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October 1965
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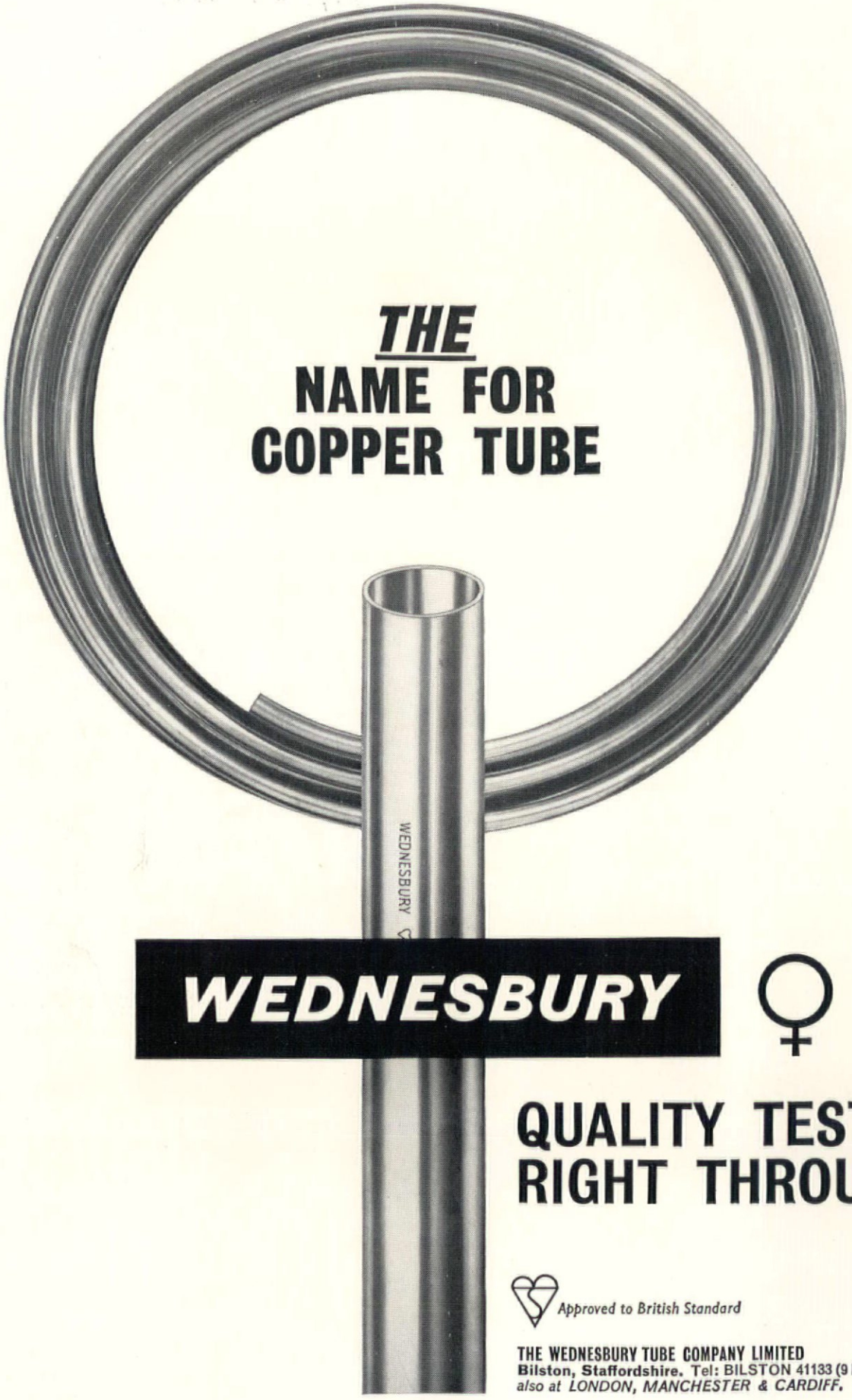

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Volume XXXV
October 1965

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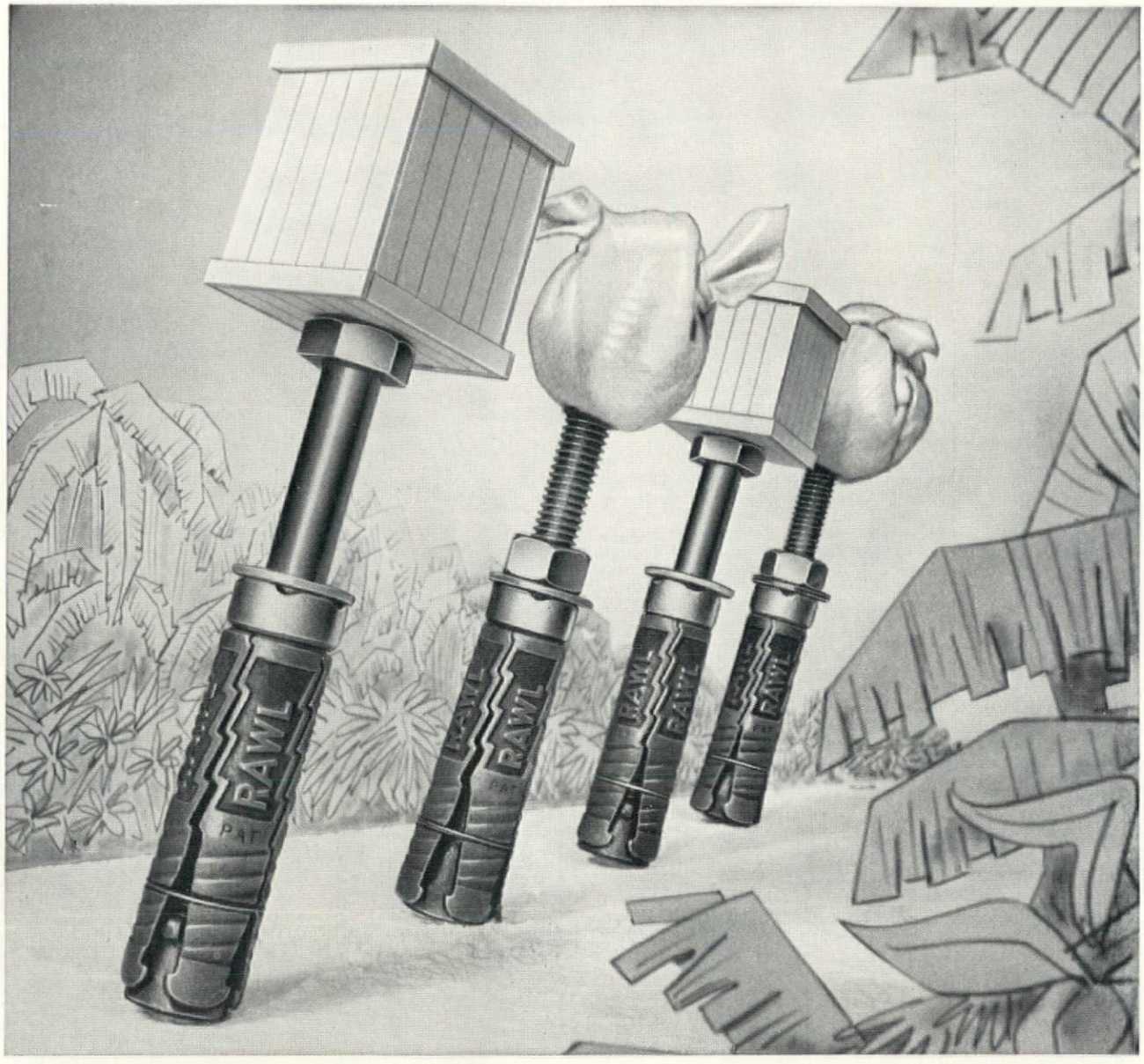

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Books

Tropical architecture in dry and humid zones

Maxwell Fry and Jane Drew. Batsford. £4 4s.

The previous book of this name by the same authors dealt with the humid tropics. Since it is long since out of print, rather than deal simply with the architecture of the dry tropics, it was decided to do a combined tropical book. Its value lies in its wealth of technical information and the authors' words of advice—fruit of long experience of planning and building in the tropics—on every imaginable aspect.

Il linguaggio grafico dell' architetto, oggi

Luigi Vagnetti. Vitali e Ghianda. 8500L.

Short text in Italian by way of prelude to a feast of reproductions of drawings and sketches by architects starting with Ernesto Basile (1857–1932) and including Otto Wagner, Gaudi, Behrens, Mackintosh, Garnier, F. Ll. Wright, D. Böhm, Gropius, Asplund, Mendelsohn, Le Corbusier, Sant'Elia, Oud, Michelucci, Neutra, Aalto, L. Kahn, Gio Ponti, A. Jacobsen, A. Vitelozzi, A. Libera, M. Ridolfi, B. Spence, L. Moretti, F. Gibberd, E. Saarinen, L. Quaroni, B. Zehrfuss, Burle Marx, G. Cullen, K. Browne and S. Steinberg.

Zodiac 13

Editor Pier Carlo Santini. A. Zwemmer (for Ing. C. Olivetti & Co.)

Henry Russell Hitchcock's opening essay on Connecticut, showing work of Rudolph, Johnson, SOM and Harrison and Abramowitz, is followed by illustrations of Carlo Scarpa's magical conversion of an old Venetian palace, the Fontazione Querini Stampalia; then features by Italo Insolera on Eiffel's iron viaducts in the Massif Central, brilliantly photographed and documented; by Alberto Samonà discussing France's *Grands ensembles*, the 'new dimension' of her mammoth-scale housing and planning; by Margit Staber describing the Lausanne 1964 exhibition and I. R. Rudin ditto New York; by Esther McKay introducing some young US architects; and finally, C. Conte and L. Fiori describing an Olivetti children's home in Aosta.

The shapes we need
Looking and seeing series No. 3

Kurt Rowland. Ginn. 15s.

In October last year we reviewed this excellent series of art education books for schools. Briefly, there are to be four in all, each costing 12s. 6d plus 3s. 6d. for teacher's notes. No. 1 dealt with pattern and shape, No. 2 with the development of shape. Film strips at £1 16s. each are being made to supplement each book.
No. 3 deals with mathematics in our surroundings, anthropometry, visual communications, and visual language past and present.
Once again we should like to commend this series to the attention of all who interest themselves in visual education.

Vision and value series:
Education of vision
Structure in art and in science
The nature and art of motion

Edited by Gyorgy Kepes. Studio Vista. 63s. each.

There are to be six titles in this 'teach-in' type series: the above are the first to appear. Kepes, Professor of Visual Design at MIT, introduces each, then hands over to his collaborators who are drawn from fields as varied as psychology, visual art or architecture, physics, philosophy, mathematics, history, metallurgy, etc.—the aim being to bridge the two 'cultures'. Emphasis is on the artist's view, since, according to Kepes, the artist must be the one who, in this threatening world, can learn to sense and then to integrate the various elements of our culture. He must not only imitate the appearance of nature, but understand its laws and its underlying processes and offer us a vision of the world as an ordered affair. Thus, from the first title he should learn 'how to create an image that makes meaning instantly whole and visible'; from the second he will learn that 'structure appears wherever elements combine into a meaningful whole whose arrangement follows definite laws'; and from the third he will find that motion is integral to the perception of structure.
The second title will probably be the one that first attracts the architect. Contributors include Max Bill, Bronowski, Buckmister Fuller, Lippold, Mahi and Ohtaka, Nervi, the Smithsons, Margit Staber. All three books are copiously illustrated.

Typographica 10 and 11

Lund Humphries. 12s. 6d. each.

Collections of illustrations are the basis of *Typographica* No. 10; newspaper seals, compass roses (of great variety and beauty), and early printers' stock blocks; with, by way of contrast, a feature on Robert Brownjohn's brilliant use of photography on/and the human figure.
No. 11 has more about photography: Alexander Rodchenko's and Herbert Bayer's experimental work in the 20s and 30s; and John Berger today trying his hand at combining his own emotive photography and poetry. Contrast this time is provided by Germano Facetti's feature on the versatile French typographer Robert Massin.

▷ page AD7

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The photograph of 250 tables with Walton chairs is by courtesy of Henley College of Further Education, Coventry.

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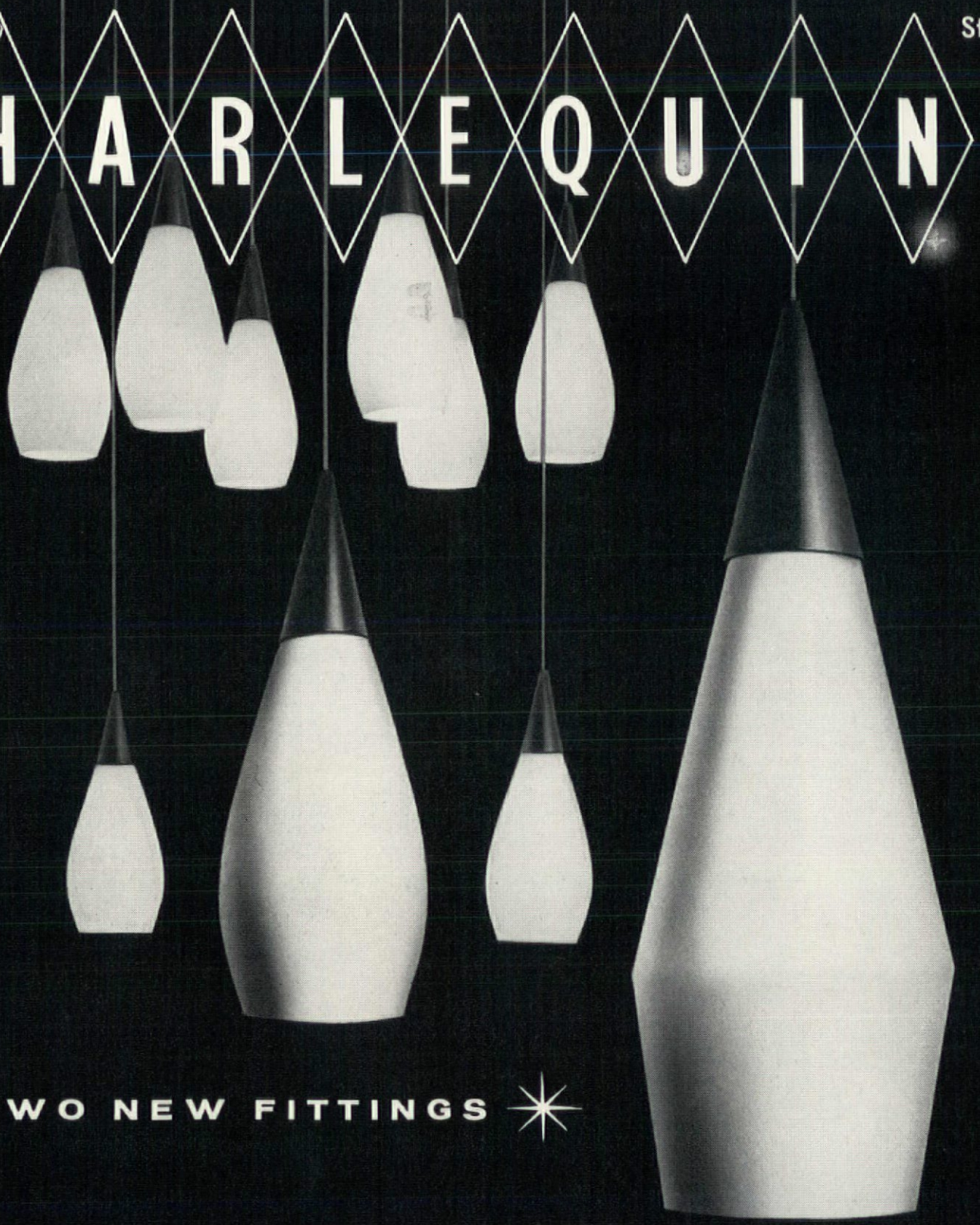

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◁ page AD5

Interior design

Diana Rowntree. Penguin Books. 7s. 6d.

As stated on the cover, this is a handbook, to be kept for reference as and when necessary. But it is far too thorough for the amateur; too solemn, requiring endless reading of pages of text, where the Sunday newspapers' pictorial technique would have frequently done the job better. For the professional it is probably more suitable—though he would be irritated by the charts that purport to compare surfacing materials but do not supply a key and use the same colour symbols to indicate things as widely divergent as price, insulation, sound absorption, or durability.

Your child's room

Lena Larsson. Penguin Books. 4s.

Another Penguin handbook, but in this one the text is subsidiary to the drawings. Being about the making of furniture and fittings, and assuming that the reader is a beginner, the author first describes the carpentry tools and their functions. Thereafter follow the ideas of what you can make for your young.

The architecture of (1) Madrid; (2) Toledo; (3) Barcelona

Carlos Flores and Eduardo Amann. Hogar y Arquitectura.

Three separate guide books with indexed maps indicating the important buildings in each city (others to follow later) with accompanying photos, notes and name of architect.

Cambridge new architecture

Nicholas Hughes, Grant Lewison, Tom Wesley and Malcolm Rowe. 7s. 6d.

A guide to the post-war buildings of Cambridge.

Architecture in Southern California

David Gebhard and Robert Winter. The Los Angeles County Museum of Art.

A guide to domestic and commercial architecture.

Your England revisited

Ian Nairns. Hutchinsons. 30s.

Illustrated commentary on urban and suburban planning.

Life guide to Paris

Life. $4.95.

Complete tourists' guide to Paris.

Landscape in distress

Lionel Brett. The Architectural Press. 30s.

Written and photographic record of post-war changes and present state of the landscape in the south-east region of Britain.

Roof design

Paschen von Flotow. Karl Krämer. 3 gns.

Illustrated with photographs and working drawings. Text and captions in English, German and Italian.

Therapy by design

Lawrence Good, Saul Siegel and Alfred Paul Bay. Charles C. Thomas, USA. $10.

Illustrated report on one of the first research projects to study the effect of architectural environment on human behaviour.

Forth Road Bridge

The Kynoch Press. 25s.

General history of the construction of the Forth Road Bridge.

Modern power station practice

Central Electricity Generating Board. £3

Volume 5; dealing with the principles of nuclear power and generation, operational efficiency, organization and management.

Detail 2

Konrad Gatz. Iliffe Books. 95s.

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A selection of outstanding examples from the German periodical *Detail*.

Architects' working details. Vol. 10

D. A. C. A. Boyne. The Architectural Press. 30s.

The third volume to consist entirely of foreign works.

Der Wohnraum

Fred Fischer. Artemis Verlag.

German text. Diagrammatic illustrations.

Insulation of buildings

R. M. E. Diamant. Iliffe. 65s.

Scientific and technological approach to thermal and acoustic insulation.

Network planning

K. M. Smith. British Institute of Management. 25s.

A practical guide to critical path analysis.

Communications in the building industry

G. Higgins and N. Jessop. Tavistock Publications. 25s.

The report on a three-month pilot study into communications within the building industry.

Il Rame nell'architettura i teti

C.I.S.A.R.

Italian text on past and present use of copper as a roofing material. Photographs and detail drawings.

Early English decorative detail

John Gloag. Tiranti. 50s.

A pictorial record of the transformation of English taste in decoration from the early 'Italiante' to the mid-eighteenth century.

Early domestic architecture of Connecticut

J. F. Kelly. Constable. 24s.

General illustrated text on construction and decoration.

Twentieth century engineering

The Museum of Modern Art.

Photographic record of contemporary engineering achievements.

The new architecture and the Bauhaus

Walter Gropius. Faber. 10s. 6d.

Translation from the German by P. Morton Shand—now in paperback.

The art of the garden

Miles Hadfield. Dutton Vista. 8s. 6d.

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Modern churches

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Photographs, plans and descriptions of churches built during the last thirty-five years.

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John Gloag. Oriel Press. 9s. 6d.

Short illustrated history of European architecture.

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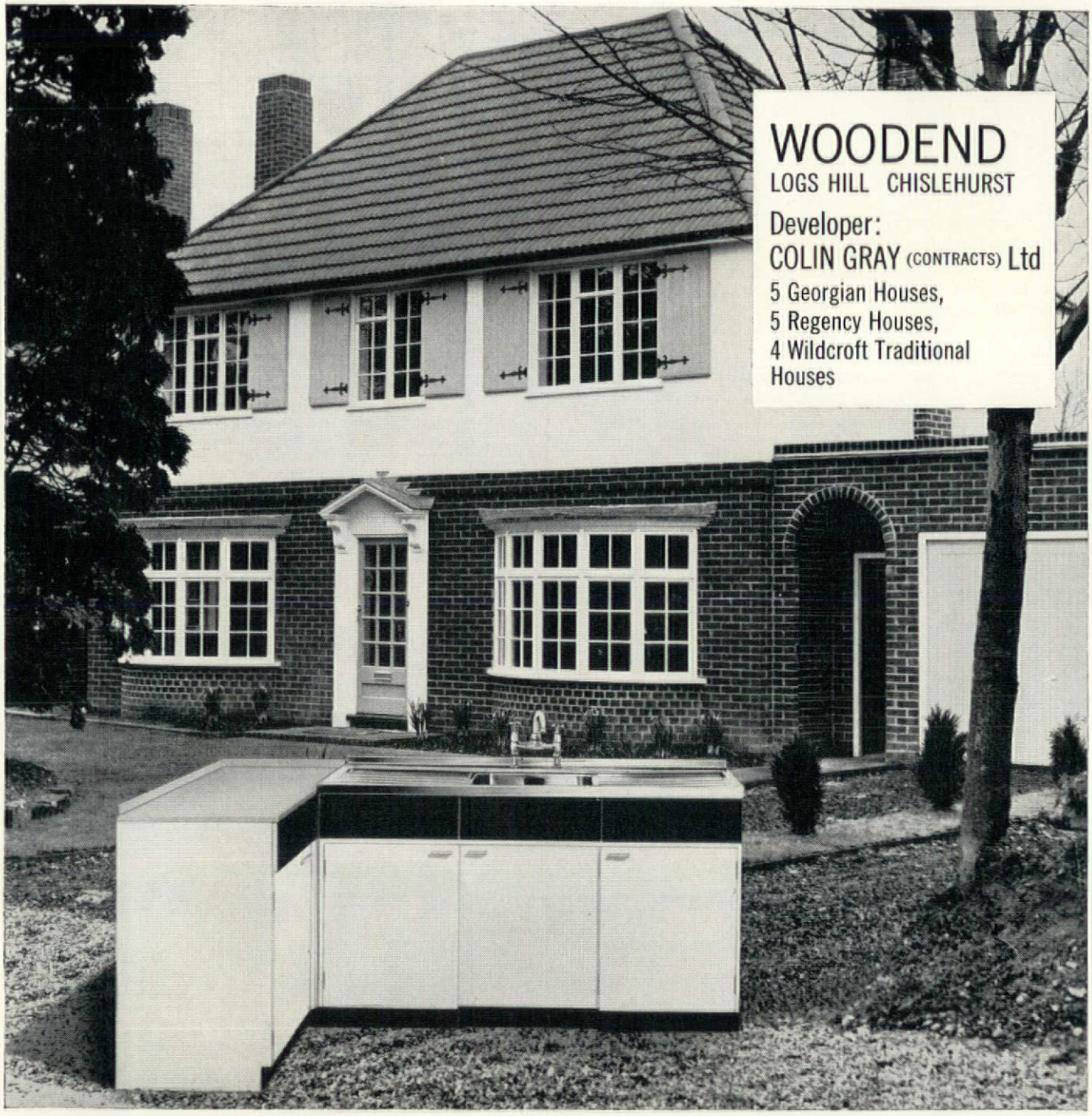

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1

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Architects office

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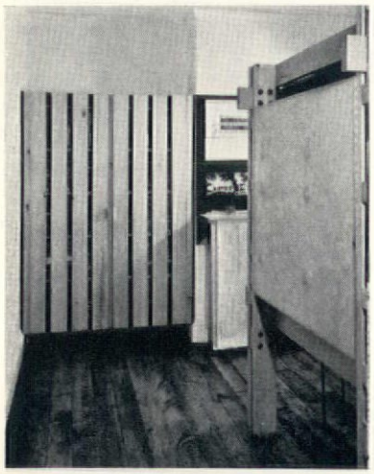
An island fitting **2**, **3** and **4** has been designed to isolate the reception area from the rest of the office. It contains the typist's desk, stationery drawers, filing cabinets, books, drawings, samples of materials, wash basin and coats, and forms the receptacle for all general bric-a-brac leaving the rest of the office clear for drawing space **1**.
The office is painted white with stained cork sheets on the walls for hanging drawings. All fittings are of varnished yellow pine.





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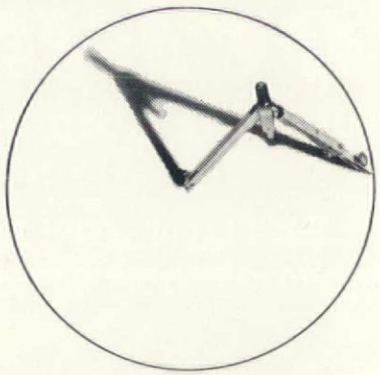

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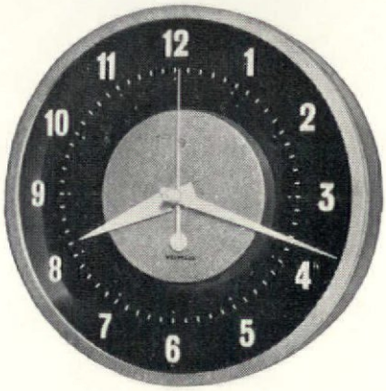
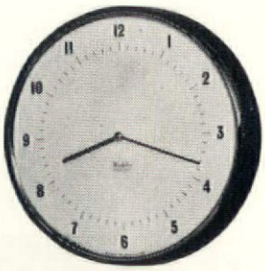


EXECUTIVE 10

A 10" electric wall clock. Accepted for Design Index. Black plastic case fits flush to the wall, recessed at the back to take cord and plug. The movement is self-starting, 210-250 volt A.C. 50 cycle. Two models: one with black hands, and black numerals on glass over a white face, the other with black and white reversed. Price £6.10.0.



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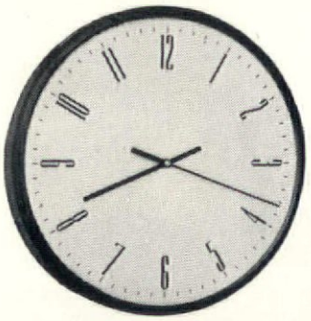

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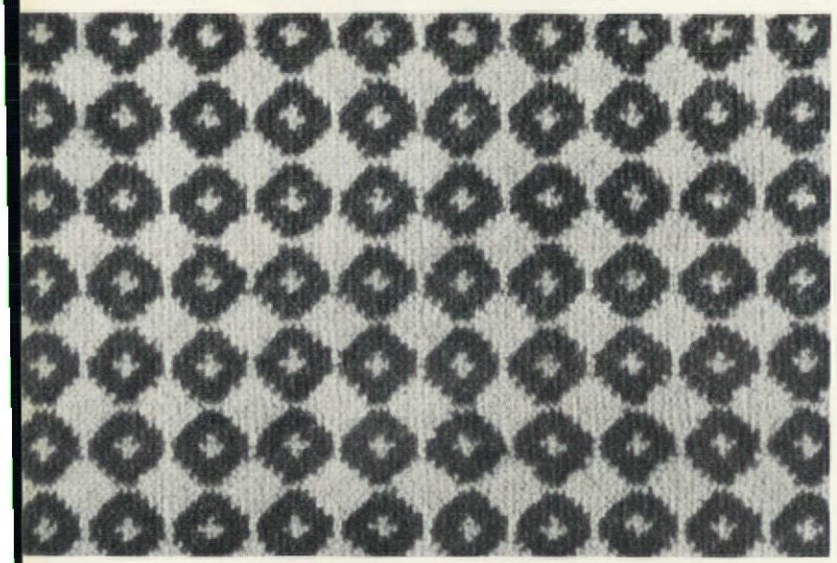

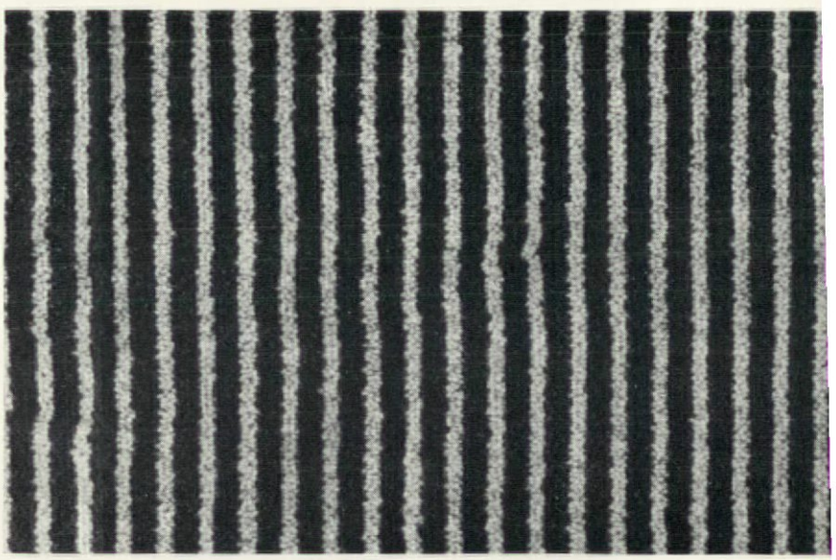





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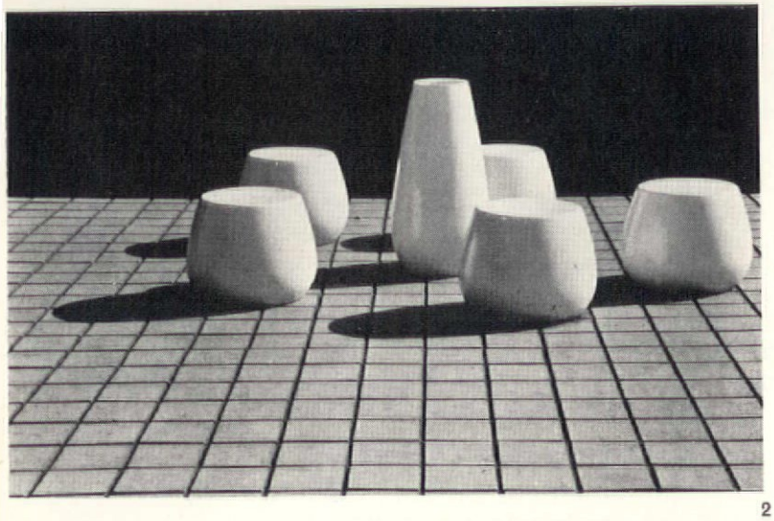
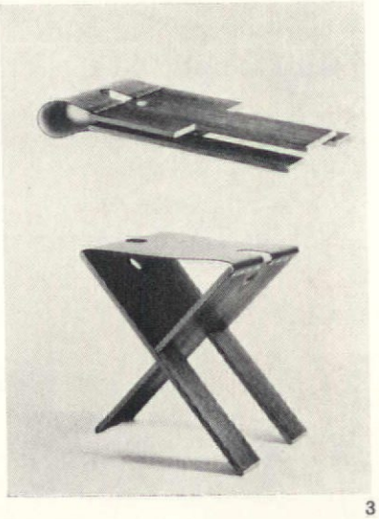


2

Stools

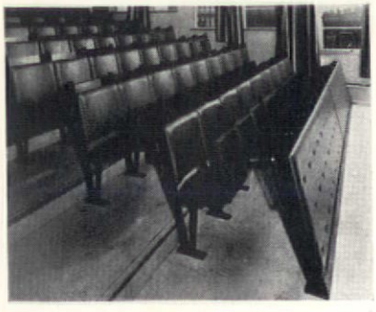
Already classics of outdoor furniture are Nanna Ditzel's 'cotton reel' wooden stools **1** and tables and Kenzo Tange's sculptural white or black ceramic stools and tables **2**, here seen on the library terrace at St Paul's University, Tokyo.
The hide and laminated ply folding stool **3** was designed by architect Kjell Nordin for Ströms Möbler, Rosenfors, Denmark.
Photos: Mobilia 2; Lehmann 1 and 3



3

Tip-up seating

Two more examples of tip-up seating for lecture halls: (1) by Messrs Hostess Tubular Equipment Ltd, **4** designed in association with the University Planning Officer at the University of Sheffield for their six new lecture halls; built from nylon coated elliptical tubing with oval and rectangular section tubing for direct support of the seats, costing £14 upwards per seat; or made from square tubing throughout, costing from £8. (2) By Jack Stafford for H. C. Shepherd & Co. Ltd, **5** with metal frame finished in black epoxy resin, and upholstered ply back and seat, costing £9 10s. per seat. By way of comparison, the Horace Olaf tip-up chair by F. H. Taylor costs £10 10s, and the Race tip-up chair by Peter Dickenson costs £12 5s.



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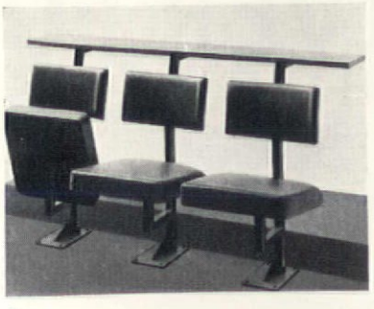

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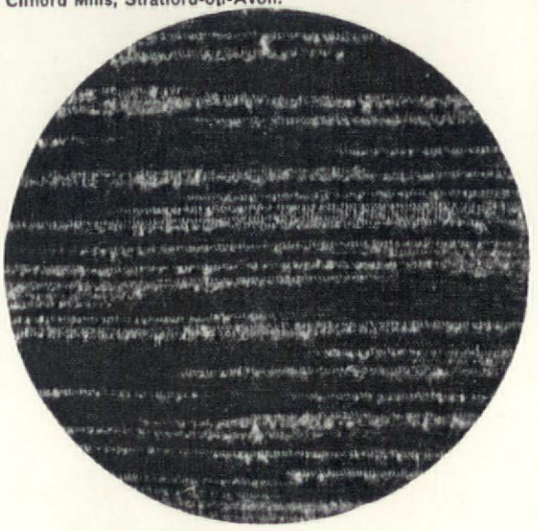

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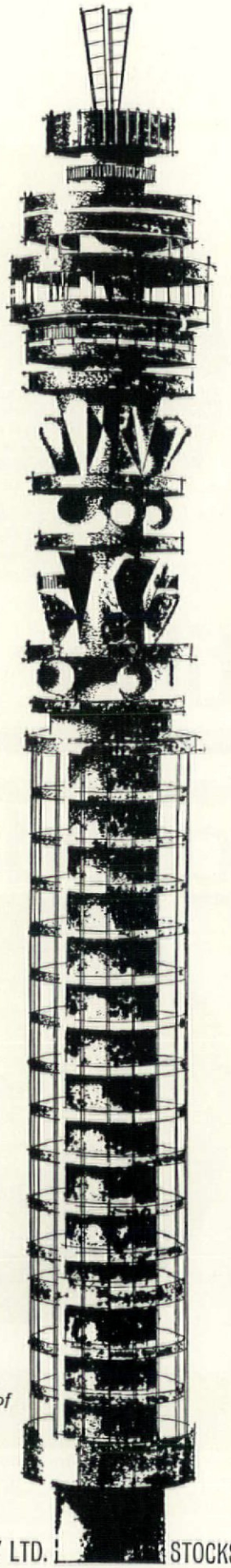
Tibor Reich designs have created a new 'contract' look for Goodacre carpets—design and quality wise. Interesting, discreet plains and textures. Bold receding patterns for hard duty in public places. Goodacre Carpets. Produced by Wm. Goodacre of Kendal. When visiting Stratford-on-Avon see our new colour exhibition centre at TIATSA, 60, Ely Street, Stratford-on-Avon.

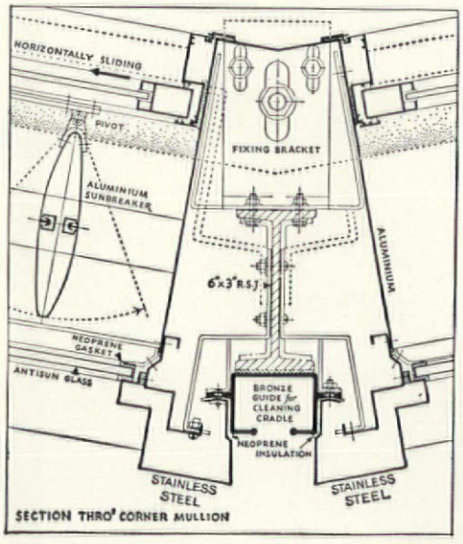


SILVER FOX
stainless steel in high places

A prominent and important feature of the new 620 ft. Post Office Tower in London is the cladding of the mullions with Silver Fox stainless steel. This highly durable material was chosen because it can easily be washed at the same time and in the same way as the windows: it will not need any other maintenance.

With this simple care, the attractive appearance of the steel is likely to last indefinitely.

For details of the many uses and advantages of stainless steel, write for the new 60-page brochure, "Stainless Steel in Architectural Design".



Detail of a mullion in the 50 ft. diameter curtain walling fabricated by Henry Hope and Sons Ltd., Smethwick, Birmingham

Designed for the G.P.O. by the Chief Architect's Division of the Ministry of Public Building and Works

SILVER FOX
STAINLESS STEEL

F.524A

SAMUEL FOX & COMPANY LTD. STOCKSBRIDGE, SHEFFIELD. A subsidiary of The United Steel Companies Limited



FORDS CHOSE V'SOSKE

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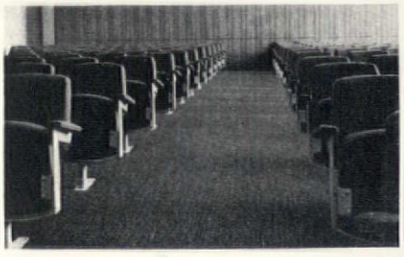

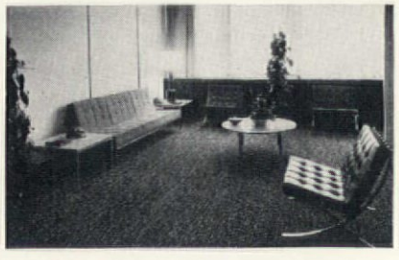

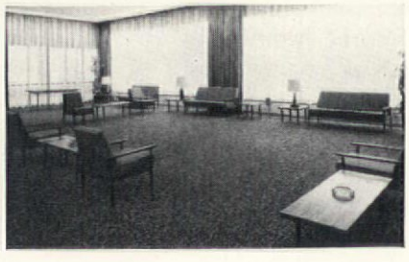

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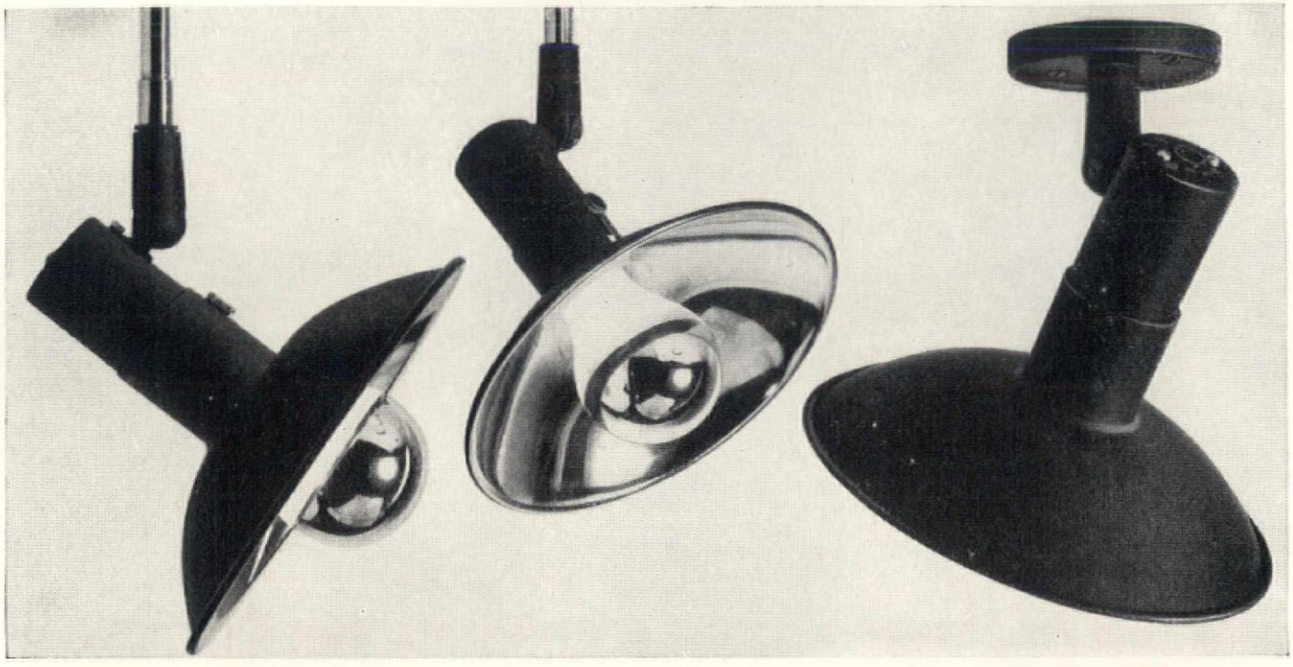

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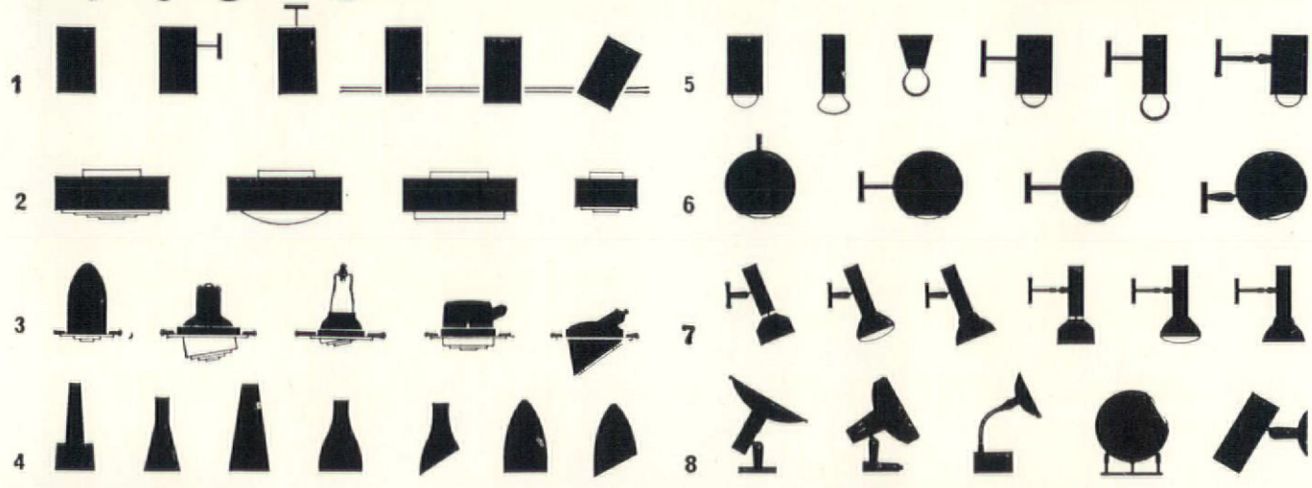

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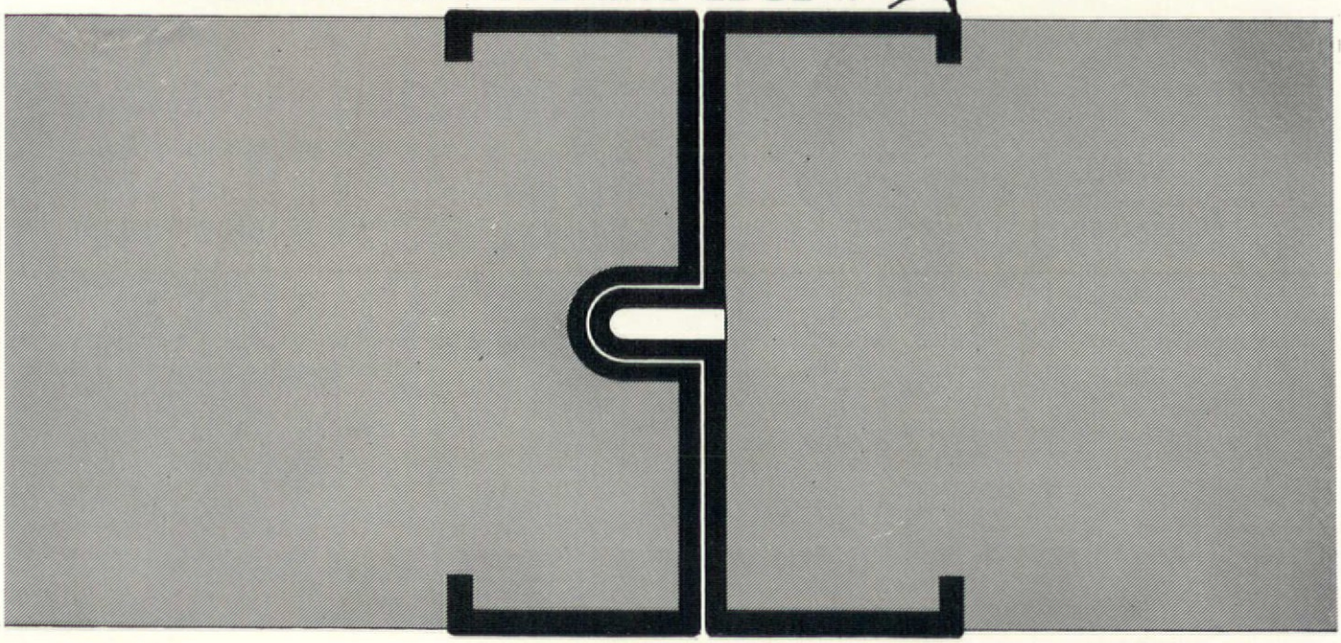

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Imitations of Unilith I.S.E.R.S. can suffer unfortunate results.
Steel edges can come adrift in transit (see illustration) or at a site resulting in damaged slabs.
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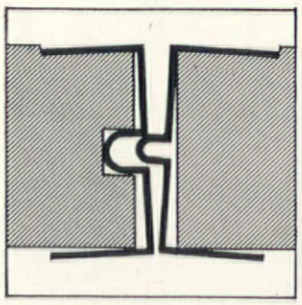
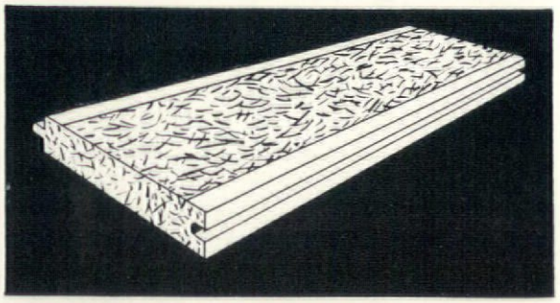
Full documentation of specifications, detail of applications, test reports and prices will be sent on request.





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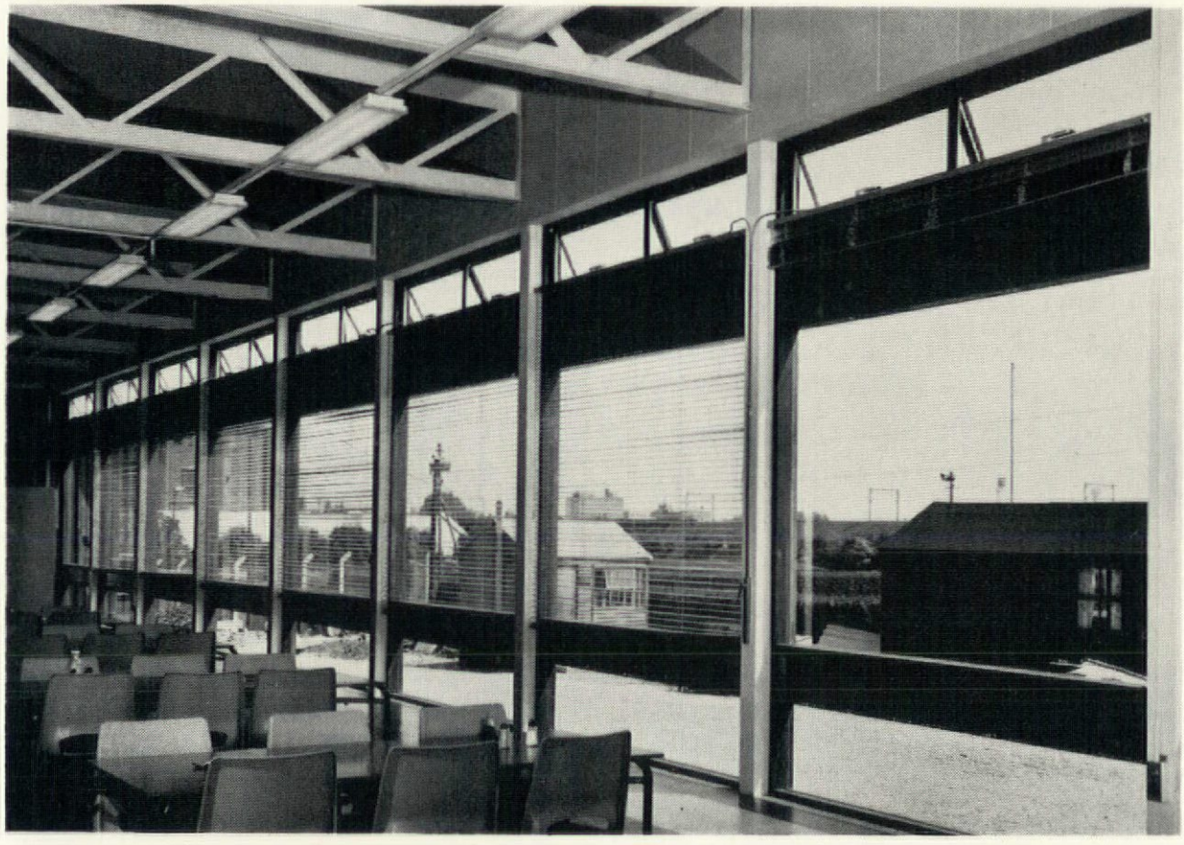
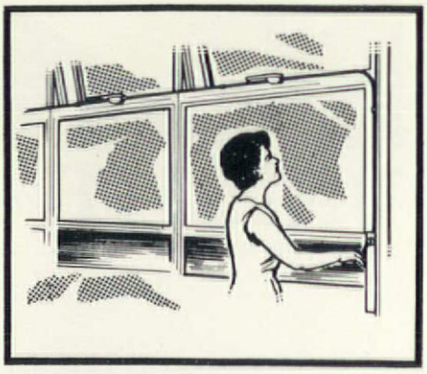
Clearly an open and shut case



(Photo : Marconi staff canteen, Chelmsford)

for TELEFLEX Clearline WINDOW CONTROL GEAR



This canteen installation shows clearly the obvious choice was TELEFLEX CLEARLINE: four top-hung vents are controlled from one direct operator using the unique Teleflex push-pull method of window control. If required up to 16 windows can be controlled from one operator. Clearline gear can also be supplied for the control of louvre vents and sliding sash windows. Illustrated literature supplied on request.



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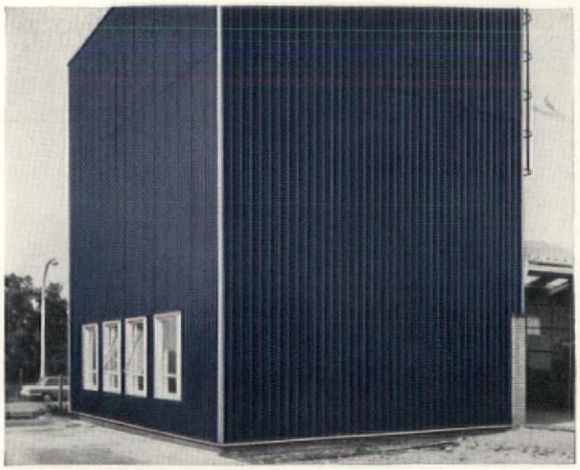

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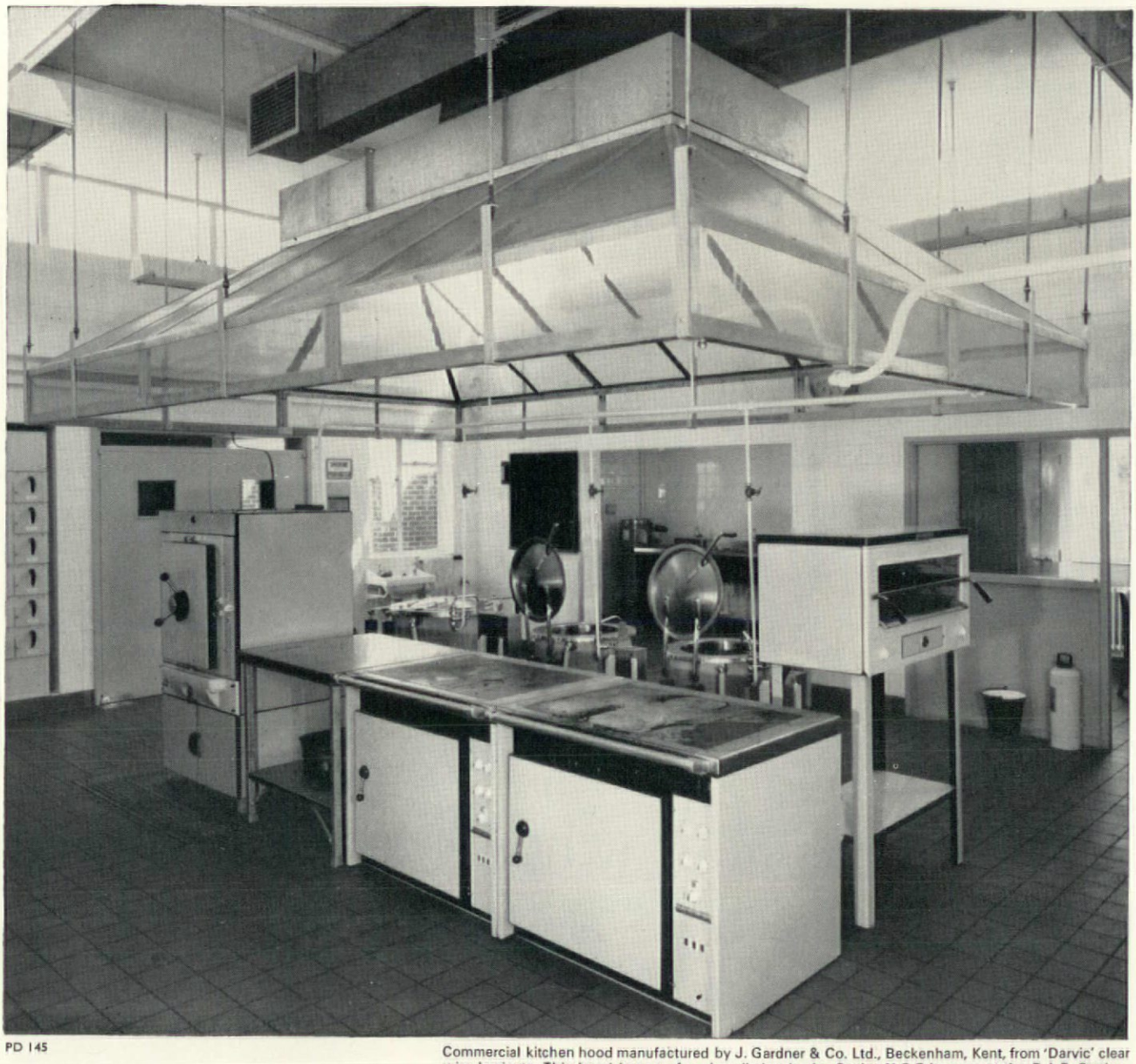

PD 145

Commercial kitchen hood manufactured by J. Gardner & Co. Ltd., Beckenham, Kent, from 'Darvic' clear wire laminate. This hood is part of an installation in the Senior N.C.O.'s mess at the R.A.F. Station, Cranwell. The heating and air conditioning engineers were G. N. Haden & Sons Ltd., London, W.C.1

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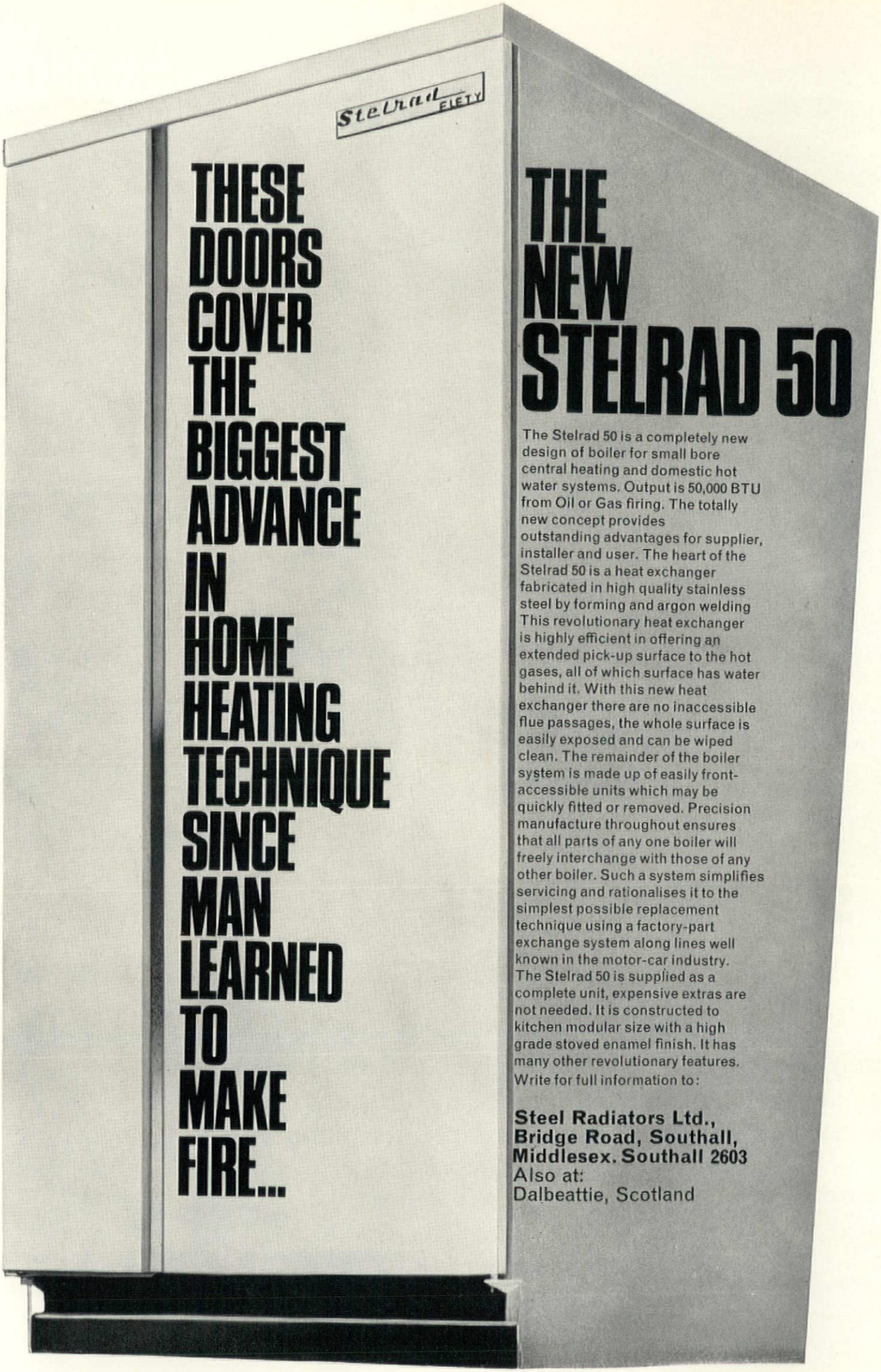
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Free Booklets describing Canotex, Canolin and Canoweave and showing the colour ranges, available from Arthur Sanderson and Sons Limited, Berners Street, London, W.1.

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The design is flexible to suit a wide range of requirements ● No. 16 Single Oven model for 30/40 people (5 cu. ft). ● No. 17 Single Oven range for 50/60 people (7½ cu. ft.) ● Suitable for installation in multiple units as wall or central suites.

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Nos. 16 & 17 Cooking Ranges. Standard finish: Vitreous enamel, Grey and White with Black Hob and Plinth.

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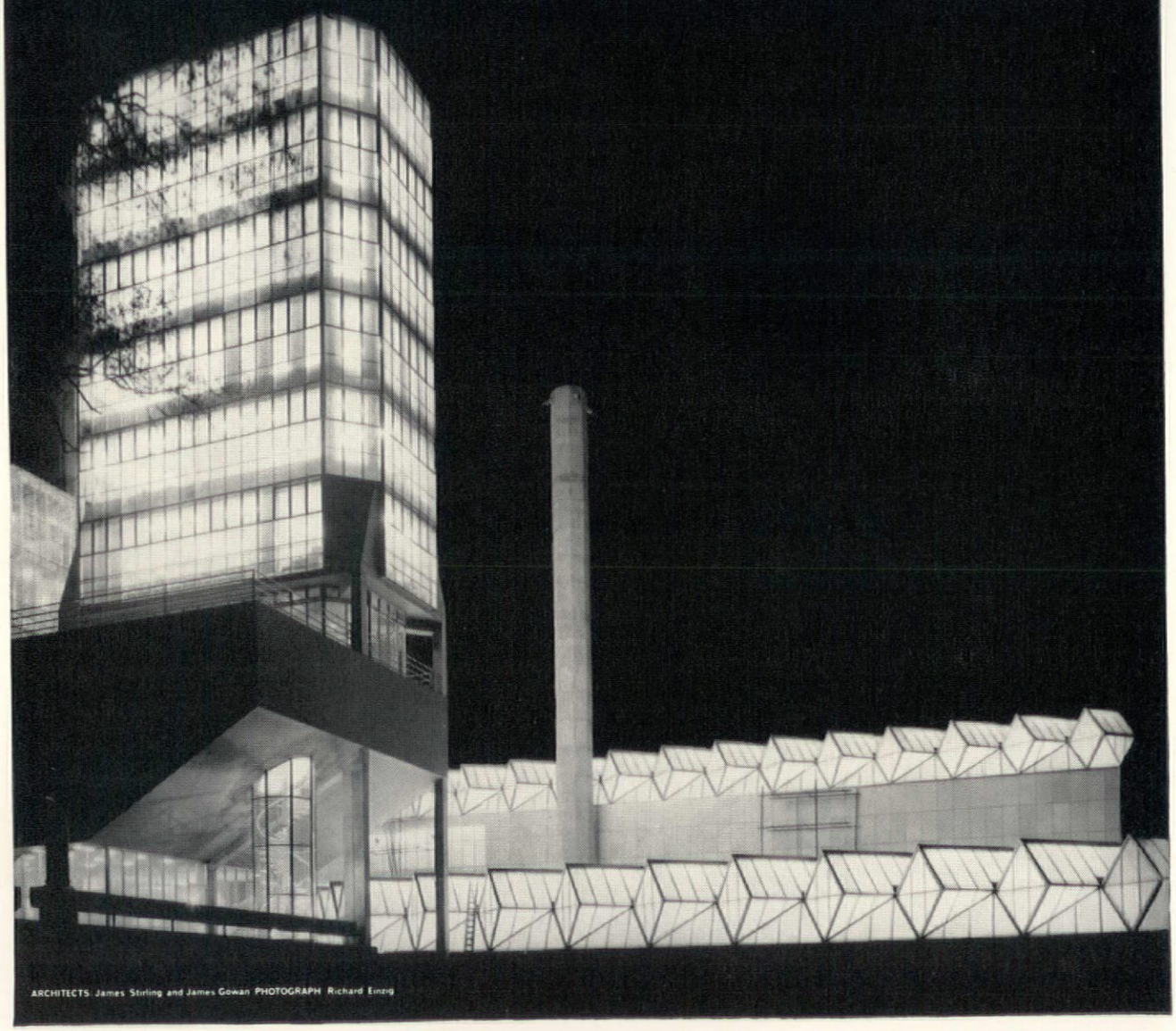

ARCHITECTS: James Stirling and James Gowan PHOTOGRAPH: Richard Einzig

Plyglass Diffusing Double-Glazing Units are usually glazed in roofs, to reduce heat gains and direct penetration of the sun's rays. In Leicester University's new Engineering Laboratory, however, they have been used very effectively not only in roofing but in the side walls as well.

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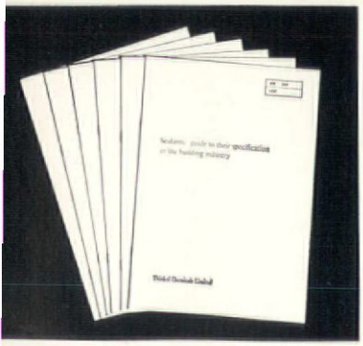

INFORMATION:
"SEALANTS: GUIDE TO THEIR SPECIFICATION IN THE BUILDING INDUSTRY"
This publication emphasises how important correct joint design and choice of sealant really is when wishing to maintain "minimum performance capabilities" on major building projects, also giving comparison cost and capabilities of Polysulphide-based sealants with oil and butyl mastics.

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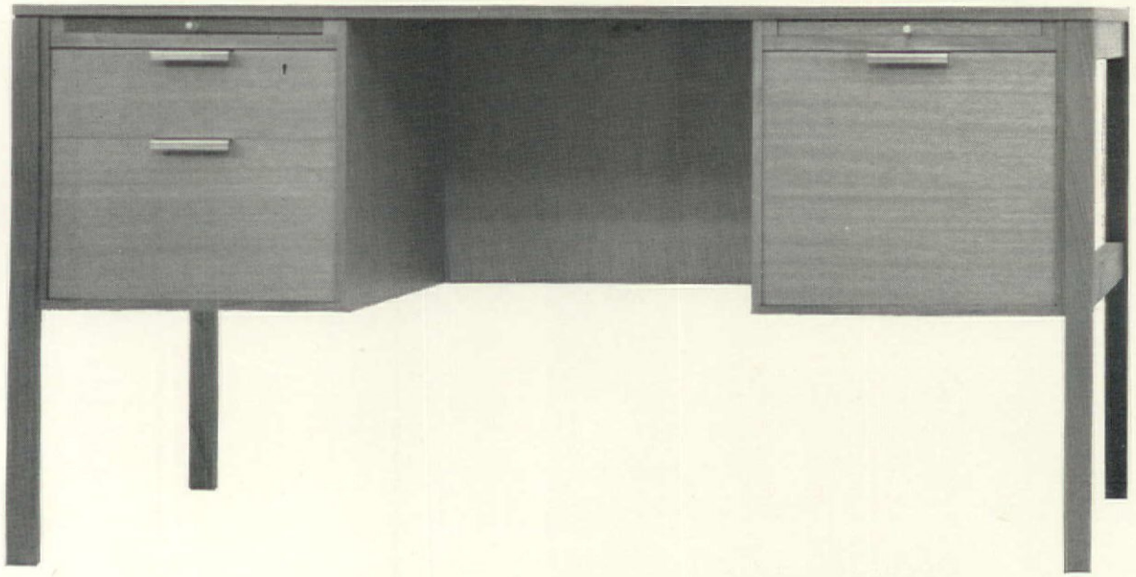
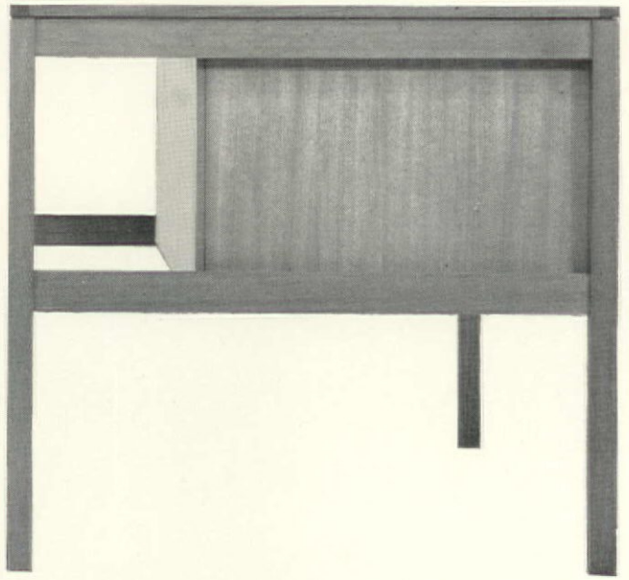
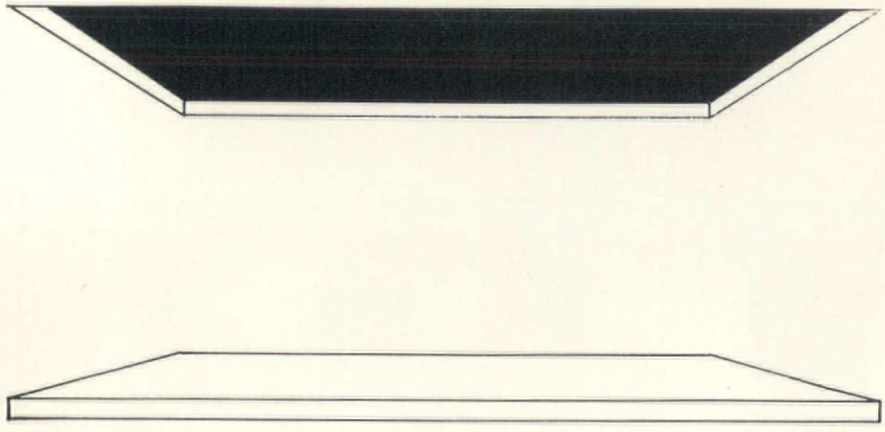
Technical Literature in: Barbour Index, Architects Standard Catalogues





LUCAS FURNITURE Double pedestal desk, Model LD46 from the Lucas Range. Designed by Herbert Berry FSIA and Christopher Cattle MSIA, it is available in mahogany or oak at £35 12s including tax. The construction used makes it easily demountable for access where space is limited. The Range includes double and single pedestal desks, tables and storage. Lucas provide furniture for all contract needs. Four ranges of desks, tables, storage, plan chests, beds and a wide range of chairs. On show in The Design Centre, London, and in our showrooms. Write or telephone for details to Lucas Furniture, Old Ford, London E3, Advance 3232. Barbour Index File Number 410



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Photograph by courtesy of Wates Built Homes Ltd.

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Gliksten Mark 12 doors are, in fact, at home in most surroundings and will give an air of quality to a lounge, dining room or an entrance hall just as well. Have you considered using Mark 12 doors in your own housing schemes? It's well worth looking into, especially as the extra cost per house is very little. If, however, the call is for painted doors, there is none better than the 'Silkstone' door. Write to us for details of either or both these types.

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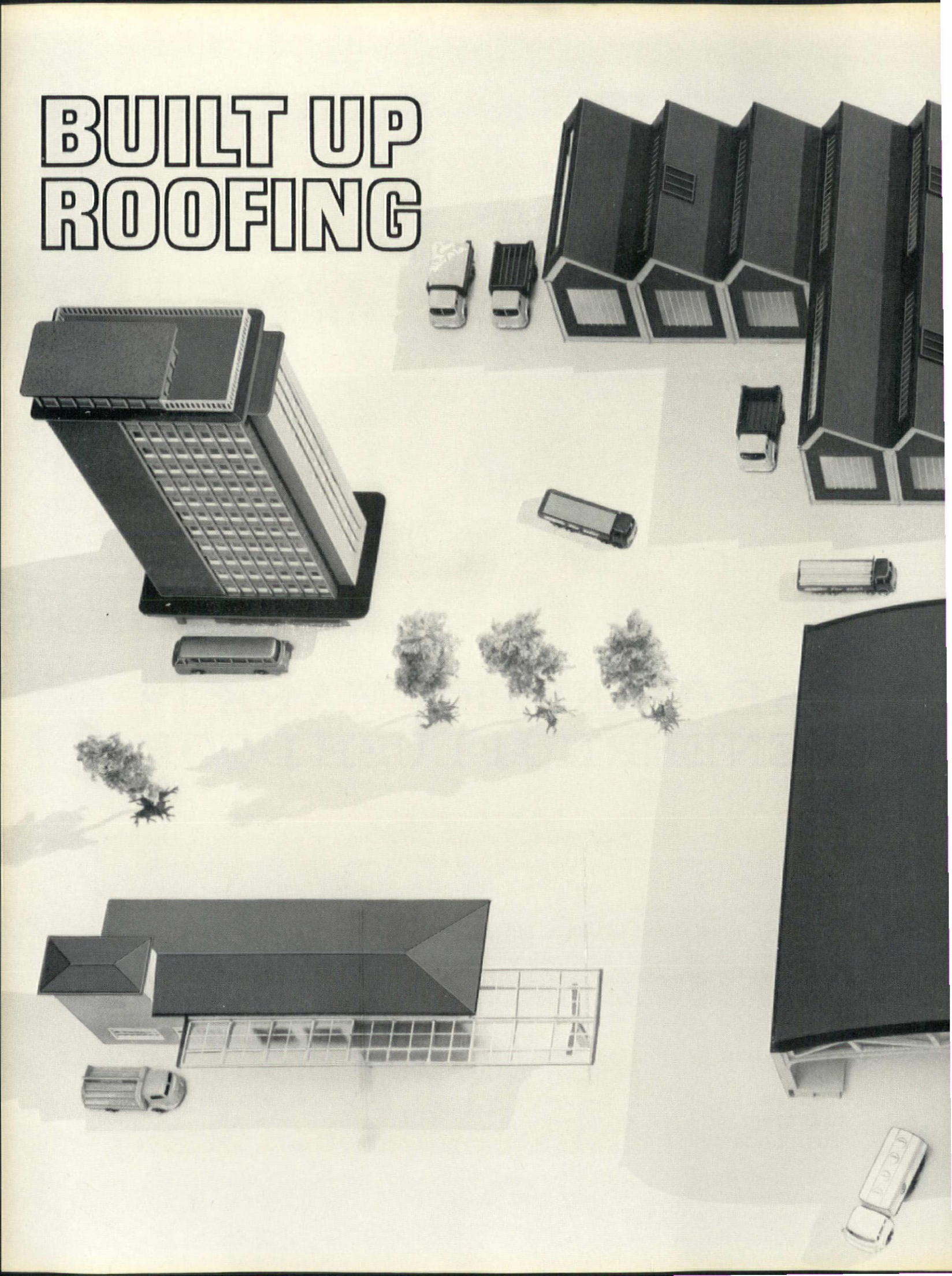
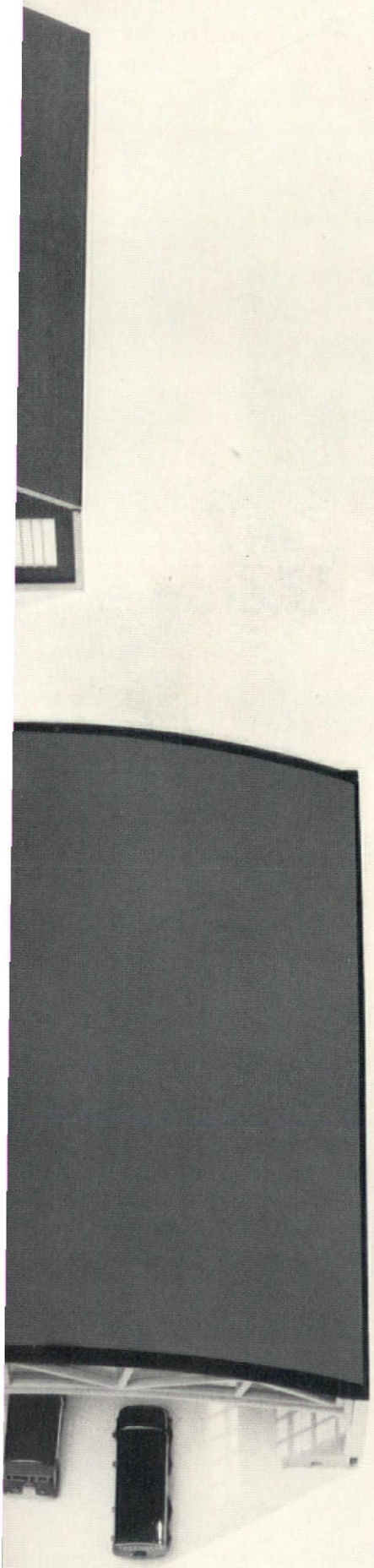
BUILT UP ROOFING





SURVEY OF ROOF SUBSTRUCTURES

The selection of a weatherproofing specification by the designer must be made in relation to the type of substructure and its shape —flat, pitched or curved. Other factors which have considerable influence on the long term performance of the roof covering are thermal or moisture movement, deflection under load, and the cycles of moisture vapour migration.

TIMBER BOARDED SUBSTRUCTURES

The finished timber thickness must be adequate ($\frac{3}{4}$" T and G or 1" close butted) and properly supported for reliable fixing and performance to be achieved. Normal humidity within a heated building will diffuse into the roof substructure, and since the weatherproofing is impermeable, ventilation must be provided between the roof soffit and ceiling to prevent timber decay and dry rot. Timber, being combustible, requires a weatherproofing specification which complies with the Building Regulations or with the stipulated fire test designation.

PREFABRICATED SLABS AND PANELS

There are many varieties of materials in this group, which have different physical properties. One characteristic is common to all—the panels abut one another; consequently, they may be subject to differential deflection under load and lateral movement caused by thermal changes and moisture content. Movement arising from any of these causes sets up severe local stress in the weatherproofing. The designer should reduce the effects of such movement by reference to manufacturers' data and fixing instructions, and by appropriate specifications of roofing materials and techniques to prevent failure of the weatherproofing due to fractures.

IN-SITU CONCRETES AND SCREEDS

In-situ concretes with sand/cement or insulating screeds contain residual structural moisture in varying degrees; some lightweight screeds are very porous. Moreover, normal humidity within a heated building will diffuse into the roof deck. Solar heat vaporizes this moisture, and the consequent pressure weakens the bond between weatherproofing and substructure and a blister forms unless special techniques are used. Shrinkage hair cracks which may rupture the weatherproofing membrane present a further factor in this type of substructure. On large roof areas, thermal movement takes place according to the coefficient of expansion of the substructure material, and movement joints should be incorporated in the structure at points determined by the designer. These joints must be satisfactorily mastered on the roof.

As a result of an extended programme of research into the physical and chemical properties of roofing materials and their relationship with the substructure, Ruberoid can assist the designer in producing a more efficient, more economical roof. To quote but one example, the Rubervent system neutralizes the effects of minor movement and also of vapour pressure underneath the weatherproofing. Consultation at an early stage in the design will enable you to benefit from our research. The Ruberoid service is nationwide and readily available. The reference manual for your file is No. 1812—"Ruberoid Built-up Roofing"

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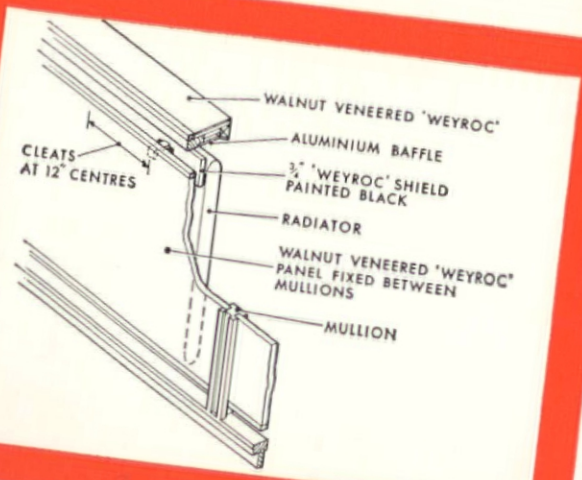

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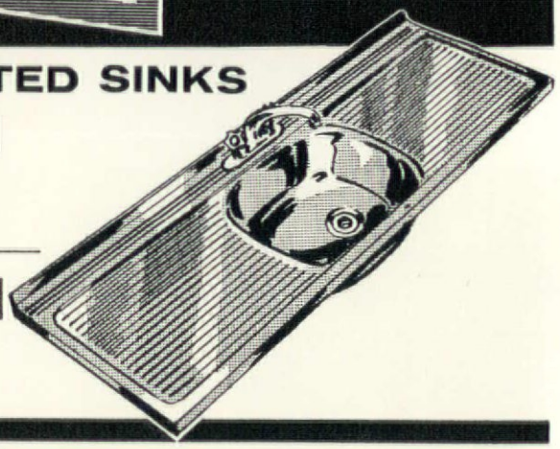

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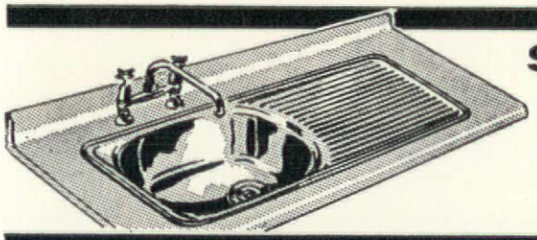

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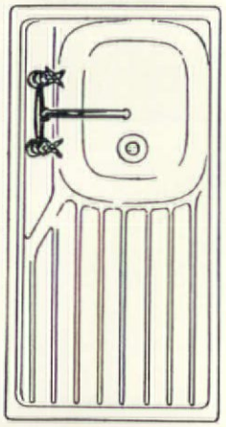

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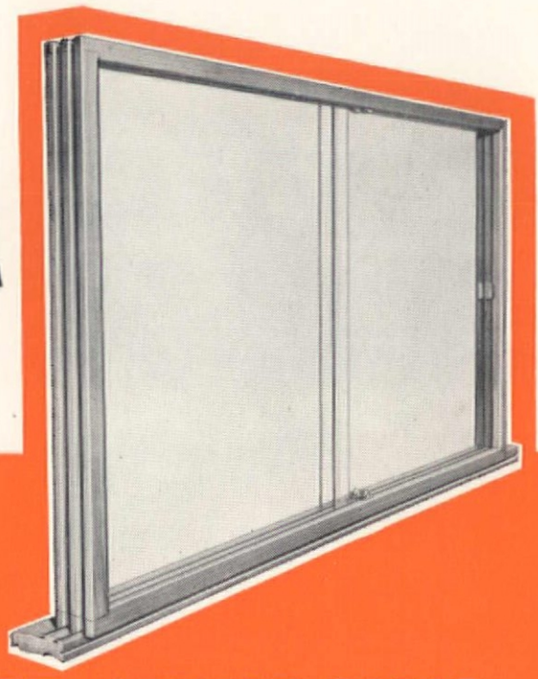

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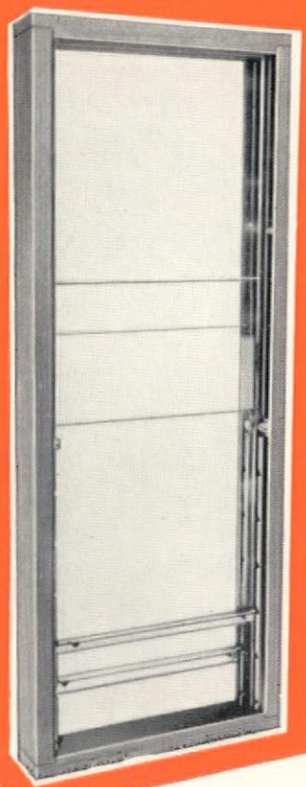

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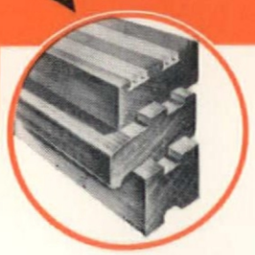

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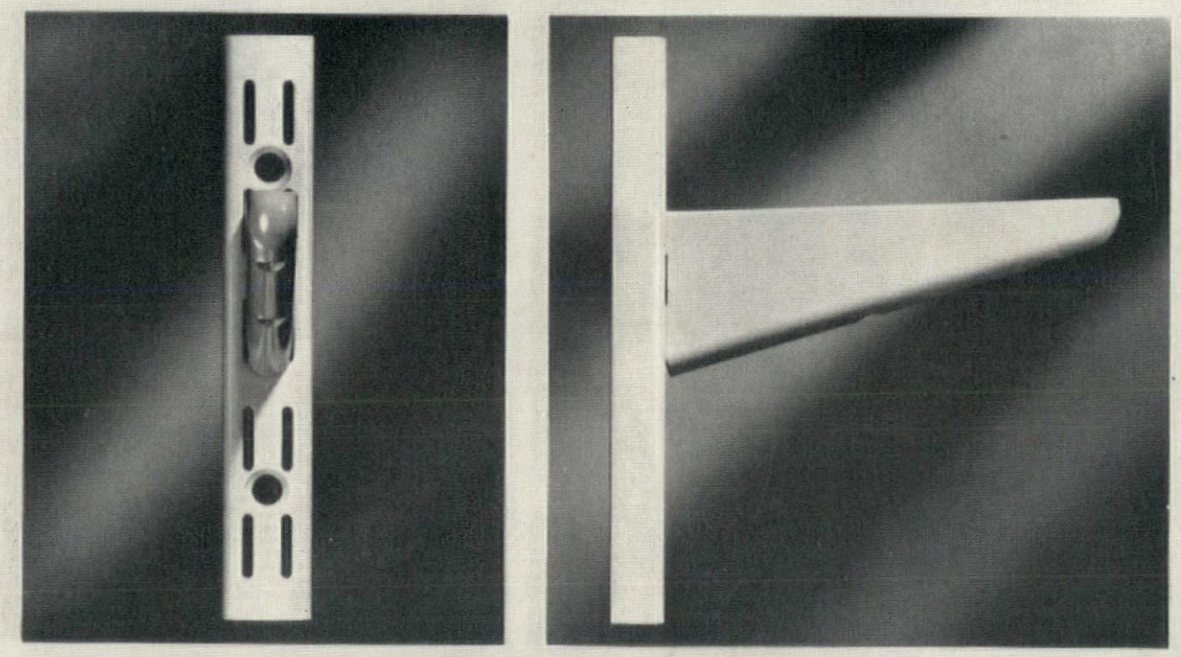

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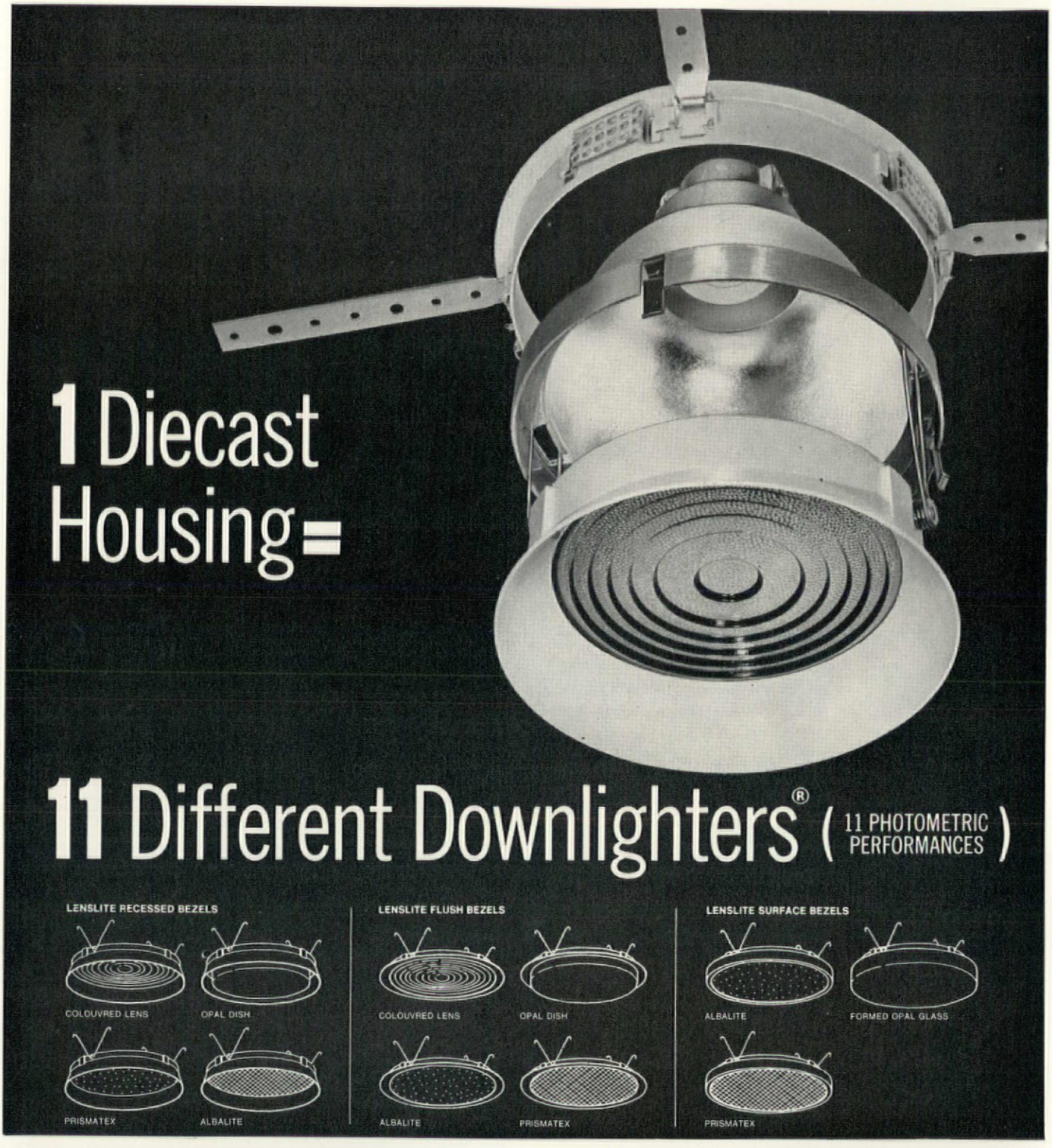

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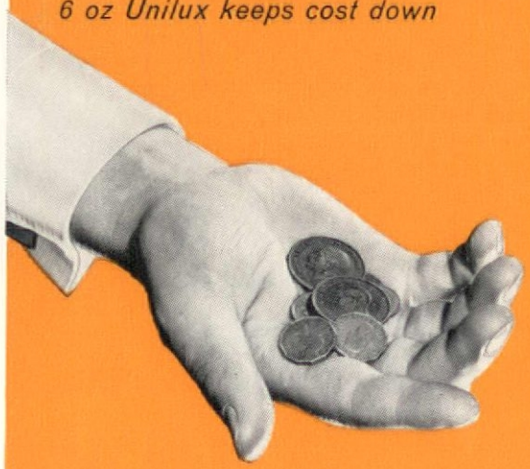

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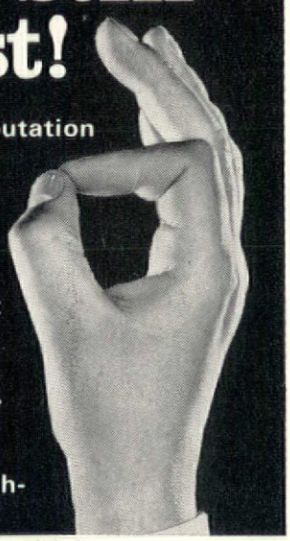

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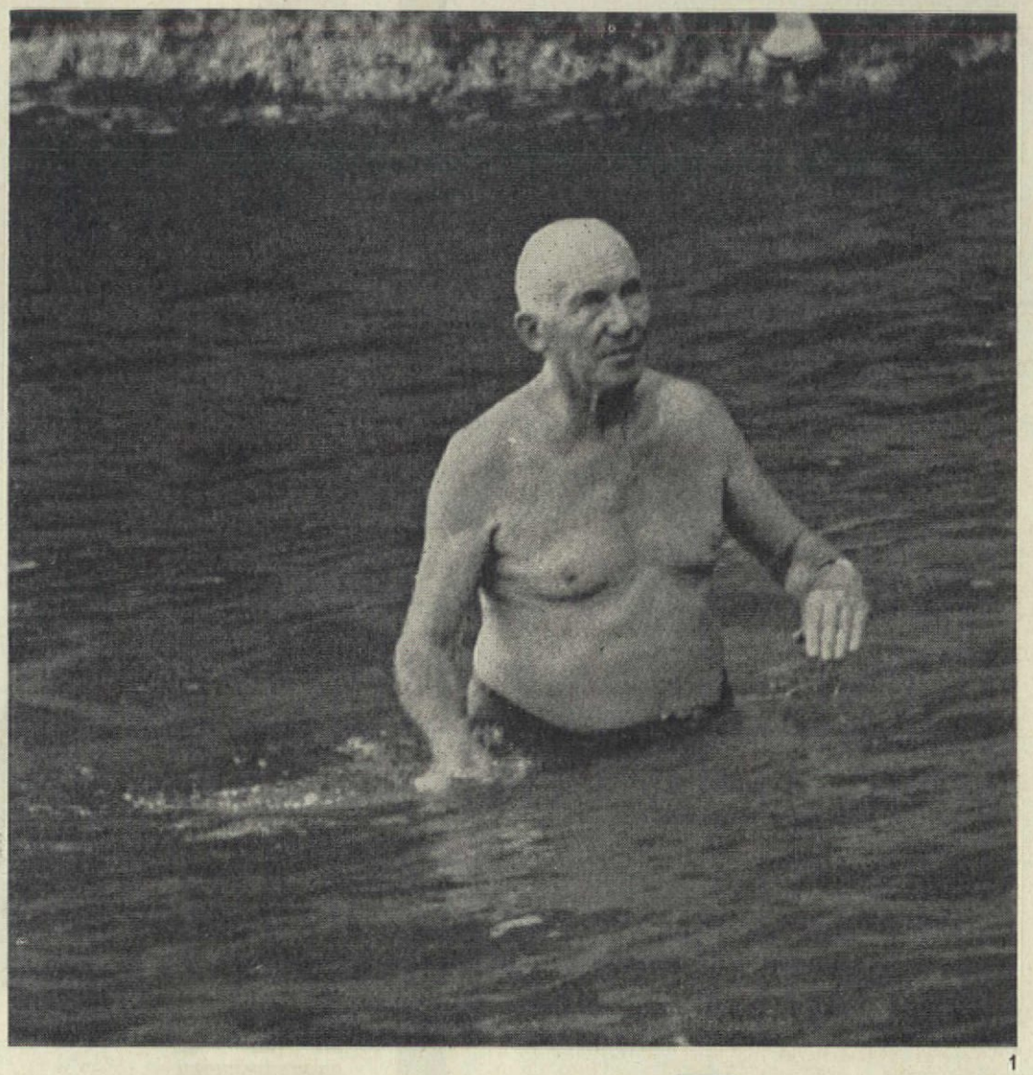

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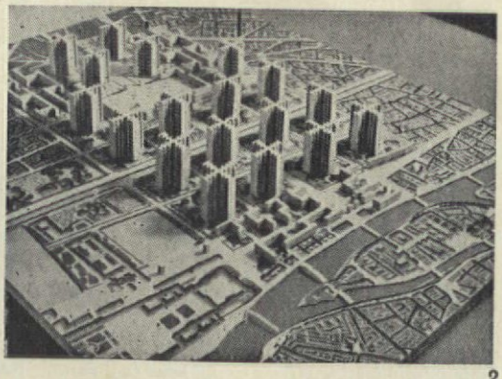

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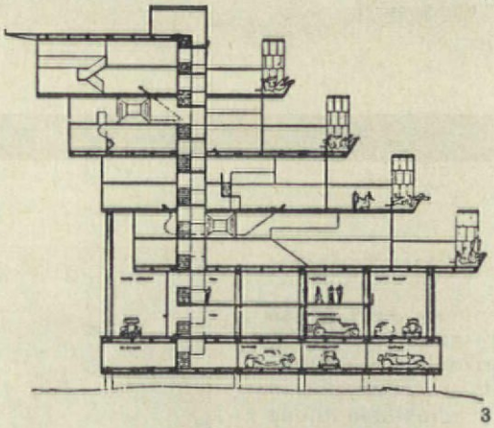

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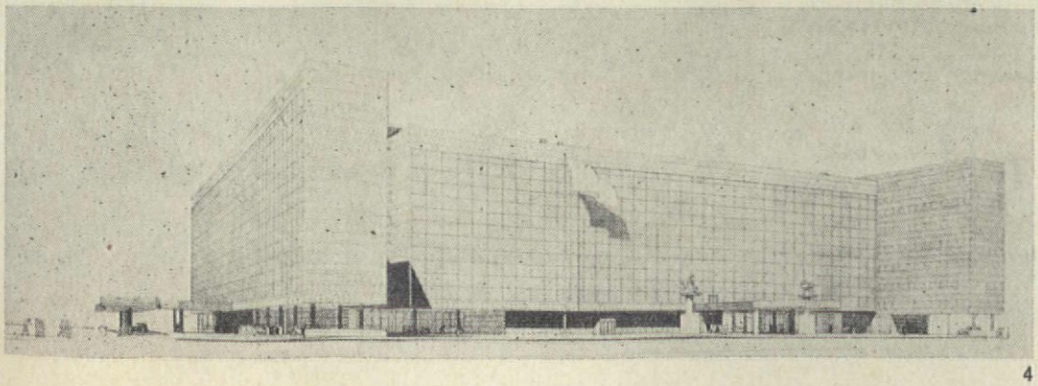


4

On Friday 27th August 1965 Le Corbusier died swimming in the Mediterranean.

Ernö Goldfinger writes:

Vers une architecture

When the architects of medieval Italy, at the end of the 'quatrocento', discovered the ruins of Ancient Rome which were there, scattered around them for a thousand years; architecture was reborn and it was to last 400 years. The Middle Ages ended when Leon Battista Alberti, in 1452, presented his manuscript of *De Re Aedificatoria* to Pope Nicholas V. It took 33 years till it was printed and then speeded to the corners of the not yet discovered globe.

In 1923, a book by Le Corbusier-Saugnier was published by Cres, dedicated to Amédée Ozenfant. Its title was *Vers une Architecture*—and architecture could never be the same again. Architecture was conceived. In fact, it was a guide to an unknown world, a world all around us—which we sensed, which we knew was there, but could not quite grasp, to be explored and discovered, a fairyland: of ocean liners, of aeroplanes, of cars, of steel bridges, of concrete grain silos, of Michelangelo and the Parthenon. It now transpires that it was also the programme-shriek of the greatest discoverer of architecture of our time. He was 36 years old and by then had built one villa in Switzerland. The book was a disjointed muddle of captions and manifestos. It was a revised collection of articles which had appeared in the magazine *L'Esprit Nouveau* since October 1920.....'A spectre haunts Europe'.....and Le Corbusier:

'Une grande époque vient de commencer.'
'Il existe un esprit nouveau.'
'L'Architecture étouffe dans les usages.'
'Les "styles" sont un mensonge. . . .'
'Notre époque fixe chaque jour son style.'
'La maison est une machine à habiter.'
'La passion fait des pierres inertes un drame', and so on, 230 pages packed with illustrations parallel with the text. A picture of an ocean liner deck on the cover, the Pont du Garabit by Eifel to start off and a pipe to end up, and between the lot, turbines, cranes, boats, aeroplanes, silos, Michelangelo, Rome, Greece, Bizantium. The golden section out of Choisy to become presently (30 years later) The Modulor. 'La maison en série' to become 'l'Unité d'Habitation'.

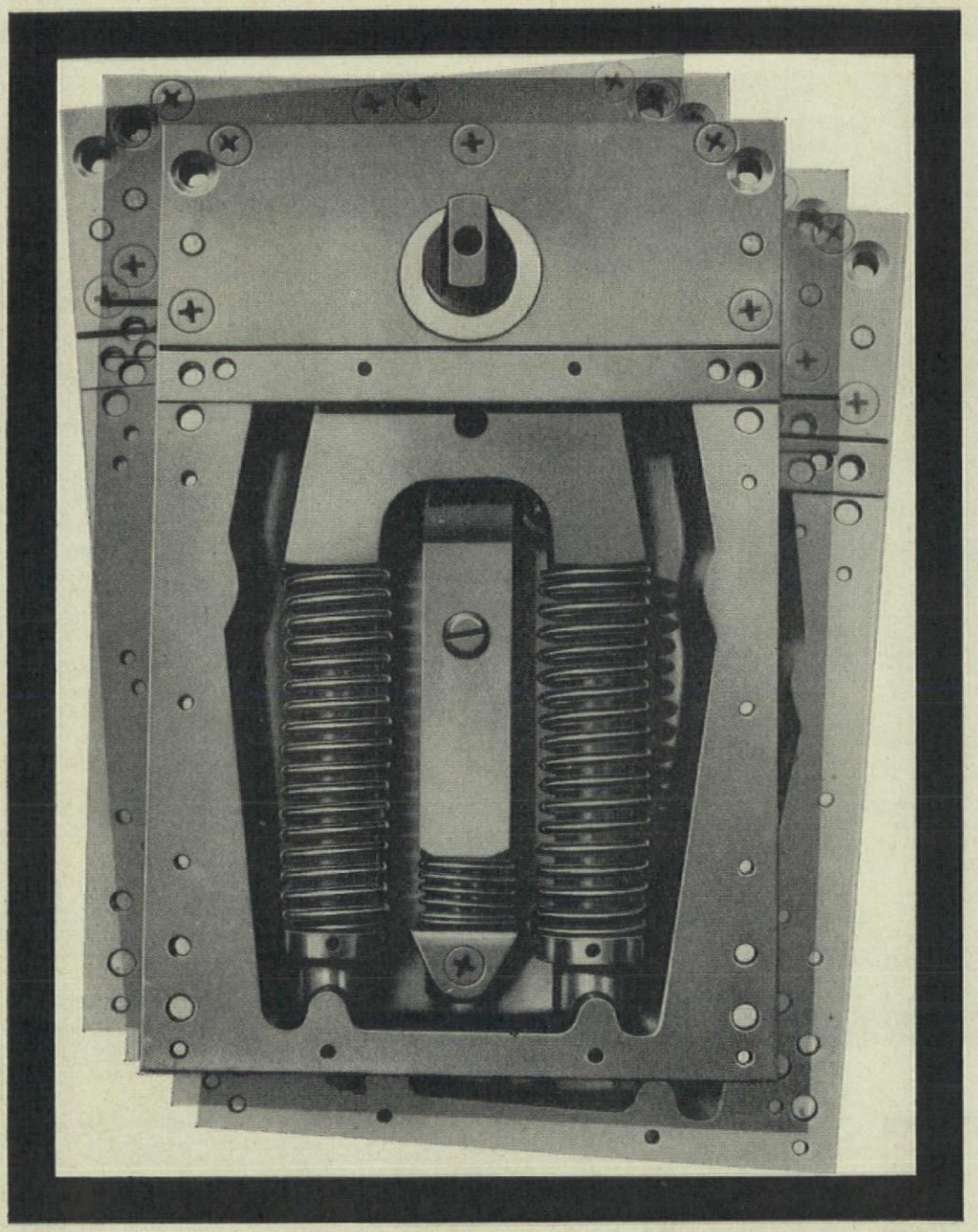
By 1923 he dropped the name of Saugnier and Charles Edouard Jeanneret became Le Corbusier.

And then came the great town planning eye-openers: still articles from *L'Esprit Nouveau*: 'L'Urbanisme' 1925, 'La Ville Verte' (Une ville de 3 millions d'Habitants) and its application to Paris 'Le Plan Voisin de Paris', a new city centre of administration between the Halles and the Gare du Nord. Paris transformed into an immense park with east–west and north–south

▷ 475

1
Le Corbusier in the Mediterranean one week before his death
2
His *Plan Voisin* for Paris, 1922–30
3
Section through his Algiers flats, 1933–34
4
The Centrosoyus building, Moscow, 1929–35
Photos: 1, Paris Match; *2, 3 & 4,* L'Oeuvre Complète *1929–34 (Girsberger, Zurich)*

MORE ADJUSTMENT



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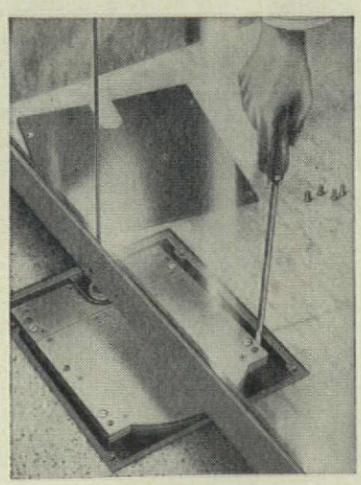


◁ 474

super Champs Elysées. High density but complete freedom on the ground, sky scrapers in a park 1935, 'La Ville Radieuse'; same theme but complete pedestrian segregation, urban motor ways, clover-leaf crossings.

The fact that Le Corbusier had no formal architectural training made him quite uninhibited; his architecture auto-didactic, he invented the rules as he went along. He set himself problems, which he then solved, like Beaux-Arts projects. First, little villas: La 'Maison Domino': La 'Maison Citrohan'. Always in the back of his mind mass production of housing, industrialization, and at his disposal an unbelievable gift of communication by drawing and writing. His solutions were, of course, quite impractical and were the laughing stock of the profession. He who laughs last. . . .

All his villas are 'one-offs'. The first, built in 1916, is rather classicistic. (He last published it in 1923.) The first really Corbusier architecture is the house at Vaucresson, and then the Ozenfant atelier. Thus started, in collaboration with his cousin Pierre Jeanneret, the heroic period.*

The first time he appeared in front of the great public of the world was with his competition for the League of Nations building in Geneva, when he was one of nine *ex-aequo* first prize-winners but did not get the commission. The world was poorer of a masterpiece.

It is in Moscow that he built his first public building, the Centrosoyus in 1934, as a result of a limited international competition which he won in 1928.

His first buildings are taut, elegant, thin. They were alien in France and referred to as 'Bosch'. They were alien in Germany and were referred to as 'French'. Both an insult in the commentators' minds. Of course they were alien. They were new, nothing like it had ever happened.

Then came the barge for the Salvation Army, flats at Geneva, the Swiss pavilion in the Cité Universitaire in Paris, in between the 'Villa' at Garches for the brother of Gertrude Stein, the Maison Savoye at Poissy, the competition for the 'Palais des Soviets' in Moscow, plans for Algiers, the flats at the Porte Molitor, competition for Antwerp; his furniture with Charlotte Perriand. In the thirties he was co-editor of the magazines *Plan* and *Prélude*, which were no longer of the high standing of *Esprit Nouveau*. Their political bias was dubious: none of the other editors could find their place in post-war France. Le Corbusier became more and more embittered. It is extraordinary that, in spite of his bitterness, he produced his real masterpieces after 1946. The Unités d'Habitations at Marseilles and Nantes, a capital city (at last) at the foot of the Himalayas, Ronchamp and La Tourette, the Museums in Tokio and Harvard (he always dreamed of building a museum).

Le Corbusier, with his writing, his ranting and building, showed the way to architecture, fired with his boundless faith in human destiny and by discovering the harmony between man, his new technology and nature.

*This period in architectural history will be the subject of the whole of *AD*'s forthcoming December issue, edited by Alison and Peter Smithson.

Richard Neutra says:

'The personality of his œuvre beyond all words holds sway. It makes a spot on earth and under the sky significant.'

Courrèges says:

'Le Corbusier is my only master. If I had the guts, I would leave it all today to become an architect.'

Life, September 6th, 1965

The month in Britain

Michael Manser

It was not a month for architecture. The death of Le Corbusier left a gap that a wavering and directionless profession can neither afford nor provide anyone of equal stature to fill.

Almost simultaneously in London Lord Bossom died at the age of 83. Among his architectural achievements, unique for an Englishman, were some of the earlier New York skyscrapers. He was Conservative MP for Maidstone from 1931–59 and was made a Baronet and Life Peer. He founded the RIBA Alfred Bossom Research Fellowship and was President of the Royal Society of Arts, Royal Designers for Industry and the Modular Society.

The Annual New Homes Show at Central Hall, Westminster, showed once again how moribund is private enterprise domestic architecture, and the almost completed Paternoster Square of the Sir William Holford St Paul's precinct scheme showed how a good bit of town planning can be killed off by moribund commercial architecture. A ten thousand pounds landscaping salvage job is to be put in hand, but nothing short of mature forest trees will obliterate the new buildings enough for the open spaces to create even an illusion of what Holford intended.

The RIBA President wrote to the Chancellor of the Exchequer to explain the long-term effects of short-term economic sanctions on the building industry and for good measure sent copies to the Minister of Public Building and Works, Housing and Local Government and Health.

The Ministry of Housing and Local Government issued its Awards for Good Design in Housing including, very belatedly, one for Chamberlin, Powell and Bon's Golden Lane Estate. The quality of these may or may not have inspired the Minister because he also commented, 'when I hear it said that modernization is impossible in Britain and technical innovation a thing of the past, I wish the critics would take a look at our new towns'. He must have convinced himself because he then approved a revised town map for Kings Lynn which will enable it to double in size by 1981.

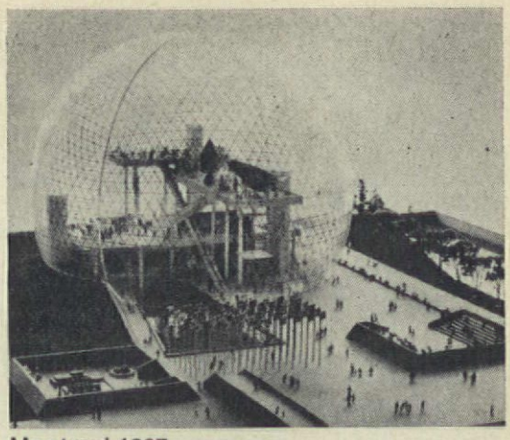
An announcement by the International Organization for World Town Planning Day designated Britain as focus country for the celebration in 1965 and November 8th is the date.

For the following year, in September 1966, England will be the location of the International Road Federation's Fifth World Meeting. The Duke of Edinburgh will be patron and with admirable optimism eight of the Ministers of the present Government have agreed to be vice-patrons.

Encouraging news came from ICI that they are forming a Plastics Application Promotion Division and from the Ministry of Public Building and Works that Lord Cohen is to be Chairman of the new Building Testing Authority.

The Cremation Society gave tea to 97 Swedish visitors at Golders Green Crematorium and the York Institute of Advanced Architectural Studies invited applications for a course with no vacancies, and the Nottingham, Derby and Lincoln Society of Architects published no. 1 of *Architecture East Midlands*, a promising new magazine.

Despite the weather, the holiday season and the international gloom, we went to press in the full swing of the Commonwealth's first Festival of Art and the heartening news that the Bauhaus is to be restored to its former Gropius-time splendour.

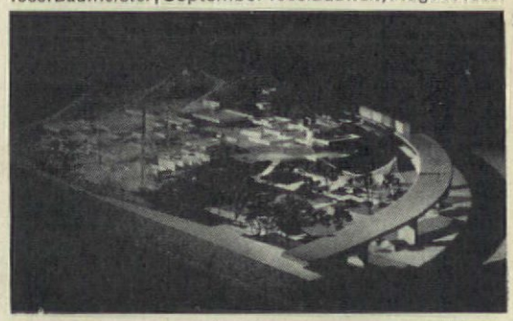


1

Montreal 1967

Lightweight structures are to come into their own in Montreal. Buckminster Fuller's US pavilion is a 250ft diameter geodesic dome **1** The multi-level structure within is by the Cambridge Seven (Chermayeffs *et al.*). The West German pavilion is to be sheathed in nets to the design of Prof. Frei Otto **2** (interior by Rolf Gutbrod). This pavilion is the outcome of a competition of lacklustre stolidity. Only the third prize, by Wolfgang Rathke and Lyubo-Mir Szabo, provokes interest **3**.

Forum, July-August 1965. *The Canadian Architect*, July 1965. *Baumeister*, September 1965. *Bauwelt*, August 1965.



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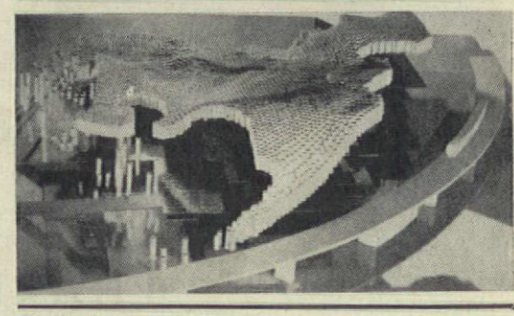

3

Order in space

Alvin Boyarsky

The enthusiasm and imaginative three-dimensional inventiveness of Keith Critchlow (his 'space families' are shown on page 514) has great relevance at the moment, when technological pressures on architects and engineers are beginning to be felt with respect to the design of lightweight assembly techniques, regulating system for component design, three-dimensional jointing problems, etc. The systematic relationships, rhythms, additive growth patterns, clusters, families of related assemblies, packing techniques, etc., to be found in Mr Critchlow's inspired intuitive analyses should stimulate us to return to geometry, in order to discover fundamental relationships in the ordering of space and matter, and to liberate us from three-dimensional cartesian rectilinear systems when not appropriate. We look forward to his forthcoming publication* due out on November 1st.

*30s. from the Standard Catalogue Co., 26 Bloomsbury Way, London, W.C.1.

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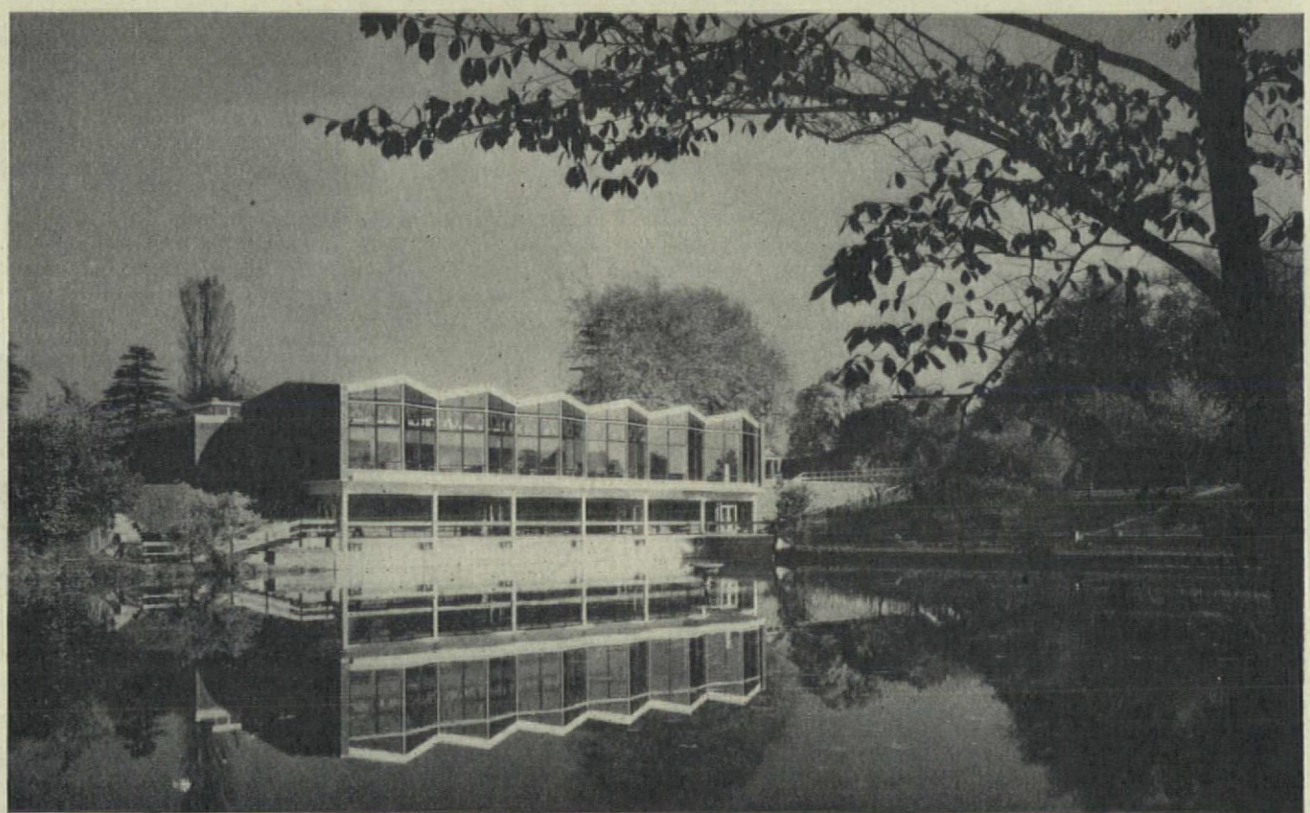

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List No. 464

Nottingham's Victoria Station redevelopment

Letter from P. J. Winchester (Arthur Swift and Partners)

Sir, With reference to your comments in September's issue of *Architectural Design*, in the section 'Cosmorama', may we bring to your attention the point that your correspondent has got some of his facts wrong.

First, the scheme lies *within* the inner ring road and by so doing, is confined within the centre of the City, the site being wholly accessible from within the road boundary; and secondly, the scheme is *not* away from the central shopping area. The scheme is linked by an underpass under one of the busiest roads in Nottingham (Lower Parliament Street), which is in turn accessible to the populated side of the City Centre; the site is but three minutes walk, even uphill, from Old Market Square.

What your correspondent should say, is that considerable commercial development has, and is, taking place south and west of the Centre, and this scheme being to the north, it would seem as if the Centre is going to be the victim of a two-way stretch; but because expansion of the City Centre includes the proposed Civic Centre to the north as well as the need to retain the Market near its present site (a very large draw), and the building of a new bus station on the site, the city is therefore either going to extend northwards anyway, or at second best, will recognize that the northern edge of its centre will become better used and better known.

One other small fact, as Mr Cullen already knows, the comment that the scheme 'will wash away what is left of old Nottingham', means pulling down a great disused railway station, a gaunt cadavre in a huge grave, which is of no use to anyone except as a place where romantic illusions can still be retained.

Missing credits

We regret that some names were accidentally not credited in other pages of this issue of *AD*!

Page AD 9: The architect was Robin Clayton.

Pages 493/5/6/8: The photographer was Michael Carapetian.

Pages 494/7 and 500: The photographer was Brecht-Einzig.

Page 499: The photographers were Michael Carapetian (Nos. 1 and 2) and Brecht-Einzig (No. 3).

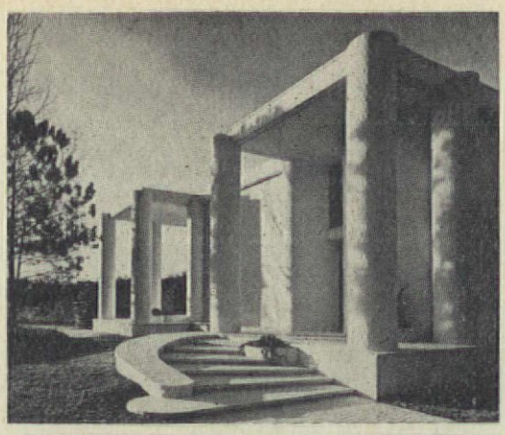
Standards

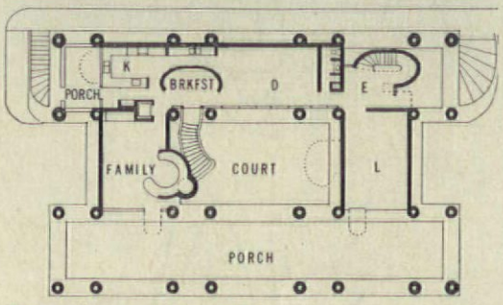
When you buy a new car you automatically acquire an instruction and maintenance manual. The same with a new central heating boiler, or a domestic electric appliance. So why not with furniture, says the Consumer Council in its recent report, *Furniture Trade and Consumer*.* (Or, come to think of it, why not with houses also, and save all that time wasted when trying to trace the water leak or the electricity fault, to mention only two contingencies?). Consumer Council recommend the use of informative labels for furniture describing qualities, performance and required maintenance, and suggest that the British Furniture manufacturers' Association should campaign to make the industry standard and quality control conscious.

The British Standards Institution has already done much to help, its latest contribution being B.S. 3893,† specifying the essential features of office desks, tables and seating, combining both anthropometric and functional requirements.

*HMSO 5s.

†BSI, 2 Park Street, London, W.1. 10s.





Fumbling in the past

The sad reassurance that American architects—following on Philip Johnson's fashionable lead—have found in their study of history has been commemorated once again in the *Architectural Record*'s 'vivid restatement of southern neo-classicism; an obscure display of architectural virtuosity by Paul Rudolf. The colonnaded loggias of his recently completed southern residence, at Athens, Alabama, are designed for 'twilight serenades'. The curved stairs and balconies 'evoke a certain romantic aura.' History, if studied with any real seriousness or humility, should surely not lead to such insipid restatements of the past. The lessons of the nineteenth century serve as an ugly warning to those students of history who seek to bolster their building with borrowed glories. Viollet le Duc himself suggested a way of thinking beyond mere stylistic attractions. *RM*

Architectural Record, May 1965

Hand made

The styling, the finish and smooth precision that one has come to associate with the architecture of Richard Neutra are, it seems, by-products only of a search for an organic architecture. They are, he told students at Stanford University last February, nothing to do with any mechanistic ideal. He not only wants no part of Detroit; he wants no truck with standardization. Man, he claims, cannot adapt himself to a universe in which products are standardized. He can accustom himself slowly to changes in his man-made environment, and in time adapt himself organically to them, but basically he is disturbed and agitated by rapid or radical change and thus deeply resentful of the ever-altering range of standardized products that are being dumped on the world markets by manufacturers and admen. It is the duty of all architects, Neutra asserts, to uphold traditional habits and customs, and design always with them in mind, so that man might not be disturbed by anything overtly new. In particular, the architect must guard against new standardized products. Standardization, he says, 'is dictated by automated production without cybermatic self-correctivity'. The answer is a greater variety of hand-made—or if necessary machine-made—products. *RM*

Expression in Rome

Lucio Passarelli and associates have recently completed an expressionist fantasia astride the Aurelian ramparts in Rome—shops at street level, glass sheathed offices above with hanging gardens and balconies to the luxury flats stuck on top.

Photo: Ludovico Canal



Elm bark beetle

Alexander Pike

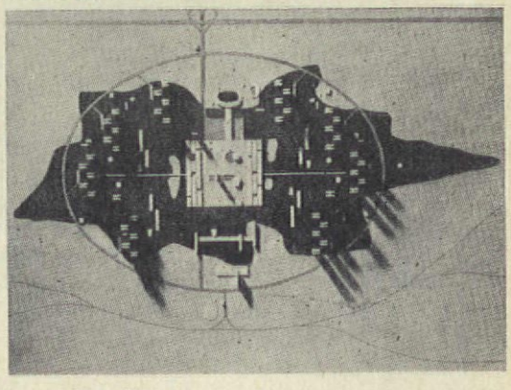
Weight for weight, *Scolytus scolytus*, the minute elm bark beetle, may have done as much to change our environment as developers or planners. The small grubs destroy the cambium layer in their breeding sites in diseased trees and emerge as beetles to feed on healthy ones, transmitting the spores of a fungus that chokes the trees' circulatory system. Thus has Dutch elm disease frequently caused the loss of fine avenues or isolated specimen trees.

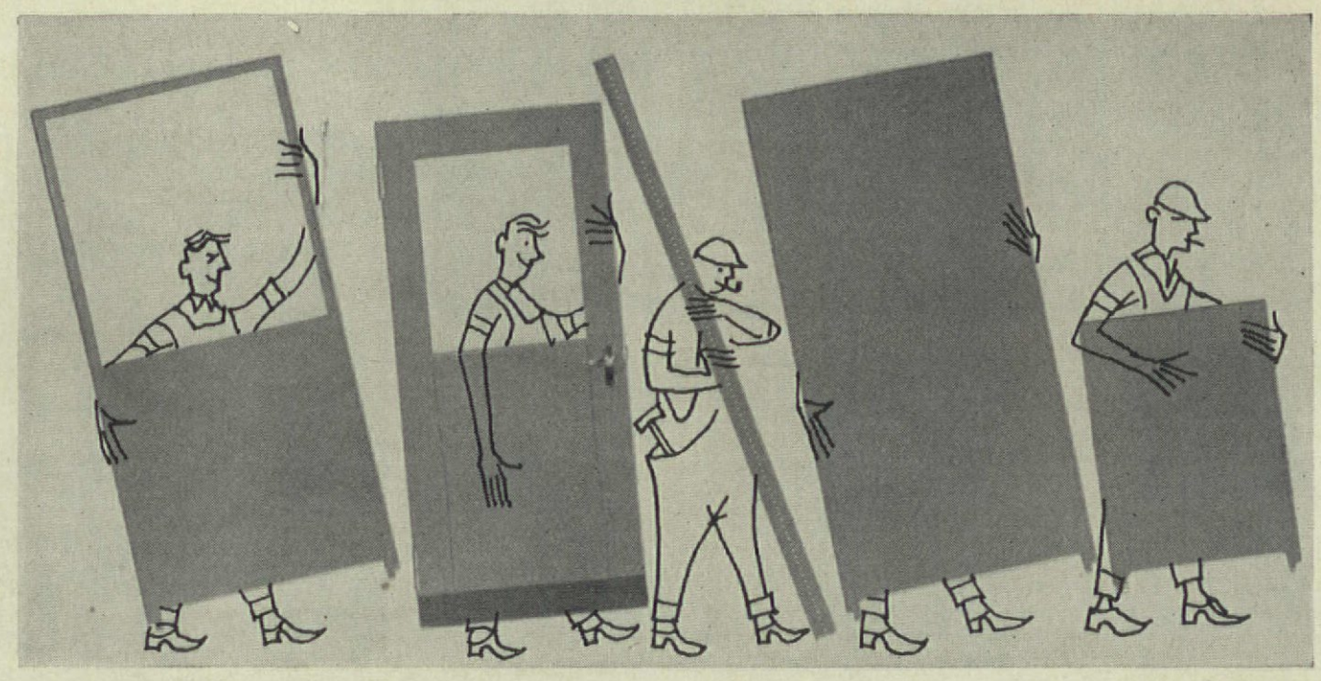
Shell Chemical Company (USA) have developed Bidrin, a substance with which the tree can be inoculated from a pressurized capsule. It retains its toxicity for 30 days, during which it either kills or repels the beetle. Its future use in this country may provide diminished justification for the large body of public opinion always ready with strong arguments for felling trees.

Niemeyer

Oscar Niemeyer has been awarded the annual prize of the magazine *L'Architecture d'Aujourd'hui*. His recent work was on show at the Musée des Arts Décoratifs, Paris, from June 23rd to October 4th. A design for a new city in the Negev, Israel, where he has worked during the past few years, is illustrated here.

Módulo 39, March-April 1965





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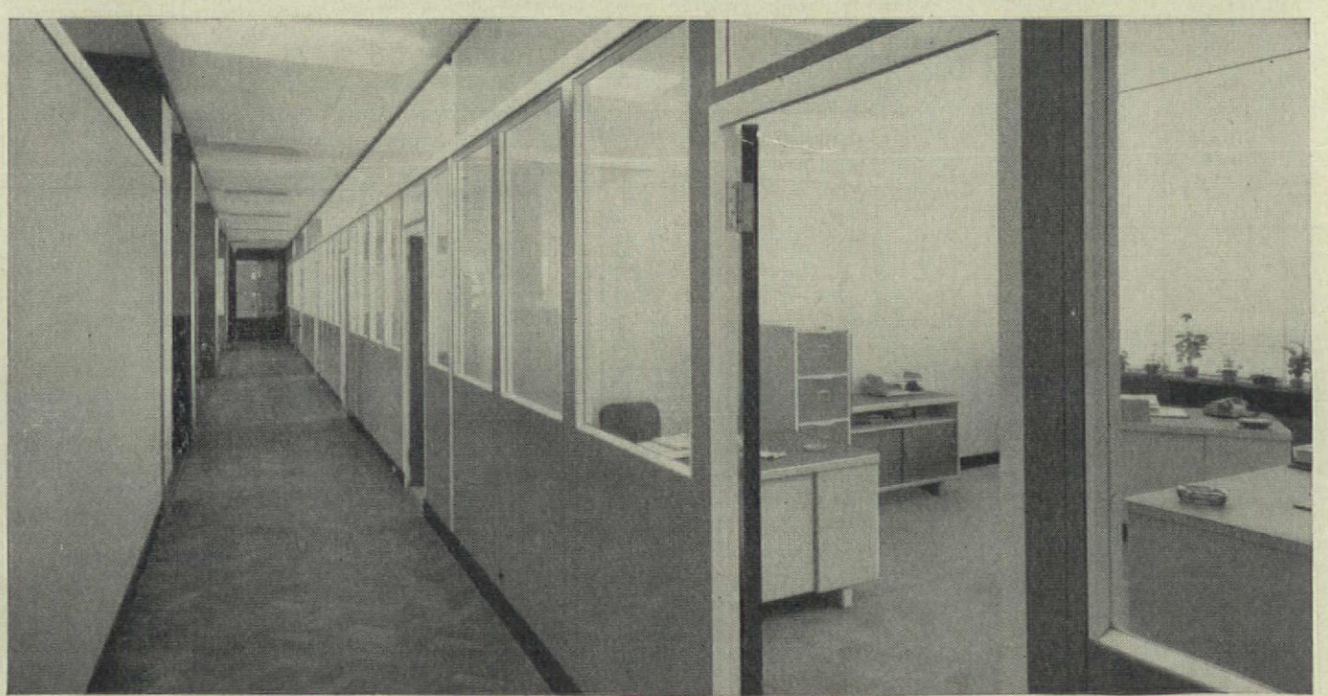

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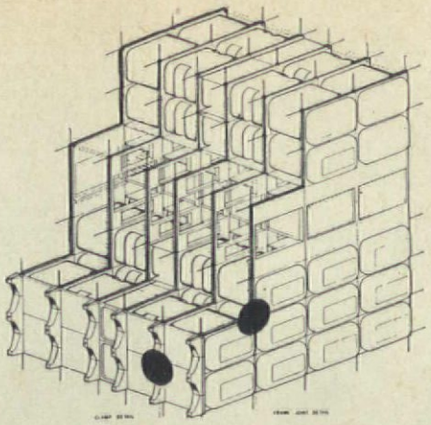

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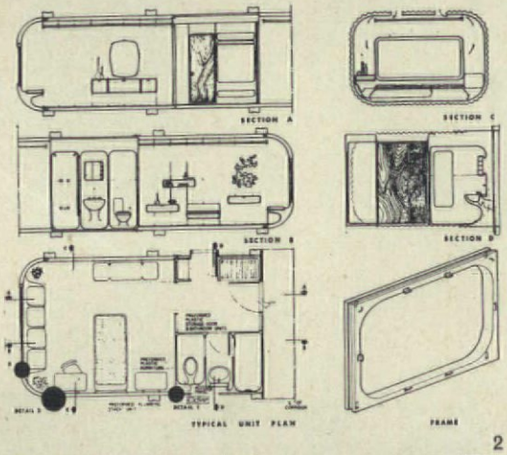

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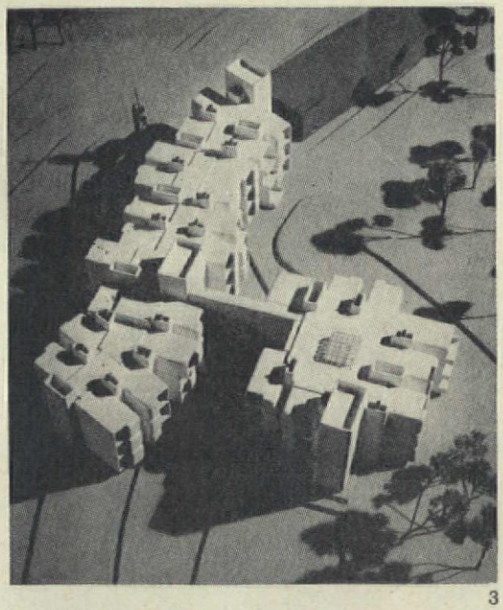

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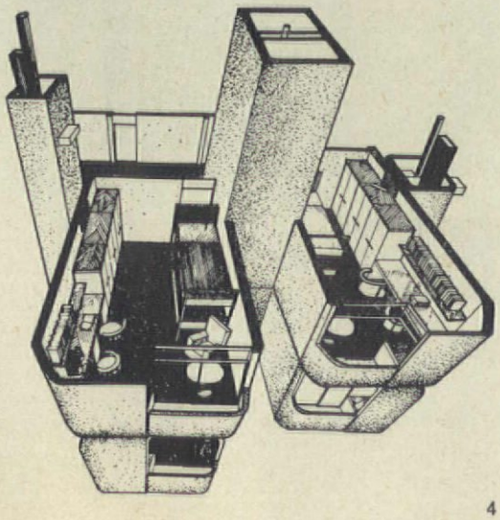


4

Standardized space or standard components?

Raymond Wilson

What distinguishes a component from a building? This is a hard question to answer when prefabricated parts have reached the size of house sections (Truscon) and entire flat units (USSR). As yet no commercial system has adopted a room size unit. Such units have, however, appeared in various projects from the Coulon/Magnant/Schein plastic motel units and the Pea plastic holiday units of the fifties to the 'plug-ins' of the UK and the cellular units from Ulm (*AD* July) of the sixties. Clearly if the room is to be the module of standardization then motels, hotels and hostels, with their quantity requirements, their optimum shapes and their 'same as the one next door' functions, are the most sensible building types for their application.

Two American schemes arouse interest along these lines: the first a hotel designed by William A. Plyer at the Graduate School of Architecture of the Pratt Institute, N.Y. of reinforced plastic capsules in a concrete mega-frame **1, 2**; and the second a student hostel designed by the US office of MGM (McMillan/Griffis/Mileto) of precast and site concrete **3, 4** (although the design is evidently as suitable for the use of reinforced plastic as the other).

The scale of prefabricated components is governed in practice by economic criteria such as handling, storage, transport and distance from factory (weight is no longer a dominant factor with the use of plastic units); in theory, however, design flexibility is the criterion.

We know that bricks give considerable design flexibility and that flat size units don't; somewhere between lies the optimal point for prefabricated residential buildings, and we suspect that it might be between the 1 metre unit and the room section element.

But in considering 'design flexibility' we must be careful to distinguish 'design convenience'. It is simpler to design with simple units, especially if these units are rooms; and there is a great danger that rooms may be standardized for this convenience.

Reinforced plastics and room sized units may be with us in the near future; already a lot of work has been done on 'heart units' and we can possibly learn some economic and design principles from these. The most contended and ambiguous issue is that between the 'space' elements and the 'works'.

Should one provide a compact and specialized 'works' component (in the case of hotels/motels this might be wardrobes, basin, electrics, window and air-conditioning) and rely on standard space enclosing elements with a certain amount of site assembly? Or should one provide a pre-assembled space with all the works built-in with no site work, but with the extra cost of transport, storage and handling? Technology can produce cheap and abundant space; it can also produce complicated and sophisticated working parts; this distinction is a principle that designers must understand if they are to make sense of prefabrication; it is a distinction that favours the first alternative.

Plyer's project makes sensible and orderly use of the potential of lightweight plastic capsules, but with the fine tolerances of plastics and the US know-how of steel, why a concrete megaframe? MGM's project demonstrates the considerable flexibility of a standardized unit, but does it really need so many specials to connect them together?

Interbuild, April 1965
Progressive Architecture, August 1965

BASA*
Edulocation conference, Edinburgh

Michael Biggs

Despite an attendance of only 35 delegates, this conference managed to cover some fairly significant ground. The problem of where schools of architecture should be put, spotlighted by the RIBA's recommendation that they all be in universities, involves some fairly basic issues. What do we want of an architecture school? What sort of architects do we want? The first will be the product of the second.

The conference did not resolve the contradictions involved in the specialist/all-rounder issue. Delegates felt that schools of architecture should be liberal and permissive institutions offering many different courses, each to a very high level, and as much freedom of choice to students as is compatible with reasonable administrative efficiency. Students should be allowed to educate themselves, to choose their teachers as well as their curricula; they can work out their own concept of the architect as they go along. Interest was shown in the idea of a spontaneous university, with no administration or red tape at all. Just a group of people going off to study together, which Alexander Trocchi (who was asked to the conference but infortunately did not come) has put into practice in the USA—with the help of a large lump of money from some millionaire! Spontaneous schools of architecture seemed an attractive if impractical possibility.

Delegates were against asserting dogmatically that schools of architecture should be in a certain type of institution; what a school was like was far more important than where it is located. Some of the requirements of a good architectural school were best met by universities, some by art colleges or institutions more closely connected with technology. The conference passed unanimously the following resolution:

'This conference considers that there are no clear advantages at present to be found in any one parent institution for schools of architecture and that a distinction must be made between opportunity and achievement.

Consequently, although it would appear that opportunities are potentially greater at university based schools, particularly in respect to facilities and cultural environment, the conference does not accept the present RIBA policy put forward to the Board of Architectural Education.

The future of each school in a continually evolving educational climate must be considered in relation to individual merits, and not subjected to judgment according to rigid formulae.'

At the end of the conference, Scottish Bill Cannon was elected President of BASA, and Geoffrey Flockton, of the Southend School of Architecture, was elected Honorary Secretary.

*British Architectural Students Association.

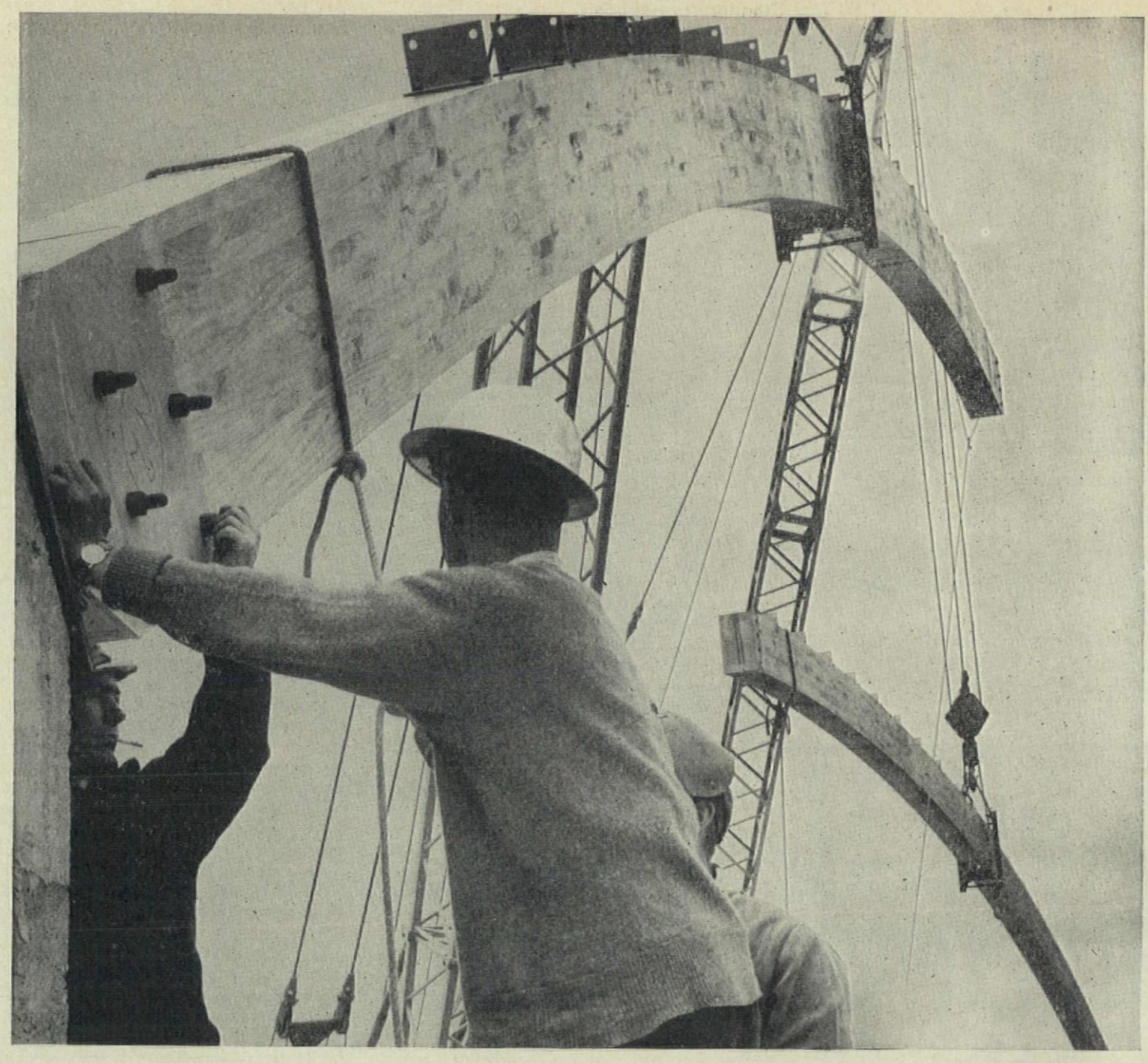
Competition winners

Ashdod town centre, Israel

Jean Ginsberg and Piérre Vago (France) with Martin van Treeck were the winners of the first prize in the invited competition for the design of the centre of this new Mediterranean port.

Tahrir Square, Baghdad

Whicheloe, Macfarlane & Towning Hill (UK) with Duraid Al Yawir & Besim Hakim (Iraq) have been awarded first prize for their design for the complicated central traffic intersection.



120ft. arches glued with Aerolite

New Zealand's biggest indoor sports centre at Rotorua, North Island, incorporates the largest glued laminated wooden arches ever erected in that country. A requirement of the project was an uninterrupted playing floor space of 150 ft. x 100 ft. in the main stadium. This was achieved by using constant radius, 2-pin arches, fabricated in two pieces and jointed at the apex by a moment transfer connection. The arches were laminated from 12 in. x 2 in. boards, giving a final design section of 21 in. x 11½ in. Span and radius were both 120 ft.

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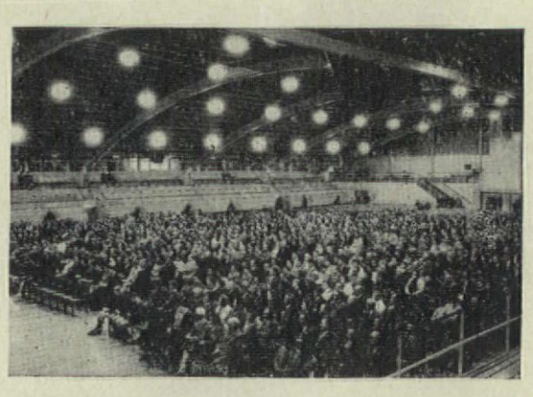

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ECOSOC

Elizabeth Young

ECOSOC's Advisory Committee on the Application of Science and Technology to Development list in their second report* several 'specially important problems of research and application' where 'massive concerted attack' seems likely to produce widely beneficial breakthroughs. In the field of housing and urban planning three are of 'outstanding importance'. These are the settlement of newcomers in urban centres, the industrialization of building, and roofing material and design suited to the tropics.

As they point out, 'the largest migratory movement in human history is now taking place. It is the migration from rural areas to urban centres. Yet in many countries little if any preparation is made for the absorption of the migrants into urban life. Consequently, squatters' colonies, in and around the larger cities of the devloping countries are apt to become breeding grounds not only for ill-health and epidemics, but also for human misery and consequent unrest'. (i.e. planned urbanization is to some kinds of political unrest what contraception is to some kinds of overpopulation, and hygiene is to some kinds of disease.)

The argument for the industrialization of building is familiar everywhere, and only complicated by the special conditions of many developing countries.

Their third candidate for a breakthrough is dead simple: a good roof. It should not be beyond the wit of man to devise a good cheap roof.

*Economic and Social Council, Official Records, 39th Session, supplement no. 14, May 1965.

Love in a beetle

I. Chippendale

In the beginning it had two things at the back, these then became an oval, then a big oval before the passing years required these to be vista vision—and as Mr Bates said, you cannot have any more window than that without the roof coming off.

And so one can see an end to the beloved beetle.

The beetle that hundreds of quiet men had a love affair with before they or anyone ever knew you could be sane and bonkers about the Beatles—or, as an American button claims, 'I'm Bugs about the Beatles'.

But Herr Volks W's beetle had no bugs.

It always started.

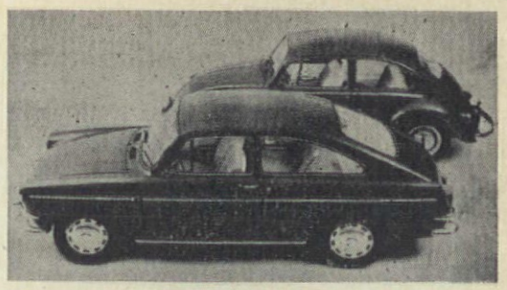
After a late fifties snowy winter I remember us driving off leaving all the street standing—so our neighbour bought a tomato. And even if you did let the battery go, or run out after you'd switched the emergency tank it could be pushed —not like the jeep.

Manhandled—perhaps not like the 2 c.v. but sufficiently—out of a snow-drift sidled into through the VW's liability to bum sway, or mud in a farm gate learning to reverse.

And with organization and know-how you could pack two whole contrary lives of luggage under cover and a baby to boot.

It only began to lose ground as the cost went up and speed went up and you wanted a bit more air between the other idiot driver and yourself and your bodywork.

As for the Beatle generation—the mini got them. But for the middle-aged there is no forgetting



your Volkswagen. It was not only love of animals or machines or sound (it was like a speed boat). You wore the Volks.

I remember thinking you were so close together in the Volks and so far apart in the DS your relationship as a married couple was bound to subtly change.

Now you could stand off the situation of each other.

Then it was love in a box.

After it a big car was a kind of physical divorce. If ever one got the chance to repeat the space experience we must all have had in a pram, it was the Volks. It was a well-made quality job, clean, cleanable, went without trouble, took you there and brought you back, comfortable, warm. And you were in return right up against it, looking out at the world.

Postscript, Volkswagen in their American ads ask 'Will we ever kill the bug?'

Answer 'Never' 'The bug forever' echoes *Time Magazine*.

Concrete poetry

Jasia Reichardt

During the earlier part of the twentieth century one became gradually aware of the area of creative activity which belongs neither strictly to literature, music, nor painting, but somewhere in between. Mallarmé's concern with the typographical arrangement of his 'Un coup de dés' (1897) was one of the earliest instances of the content of a poem being directly influenced by the way it was printed. During the early 1920s, Hausmann's poster poems, Albert Birot's 'Poèmes a la chair', Apollinaire's calligrammes are among the best examples relating semantic content of the poem to its visual form.

The idea behind the various dada extravaganzas —simultaneous, phonetic and visual poems— was to develop a form of communication where the literary message was stressed by being provided with a formal counterpart—the image. The dynamic typography of these poems was a vehicle for spontaneity, irony and satire.

Concrete poetry (under this name), which was first introduced in Germany and Brazil in the early 1950s, is directly related to those early examples. Concrete poems, such as those of Franz Mon, Kriwet or Dienst cannot be read; they are poems by virtue of poetic intent and use of type, despite the fact that the printed image is presented in such a way that no letters, let alone words, are decipherable. This, in itself, opens the field of concrete poetry not only to writers but to painters as well, and John Furnival, for instance, who started out painting pictures, has more recently been creating works composed entirely of letters and thus has crossed the borderline of poetry and painting. Often the text is limited to something extremely simple. Eugen Gomringer, who published the first concrete poetry manifesto in Switzerland, makes up his poems out of a single word, e.g. 'silencio'; Diter Rot has done this entirely out of full stops, and Pierre Garnier from a single word 'soleil'. Whereas Garnier, Jandl and Ian Hamilton Finlay are the exponents of a more lyrical type of poetry, the Noigandres group from Brazil are more specifically concerned with biting comment. Decio Pignatari's seemingly innocent 'beba coca cola' is an extemporization of blatant anti-American sentiment (beba—drink, babe—slob (both third person imperative), cola—glue, caco—pieces, cloaca—w.c.)

In some cases concrete poetry is concerned with neither semantic values nor visual ones. The phonetic poetry of Henri Chopin, for instance, is closer to electronic music; the medium is voice and words, but the way in which both are transformed and distorted on tapes, makes them completely unrecognizable. Ernst Jandl's phonetic poems, however, are the result of reading aloud a poem composed of word elements, although these have no literary meaning as such, or at least do not tell a story, and the reader can endow them with the overtones of his own interpretation. Under the banner of concrete poetry are included also semiotic poems; these consist of abstract symbols with a lexical key, so that as the various forms assume a sequence of different positions one can interpret the story of their relationships.

Concrete poetry is one of the most interesting creative phenomena of our time. Not only is this the first ever international poetry movement, it is a form of activity which recognizes no barriers and inevitably progresses towards a total work of art.

The first exhibition of concrete poetry in London, opens at the ICA on October 22nd under the title Between Poetry and Painting.

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EUGEN GOMRINGER

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PEDRO XISTO

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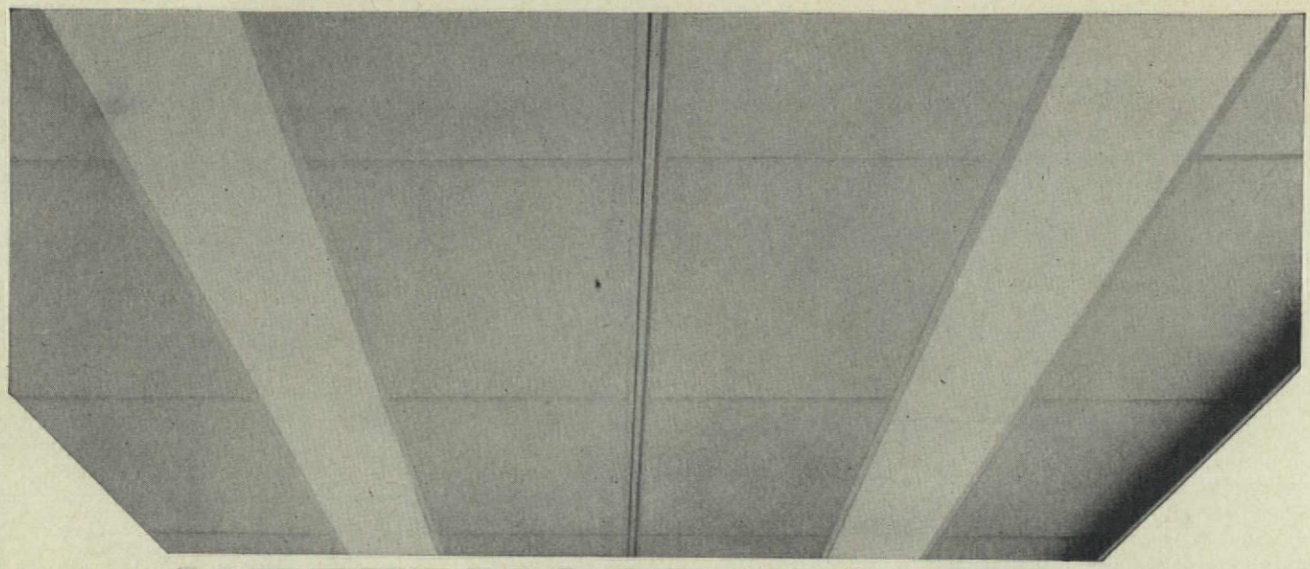
DECIO PIGNATARI



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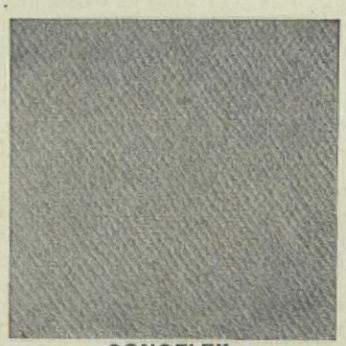

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Dans ce numéro

Vers une université mondiale
Page 481

1965 a été désignée par les Nations Unies comme étant l'Année de la Coopération Internationale pour marquer le vingtième anniversaire de leur existence. Cette année internationale ne doit pas être vue comme étant un effort isolé pour toute une année mais comme étant le tremplin pour d'autres actions concertées. Le point central des objectifs de l'ICY est l'idée que l'accumulation des connaissances de l'homme seront de plus en plus souvent et rapidement utilisées pour résoudre ses principaux problèmes mondiaux. Ceci sera plus facile à accomplir grâce à une 'université mondiale'—dont le souci principal serait les connaissances traitées sur le plan mondial et qui seraient orientées pour être appliquées sans être restreintes par des considérations locales.

Il y a déjà eu un certain nombre de propositions dont la plus réaliste fut celle présentée par l'Académie Mondiale des Arts et des Sciences.

Une tentative de prototype pour un collège mondial fut essayé en 1964, le projet était sous l'égide de la Société des Amis Quaker. Parallèlement à ces développements mondiaux il y en a d'autres qui sont d'intérêts comparables et apparentés au programme du Décade de recherche mondiale'. La conception de dispositifs d'éducation, de facilités et de systèmes pour combattre l'analphabétisme, le problème principal, est en lui-même un formidable défi. Lors d'une récente 'Conférence Mondiale pour une Cité Internationale des Sciences' il fut proposé la fondation d'une cité scientifique 'extra-territoriale' consacrée à l'étude particulière et à l'accumulation de solutions aux problèmes mondiaux spécifiques. Le premier problème choisi pour ce centre fut celui de *l'Alphabétisation du monde*. Un emplacement a déjà été offert en Italie.

La cité elle-même sera organisée pour des recherches sur une grande échelle, le développement et les possibilités de production en masse d'une gamme complète de systèmes éducationnaux.

Année de Coopération Internationale, et Décade de recherche mondiale, 1965–1975
Page 483

Les architectes auront bien des occasions de coopérer sur le plan international par exemple au sein de l'Union Internationale des Architectes ou de l'UNESCO, or de l'ONU même.

Mais l'une des suggestions les plus révolutionnaires—qui produirait de remarquables résultats si elle pouvait démarrer—est 'Décade de recherche mondiale, 1965–1975', de Buckminster Fuller, qui fut proposée lors des Congrès de 1951 et 1953. Son plan est que les écoles mondiales d'architecture devraient collaborer à un plan décennal comprenant des programmes de recherches en cinq stades de deux années. Il maintient que si les architectes et les étudiants ne peuvent prendre l'initiative de la conception mondiale alors l'industrie militante envahira le domaine de la vie, et, ainsi qu'il le dit lui-même, 'les corporations industrielles ont la vue trop courte, les scientifiques ont en général une vue infiniment longue tandis que les étudiants en architecture sont réalistiquement idéalistes et ont une vision bien coordonnée. Les corporations industrielles sont préoccupées par des projets immédiats et non par les succès de l'homme en tant qu'homme'. Nous ne donnons ici qu'une brève indication du contenu, avec des citations prises aux quatre Documents déjà publiés au sujet du programme décennal.

L'exposition souvenir de Nehru
Page 488

Sharada Prasad, le Conseiller éditorial, décrit comment l'exposition eut lieu à l'Institut National de Dessin Ahmedabad d'après le plan de Charles et Ray Eames. L'Institut de Dessin est situé (temporairement) dans la Galerie d'Art Civique construite par Le Corbusier. Travailler dans ce cube austère en ciment avait ses sensations et ses problèmes. Nous avions tous l'impression d'être moines; et les pigeons, qui pouvaient entrer et sortir par les grilles de Le Corbusier, aimaient évidemment se percher sur les tableaux qu'ils marquaient. Il y avait aussi un autre handicap—la distance de Delhi, source de tous les matériaux et de l'autorité. Les deux villes ne sont qu'à 600 miles l'une de l'autre, mais c'est une distance énorme dans un pays avec des moyens de communications sous-développés. Tous ceux qui n'avaient pas la ténacité de Charles Eames 'cela ou rien' aurient abandonnés.

Le Corbusier à Chandigarh: créateur et générateur
Page 504

Le Capitol au nord de Chandigarh comporte le plus grand nombre d'immeubles Le Corbusier réunis en un seul endroit. Ils forment un groupe ayant un rapport étroit. Il n'y a qu'ici que l'on peut voir son œuvre sur une grande échelle. La position des immeubles avec pour fond l'Himalaya et leur rapport vivant avec la cité qu'il créa en rehaussent la splendeur. Les quatre immeubles dans le complex du Capitol doivent pouvoir loger les quatre institutions principales du Gouvernement de l'Etat—le Haut Tribunal, le Secrétariat, la Chambre (ou Corps Législatif) et au début la maison du Gouverneur, mais maintenant le Musée des Connaissances ou le 'Laboratoire des Décisions Scientifiques'. Chaque immeuble est entier en lui-même, mais les quatre se complètent pour former un tout. Situés dans un parc ils seront éventuellement reliés par des chemins, des ponts, des étangs et des esplanades pavées. Ensemble ils forment le clou visuel de la ville.

Seuls trois immeubles sont terminés pour l'instant, le Secrétariat et la Chambre à l'Ouest et le Haut Tribunal à l'Est. Le rapport entre le Secrétariat et la Chambre est maintenant clair, mais le Haut Tribunal continuera à faire un peu seul et disjoint tant que le quatrième immeuble, prévu entre la Chambre et le Haut Tribunal, ne sera pas construit. Dans ce quatrième immeuble il devait y avoir la maison du Gouverneur. Mais Le Corbusier se ravisa et préféra un autre immeuble sur cet emplacement, un immeuble plus approprié à son temps, pensa-t-il—un Musée des Connaissances, son 'Laboratoire Electronique Pour Décisions Scientifiques'. En plus des quatre immeubles du Capitol, Le Corbusier construisit un club nautique sur le lac, une école des Beaux-Arts et un musée dans la Vallée des Loisirs, un prolongement du Haut Tribunal, une entrée, les accessoires pour les routes et les promenades le long du lac. Il prépara des plans pour l'aménagement, avec sculptures, du parc du Capitol, il prépara l'aménagement d'un autre parc à l'Ouest du Capitol et il en fut de même pour la Vallée des Loisirs. Il fit des plans aussi pour des immeubles le long des routes nationales et au centre de la cité.

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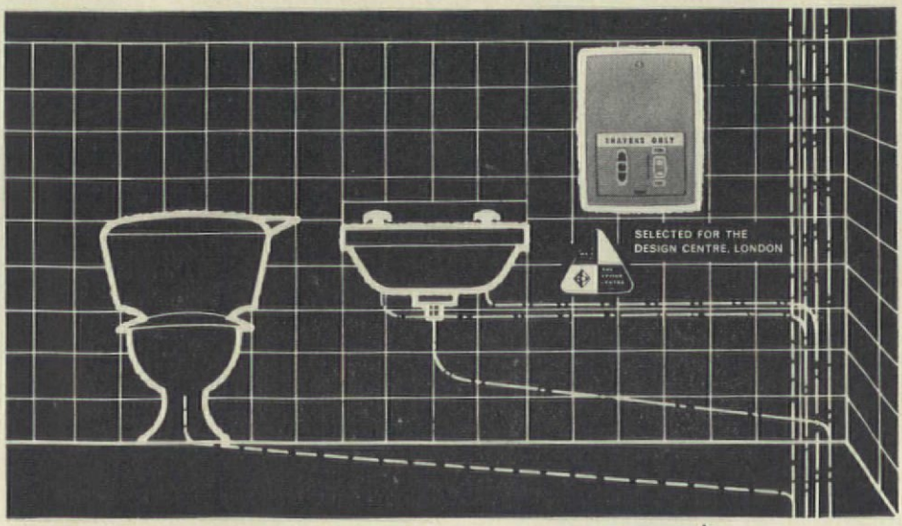

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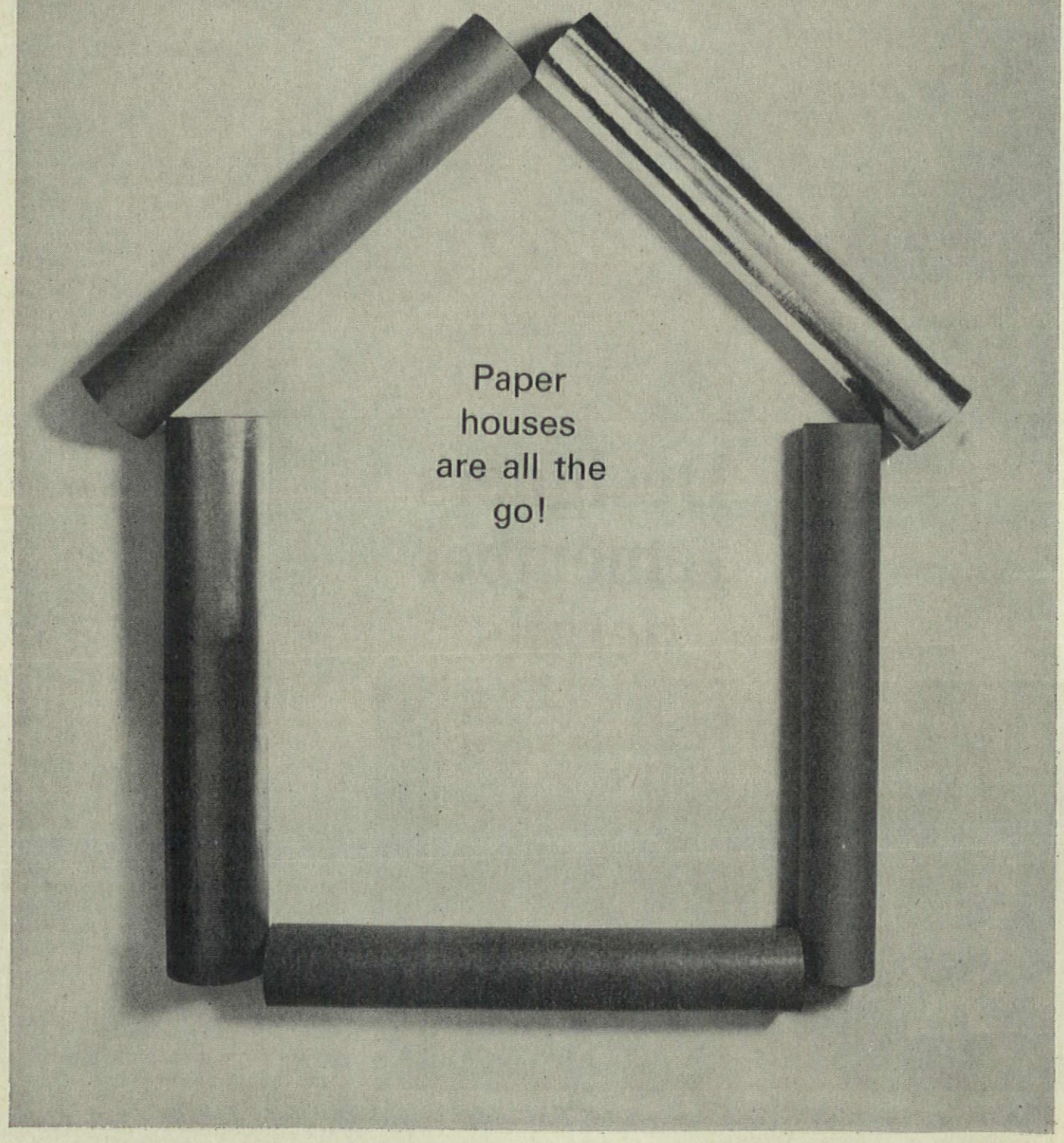

En este numero

Hacia una universidad mundial *Página 481*

1965 ha sido designado el Año de la Cooperación Internacional por las Naciones Unidas para marcar el trigésimo aniversario de actividades. Este año internacional va a ser enfocado no como un esfuerzo aislado durante un año, pero sí como una plataforma para futuras acciones de conjunto.

El objetivo central del ACI es la idea de que el conocimiento humano acumulado puede ser más y con mayor facilidad aplicado a la solución de sus problemas mundiales. Esto se podría lograr a través de una "Universidad Mundial"—una cuyo interés principal sería el del conocimiento tratado en términos mundiales, y así orientada para poder ser aplicados sin limitaciones impuestas por intereses locales estrictívos.

Ha habido un número de proposiciones recientemente de la cuales la mas realística ha sido la propuesta por la Academía Mundial del Arte y de la Ciencia.

Un prototipo experimental para un colegio mundial ha ya sido probado durante el año 1964, en un proyecto apoyado por la Quaker Society of Friends. Asociadas con estos programas mundiales hay varias otras sociedades las cuales tienen un interés relacionado con la Década de la Investigación Mundial.

El diseño de aparatos educativos, útiles y sistemas para combatir el núcleo mismo del analfabetismo—que es el mayor problema—es una empresa formidable. Una reciente "Conferencia Mundial para la Ciudad Internacional de la Ciencia" propuso el establecimiento de una **"ciudad científica"** extra territorial, dedicada al estudio exclusivo y a dar soluciones a problemas mundiales solamente. El problema inicial elegido para este primer centro es el *analfabetismo mundial*. Un terreno ha sido ya ofrecido en Italia.

La ciudad misma será organizada como un vasto complejo para la investigación y desarrollo en gran escala y producción en masa de una esfera completa de sistemas educacionales.

ACI y Década de la Investigación Mundial *Página 483*

Hay muchas oportunidades para los arquitectos de cooperar internacionalmente: por ejemplo, dentro de la Unión Internacional de Arquitectos, o en la UNESCO, o en la o NU.

Pero una de las surgerencias mas revolucionarias—la cual podría producir resultados extraordinarios si pudiera reaimente coger impulso—es la Década de la Investigación Mundial por Buckminster Fuller en los congresos de la UIA de 1951 y 1953. Su plan es que las escuelas de arquitectura de todo el mundo cooperaran en un programa de investigación durante 10 años, un programa compuesto de 5 partes de 2 años cada uno. El mantiene que si los arquitectos y estudiantes fracasan en coger la iniciativa del diseño mundial, entonces la industria armamentista invadirá el campo doméstico y—como él lo expresa—"las corporaciones industriales son muy cortas de vista mientras que los científicos son usualmente visionarios, mientras que los estudiantes de arquitectura son realisticamente idealistas y tienen una visión bien equilibrada. Las corporaciones industriales están preocupadas con proyectos inmediatos, y no con el éxito total del hombre".

La exposición en honor a Nehru *Página 488*

Sharada Prasad, el consejero de editoriales, describe como la exposición fué realizada en el National Institute de Ahmedabad en base a un diseño de Charles y Ray Eames.

El Design Institute está ubicado (provisoriamente) en la galería de arte cívico construída por Le Corbusier. Trabajar en la austera caja de concreto tiene sus encantos y sus problemas. Tendia a hacer monjes de todos nosotros; y las palomas que podían entrar y salir volando a través de las grandes aberturas Corbusieranas, eran sin duda aficionadas a posarse y a manchar las pinturas. Había tambien otra desventaja—la distancia de Delhi, la fuente de todo material y toda autoridad. Las dos ciudades están a solo 960 kilómetros de distancia, pero esto es un largo trayecto en un país con comunicaciones sub-desarrolladas. Cualquier otro sin la actitud de Eames de "esto o nada" habría abandonado.

Le Corbusier en Chandigarh *Página 504*

El Capitolio hacia el norte de Chandigarh tiene el mayor número de edificios importantes de Le Corbusier en un mismo lugar. Ellos forman un conjunto apretado. Solamente aquí es posible ver su obra a una gran escala. El emplazamiento de los edificios contra los Himalayas y con su relación vital con la ciudad que el planeó, aumentan el impacto de su grandeza.

Los cuatro edificios en el conjunto del Capitolio, fueron proyectados para acomodar las cuatro instituciones principales del Gobierno Estatal—la Corte Suprema, la Asamblea (o Legislatura Estatal), las Secretarías y originariamente la casa del Gobernador, que ahora es el Museo del Conocimiento o Laboratorio para la Decisión Científica. Cada edificio es completo en sí mismo, pero los cuatro se complementan entre ellos para formar un total. Colocados en un parque, ellos estarán eventualmente conectados por senderos, puentes, estanques y plazas pavimentadas. Juntos forman una culminación visual de la ciudad.

Hasta ahora solo trés de los cuatro edificios han sido terminados. Las Secretarías y la Asamblea al oeste y la Corte Suprema al este. Le relación entre las Secretarías y la Asamblea es ahora clara, pero la Corte Suprema va a continuar apareciendo un poco aparte y dislocada hasta que el cuarto edificio que esta planeado entre la Asamblea y la Corte Suprema sea construído. Este edificio iba a ser la residencia del Gobernador. Mas tarde Le Corbusier mismo prefirió tener otro edificio en este lugar, un edificio que él pensó mas apropiado a los tiempos—un Museo del Conocimiento, su "Laboratorio Electrónico para la Decision Científica". Además de los cuatro edificios del Capitolio, Corbusier construyó un club de botes en el lago, una escuela de arte y un museo en el Valle del Esparcimiento; una extensión a la Corte Suprema, y una entrada con avíos y terminaciones para el camino formando el paseo al costado del lago. El preparó diseños para los jardines y esculturas del parque del Capitolio, los jardines de otro parque al oeste del Capitolio como también para el Valle del Esparcimiento. También preparó diseños norma para todos los edificios a lo largo de las dos arterías principales y para el Centro de la Ciudad.

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The Hammett Rowe Norton Group Partnership, 27A Sackville Street, W1, have moved to 4 Bloomsbury Place, WC1 (Telephone MUSeum 4817). The other addresses in Huddersfield, Leeds, Leicester and Shrewsbury remain unchanged.

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Towards a world university

John McHale

Cooperation between men, and between nations of men, is the largely invisible side of human enterprise. Each day brings fresh 'news' of conflicts and disagreements, whilst the phenomenal growth of human cooperation around the world goes almost unnoticed.

Man seems to cling desperately to the notion that he survives only by competing fiercely with other men. Yet, his biological continuity is basically a cooperative venture. His individual and social survival has only been possible through the evolution of various forms of cooperation. These have grown outwardly from the family, to the tribe, to the regional/national state and eventually to the present inter-national 'families' of nations. His survival strength has been based more on collaborative and unified effort than on fiercely competitive diversity.

This is nowhere more evident than in the growth of knowledge. Science is in essence a cooperative venture. Work on the frontiers of knowledge is now conducted on a world scale, through:
(a) increased mobility and migration of scholars from one country to another;
(b) international organizations, conferences, etc., and their journals and papers;
(c) large-scale cooperative ventures such as the International Geophysical Year, International Hydrological Decade.

1965 has been designated International Cooperation Year by the United Nations to mark their twentieth year of operation. This international year is to be viewed not as an isolated effort for one year, but as a springboard for further concerted action.

Central to the objectives of the ICY is the idea that man's accumulated knowledge may be increasingly and more swiftly applied to the solution of his major world problems. This aim of making knowledge more universally available, assimilable, and more directly applicable to man's living requirements has been the long-term concern of many scholars. Comenius, the great seventeenth century educator, was possibly the first to suggest that this might be best accomplished through a world organization of scholars[1]—who would meet regularly to assemble, discuss and find ways to use their collective knowledge for the benefit of all men.

In effect, this would be a 'world university'—one whose central concern would be with knowledge treated in world terms, and so oriented as to be applied without regard to any restrictive local interest.

As a concept, it should not be confused with present 'centres for international studies', etc., already operable in various countries. These are often no more than 'cold war colleges', concerned with international politico-economic postures and strategies. Their internationalism is, generally, of the nineteenth century imperial variety and, therefore, of limited 'national' value in the world scene. In considering 'the world college', we need rather to emphasize the reality of a world which has been made 'one'—not by political or economic notions—but by scientific and technological fact.

The universities in our emerging society will increasingly fuse with the present urban/communications centres, or develop on their own, to become the major nerve centres of society.

The 'ecology' of universities is now global and the local university may be considered as already functioning as part of a large network extending around the earth. Within this net, ideas, discoveries and new configurations of knowledge are constantly in flow. It may be viewed as a kind of extension of the individual intellectual consciousness into a global 'consciousness'.

There have been a number of recent proposals which recognize this new ecological phenomenon and seek to give it more concrete direction through the formal inauguration of a world university.

The most realistic of these has been advanced by the World Academy of Art and Science[2]. Their 'Plan for a Transnational World University' was discussed at their third plenary meeting in Rome last month. Extracts from the introduction follow:

'Many detailed projects have been worked out for the establishment of a World University, but all of them remain confined to the idea of an actual, physical centre, a kind of international but locally determined campus, where people from many countries and races could meet and study.

'We do not think that such an Institute would apply under the present political conditions to the concept of a World University, or would apply to it in the foreseeable future.

'On the other hand, a close scientific cooperation, not bound by geographical limitations of any kind, would factually lead to it. In this way, it will be possible to enlarge the traditional concepts of academic work and to combine efforts undertaken in different places of our globe into worldwide research on problems affecting humanity as a whole.'

The steps towards the realization of this goal envisage, initially, that a number of our present universities will be willing to act as 'world centres'. They would then engage in collaborative research on specific world problems with other centres. As this team organization grows more closely knit, related teaching activities would also be engaged upon—with preparation of suitable textbooks, course work, etc., leading to appropriate degrees and titles of general validity. The final step would be, 'When the teams (are) sufficiently integrated, the cooperating universities or a great number of them will declare themselves part of the "World University", but not before about 50–100 of them on at least four continents are actively cooperating. This is not to be envisaged in 5–10 years.'

This programme is eminently feasible. It recognizes fully our present capacity for engaging in widely deployed and decentralized world activities, within which individual co-workers may still be in close 'electronic' contact—daily, hourly, or even minute by minute.

In discussing the role of such team research, one of the distinguished members of the WAAS has formulated this in a manner which comes close to defining our 'World Design Science Decade' activity (see page 483f):

'Providing suitable university and industrial cooperative arrangements make it possible for adequate numbers of young men to learn the advantages of competitive cooperation through participation in team-research within both science and industry, and particularly through participation in such tectonic team-studies as can cause the world's available supplies of essential minerals to continue to expand from year to year, despite the ravages of depletion, and despite a continuing rise in the world's total requirements—both for essential mineral raw materials and for mineral sources of energy.'[3]

An experimental prototype for a world college has already been tried out during 1964, in a project sponsored by the Quaker Society of Friends. Twenty-four UN countries, including the USSR and USA, were invited to send their student recommendations. From 300 applicants, 24 were selected to attend the first sessions. In commenting upon this experiment, one of its leading founder members states that:

'It suggests a college unlike any now in existence, to which would come students from everywhere in the world, Communist and non-Communist, Western and Eastern, Jew and Arab, Christian and Moslem, coloured and white, each of them different, each of them welcomed and cherished because of the difference.

'There the students would be taught, by scholars from across the world, a body of knowledge that would contain, not nationalist histories and ideologies, but the history and culture of man in the entire world.'

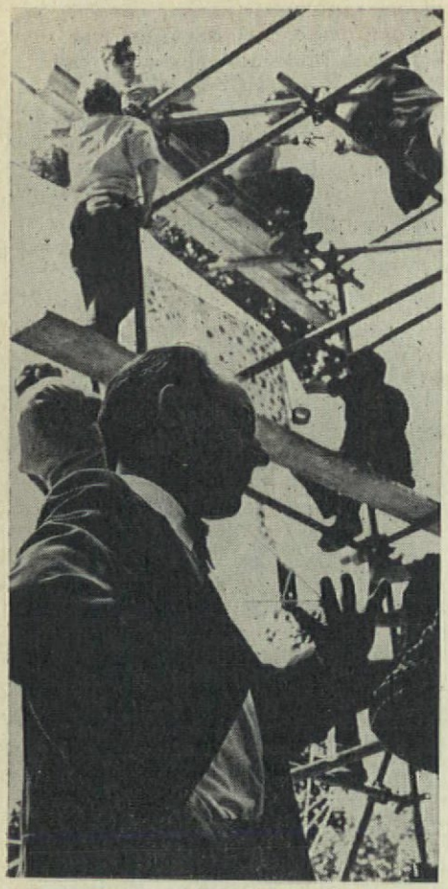
As a result of the success of this venture, it is hoped that similar centres may now be set up in various countries. Part of the development of the college includes the possibility of moving part of the student body each six months to a different centre of study in another part of the world.

Associated with these world developments are various others which are of comparable and related interest for the 'World Design Science Decade' programme.

[1] 'Pansophiae Prodromus' (1630), by Comenius (Johann Amos Komensky, 1592–1630). *Encyclopaedia Britannica.*

[2] The World Academy of Art and Science's President is Lord Boyd Orr (UK); Vice Presidents, Stuart Mudd (USA), Hugo Osvald (Sweden); Sec. Gen., Hugo Boyko (Israel); Hon. Sec., Lloyd L. Morain (USA). Address of Secretariat, 1 Ruppin Street, Rehovot, Israel.

[3] 'Tectonic Team-Research, Key to Social Progress and World Peace', by W. T. Thom Jr. Paper given before New York Academy of Sciences, 7th January 1952.



John McHale at the Paris exhibition of World Design Science Decade (see opposite and page 484). Behind him students are erecting the Nottingham Geoscope.
Photo: James Meller

An international scientific city[1]

John McHale

The Director-General of UNESCO, Réné Maheu, stated in 1964 that two-fifths of the adult population of the globe cannot read or write—more than 700 million people. In certain areas of the developing countries the illiteracy runs as high as 90 per cent of the total population and in many countries the female population is almost entirely illiterate. Schooling is available for only about 45 per cent of the world's 550 million children between the ages of five and fourteen. Full access to the world communication systems, radio, TV, newspapers, etc., which are part of the education process, is also not presently available to millions around the world. According to estimates the number of illiterates is rising by 20 to 25 million persons each year.

The design of education devices, facilities and systems to combat this hard core of the main problem is a formidable challenge in itself. A recent 'World Conference for an International City of Science' (whose first priority would be to deal effectively with this problem and to set up what would be a world educational services industry) made the following points:

1. It is increasingly evident that in the rapidly evolving countries traditional methods of instruction are of no avail. They are not intrinsically suitable for adults. Nor can they quantitatively meet the needs of children, because of the lack of suitable buildings and other equipment —this makes it necessary to consider modern methods of communication, and particularly visual media.

2. A new approach is clearly needed, through organized research and co-ordination. The project for an international scientific and technical complex is specifically designed to solve the urgent problems which this (present) situation leaves in suspense in all countries and which are particularly dramatic in the rapidly developing countries.

Further, in discussing the priority for rapidly developing countries, this conference made certain points which concern the first phase theme of World Design Science Decade, and its initial emphasis on the design of dramatic educational tools for communicating 'world industrio-economic' literacy.

The key aspect of this project would be the establishment of an extra-territorial 'scientific city' devoted to the particular study, and provision of solutions, to specific world problems. The initial problem chosen for this first centre is *world literacy*.

A site has already been offered in Italy and the Italian government appears favourable to the granting of extra territorial rights for this purpose.

The city itself will be organized as a large-scale research, development and mass production facility for a complete range of educational systems. These will be specifically designed to assist the developing nations to raise swiftly the literacy level of their populations and to improve their overall educational system. It will be a 'jointly-owned common undertaking, flying neutral colours, based on extra-territorial ground and supported by the most highly developed specialists around the world.'

In reviewing the reasons for setting up such a city, its founders point out that though many groups of scientists and organizations already exist for the study of world problems, their practical solutions are hindered by various factors. For example: (a) the absence of a global programme of information exchange; (b) the lack of a world coordinating body; (c) that existing international agencies for such purposes all too often get bogged down through their inter-government relations; (d) such agencies can rarely avoid political bias in their discussions and actions.

Their development plan, for utilizing the most up-to-date audio-visual electronic automated systems in combating illiteracy, calls for 'the largest possible cooperation of the numbers of countries concerned, an industrial production related to the size of the undertaking' and the highest scientific and technical competence in its execution. They underline also the necessity for the most rapid implementation of the plan so as not to be overtaken by population increase and its attendant pressures, etc.

The practical recognition within this project that the study of the world problems is not enough, nor their local and piecemeal solution, is parallel to our own programme. We also state that present world problems are only amenable to those solutions which emerge from the application of the highest scientific and technological knowledge and which may be implemented in terms of the most advanced industrial production available.

An international territory of science (Antarctica)

It may be a fitting conclusion to include the following extract from a recent report on the development of the polar regions under terms of international agreement.

'Since 1955 a number of international scientific bodies have been set up to organize the systematic study of the Antarctic continent. First within the framework of the Special Committee for the International Geophysical Year and now within that of the Scientific Committee on Antarctic Research (SCAR), the programmes and their coordinated execution have been studied by the representatives of the countries participating in Antarctic Research and systematic exchanges of research workers have been arranged.

Today, scientific research in Antarctica has been given recognized status by the Antarctic Treaty, ratified by the twelve powers which sent expeditions during the International Geophysical Year. Freedom of scientific research is guaranteed for a period of thirty years; the contracting parties bind themselves to use the treaty zone—delimited by parallel 60 degrees S —for peaceful purposes only, to ban nuclear explosions, not to dump radioactive waste in the area, and to exchange their programmes and results.

This is the first treaty to protect scientific research and leave a non-governmental organization—the Scientific Committee on Antarctic Research set up by the International Council of Scientific Unions —full latitude to lay down programmes. It constitutes a precedent, and is a step towards finding a concrete formula for the relations between science and governments. And, by a happy paradox, the continent that is most hostile to man is the one which will do most for the cause of peace.[2]

[1] Address: Comitato Promotore, Città Scientifica Internazionale, Piazza della Minerva 38, Roma. Professor Cohen—Seat of the Sorbonne, Paris, is an Executive Delegate.

[2] Extract from: The Polar Ice-caps IMPACT. Vol. XIV, No. 4, 1964 (UNESCO), by A. Bauer and C. Lorius.

1, 2



1
The ICY symbol

2
One of the display panels contributed by the AA School of Architecture to the World Design Science Decade exhibition in Paris (see page 484)
Photo: Lehmann

International Cooperation Year 1965

1965 is International Cooperation Year, and October 24th is United Nations Day, being the twentieth anniversary of the founding of UNO. Both will be celebrated together here in Britain.

There are many ways in which architects could cooperate internationally to the mutual benefit of everyone.

But one of the most revolutionary suggestions—which could produce remarkable results if it could really get going—is Buckminster Fuller's World Design Science Decade, 1965–1975, proposed at the 1951 and 1953 UIA Congresses. His plan is that the world's schools of architecture should cooperate in a 10-year research and design programme in five 2-year increments. He maintains that if architects and students fail to gain the world's design initiative, then the weaponry industry will invade the livingry field and, as he puts it, 'industrial corporations are too near-sighted while scientists are usually infinitely far-sighted, while architectural students are realistically idealistic and have well coordinated vision. Industrial corporations are preoccupied with immediate projects, and not with total man's success.'

The five phases into which the 10-year redesign programme was divided are:

Phase 1. World literacy re *world problems*
Phase 2. Prime movers and prime metals
Phase 3. Tool evolution
Phase 4. The service industries
Phase 5. The evoluting contact products

On the following pages we give the briefest indication of the content, with quotes, from the four Documents which have already been published[1] relating to the 10-year programme. ▷ page 484

[1] World Resources Inventory, S. Illinois University, Carbondale, USA. Also at £1 10s. each, or £5 the set from James Meller, 14 Upper Berkeley St., London, W.1.

The following quotes are taken from a 30-page document by Buckminster Fuller, entitled *The Geosocial Revolution,* written in honour of ICY.

The International Cooperation Year of the United Nations came into being as a consequence of the great and surprising success of the International Geophysical Year, wherein world scientists transcending political ideologies established an historical beach-head in the integrity of the emerging *World Man's* behaviour.

The international cooperating of humanistic concerns is far more difficult and complex. Each human is a whole universe and there are now over three billion of them around the world.'

'For technology and the humanities of the ICY to match in any way the integrities of pattern discovering demonstrated throughout by the physical scientists, the technologists and humanists of the ICY will have to concentrate on the *geosocial* instead of the *egosocial*.'

'Geosocial revolution is a tentative inventory of those heretofore invisible, techno-economic, world-force-fields now looming tentatively into view. These heretofore invisible, evolutionary systems' tidalwaves once discovered and studied apparently disclose nature's scheme, not only for successfully sustaining human life on Earth—despite the inertial negatives and shortsightedness of man's arrogant ignorance—but also the scheme by which nature will permit man to henceforth participate consciously in ever less meagre degree in his prosperous continuance on Earth, which he will occupy as a planetary base for his larger operations in universe.'

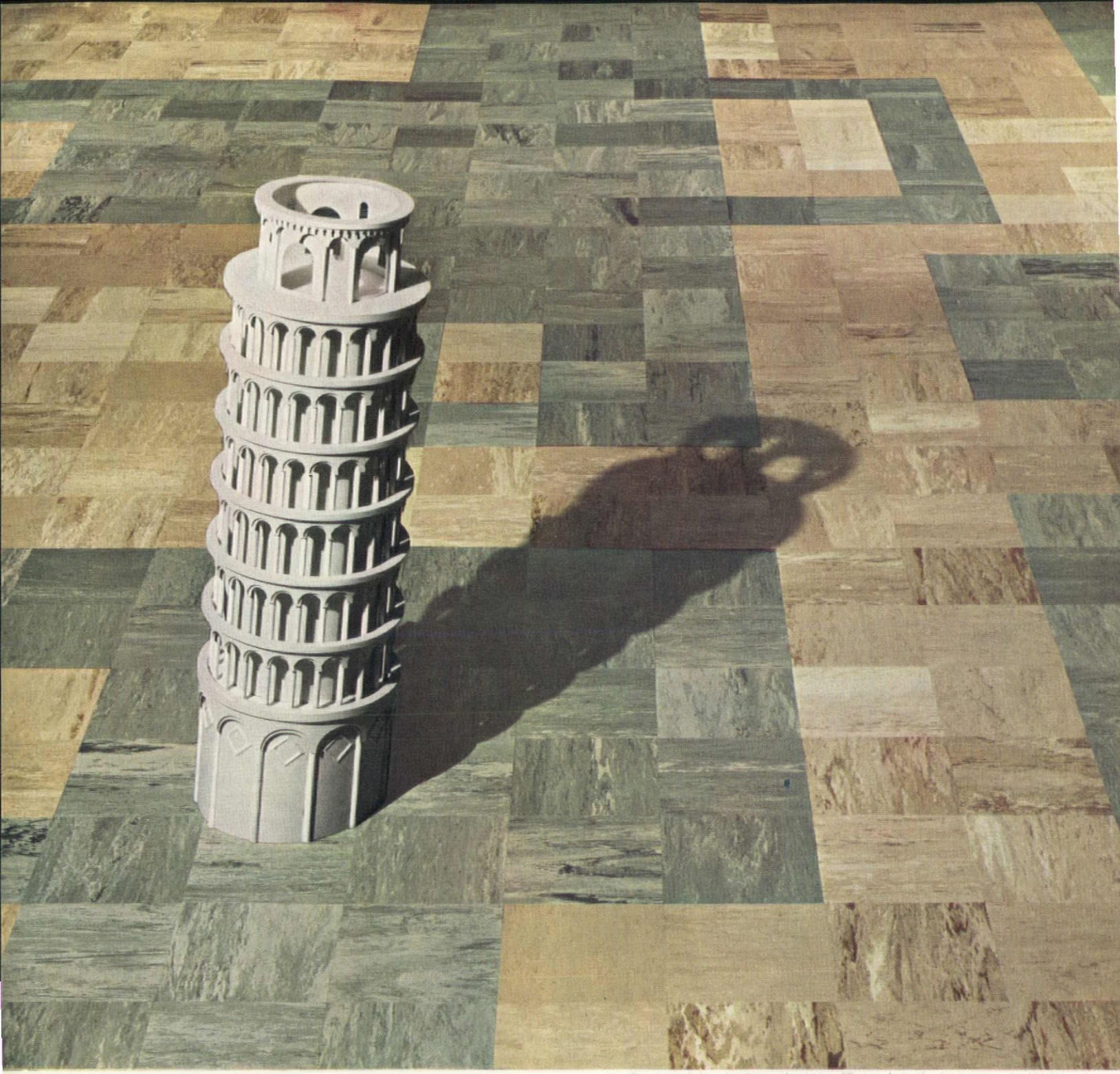
'The world's prime vital problem bears repeating a million times. It is: How to triple swiftly, safely, and satisfyingly, the overall performance realizations per pound, kilowatts, and manhours of the world's comprehensive resources. To do so will render those resources—which at the present design level can support only 44 per cent of humanity—capable of supporting 100 per cent of humanity's increasing population at higher standards of living than any human minority or single individual has ever known or dreamed of. To thus concentrate on the mastery of the physical service of man will also have its inadvertent profit increment, for to master the physical—intellectually—will bring into human intercourse a level of integrity of exploration of the metaphysical capabilities of man and the metaphysical ramifications of universe also heretofore undreamed of by man. Science and engineering say this is eminently feasible.

Doing vastly more with vastly and invisibly less is known technically as *ephemeralization*. The mass production of electronic controls inaugurated automation. With automation has come a dawning awareness of the invisible avalanche of ephemeralization.'

'In the next decade's worldizing of industrial production systems and energy generating and transmission systems, we will witness the surprise solution to the establishment of world citizenship occasioned swiftly and simply by multiplication of world passenger traffic to magnitudes which will necessitate credit-card type passports and automation of omni-border clearances; plus the amplification of the efficiencies accruing to "common market".'

'The highest priority task of the International Cooperation Year will be the dissemination to all the world's peoples of the kinds of integrated trend, experiment, invention and development information whereby total humanity can now become physically successful.'

'It will be the ICY's foremost task to clarify that the ability to do more with less in weaponry can also be applied to livingry.'



Paper sculpture by Bruce Angrave—'Tuscan' vinyl asbestos tiles, by Marley.

Secret . . .

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WORLD DESIGN SCIENCE DECADE 1965-1975

EXPOSITION

JUILLET - 9 JUILLET 1965

ARDIN DES TUILERIES, PRES DE L'ORANGERIE

HEURES DU MATIN - 10 HEURES DU SOIR

1 Page 483

It was decided, with the approval of the UIA Executive Committee, that architectural students should be encouraged to prepare exhibits for the 1965 Paris Congress which demonstrated dramatically the world's resources and human patterns and needs. Realizing that it was not going to be possible for students to assemble a world inventory of resources, human trends and needs, Buckminster Fuller managed, with the help of Southern Illinois University[1] and a colleague, John McHale, to prepare such an inventory in time for the 1963 UIA Congress.

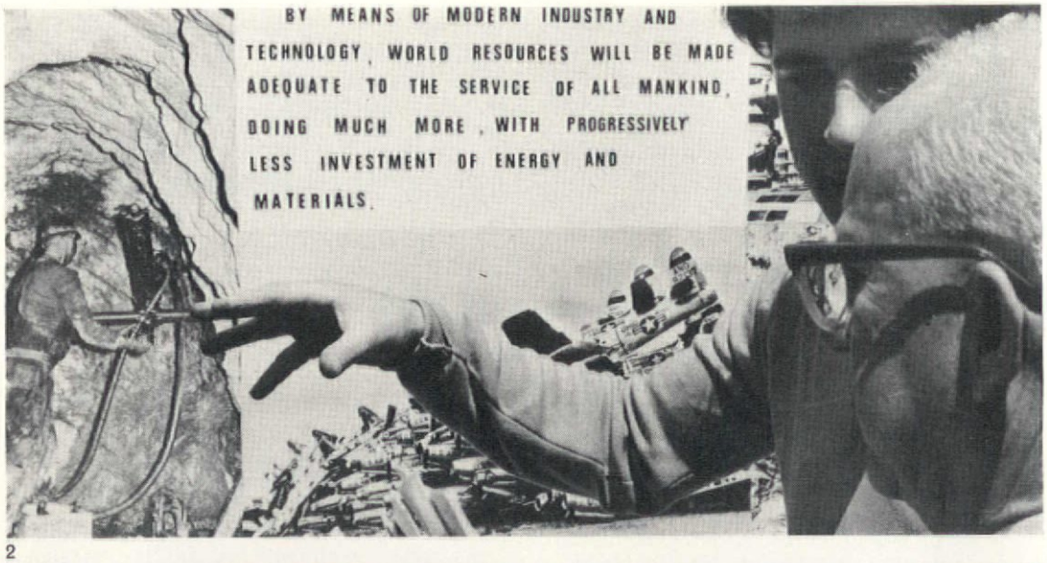
In 1964, a second Document was issued giving the students more detailed information about the phases, with an essay on the cumulative nature of wealth; and ending with Fuller's 'Universal requirements check-list', a document which unfortunately defeats its valuable purpose by its language.[2]

This year, Documents 3 and 4 were published in time for the Paris UIA Congress; and students from the US, Britain, France, Australia, etc., at their own expense and with great enthusiasm, contributed to an exhibition on a site given to them in the Tuileries Gardens. If considered purely in relation to Fuller's expectations, this exhibition was somewhat of a damp squib.



1

1–4
Pictures taken of Buckminster Fuller, students and visitors at the AA students' contribution to the Paris exhibition
Photos: 1 & 2 Keith Critchlow; 3 & 4 Lehmann



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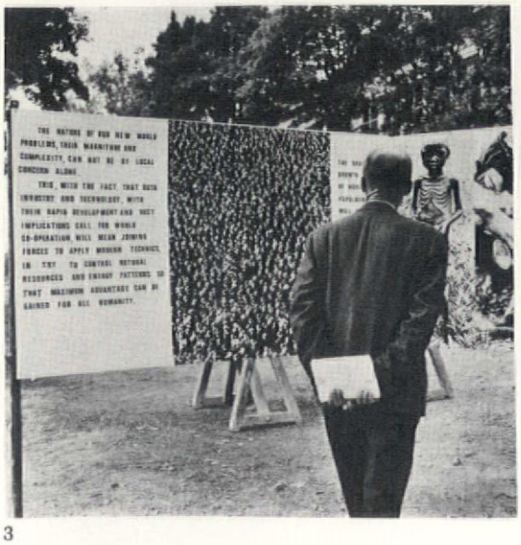


3



4

[1] World Resources Inventory, S. Illinois University, Carbondale, USA.

[2] John McHale explains: 'Though the language of some of the texts may seem difficult at first approach, it should be borne in mind that one of our major problems in thinking today is the use of language systems which still represent a fixed structurally compartmentalized world view. The terms available to us for the expression of dynamic, rather than static, concepts are far from satisfactory. Fuller's language is particularly representative of the "transitional state (of the Western world) between the older, traditional, noun-centred culture and its present-day, changing, verb-centred culture". In his search for an adequately descriptive terminology he tends to employ concepts and usages from many different fields juxtaposed in ways which may be unfamiliar to those more customarily restrained within the vocabularies of particular disciplines.'

←Code 50

But judging by the interested crowds which it drew during its short life, it was quite a success. However, what the next step is to be is not clear, since the UIA did not give the exhibition any official encouragement. Students will probably have to enforce recognition of future activity whether within the UIA or outside. Whatever the action they take, guidance from Carbondale will continue.

Document 3 consists of writings by Fuller all of which have particular relevance to the comprehensive manner in which world planning must now be approached. John McHale says in the introduction:

'In assuming an *a priori* structural order throughout, all physical events occur as interrelated energy patterns—whether they are macro events at the level of galaxies, median events as social patterns, building systems or rainstorms, or micro events at the level of the atomic nucleus.

'Within this scale, all man's environmental transactions — whether building, sleeping, designing structures, or ploughing a field—form part of the total energy system. As defined out of his experience, it is a finite system in which energy may be neither lost nor gained, therefore the process within the system is one of interrelated and regenerative cycles of energy transformation. We cannot, in the strictest sense, deal with any local aspect of the system without taking into account the regenerative and synergetic aspects of the whole. If then, in planning for man's requirements we take cognizance of such observable "universal" laws as have been found to operate in common throughout the scale, it is more probable that such planning will be on the right track.

'For example, in the designing of "shelter" for man we may note that in these comprehensive terms we are locally re-arranging certain locally occurring energy events to our immediate and future advantage. The requirement "shelter" viewed comprehensively is seen not as traditional "house" but as an "instrument" which man may employ to adjust and control the local energy patterns impinging upon him, as a "valving" device which allows him to control, shunt, or redirect environment energies in preferred forms of frequency. It is viewed as an instrument, whose primary function is to allow man to "tune in" on any preferred range of facilities he may require. The end "design", by such definition, tends not to be the obtrusive and important feature but rather to be oriented towards functioning invisibly until called into direct play by the occupant. This leads not only to a strictly scientific "energy" accounting in the design of such environment systems but returns the responsibility for the end-use control of the system back to the individual user. Man is not to be provided with "machines to live in", but with such anticipatorily designed instruments as may allow him to adjust and control his environment to any individually preferred manner of living.'

Included in Document 3 is the Geosocial Revolution essay referred to on page 483, and in which one is transported onto the Fuller thought-wavelength of optimistic forecasting.

'The prime technology contractors, veering from weaponry into livingry, accept blindly the "so-called" building "industry's" product categories as having been scientifically conceived—whereas the fact is that livingry as the historical antipriority is a bedlam of less-with-more make-do's, fortuitously contrived with the lowest capability resource left-overs, wrapped up in religious and aesthetic orders of classical-modern interior and exterior symbolic distinction superficialities.



1

'No PhD scientist has ever been retained to consider the general systems theory governing establishment of the potentially successful life of all men around Earth—let alone retained to look at a toilet. No architect or builder knows what buildings weigh—they have never heard of performance per pound.

'The rocket capsule that will keep man living successfully in space for protracted periods, entirely remote from the sewer and other service mains, will be the first "scientific dwelling" in history. The prototype of the little 300-pound black box, which will reduce the metabolic regenerative system, as now operative on Earth from a one-mile diameter ecologically accomplished chemical-energy exchange complex, to a four-foot diameter rocket capsule energy regenerating accessory, will cost in the neighbourhood of seven billion dollars. Once produced and successfully "operative". Its replicas may be mass reproduced for $2 per pound, ie, for $600. With such an integrated chemical-energy regenerator taking care of all sanitary and energy generating requirements of family living, men may deploy almost invisibly to the remote beauty spots about the Earth in air-delivered geodesically enclosed dwelling machines and survive with only helicopter and TV intercommunication at luxuriously simplified high standards of living—operative at negligible land anchorage cost similar to telephone service charges.'

Document 4, prepared by John McHale and the SIU group, details the sort of research being (and to be) done in all five phases of the 10-year programme of World Design Science Decade.

In Phase 1, World Literacy, the housing situation comes up again:

'Even in the advanced countries, housing is one of the last areas of human requirement to come under scientific design review. Though one of man's main "environ tools", it has been allowed to develop haphazardly on a combination of local historical precedent, slow accretion of craft knowledge and local climatic need.

'The family dwelling still bears little relation to the current capacities or requirement of our industrial civilization, and has nowhere reached the technical level of our other developed environmental tools. Man now produces, with ease, facilities of a similar and much greater complexity than "house". The automobile is one such example, weighing around two and one half tons, with approximately five thousand component parts; others would be air and ocean liners. The former is a mobile extension of the house, and the latter are virtually floating and flying houses, environment controls which routinely function under much more severe stress conditions than the ordinary house is ever required to in everyday circumstances.

'On the global scale this discrepancy between potential technological capacity and low achievement is marked.

'"It is estimated that over 900 million persons in Africa, Asia and Latin America are without proper housing . . . if, as is recommended, 30 years were taken as the target to meet the housing shortage, and the average life of a house as approximately 25 years, then annual construction needed for current deficit, necessary replacement and population growth would be nearly 22 million units. By 1975, required annual construction would be almost 28 million units.

he urban areas of Africa, Asia and Latin merica constituting less than 30 per cent of the tal population would account for over half of ie recommended construction."'

is patent that the only solution towards sup-lying the world need for adequate high stan-ard housing lies with a comprehensively de-igned, universally operable and mass pro-uceable facility. To consider house as an ndustrial 'end product' is no longer adequate to s efficient performance. For the fullest advan-age of available and developing technologies ve require the concept of house as that of rent-ible facility—like the telephone—with a full ervice, maintenance and replacement system. Home ownership, in the context of our present communication and transportation systems—no onger a desired prerequisite for living and sup-posed basic need, but one amongst many possible alternative choices. The function of the environmental tool facility designer is to provide the maximal degrees of freedom for such alternative patterns of living.'

In Phase 3, Tool Evolution, two kinds are distinguished—the 'software' tools such as language and other symbolic systems and processes, and the 'hardware' tools—and the effects of automation are discussed.

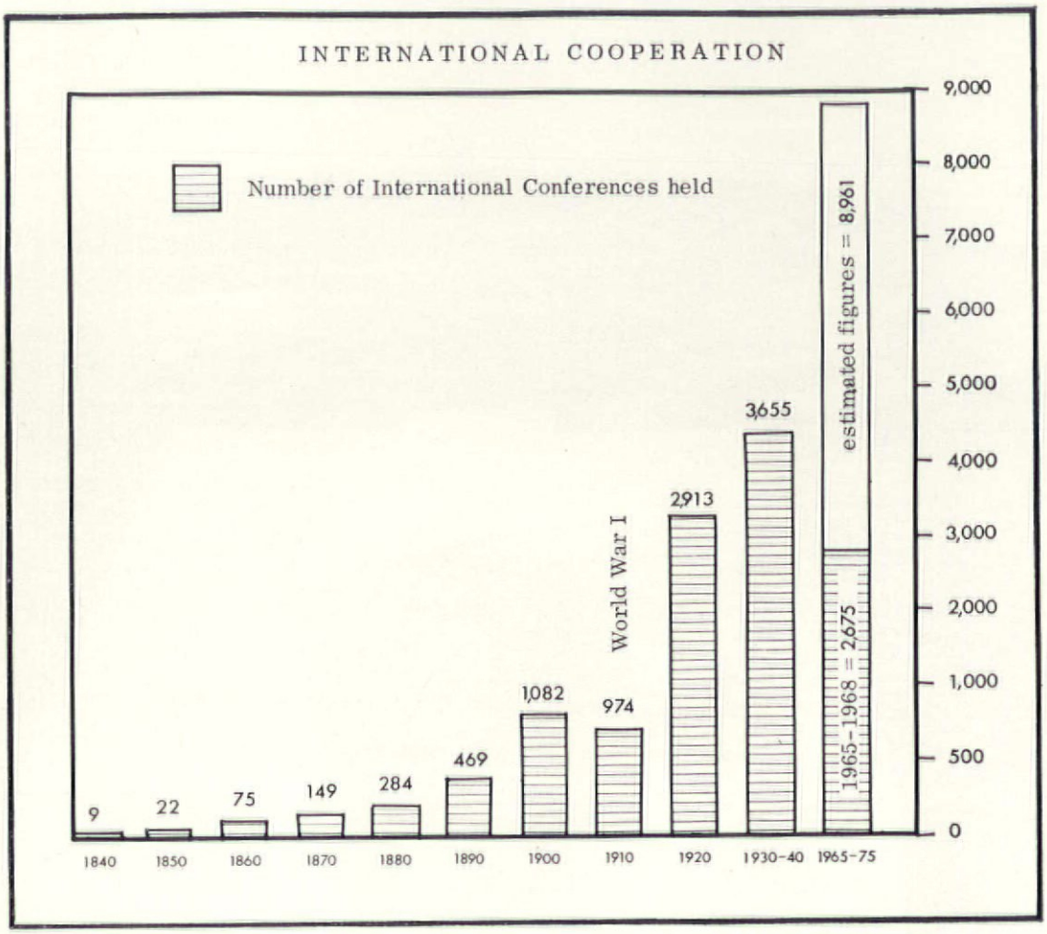
'Airfreighter building programmes using light-weight glass fibre "self-jigging" assembly tech-niques, are producing large fuselage capacity units capable of carrying many tons. Such swiftly produced transport units, plus new helicopter lifting capacities, render the air-deliverable capacity of building of immediate practicality.'

'The actual computer "jig assembled" total building is also presaged in presently develop-ing naval warship building programmes. Such ships come closer to floating cities in their complexity than just buildings! In reports on recent work, it is pointed out that it normally takes 18 months to construct the hull of such ships, with three-quarters of this time allocated to hull "fairing" and full-scale loft drawing. Using computers this was cut to three days; complete structural designs could be completed in five days. Similar time/cost savings are indi-cated at each stage of such an overall operation, which requires approximately 5000 separate job listings and more massive and complex inven-tories than are ever likely in buildings.

'Within the "warship" computer programme, a comparison is given of the time/manhour costs for a comparable industrial steel building struc-ture of eight stories, as normally requiring 50 design drawings and 300 shop detail drawings—taking 8800 man-hours and 61 weeks to complete. Using the specified computer programme for construction, this was calculated to take only 1700 man-hours and could be completed in 5·5 weeks —with a minimum (critical path) programme of three weeks.'

In Phase 4, The Services Industries, city growth is seen as that of a centralized service organism where specialized skills, facilities and other resources were main-tained; the rise of the professions as 'service' occupations are also related to city development. Our present major cities are essentially service interchange ter-

▷ page 487



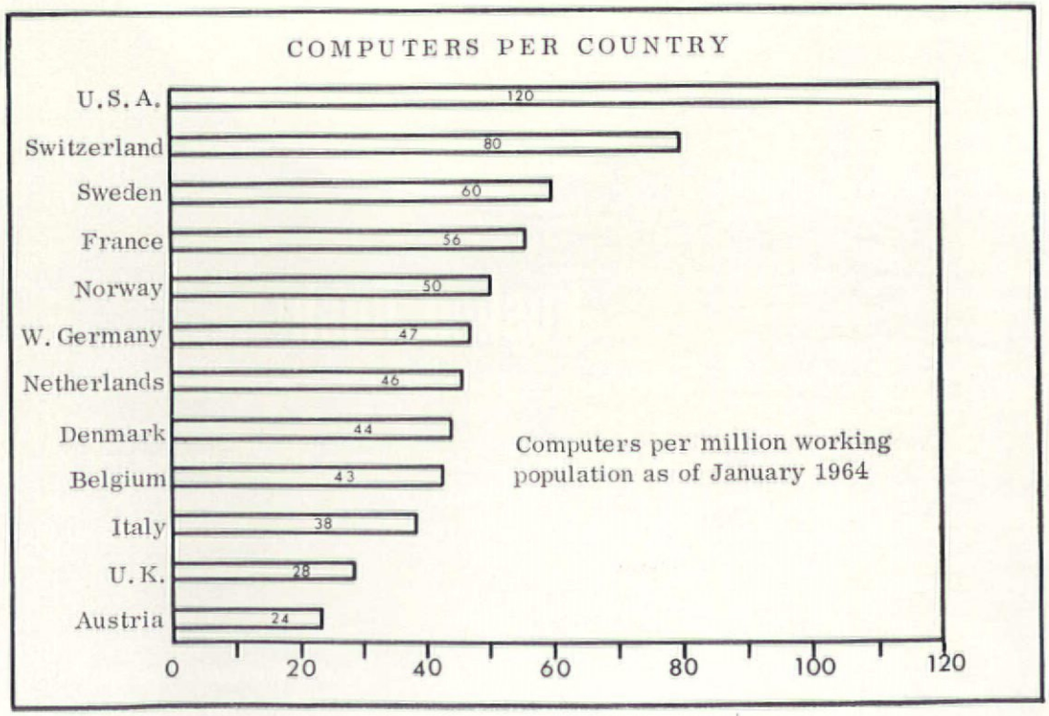
2

1
Students helping to put up the World Design Science Decade exhibition at Paris. Behind them is the Not-tingham students' contribution, a 20ft diameter geodesic sphere with a world map on its translucent plastic skin

2
Chart from Document 4. Sources of the information are: (1) the Story of International Cooperation. J. Avery Joyce. F. Watts Inc., 1964; (2) world list of future inter-national meetings (March 1965–February 1968). Library of Congress, Washington, DC, 1965

3
Chart from Document 4. Source of information: 'Computer Comeback'. David Fishlock. New Scientist, England, Jan. 1964

3





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◁ page 486

minals in the world communications and transportation network.

It having been established by Benjamin S. Bloom's researches[1] that half of all growth and intelligence in the human being takes place between birth and four years of age, and a further 30 per cent increase between four and eight, McHale underlines the importance of the home/dwelling as 'the area in which the prime development of man takes place'. He says:

'In noting that the other advance environment controls of man like the auto, the ship and airliner were part of comprehensive service systems, we underlined that behind their functioning there were full repair, replacement and maintenance systems. They also embody a high degree of anticipatory planning against part failure and have overhaul and performance improvement built into their efficient functioning. Specific industrial criteria which should operate in the design of dwelling facilities are minimum weight compatible with maximum performance and lower cost for maximum distribution and efficient production.

The technical performance of such a living facility may not be realistically considered in terms of single isolated units, or as handcrafted multiples of such units, but imply the full supporting technology of a developed industry of which house is the contact instrument. It would be as pointless to assume 'house' outside of this implied context as to discuss car, telephone or plane in the same terms—as isolated units without their support, service and forward development systems. The distribution of the human family is global, therefore, we should consider the facility as capable of performing adequately in every climatic condition found on earth.

'It may be useful to state certain aspects of "house" services to ensure that they may be given sufficient attention. The autonomous, or semi-autonomous function is an important one. Dependence on local systems of water/sewage and other utilities is one of the least efficient aspects of current dwelling. Apart from reasons related to depleted or polluted water supplies, there is also the trend towards deployed mobile living requirement in advanced countries, and, even more important, the fact that two-thirds of the population in the developing countries live in rural areas. The trend towards urban congestion in the latter countries may be reversed through the provision of scientifically designed autonomously powered high standard living unit, which would embody the latest communications and other service facilities to accommodate rural deployed living.

'In designing dwellings we should expand the home facilities in due ratio to increased "leisure" or re-investible time. The world living facilties service dwelling will have to contain direct provision for the myriad ways in which man will wish to spend his increased daily, annual and life span. It will have to be dealt with as one of the most vital core units in society and, therefore, fully advantaged with the most advanced technical provisions which may be envisaged as satisfying man's fullest needs.'

The design of larger aggregate units McHale envisages, not as static town plans, but as 'flexibly adjustable systems of community components . . . in short, "instant cities".' The larger urban centres would be a central 'services' complex, 'one type of waystation in an extended social and communication net' and no longer 'the lodestone for earning a higher living'.

[1] *Stability and Change in Human Characteristics* (John Wiley, 1964).

The fifth and last phase of World Design Science Decade, entitled the 'Evoluting Contact Products', demands much rethinking from everyone. For example, about what have always been termed 'end products': 'there are in effect no "end" products but only the contact instruments of industrialization's human ecology services which are the *plug-in* or *latch-on* terminals of service industries, eg, the telephone, transportation and other communication units, the motel (bathroom and bed)—and eventually the world-around environ control service unit.'

'Within this phase of programme, a prime priority should be, therefore, the design, development, prototyping and field testing of environment control units. This would include the design of the services, maintenance, parts inventories and transportation performances required to make such rentable and fully maintained services operable around the world.

'Little of the information required for such designing will be found in standard architectural works but will require the review, analysis and compilation of information from many different areas of advanced technology.

'Close examination and analysis of the "network" principles of the present world services of airways, telecommunications will be a valuable guide. A wealth of material may be found, also, in the technical and logistical operations manuals of various naval, air and land services —particularly those concerned with operations in the polar regions, under-sea exploration and the other 'inhospitable' and extreme environ conditions.

'The Universal Requirements for a Dwelling Advantage of R. B. Fuller' is the most comprehensive attempt to list every requirement, and meet most contingencies, likely to occur to man in relation to dwelling. As a working schedule it methodically lists, in detail, the whole concept of advanced dwelling as an energy-controlling valve, operating on a frequency modulation basis; the structure enclosure performance requirements; analysis of the internal mechanical and other energy exchange services; the communication aspects of dwelling; and its collective, global performance as a world service facility. The 'Universal Requirements' schedule also assumes:

'that the design level of each progressive model will be obsolete within a period of somewhere between 10 and 15 years and, therefore, that the older apparatus will be continually withdrawn from circulation, the materials to be scrapped and reprocessed, with appropriate addition from new resources, into advanced mechanical standards—thus instituting a world industry which will continually reprocess the dwelling facilities of the world's people.'

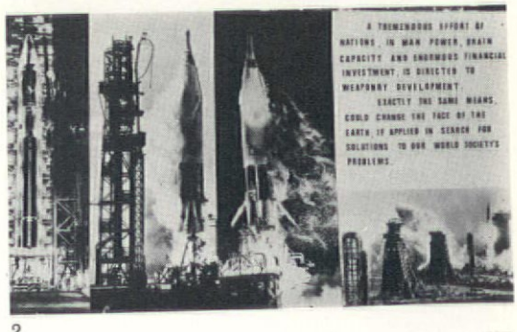
Todays weaponry potential	*vs.*	*Tomorrows livingry potential*
Four attack submarines at $45,000,000 each	would pay for	One year of agricultural aid for $178,699,760
One $105,000,000 atomic submarine minus missiles	would pay for	$132,095,000 in famine relief aid including freight costs
One $122,600,000 atomic submarine including missiles	would pay for	$150,000,000 in technical aid
One $275,000,000 aircraft carrier	would pay for	$251,000,000 for 12,000 high school dwellings
One $104,616,800 naval weapons plant	would pay for	35 school buildings at $4,000,000 each
One $104,616,800 naval weapons plant	would pay for	26 160-bed hospitals at $4,000,000 each
One $250,000,000 intercontinental ballistic missile base	would pay for	One 1,743,000 KWH capacity hydro electric dam
14 standard jet bombers at a cost of $8,000,000 each	would pay for	A school lunch programme of $110,000,000 and serving 14 million children
One new prototype bomber fully equipped	would pay for	250,000 teacher salaries this year, or 30 science faculties each with 1000 students, or 75 fully-equipped 100-bed hospitals, or 50,000 tractors, or 15,000 harvesters

Adapted from: (1) The Peace Race, Seymour Melman, 1961; (2) Atlanta Journal, March 11, 1965.

Reprinted from Document 4



1



2

1 & 2
Two of the screens shown by students of the Architectural Association at the World Design Science Decade exhibition in Paris (see page 484)
Photos: Lehmann



1

The Nehru memorial exhibition

Prepared by the	**National Design Institute. Ahmedabad**
for	**The Government of India**
In consultation with	**Charles and Ray Eames**
and	**Alexander Girard**
Exhibition committee	**Indira Gandhi, Pupul Jayakar, Dinesh Singh, Uma Shankar Dixit, D. C. Sharma, I. J. Bahadur Singh**
Editorial advisor	**Sharada Prasad**

The Nehru memorial exhibition was first shown in New York earlier this year; then in July it came to London (see AD, July page 319); and now it is back in the USA for visits to Washington, California and some of the universities; after which it will return to a permanent home in Delhi.

Since it was Nehru who first proposed an International Cooperation Year, this month seems to us to be a fitting time to publish his memorial exhibition.

2



Sharada Prasad describes the making of the exhibition:

Government exhibitions have some recognizable features—standardized sentiment, overmuch respect for the official image, a reluctance to make a personal statement. But by entrusting the Nehru Memorial Exhibition to the National Design Institute and to Charles Eames the Government of India saved it from this pattern and the deadening stamp of publicity.

To get Charles Eames meant to get for the exhibition all his imagination, his prodigious industry and his refusal to do with less than what he wants. The basic problem of design, as he puts it, is to care. And how he cared we who worked with him could see. Charles Eames himself took his task to be one of finding out what manner of man Nehru was, 'how he got to be so', and what he did for his country and the world of his time. This is the task of a biographer, and that is what the exhibition has become, a major biography. Since Nehru's life has so interacted with that of India for nearly fifty years, the exhibition also becomes a history of the recent India.

Charles Eames is shorthand for Charles and Ray Eames. Ray Eames brought to the work all her discernment, all her skill in hunting out the little things, the significant things, the beautiful things. Charles and Ray Eames persuaded Alexander Girard to give his time to the exhibition. With his special knowledge of texture and colour and shape, and of the Indian folk tradition, he scoured bazaars and village fairs, and went into the very mud-huts of craftsmen to get fabrics and rural handicrafts of rare design to give the exhibition the authentic Indian touch. Three others of the Eames team who worked in India were Glen Fleck, Deborah Sussman and Robert Staples.

The bulk of the work was done at the Design Institute in Ahmedabad. It is a young institution, hardly four years old, and it was set up on a report to the Indian Government by Charles and Ray Eames. Its aims are to study the design tradition of India with a view both to conservation and innovation, to improve the quality of articles of everyday use, and to train designers. It gets its funds from the Government, industry, and the Ford Foundation. Gautam Sarabhai, Le Corbusier's industrialist client, is the chairman. When, soon after Jawaharlal Nehru's death last year, it was proposed to hold a Nehru exhibition in the major capitals of the world, Mrs Indira Gandhi (Nehru's daughter and India's Minister of Information) and Mrs Pupul Jayakar, the authority on handicrafts, persuaded the Government to entrust the work to the Design Institute. The Institute accepted, and turned to Charles and Ray Eames. To Charles Eames, as to many



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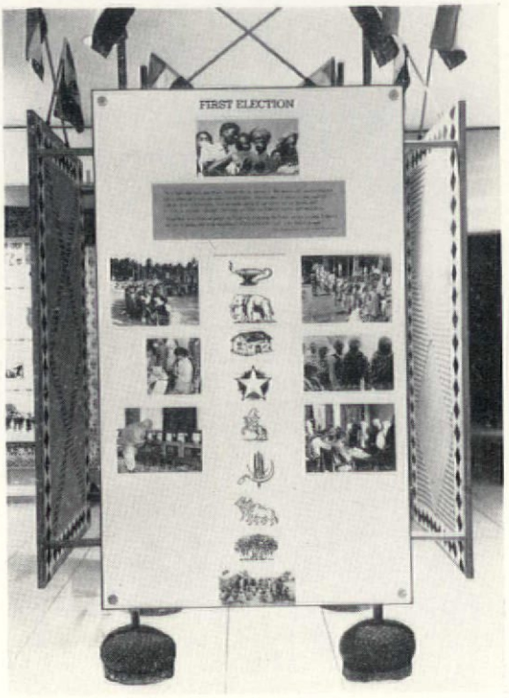

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1
General view of the exhibition

2
Prison. Enormous wall-covering photographs surround an empty space. (See also page 492)

3
The History Wall 1880 to 1964

4
One of the groups of four panels standing squarely on sandbag 'feet', the panels backed with traditional Indian fabrics

Photos: 1 Sam Lambert; 2 & 4 Eames; 3 Lehmann

Some of Nehru's words featuring in the exhibition:

One misses many things in prison but perhaps most of all one misses the sound of women's voices and children's laughter. Once I remembered being struck by a new want. I was in the Lucknow District Jail, and I realized that I had not heard a dog bark for seven or eight months.

I find myself incapable of thinking of a deity or of any unknown supreme power in anthropomorphic terms. The diversity and fullness of nature stir me, and produce a harmony of the spirit, and I can imagine myself feeling at home in the old Indian or Greek pagan and pantheistic atmosphere, but minus the conception of God or Gods that was attached to it.

My reputation as a hero is entirely a bogus one; I do not feel at all heroic. . . . It is true that I have some physical and mental courage, but the background of that is probably pride—personal, group, and national—and a reluctance to be coerced into anything.

who got concerned with the shape of the world before the Second World War, Nehru was more than a name. He was, as Lord Attlee came to say later, possibly the first statesman of a new kind of world. And the Eamses agreed, and made it a labour of love.

The Institute put on the job all the resources it could muster. All the structural parts of the exhibition (down to casting brass clamps of Indian design) were fabricated at the Institute's workshop. The text was mostly printed (on hand-made paper) at the Institute's press, and the major part of the black-and-white pictures made at the Institute's studio. The Institute regarded the work also as an educational project and assigned to it several of its graduate students. A young architect, with no earlier specialization in photographic work, became a first-rate dark-room man. A graphics student became keen researcher in Indian history. The bulk of the 'History Wall', one of the most illuminating sections of the exhibition, was filled in by these scholars. Co-ordinating all the work was Miss Gira Sarabhai, who heads the Institute's committee of direction, and an instructor, the painter Dashrath Patel.

As sponsor, the Government provided some editorial assistance, and put its own vast collection of photographers at the disposal of the Institute. The Eames team also saw the albums of the Nehru family, the collections of numerous individuals, institutions, newspapers and picture agencies. In all, something like 200,000 pictures and several dozen documentaries and newsreels must have been seen in order to pick the 1200 photographs on show. Some of the famous photographers of the world—Henri Cartier-Bresson, Margaret Bourke-White and others—gladly gave permission for the use of their pictures. (Indian photographers were less ready.) Some portraits from the family collection were shown publicly for the first time.

The editors read every published speech, article or letter of Nehru and the more important books and articles on him, besides a considerable volume of hitherto unpublished material. There are 25,000 words on view in the exhibition, most of them by Nehru himself, who was a rare combination of maker and recorder of history. Besides choosing the text the editors had another important function, to be in on the extensive discussion preceding the designing of each panel. Sometimes it looked as though the going was an inch an hour. But the endeavour was to achieve the largest possible significance. One was reminded of a sentence used by the historian Vincent Smith about the builders of the Mughal monuments in India: 'They conceived as giants and finished as jewellers.'

The Design Institute is housed (temporarily) in the Corbusier-built civic art gallery of Ahmedabad on a bank of sandy Sabarmati. Working in the austere cement box had its thrills and its problems. It seemed to make monks of us all; and the pigeons, which could fly in and out of the great Corbusier grilles, were evidently fond of perching on and marking pictures. There was yet another handicap in working in Ahmedabad—the distance from Delhi, the source of all material, and of authority. The two cities are only 600 miles apart, but that is a long way in a country with underdeveloped communications. One little part of the show—aerial photographs to illustrate the kind of land that is India—seemed to become a major project in itself. Anyone who did not have Charles Eames's attitude of 'this or nothing' would have given up.

There were delays, naturally, and they had to be made up in the Eames' office in California and in the structural contractor's workshop in New York. The structurals with fabrics in place had all been shipped in time from India, but the tooling of many panels still remained. To choose a piece of writing in New York, read it out to Los Angeles to be set up there, and to see the printed sheet the next morning, flown overnight across 3500 miles, was a wholly different kind of experience for an Indian.

When just a day remained for the opening, there were still two panels to be done. But Charles Eames went about as though he had all the time in the world. And two hours before the inauguration by Vice-President Humphrey, everything was in place—except, to be honest, a four-inch line of type and a pair of quotation marks.





2

1 & 2
Photos showing Indian fabrics used as part of the exhibition panels, and supporting framework on sandbag 'feet'
(*Blocks by courtesy of The High Commission of India*)
3
The accoutrements of marriage
Indian marriages, both among the rich and the poor, have had their full share of condemnation as wasteful and extravagant display. They deserve all this. . . . Even apart from the waste, it is painful to see the vulgar display. . . . It is often forgotten that the life of the poor is terribly dull and monotonous, and an occasional marriage celebration, bringing with it some feasting and singing, comes to them as an oasis in a desert of soulless toil. . . .Who would be cruel enough to deny this consolation to them, who have such few occasions for laughter?
4
Symbols of the British Raj
5
Nehru's travels among his people—25,000 miles in 9 weeks between Nov. '61 and Jan. '62
Photos: 1 & 2 Eames; 3 & 5 Lambert; 4 Lehmann

3



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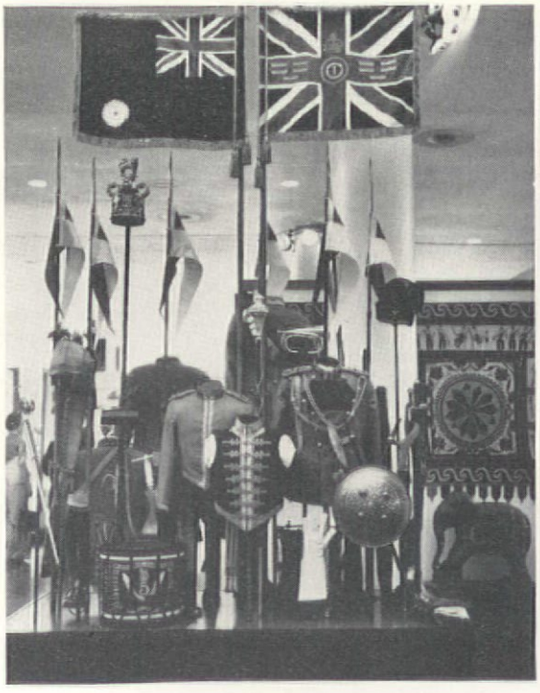

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Photos by Charles Eames of some typical layouts of the standard panels, most of which include one of Nehru's sayings.
For example:

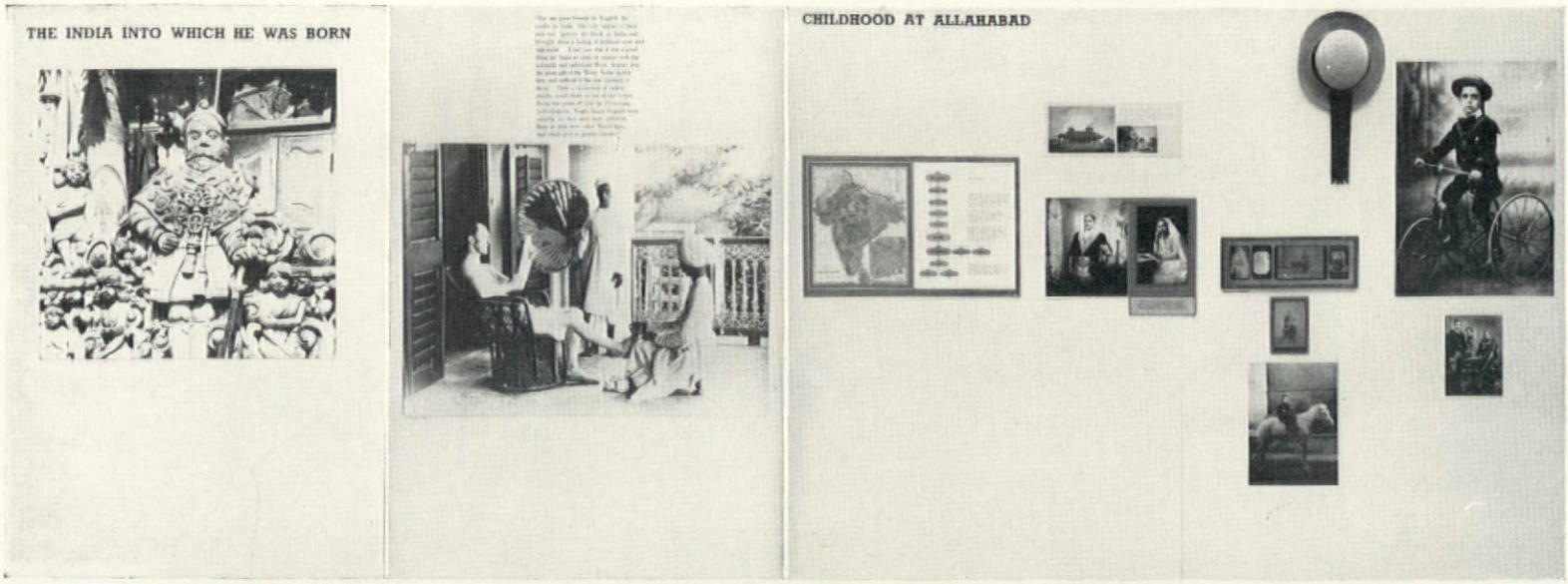
(The British Raj)
But one great benefit the English did confer on India. The very impact of their new and vigorous life shook up India and brought about a feeling of political unity and nationality. . . .

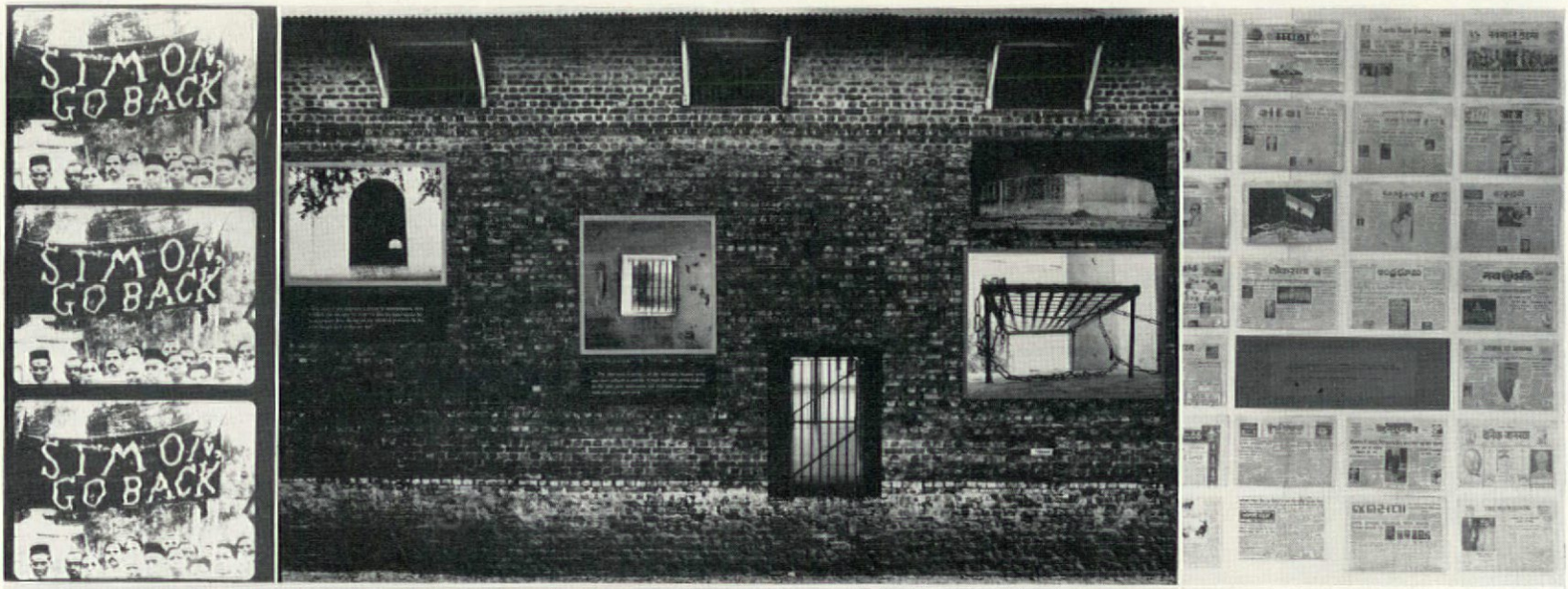
(Prison)
For nearly seven months I had no interview. It was a dreary time for me, and, when at the end of that period my people came to see me, I was almost intoxicated with the joy of it. My sister's little children also came to see me, and, when a tiny one wanted to mount my shoulder, as she used to do, it was more than my emotions could stand.

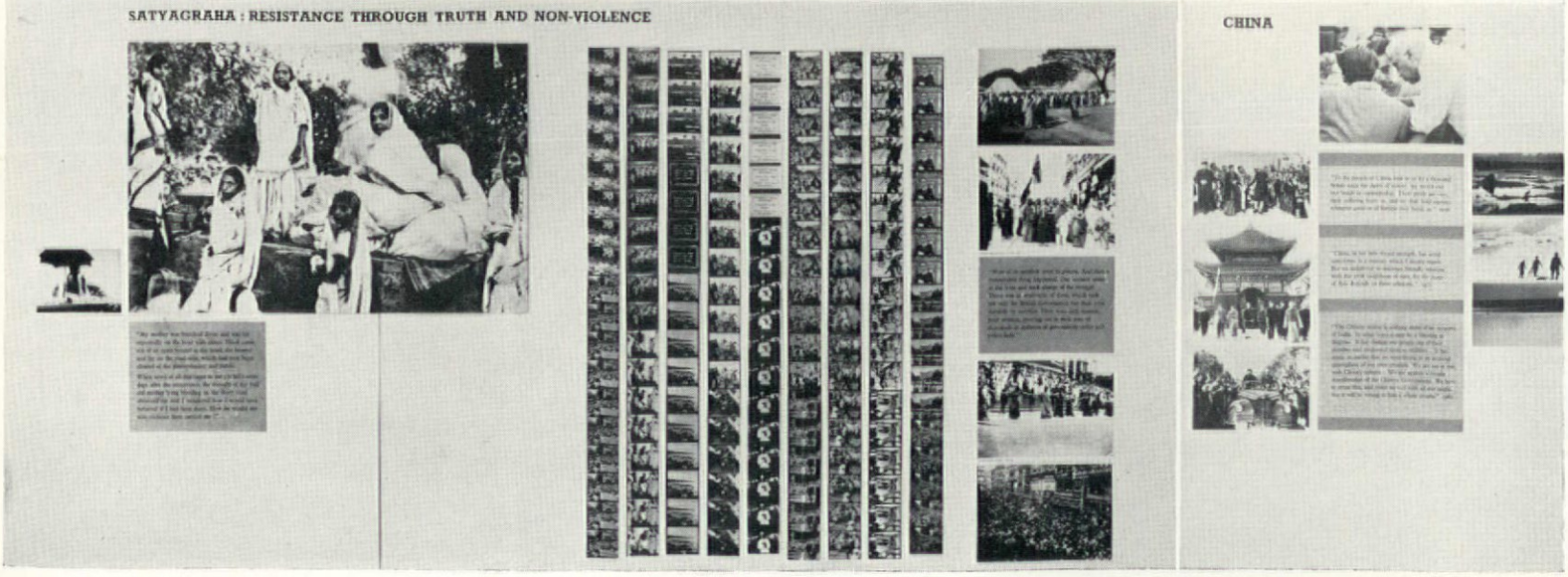
(Satyagraha)
My mother was knocked down and was hit repeatedly on the head with canes. Blood came out of an open wound in the head; she fainted and lay on the road-side, which had now been cleared of the processionists and public.

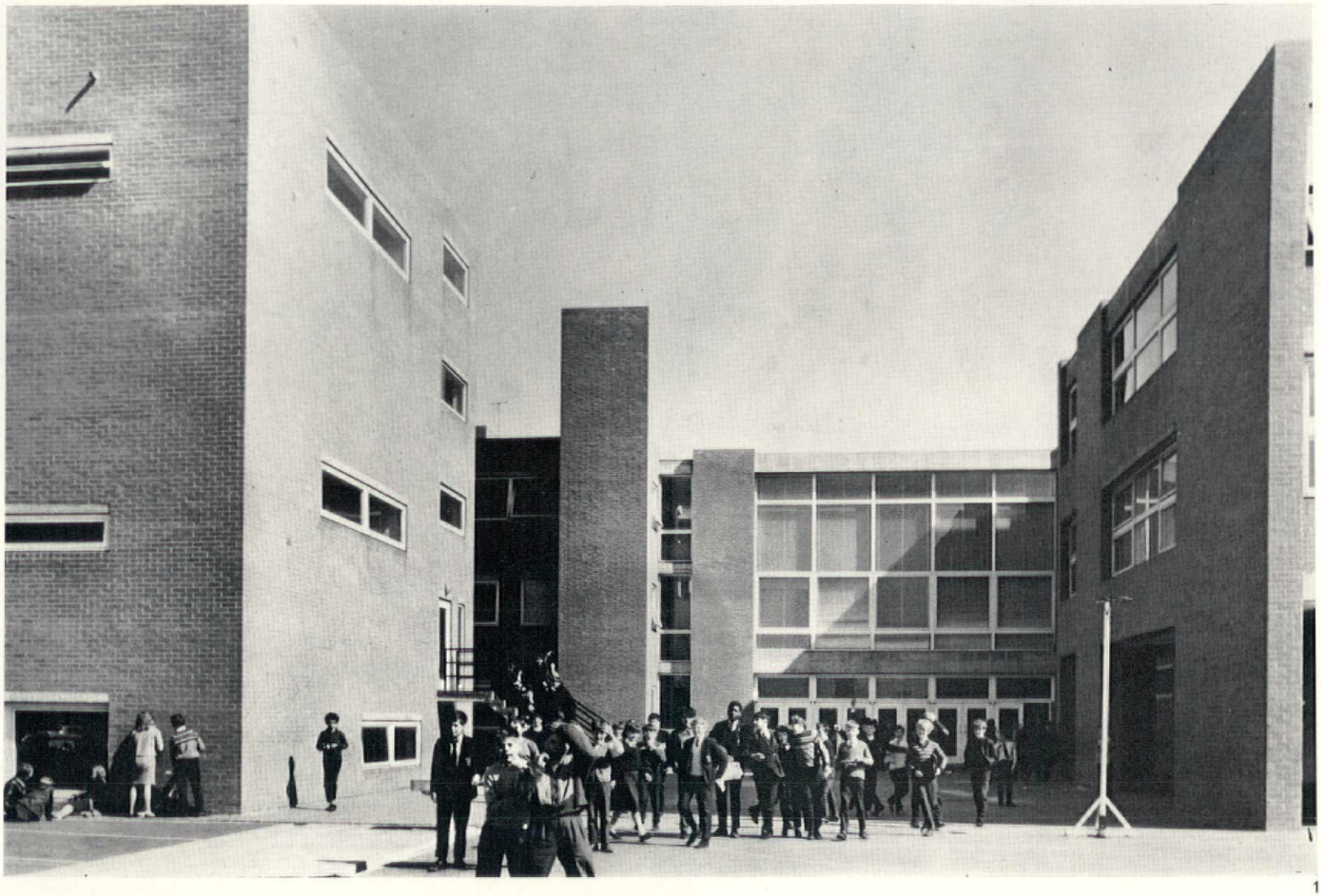
(Non-violence)
When news of all this came to me (in jail) same days after the occurrence, the thought of my frail old mother lying bleeding on the dusty road obsessed me and I wondered how I would have behaved if I had been there. How far would my non-violence have carried me?

(China)
We are not at war with China's culture. . . . We are against a certain manifestation of the Chinese Government. We have to resist that, and resist we will with all our might . . but it will be wrong to hate a whole people. (1962)





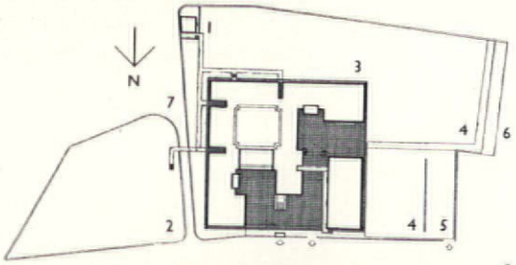




1

1
West forecourt, showing gym block, boys' entrance and covered play area

2
Site plan
1 school keeper's house
2 'Hartco' play area
3 grass
4 asphalt play area
5 parking
6 cycle store
7 public footpath



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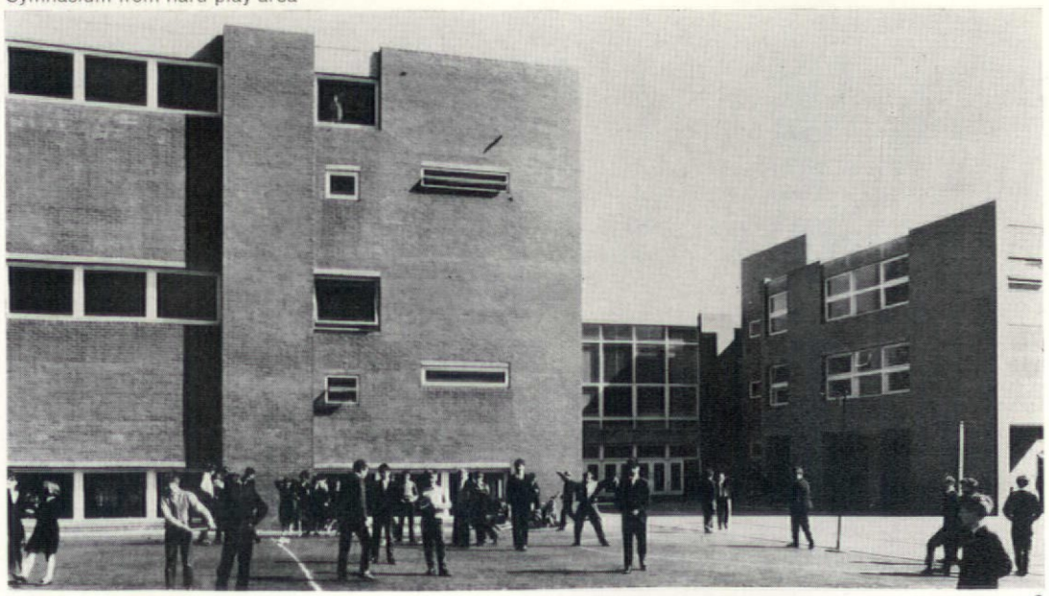
3
Gymnasium from hard play area



3

Secondary school, London E.15

Colquhoun and Miller, in association with Thomas E. North (Borough Architect, County Borough of Newham)

Assistant Architects: Paul Yarker and Christopher Cross

Three acres at Forest Gate, bounded by Forest Lane to the south and Forest Street to the north. Access is from Forest Street. The site is divided into two unequal parts by a public footpath. The new school is built on the larger of the two parts. The smaller part is a hard play area, but will also contain the extension for 120 pupils when the school-leaving age is raised to 16 years.

The school is a six form entry mixed secondary school for 780 pupils.

In addition to 33 classrooms, including science and housecraft and art and craft rooms, it comprises an assembly hall with stage and small hall, cloak rooms, dining rooms and kitchen, staff accommodation, two gymnasia and workshops.

▷page 494

PERMANITE protection

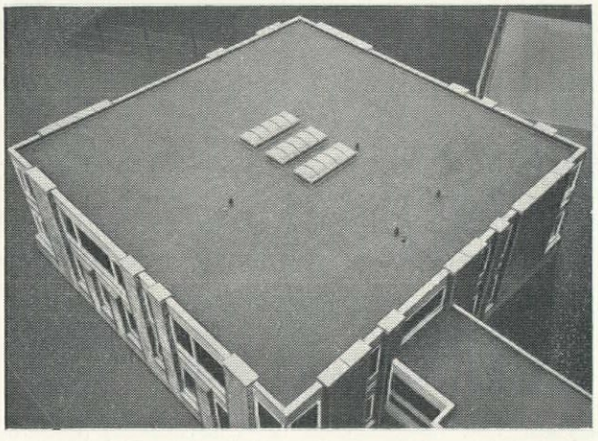


'Asbex' Damp-proof Course

Nurses' Home & Training School at Crawley, Sussex, for the South West Metropolitan Regional Hospital Board.

Architects: Yorke Rosenberg Mardall in collaboration with Richard Mellor, FRIBA, Architect to the Board.

Main Contractors: Sir Lindsay Parkinson & Co. Ltd.



The Nurses' Home is an eight-storey building with a basement housing the boiler plant etc. It has accommodation for 135 Nurses and 17 Sisters, and has six small flatlets for senior nursing staff. Common rooms are situated on the fifth floor of the Home, centrally placed for convenience and fairly high up the building to secure the benefit of the pleasant views over the trees and rooftops of Crawley.

The construction of the Nurses' Home comprises reinforced concrete external walls with permanent shuttering as insulation, clad with 4½" facing bricks. The reinforced concrete walls of the core of the building, enclosing the ancillary rooms, form the central supporting element. Floors are also in reinforced concrete.

The Training School has two classrooms, a lecture room, a library, practical rooms and accommodation for tutors. It is a two-storey building attached to the Home with a single storey link which serves as an entrance hall to both blocks. The constructional system used is load-bearing brick walls and piers with reinforced concrete floors and roof.

Heating throughout both blocks is by means of skirting convectors. Internal ancillary rooms are artificially ventilated.

The damp-proof course used on this project was 'Asbex' manufactured by Permanite Limited. 'Asbex', a flexible bitumen dampcourse with an asbestos base, is almost entirely mineral in content and conforms to B.S. 743 : 1951 Type 5C.

The built-up felt roofing on both the Nurses' Home and the Training School was carried out by the Contracts Division of Permanite Limited.

write PERMANITE protection into your specification

Technical leaflets describing Permanite Dampcourses and Built-up Felt Roofing are available from: Permanite Limited, 455 Old Ford Road, London E3

◁ page 493

1
Main building from cycle store

2
Ground floor plan
2 classroom
3 w.c.
4 covered play area
5 cloaks
6 dining room
7 kitchen
8 store
9 workshops

3
First floor plan
1 classroom
2 w.c.
3 assembly hall
4 stage
5 small hall
6 entrance hall
7 staff offices
8 girls' gymnasium

4
Second floor plan
1 classroom
2 w.c.
3 upper part of stage
4 upper part of hall
5 library
6 staff common room
7 staff rooms
8 boys' gymnasium

The building consists of a main block of three storeys, with the principal circulation on the first floor, and a separate block containing gymnasia and workshops, linked to it by means of a bridge at first floor level.

The assembly hall has been conceived as the core of the scheme, forming a place to which all the teaching spaces are related.

An open gallery round the assembly hall at first floor level forms the main circulation route, linking to the two main staircases at the NE and SW corners of the hall. This gallery is used for supplementary seating, and seating can also be arranged on the stage and in the small hall, when the hall is used for theatre-in-the-round.



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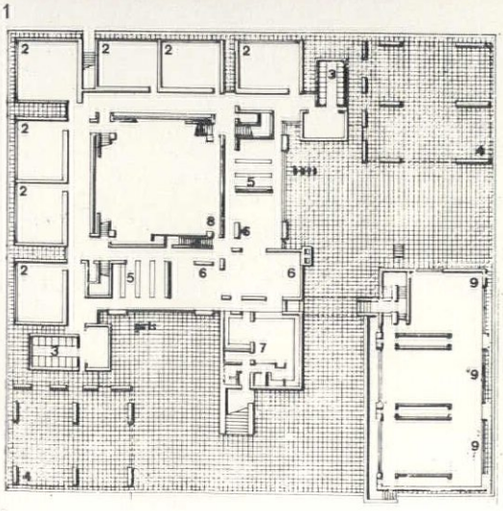

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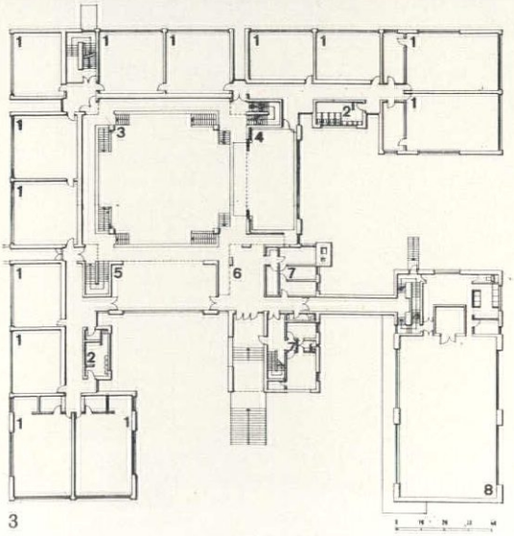

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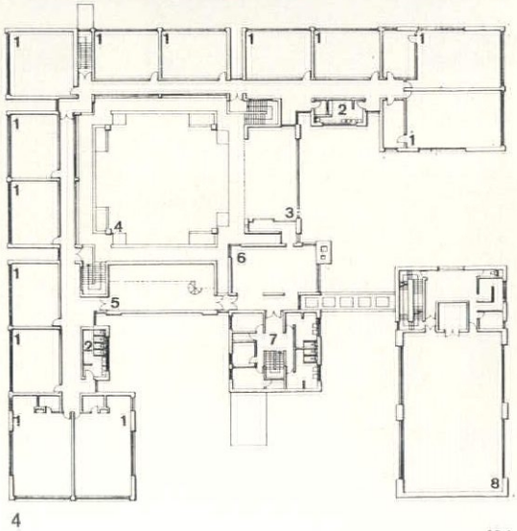

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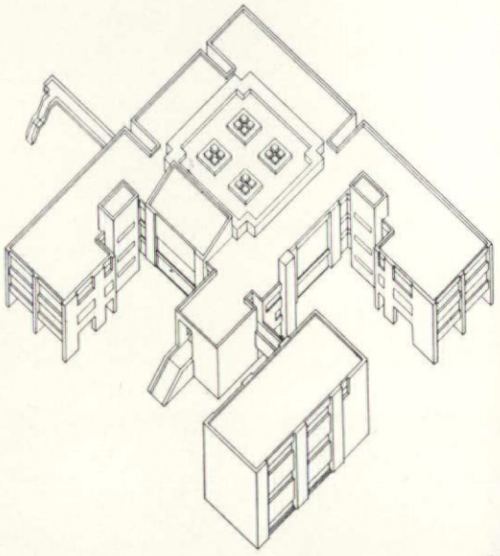


2

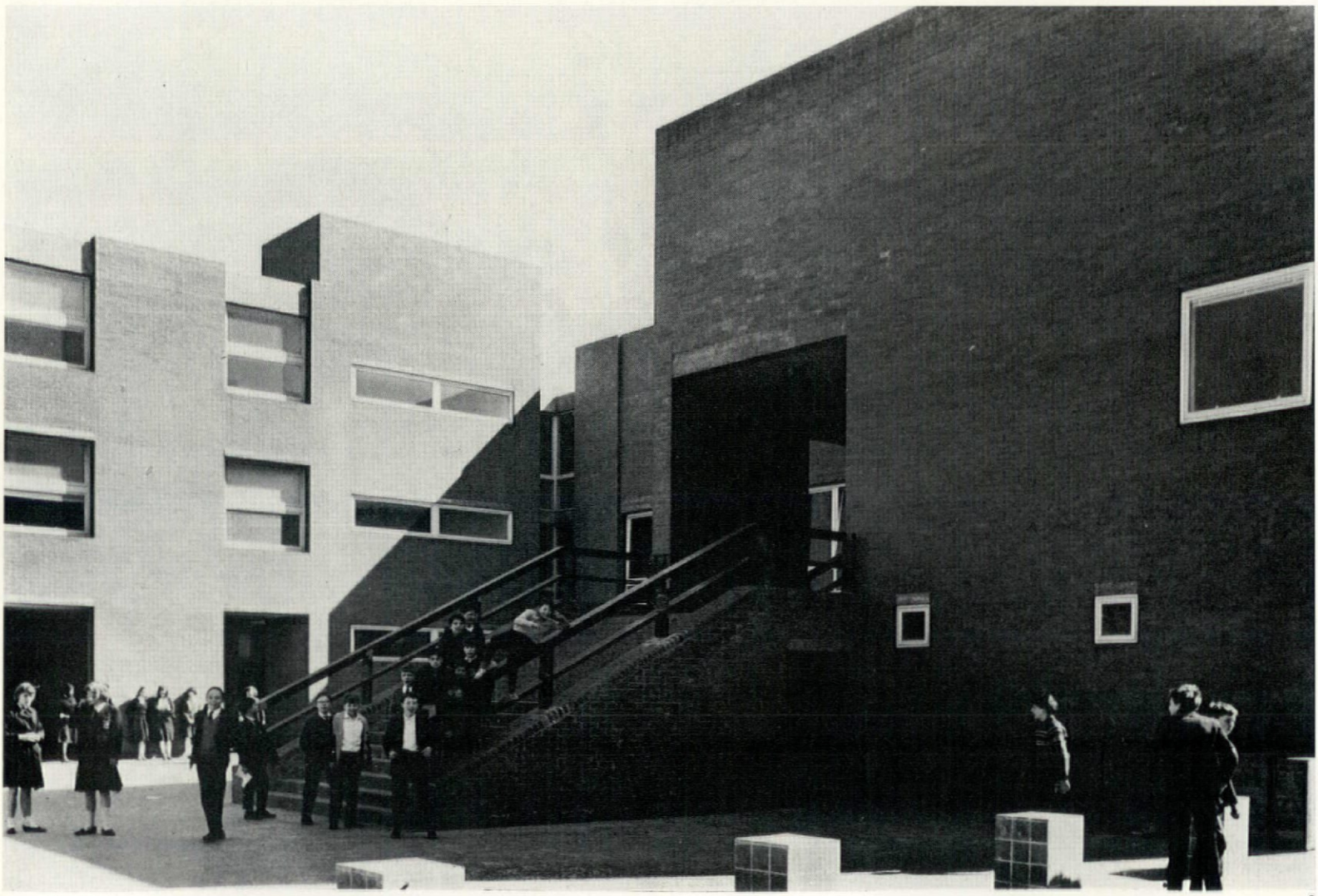
1
Boys' covered play space from boys' entrance

2
Axonometric view

3
Public and staff entrance from north forecourt

4
Staff block from west forecourt, showing bridge to gym and boiler flue

5
Bridge to gymnasium and gymnasium, from north forecourt



3

The stage lighting is flexible, and can be fixed either in the stage fly or round the perimeter of the hall roof.

The hall is lit by means of a continuous roof light separating the roof of the hall from the surrounding structure. Short stairs lead from the entry cloak rooms on the ground floor to all four corners of the hall, which thus becomes a collecting point from which the pupils disperse to their various classrooms.

An external stair connects the main forecourt with the entrance lobby at first floor level. This entrance lobby is directly related to the staff accommodation at the NW corner of the hall, and to the hall itself, and is used by staff, visiting parents, and the public when the hall is let out. The assembly hall is two storeys high, and is overlooked by a further gallery on the second floor which serves classrooms.

A bridge at first floor level connects the main building with the play court on the eastern part of the site.

The pupils enter the school by means of separate girls' and boys' cloak room areas, each related to a covered play area, and giving off tiled forecourts. These forecourts are conceived of as outdoor rooms; they are paved in red quarry tiles and are embraced by the walls of the surrounding buildings.

The building consists of brick cross wall and brick pier construction, faced in smooth red facings. Floors are prestressed precast concrete T beams, carried on in-situ concrete spreader beams. The hall roof is a two way in-situ RC grid pin jointed to four in-situ RC columns, and independent of the surrounding structure.

Lintels are of fair faced concrete.

Windows and external doors are white painted softwood.

Internal doors are of varnished quarter sawn British Columbian pine ply, in white painted frames. Cupboard fittngs are of varnished British Columbian pine with hardwood work tops.

The floor finishes are as follows:

Classrooms and corridors	buff 'Granwood' tiles
Lavatories and kitchen	red quarry tiles
Assembly hall	maple block
Gyms and stage	maple strip

The heating is by means of a low pressure hot water system serving convectors and skirting coils.

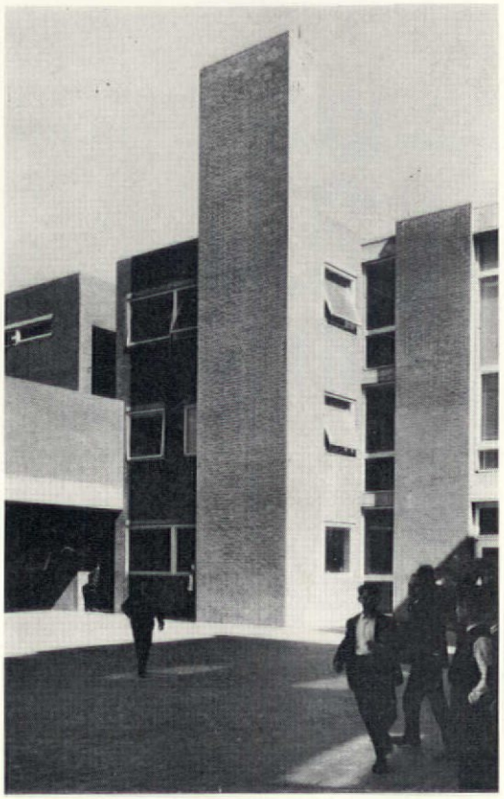
Cost: £337,000

Quantity Surveyors: J. A. Burrell

Structural Engineer Consultants: F. J. Samuely and Partners

Mechanical and Electrical Consultants: Wingfield-Bowles

Main Contractor: J. & R. Rooff



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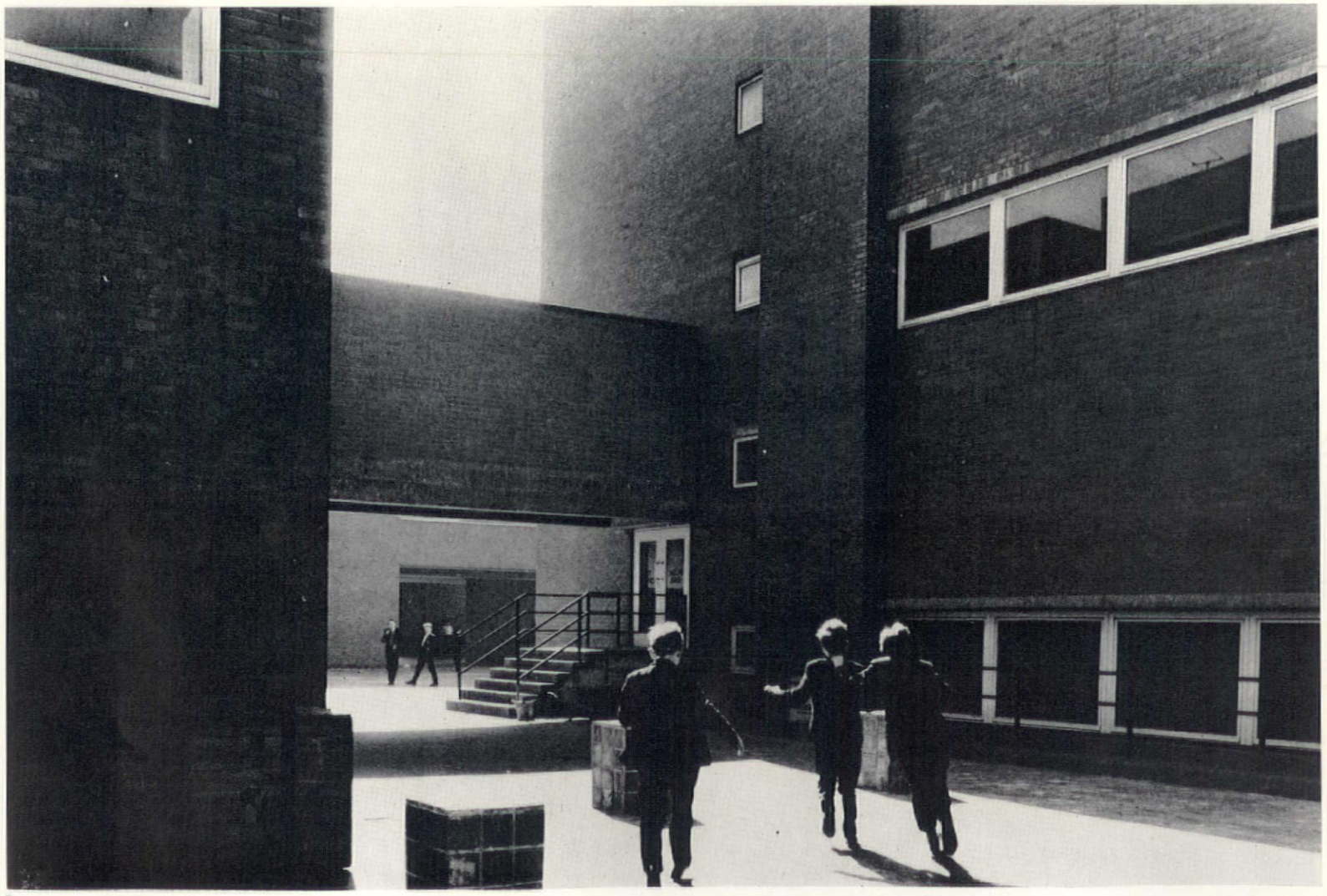

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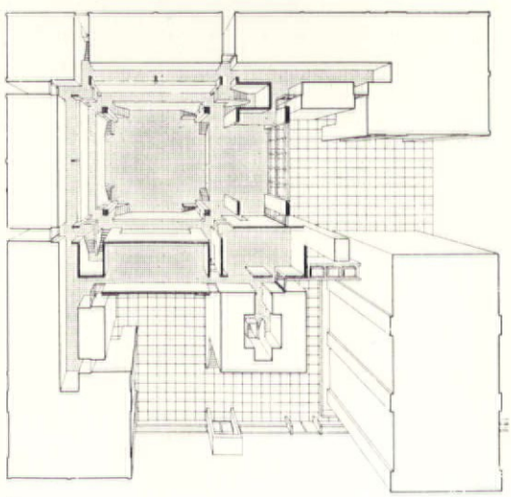
2

1
View of assembly hall and forestage from second floor bridge between staff common room and library
2
View of assembly hall from south-east corner
3
Plan projection showing assembly hall and circulation system
4
View of assembly hall from south side
5
View of assembly hall from the stage



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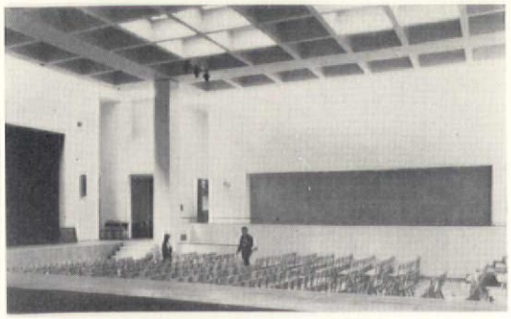

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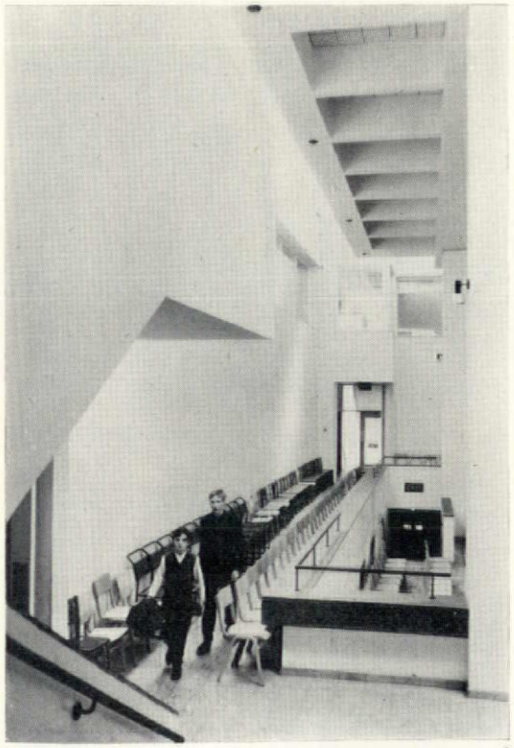

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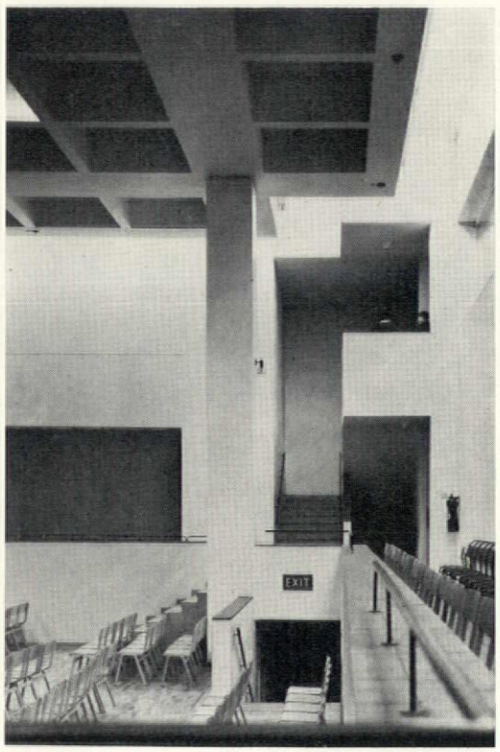

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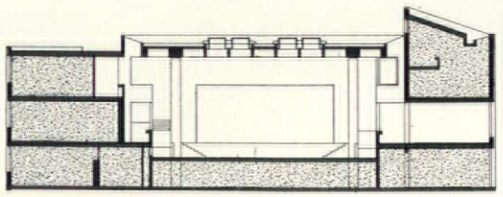

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1
View of assembly hall from the north-west corner

2
View of assembly hall from the north-east stair

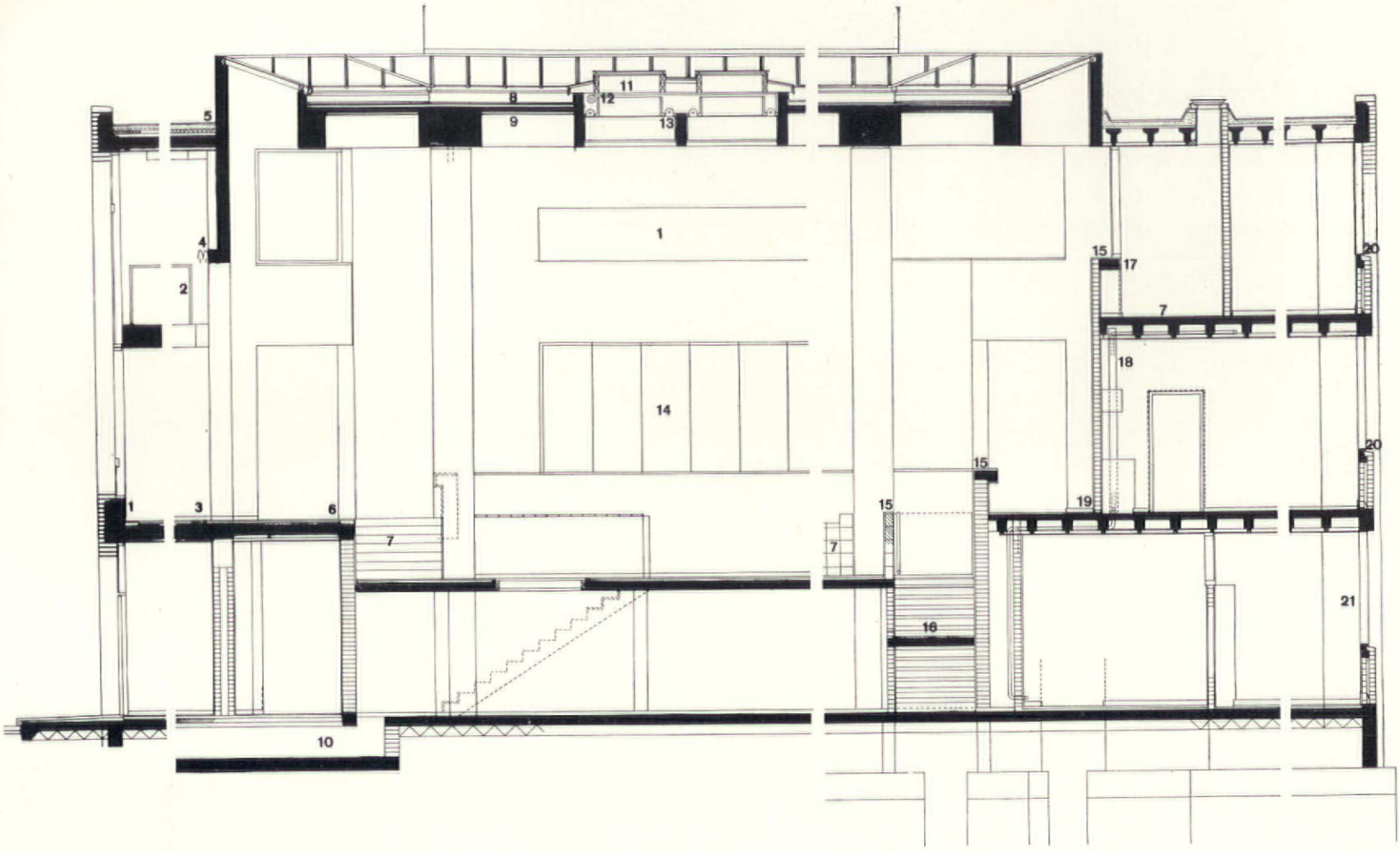
3
View of assembly hall from south-east corner

4
North–south diagrammatic section

5
Broken section through stage, assembly hall and classrooms

6
Library

7
Gymnasium showing gallery at south end



5

Key to drawing
1 solray panel
2 tubular balustrade
3 1in boarding on fillets laid in mastic
4 curtain track
5 ¾in asphalt on screed on 2in wood wool
6 granwood margin
7 granwood tile
8 asphlate on ½in cork
9 acoustic tile
10 duct
11 hercules rooflight
12 roller blind
13 cold cathode lighting strip
14 sliding and folding doors
15 quarry tile
16 granwood tread
17 precast concrete cill
18 heating return pipe
19 granwood skirting
20 brick cill
21 plywood duct cover



6



7

Zoological society laboratories, Regent's Park, London

Llewelyn-Davies & Weeks and John Musgrove

Associate: M. Huckstepp; Assistants: B. Rotherham, R. Attfield, B. Darvill

Structural engineers: Ove Arup & Partners

Mechanical and electrical engineers: J. Roger Preston & Partners

Quantity surveyors: Davies, Belfield and Everest

Commissioned in 1960 by the Zoological Society of London, the building provides new meeting halls for the Society and laboratory accommodation for the newly formed Nuffield Institute of Comparative Medicine.

The primary purpose of the Institute is to extend knowledge of human diseases by the comparative study of those diseases which are common in man and animals.

The laboratories and the halls are each used by two quite separate organizations carrying on different activities.

The research laboratories have indeterminate requirements and need to be capable of change within and growth beyond the space as built, whereas the meeting halls have predetermined spatial requirements.

The building is of in situ reinforced concrete.



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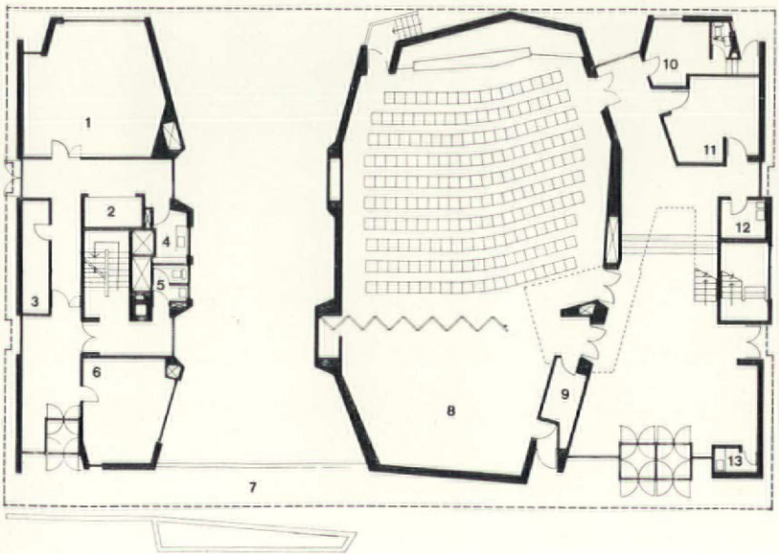

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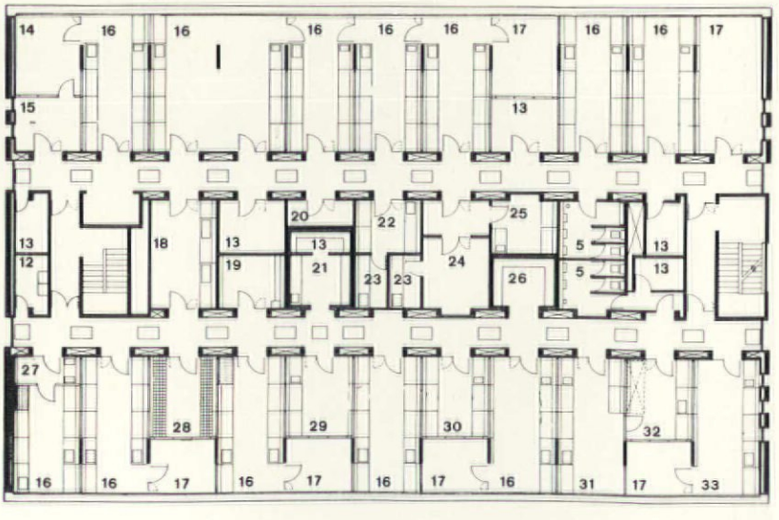

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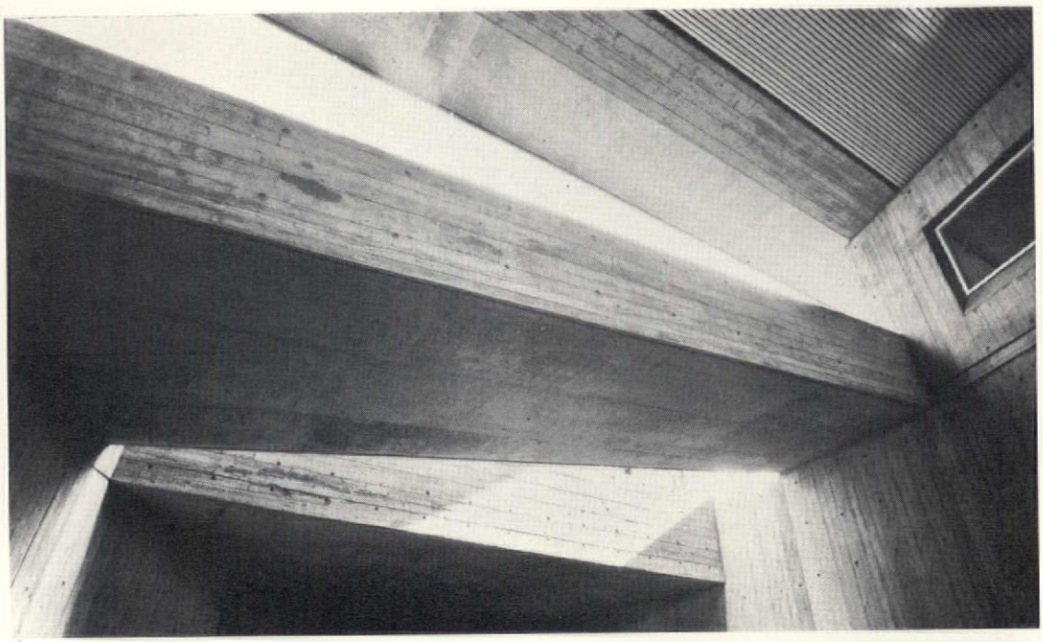

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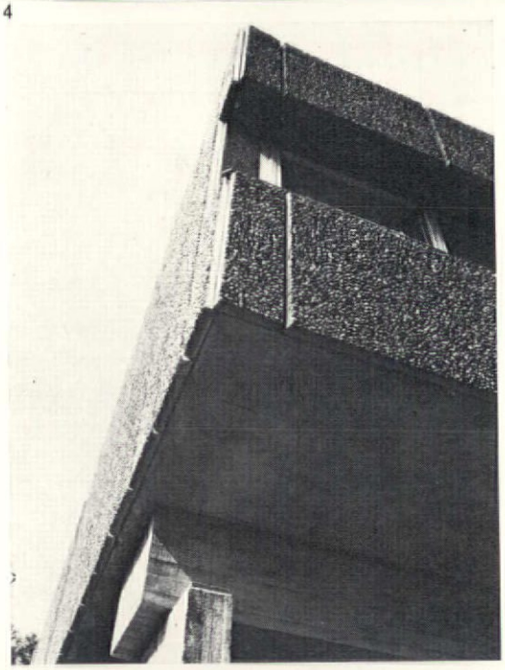

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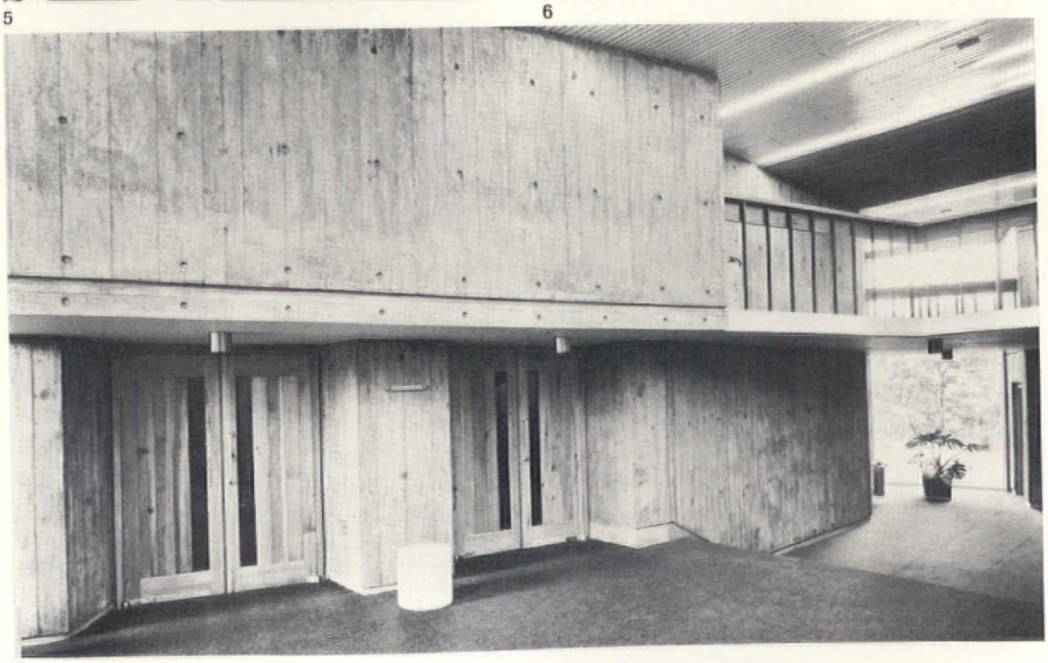

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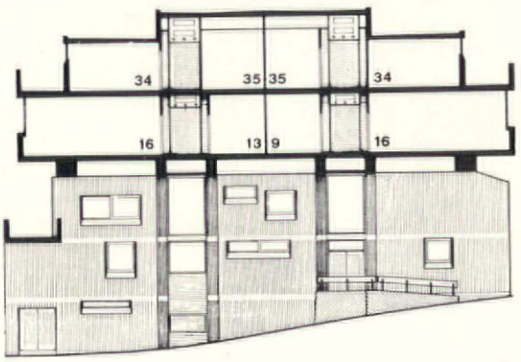
On the ground floor the exposed concrete of the enclosing walls is from boarded formwork. The second floor walls are similarly constructed, but the cantilevered first floor laboratories are clad in grey flint-faced pre-cast concrete panels.

All main service runs are carried in ducts accessible from circulation space so that alterations to services can be made without affecting research work unduly. The vertical service ducts which are formed by the closely spaced columns, allow for a full complement of piped services and ventilation trunking so that all working areas are potential serviced laboratory spaces.

The two centre beams carrying the columns are box beams forming a duct for drainage from the laboratories.

Because the columns forming the vertical ducts are closely spaced it was possible to design the second floor slab without beams and to omit the slab between every other column, giving

▷ page 503



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1
The new laboratories seen from Prince Albert Road, showing the pedestrian way through that had to be retained as part of the programme

2
Ground floor plan

3
First floor plan

4
View from the pedestrian access way, looking north towards the footbridge that sails over the entrance to the underground tunnel

5
Detail of the junction between the ground floor and the first floor, showing, below, the walls and beams of boarded in situ concrete and, above, the precast facing panels

6
Detail of a junction between a plate glass wall and the boarded concrete of the lower floor, with an intermediate floor slab clearly expressed

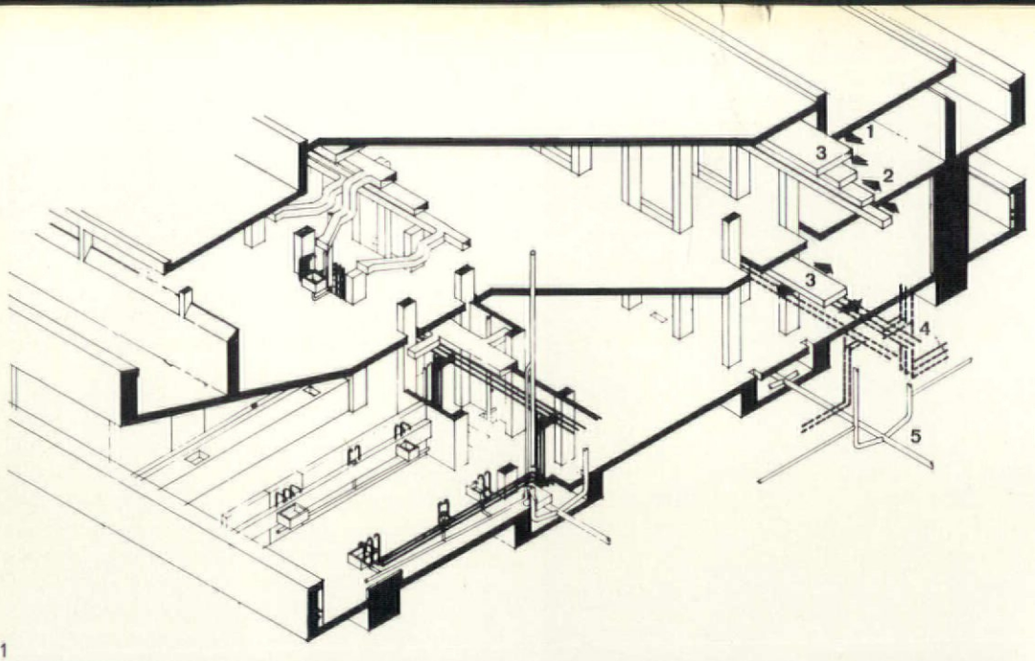
7
Section

8
Entrance hall to the lecture theatres

Key

1 seminar room
2 lift
3 archives
4 kitchen
5 w.c.
6 typists' room
7 footbridge
8 lecture hall
9 chair store
10 speaker's room
11 cloaks
12 cleaners
13 store
14 director
15 secretary
16 laboratory
17 office
18 glass wash
19 centrifuges
20 plant room
21 cold room
22 photographic
23 dark room
24 E.M.
25 microtome
26 hot room
27 shower
28 geiger counters
29 chromatography
30 spectroscopy
31 media preparation
32 sterilization
33 bacteriology
34 animal room
35 X-ray room

Photos: 1 Henk Snoek; 4, 5, 6 & 8 Gareth



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1
Diagram indicating the service runs
1 extract
2 supply
3 ventilation duct
4 piped services
5 drainage

2
Door and window details

3
Standard laboratory furniture, designed by J. Musgrove

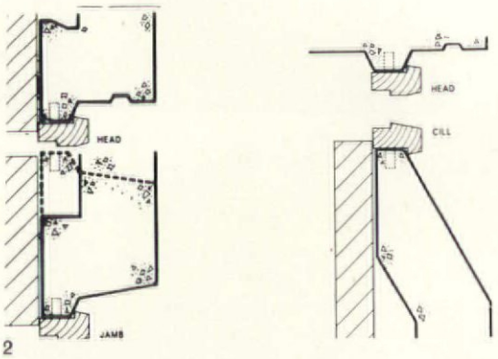
4
First floor corridor ceiling with one of the Burgess metal trays removed to show the service duct

5
A typical laboratory, looking outwards

6
The same laboratory looking inwards

7
One of the animal rooms on the second floor. The heating panels on the wall to the left are supplemented by panels on the ceiling in case of failure. All fittings and details are designed to be proof against tampering by animals

Photos: 3–7 Gareth



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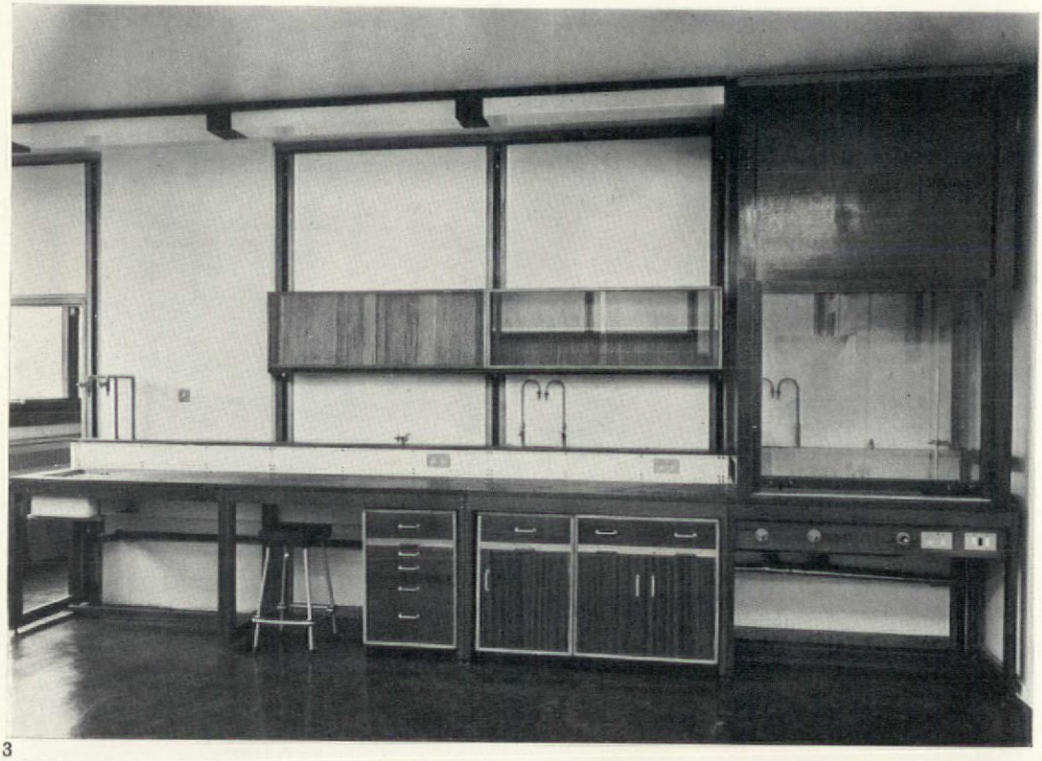

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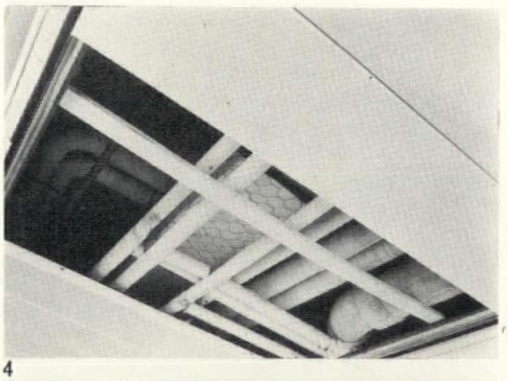

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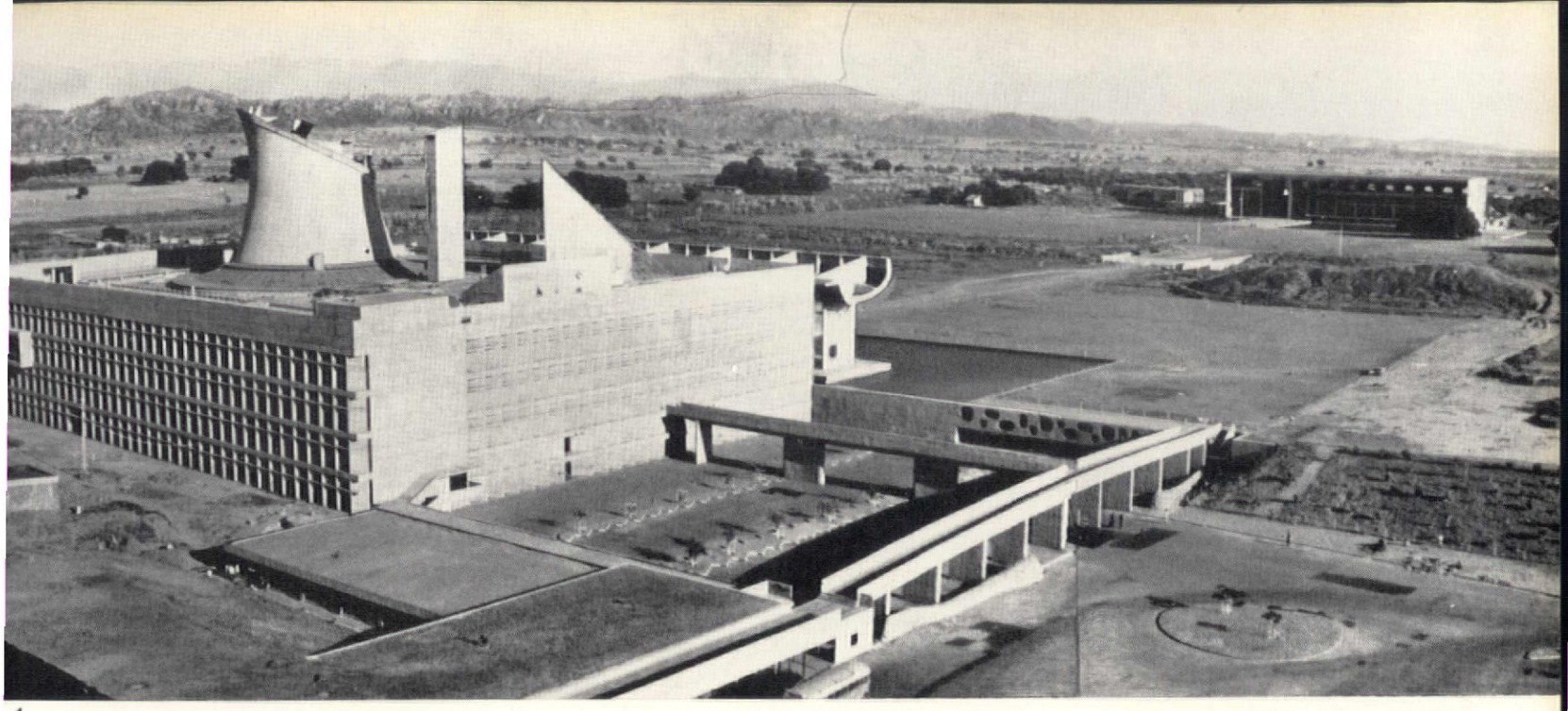
complete freedom to service runs.

During the preparation of the Nuffield Report ("The Design of Research Laboratories") it was found that peak demands for bench length, together with the need to economize on service runs, floor space/bench run ratios and corridor lengths, implied a long laboratory unit with serviced benching on two long sides: in this context, it is interesting to note that a laboratory planned on this basis shows a saving of 20 per cent on the area required to provide a square laboratory with the same amount of benching on three sides. Further studies showed that approximately 40–45ft length of serviced bench, including provision for fume cupboards, sinks, apparatus and built-up experimental equipment, houses comfortably groups of two, three or four workers dependent on the volume of work at any time, and that, therefore, a laboratory depth of the order of 22ft 6in is reasonable. It has also been found from anthropometric studies that a scientist can work efficiently and comfortably at a bench whose width is approximately 2ft. To this dimension should be added six inches to accommodate a prefabricated service spine which houses the various piped services to and from the laboratory as well as drip cups and taps.

The third critical dimension of a laboratory planned on this basis is that of the clearance between the benches. This must take account of the space taken up by a worker when engaged in working at the bench, the space needed for bending down in front of the bench. It has been found that a dimension of the order of 6ft 0in is reasonable.



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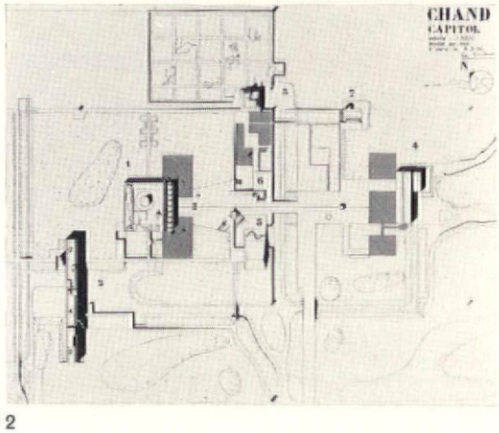

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Le Corbusier in Chandigarh: creator and generator

Eulie Chowdhury

All photos by the author unless otherwise credited

The Capitol to the north of Chandigarh has the largest number of Corbusier's major buildings in one place. They form a tightly knit group. Only here is it possible to see his work on a grand scale. The setting of the buildings against the Himalayas and their living relationship to the city he planned heighten the impact of their grandeur.

The plan of the city, with small variations and with the exception of vertical buildings is, in essence, the outcome of his theories on planning —the sector as an organ for living and working, the seven types of routes for circulation, the sharp contrast between town and country with no intervening suburbs (achieved through a periphery control act) the linear shopping street and the linear parks. Before the town was built, these theories did not come alive; but now that it has been going for over fourteen years, and even though there are vast tracts of empty space in the town, what was theory is now fact and it works remarkably well—better than one would have imagined possible. Even though at present camels and bullocks are seen as frequently as cars on the roads for mechanized traffic, the theory comes through. Only when one has actually lived in Chandigarh and experienced it, does one know how sure was Corbusier's touch and how even small departures made by others, though well meant, have turned out less successful.

The four buildings in the Capitol complex are intended to house the four major institutions of the State Government—the High Court, the Secretariat, the Assembly (or State Legislature) and originally the Governor's house (but now the Museum of Knowledge or Laboratory for Scientific Decision). Each building is complete in itself but the four complement each other to form a whole. Set in a park they will eventually be linked by footpaths, bridges, pools and paved esplanades. Together they form a visual climax to the town.

The Assembly seen from the roof the Secretariat, with the High Court in the distance on the right **1**
Photo Lehmann

LC's plan of the Capitol **2**
(*Oeuvre complète* 1952–57. Boesiger/Girsberger)

The Assembly with the Secretariat for backcloth **3**

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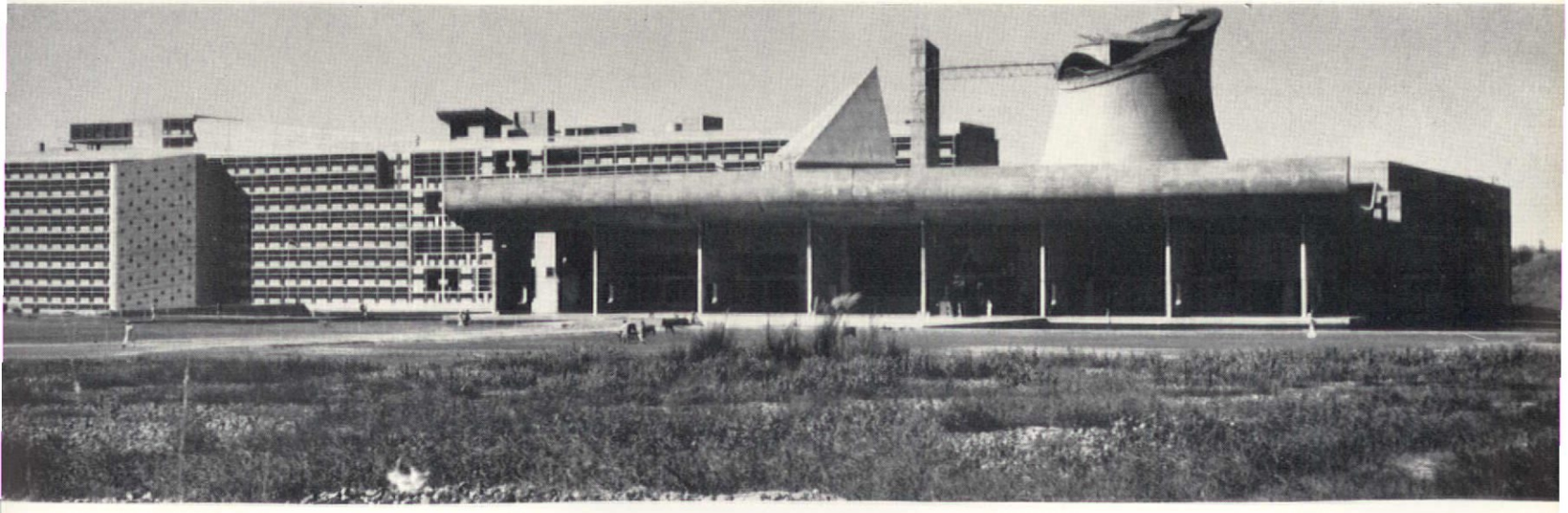
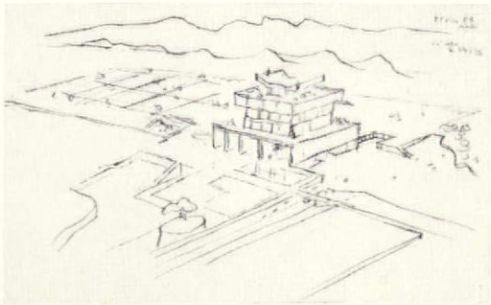




1

LC's sketches for the Governor's Palace **1** and the Open Hand sculpture **8**
(*Oeuvre complète* 1952–57. Boesiger/Girsberger)

The author's sketches of the proposed Museum of Knowledge **2, 3, 4**

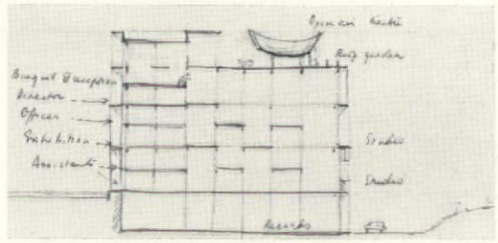
So far only three of the four buildings have been completed—the Secretariat and the Assembly to the west and the High Court to the east. The relationship between the Secretariat and the Assembly is now clear, but the High Court will continue to look a little apart and disjointed until the fourth building which is planned between the Assembly and the High Court is built. This fourth building was to have been the Governor's house, consisting of superimposed squares—of varying areas each floor serving a different function. It was a small finely detailed gem of a building, and it would have provided the link which is missing at present. The Governor however, was eager to live in Chandigarh before the building was started, so he moved into another house where successive Governors have stayed ever since. Latterly Corbusier himself preferred to have another building on this site, a building which he thought more appropriate to the time—a Museum of Knowledge, his 'Electronic Laboratory for Scientific Decision'. The idea for this building is curiously like Corbusier's other ideas—years and perhaps a continent ahead of its time. It was not commissioned by the Punjab Government and for a long time they could not see why it was required. No funds have been allocated for it. But Corbusier's logic was his own and in a broader context difficult to refute. He was told electronics would be very expensive and a poor country such as India could hardly afford equipment which was not used even in a highly industrialized one. His answer was that a poor country cannot afford to waste its resources and must use the most efficient tools it can find to overcome its problems. Books and reports take a long time to read and assimilate, especially

Le Corbusier's description of the Museum of Knowledge

Extracts from a letter of his to the Government of India

While agreeing with your suggestion of a 'Museum of Knowledge', *I am not in favour to build the necessary premises and eqiup them with demonstrations permitting the visitors, by means of photographs, drawings and various diagrams, to perceive the mechanism of the world and all its consequences throughout the ages of the human race;* one can only meet such an ambition with extremely scientific initiatives and a series of programmes prepared by specialists for a public which is not the public of Chandigarh!!!
This kind of museum has already its prototypes at the '*Palais de la Decouverte*' and the '*Musée de l'Homme*' in Paris (both of them exceptionally well conceived and managed museums). They only provide very localized and fragmentary informations, etc. . . .).
The entire work (your programme) *cannot be* realized with the techniques actually at our command. This is why I declared to the Chief Minister that your excellent idea *could only find its true means of realization by the use of electronic devices*. And here we reach the line of conduct discerned by me long ago: the use of electronics (this formidable tool of our times) to broach the synthetical problems of the modern conjuncture (which cannot be perceived with the techniques in use up to now).
On the other hand, your museum becomes practicable and *capable of being used* as soon as the overwhelming techniques of electronics intervene (pictures, sounds, words, colours, diagrams etc. . . .) manifested by magnetic tape recordings and by a *practical form of edition of these recordings* which I have called the 'Round Books', that is to say audiovisual films. These 'Round Books' are therefore a new form of modern edition: instead of being printed on paper they are recorded on magnetic tape. They can be multiplied *ad libitum*. They are capable of finding their decisive customers (scientists, universities, the public in general, educators, etc., etc. . . .; a whole scale of enlightenment).
Therefore I have noted in my programme this 'Library of Knowledge': (the 'Round Books'). How can it be realized?
It can be realized by the creation of '*Electronic Laboratories of Scientifical Decision: Investigation, Reply. Explanation, Expression*'.
The modern world is helpless today before the conjuncture; the conjuncture is numberless, unlimited, imperceptible in time and space, imperceptible by the human mind even though man has exceptional faculties of comprehension, invention and action. Just as the electronic calculation has perturbed the present state of practical sciences (travels to the moon), likewise the organized recordings, which have at their disposal the useful laboratories and a sufficiently qualified management, will endow the men who must assume responsibilities (statesmen, ministers, administrators, administration clerks, etc.) with powerful arguments in the shortest possible time and constitute splendid demonstrations. These demonstrations *are liable to be repeated at any time of the day or of the year* before the greatest variety of people and will no longer require either the speeches or the presence of the men of elite, or the man of elite, who have instigated, created and directed them. It is a new transformation of the mind by the electronic. You will note that in 1831, when electricity made its appearance in our civilization, Balzac already wrote:
'. . . Fear is a semi-morbid feeling, which presses the human machine with such violence, that the faculties herewith are suddenly carried either to the highest degree of their power or to the last degree of disorganization. Physiology has long been surprised by this phenomenon which upsets its systems and perturbs its conjectures, though it is merely an internal thunderbolt but, as all electric accidents, it is strange and uncertain in its modes. *This will become a common explanation when scientists recognize the immense part played by electricity in the human mind.*'
My project for the 'Museum of Knowledge', at the summit of the Capitol of Chandigarh, can thus be defined:
Museum of Knowledge:
The 'Round Books' will be one of the indirect and complementary productions of the distinct activities constituting the programme of the Palace of Chandigarh.
(1) The Palace of Chandigarh (Government House) will have at its top a reception room (State Room), a roof-garden with different manifestations, facing the Himalaya, for the regular or exceptional guests of the Punjab Government.
(2) Four spectators' balconies for projections will occupy one of the sides of the State Room opening at will on each of the screens of the four electronic laboratories which are located in the building (under the premises reserved for the Government propositions of the Prime Minister or Chief Minister or the administrators of the elite of India or even of foreign countries).
(3) The four above-mentioned laboratories are four empty naves in which continually mobile installations permit the realization of the specific programmes of each of the four laboratories.
Each of these four laboratories deal with a special branch:
(*a*) technical; (*b*) economical; (*c*) sociological; (*d*) ethical.
Each laboratory has a sub-manager.
The four laboratories have a Direction and an Administration.
Each of the four laboratories has its works materialized (electronic transcription) by the General Workshop which occupies the entire basement of the Palace.
(4) The Direction and the Administration of the laboratories occupy the area under the State Room. The same area, situated under the Administration and the Direction, will be reserved for Temporary Exhibitions.
The Museum of Knowledge of the Capitol of Chandigarh is thus defined in a building of a great facility of construction.
The enterprise is governed by the highest purpose which consists of endowing the Punjab Government with a Scientific Tool of Investigation, Reply, Explanation and Expression. This will enable the big problems, the serious problems, the unseizable problems of the present times, and of India in particular, to be perceived, explained and to receive their solutions. These solutions will be explained before Government audiences or public audiences. India will be the first to dispose of this tool. However, it is but right to point out that these researches are issued from a universal need of audiovisualization followed by the creation of several most significative organizations.
It is easy to realize that organizations such as the United Nations are submerged by bureaucracy, phrases and speeches, for lack of electronic means which are indispensable for analysis and proposition. When a hundred different nations are suddenly brought together under the terrible pressure of ambitions, of rivalries as well as of generosities, to endeavour to restore order in the world, to realize the strict duty of solidarity and to open the door to peace instead of vainly trying to save a world which draws back behind a turned page, it is necessary to know that one can dispose of new means of realization. But one must be able to seize them, make use of them and through them let live a new world!

Paris, the 29th December, 1960
LE CORBUSIER



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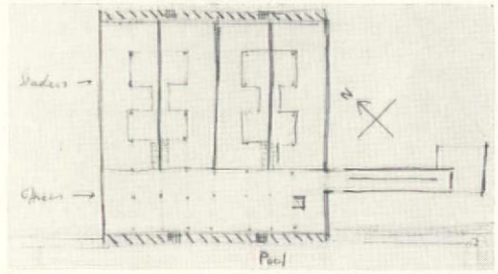

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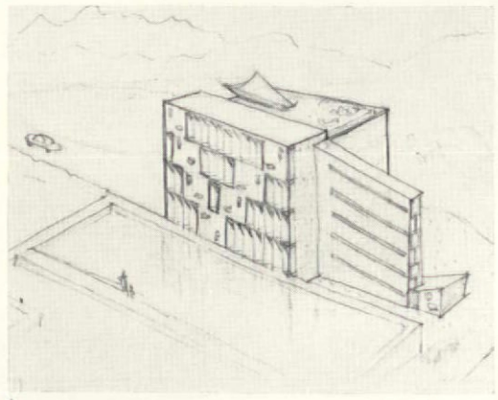

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in India where bureaucrats are almost submerged in paper. Audiovisual techniques can pose the problem in a much shorter time so that it is readily grasped by those in Government as well as the public. The same method can be used to arrive at solutions. He says, 'I have discovered the necessity for the creation of an electronic laboratory to be put at the disposal of the administration (Prime Minister, Chief Minister) and designed to ensure the carrying out of the necessary orders concerning that part of a nation's life which is called its planning'. Having analyzed the whole and given the idea, he designed a building which will accommodate its various functions. The details of the electronic equipment which will be required will have to be worked out by a specialist in that field. In the meantime the people to whom he made this brilliant and original suggestion are a little puzzled about its utility. After the Chinese aggression, it was among the first projects to be axed and it has still not been revived.

In addition to the four Capitol buildings, Corbusier built a boat club on the lake, a school of art and a museum in the Leisure Valley, an extension to the High Court, and an entrance and road fittings and finishes for the promenade along the lake. He prepared designs for the landscaping and sculptures of the Capitol park, the landscaping for another park to the west of the Capitol as well as for the Leisure Valley. Also standard designs for all buildings along the two arterial roads and in the City Centre.

During the last few years industry has been expanding very rapidly in the Punjab. Much of it has been haphazardly located with the result that it has often choked the growth of existing towns. Ribbon development along trunk roads has caused clogging. Understanding that this way leads to chaos Le Corbusier suggested that the idea of linear industrial towns proposed by him in his 'Les Trois Etablissements Humaines' should be adopted in the Punjab, and he offered to permit his work to be translated and published in Chandigarh. He was acutely conscious of the problems of town and country planning and wanted the Punjab which is on the threshold of industrialization to avoid the pitfalls encountered by the west and to learn from their mistakes. The book has yet to be printed. His architecture and his town planning ideas have influenced all the people with whom he has worked, and directly or indirectly his analytical insight, his breadth of vision and his greatness are translated, but not equalled in their work.



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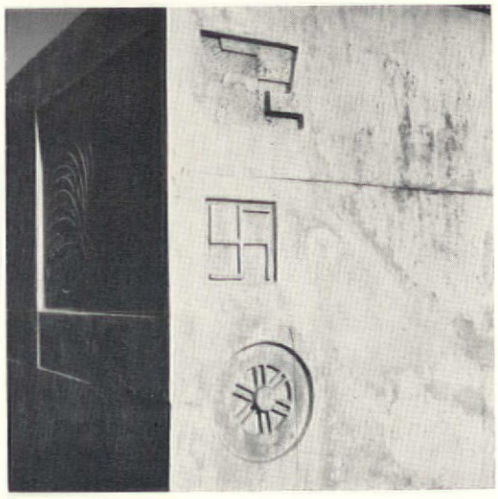

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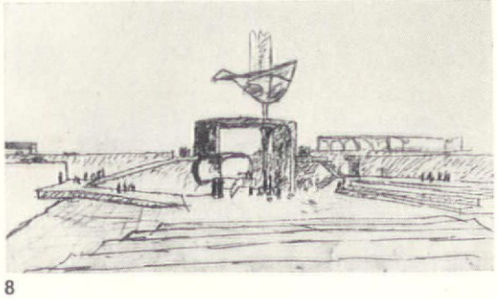
Driving from Delhi to Chandigarh and in Chandigarh itself one sees how life in the Punjab is lived. This is one of the more prosperous states. The peasants work hard and they reap good harvests. The Punjabis are known for their bravery and adventure—qualities which helped to bring forth Chandigarh. They take good care of their animals. The wheel, the bull, the camel, all common sights, made a telling impact on Corbusier, which expresses itself in his buildings, his paintings, his tapestries and his reliefs. The cart wheel **5** still used by peasants to carry the harvest to market impressed Corbusier so much that he intended to use it in concrete as a focal point on the entrance façade of the Governor's house. He uses it as a bas-relief **6** in a monument on the lake below two other reliefs. The camel loaded with grain or resting in lines of six or seven after being unloaded, is a familiar sight on the high-speed roads of Chandigarh and appears in bas-reliefs in the concrete walls of the Assembly. Also the sun, the most important force in LC's work **7**. The long massive Secretariat **9** with its repeating rhythm of vertical fins acting as sun-breakers and parapets, broken only by the ramp and the change in floor heights for the larger rooms for Ministers, effectively complements the square squat Assembly with the three unusual shapes on its roof (pages 507, 510). The hyperboloid at the top sliced off at an angle roofs the lower house. The idea for this form came to LC when he saw the cooling towers of the factories on the outskirts of Ahmedabad. (Isamu Noguchi says the roof of the Assembly is the biggest lingam in Asia). Structurally it is independent of the frame of the rest of the buildings. The pyramid, with glazing only on the north side for light, is the roof of the upper house. The long slender tower encloses a service stair leading to the top of the hyperboloid.

A wide paved esplanade still to be built will connect the Assembly to the High Court. The park around the Assembly is at present mostly scrub, weeds and left-over building material. The whole of the Capitol was designed for pedestrians, with landscaping, paved walks, hillocks, foot bridges, pools and a number of Corbusier sculptures **8** (the path of the sun, the open hand, the tower of shadows and the martyrs' memorial). Except for two or three artificial hillocks (made from the excavated earth of the buildings) which have been planted, there is little likelihood that the landscaping of the rest of the Capitol will be completed in the near future. This is a pity as the buildings will only show to their best when they are in their proper setting and not, as now, left in the middle of near wilderness.



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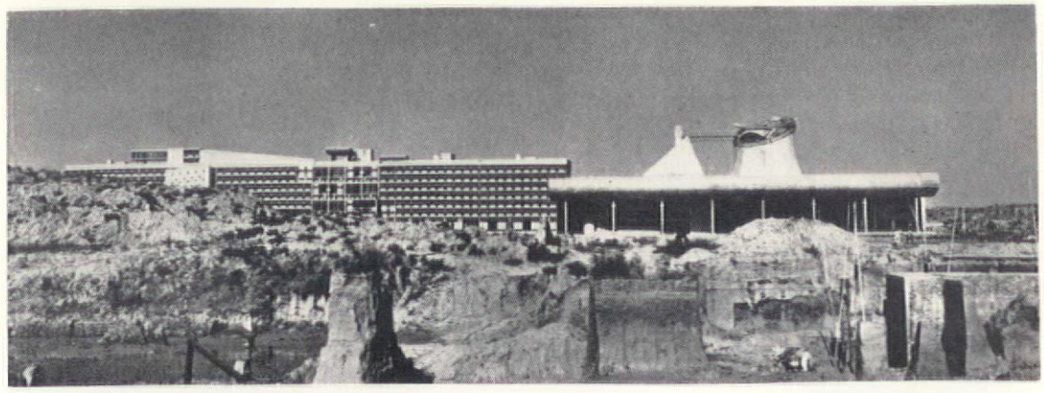

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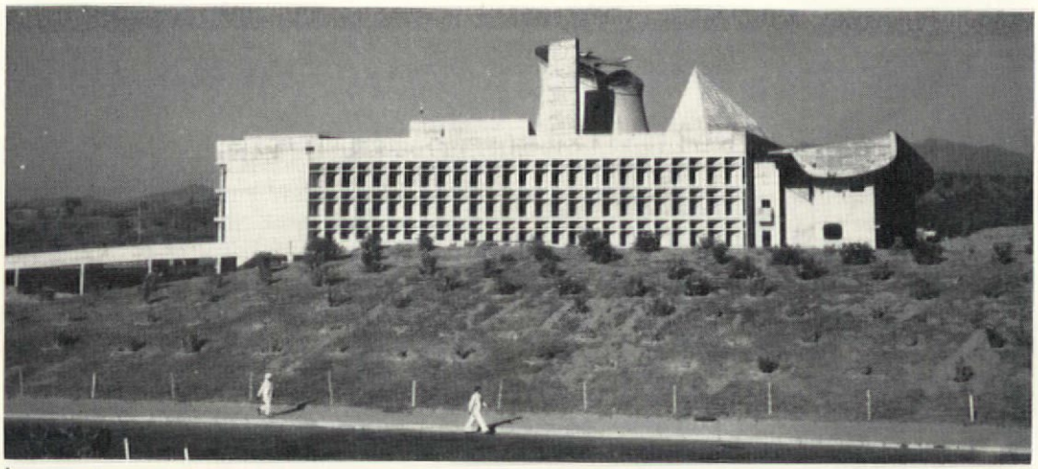

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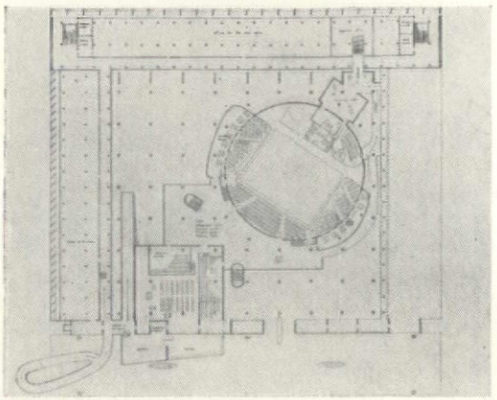

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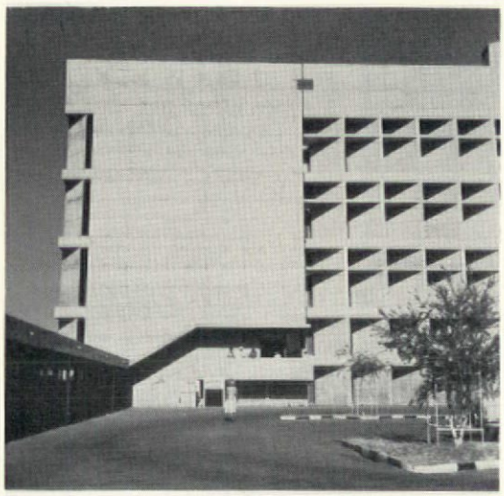

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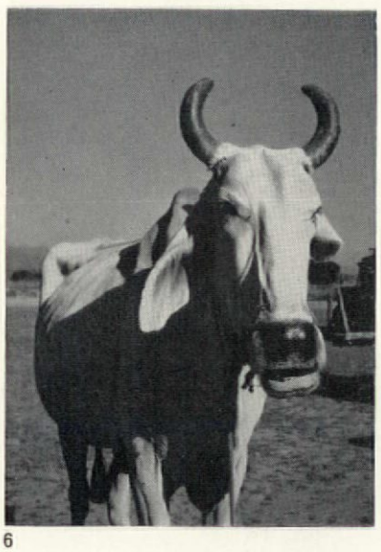

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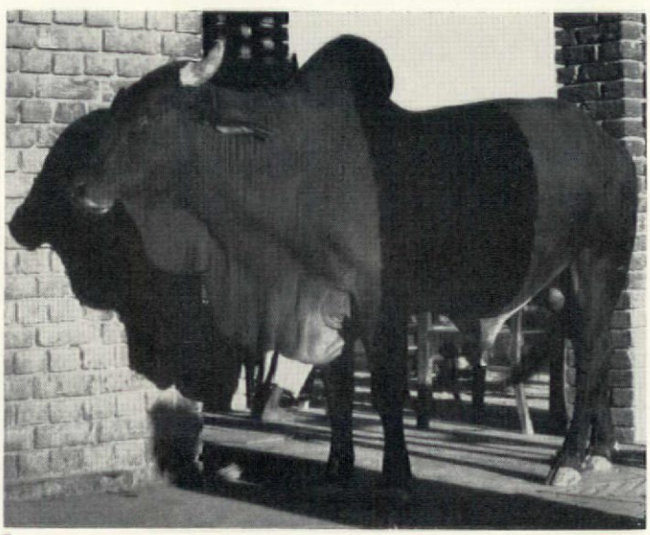

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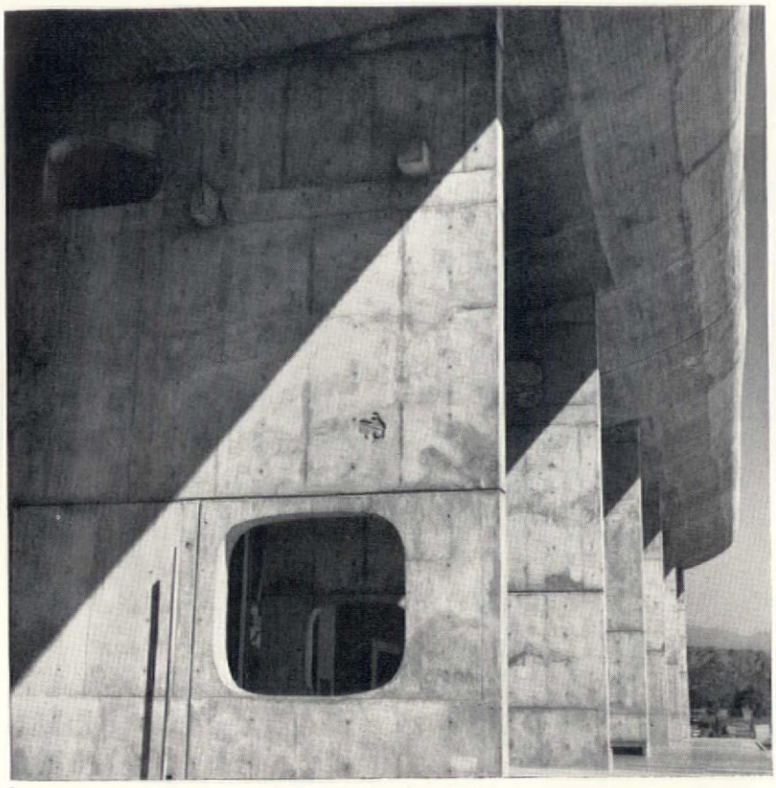
The south-west façade **1** has the foothills of the Himalayas for background. The car road, 15ft below the level of the pedestrian park, leads left to the Assembly and Secretariat and right to the High Court. A footbridge connects the Assembly to the Secretariat.

The portico of the Assembly is reflected in the pool **10**. To the left behind the sun-breakers are offices.

The high portico of the Assembly with its curving roof forms the ceremonial entrance **9** (car access is forbidden) with, just off-centre, the pivoted enamel metal door painted by LC himself **11**. On the other three sides of the Assembly (see **2**, LC's plan, *Oeuvre complète* 1952–57) are offices glazed from floor to ceiling, protected by vertical and horizontal concrete sun-breakers. The rectangle at the core contains the round lower house and the square upper house. The remaining space is used for a lobby which seems to flow round the two houses and because of its height conveys a feeling of immensity. Stairs and ramps lead to the different levels and to the spectators' galleries.

The building from the west **3, 4**. The connecting passage in the right foreground has 'potatoes' in the concrete wall. The sun-breakers effectively cut off sunlight from the glazing of the offices.

The vertical concrete membranes of the portico have irregular rounded openings which LC described as 'potatoes' **9**. A relief in the concrete can be seen in the nearest membrane. Several motifs were used for these reliefs. They were first carved in wood from full-size drawings by LC, then left in the shuttering before the concrete is poured. When the shuttering was removed the wood relief left a perfect impression in the concrete. Corbusier insisted on large-scale and often full-size drawings of every element in the design—the 'potatoes', the shuttering and the joints. Alternatives were prepared under his direction and only when he was satisfied was a drawing issued for construction.



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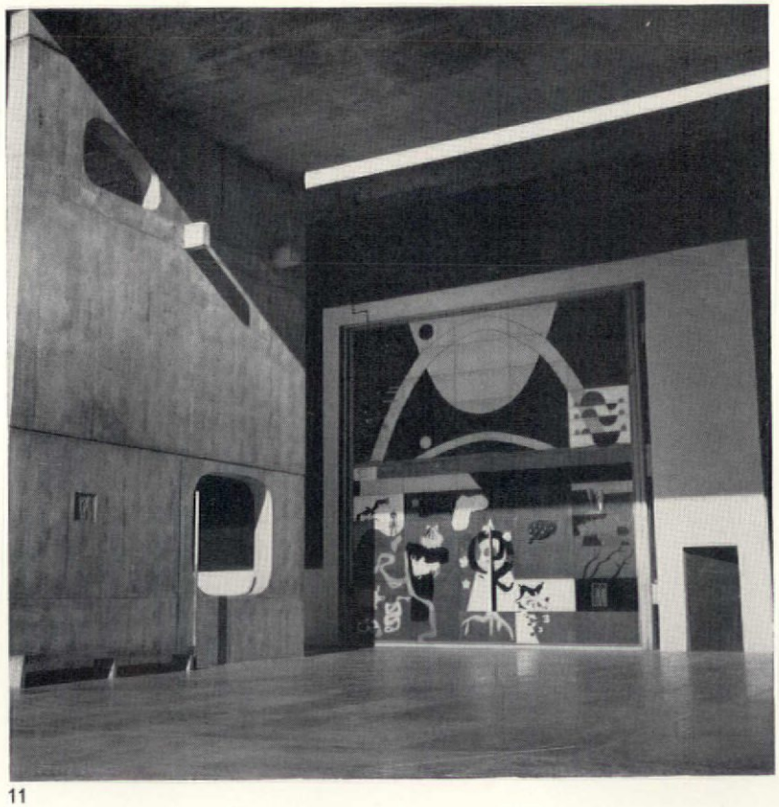

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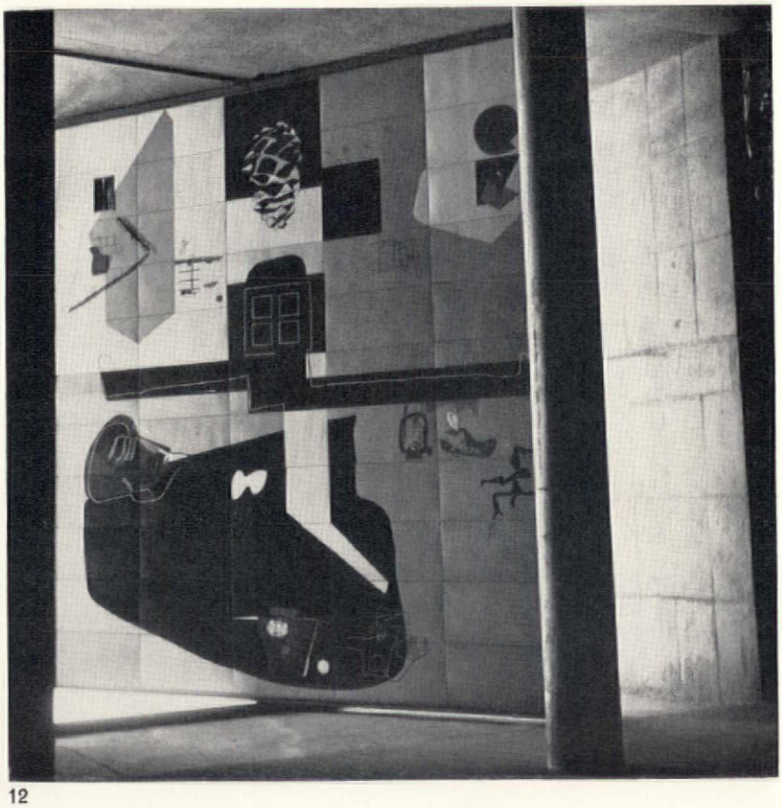

12

On his visits to Chandigarh he spent the early morning hours visiting building sites, making notes and sketching. Then he went to the architects' office and worked late into the night doing much of the drawing himself and having an assistant in the room working on another drawing on a table bigger than a ping-pong table. His study drawings and sketches were normally too large to fit on a conventional drafting board. It was not all work and no play, however, as he often stopped to relate an amusing anecdote or to digress about ideas and concepts far removed from the local context, which seemed to project themselves into a future not yet known. It was at these times that he gave the feeling that whether it was problems of traffic and circulation, or population or industrialization, he was far and away ahead of many younger men who were thinking and writing about the same subjects. He had a remarkable capacity to analyse a problem and reduce it to its simplest components and then go on to its solution.

The great enamel door has brilliant colours on the outside **11**. It is framed by a plastered wall painted bright yellow and black. Nature, as in LC's architecture, is equally forceful in his painting. The door is dominated in LC's words by 'that great regulator of life—the sun', seen at the top with a wide arc showing its path in summer and a small arc showing its path in winter. To the right above the centre are the curves for day and night in summer, the equinoxes and winter. The lower half has familiar elements taken from the countryside—a tortoise, a goat, a hawk, a bull **7**, a snake. The snake appears also on the tapestry near the main entrance **5** and in a bas-relief **8**.

The door has another painting on the inside **12.** It too is of enamel metal sheet but the colours are muted and the blue and brown have an almost pastel gentleness. A man, a hand, a pine cone are recognizable motifs in the patchwork of coloured shapes.



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2



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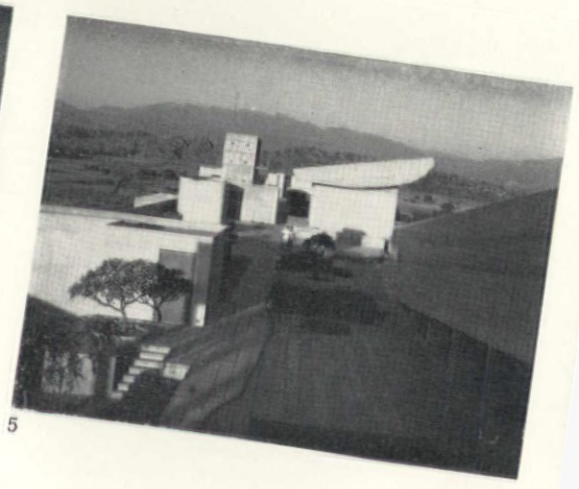

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The entrance hall **3** (photo *Design Annual*) has a ramp **1, 2,** leading to the main lobby on the first floor. The brilliant colours of a double height tapestry create a feeling of lightness and gaiety in the subdued light inside the building. Going up the ramp the slender grey columns of the lobby seem to dissolve into the black ceiling. There is a feeling of mystery as if one stepped into a vast and ancient place. The regular spacing of the columns is not monotonous as the sources of light create a play of their own. Clerestorey lighting along the sides above the offices throw indirect, diffused light on the mushroom tops of the columns and on the ceiling.

Inside the lower house **9, 11** (photo *Design Annual*) the bold upward sweep of the curving shell has been deliberately cut by horizontal planes of colour. Grey 'clouds' of acoustic material float against a yellow and, below, red ground. Though there is some natural light, for all practical purposes the hall is artificially lit.

The interior of the upper house **7, 8.** The roof is a square sitting diagonally on the square plan. On the right wall is another wool tapestry in bright colours—red, yellow, white, black, blue and green.

The north glazing which lights the upper house **6.** The vertical concrete members are described by LC as 'ondulatoires' or 'undulatories', as the variation in the glass widths is in waves graduating easily and not suddenly from small to large. The horizontal divisions are of very light steel. This type of glazing permits the use of nearly all of the glass sheet, as left-overs can be used in the narrow widths. As the glass is set directly into the concrete mullions, money is saved on joinery. The undulatories have been extensively copied by other architects.

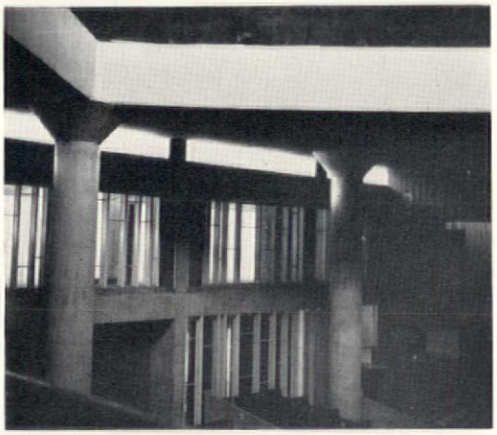
The roof of the Assembly **10**. The stair tower is on the right. A metal bridge gives access to the top of the hyperboloid.

The Secretariat **4** (photo *Japan Architect*). The long repeating rhythm of the façade is broken in an almost musical manner by the chord of the solid mass of the ramp and the playful fantasia of the ministers' block. The canteen, ramp, lift towers and curving porch on the roof form a counterpoint to the main building. The town is to the left and the fields and mountains to the right. An artificial hillock built-up from the excavated earth of the foundations, hides the lower floors of the Secretariat from the town. It comes into full view only after turning left at the roundabout. LC's theory that a direct contrast between the lone peasant in his fields and the gregarious relatively sophisticated office worker who lives in the city can be a stimulating and creative experience for both is borne out in Chandigarh. Within a minute's walk of the Secretariat one is in open fields. Villagers feel no hesitation in asking a visitor to drink milk or freshly boiled sugar cane juice. The pleasures and anxieties of those who work on the soil become real and moving to the city dweller. The peasant can see at close quarters all the paraphernalia —the comforts as well as the drudgery of city life. The city dwellers have cinemas and houses, plumbing and cars, but they have not fresh milk or their own freshly made butter, nor flour ground from their own wheat.

The varying shapes on the roof of the Secretariat **5**—the lift towers, the pavilion with its curving roof, the ramp leading to the canteen contrast with, but do not dominate the mountain background.



6



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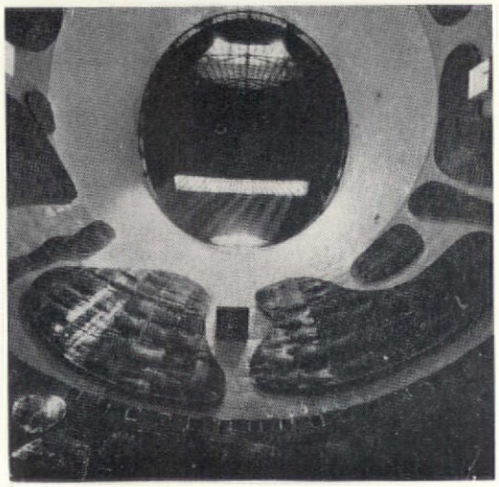

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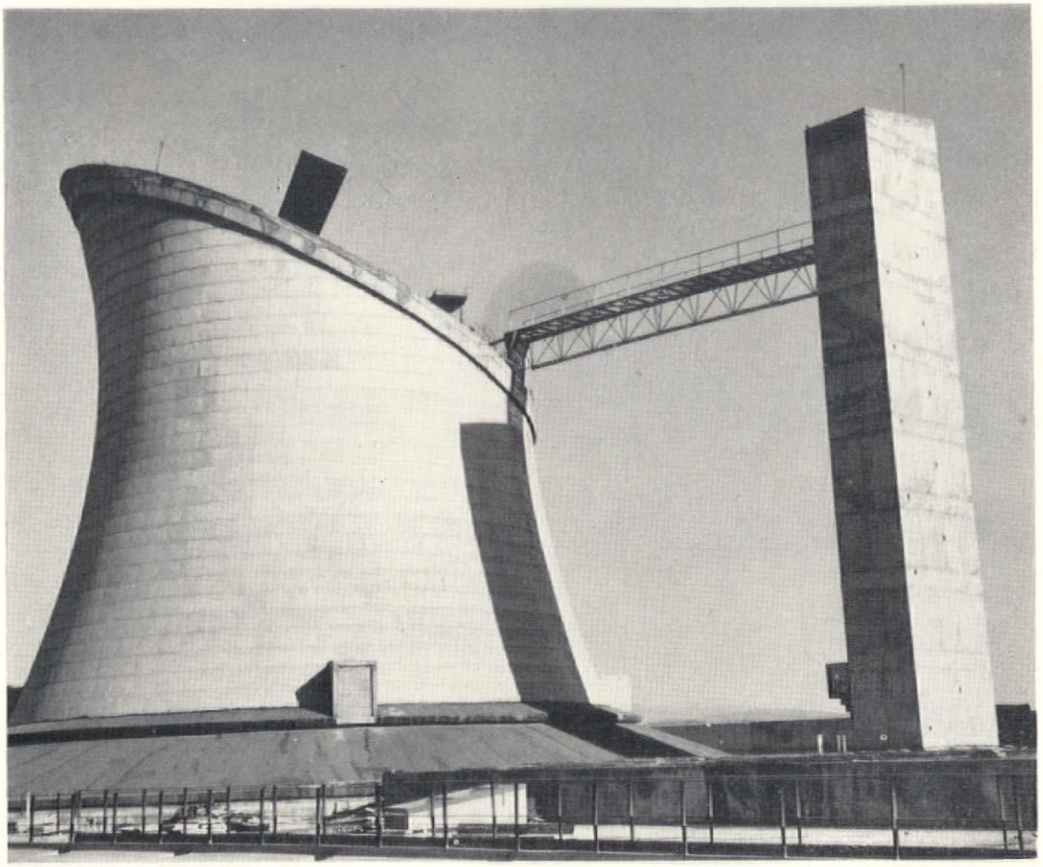

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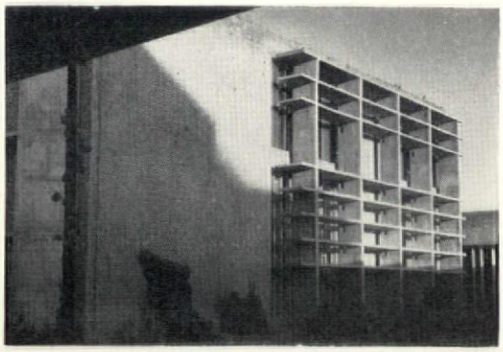

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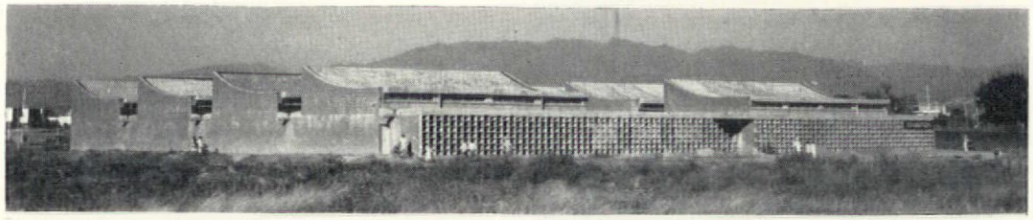

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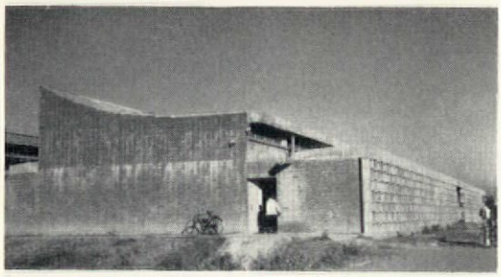

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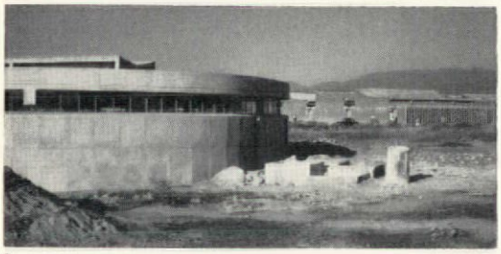

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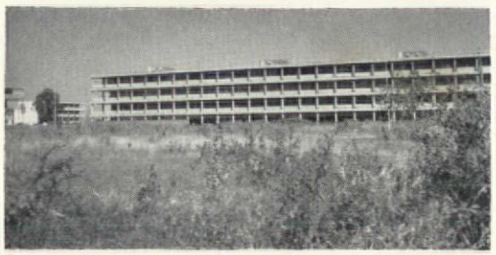

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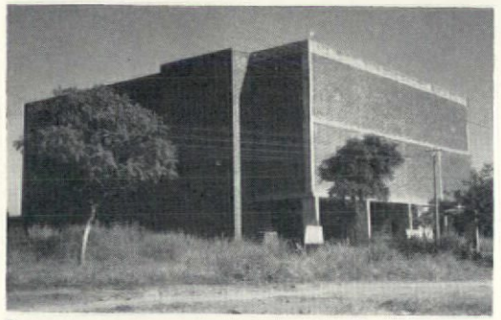

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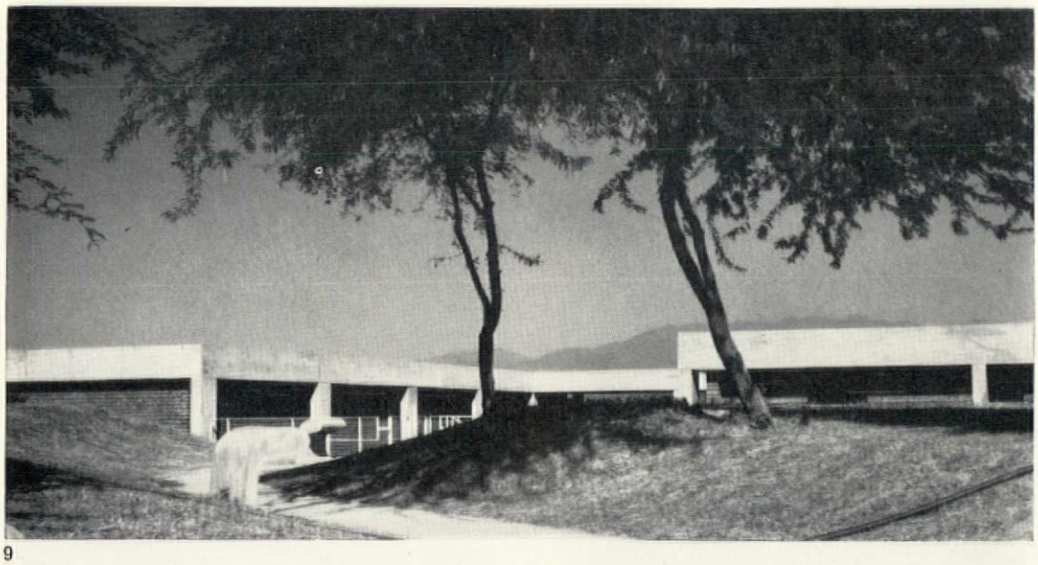

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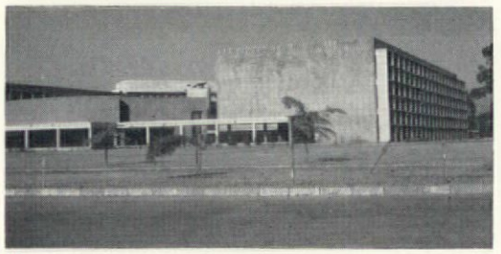

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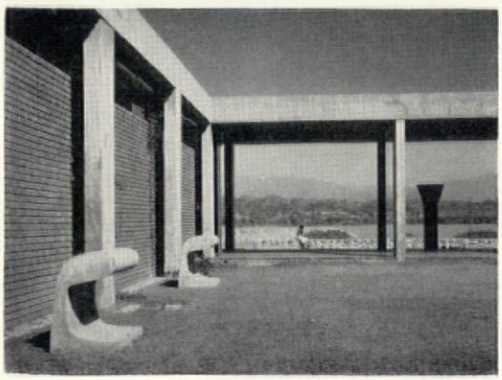

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11

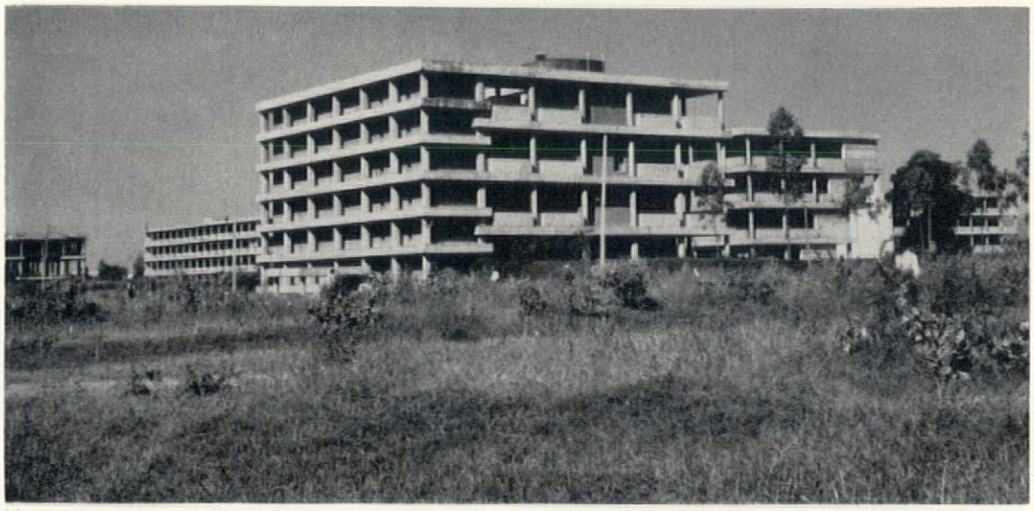
Originally the High Court was designed for nine courts but, as a few years after it was completed, the Punjab State merged with the State of Pepsu, six new court-rooms were needed. The original building could not be easily extended. LC designed an extension in brick which goes off diagonally to the east behind the original High Court **1**. The exterior is in brick. It is a low unobtrusive structure which should, after planting, merge in the landscape. The sun-breakers on the south-east of the court-rooms have more horizontal members than vertical ones as the sun is high on this side of the building during the hot months.

In addition to the buildings in the Capitol LC has done a number of other buildings in the city.

The School of Art **2–5** has load-bearing brick walls. Concrete beams support slabs curving towards the north to give north light in the studios. All the glazing is above eye level. Ventilation is provided by means of slits at a lower level. Interior courts are pleasantly designed for students to gather in when there are functions or chat in informal groups between classes. The entrance lobby is low enough to allow for clere-storey lighting to the studios. The sun-breakers on the south façade are made of precast concrete open blocks.



13



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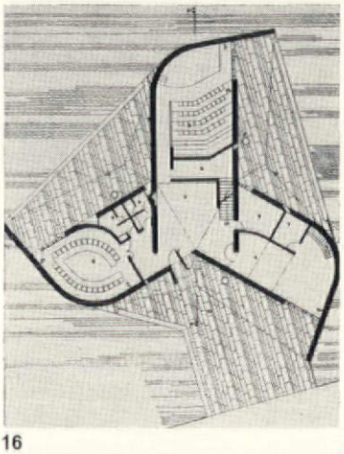

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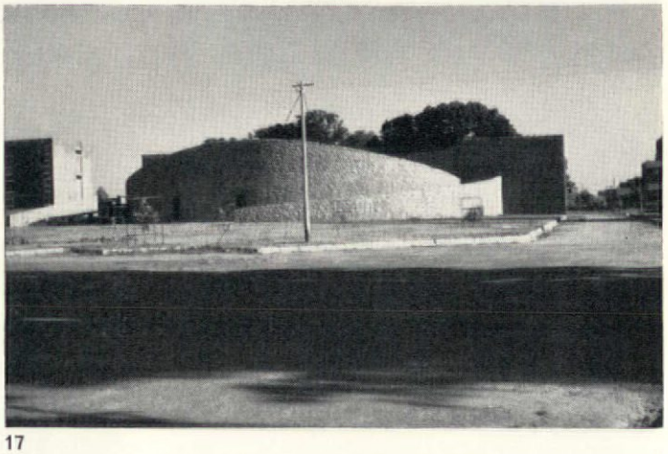

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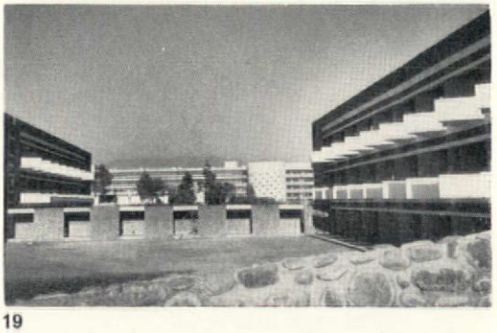

19



20

The Leisure Valley flows through the centre of the town. Parts of it are complete with footpaths, benches, shrubs, trees and grass. The Museum **6** and the Art School (in the background) are sited in the Leisure Valley as they are part of the 'Care of the Body and Spirit' function of the town.

LC was opposed to having any buildings other than his four buildings in the area north of the town. When the lake was built a boat club was required. To preserve the informal character of the lakeshore and the mountains beyond, and to hide the fact that another building was being put up, LC built his club **9, 10, 11** at as low a level near the lake as possible and hid it from the road by gently sloping the ground in front, and planting it with shrubs and trees. This is so effective that the building is almost invisible from the city but stands out clearly from the lake. It is built round a central green space and has generous verandahs overlooking the mountains. The 'brut' concrete columns and roof with brick walls and 'undulatory' glazing behind are as simple and unpretentious as a very early Greek temple.

The City Centre is designed as a pedestrian piazza with parking facilities on the outside. It is gradually taking shape **7** as more and more buildings are built. Corbusier gave a standard design to which all the buildings must conform. Like his buildings in the Capitol, here too the buildings have to be in 'brut' concrete. (The rest of the city is built in a cheap local load-bearing brick). The height is fixed at four storeys —the maximum practicable without lifts, which are still too expensive for the majority of clients. Architectural unity is achieved by means of a standard bay, a standard floor height, and a verandah which shelters the building on all its external faces. This verandah has a standard parapet and column treatment. Variations of this theme in the form of double floor heights provide relief from monotony, as can be seen in Jugal Chowdhury's State Bank building **13.** The wood glazing is set back from the parapets. Other variations are Jeanneret's library **14** (centre) and Town Hall (right) both of which take some liberties with the prescribed standard. In the library the stacks have lower ceiling heights than the reading rooms with three floors of the former to every two of the latter. Unlike the other buildings of the City Centre brick has been used extensively. In the background the Town Hall has overhanging floors, this too being a departure from the standard.

The arterial V2s of the city have parallel service roads giving access to large commercial establishments such as hardware stores or car showrooms. LC prepared standard designs consisting of a blind street façade with a reinforced concrete frame and brick in-filling. The showroom for sanitary fittings **8** with its big glass areas looking onto the pedestrian covered verandah is on the ground floor. The upper floors look onto an interior court and can be used for offices or for residential purposes. At the back there is an open yard for storing material, with access from a back lane.

Pierre Jeanneret's Gandhi Bhavan **15, 16** has overtones of Ronchamps, though the buildings are unlike. So, too, the curving walls of his open-air theatre **17.** LC's influence, less evident, is still there in detail and in the whole in Jeanneret's Arts Faculty **12** and Men's hotel **19.**

'Undulatory' glazing is taken directly from LC's in B. P. Mathur's simple straightforward Gandhi library **20,** and M. S. Sharma's sensitively detailed food analysis and health laboratory **18.**

A. R. Prabhawalkar's brick and concrete frame bus terminus **1** also has LC's 'undulatory' glazing.

In Jeanneret's hospital **5** various elements are taken from LC's work, but put together they are not as directly derivative as for example in J. C. Malhotra's post-graduate Medical Research Institute **7**.

A venturesome architect who has absorbed LC's influence and yet puts his own unmistakable stamp on his buildings is Aditya Prakash. In the cinema **2** in the City Centre he has produced a building which goes with Corbusier's standards and yet is quite distinctive.

The District Magistrates' Court building **3** by A. Prakash is again unusual and a work of integrity.

Eulie Chowdhury's Women's Polytechnic **6** and houses for Deputy Ministers **8** are undoubtedly influenced by LC's work.



4

Corbusier held that for centuries the hand of man has been used to grab and seize. Now the time has come to open the hand to give. He designed a sculpture 'The Open Hand' for the Capitol Park and this theme recurs in the tapestries and in relief in concrete **4**. He himself set an example in the city and the country to which he gave so much and so generously. His own buildings and the life he has infused into the work of others bear testimony.



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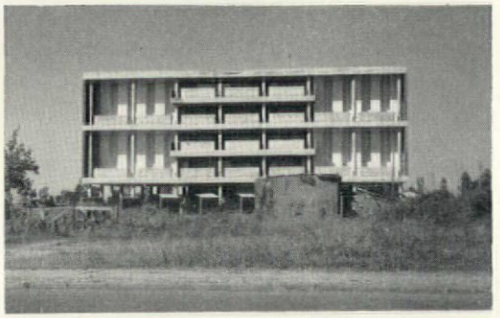
2



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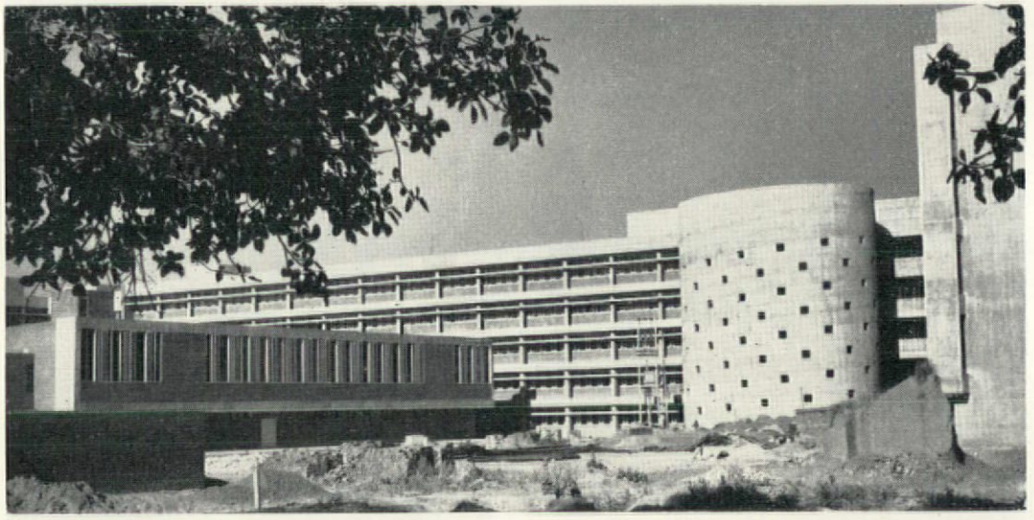

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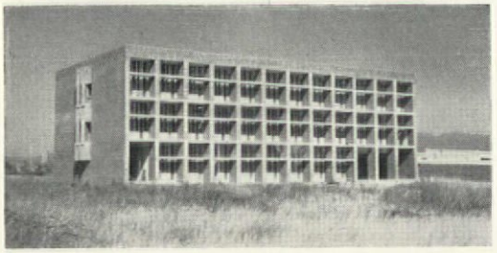

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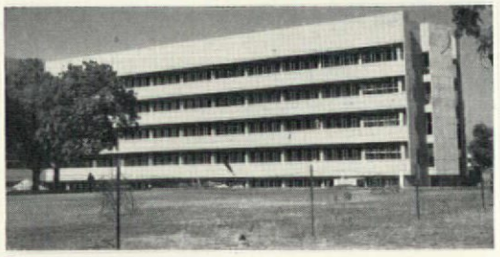

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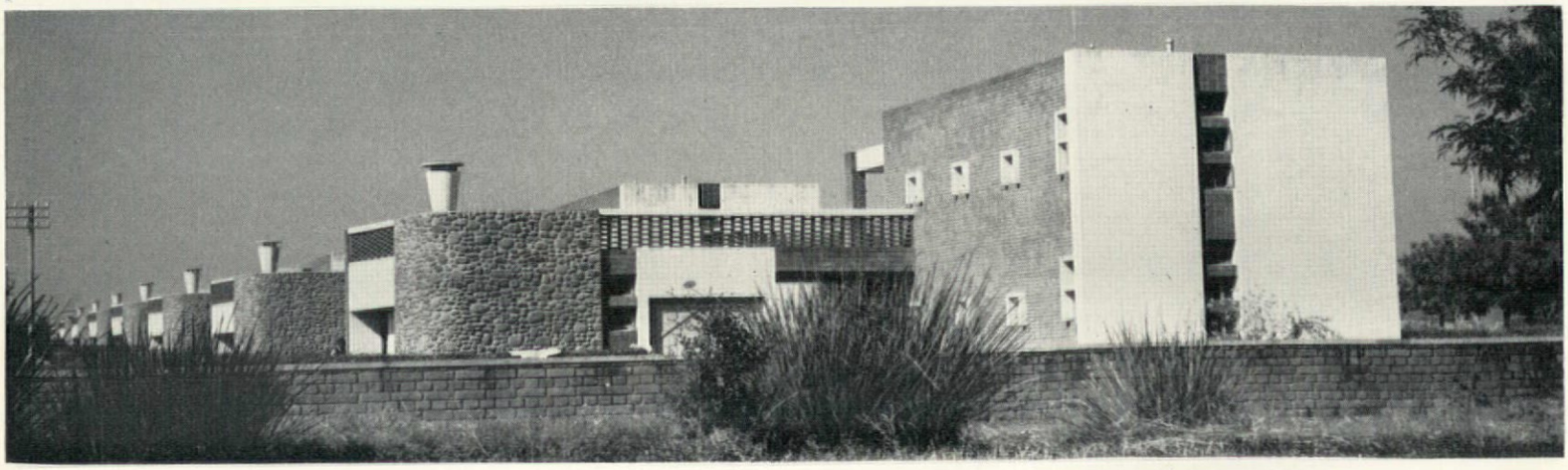


Universal space families

Keith Critchlow

This sheet of drawings was an International educational tool developed in co-operation with the World Design Science Decade (see page 483).

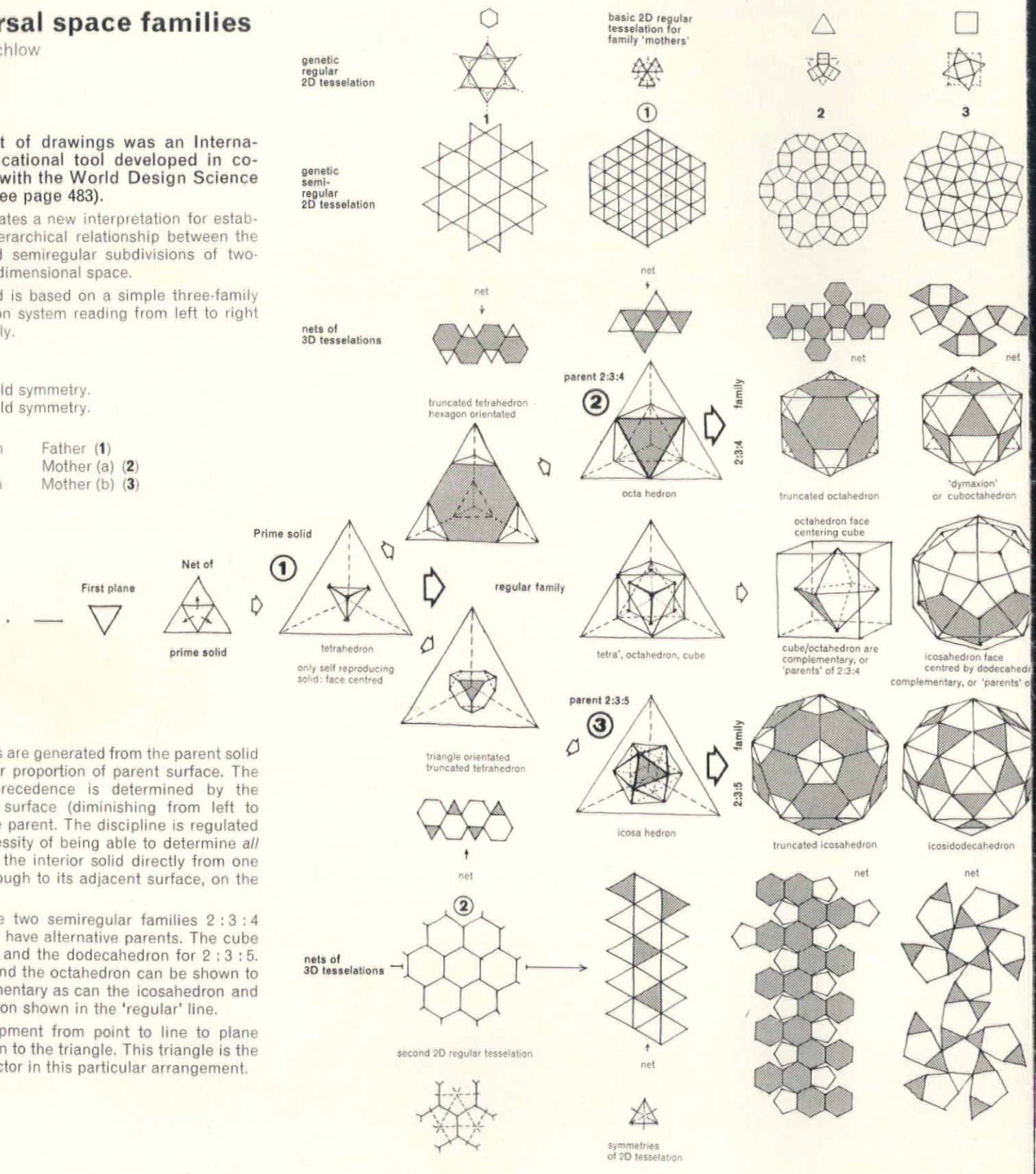
It demontsrates a new interpretation for establishing a hierarchical relationship between the regular and semiregular subdivisions of two- and three-dimensional space.

The method is based on a simple three-family eight-division system reading from left to right and vertically.

Families:
Regular.
2 : 3 : 4-fold symmetry.
2 : 3 : 5-fold symmetry.

Parents:

Tetrahedron	Father (**1**)
Octahedron	Mother (a) (**2**)
Icosahedron	Mother (b) (**3**)

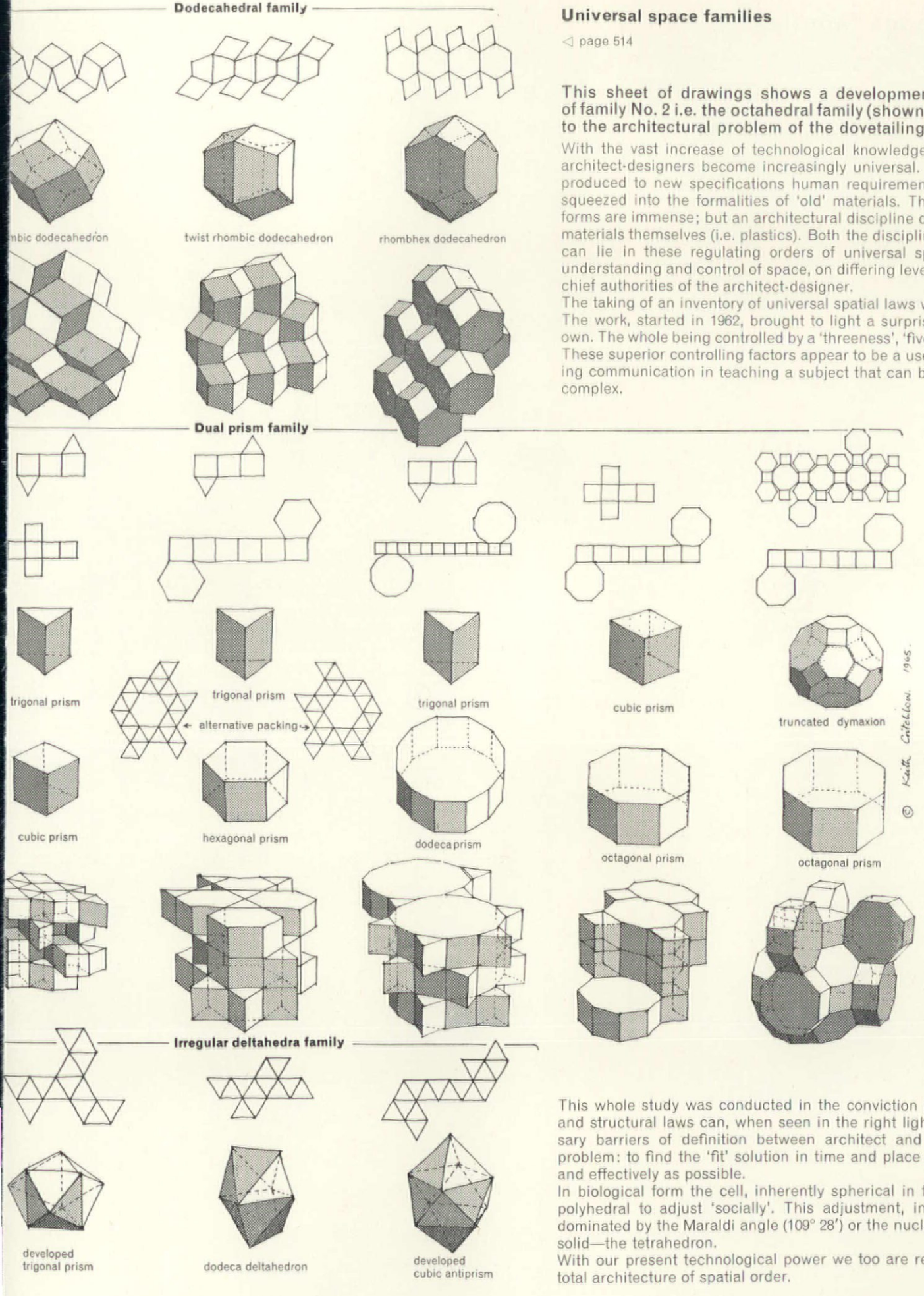


The families are generated from the parent solid by a regular proportion of parent surface. The order of precedence is determined by the amount of surface (diminishing from left to right) of the parent. The discipline is regulated by the necessity of being able to determine *all* surfaces of the interior solid directly from one surface through to its adjacent surface, on the parent.

Each of the two semiregular families 2 : 3 : 4 and 2 : 3 : 5 have alternative parents. The cube for 2 : 3 : 4, and the dodecahedron for 2 : 3 : 5. The cube and the octahedron can be shown to be complementary as can the icosahedron and dodecahedron shown in the 'regular' line.

The development from point to line to plane here is taken to the triangle. This triangle is the constant factor in this particular arrangement.

▷ page 516



Universal space families

◁ page 514

This sheet of drawings shows a development of the properties of family No. 2 i.e. the octahedral family (shown overleaf) orientated to the architectural problem of the dovetailing of volumes

With the vast increase of technological knowledge the problems facing architect-designers become increasingly universal. As new materials are produced to new specifications human requirements need no longer be squeezed into the formalities of 'old' materials. The possibilities of new forms are immense; but an architectural discipline does not arise from the materials themselves (i.e. plastics). Both the discipline and the inspiration can lie in these regulating orders of universal space-functioning. The understanding and control of space, on differing levels, is in fact one of the chief authorities of the architect-designer.

The taking of an inventory of universal spatial laws was an inevitable step. The work, started in 1962, brought to light a surprising 'over' order of its own. The whole being controlled by a 'threeness', 'fiveness' and 'eightness'. These superior controlling factors appear to be a useful means of simplifying communication in teaching a subject that can be made unnecessarily complex.

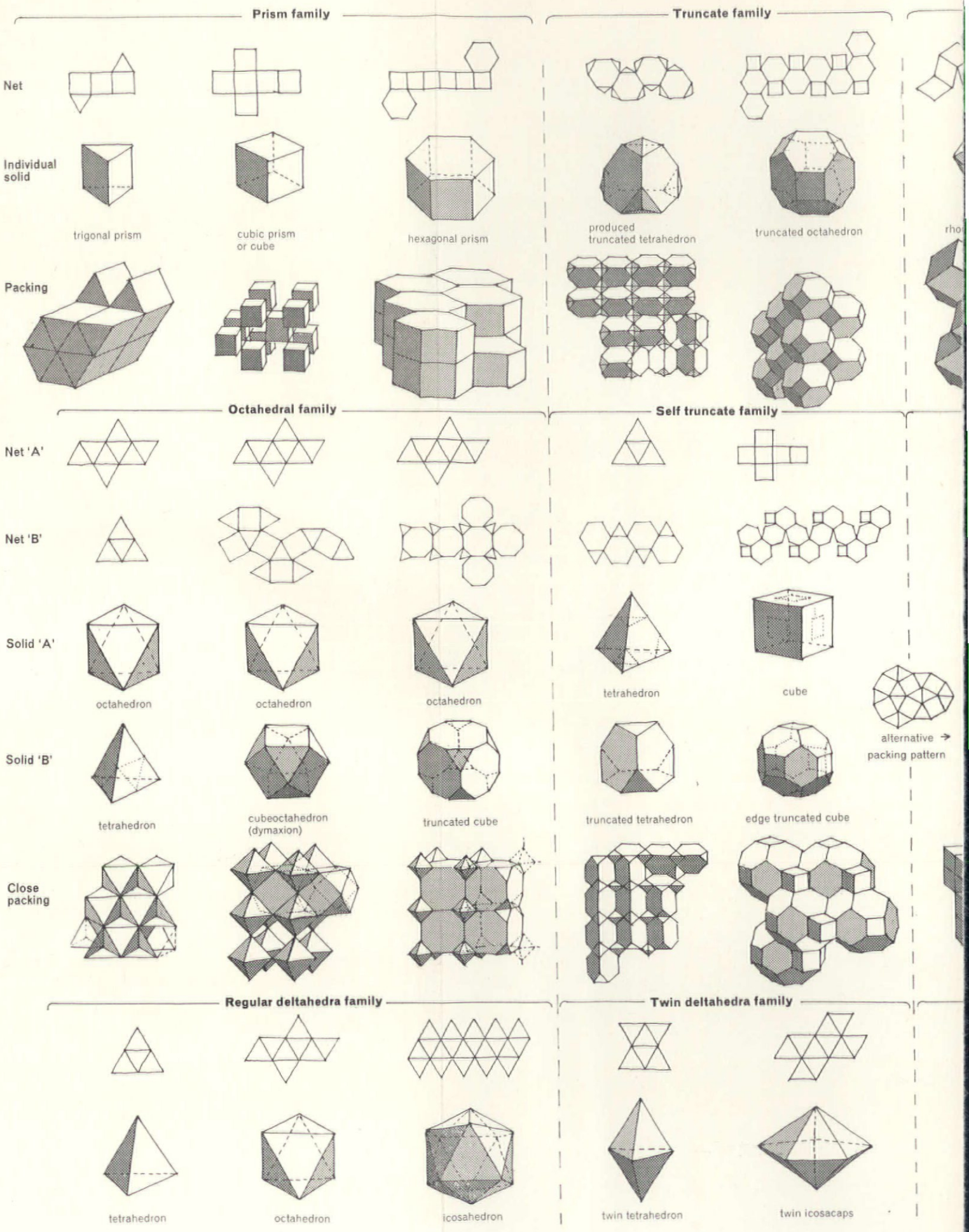
This whole study was conducted in the conviction that ultimately spatial and structural laws can, when seen in the right light, dissolve unnnecessary barriers of definition between architect and engineer. The main problem: to find the 'fit' solution in time and place as directly, efficiently and effectively as possible.

In biological form the cell, inherently spherical in free growth, becomes polyhedral to adjust 'socially'. This adjustment, in a surface sense, is dominated by the Maraldi angle (109° 28′) or the nuclear angle of our prime solid—the tetrahedron.

With our present technological power we too are ready to re-explore the total architecture of spatial order.

KC

Code 53→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Truncate family
Net
Individual solid
Packing
trigonal prism
cubic prism or cube
hexagonal prism
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truncated octahedron
Octahedral family
Self truncate family
Net 'A'
Net 'B'
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Solid 'B'
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octahedron
octahedron
tetrahedron
cube
alternative packing pattern
tetrahedron
cubeoctahedron (dymaxion)
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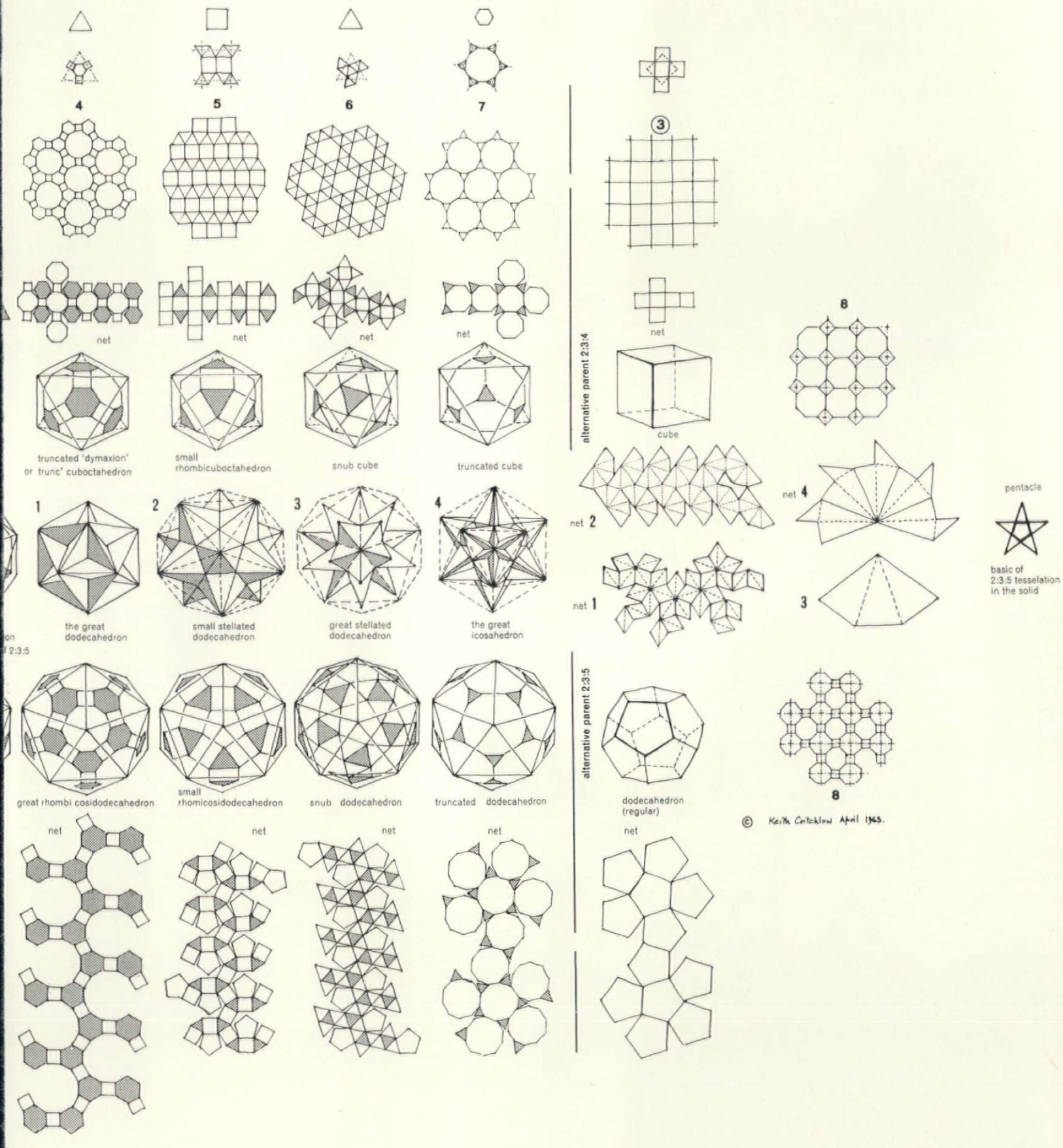
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truncated cube
cube
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net 4
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basic of 2:3:5 tesselation in the solid
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2
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the great icosahedron
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truncated dodecahedron
alternative parent 2:3:5
dodecahedron (regular)
8
© Keith Critchlow April 1965.
net
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Leo works very well at work...

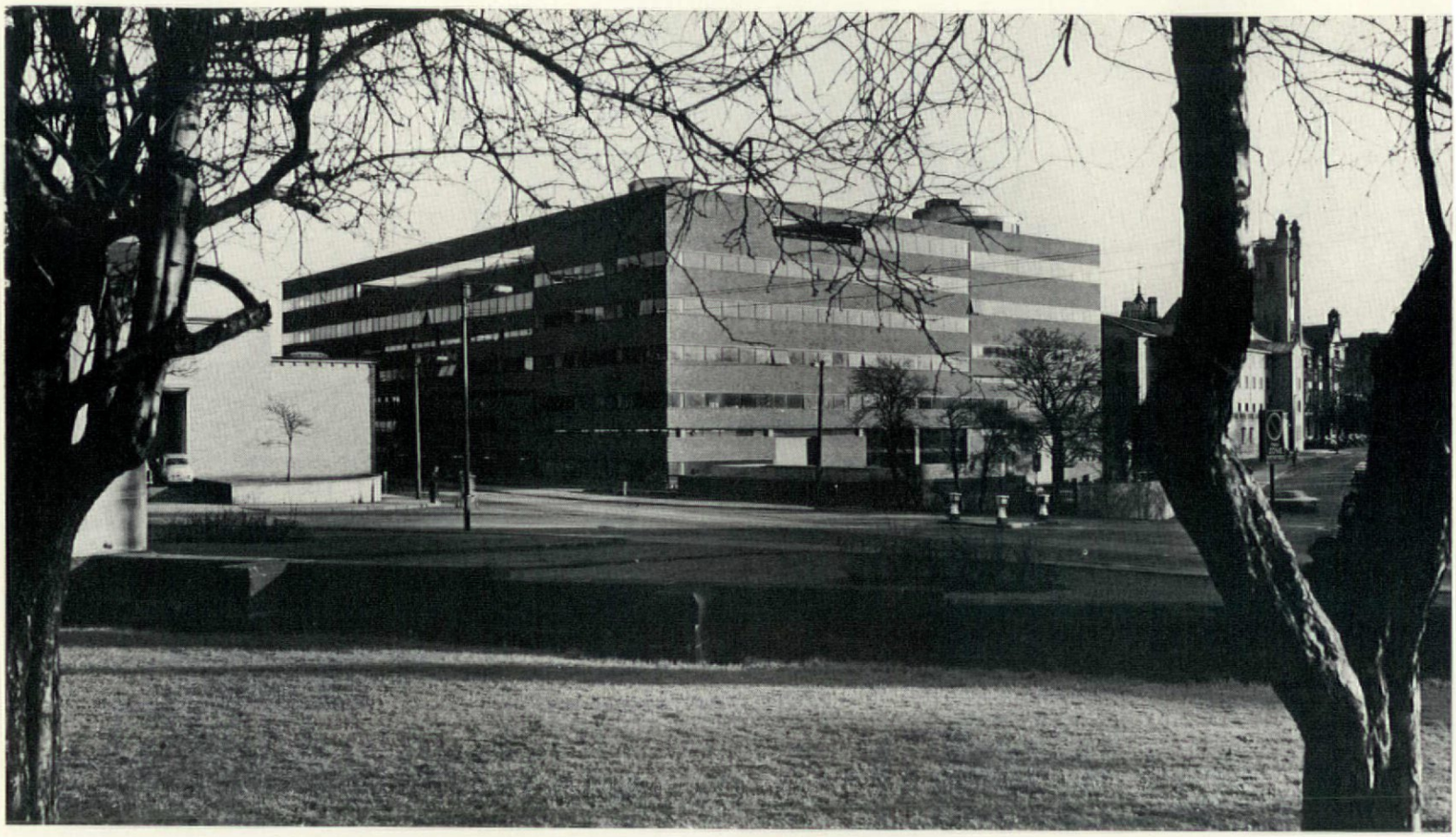


is perfectly at home, at home

In fact Leo has the sort of strong but well mannered personality which people everywhere find attractive and relaxing. Designed by Robin Day, it is the latest addition to the Hille range of easy chairs and one of several in the range which have proved equally successful in working and domestic environments.

Generous proportions, soft latex cushions and the reclining angle make this an extremely comfortable chair. It is available on a five pronged swivel base or on a shaped metal support (both bright chrome plated). The upholstery is leather, pvc or fabric and the chair is knock down in construction for easy transportation. The Leo chair can be seen at our showrooms: London: 41 Albemarle St. London, W.1. Tel: Hyde Park 9576-9 Watford: 134 St. Albans Rd., Watford, Herts. Telephone Watford 42241 / Birmingham: 24 Albert Street, Birmingham 4. Telephone Midland 7378/Edinburgh: 25a South West Thistle Street Lane, Edinburgh 2. Telephone Caledonian 6234/ Manchester: Sackville St. Manchester. Telephone Central 6929.

hille



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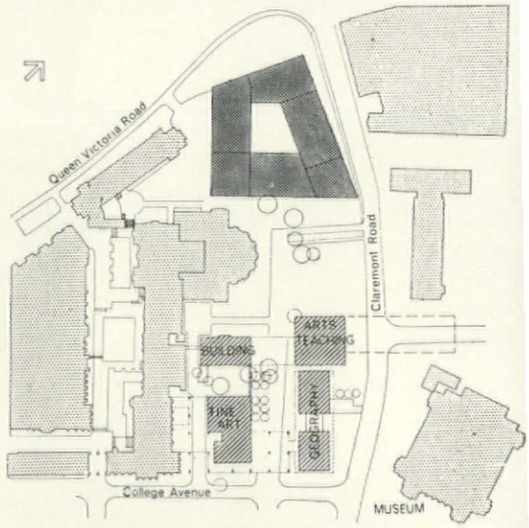


2

University laboratories Newcastle-upon-Tyne

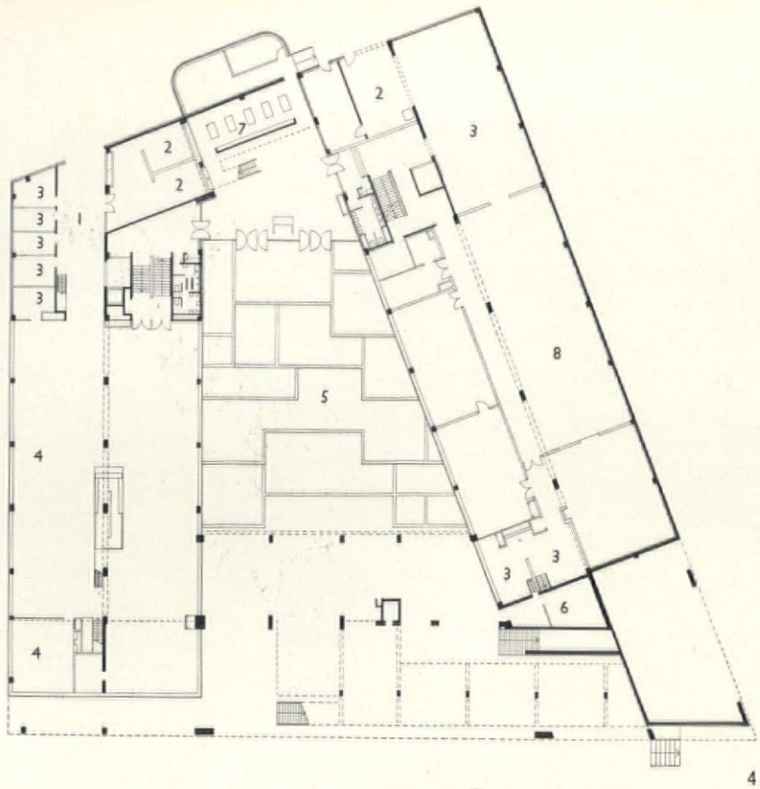
Departments of Chemical Engineering
Electrical Engineering
Mathematics

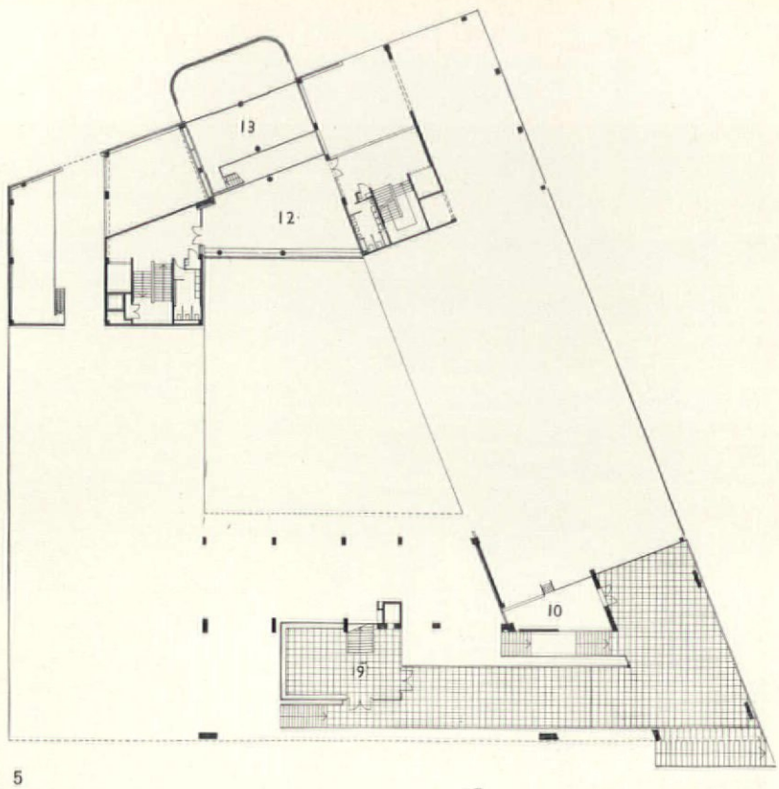
Richard Sheppard, Robson and Partners

The building, known as Merz Court, is of reinforced concrete frame construction carried on bored in situ concrete piles.

The external walls are cavity construction generally. The inner skin is either a reinforced concrete upstand beam forming part of the frame or Thermalite blocks. The outer skin is of

▷page 521





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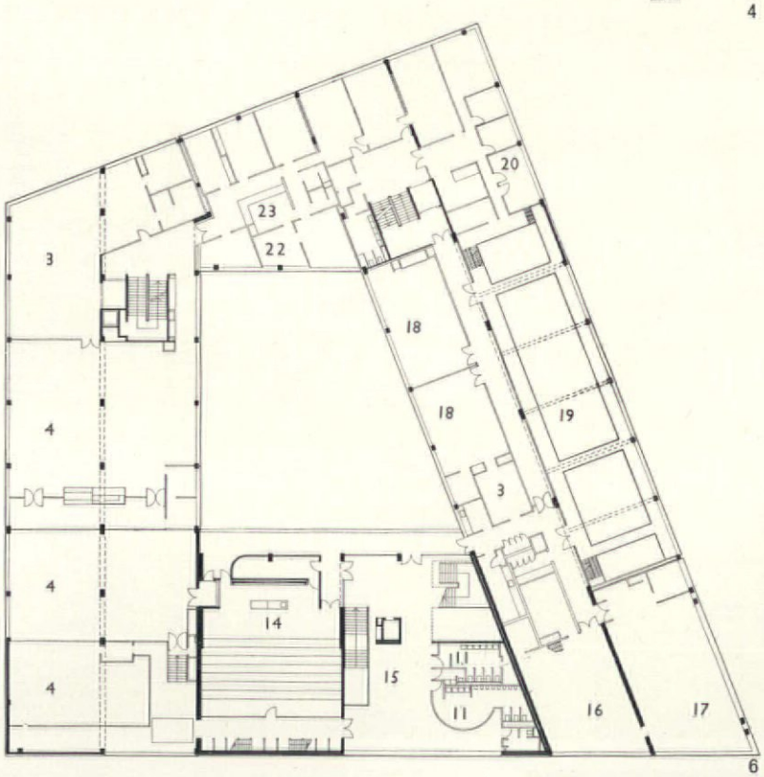

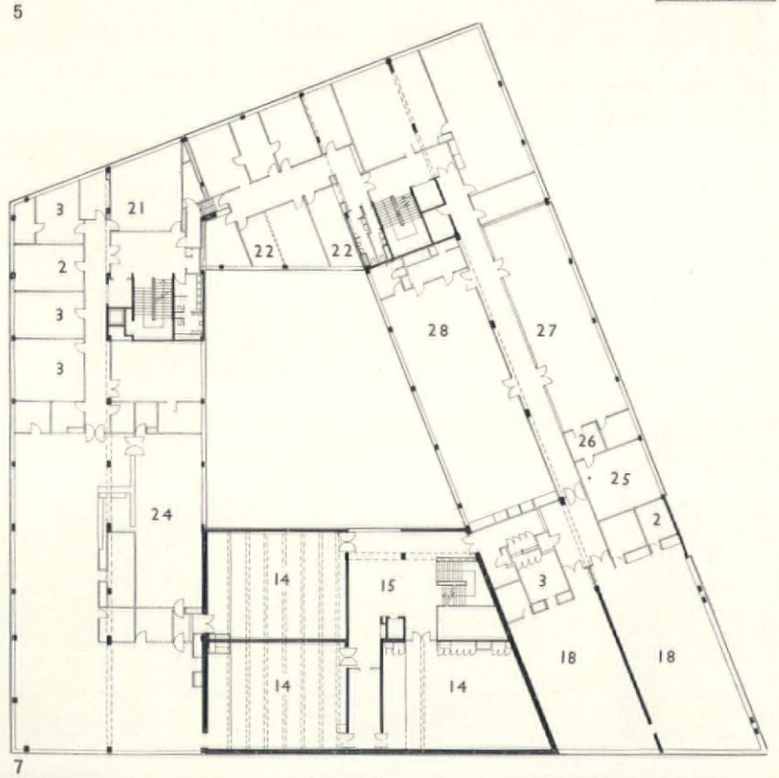

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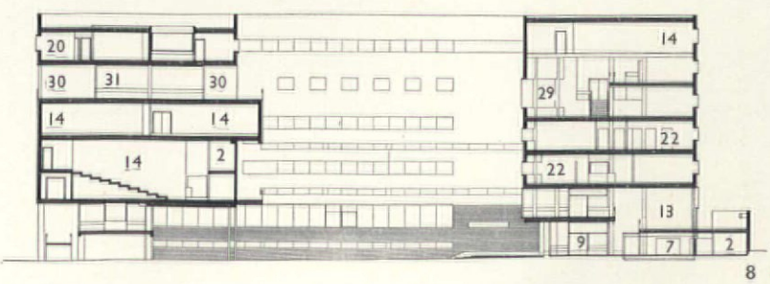

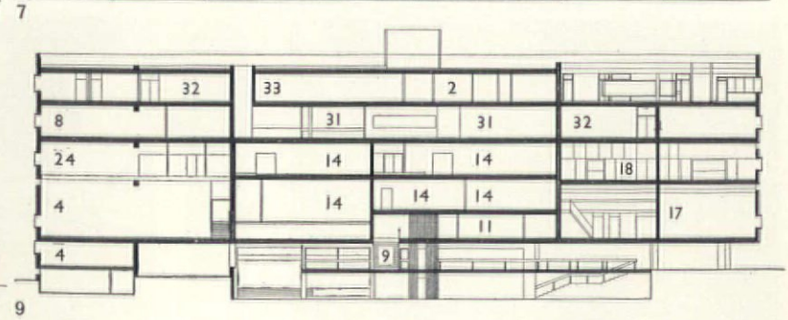

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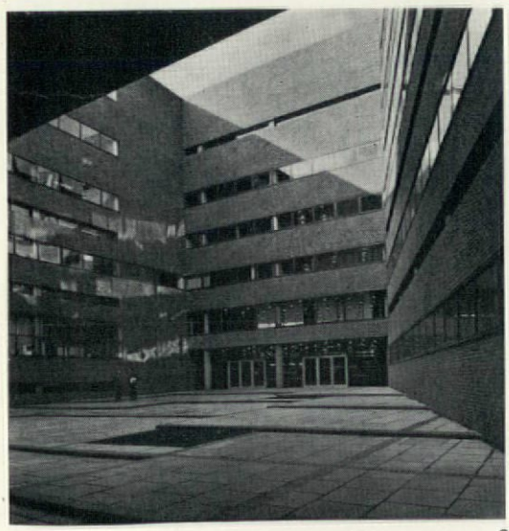
1
Merz Court seen from the north, across Queen Victoria Road
2
Location plan
3
The east corner of Merz Court, showing the gallery leading off Claremont Road parallel to Eldon Place
4, 5, 6 & 7
Typical floor plans

8 & 9
Sections
Key to drawings
1 unloading
2 stores
3 workshops
4 high voltage lab
5 paved court
6 switch room
7 lockers
8 pilot plant laboratory
9 entrance hall
10 research boiler
11 w.c.
12 students' common room
13 exhibition space
14 lecture theatre
15 foyer
16 chemical lab
17 heat laboratories
18 chemical engineering lab
19 pilot plant gallery
20 lecturer
21 seminar room
22 office
23 enquiries
24 mechanics lab
25 radioactive
26 counting
27 nuclear technology
28 fuel lab
29 library
30 terrace
31 tearoom
32 computers
33 plant

1



2



3

1
View of the gallery running parallel to Eldon Place, under the lecture theatres and foyer

2
The courtyard looking north-west

3
View of the foyer outside the electrical engineering department

4 & 5
Chemical engineering laboratories

All photographs Colin Westwood

◁ page 518

Crowborough medium multi-kiln stock facing bricks.

Windows are generally single glazed in top-hung opening out galvanized metal casements; head and sill flashings are bronze.

The wall finishes internally are fairface concrete and fairface brick walls in laboratories and fairface concrete and plastered sand lime brick work in lecture, seminar, administration and staff rooms. Wood block and cork tile floors have been used almost universally throughout. Acid and solvent resistant tile floors are laid in wet chemical laboratories. Door frame, screens and joinery generally are constructed in padauk (*pterocarpus macrocarpus*) hardwood. Doors are plywood faced flush doors finished with a polyurethane paint. Painted or polished softwood slats spaced apart and backed with fibreglass insulation have been used as a ceiling finish.

The heating plant is designed to carry the heating and service load of further buildings under construction in the University and has a total thermal output of 34,500,000 BTU/hr. Three oil-fired boilers are sited in the boiler house, but at the present time two only are connected to serve this building.

The heating plant also supplies steam for the experimental and teaching work of the Department of Chemical Engineering at a pressure of 500lb/hr at 100 p.s.i. An electrode steam boiler installed adjacent to postgraduate research laboratories can provide steam at 500lb/hr at 500 p.s.i.

Piped services dominate the chemical engineering laboratories. All laboratories have high level ring mains for cold water, steam, gas and compressed air. These ring mains are tapped at approximately 10ft 0in centres for connection to experimental and teaching rigs and permanent connections are made to low level rings of services to benches and equipment.

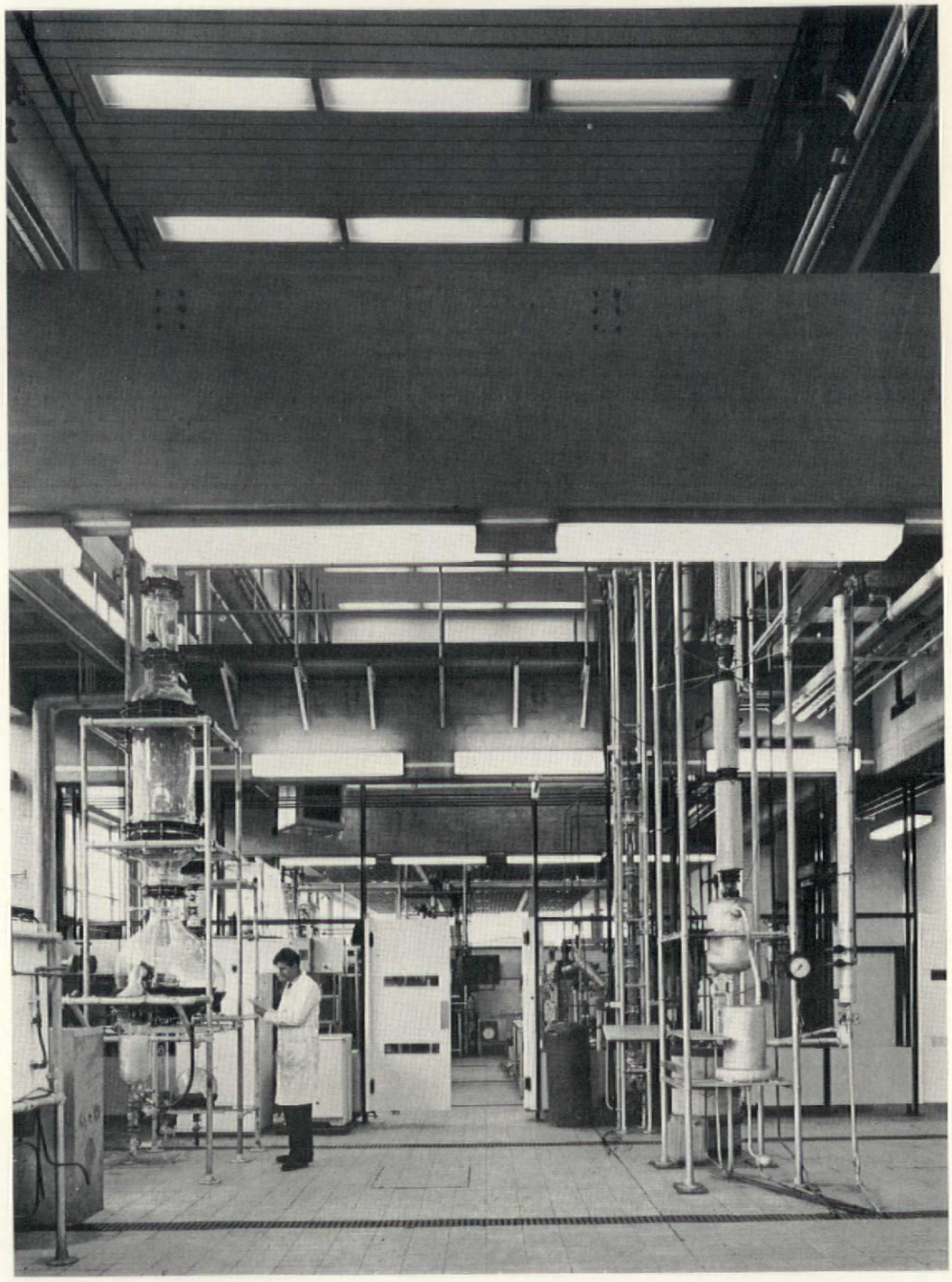
Water is supplied from tanks at roof level with a capacity of 14,700 gallons and the service to laboratories is pressurized to maintain 25 p.s.i.

A compressor with an output of 315 c.f.m. at 120 p.s.i. is installed to supply oil-free compressed air. Drainage is a significant element of the chemical laboratories' services. Most laboratories have a floor drainage system of acid- and solvent-resistant construction at approximately 10ft 0in centres across the width of the laboratories coupled with a waste system from bench sinks and bench experiments. Most laboratories also have extensive electrical installation fed by busbars to provide numerous 30amp supply outlets in each laboratory. Lecture rooms and some specialized laboratories have a mechanical ventilation system comprising thermostatically controlled and filtered warm air supplies and mechanical extraction.

Approximately 150 miles of cables have been used for the lighting, power and distribution.

Electrical supplies are derived from two 750kVA transformers. General supplies are distributed throughout the five floors by four rising mains with tap-off units at each floor level housing lighting, power and heating services distribution boards together with emergency lighting distribution equipment.

The costs per square foot of gross area:
Building works £5 15s 0*d* per ft².
Fixed furniture and equipment £1 10s 0*d* per ft².
Total £7 5s 0*d* per ft².



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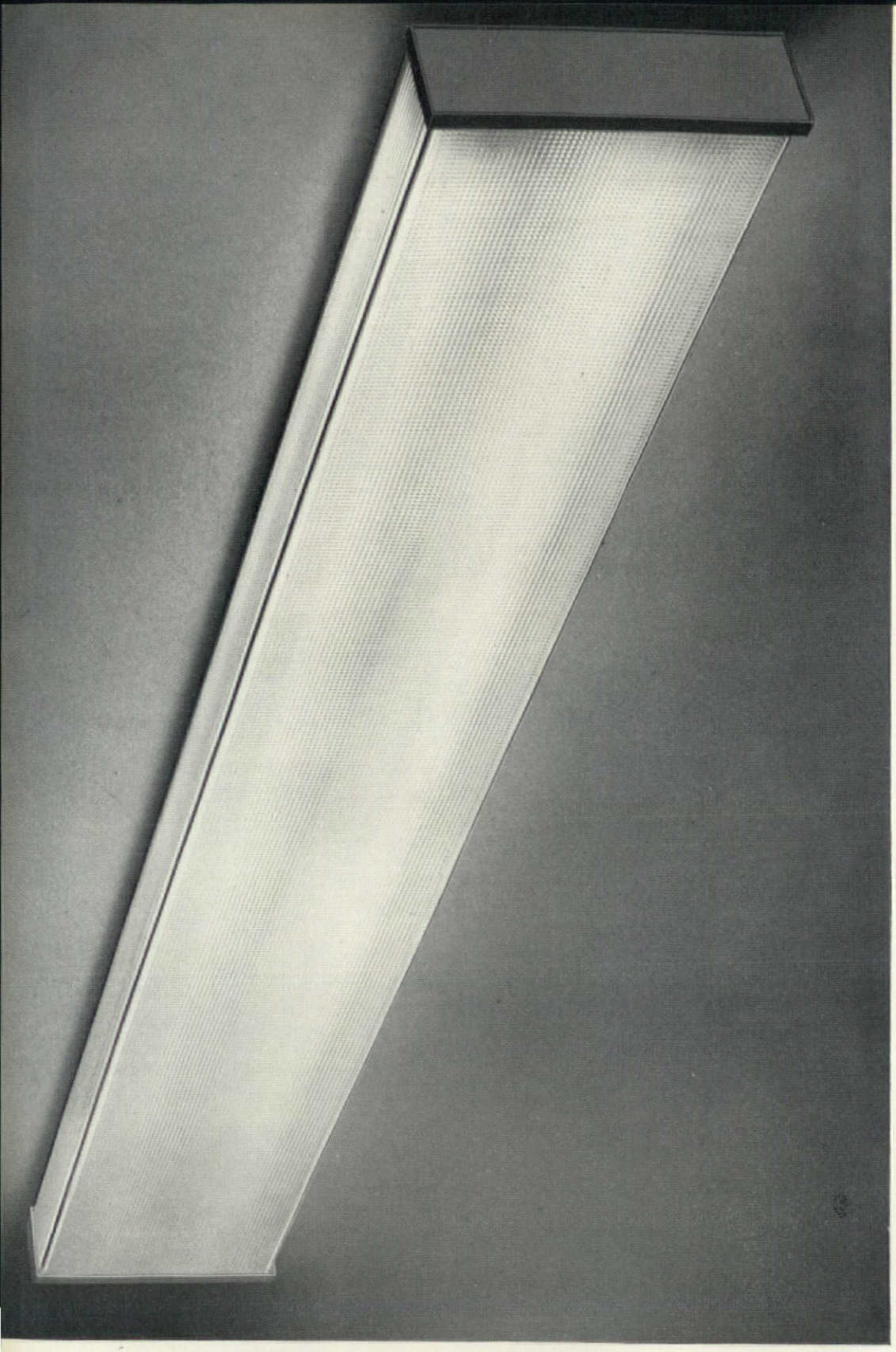
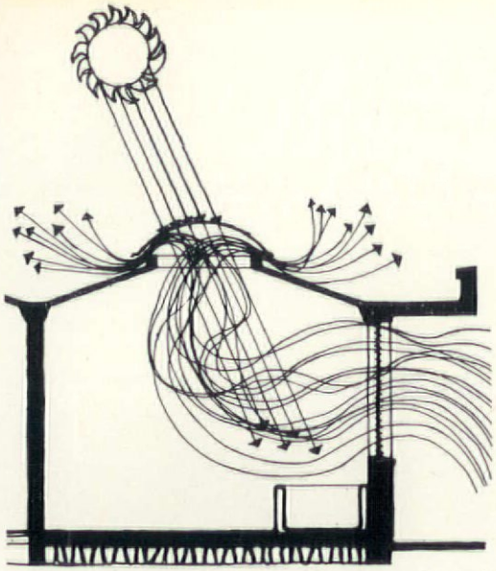


New KGP atlas diffusalux with specially developed optical system

This new Atlas prismatic diffuser fitting incorporates a special optical system which provides a BZ 4 classification of advanced technical performance. Light control is facilitated by the configuration of the lamp and chassis combination which permit the use of a rectangular shape diffuser of clean modern design. A pattern of pyramids integrated into the base during manufacture ensures that the light is concentrated downwards and reduced in the 30 degrees zone from the horizontal. This reduced intensity in the low glare zone is achieved by control of the light through the side prisms. High efficiency, 66%, is a notable feature of the Atlas KGP diffusalux prismatic diffuser fitting. The KGP is just one of the Atlas range of prismatic diffusers.

atlas

Full details from :
Atlas Lighting Limited,
Thorn House, Upper Saint Martin's Lane,
London, WC2.
A subsidiary company of
British Lighting Industries Limited



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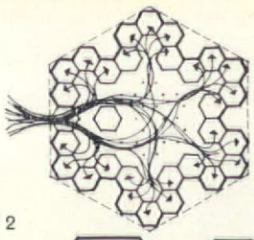

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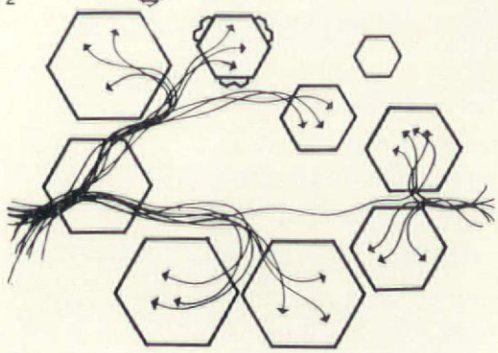
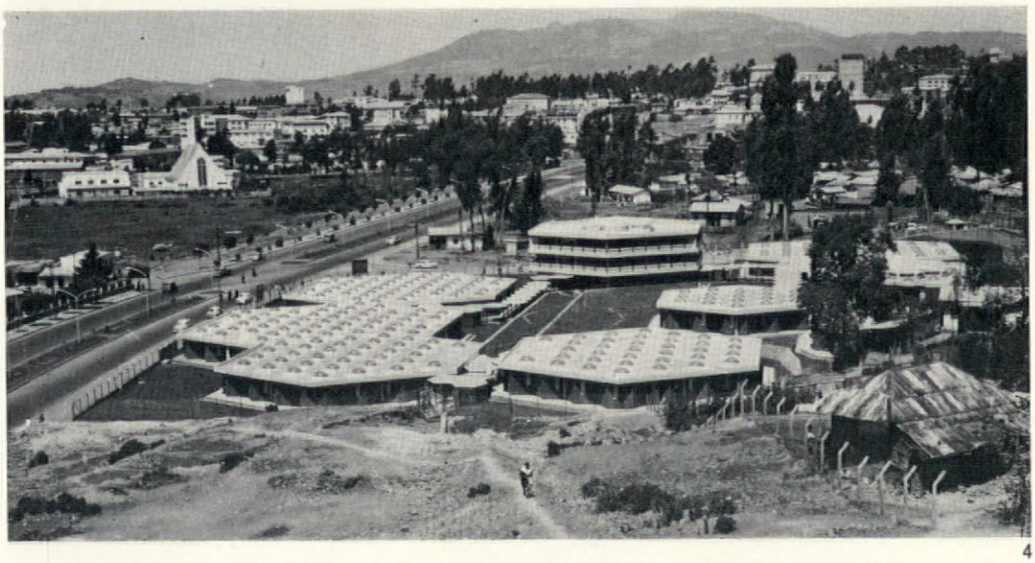


3

Thermal baths, Addis Ababa

Z. Enav and M. Tedros

Structural engineers: Professor E. Spira, D. Eizenberg
Sanitary engineer: Cherniak
Electrical engineer: R. Branca



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5

One of the prime factors in the siting of Addis Ababa is the existence there of the Filwoha springs—Filwoha in Amharic meaning boiling water. For generations Ethiopians have visited these springs and the baths there has acquired an almost ritualistic significance.

The site is part of what is intended to be the recreation area, between the commercial and administrative areas, in the centre of Addis Ababa. The arrangement of the new baths follows the traditional pattern of the *hamam*, a communal central space surrounded by individual cells, the whole lit by blue glass domes and rooflights. Ventilation is provided under these same glass domes, continuing through the metal louvres in the outside walls.

The first design involved a much freer grouping of individual cells around communal areas, but building and functional limitations determined the tighter plan of closely packed hexagons. This relates to the traditional Ethiopian plan form for churches, which are often hexagonal with pyramidal roofs, and even to the ubiquitous round hut with its thatched roof, often set together in clusters.

The buildings are designed as independent entities each having a distinct function and, allied to that, a social value. The administration block has an internal court with shops, a restaurant and bar, a hotel and administrative offices. The baths are divided into the first-class establishment, with 18 private bathrooms and related rest-rooms; the second class, with 56 baths; the third class in which there are ten showers; and the fourth class with 56 baths and communal pools.

As an experiment some degree of prefabrication was attempted in the construction, the ground beams, roof channels and slabs all being prefabricated.

▷ page 523

1
Section through a typical bathroom cell with an indication of the lighting and ventilation flow

2
Diagram showing the cellular grouping and the circulation within an individual building

3
Diagram of the circulation pattern in the total layout

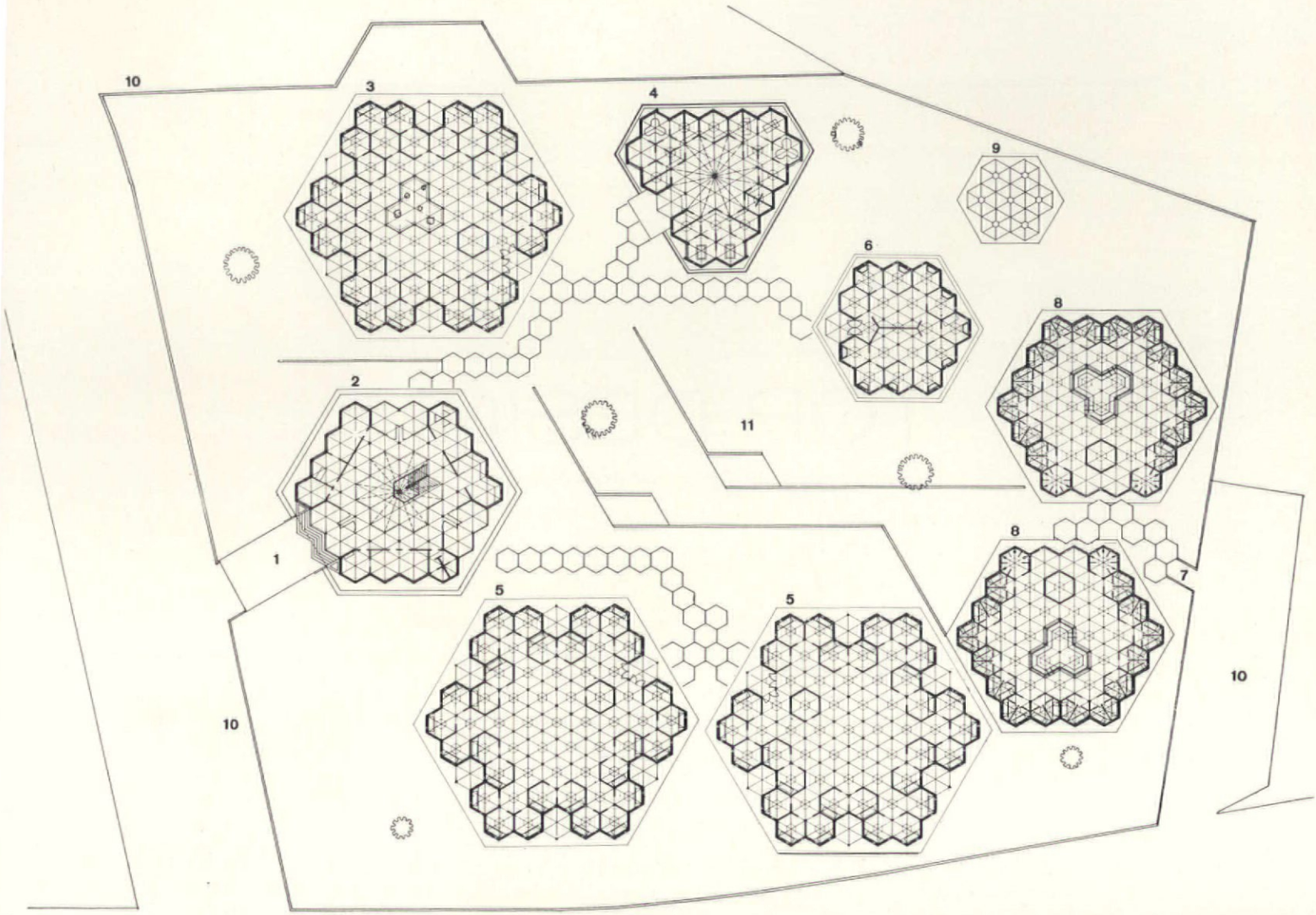
4
Overall view of the baths, with Addis Ababa in the distance. The two-storey building is the administration block

5
General view of the bath houses linked by a covered way

One of the really good things about today's way of life is the shower. The exhilarating, refreshing shower, now universally demanded by the modern family. But the shower isn't what it was. It has developed, matured, grown up. No more temperament, no more blow hot—blow cold. And all because of the Leonard thermostatic control —a strict disciplinarian if there ever was one. With the utmost precision, Leonard selects temperature and flow. And never wavers. Brings modern shower luxury to everyone—simply, precisely, unfailingly. Are *you* shower-minded?

WALKER CROSWELLER & COMPANY LIMITED
CHELTENHAM · GLOS.





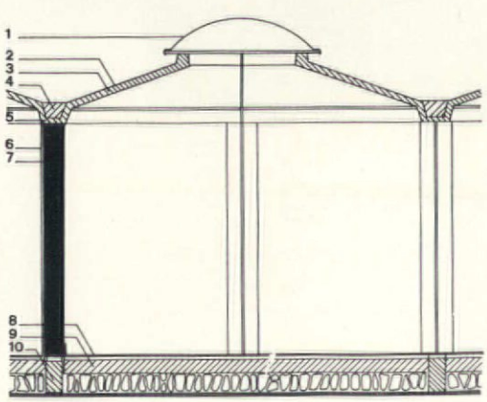
1

◁ page 522

1
Ground floor plan
1 main entrance
2 administration
3 first class baths
4 hydrotherapy
5 second class baths
6 third class showers
7 entrance
8 fourth class baths
9 laundry
10 parking
11 terraced garden

2
Section through a cell unit
1 blue dome
2 roofing and paint
3 precast pyramidal element
4 r.c. filler
5 precast
6 glazed tiles
7 block wall
8 floor finish
9 r.c. slab
10 precast beam

3
The pool in the fourth-class bathhouse



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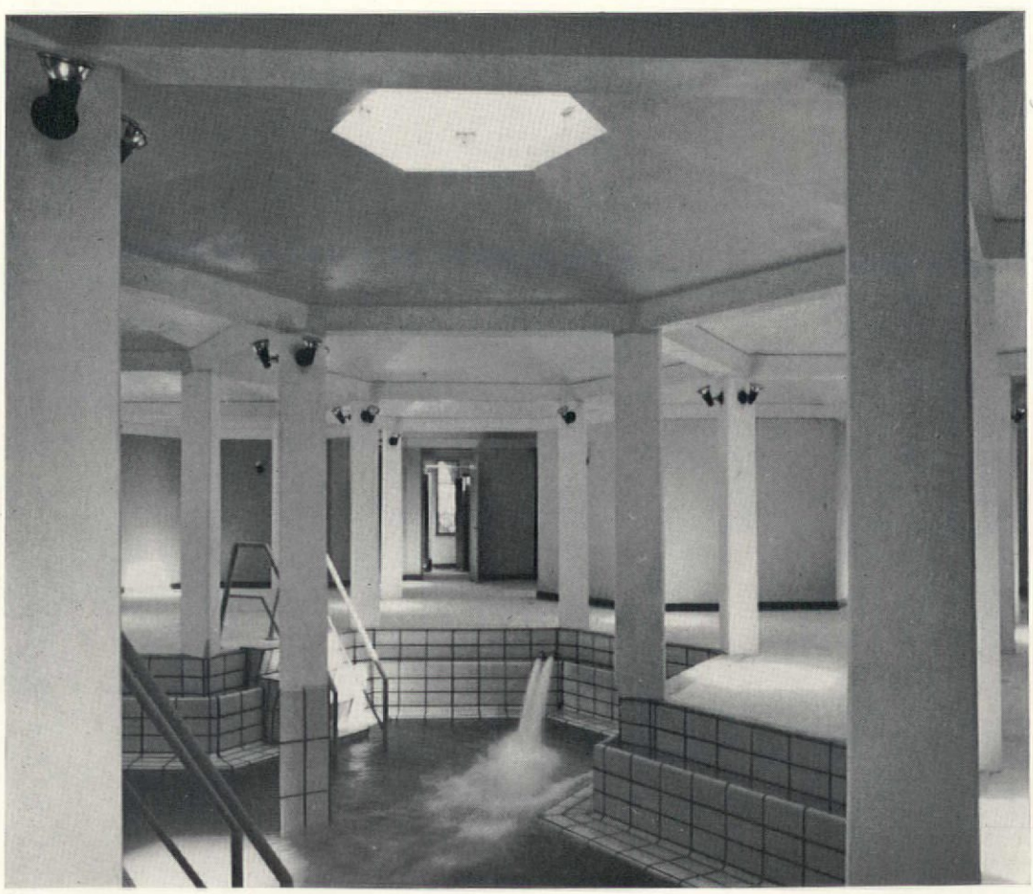

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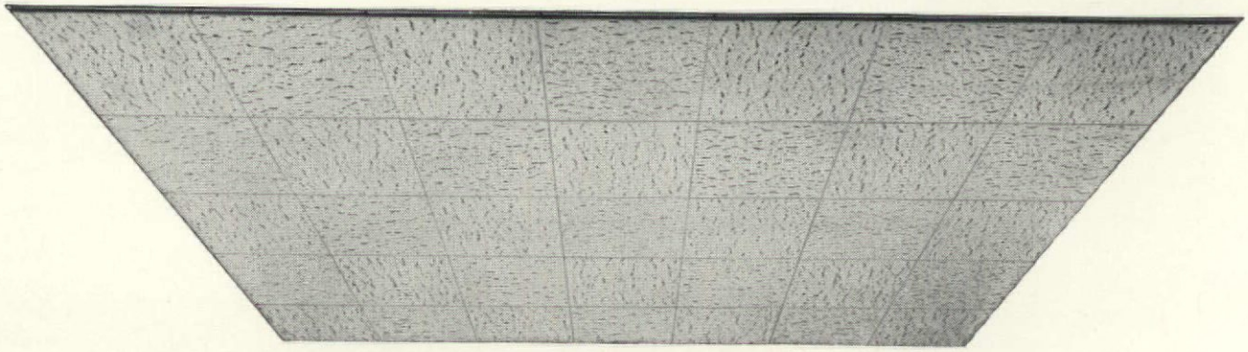
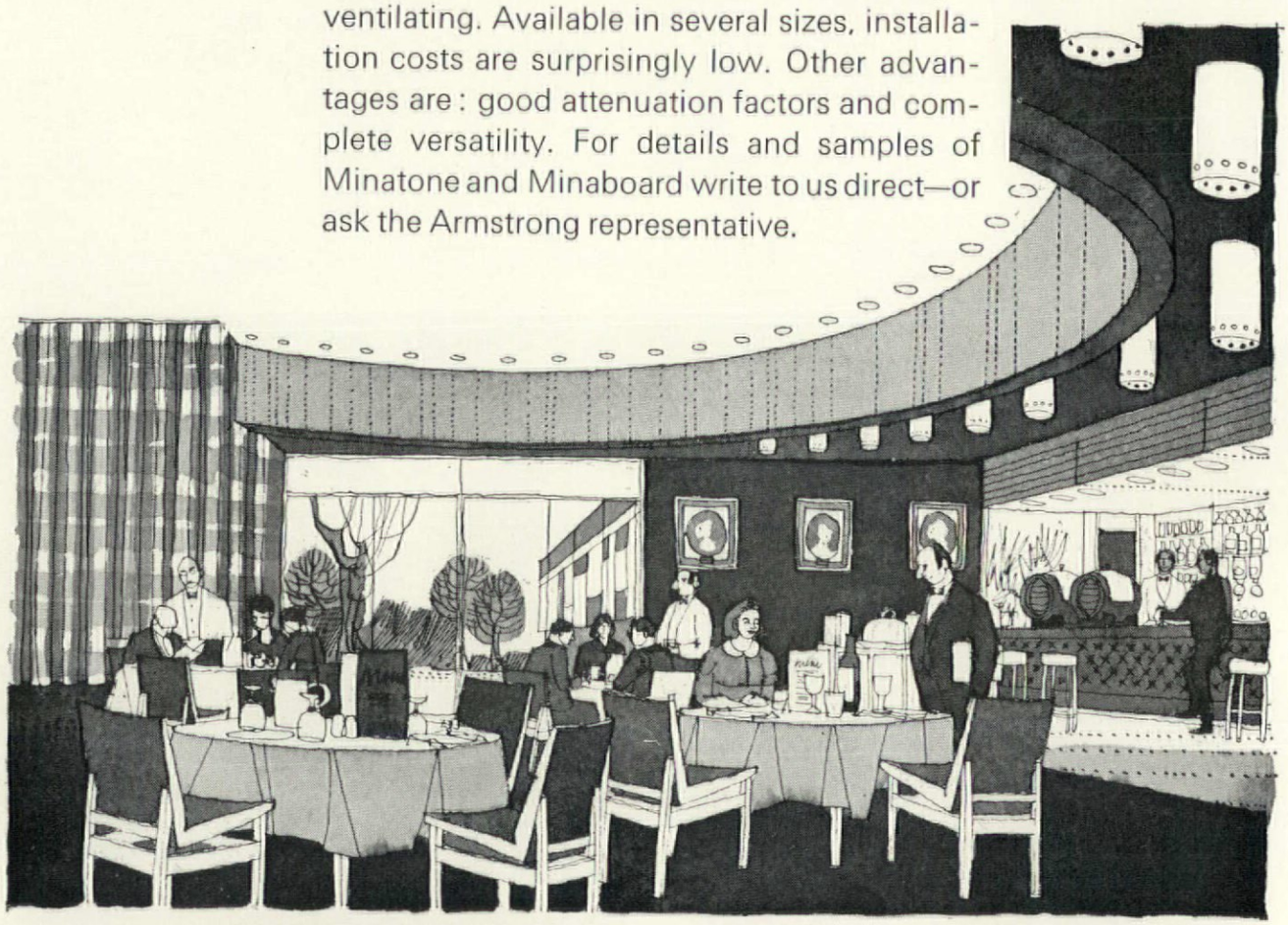


TOP DESIGN

Armstrong Ceilings offer the utmost in design. Not just good looks—though the lace-like pattern of Minatone and the directional fissuring of Minaboard are highly attractive—but ceilings that are *completely* functional: acoustic, fire-resistant, fully accessible, and—if necessary—ventilating. Available in several sizes, installation costs are surprisingly low. Other advantages are: good attenuation factors and complete versatility. For details and samples of Minatone and Minaboard write to us direct—or ask the Armstrong representative.



CEILING SYSTEMS BY Armstrong

ARMSTRONG CORK CO. LTD., CEILING SYSTEMS DEPT., WOODGRANGE HOUSE, WOODGRANGE AVENUE, KENTON, MIDDX. TEL: WORDSWORTH 0151

Makers of Minatone, Minaboard, Tacetone, Travertone, Corkoustic, Cushiontone.

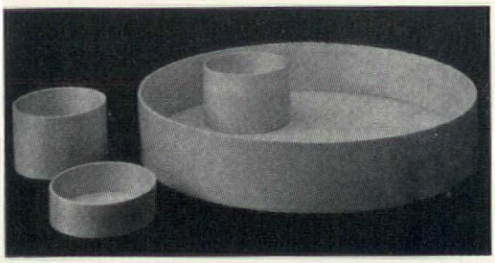
AT46

Design

Torsten Johansson

The versatile Danish sculptor Torsten Johansson (remember his zany helter-skelter in the Tivoli Gardens?) has been experimenting with pressure-formed wood for mass-production by AB Formträ and has come up with a variety of Japanese cylindrical trays in pine and rosewood **1–3**, a coat hanger and a most original bottle rack **4, 5**.

Mobilia, June 1965



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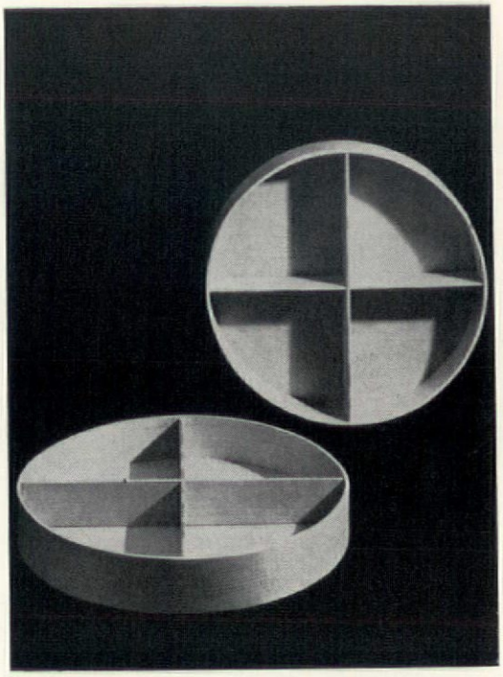

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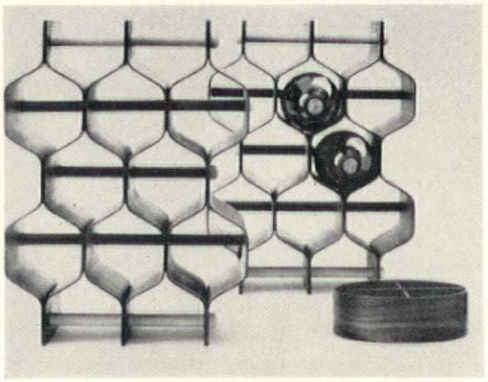

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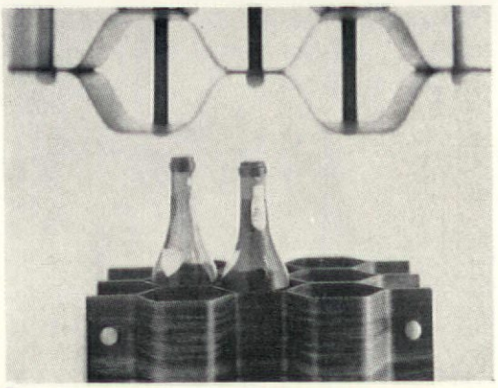


5

Telephone booths **6–10**

Bell System (USA) and their industrial design consultant Henry Dreyfuss, have produced two new phone booths, indoor and outdoor phone shelves, and a mobile booth unit, all of them including 'coin-box' vandal-proof panel collector.

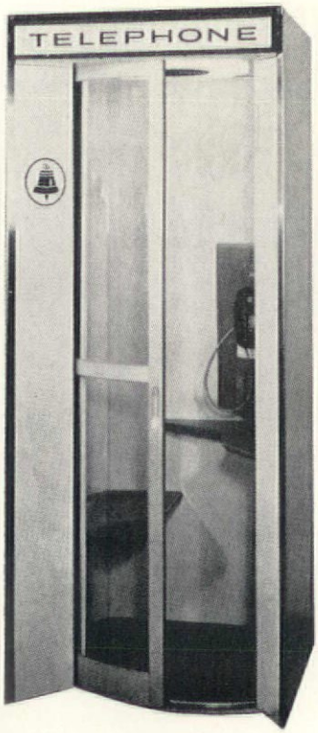
The first **6**, though square on plan, has a sliding curved glass door, made in two sections and top hung to avoid dirt collecting in a floor track. It stays open when not in use. The three sides are in steel finished inside with porcelain enamel, and externally with grey-green vinyl. The cantilevered seat is moulded in glass fibre. There is no longer provision for phone books inside booths; they are to be hung outside or elsewhere.

The Versatel phone shelf **9**, designed on a 45° angle for maximum versatility of installation, is for use where space and capital are limited. For example, four of the shelves can be placed round one post in a 2ft 6in square space. One can be mounted on a wall, or on a post **10** containing the wiring inside, with a polypropylene-covered book recess below the shelf.

The mobile unit **7** is on two retractable wheels and contains four booths and four shelves, all panelled inside with perforated aluminium over sound-absorbent material. The central air conditioning unit is optional.

Industrial Design (USA), July 1965

▷ page 525



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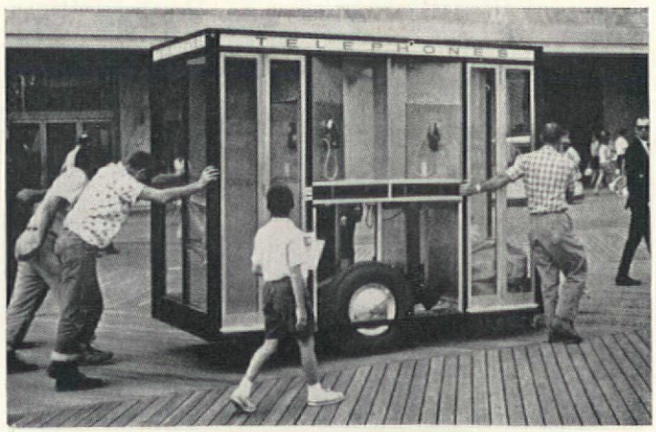

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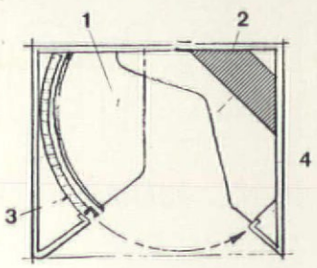

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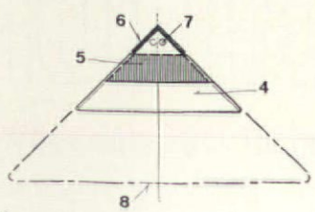


9



10

8
Circular booth plan
1 seat
2 collector
3 curved door
4 shelf

9
Versatel phone shelf plan
4 shelf
5 collector
6 angle stanchion
7 wiring
8 canopy

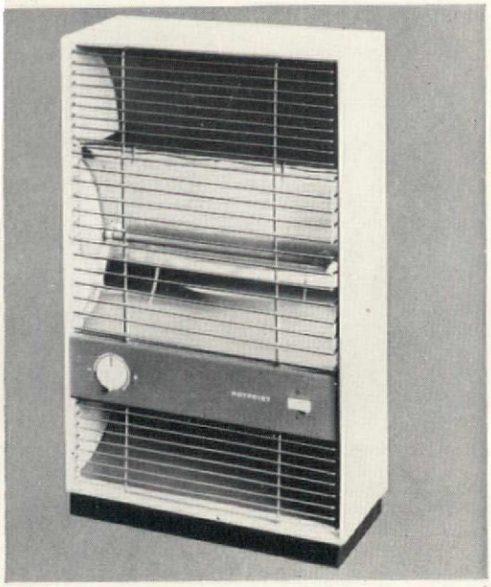


387 specially designed lighting fittings were installed in the canopies alone at London's latest hotel, the Royal Garden at Kensington. For the whole exciting building Troughton and Young Lighting supplied literally thousands of fittings, either specially designed or taken from the wide standard range they offer.

Architects: R. Seifert & Partners
Designers of Public Rooms: Design Research Unit
Main Contractors: Tersons Ltd

TROUGHTON & YOUNG

TROUGHTON & YOUNG (Lighting) LTD WANSDOWN PLACE FULHAM ROAD LONDON S.W.6



1

Radiant convector **1**

AEI-Hotpoint Ltd's coordinated design policy must surely be producing dividends. All their products (cookers, refrigerators, washing machines, space heaters, etc.) are developed by their engineering design department in co-operation with Industrial Design Unit Ltd. We show the *Miami* space heater which combines 2Kw convection with 1Kw radiant heat. The case is white, with satin-chrome grilles and blue or red switch panel. Retail price £10 10s (including tax).

Hotpoint House, Putney, London, S.W.15

Letter box **3, 4**

The GPO letter box by RCA student Edward Chamberlain is based on unit construction with separate interchangeable parts that can be replaced individually when necessary.

The structure of the box enables it to be used as a free-standing or wall-mounted box. One, two or three sizes of box can be achieved by using standard units and enclosing volumes of $3\frac{3}{4}ft^3$, $7\frac{1}{2}ft^3$, and $11\frac{1}{2}ft^3$ respectively. Where a three-unit box is used, it could carry the indication 'London, Country, Abroad' in order to presort the mail.

Where the amount of mail is large, a removable bag can be hung inside the box; where it is small, an auxiliary box is fixed inside. The door is a one-piece aluminium casting and opens outwards and downwards, being controlled by two friction arms. It can accommodate one or two stamp machines.

The changing of the collection number is achieved by turning a disc fixed to the back of the collection times plate.

The folded steel panels, top and base, are finished in vitreous enamel.

The design incorporates a new GPO symbol.



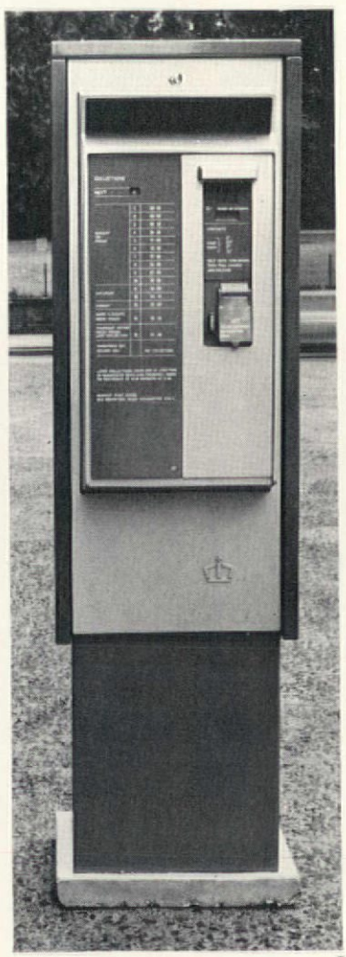
2

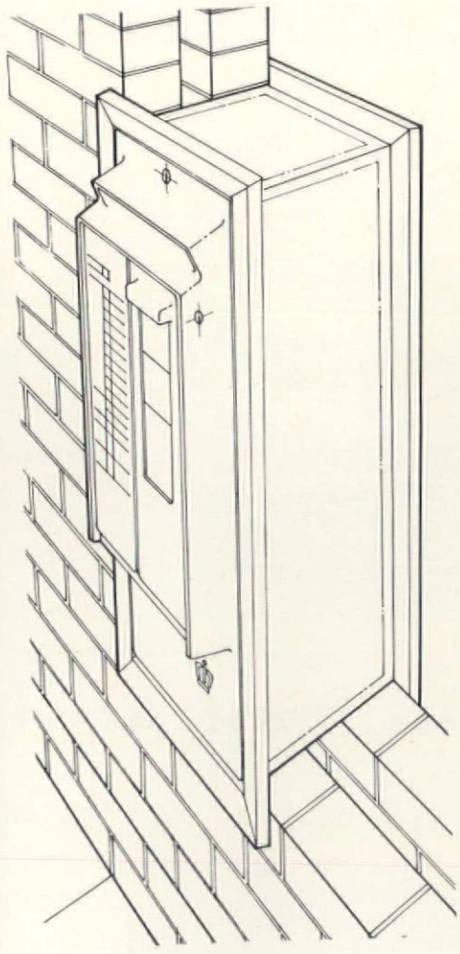
Child's convertible chair **2**

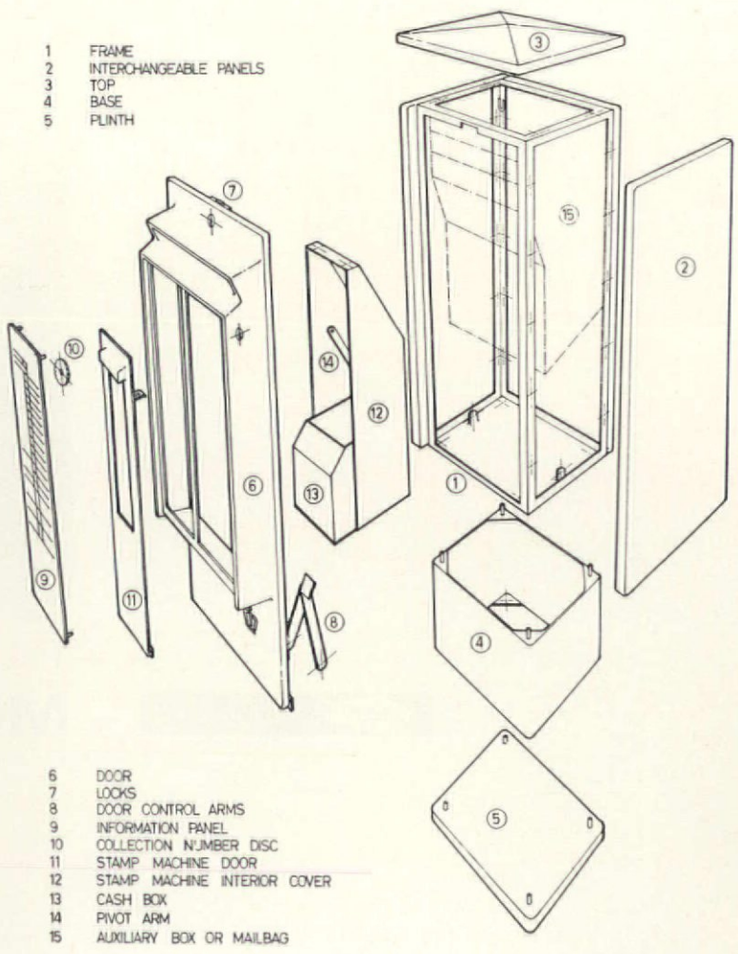
The child's chair by Michael Dupree (also at RCA) has attachments that enable it to be used as a high chair (as shown), a car seat, a push chair (collapsible to fit in boot of a car, and with space for parcels, etc.), a carry chair (rucksack style), a rocking chair, and a swing.

The chair and tray are injection moulded in polypropylene. The chair, simple in shape, with no sharp edges, can be clipped to any of the tubular steel attachments by means of three polypropylene clips, which are an integral part of the moulding. The tray is large, and clips to the attachment to avoid any pinching action between the chair and tray.

It is hoped that in production the chair moulding would sell for about £1, the tray for 12s, and an attachment 30s.







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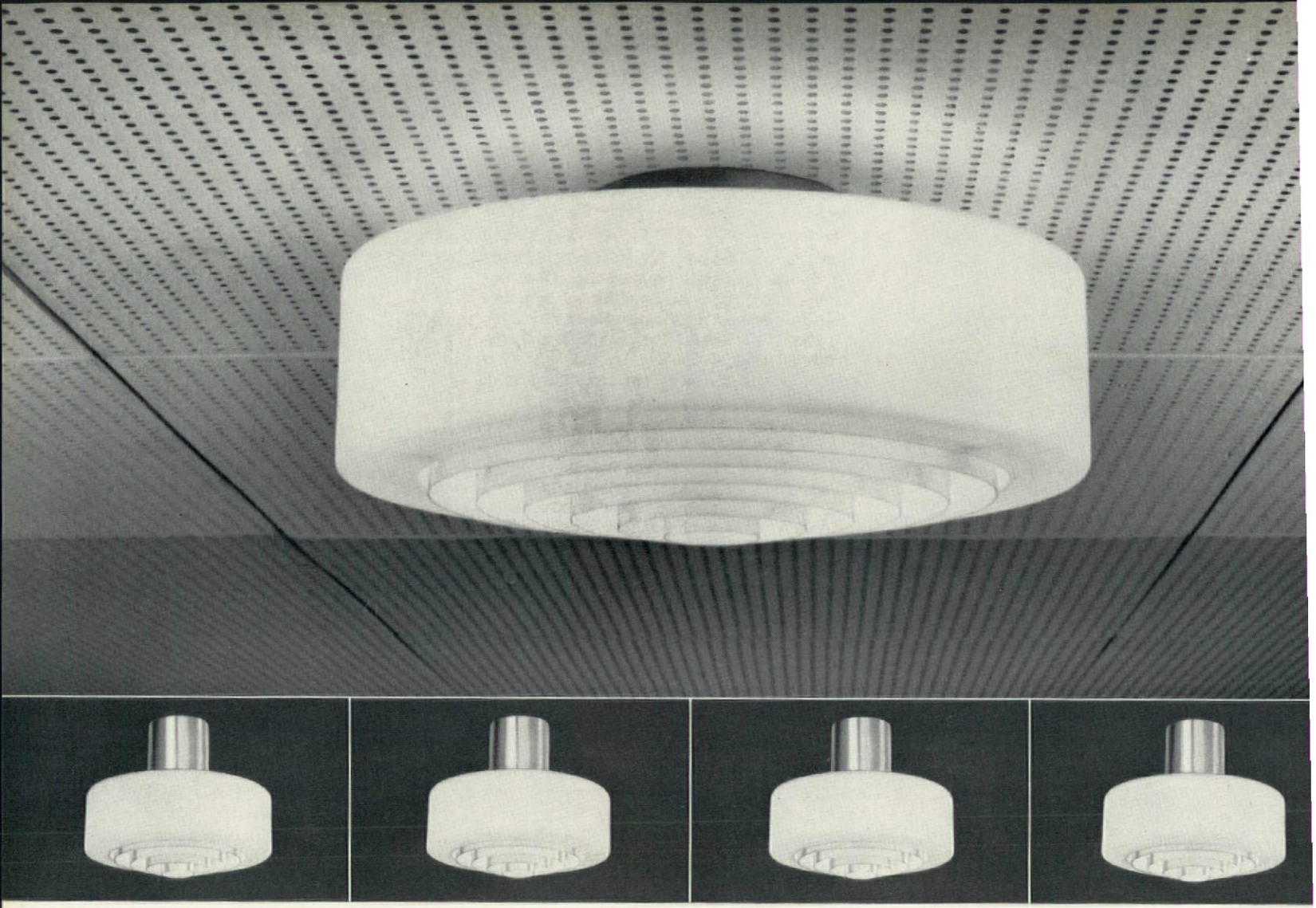
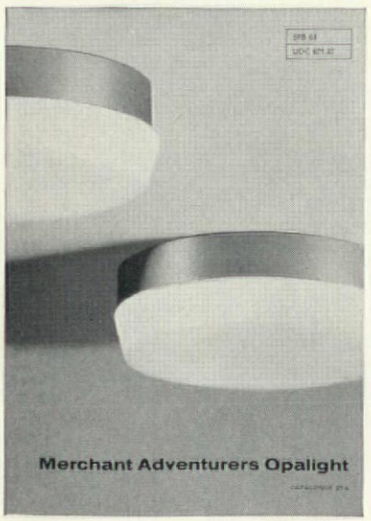


Louvred 1560 series ceiling units from Opalight catalogue 21A



Opalight 21A

This publication illustrates with photographs, dimensional drawings and prices, some 450 MA lighting fittings using opal glass diffusers and provides an indispensable guide to the best ranges in Opal lighting today

MA LIGHTING

Merchant Adventurers

Head Office :
Feltham, Middlesex (FEL 3686)
London Showrooms :
231 Tottenham Court Road W 1

Trade notes

Alexander Pike

To obtain additional information about any of the items described below, circle their code numbers (E1, E2 . . . etc.) on the Readers' Service Card inserted elsewhere in this magazine.

E1 Slab urinal

Leeds Fireclay Co. Ltd., Farnley, Leeds

The LF 65 has a back outlet cistern and back inlet spreader, completely concealing all pipework. Cistern lid has a special double lock nut fixing, removable only with a special tool.

E2 Ceramic wall facing units

Langley London Ltd., 163 Borough High Street, London, S.E.1

Keramag fireclay units finished in a non-crazing glaze, either matt or glossy. Plain, three-dimensional or pierced, moulded by a slip casting process permitting units over 3ft long.

E3 Stainless steel sinks for hospital kitchens

The Stainless Steel Sink Co. Ltd., Cultha House, 10 Storey's Gate, Westminster, London, S.W.1

A new catalogue includes ultrasonic cleaners, sterilizers and a new range of durable and fully sound-deadened suites from 3ft 6in to 7ft.

E4 Ceiling switches

J. A. Crabtree & Co. Ltd., Lincoln Works, Walsall, Staffs

Designed for domestic installations but suitable for the heavier loads encountered in factories. Available in 5amp one-way at 4s. 7*d*.; two-way, 5s. 5*d*.; and 15amp double pole at 6s. 8*d*. In ivory finish only.

E5 Non-toxic bactericide

Winton Laboratories Ltd., 54–56 Cheam Common Road, Worcester Park, Surrey

Halophane is a powerful bactericide, algicide and fungicide which is non-inflammable, non-staining and non-corrosive. It can be mixed with emulsion paint and is completely non-toxic.

E6 Resin putty

British Insulated Callender's Cables Ltd., Prescot, Lancs

Bicaseal putty consists of a two-part mix of resin and hardener supplied in red and white sticks. Worked together by hand to a uniform colour, it hardens to form a material that may be cut, filed, drilled or tapped and is suitable for repairing, jointing or insulating a wide range of materials, including metal and plastics. Price £3 10s. per 10lb pack.

E7 Concealed overhead closer for glass doors 1

William Newman & Sons Ltd., Hospital Street, Birmingham 19

The Briton 1100 is now available for glass doors with 2in or 3in New edge rails. Single or double action, for doors up to 200lb.

E8 Garage door

Coburn Engineers Ltd., Coburn Works, Peasmarsh, Guildford, Surrey

A version in steel of the standard assembly kit of cedarwood panels introduced earlier this year. May be used on new or existing garages. Five sizes from 7ft wide × 6ft 6in, £17 10s., to 8ft wide × 7ft, £20 17s. 6*d*.

E9 Screw tie for wood frames

W. M. Owlett & Sons Ltd., 15–21 Bourne Road, Bexley, Kent

The Owlett screw tie is a 6in loop of $\frac{1}{4}$in galvanized wire with a 12g wood-screw point. Can be screwed in by hand to the back of the frame, one course above the brickwork and screwed to any required angle.

E10 Concealed cabinet hinge and catch

Industrial Devices Ltd., 313 West End Lane, London, N.W.6

Primo-Ura cabinet hinges incorporate a ball catch in one leaf engaging with a hole in the other, securing the door when closed. Fitting is simple. Price 4s. 6*d*. per pair.

E11 Transistor intercom

Claymore Manufacturing Co., 39–41 James Street, London, W.1

Powered by a 9v battery lasting approximately 4–5 months, the Model KE 20 two-station intercom has a printed circuit and two transistors. Master and sub-stations, 3in × $1\frac{1}{4}$in × 4in, house $2\frac{1}{4}$in speakers and are connected by a 66ft cord. Price complete £6 19s. 6*d*.

E12 Filling hatch for oil storage tanks

Landon Kingsway Ltd., The Avenue, Egham, Surrey

Cabinets to protect and conceal the valves, warning signals, contents gauges and automatic switches associated with oil storage tanks are available in mild steel, weather-sealed and with a top-hinged door, self-supporting when open. Height $22\frac{1}{2}$in, depth 12in, widths $22\frac{1}{2}$in (single tank), 32in (double), $41\frac{1}{2}$in (treble).

E13 Oil-fired air heaters

Dragonair Ltd., Farlington, Portsmouth

The HLO 25 has a heat output of 275,000 B.Th.U. per hour from a consumption of 2·1 galls. Size 2ft 10in square × 8ft 10in high. Weight $6\frac{1}{4}$cwt.

E14 Lighting fittings 2

Courtney, Pope (Electrical) Ltd., Amhurst Park Works, Tottenham, London, N.15

The new Rainbow range consists of nine pendants in which light is reflected from a coloured inner surface of the black stove-enamelled outer drum to give a halo effect. Prices range from £3 7s. 6*d*. to £5 7s. 2*d*. The 100w fitting illustrated is £4 11s. 9*d*.

E15 Timber finishes

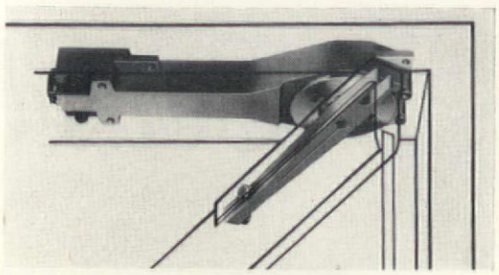
The Timber Research & Development Association, St John's Road, Tyler's Green, High Wycombe, Bucks

A new leaflet gives basic information on preservatives, water-repellents, stains, clear varnishes and paints. A reference table compares appearances, initial treatment and cost, maintenance procedure, and period and cost of renewal.

E16 Refrigerators and freezers

Henning Glahn Ltd., 22 Grosvenor Street, London, W.1

Atlas Danish domestic refrigerators are now available in this country in capacities from $3\frac{1}{2}$ to 8cu ft. The Crystal Regent **3** has forced-air cooling, automatic defrosting and reversible doors. All models are $21\frac{5}{8}$in wide and $21\frac{1}{2}$in deep. Prices vary from £49 1s 11*d* ($3\frac{1}{2}$cu ft) to £127 9s 2*d* (8cu ft).



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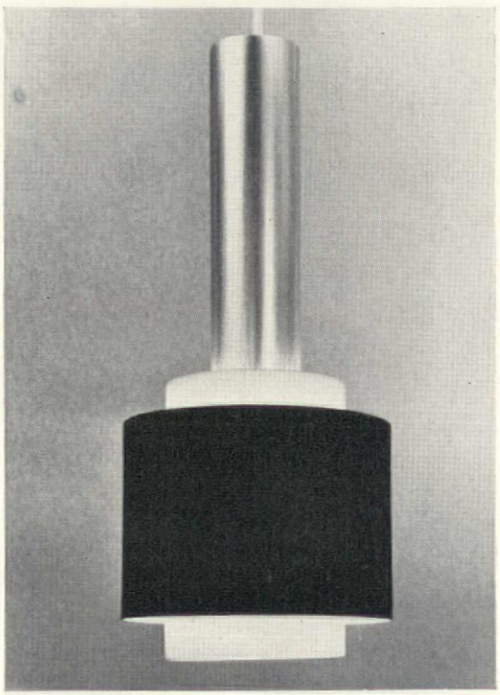

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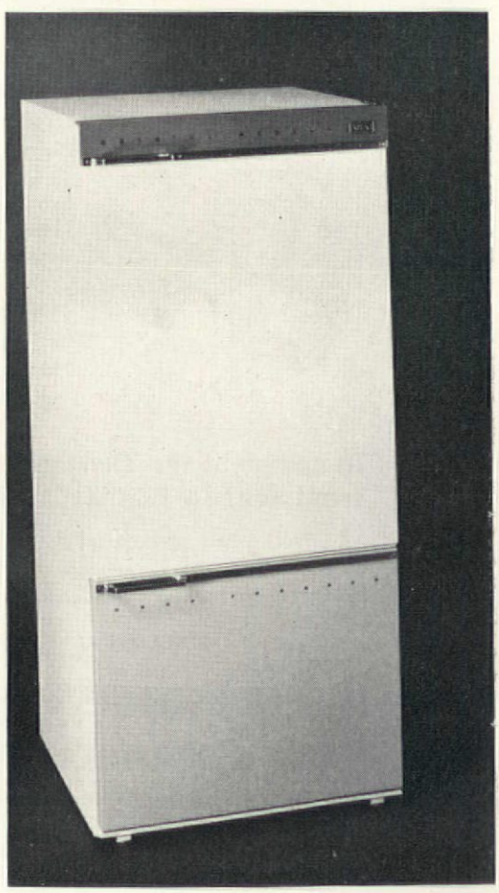


3

THE Berkeley DOUBLE GLAZED WINDOW

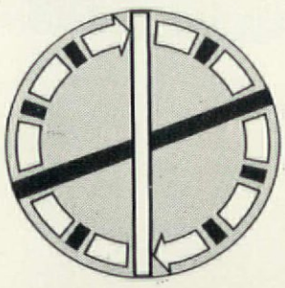
with the patent Balanced Pivot Hinge



DOUBLE GLAZING

at its most efficient!

The Berkeley comes from the original home of double glazing—Norway, and represents the most advanced development in this type of window. The special construction enables it to be fitted quickly and easily and maintenance is a simple matter.
Wherever double glazing is contemplated, specify the Berkeley for fine appearance and lasting dependability.



The unique, specially balanced pivot hinges of the Berkeley Double Glazed window permit it to traverse 180° and to be held securely at any angle within the arc. This affords maximum adjustability, provides any desired degree of ventilation and facilitates cleaning. Furthermore, the design of the hinge eliminates the possibility of wear impairing the functioning of the window.



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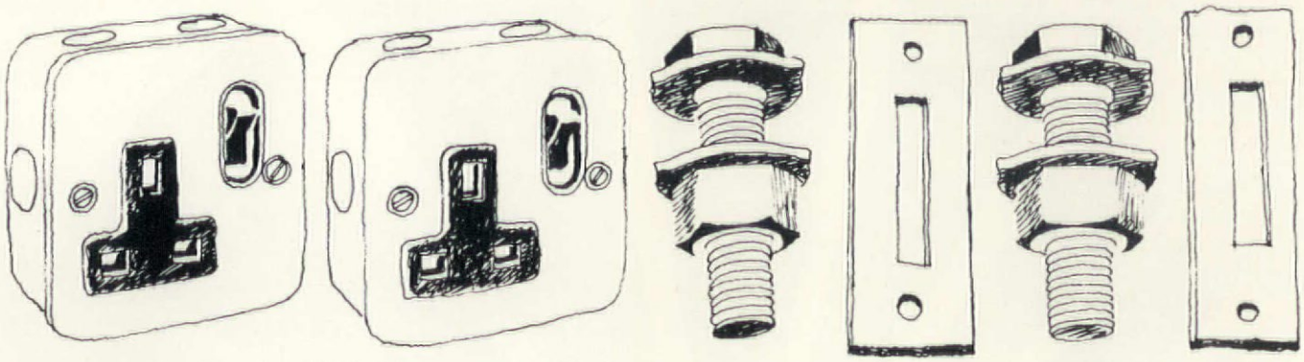
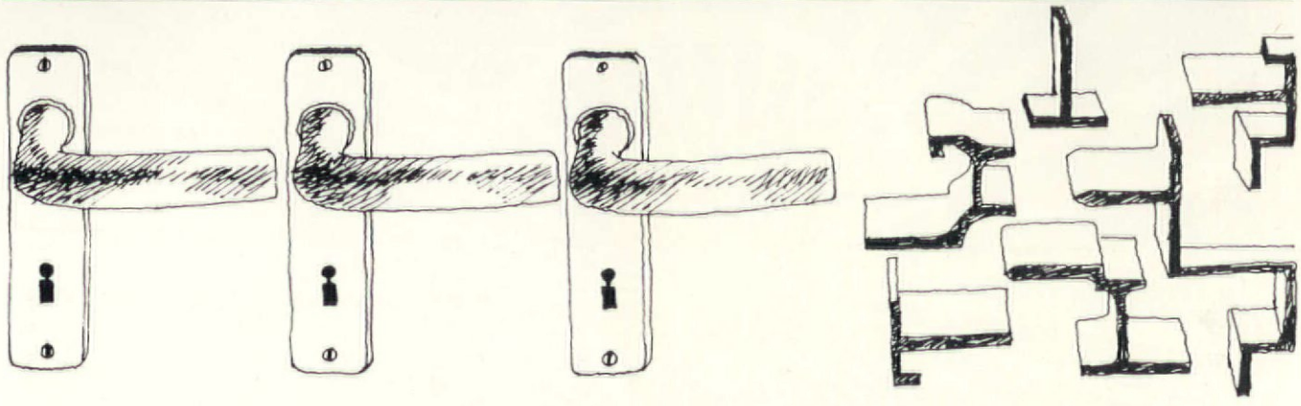
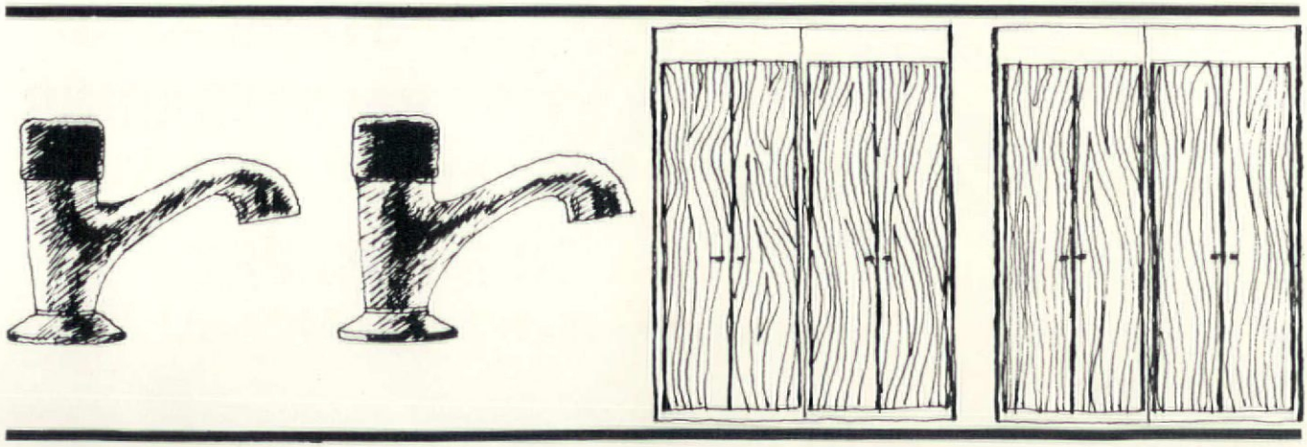
components for architecture



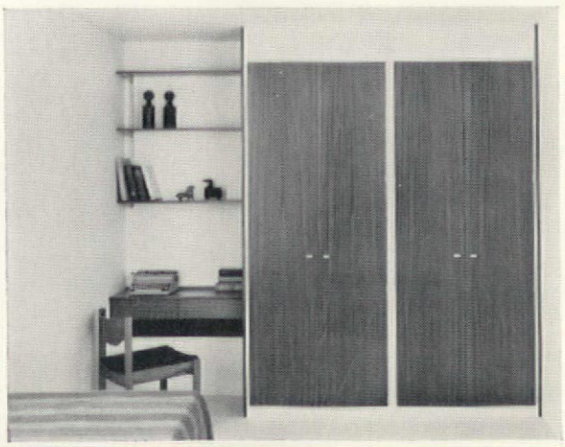




CONSORT
CONSORT

designer R. L. Carter Des RCA FSIA

built-in furniture



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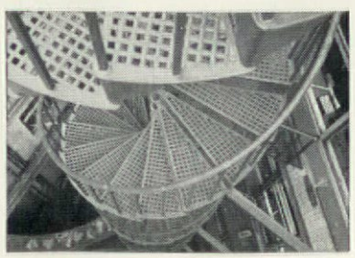
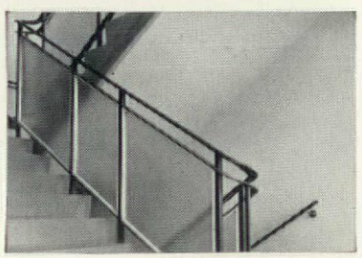

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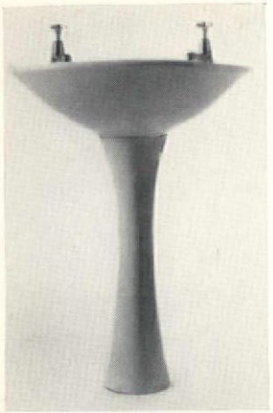



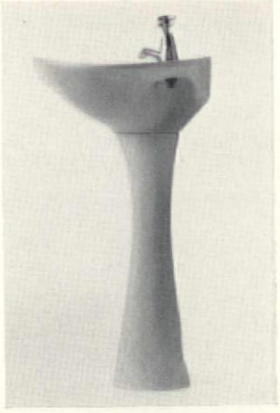



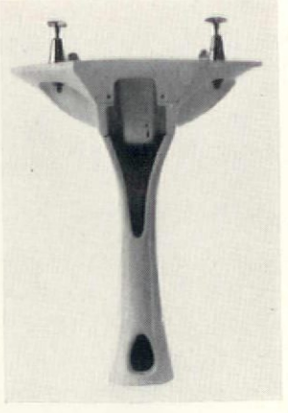

adamsez

have introduced a new pedestal basin into their well-known 'Lotus' range:

the 'Lake Lotus and Stem' (Fig. 1145/A15) designed by Alan H. Adams.
24"x18"x32" high, the basin can be supplied without the pedestal, when a patent

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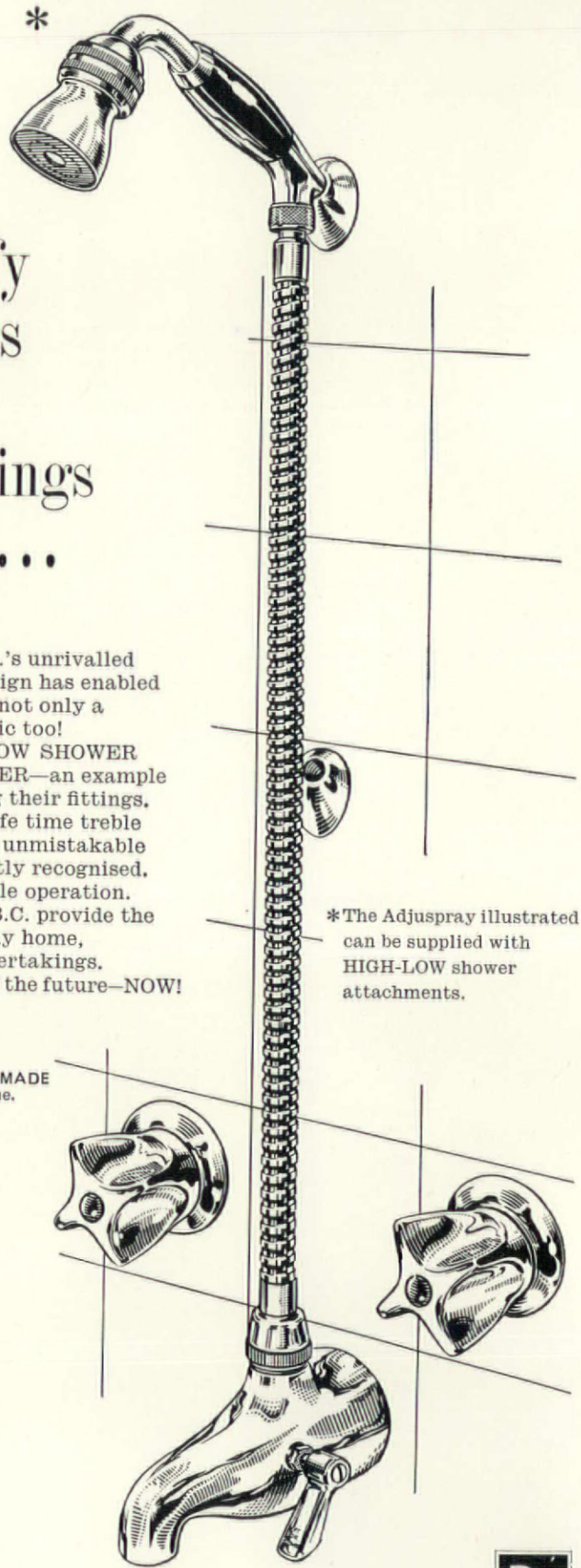

*The Adjuspray illustrated can be supplied with HIGH-LOW shower attachments.



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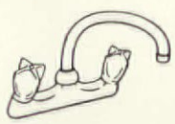

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HOT SPRAY



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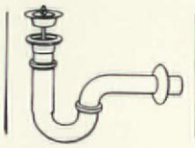

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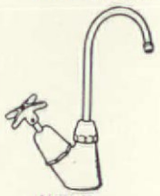

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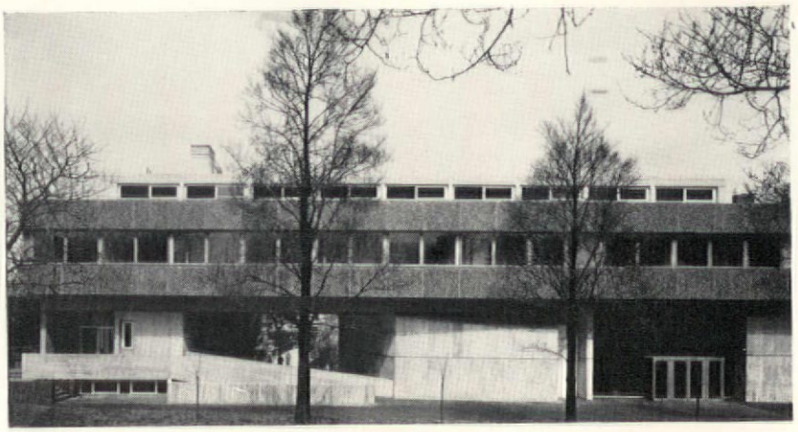
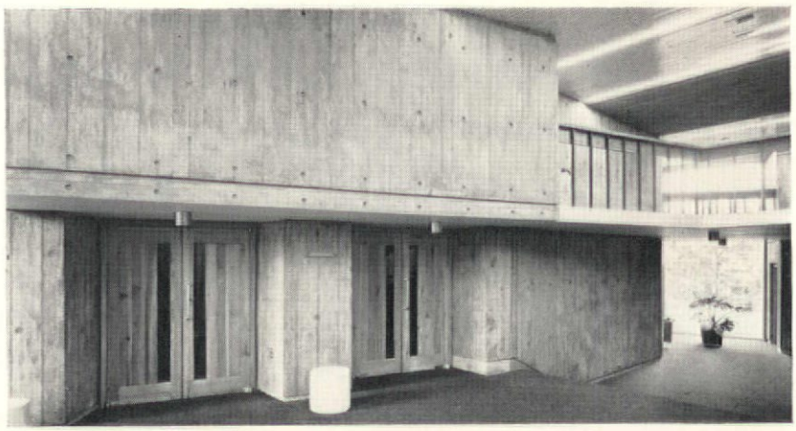


Architects: Llewlyn Davies Weeks and Partners

Purpose made Pivot windows in Utile and Softwood. Designed in collaboration with the architects



Architects: Llewlyn Davies Weeks and Partners

Internal doors to meeting hall foyer manufactured in pitch pine

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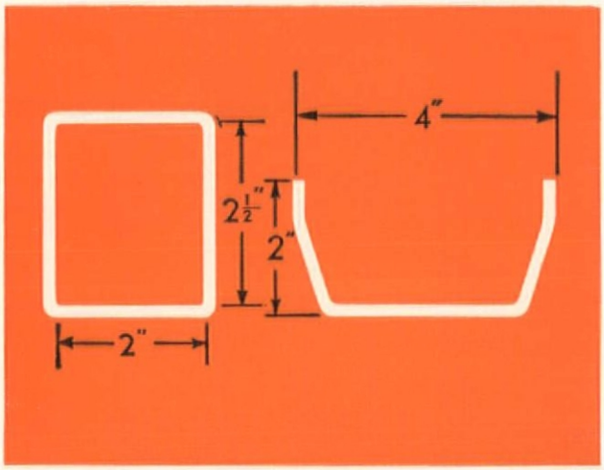
introducing Limpet

PVC RAINWATER GOODS



A new complete range of unique design.

Here, at last, is a superb range of high-quality PVC rainwater goods which, through its unique rectilinear design, provides new scope for distinctive elevational treatments. No longer need gutters and downpipes be 'hidden'; the LIMPET line is neat, good-looking . . . a very interesting architectural feature in itself. LIMPET rainwater goods have been exhaustively tested by the manufacturers, J. W. Roberts Ltd. – a company of the Turner & Newall Group. But its unique rectilinear design is not the only reason why its success is assured. Far from it. Consider all these other advantages!

* EASIER & QUICKER TO FIX. All gutter outlets, unions and fascia brackets are designed to allow gutters to be snapped into position. Built-in neoprene seals ensure water-tight joints and allow for expansion. Gutter unions and outlets act as support brackets and simplify erection, and with single screw fixing, easier alignment is achieved.

* AMAZINGLY LIGHT, STRONG & DURABLE. Made from specially formulated high-grade PVC, LIMPET rainwater goods will take normal ladder loadings and will withstand frost, ice, snow and anything the climate can produce.

* MORE WATER CAPACITY. 4" width gutter in the new rectilinear shape will handle more rainwater than a 4½" nominal half-round gutter. The new shape of the downpipe has a cross sectional area equivalent to a 2½" diam. downpipe and maintains the same discharge capacity.

* CONVERSION PIECES. A special change piece from rectangular to circular is available where downpipes are required to fit directly into a circular back inlet gully.

* ADAPTABILITY & ECONOMY. Swan necks are available in a range of sizes or can be fabricated on site to fit intermediate dimensions. Separate pipe connectors rather than socket-ended pipes allow pipe off-cuts to be used up on site.

* MAINTENANCE FREE. Needs no painting. Will not corrode or rust.

* COLOUR—GREY to B.S. 2660. Shade 9-097 – with a high quality finish.

* AVAILABLE NOW—Complete range of fittings. Gutter and downpipes in standard 6 ft. and 12 ft. lengths. Available from leading Distributors and Builders Merchants.

LIMPET rainwater goods are manufactured by J. W. Roberts Ltd., a Turner & Newall company that specialises in the production of plastics for building. It is backed by all the research facilities and production resources of this £100 million Group – which today comprises 17 companies and operates in 10 countries.

Technical Advisory Service. The technical staff of J. W. Roberts will be pleased to answer any queries about LIMPET rainwater goods. Fully descriptive literature is available on request.

NOW IN BARBOUR INDEX

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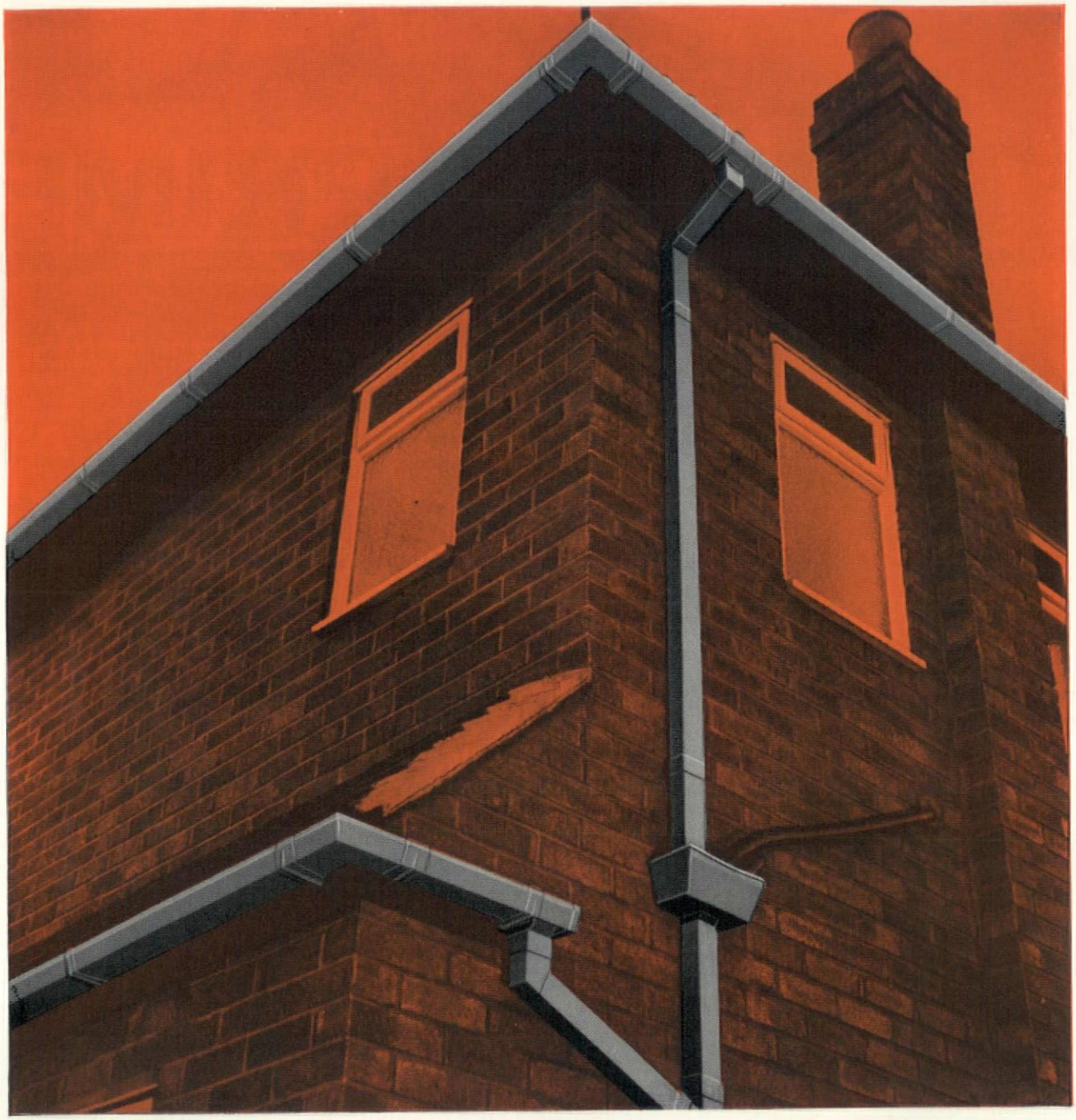
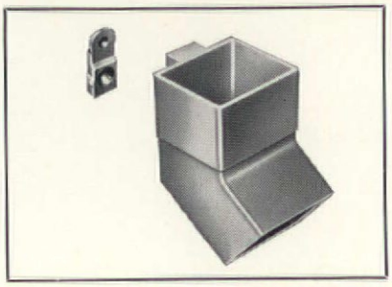
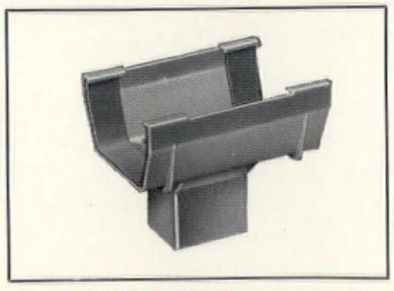
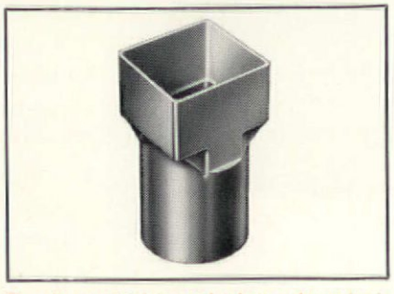




The wall clip is fixed by a masonry pin or screw, and the shoe is placed over it and snapped into position.



The gutter outlet has well radiused corners allowing for a smooth flow of water. This component also acts as a support.



The change piece is used when a downpipe is fitted directly into a back inlet gully, the circular section is cemented into the gully.

THE Limpet LINE ADDS THAT TOUCH OF DISTINCTION

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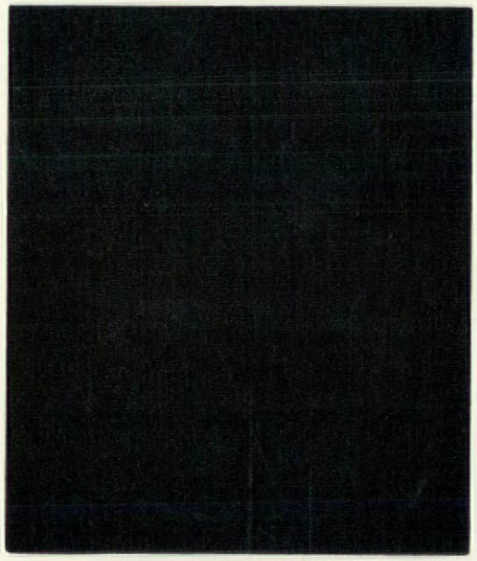
TEAM 10 PRIMER



The Aim of Team 10

Aim of Team 10 has been described as follows:
Team 10 is a group of architects who have sought each other out because each has found the help of the others necessary to the development and understanding of their own individual work. But it is more than that.
They came together in the first place, certainly because of mutual realization of the inadequacies of the processes of architectural thought which they had inherited from the modern movement as a whole, but more important, each sensed that the other had already found some way towards a new beginning.
This new beginning, and the long build-up that has followed, had been concerned with inducing, as it were, into the bloodstream of the architect an understanding and feeling for the patterns, the aspirations, the artefacts, the tools, the modes of transportation and communications of present-day society, so that he can as a natural thing build towards that society's realization-of-itself.
In this sense Team 10 is Utopian, but Utopian about the present. Thus their aim is not to theorize but to build, for only through construction can a Utopia of the present be realized.
For them 'to build' has a special meaning in that the architect's responsibility towards the individual or groups he builds for, and towards the cohesion and convenience of the collective structure to which they belong, is taken as being an absolute responsibility. No abstract Master Plan stands between him and what he has to do, only the 'human facts' and the logistics of the situation.
To accept such responsibility where none is trying to direct others to perform acts which his control techniques cannot encompass, requires the invention of a working-together-technique where each pays attention to the other and to the whole insofar as he is able.
Team 10 is of the opinion that only in such a way may meaningful groupings of buildings come into being, where each building is a live thing and a natural extension of the others. Together they will make places where a man can realize what he wishes to be.
Team 10 would like to develop their thought processes and language of building to a point where a collective demonstration (perhaps a little self-conscious) could be made at a scale which would be really effective in terms of the modes of life and the structure of a community.
It must be said that this point is still some way off.



The object of this Primer is to put into one document those articles, essays and diagrams which TEAM 10 regard as being central to their individual positions.

In a way it is a history of how the ideas of the people involved have grown or changed as a result of contact with the others, and it is hoped that the publication of these root ideas, in their original often naïve form, will enable them to continue life.

The first part of the document —the role of the architect—is concerned with the attitudes which the subsequent project material speaks about in another way. The project material has been roughly grouped into three sections—'Urban infra-structure', 'Grouping of dwellings', and 'Doorstep'. Each of these sections tends to be dominated by one person or group—he or they, whoever developed the root idea—and the complementary or commentary material by others is printed alongside making a kind of counterpoint. The following material is also included.

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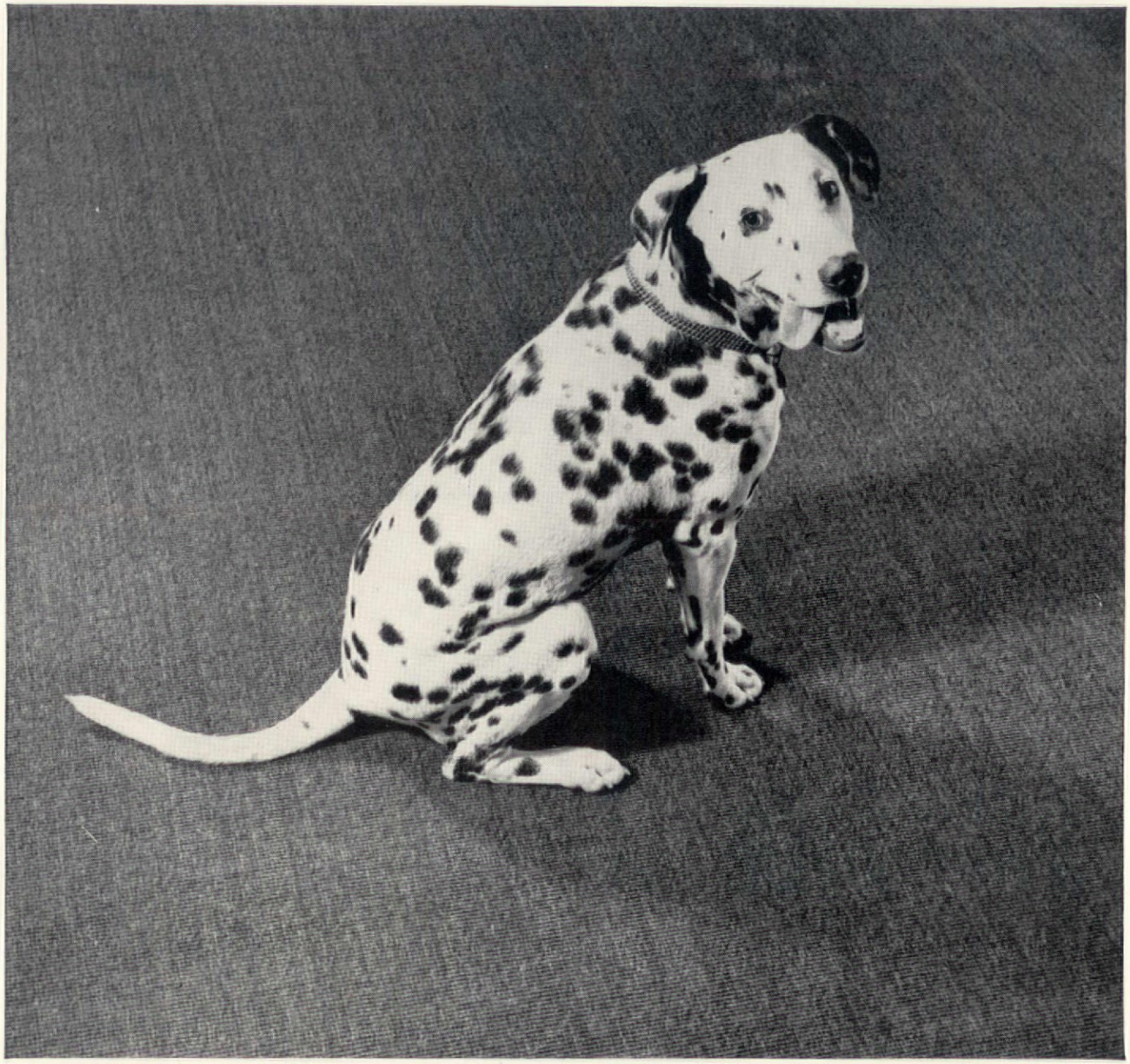

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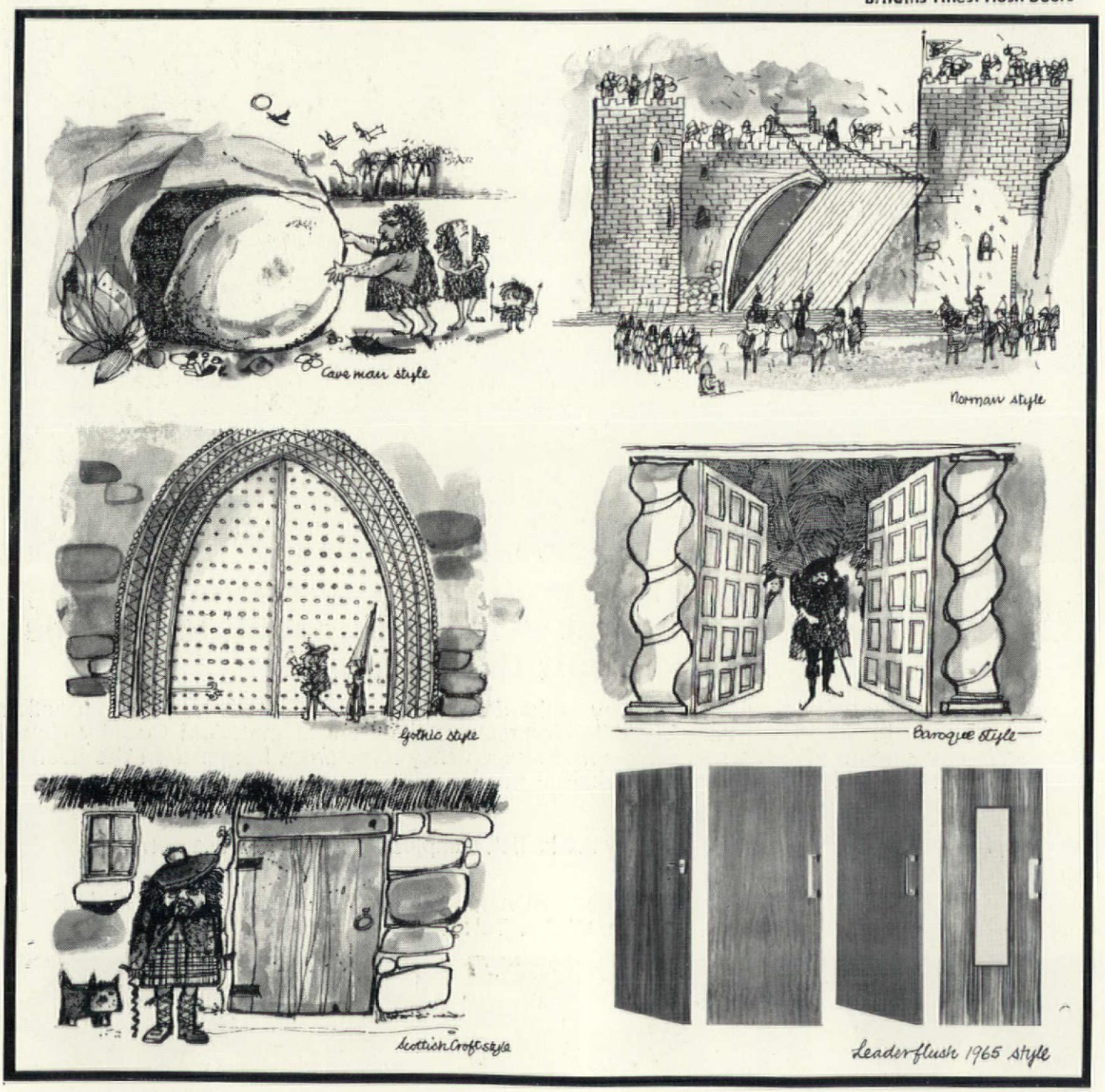

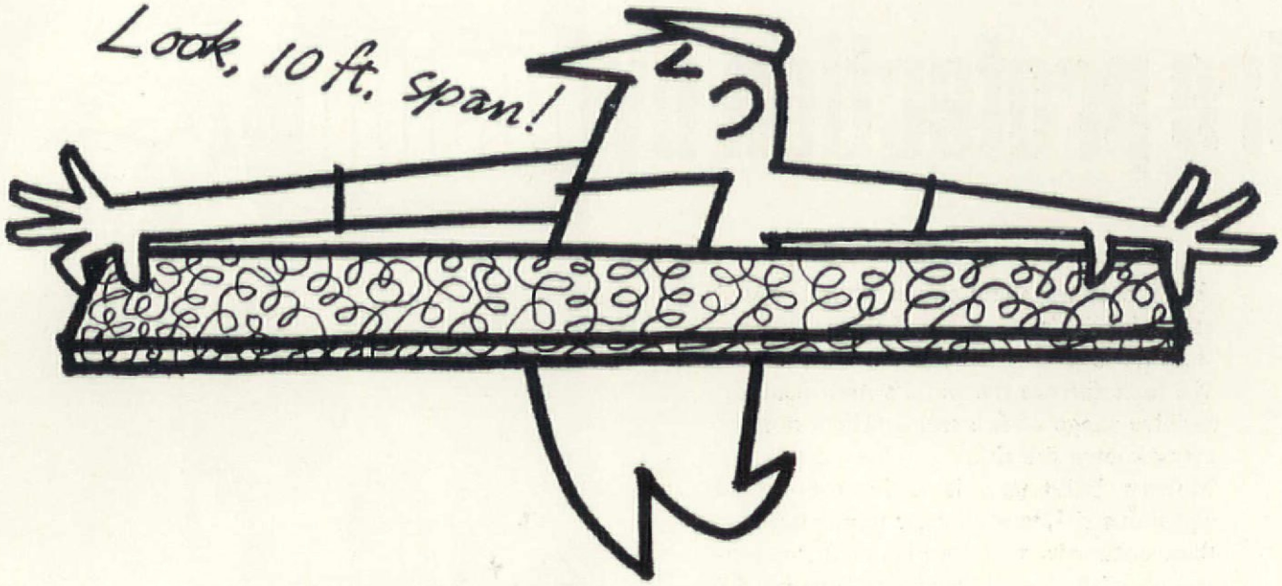

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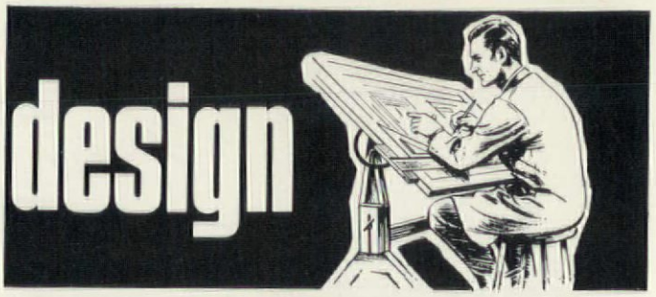

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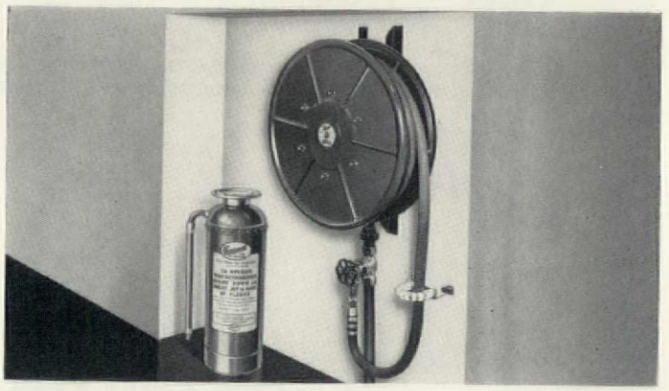



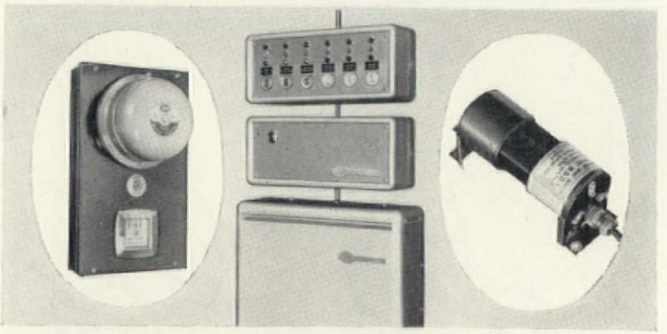



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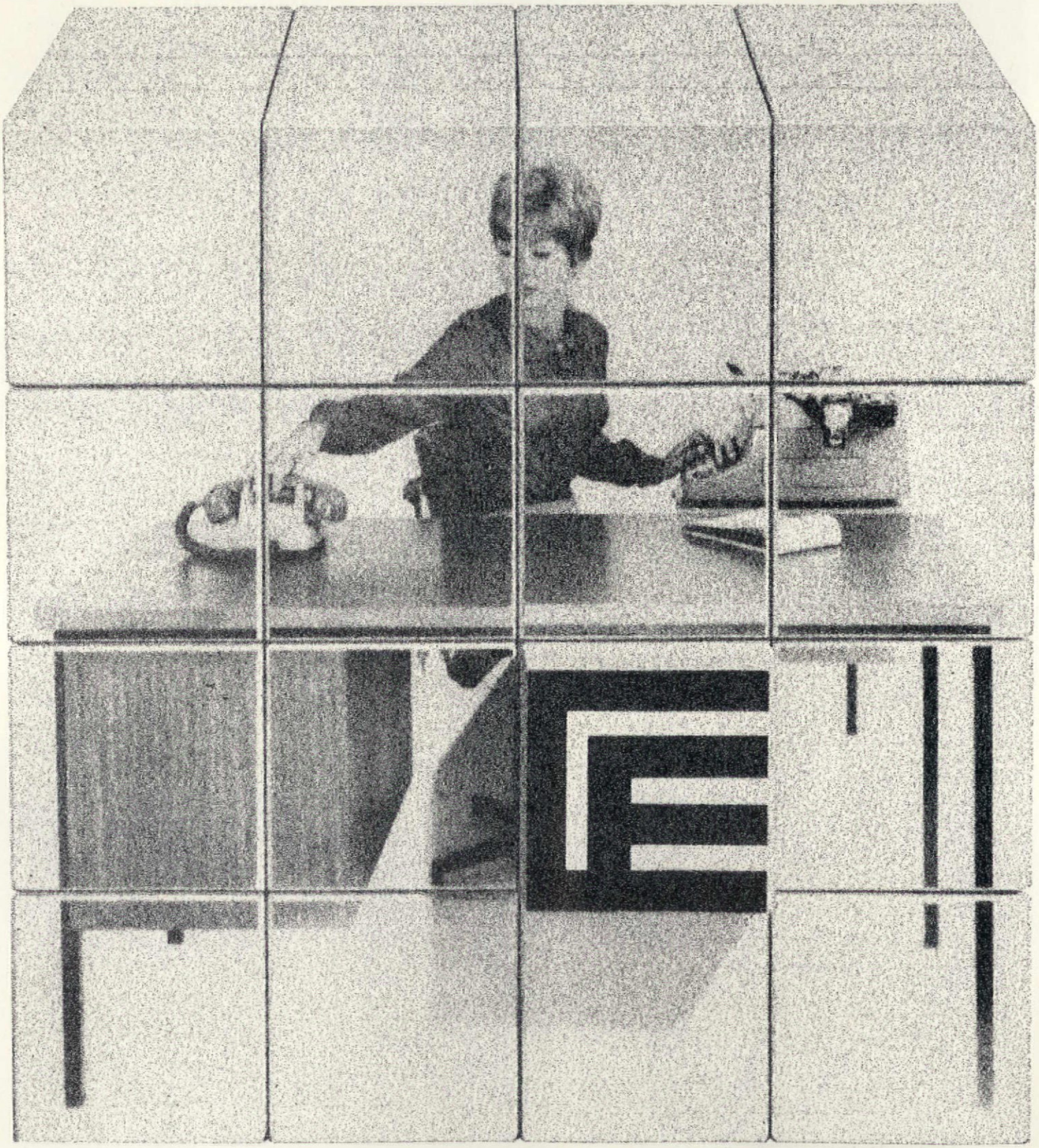

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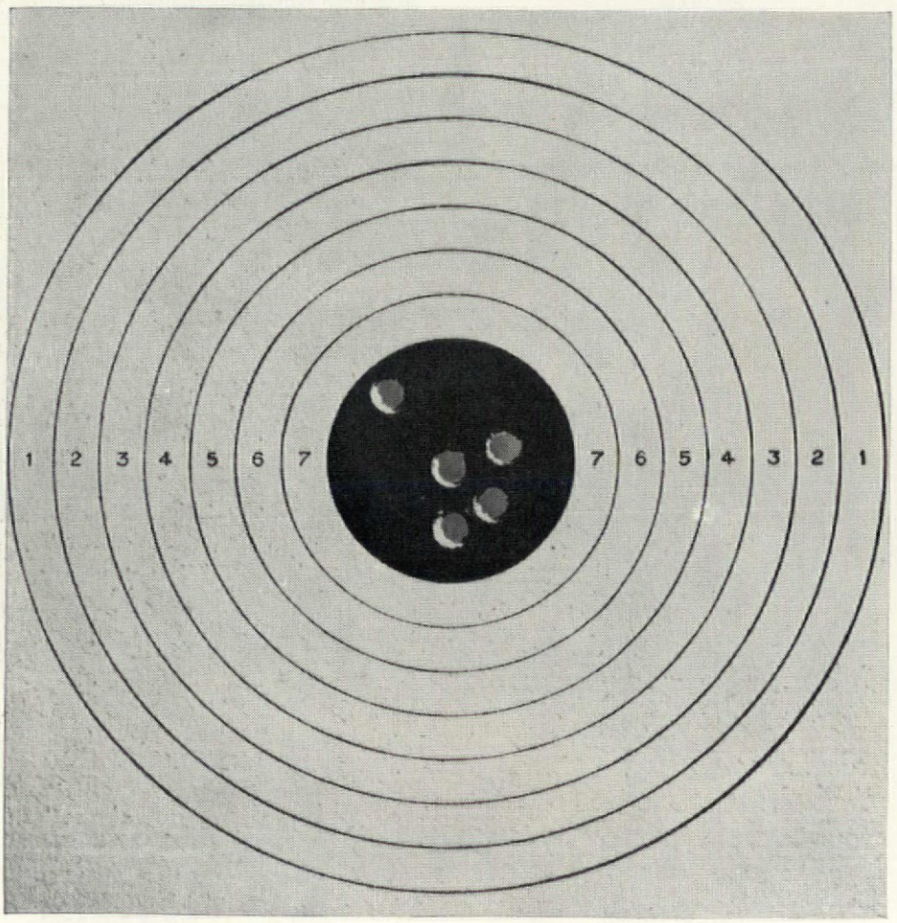

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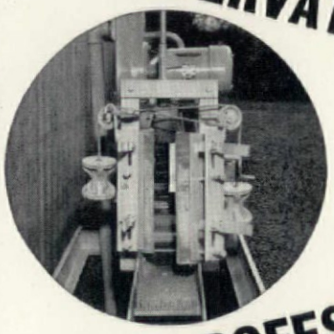

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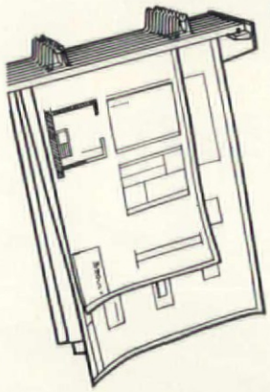

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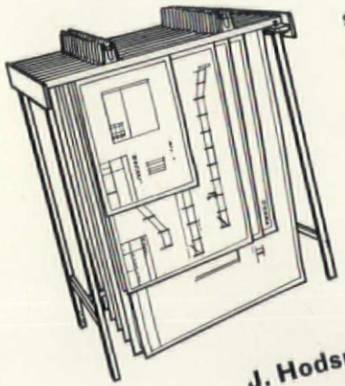

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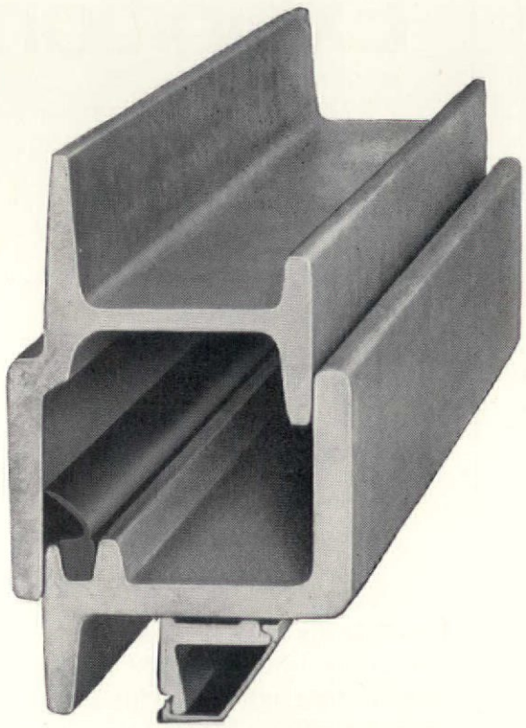

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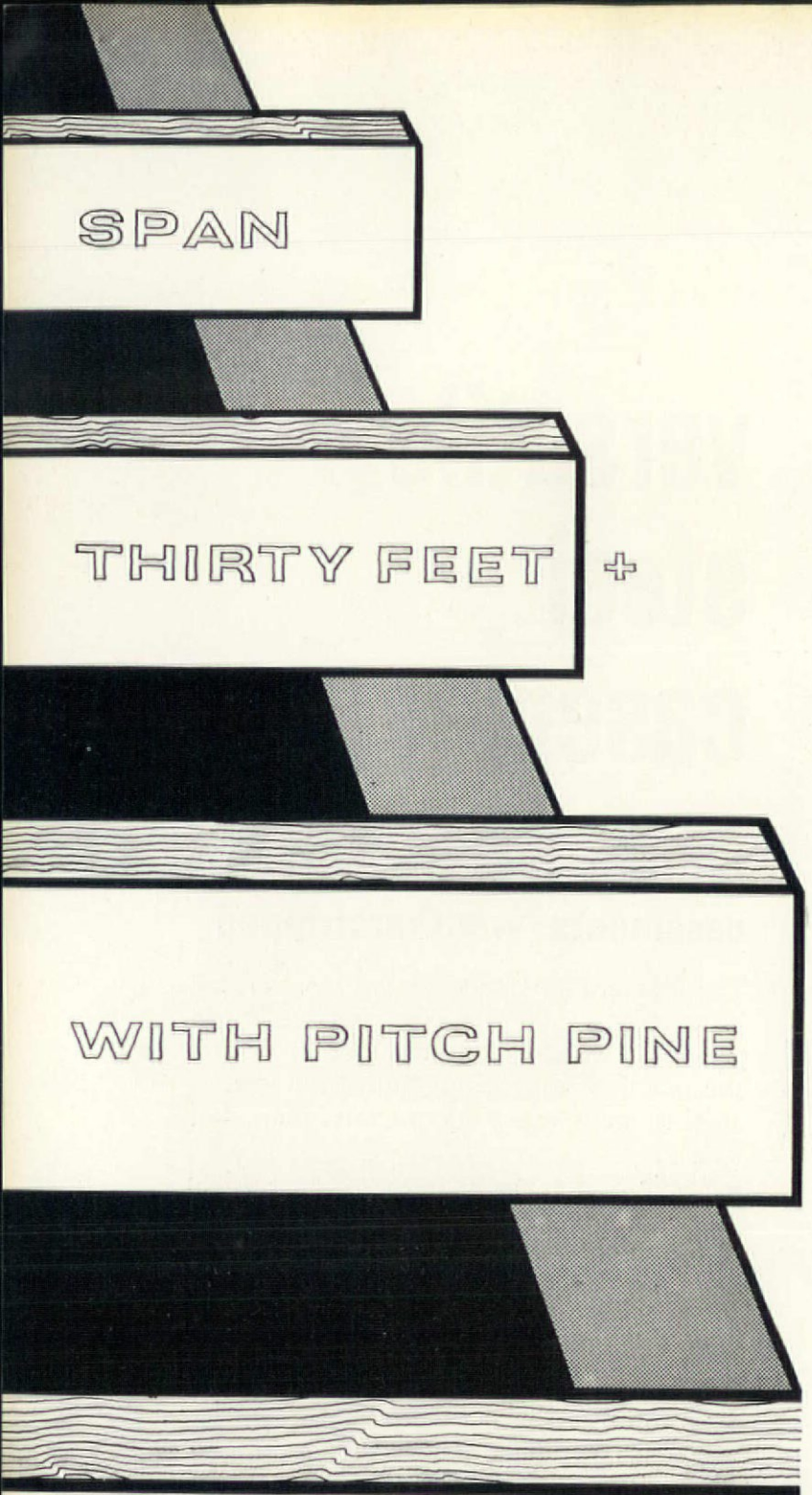

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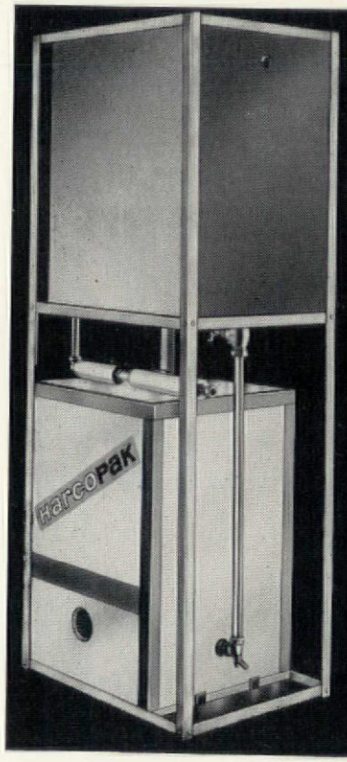

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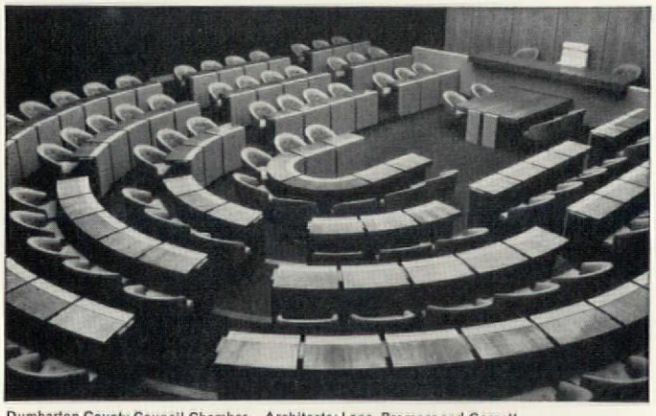

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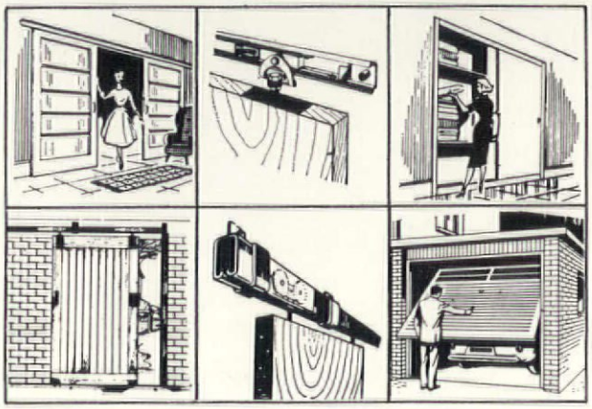

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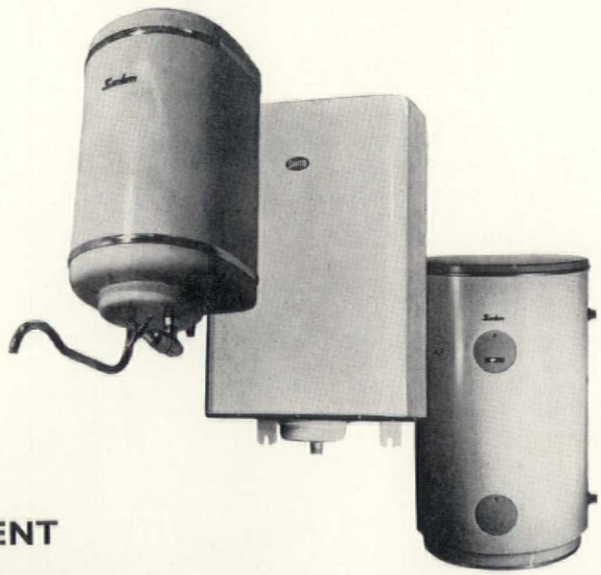

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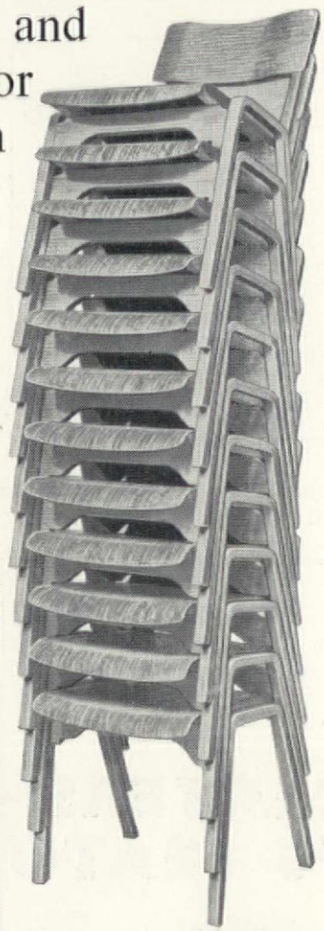

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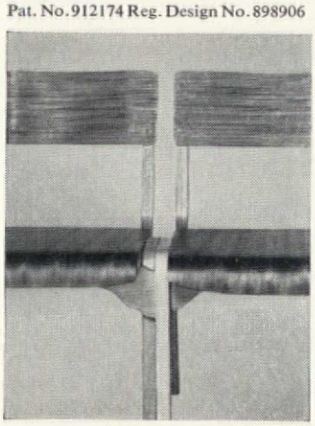

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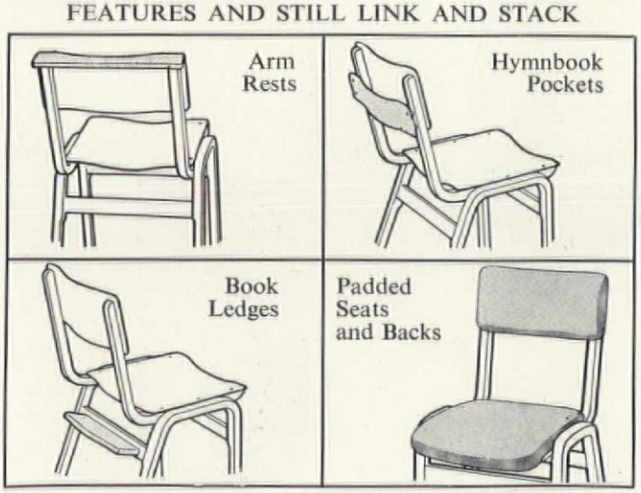

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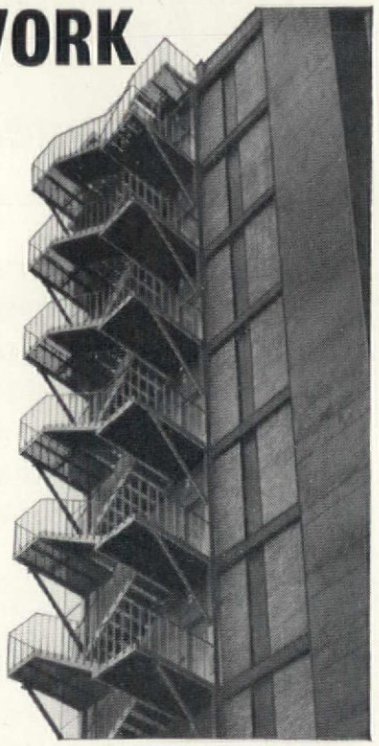

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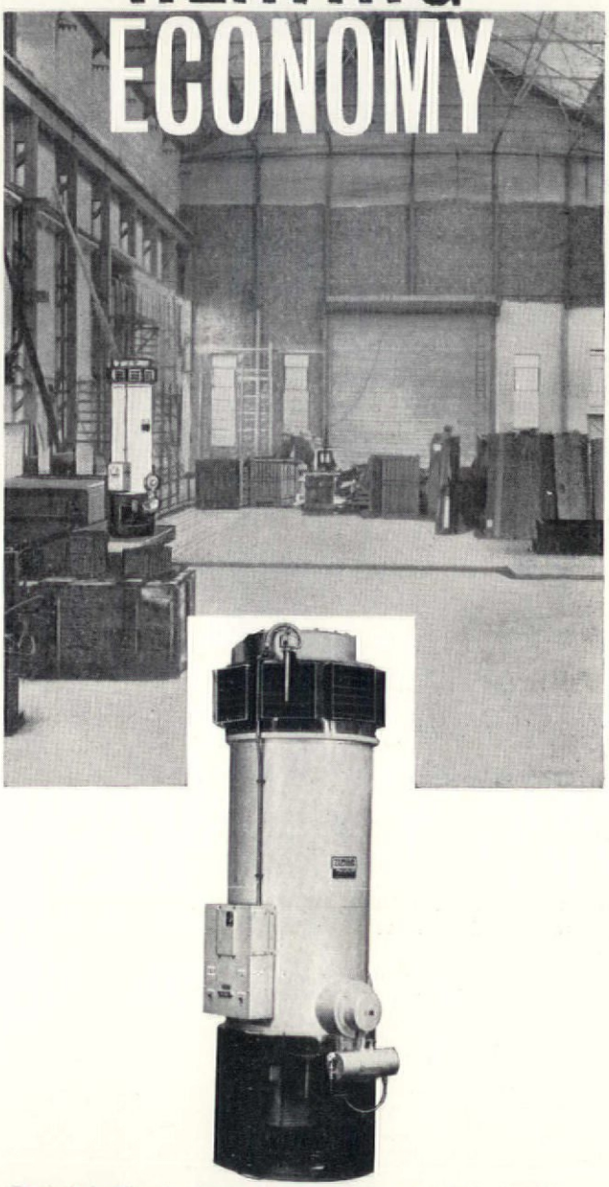

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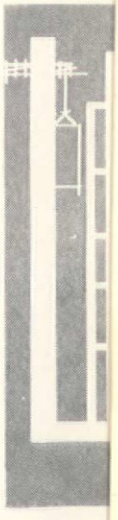

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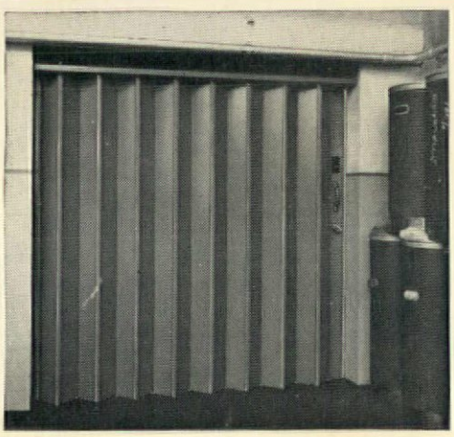

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