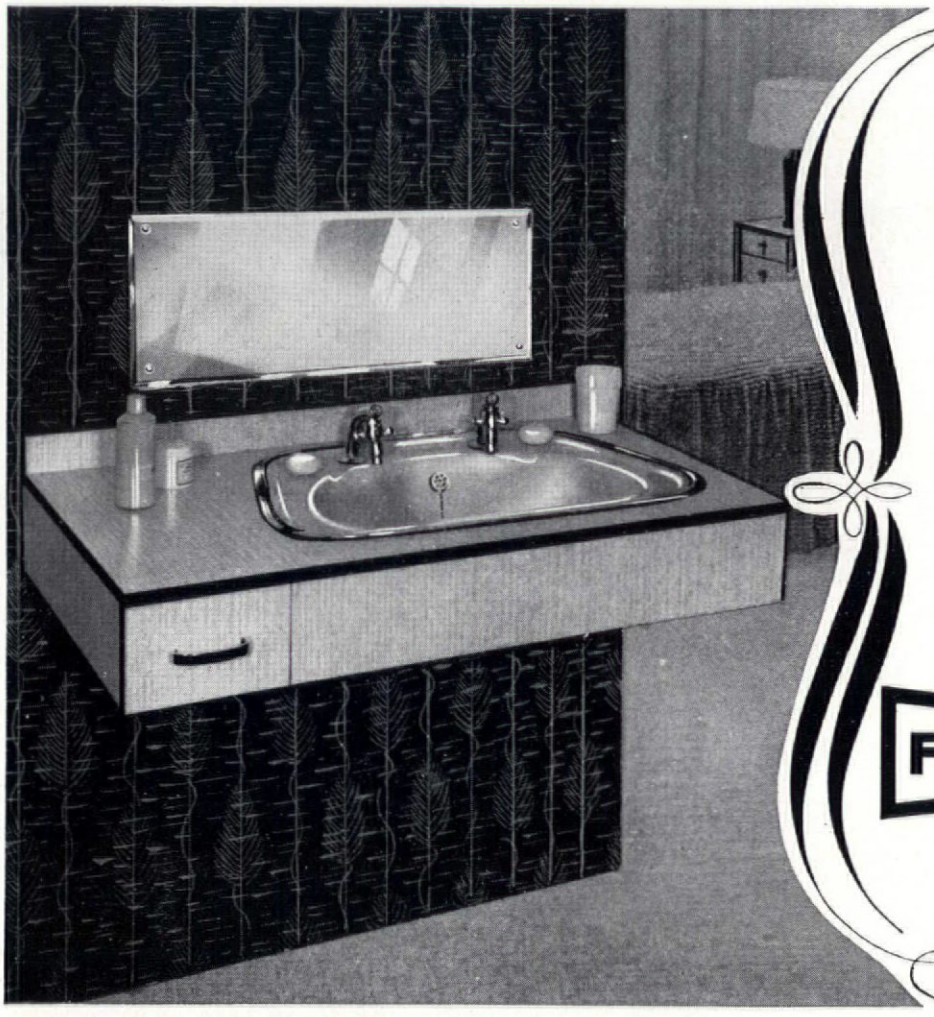
Late Entry

G.E.C. Anderson Ltd. (9) (10)
89 Herkomer Road, Bushey, Watford
Herts. Tel.: 1826

Stainless Steel
Surfaces are flat
Over 400 models from 30″ to 120″ available in five widths, 23¾″, 22½″.
Bowl sizes 11¾″ × 13¾″ × 6″
15¾″ × 13¾″ × 6″
27½″ × 15¾″ × 6″
40⅛″ × 15¾″ × 7″
Single and double drainer available
Also with slop sinks
Backset Stainless Steel Outlet and 1½″ BS Tail
Seamless corners to top; continuously welded-in bowls; Satin finish
Prices include complete undersealing, overflow, bowl outlet in stainless steel, plug and stainless steel chain. Bowls only with flat or domed flanges are available for building into formica tops. Any make of taps and traps can also be supplied.

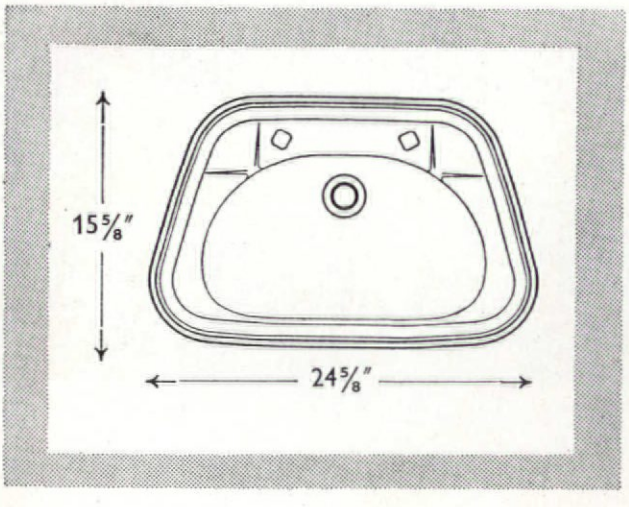






Basins for vanitory units by

FISHOLOW



SPECIALLY DESIGNED for flush fitting, the modernly-styled Fisholow Basin is ideal for Vanitory Unit installations in bathrooms, bedrooms, cloakrooms etc.

Available in either white, cream, green, blue, primrose, turquoise or coral pink vitreous enamel, and surrounded by a polished stainless steel fixing rim, the basins have integral overflows and can be pierced either 4″ or 8″ centres for pillar or mixer taps.

Overall Dimensions 15⅝″ × 24⅝″.

Supplied complete with template, polished stainless steel surround, sealing strip, cam-action clamp assemblies, chainstay assembly and installation instructions, all packed in a strong cardboard carton. External measurements 25″ × 17″ × 9″. **Price £5.15.0**

Barbour Index File No. 227

FISHER & LUDLOW LTD (Dept TD) · BIRMINGHAM 24

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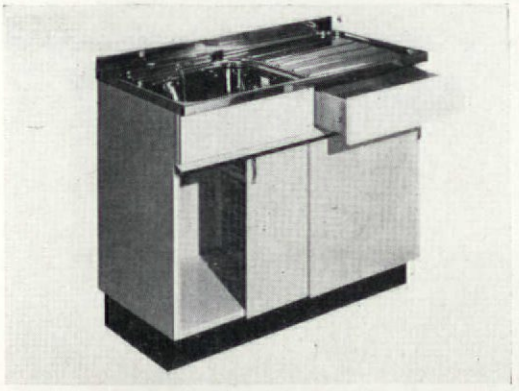
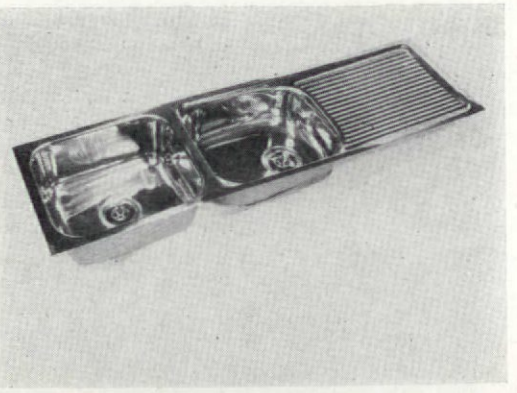
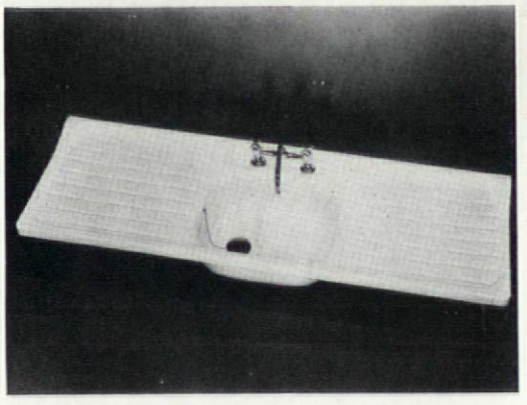
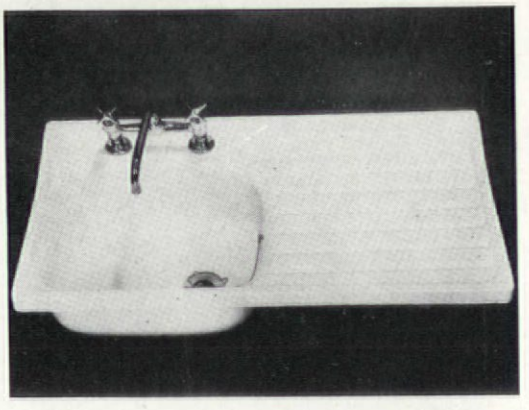
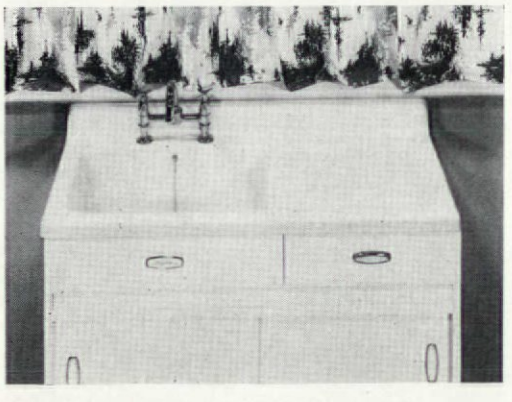
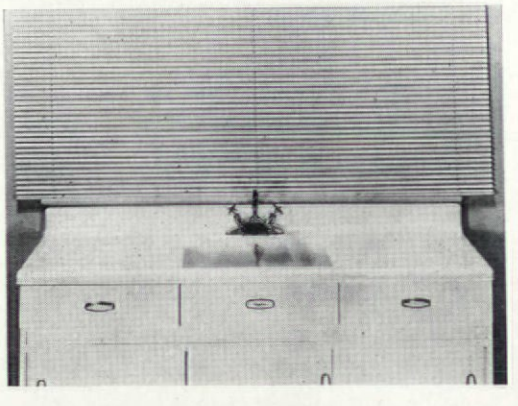


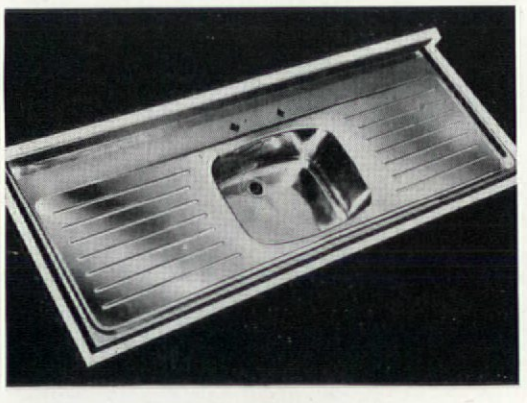


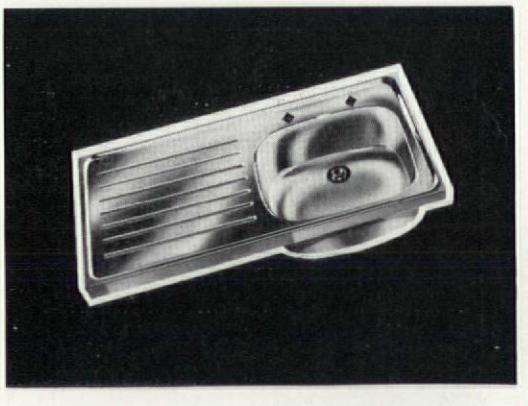


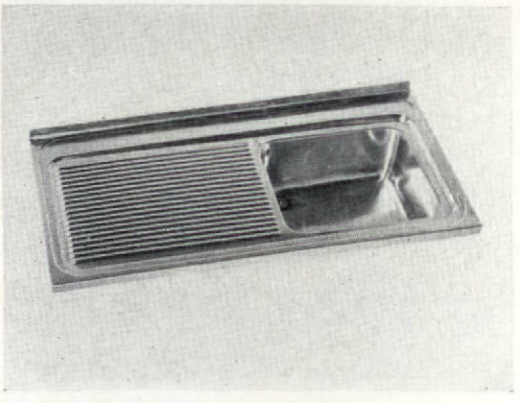


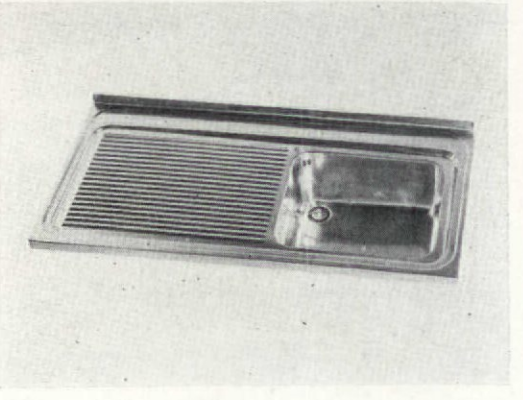












English Rose Kitchens Ltd. (1) (2)
Warwick. Tel.: Warwick 41221

Stainless Steel or Vitreous Enamel
Sizes 21″ × 42″, 63″, 84″
Bowls 18½″ × 14½″ × 7″ Stainless Steel
,, 18½″ × 15″ × 7⅞″ Vitreous Enamel
Twin Bowl 16″ × 14″ × 7″ Stainless Steel each Bowl

Fisher & Ludlow Ltd. (3) (4)
Albion Works, Birmingham 24
Tel.: Erdington 2141

Stainless Steel, Multifluted
Single Drainer

Size 18″ × 42″	Wt. 12½lb.	Bowl	15″ × 18½″ × 7⅞″
,, 21″ × 42″	,, 13½lb.	,,	15″ × 18½″ × 7⅞″
,, 18″ × 36″	,, 10lb.	,,	13⅜″ × 16¼″ × 6⅜″

Double Drainer

Size 18″ × 63″	Wt. 17½lb.	Bowl	15″ × 18½″ × 7⅞″
,, 21″ × 63″	,, 18½lb.	,,	15″ × 18½″ × 7⅞″

Sink and Worktop

Size 18″ × 63″	Wt. 20lb.	Bowl	15″ × 18½″ × 7⅞″
,, 21″ × 63″	,, 23lb.	,,	15″ × 18½″ × 7⅞″
,, 18″ × 54″	,, 18lb.	,,	13⅜″ × 16¼″ × 6⅜″

Twin Sinks

Size 18″ × 72″	Wt. 20lb.	Bowl	13⅜″ × 16¼″ × 6⅜″
,, 18″ × 84″	,, 25lb.	,,	15″ × 18″ × 7⅞″
,, 21″ × 84″	,, 27lb.	,,	15″ × 18½″ × 7⅞″

Twin Bowl Single Drainer
Size 18″ × 54″ Wt. 16lb. Bowl 14″ × 16″ × 7″
Vitreous Enamel
White and Cream
Single Drainer

Size 18½″ × 36″	Wt. 20lb.	Bowl	14″ × 17″ × 7⅛″
,, 21″ × 42″	,, 28½lb.	,,	15″ × 18½″ × 7⅞″
,, 18½″ × 36″	,, 20lb.	,,	17″ × 17½″ × 7⅛″
,, 18″ × 42″	,, 22lb.	,,	15″ × 18½″ × 7⅞″

Double Drainer
Size 21″ × 63″ Wt. 38lb. Bowl 15″ × 18½″ × 7⅞″

Ideal Standard Ltd. (5) (6)
Ideal Works, Hull, Yorks.

Porcelain Enamel on Rigid Cast Iron. 3 Colours Available
Sizes 21⅜″ × 42″ Bowl 15½″ × 20½″ × 8½″
,, 21⅜″ × 63″ ,, 15½″ × 20½″ × 8½″

Harold Moore & Son Ltd. (7) (8)
Bailey Works, Bailey Street
Sheffield 1. Tel.: 27311
Moorecraft

Acrylic Sinks. Available in 4 Colours
Single Drainer

Size 18″ × 36″	Bowl	12½″ × 16″ × 7″	Wt. 8lb.
,, 21″ × 42″	,,	14″ × 19½″ × 7″	,, 11lb.

Double Drainer
Size 18″ × 54″ Bowl 14½″ × 17″ × 7″ Wt. 10lb.
Double Bowl Sink
Size 21″ × 42″ Bowl 14″ × 17¾″ × 7″ Wt. 16lb.
Maid Stainless Steel

Size 18″ × 36″	Bowl	13½″ × 15½″ × 7″	Wt. 16lb.
,, 18″ × 42″	,,	13″ × 19″ × 7″	,, 19lb.
,, 21″ × 42″	,,	13″ × 19″ × 7″	,, 22lb.
,, 21″ × 54″	,,	13″ × 19″ × 7″	,, 29lb.

Double Drainer
Size 21″ × 63″ Bowl 13″ × 19″ × 7″ Wt. 29lb.

International Marketing Division (9) (10)
Oversea Buyers Ltd.
Monotype House, Fetter Lane, London, E.C.4
Tel.: Fle 0701

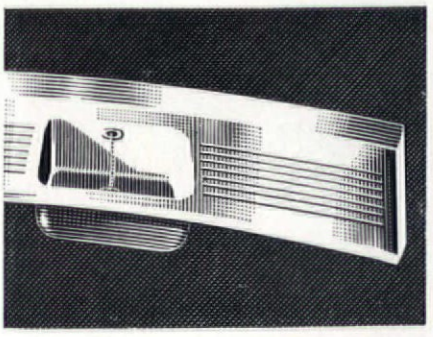
Stainless Steel. Satin finish
Size 21″ × 42″ Bowl 15⅜″ × 13½″ × 7″
,, 21″ × 63″ ,, 15⅜″ × 13½″ × 7″
Other sizes to complete the range will shortly be available.
Sound proofing—thick layer of tough foamed plastic on underside.



We can make a sink to fit your shape!

This is the bowl of a Leisure sink tailored to your specification. The next step will be to form the draining surface to the required size and shape. Leisure sinks are made from stainless steel or vitreous enamelled steel. Your particular shape may well be one of the many standard Leisure models. Why not find out? For ready-made or purpose-built sinks write to Allied Ironfounders Ltd., Leisure Division, Nottingham Road, Long Eaton, Nottingham.

This is how your shape in our sink might well look, when it is finished.



LEISURE SINKS BY **ALLIED IRONFOUNDERS**

ad

The second of four supplements on the kitchen

Sinks

SfB (73)

UDC

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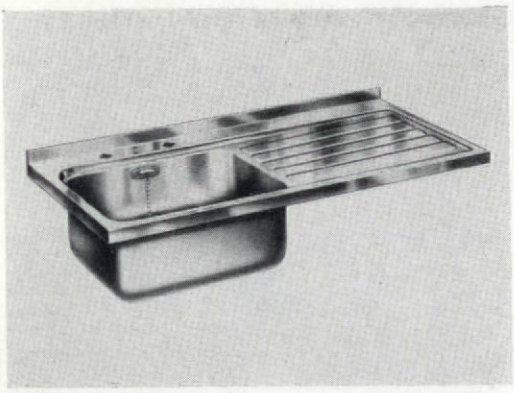
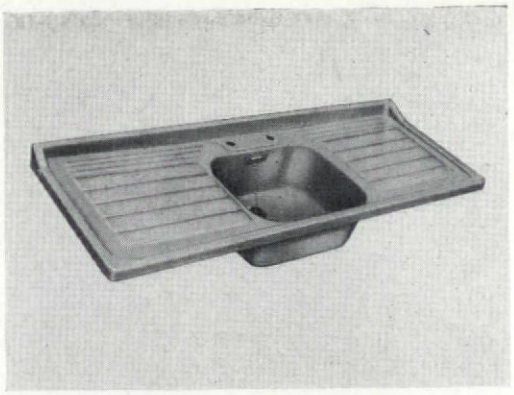
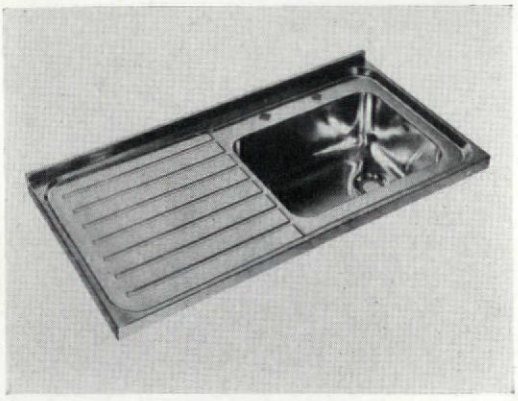
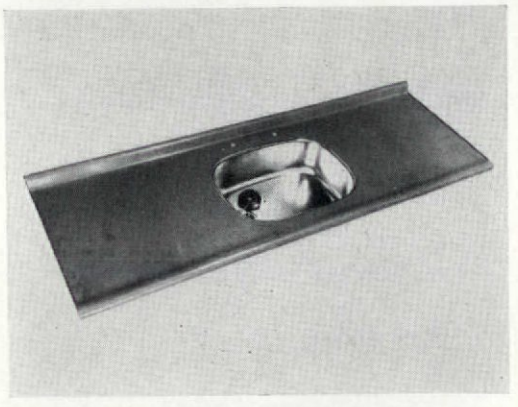


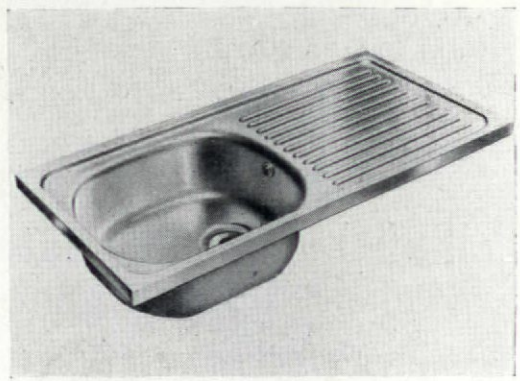














Allied Ironfounders Ltd. (1) (2)
Leisure Kitchen Equipment Ltd.
Nottingham Road, Long Eaton, Nottingham
Tel.: Long Eaton 4141

Stainless Steel
Single Drainer
Size 21″ × 42″ Bowl 18½″ × 15″ × 8″
,, 18″ × 36″ ,, 16″ × 12″ × 7″
,, 18″ × 42″ ,, 18½″ × 15″ × 8″
,, 18½″ × 30″ ,, 15″ × 14″ × 7″
,, 18½″ × 36″ ,, 15″ × 14″ × 7″
,, 18½″ × 42″ ,, 18½″ × 15″ × 8″
,, 18½″ × 48″ ,, 18½″ × 15″ × 8″
Double Drainer
Size 21″ × 63″ Bowl 18½″ × 15″ × 8″
,, 18″ × 54″ ,, 18½″ × 14″ × 7″
,, 18½″ × 63″ ,, 18½″ × 15″ × 8″
,, 18″ × 36″ ,, 15″ × 14″ × 7″
,, 18″ × 42″ ,, 15″ × 14″ × 7″
,, 18″ × 48″ ,, 15″ × 14″ × 7″
,, 18″ × 54″ ,, 15″ × 14″ × 7″
,, 18″ × 60″ ,, 15″ × 14″ × 7″
,, 18″ × 66″ ,, 15″ × 14″ × 7″
,, 18″ × 72″ ,, 15″ × 14″ × 7″
,, 18″ × 48″ ,, 18½″ × 15″ × 8″
,, 18″ × 54″ ,, 18½″ × 15″ × 8″
,, 18″ × 60″ ,, 18½″ × 15″ × 8″
,, 18″ × 66″ ,, 18½″ × 15″ × 8″
,, 18″ × 72″ ,, 18½″ × 15″ × 8″
Twin Bowl Single Drainer
Size 21″ × 63″ Bowl 18″ × 15″ × 8″
Tub 18½″ × 15″ × 14″
Vitreous Enamel
Single Drainer
Size 18″ × 36″ Bowl 16″ × 12″ × 7″
,, 18½″ × 42½″ ,, 20″ × 16½″ × 7″
,, 21″ × 42″ ,, 20″ × 15″ × 8″
Double Drainer
Size 18″ × 54″ Bowl 18½″ × 14″ × 7″
,, 21″ × 63″ ,, 20″ × 15″ × 8″

Cooklin Kitchen Fitments Ltd. (3) (4)
Great Western Trading Estate
Park Royal Road, London N.W.10
Tel.: Elgar 2306

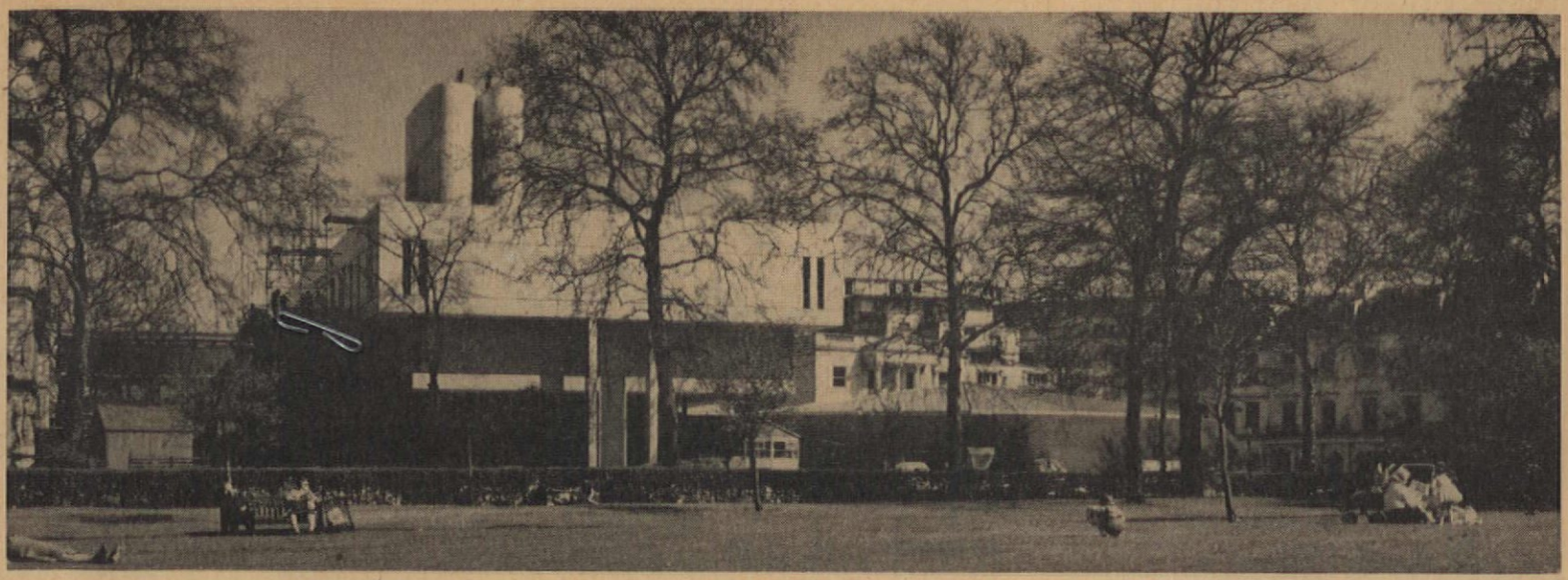
Leisure or any other top quality sink top

Dahl Brothers Ltd. (5) (6)
22 Replingham Road, London S.W.18
Tel.: Van 4377

Stainless Steel, Plastic Composition. Sound Deadening.
Formica Tops in All Colours
Stainless Steel Top
Size 18″ × 36″ Bowl 16″ × 13½″ × 7″
,, 21″ × 42″ ,, 19″ × 13½″ × 7″
,, 21″ × 63″ ,, 19″ × 13½″ × 7″
,, 21″ × 84″ ,, 16″ × 13½″ × 7″
(Double)
Bowls
Size 17½″ × 15″ × 6½″ Single
,, 17½″ × 17½″ × 6½″ ,,
,, 20½″ × 15″ × 6½″ ,,
,, 34½″ × 15″ × 6½″ Double
,, 34½″ × 17½″ × 6½″ ,,
,, 41″ × 15″ × 6½″ ,,

Easidene Porcelain Enamel (1938) Ltd.
Woden Road, Wolverhampton (7) (8)
Tel.: 24973

Stainless Steel or Vitreous Enamel
Sizes 18″ × 36″, 42″, 54″
,, 21″ × 42″, 54″



1

UK news

Terence Bendixson

Physicians

The staff in the hall of Denys Lasdun's Royal College of Physicians building **1** in Regent's Park, London, say they have to keep polishing nose prints off the glass of the front doors. The curiosity of the public is so great that they stand outside in rows peering in. Bus loads of art students arrive unannounced. The College looks as though it will become another Leicester Engineering Laboratories. The quality of the building is very impressive—real Rolls Royce work. In the hall white Sicilian marble, white porcelain mosaic, polished bronze and gold carpet create an air of cool richness. Lasdun says the three main exterior materials, exposed concrete, mosaic and pure Baggeridge bricks indicate the three themes of the College: the service elements are in concrete, the unchangeable and ceremonial in mosaic, and the adaptable in brick.

Women and columns

Last month it was women and bricks. This month it is women and columns. Arup Associates' building for graduate students at Somerville College, Oxford **2**, has a structural frame 2ft proud of the exterior walls. Sometimes the columns fall between rooms, sometimes in the middle of them. The architects say the structure sprang partly from a desire to have full height windows. This made horizontal fire breaks necessary. It also enabled rain water to be collected at every floor and provided full access for maintenance. In fact the white, bush-hammered, precast concrete frame has an appropriate feminine softness to it. The pity is that an inept old chapel obscures the sight of it on the quadrangle side.

Leicester plan

Leicester is the first city in Britain to produce a policy plan based on home interviews and traffic counts projected with help of a computer. It is also the first to say no to the motor car scientifically. The essential part of the traffic solution is interchange carparks straddling the radials **4**, in which visitors to the town drop their cars and go on by fast bus, electric 'rickshaw' or monorail. (City Planning Officer W. K. Smigielski is quite honest about the monorail being a gimmick. He sees it as giving the plan a psychological fillip.) The reduction in road capacity resulting from the interchanges **3** makes it possible to have a ring motorway mostly of dual two-lane size. Full motorization would have made dual seven- or eight-lane roads necessary. Quite an extensive network of paths has also been worked out.

King's Lynn plan

King's Lynn is a very difficult kettle of fish. Here Norfolk County Council has done what in France, Malraux, the Minister of Culture, has to do—step in to preserve an important small town. Thank God centralization has not yet gone that far in Britain. But nor has the future of other towns such as Alnwick or Conway been assured. Elizabeth Chesterton (Leonard

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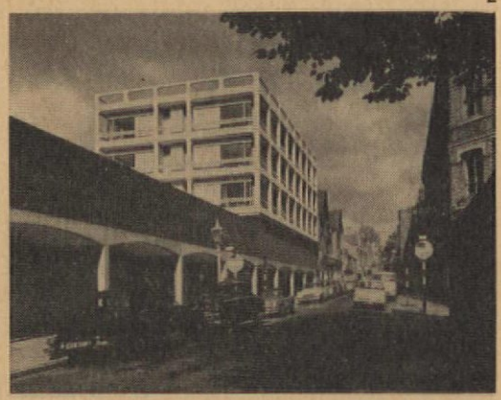

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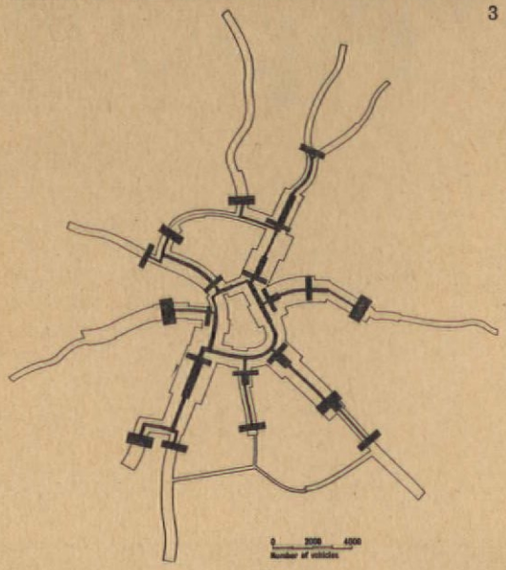

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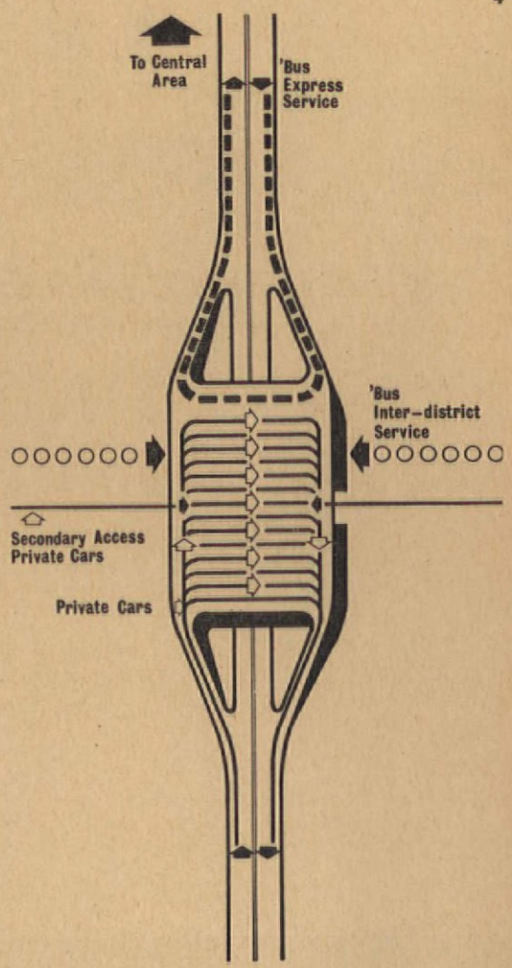


3
Total predicted flows of traffic to inner Leicester 1995 and the effect of interchange car parks

4
Transport interchange car park for Leicester

newmans cable gear

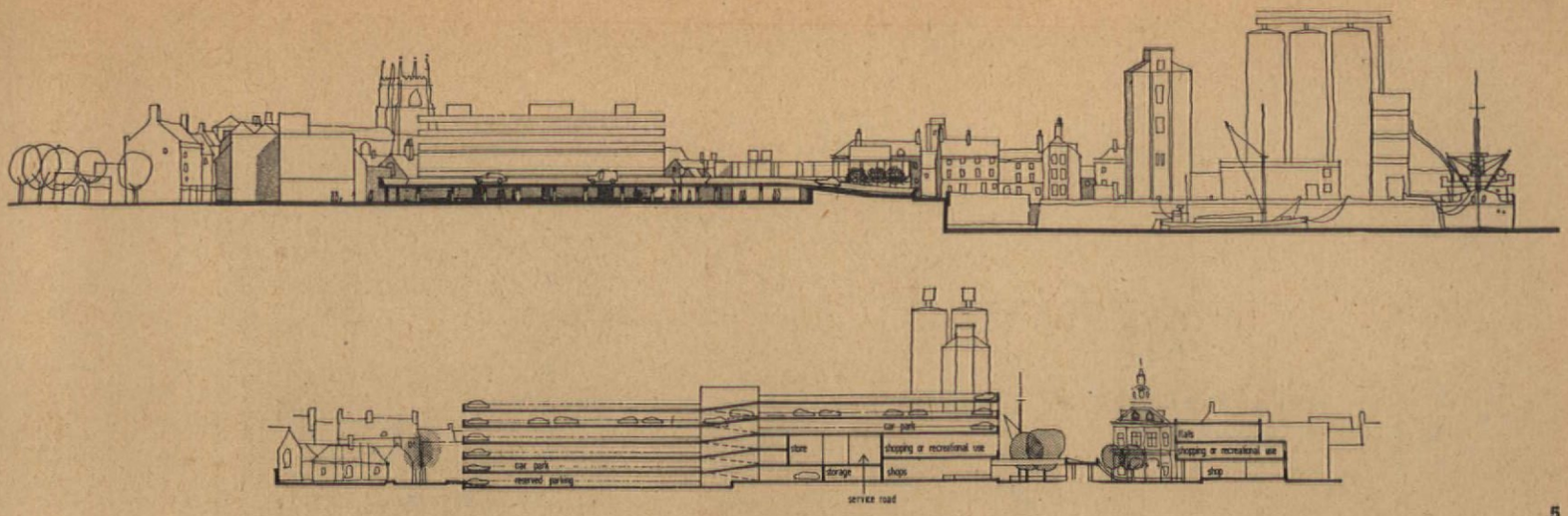


newflex

Newflex is an entirely new type of cable gear incorporating a unique swivelling thrust design that ensures a direct thrust on the windows throughout the opening cycle.
Neat in appearance and efficient in operation Newflex is designed to operate up to 4 lights from 1 gear box, giving an opening of 9". It is also suitable for louvres and window ventilators. A simple flip over cable release allows the window to be quickly detached for cleaning. Newflex is manufactured by Newmans, specialists in window control for more than half a century.

William Newman & Sons Ltd., Wellhead Lane, Birmingham, 22B

NEWMANS



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Manasseh's planning associate) has changed the ring road proposed for King's Lynn in the county development plan for a pincer road **6**. She has surveyed and noted what is of visual importance and made the point that 'in this town, more important than many of its individual buildings is the sequence of spaces that they define'. This opens up the way to large-scale proposals for new water front houses and multi-storey garages **5**. Feasibility, as in so many of our national plans, depends on economic growth, in this case due to be generated by expansion under the Town Development Act.

The planning world

Other planning events: Arthur Ling's appointment as master planner at Runcorn New Town; a ministerial suggestion to expand Basildon beyond 106,000; and a total ban of office building in the London conurbation.

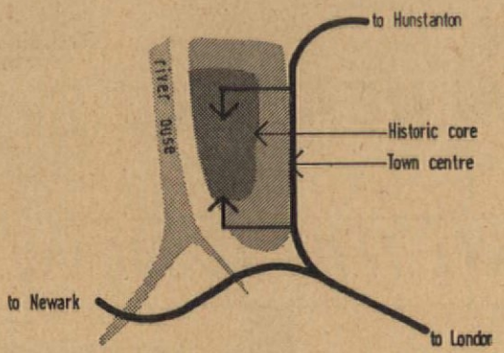
Competition

The Borough of Port Talbot in Glamorgan is holding a two-stage planning competition for a 349 acre residential neighbourhood. They are seeking 'the best modern thought and practice'. Entries must be in by March 1st, 1965, and the assessors will be Maurice Hellier and Leslie Watson. The authors of the three best schemes will receive 500 guineas and asked for further details. Subsequent prizes will be 1500, 500 and 250 guineas respectively. The winner will be appointed consultant for the development.

Schools

Peter Moro has designed an infant and junior school for Leicester County Council at Birstall which is based on octagons **7, 8**. There are three infant and four junior classrooms as well as a kitchen and a hall, all octagonal in plan. Peter Moro says the shape permits a greater choice of view and aspect, gives internal flexibility and enables a tight clustering that reduces corridors. The result is a family of lesser rooms presided over by the larger and taller assembly hall. To a child it might well seem a friendly and understandable place.

An educational building note (number 2) from the Scottish Education Department is about art rooms for secondary schools. It says an art department should be an observation point, a place for individual creative work and an exhibition centre. An inspiring view is considered sufficiently important to override north light. Venetian blinds are recommended for controlling sun in such cases where the best view is into the sun.



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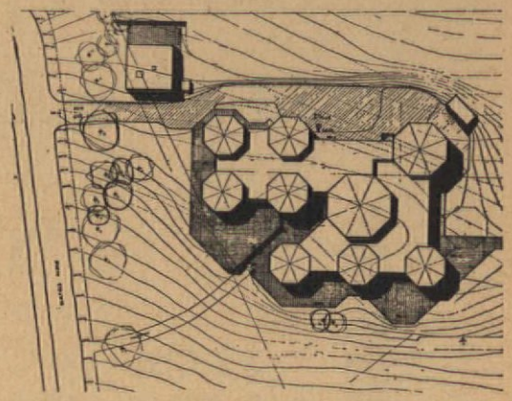

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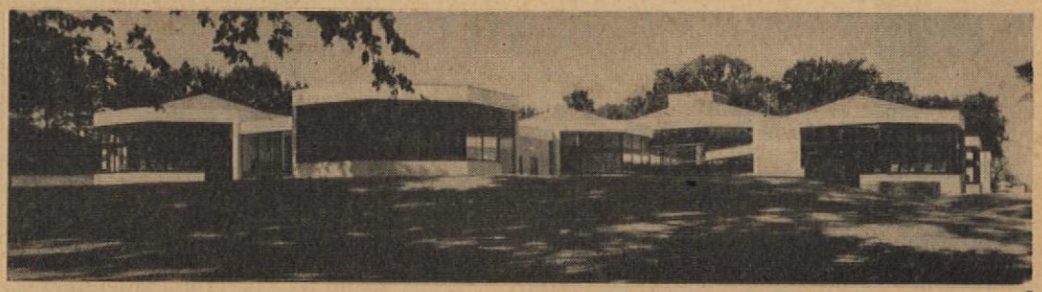
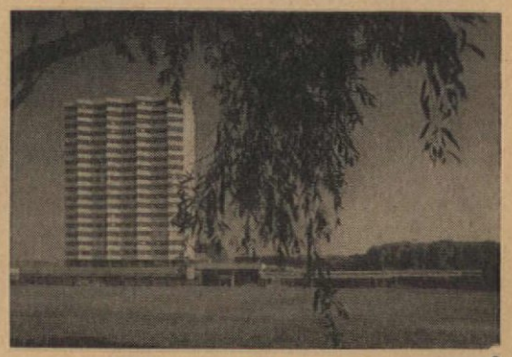


8

Sky pier

If nineteenth-century Margate launched out into the sea with a pier, it has now launched into the sky with a block of flats ingeniously planned for sea views **9**. Although the long axis of the block is at right angles to the front, a series of triangular bays, thin at the landward end and forming a cove at the seaward, give every flat a room with a view. This sometimes plays havoc with the internal layout, but it creates interesting elevations. Russell Diplock Associates were the architects.



9

Technics

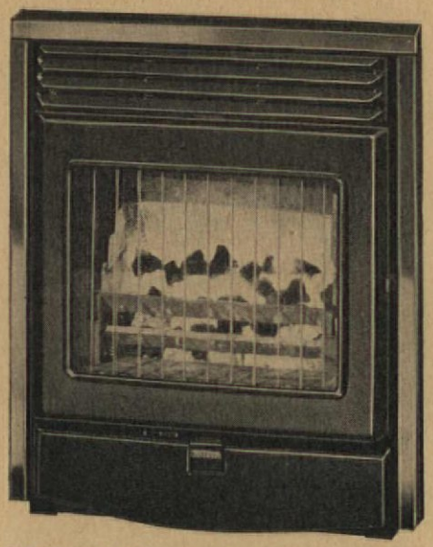
Sir Leon Bagrit in the Reith Lectures predicted cigarette-pack computers capable of translating. He reckoned that miniaturization was likely to be the main preoccupation of the next decade or so. Meanwhile, Univac, the American computer firm, has out-dined the diners' club with an automatic booking system that ties in hotels, motels, ships, trains and hirecars. To book any of these services you contact your nearest friendly Telemax office and state your needs. The clerk transmits the information to a computer centre which either books and confirms the service or, if there is no room, offers the next best alternative.

Dissemination of information

A body called 'The Environmental Group' has been formed to bridge the building professions, spread information and provide feed back on environmental matters. Those interested should write to Peter Jay, the Secretary, at 16 Gloucester Place, London, W.1.

REDFYRE
announce their new

'PLUS FIVE'
INSET ROOM HEATER



24½" high x 19" wide o/a to fit fire openings 20/24" high x 16/18" wide. Choice of 2 vit. enamel finishes, Pewter and Copper lustre.

AND THIS IS NEWS!

21,000 B.Th.Us/HR.

Equivalent performance to a good solid fuel domestic boiler PLUS fireside comfort in a room, say, 1650 cu. ft.

QUICKEST EVER INSTALLATION

Sealed convection chamber. All built-in ready-to-fit construction. Fits an ample range of fire openings, too!

To the customer . . .

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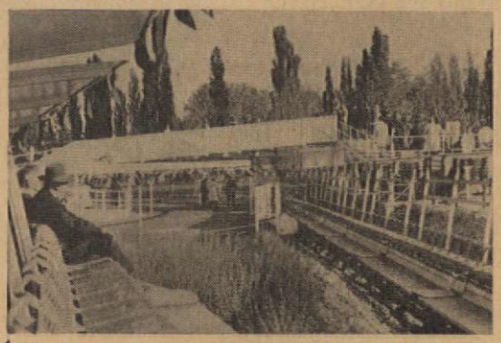
World news

Switzerland

Swiss National Exhibition, Lausanne **1**
Since the early nineteenth century, world and national exhibitions have always been occasions for showing dramatic new inventions. The recent Swiss National Exhibition, however, only just managed to maintain this tradition, for apart from a hydrofoil and a submarine (no surprises in this field) only three devices of any drama were shown, a small monorail (see page 616 of this issue), the 'telecanape' transportation system and a ring lift. The ring lift operates as a circular viewing cabin, turning on a cylindrical central column as it rises. The 'telecanape' is a continuous transportation band, that was used to link the main entrance of the exhibition to the first pavilion. A continuous moving band of seats carried the visitors to and



1

from the entrance **1**. In this system entry and exit on to and off the band is via the stationary centres of circular platforms, that have the property of turning slower near the centre than on the circumference. The gradual increase in speed across the surface of these discs enables people to mount or dismount directly on to or off the moving band at the periphery.

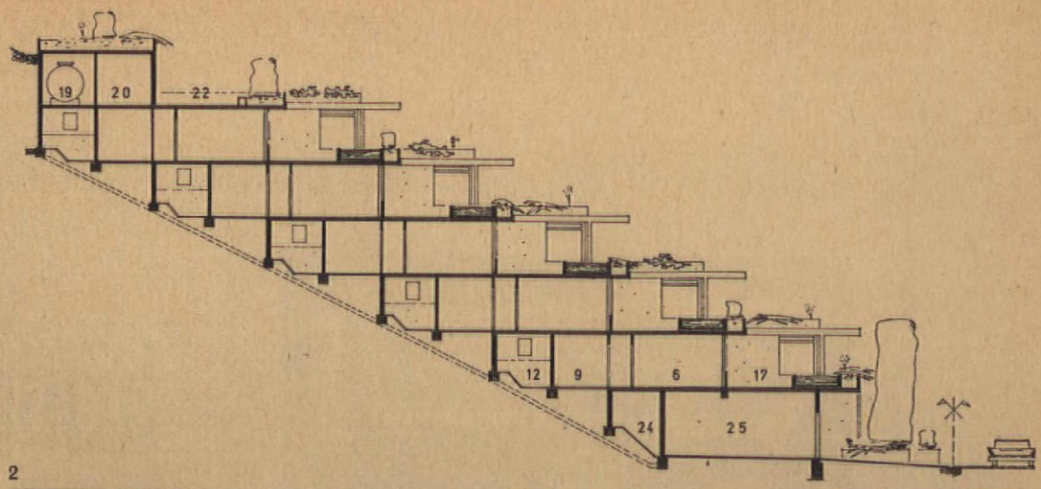
Terrace housing, Untersiggenthal **2**
This terrace housing by the architect Robert Frei is only one of an issue of *Werk* devoted to this type of housing.
This is undoubtedly one of the best issues of *Werk* published in recent years. Terrace housing stacked on either natural or man-made slopes is becoming at last to be accepted as a 'habitat' technique. We are presenting two examples of this approach in this issue (pages 620–629), one of which is published in *Werk*.
Werk, October 1964

Denmark

Housing, Fredensbourg **4**
Two archaic and venerable concepts have sustained Utzon in all his mature professional life. The concept of the acropolis with the floating roof over and the concept of the patio house. The housing at Fredensbourg is his latest essay on the theme of the patio. In this scheme, however, he has produced a new type, a two-bedroom row house of disarming simplicity.
Arkitektur, 4, 1964

Finland

Housing, Bergasa **3**
Few designers are capable of producing work of such direct elegance as the younger generation of Finnish architects. This atrium housing by the architect Jaakko Laapotti is an example of such development. This is truly the 'immaterialized' architecture that was sought for and sometimes found in the 30's and still remains rightly prized today.
Arkkitehti Arkitekten 4–5/1964



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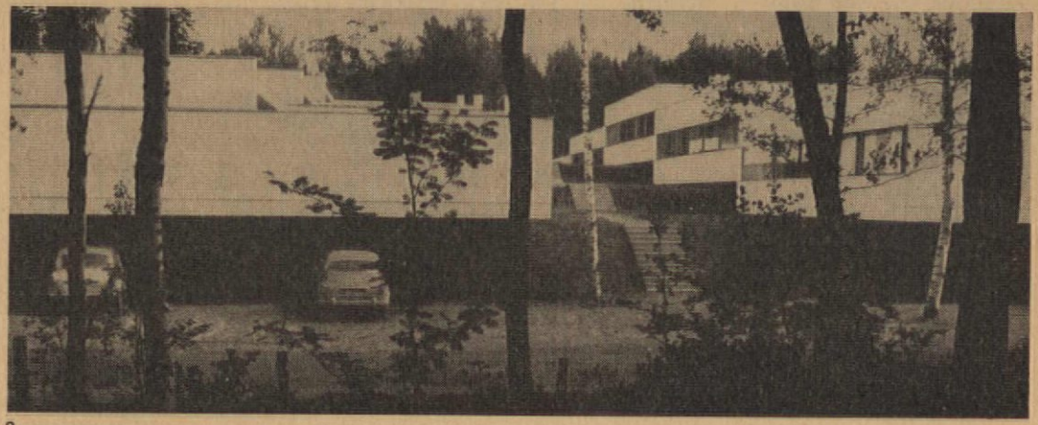

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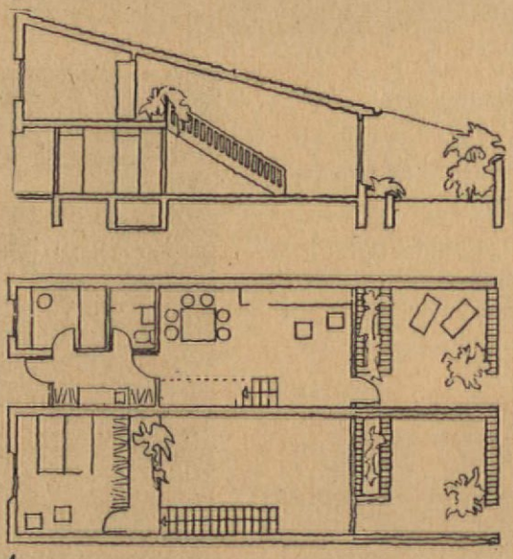
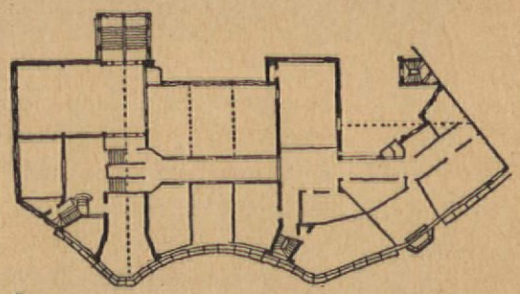


4

Belgium

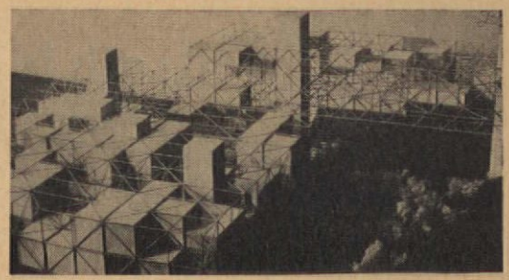
Maison du Peuple, Brussels **5**
Every so often it happens and the architects' artists of the world struggle to save the achievements of the recent past from the juggernaut of the present. A few years ago it was the Villa Poissy of Le Corbusier and the Robie House of Wright. Now it is Horta's turn and imminent destruction hangs over his master work, the Maison du Peuple in Brussels. Bakema's European newsletter, his 'Post Box for the Development of Habitat' carries an appeal to save the Maison du Peuple, by world public opinion, issued from the Société Centrale d'Architecture de Belgique, 3 Rue Ravenstein, Bruxelles 1. Passionate sympathizers should add weight to this urgent cause by writing to the Société at once.



5

Germany

University of Bochum
Two magazines have recently published the hitherto unpublished entry for Bochum by the German architect Eckhard Schulze-Fielitz. They are *Progressive Architecture* in a number devoted to the 'aesthetics and technology of pre-assembly' and *L'architecture d'Aujourdhui* in a number devoted to 'research'. Schulze-Fielitz's principles of planning have been worked out in close collaboration with Yona Friedman and he brings to each problem the same conception of a space grid which is infilled as required **6**. The grid spans over the countryside, easily accommodating the topology of the land. Bochum seems to have been an ideal site on which to demonstrate this principle.
Progressive Architecture, October 1964
L'Architecture d'Aujourdhui, June/July 1964



6

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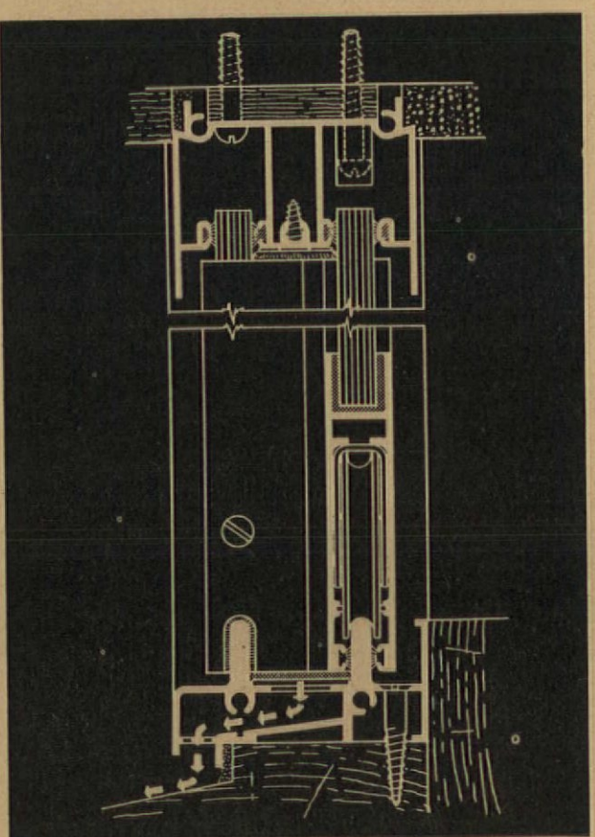

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Italy

Luigi Moretti **7**

Domus, October 1964, carries three works by Moretti, that grand old master of modern Roman baroque and dark horse of Italian architecture. Once more his work is brought into the international limelight—this time to reveal that Moretti's thinking has become less disciplined and certainly less sublime than in the days when his hand was responsible for the magazine *Spazio* and the delicate Casa Girasole. Now his work runs close to Marcello d'Olivo—so close in his residential project for Washington, DC, **7** as to be embarrassing. Something remains of his idiosyncratic proportions but little else, and his villa at Santa Marinella and his project for Genoa are the dissolution of a controlled baroque into a loose baroque approximating to neo-liberty.

Domus, October 1964

Palace of Justice, Lecce **8**

This building will be erected between the old historical centre of Lecce and a sector dedicated to residential expansion. It has been conceived as a dynamic flexible form without main fronts. The building consists of three main slab blocks containing offices. The courts themselves are arranged on the ground floor under the slabs. The slabs are linked by circular stair towers—access from one slab to another being via the stairs. The architects are Carlo and Maurizio Aymonino, De Rossi, in collaboration with Cicirillo and Marasco.

Casabella, July 1964

Poland

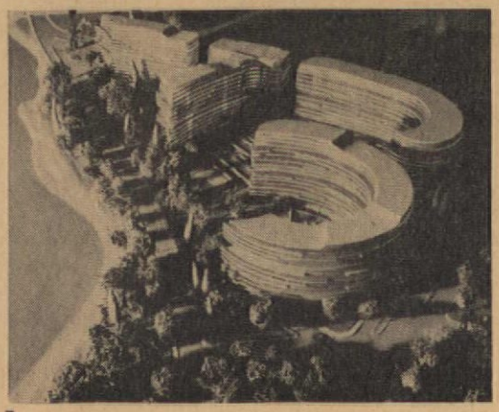
British Embassy, Warsaw **10**

The Ministry of Public Building and Works continues to put up one mediocre edifice after another, in which to re-house our diplomatic staff abroad. The Bern Embassy was pedestrian, to point of being almost a piece of incompetent design and this new embassy at Warsaw does nothing to improve the standard. One can only be relieved to know that our embassy at Brasilia is in the competent hands of Peter and Alison Smithson.

USA

San Francisco competition

This international competition is for the design of a civic centre plaza in San Francisco, including sculpture and landscape in combination. The assessors are Thomas Church, Dr. Lorenz Eitner, Luis Barragan, Jacques Lipchitz and Moses Lasky. The first prize is $3750, the second $3250 and the third $3000. If the scheme is finally approved the winner will receive a further $10,000. Registration forms may be obtained from Miss Kathleen E. Hall, Secretary of IUA, at 66 Portland Place, W.1. Completed registration forms must arrive in America not later than December 31st, 1964.



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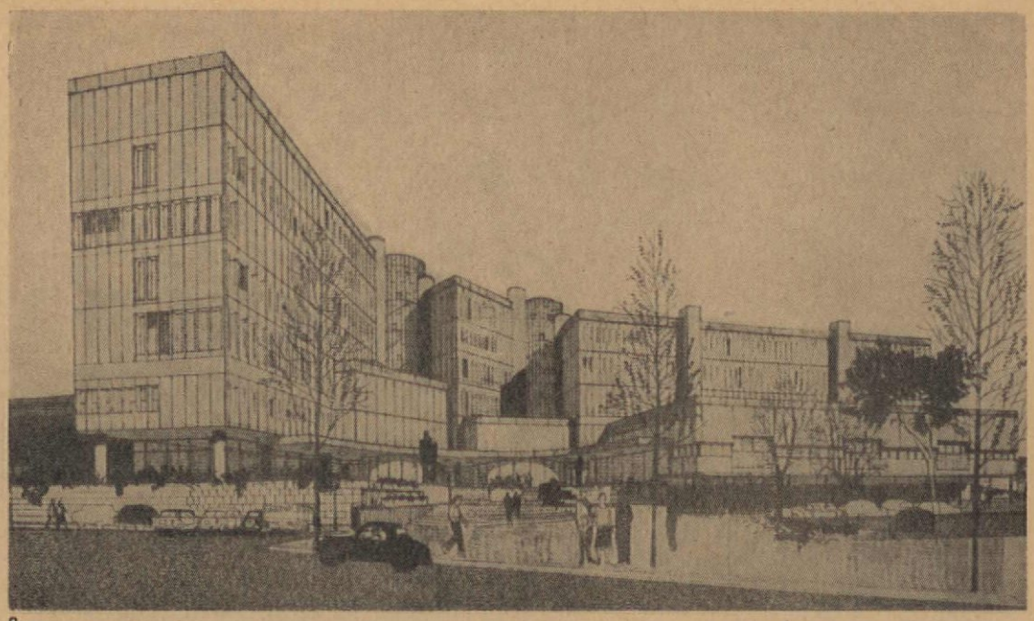

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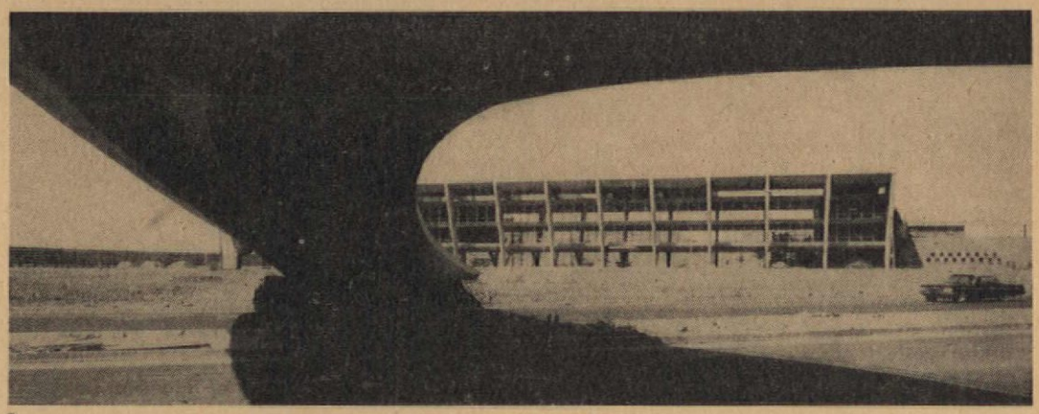

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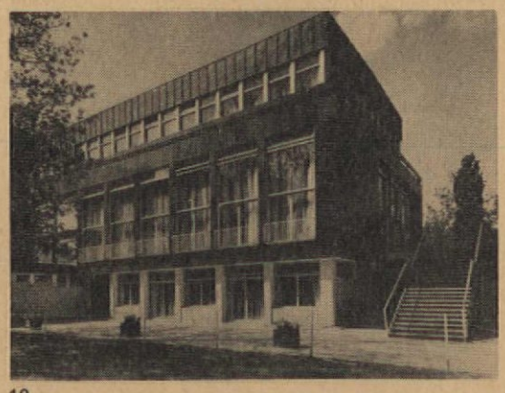


10

Japan

Imperial Hotel, Tokyo

F.L.W.'s Imperial Hotel, Tokyo is one more monument in danger of demolition. Its present unpopularity as a hotel now renders it an uneconomic proposition for its owner Mr Tetsuzo Inumaru. Mr Inumaru is a dynamic tycoon of the new Japan, owning amongst other interests, the monorail linking downtown Tokyo to the airport. Protesting architects, etc., with ideas for its salvation should address themselves to Mr Inumaru, at the Imperial Hotel.

Brazil

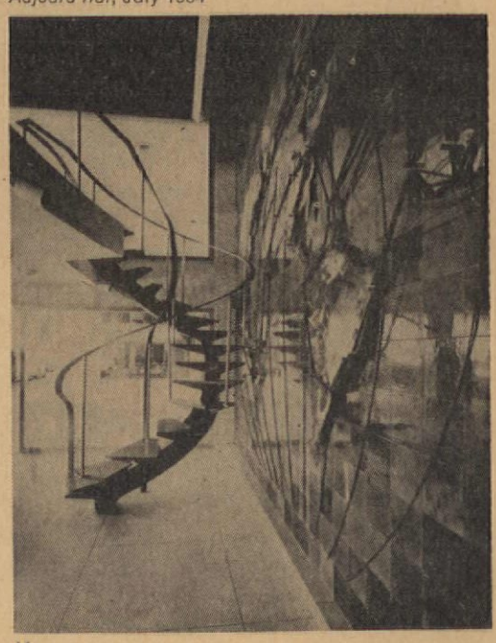
Museum of Modern Art, Rio **9**

The recent death of Affonso Eduardo Reidy deprives Brazil of one of her finest, first generation modern architects. Reidy leaves behind two positive monuments to his talent and integrity, his Pedregulho neighbourhood unit, which is still one of the finest pieces of social housing in Brazil, and his Museum of Modern Art at Rio.

Air France Office, Brasilia **11**

The ever active Charlotte Perriand has again produced the furniture and equipment for another Air France office. This time her collaborators were Pontraby who was associate architect, and Panzer who did the mural of world air routes.

Aujourd'hui, July 1964



11

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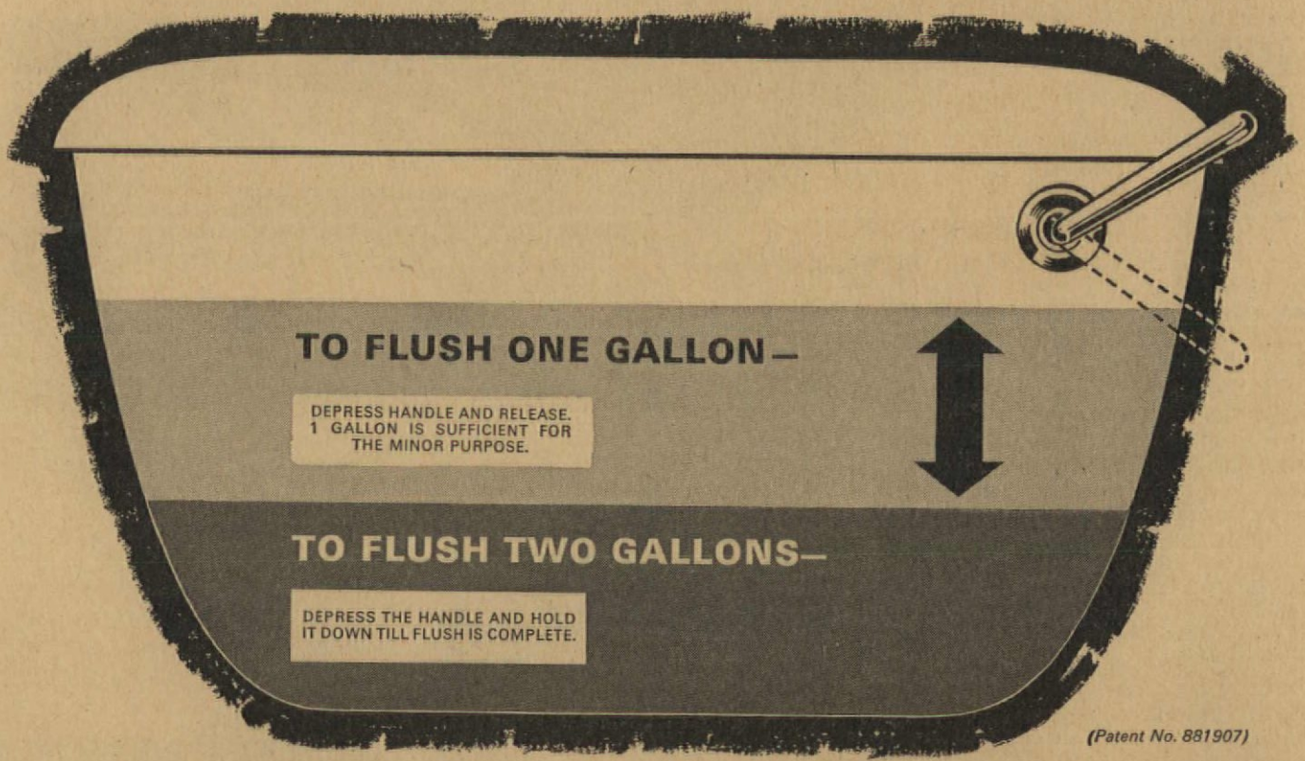

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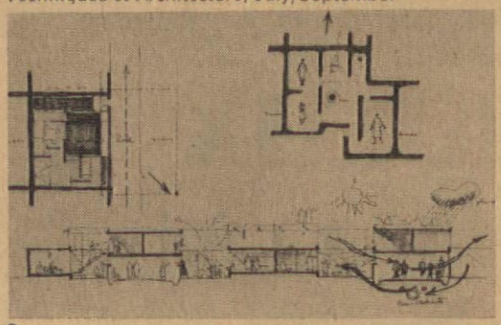
Planning

Fort Lamy (Tchad), Fr. Eq. Africa

This project for a new town of 6000 units (25–30,000 inhabitants) is to be realized in French Equatorial Africa. The site is La Cuvette St-Martin, at present wasteland situated between existing European and African settlements. Candilis, Josic, Woods, the architects, in collaboration with Dony,have again attempted to realize as at Toulouse le Mirail, a low urban pattern, which in this case is particularly appropriate to the African way of life; most of the inhabitants being Muslims. The designers have established a carefully built up hierarchy—starting from the individual unit **2** whose separate rooms are grouped around an open courtyard. The circulation to these units is via covered streets at either ground or second floor level—the streets eventually opening on to squares **3**. These squares mark the limit of exclusively pedestrian access, and from this point onwards the pedestrian pattern is bonded together by traffic routes. The squares and streets build up into larger patterns **4**.

Techniques et Architecture, July/September



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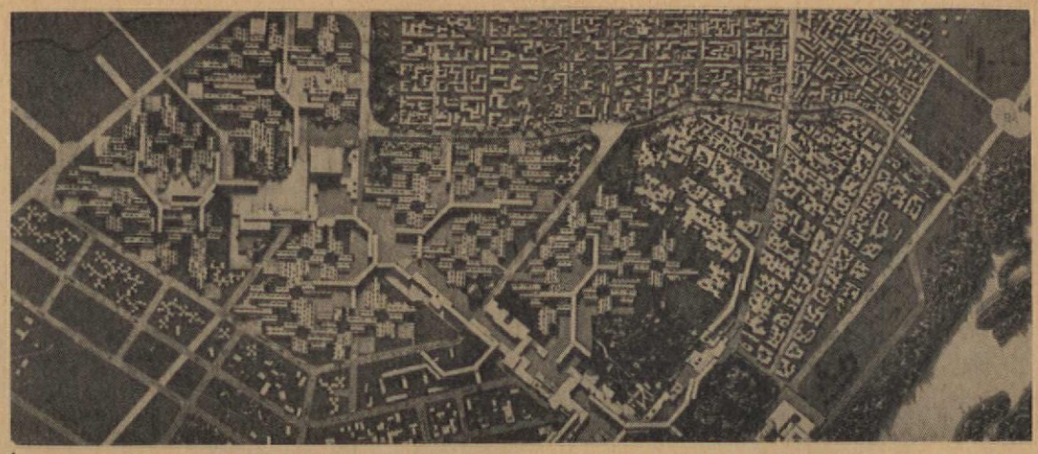

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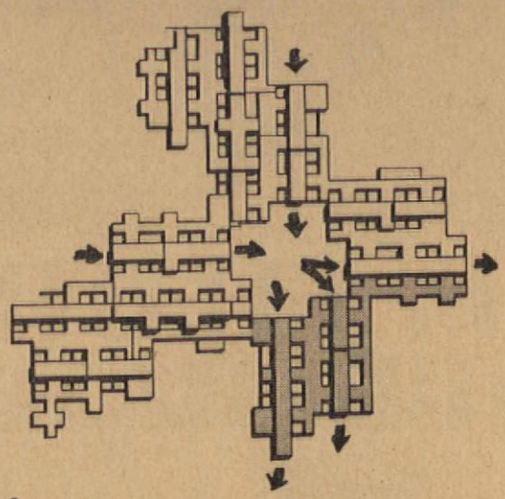

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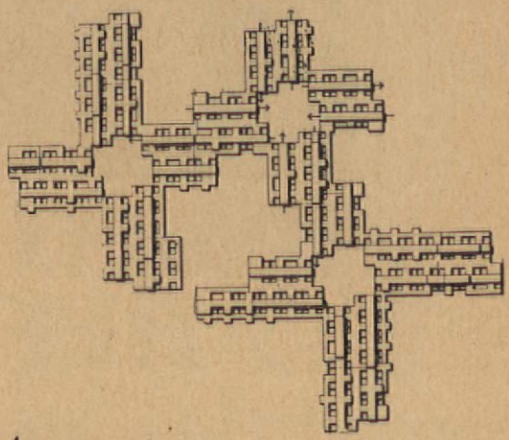


4

Art

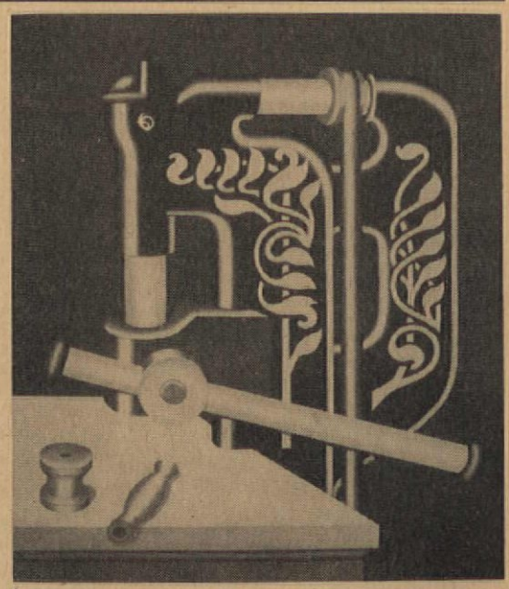
Portraits of machines

In years to come the art historians of the future might well refer to the mainstream of art in the early sixties as the expression of the cult of the object. The exponents of pop art, for instance, are most definitely preoccupied with the portrayal of objects from the urban environment (coca cola bottles, soup cans, cigarette packets, posters and various glamorized commodities), or even making them (e.g. Oldenburg's ping-pong table and giant hot-dogs, Jim Dine's ties and tools, or Christo's parcels). Objects made by the surrealists and those endowed with a signature by the dadaists have been retrieved and dusted, while contemporary objects of the imagination (those three dimensional configurations that are neither sculpture nor paintings) also specifically belong to the present time.

To many, the contemporary portrayal of objects from one's surroundings is not very different, as a process, from the painting of a still life with the traditional paraphernalia of carefully selected fruit, glasses and other table objects. This is true to some extent, but whereas the traditional still life is a faithful, if artistic, replica of the things in front of the painter, a contemporary object painting may be faithful to the original in almost every detail except, say, size, or colour, or relationship with other things within the picture, and is very often completely lacking in any aesthetic intent. This means simply that the artist aims at depicting qualities which are often chosen at random, as is the case with Rauschenberg, or deliberately assaulting the eye with the most unpleasant or menacing facet of the given object.

Unlike most other object painters, Klapheck (Robert Fraser Gallery) embodies his regal and withdrawn machines with all the attributes of a portrait painting. An ex-pupil of the little known German artist, Bruno Goller, whose main contribution was to make formal arrangements of things in the form of charts, Konrad Klapheck, the 28-years-old painter from Düsseldorf, has distinguished himself as a painter of cryptic humour and disquietening imagination. His subjects are imaginary machines—evocations of typewriters, sewing machines, calculators, shoe-trees, key-rings, all transformed and streamlined. These works are reminiscent of board-room portraits of a super-human, fully mechanized industrial concern where pomp and severity are the requisite qualifications. Painted with a refinement of finish that belongs essentially to artists like Dali, Magritte and Tanguy, Klapheck might well have been in the ranks of the surrealists had he been born 25 years earlier. Today he belongs to neither a specific trend, nor a movement, but his subject matter, its treatment, and the comments in his titles bring him inevitably into the mainstream of the sixties.

Jasia Reichardt



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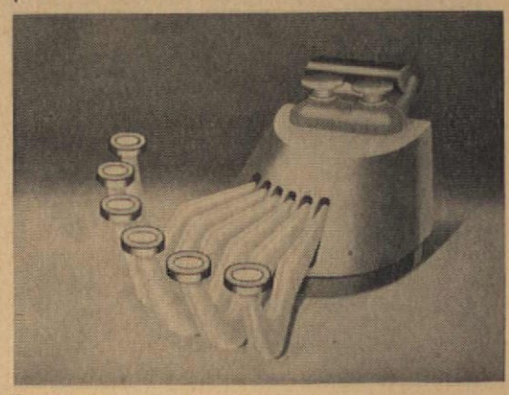


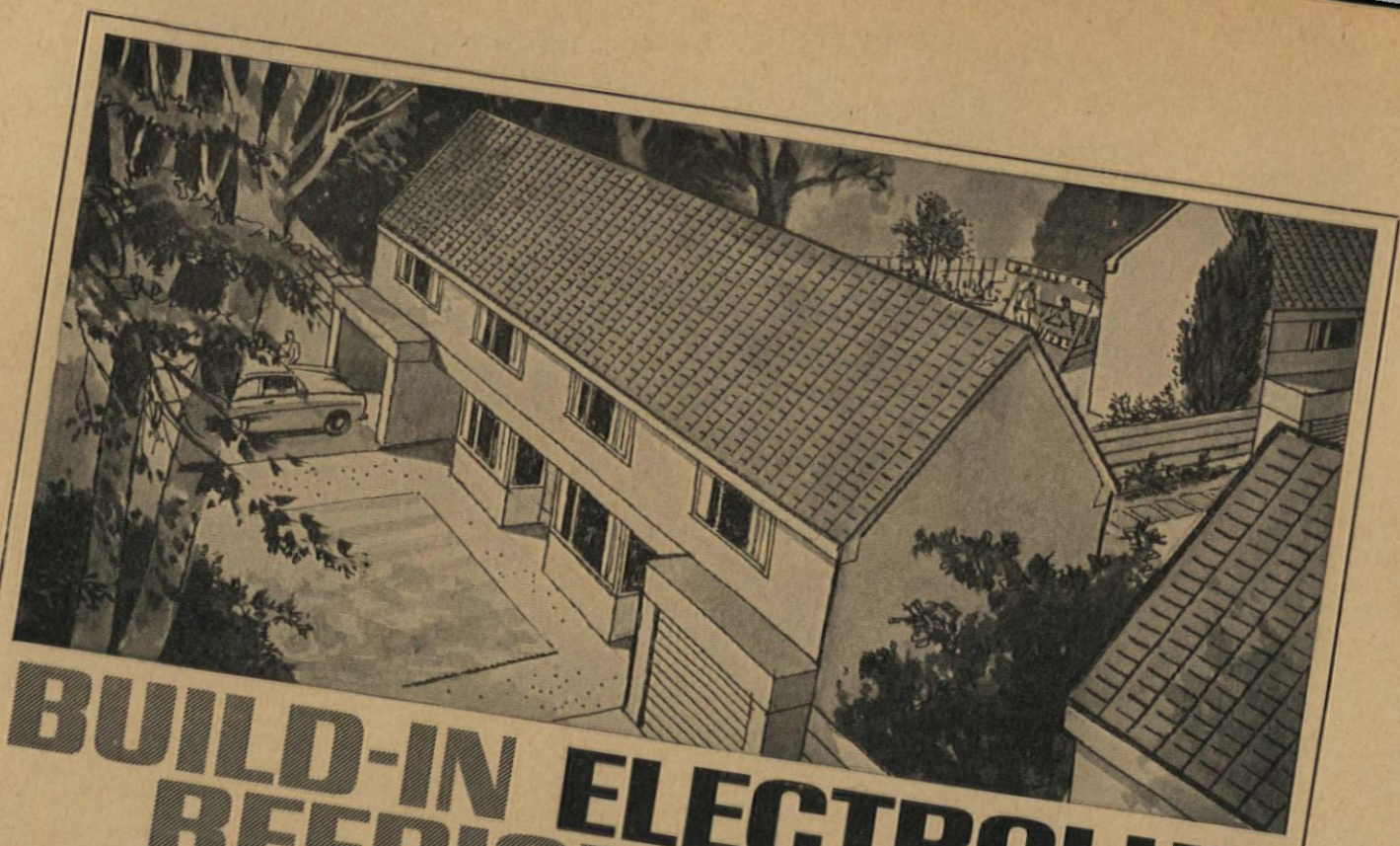
2

1
Intellectual Woman: 55in × 43½in

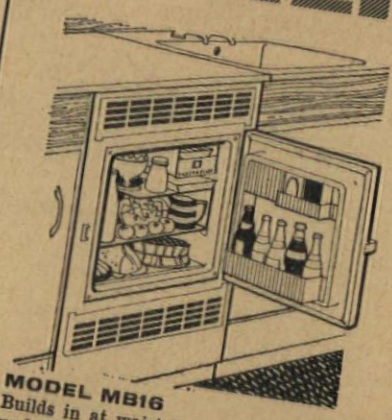
2
Triumph of Memory: 39½in × 47½in

Correction

We regret that in our November issue on page 537 the word kinetic was used instead of cinetic. Kinetic implies the use of physical movement, e.g. mobiles and machines, whereas cinetic is the original term for what is now called 'optical painting'.



BUILD-IN ELECTROLUX REFRIGERATORS



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MODEL MA27
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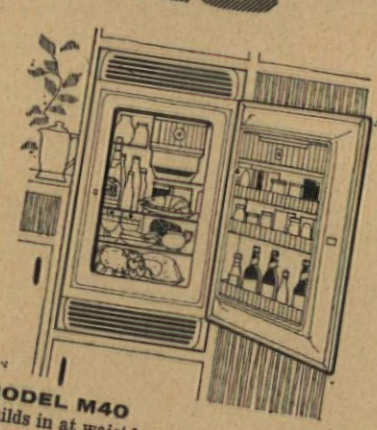

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Dans ce numero

Immeubles pour les sciences
pp. 595–602

Dans cet article le Professeur Sir Leslie Martin de l'Université de Cambridge examine les immeubles pour les sciences en tant qu'immeuble type—avec une référence toute particulière à l'utilisation d'un 'tableau de planification' en tant qu'aide immédiate à la planification et au développement postérieur des sites pour les nouveaux laboratoires des universités. Les arguments de cet article sont le résultat de la conception de nouveaux laboratoires pour les facultés de Zoologie et Psychologie pour l'Université d'Oxford. On a utilisé un système structural et spatial qui est en escalier et éclairé d'en haut par section, des blocs de laboratoires d'une grande profondeur peuvent être construits. Au centre on trouve les salles de conférence et autres commodités communes.

La beauté du métabolisme
pp. 603–607

Günter Nitschke l'auteur des articles sur Tokyo et les métabolistes japonais publiés dans l'*AD* d'Octobre '64 nous donne ici une transcription d'un article par Kurokawa publié récemment dans un journal japonais 'Kenchiku Bunka'. Deux conclusions semblent dominer la pensée de Kurokawa. (1) Le présent—en tant qu'expérience de l'enfer auquel, les héros reconnus de l'architecture occidentale au Japon comme par exemple les Futuristes ou les idées du CIAM, sont condamnés par le chaos actuel; at (2) la 'route' le principe de vie symbolique et principal de l'architecture d'aujourd'hui dont la caractéristique essentielle est le changement. Kurokawa illustre sa thèse avec des exemples pris de son œuvre, démontrant le rôle de la 'route' dans son centre de travail pour Kyoto. Parmi les autres projets de Kurokawa on trouve son Centre de Conférences à Kyoto et son projet pour l'Université de Osaka et l'usine construite pour la compagnie Nitto-Shokuin.

Oeuvre récente de Kikutake
pp. 608–611

Nitschke examine aussi les ouvrages récents de Kikutake y compris son Hôtel de Ville à Tatebagashi et le sanctuaire Izumo Taisha.

Bibliothèque à Oita, Japon
pp. 612–613

Cette bibliothèque, œuvre d'un jeune architecte métaboliste est maintenant en cours de construction. Les 'groupes dans l'espace' d'Isozaki étaient présentés page 520 de notre numéro d'Octobre.

Le pavillon 'D'Art vivant' exposition nationale Suisse, Lausanne
pp. 614–615

Cette étude simple et élégante de la pré-fabrication utilise trois éléments de base (une unité de toiture en asbeste, une poutre-égout ainsi qu'une colonne cylindrique prenant l'eau de pluie), reçoit les expositions de livres, de télévision, de radio, d'art, de planning, de théâtre, etc. Les murs sont soit en verre, en polyvinyl blanc ou en polyester transparent. Un monorail qui dessert le site tout entier passe autour et dans l'immeuble.

Habitat '67, Montréal
pp. 620–626,

Ce projet de logement pour Montréal promet d'être une étonnante recherche sur le problème du logement. Les unités d'habitation ont toutes des terrasses jardins; pour ceci elles ont été empilées dans des plans rhomboïdaux qui reçoivent la lumière et sont ventilées des deux côtés. Lorsque 'L'Habitat 67' sera terminé il y aura 6.000 habitations sur le bord du St. Laurent.

Les membranes des maisons à terrasse forment une structure continue d'entre-support. Elles arbritent un espace continu pour tous les usages publics. A l'intérieur de cet espace on trouvera magasins, bureaux, distractions, parking, etc. Cet espace est abrité de la pluie. La lumière y arrive de toutes les directions. En été il est ombragé; en hivers il est à l'abri du vent et de la neige. Le lumière solaire arrive à tous les niveaux de la structure y compris le parking et l'espace réservé aux services. Les unités d'habitation répétitives sont pré-fabriquées avec les cadres pour les fenêtres et les portes, le câblage électrique et la plomberie. Les murs, les toits et les planchers sont isolés et sont en béton spécial étanche à l'eau et épais.

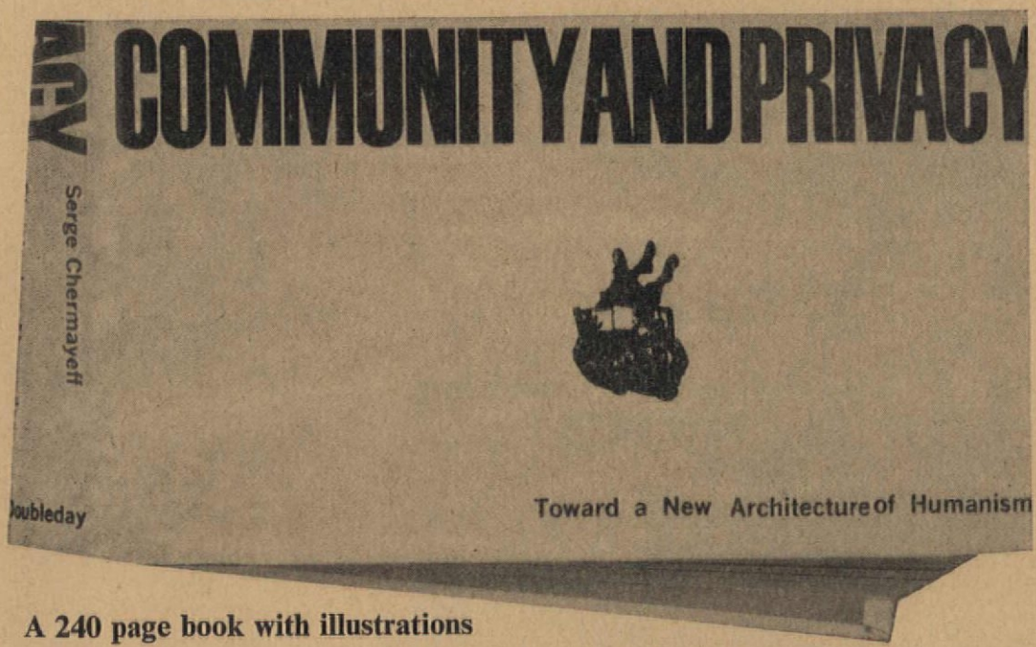
Le réseau des services se trouve dans les rues verticales et horizontales de chaque membrane. Les habitations sont inter-connectées pour les services aux rues immédiatement au-dessus ou au-dessous. Les égouts, etc., sont connectés à la rue horizontale supérieure—et se vident en haut de la colonne de service verticale.

Collines d'habitation
pp. 627–629

Encore une expérience de logements en série. Le bloc offre des appartements de 2, 3 et 4 pièces ainsi que des duplex. Le centre de la section est utilisé en tant que garage et donne un parking à voitures de 100%.

Centre sportif de Crystal Palace, Londres
pp. 630–631

Ceci est le premier centre sportif en Grande Bretagne construit selon les normes olympiques. L'immeuble principal devait avoir trois salles d'entraînement pour la boxe, le catch, le judo, la gymnastique, le ping-pong et l'haltérophilie; une salle d'entraînement à but divers mais principalement pour le cricket, le golf et le basketball, six courts de 'squash' et une arène pour l'entraînement au basket-ball, au badminton et en gymnastique. Pour la natation il y a des piscines pour les courses, le plongeon et l'entraînement ainsi qu'une piscine d'entraînement pour les courses de 55 yd à huit voies.



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It is to this job that the authors of this book address themselves. The book is not a plea for the old way of life, but an attempt to reconcile the human need for community and privacy that was satisfied by the old world with the new and different context of mass technology and high-density urbanization.

To this end, Chermayeff and Alexander define a kind of city house and an anatomy of city planning in which a series of clearly articulated separate domains provide for all degrees of community living and of privacy.

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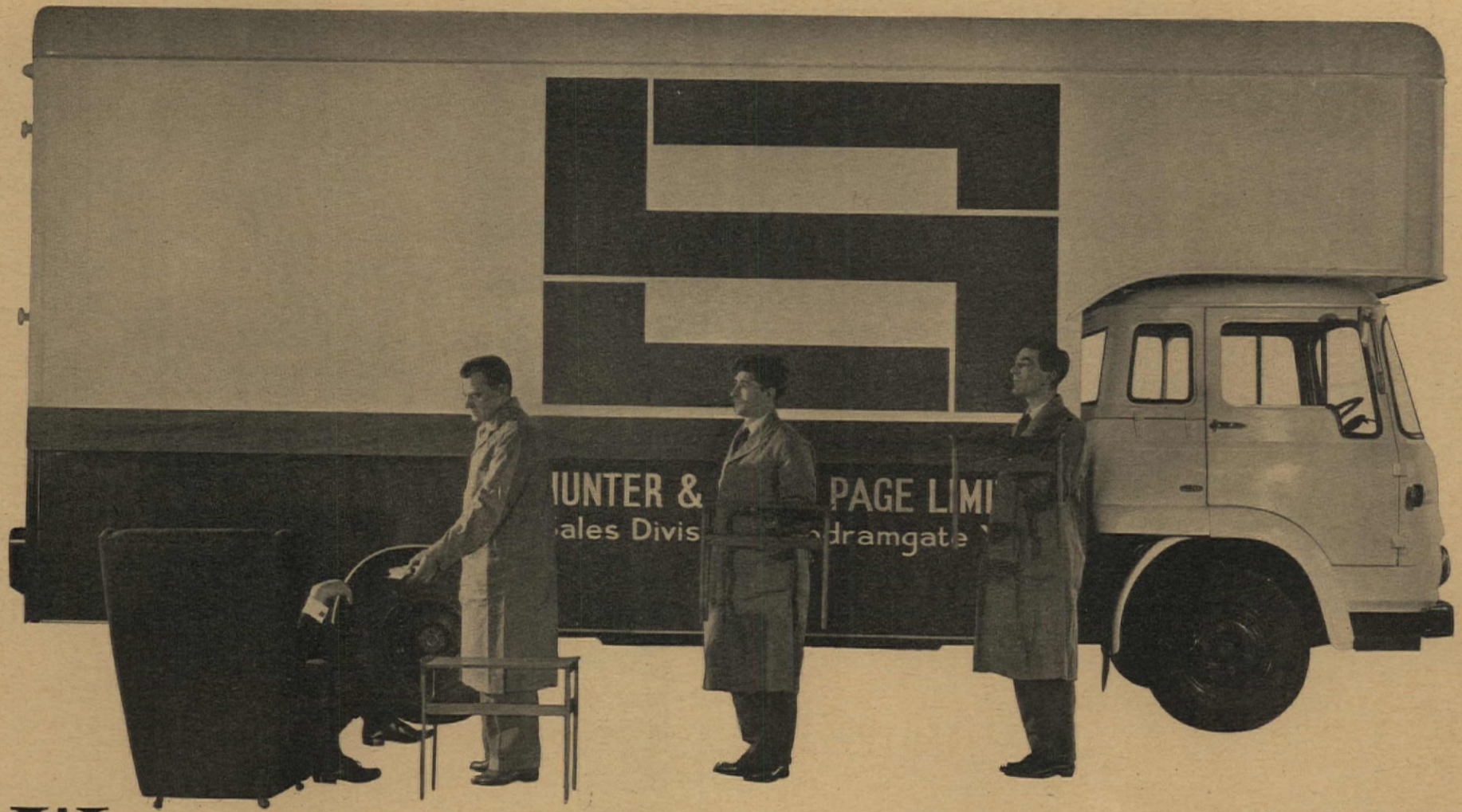

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In dieser Nummer

Wissenschaftsgebäude
S. 595–602

In diesem Aufsatz untersucht Professor Sir Leslie Martin von der Universität Cambridge Wissenschaftsgebäude als eigene Bauform—mit besonderem Hinblick auf die Anwendung eines 'Plangitters' als unmittelbare Hilfe bei Entwurf und Weiterentwicklung neuer Universitätslaborkomplexe. Die Richtlinien dieses Aufsatzes wurden entwickelt aus Entwürfen für neue Laboratorien für die Fakultäten Zoologie und Psychologie an der Universität Oxford. Durch die Anwendung eines besonderen Raum- und Strukturssystems, das stufenweise aufgebaut ist und in jeder Sektion von oben her das Licht empfängt, können Blocks von Laboratorien in großer Tiefe gebaut werden, und zwar angeordnet um ein Zentralgebäude, das Räume zum gemeinsamen Gebrauch aufnimmt, wie z.B. Vorlesungsräume und anderes.

Die Schönheit des Metabolismus
S. 603–607

Günter Nitschke, der Verfasser der Artikel über Tokyo und die japanischen Metabolisten, die im Oktober 64 in *AD* veröffentlicht wurden, gibt hier die Übertragung eines Artikels von Kurokawa, der kürzlich in der japanischen Zeitschrift 'Kenchiku Bunka' abgedruckt war. Zwei Hauptsachen scheinen zur Zeit Kurokawas Denken zu beherrschen: 1. Das Gegenwärtige—als eine Erfahrung der Hölle, in der die alteingeführten Helden der westlichen Architektur, wie die Futuristen oder die Ideen der CIAM, durch das augenblickliche Chaos vernichtet werden—und 2. der 'Weg' als das wesentliche und lebenssymbolische Prinzip der heutigen Architektur, bei der das wichtigste Kennzeichen die Veränderung ist. Kurokawa illustriert seine These mit Beispielen seiner eigenen Arbeiten und zeigt dabei, welche Rolle der 'Weg' in seinem Arbeitszentrum für Kyoto spielt. Andere illustrierte Pläne Kurokawas umfassen sein Kyoto-Konferenzzentrum, seinen Entwurf für die Universität Olaka und seine Fabrik für die Nitto-Shokuin-Gesellschaft.

Neue Arbeiten von Kikutake
S. 608–611

Nitschke bespricht auch die neuen Arbeiten Kikutakes unter Einschluß der fertigen Stadthalle Tatebagashi und des Izumo-Taisha-Schreins.

Bücherei in Oita, Japan
S. 612–613

Diese Bücherei von einem jungen metabolistischen Architekten ist zur Zeit im Bau. Isozakis Projekt 'Traube in der Luft' ist auf S. 520 unserer Oktoberausgabe dargestellt.

Der Pavillion 'Lebenskunst' auf der Schweizer Nationalausstellung in Lausanne
S. 614–615

Diese elegante und einfache Studie in Fertigbau, bei der drei Grundelemente verwendet werden: eine Asbest-Dacheinheit, ein Träger, der gleichzeitig die Kanalisation aufnimmt, und eine Rundsäule, mit Regenwasserabfluß, beherbergt Ausstellungsabschnitte über Bücher, Fernsehen, Radio, Kunst, Theaterpläne u.s.w. Die Einsatzwände sind entweder aus Glas, weißem Polyvinyl oder transparentem Polyester. Eine Einschienenbahn, die das ganze Gelände befährt, geht durch und um das Bauwerk.

Habitat 67, Montreal
S. 620–626

Dies Wohnungsprojekt für Montreal verspricht eine welterschütterndes Beispiel für Untersuchung über Wohnbau zu werden. Die Wohneinheiten haben alle Gartenterrassen; um dies zu erzielen, sind sie in rhombischen Ebenen angeordnet, die Licht und Luft von beiden Seiten bekommen. Habitat 67 wird nach Vollendung 6000 Wohneinheiten am Ufer des St. Lorenz-Stromes bieten.

Die Membranen der Terassenhäuser bilden eine zusammenhängende, sich gegenseitig stützende Struktur. Sie überdecken einen zusammenhängenden Platz für öffentliche Zwecke, wie Läden, Büros, Erholungsplätze und Parkmöglichkeiten. Der Raum ist vor Regen geschützt, Licht dringt von allen Seiten ein, im Sommer ist er schattig, im Winter vor Wind und Schnee sicher. Das Sonnenlicht kann in alle Schichten der Struktur eindringen, auch Parkplätze und Versorgungswege. Die sich wiederholenden Hauseinheiten sind vorgefertigt, mit Türen und Fensterrahmen, elektrischen Leitungen und Rohrsystem. Wände, Dach and Fußboden sind isoliert und aus besonders dichtem und wasserundurchlässigem Beton gefertigt.

Die Versorgungsleitungen sind untergebracht in den vertikalen und horizontalen Wegen jeder einzelnen Membran. Die Häuser haben ihre Versorgungsleitungen zu den unmittelbar darüber oder darunter liegenden Straßen. Abwässer u.s.w. werden zur unteren Straße geleitet, Lüftungen u.s.w. gehen zur oberen Straße und münden in die Außenluft am oberen Ende des vertikalen Versorgungsschachtes.

Wohnhügel
S. 627–629

Ein anderer Versuch im Terrassen-Großbau. Vorgesehen sind Wohnungen mit 2, 3 und 4 Räumen sowie kleine Eigenheime. Die Mitte der Sektion wird als Parkplatz geplant, und zwar mit 100%iger Nutzung.

Sportzentrum Crystal Palace, London
S. 630–631

Dies ist ein Sportzentrum das nach olympischen auforderungen gebant ist. Die Grundforderung für das Hauptgebäude war, drei Übungsräume zu schaffen für Boxen, Ringen, Judo, Gymnastik, Tischtennis und Gewichtheben; weiter gibt es einen Vielzweck-Übungsraum, vor allem für Cricket, Golf und Baseball, sechs Squahplätze und einen Trainingplatz für Basketball, Badminton und Gymnastik; außerdem eine Schwimmhalle mit Wettschwimm-, Tauch- und Lehrbecken und Trainingsmöglichkeit in einem 50 m langen Acht-Bahn-Becken.

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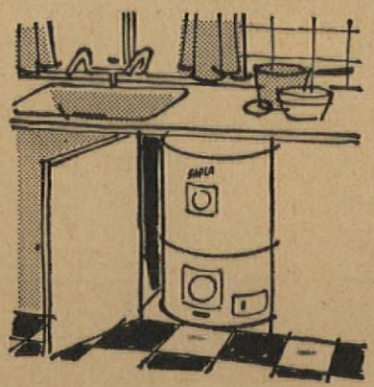

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Venice: Tronchetto Island international competition

Teodora Olga Sammartini

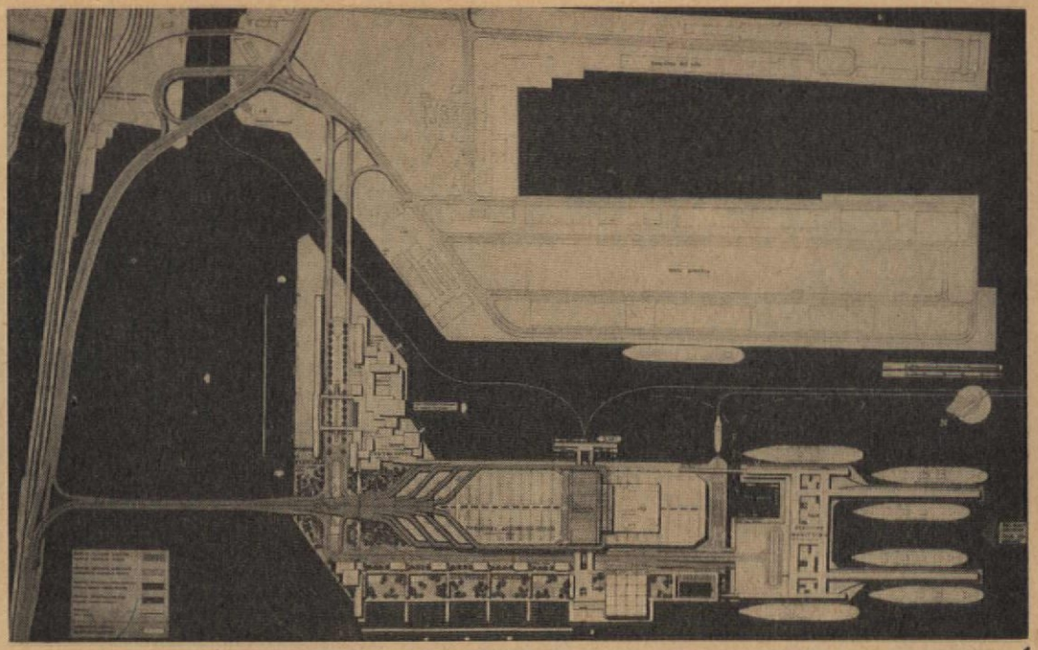
The town plan of Venice, after the vicissitudes that we previously observed in these columns*, was approved in April 1962. One of the controversial points was the creation of an Administrative Centre in the area between the present bridge-end, the Giudecca Canal and the new Tronchetto island. This proposal was at first rejected by the Superior Council of Public Works and approved after it had been reduced in size and limited in function, changing its name to 'Port and Commercial Centre'. The plans have to be submitted to the Ministry of Public Works for approval, the area of the island must cover no more than 15 hectares, and the constructions to do with parking areas, traffic squares, garages and hotels have to be moved to the mainland at San Giuliano. All the private and public buildings connected with the public and economic life of the city are provided in the approved Centre project.

On October 29th, 1963, the Municipality of Venice held an international competition for the design of the 'Urban Planivolumetric Plan' for the new Tronchetto Island that caused protests on the part of the UIA because it violated many provisions of the regulations adopted by the UNESCO members. On March 27th, 1964, the Municipality held a new competition (postponement of the final date of expiry to August 10th, 1964, and modifications to the articles 3, 6, 7, 8 and 9) that amended the provisions of the UNESCO Regulations and, in fact, changed the substance of the first one. (In this, precise questions were posed as to a garage for cars and coaches with parking areas, a workshop and lodging for drivers, a parking area and hotel or hotels for tourist groups, transport services for passengers and goods, warehouses and deposit for goods in transit and the organization of the water-road-railway traffic requirements.) In the second announcement, the greatest freedom was given to competitors, because the Administration felt itself entitled 'to extract from the competition the elements for possible variation in the General Urban Plan', and because particular attention was to be given 'to the organization of the infrastructures network in the area indicated on the General Urban Plan as Port and Commercial Centre, even if this implied a change in the Plan itself'. The competitors were, consequently, free to propose solutions in opposition to the town plan.

The Municipality of Venice seems not to have given up the original Administrative Centre at the bridge-end; only its name, in fact, has been changed. The Venice administrators think that the widening and development of the present bridge-end will assure the future of Venice as commercial, administrative and politic capital of the region, and meanwhile will reduce the discomfort of the crowds of people arriving by train, car and boat. This means that it is absurd to try to resolve the Tronchetto Island problem independently.

The jury, after remarking that the logical order had been reversed because the judging of ideas had to precede the construction of the island, awarded five first prizes.

* See *AD*, October 1961, February 1962 and December 1962.



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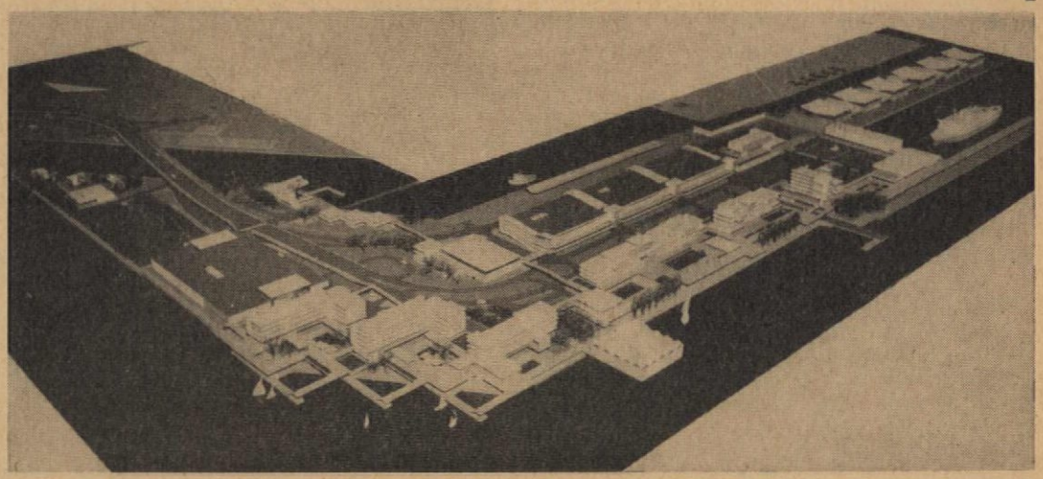


3



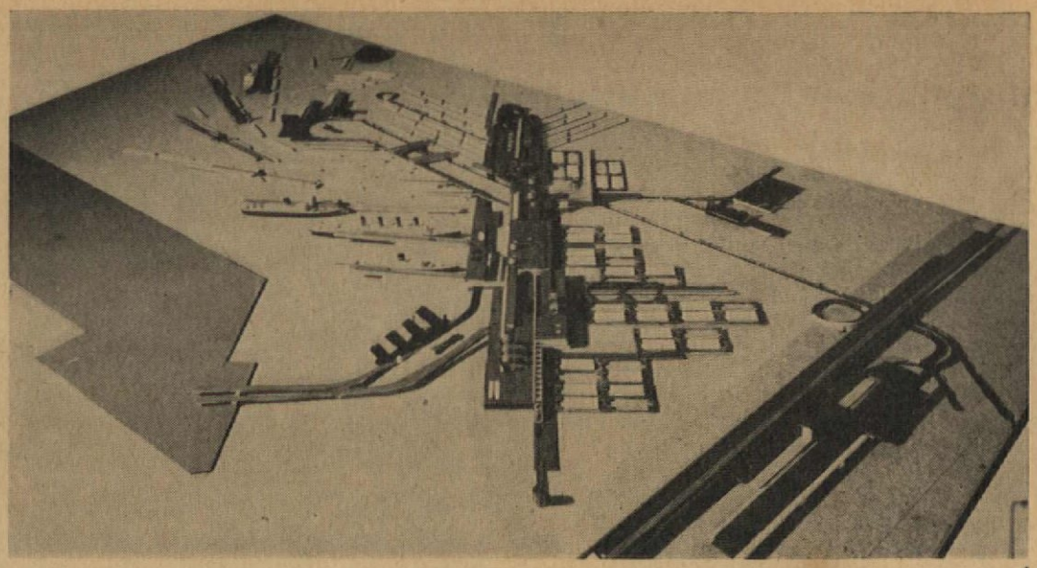
The project of the architects, Manfredi Nicoletti and Morandi of Rome, **1** gives a functional distribution to all the requested services with a rigorous system of circulation. The project of the group headed by Prof. Ostrowski of Warsaw **2** develops especially the lodging function and proposes a longitudinal separation between the commercial and tourist quarters. The project presented by the group headed by R. Maestro of Florence **3**, free from the terms of the competition, foresees the extension of the Grand Canal with a long sinuous wing opening with four fingers onto the lagoon. At the interior of this snake there are parking areas on different levels, while pedestrians circulate with ease by moving pavements. The project of the Venetian architects, Cappai, Foscari and Mainardis **4**, reduces the present island to a spine with fixed installations, at the sides of which can be placed, according to the season, large floating elements assigned for parking, hotels, etc. According to all four projects, the utilization of Tronchetto Island would only aggravate the discomfort of the present bridge-end of Piazzale Roma. These projects bring a concentration of activities to the area and create building contrasting in size with the traffic density on the pre-existing buildings.

The fifth winning project **5** came from a group headed by Prof. E. Ravnikar of Ljubliana and presents a solution in realistic terms: elimination of the existing reception structures, included the translagoon bridge, in three different phases of seven–ten years each; reconstruction of a Grand Canal extension with low buildings and gardens. The final phase foresees the elimination of the railway structures and the construction of an International University of Arts at the Piazzale. These planners think that Tronchetto traffic centre is an obstacle, and that it is necessary to bring back Venice to her original state, an island instead of the present hybrid mixture of island mainland.

The jury gave a special second prize to the group headed by Prof. G. Samonà **6**, who, having established the advantage of moving the commercial port to the mainland, and the uselessness of the car and railway bridges, cancels all the post-eighteenth century incrustations of Venice's terminal; cancels the Tronchetto, Piazzale Roma, the boat station, the railway station and the translagoon bridge. The only connection with the mainland is a suspended monorail. We agree with this Samonà proposal, since we already said in these columns in October 1961 that the planning problem of Venice began in 1846 with the construction of the railway bridge. We are glad that today such a proposal comes from Prof. Samonà, who has backed the town plan from the beginning, and who has been the architectural adviser for the new housing scheme at Sacca Fisola island planned with the features of a mainland town.

The report of the jury ends: 'It is clear that all the uses proposed for the Tronchetto area can be considered because the statistical inquiries are not yet complete and because the present technical revolution, particularly to do with transport, demands discussion of ideas.' The town administration (so authoritively represented on the jury) knew very well that realizing the programme for Tronchetto was not easy, whether because of the conditions imposed by the approved town plan, or because only a third of the new island belongs to the Municipality. At present a private company is building three circular garages (600 cars each) on this land with a three-year renewable lease.

So what was the aim of the competition?



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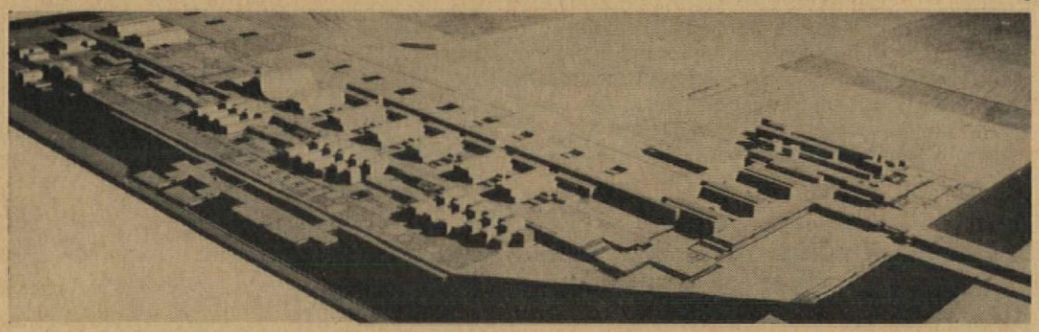

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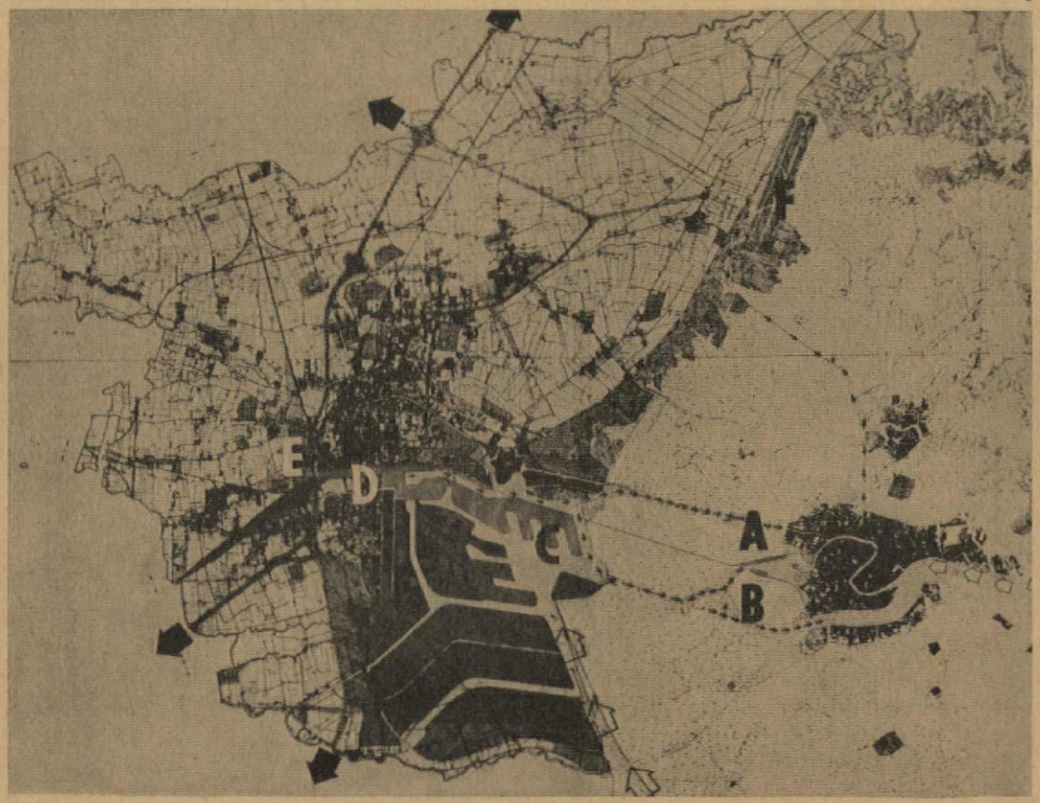
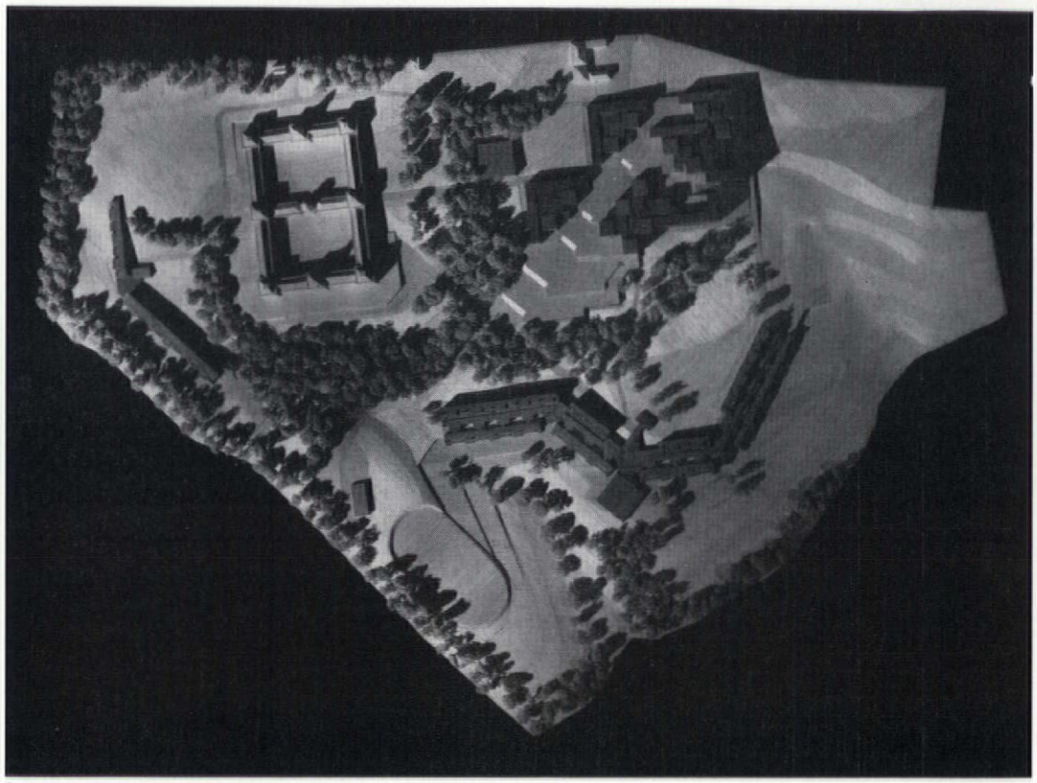


Note: the illustrations to this article are numbered consecutively in order of their appearance; occasionally this order is not identical with their sequence within the article

1
The illustration shows a group of science buildings (top right) in which different types of use, i.e. teaching and residential, are separated out, and units of building for each activity are arranged on the sloping site in a form which allows provision for growth



1

Science buildings Notes on the study of a building type

Professor Sir Leslie Martin

These notes are written at a time when considerable attention is being paid to the development of technical processes. Industrialization, prefabrication and 'system' building are seen as a means of solving urgent national building problems.

It seems a suitable moment to remark first, that appropriate technical processes or constructional systems are rooted in and are inseparable from the needs of particular building types; second, that every building type (housing, offices, laboratories, etc.), can be developed to the point at which its own organization and therefore its characteristic forms emerge. These carry with them their own appropriate constructional systems.

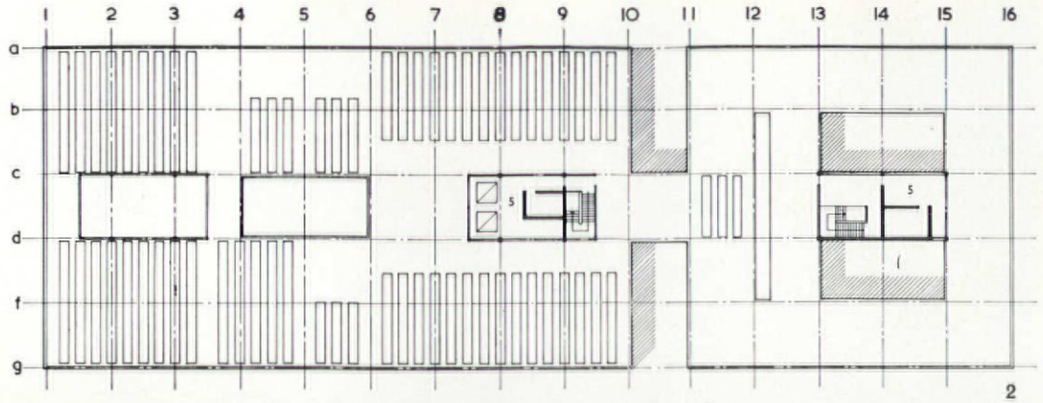
The characteristics of the building 'type' are seldom studied except at the level of room relationship within a given envelope. Thus housing, for instance, the office block or the laboratory are repeatedly contained within a similar envelope—the slab. To apply industrialized techniques to these slabs is to mass-produce buildings which may be already obsolete as forms of housing, offices or laboratories. The characteristics of the type have first of all to be discovered and the development of the appropriate constructional system is essentially one of the parts of this process.

Science buildings, like other building types, have tended to be limited by predetermined forms. The limitations of the slab are obvious, although it is frequently used[1]. The slab width is mainly determined by daylight penetration and is usually between 40 and 50 feet. In order to assist this penetration, ceiling heights may be increased for the larger rooms. These then, in turn, become difficult to associate with smaller rooms requiring lower ceiling heights and both structure and spatial arrangement may become incoherent.

In the case of smaller research laboratories, some architectural clarification becomes possible by the use of single-storey building and the introduction of roof lighting[2]. But in university science buildings, with their complex demands for many different kinds of space, including larger laboratory areas, administrative areas, lecture rooms, libraries and research space, the problem becomes more acute and a more fundamental rethinking becomes necessary. The separation of types of use by different levels is at least one clarifying step. In the Physics Building at Leicester, lecture rooms and the main administrative areas are placed at ground level and above these at first floor level, the teaching areas. A central core of service rooms and staircase, and the top lighting of the upper floors allows the total width of the block to be increased to 100 feet. Research areas are self-contained and their smaller rooms are planned around patios which, in turn, admit top light to the ground floor level **2, 3, 4, 5.**

Within such a system, uses and their appropriate spaces can be related, organized and clarified so that they can be effectively fitted to a structure; in this case a precast reinforced concrete frame. But there are again limitations. The total content of the building is conditioned by its two-storeyed height. The building remains largely tailor-made to a limited programme. It may be difficult to adapt and extend such a building to meet growing needs and, in particular, to relate it compactly with other science buildings with which it might in the future need a close connection.

There is now some general agreement that in considering the science areas of universities, we are no longer considering separate buildings, but a general principle or system of layout in which individual departments and faculties form part of a larger concept. Quite apart from teaching needs in which students from one



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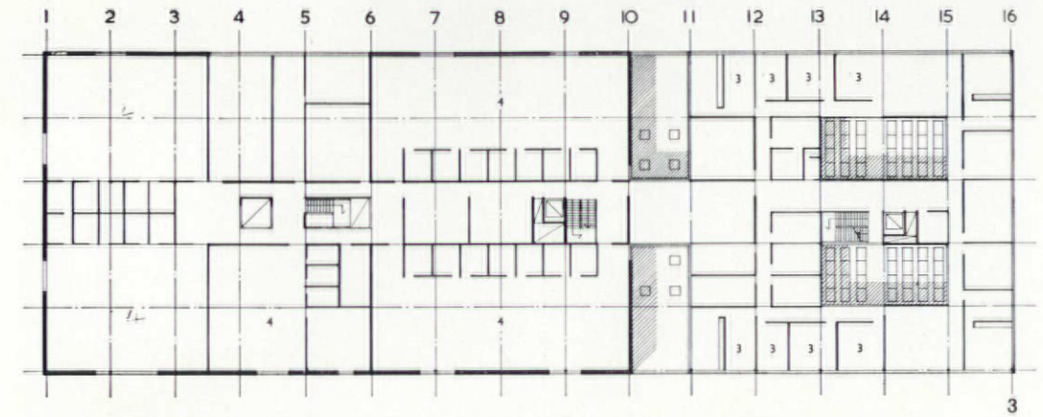

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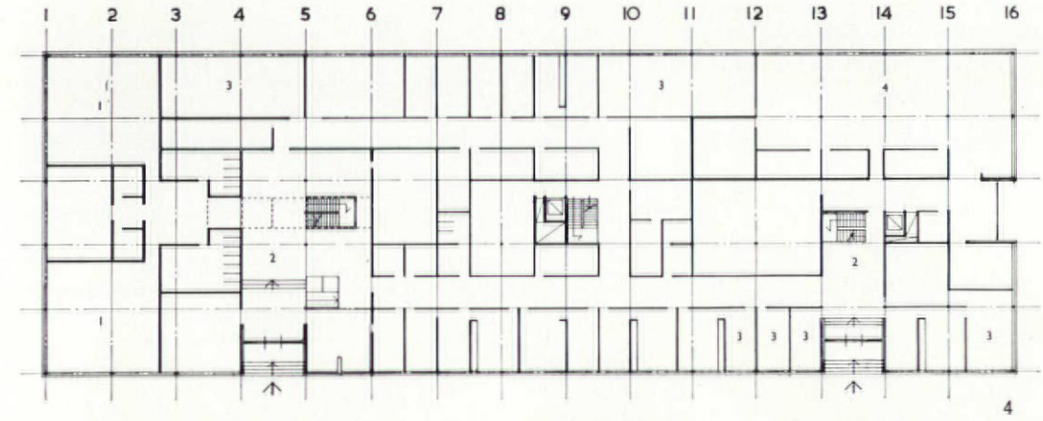
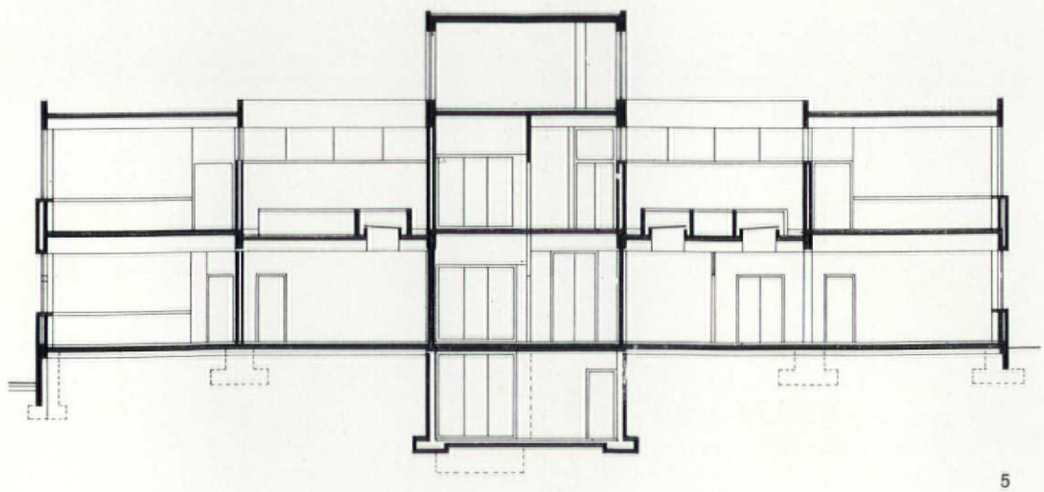


4

2, 3 & 4
Roof, first and ground floors respectively of the physics building at Leicester University (1958)
1 lecture theatres
2 entry foyers
3 research labs and lecture rooms
4 top lit laboratories at first floor; workshops at ground floor
5 air conditioning

5
Section through the physics building. By layering the building according to the daylight demands of the accommodation and by placing storage in the centre and by the introduction of lighting courts at roof level the block width has been built up to 100ft



5

department use the facilities of another, there is a case for sharing lecture rooms, cloakroom space, etc. In addition, there is the certainty of change in needs; for increase or reduction of space in known departments and the unpredictable needs of new 'growing points' between them. Sir William Holford in his report on the new Science Area for the University of Oxford expressed this in general terms by calling for 'the development of this site by means of a more flexible and comprehensive system of building for future Science Departments'. The scheme for the layout and the detailed design of two buildings for this new science area has provided the opportunity to apply a study which was developing independently and to demonstrate one possible method of providing a physical form for this new demand.

The need for a comprehensive system which will relate the needs of various departments and the possibility of sharing communal accommodation leads to a study of compactness and density of organization. Here again, if a particular attitude to natural lighting is adopted, as it is in these notes, the use of slab blocks appears to be unsatisfactory. At a theoretical level the plot ratio of any given site can be demonstrated in relation to the number of floors used. With a conventional light angle of 45° the plot ratio for four-storey buildings will be 2 : 1. If, however, the building becomes a solid block lit by courts (and although for certain heights such a form may be unacceptable) in four-storey building the plot ratio will be increased from 2 : 1 to 3 : 1, that is by a factor of 50 per cent.[3]

Such rather primitive studies suggested a form of building in which lower floors accommodating large rooms, such as teaching laboratories, could be mainly lit by top light and related to upper floors containing smaller rooms for administrative and research accommodation. Space is arranged in horizontal layers conforming to different types of use. This idea when related to convenient movement suggests a 'layering of accommodation'. Stores needing direct road access and little daylighting, special research work involving heavy equipment, cloaks, lecture rooms, etc. will be at ground level. Teaching laboratories and rooms requiring well lit areas will be at first floor level where they are conveniently close to cloaks, entrance halls and shared accommodation. Above these again are the research areas, their smaller rooms being lit by side lighting **6**.

This arrangement of uses and the total layout are related to a regular grid which is derived from considerations of space, lighting and an integrated system of structures and services. The grid consists of 35ft squares separated from each other by 5ft strips. At any point within these strips, services, ducts, etc., can be introduced. The ceiling of the square itself consists of beams arranged so that it may be used for services or roof lighting **10, 11** (page 598).

Many variations of accommodation and several major planning advantages can be gained within this general system of organization. For instance, at the main teaching laboratory level, areas of very considerable size become possible. Laboratories 120ft square can replace the limited widths imposed by the slab block **11**. Lighting studies made with the assistance of an artificial sky show that such large areas can be very effectively lit **7** and **8**; they are furthermore capable of many forms of subdivision to future different teaching needs or changes of use. The dividing plaid of the grid and the ducting system formed in the floor construction allow

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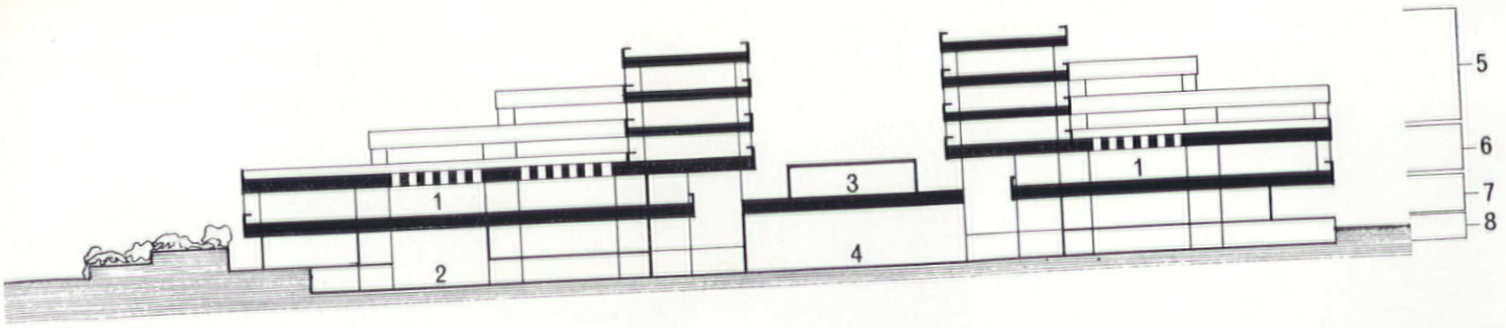

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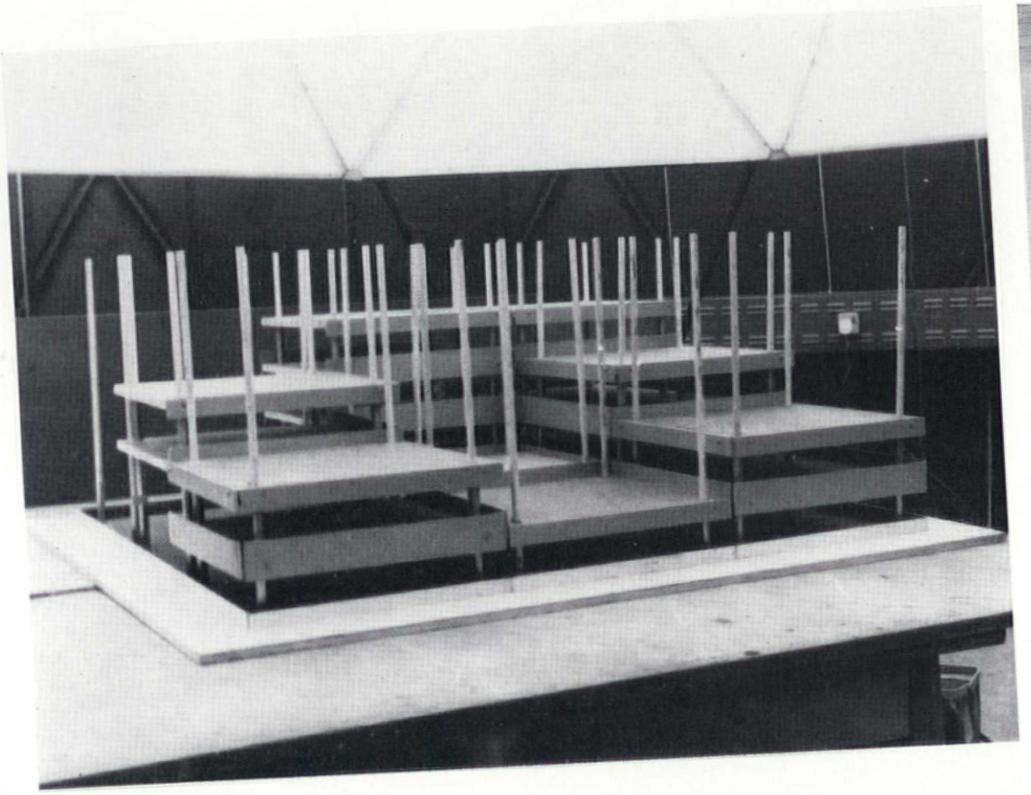

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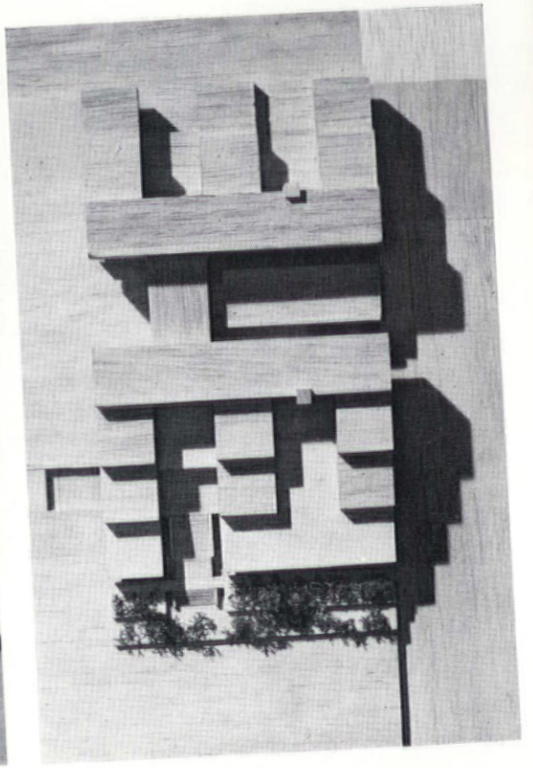

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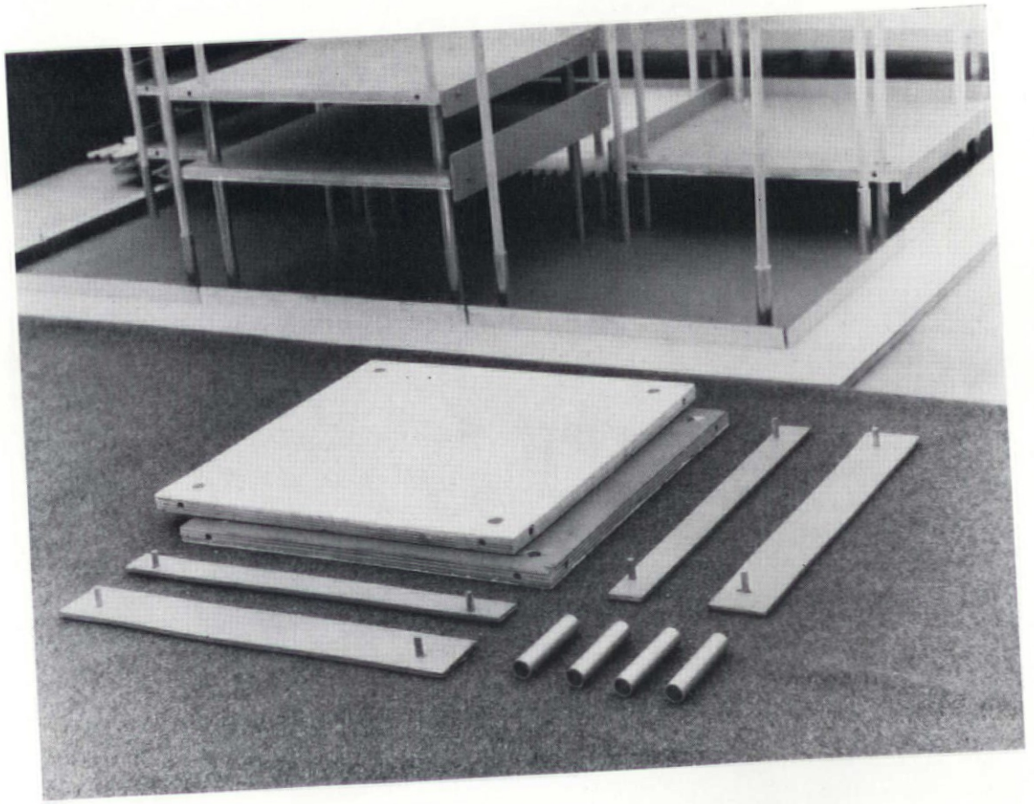
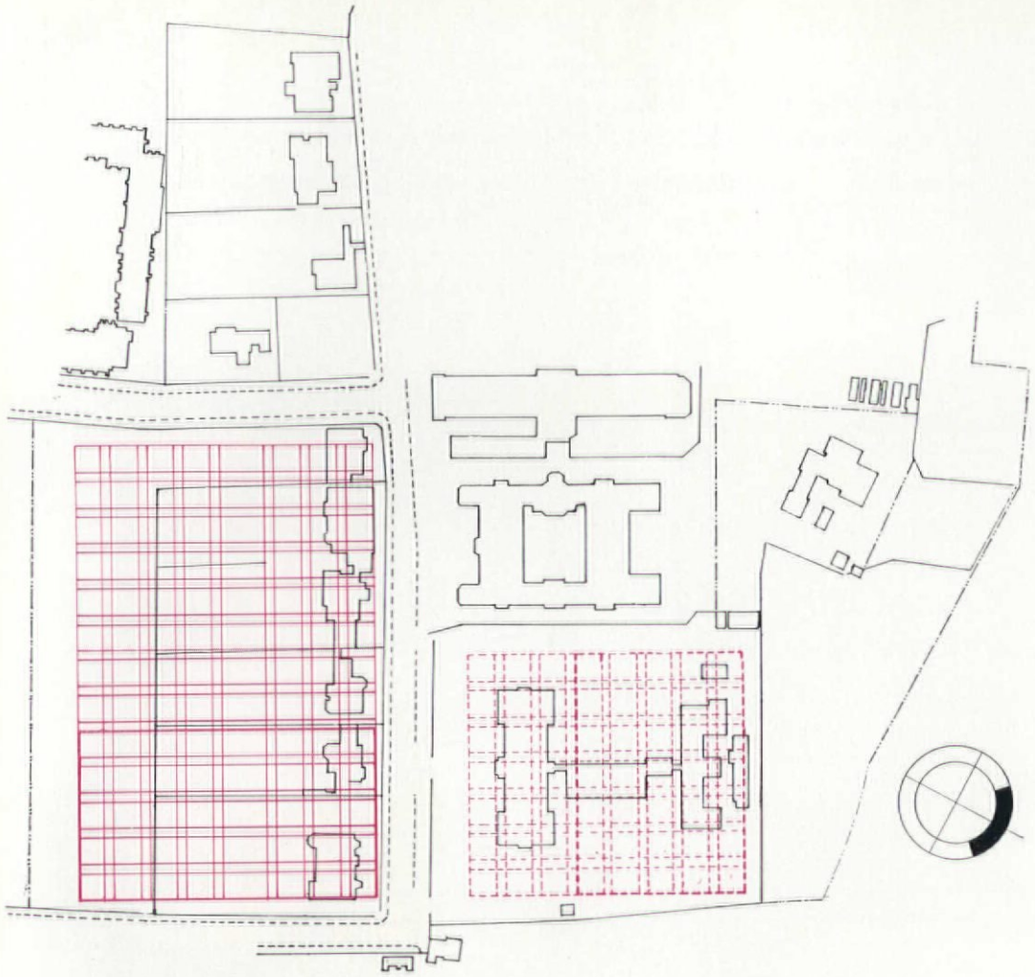


8

6
Cross section illustrating the principle of layered accommodation
1 teaching labs
2 service road
3 library
4 lecture room
5 research areas
6 undergraduate areas
7 lecture rooms and storage
8 car parking

7 & 8
Lighting study models. Lighting studies made with the assistance of an artificial sky demonstrate that such large areas can be very effectively lit by the use of courts

9
Model of first stage of laboratory development at Oxford University based on cross section above (1964). The departments of Zoology and Psychology are planned on either side of a central spine, each department naturally having different space requirements within the grid. The stepped form provides external roof space needed by these departments



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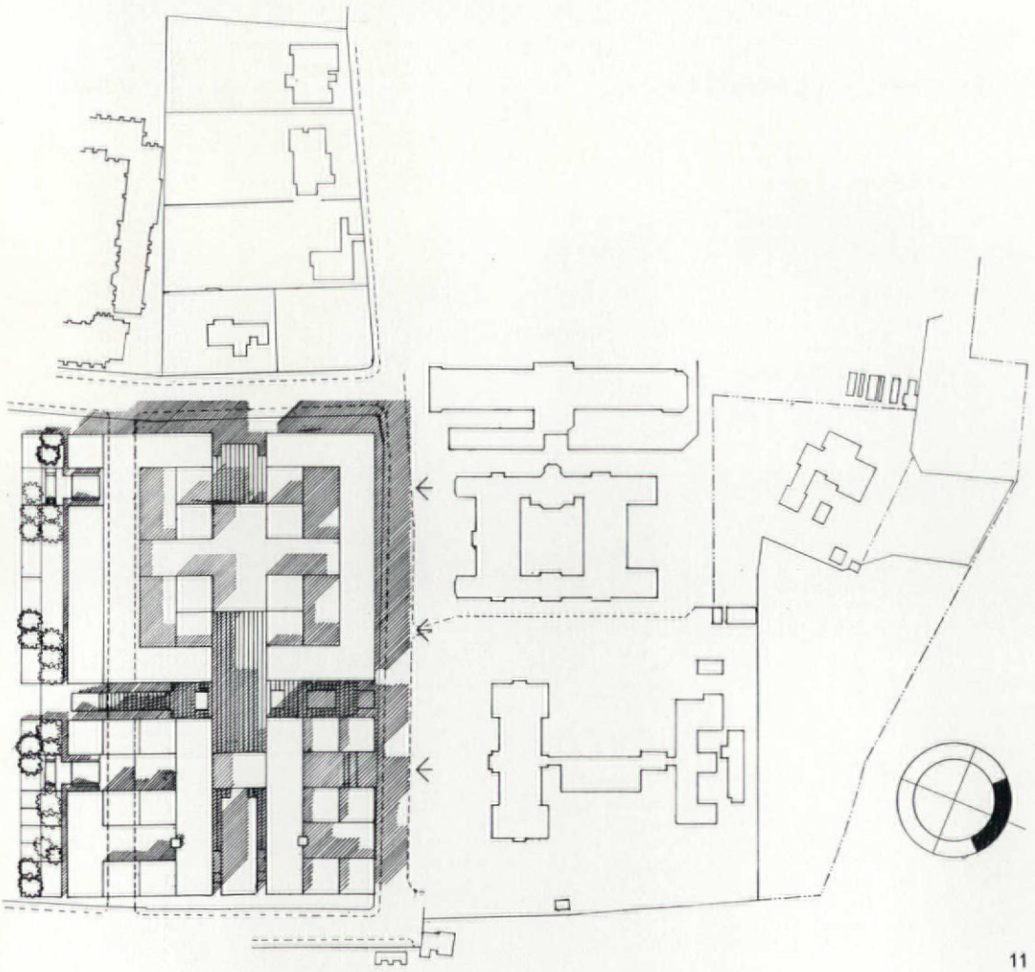


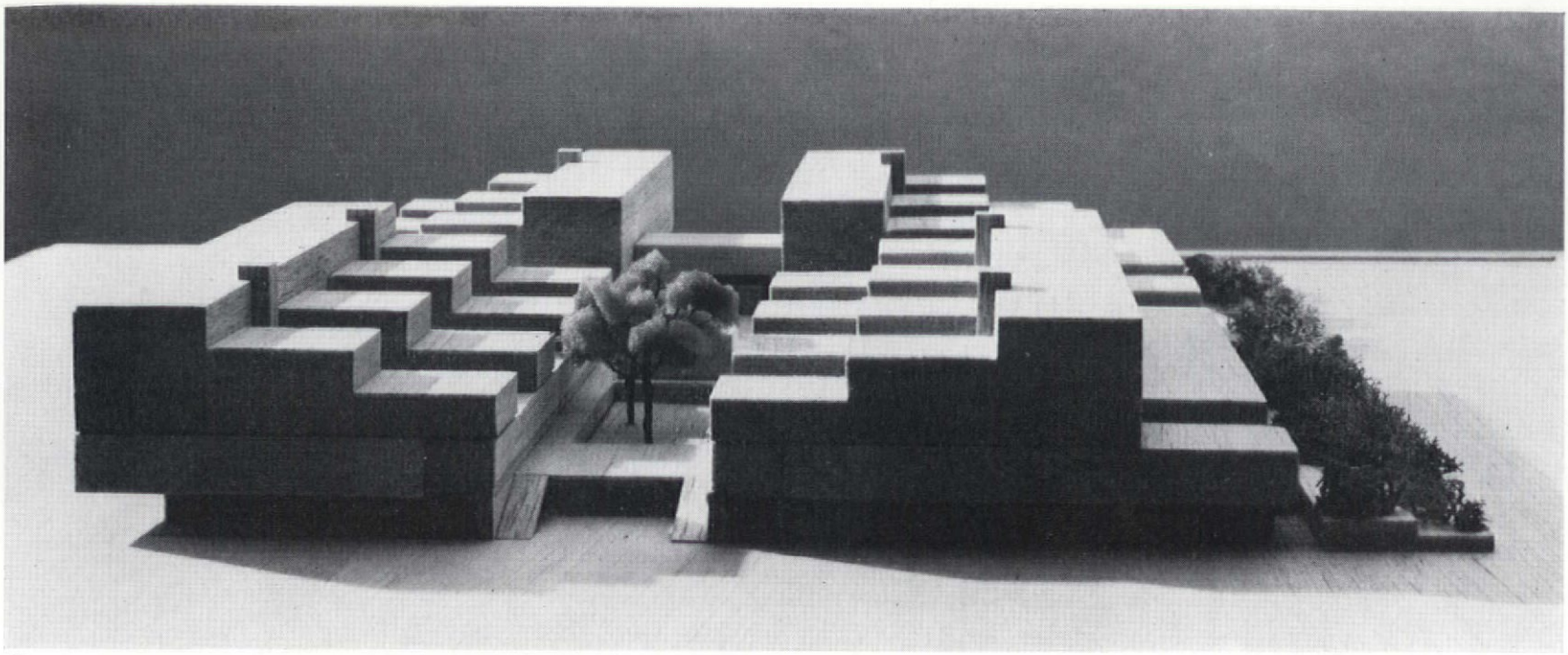
11

10
Diagram showing application of the 'planning grid' (shown in red) to an existing Oxford University site. The grid is regular except for the wider bay introduced to accommodate the central access spine

11
Plan showing the Zoology and Psychology building in the lower section and a possible way of completing the development of the site. Entrances are from South Parks Road

12
The block model of a possible assembly of accommodation shown the cellular formation

13
Perspectivized sections through proposed Oxford laboratories, showing structural system. Each cluster of four columns forms a potential two-way passage, both laterally and vertically, through the structure. Sections left white in shaded sandwich slabs are potential longitudinal routes for service runs. The stepped section meets the departmental need for considerable areas of outdoor space associated with the laboratories as well as maintaining lighting standards



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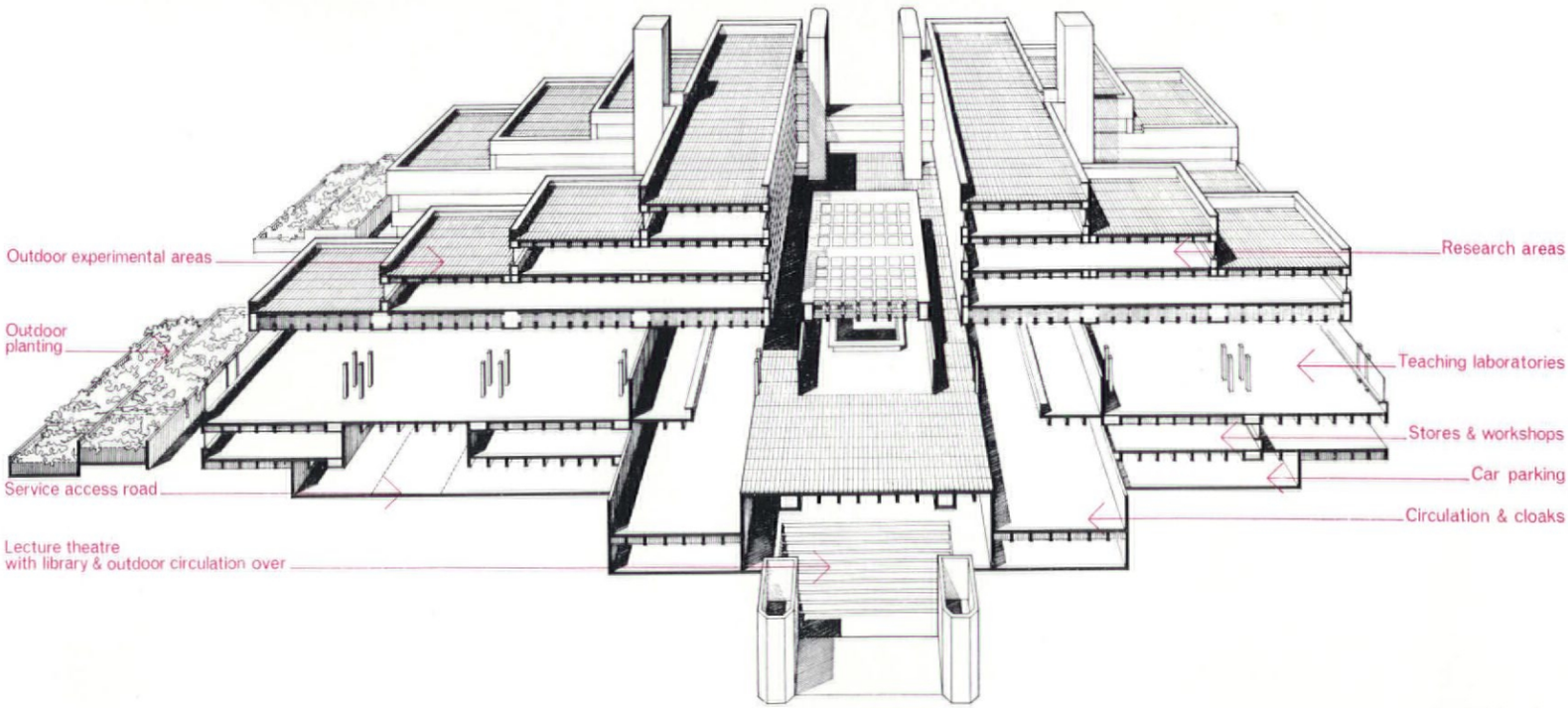
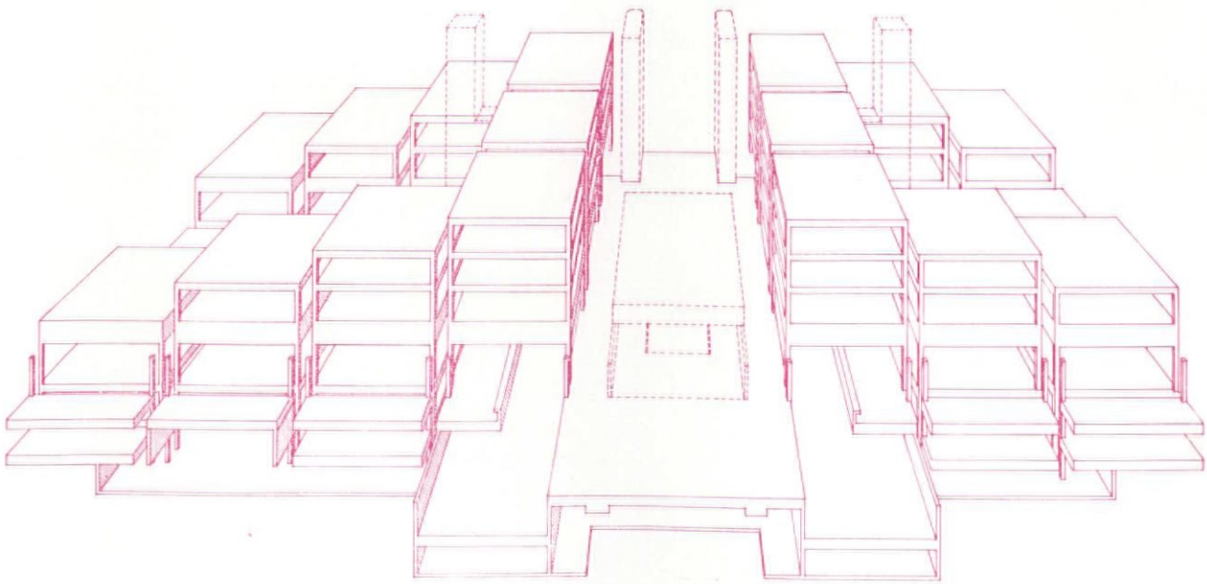

Outdoor experimental areas
Outdoor planting
Service access road
Lecture theatre with library & outdoor circulation over
Research areas
Teaching laboratories
Stores & workshops
Car parking
Circulation & cloaks



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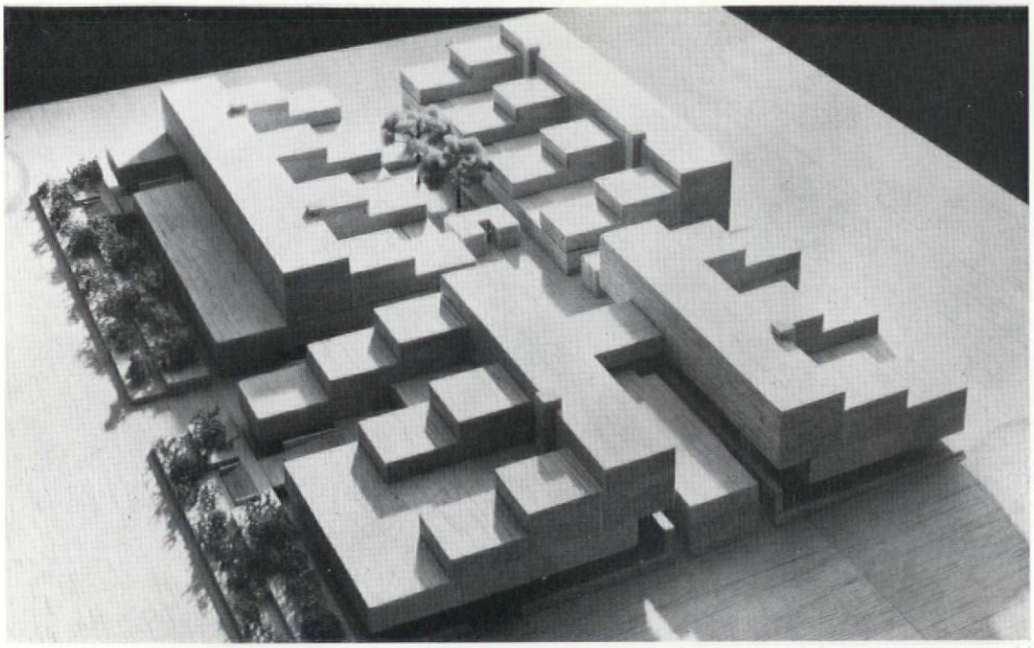

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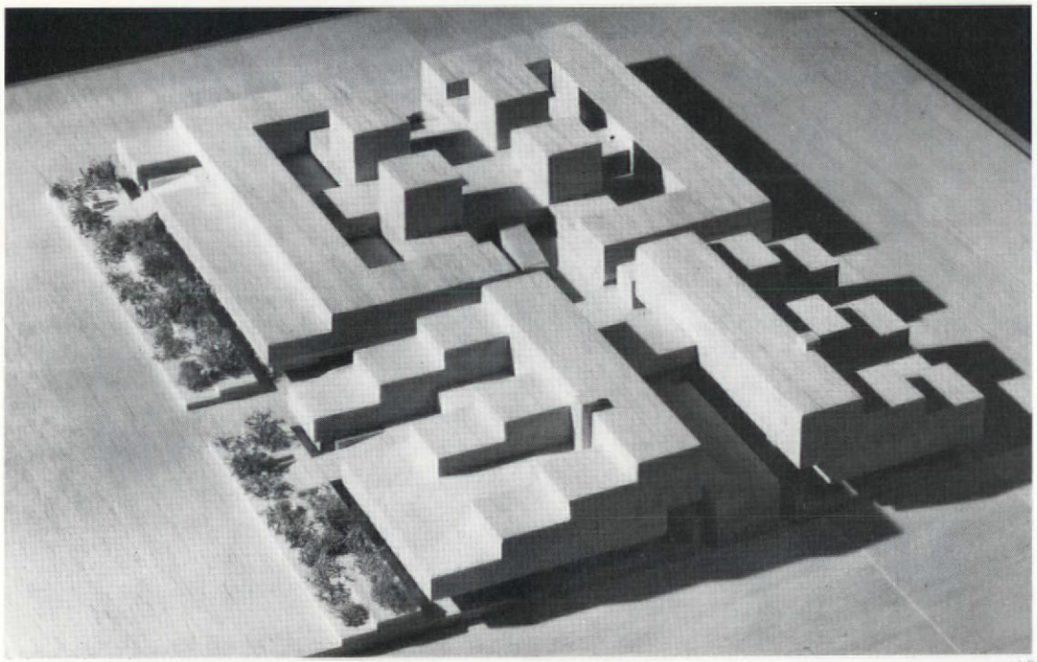

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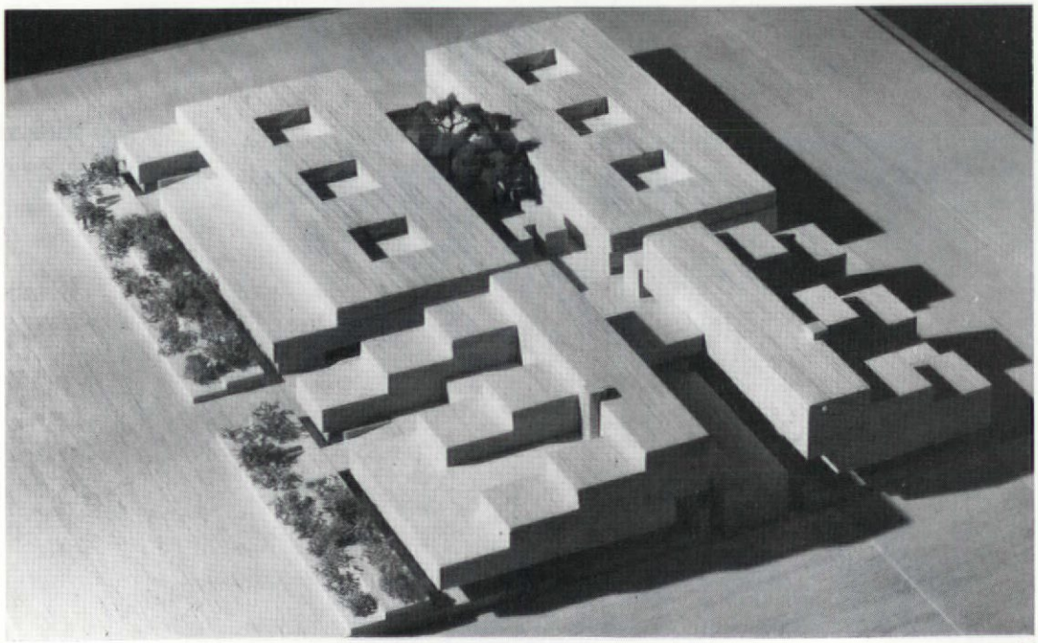

16

services to be run to any point in the floor area.

If teaching laboratories are combined with research areas, these may be arranged above this level and again will be built up on the basis of the grid. The subdivisions of such areas are controlled by various choices of corridor position from which a wide range of room sizes may be developed.

The total design is ordered first by the classification of uses and the arrangement of these in layers related to convenience of movement. The varying areas required by these uses are then built up from an assembly of cells arranged so that the lower layers of accommodation are given adequate lighting **12.** The cells themselves form the structural units and within these again, the services are integrated. Use, spatial order and structure are therefore inseparable. In any total conception of layout the modifications of use and form may be varied but they are part of a total unity which is built up from the use of common elements.

The illustrations demonstrate this in relation to the Science Area at Oxford. In this case the layout is developed around a central spine running from St. Cross Road to Mansfield Road. Cloaks areas, lecture rooms are arranged along this spine at ground floor level and over these, libraries, museums, etc., so that they are commonly available. The spine itself forms the connecting link between departments at ground and first floor levels. Various departmental groupings are arranged on each side of this spine and each section has an entrance from South Parks Road **13.** In this form of layout each department has its own sense of identity but it is linked to others by common assembly and circulation areas. Lecture rooms, opening off this circulation may be shared and departments with interests in common may be easily linked.

9 shows a block plan of the first stage of development and illustrates buildings planned for Zoology and Psychology on each side of the spine. The stepped form meets the departmental need for considerable areas of outdoor space associated with research laboratories. In this case the separate departments also have a physical link at an upper level in the form of a research laboratory for joint use. Illustrations **14** and **15** and **16** show possible ways of developing the system so that it extends over the whole site area. They demonstrate the general form that will be generated by different amounts and relationships of teaching space, research areas, etc. In the case of illustration **14** the requirements will be similar to those of Zoology and Psychology. Illustration **15** makes greater provision for smaller departments and a larger number of research units and smaller laboratories. Illustration **16** meets the needs of large departments where there is a considerable demand for small rooms. Each layout leaves open the possibility of expansion within itself and of further extension, or of providing connecting links at first floor level to the adjacent science area across South Parks Road **17, 18, 19.**

The system has been tested in other situations; for example, in an urban area where replacement of existing property conditions development **20** and **21.** Its application on sloping sites where a more random disposition suggested by illustration **1** may be necessary, has still to be fully worked out.

Some factual information can be added. At Oxford, although the maximum height at any point need not exceed five storeys (and along the Merton Playing Fields and South Parks

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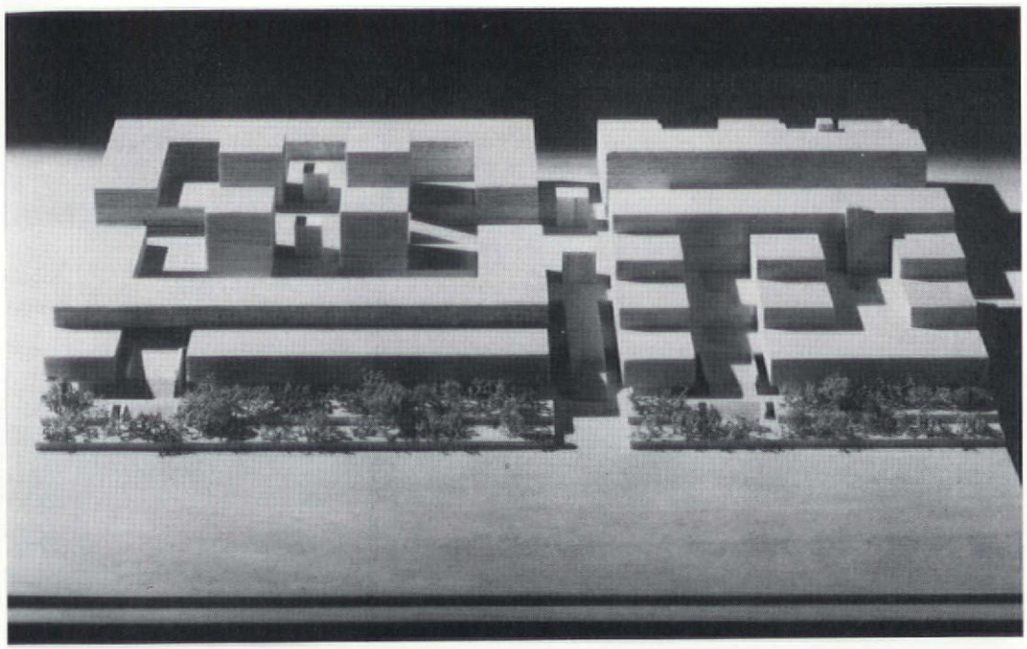

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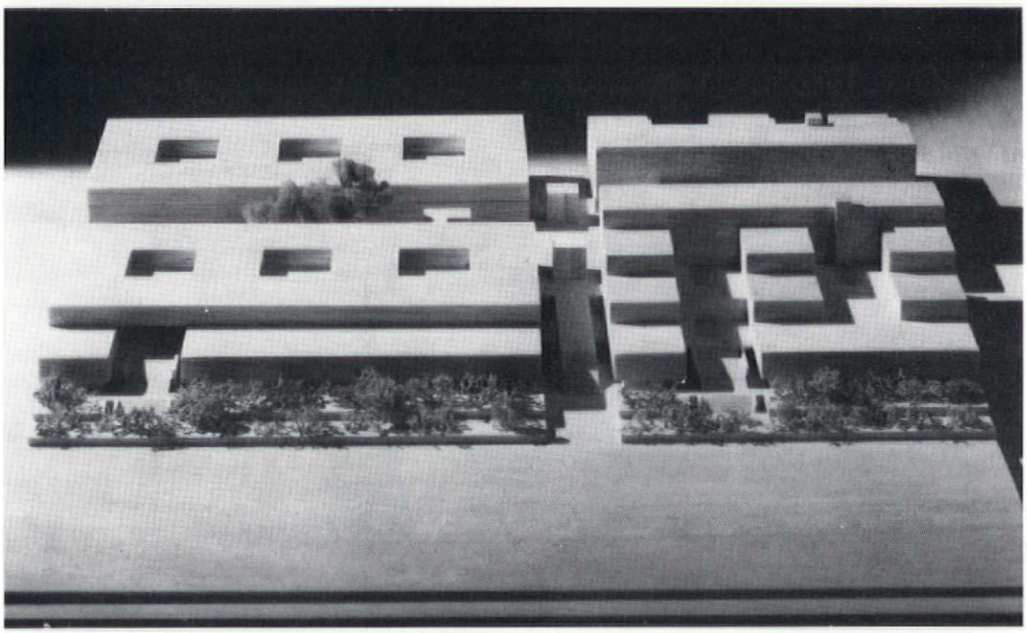

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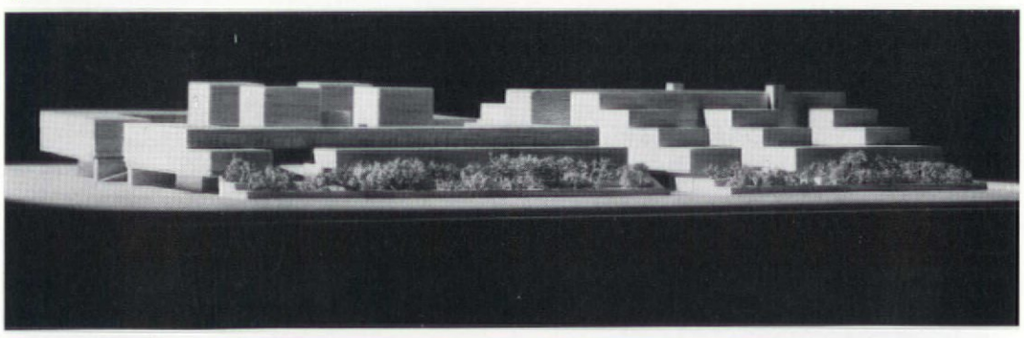
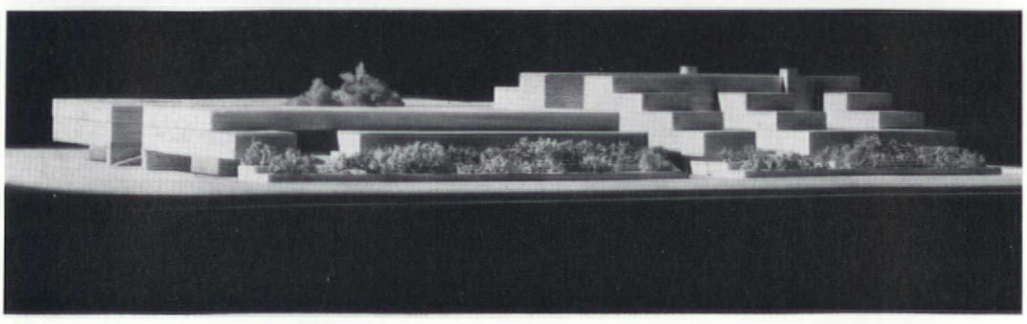




19

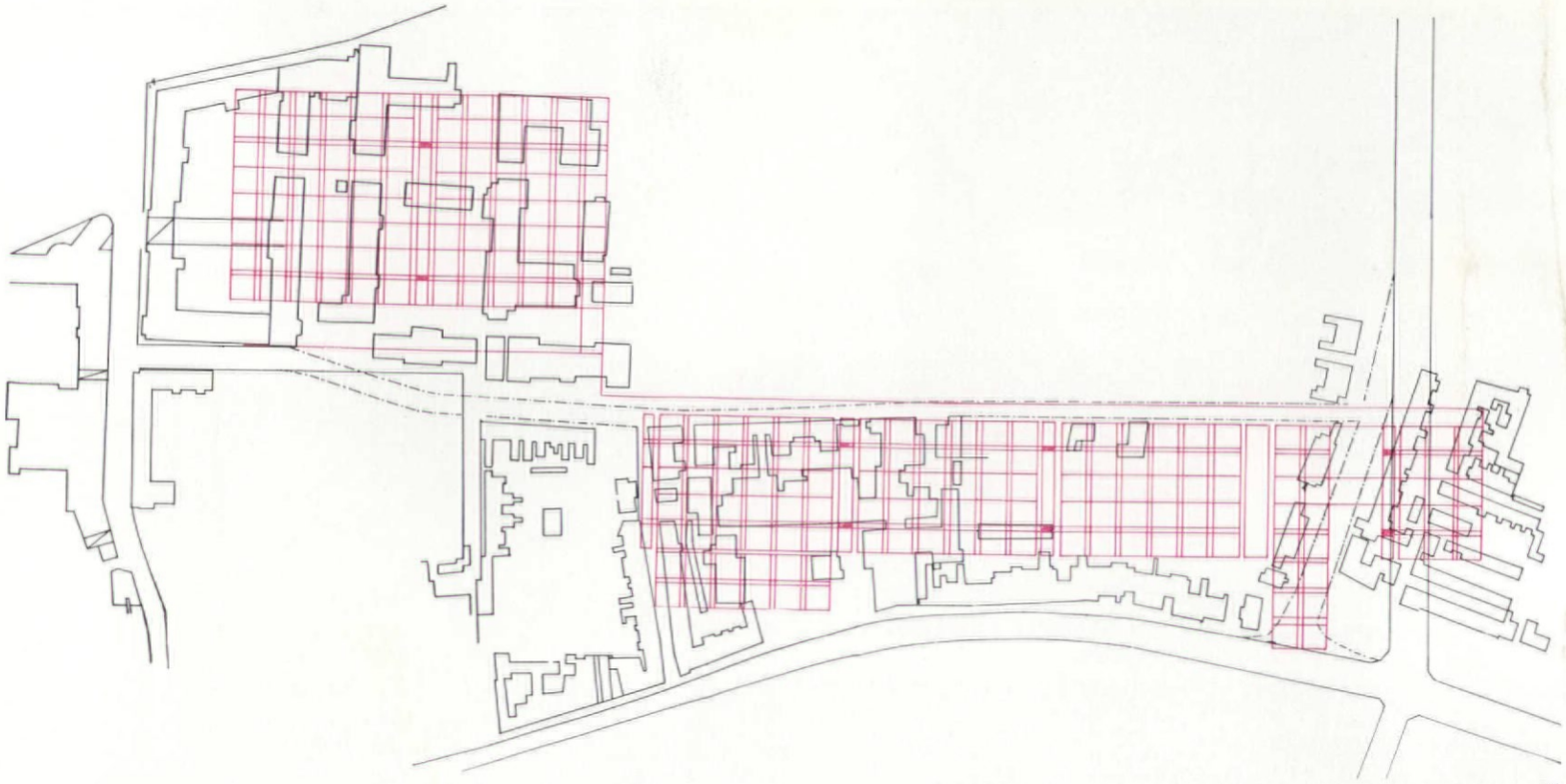
14, 15 & 16
These models show the Zoology and Psychology building and demonstrate possible ways of extending the system to a whole site, the grid accommodating different programme requirements

14
This development shows a build-up similar to that evolved for the new Zoology and Psychology laboratories

15
This development makes greater provision for smaller departments and a larger number of research units and smaller laboratories

16
This development meets the needs of large departments where there is a considerable demand for small rooms

17, 18 & 19
Lateral views of various versions. Such layouts leave open the possibilities of further expansion within and for futher extensions laterally outwards by bridge links to other science buildings



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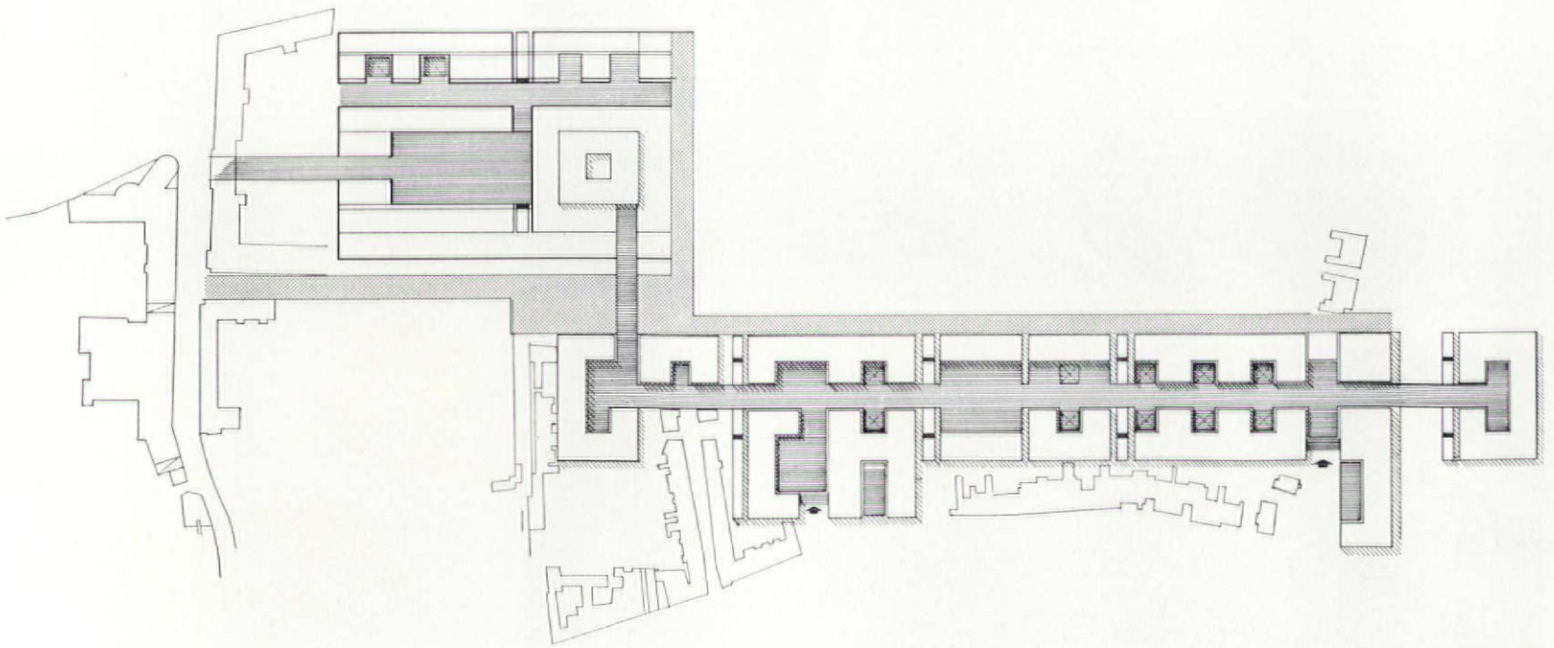
Road, two storeys only) the plot ratio could be built up if required to 2 : 1, and in other circumstances could exceed this. The constructional system proposed is precast concrete. At a purely practical level the use of the grid makes possible a rapid assessment of site capacity and may in the long run lead to a consideration of overall economies arising from the extent of floor space that can be economically built rather than from detail savings on individual schedules. Certainly any such consideration would make far more sense in relation to the provision of services, such as heating, ventilation, etc., which could be built up in the form of units related specifically to the floor space provided.

20
The grid (shown in red) applied to a complete progressive redevelopment of a large sector of existing property

21
A possible layout resulting from the applications of the 'planning grid' above

[1] See Appendix I. The Design of Research Laboratories.
[2] See: Agricultural Research Council's Animal Research Station, Cambridge.
[3] Lionel March, developing this study in Cambridge, provided a formula for general application.



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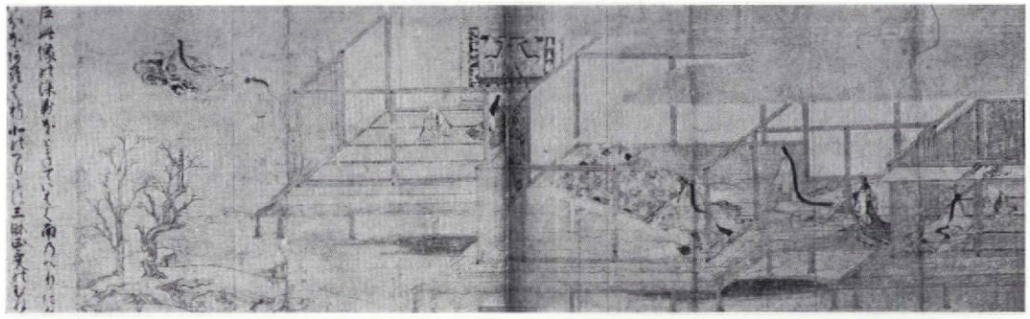
1



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3



4

Subsequent to Günter Nitschke's article on the Japanese Metabolist's which was published in our October issue, we are printing this supplement edited by Günter Nitschke, which examines in some detail the more recent work by prominent members of the metabolist movement. This supplement is introduced by a precis of an article by Kurokawa which appeared in the September 1964 issue of *Kenchiku-Bunka*.

'The Architecture of Action'

by Noriaki Kurokawa

1
Of this traditional print Kurokawa writes, 'In the experience of hell, symbolic for destruction and chaos, one can arrive at a philosophy of new action, from which may result the beauty of Metabolism'

2
Japanese painting is always dynamic; the centralized perspective of western painting is absent. The observer chooses a particular section of interest to him, and 'moves' from this point, thus functioning as a co-creative element in the design

3
An example of a 'side-walk'. In designing the labour centre in Kyoto, Kurokawa became obsessed with the notion of a 'sidewalk', as a positive architectural element

4
Perspective of Kurokawa's Christian labour centre in Kyoto

In a recent issue of *Kenchiku Bunka*, Noriaki Kurokawa attempted to redefine the 'aesthetics of metabolic space-making'. The methods which he propounds as basic to metabolism, sound somewhat similar to the basic principles of Buddhistic philosophy, outlined in my introductory article to the work of the Japanese Metabolists in *AD* October 1964. Firstly the doctrine of phenomenality or impersonality which proceeds analytically, to split existence into its ultimate constituent parts, into mere empty and unsubstantial phenomena and secondly the doctrine of dependent origination which proceeds synthetically to show that all these phenomena are, in some way or other, conditionally related to each other.

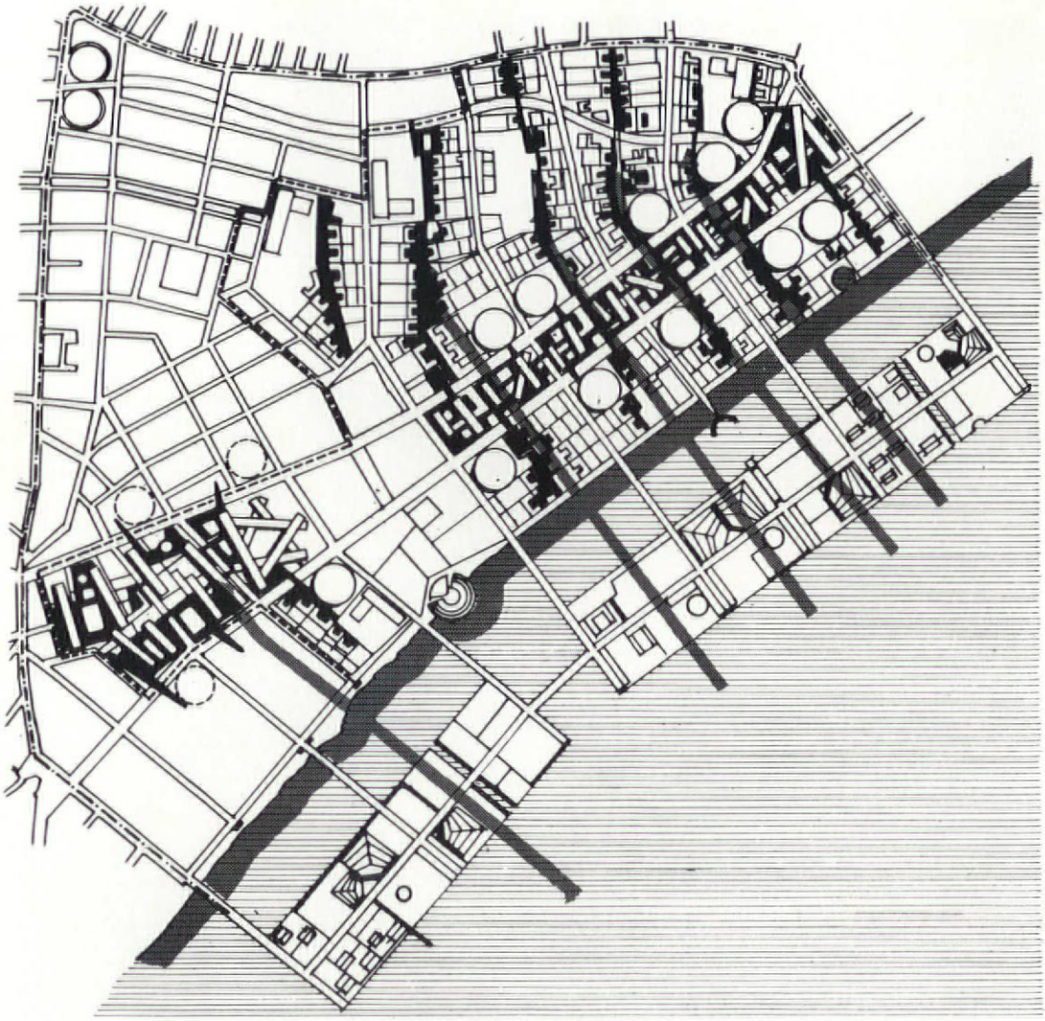
Consequently Kurokawa sees 'metabolism' as employing two basically complementary methods. Firstly, the analytic method, which looks into growth, expansion, plot-type, and thus into the basic principles determining the quantity of space. Secondly, the unifying method which postulates conceptions like the architecture of the road, of the side-walk and of movement generally; concepts such as these determine the quality of space.

The present—an experience of hell

Kurokawa defines this symbolically as destruction and change not only affecting our environment as such, but also the ideas of CIAM, of Futurism and generally of the 'established' heroes in Japan. Out of this chaos now arises a new philosophy of action, from which may eventually derive the 'beauty of metabolism'.

Life is movement—road is architecture

What Kurokawa means by this concept becomes clear in his design for the Christian labour centre in Kyoto, which is a concretization of

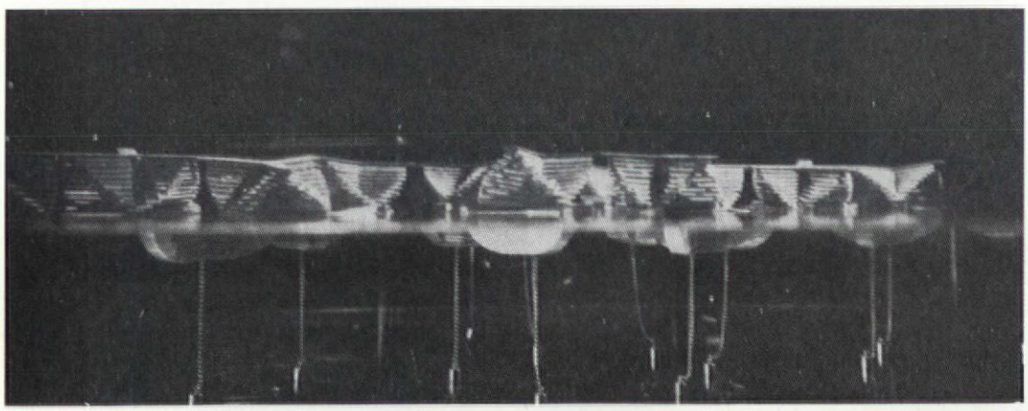


1

pedestrian movement within built-up blocks or similarly in a recently completed hotel, where he no longer speaks of the layout of building masses, but of a 'flow chart'; not of a corridor but of a 'road or side-walk'. Kurokawa sees this 'road or side-walk' as having the same texture as the real exterior road or side-walk. In this context one thinks not of rooms but of individual 'houses', not of lounges or common meeting rooms, but of 'squares'.

What is meant is clarified by its application to a project of larger scale, such as his design for Tel Aviv-Jaffa 1963. Here his manner of connecting the two existing conurbations of Tel Aviv and Jaffa leads to a new city-infrastructure utilizing two existing routes, which enclose an area of obsolete slums, destined to become the new commercial centre. His flow-chart shows a superimposition of:

1. Black lines indicating pedestrian movement tending towards the sea-side and along the commercial linear centre. This movement being on natural ground and also in the shadow of terraced housing. Along these streams of pedestrian movement are the shopping facilities, here arranged like oriental bazaars.
2. Roads indicating car movement fed from two interurban connectors, from which spring the ribs to which circular garages are attached, catering for approximately 60 per cent of incoming cars stationed there all day, whereas for the rest of 40 per cent of shoppers, parking facilities are provided along the bazzars, etc.
3. Tinted arrows indicating breeze movement. An essential movement to be utilized and recognized in tropical countries, here it runs along the shaded areas of the housing in from the sea.
4. A broad tinted line indicating winter movement along the existing coast with occasional inlets.



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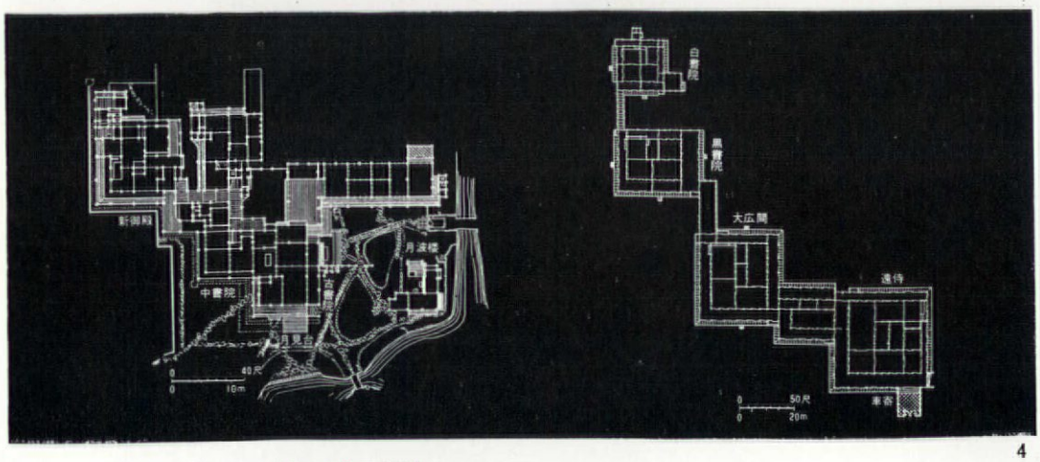


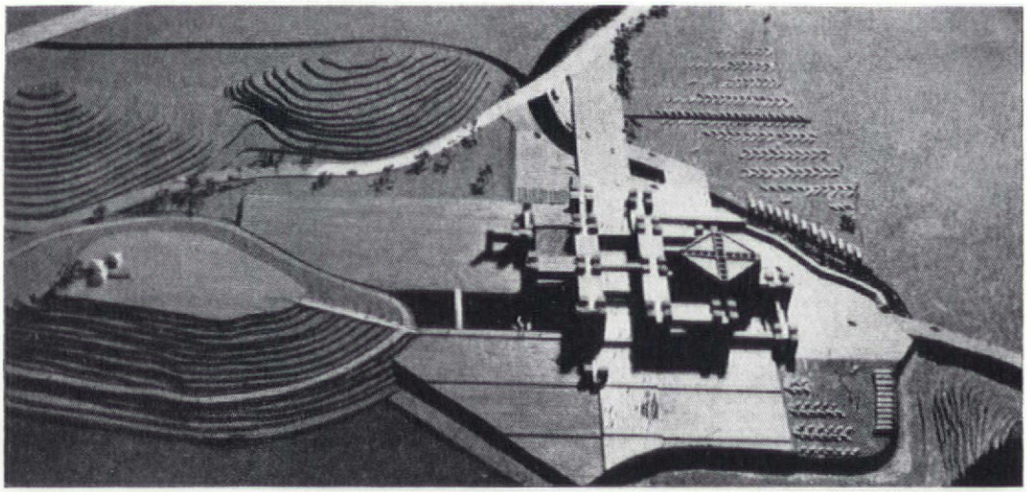
4

1
The principle of the 'flow chart'. Entry by Kurokawa for the Tel Aviv-Jaffa International Competition 1963

2
'Helix'. Kurokawa's floating city consisting of helicoidal structures built on artificial land

3
'Futurism'. The one movement that tried to capture the entity and essence of movement

4
'The plot type' method of growth. Traditional Japanese buildings which are complete at each stage of their unit growth; the Nijo Castle and the Katsura Palace



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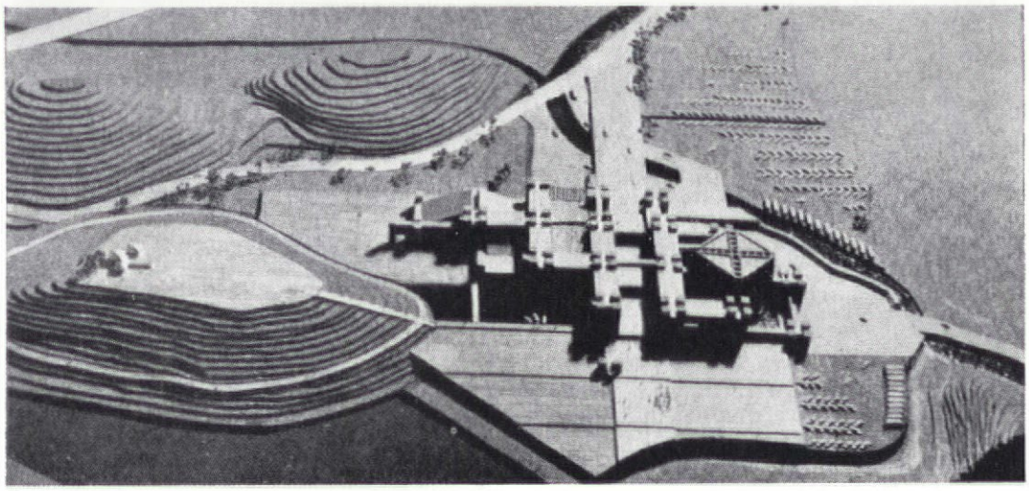
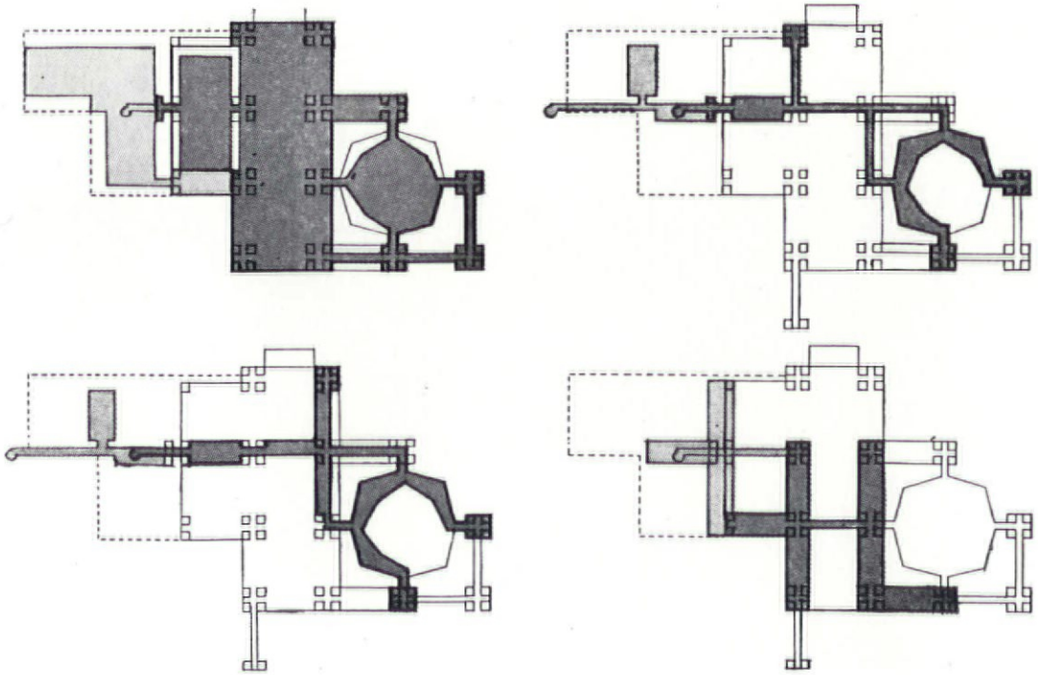


6

5 & 6
Two stages of growth in the Kyoto Conference Centre project

7
The 'Meliorama', environmental sculpture by Munari

8
Plans showing stages of growth and use, both horizontally and in vertical layers. Shaded areas indicate connected levels. The levels are designated as follows: First level: representatives, members of Congress. Second level: TV, journalists, radio, etc. Third level: general public audience. Fourth and fifth levels: offices



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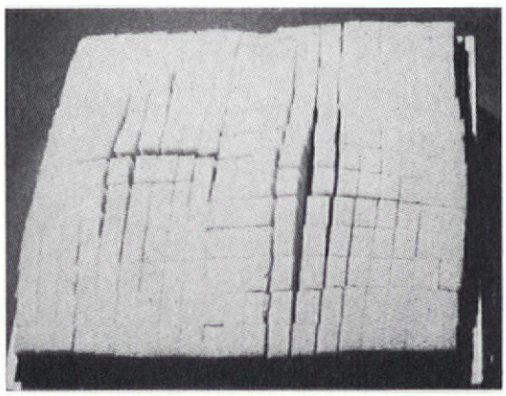
Having broken finally with CIAM, which for Kurokawa, was a cubist inspired movement and the architect now founds his thinking on futurism for its preoccupation with movement and change, on Munari's 'Merliorama' Sculpture, in which the observer (i.e. the client in the building process) takes a creative part in the actual design and also on Team 10 for its research into communication systems and the relationship between the infrastructure and its elements. From this basis Kurokawa sets up the new dynamic beauty of metabolism. His methods are as follows:

(*a*) The method of stimulation which involves the setting of a new structure into a group of existing structures. This should not only allow the possibility of an unknown future growth, but stimulate it into a certain direction.

(*b*) The method of plot–type, which he sees as the basic characteristics of traditional beauty in structures like the Nijo Castle or the Katsura Palace, where at each separate phase of growth a vision of 'complete' beauty was established. There is nothing like a final static shape in these designs, but of a harmony achieved through balance.

Kurokawa is able to give examples to illustrate these principles; in particular his notion of the point stimulation system. The concentration of certain activities within a cluster with their tendency to radiate from these points of concentration becomes the main influence for a dynamic infrastructure within a city.



7

Kyoto conference centre 1963

Noriaki Kurokawa

An example of Kurokawa's point stimulation system is his design for the competition of a new conference centre in Kyoto 1963: Here in contrast to the first prize given to Otani, a former assistant of Tange, whose design can be looked at as a static compositional arrangement of sculptural elements, Kurokawa devises a point-stimulation system on a smaller scale, which allows for the phased construction required in the first stage and for future extension to double the volume of the first stage. The stimulating points here are the vertical, structural and equipment shafts, which form the basic grid structure of the growth, between which a seemingly limitless variety of inner space arrangements is possible, whilst also permitting external growth. The four basic functions are divided up vertically, each of which can claim complete freedom of arrangement on its level horizontally.

Factory for the Nitto-Shokuin Company 1964

Noriaki Kurokawa

A rapidly increasing production capacity which so far has doubled itself every three years became the determining factor in the conception of this unit-type factory, with a basic unit of 17 metres derived from structural and functional considerations, and the invention of a stimulating column, a true symbol of the dynamic beauty of metabolism. This column not only provides a structural point for the support of the prefabricated roof, but serves also to simulate the rhythm of the production process itself and as a symbol of the anticipated and stimulated future growth. Kurokawa can definitely also claim an economic success with this building for the time between prefabricating the elements and the completion of the entire factory was only three months.

Art University, Osaka, 1964

Noriaki Kurokawa

A similar general approach is made in Kurokawa's competition design for a new Art University in Osaka. It is structured by the three main functions. They are: sport activity, lecturing activity (horizontal, because a common activity), and living activity (vertical, because of the required privacy).

The principles involved in the design are as follows:

1. Along an existing valley is stretched the new university infrastructure, containing all common equipment and communication elements like the total administration, eating and meeting spaces, museums and libraries.

2. On top of these elements are situated the spaces for lecture rooms, which then allow for two types of growth:

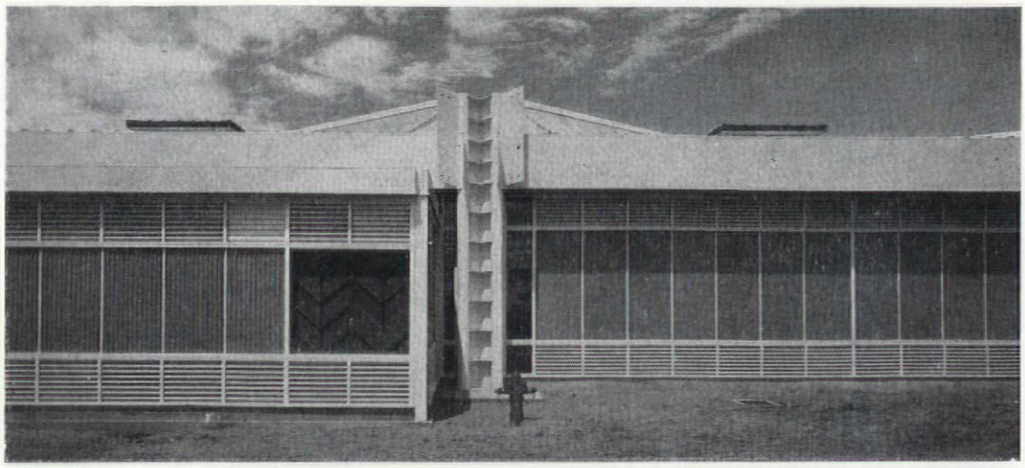
(*a*) Externally by building a completely new block or even starting to build over the adjacent valley.

(*b*) Internally by the structure being conceived as 'major bridge structure' with 'minor element structures' being situated on top of it.

The complex is designed for a maximum vertical extension of three floors, which obviates any need for vertical communication shafts. The movement of the people in terms of stairs on the outside of the building structures the façade, i.e. 'movement is façade'.

3. The housing is provided in terms of growing towers for the students and lower blocks of a cellular growth type for the professors.

4. The gymnasium is provided with all secondary facilities underground and a stadium above.



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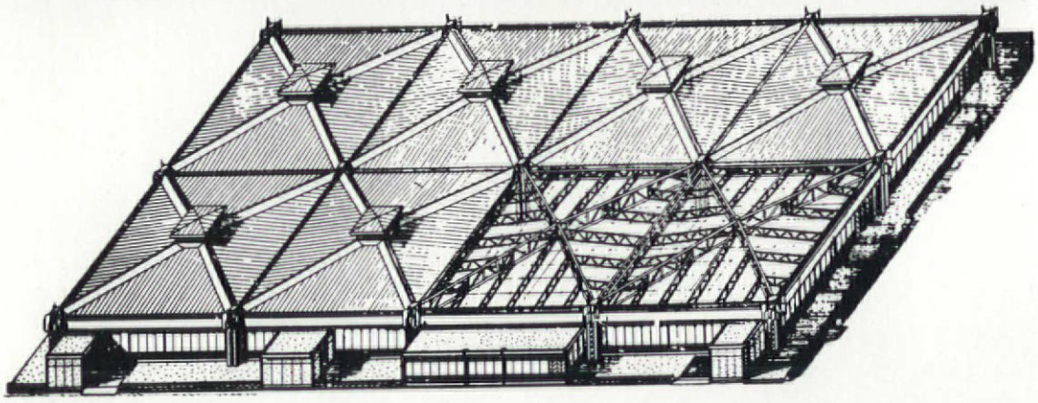

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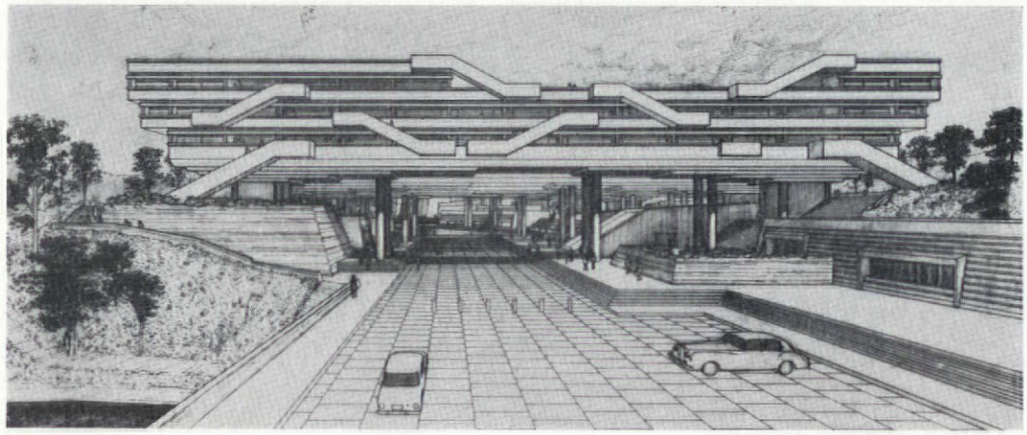

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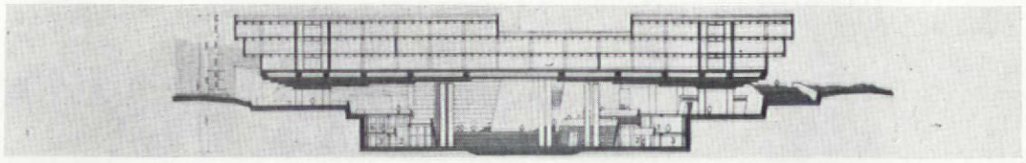

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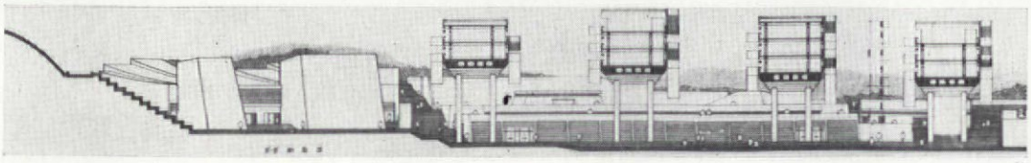

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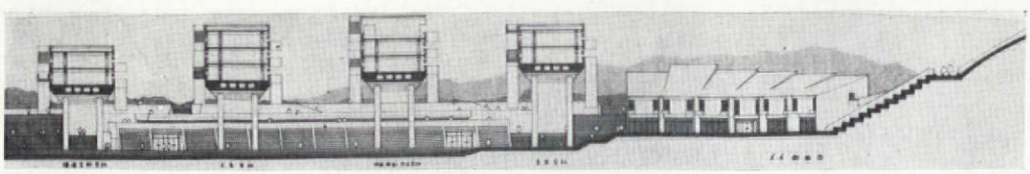


6

1
Exterior of the Shokuin factory. Columns are considered by Kurokawa to be symbolic of expansion

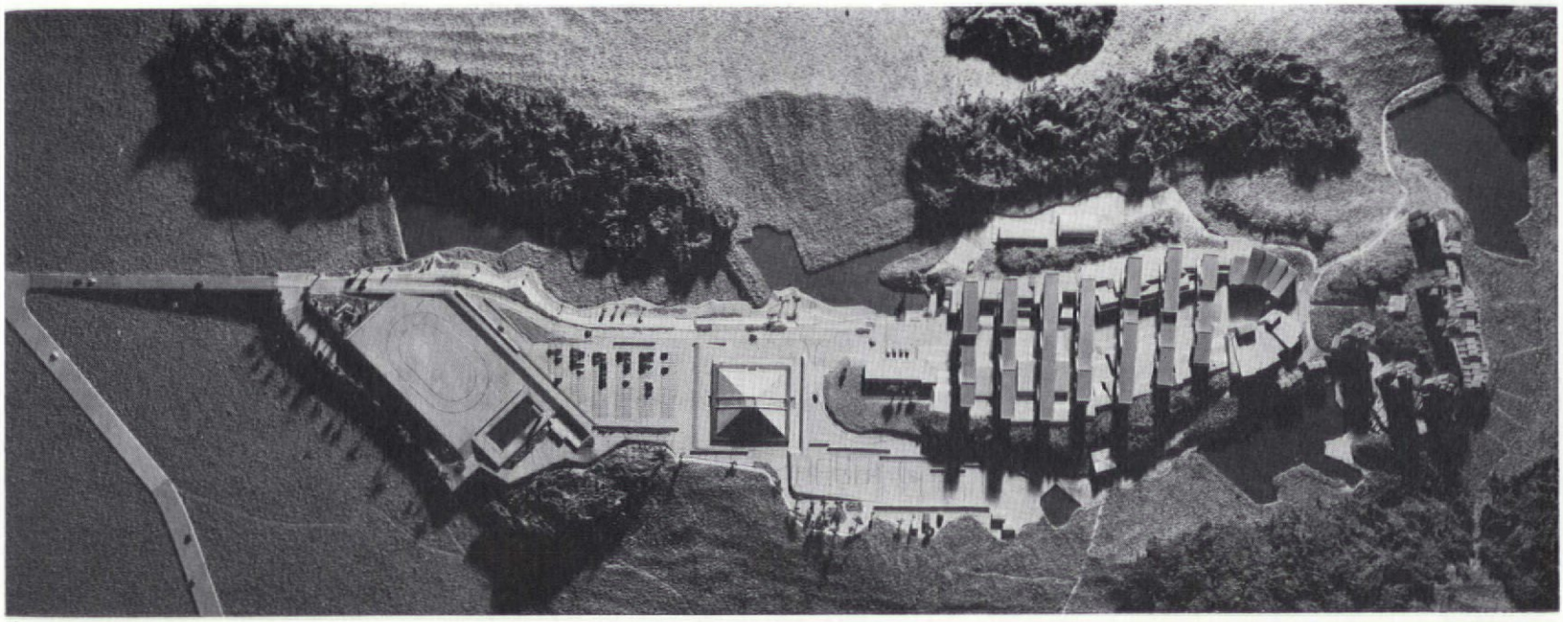
2
A drawing of the Shokuin factory showing the structural system

3
General view of Osaka University. 'Movement is façade'—'façade is movement'

4, 5 & 6
Section through the Osaka campus

7
Plan view of the complete Osaka project

8
Stages and systems of growth at Osaka University



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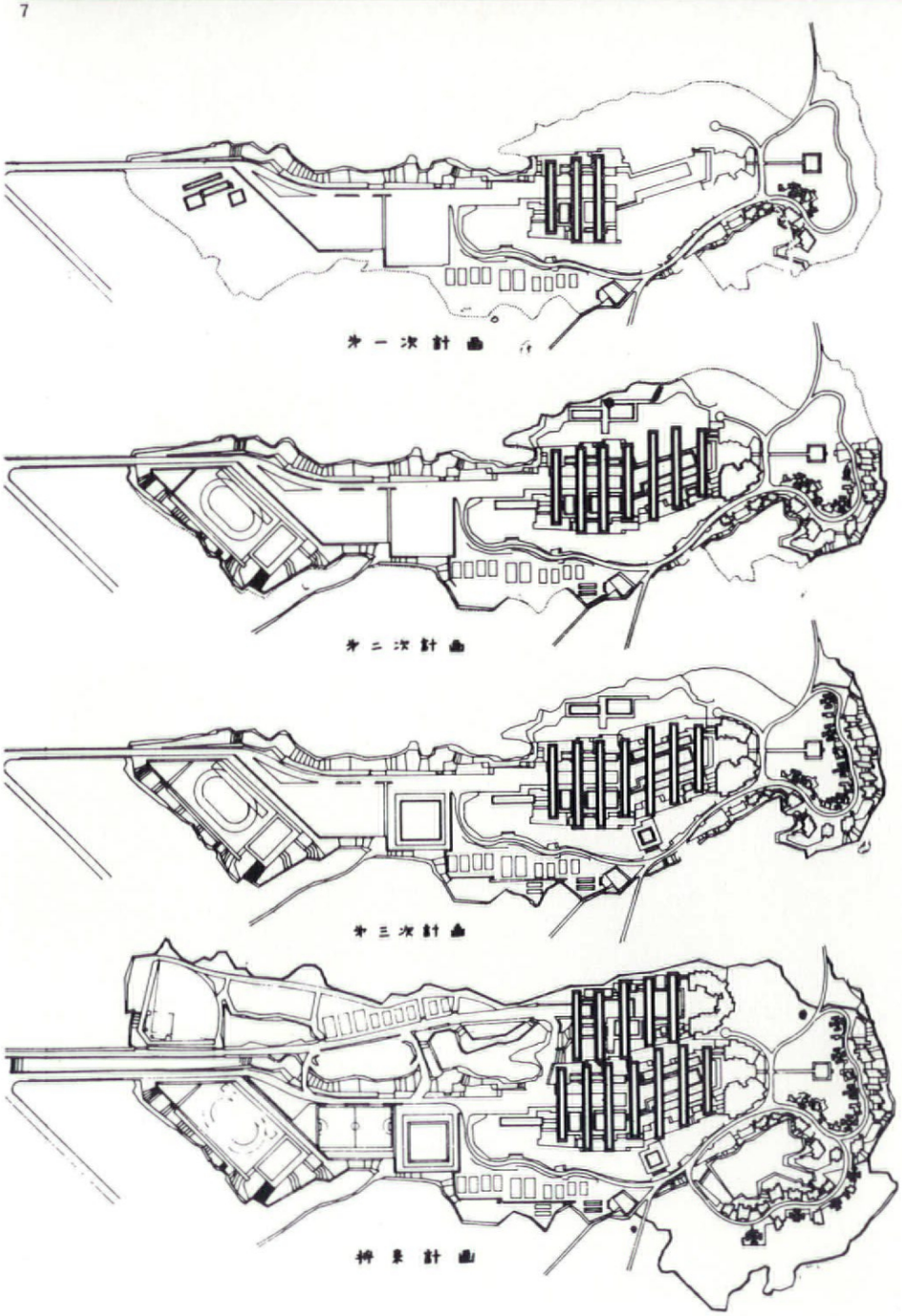
第一次計画
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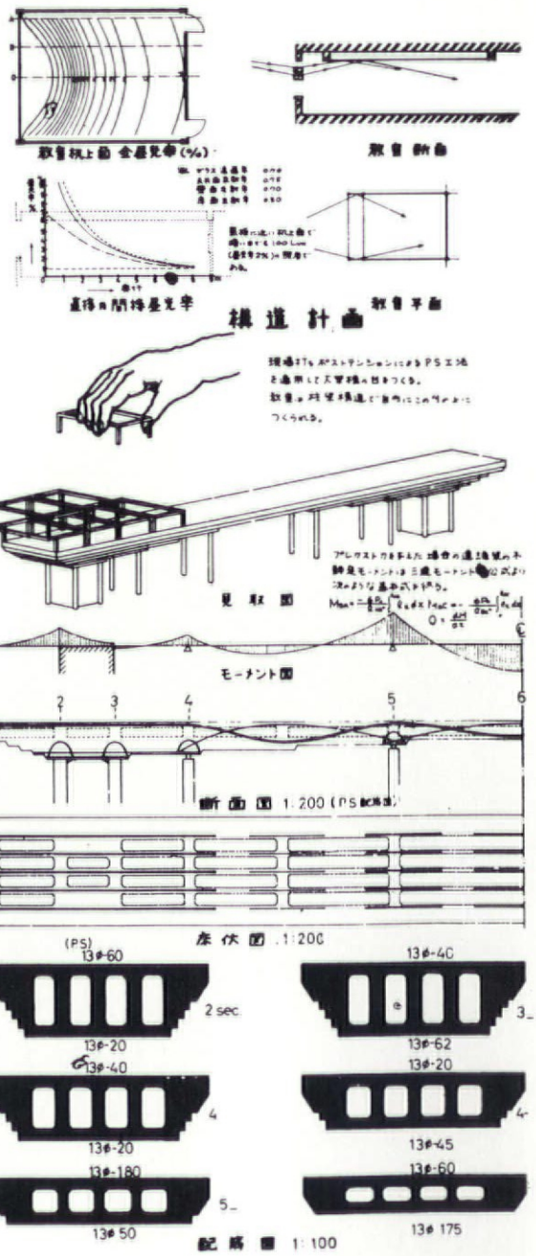
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モーメント図
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床伏図 1:200
配筋図 1:100

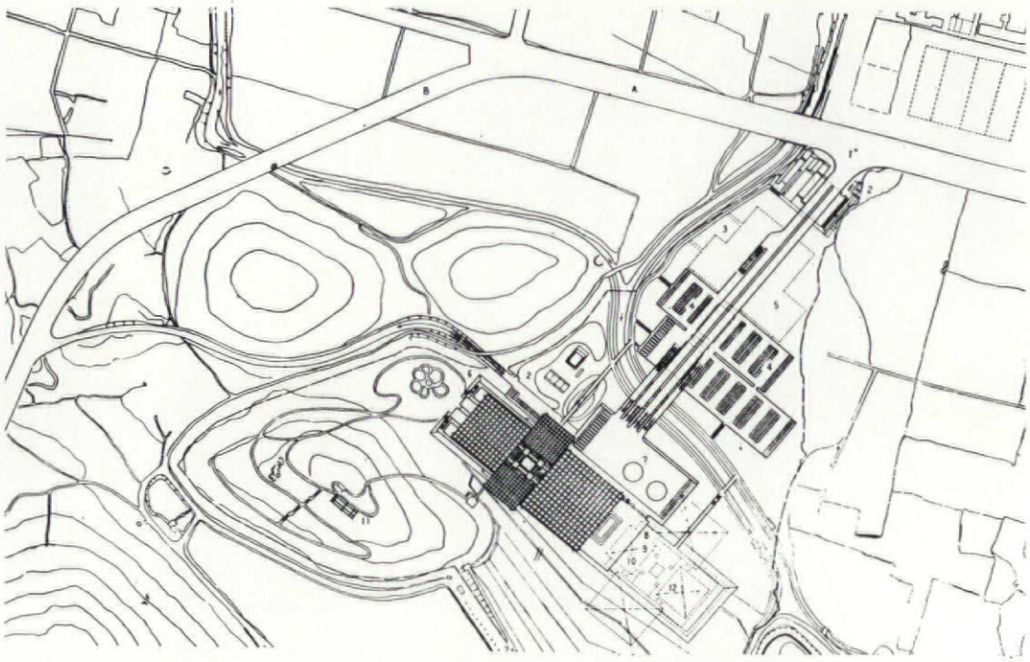
8

Kyoto conference centre and Ichigaya project

Kiyonori Kikutake

Kikutake's preoccupation with prefabrication, i.e. with the building process itself and with the growth and decadence of cells in forming the environment manifest in all his 'sea-projects', also appears in his 'land-projects', like his suggestion for a system of terrace housing in Ichigaya, Tokyo. Here, in opposition to the traditional Tokyo chaos of two-storied terrace houses in wood, which provide no privacy, no flexibility and hardly more than just a spot of private green, he proposes a system of r.c. equipment shafts (cf. Isozaki) which support artificial land for terrace housing. This system, if related to existing natural features, seems to satisfy a demand for prefabricated elements capable of cellular metabolic changes.

It is not surprising that such ideas on prefabrication, structuring and exchangeability, when interpreted in modern construction, create forms somewhat similar to the age-long tradition of Japanese timber building. An example of this is Kikutake's commended entry for an international conference centre in Kyoto. Because of this resemblance, many of these ideas find a favourable reception amongst conservatively minded laymen, as, for instance, in Kikutake's building for the priests at the 'Great Shrine of Izumo Taisha', a building complex, where the use of wood seems to comprise an essential part of the religion.



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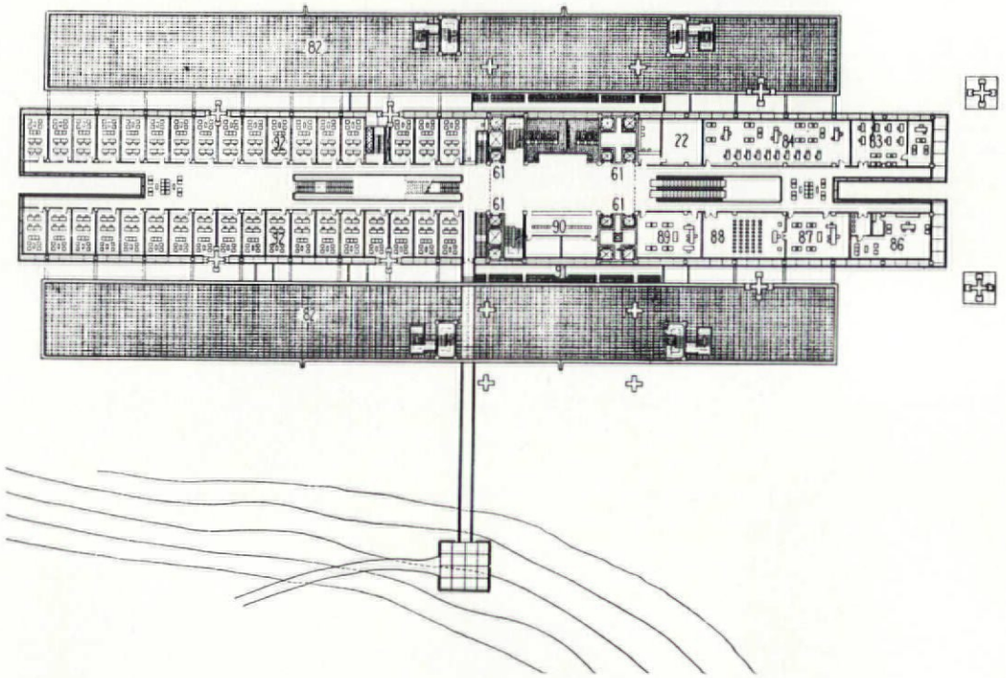

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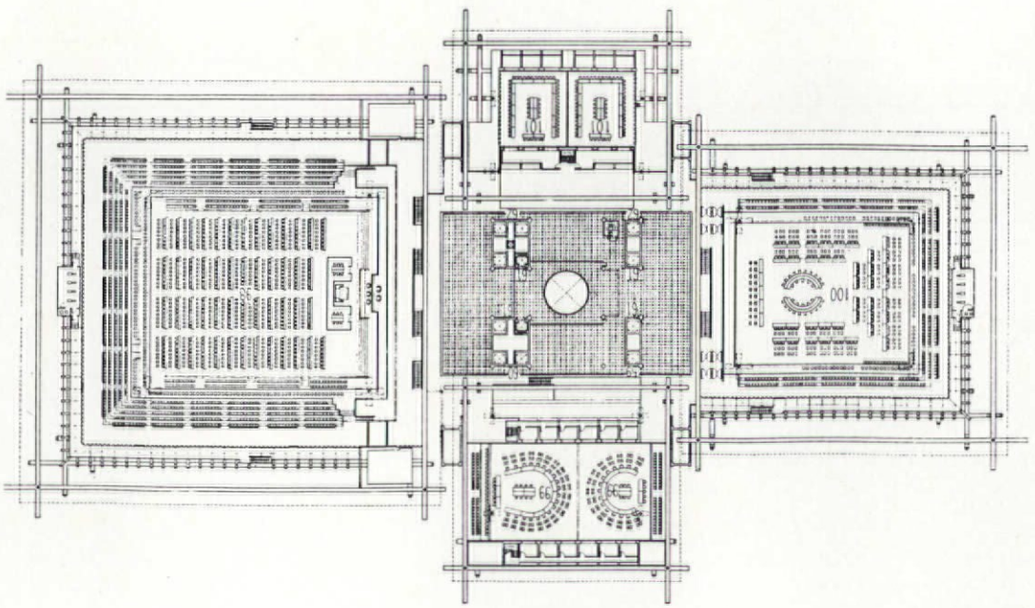

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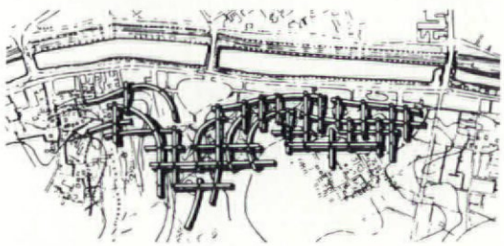

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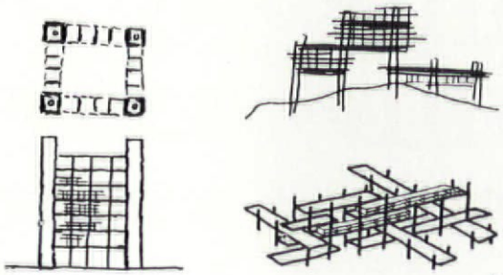


5

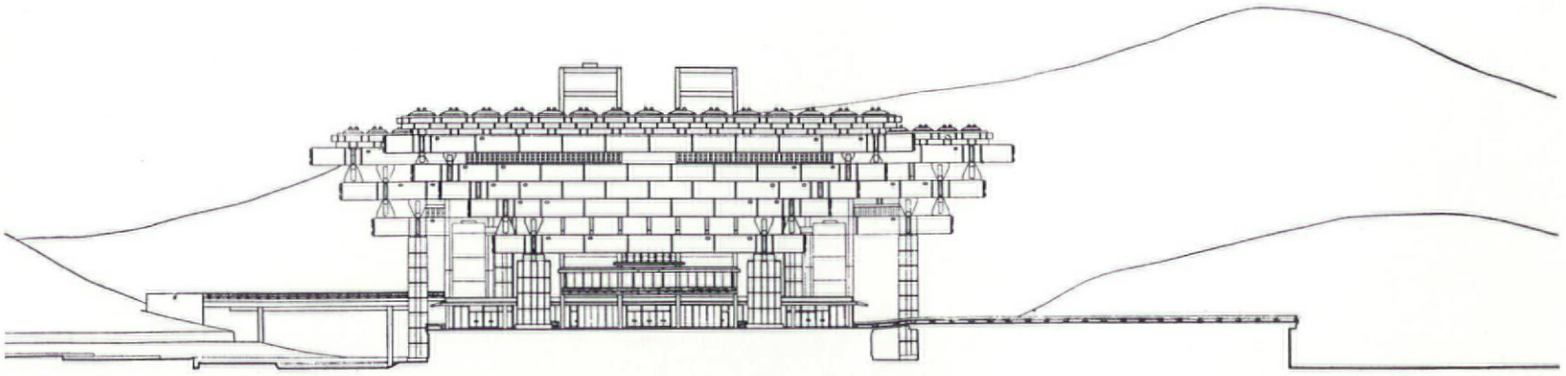
1
Site plan for the Kyoto conference centre

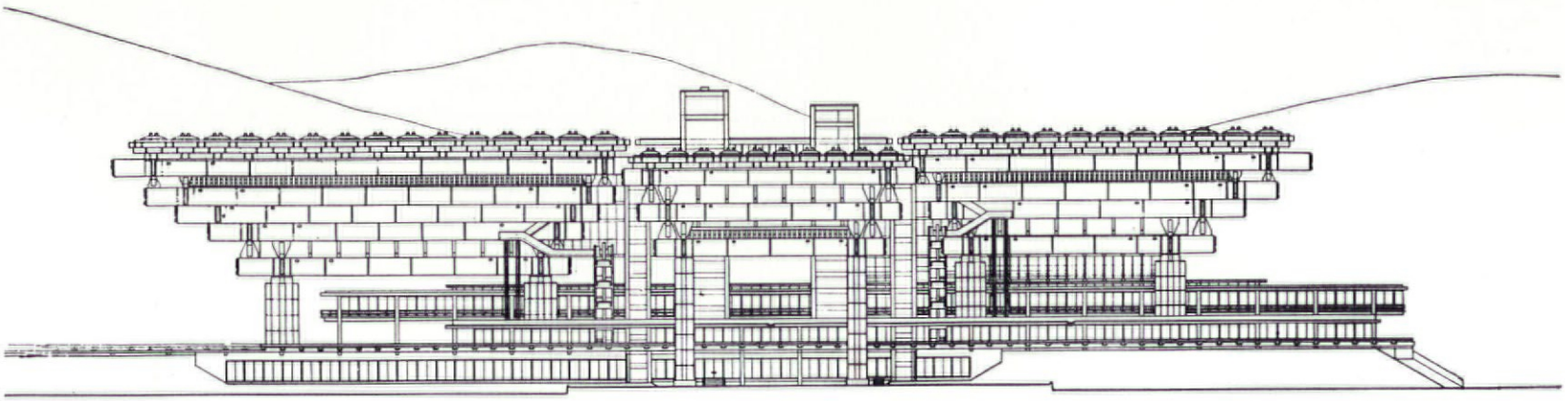
2
Lower floor plan, offices for the Kyoto centre

3
Upper floor plan conference halls, foyer, etc., Kyoto centre

4 & 5
Site plan and building system for Ichigaya project, Tokyo

6
Elevations and sections for Kyoto conference centre





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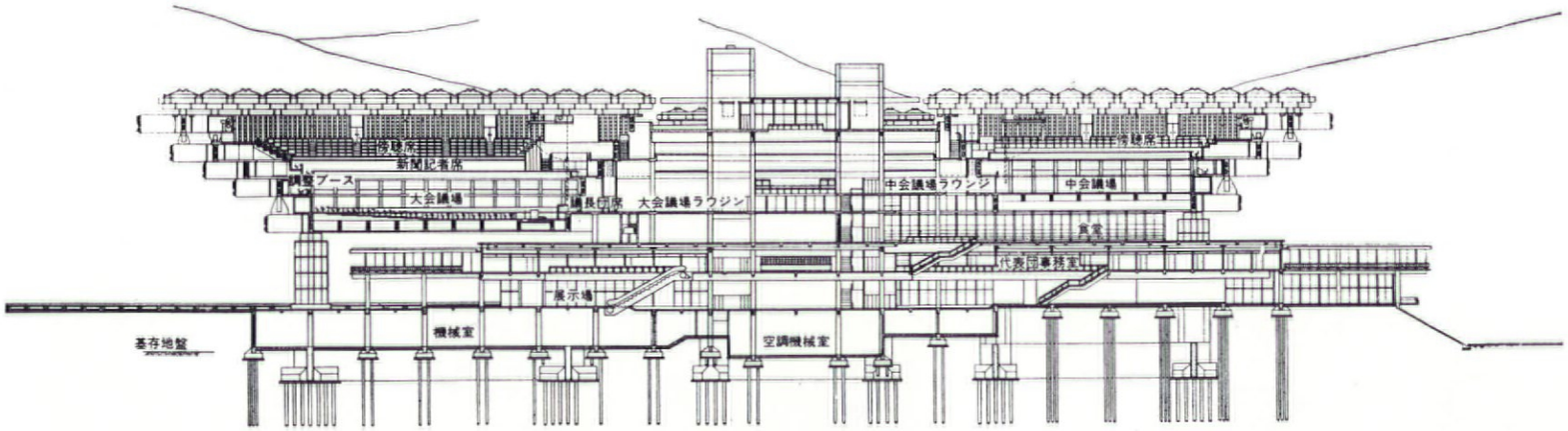

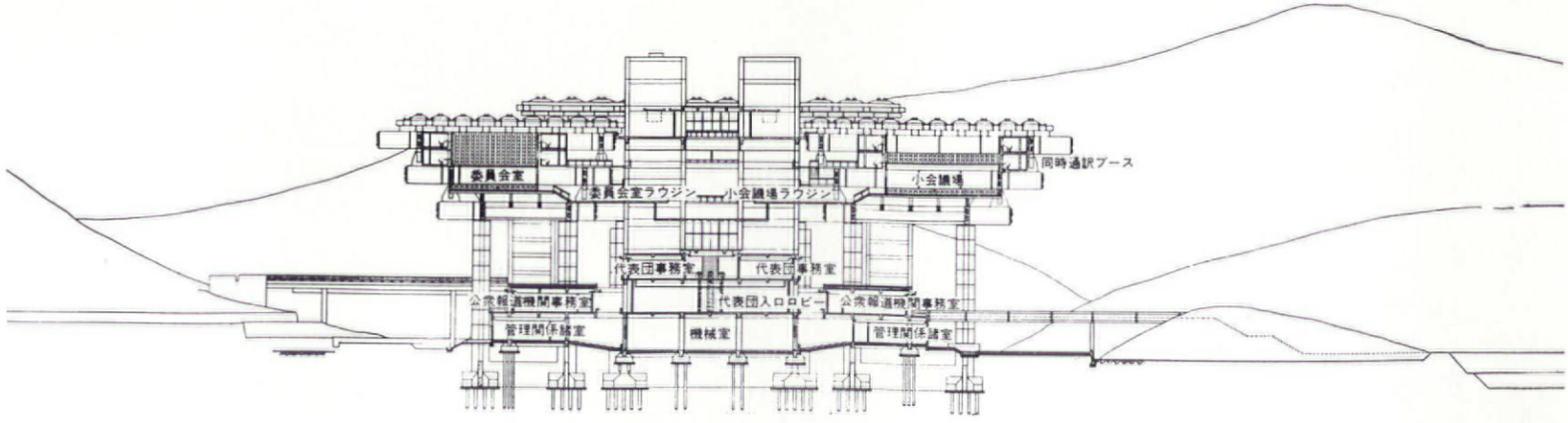

Tatebayashi city hall, Seconic factory and the Great Shrine of Izumo Taisha

Kiyonori Kikutake

As in the 'productive belt' of 'Unabara' ocean city, Kikutake feels that productive structures should be able to adapt themselves to future expansion or contraction requirements. In other words, what is required is a kind of biological space unit system affording limitless expansion or contraction of cellular structures in any direction. He has recently applied these ideas in a new factory design—the Seconic factory— based on two different space units, a 250m² eight-storied productive space and shafts containing the necessary services and systems of vertical communication. The same system may be applied to the horizontal expansion of the productions halls themselves, having a lower vertical height.

A similar structural/space conception seems to have been incorporated in his building for the new city offices in Tatebayashi.

This hall has double height upper and lower ground floor reception halls for public use, with office floors mounted on three large cantilevering decks above. One of these office floors embraces the council chamber within its core.



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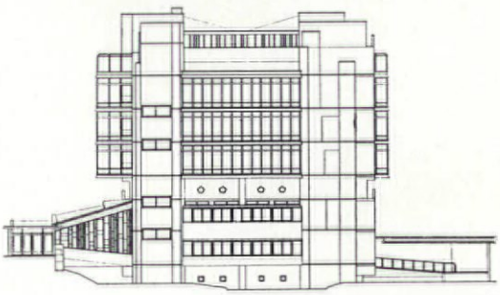

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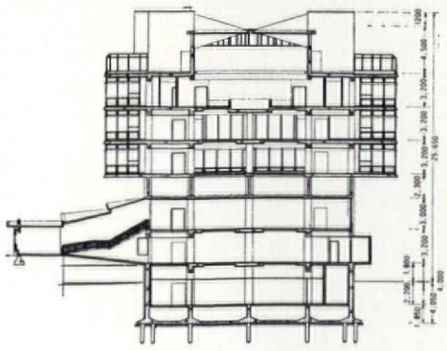

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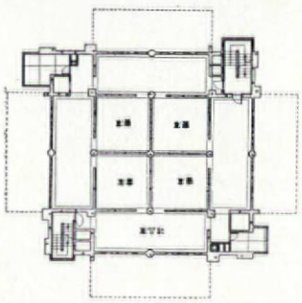

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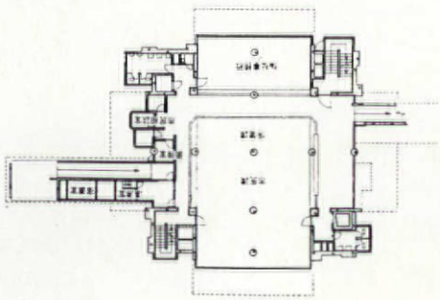

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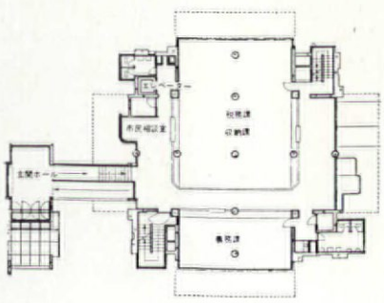

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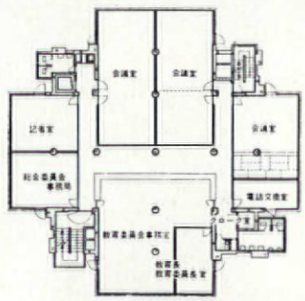

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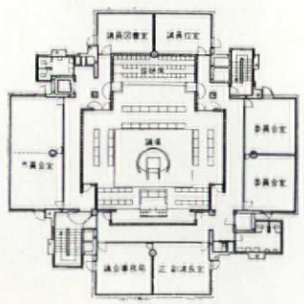

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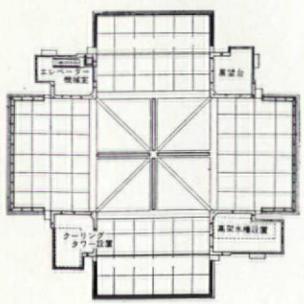

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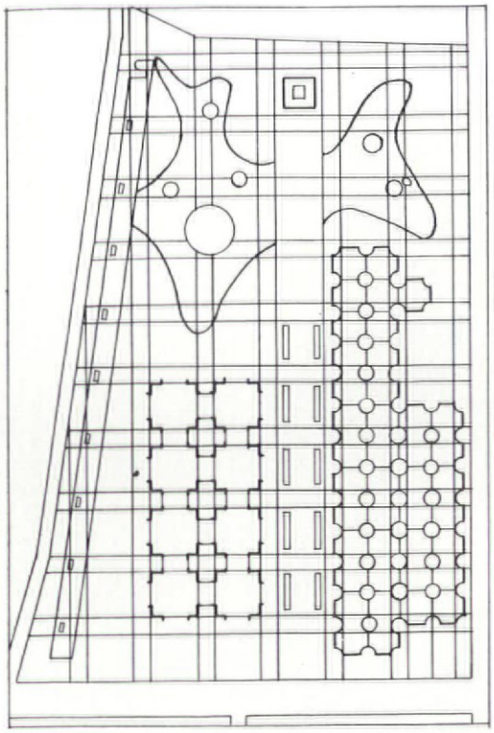

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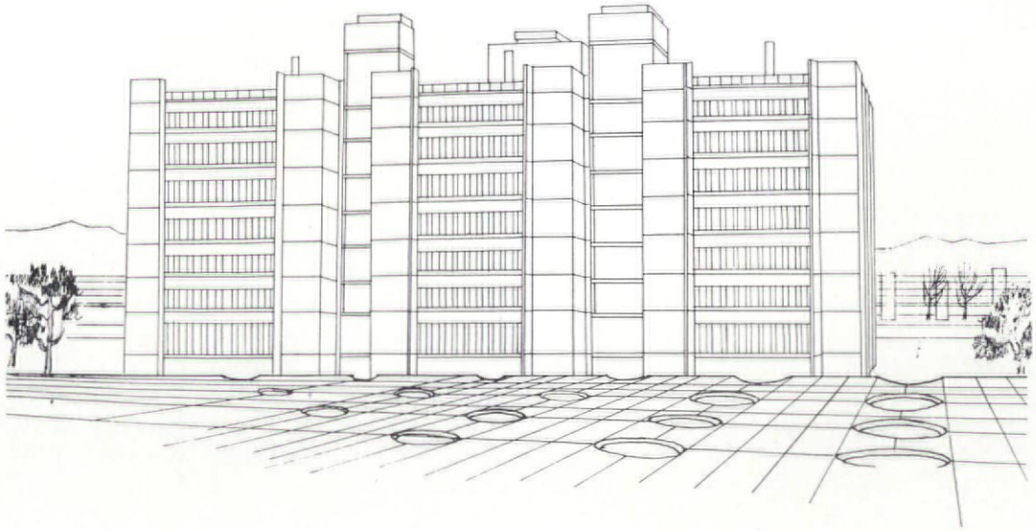

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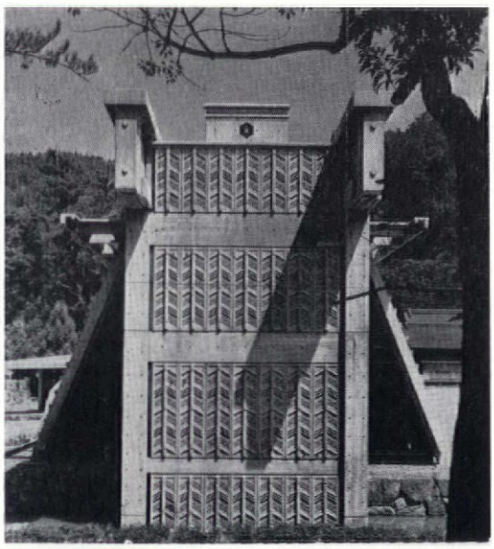

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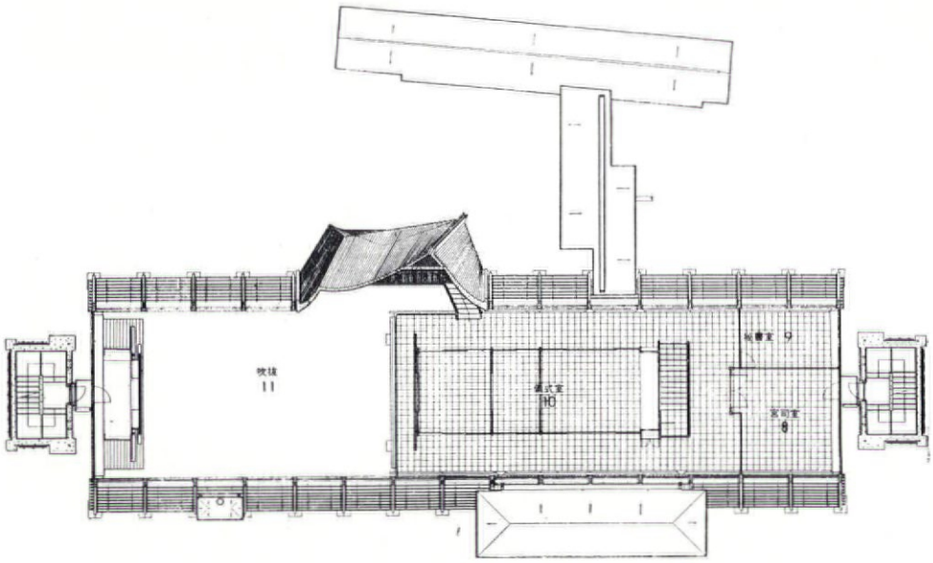
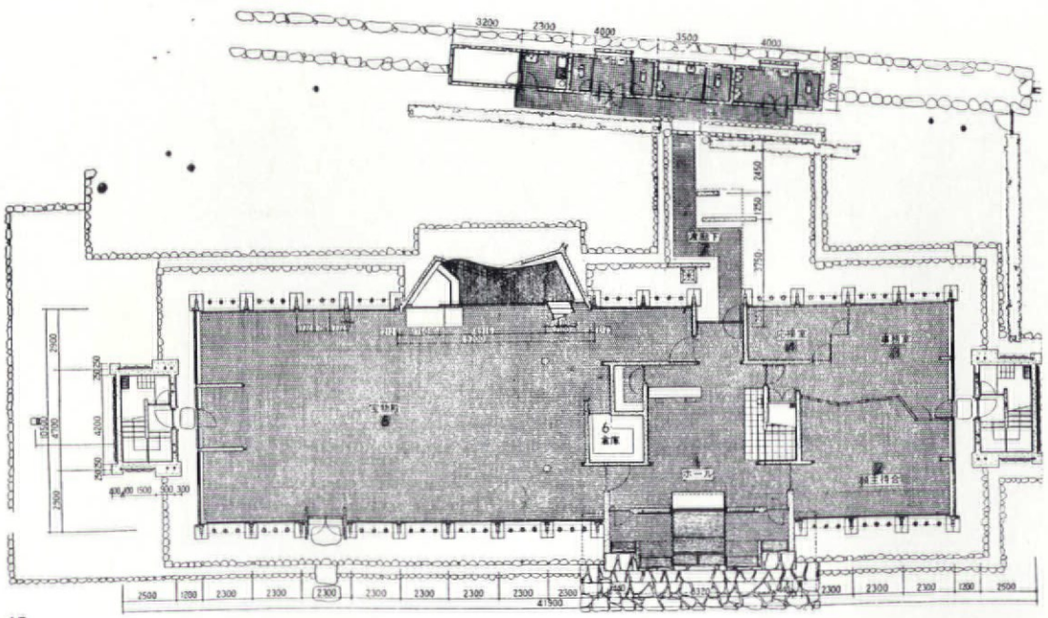


14

1
General view of Tatebayashi city hall
2 & 3
Elevations of Tatebayashi city hall
4
Section through Tatebayashi city hall
5
Basement floor plan
6
Lower ground floor
7
Upper ground floor
8
Typical office floor
9
Council chamber plus admin floor
10
Roof plan
11
Plan of Seconic factory. Administration and small scale production is on the left, factory production halls on the right
12
Perspective of the Seconic factory group
13
End wall of the great shrine of Izumo Taisha
14 & 15
Floor plans of the great shrine of Izumo Taisha



15

Library at Oita

Arata Isozaki

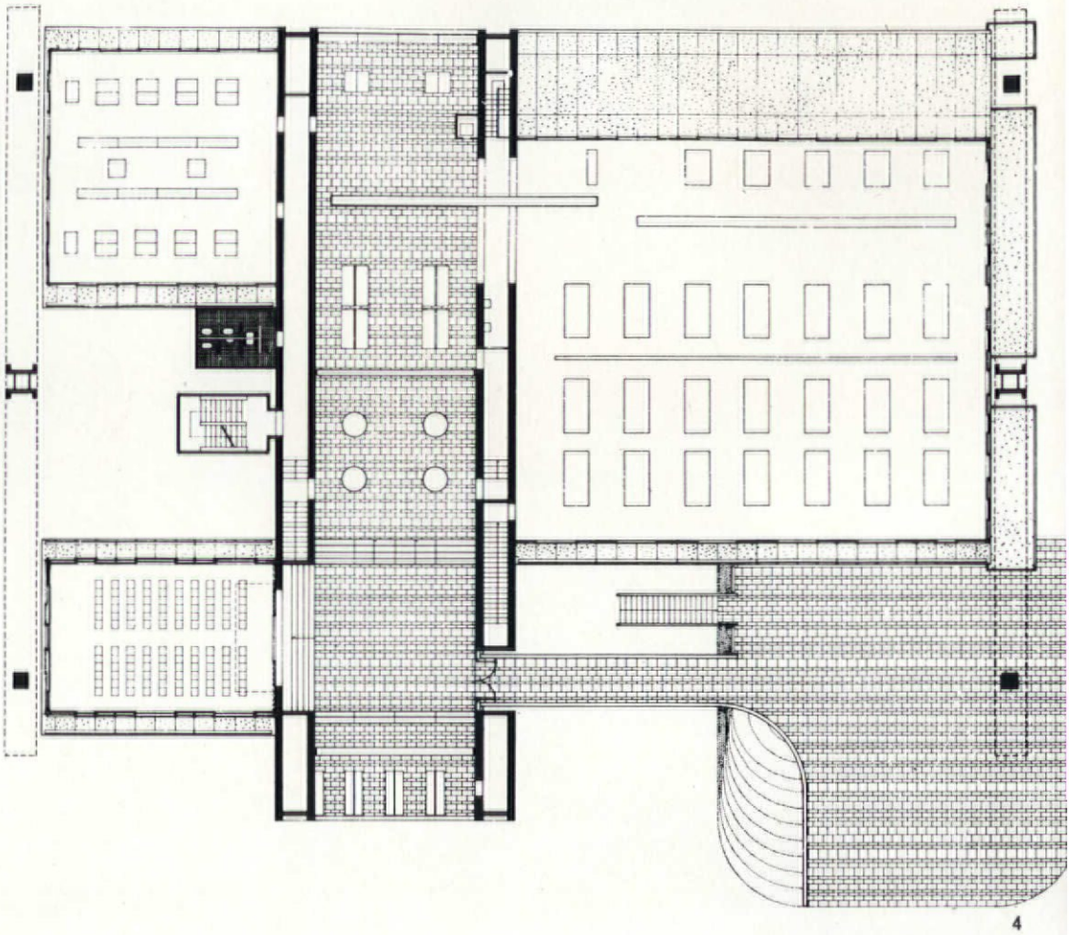
Isozaki's library has been evolved around a theory of 'process planning' deliberately avoiding the creation of a complete piece of architecture with provision for future extension, and instead postulates a system of growth. Since it is impossible to foresee the total final shape and since we can only see parts of the process as a whole, emphasis is put on the invention of a system, according to which a process of design can take place in time.

Isozaki's library at Oita on the Kyushu, which is going to be built at the end of this year embodies this principle. He arrived at his particular 'process' by the following chain of thought:

First step: Function: the relation between the case desk and the stack—with increasing growth, group classification must occur within which flexibility must be granted. These group elements must have the possibility to grow according to their own inherent laws.

Second step: A critical point in the growth-process is reached, when the introduction of a skeleton becomes necessary. The form of the skeleton must be of an open character, because in the future, it will direct the growth-process.

As we are never able to foresee the ultimate totality of the building, the section under construction at Oita implies, in its detail syntax, the appearance of something which is 'under way', of the unfinished. The box-beam sections and the duct-walls show a complete integration of structure and service installation.



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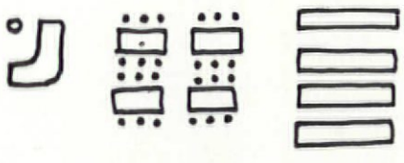

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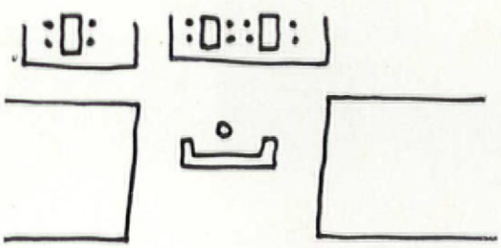

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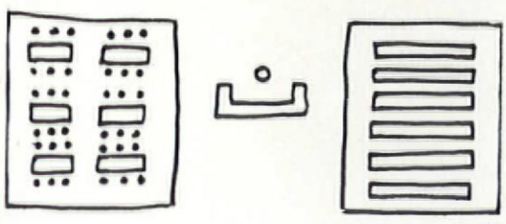

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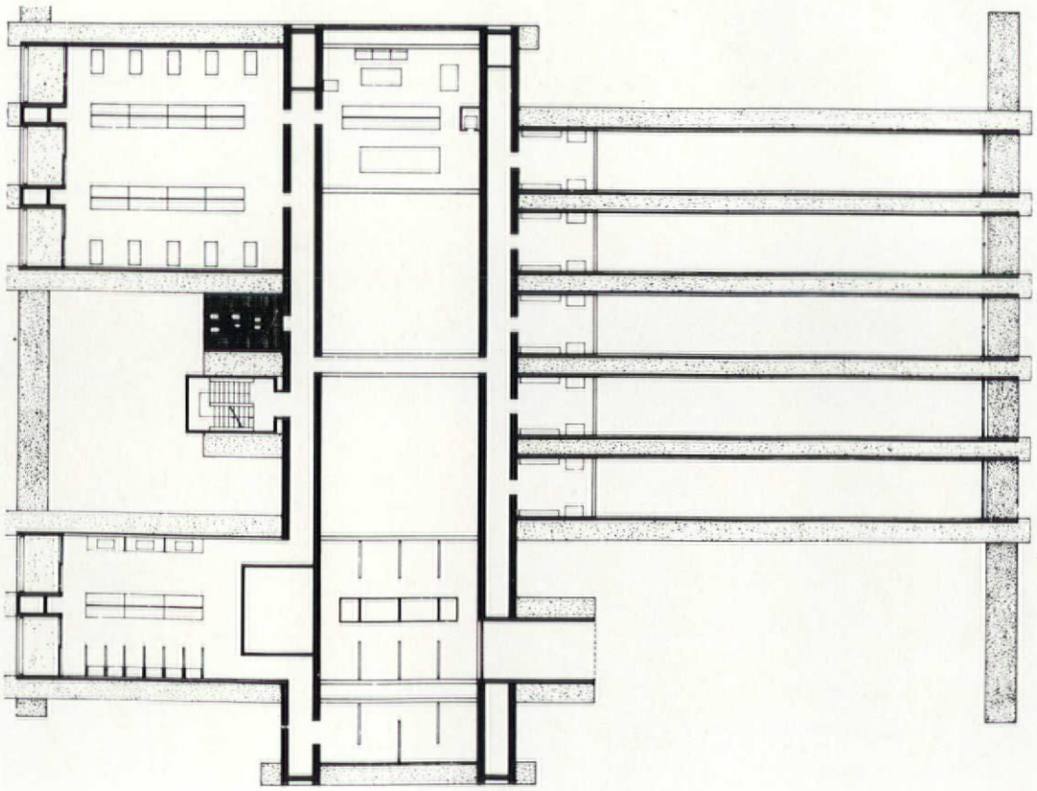

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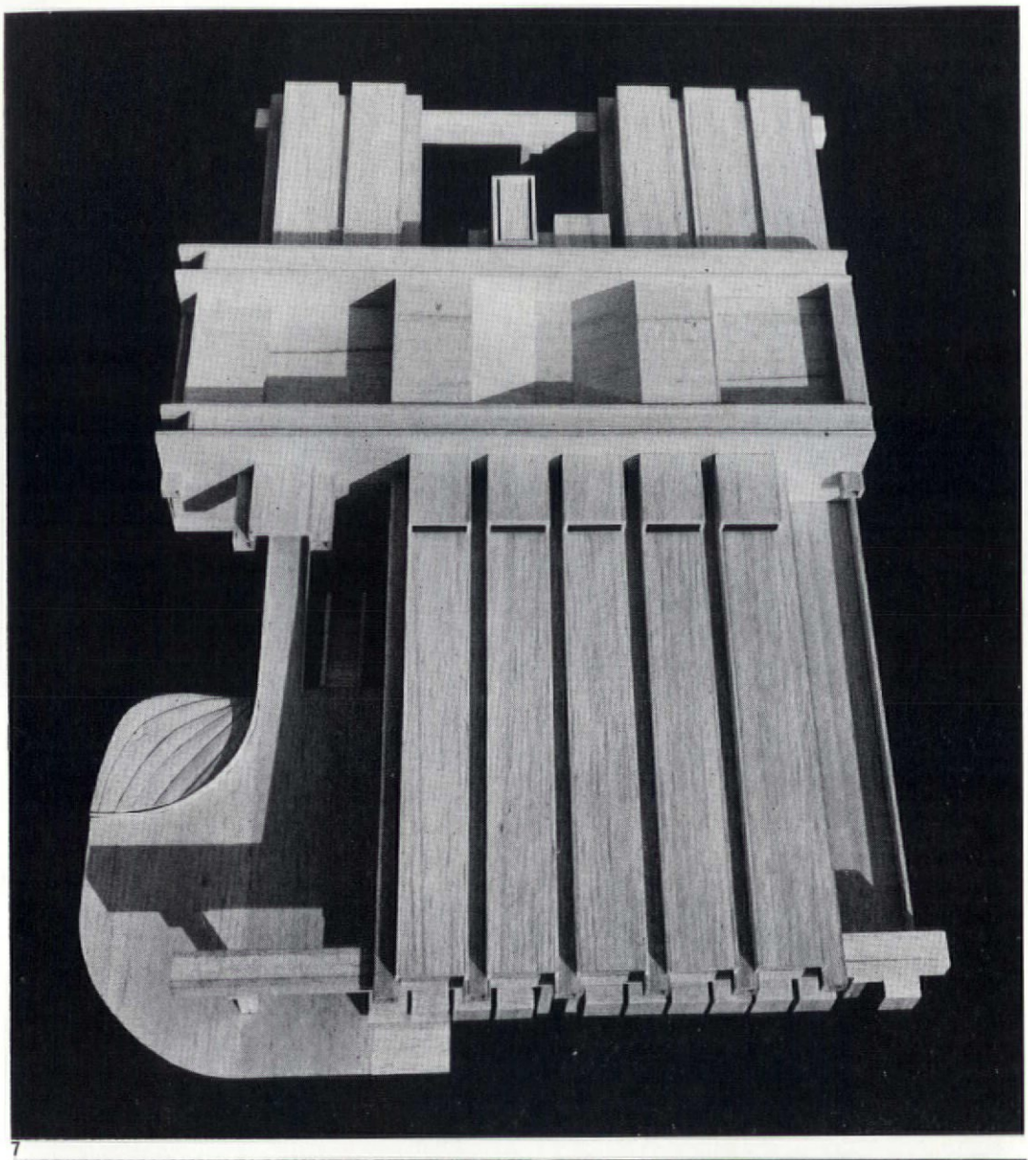

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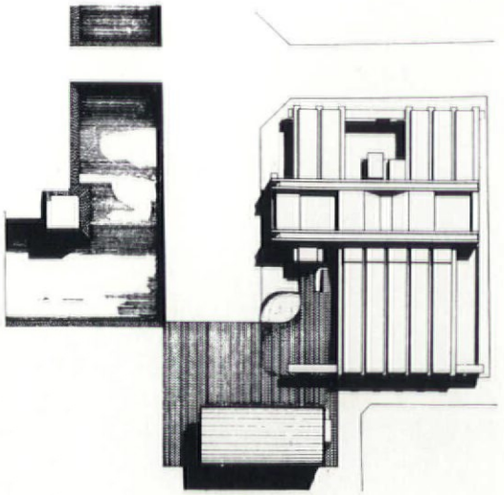

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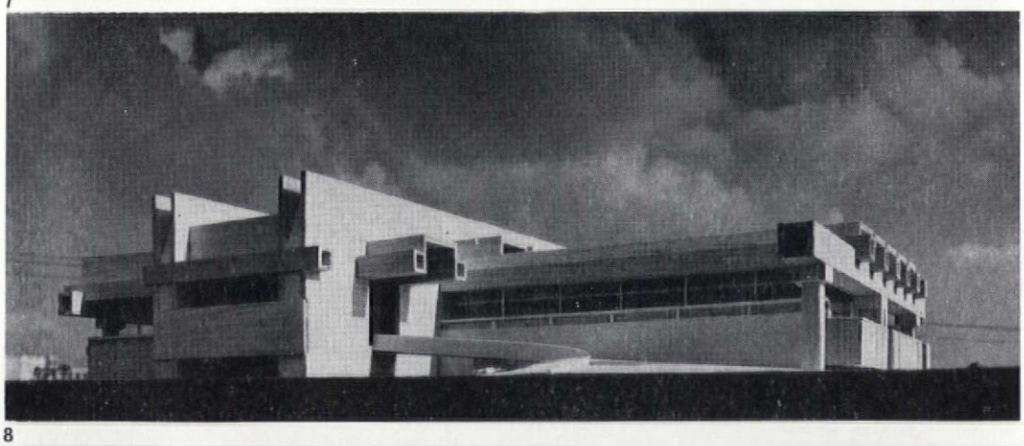

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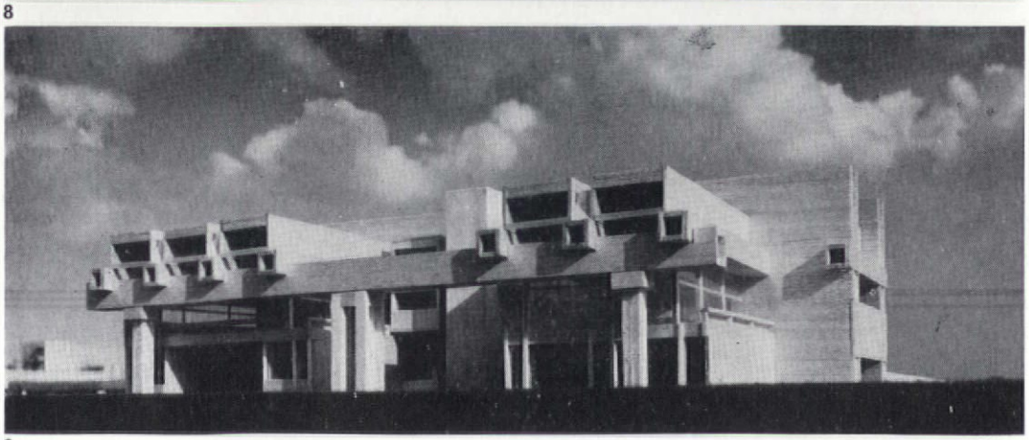

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1, 2 & 3
Sketches demonstrating the relation between parts constituting a process

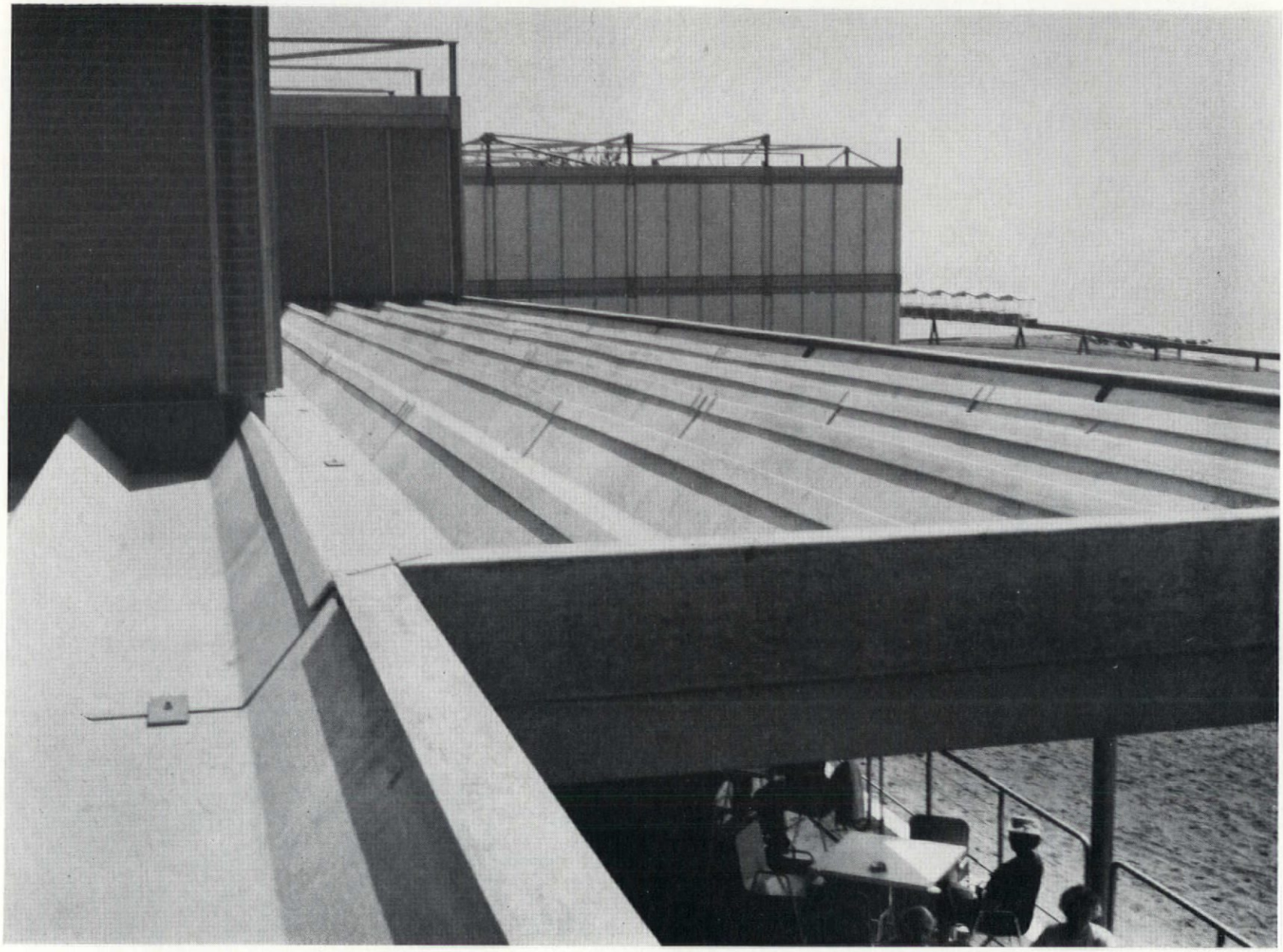
1
An analysis of components; the relationship between control desk, readers and book stack

2 & 3
Sketches of possible relations between control point, readers and book stacks, each being considered as self-contained elements which are progressively added to the whole

4 & 5
Ground floor and first floor plans of the library

6
Roof and block plan of the Oita library

7, 8 & 9
Various views of the model of the library



1

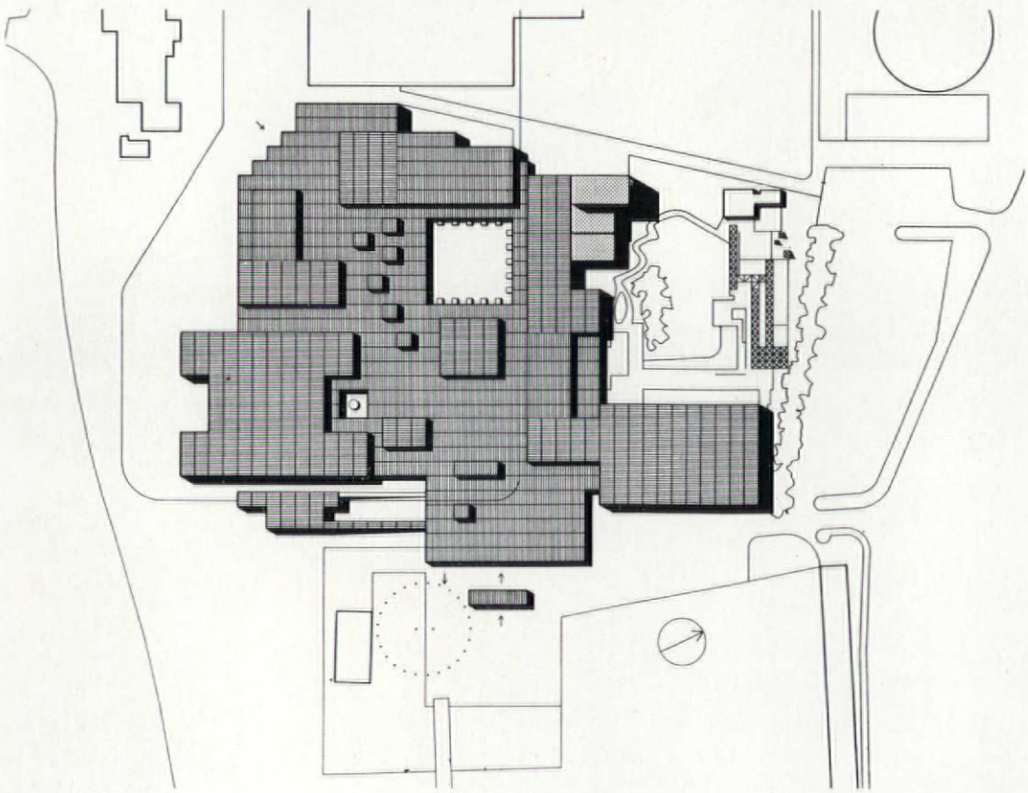
Art of Living pavilion, Swiss National Exhibition, Lausanne 1964

Max Bill

1
A view of the roof with the monorail and the Lake of Geneva in the rear

2
Site plan of the exhibition

3
Plan of the exhibition
1 Man and Home
2 Planning and Urbanism
3 Art and Life
4 World and Image
5 Documents and Traditions
6 Printing
7 Graphic Arts
8 The Book
9 Education and Research
10 Radio and Television
11 Theatre
12 Court of the Arts
13 Theatre bar
14 Café of the Arts
15 cinema
16 Café de la Presse
17 information
18 telephones
19 kiosk
20 tobacconist
21 flags
22 monorail station



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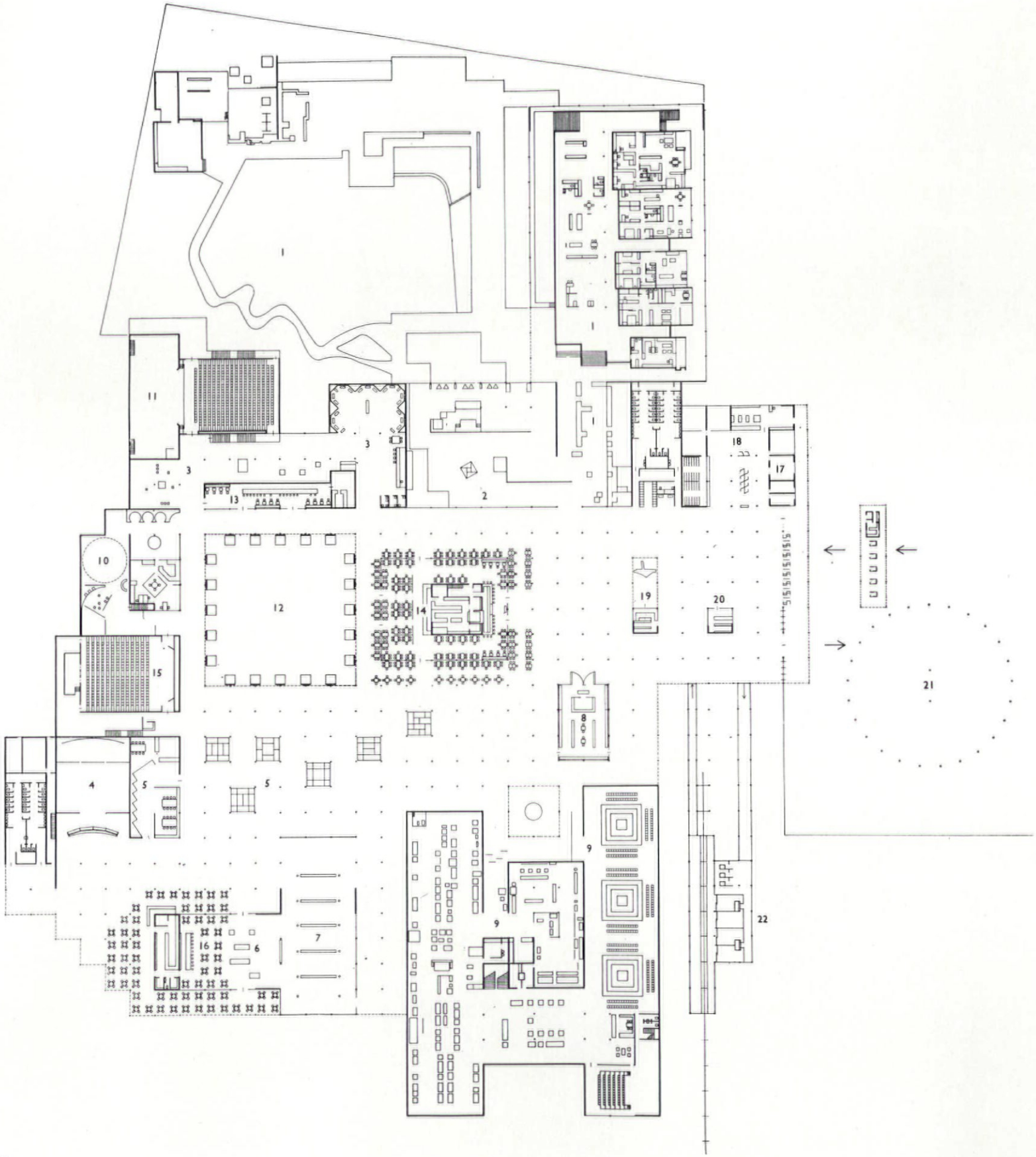

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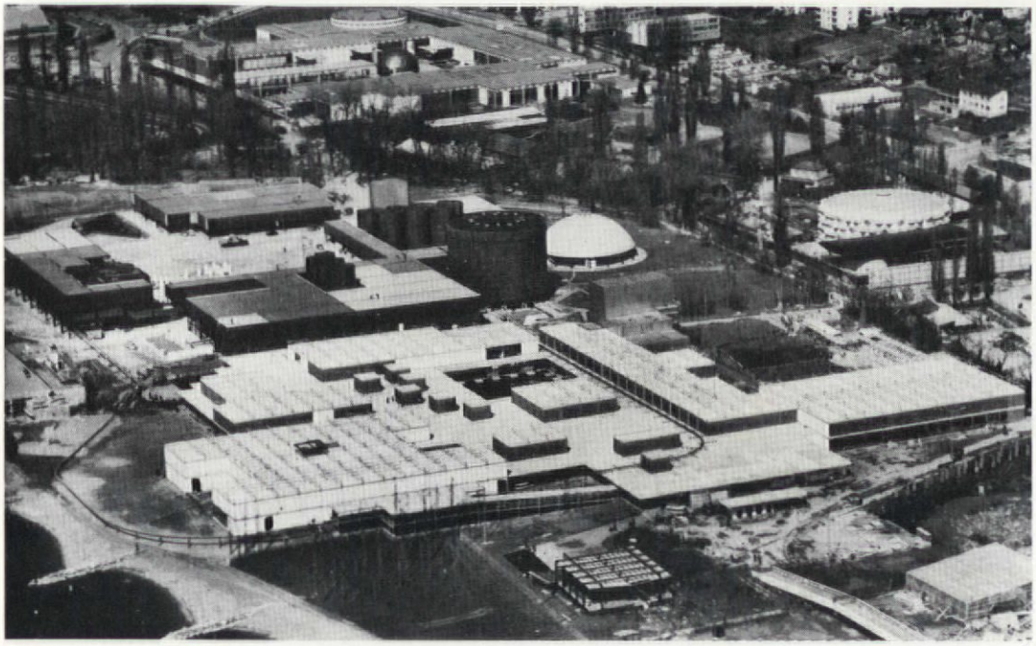

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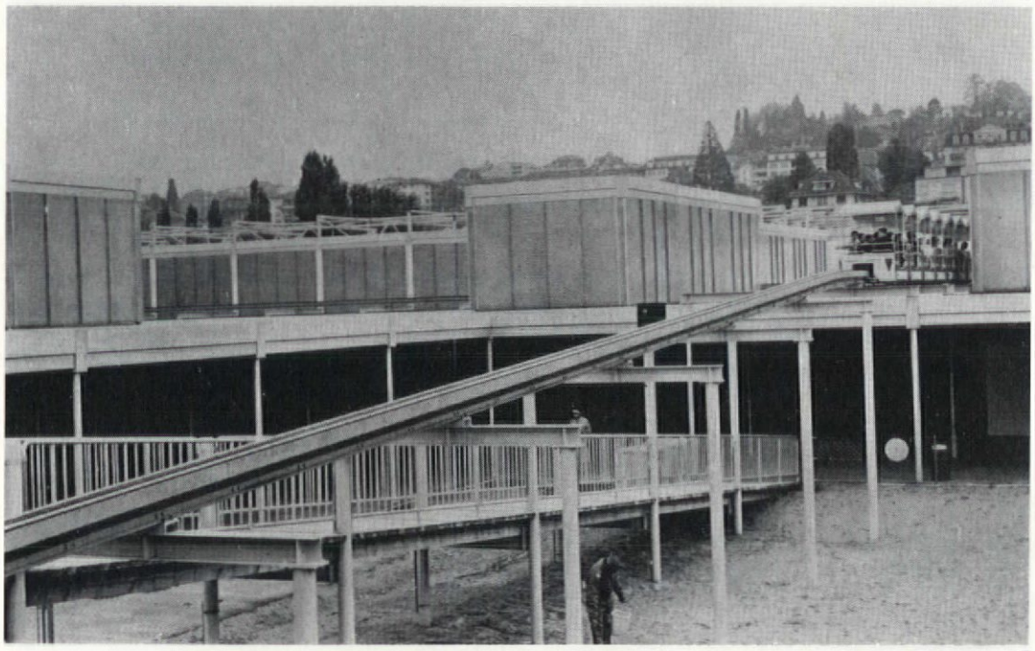

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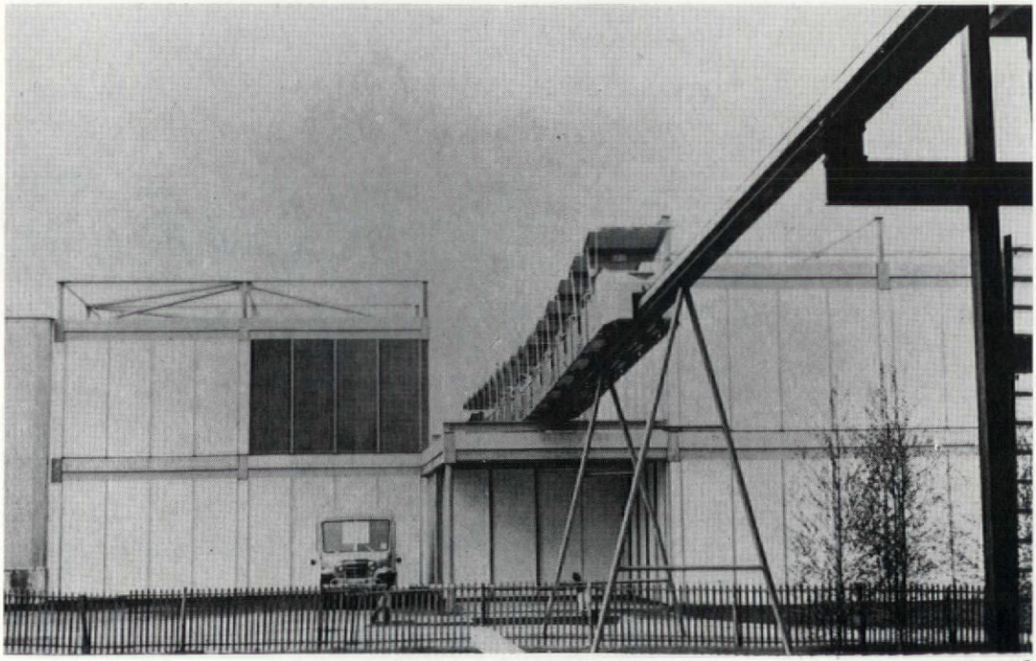

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Description of the Art of Living pavilion

The organization is so conceived that the whole structural complex, together with the east entrance, forms a unity. This unity has been conceived of in the same way as the pedestrian core of an average village.

There is a square in the centre, the 'Hall of Arts', which is lined with twenty pieces of sculpture by different Swiss sculptors. Around this square the whole pedestrian level is covered over as a protection against sun and rain. This overhang has a 3·5m ceiling height which is maintained over all the pedestrian ways of the exhibition. The actual exhibition spaces are about twice this height, set at about 7m. In this way the light falls from above on the exhibits and thus these stand out clearly.

Around the 'Hall of the Arts' is grouped the section entitled 'Information and Knowledge', with a documentation centre, a museum, a cinema, a café, 'Café de la Presse', small sections on photography, the graphic industry, Swiss books, together with a section devoted to radio and TV, including a mock-up TV studio. Then there is a section entitled 'Art and Life' with a small theatre, a concert hall and the information stands on literature, theatre, painting, sculpture and music. The 'Café des Arts' and the 'Bar du Théâtre' complete this whole group. There is a further section entitled 'Man and House' as a Home Exhibition with many individual living units displayed within fundamentally identical spaces leading on to the section entitled 'Planning and Conservation', where the problems and advantages of provident planning for the exploitation of the land of Switzerland and its resources are presented.

A section entitled 'Education and Research' rounds off this section and demonstrates that a good school grounding must be completed and complemented by sound industrial training, and that Switzerland needs to make greater efforts in the field of scientific research. A part of this section is called 'Youth witnesses Science'.

In order to cope with this extensive subject-matter, I have developed a system of construction on the basis of a 5: 5 metre-scanning-field or grid system. This system has the characteristic and the advantage of providing small concentrated loads, which in the circumstances of bad building land is an important factor.

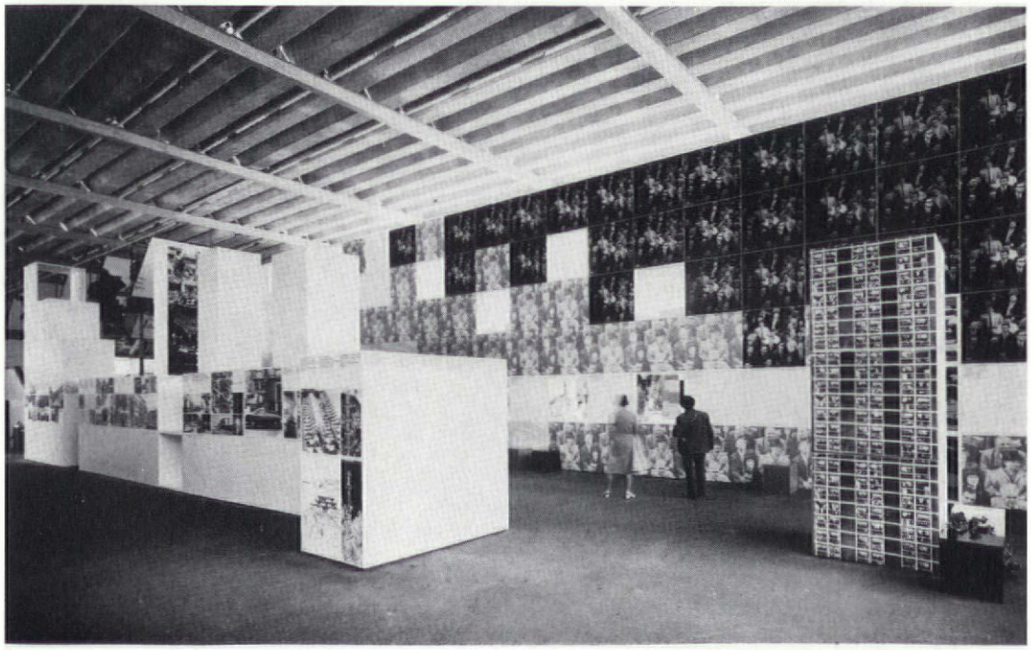
The construction embodies a primary draining system within the sunken pipe-supports which are capped by an all-round strut-head. The struts take sheet-metal gutter beams which discharge into the pipe supports. Where large spans are necessary the gutter beams are extended in the form of lattice girders. On the gutter beams lie 5-metre long, freely supported Eternit troughs. The whole system depends upon a system of structural draining canals and at the close of the Exhibition it can be economically dismantled.

The outside walls of the buildings are clad in plastic-lined opaque Novopan panels and glass or polyester panels for transparency. All the panels are fixed and retained by chrome-nickel steel connectors. The theatre and some walls of the section 'Man and House' are lined with a ply panelling which is covered with chrome-nickel steel plate.

The floor of the Exhibition, with the exception of some raised parts, is made simply out of rolled macadam, so that protection against damp and freedom from dust are assured.



4



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1
Aerial view of the Swiss National Exhibition with the 'L'Art de Vivre' section designed by Max Bill in the foreground

2
A view of the building from the south. The pedestrian ramp leads up to the monorail station

3
A view of the building and monorail from the west

4
The garden court of the 'Man and Home' section with steel sculpture by Bernhard Luginbuhl

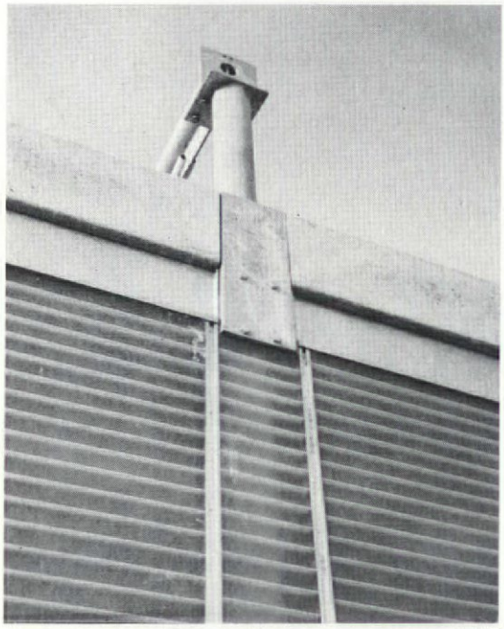
5
Introduction to the section 'Man and Home' where the visitors are introduced to the principles of 'master planning'. The graphic display is by Hans Neuberg and Herman Eggman; the architect of the section is Hans Litz



1



2



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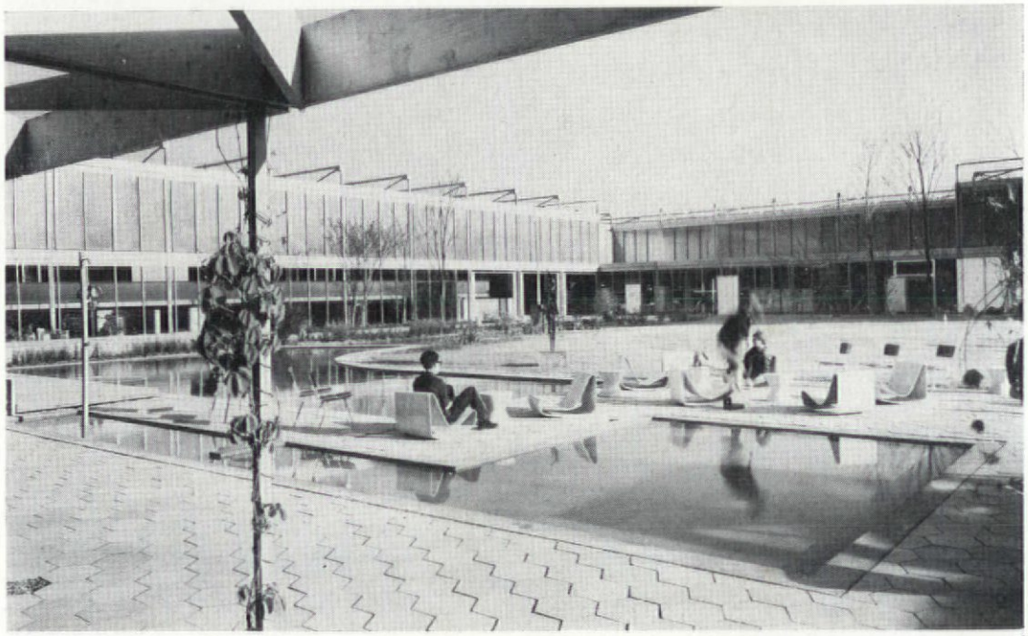

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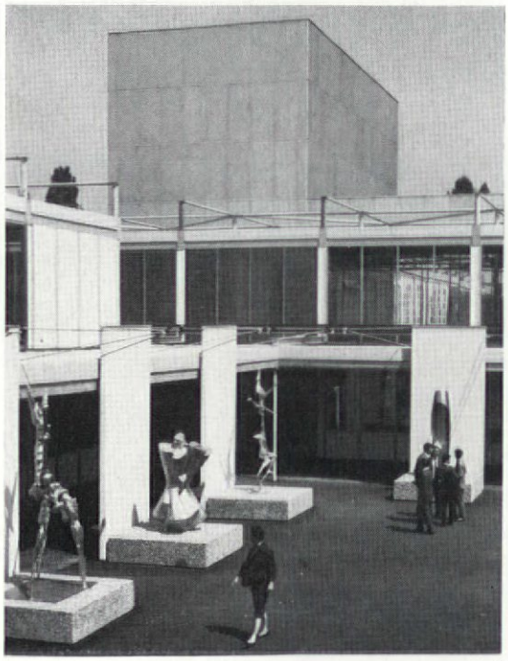

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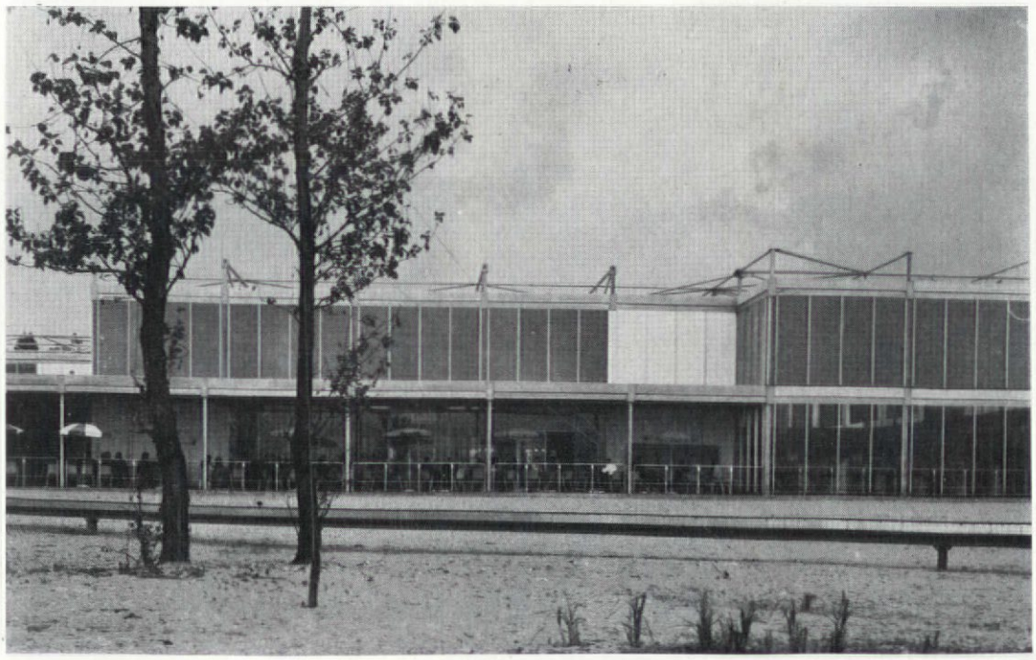

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1
View of the roof with clerestorey light structures rising through the general level. The Eternit roof elements serve as rain channels

2
The Eastern entrance to the Expo and the section 'Pictures and Images'

3
Detail of the façade

4
Garden court of the 'Man and Home' section

5
'Court of the Arts'. In the rear is the Fly Tower over the stage and concert hall with the Theatre Bar in front of it flanking the court. The high gallery of the theatre bar is decorated with a mass of prisms hung freely in the space. These prisms constantly move and reflect other images and light sources both static and moving

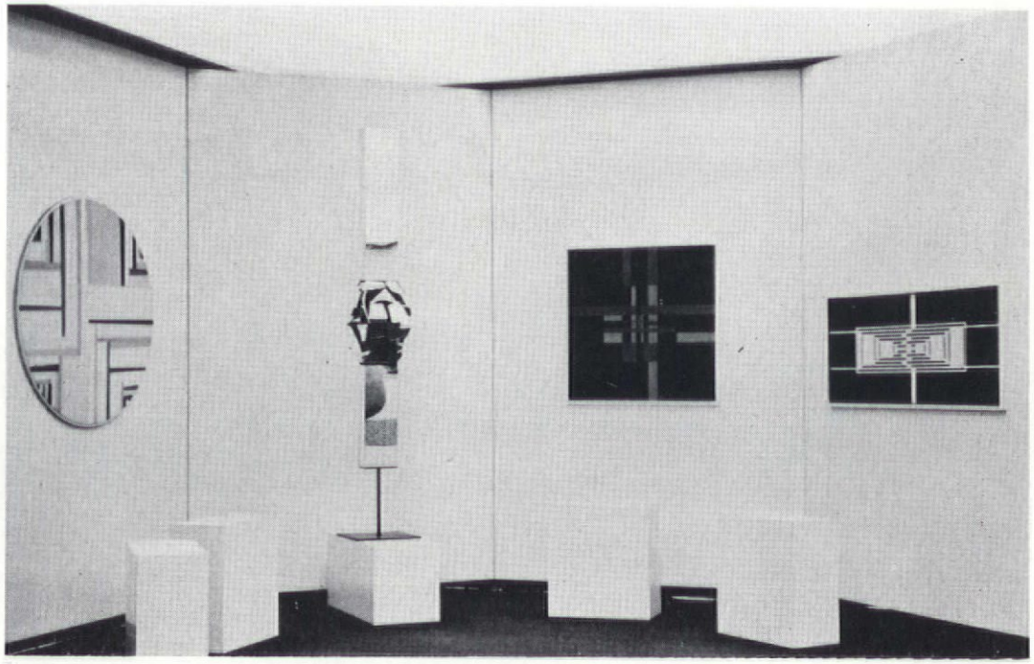
6
Café de la Presse. The monorail shows in the foreground

7
Interior of the 'Pictures and Images' section with paintings by Glarner, Lohse and other 'concrete artists'

8
The monorail station

9
View of the pavilion from the north east

10
Detail of constructional system (see *AD*, Nov. 1963). The system is so chosen that the various requirements of the separate sections are satisfied, and the living relationships of the structural groups express themselves in a structural organization naturally evolved
1 foundation
2 asphalt on gravel
3 short column
4 long column with mid support
6 supporting head
7 channel support
8 asbestos cement eaves element
9 asbestos cement roof element
10 white polyvinyl wall element
11 transparent polyester element
12 chromium nickel section
13 double winged door



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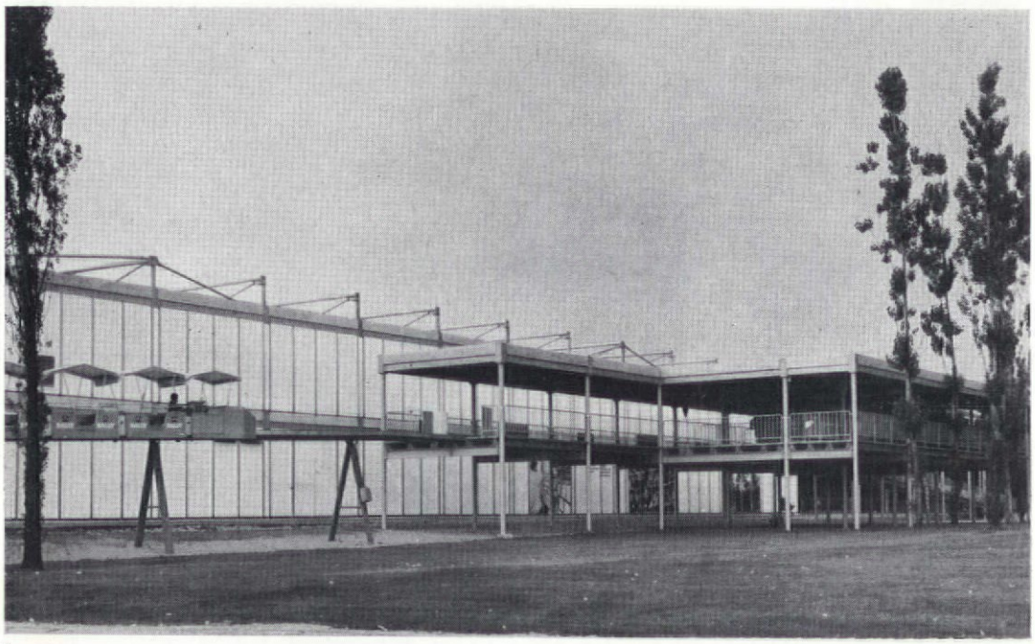

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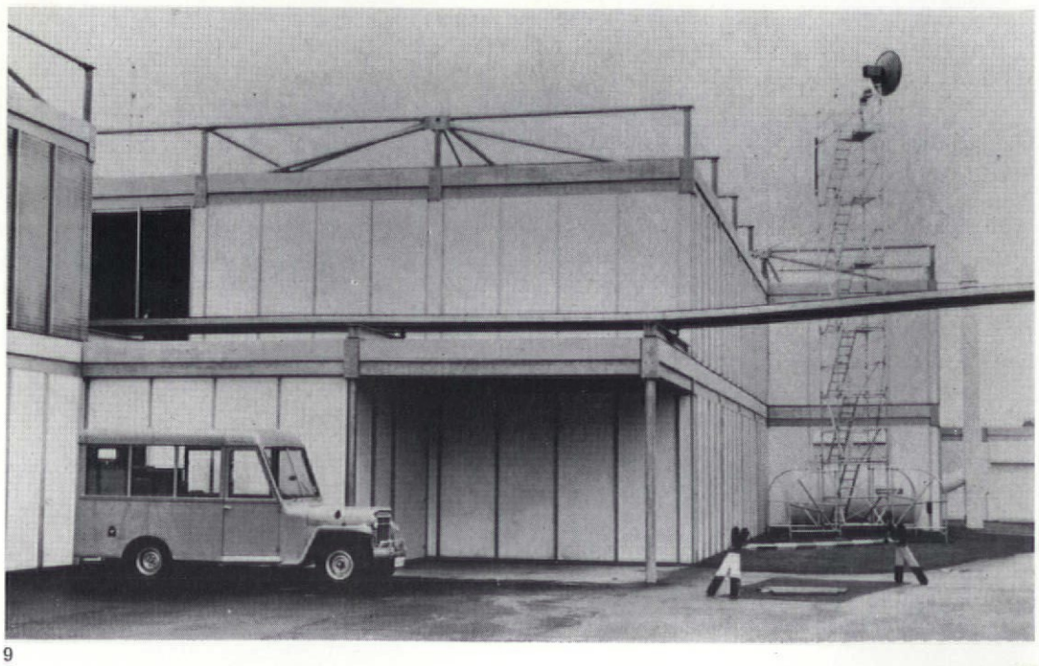

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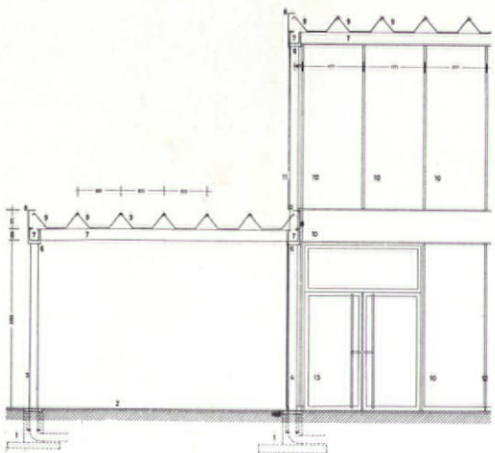

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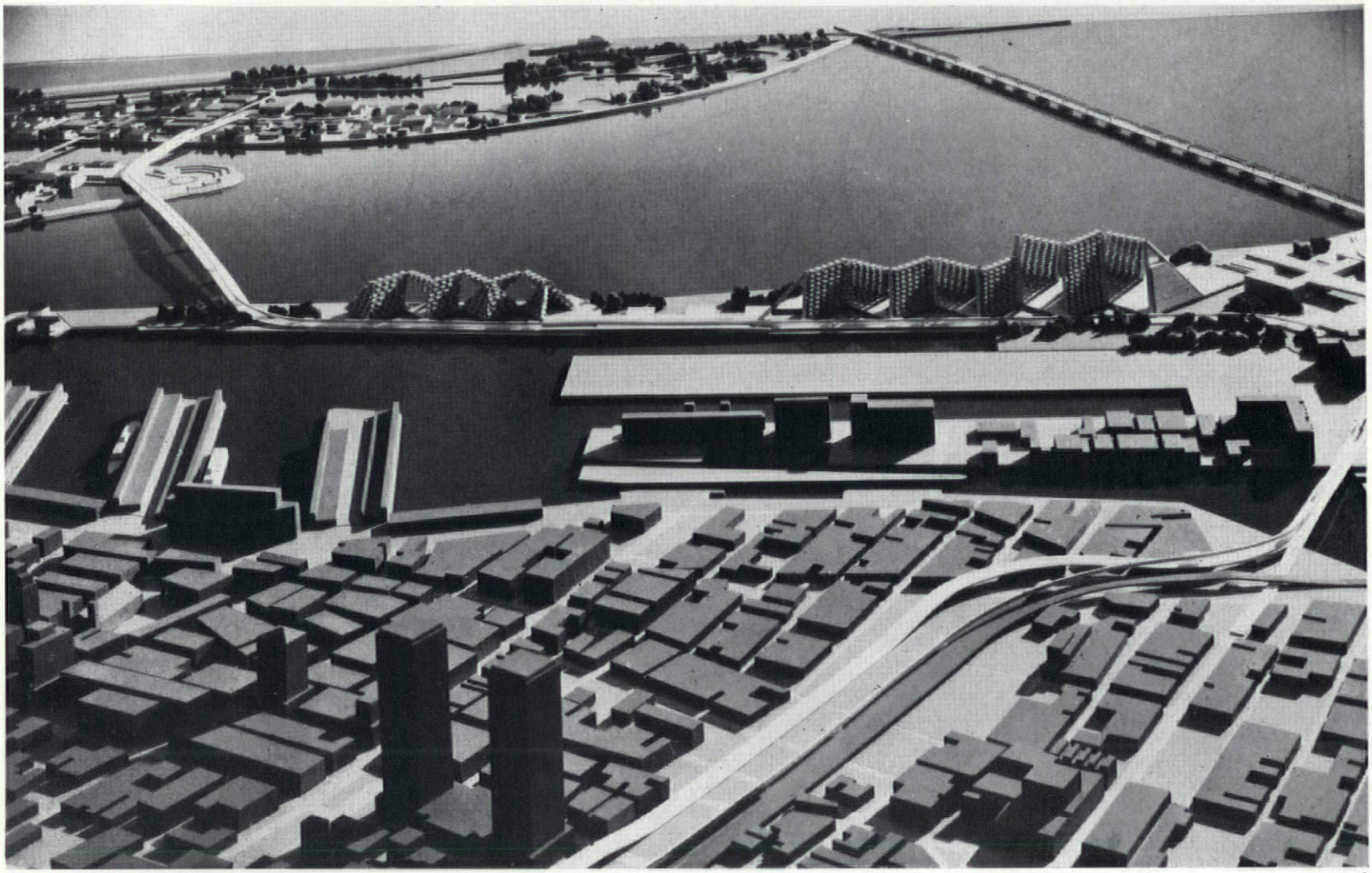


1

1
View of 'Habitat '67' from the west looking over the St Lawrence river. Bickerdyke and Windmill dock basins are in the foreground

2
View of 'Habitat '67' from the south-east; the St Lawrence river in the foreground

3
Site plan 'Habitat '67'; north is at the top of the plan
1 St Lawrence River
2 Windmill Basin
3 Bickerdyke Basin
4 arena
5 sports stadium

Habitat '67 Montreal

Moshe Safdie & David, Barott, Boulva, Associated Architects
Dr. A. E. Komendant, Structural Consultant
Adjeleian & Associates, Structural Engineers
Huza & Thibault, and Nicholas Fodor & Associates, Mechanical and Electrical Engineers

A major objective of Habitat '67 is to provide within a high density development the essentials of a complete environment. Privacy, garden, identity and choice, commercial spaces, fresh air, sunlight, a total environment for young and old. What the people seek in the suburb must be provided in the urban habitat.

The site combines the openness and calmness of the river side—the urbanity and romantic quality of the harbour with its ships, its activity. Beyond is the magnificent view of the city skyscrapers and the old city and Mount Royal. After the Expo, the site will be connected by a network of roads, expressways and mass transit to the entire metropolitan region.

One thousand living units is the minimum population to support a community of the nature of Habitat; and this number of units is proposed.

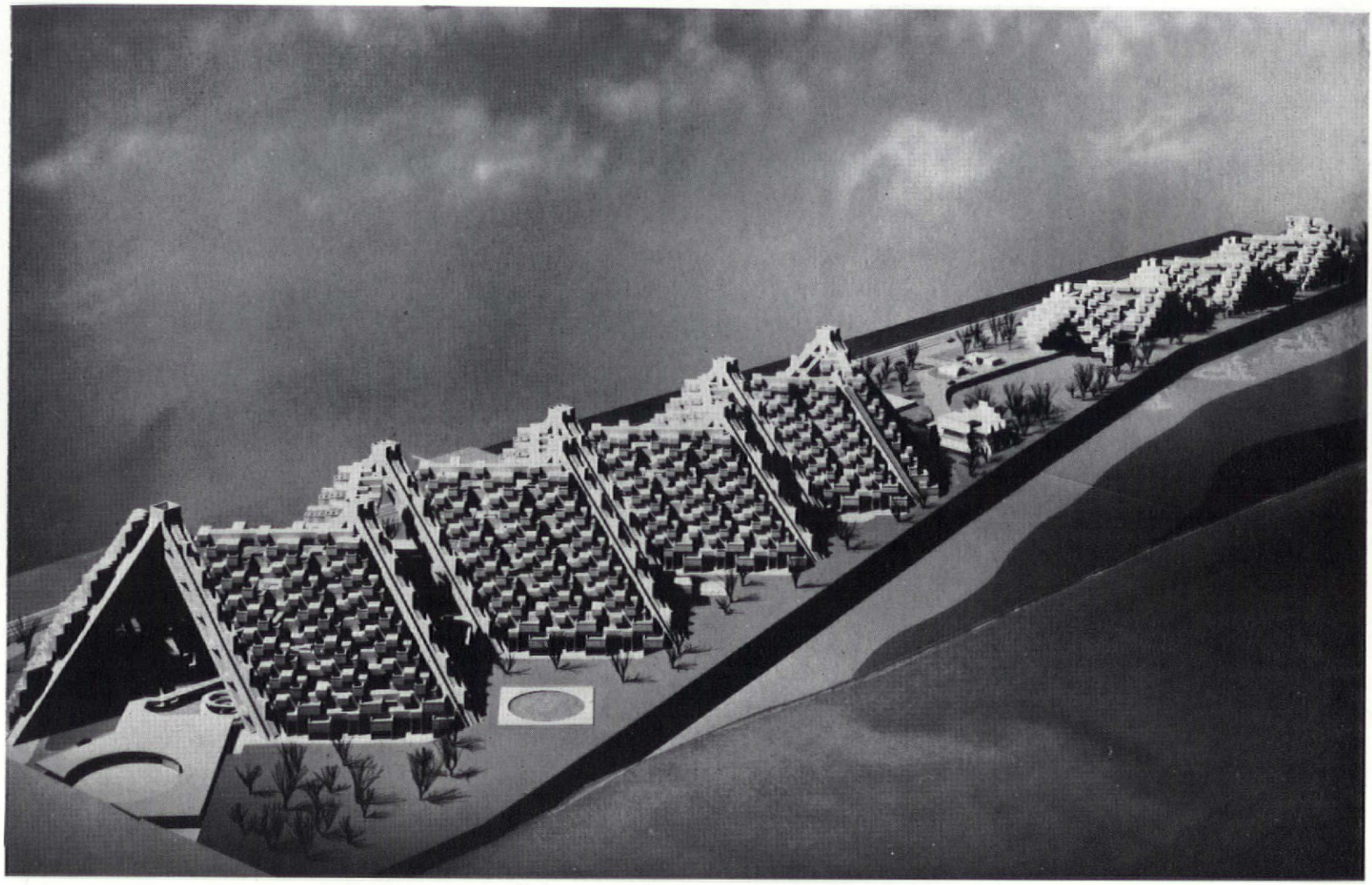
A school and shopping centre will be provided for the local population. Recreational and cultural facilities will serve both the project and the region.

In addition, some office space will be available. Regional sales offices and commercial space relating to the Harbour will find this location attractive.

The project consists of a sloping membrane of terraced houses, each with its own garden, oriented so that each house absorbs sunlight: each and every garden being sunlit most of the day. The houses terrace upwards so that each garden is open to the sky and rain. A system of terraces, walls and plant life give privacy to the houses and gardens. The houses in the membrane are so arranged that large openings are formed allowing sunlight and air to penetrate the public spaces. Because of the angle of the sun in various seasons, this allows more sun into the public spaces in winter than in summer. A network of vertical and horizontal streets forms a three-dimensional circulation and park system as well as distributing the mechanical services. Each house is entered off the horizontal pedestrian street. This street is open to the sky and view. A transparent shelter provides weather protection. The houses are fabricated of repetitive modular elements. One, two or three such elements form houses of various sizes and plan-types. The entire range is provided from the small dwelling to the large, accommodating all family formations.

The vertical street connects the houses to parking, shopping and other public facilities. A network of roads is integrated with the vertical street.

The membranes of terraced houses form a continuous intersupporting structure. They



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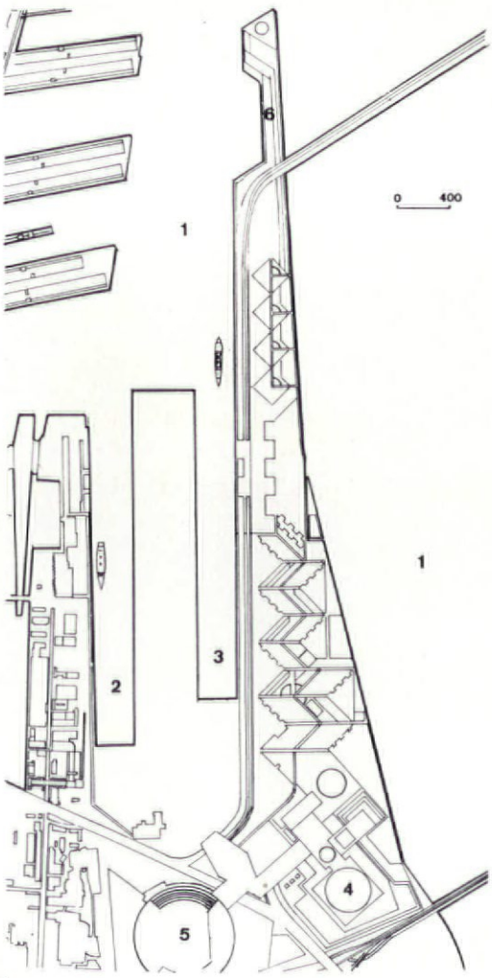

3

shelter a continuous space for all public uses. Within this space are found shops, offices, recreational facilities, parking, etc. This space is sheltered from the rain. Light penetrates it from all directions. In summer, it is shaded; in winter, it is sheltered from wind and snow. Sunlight penetrates all levels of the structure, including the parking and service area.

The structure is made of rhomboidal planes inclined at 60° to the horizontal and joined in such a way that the top lines of these planes form a continuous saw-tooth line in plan. Each plane contains a number of housing units and is a structural unit in itself.

The housing units are arranged into the rhomboidal panel in two layers, each layer approx. 32ft in depth and approx. 52° oppositely inclined to each other. Thus the total depth of the rhomboidal plane is approx. 64ft and internally somewhat stable in its own plane. External stability of the rhomboidal housing panel is obtained by providing marginal members along the exterior inclined edges of the rhomboid and a series of horizontal bridging members framed into the marginal members and extending from marginal member into neighbouring rhomboids. The bridging members are located at every fourth floor level, thus approx. at 36ft intervals between two housing layers. The marginal members of the neighbouring rhomboid are leaning against each other at the top and are anchored at the bottom into the plaza foundations. Besides their structural functions, the marginal members house elevators, stairs and mechanical facilities.

The structural functions of the bridging members are as follows:
(1) To resist torsion and provide stability between the housing unit layers in the rhomboidal plane.
(2) To resist horizontal loads acting upon the rhomboid (gravity, live, wind, seismic, etc.) and to transmit them into marginal members.
(3) To balance the vertical load of the self-supporting 'housing unit-columns'.

The bridge members accommodate mechanical utilities (piping, sewerage, etc.) and at the top serve as streets linking the housing units of the rhomboidal plane.

The repetitive housing units are precast complete with window and door frames, electric wiring and plumbing fixtures. Walls, roofs and floors are insulated and made of specially dense and watertight concrete. In addition, the roof slab is treated with a rubber-paste material to provide for complete watertightness of the roof. Units are jointed together and to the bridging streets by a simple tensioning procedure: threaded bars are projecting from one unit into the matching sleeves of the other one and nuts are turned tight to press the units together. All the sleeves are grouted to avoid corrosion. The surfaces of the units in contact are provided with rubber gaskets to compensate for possible inadequacies in the surface and are dry-packed after erection. Seating of the units to transmit vertical loads is accomplished by means of steel base plates arranged as required to avoid over-stressing and provide stability.

The marginal members will probably be in-situ,

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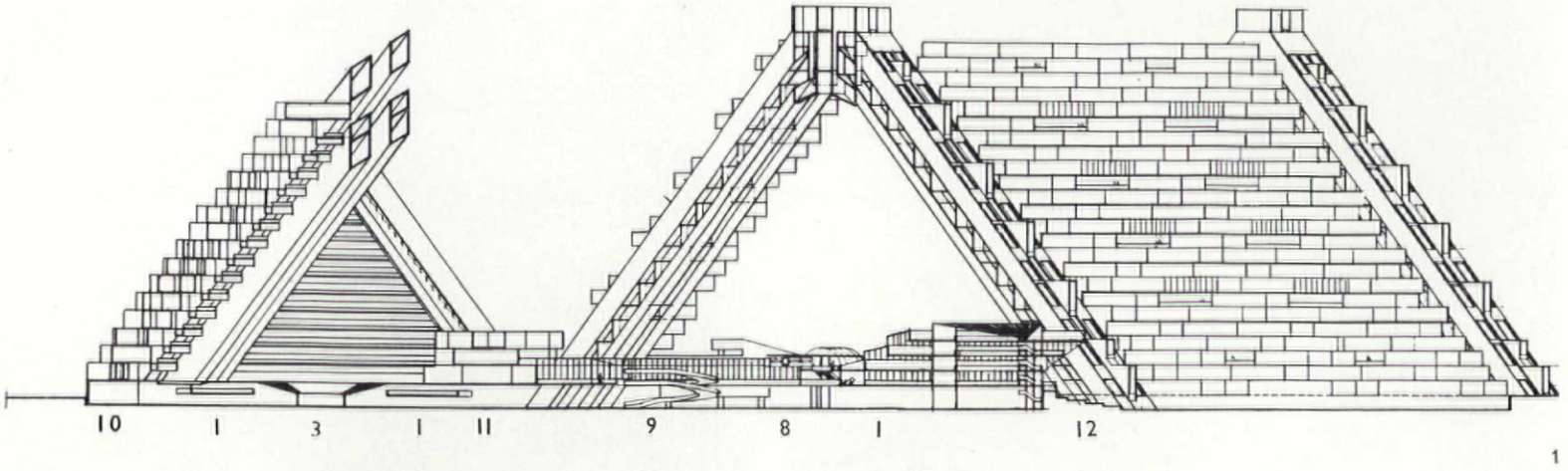

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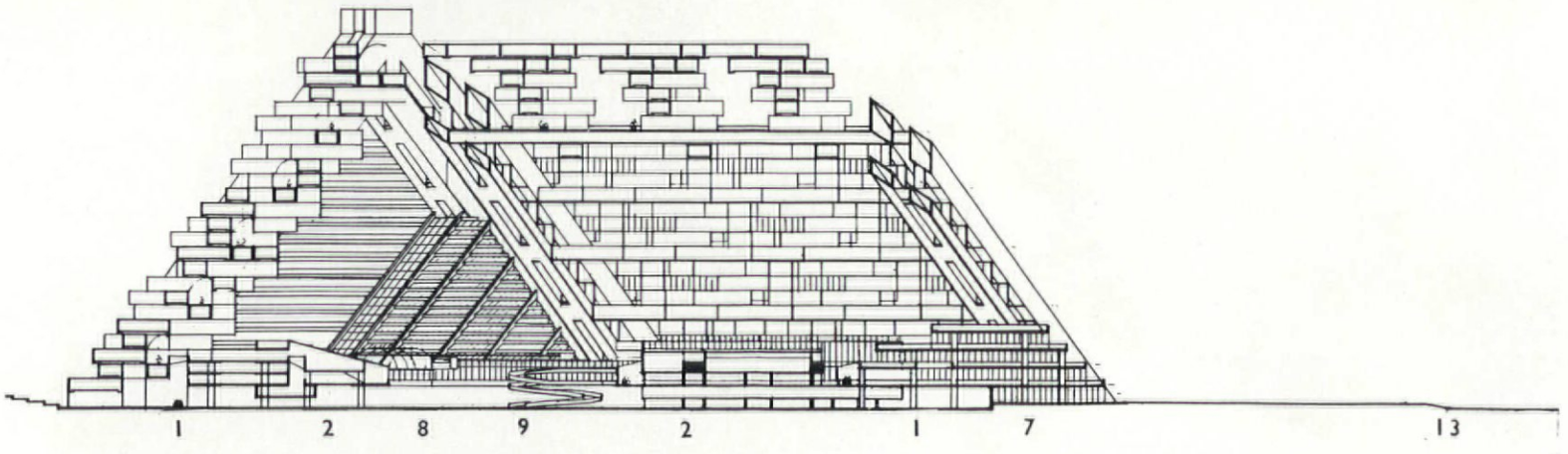

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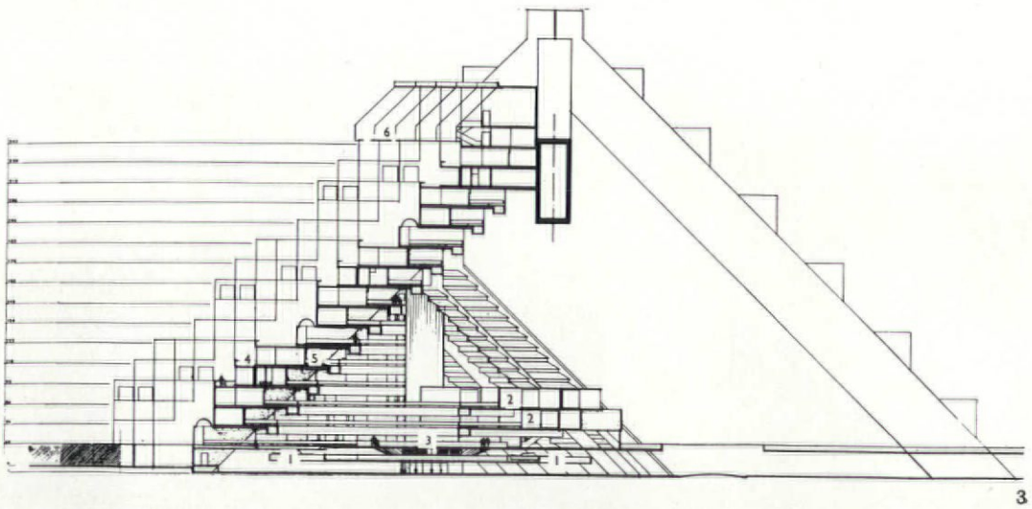

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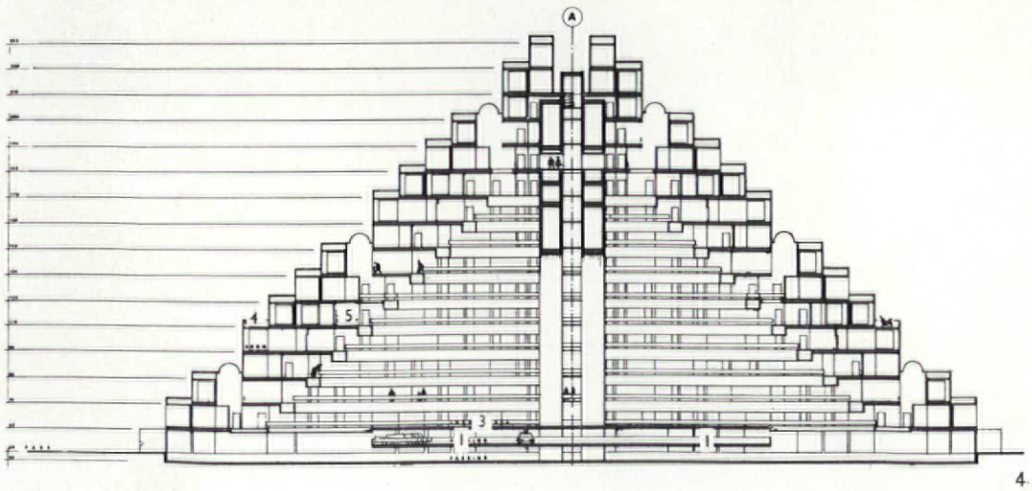
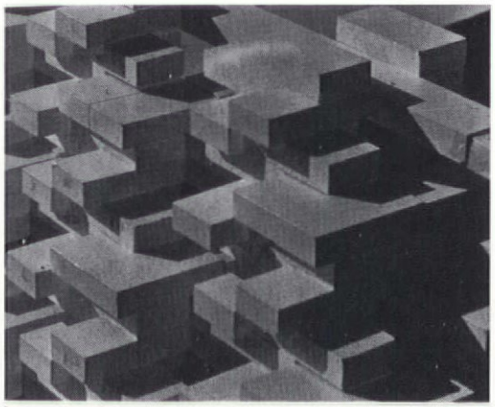


4

1 & 2
Sections and part elevations through 24-storey housing structure

3 & 4
Sections through 15-storey housing structure
1 parking
2 shops
3 lobby area
4 garden terraces
5 access galleries
6 restaurant
7 offices
8 'B' system transit
9 ramp up to residential parking
10 living units
11 service, administration and convention hall
12 structural base edge member



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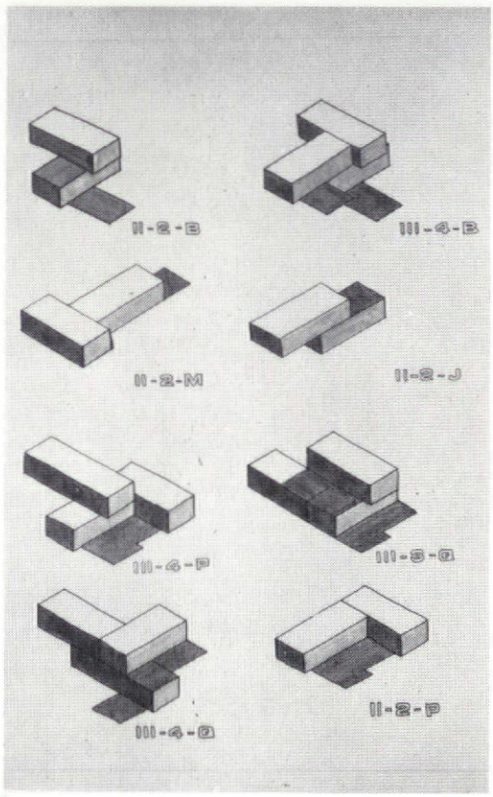

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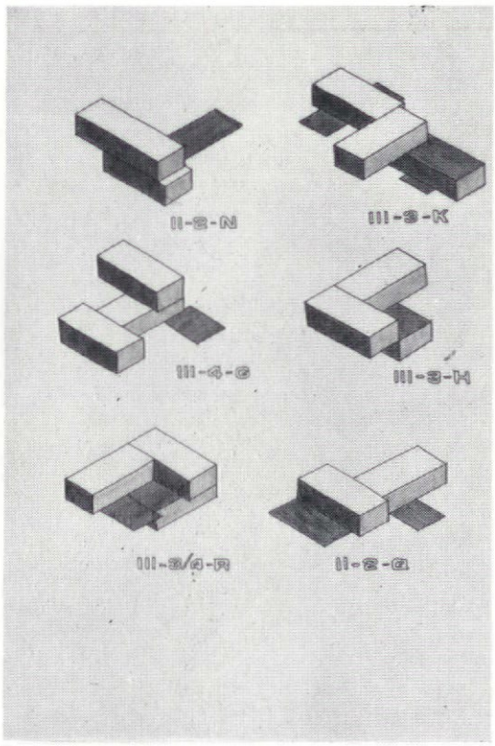

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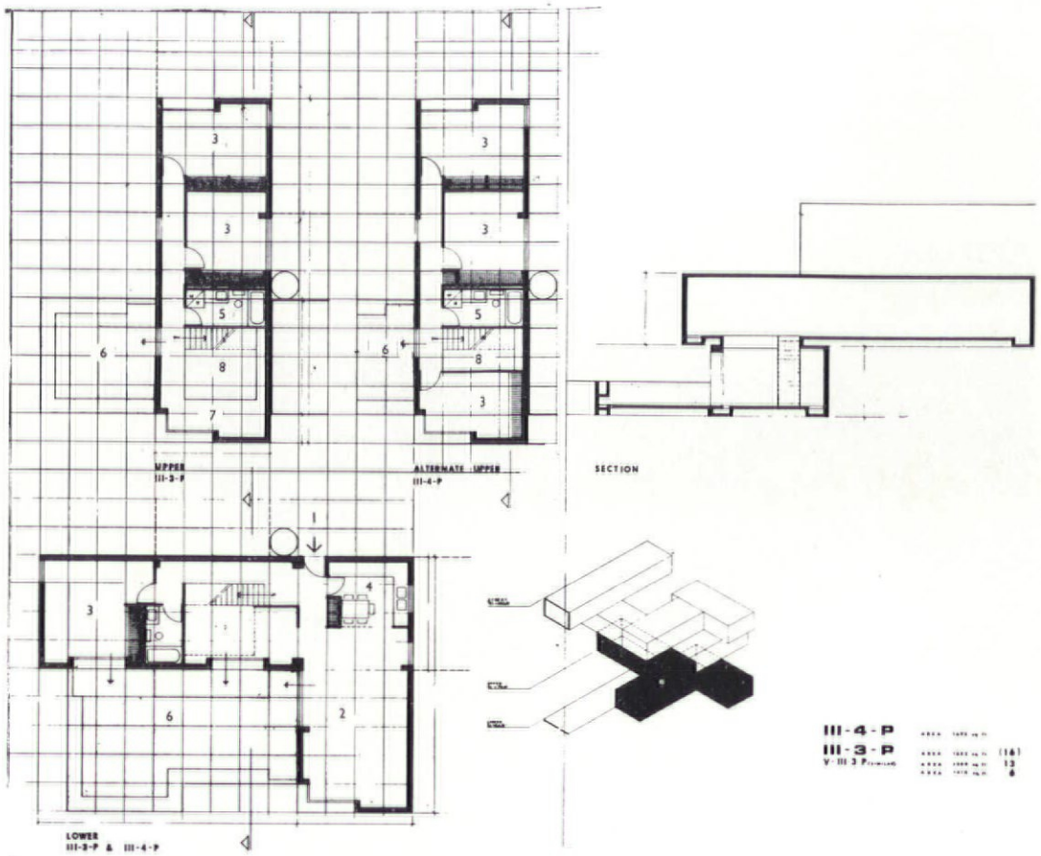


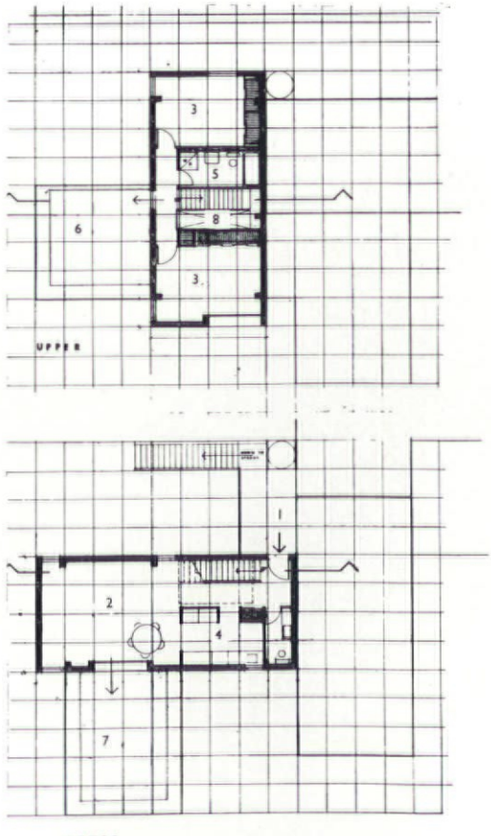
4

1
A model of prefabricated housing elements stacked on each other

2 & 3
Diagrams showing the various ways in which elements may be stacked in order to produce living units of varying sizes and types. Roman numerals indicate the number of prefabricated block elements used in each case; arabic numerals indicate the number of bedrooms per unit; the letter is key for the type of maisonette or apartment

4
3/Block, 4 and 3 bedroom type maisonette plans, section and axonometric (key below)

5
2/Block, 2 bedroom type maisonette plans, section and axonometric
1 entrance
2 living/dining
3 bedroom
4 kitchen
5 bathroom
6 terrace
7 upper level gallery or terrace
8 void



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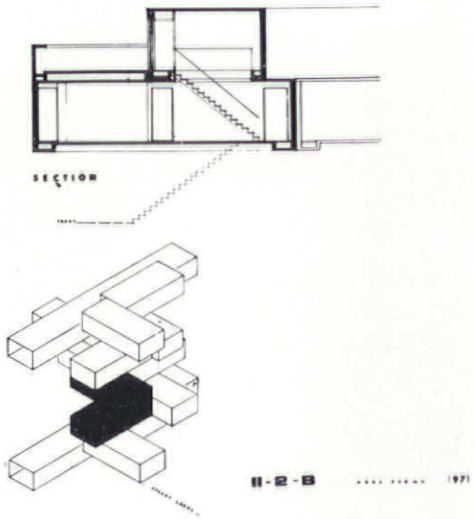

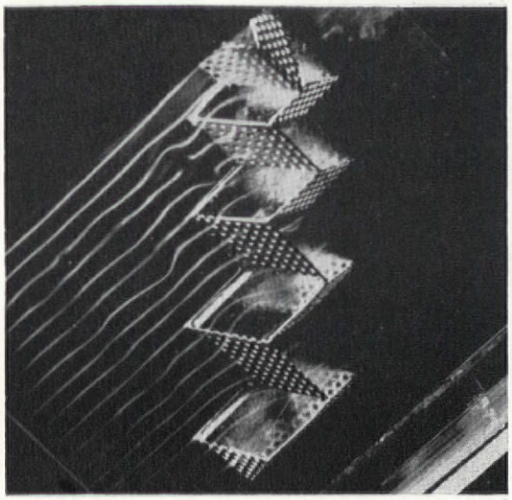

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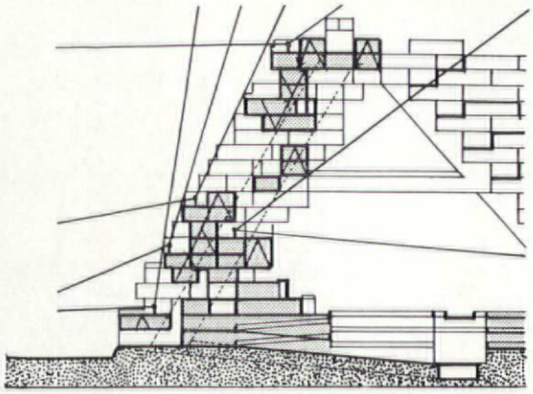

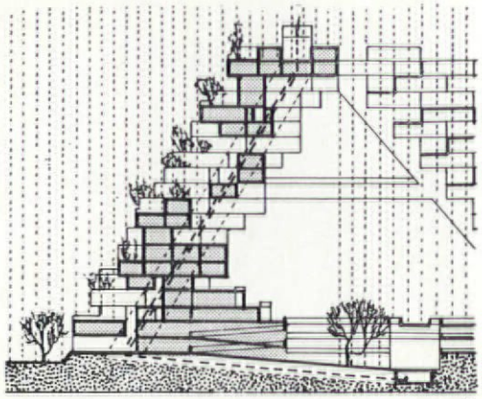

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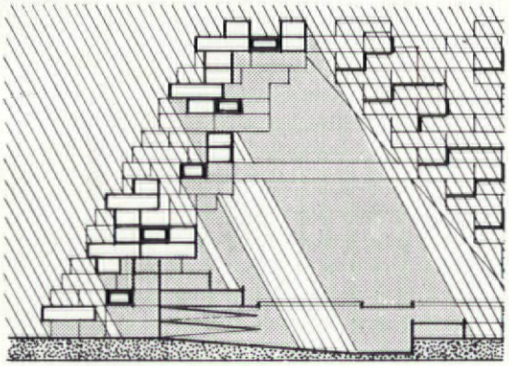

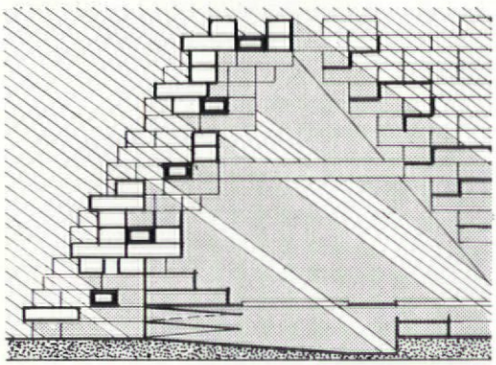

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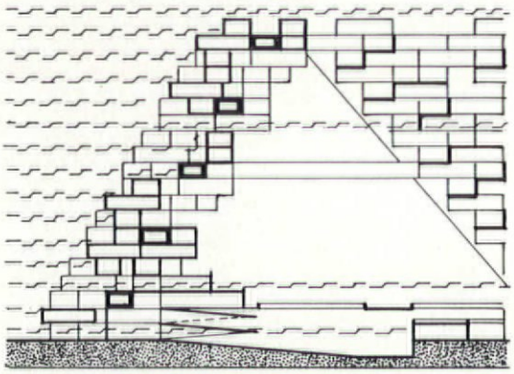
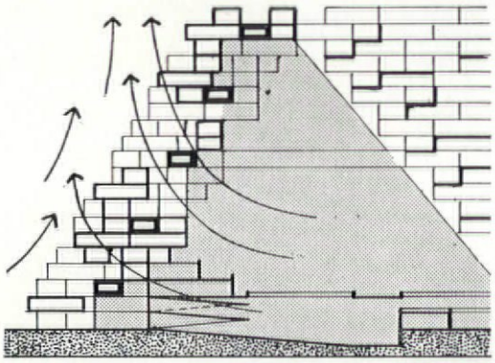




4

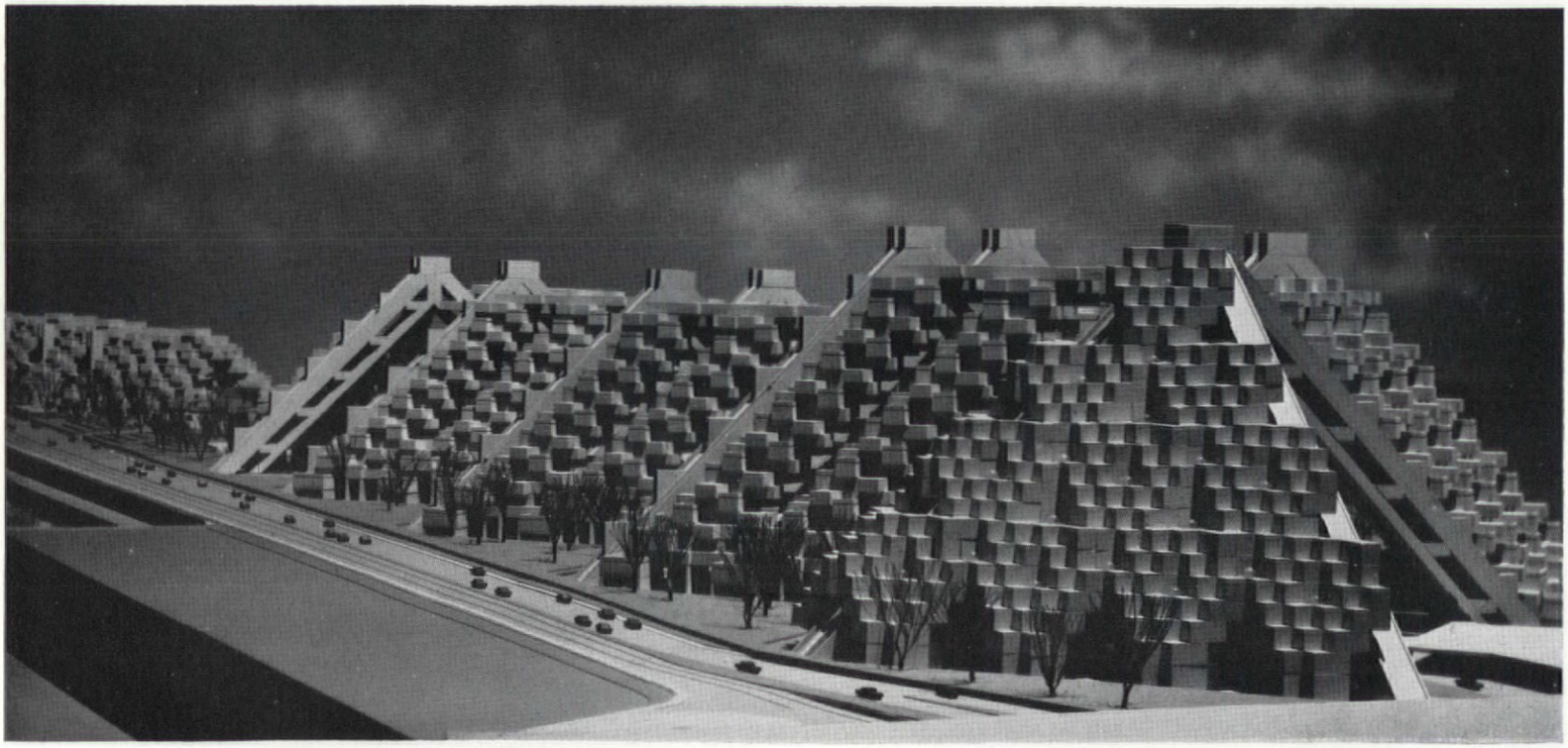
1
Smoke test in wind tunnel for breeze infiltration into housing rhomboids

2
Diagrams of sound, sight, and rain, plant life drainage criteria. The left hand diagram shows the great possibilities for views from both public and private terraces. It also shows the standards of acoustic isolation it is hoped to achieve within the housing membrane. The right diagram shows the plant life of the membrane terraces receiving direct rainfall—and drainage runs passing at an angle down the structural edge members

3
Diagrams showing sun penetration into the interior of the housing membrane. The left hand diagram is summer, the right hand winter

4
Breeze infiltration and convection diagram. The left hand diagram shows infiltration; the right hand, convection currents set up in high summer

5, 6, 7 & 8
Various views of the model of Habitat '67



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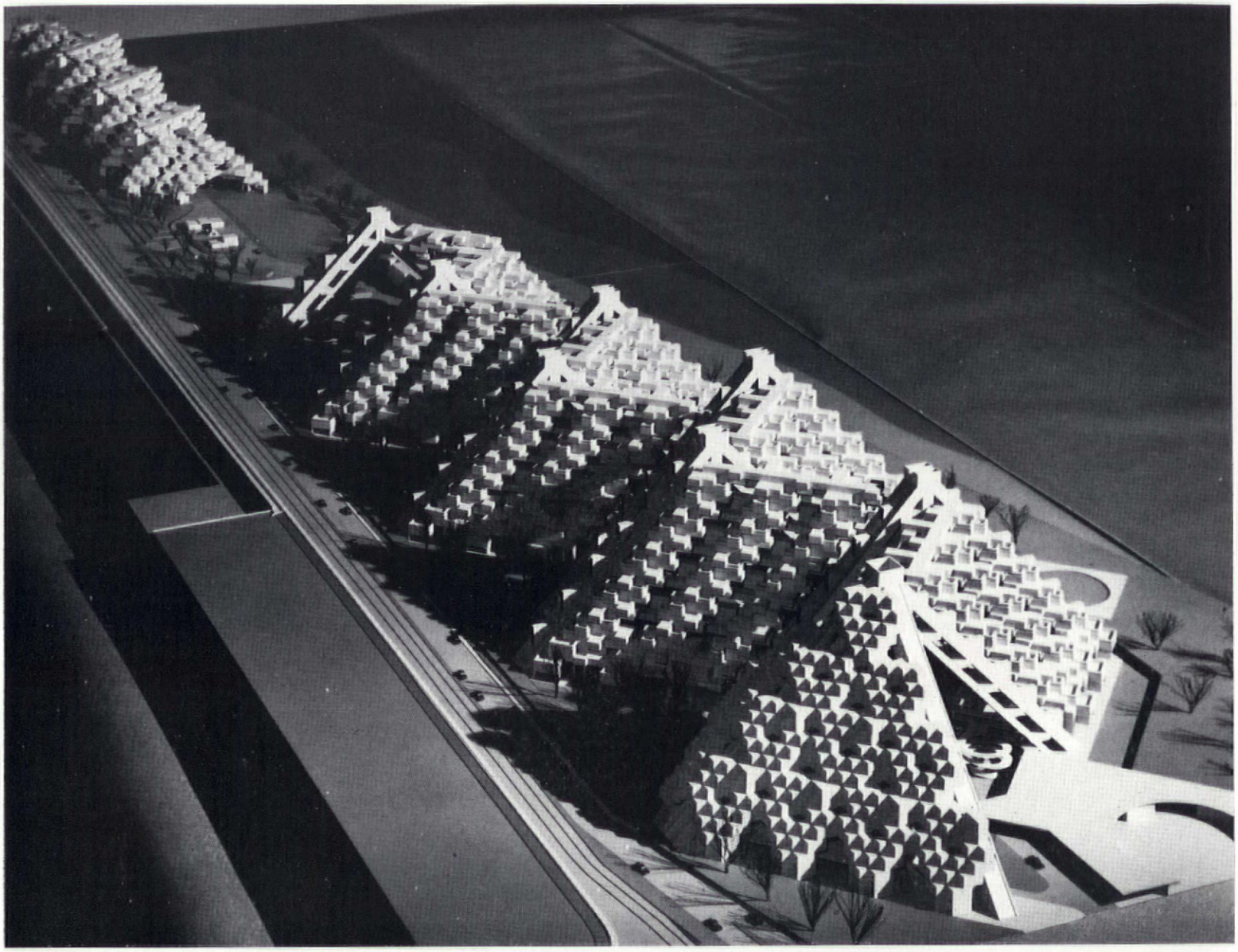

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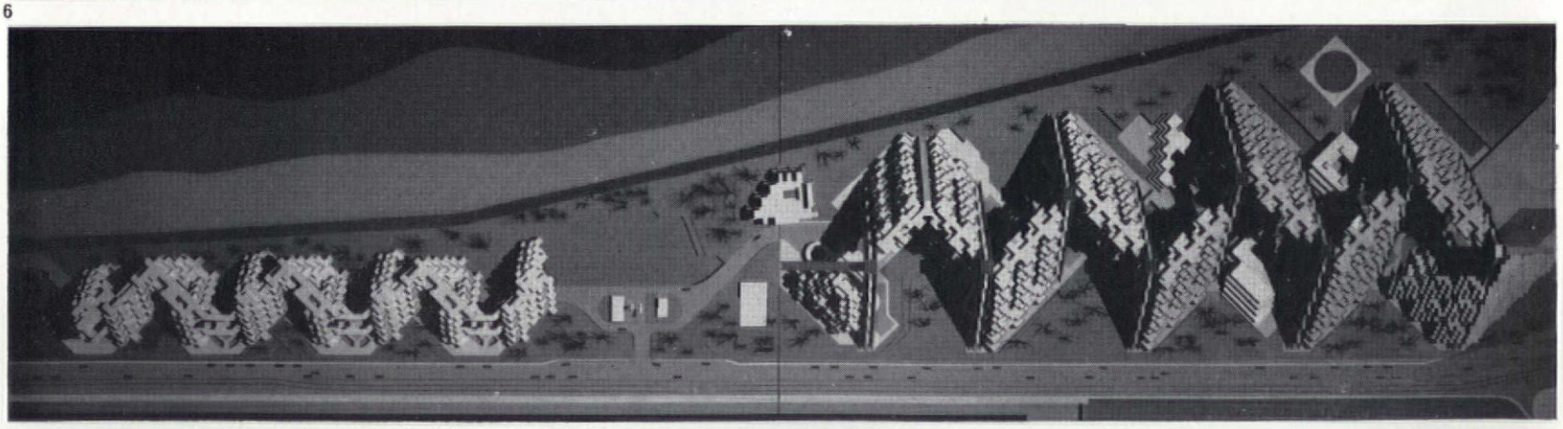

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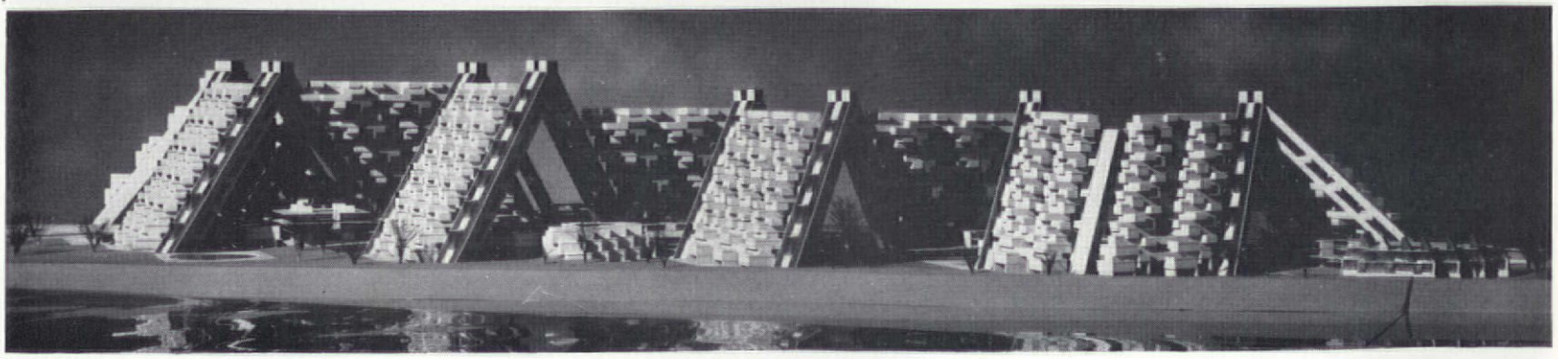

8

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post-tensioned concrete or a combination of a steel-rigid-truss structure embedded in concrete and post-tensioned. The bridge members will be of prefabricated concrete post-tensioned with strand-cables or steel-rigid-truss structures embedded in concrete and post-tensioned. The Plaza will be of in-situ concrete or a combination of precast elements and in-situ concrete.

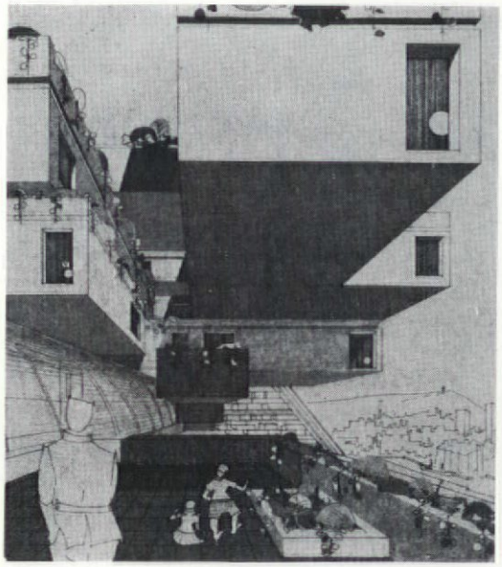
Foundations will be a concrete pile and reinforced concrete mat combination.

The construction of the project will start with the manufacture of the housing units together with the foundation and marginal members as well as all the plaza areas where possible. The erection should start immediately when a sufficient number of housing units are available for erection and the marginal members are sufficiently advanced. The bridge members will be erected in the proper sequence, so that stability and safety are assured during erection.

The service network is housed in the vertical and horizontal streets within each membrane. The houses are interconnected for services to the streets immediately above and below them. Drainage and refuse water, etc., is connected to the lower street. Pipe venting and ventilation are connected to the upper horizontal street—and exhausted at the top of the vertical service shaft.

An extensive analysis of the behaviour of air movements within Habitat '67 was undertaken. The design aim was to create a pattern of air movements due to prevailing winds which provided uniform ventilation in each unit. Furthermore, the induction of air currents due to convection on hot, breezeless summer days is provided for.

Habitat '67 attempts to provide an entire range of dwellings using a limited number of repetitive mass-produced units. It strives for long-range economics by minimizing manual labour in production. To build economically is a social and political aspect of our time. In order to provide a growing population with livable space, we strive to produce more space for less labour and materials on less land. A global view of housing and urban economics must include a re-examination of all aspects of the construction of environment. The life of structures and their maintenance costs; the cost of servicing land and transportation; the time lost by travelling to and from work. Presently, many of these expenditures are disguised in uneven taxation, in financial and mortgaging systems, and indirect subsidies. According to R. F. Leggett the real cost of housing can only be evaluated by considering the interrelation of interest on capital, amortization, maintenance, taxes, servicing, insurance and transport.



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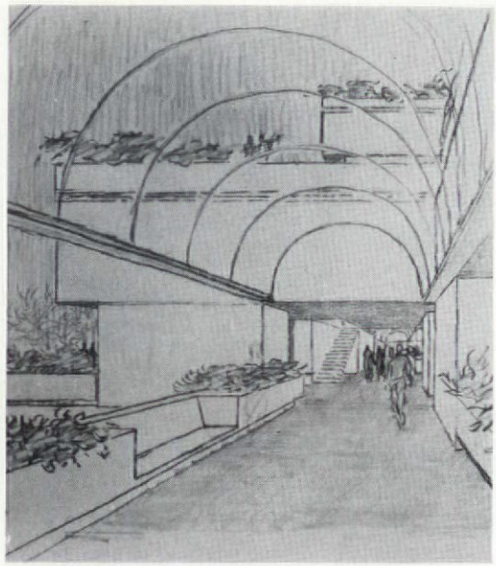

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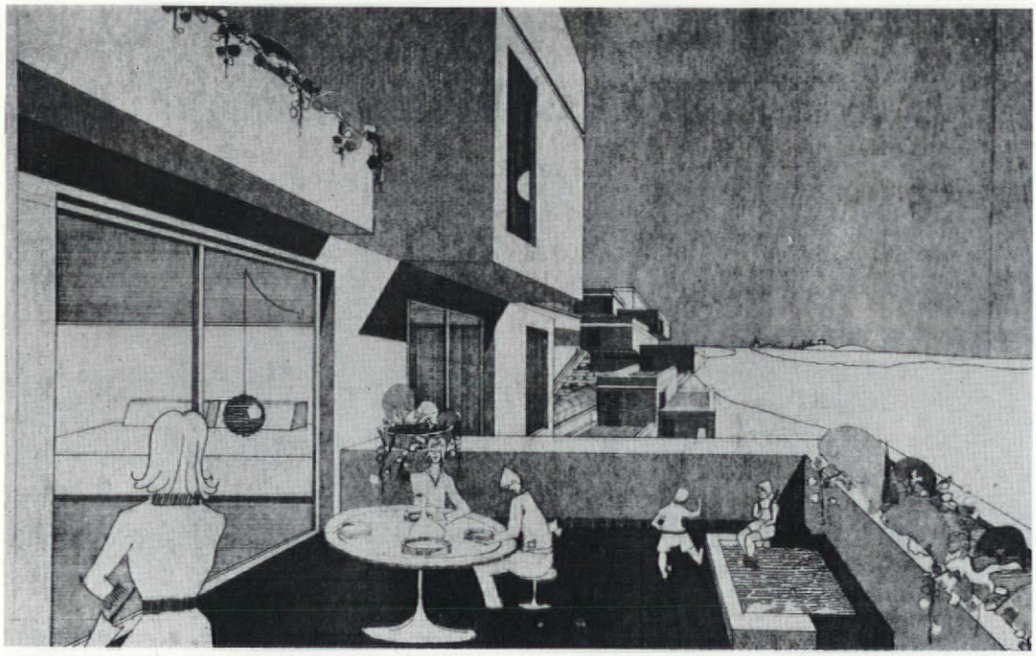

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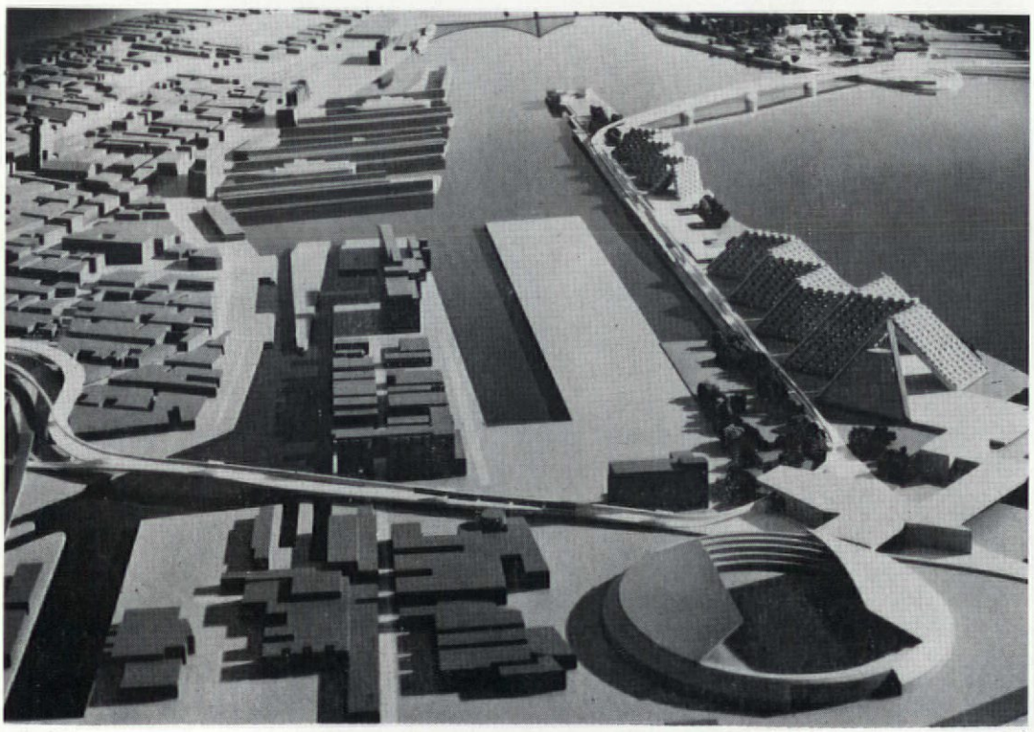


4

1
View of housing from public terrace. Glazed horizontal street through housing membrane is on the left

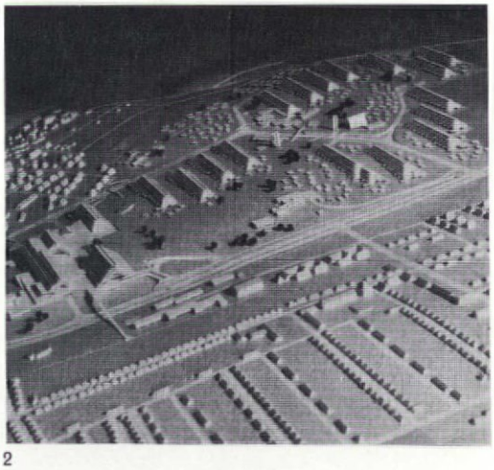
2
View of glazed horizontal street with public terraces

3
A typical large living unit with garden terrace overlooking the St Lawrence river

4
A general view of the project from the south with the sports stadium in the foreground



1



2

'Hill Housing'

Roland Frey and Hermann Schroder, Stuttgart

The shape of this 'living hill' has developed out of an endeavour to achieve an optimum type of apartments within a large block of flats. Its peculiar section allows for the mixing of all the ordinary flat sizes and types—from the 2-storey 'row-house' to the standard types of 2-, 3-, and 4-room flats, also to the maisonette type of unit. It is intended that the 'hills' are aligned east–west. Owing to the diagonal inclination of the walls the living rooms still enjoy two hours of sunshine even on 21st December.

The cross-section of the 'living hill' is arranged as follows: The ground floor and first floor are occupied by 2-storey 'single-family row-houses'; the second floor is occupied by 2-, 3-, and 4-room flats; while on the third and fourth floors are maisonettes combined with 1- and 1½-room flats.

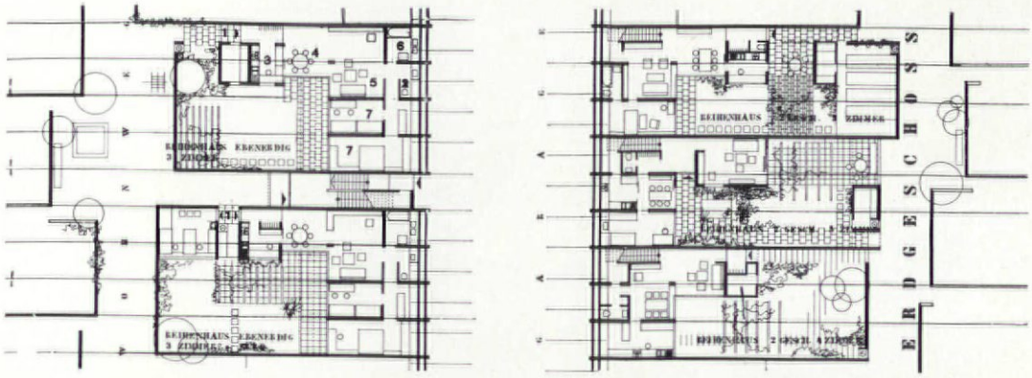
The centre of the section is utilized as garage space on the lower ground floor with dead storage at first floor level. One hundred per cent parking is provided at lower ground level.

The frontage of the units varies from the east to the west side of the building. The building is planned on 9½ft grid and this is the modular unit. The frontage of the units on the west side of the building, comprises four such modules with the exception of the top floor which comprises three.

The architects have contrived to keep the widest frontages on the western side, which is the more favourable orientation. For the same reason there is a slight predominance of garden terraces on the western side. All the units on the eastern side, with the exception of second floor three-bedroom flats which have a four-module width, have the narrower three module frontage, and this frontage is used to house the ground floor two-storey court house, and the third-floor maisonette.

In spite of east–west alignment the flats enjoy south sunlight as a consequence of the projecting terraces and the diagonal inclination of the building. The terraces are private and vary in size depending on the size of the flats.

1
Detail view of the terraces of the 'living hill'
2
Model of a layout of 'hill housing' units



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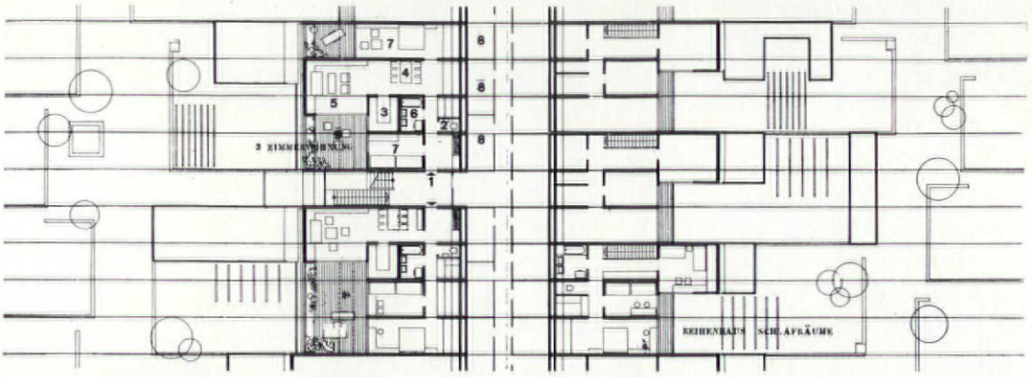

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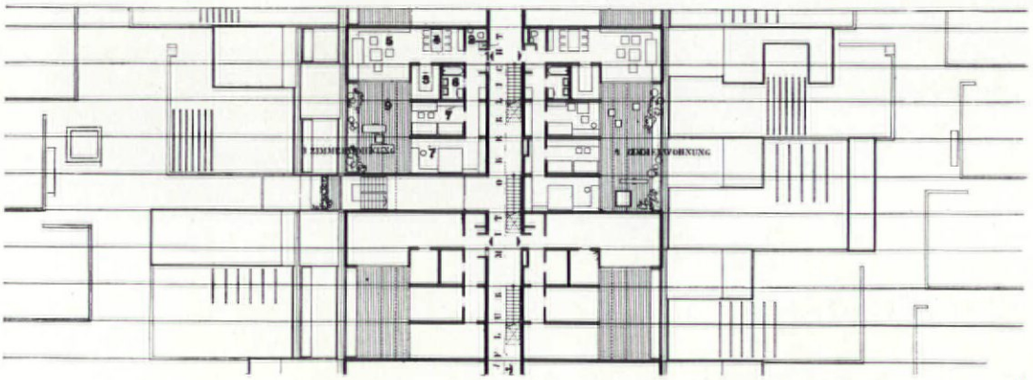

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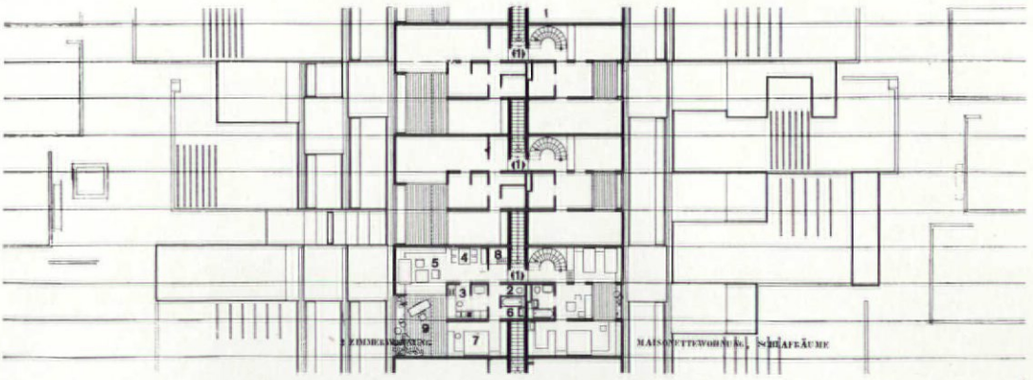

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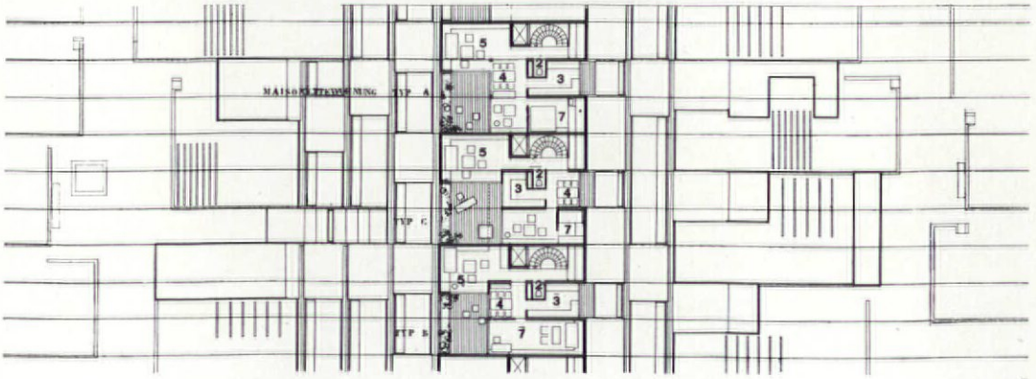


5

1
Ground floor plan. Garaging situated on the central spine. Left hand side: courtyard flats with access through garden court; right hand side: maisonettes with courtyards with access through the garden court

2
First floor plan. Left hand side: flats with direct access in pairs from ground floor; right hand side: bedroom floor of the maisonettes situated below; dead storage in the centre

3
Second floor plan. Central access corridor served from main stair giving direct access to flats ranged on either side and serving individual stairs up to third floor flats and maisonettes

4
Third floor plan. Third floor flat on left hand side and bedroom entry floor of maisonette on right hand side

5
Fourth floor plan. Top living floor of third floor maisonette. Keys to all plans below
1 entrance lobby
2 w.c.
3 kitchen
4 dining room or recess
5 living room
6 bathroom
7 bedrooms
8 storage
9 terrace

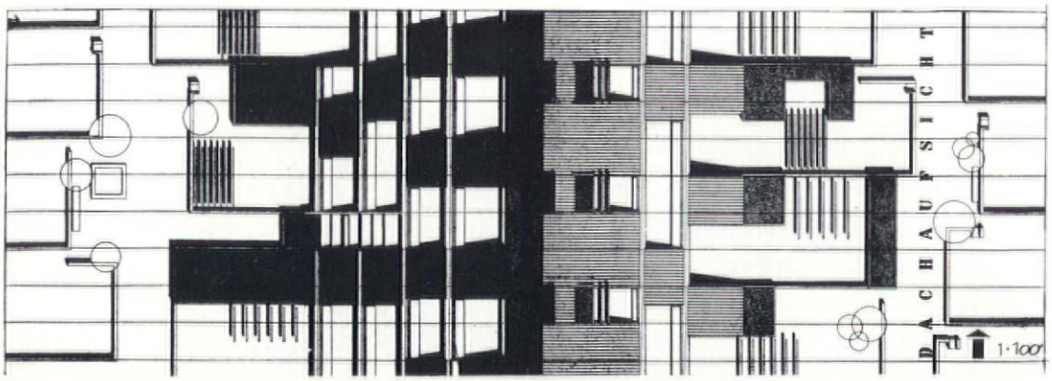
Schedule of accommodation for one bay 9 modules wide

Ground floor: 21 cars, two 2-bedroom courtyard flats, one single room flat, three 3–4 bedroom two-storey courtyard maisonettes

First floor: two 2-bedroom flats, dead storage

Second floor: three 2-bedroom flats, one 3-bedroom flat

Third floor: one 1-bedroom, one 2-bedroom maisonette



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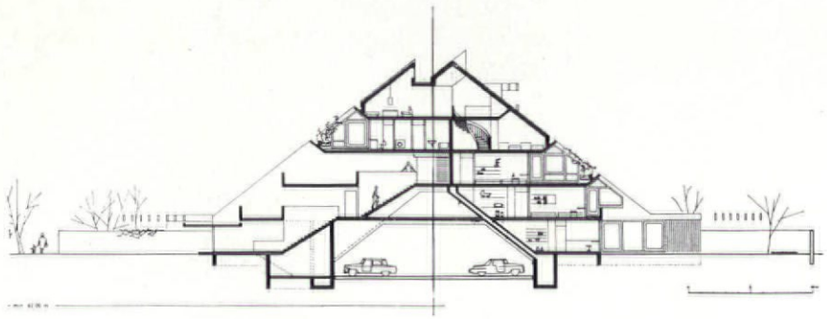

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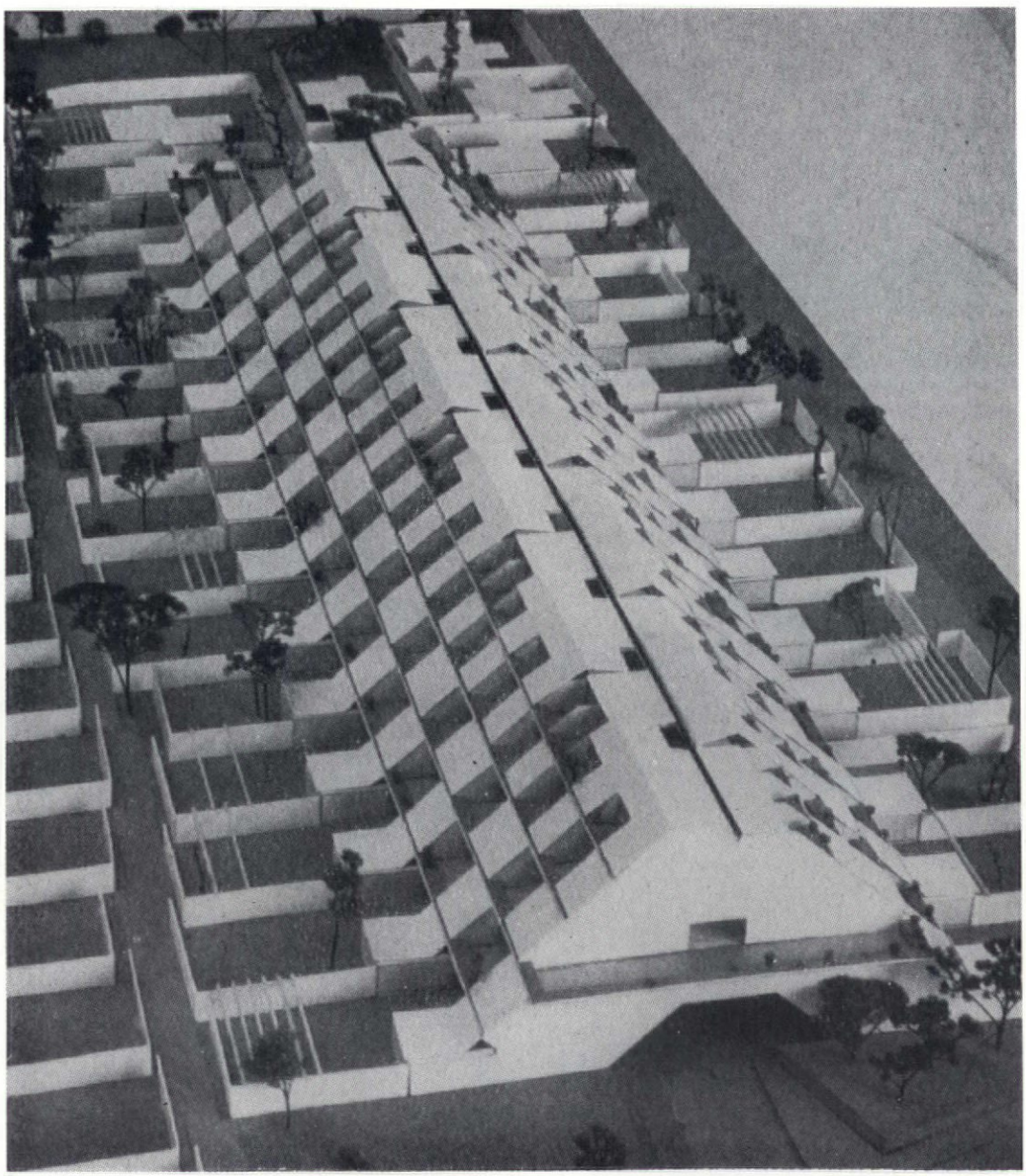

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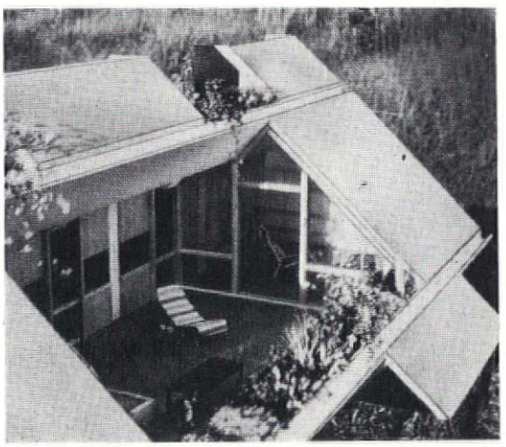


9

6
Roof plan of 'hill housing'

7
Section through the 'hill housing' block showing position of parking and dead storage in the centre of the block

8
View of the model of a complete 'hill housing' unit

9
A mock-up of a typical garden terrace to the block

Crystal Palace national recreation centre

Hubert Bennett in succession to Professor Sir Leslie Martin

Deputy architect: F. G. West
Senior architect: Geoffrey Horsfall, in succession to D. C. Jenkin
Group leaders: N. Engleback, E. R. Hayes

The basic brief for this building was to provide the necessary pool and training areas with the greatest amount of flexibility and for the maximum degree of intensive usage. This was to be provided in varying sized elements to aid the letting of the various areas to independent users or sporting associations: to provide easy access by the public to seating areas with segregation from competitive levels; and to provide the necessary servicing accommodation such as offices, boiler rooms, filtration rooms, medical service rooms, etc.

The structure encloses an area of about one and three-quarter acres and contains on basically three levels above ground the following accommodation:

Ground level: three practice rooms (1850ft² each) for boxing, wrestling, fencing, judo, gymnastics, table-tennis and weight-lifting; a multi-purpose practice room (5000ft²) principally for cricket, golf and basket-ball; six squash courts; changing rooms for all indoor and outdoor facilities and a swimming cubicle changing system; a medical inspection room and lecture room and accommodation for coaches are also planned at this level. A corridor giving underwater observation to both the diving and racing pools is approached from this level.

Intermediate level: To the west of the central spine-framed structure is a 15,000ft² arena for training in basket-ball, badminton, gymnastics or lawn tennis. This arena will also be used for events to which the public will be admitted and has retractable seating accommodating 1270. By the use of additional seating units located on the northern practice area overlooking the arena seating accommodation of up to 2000 can be provided.

To the east of the central spine-frame structure is the swimming hall containing the racing, diving and teaching pools. The provision of these three separate elements makes the use of this area greater to the extent that diving training can be taking place concurrently with racing training in the 55yd, eight-lane pool. The shallow teaching pool has allowed the main racing pool to be of a standard depth of 6ft 9in throughout its length, thus enabling starting practice to be carried out at both ends of the pool at the same time. A further advantage of the separate diving and racing pool is that during intensive training sessions over long periods it will be necessary for the temperatures of the water in the two pools to be varied in accordance with the Amateur Swimming Association's recommendations. The 16ft deep diving pit enables 10-, 7½-, 5- and 3-metre diving platforms to be used from the diving stage and two one-metre spring boards from the bath surround. The eight-lane racing pool will be used to its maximum for training but for competition purposes there are only two events in the swimming calendar which involve the full use of the eight lanes, these being the National Championships and the British Empire Games, all other events having a maximum of six lane use.



1

Upper level: This is the main access level for the public for the viewing of events (a public concourse approachable from the high-level bridge traversing the site) giving access to the upper and lower seating units of the swimming hall and the retractable seating units of the indoor arena. Two practice areas at this level, each 5000ft² are for tennis, badminton and general practice, one being connected by helical stair to the administrative offices for the Central Council of Physical Recreation, discussion rooms and a club area and coffee bar for the use of trainees.

The basic requirement was that all accommodation should have clear floor areas and unrestricted vision for spectators.

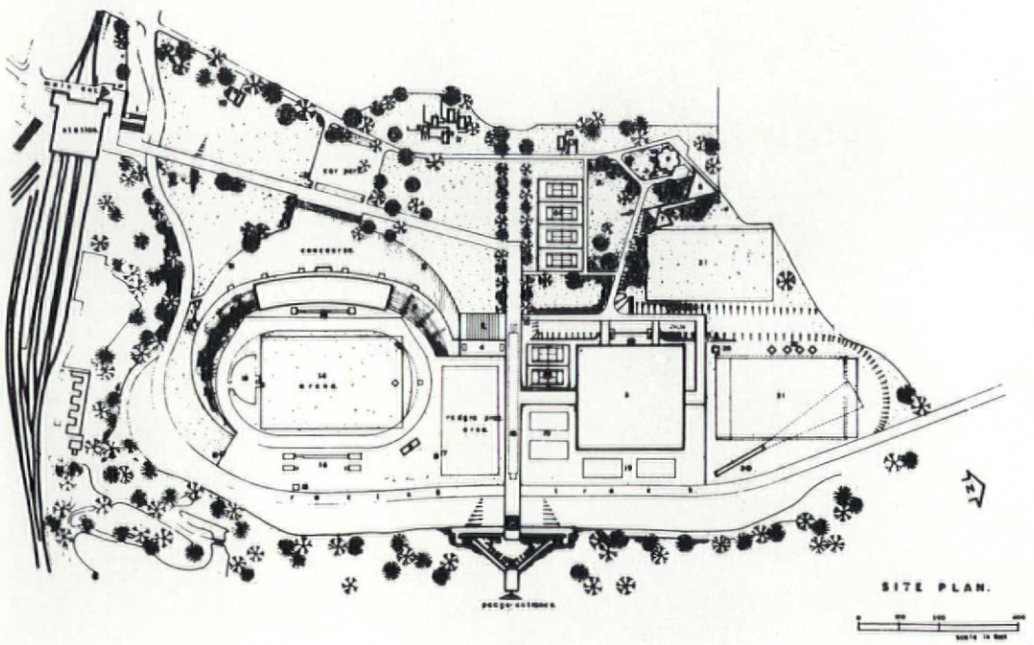
The structure is of reinforced concrete except for the roof. The foundations to the west side and centre frame area is a reinforced concrete raft and 60ft bored piles support the pools and their enclosing structure. Pre-cast beams have been used over the four practice rooms which are on solid ground. The roof system is on a prop-cantilever principle with 100ft steel trusses cantilevering from the centre frame structure of post-tensioned concrete members both in-situ and pre-stressed and stressed down on to the external in-situ reinforced concrete mullions.

The cross-bracing between the trusses produces the lozenge-shaped roof booms which are finished above with copper sheeting on wood wool slabs and the underside of which is of separated teak strips with rigid glass silk acoustic absorbent material above. The voids in the roof booms give access to the fluorescent

1
Aerial photograph of Crystal Palace national recreational centre from the south

Photo: Archie Handford

2
Site plan



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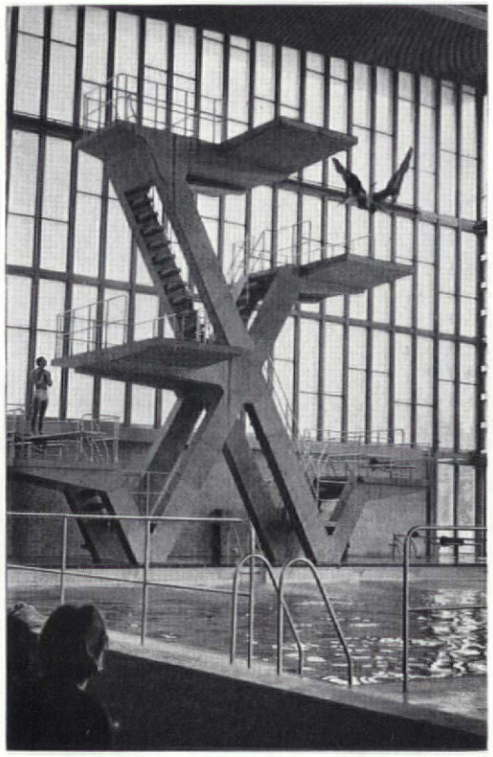

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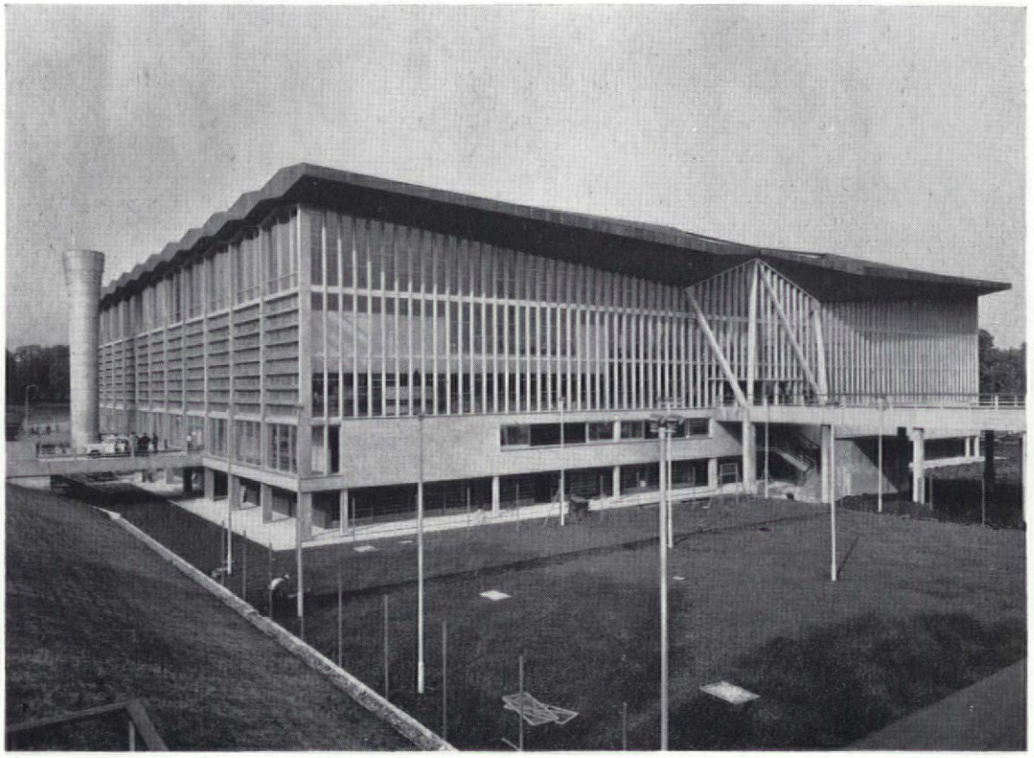


2

lighting troughs, the specialized display lighting and the operation of the window cleaning apparatus.

The walls above the intermediate level are completely glazed. ¼in or ⅜in plate glass with a 4in sealed cavity is used for thermal insulation. The pressed metal frames for these glazed areas are of 18 s.w.g. stainless steel on the interior to resist the corrosive atmosphere generated by the pools and 14 s.w.g. natural grey anodized aluminium externally.

The training halls and training and display areas, practice rooms, lecture theatres, etc. are finished in 1in Rhodesian teak strip flooring on softwood dovetail battens set in haunchings of screed.

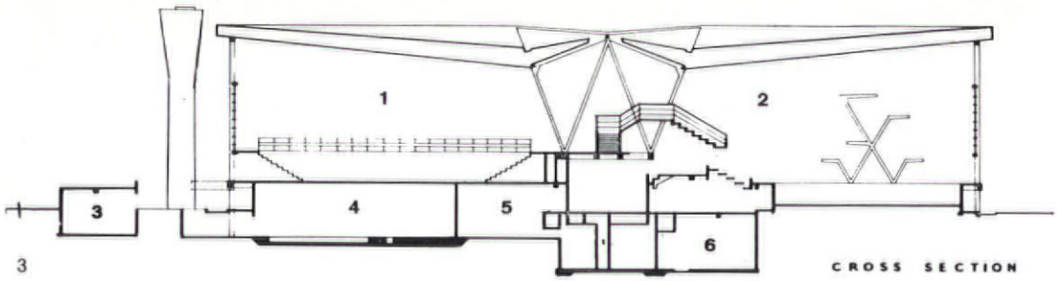
The main ceiling finish to the Sports Hall is in 3in × 1in Mahaborn teak slats with ¾in gap between.

All joinery throughout the Sports Hall is in Burma teak to reduce maintenance.

All balustrades to pools and diving platforms are in 18.10.3 stainless steel.

The stadium was designed to take advantage of the contours and obtain the best orientation. The sickle shape was considered to provide the maximum number of seats for viewing the running track straight and pitches. For a great number of events the 4000 covered seats will be adequate. Public lavatories are cut into the banking under the rear of the seating units and the arc of seating to the north provides cover to the team changing rooms, referees room and stores for maintenance and athletic equipment. Electrical switch-rooms and battery rooms also are accommodated in this area. The total provision of seats is 12,400, which includes 50 VIP seats and 30 press desks.

The seating enclosure wraps itself round the 440yd AAA track with a nine-lane straight, seven-lane circuit. The area enclosed by the track is turfed and will be used for rugby, association football and hockey and also included within the centre area is a high-jump fan, and javelin run-up.



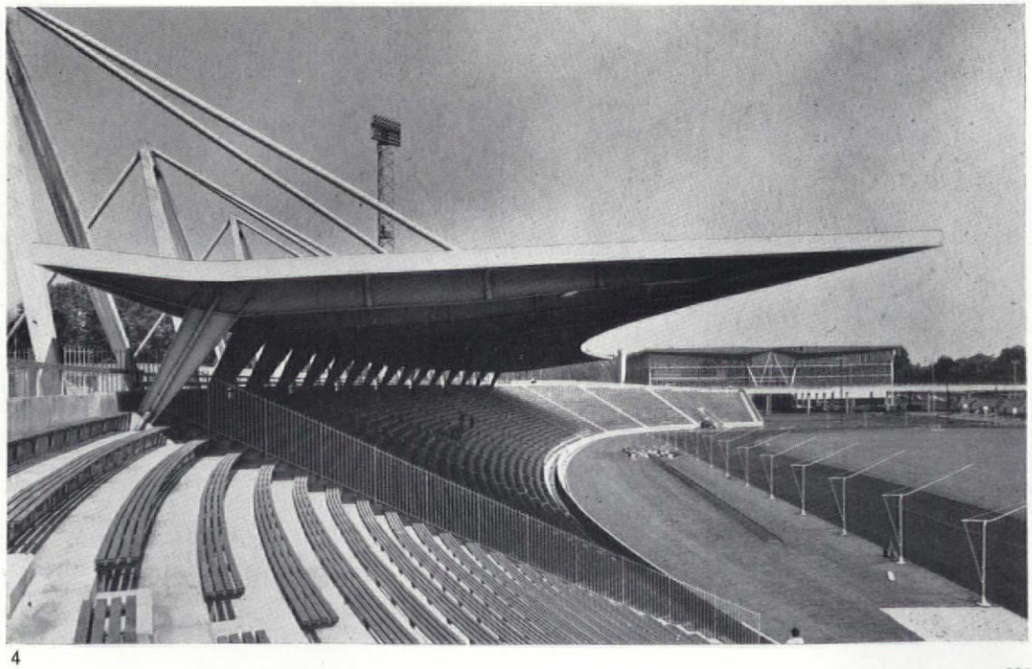
3

1
Interior of sports hall showing the diving pool
Photo: Henry Grant:

2
Sports hall from the south-east
Photo: LCC Architects Department

3
Section through sports hall
1 arena
2 swimming
3 fuel
4 boilers
5 ventilation
6 filters

4
Stadium from south-west showing concrete bipods and steel tubes in tensions supporting the canopy
Photo: LCC Architects Department



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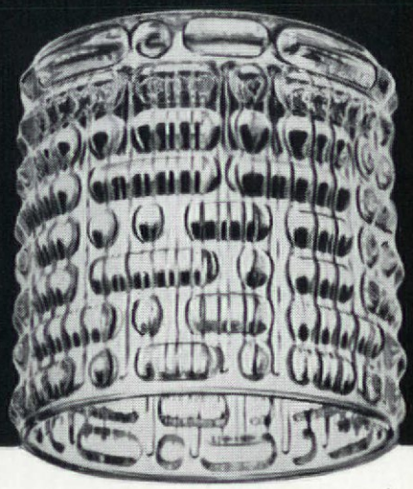
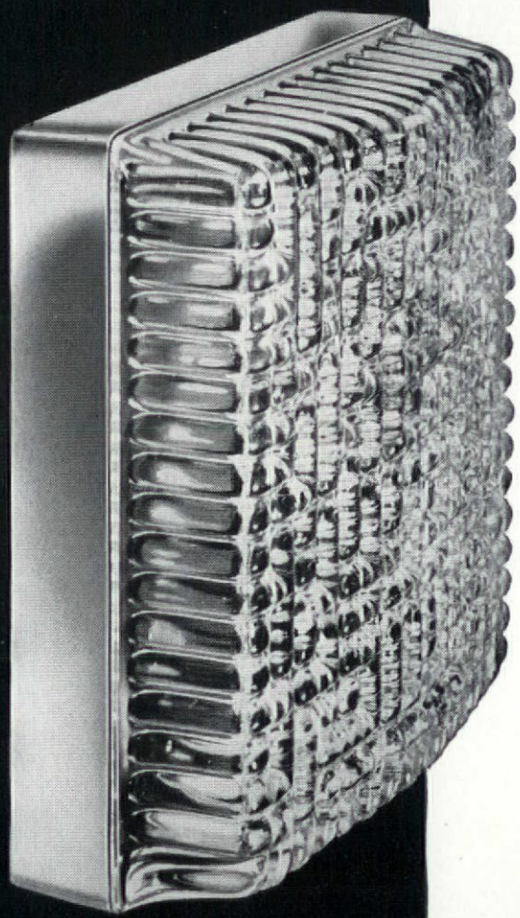
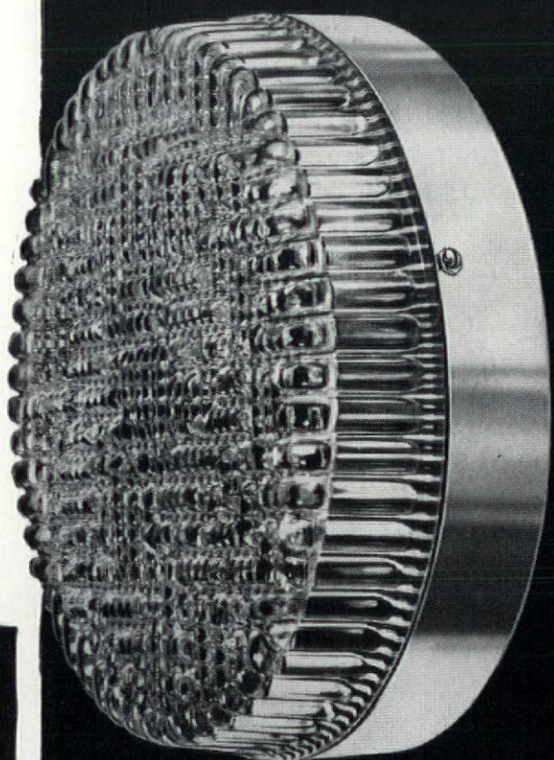






MODERN BRILLIANCE IN CRYSTAL GLASS



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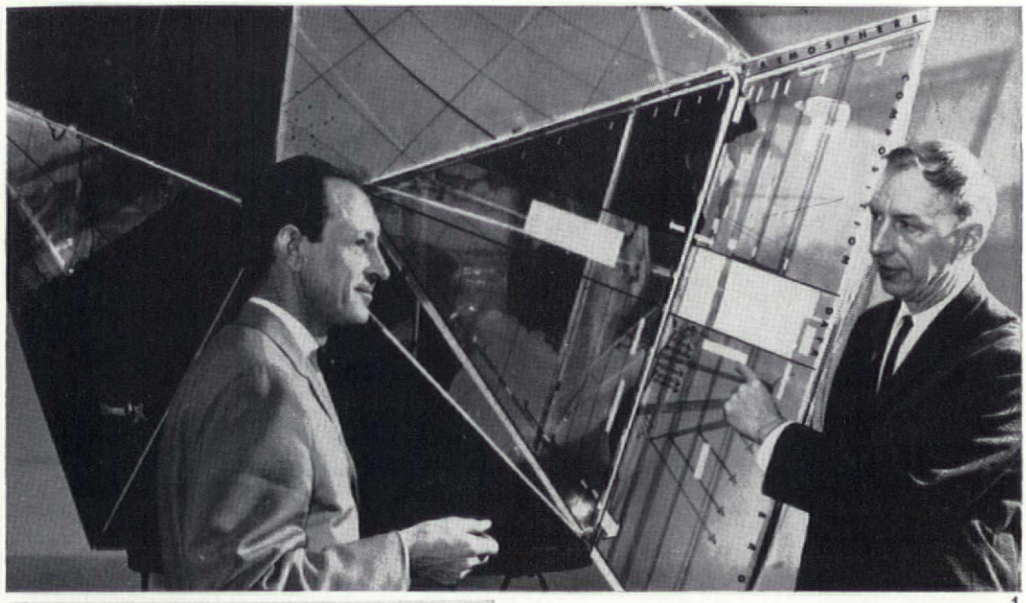
The Geoscope

John McHale[1]



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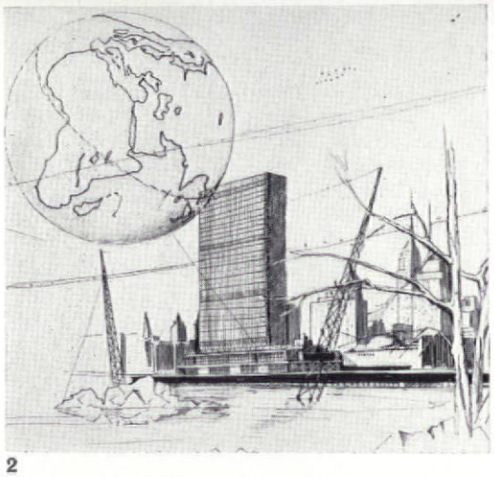

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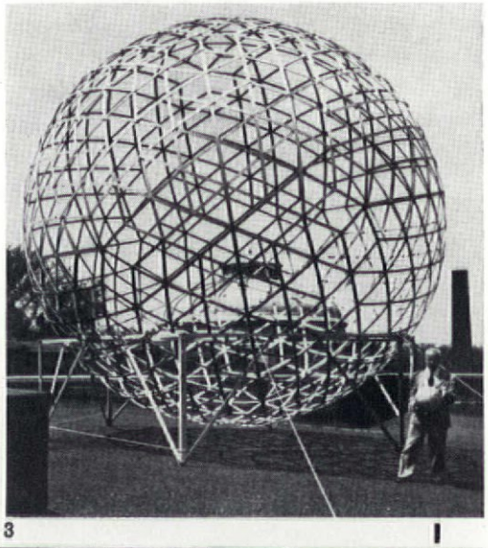

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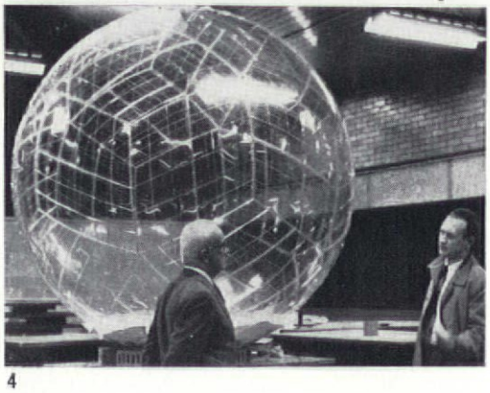

4

1
Geoscope, University of Colorado, 1964. 6ft icosahedral version. John McHale (left) and Dean De Von Carlson of the School of Architecture

2
'The Minni-Earth or Geoscope' may be located as a major world city's focal point, analogous to the Eiffel Tower, or as a continuing feature of World Olympic Games—or as in sketch, be suspended from masts mounted on the ring of rocks in midstream of New York City's East quarter, a mile distant from the East face of the UN Building to serve as a constant confronter, of all nations' representatives, of the integrating patterns, both expected and unexpected occurring around the face of man's constantly shrinking 'one town world' (Fuller)

3
Geoscope at Cornell University School of Architecture, 1952. 20ft diameter

4
Geoscope at University of Minnesota, School of Architecture, 1954. R. B. Fuller in foreground

This study for the design of a comprehensive world data storage and display device, originates with the proposal made by R. Buckminster Fuller to the International Union of Architects (IUA) at their sixth Congress in London, England, 1961[2]. He proposed then that 'the architectural schools around the world be encouraged by the IUA to invest the next ten years in a continuing study of the problem of how to render the total chemical and energy resources of the world, which are now exclusively pre-occupied in serving only 40 per cent of humanity, adequate to the service of all of humanity, at higher standards of living and total enjoyment than have yet been experienced.'

This proposal has been further developed and documented through the 'World Resources Inventory' centre at Southern Illinois University. It was formally presented by Fuller as the 'World Design Science Decade 1965–75' programme to the International Symposium on Architecture of the IUA in Mexico City, 1963. A number of groups and individuals around the world have now initiated work on the first phase of this programme. At the 1965 Congress of the IUA to be held in Paris[3] Fuller will address the Congress on development of the programme and review work which has been accomplished to this date.

The Geoscope concept

The theme submitted to the IUA for the first two-year phase of this programme is concerned initially with the 'literacy' of world problems—'The design of a facility for displaying a comprehensive inventory of the world's raw and organized resources, together with the history and trending patterns of world peoples' movements and needs . . .' that is the assessment or inventory of those social, economic, and industrial trends defining world problems and their effective communication through dramatic educational tools in such a manner as to catalyse their possible design solutions.

One such dramatic educational tool, outlined in the Fuller proposal, is the construction of a 200ft diameter miniature earth or Geoscope. This main display facility fabricated of light metal trussing would be correctly oriented on its polar axis in location, with basic geographic data marked accurately on its surface. Linked to an electronic computer, within which would be stored all available 'inventoried' world data, and wired on its interior and exterior surfaces with approximately ten million variable intensity light points under computer control, this would furnish a giant spherical television screen—allowing for the flexible display of dynamic world trending patterns at variably controlled display speeds. Viewing the stars through the semi-transparent land masses, from the centre of such a miniature-earth would powerfully locate man in his universe and its electronic display facilities would enable him to see and comprehend patterns far beyond his normal 'timing' range . . . 'man recognizes a very limited range of motions in the spectrum of motion. He cannot see the motions of atoms, molecules, cell growth, hair or toe-nail growth—he cannot see the motion of planets, stars and galaxies; he cannot see the motions of the hands of the clock. Most of the important trends and surprise events in the life of man are invisible, inexorable motion patterns creeping up surprisingly upon him. Historical patterns too slow for the human eye and mind to comprehend such as changing geology, population growths and resource transpositions may be comprehensively introduced into the computer's memory and acceleratingly pictured around the surface of the earth.'[4]

Geoscope development

Several study projects on such a Geoscope/Minni-Earth facility have been carried out by Buckminster Fuller over the years, notably those at Cornell University in 1952, University of Minnesota in 1954–56, and at Princeton in 1960. At Cornell a 20ft diameter miniature Earth was constructed on which continental land masses were marked with transparent copper screen mounted on the openwork geodesic grid of the sphere. The latter could be entered and observations could be made through the surface of the Geoscope from its exact centre. The sphere was polarly oriented to the axis of the Earth and rotated so that Ithaca, New York, on the surface (corresponding to its real earth location) was in zenith. It was then locked in place to prevent any further relative motion. In use this Cornell facility gave immediately certain direct sensa-

continued on page 633





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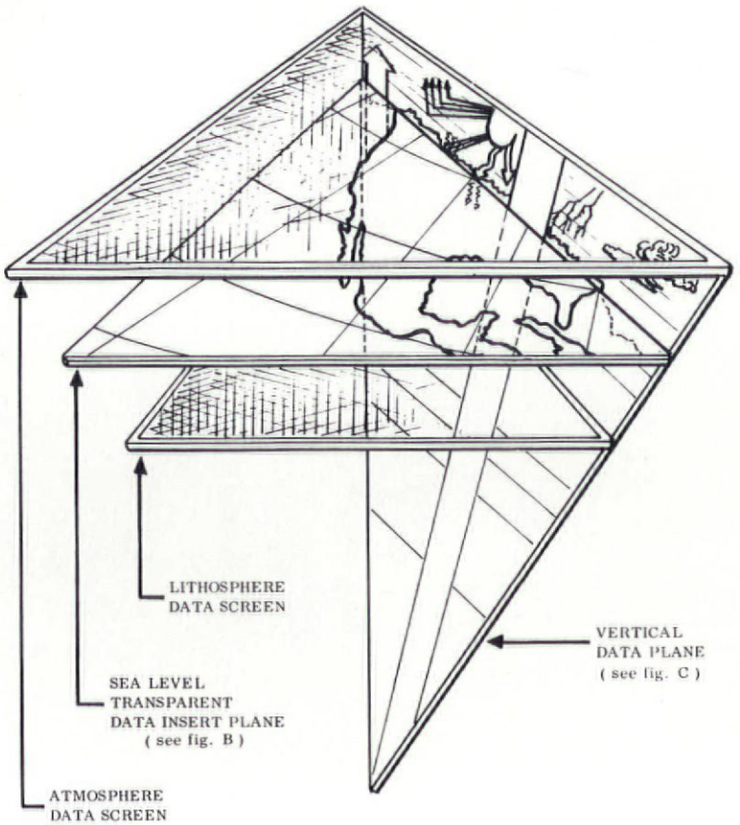

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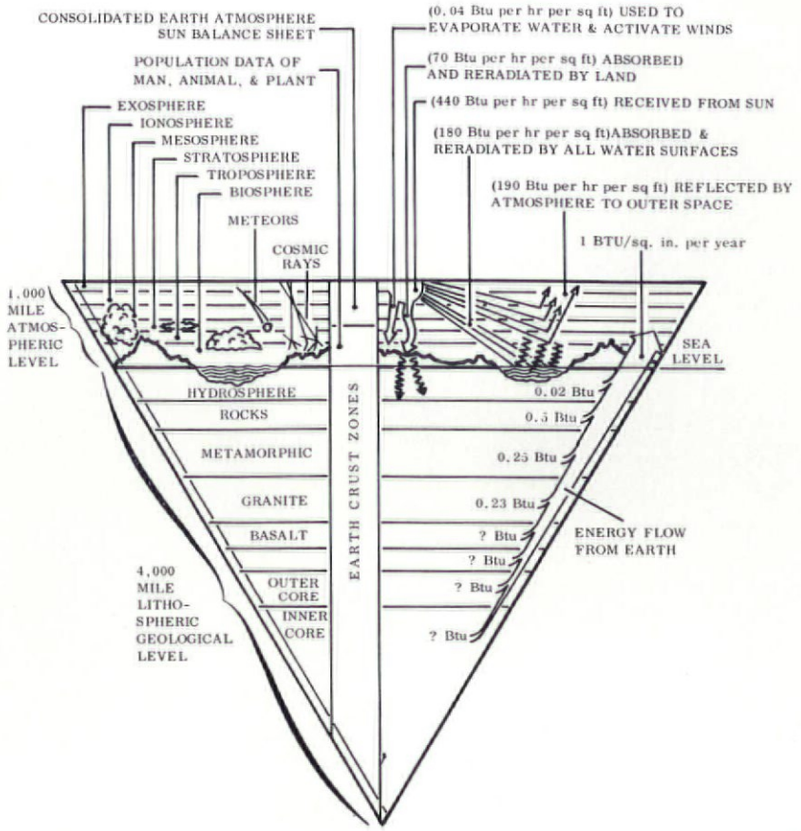

2

continued from page 632

1
Typical tetrahedronal data display

2
Typical vertical data plane, running from 1000 miles atmospheric height into the earth's crust

tions of true earth/universe relations—by observing the movements of the sun and stars against the grid lines relative to the polar constants the rotation of the Earth could be vividly experienced: the location of the sun at zenith at any point on the globe surface, where viewing was not blocked by the real Earth, could be verified accurately. The Princeton 1960 Geoscope utilized data compiled during the several University of Minnesota studies in transferring the Fuller Dymaxion map projection with detailed accuracy on to a six-foot geodesic sphere. By coordinating the triangulated plane surfaces of the map with the spherical geodesic this projection may give minimally distorted world geographical features at any scale. The six foot globe so constructed was probably the most accurate globe of this size ever made. Other big globes are usually more or less approximate enlargements of smaller standard units using spherical 'square' coordinates with relative distortion progressively enlarged in their land mass projections. The ratio of the Princeton Minni-Earth to real Earth was 1:7,000,000, thus rivers, shorelines, and small lakes could be shown in the fine detail usually only found in small area maps.

Research into the Geoscope/Minni-Earth concept presently being conducted through the World Resources Inventory at Southern Illinois University, and the Buckminster Fuller Institute, ranges through the investigation of various multi-projection and panel wiring devices, such as multi-slide and 8mm cinema units for the smaller scale systems and the incorporation of triangular-faced TV tubes now available with data storage and display through videotape. The system for the 200ft Geoscope, outlined above, has been fully analysed and design schedules and costs for its complete production have been compiled.[5]

The Colorado Geoscope

It is obvious that, in addition to the development of a major Geoscope facility, the concept has far-reaching potential in relation to large-scale operations and planning in industry, education, public health, communications, etc., and may also be adapted to the needs of universities, schools, smaller groups, and individuals. At the present time the most sophisticated systems for reviewing world data are employed mainly in weaponry—in the massive computer linkages of the various national defence organizations and the great missile tracking displays affording swift global data review. At a lower level there are the various 'mobile inventory' networks operating in industry on a continental, and beginning international scale—these would include systems components like the teletype, dataphone, etc.

No such priority of investment of the highest scientific and technical potential has yet been accorded the direct development of such systems for 'livingry' purposes though the requirement is obvious in the operation of various world agencies like the UN, UNESCO, World Health Organizations, and in relation to world co-operative ventures like International Geophysical Year, etc. Still less direct attention has been given to the provision of such world information tools at the local educational and research level. The pilot study, whose description follows, was carried out under the direction of the author at the School of Architecture, University of Colorado, in April, 1964.[6] The project was designed to investigate the possibility of such intermediate Geoscope models for use in education, or as part of a generalized information tool system for the storage and display of world data, operable at the individual or group research level. Such smaller scale devices may function autonomously or could be remotely linked to the centralized large-scale Geoscope which Fuller outlines.

The specific aim of the Colorado project, then, was to develop a global model which would allow for the display and storage of information on world resources, human trends, major geophysical cycles, etc., in a form which would

continued on page 634





Our pictures show (above) two of our studio artists at work preparing a colour scheme and (right) The County Hotel, Nottingham.

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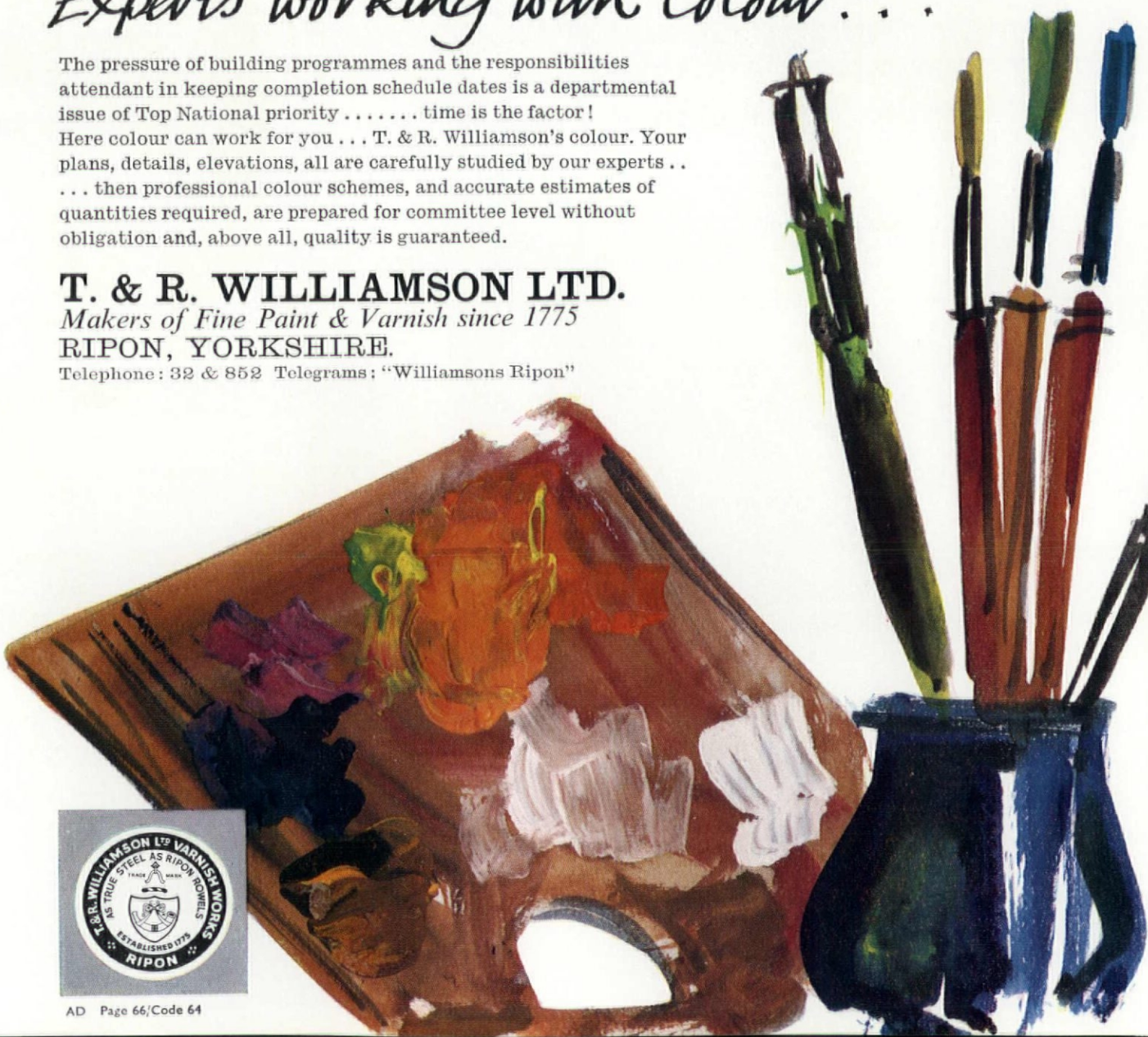

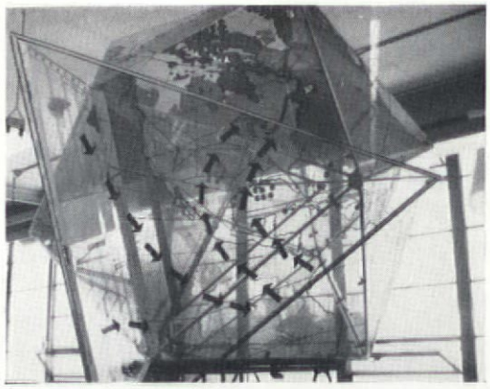

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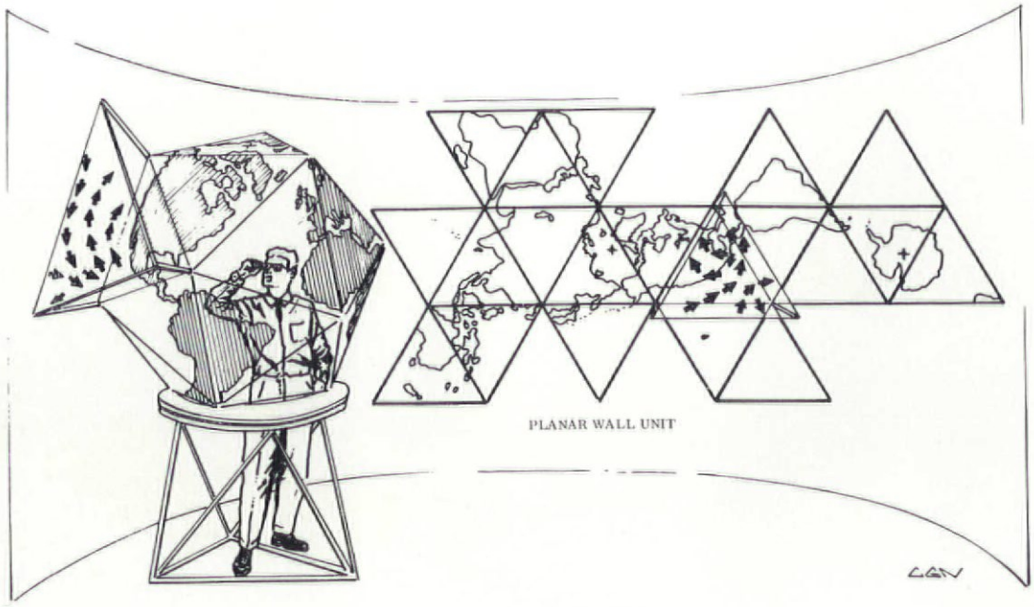


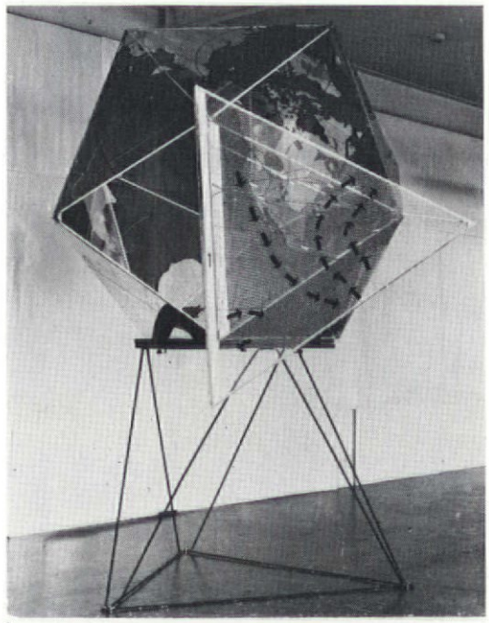
2

1
Geoscope, University of Colorado, 1964. Close up view through various data plane levels—from atmospheric wind patterns on the upper level, to air and sea routes and principal cities on the earth plane, and below earth level mineral resources data

2
Icosahedral unit on revolving stand

3
View through tetrahedronal unit

4
Side view showing vertical data plane on right



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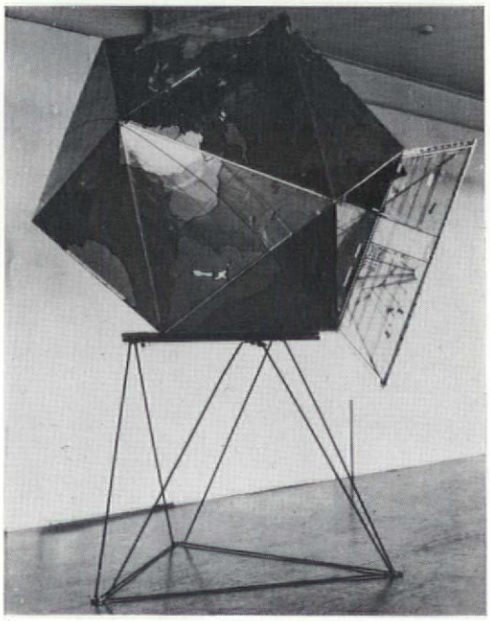

4

continued from page 633

enable their comprehensive and dynamic relationships to be viewed. Such a model should also serve as a flexible storage device for such data so as to provide swift review and demonstration of world trending patterns. It was further specified that the model should be of minimal weight and easily demountable for storage and transport. As noted on the preceding page this should be a fully operable unit—but so designed as to furnish a material basis and theoretical direction for further research. Attention was drawn to the requirement of operation at different control levels—manual, mechanical, and electronic—and that the prototype be so constructed as to accommodate any such further technical modifications.

The Icosahedral form was chosen at this stage as more suitable in time available and to the scale of this particular model for use within restricted school or conference room dimensions. This allowed also direct transference of the Fuller Dymaxion Air Ocean map projection into the twenty flat planes of the icosahedron for three dimensional or planar viewing.

The six-foot icosa is made of a light steel tube frame onto which are clipped the double transparent face panels. These face panel units of two triangular Plexiglass sheets hinged together form the basic storage and display unit, each of which may be individually removed or opened for insertion of data—see below. One sheet of the double plane is incribed in black line with the main world geographical data, i.e. continental land mass outlines, longitude and latitude lines, etc., from the Fuller Projection, the other is left clear.

Additional data may then be stored and presented on thin film (Mylar) transparencies inserted within these hinged panel units. In this way, a considerable amount of information may be overlayed and compared on, and through, the earth surface plane. Such data inserts may also be 'roughs' drawn on any suitable material, i.e. tracing paper. Appropriate erasable markers may also be used on the surface sheet of the panel units to sketch or mark up various relationships or configurations.

In addition to this earth surface double panel unit, a vertical storage and display unit was also developed, and one such unit was incorporated in the prototype. This unit was based on a set of telescoping tubes which connect at the centre of the icosahedron and run through the frame hubs thus providing a tetrahedronal frame upon which vertical data planes may be attached (based on the double hinged panel principle) and also allows further data planes to be inserted horizontal to, but above and below, the main earth surface plane. The telescoping members extend outwardly from the earth surface hubs and provide for the data planes above the earth surface. Such members may obviously have further extension tubes added, and allow for example scaled satellite tracks to be flexibly located around the 'globe'.

An important feature of this combined vertical and horizontal plane capacity is that it allows for the direct viewing and comparison of many different areas of information. Information on the overall energy exchange cycles above and below the earth's surface may be related to atmospheric layers, temperatures, pressures, earth geological strata, etc. Appropriate cross sections may be introduced at any level on these planes. Where necessary such cross sections could be modelled in three dimensions, for specialized studies in geomorphology, hydrology, etc., or ocean floor mapping.

The whole system, as described above, is mounted on a stand so that the user may easily view and manipulate data from both inside and outside the main 'globe', which revolves freely on a circular track under manual control. Similar member and hub units are used in the stand so the complete unit may be economically demounted and packaged for transport with swift re-assembly. An accompanying wall frame, or freestanding, planar display system was also designed using the same member/hub construction, and incorporating the tetrahedronal units for each surface plane. The detachable hinged panel units may then be used on either the 'global' or planar frame, or a duplicate set might be used so that the planar frame becomes the main information storage unit, and the icosa frame the display unit. In order to provide for flexible and swift assembly and use of the hinged panel units, each unit has its own reference number to that portion of the earth's surface which it represents. Each panel edge then has two numbers; one is the panel identification number as above, the other is the panel to be placed adjacent to the edge so identified.

continued on page 635



MARLEY MOSAIC

The Royal Southern Yacht Club, Hamble, Hants is another example of the many and varied contracts that have been carried out using Marley Mosaic Hardwood flooring. Equally at home in situations that call for the maximum in wear and appearance as well as those in the lighter domestic field, Marley Mosaic with its rich hand selected timber, provides a floor of distinctive beauty. Only the most attractive and durable woods are supplied in the range, Agba, Afzelia, Oak, Sapele-type, and Teak,...available in either basket weave or herring-bone pattern. Agba and Afzelia are suitable for installation where underfloor heating systems are incorporated.

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Barbour Index No. 372 Gorco Bureau Section 17/6

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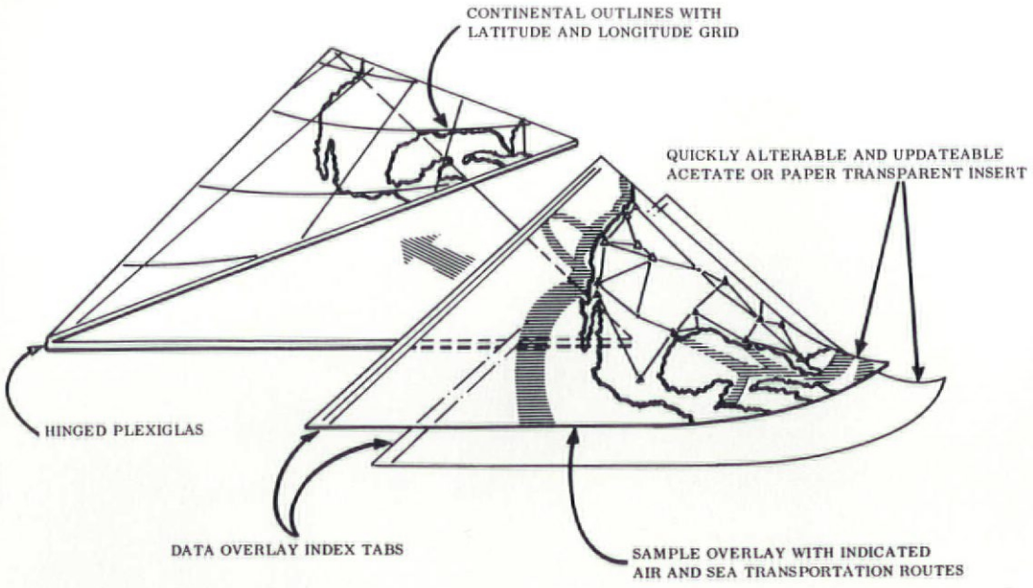


1

1
Typical hinged display panel and data insert

continued from page 634

To establish a system for coding and reference of the data inserts each sheet has one edge marked with the panel edge code plus content references and legend giving translation of symbols used. Such insert sheets may then, if necessary, be stored in a hinging file and indexed according to this edge marking for access and retrieval. All data planes were similarly edge indexed.

Where edge marking may be critical in obscuring detail as at this prototype scale it may be in the form of a hinged flap. This would also allow of code punching such flaps for rapid random access—as in Keysort or Hollerith systems.

In further development of this aspect of data control within the system a triangulated reference grid may be employed which would permit correlation between panel data and electronic data processing facilities. By using such a reference grid in relation to the vertical and horizontal cross section panels any point above, on, or below the earth's surface could be allocated suitable coordinates and data stored on such coordinate code references.

Other possibilities include microfilming of separate data inserts, either singly or in various overlaid arrays, and the swift assembly of smaller scale 'ateases' through the print-out facility. The latter device would allow for swift communication of data in immediately usable form between relatively remote centres using the Geoscope system. Such printed-out data might also be employed as the successive animation sections for the filming on videotape or cinefilm of dynamic trends in accelerated or decelerated review as described in the original Fuller proposal. (One such film, for example, has been made under the direction of the author. Using a standard Dymaxion map outline and one dot on this as representing a one million person increment, the growth of world population was charted on the earth surface from 4000 BC to the present. The film was designed within 100ft standard length and so ran off 6000 years of population growth in approximately three minutes—30 years per second. This was correlated with main historical events and provided a most dramatic picture of what one may term a 'dynamic trend'. The idea of using standard length and standard methods throughout was that many such documents could be made independently, at various geographically remote centres, of many such trending patterns and be joined together for showing or combined in processing so that such patterns could be related together in mobile review.)

The forward design schedule of this Colorado model, as mentioned above, allows for its further refinement technically, and its use as a basis for the investigation of various mechanical and electronic display and storage systems. From the interest expressed in the University presentation and demonstration of the model it is planned that such developments may be conducted in collaboration with other departments thus providing a focus for interdisciplinary work at various study levels.

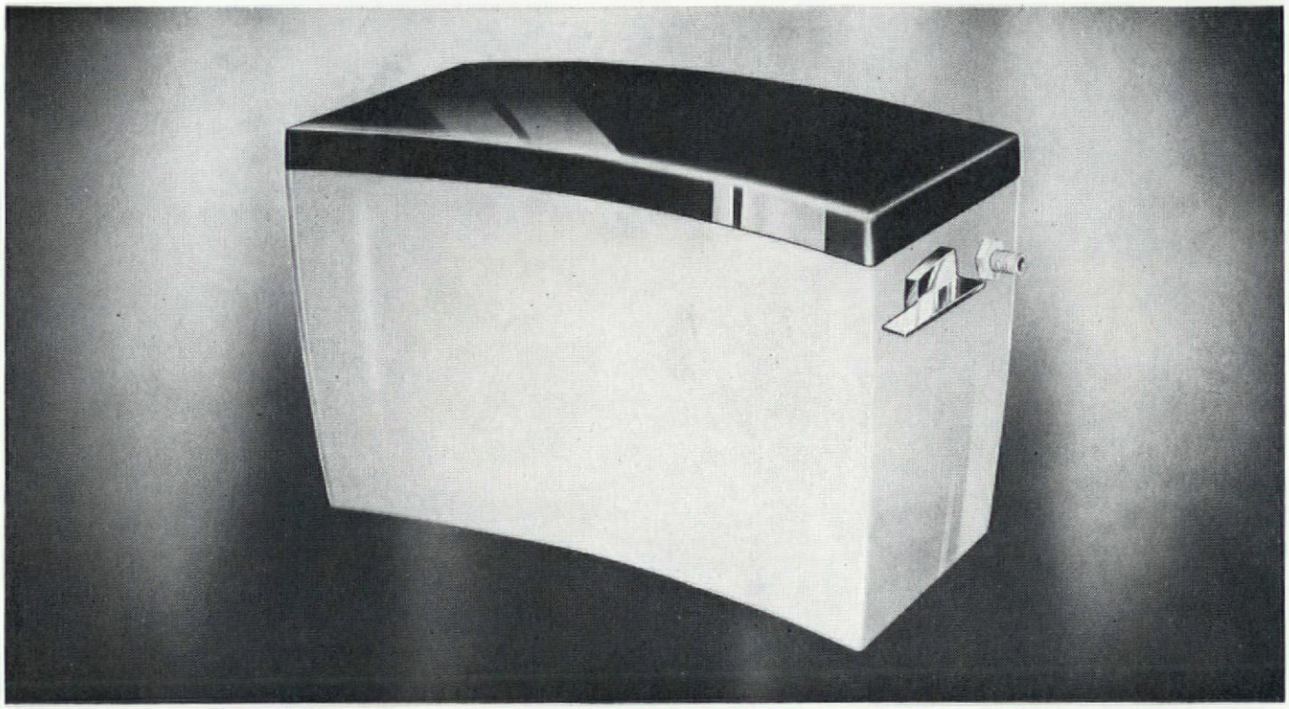
It is also evident that such Geoscope models may function as nuclei for world information centres in universities, schools, libraries, museums, and communities. Within such centres may also be housed, in easily viewable display forms, chartings, and graphic compilations of all such information as would afford the viewer a swift and comprehensive awareness of man in universe. He may thus be able to review and project all past historical and future trending patterns of the human society on earth—the history of invention, of scientific and technological developments, world population and resources, social and cultural trends, the circulation of raw, processed, and scrap materials, etc. These would be conveyed in such a manner as to communicate the sense of their interrelations within various overall ecological development.

No such centres for direct experience and participation in the 'global navigation' of world society have yet been directly developed, though the function exists embryonically in the world's universities, libraries, and institutes, and in its international cooperative agencies and communications networks.

Such facilities, once initiated, might eventually evolve into the beginnings of 'world' universities in the truest sense. The activities necessary for the design, maintenance, servicing, and processing of such facilities would certainly attract and provide for the education and training of world educators of a unique kind. Their necessary grasp of the fundamentally integral patterns of man's accummulated knowledge would enable them to communicate and engender that awareness (or 'world view' which is essential to), or attainment, of a truly 'world view' which is now essential—not only to further development of human society, but to its basic survival.

[1] John McHale is Research Associate of R. Buckminster Fuller, and Executive Director of 'World Resources Inventory' programme at Southern Illinois University.
[2] See *Architectural Design* August 1961.
[3] July 5th to 9th 1965.
[4] World Design Science Decade 1965–1975, Phase I, Document I (1963), World Resources Inventory, Southern Illinois University, Carbondale, Illinois. Pages 64–66, 1963.
[5] Such developments, including those specifically described in this article, are presently related to Fuller US patent No. 2,393,676 and others pending.
[6] Acknowledgement should be made in this article to the student group at the School of Architecture, University of Colorado with whom the project was conducted, and to the Dean and Faculty of the school whose cooperation made it possible.

Here's the cistern design you've been waiting for....



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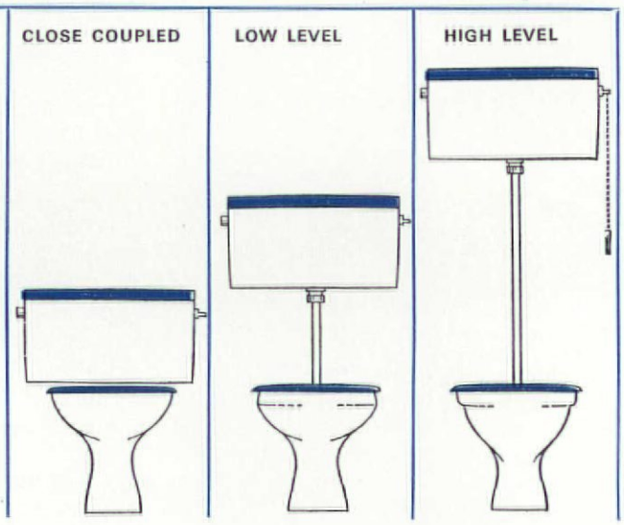

Design notes

Modular office furniture

There are now so many firms making modular office furniture that, in order to make a choice, one really requires a catalogue such as that published by COID (see below), or the one shortly to be issued by *AD*'s publishers. New on the scene is a range called 'Nexus' **1–4** made by Aston Cabinet Co. Ltd. Martin Grierson, who designed it, uses the 4in module and provides for the usual permutations of tables and drawer units. But he uses one or two interesting details: for example, the chromed height adjuster built into every leg **4** and the drop door on every cabinet that can also be used as a pull-out side; and the grooved internal sides to the desk pedestal that take sliding trays or filing frames or other stationery fitments **3**.

A basic table 5ft 4in × 2ft 8in retails at just under £21 with £12 added for a simple pedestal; trays for a pedestal cupboard are £2 14*s*. each, a filing frame £3 7*s*.

Astrola Works, Roebuck Lane, W. Bromwich, Staffs.

LM Contracts Ltd. have launched their 'Quorum' range, comprising desks, tables, chairs and seating, designed by Ronald Carter. It does not offer, such a comprehensive range of permutations as 'Nexus', nor its alternative storage details. Prices are similar, the LM 5ft basic table retails at £21 10*s*. 3*d*. and a 3-drawer unit £18 5*s*. 2*d*.

43 Earlham Street, London W.C.2



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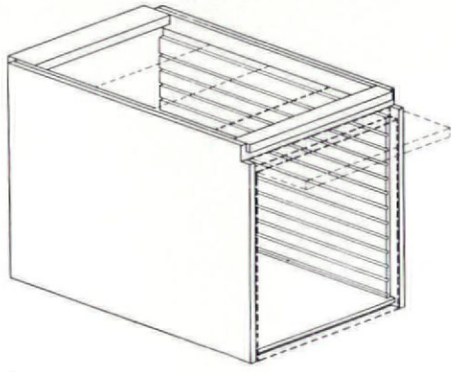

3



4

Contract furniture catalogue

The COID's excellent Design Index can be studied at the Design Centres in London, Glasgow, Bristol, Nottingham and Manchester. But for those who cannot get to these places, or who would like to have their information always to hand, the COID has now issued an excellent catalogue which consists of information on products suitable for contract use, selected by their manufacturers. Design Index contains particulars in photographic or sample form of more than 10,000 well designed modern British products; there is no charge for inclusion. The book contains 266 pages of similar particulars of furniture, one item or range per page **5**; but each page has to be paid for.

Nevertheless, it provides an invaluable service.

21*s*. from 28 Haymarket, London S.W.1

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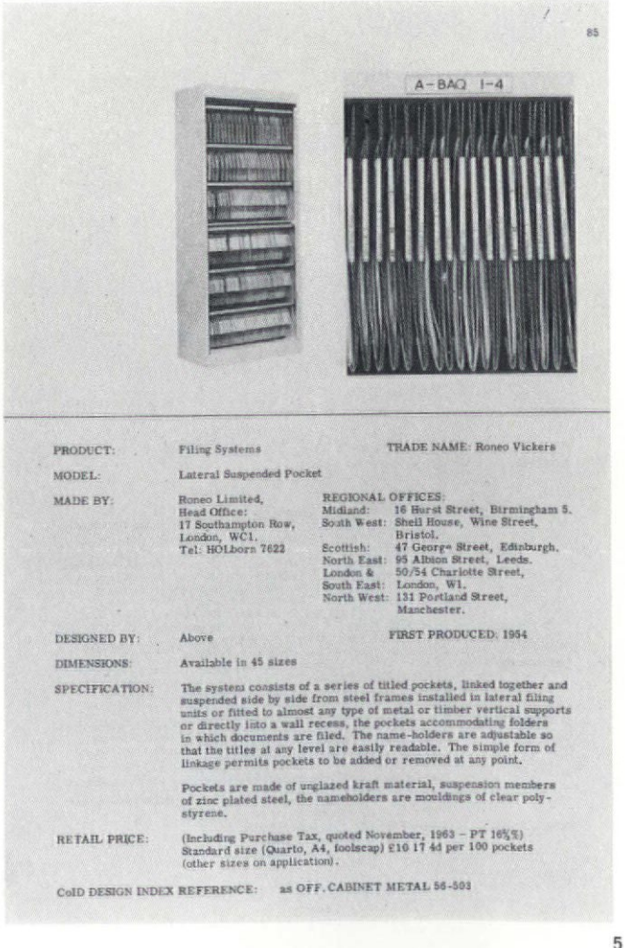

85

A-BAQ 1-4

PRODUCT: Filing Systems — TRADE NAME: Roneo Vickers

MODEL: Lateral Suspended Pocket

MADE BY: Roneo Limited, Head Office: 17 Southampton Row, London, WC1. Tel: HOLborn 7622

REGIONAL OFFICES:
Midland: 16 Hurst Street, Birmingham 5.
South West: Shell House, Wine Street, Bristol.
Scottish: 47 George Street, Edinburgh.
North East: 95 Albion Street, Leeds.
London & South East: 50/54 Charlotte Street, London, W1.
North West: 131 Portland Street, Manchester.

DESIGNED BY: Above — FIRST PRODUCED: 1954

DIMENSIONS: Available in 45 sizes

SPECIFICATION: The system consists of a series of titled pockets, linked together and suspended side by side from steel frames installed in lateral filing units or fitted to almost any type of metal or timber vertical supports or directly into a wall recess, the pockets accommodating folders in which documents are filed. The name-holders are adjustable so that the titles at any level are easily readable. The simple form of linkage permits pockets to be added or removed at any point.

Pockets are made of unglazed kraft material, suspension members of zinc plated steel, the nameholders are mouldings of clear polystyrene.

RETAIL PRICE: (Including Purchase Tax, quoted November, 1963 – PT 16⅔%) Standard size (Quarto, A4, foolscap) £10 17 4d per 100 pockets (other sizes on application).

COID DESIGN INDEX REFERENCE: as OFF.CABINET METAL 56-503

5

Set the final scene with a wallpaper

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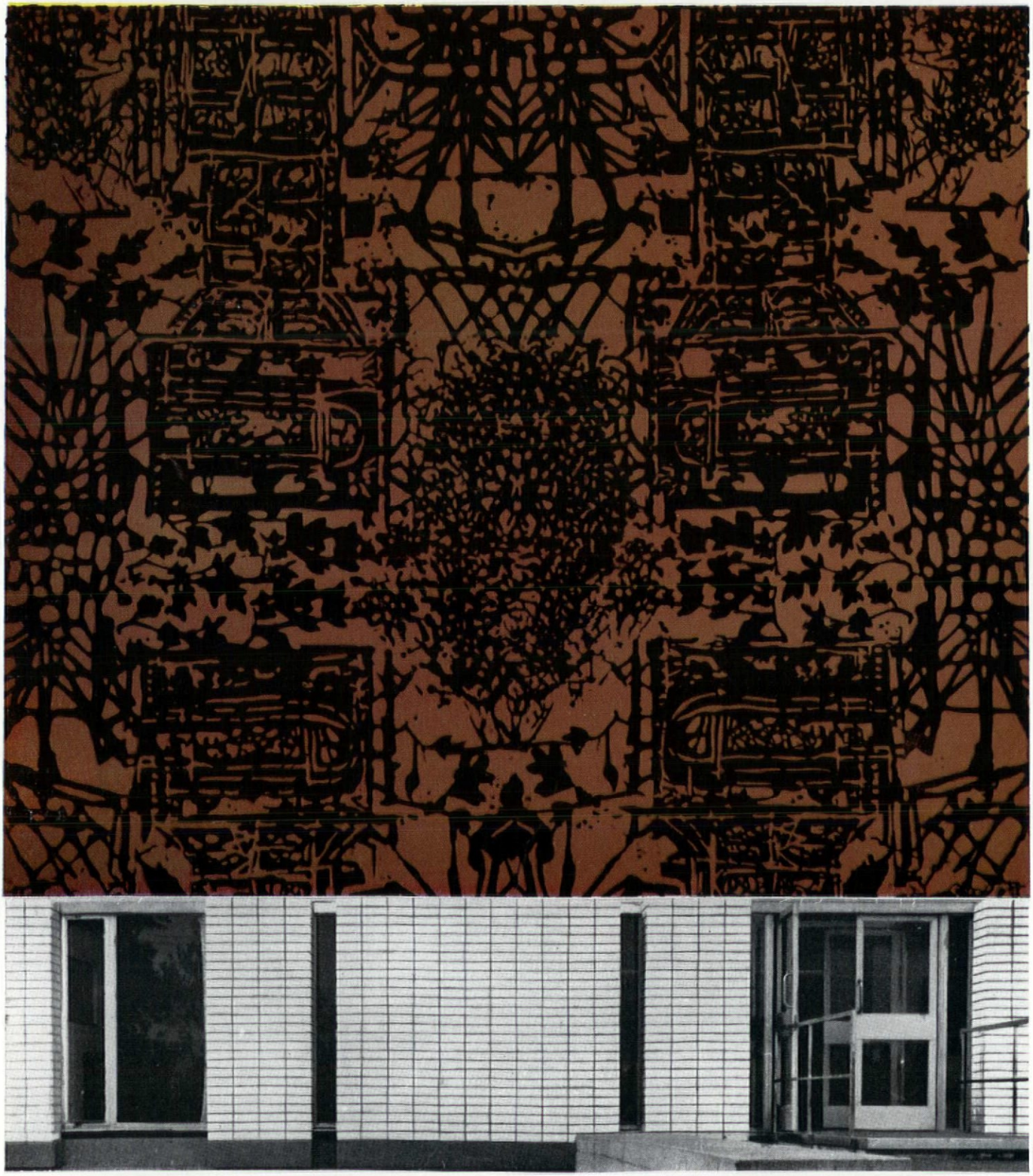
Current Exhibition: Palladio Magnus Wallpapers.
The wallpaper shown is Haywards 500, 'Woburn', one third scale.



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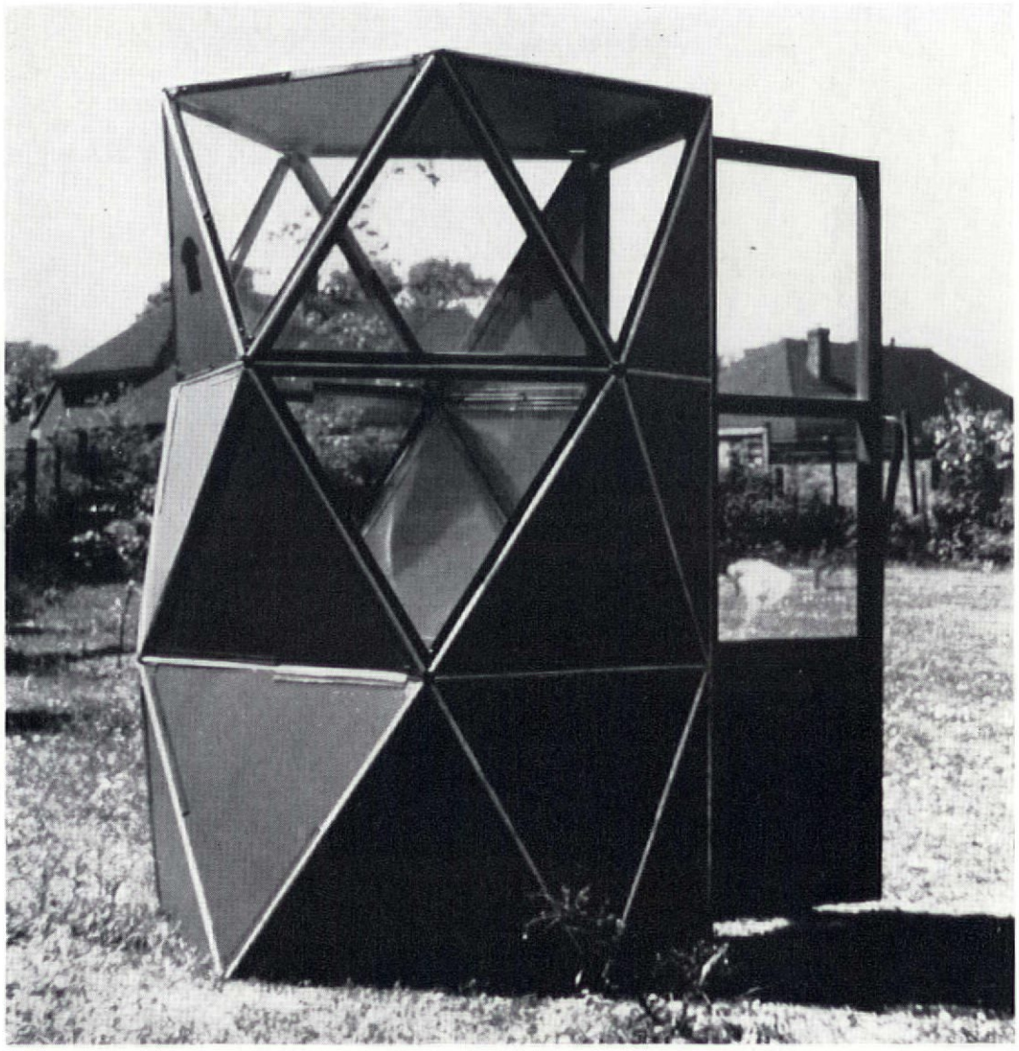


6

Telephone kiosk

Michael Farraday of (Design Workshop) produced a prototype telephone kiosk **6** for the GPO; which will not be put into production on account of its appearance, despite the fact that it only took two men an hour and a half to erect, and one man forty-five minutes to demount, and the estimated finished production price was about £44 (compared with the present £85).

Designed for temporary use, at exhibitions, fairs, etc., it is a geodetic structure (i.e. all panels, including windows, are identical in size and construction, and therefore interchangeable).

Assembly is by means of rods pushed through the tubes bolted to the panels, thus forming a hinge joint. 'Nodal caps' screwed to the apexes seal these joints, and the door is hinged to the side panels in the same way. The roof gives great rigidity to the structure.

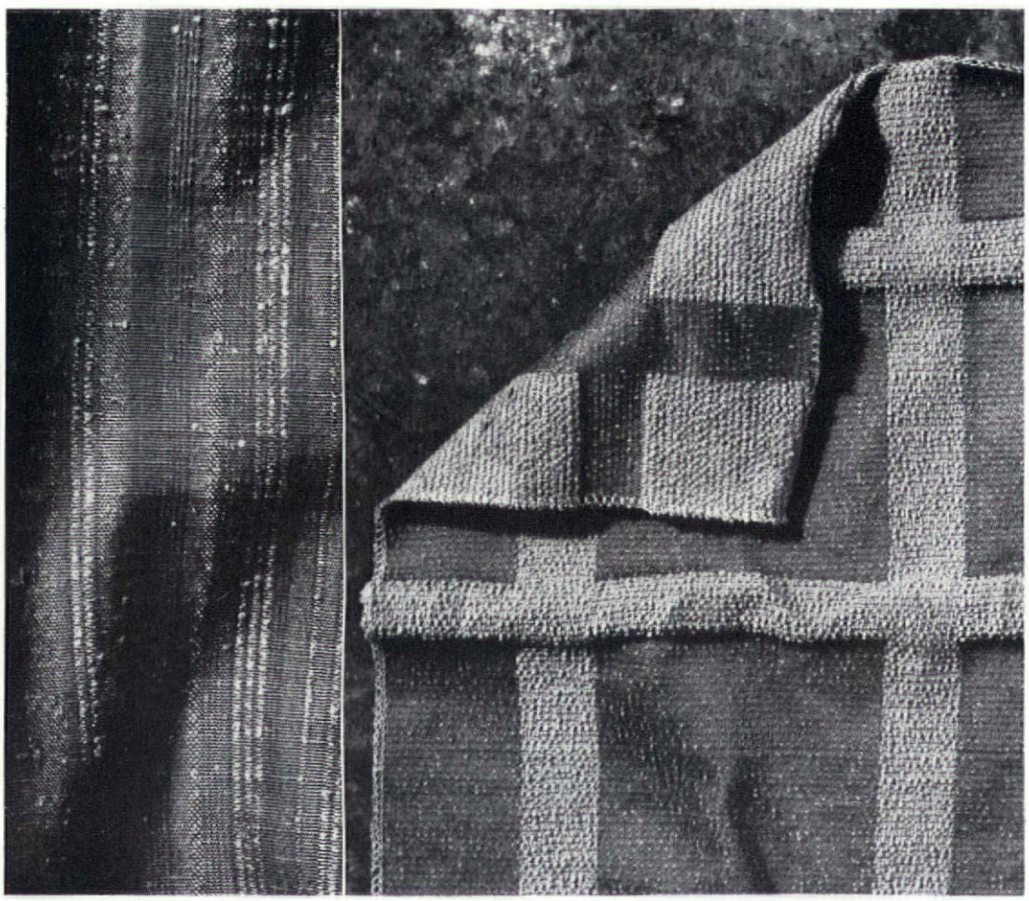
Textiles

Isabel Tisdall, long known in the architectural world for her work at Edinburgh Weavers, has just launched out on her own. Her new wholesale firm, Tamesa Fabrics London Ltd. (the name Tamesa is a Celtic name for the Thames), has for its aim the production of very high quality furnishing fabrics, both woven and printed, with texture and colour, rather than pattern, as the key note to the first collection. They are based on a limited group of colours, the pivot of which is 'Tarnished Brass', developing on the one side of the scale from ochres and sandy colours to ivory and white, and on the other side through olive and bronze, to peat and blackish green. The weaves, all yarn dyed, are woven at Braintree with the cooperation of Marianne Straub and Frank Davies. Shown here are: '*Echo Stripe*', **7** a lovely weave of cotton and rayon in eight colour combinations, including white, and selling for about 37*s.* 6*d.* the yard, which has a matching check cloth, '*Echo Check*' in four of the colour combinations: and '*Candour*' **8** a completely reversible monochrome checked weave of cotton and rayon of supreme quality, for curtains or upholstery, in white, tarnished brass and peat, at approximately 59*s.* 6*d.* the yard.

6 Bourne Street, London S.W.1

Currently in vogue are the semi-transparent curtain materials. Tibor Ltd. have fine 'Balaton' nets, **9**, sheer mesh-weaves in white and off-whites, using slubs and bouclés, 60in wide, selling at about £1 the yard.

Clifford Mill, Stratford-on-Avon.



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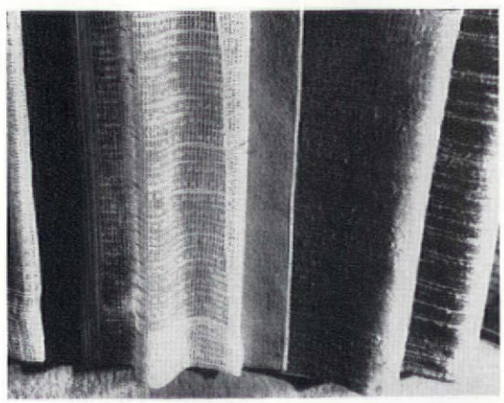
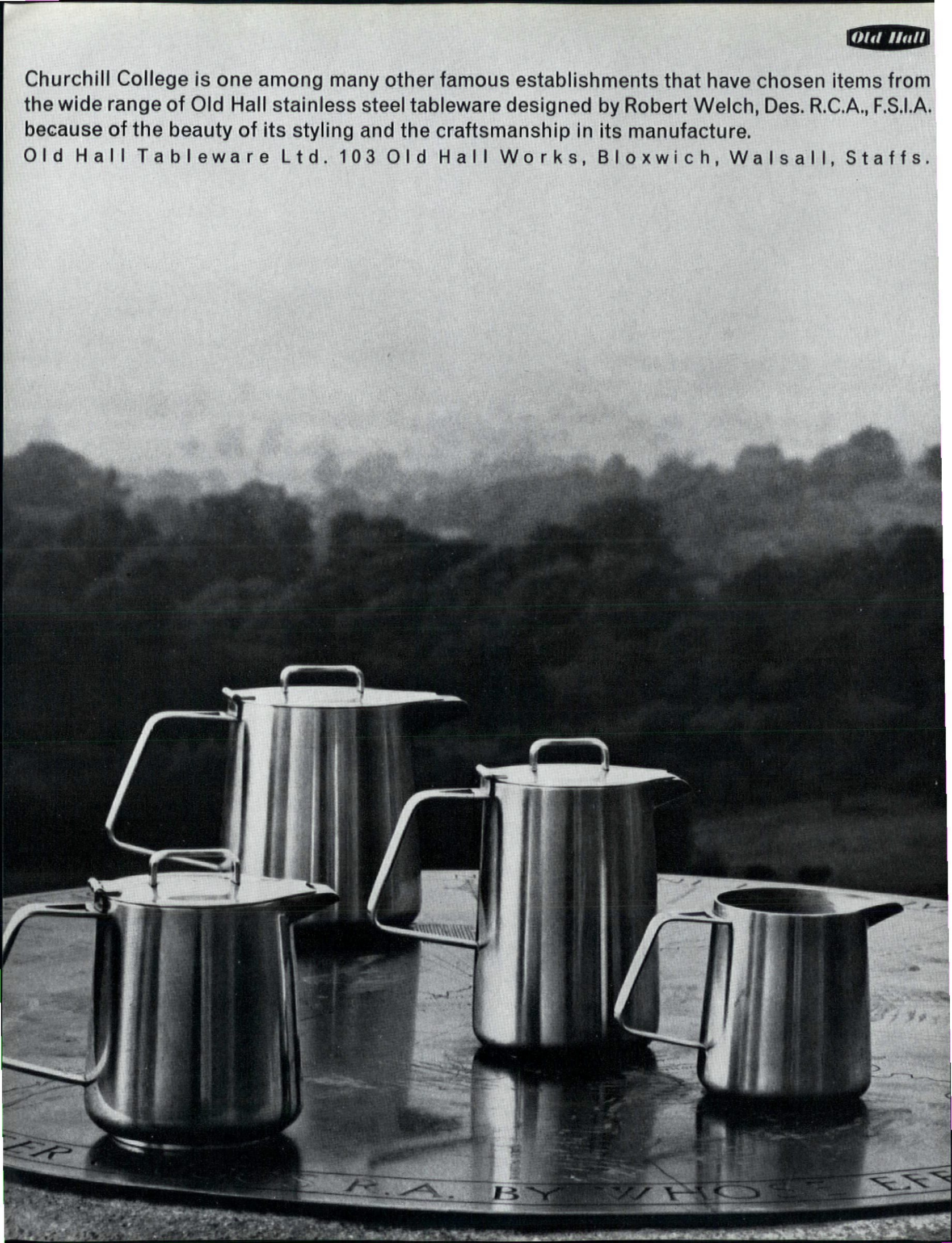


9

Old Hall

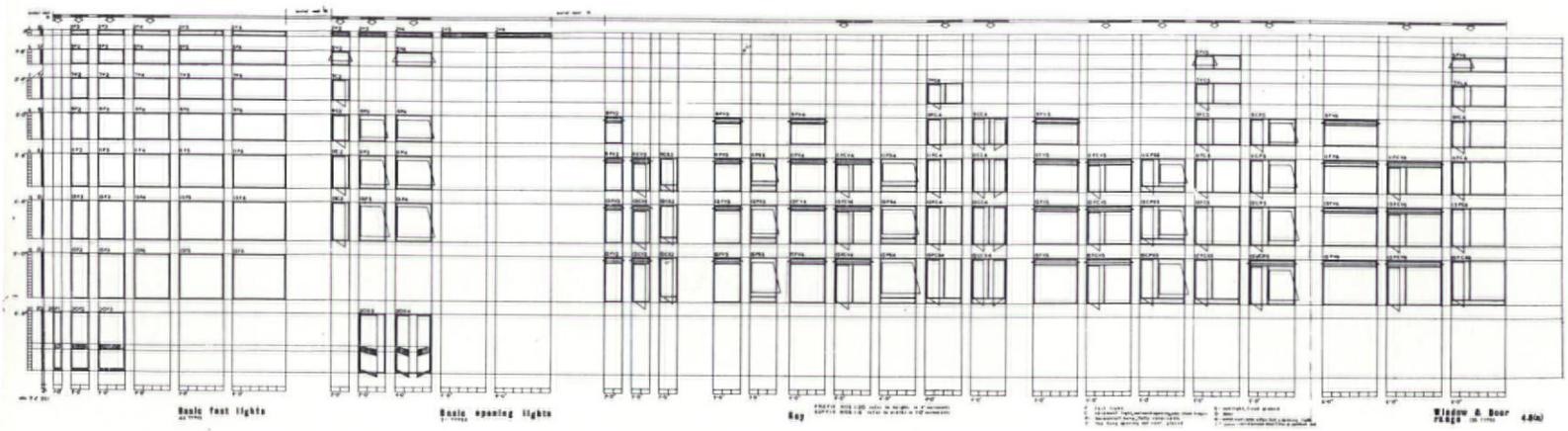
Churchill College is one among many other famous establishments that have chosen items from the wide range of Old Hall stainless steel tableware designed by Robert Welch, Des. R.C.A., F.S.I.A. because of the beauty of its styling and the craftsmanship in its manufacture.

Old Hall Tableware Ltd. 103 Old Hall Works, Bloxwich, Walsall, Staffs.



Trade Notes

Gontran Goulden



Module 4—A new range of standard metal windows

It is now 45 years since the first range of standard metal windows was introduced. It was almost the first step in the industrialization of building as it affected the public, and from the manufacturer's point of view it was a tremendous step forward. From the builder's point of view it made life a great deal easier. Aesthetically it was a disaster. The proportions of the range based on a unit width of 1ft 8in and height increments of 1ft were not very satisfactory to look at, and the original range was added to, refined as far as possible and altered so that in time it became far too big and almost unrecognizable as a standard range. It passed from Georgian-paned sub-division to horizontal panes, to no glazing bars, while retaining all three as standards. No matter what form it took it was never popular with good designers and no matter what was done with it by way of building up composite lights it remained 'a standard metal' or, rather unkindly, a 'Crittall' window although it was made by a number of manufacturers.

The original standard range had a curiously powerful influence on any elevation into which it was put, and for this reason architects tried their best to avoid using it, turning to the more expensive purpose-made ranges and thus nullifying the whole point of the standard range. For years, particularly after the second world war, architects complained, and manufacturers replied by protestations of the difficulties, nay, the impossibilities of changing the standard. Some effort however was made to meet criticism by introducing the Z range in 1952, based on a 2ft width of unit. This was, however, a half measure and no real effort was made to design a range from first principles taking into account user requirements. Criticism continued.

In 1960, the Metal Window Association decided that something must be done, and towards the end of that year wrote to the RIBA asking for assistance. The RIBA Technical Standards Committee considered the question and referred the Association to Mr Cleeve Barr, then chief architect of the MoHLG. As a result of meetings with him and Mr Oliver Cox, head of the Ministry's development group, the Association appointed the firm of Edward Armstrong and Frederick MacManus, architects, to design a new standard range. This was a particularly good choice, for Mr MacManus had, just after the war, designed the outstandingly successful EJMA range of standard timber windows and also had wide experience of the design and construction of housing. Part of the brief was to examine the shortcomings of the existing range of windows and to advise how it could be amended and redesigned to meet urgent needs using the existing highly organized manufacturing techniques. Any question of developing entirely new proposals involving research, the materials and methods of manufacture could only be considered, if at all, as a long-term project.

Mr MacManus and his team started from basic principles, and from the first consulted all branches of users. They cooperated with and sought advice from the RIBA whose Industrial Note No. 1 had already made recommendations for the adoption of the 4in module and was later followed by the document DC 1 published by a Working Party of the Interdepartmental Government Committee on dimensional co-ordination. MoHLG Bulletin No. 9 'Dimensions and Components for Housing' was at that time being prepared and Mr MacManus had access to its proceedings and was able to work in parallel. The Modular Society was also consulted.

Design considerations taken into account were cleaning, maintenance, light, ventilation, weather penetration, heat, sound and strength. These considerations led to a number of conclusions, most of them simple and logical but nevertheless considered in this context for the first time. An important point was the requirement for weather stripping to avoid weather penetration in exposed positions, to reduce heat losses and to help in the reduction of airborne noise. Among the user requirements which were considered were those of disabled and old people, local authority housing departments, statutory requirements, internal dimensions and modular coordination.

Improvements incorporated in the new range are: Weatherstripping. A plastic weatherstrip will be provided as an optional extra. It will be replaceable.

Ironmongery. New fittings are being produced which are in keeping with other ironmongery ranges. An economical method of opening high solid ventilators and high level top hung lights within easy reach has been designed.

Doors have been redesigned; the single leaf is wider, 3ft overall, with a solid lock rail lining up with two of the required cill heights.

Opening types. For small openings the casement on extended hinges is used. For large glass areas horizontally pivoted windows are used. These last are easy to clean from inside and simple to weatherstrip. Top-hung ventilators can be solid or glazed and a top-hung ventilator 1ft 8in high is available for larders.

Glass. The maximum opening light size was determined by 32oz glass sizes, i.e. 4ft 4in × 4ft overall frame size. Plate or float glass can be used of the large fixed lights.

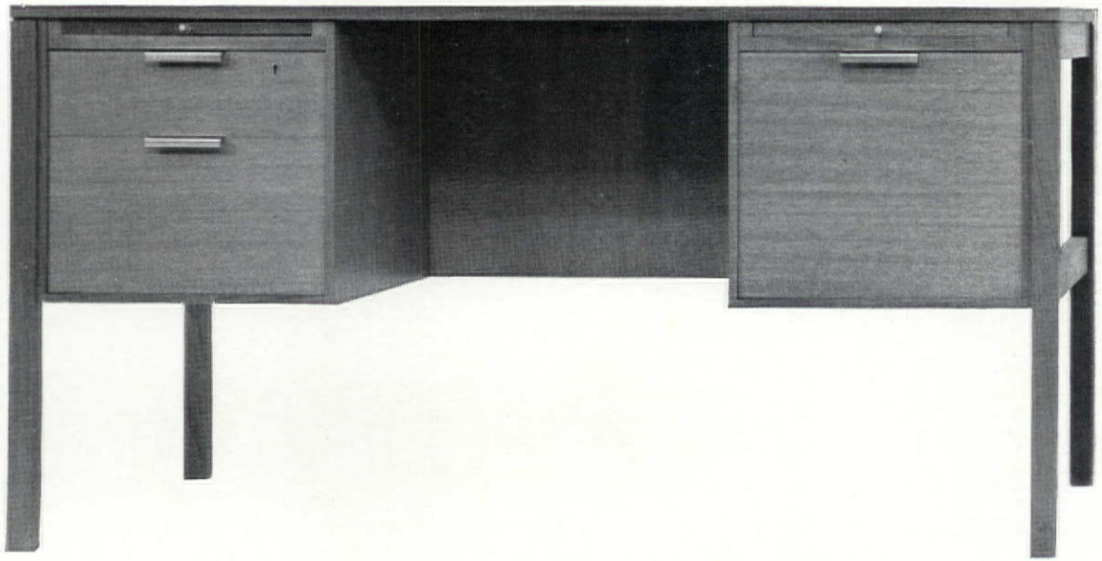
Dimensions. All dimensions quoted are those from module line to module line, the actual frame size is 3/16in less overall. For vertical dimensioning a 4in vertical nodule was chosen in a series of eight multiples 2, 5, 7, 9, 11, 13, 15 and 20.

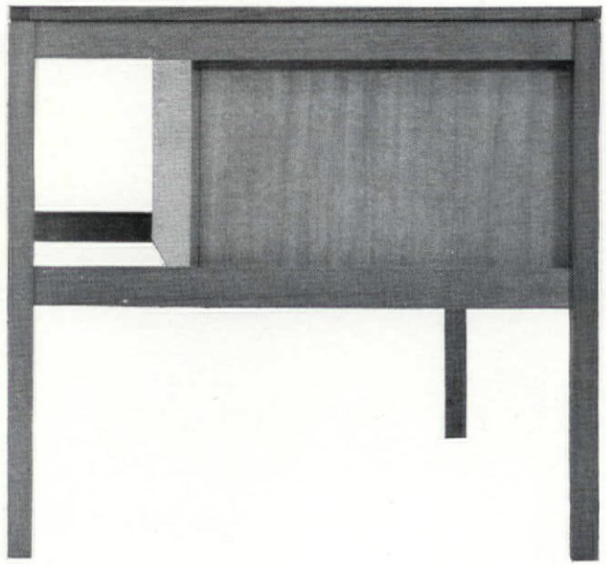
Horizontal dimensioning. A 1ft horizontal module was used in conjunction with a 4in solid filler piece. The range being 4in (solid) 1, 2, 3, 4, 5 and 6ft.

Flexibility. Any window can be linked with any other to build up a composite window.

Conclusions

The Metal Window Association is to be congratulated on setting an admirable example for other manufacturers. It has gone about the production of this new range in precisely the way that is most likely to satisfy user requirements. It has listened to advice, it has consulted the right people and it shows every sign of having learned from past experience. A comparatively small range of windows has been produced which will provide wide flexibility by its ingenious use of dimensional increments and differing type of lights. The first really significant set of industrialized fully modular building elements has been produced. Mr MacManus and his team have done very well. It is very much to be hoped that other groups of manufacturers will appreciate the significance of this development and will hasten to emulate the initiative of the Metal Window Association. The new range, by the way, will start to become available in February 1965, while the old range will gradually run out.





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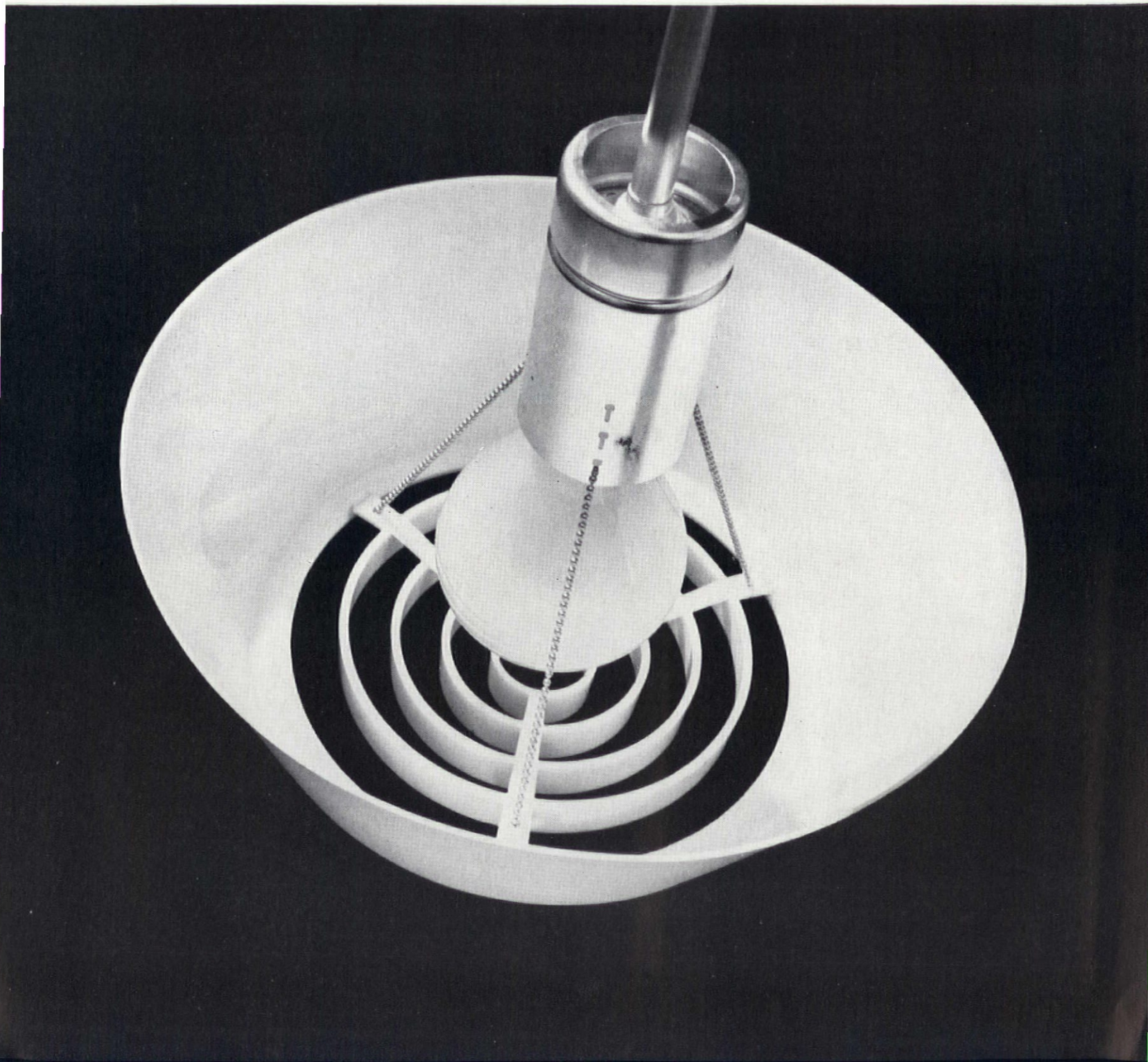

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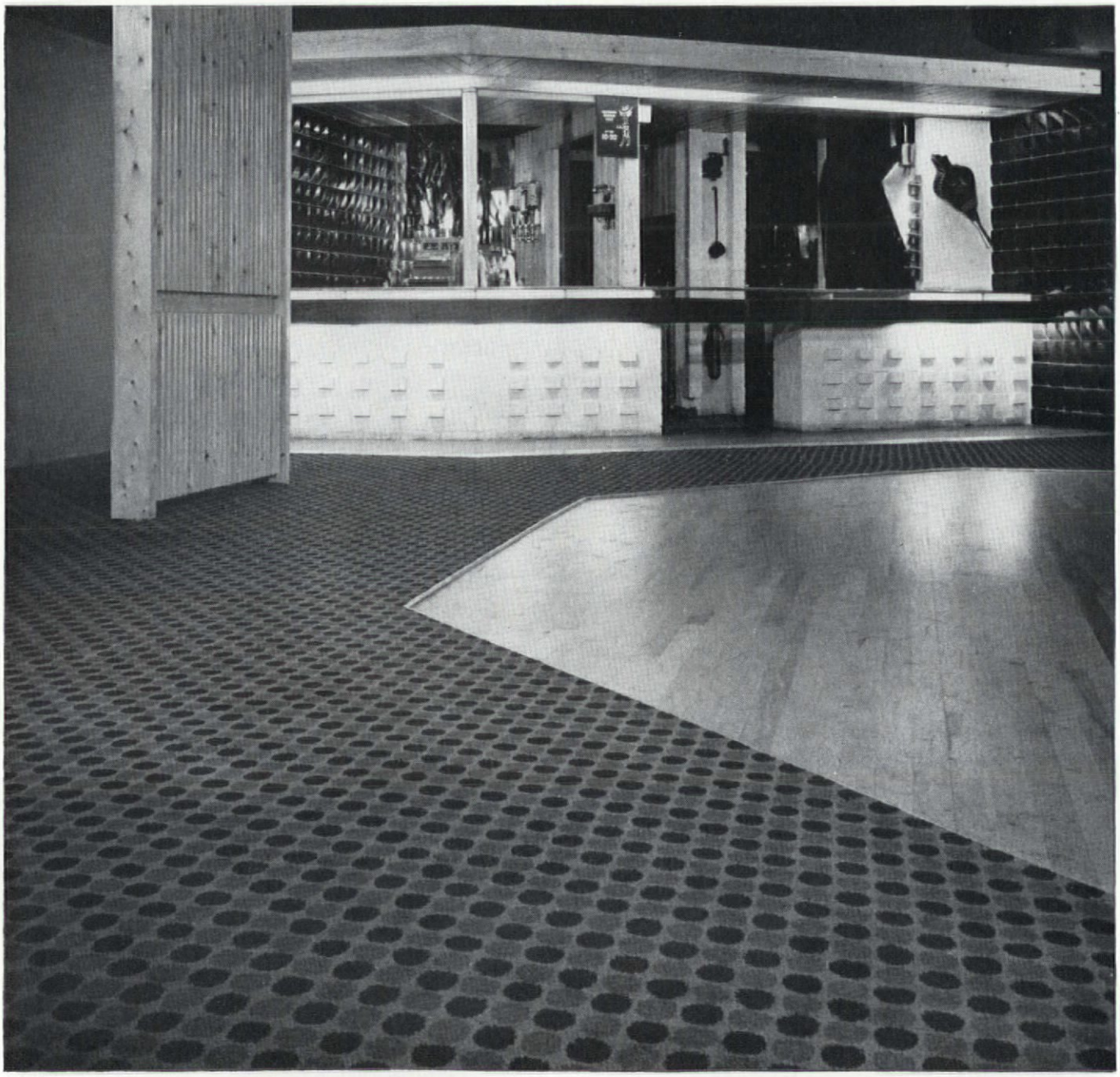

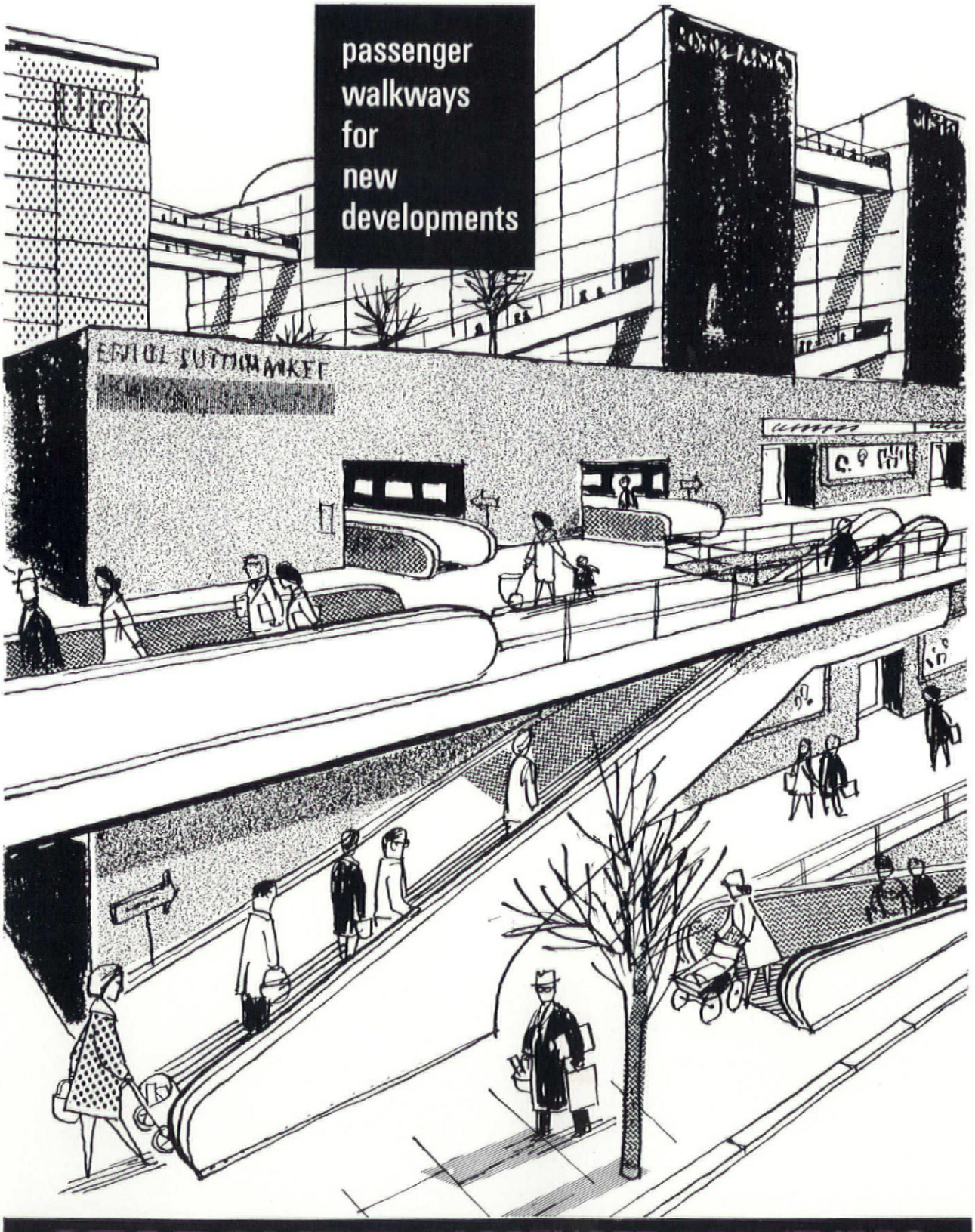

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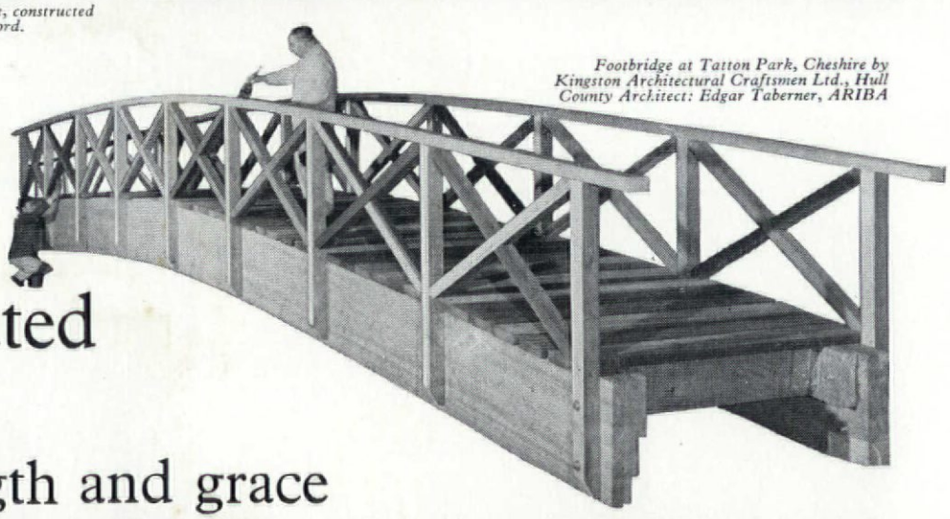

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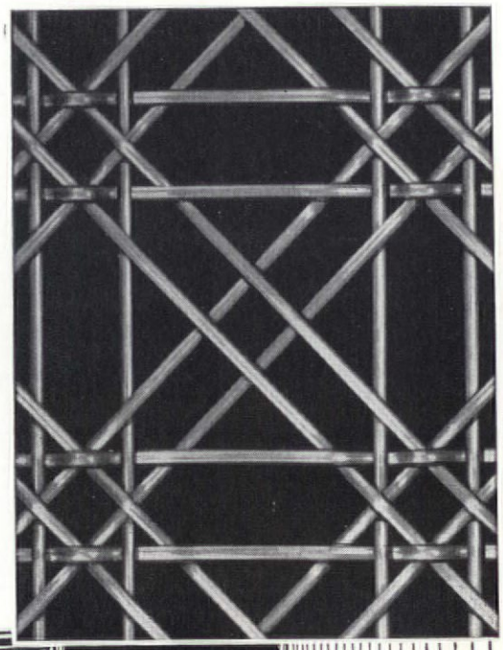

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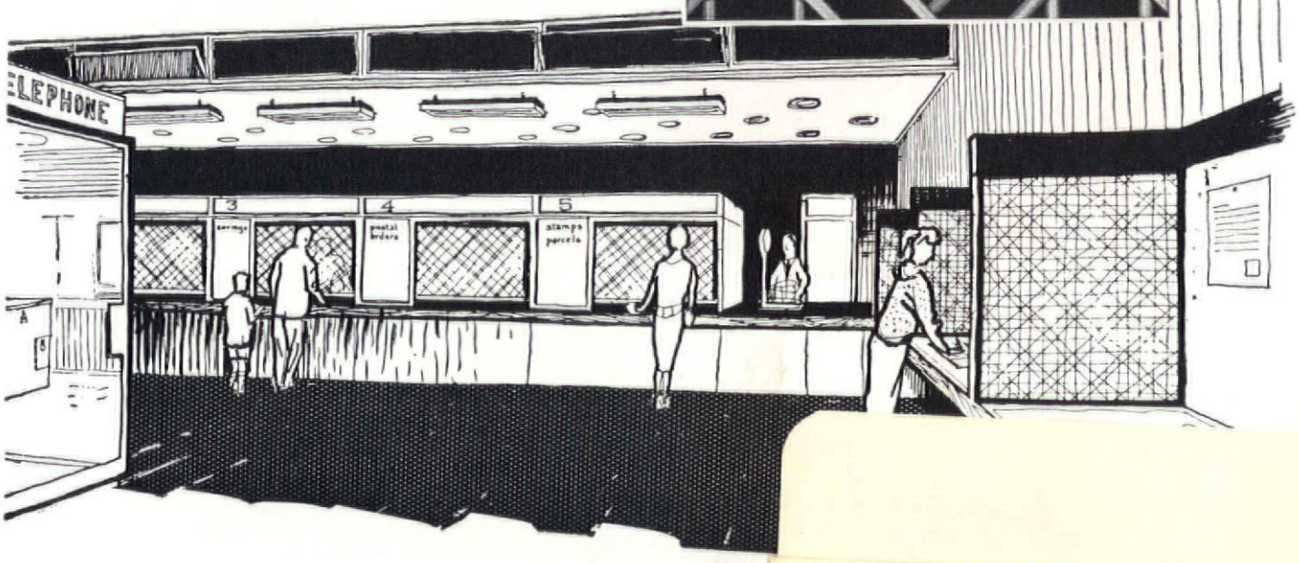

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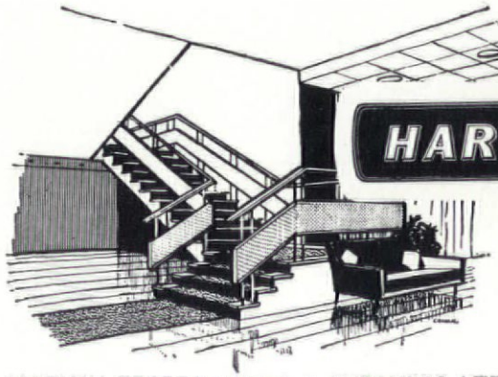

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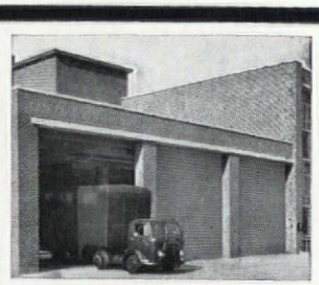

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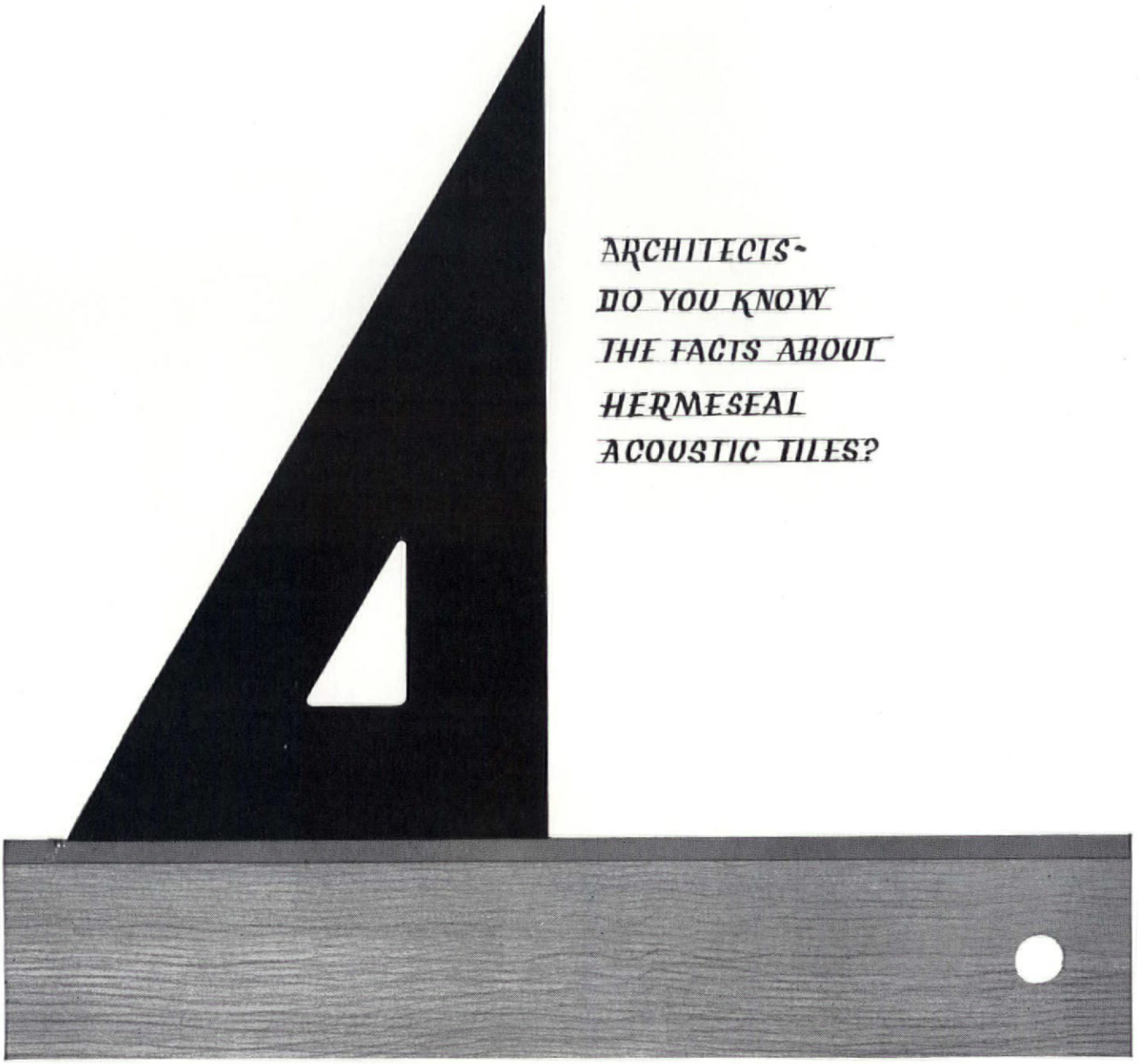

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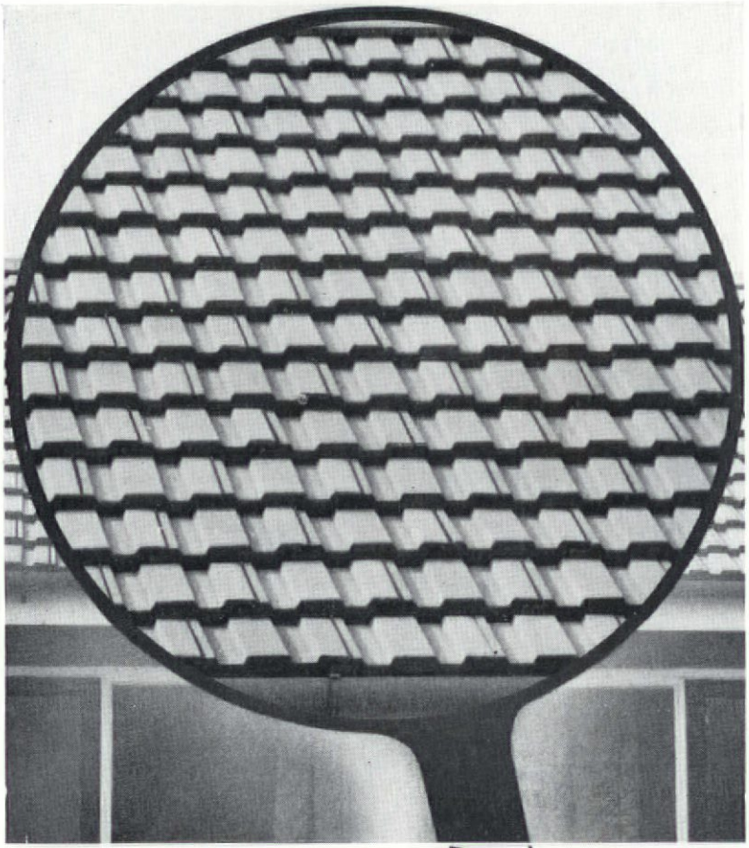

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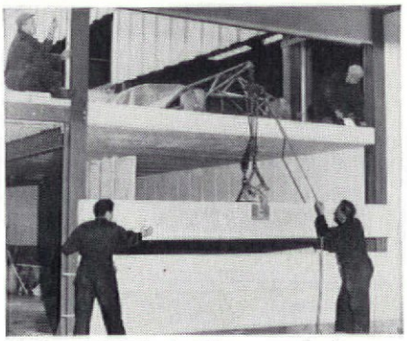

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Industrialised Building Systems and Components, Volume 1, Number 5, May, 1964.

As can be seen in the extract from the journal above, the advantages of system building over traditional methods speak for themselves. Still widely specified, however, are traditional materials—a hang-over from traditional methods. The direction for ever greater economies in time and labour, therefore, lies in the choice of material—a material such as Durox.

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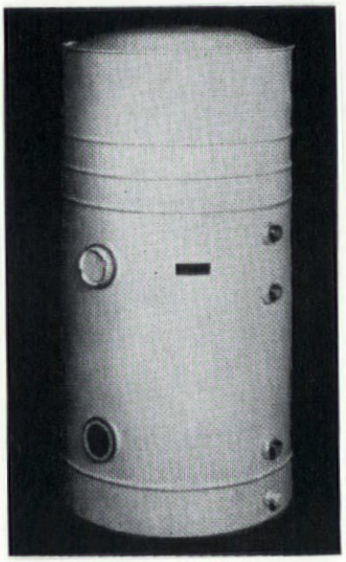

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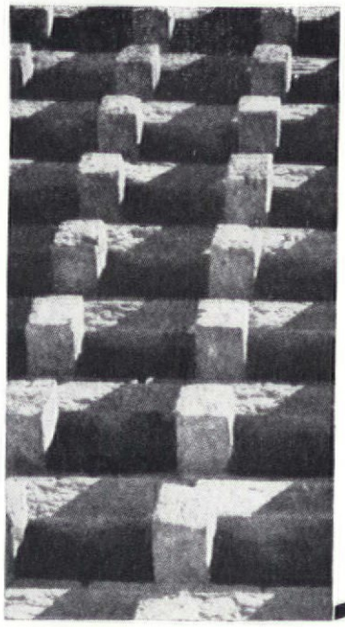
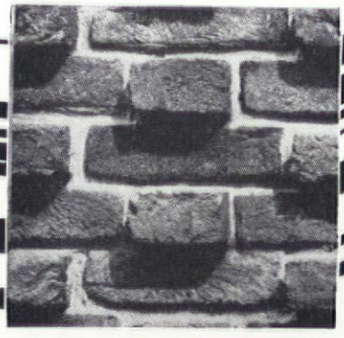
"Brick as an element in design"







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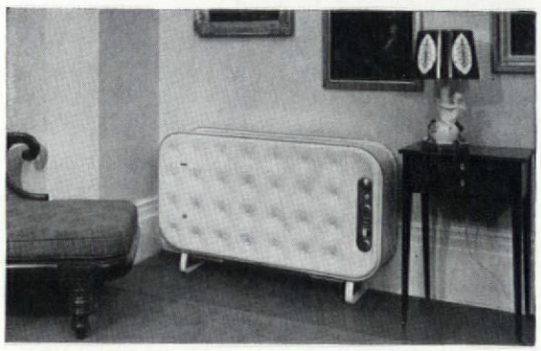

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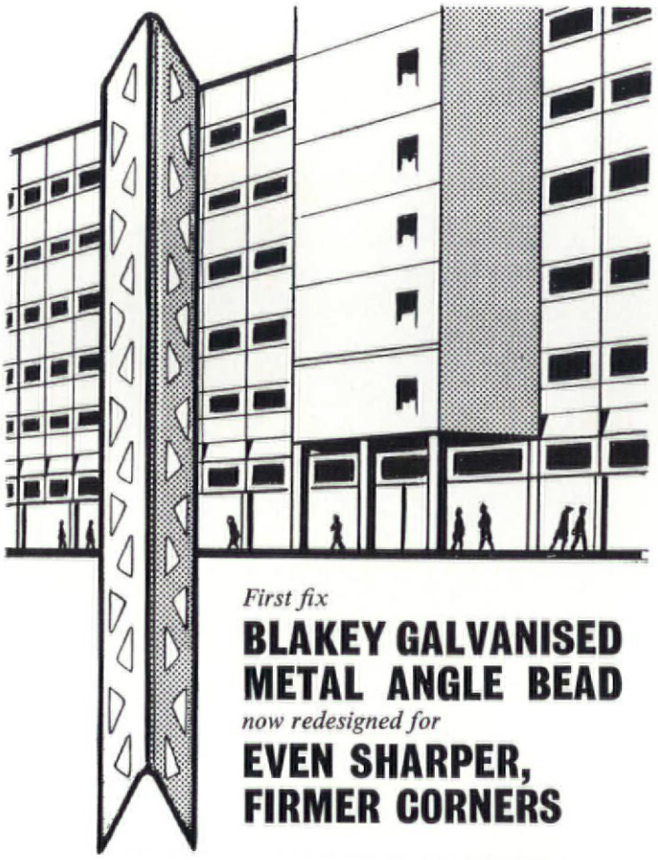

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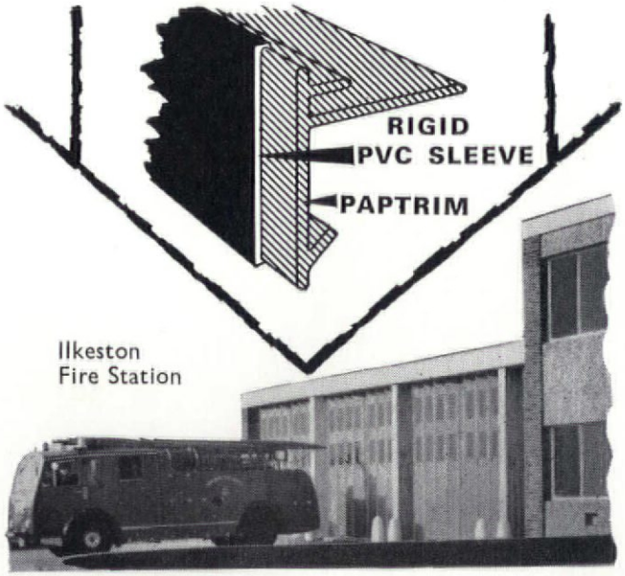

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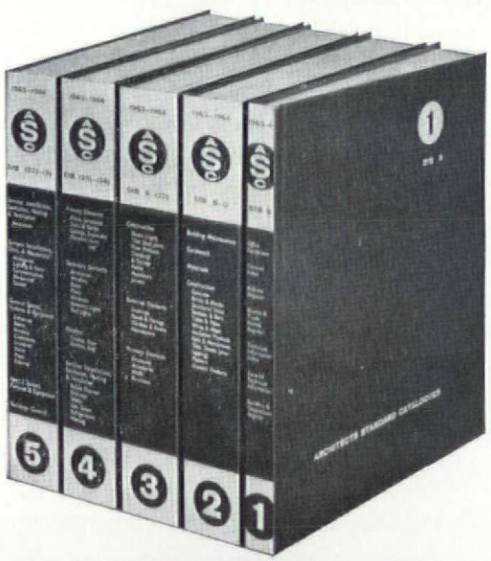

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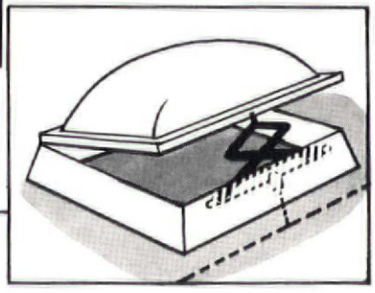

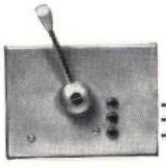

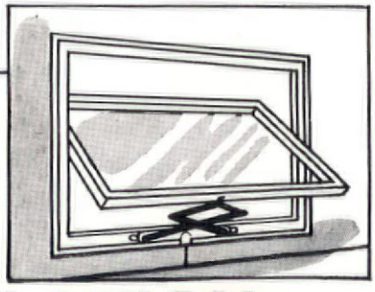

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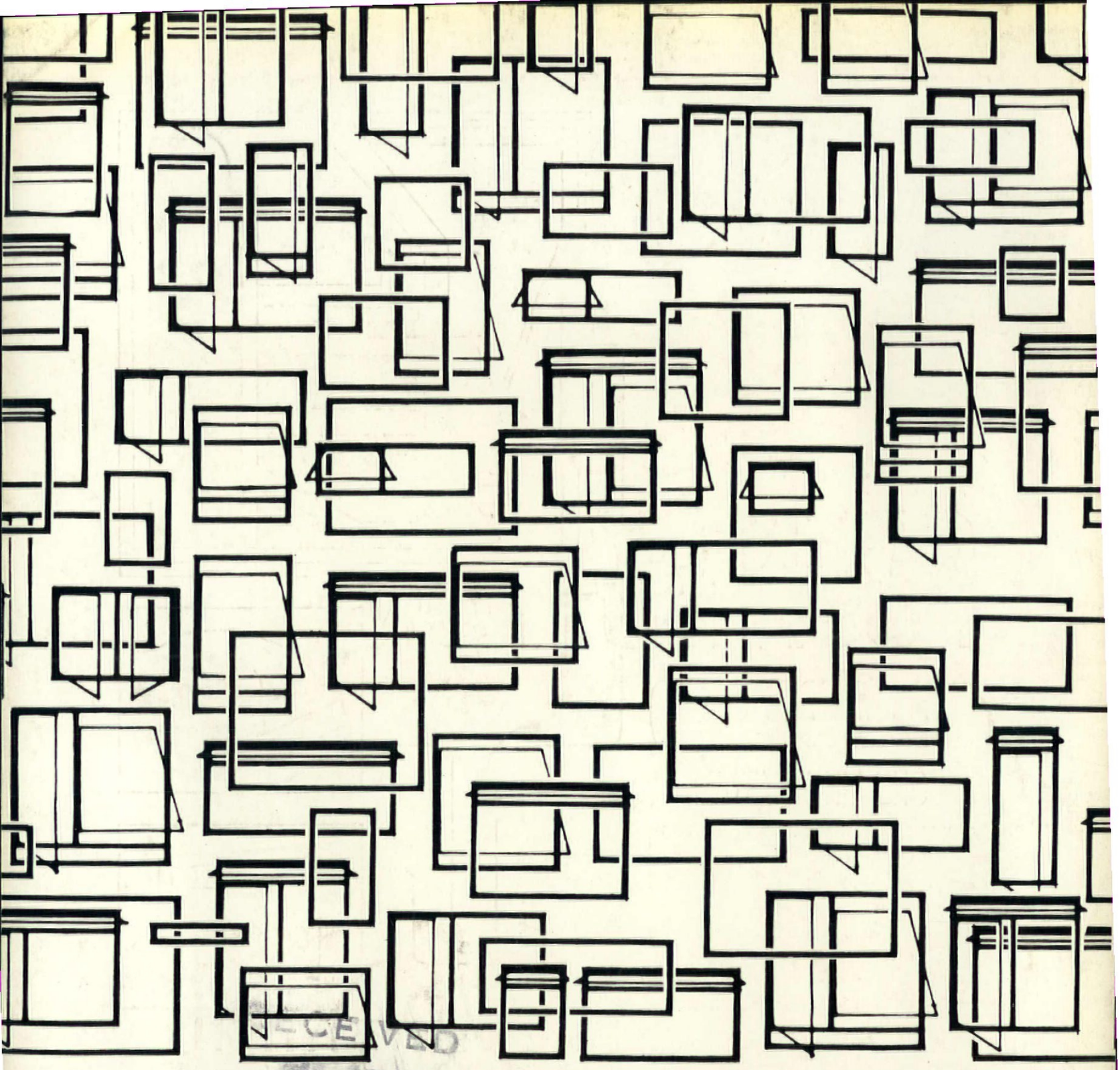

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