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WHAT TIMBER-FRAME HOUSING MEANS TO THE ARCHITECT

"Timber-frame dwellings offer a wide choice of plan forms...

...great flexibility of planning...ease of alteration for the changing requirements of occupants."

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Versatility. This is a key advantage of timber-frame housing for the architect. It not only cuts the national average building time by up to two-thirds but also saves on labour costs, and meets every need in design—from the conventional to the highly individual. It combines to the highest degree the standardisation provided by industrialised building with the wide degree of flexibility essential for the proper control of design. It gives the architect a wider range of design possibilities at a lower price range and permits any type of exterior cladding to be used.

Timber-frame housing cuts waiting lists

Speed of erection with timber-frame housing means shorter waiting lists, better quality at lower cost, and greater flexibility and finish in design. Capital is released faster for further developments. Lighter foundations permit the use of 'difficult' sites. It enables an authority to provide higher standards within a realistic budget.

How timber-frame housing fits into any landscape

Above: Part of a timber frame house estate at Wargrave, Berks. (John Mclean & Sons Ltd).

Below:

- 1 Three-bedroom timber-frame houses, brick and timber clad, for Cannock R.D.C., Staffs. (Mactrad).
- 2 Stone and cedar-clad timber-frame bungalow at Swansea. (Engineered Homes).
- 3 Timber-frame terraced houses at Eastbourne—brickbond tile hung. (Quikbild).
- **4** Block of 18 one-bedroom timber-frame flats, wood and asbestos clad, for Borough of West Bromwich. (Simms C.D.A.).

Write for your copy of 'Design for Progress with Timber-frame Housing' which describes the method's benefits in detail.

THE TIMBER TRADE FEDERATION OF THE UNITED KINGDOM CLAREVILLE HOUSE (DEPT AR7) WHITCOMB ST LONDON WC2 TRA 1891





TT198/1

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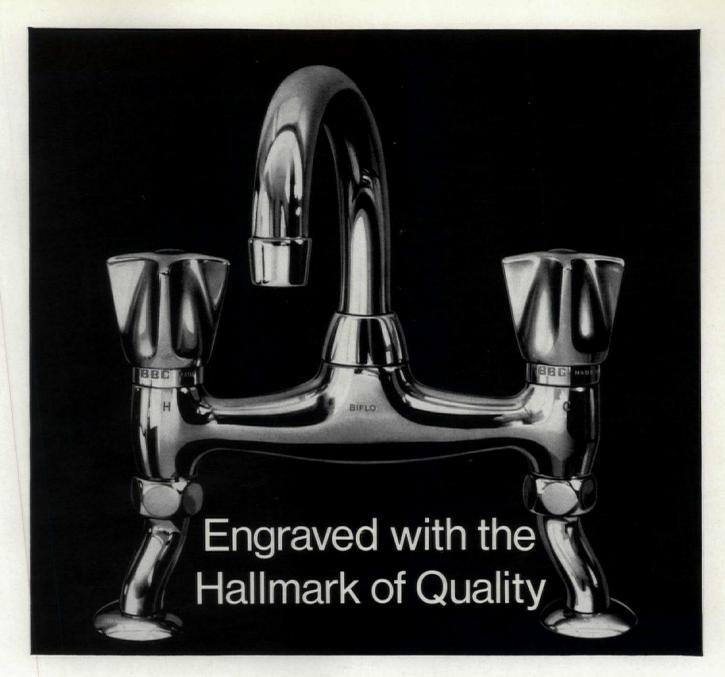
OXFORD

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



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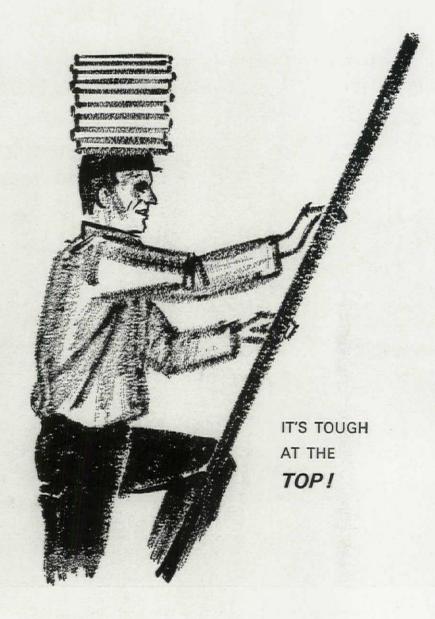
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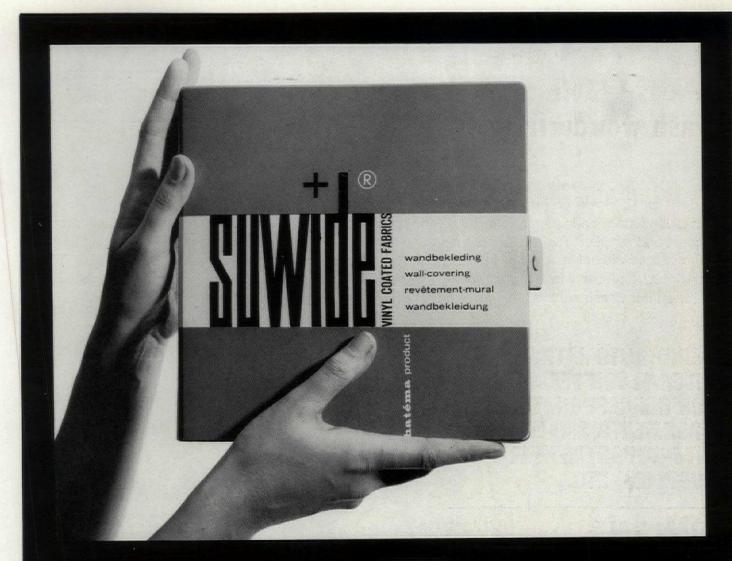


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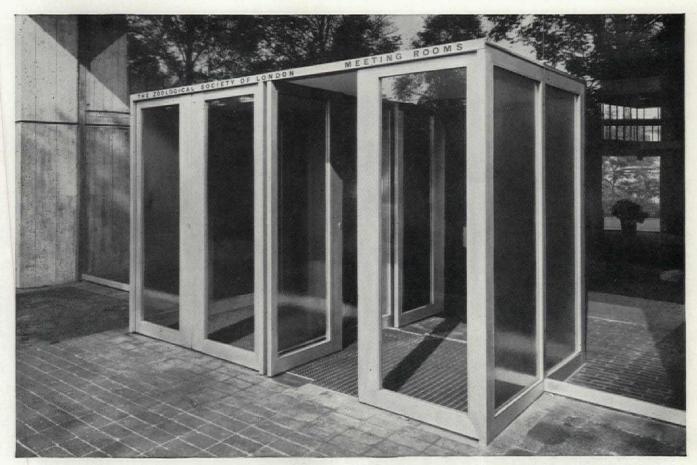
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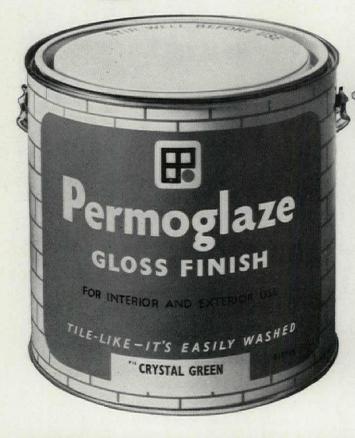
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station recently erected by a local authority as shown in this new steel-framed fire in plan and appearance are also possible, economy essential. Striking individuality when building needs are

> support cantilevered steel lattice trusses which columns outside the building's window walls 165 ft by 196 ft. Four compound steel closing structure which has a roof area Distinctive design New public swimming baths at Coventry. Steel provides the engive a distinctive butterfly profile to the roof.



of



Systems speed completion Flexible A75 and CLASP systems are typical of many using factory-made steel frame compobuilding of schools, universities, health, welfare, local authority and various nents for quick, light and dry industrialised government administrative buildings. clinics,



building products, provide practical answers to the call for more produc-

greater durability in service, and resources, together with economy, tive use of the nation's available labour

reduced maintenance requirements.

systems, new and ingenious factorysteel-based industrialised building structures. New forms of steel, modern

produced steel components and

exist for special-purpose buildings and

Steel is helping to meet the many

Modern forms of stee in Public Buildings

urgent national and social needs that

construction depths and their controlled deflection permits maximum use to improved allowable stresses obtainable by high-tensile steel. Economical wide spans with pre-stressed high-tensile steel beams Norwich City Hall Extension, 'Preflex' pre-stressed high-tensile steel beams heavy vehicle car park above. They enable large spans to be bridged with low span of 60 ft over garage space for Police and Health Department vehicles, be made of the s For the new permit a clear er-than-normal and support a

> to this old people's home. Laminated backings give a decorative, maintenance saving finish A bright home for the elderly Colourful vitreous enamelled steel sheet infill panels

and insulation can give U value specified

Matt surfaces eliminate glare,





needs. A library, meeting hall, child welfare clinic, youth people's club with dining facilities. work for this project to serve local community steel frame, were reasons for choosing steeltures that meet urgent social needs. Economy, speed of erection, suitability of a lightweight Multi-purposebuilding Steel provides strucclub, and maternity and

design choice for

prominent

must be elegant, surfaces in Stainless steel is a practical and economical

public buildings that

this, at Trafalgar Square Post Office, London.

denting, ease of maintenance, mean

long

economical service in applications

yet resist hard wear or corrosive conditions

Its high strength, resistance to abrasion and



tive plastic-coated steel sheet cladding panels give a pleasant 'boarded' effect on struction times and costs. and because it is speedily fixed cuts con-Formed from pre-finished steel sheet, panel-Maintenance-saving colour finish Attracthis new Hereford County Secondary School.



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2

n form and rapid construction Steelwork brings elegance to public projects

public building projects. The structural versatility of steel, its speed and convenience in erection, together with its practical and economical advantages for fast, dry, labour-saving construction, are speeding the completion of more and more public buildings to fit their surroundings perfectly, express Modern steel construction is giving an exciting new look to successful and imaginative public schemes. Steel construction design and elevational treatment. Structural steel thus permits Shown here are some of the many recent outstanding examples true individuality, and match local character and environment. freedom of achitectural of functional, aesthetically pleasing design in steel for national alone provides such adaptability, and local government projects.



buildings are needed quickly. This modern steel-framed addition to a Farm Institute designed for the Nottinghamshire County Council, has taken full advantage of the speed and economy of a steel-based industrialised building system. The system permits considerable individuality in plan and appearance, and excellent accommodation school and college is provided,

I time saved in major projects.

fast, labour saving construction for the GIRO Headquarters at Bootle—designed to house facilities for the new current account post-office banking scheme. This large scale project has been designed by the Ministry of Public Building and Works.

Industrialised building elements, steel framing and factory-made components will ensure

building with steel have a significant effect on actual costs and

Steelwork speeds the project A wider range of steel sections, improved erection and fabrication techniques, fast dry erection independent of weather—these advantages in

.........



National Service The Nenk method of industrialised building rationalises the construction process for a wide Rapidly erected steel-frame structures have space-frame' roof and floor decks formed of buildings for the Services. from easily handled and erected steel pyramidal units. Steel is also used for columns. and in staircases at Maidstone Barracks. Steel on range



Recent major GPO projects which have been strength and economy of steel construction, include the new West Central District office work met special requirements of the site, Steelwork chosen for GPO buildings designed to take full advantage of the speed, in High Holborn, London. The steel framewhich is directly above the Post Office

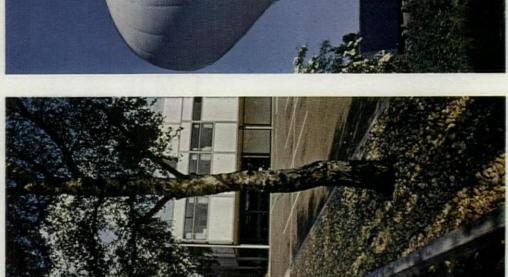


rosion-protected steel cladding and roofing products with permanent colour finish inasbestos coated cladding with applied Grimesthorpe, Sheffield, 360,000 sq ft of clude this attractive 'Cellactite' bitumen, largest and most modern freight terminal Colourful Steel Sheet cladding Corcolour finish, shown at steel sheet was employed. railway tunnel.

Rail's

British





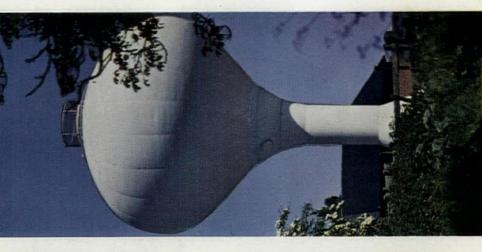
'Fair face' steelwork New Maternity and Out-patient's Dept.—first stage in develop-ment of Sevenoaks Hospital into a district posed, corrosion-protected steelwork enhancing its architectural appearance, it dating services. External load-bearing columns save internal space. Steel frame accommogeneral hospital. Steel framed, with exemploys castellated beams permits future extension.

airport New Luton Airport buildings employed the quick, economical SPACE-DECK system using light, easily transported

and erected bolted open-steel pyramid units. Large clear spans and wide column spacings now provide improved, econoincreased 'big-jet' passenger traffic which

is expected in future.

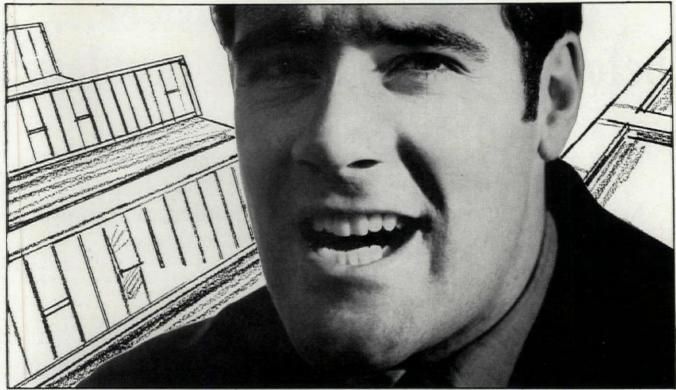
mical facilities for the efficient handling of



design—an aesthetically pleasing shape. This welded steel water storage tower is maintenance-free protection inside and out. one of a range which can now be speedily cities up to 2½ million gallons. Low in cost and upkeep. No seepage problems. Special erected on economical foundations. Capaliquid metal finish guarantees

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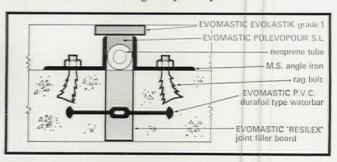
We showed him how, by evaluating the project as a whole, we could put up a complete scheme—a Sealing Systemtailored to the job and to the budget. There was no question of embarrassing 'extras' through bad planning.

Ted Hirst began to take real notice after the first project had gone through. He discovered good ideas and dedicated.

gone through. He discovered good ideas and dedicated personnel; with a breadth of experience and the intelligence to take a professional brief and come back with a rationalised scheme. By calling them in early he realised that these men could contribute their own know-how at the design stage and chop sealing costs before they developed. By selling him a unified Sealing System instead of individual mastics, Evomastics were able to deliver in step with his critical path planning and give him the extra margins as a result. And we didn't just dump the stuff on site and hope there was someone who knew how to apply it. We sent our demonstration team in on each job to watch our interests—and the client's.

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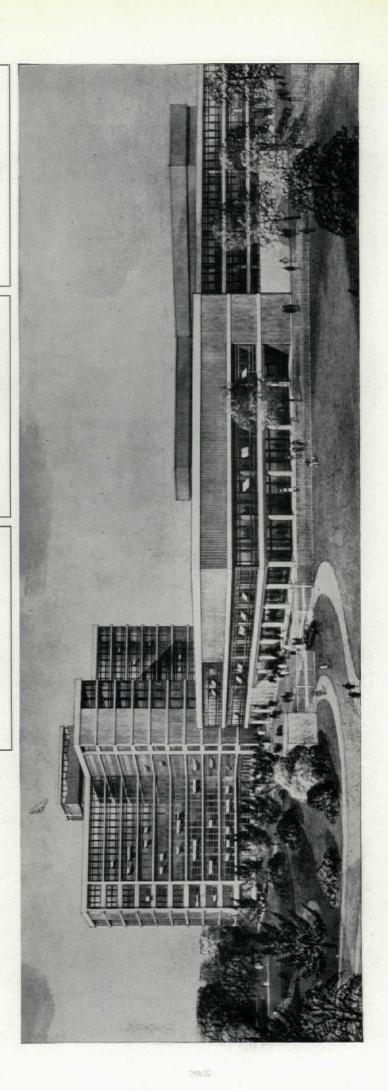
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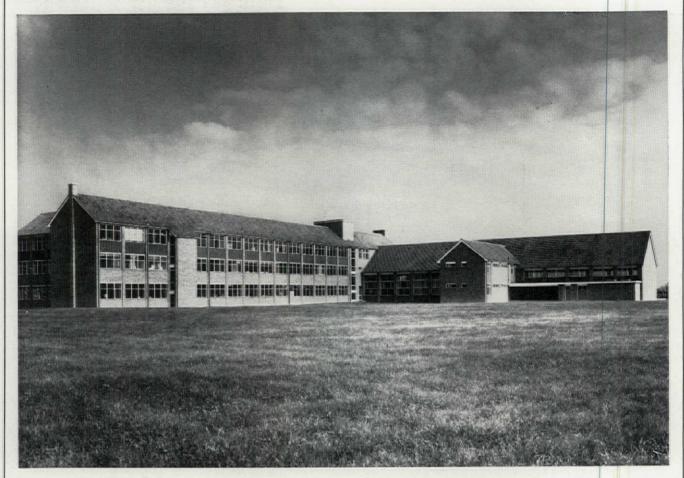
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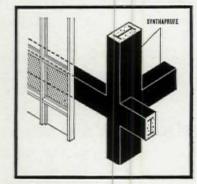
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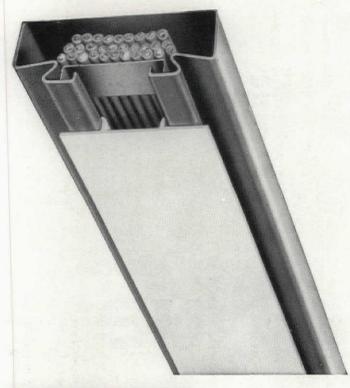
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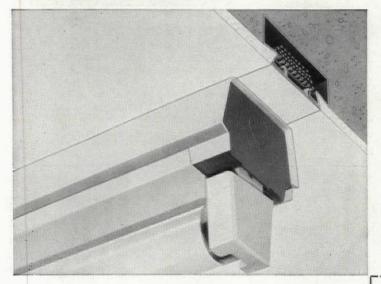


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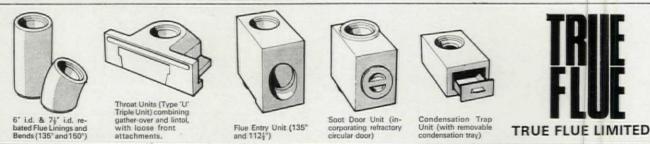
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* The Building Regulations 1965 No. 1373 Para L6(1)(a)(ii)
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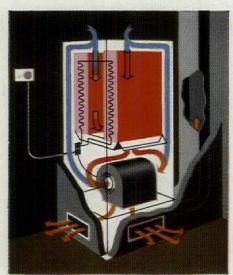
CRILAN

Acrilan are behind the nicest curtains.

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the warm-air central heating that runs on half-price electricity

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How does Electricaire work?

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7 reasons for choosing Electricaire

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ELECTRICAIRE

warm-air central heating on half-price electricity

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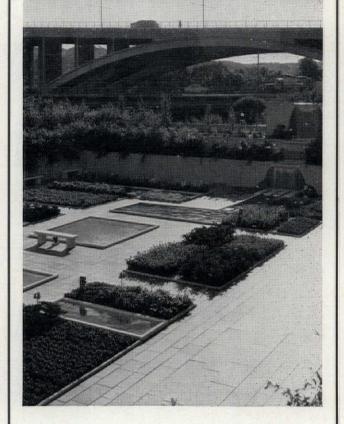


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He also discusses how the needs of whole regions must be considered when recreation areas are planned, and the requirements which park designers will have to meet in future. The park of tomorrow may assume forms as varied as the children's play space, the field for organised games, the green way threading through the town, or the nature reserve in distant coasts or mountains.

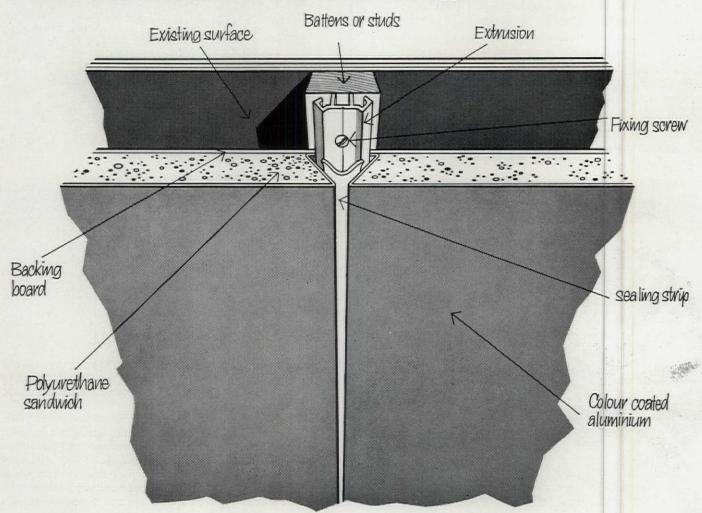
Size $10 \times 7\frac{1}{2}$ ins. 388 pages, including 180 pages of illustrations price 70s. net postage 4s. 6d.

The Architectural Press 9 Queen Anne's Gate, S.W.1

4

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New Insural cladding



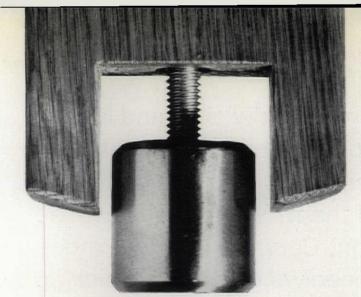
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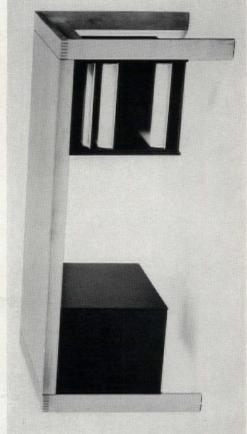
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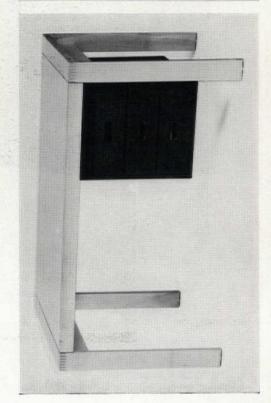
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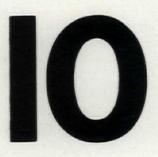
Designed by Martin Grierson MSIA FRSA desk 24 U/203 in beech Left: single pedestal are available in the Nexus 24U range





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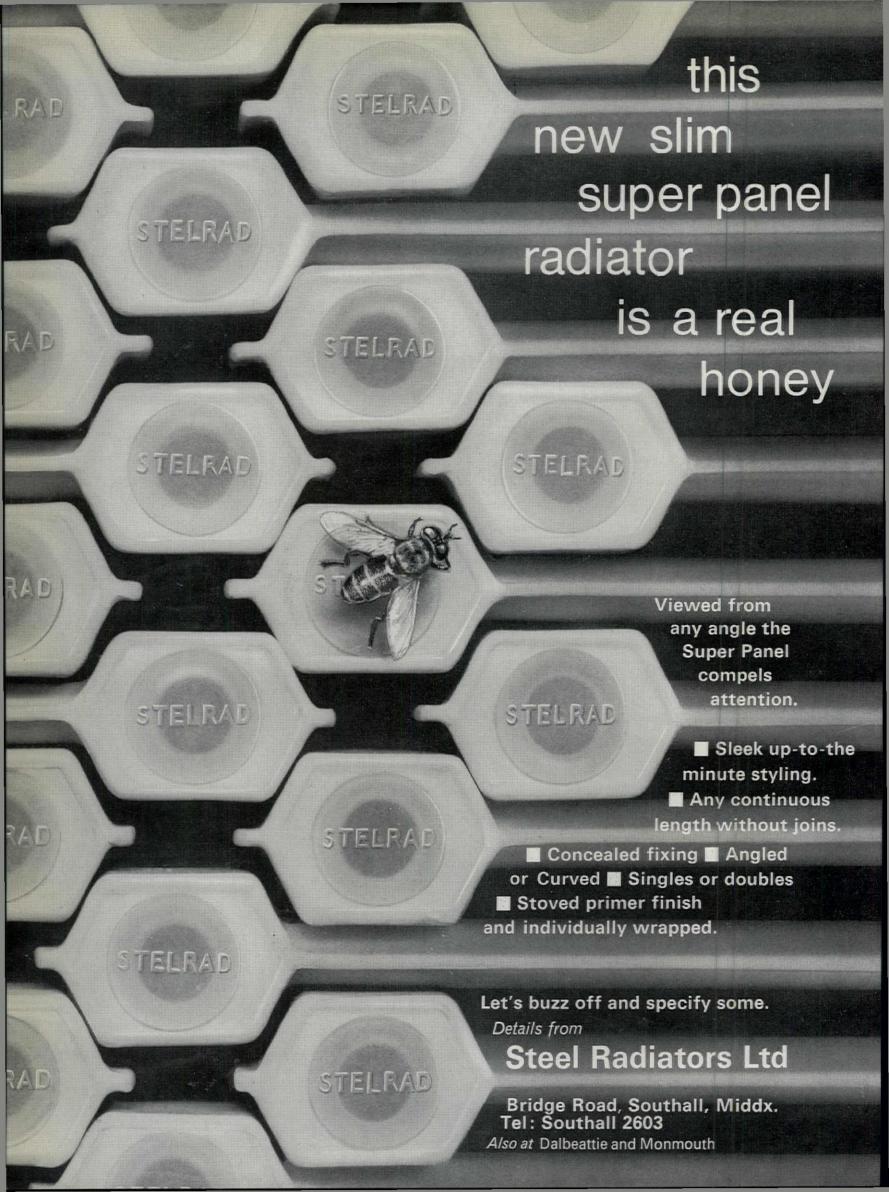
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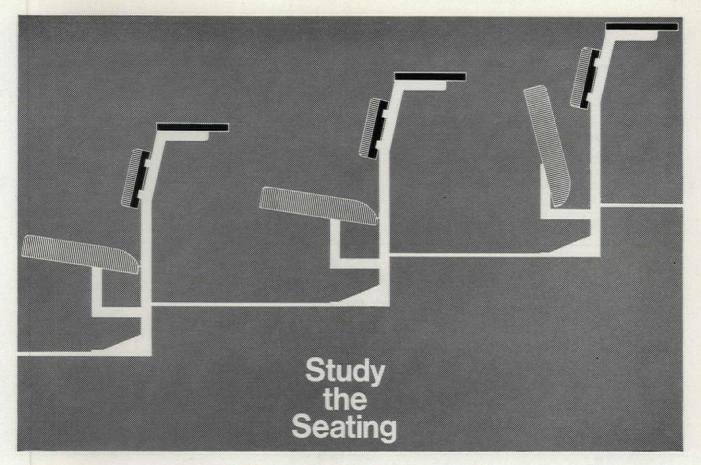


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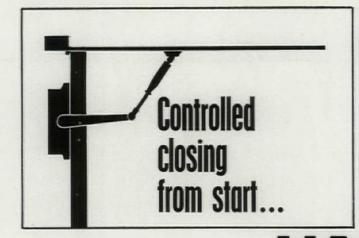
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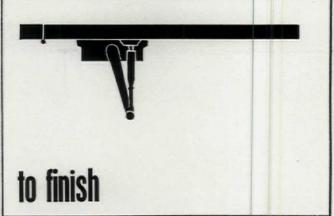
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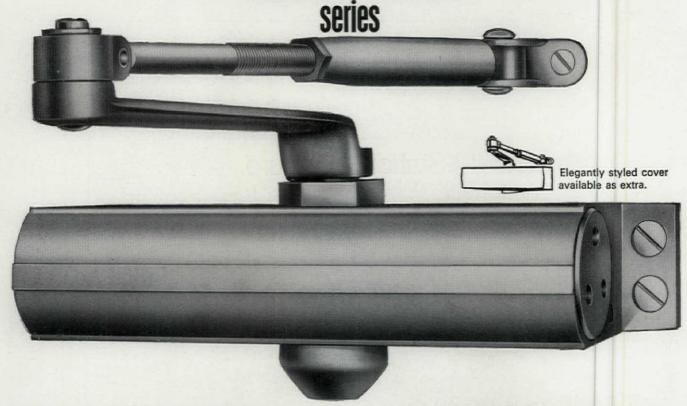








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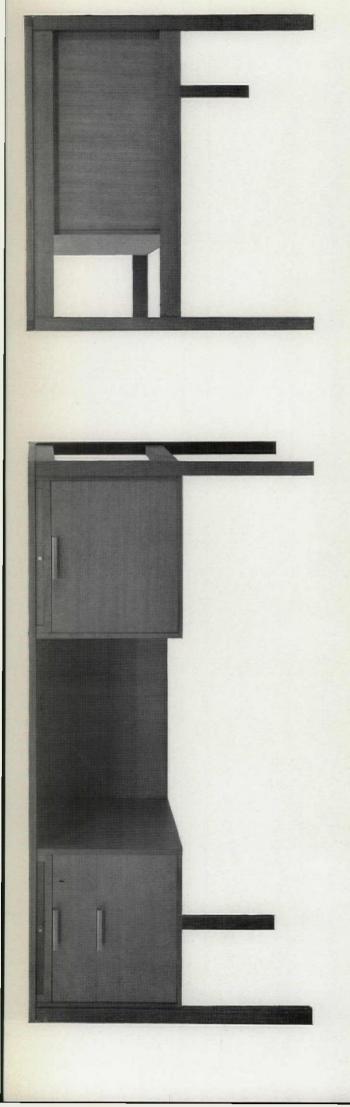
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to Lucas Furniture, Old Ford, London E3, Advance 3232. Barbour Index File No. SfB 82 single pedestal desks, tables and storage. Lucas provide furniture for all contract needs. Four ranges of desks, tables, storage, plan chests, beds and a wide range of chairs. On show in The Design Centre, London, and in our showrooms. Write or telephone for details it easily demountable for access where space is limited. The Range includes double and it is available in mahogany or oak at £35 12s including tax. The construction used makes



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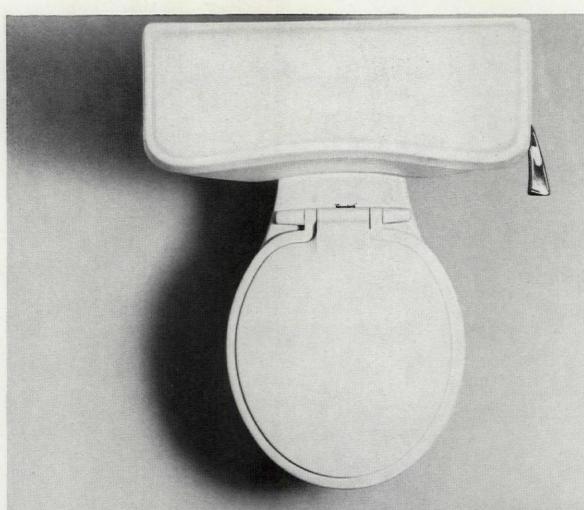
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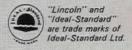


Even to the trained eye, this "Lincoln" closet probably looks much like any other closet

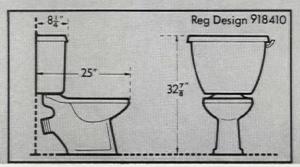
The big difference: its small size. It's made-to-measure by "Ideal-Standard" for small modern homes!

Nothing cramped about the way the "Lincoln" closet looks. Yet it projects only 25" out from the wall. That's 3" less than ordinary closets, a factor that can make all the difference in a small modern bathroom. Another feature that's right up to date—the "Lincoln" is available with either wash-down or double trap siphonic bowl. And, of course, it comes

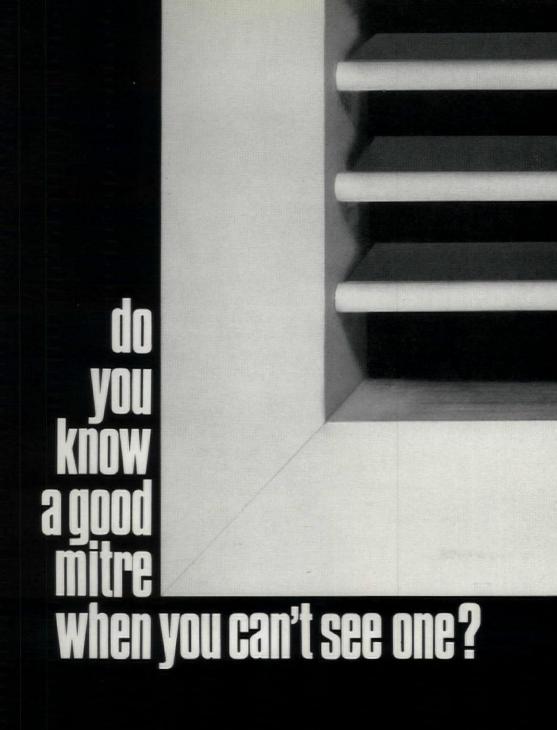
in "Ideal-Standard's" 8 fashionable colours or white. "Lincoln" by "Ideal-Standard": designed for spacious modern living—send for full specification today to:







561



hat's a good mitre you can't see there at the corner of our grille! But the amera does lie a little—with good eyesight and a strong light it *is* possible to se the mitres on our extruded aluminium grilles. Enough to prove that good raftsmanship has been at work. Fine finish in every detail like this is just one spect of the aesthetic quality and high technical performance that charac-

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The brewery has gone. That seems a shame. Half the town square has been rebuilt. But it's on the outskirts that you really notice the difference.

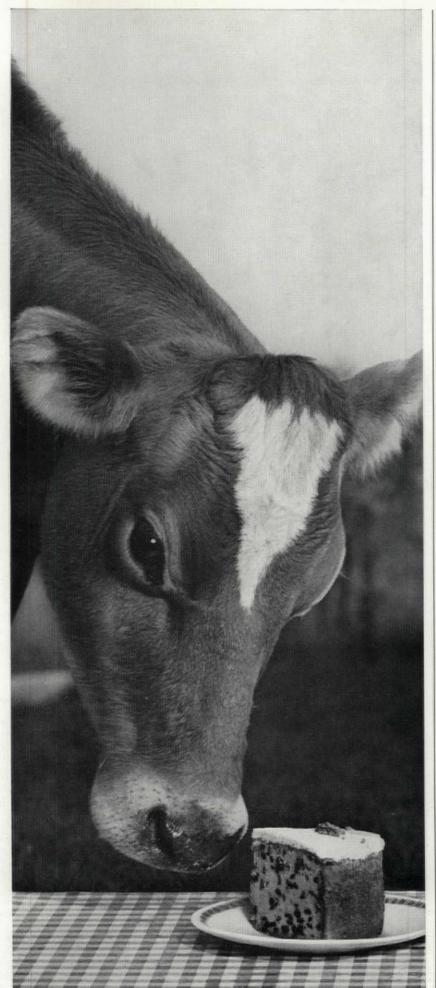
New factories by the acre. With new houses for the people who are manning them. Shell-Mex and B.P. knew all about this expansion years ago. And laid plans accordingly. So that now, when the new factory managers want fuel oils or liquefied petroleum gases or a special grade of lubricant, they are never disappointed or delayed. All over the country, Shell-Mex

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Shell-Mex and B.P. Ltd distribute the petroleum products of both BP and Shell in the United Kingdom – and have a happy knack of turning up with them exactly when and where their customers want them.

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Engineer: Mr. M. Hurn, B.Sc.(Eng.), C.Eng.

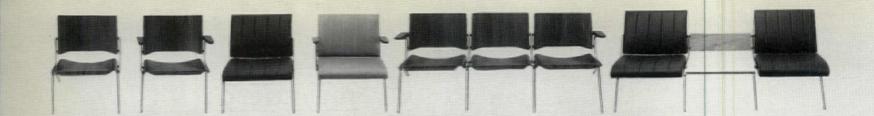
Architects: Gelder & Kitchen, Hull

TEAM SYSTEM PLUS TEAM SPIRIT

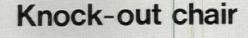
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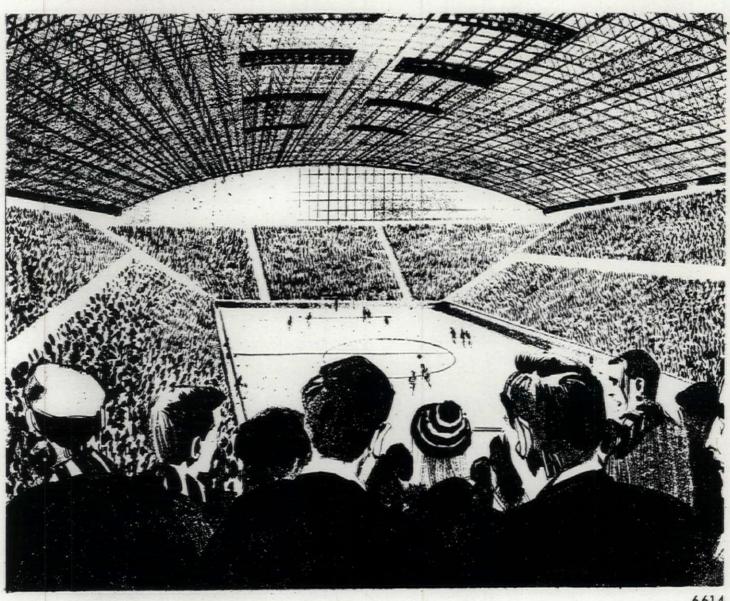
SHS are Structural Hollow Sections made by Stewarts and Lloyds. Square, circular or rectangular they combine high strength with light weight.

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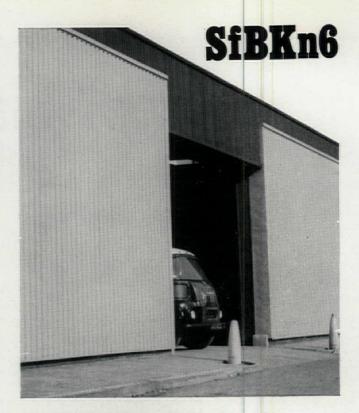
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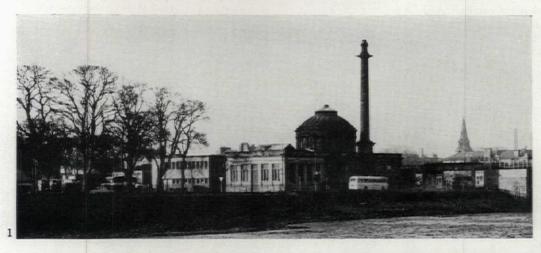
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architectural quality of the chapel. Because of this latter factor it was decided that the resulting unit or units should be free standing in order to minimize any visual interruption, and vertical and linear in emphasis, when practical, to ensure some pattern linkage with the existing chapel detail. The light quality

of the chapel is basically dark in tone and a further attempt to harmonize the resulting design with the environment was envisaged by toning down to a maximum the colour of the general structure, allowing the selling areas only to become the points of illumination and interest.'



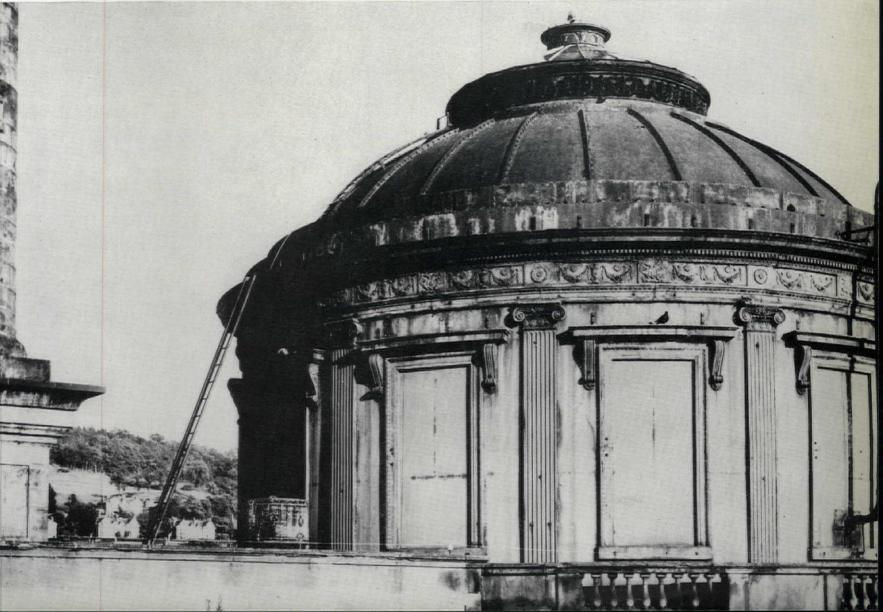
SOS FROM PERTH

At the close of the eighteenth century Perth | became a miniature capital for the county gentlemen and the newly-rich textile mag-

nates. Under the régime of Provost T. H. Marshall a great programme of town improvement was undertaken: long terraces fronting

the Inches and a handsome new Academy were built to designs by Robert Reid. When it came to public utilities such as the water works, 1 and 2, the city turned for designs to the rector of that institution, Dr. Adam Anderson (1783–1847).

His distinguished building was illustrated in the AR in April, 1957. Now the whole water works are redundant and Anderson's appropriately school-boy Latin inscription AQUAM IGNE ET AQUA HAURIO has been transferred to the new pumping station. The appropriate committee has recommended the building's demolition as useless. There is no comparable structure in the United Kingdom. It might have been compared with Latrobe's Philadelphia pumping station had that still existed. A small industrial museum has been suggested but there are other functions it could fulfil if converted. But so far Perth's attitude has been that since it is of national importance, the nation should pay for it. It is time responsibility was sorted out.



2

Grass

Grass has always been an important architectural surface in this country; and it takes up an increasingly large proportion of the total visual field in which buildings are set. Obtaining a good grass surface requires about as much expertise as it takes to obtain a good finish to concrete. Shirley Andrew describes the various techniques of grassing and of preparing surfaces to receive it.

When an area of land is to be covered with grass it can be done one of three ways: by turfing, by conventional grass seeding or by hydraulic seeding. The choice depends on site conditions, season of the year, budget, the amount the owner is prepared to spend on maintenance and the function of the grassed area.

TURFING

Turfing is the most expensive and is consequently normally used only on small areas. It is the quickest way to make a lawn and the lawn can be used within days. It can be laid at any time of year provided there is no frost (although autumn and early winter are safest) but should not be laid during May to August unless plenty of water as available and a suitable means of sprinkling it

liberally on the surface. The finest turf (e.g. Cumberland sea-washed) grows on salt flats where only fine grasses adapt themselves to the periodic tidal floodings. These are very expensive and suitable for the finest work such as bowling greens where very smooth surfaces are necessary. Sea-washed turf should only be used where it will be under the continuous supervision of a skilled groundsman, because its fine-ness can easily be lost if it is not given correct maintenance. Turf rarely the result of growing specially for the purpose, but is simply cut from well established grassland that has been first treated with weed-

killers and close mown.

The most suitable turf for general use comes from old parklands on great estates, from the South Downs and from parts of the Northern moors. Next best are old pasture lands undisturbed for perhaps 50 years or more, which have developed a strong fibrous root structure. This makes the turf easy to handle and lay. If turf is available on the site, either over the area of a building or an area to be paved, it should be left in position for as long as possible and when required should be expertly cut by skilled labour supplied by the landscape contractor. This can be done by hand or, ten times faster, by a machine such as the American Ryan Turf Cutter, 2. As turf de-teriorates rapidly when stacked it is often not possible to recover it for reuse on a building site.

Turves should be rectangular in shape with straight sides and of uniform thickness, 1. If the sides are not straight the resultant gaps when filled up will encourage weed growth. Variable thickness requires extra labour to lay a smooth lawn by packing up with topsoil. Sea-washed turf is usually 1 in. thick, and other turf should preferably be $1\frac{1}{2}$ in. to 2 in. thick, of which at least 1 in.

is soil.

BS 3969:1965; Recommendations for Turf for General Landscape Purposes is a very brief document which sets out 'to provide a simple description of turf which will help to reduce the risk of misunderstandings when it is bought and sold.' A list is included of desirable grasses and of undesirable grasses and weeds. Annual weeds die out of a cared-for lawn by not being permitted to seed, and many other lawn weeds are readily dealt with by modern weed killers. Some however are very difficult and expensive to eradicate.

Most plants listed in this British

Standard are illustrated in two useful booklets available from Suttons Grass Advisory Service, Reading, at 3s. 6d. each, post free. Turf Weeds,

Identification and Control shows line drawings of weeds in plan and as they appear when they have adapted themselves to life in a mown lawn. Each is classified under one of five headings ranging from 'good control' to 'resistant' and recommendations are made for eradication. The Identification of Grasses by the Foliage illustrates in a more conventional way most of the grasses mentioned in the British Standard on turf.

Site preparation

Whether turfing or grass seeding is used the preparation required for the ground will be the same, the aim being to provide a surface with a fine tilth which will encourage the grass roots to form a dense mat. The whole area must be well drained, as the better the drainage the finer the lawn that can be grown and the less often it will become too wet for use. Site layout must be determined by taking into account a reasonable system of maintenance, e.g. access will be required for machinery (for cutting, fertilizing, spiked rolling) of a size appropriate to the area. If large machinery is to be economically used it is better not to have too many sharp curves (a curved appearance can be achieved with much flatter curves on plan than might be thought necessary, due to the effect of foreshortening) or inclines (not exceeding 30 deg.) or obstructions which require trimmed around by hand. Upstands by paths are an obstruction, whereas a flat stone surround to a planted area enables a tractordrawn machine to cut the grass right to the edge.

Land shaping

When the land requires shaping either for decorative purposes or to provide a flat playing surface (minimum slope 1 in 150. for surface run-off, maximum permissible for playing fields 1 in 50) any or all of three degrees of grading may be required. Minor grading means the removal of local mounds and depressions. This is done either by (a) blade grading in which the surface is smoothed by pulling and pushing a rigid bar (the blade) across it or (b) if less than 4 in of tonsoil would a flat playing surface (minimum slope (b) if less than 4 in. of topsoil would remain after this operation then local grading of the subsoil should be carried out. This means stripping the topsoil locally, adjusting subsoil levels and replacing topsoil, 3.

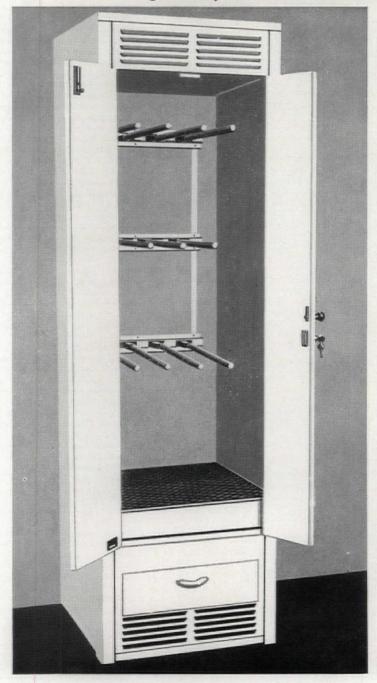
(c) When considerable changes in level are required then the grading becomes major and the whole site or area involved must be stripped of topsoil, the subsoil levels adjusted and topsoil respread, 4. Obviously it is more economical to balance the amounts of cut and fill rather than to have to bring in extra or to cart away spoil from digging out for foundations and basements. It always seems to require more to fill up a hole than is taken out of it. Fill should be laid in well compacted layers and given ample time to settle before finalizing levels. In the case of heavy clay subsoils this period of settlement should ideally extend over the winter months. Natural underground drainage can easily be interrupted by the alteration in subsoil levels and a system of land drainage may then be required.

Rainwater will not drain away quickly, even if the topsoil is quite permeable, unless the natural drainage rate is fast enough to prevent the natural water-table rising into the topsoil layer. On fairly flat sites the

[continued on page 236

A built-in drying area that takes a whole family wash in less than four square feet

Specify the Flavel Multiplex clothes drying cabinet (GAS, ELECTRIC OR WARM AIR)



Compact—that's the Flavel Multiplex drying cabinet. In less than 4 square feet of floor space it will take a whole family wash. Standing 78" high, $23\frac{5}{8}$ " wide, with 24" overall depth, the Multiplex takes 16 lbs. of damp washing—and dries it ready for ironing in less than $2\frac{1}{2}$ hours, using gas, electricity or warm air.

Easily Installed. With the use of breeze blocks or sheet metal sides, the double-doored front assembly can be built into a corner, on to a plain wall, or in a series for laundry rooms. Eleven hanging rails are provided at three different levels and can be supported either from side to side or from the back wall. A top-plate is available, but when this is not required, panels can be supplied to extend the cabinet to ceiling height.

Gas and electric models have a clothes guard fitted above the burner box—a removable front panel is provided for easy access to the controls. Top and bottom louvred panels provide sufficient ventilation for well aerated rooms, but where aeration is poor, extension flueing is necessary; this is catered for by a sheet metal top with a $4\frac{1}{2}$ " flue spigot. The warm air model is fitted with a 12" x 8" adjustable ventilator inside the cabinet; as an optional extra, a similar ventilator can be fitted to the plain bottom front panel for room heating. The Multiplex is delivered in prime coat finish.

The model illustrated is for communal use and is fitted with a lock and key as an optional extra.

FLAVEL MULTIPLEX

For further details please complete this space now.

	l & Co. Ltd., Leamington Spa.
	ington Spa 27027. Telex: 31558
Please send me ful	
Flavel Multiplex	Clothes Drying Cabinet.
NAME	
ADDRESS	
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	AR 3/6

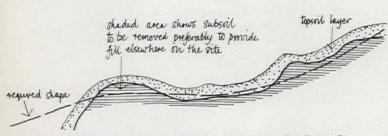
skill



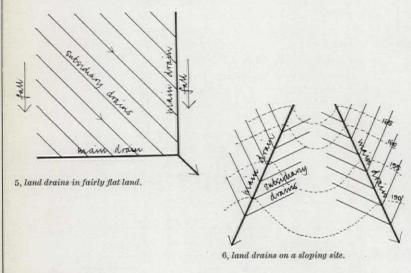
2, the Ryan Turf Lifter can cut turves ten times faster than the most skilled hand.

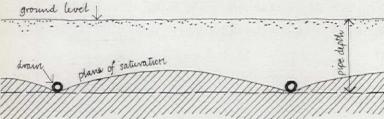


3, minor grading to smooth out high points and depressions.



4, major grading, which involves adjusting the subsoil levels and respreading the topsoil.





7, the more permeable the soil the flatter will be the plane of saturation.

continued from page 234]

natural drainage is rarely good enough for any area of grass which is to be walked or played on, and again a system of land drainage is required.

Land drainage

Land drains are usually constructed of unglazed agricultural pipes (sometimes called 'tile' drainage) butted together with pieces of broken pipe or straw laid above each joint and the trench filled to a depth of 6 in. above the pipe with a porous material such as well burnt clinker ash without too much fine material, gravel rejects or clean hard-core. The pipe lines should preferably cut across the line of natural flow of the drainage so that water is being picked up all the way along, 5, 6. If the pipe lines follow the direction of natural flow then water will tend to flow between the pipelines as well as along them. Subsidiary drains should not be less than 3 in. diameter and a 3 in. pipeline should not exceed 300 ft. before discharging into a main drain. If it is difficult to avoid exceeding this length then the lower part of the run should be increased to 4 in. diameter. In heavy clay soils branch drains should be 10 ft. to 15 ft. apart, laid about 18 in. deep. Because of the lesser curve of saturation, 7, drains can be more widely spaced in very light loamy soils and by increasing the depth to 24 in. the spacing can be increased to as much as 30 to 40 ft. Main drains should not be less than 4 in. diameter and laid about 6 in. lower than the subsidiary drains. As a rough guide, assuming a fall of 1:200, a 4 in. diameter main will drain up to 6 acres, a 6 in. main will drain up to 15 to 20 acres and above this a 9 in. main will be required.

Drains should be laid to uniform falls of not less than 1:250 and not more than 1:75. If falls are not uniform or sharp bends occur the flow will be uneven, causing solid matter to be deposited which may result in blockages. Silt pits should be incorporated on mains wherever there is a change in direction or a junction with another main. An inspection chamber should be provided at changes of direction and approximately every 300 ft. along the main. Where a pipe-line passes near to a tree it should be encased in concrete for that portion of its run.

Porous layer drainage

Where the natural drainage of the land is very poor it is possible to drain by providing a porous layer of material, as for fill over agricultural pipes, between the subsoil and the topsoil layer. This porous layer is itself drained by a pipe system. This method is very expensive and normally used only for special areas such as bowling greens, cricket tables and tennis courts. Suitable specifications for these special playing field areas are given in Sports Ground Construction—Specifications for Playing Facilities prepared jointly by The National Playing Fields Association and The Sports Turf Research Institute.

After completion of drainage work it is important to bring the original drawings up to date so that a complete and accurate record is available for future use.

Topsoil

For grass areas there should be a minimum of 4 in. of topsoil. Topsoil should be stripped from any areas to be built over and re-used on planted areas of the site. Topsoil stacked in heaps loses fertility and should therefore be stacked for as brief a time as possible, and in heaps as low as possible but preferably not more than 5 ft. high. If topsoil has to be imported to the site it should be specified to be in accordance with British Standard 3882:1965: Recommendations and Classifications for Topsoil, which describes some of the requirements for topsoil for general landscape work. It also classifies soil according to texture, reaction and stone content which it may sometimes be necessary to specify precisely, particularly when the topsoil is to be used for a special purpose.

Fertilizers

The exact requirements, if any, for lime and fertilizers depends on the chemical composition of the resultant topsoil and this can only be esta-blished by chemical analysis. For a laboratory analysis a sample of not less than one pound weight should be taken once the topsoil is in its final position. The sample should be made as representative as possible by taking samples from a number of points and mixing them. The information required from the tests is the pH value, the lime requirement and the composition of a complete fer-tilizer that will supply the required amounts of nitrogen, potash and phosphate. Chemical analyses should be obtained periodically at intervals of perhaps three years as the soil will gradually be altered by the vegetation and fertilization it receives. A rough estimate of the pH value of the soil can easily be made on the site.* A sample of soil is put in a jam jar, water added and shaken. Indicator papers, available from agricultural suppliers and some chemists, can then be put into this solution and, according to the colour change of the paper, the pH value can be determined as follows:

Red	riema neid	- II + 0 loss
	very acid	pH 4.0 or less
Orange	moderately acid	pH 4.5 to 5.5
Yellow	slightly acid	pH 6.0 to 6.5
Green	neutral	pH 7.0
Blue	alkaline	pH 7.5 to 8.0

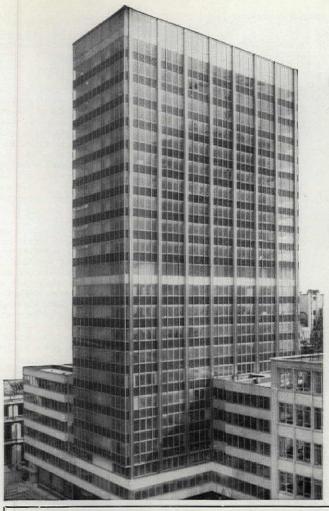
Lime, mostly in the form of ground limestone (calcium carbonate), is usually only recommended for acid soil of pH below 5.5. The fine lawn grasses appear to be very suited to soils with a value of pH 5.5 to pH 6.5, whereas some of the lawn weeds such as dandelions and daisies prefer more neutral conditions. The chemicals usually required for grass growing are nitrogen, phosphate and, on sandy soils, potash. Quantities are generally given as ounces per sq. yd. or cwts. per acre as appropriate, 2 oz./sq. yd. being approximately equal to 5 cwt. per acre.

Cultivation

Cultivation of the soil by some form of digging is carried out in order to produce a fine tilth which will help the growth of the grass and assist drainage. The ground should be ploughed to a depth of 6 in. or the depth of the topsoil whichever is least. Ploughing will dig in any existing grass or weeds. This cultivation should be carried out in the autumn

[continued on page 238

^{*} pH value or hydrogen-ion concentration of a solution of soil and water is a measure of the acidity or alkalinity of the soil. The pH scale runs from 0 to 14 with 7 as the neutral point. Values below 7 are acidic, those above alkaline. The majority of soils in this country are in the range pH 4 to pH 8.



'M'-section column covers on Winchester House -in 'Silver Fox' stainless steel

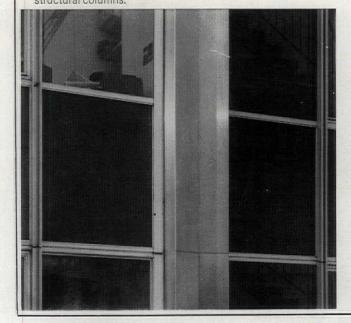
The latest application for "Silver Fox" stainless steel can be seen on the recently completed Winchester House in the City of London, where it is used to clad the eight 20-storey high, two feet wide, structural columns on each of the main elevations above the podium.

"Silver Fox" stainless steel enhances the aesthetic feeling of the building and provides the architect with a material of strength and durability, with minimum maintenance—a quick wash down will bring it up like new.

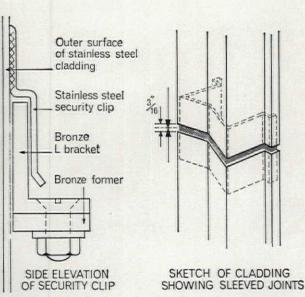
Winchester House, Londan. Owners: St. Martins Property Corporation Ltd. Architects: Gunton & Gunton. Contractors: Trollope & Colls Ltd. Stainless Steel fabrication: Culford Art Metal Ltd.

Manufactured as an inverted "M" section in 11' 8" storeyheight lengths from a single 14G sheet, the dull-polished stainless steel covers produce differences in light reflection to provide a clean and slender appearance to the heavy structural columns.

oolished spot w reflection bolted heavy



The stainless steel covers are secured by connecting cleats, spot welded to bronze angles and tees, which are in turn bolted to the concrete columns.



If you would like to know more about "Silver Fox" stainless steel in action write for our recently published book, "Stainless Steel in Architectural Design."

Samuel fox Ecompany limited

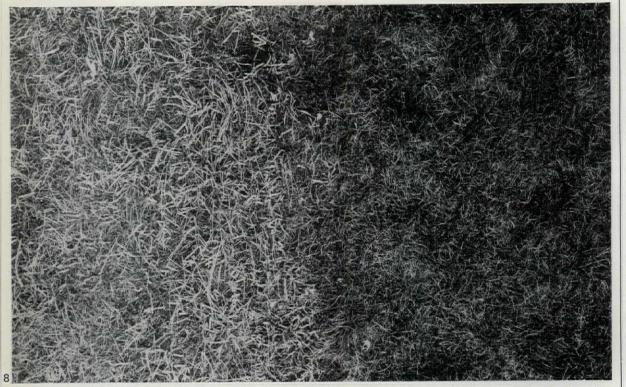
STOCKSBRIDGE · SHEFFIELD

The makers of "Silver Fox" stainless steel
A subsidiary of The united steel Companies Ltd





F552



8, turf made from Chewings' fescue (right) and 90 per cent Chewings' fescue and 10 per cent perennial rye grass (left). Even this small proportion of rye grass completely alters the character of the turf. 9, hydraulic seeding being carried out on a difficult site.

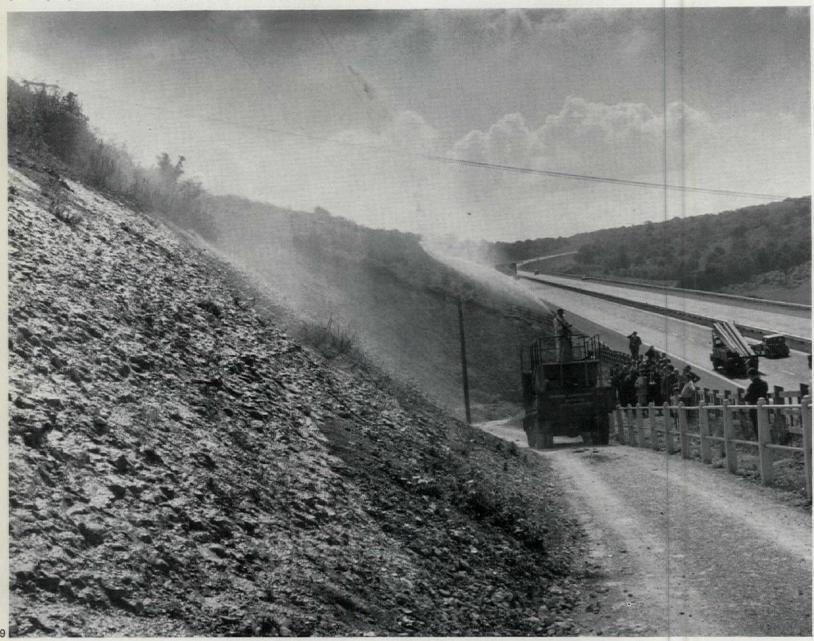
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and left over winter to allow time for the vegetable matter to rot down and

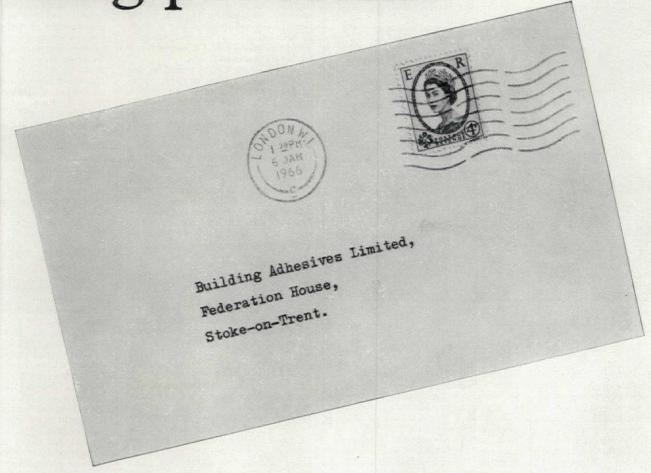
the vegetable matter to rot down and for the frost to break down the soil, especially useful with heavy clay soils. Once the site is sufficiently dry to be walked on in the spring, it can be surface-cultivated over the top 2 in. and any soil ameliorants (conditioners) added at this stage. Chemical additions have been discussed under fertilizers, but it is sometimes possible to improve the physical condition of the soil as well. Very heavy soils can be improved in texture by the addition of sharp, gritty sand, processed sewage and/or granulated peat. The quantities will depend on the nature of the soil but granulated peat. The quantities will depend on the nature of the soil but should be within the range: sand, 50 to 100 tons per acre; sewage, 5 to 10 tons per acre; peat, 2 to 4 tons per acre. Light soils are improved by growing a green crop such as lupins and ploughing it in if time permits, or else (or as well) by introducing peat and processed sewage at the above rates. If time permits the soil should be allowed to lie fallow through a summer and weeds which develop treated by cultivation or chemicals. chemicals.

If major grading operations have been carried out it will probably be necessary to cultivate the surface of

[continued on page 240



How hundreds of architects and builders solve difficult ceramic tiling problems



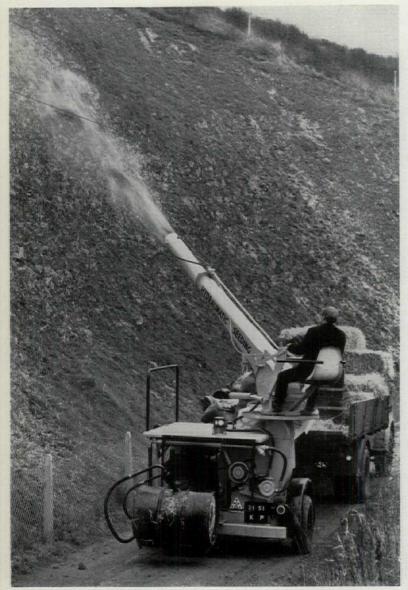
And they only need five minutes to do it! That's all the time it takes to dictate a letter to Building Adhesives explaining the problem. No ceramic tile fixing problem is too simple or too complicated for Building Adhesives' Technical Advisory Service. If it is impossible to fix ceramic tiles in a particular situation—though this is a very rare occurrence these days—Building Adhesives will tell you so. In 1965 Building

Adhesives' Technical Advisory Service answered several thousand enquiries on tile fixing from architects, surveyors, tile fixers and many others. Where necessary Building Adhesives sent one of their men personally to the site to investigate. The result? Lots of satisfied clients, lots of successful tiling.

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permanently. There need never be a failure. So before another tile is fixed take Building Adhesives' free advice; and dictate that letter to them now!

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10, a straw mulch being applied to a very steep site.

continued from page 238]

the subsoil to a depth of 12 in. with a deep rooter before replacing the topsoil. In particularly heavy soils the addition of some clinker or gravel would help the texture. If the surface of the subsoil is very compacted due to repeated cultivations having taken place to the same depth, or after the operation of replacing the topsoil after major grading, the subsoil must be cultivated. This can be done with a subsoil plough or a mole-plough fitted with a sub-soiling attachment. It must be capable of breaking up the subsoil without mixing it with the topsoil.

CONVENTIONAL GRASS SEEDING

Grass seed is normally used as a mixture of two or more varieties. This is because each has different characteristics and a mixture well chosen for particular circumstances provide a number of desirable qualities.

The finest groups of grasses are the bents and fescues. The fescues are very suitable when soil and drainage conditions are good. In poor soils and shady conditions some bents and some meadow grasses should be included. Bent will stand very hard wear. Crested dogstail is coarser but is used in mixtures on poor soil and where the grass will receive hard

wear. If the chief considerations are rapid development and durability, perennial ryegrass should form part of the mixture. Perennial ryegrass and crested dogstail are used in playing-field mixtures. They are deep rooting and very resistant to wear, 8. The seed should be of certified germination of not less than 80 per cent and a certified purity of not less than 90 per cent. Rates of sowing for fine bent and fescue mixtures for fine lawns, tennis courts, first class hockey fields and cricket tables should be sown at the rate of 1 oz. per sq.yd. (300 lb. per acre) and ryegrass mixtures suitable for playing fields at the the rate of 11 cwt. per acre.

Seed mixtures

Sports Ground Construction, Specifications for Playing Facilities gives the following mixtures for guidance and goes on to list some alternatives taking into account cost and availability of supplies:

(a) Fine turf for tennis courts, cricket pitches, bowling greens, putting greens, croquet lawns, first-class hockey:

84 lb. Chewings' fescue 28 lb. browntop bent

112 lb.

(b) Medium mixtures for tennis courts and hockey pitches: 28 lb. New Zealand crested dogstail

28 lb. Oregon Chewings' fescue 28 lb. S.59 certified creeping red

14 lb. Dutch rough stalked meadowgrass

14 lb. Oregon browntop bent

112 lb.

(c) General purpose (soccer and rugger pitches, etc.):
42 lb. S.23 certified perennial rye

grass 14 lb. New Zealand crested dogstail

7 lb. Dutch rough stalked meadowgrass

21 lb. Oregon Chewings' fescue 21 lb. S.59 certified creeping red fescue

7 lb. Oregon browntop bent

112 lb.

Commercial seed suppliers market mixtures suitable for various conditions of soil and locality. The content is often satisfactory enough for one's requirements to make it unnecessary to specify a mix in detail.

A sample of seed can be sent to the Official Seed Testing Station, Cambridge, for a test of purity and a germination report. The sample should be at least 4 oz. and made up of a mixture of a sample taken from

each bag. Sowing should be done during calm weather and on to a dry seedbed normally during spring or early autumn. Sowing should be by hand or broadcast machine in two applications at right angles to each other. After sowing the area should be lightly raked or harrowed but the seed should not be covered to more than $\frac{1}{4}$ in. deep.

After care

Large stones should be removed from the surface. When the seedlings are 2 in. to 3 in. high and when the surface is dry the surface should be lightly rolled. About 48 hours later it should be mown with a rotary mower or roto-scythe removing only 1 in. of grass.

HYDRAULIC SEEDING

This is a method introduced to this country about three years ago from North America. It enables grass to be sown on difficult sites with little or no topsoil, without preparation, very quickly and cheaply, 9. A slurry containing soluble fertilizer, seed, water and a bonding mulch (e.g., wood cellulose fibre) is sprayed on to this surface. The necessary equip-ment is carried on a 6-7-ton platform truck, railway waggon or on a barge. On inaccessible sites it is possible to pump slurry to a distance of 800 ft. from the machine, using extension hoses.

Instead of using wood cellulose, a mulch of chopped straw made tacky with bitumen emulsion can be sprayed on as a second stage, 10. This method is useful in land subject to erosion. The mulch creates a favourable micro climate for the seed which induces rapid germination and protects the young seedlings. This is an extension of the Petas Ply principle of stabilization patented by Alexander Asphalt. In this method seed is spread then covered with sand or sand and fine peat and sprayed with a bituminous emulsion. Hydraulic seeding is a specialized process carried out, to the writer's knowledge, by only three firms* in this country.

Their service includes investigation of the site material and laboratory testing of samples, in order to recommend suitable fertilizers and seed mixtures. These firms are also developing methods of protecting vegetation until it is sufficiently developed to stabilize canal and river

The use of seed by this method is not restricted to grass, but seed of shrubs and trees can also be included.

The cost of providing grass areas varies so enormously with the con-ditions of the site and the kind of lawn required that it is difficult to quote figures with any accuracy. The following approximate figures do however provide a general basis of comparison between the three main methods of providing grassed areas. All figures are per square yard. Turfing: 5s. 3d. to 8s. assuming sufficient topsoil available on site. (If it is necessary to bring in 3 in. of topsoil which is sufficient for turf

add another 1s. 6d. to 2s. 3d.).

Grass seeding: 2s. to 3s. assuming sufficient topsoil available on site. To bring in 4 in. of topsoil add 2s. to 2s. 6d.

Hydraulic seeding-large areas only: 8d. to 1s. 6d. This method is economical for large and difficult areas, but not suitable for small areas.

These prices do not include the maintenance which should be carried out during the first six months and which should be regarded as part of the planting costs, e.g. a first scything or rotary mowing then cutting weekly or every 10 days for six months from spring to autumn would cost another 6d. to 9d. A hydraulically seeded site will probably only be scythed once if at all.

Maintenance

A programme of maintenance should be decided upon at the design stage because the choice of grasses used will depend partly upon the number of maintenance staff available and their skill, e.g. fine grasses will require very frequent mowing during the growing stage to keep them that way. A much better sward is produced by cutting an inch or so off the grass frequently than by letting it grow to, say, 9 in. high and then having a major cutting operation. This is particularly important during the early stages of development.

The amount of mowing required will depend on the grass varieties, soil conditions and season. Cutting should be done preferably when the grass is dry. Cutting will be required during spring, summer and autumn and most frequently in May, June and July. Fine lawns will probably require cutting twice a week at this time. As a guide, special areas of grass such as fine ornamental lawns, cricket tables, etc. will probably require cutting about 50 times in a year and other mown grass about half that. In addition there will be rough areas of grass which may only require scything two

or three times in the year.
As well as mowing, other treatments such as spiking, forking, fertilizers and lime, top dressing, weed control and control of any diseases which may appear, will be required from time to time and expert advice should [continued on page 242

Firms carrying out hydraulic seeding:
Hydraumatic Seeding Ltd., Higham,
Rochester, Kent. Also in Scotland and Wales.
VEB Landscape Reclamation Ltd., 230
Tottenham Court Road, London, W.1.
ETS Ltd., East Busk Lane Works, Otley,
Yorkshire.



These specials are applicable particularly to the use of A10 and B75, but are available for use in conjunction with Calculon C5 for highly stressed brick work where cutting is inadvisable.

TECHNICAL DATA

Nominal dimensions 9 x 7 x 3 in., actual $8\frac{5}{8}$ x 7 x $2\frac{5}{8}$ in. subject to normal standard tolerances.

COMPRESSIVE STRENGTH

Averages 5,000 lb. per sq. inch.

WEIGHTS

Average weights are 9.5 lb; per brick, 2 cwt. 13 lb. per pack of 25 bricks, 4 cwt. 8 lb. per yard of 48 bricks and 4 ton 4 cwt. 92 lb. per 1,000.

RATES OF LAYING

Results of trials carried out by our own staff indicate a 30% increase in the speed of laying when compared with 9 in, solid walling,

MEASURED RATE

The measured rate for Calculon C5 in the London area is 46/- per yard super, which compares with 68/6 per yard super for a 9 in. wall of 5,000 lb. per square in. in standard pressed bricks with one frog. For more detailed information on measured rates refer to the schedule at the back of booklet LB6 on calculated brickwork.

The Calculon C5 is a solid brick designed to meet requirements for highly stressed brickwork. It can be used to advantage for most internal loadbearing walls, both cross walls and spine walls. or a combination of both. Where necessary for design considerations, it can also be used as an internal skin to a cavity perimeter wall. It incorporates an adequate hand hold to aid speed of laying. Sound transmittance 51.4 decibels.

Redland Bricks Ltd.

Graylands, Horsham, Sussex. Tel: Horsham 2351 London Showroom: Redland House, 42 Kingsway, W.C.2



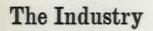


skill

be sought on a suitable programme for these to suit the particular requirements. The British Standards Institution is at present preparing recommendations for grounds maintenance. It aims to deal with the kinds of maintenance appropriate to the various kinds of planting as well as remedial work and to consider possible changes in development where the maintenance required has proved too difficult and expensive. Advice on all aspects of the provision

proved too difficult and expensive.
Advice on all aspects of the provision
of good turf for playing fields may be
sought from the Sports Turf Research
Institute, Bingley, Yorkshire, on payment of an appropriate fee.

PUBLICATIONS
BS 3975:1966. Glossary for Landscape Work.
British Standard (in draft only but shortly to
be published): Recommendations for General
Landscape Operations. Attention is drawn in
particular to Part 3 Groundworks; Part 4
Seeding of grass areas; Part 5 Turfing.
Playing Fields and Hard Surface Areas.
Department of Education and Science Building Bulletin 28. HMSO, 12s. 6d.



Leather luxury

In these days of ergonomic plastic mouldings shaped to the vital statistics of human beings to British Standard size it was something of a relief to find, at the Decor '67 exhibition, that the type of vast Chesterfield one associates with Pall Mall clubs is still being made. The one illustrated, 1, was designed by John Pound, and on personal test proved to be as comfortable as it looked, an opinion shared by a teenager about



half the writer's size and weight. Retail price, on a steel frame and covered in deep-buttoned Connolly hide, is about £300, which in view of the overall length of 8 ft., seems pretty reasonable.

pretty reasonable.

The makers are G. N. Burgess & Co.,
Feltham, Middlesex.

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

Contractors etc

Army Housing, Camberley, Surrey.
Architects: Bicknell and Hamilton.
General contractor: G. T. Crouch Ltd.
Sub-contractors: Site clearance: R.
Meadus Ltd. Pavements, external
finishings and topsoiling: Gorman &
McGuinness. Stramit decking and mineral felt roofing: Vulcanite Ltd.
Plasterer: P. Brent & Sons. Painter:
R. Bryant (Painting) Contractors
Ltd. Plumbing and water mains:
Plumbing Services Ltd. Glazier: J. &
J. Adaman & Co. Wall tiling: G. Morley. Electrician: Hartley Electromotives Ltd. Gas, hot water and heating
installations: The Freeman Heating
Co. Plastic ceilings: Halford Jarvis &
Co. Mastic pointing: M. & R. Mastics
Ltd. Fencing: The Stenoak Fencing

& Construction Co. Communal to aerial: Belcher Electronics Services Ltd. Telephones: GPO Telephones. Lino layer: Great Metropolitan Flooring Co. Street lighting: SE Electricity Board. Tarmacadam roads and footpaths: Durastic Ltd. Ironmongery and sanitaryware: John Knowles & Co. Joinery: G. T. Crouch Ltd., H. D. Sinclair Ltd. External doors: D. M. Sweetland Ltd. Flush doors: Crosby & Co. Kitchen units: Jameco Products Ltd. General materials: W. W. Hall Ltd., Hall & Co. Kerbs: McCreath Taylor Ltd. Ryarsh facing bricks: Richard Parton Ltd. Carcassing timber: Hollis Bros. Steel and ironwork: Laughton & Jarrett Ltd. Playground equipment: Chas. Wickstead & Co. Asbestos fascia panels: Turners Asbestos Cement.

Tryweryn Reservoir (Llyn Celyn), Merionethshire. Architects: Frederick Gibberd and Partners. General contractors: Road diversion, dam and associated works: Tarmac Civil Engineering Ltd. Generating machinery: Gilbert Gilkes & Gordon Ltd. Subcontractors: Clearance of reservoir area: Clarke Demolition & Construction Co. Foundation piezometers and pressure relief wells: Foundation Engineering Ltd. Division tunnel: Tunney (Engineering) Ltd. Grouting of cut-off trench and tunnels: Simon-Carves Ltd. Sand drains: Soil Mechanics Ltd. Piezometric apparatus: George Wimpey & Sons. Haulage of embankment materials: Midland Excavators Ltd. Power station join-ery: W. Marchbank & Co. Copper roofing: Broderick Insulated Structures Ltd. Tunnel grouting: Intrusion Prepakt (UK) Ltd. Electrical plant: Brush Electrical Engineering Co. Electrical installations: Crompton Parkinson Ltd., Fletcher Langley Ltd. Fixing mosaic on roof and balcony of draw-off tower: John Stubbs (Marble & Quartzite) Ltd. Masonry stone for road diversion and stone for pitching: The Arenig Granite Co. Masonry Stone and pitching: Penmaenmawr & Welsh Granite Co. Concrete aggregates: A. Salisbury. Cement: Tunnel Portland Cement Co. Cement and building materials: A. G. Evatt Ltd. Steel pipes: South Durham Steel & Iron Co. Valves: Glenfield & Kennedy Ltd., J. Blakeborough & Sons. Cast-iron pipes: Stanton & Staveley Sales Ltd. Bulkhead gate: Ransomes & Rapier Ltd. Discharge regulators: English Electric Ltd. Electro-magnetic flow meter: George Kent Ltd. Discharge control apparatus: Evershed & Vignoles Ltd. River flow gauges: Lea Recorder Co. Fish screens and syphon liners: Mechans Ltd. Lift: Elevator Co. Piezometric apparatus: Soil Mechanics Ltd. Temporary houses: Terrapin Ltd. Constructional steelwork: John Derbyshire & Co. Windows: Williams & Williams Ltd.
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and handrails: Steelways Ltd. Aluminium handrails: E. C. Payter & Co., S. W. Farmer & Son. Slate floors and fascias: Setchell & Sons. Seeds: George Howarth Ltd. Boreholes, trial pits and geophysical surveys: Soil Mechanics Ltd. and Richard Costain Ltd. Model of the dam: Hunting Aero-surveys Ltd. Aerial photographs: Aerofilms Ltd. Aerial contoured survey: Hunting Surveys Ltd.

Library, Aldeburgh, Suffolk. Architect: Peter Collymore. General contractor: Walter French. Sub-contractors: Floor tiles: Wheatly Triton. Roof finish: Nuralite.



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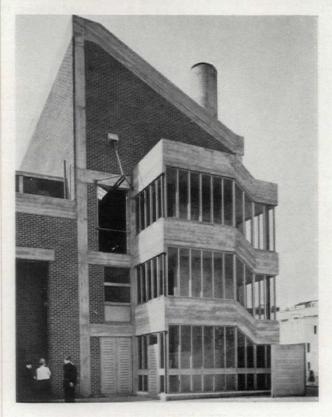
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THE NEW BRUTALISM by REYNER BANHAM



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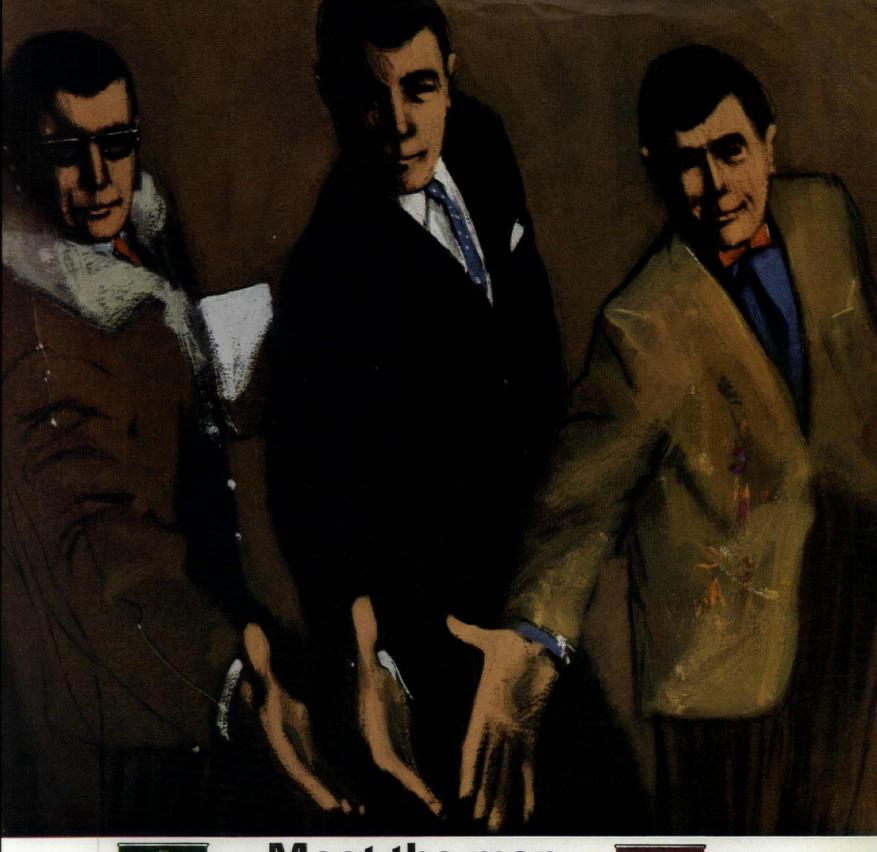
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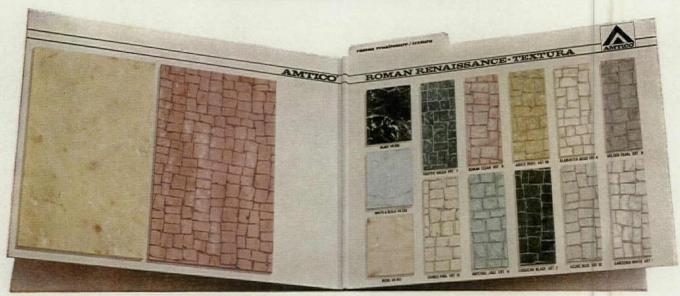
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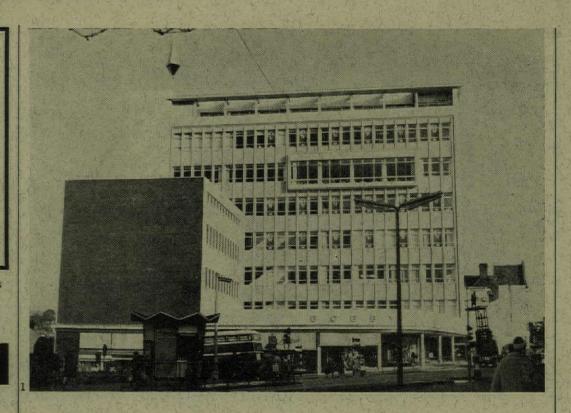
A monthly anthology from all over Britain of townscape problems, outrages and opportunities, compiled by Ian Nairn with drawings by G. J. Nason.

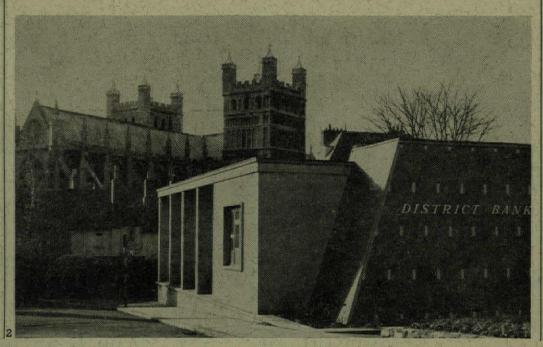
The worst of all postwar rebuildings grinds to its unhappy close. I is Exeter modern, closing the view up the shattered High Street. 2 is what those in authority thought fit to frame a view of the Cathedral. It is on the site of that Georgian masterpiece, Bedford Circus. Well done.

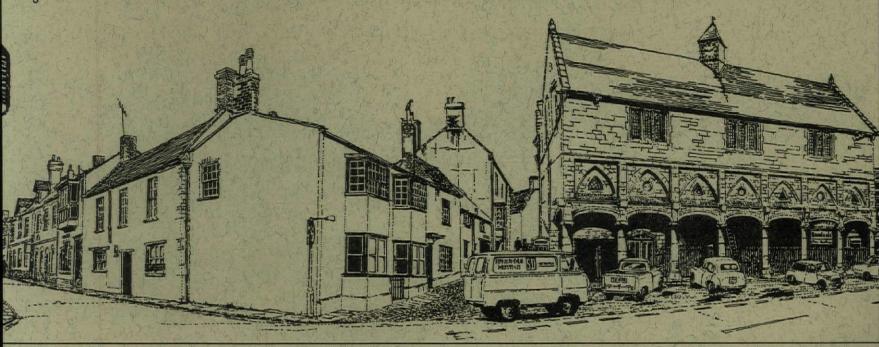
CASTLE CARY, SOMERSET

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now empty. But also an essential
part of the kind of place that is splendid
— "Typically English" in the best sense—
but rarely admired and not often visited.
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the AR puts out this plea; better
duplication than demolition.

KIRRIEMUIR, PERTHSHIRE
...or Barrie's 'Thrums' if you prefer it
that way—is one of the few towns, in the







area to keep an intricate plan. Awkward buildings jut at awkward angles; several of them are menaced, the most important being the entrance to the town square (right in 4, left in 5). The traffic through here is minute by any metropolitan standard; why not leave the town alone?

LYMM, CHESHIRE
The Market Cross treated as every old
building ought to be, 6; no fences, no

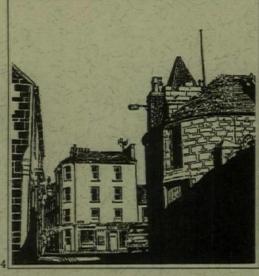


notices, the architecture growing out of solid rock, the surround still just a place to sit down on.

CADBURY, SOMERSET
A magnificent case of giantism in defiance of sightliness, overhangs and everything else, long may it survive; for this is what the town planners should really be planning for—the development of different characters as happily crazy



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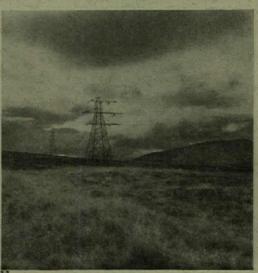
















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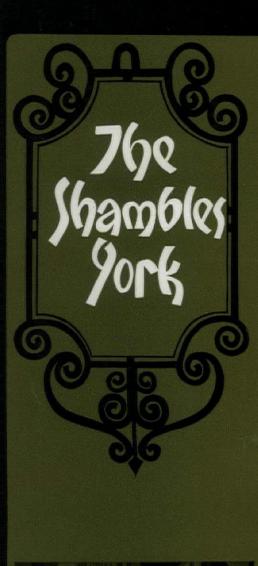
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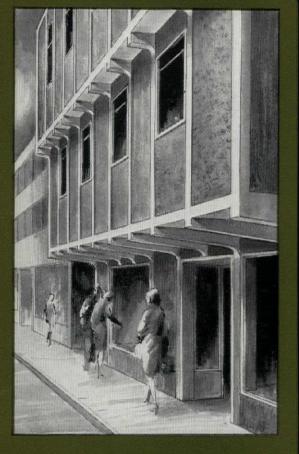
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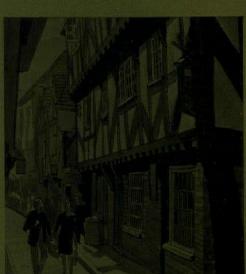
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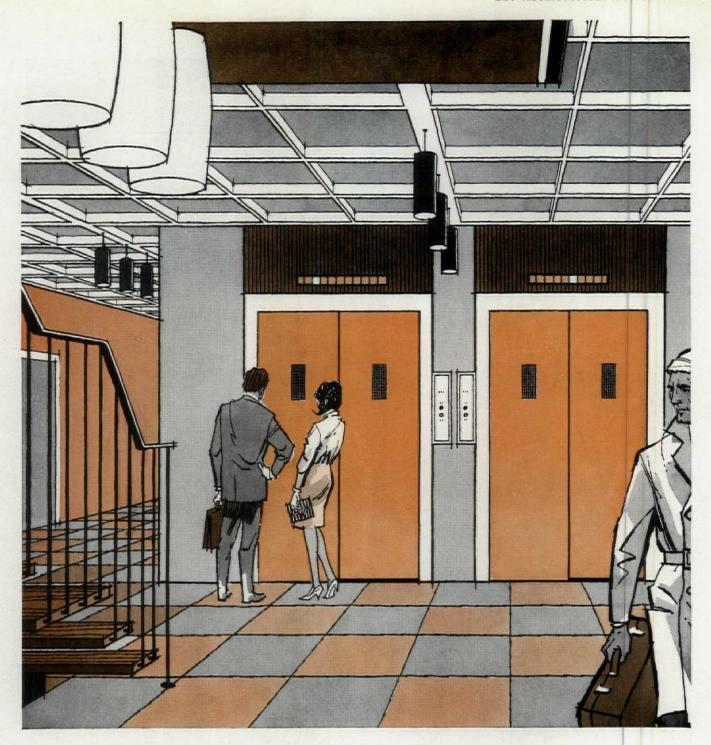
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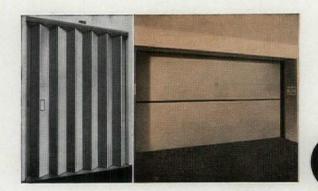
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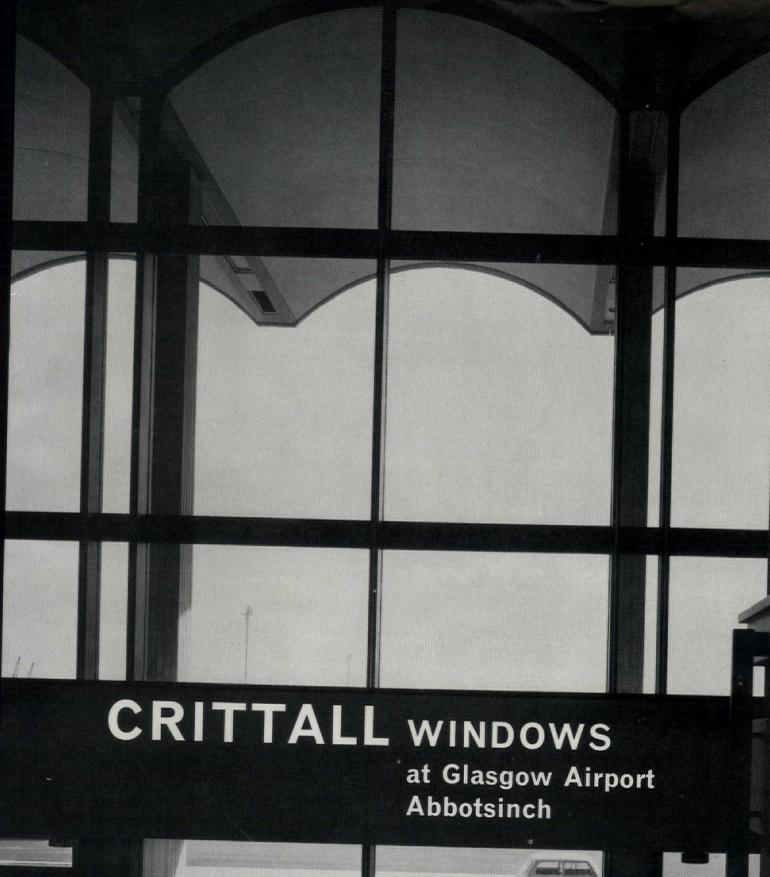


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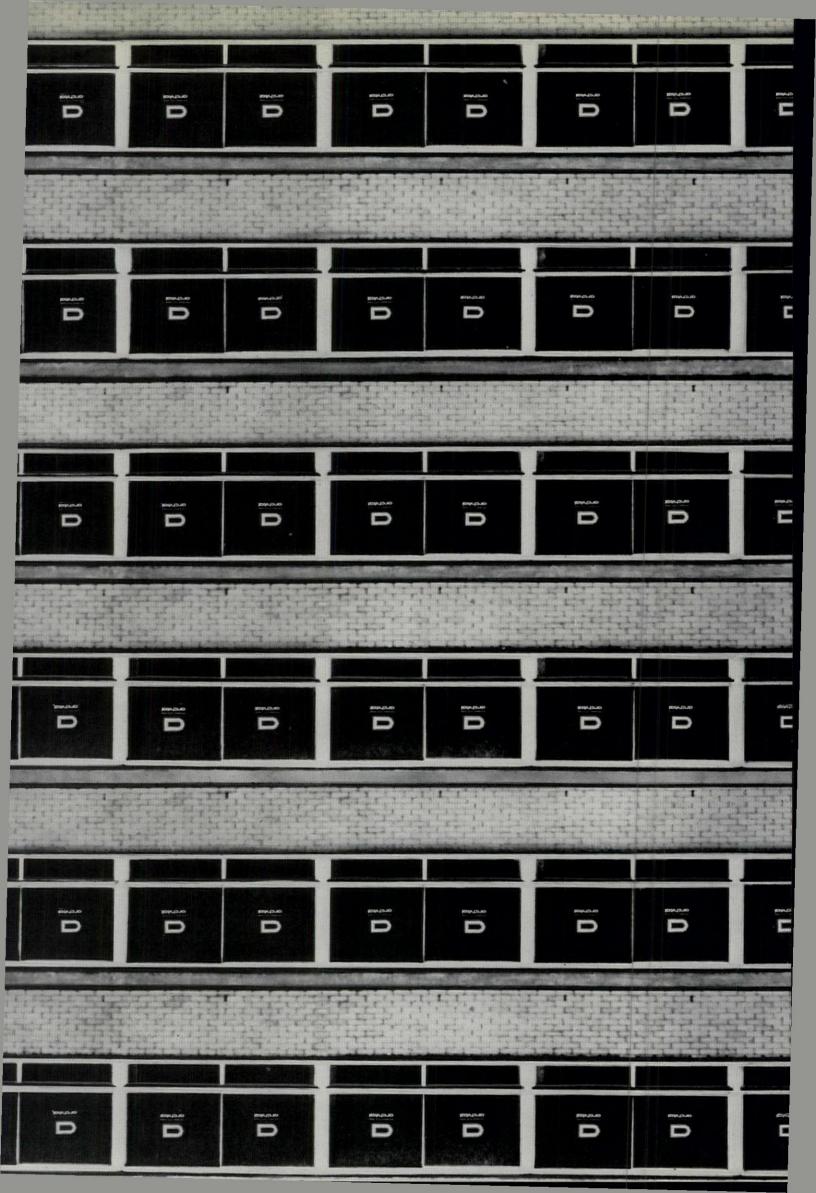
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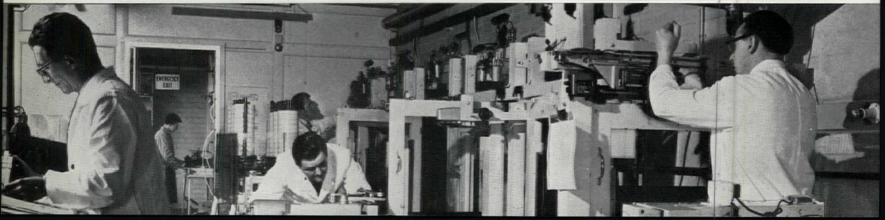
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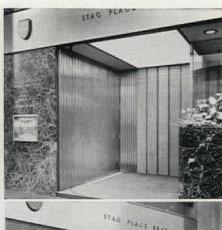
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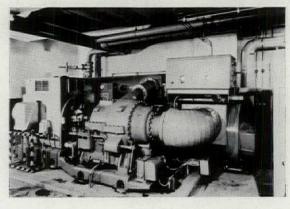


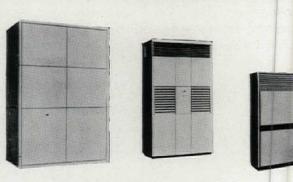




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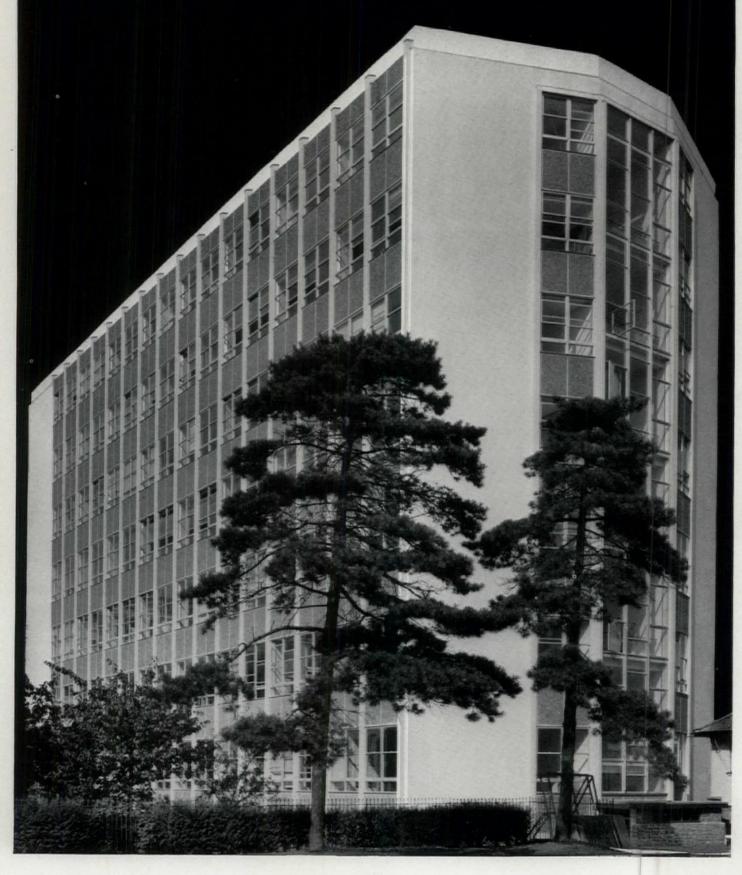
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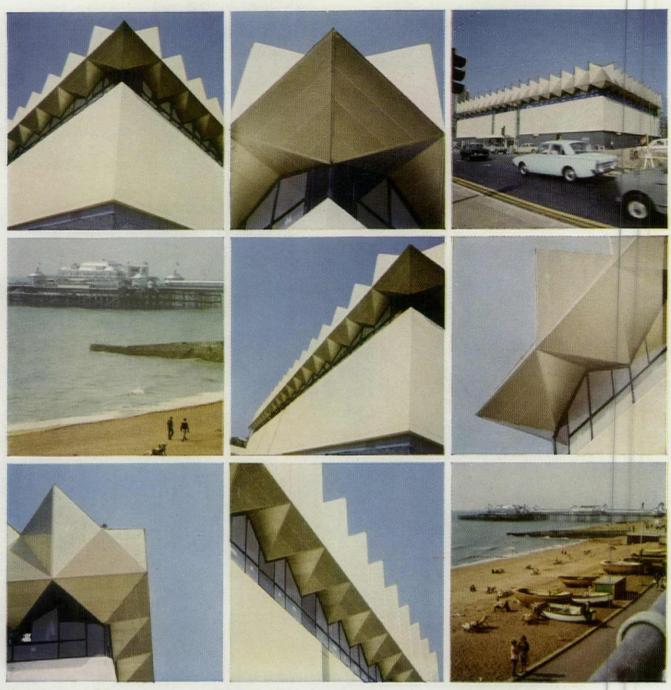




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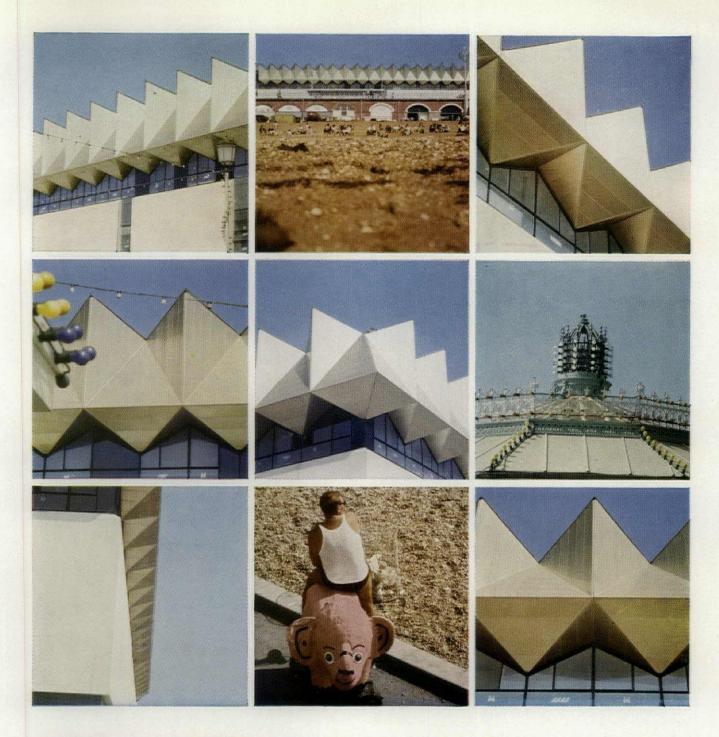
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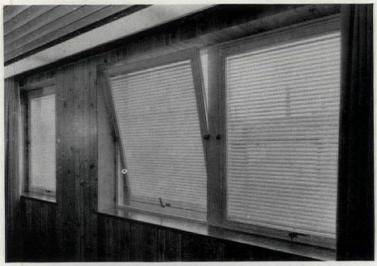
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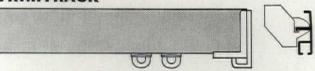
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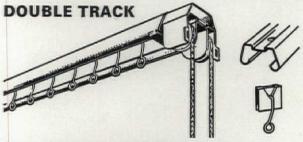
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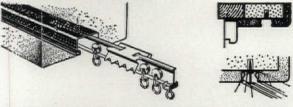


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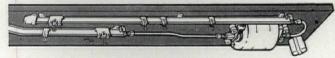
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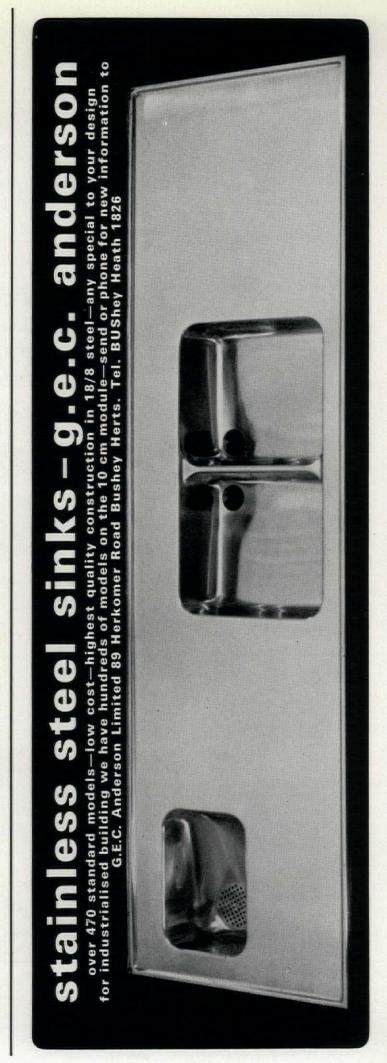
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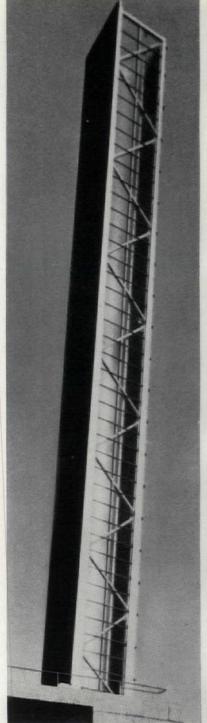




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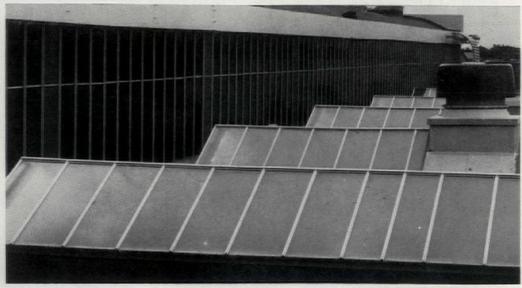
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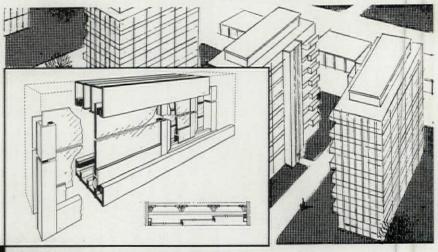
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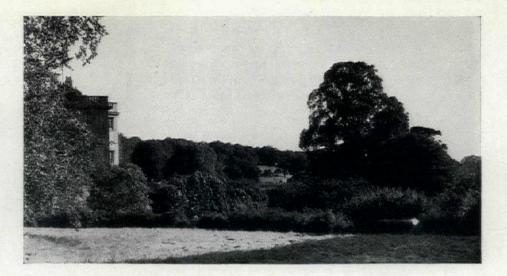
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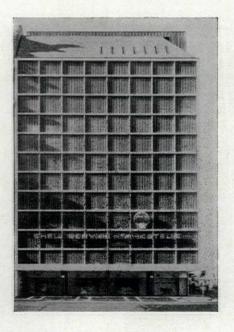
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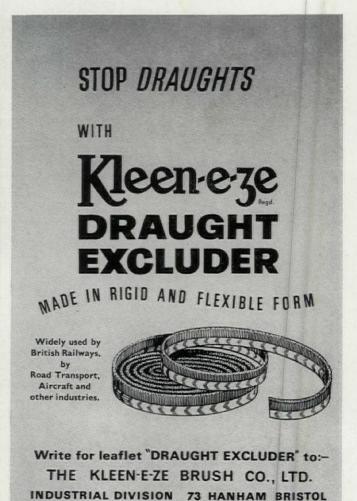
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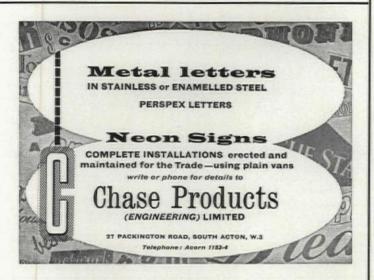
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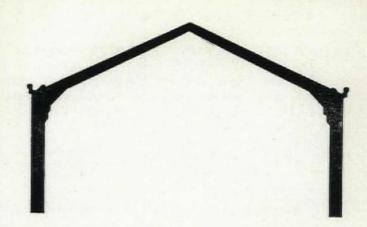




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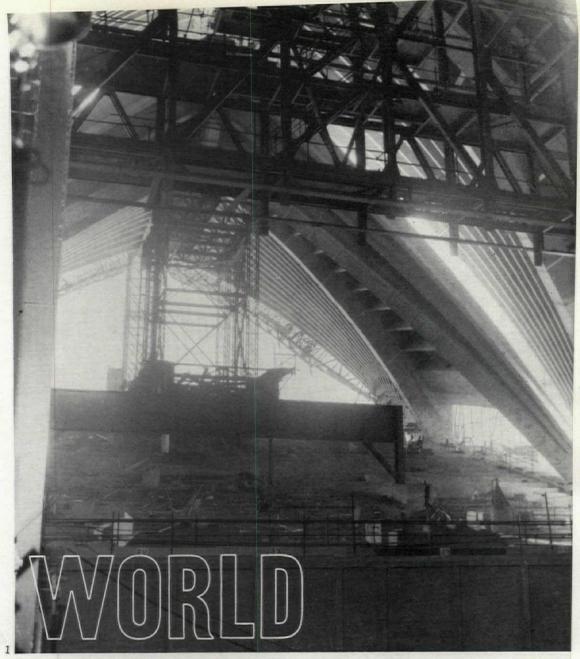
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SYDNEY OPERA



gauged by the size of the more distant pair of men, 4, in a view of the cloistered space between the main hall and the experimental theatre. The rough surfaces will be left, one hopes, to contrast with the shimmering ceramic tiling that has now transformed the exterior, 6, away from the cellular beehive of precast units under construction and back to an image not far from the original 'shell concrete' sketches. All now depends on the architect appointed for the internal design, Peter Hall-an appropriate name. Utzon's concrete seating ramp, 7, has hamstrung his successor, for the estimated capacity for 2,800 people has turned out in reality to be 1,800 (or up to 2,500 in discomfort).



WHEEL OF CHANGE

The permanence and inflexibility of cultural centres has not surprisingly triggered off self-doubt in Japan amongst those younger architects most involved in supplying brutalism to that nation's insatiable demand for public buildings, Kiyonori Kiku-take's cartwheel, 8, for the Miyakonojo Municipal Hall is intended not just as a piece of constructivist sculpture but as the prototype of a new type of public building in which a permanent pedestal of reinforced concretecontaining, in this case, offices, conference rooms and marriage roomssupports a 'disposable' auditorium of steel, which will be responsive to technical and mechanical change. This shows a similar philosophy to the



South Bank Arts Centre in London (though all is enveloped in concrete there) and a similar parti, 9, to Gibberd's Catholic Cathedral at Liverpool, which also has on its podium an open-air meeting place backed up against the covered auditorium. Kikutake's other aim-to create a 'total environment' of sound, light and airis less easily judged in photographs, though the brightly coloured hall, 10, seems well integrated with its structure. Much more attention has meanwhile been given in the local magazines to Sachio Otani-the Alfred Waterhouse of Japan-whose International Conference Hall at Kyoto alongside Lake Takaragaike, 11, has been a resound-



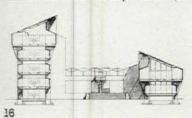






ing popular success. Its interest lies in a crafty synthesis of traditional Japanese trapezoid shapes in section, 12, with an extendible linear layout. The bric-à-brac detailing, 13, gives up any pretence at the unity of materials which Otani achieved at his other recent colossus, the religious centre for the Tensko Kotai Jingu sect at Tabuse, 14.

Arata Isozaki was a contemporary of Otani's in Kenzo Tange's office. His High School for Girls at Oita, 15, displays with refreshing clarity the first phase of a linear layout, the peculiar silo-shaped silhouette of which is the result, 16, of placing the laboratories at rooftop level (as





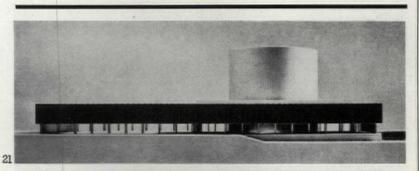


CHANGEABLE

though they were studios) over repetitive stacks of classrooms; these are linked across a central pedestrian way by a first floor bridge with an appropriately light parasol roof. In the same town, next to a Medical Hall he designed for Tange in 1960, Isozaki has recently completed a library, 17, with a ruthless box-beam combination of structure and services, poking out of the volumes to give a suggestive impression of incompleteness. Whether



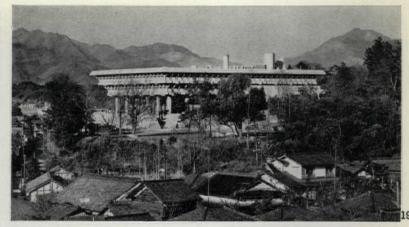
18 such a combination succeeds internally in being either functionally flexible or visually in scale is another matter, 18.











EAST IS EAST

The non-Communist East is in no less of a cultural turmoil than China itself. In Japan, for example, the Free World can easily appreciate the out-stepping image of the Tsuyama Culture Centre, 19, designed by Koshi Kawashima (out of Boston City Hall). But what can be made of the historicist styling by Kenji Imai of the Music Hall in Tokyo, 20, built in honour of Her Majesty the Empress's sixty-first birthday? At Islamabad, the new capital city of Pakistan (see pages 211–216 of



25

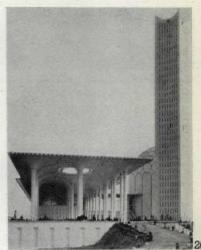
this issue), Arne Jacobsen had no cultural doubts: his Parliament Building, 21, was to have displayed pure geometry, a masonry cube surrounded by a light steel-framed palazzo. It was nonsense on grounds of cost and technique, so why did he try it? The Islamic authorities can at times be just as obscurantist, though it was Derek Lovejoy Associates, the English landscape consultants, who suggested that the pretty shrine at the existing village of Noorpur Shahan, 22, should be retained as a foil to the new city on the plain below. Meanwhile, new mosques are 'stripped traditional'; this one by Khwaja Zaheer-ud-Deen, 23, is in the

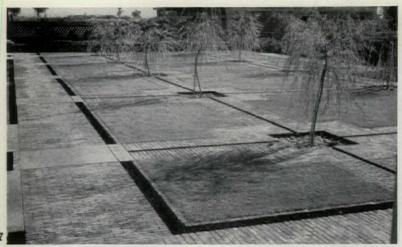


Class V centre of G6 close to the Municipal Offices (see page 215), with paving by Lovejoy.

Confusion of cultures has reached its climax at Islamabad in Edward D. Stone's deplorable design for the President's Palace, 24. In the Matthew plan for the administrative sector, 25, it faces symmetrically down the 'spine' of Capital Avenue between the Cultural Group to be designed by Robert Matthew, Johnson-Marshall and Partners (top of 25) and Rosselli's Secretariat (right of 25 and page 213). It will be flanked by colonnades leading to symmetrical pavilions, also by Stone, each with fifteen little domes, for the Foreign Affairs Ministry and for the Parliament Building. Stone arrived at the Islamabad as architect of the American-financed Institute of Science and Technology which lies in the National Park to the east of the city. A mosque-like minaret, 26, covers the exhaust system of the domed nuclear reactor next to it.

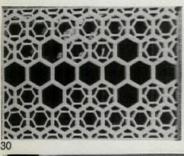
It is in Lovejoy's landscaping that





ISLAMABAD

East and West have most happily joined at Islamabad; 27 is the courtyard of the National Health Laboratories (next to Llewelyn-Davies's teaching hospital-see AR Preview, 1967), which were designed by John Musgrove but recast by local officials. In a G6 public park is a delightful Japanese garden by S. Tabata, 28. Yet one firm of local architects, Naqvi and Siddiqui, has shown in the Telephone Exchange, 29, that modern cubic shapes can be contrasted happily against natural contours. Response to the East must above all be environmental, as the work of the Colombo Plan team has proved: the climate can be controlled by jali screens, 30, as at Gerard Brigden's Government Hostel, 31 (see also page 214), and strong and simple enclosures, indirectly lit, can be made to stand out under the vast sky-



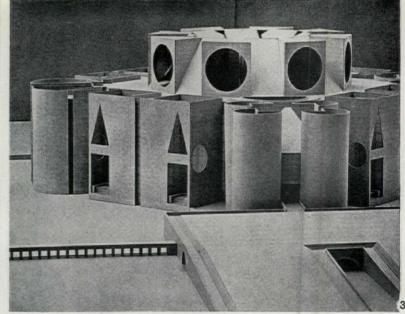




a primary school by Brigden, 32, shows this truly local and Oriental architecture without pretension.

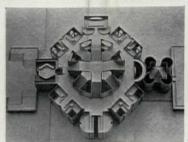




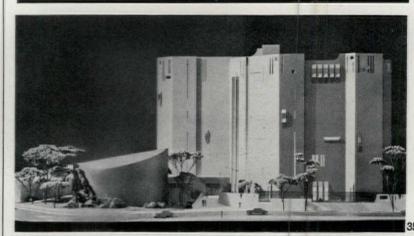


DACCA

In spite of Louis Kahn's unhappy interlude at Islamabad between Jacobsen and Stone, he is busy with actual construction of the major buildings for East Pakistan's capital at Dacca. The model of the Assembly Hall, 33, displays his extraordinary mixture of naivety in perforation and massing of the elevations with great sophistication in the complicated rooflighting, 34.



The consistent brick masonry construction will no doubt give the scale which the model lacks.



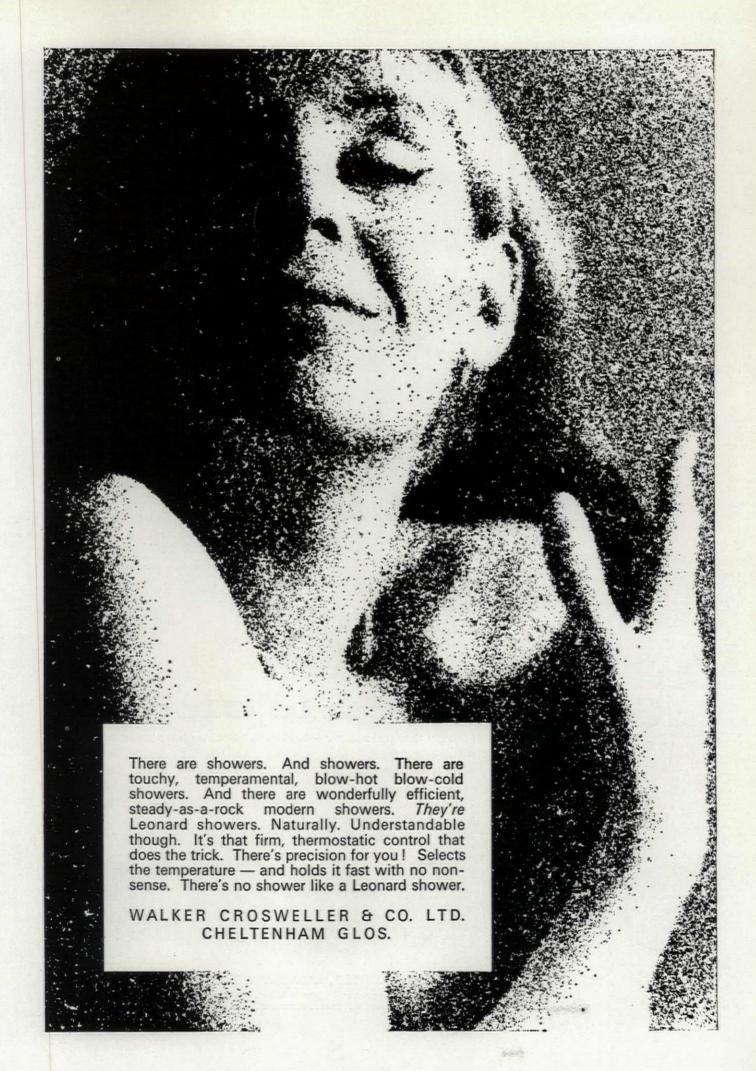
PONTI

Contacts with the East seem to have fixed Gio Ponti in a mannerism of random slits and thin verticals. 35 is the Denver Art Museum in the United States, designed by Ponti with James Sudler Associates. 36 is the interior of Ponti's chapel at the San Carlo Hospital in Milan, slits to the south, 38, and hexagens to the north, 37.





170





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VIEWS AND REVIEWS

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FLORENCE IN NEED

The fund for the restoration of Florentine museums and works of art damaged in the recent floods has been building up steadily even though it can hardly be hoped that it will amount to as much as is needed: but what is not generally realized is that there are two separate committees in Florence, each with its own appeal for funds. One is concerned with the major monuments and the other for Estetica Cittadina; that is, the general town furniture that gives Florence as a place its attractive character. This second appeal is not going so well as the first, perhaps because of the greater publicity the restoration of the major monuments naturally gets. But REVIEW readers, with their interest in townscape, may feel a special sympathy for the cause of Estetica Cittadina. They should send contributions to the Mayor.

CAPITOL MURDER

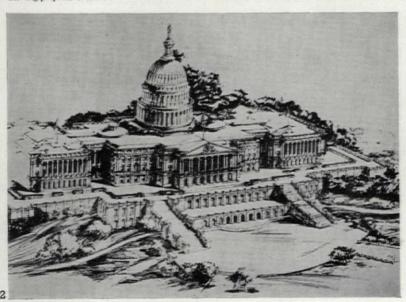
It is less than two years since a proposal by MPs for a 'Gothic extension' to the Palace of Westminster was scotched by public ridicule-prompted no doubt by the Downing Street fiasco, though there was more resentment of the doubled cost of restoring Nos. 10 and 11 than there was of the aesthetic incongruity of the large-scale mock-Georgian addition on the site of No. 12. They run these things better in the States, we often think. But they don'tnot at Washington, where furious controversy as long been raging over a major remodelling and extension of the west front of the Capitol, 1, and the work is in imminent danger of actually being carried out at the mindboggling cost of \$34 million (\$178 per

The Capitol is not, on anyone's reckoning, a perfect building for its present use. For a start, it is not big enoughin spite of another large extension carried out in the last five years by bringing forward by 32 ft. the central portion of the east front. The AIA and the architectural papers have emphasized that the fundamental decision should be made now to call a halt to the piecemeal growth of a pseudo-classical afflatus; a long-term master plan should be drawn up, and if this means beginning a separate new building (the same argument as over the Bridge Street site at Westminster), the finest architectural talent should be selected by open competition. Even the supporters of the present extension admit that it is the 'last great volume, which can effectively be added harmoniously to the structure' (Neil R. Greene in a special issue of the *Potomac Valley Architect*). And the space that has been and will be gained (45,000 sq. ft. on the east front, about 190,000 sq. ft. on the west front) is puny compared with its escalating cost—in 1958 the west front job was estimated at a mere \$18 million.

Worse still is the character of the proposed west front extensions. The present state of the front is not one of divine perfection: the central block of Thornton, Latrobe and Bulfinch (1793-1829), which in its Grecian purity reflected the early Republican ideals, is flanked by enormous wings and surmounted by the equally enormous (and popularly successful) cast iron dome (1851-65) designed by Thomas U. Walter. As early as 1905 Carrère and Hastings suggested replacing the centre's decayed sandstone with marble to match Walter's wings. They also suggested the east front extension finally carried out fifty years later; and unfortunately, in opposing the design of this at the 1957-8 hearings, Douglas Haskell and others made the error of counter-suggesting that 'the real needs of Congress could in any event be best cared for by extending the building to the west where there is no great architectural masterpiece to be preserved.' The present proposals, 2, are intended, alas, to provide this masterpiece: they represent not just the bringing forward of the centre by 44 ft. and of the old House and senate wings on either side of the portico by 88 ft. so that the projections and re-entrants that at present give life to the facade are largely lost, but also a wholesale attempt at 'improving' on the designs of earlier ages. The central portico is to be heightened and widened and



1, west front of the Capitol, Washington. 2, sketch showing proposed extensions and alterations.





3, swimming pool and gymnasium block at Ambassador College, near St. Albans. See note below.

given a pediment (complete with sculpture); F. L. Olmsted's two great stairways to the terraces, which he carefully aligned on the corners to enhance the picturesque or scenographic qualities of the previous mixture, are to be pushed sideways and re-aligned dead centrally on the pre-Walter wings; and the two-storey terrace front is to be entirely remodelled. All this is said to 'balance' Walter's rather crushing dome; in fact by being pushed further back the dome will 'disappear' from close viewpoints in the same unsatisfactory way as St. Peter's and St. Paul's.

The man in charge is the Architect to the Capitol, J. George Stewart, who is not an architect at all but a former Republican Congressman of blameless loyalty installed in that office by Eisenhower. 'He has an Assistant Architect, who is one, Mario E. Campioli (he was previously in charge Colonial Williamsburg); a team of Associated Architects (Roscoe DeWitt, Fred L. Hardison, Alfred Easton Poor, Albert Homer Swanke, Jesse M. Shelton and Alan G. Stanford); and various consultants, from John Harbeson, Henry R. Shepley and Arthur Brown in 1957 to Paul Thiry, Gilmore D. Clarke and Harbeson again at the present time. No SOM, no Mies, no Marcel Breuer-the last-named, incidentally, having recently been given the unenviable job of making a new design for the F. D. Roosevelt Memorial, the competition-winning one by Hoberman, Wasserman and Beer of Pedersen

and Tilney (AR, September 1961) having been rejected for its excessive modernism by the Roosevelt family. Meanwhile Stewart's department has completed the hideous \$122 million Rayburn Building-also, surprisingly enough, for the use of Congress, as offices for individual Representativeswhich no American architectural magazine has dared to publish, and is at the moment pushing through the appropriate committees the \$75 million Madison Memorial Annexe to the Library of Congress. All this has been done by Congress at a time when an Administration dedicated to Beauty (with White House conferences on the subject) has been making serious attempts to improve the quality of Government buildings.

AMBASSADOR IN HERTS

Latest in the transatlantic traffic of architectural designs to be completed in England is the swimming pool and gymnasium block of Ambassador College, 3, at Bricket Wood near St Albans, designed by Daniel, Mann, Johnson and Mendenhall of San Francisco in association with the Londonbased firm of Denkers and Maddison. DMJM will be remembered by recent AR readers as the authors of a romantic cliff-hanging holiday town at Sunset Mountain near Los Angeles (World, June 1966). At Ambassador College, a co-educational college for Arts and Humanities at university level (specializing in theology), they have adopted a more rational system of tubular steel framing, with infill panels of handmade reddish-brown brickwork. The swimming pool, 75 ft. by 42 ft., matches that of the parent college at Pasadena. The entrance for visitors is 'from Drop Lane in Smug Oak village,' which must delight the transatlantic visitor in search of local colour

HUDDERSFIELD DEFENDED

The recently published Final Draft Report on the Town Map of Huddersfield, prepared by a team of architect-planners from Building Design Partnership, led by G. Grenfell Baines and H. W. Pearson, is notable for containing an impassioned defence of the town's finest building, the Railway Station of 1847, designed by J. P. Pritchett of York, which was valued among the 'first twelve' of Britain's historic railway stations in AR, February 1966. A through-station with

long platforms, it has a superb Corinthian facade with colonnaded wings spreading out either side of the central porticoed block. The value of BDP's report, prepared in association with the borough architect, J. Blackburn, is that it sees this facade not in isolation but as part of a whole group of midnineteenth century civic buildings; for this is one of the few stations to make an impact directly on a city centre (Newcastle is another). In this case it was the town, under the enlightened control of the Ramsden family, which grew northwards towards the station, forming St. George's Square in front of it. The flanking classical buildings include a block of offices by Sir William Tite (1856) on the south, the George Hotel by William Wallen and Child of Leeds (1849-50) on the north, and Lion Building by Pritchett (1852-4) on the east. The report suggests positive action by the corporation to conserve all these (and also a second distinguished group, of County Court and Methodist Mission, in Queen Street).



After systematic negotiation with the owners over methods and costs of rehabilitation (the Corporation may contribute if necessary), a programme of urban landscaping and tree planting, 4, will accompany the re-organization of motor traffic in the square as the northern end of a comprehensive central area precinct. However, the ominous rumours-first published in the Press nearly two years ago-that British Rail intend to redevelop the station for profit are not stilled by this sentence in the report: 'Although a preliminary meeting has been held with a representative of the British Railways to acquaint them with our proposals, at the time of writing nothing firm is known of their intentions.' They should come clean without delay.

GOOD NEWS FROM GLASGOW

After all the notes of doubt and despondency about Glasgow in recent issues of the AR, it is only fair to report that in the last six months a remarkable and entirely praiseworthy change has come about in Corporation policy. Perhaps it was the Caledonia Road Free Church fire (AR, February 1966) which pricked consciences. At any rate £37,000 has been voted for immediate repairs to the portico, tower and outside walls of that church, thus scotching for the moment the threat of a roundabout on the site; £40,000 has been given to restore the other surviving Thomson church at St. Vincent Street; probably £100,000 will be needed for the confirmed intention to buy Park church (AR, June 1965 and October 1966), probably as a depository for municipal archives; and the sensible decision has been made to preserve the Corporation's other firegutted Grecian shell, that of St. Andrew's Halls, to enclose an extension of the adjoining library.

This is all highly commendable, though there are still other demands that can be made. When is the report on the landscape and architecture of the whole Park area, commissioned from A. G. Lochhead and W. Gillespie as long ago as 1962, going to be made public? Will the Corporation take positive action to organize schemes of rehabilitation throughout the West End terraces? And when will the tragicomic Rennie Mackintosh Gift Shop in Ingram Street be restored by its owners, the Corporation, with its Tea Room furnishings (mainly stored, partly defaced in situ)?

DOGG KENNELL ATT HAMILTON

In James Macaulay's article with the above title in the October, 1966, AR (describing the history and present condition of the Duke of Hamilton's eighteenth-century summer palace of Chatelherault) reference was made to

ment-sponsored aid in restoring the building more difficult. We now learn that the deterioration of the building after it ceased to be occupied in 1964 was due to vandalism (including stripping the roof of lead) which the owner did his best to stop, initiating one successful prosecution. He also employed eminent architects to examine the building, and they reported that dry rot was extensive and that the cost of restoring it would be prohibitive.

neglect by the owners making Govern-

BOILER CHIMNEYS

In David Kut's article in the 'Skill' section of AR, November, 1966, the designs of the three concrete chimneys illustrated, those of the British Shoe Corporation's warehouse at Braunstone, the Newport Marshalling Yard at Thornaby-on-Tees and the swimming pool at Southgate, were attributed by implication to the architects of the schemes. In fact, these chimneys are all registered designs manufactured by John Ellis & Sons Ltd.

OBJECTS

The glass paper-weights included under the above heading in the December AR (Ronald Cuddon's 'Design Review') were not made by Caithness Glassworks as stated in the text but by Strathearn Glass Ltd., Crieff, Perthshire.

CLARE HALL

The list of professional credits for Ralph Erskine's Clare Hall, Cambridge, published in the January 'Preview' issue, should have included: executive architects, Twist and Whitley; supervising architect, Brian Matthews.

correspondence

DANGERS OF SCIENTISM

To the Editors.

sirs: Mr. John Musgrove's article in your July issue raises some interesting points for designers, but a few details appear to need clarifying. Whilst few would disagree with the need to be aware of the dangers of 'Scientism,' I feel his whole argument looses impact through lack of definition. Clearly 'Scientism' is dangerous when it implies an undue concentration upon one set of data which has been fairly accurately measured and formalized (including use of mathematical equations, etc.), to the detriment of other important factors which are less easily formalized or amenable to precise 'daylighting' measurement. The example given seems to be an excellent illustration of this. However, the 'attempt to transfer uncritically the methodology of the physical sciences to the study of human action' is not obviously the same thing at all. In fact it is not obvious from the article that the methodology of the physical sciences cannot be successfully applied to the study of human action; it can obviously be misapplied, but so can practically anything.

Different again is the assertion that 'Scientism' is linked with 'pseudoexactitude, of embracing incongruous models of scientific method and conceptualization.' Also with 'taking quantitative and experimental methods beyond their proper domain.' and 'repressing creative deviation in the interests of national order.' The meaning of these statements seems questionable to say the least, and do not appear to contribute towards a definition of 'Scientism'

It is certain that we must be clear on the meanings of our terms, but what could possibly be meant by a 'plan/ performance system?" Again, in what sense could anyone who is guilty of scientistic thinking, make the assumption which Ryle is attacking, namely, 'that a performance of any sort inherits all its title to intelligence from some anterior internal operation of planning what to do.' It seems to me that Ryle has been totally misunderstood here, for surely he makes the point that the criteria for intelligence in a performance are found in the manner of procedure and not in special antecedents. The connection between Mr. Musgrove's distinction between 'procedural models' and 'regulatory models' and this point made by Ryle is thus very unclear.

It should be self-evident that people who are interested in the design process ought to know what they mean by the term 'analysis.' However to point to philosophical controversy about the nature of philosophical analysis and use this as a prima facie example of the concepts of design-theorists, is pretty ridiculous. Russell, Wittgenstein and others talk about the analysis of statements (or propositions, or sentences) and occasionally of concepts. They do this in a very technical sense which is at present remote from the needs of designers who are concerned with analysis of problems and situations in terms of needs, resources and techniques.

However, this subject is probably still fairly open and the two senses of 'analysis' may be nearer than expected, though John Musgrove's remarks in this area do not help much. One possible connecting link where philosophers and designers may have similar concepts is in the field of 'analysis' of spatial wholes into components. This field has been examined to some extent by Russell.

However, all this requires a lot more study and no doubt should provide useful material for future articles.

Yours, etc.,

W. H. NANKIVELL

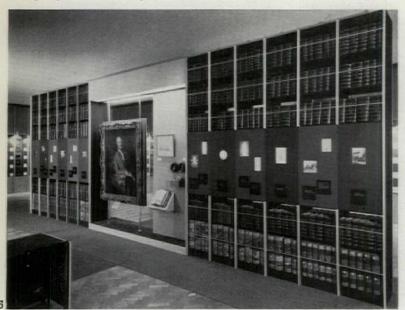
Melbourne, Australia.

Mr. John Musgrove replies: 'Lack of definition' in my argument stems principally from brevity. I was concerned with making one or two points which seemed to me to have some urgency, whilst carrying on a study which I hope to publish more fully elsewhere. I apologize for the shorthand and will answer the three main comments (again, briefly):

Paragraphs 3 and 4 refer to Schoeck and Wiggins' definition of scientism, not mine.

The context of my quotation from Ryle is a discussion of 'category mistakes.' I still consider it directly apposite, as the confusion between procedural as opposed to regulatory modes of activity constitutes a 'category mistake' in Ryle's sense. I accept the criticism that my article does not make the connection clear enough.

The Bi-Centenary Exhibition of Christie's, the auctioneers, held in London in January, was designed for them by John Bruckland and Ronald Sandiford. 5 shows the centre display unit in the ante-room, containing the Gainsborough portrait of James Christie (lent to the exhibition by Mr. Paul Getty), various pictures and historical items, the catalogue of James Christie's first sale, bound catalogues and day-books covering 200 years and colour transparencies of notable recent purchases.



I maintain that citing philosophical argument about 'analysis' is not in the least ridiculous. What other kind of argument is there to bring to bear on a situation where no two users of the term mean the same thing? Is Mr. Nankivell suggesting that 'analysis' is a term, the meaning of which may vary with the nature of the 'whole' to be analysed—i.e. that analysis of a problem is a different category of activity to the analysis of a proposition?

What a pity, incidentally, Mr. Nankivell did not tell us whether or not he is an architect.

CRISP

To the Editors.

sirs: In an interesting letter in your February, 1966, issue Professor Peter Collins discussed the use of the word 'crisp' in architectural criticism, saying that he could not recall ever having noticed the word applied to architecture in any book published before the last war.

Recently I chanced upon an example of the use of the word in architectural criticism as early as 1895, and by nobody less than the great American critic Montgomery Schuyler. This was in an article entitled 'The Works of the Late Richard M. Hunt' in the Architectural Record, which was reprinted in 1961 in volume II of American Architecture and Other Writings, edited by William H. Jordy and Ralph Coe (The Belknap Press, Cambridge, Mass.). The following passage by Schuyler, discussing the Coal and Iron Exchange (1873-76) in Cortlandt Street, New York, will be found on page 515 of that volume: 'The detail is still unmistakably neogrec, but it is by no means so insistent as in the architect's earlier works in the same kind, as in the Brimmer houses, in the buildings for the Divinity School at New Haven, in the Victoria Hotel, or in the Presbyterian Hospital. Not all of these, indeed, can be classified as neo-grec at all, though they all bear unmistakably the same impress, and are in the same manner,

The building under discussion no longer exists.

whatever difference of detail a minute

examination may reveal. The detail

here is, if I may say so, less sudden;

Yours, etc.,

MARCUS WHIFFEN

Arizona State University.

it is more crisp and effective.'

BOILER CHIMNEYS

To the Editors.

SIRS: I read with interest the informative article on the above subject by Mr. David Kut in your November issue. Mr. Kut states that the use of aluminium-clad chimneys 'is becoming increasingly common.' I think this may be open to dispute. Aluminiumclad chimneys do not, in fact, provide the insulation values essential for many modern boiler installations. As boiler efficiencies keep on increasing, flue-gas temperatures fall lower and lower, and if smutting and corrosion are to be avoided, it is imperative to maintain the inner walls of the chimney above the dewpoint of the gases. The modern, high-efficiency boiler demands high-efficiency insulation. For example many applications now require thermal insulation 'U' values as low as 0.25 which aluminiumclad chimneys of any great height are unable to provide. Enforcement of the Clean Air Acts results in greater chimney heights and the standard efficiency of aluminium-clad chimneys will not guarantee corrosion-free operation in the higher sections of the chimney.

A further limitation to this type of chimney is that, as the internal skin forms the loadbearing element, regulations require that inspection panels be fitted in each section of the chimney to facilitate regular inspection. This should be carried out at intervals of not more than eighteen months and requires scaffolding or use of a crane in addition to the necessity of shutting the plant down. Where a double-skin chimney is constructed so that the external skin forms the loadbearing element, the insulation can be packed in the factory before delivery to the site, which avoids settling, and the resulting possibility of 'cold patches' and prevents ingress of moisture. Furthermore, it can be left intact throughout the life of the chimney. In an insulated double-skin chimney, however, the low temperature of the external skin not only preserves the finish, but enables repainting to be undertaken at any time. Although the life of the finish depends to some extent on the degree of pollution in the atmosphere, the practice of my own company is to recommend repainting on approximately a five-year cycle.

A further, very substantial advantage of a well-insulated, double-skin chimnev is that one stack can be divided into two or more compartments to serve several boilers. In the aluminiumclad chimney, however, the divider plates cannot be insulated from the internal skin and therefore the heat loss between compartments when the boilers are operating on part load results in differential expansion being transmitted to the inner skin. This can cause buckling or leaning, which in a high chimney could result in the cladding being distorted. The principle, however, of using concentric flues separately insulated and clad with aluminium on the outside is very sound practice, but can be rather expensive.

There is a quite separate aspect of chimney design which I think merits brief mention. The Clean Air Acts and the Memorandum on Chimney Heights are designed to ensure that the plume of exhaust gases is discharged at a height which is great enough to ensure adequate dispersal. The same effect can, however, be obtained if a truncated cone is fitted to the top of the chimney and the plume is discharged at a lower height but with an efflux velocity which will produce a plume pattern equivalent to that of a parallel chimney of greater height.

This design is accepted by local authorities in various parts of the country as fulfilling the requirements of the Clean Air Acts, and in one instance such a chimney of 93 ft. in height was accepted as an alternative to a fully parallel chimney which would have been 115 ft. high.

Yours, etc.,

Glasgow.

A. D. THIRD (Research Director, Thermotank Ltd.) Mr. David Kut replies: Dr. Third's letter elaborates a number of points made in my article. These are particularly valuable, as they come from the pen of someone intimately concerned with the manufacture and testing of double-skin insulated chimneys. To put the record right, detailed reference was made in my article to double-skin chimneys, to chimney terminals designed to give a high efflux velocity and to the inadequacy of the thermal insulation provided by tall aluminiumclad chimneys without thermal insulation material between chimney and aluminium skin.

I was very interested to learn that local authorities have in the past agreed to reduce the 'Memorandum Chimney Height' when a high velocity efflux terminal has been provided, and this point could be of great interest. Reference was made in my article-and a photograph included-of efficient compartmented chimneys included within aluminium cladding and it might well be that manufacturers of aluminium-clad chimneys might wish to comment on some of the statements made by Dr. Third. He mentions that double-skin chimneys need be painted only every, say, five years; an aluminium-clad chimney would not require painting at all.

book reviews

LIBRARY LIST

BRITISH PUBLIC LIBRARY BUILDINGS.

By S. G. Berriman. and K. C. Harrison
Andre Deutsch. 7½ guineas.

This volume is a listing of about 300 postwar structures, over 60 of which are illustrated and annotated. The list is prefaced by a twelve-page introduction referring to various other sources and concludes with a plea for flexibility within the buildings of an expanded library programme. Very few of the mainly post-1960 municipal and county libraries illustrated are of functional, formal or technical interest. Those wanting a complete catalogue will find this book a well documented record; those looking for principles of library design may well be disappointed.

Books by non-architects about buildings are always difficult; this volume, although by extremely distinguished authors, is no exception. That the problem is however not insuperable was recently shown by Keyes Metcalf's Planning Academic and Research Library Buildings (McGraw-Hill Book Company, 1965). Its intention is of course quite different; it deals with those aspects of library design in which the specialized knowledge of librarians is particularly relevant. British Public Library Buildings is principally an unselected picture record and as such makes it difficult for architectural sympathies to be engaged. MICHAEL BRAWNE

LIFE OF BUMPS

MISS JEKYLL: PORTRAIT OF A GREAT GARDENER. By Betty Massingham. Country Life. 63s.

Apart from fourteen works by Gertrude Jekyll herself, the bibliography in Mrs. Massingham's book refers to no fewer than sixty publications, most of them well-known, which are related to this great gardening pioneer. No one, in this country or anywhere else, can have had so much influence on the design of planting. Mrs. Massingham is more concerned with personality than influence, and her charming book takes us behind scenes to meet 'Bumps' herself and feel the warmth of her personality. For Miss Jekyll, as well as being far more cultivated than her contemporary gardeners and with a wide circle of friends eminent in the arts, was above all a gentle and loveable body. Her true portrait lies in the Two Boots by Sir William Nicholson, illustrated on the dust jacket. The rest of the book is a fascinating explanation of these boots.

For architects the most interesting aspect of Gertrude Jekyll is undoubtedly her relationship to Sir Edwin Lutyens. This runs like a thread through the whole book, and illuminates a partnership in design that has found a place in both architectural and garden history. It is significant that the only known work by Lutyens before he met Miss Jekyll is recorded by Mrs. Massingham as being without much interest: that his finest works were the country houses and gardens carried out in association with herself around the turn of the century; and that when he became eminent and received great commissions, these lacked something of the earlier inspiration. Her visual contribution to the partnership was planting conceived as an art rather than as horticulture; her indirect and probably more valuable contribution must have been that she imbued the geometric architect with a passionate sense of natural landscape, whether it was of the disposition of the environment as a whole, or of the materials of which this environment was made. The myopia that affected her eyesight at an early age and forced her to leave the other arts in which she was interested. and to take up gardening, may have been a tragedy for herself, but was not so for posterity. G. A. JELLICOE

REVELL RECORD

VILJO REVELL: WORKS AND PROJECTS.

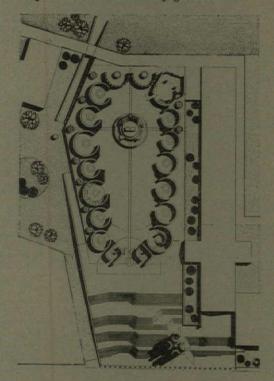
Edited by Kyosti Alander. Helsinki: Otava
Publishing Co. (No price given.)

Revell, whose death in 1964 at the age

of 54 was a sad loss to Finnish architecture, had begun compiling this record of his work a year or so before. It now comes out, with text in English and German, under the able editorship of the director of the Museum of Finnish Architecture who has also written a sympathetic preface. It is significant not only because of the quality of the work shown (which ranges in time from the Palace Hotel. Helsinki, designed in 1949, to the highly original project for the Peugeot Building, Buenos Aires, begun in 1962) but because of Revell's position as the second most influential architect in Finland and the man round whom the younger men gathered who preferred clarity and rationalism to the romanticism and individualism of Aalto. Revell had begun as Aalto's pupil and owed a lot to him-as does every architect in Finland-but his qualities were more in the main stream of international development and Finland's position as an important contributor to the mature development of this stream is due largely to Revell. The buildings in this book illustrate that development admirably.



Plain cylinders of brick form the whole wall structure of a recently completed church at Todi, near Perugia, by Julio Lafuente. As the plan shows, each cylinder contains a chapel, opening to the nave. The photograph opposite looks upward to the rooflight that crowns each chapel—more illustrations on pages 221-223.



Peter Collins

OECODOMICS*

'Perhaps it is the almost total irrelevance of architectural theory to architectural practice that drives historians of the Modern Movement to despair, cynicism or—worst of all—eighteenth-century studies.'

With this sentence, Reyner Banham began his review of Renato de Fusco's L'Idea di Architettura in the AR last July. In its context, it was simply a witty paradox introducing some pointed comments about Ruskin, Croce, etc.; but isolated from its context, it distends to constitute an ominously disquieting apophthegm. For if, in fact, architectural theory is considered among the intelligentsia to have 'almost total irrelevance to architectural practice,' either the word 'theory' is being used merely as an existentialist gibe, or else Dr. Banham's definition of 'theory of architecture' needs a radical overhaul.

His own first book, it will be remembered, was entitled Theory and Design in the First Machine Age; but curiously enough, on the few occasions when the word 'theory' occurs in the text, it occurs in conjunction

with such adjectives as Cubist, Elementarist, Futurist, except of course in the first few pages, when he discusses Guadet. In other words, though the title might lead one to think that Dr. Banham is concerned with theorists of architecture, he is only in fact concerned with what he calls on page 66: 'theorists of Abstract art.' Now if the purpose of his book was to demonstrate that the architectural ideals most vociferously enunciated during the First Machine Age were in fact architecturally-irrelevant theories of painting, sculpture, literature and music, his argument is, in my opinion, brilliantly conclusive. But if this was not his purpose, it would be fallacious to deduce from his evidence that 'architectural theory' was, is, and always will be, eye-wash.

^{*}Since neologisms like 'Ekistics' and 'Semiotics' are fashionable nowadays, Professor Collins has preferred 'Oecodomics' to 'The Theory of Architecture' as the title of his essay. But the term is simply a Greek equivalent of De Re Achitectoria, and should therefore be strenuously resisted by all who share his view that 'The Theory of Architecture' is still an appropriate and meaningful expression.

Before going any further, I suppose I must stick my neck out and say what I personally think the term 'architectural theory' did, does, and always should, mean. This is embarassing, not because I have any doubts on the matter, but because 'Vitruvius, Go Home' was the most inspired lecture-title Dr. Banham ever devised. However, since Vitruvius, whether we like it or not, supplied the most enduring definition of architectural theory so far published, it will not be amiss to begin with his definition of Ratiocinatio*: 'Theory is that which is able to explain and analyse material constructions by the exercise of skill and reason.' In other words, theory for him, as for me, means the sum total of academic knowledge required to design a building, as opposed to the sum total of

practical experience.
To avoid the opprobrium attached by Dr. Banham to 'eighteenth-century studies,' I will gloss over the fact that the traditional interpretation of 'architectural theory' was first undermined in that era by the ruins of Athens (when J. D. Leroy divided his book into two parts so as to study the buildings (a) as related to 'history' and (b) as related to 'theory'), and simply assert that the subdivision of architectural studies into 'theory' and 'history' officially occurred in 1818. In that year, the French Government, when revising the Statutes of the Ecole des Beaux-Arts, created a second architectural professor; and in order to distinguish between the two, the first was called 'the professor of

theory' and the second 'the professor of history.'

This official distinction could not have occurred at a more opportune moment, since Historicism, in the form of archaeological Revivalism, had already eroded the traditional roots of architectural evolution beyond repair. Unfortunately, however, the schizophrenic system of teaching developed in Paris in the nineteenth century disregarded the distinction between history and theory, and as a result made the confusion worse. Successive professors of history, being practising architects, understandably tried to relate their courses to contemporary problems. But the professors of theory thought only of justifying the tectonic forms they favoured by triumphantly demonstrating their primeval origins. Indeed, one professor of theory, J. B. Lesueur, actually entitled his book: The History and Theory of Architecture.

Julien Guadet was probably the first professor of theory to attempt to find a way out of this dilemma. Appointed in 1894, at the age of sixty, his basic solution was certainly not ideal; but at least it was clear-cut, and developed with extraordinary lucidity. He took 'theory' to mean the detailed study of building-types which the students would one day have to design for eventual clients; and as far as he was concerned, history could be taught in any way the archaeologists wished.

The conventional prohibition against criticizing (and hence mentioning) the works of living colleagues naturally inhibited him when dealing with the more immediate aspects of contemporary building-types; hence much of the information he imparted was inherently obsolete, and would have remained so even if steel and reinforced-concrete construction had not just then been invented. But when all his difficulties are taken into consideration, his attitude must com-

mand our respect, since he was more concerned than any of his predecessors with giving students solid notions on which they could develop and assess future designs. Perhaps his philosophy of teaching is best summed up by a remark in his lecture on theatres. Commenting on Charles Garnier's elaborate analytical monograph, he said: 'unfortunately this sort of book is rare; I regret it all the more because if there existed one for each type of building, the collection would constitute a complete course on the theory of architecture' (iii. p. 73).

The task of those who immediately succeeded Guadet was unenviable, and the first occupant remained in office until 1933 without giving any lectures at all.† In 1937 Georges Gromort made a gallant attempt to evolve something different; but although in the preface to his own course he dismissed Guadet's course as mere history, the bulk of his book is little more than a superficial summary of Guadet's text. However, he seems to have felt certain in his own mind that this superficiality was one of the prime virtues of his approach. 'The theory of architecture,' he asserted in his preface, 'is that ensemble of uncontested principles which are equally valid for every type of building.' Thus, following Auguste Comte's dictum as quoted by Vaillant; (to the effect that 'true theory is always general, just as healthy practice remains constantly special'), and pursuing a method already popularized by Trystan Edwards and others, he elaborated upon such generalities as 'unity,' 'duality,' 'contrast,' etc., thereby boosting an abstract notion of 'architectural aesthetics' which had been hotly repudiated by Guadet and his friends, especially after Viollet-le-Duc (who was responsible for instituting a Chair of Aesthetics at the Ecole des Beaux-Arts) had been replaced by Hippolyte Taine.

All-embracing theories of 'aesthetics' today reign supreme, and since we no longer consider it indelicate for a professor to discuss the work of his colleagues in front of his students, it would be flogging a dead horse to show that Guadet's approach is now hopelessly inadequate for present needs. But the main reason for this is that, whereas eighty years ago all the 'historical, theoretical and practical' knowledge required of an architect could be published in a single volume, such as Gwilt's revised Encyclopaedia, the knowledge required today is so complex and subdivided that many architectural students spend about three hundred and fifty hours a year in lecture-rooms during their five-year academic training. Thus the task of writing a modern synthesis of 'The theory of Architecture' would be as formidable as trying to bring Dr. Robison's Mechanical Philosophy up to date.

Many authorities argue, very cogently, that since the theory of architecture is so complex, and fragmented into so many disparate parts, a course of study specifically entitled 'The Theory of Architecture' is no longer valid, and hence the term itself is meaningless. I have every sympathy with the main conclusion, but none with its corollary. On the contrary, I would contend that it is precisely because the theory of

For the benefit of those Latin scholars who at this point are taking out their pens to write a letter to the Editors, I should state that every manuscript variation and printed Latin version of this text has been submitted to the Classics departments of Columbia and McGill, to I am well aware that there are as many translations as there are translators.

According to verbal information given me by his son-in-law, Paul Gélis.

architecture is so diffuse and subdivided that a synthesis is absolutely essential. An architect must not only know how to evolve designs; he must also know how to assess them. The means of achieving this within a university is of course debatable. Perhaps the answer is to be found in the arguments for or against the Intentions of Christian Norberg-Schulz. I myself believe that it is impossible actually to teach students the criteria of assessment, and that all one can hope to do is provide the stimulus and techniques which will permit each student to evolve a true philosophy of design for himself.*

I am convinced that it is wrong, in this age of constant change, even to attempt to impose a neat philosophy of architectural ideals on architectural students. Moreover, gifted and imaginative students would reject such an attempt with derision. Hence it would seem to me that the problem confronting our schools of architecture is not how to expound a viable and coherent theory of architecture (which still means, for me, those unlimited permutations of Firmitas, Utilitas and Venustas which can produce the best environment with respect to each individual programme), but how to expound the history of theory in such a way that each student can then go on to create a theory valid for his own generation.

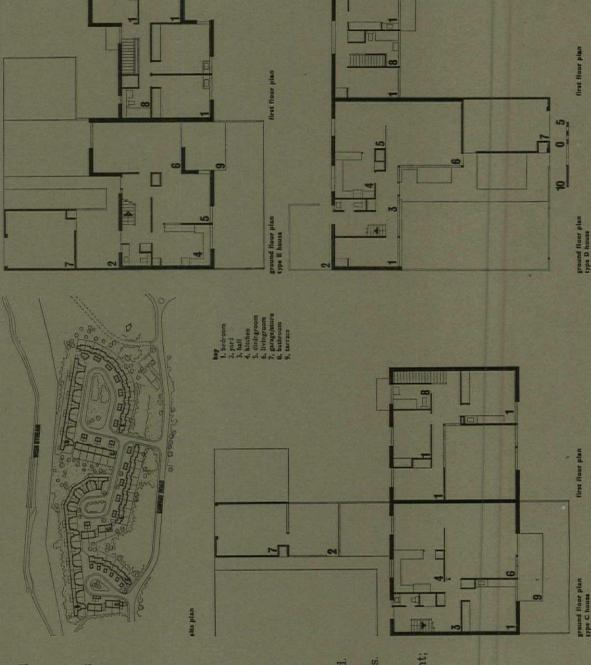
This of course involves an appraisal of the meaning of Dr. Banham's term: 'historians of the Modern Movement,' since architectural history is too readily evaluated today in its threadbare nineteenth-century terms as the science of attributing precise dates to extinct ornament. Anyone who has attended congresses of architectural historians will be only too well aware that these meetings are still dominated by arthistorians and archaeologists who are concerned with little more than the classification of forms: chronologically, morphologically, or chrono-morphologically†; that the majority of participants tend to be indifferent to the synthesis of forms/programmes/technology/ environment. I do not despise the work of these scholars; but it is useless to architectural students unless someone has first sifted it for such theoretical implications as it may contain.

To sum up, then: my view is (a) that each student must be given the appropriate means to create his own viable, synthetic theory of architecture, and (b) that the most promising way to achieve this would seem to be by discussing fully, in his presence, all the architectural ideals formulated since the invention of printing. If philosophers limit themselves to the architectural implications of symbolism and semiotics (i.e. to purely abstract 'theories of form'), and if historians limit themselves to digging in Anatolia, no harm will be done; but each architectural student will then have to fend for himself. For it cannot be emphasized too dogmatically, pace Dr. Banham, that all conscientious architects evolve some theory of architecture of their own, whether it be good, bad, or indifferent; and their teachers' main concern must be that a viable, coherent theory should have taken possession of their minds before they are legally empowered to modify the environment in which we

^{**} Of. Guadet. 1. 652: 'I shall be happy and proud if, when you think over these lectures, seeking to summarize their contents for yourselves, you find that the only way to condense their substance is to use the single word: TEUTH.'
† The most advanced stage of the disease. For example, no one now knows whether Baroque is a morphological or a chronological term. Architectural taxonomy has reached such profundity that we find Professor Morrison claiming that the earliest 'Georgian' house in North America was built in 1688, whilst Professor Gowans has named the period from 1725 to 1750: 'American Queen Anne'...

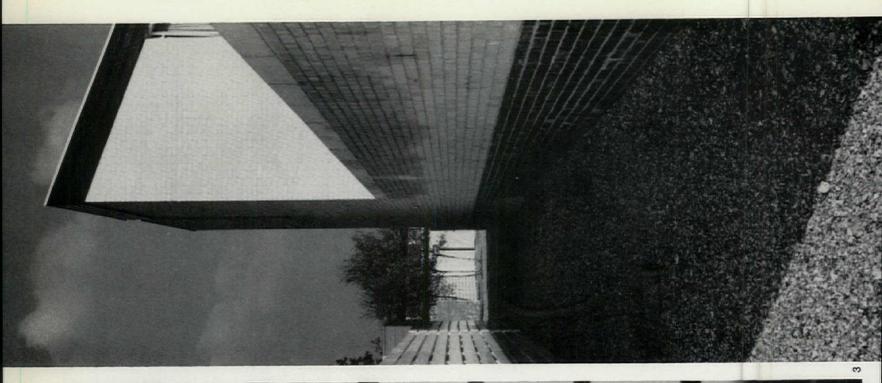
This scheme provides 72 four-bedroom houses for married officers, 42 of which (to be occupied on annual tenancies) are for officers, principally from overseas, attending the Staff College, Camberley, and the remaining 30 (on longer tenancies) for officers at the Royal Military Academy, Sandhurst. Each house is 1,500 sq. ft. in area plus a 16ft. by 9ft. garage. The site is 13 acres of heathland surrounded by trees and sloping from the north-west. The houses are placed away from the existing road at the top end of the site and are arranged in three clusters, each cluster being planned around a looped access road. There are three basic and fundamentally different type plans, all designed, however, to contain similar fittings and furniture.

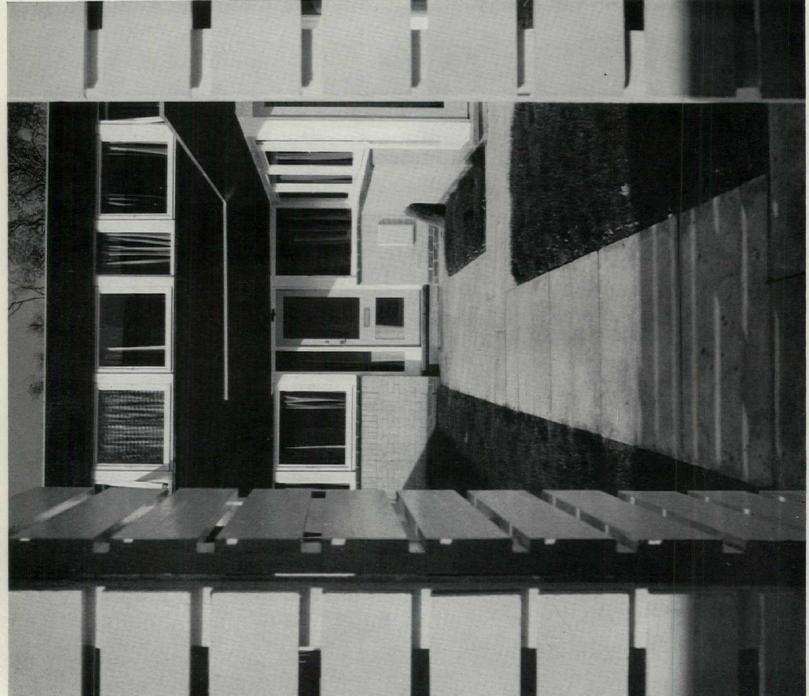
Public Building and Works). Assistants, Philip Sargeant; heating from gas boilers, supplemented by electric fires. with felt and chippings. Windows are painted softwood. The houses have either under-floor coil or warmed air backed by clinker blocks. The wall on the access side of some of the houses is wood framed. Internal walls external cavity walls having flint-lime facing bricks are brick or clinker block. Timber roofs are covered & Partners. Quantity surveyors, Ministry of Public Construction is load-bearing brick and timber, the Electrical and mechanical engineers, C. W. Glover Bryan Collins; Timothy Bunting; D. P. Quin. Civil Spandrels are black colour-glaze asbestos cement Building and Works. For contractors see page 242. Partner in charge, John Bicknell (in consultation with the Director-General of Works, Ministry of engineers, Roughton, Campbell and Fitzgerald.

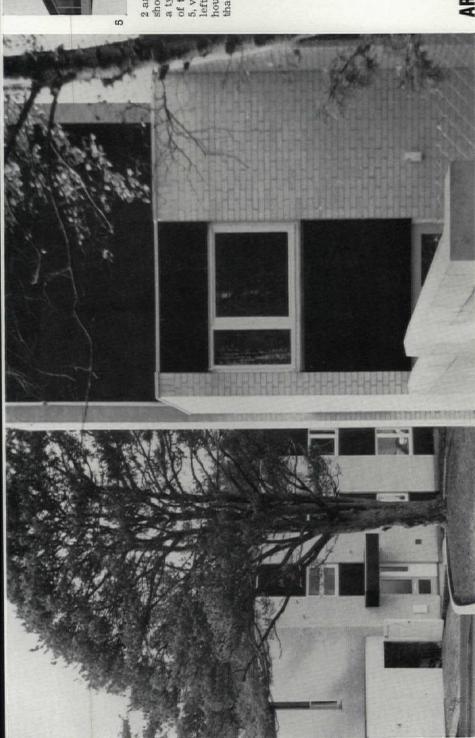


1 (opposite), type D houses seen from the south west across the small planted close in the centre of the site.



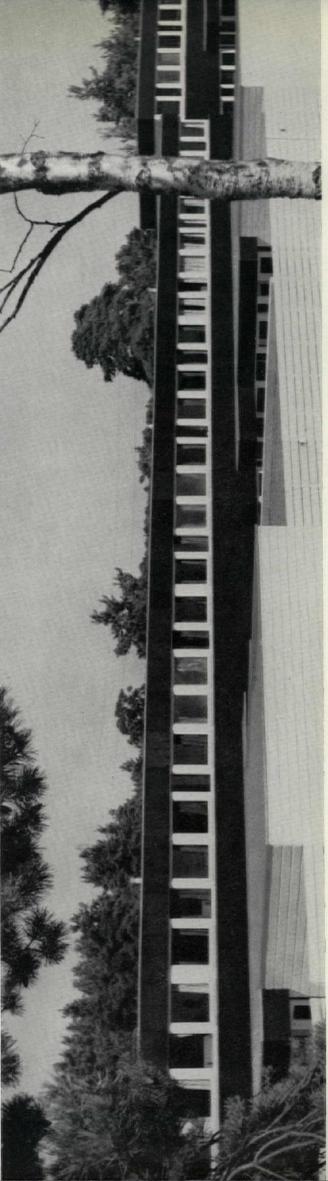


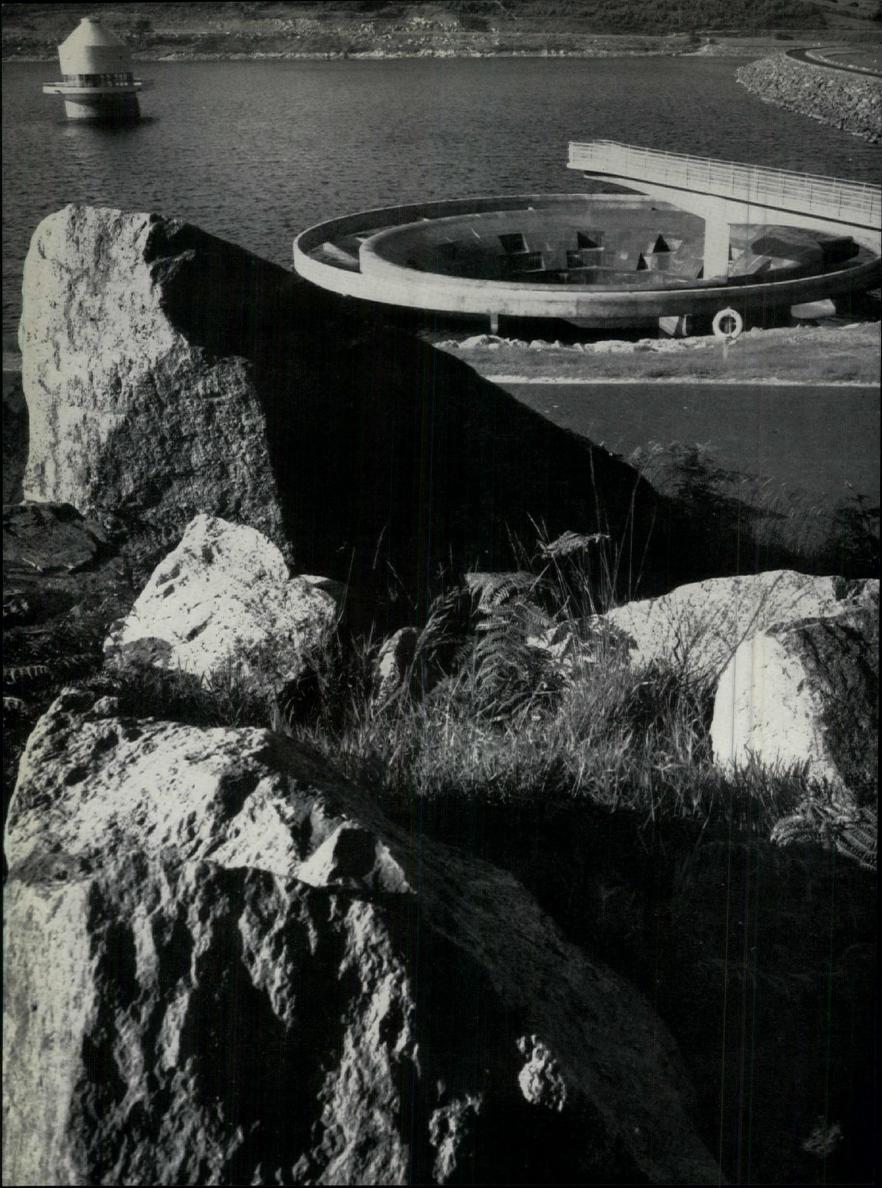






ARMY HOUSING, CAMBERLEY, SURREY





RESERVOIRS

Now that water supply in Britain has been put on a national basis by the setting up of the Water Resources Board, rivers will be increasingly used for moving water about the country and more and larger reservoirs will be constructed. Until recently the design of reservoirs has been an engineering process, but shrinking land resources and the demands of recreation make it essential that landscape should be an integral part of the design. This article considers some of the visual problems that arise when a valley is drowned through damming a river, and illustrates some of the theories put forward by the example of the recently completed Tryweryn reservoir in Wales (1, opposite), later named Llyn Celyn (Lake of Celyn, after the drowned hamlet of that name), for which Frederick Gibberd was landscape consultant. The reservoir was constructed by the City of Liverpool to impound the waters of the Afon Tryweryn and its catchment area, from which it is discharged some seventy miles down the River Dee, where it is treated and pumped to storage reservoirs.

There is not, as is sometimes supposed, any shortage of water in this country; there is ample flowing overground in rivers, or stored underground in strata, to meet all the foreseeable needs for many years. Shortages exist, and their cause is simply that the demand for water is steady, whilst the rate of natural flow is variable. Such shortages are aggravated when large concentrations of population grow up remote from large sources of supply-for example, in the dry areas of the Thames estuary the water used exceeds the natural supply; but for the country as a whole only about 6 per cent is consumed. The obvious solution to these problems is to store the high winter or flood flows in reservoirs for use in dry periods. One of the simplest and most economical ways of doing this is to dam a river in its upper reaches of high rainfall, hold the water in a lake and pipe it or let it down the river to the centres of demand in periods of drought.

Forming a lake means obliterating an area of landscape for all time; it is literally drowned, and constructing a dam across a valley abruptly changes its charactersmall wonder that the amenity battles fought over reservoir proposals are as violent and bitter as any over power stations and motorways. It is not unusual to find objectors to reservoir proposals putting forward alternative sources of water, such as desalination, barrages across estuaries and underground strata; but it is the hard fact that these are, as yet, so far undeveloped or so costly that for some years to come the catchment areas of rivers will continue to be the source of water supply, which means, in terms of the landscape of this country, the construction of many new reservoirs to control their flow.

The ideal valley site for a reservoir is one with a non-permeable bottom, steep sides and a narrow neck across which the dam can be thrown, and such sites occur most of all in the wild natural areas of the north of England, Wales and Scotland, the national parks being particularly vulnerable. In the south, where the demand is great, suitable sites are fewer and they occur in fertile valleys with shallow sides. Wild landscape, or agricultural landscape, it seems inevitable that there must be conflict with the National Parks Commission or the National Farmers' Union, or both.

The greatest loss to the landscape of the country is, of course, the rapidly shrinking areas of wild landscape. As a nation of gardeners we feel passionately about the preservation of 'beauty spots' and when there are overtones of local or national pride opposition can become violent: Tryweryn Reservoir in the Snowdonia National Park became a battle ground for Welsh nationalism. The situation is aggravated by the consumer, in the form of the water company, being remote from the source of supply; it is disconcerting, when walking in Wales, to be confronted by a notice-board of bye-laws, signed by the Town Clerk of Liverpool.

Water is indispensable: both the consumers and the amount of water they consume are rapidly increasing; but it is not only a matter of baths and lawn sprinklers in summer; water is as indispensable to industry as power and transport. The recent highly controversial proposal for the Cow Green Reservoir in Upper Teesdale does not originate with the Tees Valley & Cleveland Water Company; it is ICI who want the water for their plant at Billingham. The water undertaking has a duty to provide water and so it finds itself in the unhappy situation of being ranged against such champions of the beautiful as the Council for the Preservation of Rural England, the Ramblers' Association and the Country-wide Holidays Association. However conscientious the water company may be in discharging its responsibilities, it will be branded as 'they': the hard, impersonal despoilers of natural beauty. This unfair and unhappy situation should, in time, be righted; for we have, with the setting up of the Water Resources Board, recognized the need for national planning. When a plan does exist, there will be assurance that there is no reasonable alternative to the sacrifice of an area of natural beauty; the long preliminary period of inquiries, with their intrigue, cost and appalling waste of time (only one side can win), can be drastically reduced.

The Water Resources Board operates at national level; it will be the planner of the water resources of England and Wales, with such practical tasks as the building up of comparable data about resources and the demands upon them, and the promotion of schemes for water supplies. Just as important, it can commission or undertake research into such problems as the recharging of areas of natural underground storage, desalination and barrage schemes. At the regional level, the country is divided into River Authorities who are the 'executive arm' of the new system, discharging their water resource duties under the guidance of the central board.

The visual changes resulting from the new system will be considerable. Instead of a host of water undertakings meeting local needs from local sources or, when local sources are polluted, piping it across the countryside from a remote reservoir, there will develop a new regional technique using rivers as giant aqueducts for moving water about the country from areas of high rainfall in the upland regions to the areas of population where it is abstracted and purified. Regulating reservoirs will allow the successive re-use of the water down the river, and the whole scale of the operation can be extended by the transfer of one regulated river to the upper reaches of other rivers, such as the Severn to the Thames. Apart from the obvious advantage of the change from local to regional scale, there can be considerable improvement to the landscape of the country; the rivers themselves will have improved flows, the flooding of land will be mitigated, and the reservoirs themselves can change from the single use of supplying water to become important centres of recreation.

The new scale of reservoir construction and their multiple use make landscape design an essential part of the programme. It must no longer be a question of a reluctant water undertaking calling in a landscape consultant, under pressure from a county council, or as a result of a government order; he must automatically be involved in design from its inception and that means giving his views on the choice of site—a hitherto unheard-of procedure in the world of water engineering.

Changing the landscape

Four major landscape changes take place with the construction of a reservoir. First there is the change from land to water. Most people like the appearance of a lake; the objections arise when it is badly designed-that is, when it causes the topography to look unnatural in appearanceand they arise when it looks inappropriate to the character of the existing landscape. The second great change is the complete obliteration of an expanse of countryside that has taken centuries to develop. Being a valley bottom, it will be the most fertile. the most worked by man and the smallest in scale. At Derwent, on the Durham-Northumberland border, it was disturbing to lose some of the best agricultural land in the district; at Tryweryn, in Merionethshire, there was no loss to agriculture but one mourns the obliteration of all the small-scale details like tiny waterfalls cascading between rocks in a setting of moss and ferns, an enchanting fairyland made by nature and sheep farming.

The third change is the junction between land and water. Instead of the balanced ecology of a river bank there is an abrupt and illogical severance of the land: it is as if it had been cut by a knife; no matter how skilled the new landscape design may be, it will be many years before the land and water will fuse naturally together. And they will never appear completely natural; for areas of bare ground will be exposed when the reservoir is drawn down in summer—the period, incidentally, when most visitors come to the reservoir.

The fourth landscape change is the introduction of the dam itself across the neck of the valley. It is a large man-made artifact and even if formed by an earth bank it will appear an intrusion in the natural scene-no one has yet made an earth bank of geometric cross-section look completely natural. There is one further possible condition that can change the character of the landscape when the dam is of earth, and that is when insufficient material for building it can be dug out from the bed of the lake. 'Borrow pits,' as they are so inaccurately termed (for nothing is returned), may cause considerable scarring to the landscape, which only skilled treatment and time can repair. With most reservoir proposals there is often the fear that the buildings required, such as the control and recorder houses, will conflict with the scene. Whilst this is not without some foundation, there is no reason why the buildings should be more of an intrusion than a large farmhouse and its attendant barns and silos.

The character of the site

In the survey for the ideal valley form in which to contain the reservoir, the interests of landscape architecture are likely to coincide with those of water engineering. Thus a steep-sided valley has a larger capacity than a shallow one of the same area, and the steeper the bank the less the unpleasant expanse of mud exposed when the water is drawn down; again, the narrower the neck of the valley the shorter and cheaper the dam and the less the intrusion of an alien form into the natural scene; yet again, the more the material that can be dug from the site of the reservoir for constructing the dam the greater the capacity and the less the need to disfigure the land with borrow pits.

Once a decision has been made on the site, it is probable that the basic features of the reservoir, the position and size of the dam, the extent of the flooded area and so on, will largely be determined by geological, engineering and economic considerations. After the preliminary ecological, climatic and visual surveys, the landscape problem is primarily concerned with assessing the character of the site, because only by an understanding of the environment is there any possibility of the introduction of a vast lake without conflicts being set up.

Land form, plants and water are the three basic materials of landscape design, and so the introduction of a lake should not set up any fundamental conflicts. The vast sheet of water not only introduces a new scale and magnificence, but it obliterates all the smaller elements that inevitably occur in the valley bottom. This means that the new landscape design must be bold and decisive. Tree planting, in the form of broad masses and shelter belts, will form a series of visual compositions dependent on the character of the land, the shape of the lake and the prospects over land and water. Thus the landscape of a wild natural site will be wild and rugged and give as little impression as possible of human activity; anything which is redolent of the humanized landscape of the English parkland, which might well be appropriate for a lush and gentle lowland site, would entirely destroy the character of the place. New planting will be directed towards emphasizing the existing character and developing the visual potentialities of the new elements introduced into it. Trees may be used to screen a view, or, alternatively, to underline it; they may be used to define spaces or contrast with the horizontal lines of field boundaries; they may emphasize a prospect by directing the eye to it, or by partial concealment; there is no limit to the variety of compositions, as no two landscapes are identical. The existing plant material will be a guide to the choice of species, and anything that is redolent of municipal planting will be rigorously excluded, even though it flourishes at many a reservoir. New species may be required, particularly in association with and in recognition of the new element, the lake:

but they should only be reluctantly introduced and, of course, after study of the site and climatic conditions.

The new scale of the lake will probably require the planting of tree masses and shelter belts to be developed in depth into the surrounding countryside, which means going well outside the boundaries of the reservoir site. A water undertaking will only acquire that land which is essential for its needs and, unless the site is part of a wider area under some form of public control, such as a national park, the landscape design will be abruptly and illogically terminated. Adjoining landowners may be persuaded to allow some shelter belt planting when it is in their interests to do so-(the experience at Derwent was discouraging)-but the problem cannot be satisfactorily solved until it is recognized as being a regional one. The water undertaking has no powers to acquire land for planting outside its area, even if it were persuaded to do so. The setting up of the new Water Resources Board is an admission that water must be put on a regional basis; it must now be recognized that the setting for the water must be placed on the same basis.

Complementary to the new planting plan is the conservation of existing features, particularly small-scale ones like a dry-stone wall, a hedgerow or a brook. Although individually unremarkable, they have an appearance of inevitability within the immediate environment, which is as important to the topographical character as the broad design. The physical disturbance caused by a large civil engineering contract running into millions of pounds can be devastating. Thousands of tons of material are moved about by giant machines and those who control them are not normally sensitive to incidental landscape details. Contractual procedure at a reservoir site is pre-planned for a smooth and efficient sequence of work; that planning needs to be extended to restrict the area of operation to the minimum. Plant should be sited within the area of the lake wherever possible, so that the scarring will be submerged; temporary road access should be to a minimum and any natural features within the area of the work that it is possible to preserve caged in barbed wire. These and other precautions of a like nature are of fundamental importance, for once the destruction has taken place it will be very many years before the original natural balance is re-established, if at all. The shape of the lake itself is determined by nature: when the reservoir is filled, the water will assume a natural shore-line which cannot be improved on. Where an aesthetic decision may be made is in relating the shore-line to the existing land pattern; that is, deciding the waterlevel from a study of the land form and planting-should it stop short of a copse? Is it worth leaving an island?—to take two simple examples. On this decision a major conflict can occur. As yet no landscape architect has kept the water-level below its maximum economic height, for the simple facts are that several million pounds are involved in the construction of the dam and its ancillary works and it is the top levels of the reservoir that have the greatest capacities; for example, the proposed reservoir at Cow Green has a dam some 80 ft. high but 44 per cent of the capacity is contained within the top 23 ft. So long as the landscape consultant is responsible to the water undertaking, the prospect of sacrificing water capacity for aesthetic appearance is remote.

The ideal lake shore is one of rocks and gravel, for whatever the level of the water, there is then a continuous ground texture disappearing into the lake. The most unpleasant is that of lush green vegetation, as with a water meadow, for the land is then separated from the water by a band of mud. Catch crops can be taken off broad mud areas in countries where there are long periods of drought, but the water line in Britain is subject to such variation that plant-life cannot establish itself. The shallowest areas, such as occur in creeks, can be adjusted by modern muck-shifting machinery: the ground excavated from some areas to steepen the banks and the surplus material dumped in others to raise them above top water-level-a system of balanced cut and fill. When wide areas of mud are inevitable they can, where appropriate to the character, be faced with shingle to make a beach; otherwise the only treatment that seems possible is to plant forest trees down to the water's edge to give an abrupt change in form between land and water and to mask the fringes. Once the reservoir is filled, the character of the plant life will itself change as nature adjusts herself to the new conditions. Water-loving plants like reeds and rushes will, in time, establish themselves on the fringes and extend into the water and those unsuited will die off.

The advent of the reservoir may mean considerable changes in the existing farming pattern. Some units will be so reduced that they are no longer economic and the balance of their land will be combined with other farms or put to other uses such as forestry. The re-arrangement of the field pattern will give opportunities for new lines for walls and fences and for introducing new planting so that the marginal land fuses naturally with the lake shore.

The dam and its landscape problems

The dam is constructed of either concrete or earth, the choice being determined by the nature of the foundations and the shape of the valley. Earth will normally be used in preference to concrete because it is

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cheaper, and so we find in this country concrete dams limited to wild rocky sites where the ground will have the greater bearing strength required by the foundations. Such sites have mostly been used up, and so future constructions are likely to be in earth, although there may be cases of composite dams such as that proposed for Cow Green reservoir, where one side of the dam is earth on a clay sub-soil and the other concrete on rock.

The landscape problems of a concrete dam are comparatively simple as compared with an earth bank. A reinforced concrete structure stretching between mountain crags, to take the most dramatic example, is acceptable as a man-made artifact in splendid contrast to nature: it is a problem of structural engineering and architectural form and the more audacious the design the more acceptable we find it. The earth dam looks more natural because of its softer forms and coverage of grass or other natural plant materials. But there is a disturbing dichotomy, for it is fundamentally an engineering structure of flat planes and straight lines determined by problems of stability, drainage and so on, a structure that can never look completely natural. It must follow that, as the dam will never have the hard appearance of an engineering structure, design can only be towards the other extreme; that is, to make it look as natural as possible, both as a bank and in the way it is fitted into the environment.

The dam is normally run straight across the valley to hit the banks on either side. with a violent clash of forms. When the water rate is no longer the sole criterion it may be shaped into the existing land form; this will probably mean that on the upstream side the straight line of the dam will be curved into the bank to produce a flowing water-line between the two elements and, on the downstream side, the flat, even slope will be smoothed into the uneven shoulders on either side. The land shaping may be taken a stage further by curving the dam itself, a form adopted at Tryweryn on the initiative of the consulting engineers. Curved or straight, the vast, even slope of the dam will always look unnatural from the important downstream views. The artificial appearance is emphasized by the terracing across the dam, berms, which are for slowing the flow of surface water down the face and for maintenance; but, as has been shown at Tryweryn, the flat planes of the terraces can be replaced by lines, in the form of open drainage

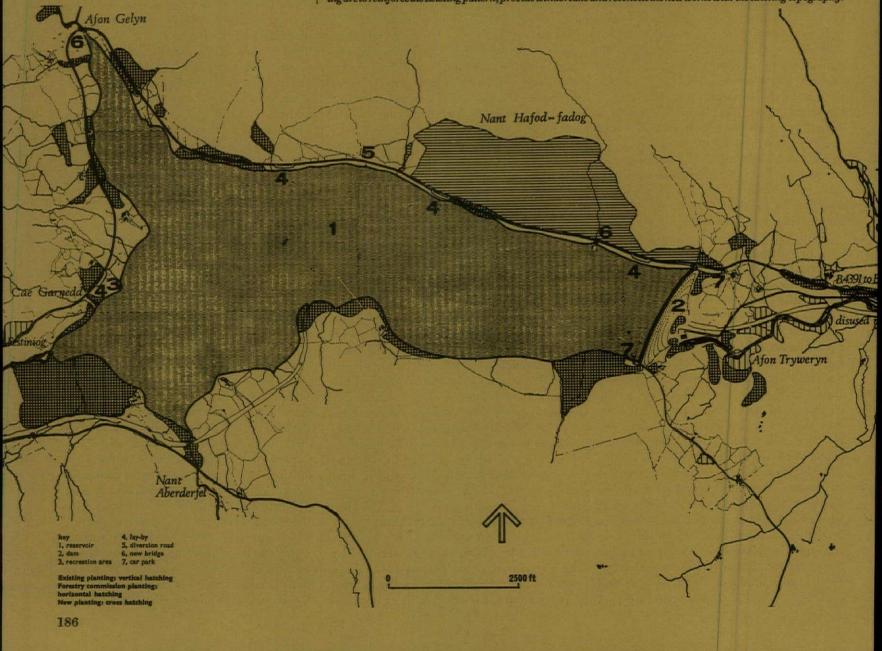
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channels. Perhaps one day someone will be persuaded to add extra material to the downstream face of the dam to vary its unnatural, even shape; at present, cost and drainage problems are the barriers.

The face of the dam is never planted with trees because of the fear that roots will upset the drainage and stability, but there are cases where trees have been growing on reservoir embankments for many years. The most that water engineers will tolerate is the mass planting of forest trees hard against the bank. Such planting, when skilfully related to the topography and extended in depth into the countryside, can do much to break the even plane of the dam and is particularly valuable as mass screening from distant views. It might be [continued on page 192]

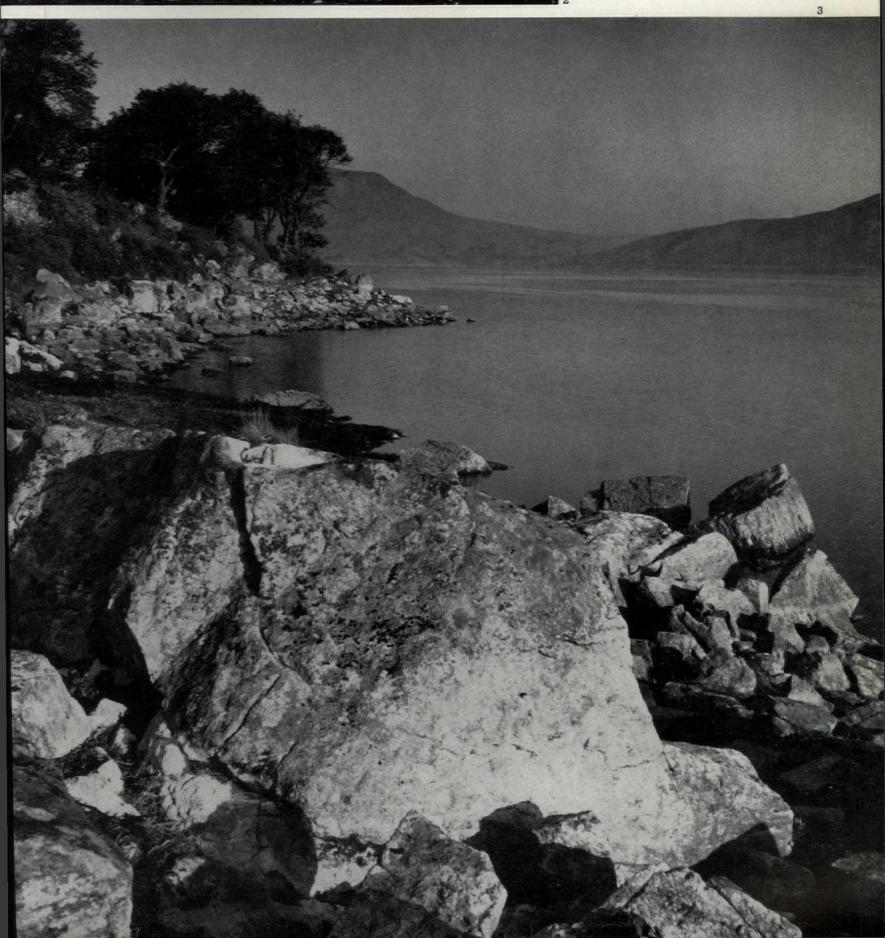


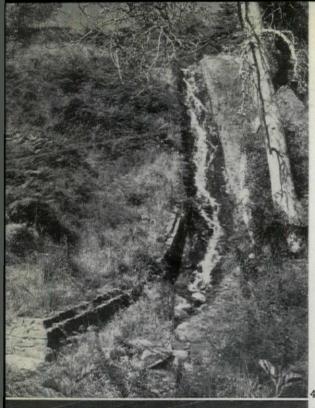
The small-scale plan above shows the siting of the Llyn Celyn reservoir (1) in the Snowdonia National Park, with Lake Bala (2) some five miles downstream, and the reservoir's catchment area (dotted). The plan below shows the new lake extending from the dam thrown across the steep and narrow neck of the valley, to widen out into the comparatively shallow valley of the river and its tributaries. The road diversion scheme and the new planting are to reinforce the existing pattern, provide windbreaks and reconcile the new works with the existing topography.

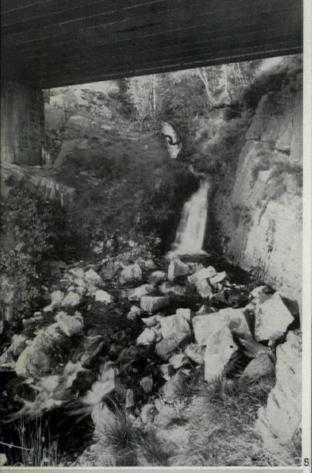


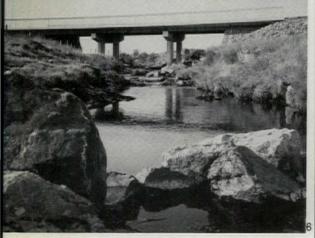


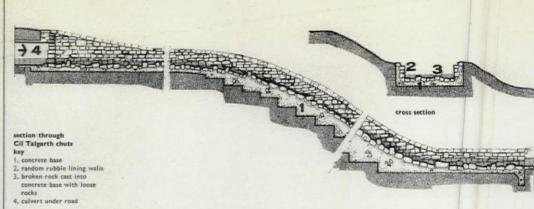
the landscape character: the arable bottom lands, with their signs of human intervention, have totally disappeared; there is now a vast lake, some $2\frac{1}{2}$ miles long and $\frac{3}{4}$ mile wide, contained by a wild landscape of rock outcrop, forest and mountains. A magnificent large-scale landscape, 2, has become even larger in scale and more dramatic. The lake, when filled, assumed a natural shore line with little sharp severance between water and land, for the rough rock outcrops and gravel form a continuous ground texture disappearing into the water, 3; when the lake is drawn down, rock instead of mud is exposed.













landscape details : the attention given at Llyn Celyn to small-scale landscape details is indicated by 4, a cascade which diverts the Cil Talgarth down a steep bank (see sections above). The cascade itself is a concrete channel lined with boulders into which loose boulders were thrown on completion. 5, another cascade is the Nant Hafod Fadog, passing under a bridge of the diversion road. It illustrates the preservation of intimate landscape from destruction by engineering works. The new road diversion, 7, was designed to a rural character with lay-bys at typical view points. Where barriers were required, boulders were tipped at random instead of fencing. The new bridge at the toe of the lake, 6, is a simple structure of concrete beams spanning between concrete trestles and abutments faced with local granite. Rough boulders were tipped to adjust the new abutment to the river bank.

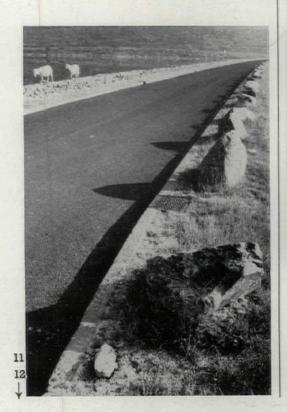
the dam: it stretches in a bold curve between the hills forming the Tryweryn valley, 8. In the lake stand the draw-off tower and the overflow, by the near shore. Immediately at the foot of the dam on the right is the power station and, in front of it, the stilling basin at the head of the river. The water is drawn off from the lake through the tower and is discharged either direct through the stilling basin into the river or via the power station turbines. The farm houses at either end of the dam are retained but the contractors' huts below the dam will be removed. New tree planting in bold masses will, in time, relate the new work to the existing topography. 9, (opposite), looking upstream from the river towards the dam, with the stilling basin and power house at the foot of it. The buildings have rock-faced granite walls, bronze windows with concrete lintels, and copper roofs. 10, the crest of the dam with

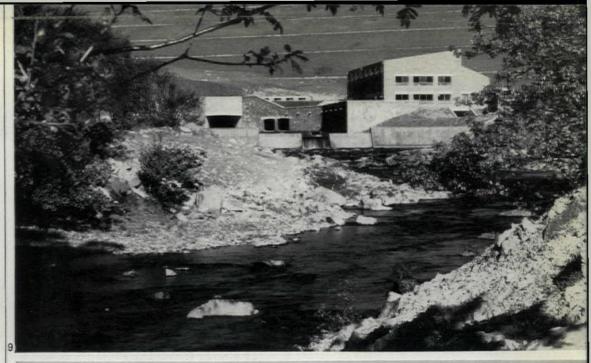


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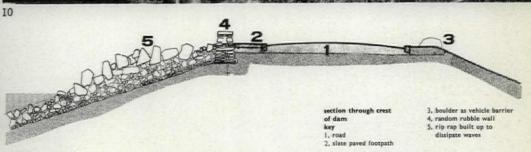
its road and protective beach. Its lake-side face is protected from damage by wave action by carefully graded and placed layers of granite rubble from local quarries. This flattens out at the top into a beach on which waves are dissipated, thus removing the need for a large structural wave-wall. Instead there is a low dry-stone wall in the local vernacular. The walkway is paved with slate off-cuts from local quarries with a granite kerb. Sheep graze the dam, 11, and large boulders, saved from the site of the lake, are placed on the top of the grass slope, as a barrier to vehicles.

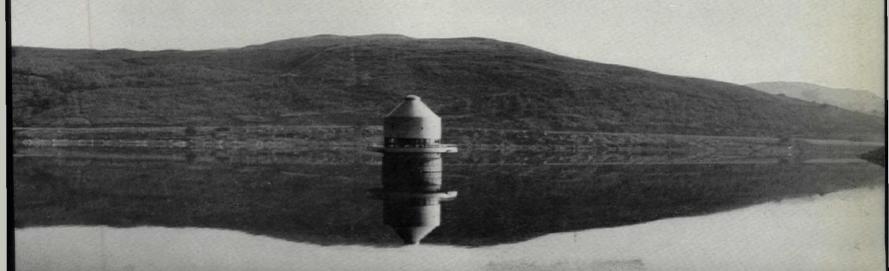
the draw-off tower: 12, the most characteristic reservoir structure, the draw-off tower, rises above the crest of the dam, to become an important focus. It was designed to be a focus from all viewpoints, its cylindrical form and conical roof, faced in greymosaic, reflecting the hill forms and being mirrored in the lake. Below the reinforced concrete maintenance and viewing balcony can be seen the granite-faced tower, submerged some 140 ft. below the water.

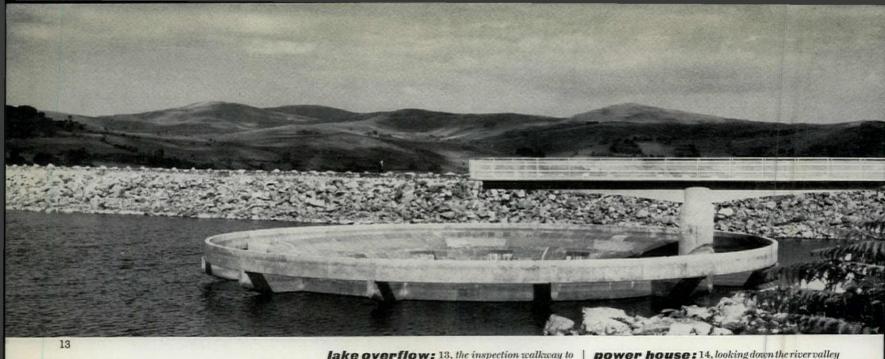






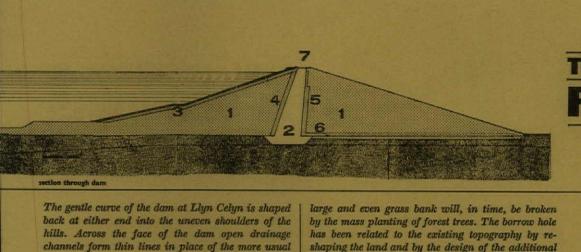






lake overflow: 13, the inspection walkway to the lake overflow at Llyn Celyn; the overflow is a concrete funnel faced with smooth stone, and a concrete boat-fender is cantilevered from the edge. In the background is the beach to the crest of the dam (see section on facing page). power house: 14, looking down the river valley from the top of the dam, with the stilling basin and power house in the foreground. The existing tree clumps will be extended to link the new structures to the land forms and repair the scarring from construction works.

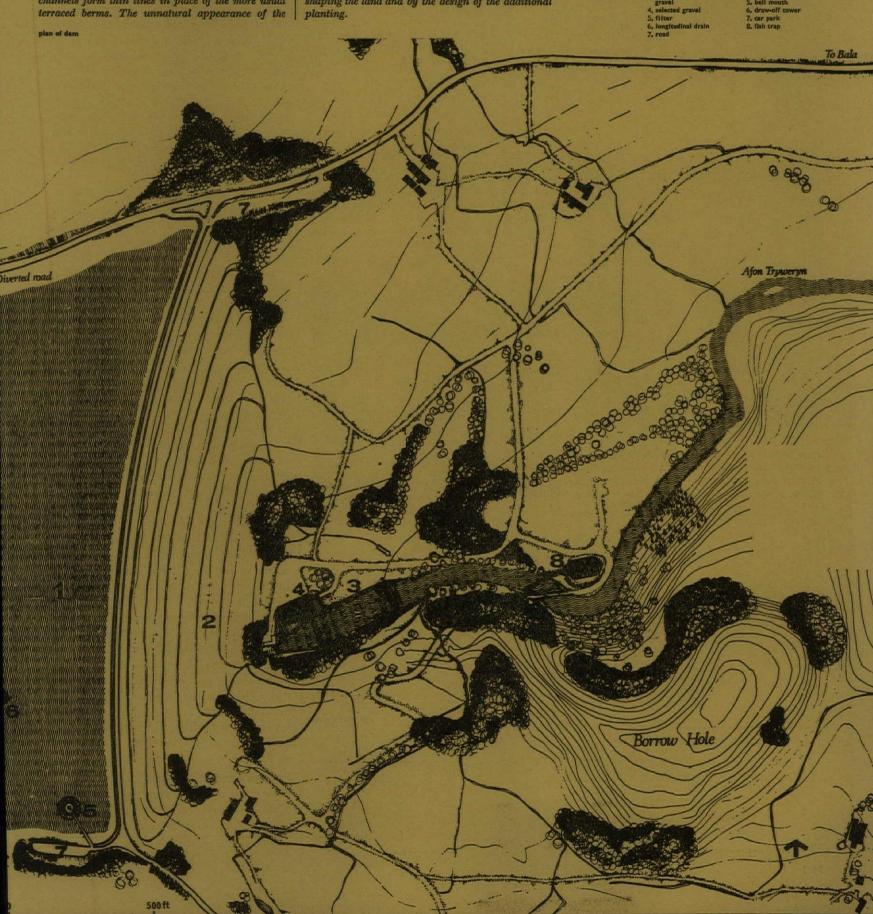


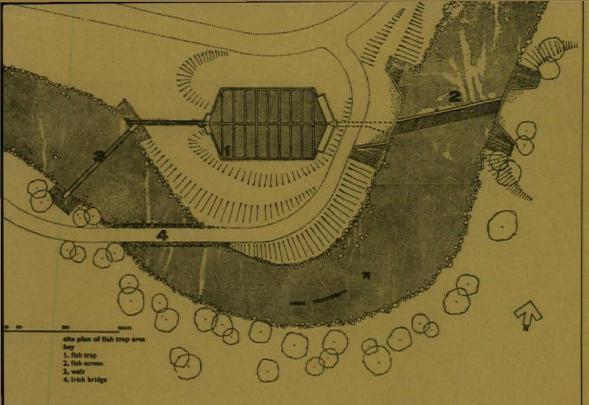


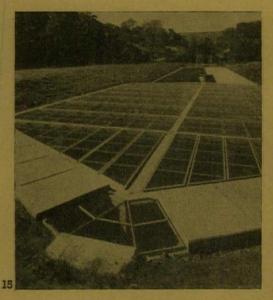
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The gentle curve of the dam at Llyn Celyn is shaped back at either end into the uneven shoulders of the hills. Across the face of the dam open drainage channels form thin lines in place of the more usual terraced berms. The unnatural appearance of the

large and even grass bank will, in time, be broken by the mass planting of forest trees. The borrow hole has been related to the existing topography by re-shaping the land and by the design of the additional planting.

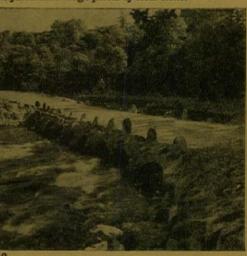


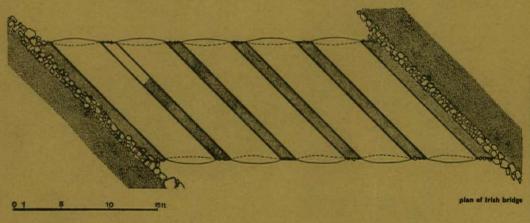


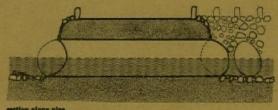


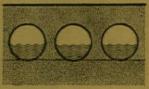
the Irish bridge and fish trap: these are in the bend of the river below the Liyn Celyn dam. 15, the fish trap looking upstream, with the dam crest visible on the skyline. The trap prevents migratory

salmonfromgoing up theriver into the works associated with the dam. The salmon are taken from the trap and spawned by hand at the River Board's hatchery, to re-stock the river. 16, the Irish bridge, for the use of waterworks personnel on the site. When the river is in flood, the bridge becomes a ford. It is formed of steel pipes with shaped ends set in mass concrete and is faced with rough pieces of local stone.









section across pipe

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continued from page 186] extended to encroach on the dam itself without setting up structural difficulties, but so new is the idea of landscaping a reservoir that little data exists, and satisfactory solutions will not be found until considerable research and experiment have taken place into tree growth and, for that matter, into all three-dimensional ground cover, such as gorse and broom, as an alternative to the ubiquitous grass. It is unlikely that research of this nature has occurred to the Water Resources Board. although they are on record as advocating the employment of landscape consultants for reservoirs in national parks*; but it does seem that they are the only body in a position to undertake it.

The water face of an earth dam is protected against erosion by a hard surfacing, and the road or path across the crest is protected from waves by a parapet wall. The seldom-exposed lower part of the dam is covered with broken stone or beaching and the surface above is paved with stone or concrete pitching, which is generally extended above the water line, in the form of a series of steps or a curve to join up with the wave wall. Traditional structures of this nature in squared masonry can have a heavy and formidable appearance. There is now a shortage of masons, and the modern substitute, mass concrete laid in large panels, whilst eliminating mass, substitutes the more objectionable appearance of a vast area of concrete subdivided by out-of-true joint lines-out of true because settlement is a calculated factor in dam design. Precast concrete blocks offer a reasonable solution, provided the joint lines form a broken pattern. When stone is available, it is possible to obtain a rough, natural surface, without the use of masons. At Llyn Celyn quarries within a reasonable distance allowed a single bed of natural quarry stone to be laid on the slope of the dam and merged into the banks on either side; above the top water-line the profile increases and then finishes as a level beach, some 14 ft. wide. The high wave wall is eliminated and, instead, there is a continuous beach separated from the road by a low dry-stone wall of the same character as local field

Buildings and other works

Unless there is a treatment works or hydro-electric scheme at the dam, there will be few buildings and, as the prime

• Second Annual Report of the Water Resources Board. HMSO, 1965. objective in the master design will be to produce a splendid area of natural land-scape, such buildings as there are will be fitted into the environment as unobtrusively as possible; their relationship to the land form and to the planting can have the quality of inevitability that is experienced in the traditional English farm group.

The essential ancillary works for the dam are concerned with the overflow of water and its controlled outlet to the river below or to supply pipes. They pose few landscape problems with concrete dams, as they are an integral part of the structure, but it is another matter with earth dams, as they are in a natural green setting. The overflow works are simply an outlet to discharge water into the river below the dam when the reservoir is full. In its most elementary form it consists of a weir at one side of the dam and an open channel leading into the river below, which can cause considerable disfigurement to the form of the dam. The more modern method of a deep shaft connected to a tunnel is an obvious visual improvement, as the greater part of the work is buried in the ground. The outlet itself, when in the form of a circular concrete bell-mouth set in the lake, can be an attractive example of reservoir vernacular.

The most important and characteristic reservoir structure is the valve tower from which the water is drawn off into the river below. The tower houses a vertical stand pipe, with inlets at intervals in its height, which is connected to a discharge main which runs through a tunnel to connect to an open 'stilling basin' near the foot of the dam, whence an open channel carries it to the river. Rising as it does above the crest of the dam, the tower is a focus in distant prospects, and its forms, being mirrored in the lake, are significant in near views. For these reasons, and because it is symbolic of the change from land to water, it may legitimately assert itself in the landscape (its height and bulk are never so great that there will be conflict), which it may well do if its basic tower-like forms are allowed to develop from their function, although there is a waterworks tradition of making it a folly. An unusual form was devised for Llyn Celyn which, working on a siphonage system, enabled the tower to be reduced to a drum with a conical roof; moreover, standing out in the lake some 130 yards from the land, access being by tunnel, it has a quality of strange isolation—like the turret of some drowned palace.

The outlet and stilling basin near the foot of the dam and the channel to the river are reinforced concrete structures which may have a stone face incorporated. The formal problems are primarily architectural, those of landscaping being the shaping of the ground up to them and, possibly, planting. The environment of many dams is disfigured by a litter of buildings: sheds, fenced concrete yards and car-parks for administration and maintenance. Most of these can be drawn together as a compact group like a farmyard and, when set well down in the contours, there is little fear of conflict with the land form—planting ties them into the composition.

Water undertakings have tendencies towards both whimsy and the monumental. It is common to find buildings like staff houses decorated with traditional features or, when visiting the works, to be confronted by elaborate railings, wrought iron entrance gateways on massive piers and commemorative plaques cataloguing the names of everyone who had any connection with the enterprise. Much of this paraphernalia is quite unnecessary; the buildings can rely for their effect on architectural form and the site can be left as natural landscape with such protection as may be absolutely necessary by simple walls or fences. The ambience of the catchment area can be destroyed by the sudden appearance of some crude incidental work such as concrete channels, culverts, fence posts and the like. Only when it is recognized that all the reservoir structures are subjects for architectural design, and some trouble is taken in choosing an architect who is both sensitive to landscape and the views of the other members of the design team, can there be any assurance that the total design of the reservoir will succeed.

The road and the landscape

Considerable scarring of the land and conflict with the rural character can be caused by road works which, when existing routes are submerged, can be formidable. The roads will be designed to have a rural character appropriate to the topography and those skirting the reservoir be regarded as viewing points of the lake when moving and at rest. In deciding the line of the road, regard will be paid to distant prospects over the reservoir; to the need to contrast such views with local intimate ones; to the unfolding view, as when the road takes a gentle curve round a promontory and to the pleasure of the sudden view, as when one comes out of a tree plantation, to name but a few: the possibilities are endless when road and landscape design are regarded as inseparable arts. As an object which is seen in the landscape, the road will be fitted naturally into the environment, the best result, both econonomically and aesthetically, being generally obtained by letting the line follow the land

It is of some importance to consider the shape and area of the land left between the road and the reservoir—a fringe area problem already referred to. Narrow strips of land are useless for cultivation and are limited for grazing unless the water is to be shut off by unsightly fences. The choice is between siting the road well inland, to leave a useful area of land, or running it quite close to the water's edge, when pleasure will be given to the visitor; the temptation will be to stop the car and give the children a chance to paddle, or make a camp-harmless and enjoyable pursuits to anyone but a water engineer. County councils naturally have a tendency to expect road diversions to show a considerable increase in design standards over the existing road system-after all, they are not paying for them. The wider the road, the greater the disturbance to existing plant life and the form of the land (through cut and fill), and so excessive requirements for widths of verges, radii of curves, sight lines and so on must be firmly resisted. There may, too, be a desire to impose an urban character on the detail design: kerbs, for example, are an anachronism when the new road is inserted into a rural system with natural edges.

Reservoirs and leisure

Any lake is a source of recreation; the constant changes in surface texture, the power to reflect light and surrounding objects are sources of passive enjoyment which will draw people from miles around. Also attracted will be all those who like making water ripple and splash, getting on it and in it and generally doing all those things which water undertakings, whose prime duty is to provide safe water, do not approve of-typhoid is the spectre. And there may also be the attraction of the surrounding countryside-many catchment areas are admirably suited for rock climbing which, again, may pose conflicts of interest: for example, unrestricted rambling over catchment areas is, wherever possible, prohibited.

In the past recreation has been limited to the very few who enjoy special pursuits like bird watching and fishing and, even here, a tight control is exercised through limitation of permits to approved societies. Thanks to the motorcar, every water company is today under pressure to make available their land and water for the recreation of the townsman, and it is common at enquiries into new schemes to find the county council insisting on provision for public recreation.

The leisure problem is, first, the extent to which the reservoir may be used without detriment to the water supply; and secondly, in the wider landscape, the extent to which recreation can take place without destroying the character of the place. The water engineers' point of view is clearly

^{*} Recreational Use of Waterworks: The Institution of Water Engineers.

stated in a recent report.* Its findings are largely based on the replies to a questionnaire sent to sixty-seven water undertakings and, whilst hedged with reservations (after all it is the water engineer who bears the scandal of a typhoid outbreak), it accepts that a wide variety of facilities may be provided. In fact the report represents a considerable change in attitude towards recreation when one considers that, at present, sailing is only allowed by five water undertakings and unrestricted rambling is, wherever possible, prohibited. It accepts that activities like sailing, fishing, rock climbing and bird watching should be permitted, but adds that there must be control by clubs or permits and that they must be financially self-supporting. Whilst every undertaking consulted condemned camping, they accepted that it may occur on specially-equipped sites. None of these activities need conflict with the character of most reservoirs; a camping site is, in fact, being provided at Tryweryn, based on a derelict farmhouse in a bosky setting -all that is required is well-designed and sited equipment and access.

The White Paper, Leisure in the Countryside* has few inhibitions and, after saving that bodies who control reservoirs are to be asked to overhaul their rules governing public access, states quite categorically, 'new reservoirs should present no problem.' With compensation reservoirs, which only control the flow of a river, it is quite clear there is little risk of pollution: Tryweryn could be a lido, for anything can happen on the seventy miles the river runs before the water is extracted and treated for human consumption. None the less, activities that are condemned by water engineers, like swimming and water ski-ing, may also be condemned by the landscape architect on the grounds that they can lead to activities quite out of character with the environment-swimming, sunbathing, beach balls, ice cream vendors. There is, too, the risk that, in the enthusiasm for throwing reservoirs open to the public, there will be an indiscriminate demand for recreation. For example, at the Parliamentary enquiry into Cow Green reservoir, the author found himself opposing the county council's demand for recreational facilities on the grounds that Upper Teesdale, being an area of wild natural beauty, has landscape problems concerned only with the few who seek quiet and solitude.

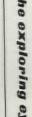
* Leisure in the Countryside (England & Wales): HMSO 1966.

A large lake is such an attraction that many of the problems involved, such as nearness and density of urban population, can only be studied at a regional level. When the requirements are known, it is likely that there must be new roads to the area, with places to park a car and a system of walks and tracks giving reasonable access to the countryside around the lake. There are often existing bridle tracks, lanes and footpaths which can form the basis for the system, new routes being formed in those places where access has been severed by the lake, or where there are particularly fine prospects. It is likely, too, that motorists from the surrounding region will use the lake as an objective for outings and others will make a detour for the pleasure of seeing it. They will require lay-bys or parking spaces in those places where there are fine prospects or interesting foreground views. All this adds up to a considerable expenditure which no water company is likely to face. It may provide lay-bys on a new road diversion scheme but will not expect to pay for them on new roads, let alone construct a quite new road system.

With the increasing use of reservoirs for recreation there will not only be the attendant problems of providing a wide variety of facilities like access roads, car-parks, lavatories, club houses, jetties and slipways, but of paying for their running. Some may be self-supporting, like a fishing club, but considerable money will be required to both finance and run them. Obviously this cannot be left to a haggle between the water company and the county council; for that matter, the latter's boundaries are arbitrary and it may be that population from a county in which the reservoir is not situated will benefit most. There is, moreover, the problem of adjoining owners; they will not encourage 'trespassing' on their land any more than they are willing to collaborate on an overall landscape design.

Tryweryn, the example illustrated here, is quite close to Lake Bala and both are in the Snowdonia National Park. The whole area needs study and it is encouraging that the National Parks Commission intends to have a landscape consultant appointed to make recommendations. Only by lifting the problems of both landscape design and recreation from a local to a regional level can the full potential of the reservoirs that are to be constructed in the future be realized.

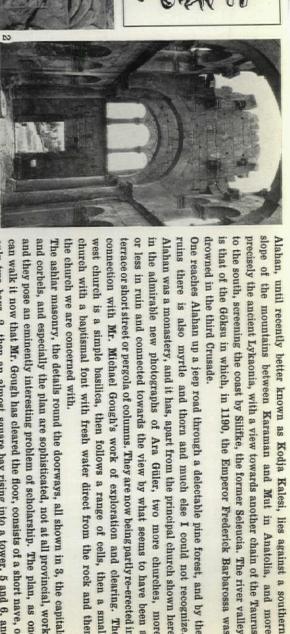
The construction of Llyn Celyn, the subject of the illustrations on the preceding pages, was the responsibility of Mr. J. H. T. Stilgoe, water engineer to Liverpool Corporation Water Works, with Messrs. Binnie & Partners as the consulting engineers and Mr. Frederick Gibberd as the landscape consultant and architect.





ring towarss one of the r main front. 4, detail of one of the r udows, 5 (overleaf), the ruins of th squinch top left), looking to





is also myrtle and thorn and much

up a jeep road through a delectable pine forest, and by the

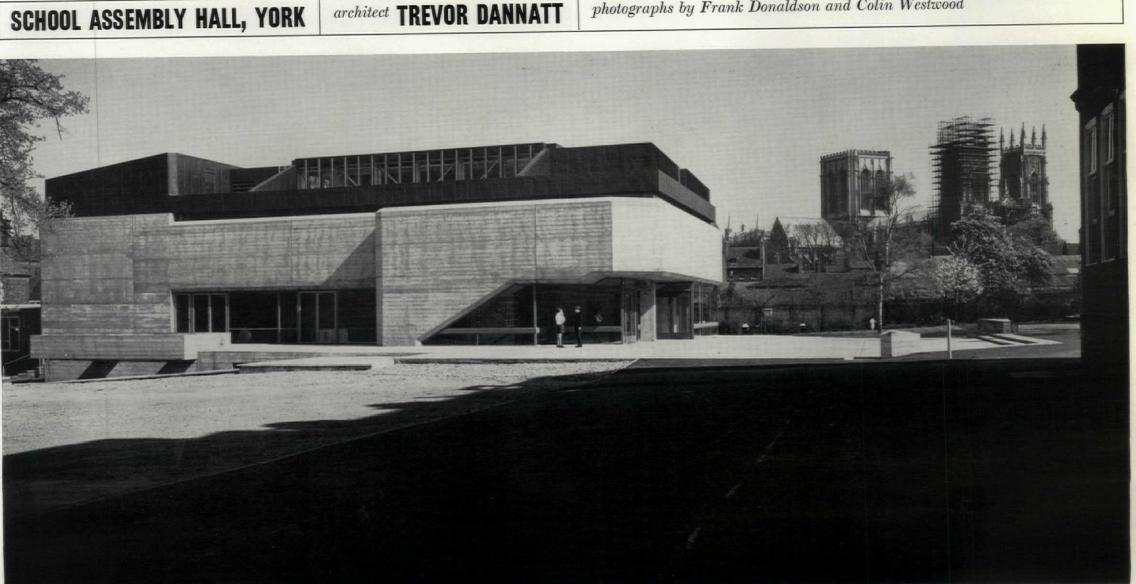
else I could not recognize.

Alahan was a monastery, and it has, apart from the principal church shown here give an answer, even if not on the monumental scale of all the churches just squinches with colonnettes calling for a dome or domical vault as its achievepatterns of Aia Sophia, Aia Irene, Holy Apostles-all at Istanbul-St. is fifty years earlier than the age of Justinian, when major vaulting began date is known or at least extremely probable. It is c. 475-90. Now such a date church is all but identical with one at Meriamlik outside Silike, and there the ment, the south aisle has buttresses outside, calling for a vault inside, a tunnel nave and tower and also end in apses. The tower bay then a very short chancel, higher than the nave, and an apse. Aisles accompany and they pose an eminently interesting problem of scholarship. The plan, as one The ashlar masonry, the details round the doorways, all shown in 3, the capitals the church we are concerned with. Ephesus and so on. What happened to vaulting between the glorious Basilica of memorable; for though we have no direct indication of the date, the plan of the tion would be a tunnel vault in the nave. vault, one would presume from evidence in other places, and the natural complewalk it now that Mr. Gough has cleared the floor, consists of a short nave, of corbels, and especially the plan are sophisticated, not at all provincial, in ruin and connected towards the view by what seems to have been a almost square bay rising into a tower, 5 and 6, and fresh water direct from the rock and then Justinian is still a mystery. Alahan would Mediterranean, has in the top corners

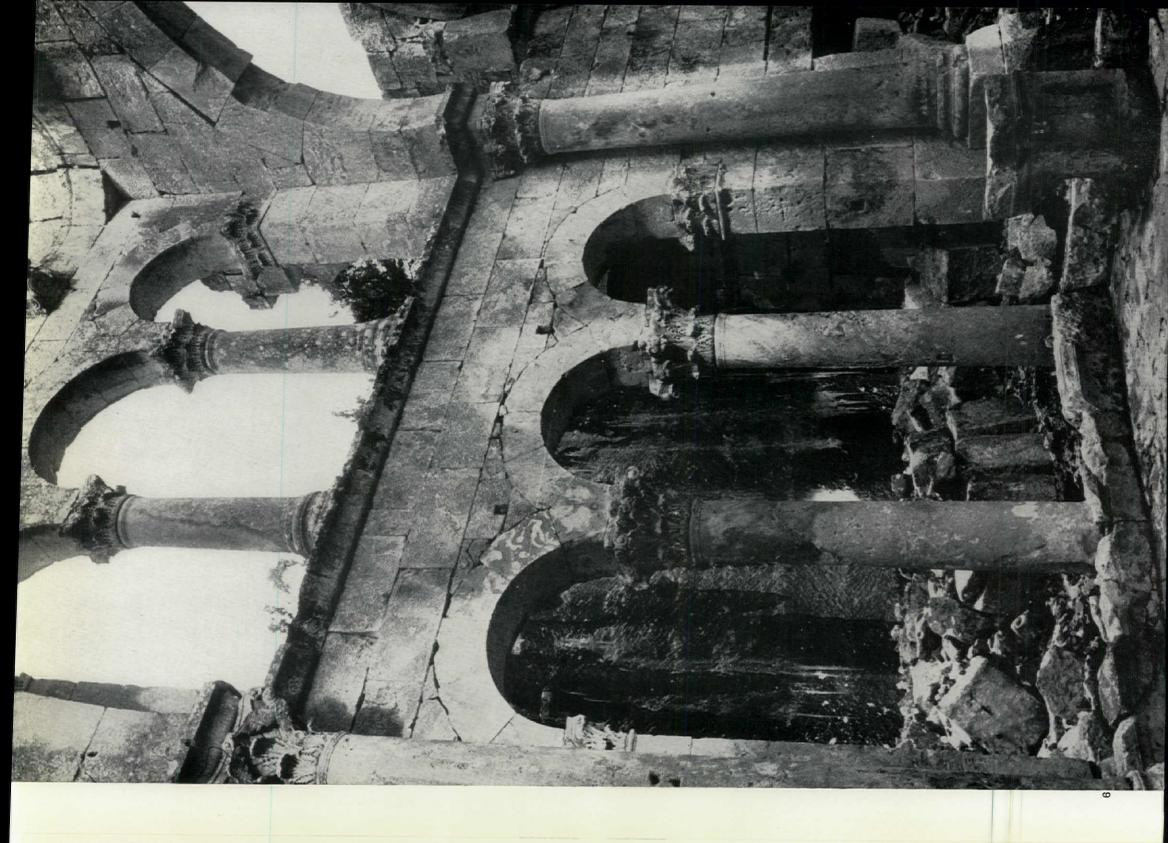
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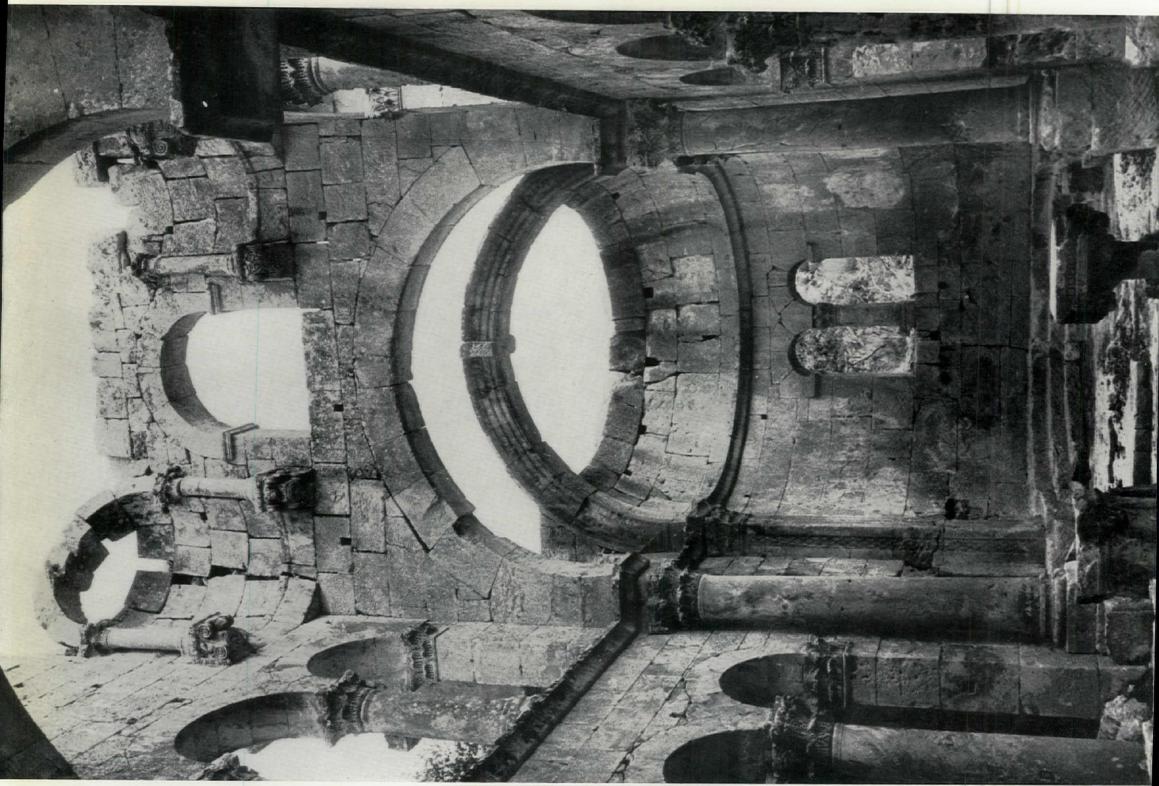
architect TREVOR DANNATT

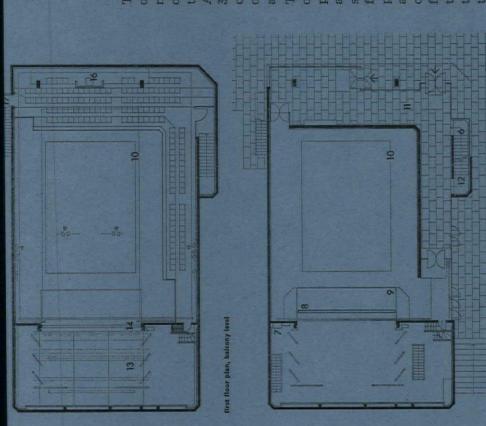
photographs by Frank Donaldson and Colin Westwood



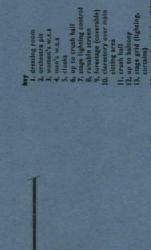
1, the hall from the west, with the towers of York Minster beyond.











12, up to balcony
13, up to balcony
13, unge gred (lighting,
curtains)
14, screen in raised position
15, front of house lighting
16, projection
17, curpe stairs

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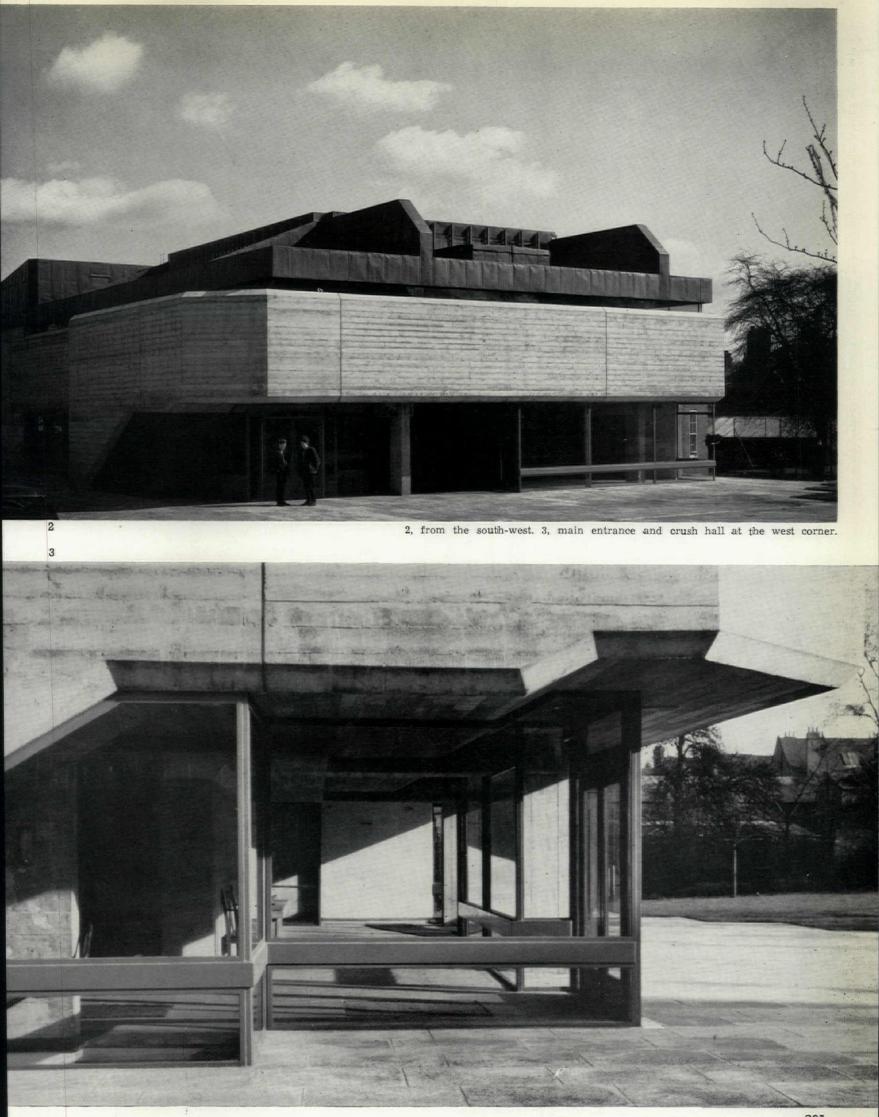
This hall has been built for Bootham School, a Society of Friends school for boys. It was required for assembly, meeting for worship, lectures, concerts, theatre and opera. It frees space in the existing building, where the hall used for such functions was inadequate. Accommodation asked for included seating for about 500 on the 'floor,' and 140 on a balcony; a generous conventional stage but with a forestage/dais and orchestra pit; also dressing rooms, crush hall, cloaks and lavatory accommodation, etc.

carried into the interior by means of the L-shaped crush stronger reason for not doing so; from the outset it was ully modelled and of strong, formal quality, analagous o freestanding sculpture in a courtyard. The entrances placed pivotal to the complex of school buildings, as is cardinal building should be architecturally distinctive, he stage is placed furthest away, using the fall of the attaching it to the main school. However, there was a site to provide dressing rooms, etc., beneath the stage preserve a view of York Minster gave reason for not of the stepped gallery over. The long axis of the hall is at right-angles to the main front of the school and elt that the hall should be a freestanding building, to the hall are on the south-west corner, relating to outlying science and music departments. A wish to nall, with entrances into the hall itself at each end. The ceiling of the crush hall is formed by the soffit he angle of approach, and a directional feeling is The hall is sited between the main school and the appropriate to its use. It was also felt that such a and necessitating the minimum of excavation.

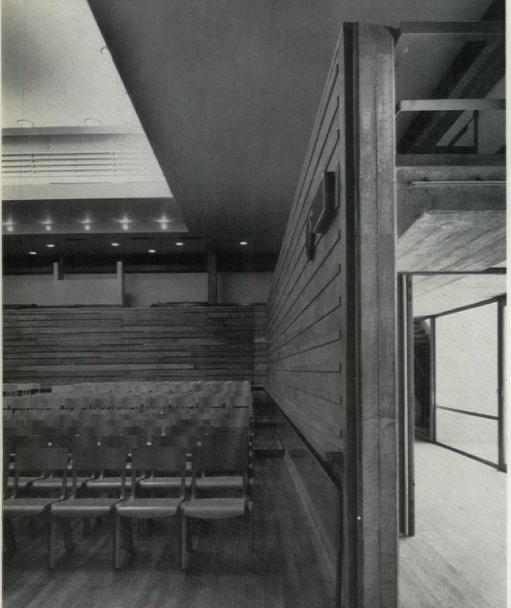
For worship and other purposes that require central seating, a space top-lit from four sides of a high clerestory is formed on two sides by the walls that separate the crush hall from the main hall (and which carry up to form the gallery front), on the third side by the side wall of the building and on the fourth side by a freestanding screen wall which stands in front of the stage curtains. For assembly or drama, when seating with a directional focus is required, the screen wall is raised out of sight and (if necessary) the clerestory blacked out. Directional artificial lighting, related to shallow recesses in the ceiling over the stage and at the gallery end, also changes the emphasis of the

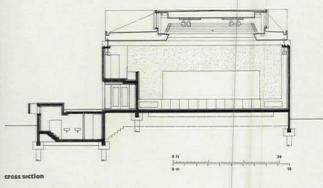
roof is of steel and consists of two main trusses spanning interior, making it appear more elongated and bringing which, in turn, is picked up on two cross beams running trusses form a central 'box' carrying a high-level roof, protection. Ceilings are of expanded metal and plaster. cantilevered, with its parapet wall carried down to the and clerestory light enters the hall through the trusses pivot, the tensile force from the cantilever being taken stage with forestage, stage with orchestra pit. The hall (entrance end) and two cross trusses cantilevering out gatherings in summer. linking the hall to the terraces. different types of production, e.g., conventional stage, through the roof-support columns to the parapet wall. tower. Heating is part natural convectors, part forced taken to the foundations by the side wall to the stage side of the building. From the beam wall the force is exposed externally with sawn board shuttering. The roofs are of edge reinforced wood wool, spanning on to secondary joists. The steelwork is grit blasted and The roof finish is part proprietary sheet, part copper Round the corner, the side wall to the stair acts as a floor can also be flat or in two steps. Sections of the The lower roof surrounding the 'box' spans off the carried by the external wall acting as a deep beam The building is of reinforced concrete construction, transmitting it to the beam wall running down the trusses with an 18in. gap between it and the lower air convectors combined with a simple warmed air floor on one side. The other edge of the balcony is to carry edge beams on the long sides. These four with copper facings and flashings. The balcony is the stage into prominence. By means of movable out by the concrete roof to the stair and, in turn, occasion, when the crush space is used for social sections various arrangements can be made for from stage wall to the two columns at the rear structure which it covers like a velarium. Both zinc silicate painted throughout to ensure good glazed south and west walls can be opened on ventilation scheme.

Assistant architect, Colin Dollimore. Structural consultants, Ove Arup and Partners, Acoustical consultant, Hugh Creighton. Quantity surveyors, Monk and Dunstone.









4, the hall seen from the cantilevered balcony, showing the two levels of clerestory windows. The stage is behind the curtains, and the platform is lowered and the screen raised when the stage is in

use. 5, looking towards the back of the hall, with the crush bar on the right and the balcony above. The walls below the balcony are faced with elm strip board on rock wool backing.

for the Tourist

Planning BEAULU

These overcrowded islands still contain some of the finest small-scale landscape in the world, but it is in imminent danger of saturation. With more leisure and more money, everincreasing numbers seek recreational and educational outlets and the pressure of this demand threatens to swamp the countryside. Uncontrolled. we are faced with the prospect of giant car and caravan parks everywhere and the wholesale widening of country lanes and village streets. Things can no longer just be left to chance; planning becomes essential to discover how the pressures can be controlled. In their South Hampshire study, Colin Buchanan and Partners described the problem of these pressures on the New Forest. They stressed the need to achieve, through long-term planning, a proper balance between accessibility, preservation of countryside and cost, and they concluded that largescale urban expansion could only be contemplated if areas like the New Forest were consciously designed to withstand the impact. They said 'it is the exploitation of the recreational areas and magnets of pressure which will allow the "reserved" areas to survive. To a certain extent this concept can be seen in action in the Beaulieu Estate where productive farmland is protected partly by the magnetism of Beaulieu and Buckler's Hard.'

However, though a degree of success is achieved there now, sheer weight of numbers presents an estate like Beaulieu with serious problems of circulation and management and, if increased, threatens to destroy the very things which make it so attractive. With this in mind, Lord Montagu. the owner, in 1965 commissioned Elizabeth Chesterton and Leonard Manasseh to produce, in close consultation with Brian Hubbard* his chief agent, a plan and programme for the next twenty years. This would form the basis for a long-term management and investment policy. As yet such examples of enlightened estate ownership calling on the services of the planner are rare, though somewhat similar work has been carried out by the same planners at Dartington Hall, Devon.†

Their plan for Beaulieu, summarized below, which was preceded by a very complete survey and grading of existing buildings, was carried out in full consultation with Gerald Smart, the Hampshire County Planning Officer. Subject to public approval, it will be absorbed into the county development plan and will then in effect form the basis of development control.

THE BEAULIEU ESTATE

This estate, of which the Beaulieu River forms a part, is a stretch of country five miles long and three miles wide under one ownership. Part of the New Forest, it is designated as an area of outstanding beauty. But it contains two major international tourist attractions: the Montagu Motor Museum and Abbey at Beaulieu and Buckler's Hard, down river, an eighteenth-century hamlet of naval boat-building fame. Together they attract nearly three-quarters of a million visitors a year.

THE PROBLEM!

The problem facing the planners amounted to how to create within the existing fabric, a physical framework which could withstand the recreational pressures without, at the same time, damaging the character. How to safeguard the present quality and viability of the territory both for residents and visitors.

It was decided that the policy must be: first to preserve the existing character of the estate maintaining the prosperous agricultural industry and the woodlands; second to keep road traffic at such a level as not to precipitate major changes.

PROPOSALS

TOURIST ATTRACTIONS

These are to remain strictly limited to the museum complex at Beaulieu and to Buckler's Hard. Here improved provision for visitors is planned and the need to limit numbers to an acceptable level is recognized.

SOLENT SHORE

This is to remain, as now, with public access along a stretch at Park Shore. Parking will be limited and car parks kept well back from the shore to which visitors will have to walk. Later it may be found necessary to limit parking to holders of tickets bought elsewhere. A general clearing of wirescape and a relocation of substandard buildings will also be carried

REATILIEII RIVER

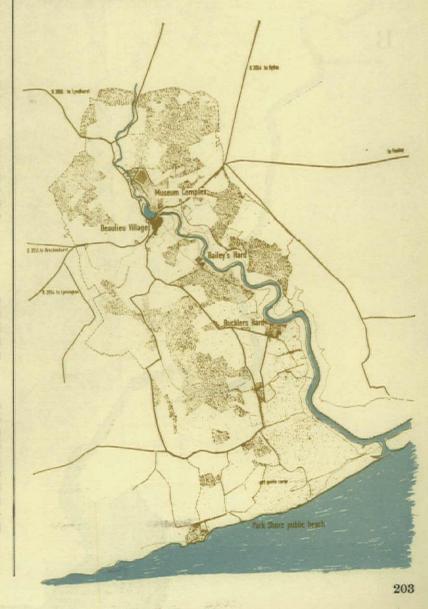
Here the number of permanent moorings is to be only slightly increased but better facilities will be provided for river users, including a small yacht-harbour at Buckler's Hard and boat repair facilities at Bailey's Hard (see 6-9)

A survey has been made of present conditions and a forecast of future volumes. Based on this information, traffic proposals are seen as a series of stages, the move from one to the next taking place as increasing vehicles make each cease to be effective.

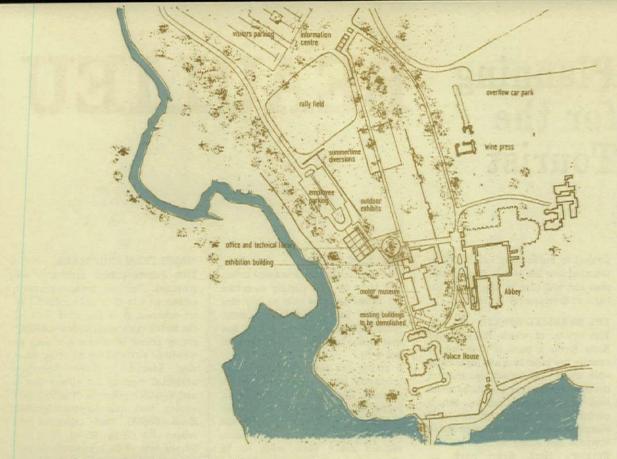
SHORT TERM PROPOSALS

Two interdependent measures are proposed. First the present museum entrance (A in 3) is to be replaced by an entrance, B, to the north-west off the Beaulieu/Lyndhurst Road (B3056) giving access to a new car park in woodland north of the museum complex. Second, a short by-pass is suggested west of the village (see 1 and 4) with a roundabout at its intersection with the Lymington/Hythe Road (B3054). These measures will relieve the High Street of about 74 per cent of its present traffic and eliminate the bulk of turning traffic

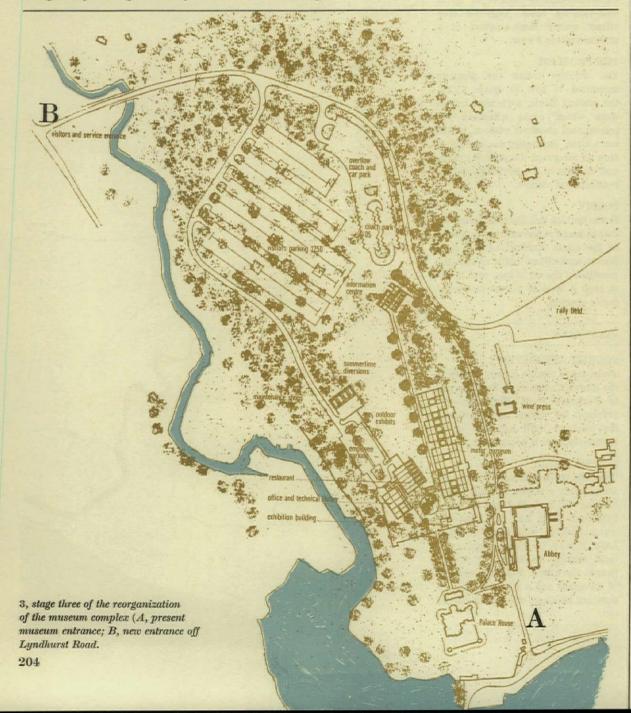
1, map of the Beaulieu estate.



Of Strutt & Parker, Lofts & Warner.
 Dartington Hall: A Study and Plan.
 July 1965.



2, stage one of the reorganization of the Beaulieu museum complex.



at the existing intersection. With the relocated museum entrance, the village generally will be relieved of around 81 per cent of museum-bound traffic. This still leaves the problem of traffic in the east/west village street and this will need to be solved outside the parish boundary. Any consolidation of through traffic on the present line would cut the village in two.

LONG TERM PROPOSALS

The time will come when the above measures become inadequate; for instance with traffic building up on the narrower stretches of road, such as that between Beaulieu and Buckler's Hard. 'Improvements' and widening will then be hard to resist, so it will become imperative to make such measures unnecessary. This will mean removing as many vehicles as possible from the area altogether. From that time, tourist vehicles will have to be induced to stop at a single reception point, strategically placed in relation to traffic flows, local road pattern and points of attraction. Here will be assembled all the necessary tourist reception facilities such as advance information, refreshments, tickets, literature, postcards, souvenirs, etc. And from this point tourists will be carried by estate transport (buses, small-gauge rail or overhead cablecar). Thus road congestion will be lessened and large and out of scale car parks and other facilities reduced. Here again, numbers could be controlled if necessary by limited issue of tickets and pricing, methods successfully adopted under similar circumstances in America.

DETAILED PLANS

MUSEUM COMPLEX

This consists of Beaulieu Abbey, Palace House (Lord Montagu's residence) and its gardens and the motor museum and the library. An analysis of existing conditions shows that with the present vehicle entrance off the B3045, vehicles have to pass both the historic buildings themselves and the museum to get to the car park. The visitor then has to retrace his steps, and this leads to a conflict of circulation. Also the museum buildings are already too small for a summer average of 5-6,000 visitors a day. The suggested reorganization of the museum complex, 2 and 3, aims first at achieving a segregation of pedestrian and vehicle movement and second a separation of buildings of historic and architectural importance from those connected with the exhibition. It is visualized in three main stages, the third coinciding with the introduction of the reception point outside the museum complex already mentioned.

BEAULIEU VILLAGE

A complete survey has been carried out and every effort will be made to retain the existing village buildings and ensure their maintenance. As individual properties come to hand, improvements will be effected and the plan shows how limited small scale development could be built which would harmonize with the village, in case this is ever needed. The road proposals already described would relieve the High Street and so, when pressures demand, it will be possible, by the introduction of bollards, to turn the High Street into a cul-de-sac during the summer months. Also to help recover the character of the village street by ridding it of parked vehicles, a car park is shown sited on the west side of the village with provision for rear access and garages to relieve the High Street. It is recognized that the proper landscaping of the village and its approaches is of the greatest importance.

BUCKLER'S HARD

In order to keep its beauty and character, despite increasing visitors, its functions as a boating centre and a place of historic interest to the tourist will be separated out. Also the space for tourists to circulate and picnic in is to be greatly increased, so that they will be dispersed over a wider area than today. The core of the hamlet will remain unchanged, and all unfit property, as it comes in hand, will be restored and modernized by the Estate. There will be no attempt at wholesale modernization

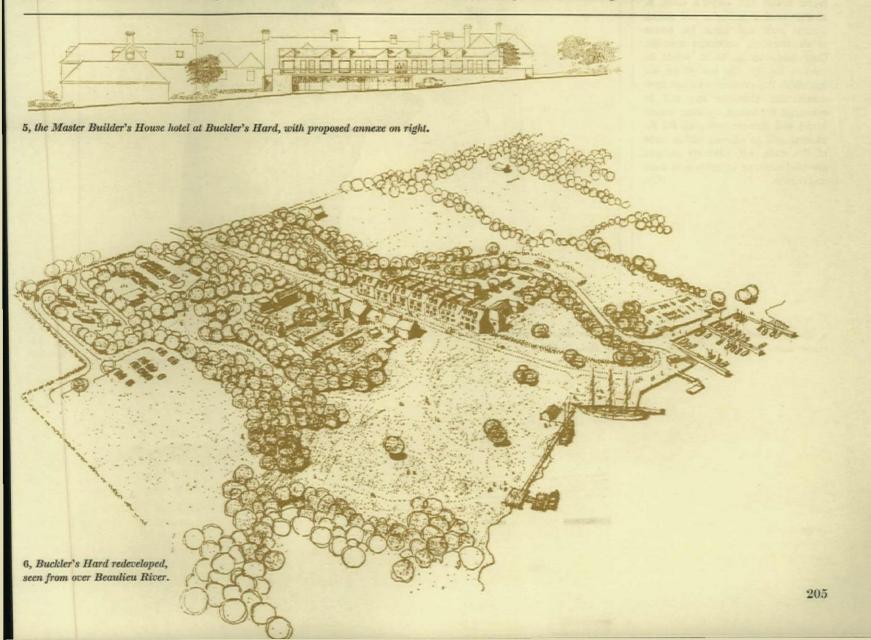
and occupation will be by employees of the estate only. To emphasize the Hard's past significance as a boat building centre a 'live' ship museum is proposed berthed at the original slipways (see 6 and 7).

Two new roads are proposed, one to serve the tourist and the east side of the hamlet, the other the river user, the hotel and garages of local residents.

The proposed plan, 7, shows permanent tree-screened parking for 70 cars with a further overflow park, part semi-permanent and part grass for 240. It also provides a park for 16 coaches, and the intention is that as the individual car makes way for estate-provided transport the ground now occupied by the eastern car park can revert to landscaped open space. Pedestrian circulation space will be trebled by taking in land once occupied by the Agamemnon boat yard. This will become a picnic area, landscaped as part of the natural scene-and should relieve the area between the terraces which is now used for the purpose. A carefully designed footpath system will be established linking the car and coach parks with the tourist attractions and designed to disperse the public over the whole tourist area. Again, if necessary, the number of visitors will be reduced by limited tickets or by price.



4, map showing redevelopment of Beaulieu village with new by-pass on west side. Existing buildings solid, new buildings tinted.



As for the river user, the number of permanent moorings will be limited to a figure only slightly greater than now (250 instead of 228), but a small yacht harbour for 48 yachts is proposed. Otherwise facilities will remain as they are now with a launching slip for small visiting boats, a park for 35 tender and 45 sailing dinghies but with additional car parking to meet the need of boat owners; 90 permanent and 45 grassed overflow places will be provided along the approach road, slightly sunk and surrounded by banks and gorse so as to be largely concealed. No parking on the river front will be allowed save for loading and unloading.

It is suggested that the Master Builder's Hotel might be enlarged by the addition of eight double bed units, 5, and these would run parallel with the back of the western terrace and be built above the residents, garages, taking advantage of groundslope. Here they would complete the architectural form of the hamlet, 6, but not affect the view from the river.

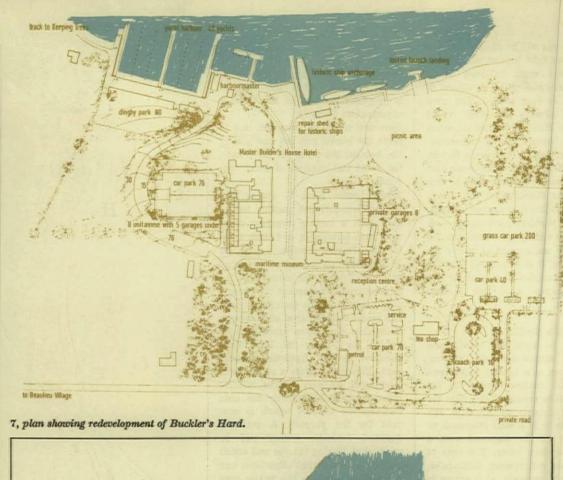
All landscaping would be as natural and unsophisticated as possible with gravel surfaces, indigenous heathland shrubs and trees and pony cropped rough grass.

BAILEY'S HARD

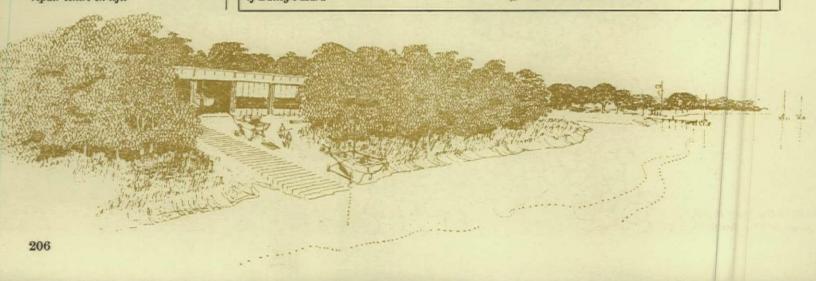
At present the river has no boat repair centre and Bailey's Hard, 8, already used as a tender and sailing dinghy park and place for owner repair work, is eminently suitable. Only boats up to 45 ft. would be catered for. On the site of an old brickfield, the existing buildings have considerable character and will be converted for use as a sailing school hostel and canteen (see plan 9). No parking will be allowed within sight of the river, but adequate parking provided screened by indigenous trees and shrubs.

K.B.

8, Bailey's Hard, with proposed boat repair centre on left.







Library, Aldeburgh, Suffolk

architect: Peter Collymore

photographs by H. de Burgh Galwey and Peter Collymore



Interior Design

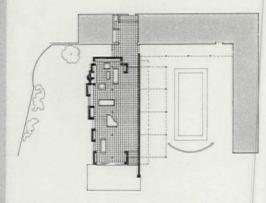
1, detail of column-top, shores and joist grid











floor plan

This library/music room/picture gallery for a well-known composer is used also for music rehearsals, built into one arm of an existing U-shaped group of buildings. The old side wall to the courtyard was retained as were the conical cast iron column bases, new hexagonal Columbian pine columns do not reach the roof but have flying shores morticed into their tops supporting a grid of joists. The underside of the ceiling is boarded with Columbian pine. Brick walls form individual panels with return ends. The floor is of 9 in. square quarry tiles with electric heating under.

2 and 3, general views. 2, shows right, how the flying shores are used on both the inside and outside of the long picture wall. 4, exterior with courtyard wall, right.

Library, Aldeburgh









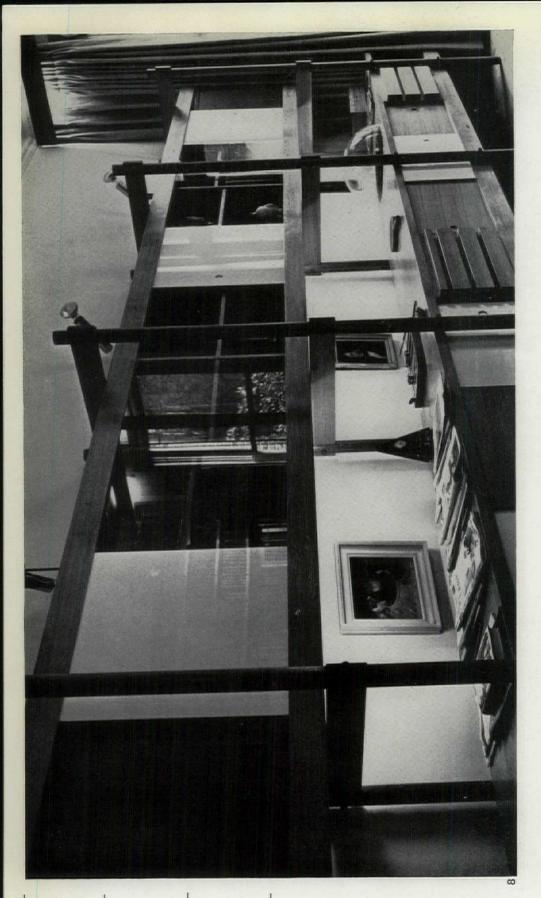
5, the library seen from the hallway.
6, view looking towards the hall, showing the lighting for the picture wall mounted on ceiling joist. 7, window corner of the library.



Storage Unit in Flat, Drayton Gardens, London

architects: Robert Howard and Philip Pank photograph by Marilyn Stafford

This wall storage unit, 8, 17 ft. 4 in. long, forms part of an entire redesign scheme. The unit, of oak, contains cupboards and shelves and a stereo record player under a hemispherical dome of perspex. The upper dresser has sliding glass or oak doors.



ISLAMABAD

a progress report on Pakistan's new capital city

When partition in 1947 gave India the Lutyens-designed city of New Delhi, Pakistan needed a new metropolitan focus to express the distinctive aspirations of a separate Islamic nation. When Field-Marshal Mohammed Ayub Khan established strong leadership in 1958, one of his first acts was to appoint a Commission for the Location of the Capital, with Dr. Constantine Doxiadis. the Greek architect-planner, as adviser. The Commission recommended two possible sites. One was just outside the temporary capital of Karachi; but, quite apart from its chronic congestion with refugees and with the commerce of West Pakistan's only modern port. Karachi was badly situated for a capital, having a very hot and humid climate and a hinterland of desert.

So the other possible site was chosen: the Potwar plateau, lying to the north of the country in a less steamy atmosphere 1,600-1,900 feet above sea-level with the foothills of the Himalayas rising another 3,000 feet as a backdrop. The existing town of Rawalpindi nine miles to the south, besides having good air and rail links to the rest of the country, lies on the Grand Trunk Road which connected Teheran and Kabul with Peshawar, Lahore, Delhi and Calcutta—a linear growth of historic capitals which Doxiadis was quick to identify as the basis of a future Asian 'ecumenopolis.' Another ancient road, now sadly a cul-de-sac, runs north to Kashmir and Central Asia. In February. 1960, Ayub Khan named the Potwar site Islamabad (city of Islam). Rawalpindi became the second temporary capital until 1965 when Islamabad took over officially from it.

THE DOXIADIS PLAN

Doxiadis Associates were appointed in 1959 to prepare the new capital's Master Plan, approved in May, 1960, and followed in most of its essentials ever since. The basic idea, which Doxiadis calls 'dynapolis,' is of a city expanding in a linear fan-shape from an initial focal point. In the case of Islamabad, there were to be two foci: the old centre of Rawalpindi and the new administrative centre of Islamabad, situated directly below the escarpment of the Margala Hills. A linear layout made sense of the site, which, besides the Margalas, was bounded to the east by more hills and to the south by the Sohan River. Doxiadis accepted the uncertainty of dynamic growth, his population graph, showing an increase of 400,000 people in twenty years and a total of 2,250,000 by the end of the century, being open to con-

stant revision. In having a tightly built up nucleus constantly expanding, Islamabad is a Mark II capital compared to the Mark I of Brasilia and Chandigarh (and New Delhi), where an essentially static layout of monumental buildings and zoned uses will only gradually have its gaps infilled over the years. In one major respect, however, Doxiadis has compromised his own principles: whereas the buildings for local government will expand gradually with offices and shops as the spine of the linear layout, the buildings for national government and national culture have been treated as a fixed 'focus' at the point of the fan, with only the National Park and the enormous artificial Rawal Lake to the east of it. Islamabad will for some years be a one-industry city of Government, and there may be increasing difficulties of 'tidal flow' and congestion of transport as the growth of the whole city moves increasingly away from this focus. The administrative centre includes the main Government Secretariat buildings, the President's Palace, the Parliament Building. the National Library and Museum, and the Armed Services Museum. To the south is the diplomatic enclave of embassies and high commissions. To the west are sites for various 'buildings of national importance' and an exclusive residential area for high officials. Only to the west of these do the residential sectors around the main spine start.

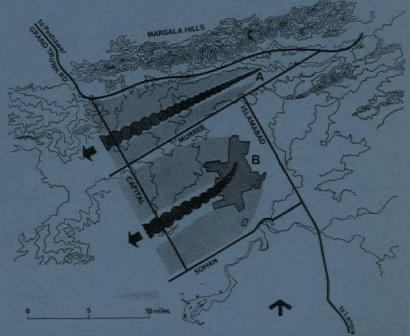
These residential sectors are built on a disciplined hierarchy of communities. Each sector, housing 30-40,000 people, is known as a Class V community, the centre of which contains municipal offices, large shops, health centre, cinema, fire station, police station, post office, Jamia Masjid (Friday mosque), dhobi ghat (central laundry area), sports centre and recreation areas. Each Class V community is subdivided into three or four Class IV communities of about 10,000 people, with centres containing shops, covered food market, mosque, secondary school, health clinic, restaurant, local police point, municipal maintenance office, and sub-post office. Each Class IV is again subdivided into three or four Class IIIs of about 2,500 people each; these contain local shops, primary school, tea house and praying place. A Class II community is a group of about a hundred people served by a corner shop: Class I is the family itself or 'any gathering of two or three people.' This hierarchy is not perhaps very different from Gibberd's at Harlow, and the range of facilities contained in a Class V centre (essentially radial in its focusing of traffic, not linear) seems to leave remarkably few activities over for the 'main spine.'

The test of Doxiadis, however, is not his diagrams but the environment he has created; and there can be no doubt as to what he intended, as his firm did detailed designs for the first four Class V communities, and in one of these, G6, a large quantity of housing to these designs was actually built in 1961 and 1962. The whole layout is based on the most rigid grid of squares, each Class V sector having a side of about 11 miles. There is no reason for the main roads to be curved,' Doxiadis has said, 'unless the form of the landscape compels us to do so'-and in fact he has allowed virtually no curves, even though the Potwar Plain is undulating, being eaten into by deeply eroded water courses. Sometimes the grid results in rollercoaster gradients for straight roads, and in a city where the housing is almost entirely single-storey, the failure to follow the natural contours sufficiently means a monotony of aspect and an excessive dictation of pedestrian movements, even though vehicles and pedestrians are meticulously kept apart. Standard house plans were evolved by Doxiadis for the eight established levels of Government housing (A to H), corresponding closely to income and status. Each man moves to an appropriate house on being promoted in the civil service. The climate runs to extremes, from 30 deg. F. in winter to 115 deg. F. in summer, with 40 inches

of rain per year, mostly in the July-August monsoon but also in the spring rainy season. Doxiadis has aimed, so he told the REVIEW in a recent statement, at 'creating types of spaces which have two characteristics: (a) they should have a small exposure to the winds which can make living outside during the sunny winter days very unfavourable when man needs the sun but avoids the wind; (b) people tend to forget the necessity to create as many shaded places as possible, which will be indispensable during the summer when greater exposure to the sun means much more unfavourable conditions.'

MUSLIM OR MODERN?

Unlike India, Pakistan has very few qualified architects and fewer still of talent. There are five local firms at Islamabad and an American from Karachi, William Perry; but up to last autumn the Capital Development Authority-the equivalent of Nova-Cap at Brasilia-had recruited only one qualified architect-planner, one architect and one town planner of Pakistan nationality. No one can say the CDA did not go to big outside names: Sir Robert Matthew, Gio Ponti, Arne Jacobsen, Louis Kahn, Lord Llewelyn-Davies. Matthew and Percy Johnson-Marshall have done the overall plan for the administrative sector with Derek Lovejoy Associates as landscape architects. Matthew's superlative diplomacy has faced unequal odds. In the first place, Dioxiadis's layout for the area showed



Islamabad: Doxiadis's diagrammatic conception of 'dynapolis'. The new linear growth of Islamabad itself (A) is paralleled by a similar growth of Rawalpindi (B), which is enclosed by the four main highways.

just how irrational 'rationalist' planning can be: along National Avenue were to be serried ranks of ten-storey slab blocks for the Ministries, inflexibly subdivided for a rapidly evolving country and wildly optimistic for a technology of cheap manual labour still geared very largely to single-storey structures of brick and stone. Doxiadis nevertheless stated that these block shapes were based on 'detailed calculations . . . covering both present and future requirements.'

Matthew and Johnson-Marshall kept Doxiadis's zoning but laid it out again with more regard to the contours of the landscape. Gio Ponti had already designed the first public building built in the miscellaneous area to the west—Pakistan House, an hotel now renamed the Shehrzad and considerably redecorated. His partner Alberto Rosselli then began work on the Secretariat buildings to go on Doxiadis's Ministries' site. The first phase of these, now nearing completion and partially occupied, consists of two groups of four L-shaped blocks. containing about 1,000,000

sq. ft. in all. Space is so arranged that Ministries can rapidly expand and change places. Visually the expression of the lift and stair towers at the corner of each 'L,' together with the placing of the blocks at different levels on the slope, enables the buildings to blend with their mountainous background. Rosselli rejected local brick as too small in scale and local stone as too costly-and both gave inadequate earthquake-proofing; but, having chosen instead to use an infill of precast concrete within an in situ concrete frame. he discovered that precasting had to be taught from the beginning and lifting tackle was non-existent. The primitive lifting method ultimately adopted consisted of a pulley wheel fixed high up and worked by driving a tractor away from it with the cable attached. Rosselli points out that the buildings were intended all along to have an educational effect on the local building industry. Nevertheless, he admits, 'the technology adopted betrayed its origins and was difficult to graft into the country with its particular climate; technology

The Doxiadis master plan for Islamabad. Civic and commercial areas are hatched, F6, F7, G6, G7 are the first four housing areas, and S is the secretariat—see the detailed plan below.



Detailed plan by Doxiadis of the administrative area (secretariat) and first four housing areas, which are illustrated on the following pages. The hierarchical division of communities (classes I-V) can clearly be seen, as can the almost total separation of pedestrians from motor traffic. There are few cars at present, but main roads are planned for massive flows of traffic later in the century.

was revealed as a product designed for a given society rather than a mass of universally valid techniques.' The closeup photographs of the buildings, handsome as they are, reveal many jagged edges to the precasting, eventually rendered over. A major problem was the filing and accurate reading of the architect's drawings sent out from Italy.

Much more challenging than mechanical functioning or technological sophistication is that deeper level of aspirations, which a nation looks to find expressed in its capital's monuments. 'Being Western architects designing for the East,' says Rosselli, 'we tried to establish a method of approach to Muslim tradition: we interpreted it as not bounded to the "forms" of the past but to its general ambience, to present culture, to the actual way of life and to the local climate. We went beyond rationalism [i.e. Doxiadis] as regards our interpretation of the environment. But on the other hand we had too to keep a rationalist position before the problems of technology, economy and structure. . . . They are not imported European buildings and are completely different from what we have designed for Italy or abroad.' Yet in spite of Rosselli's slightly Oriental precast panels, the Secretariat has been flercely criticized for being too Western in style. Delay and lack of funds gave the opportunity for a wholesale change of consultants. Jacobsen was the first to go: his sleek and serene Parliament Building was as remote from Muslim culture as a sauna bath. He was replaced by Kahn, who produced three different schemes for the President's Palace and the Parliament Building in that extraordinary style with holes punched in it which is actually achieving splendid results at Ahmedabad in India and at East Pakistan's capital of Dacca (see AR World, November, 1966). But at Islamabad he was not acceptable. Last November a third architect was anpointed: Edward D. Stone. His design for the President's Palace, which has been accepted, flatters Islamic grandeur in the crudest way (see World, pages 169-170, for illustrations of this and other buildings attempting local character).

TROPICAL COMMUNITIES

That it is not impossible successfully to create new communities in Pakistan which are both Muslim and modern can be seen in the work carried out at Islamabad in 1962-66 by the team of experts provided by Britain under the Colombo Plan, with Gerard Brigden as chief architect. Their work reached maturity in designs for the Government Hostel, the State Guest House and the Supreme Court, of which the first has been completed, but principally they have built up the residential sectors. Of these, G6 is virtually finished and parts of G7 and F6 are ready, accommodating about 60,000 people in all, together with shopping centres, food markets, primary and secondary schools, health centres and municipal offices. Doxiadis had laid down for

G6 a two-dimensional plan which overestimated actual requirements as much as his plan for the administrative centre. Development thus became too low or too broken up. In his completed area of 67 by contrast Brigden was able to move away from the rigid parallel lines of housing in the Doxiadis areas. The Colombo Plan team have attempted to develop an appropriately regional domestic architecture, extracting the functional principles that originally lay behind the motifs of Islamic ornamentin particular, those of climatic control. They have used open-work screens (known as 'jali') which give shade but admit cross-ventilation, water gardens which give coolness and relaxation in the heat of summer, and geometric forms which stand out in the sun without glaring reflections. Domestic buildings were traditionally built where sible with 15-20 ft. ceilings so that cold air could be let in at night and stored during the day. The Colombo Plan architects have instead developed a form of double roof construction in which the upper roof of shell concrete shields the main roof from the sun like a parasol; with this method rooms can be given lower ceilings and can be heated more easily in winter.

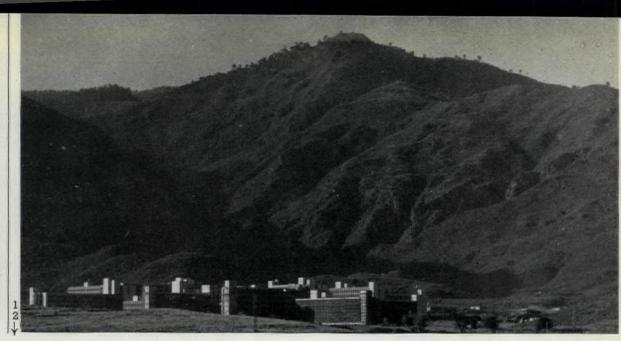
Doxiadis's provision of generous public spaces in graduated amounts for each class of community was paralleled by a careful ecological analysis of the four main categories of natural landscape: the mountains, the hillocks, the plain and the ravines. The Colombo Plan landscape consultants, Derek Lovejoy Associates, who are employed throughout the city, have been allowed lavish funds for their work, which has extended from afforestation to consolidate the seriously eroded hillsides and ravines to the hard brick paving of urban squares. In some of the public buildings such as the Government Hostel and the National Health Laboratories they have created water gardens which successfully translate traditional ideas into modern forms.

Much more difficult has been the treatment of the major highways: when Doxiadis drew them straight across the ravines, he forgot that the problems of cut and fill would have to be solved without the use of earth-moving machinery, thus leaving the ugly scars of labourers' 'borrow pits.' Even in landscaping the problem of Muslim versus modern has arisen: the Director of Horticulture wished to plant the hills with flowering cherries rather than forest trees and to lay out urban squares with rosebeds. However, the enthusiasm with which the Director and the inhabitants have smothered the cerebral grid of Doxiadis's first terrace houses in an emotional frenzy of foliage and flowers is one of the most encouraging signs at Islamabad that living communities have been delivered from the birth pains.

ACKNOWLEDGMENTS

ACKNOWLEDGE This article has been made possible by help from the architects concerned, in particular from Gerard Brigden of the Colombo Plan team, Michael Lancaster of Derek Lowejoy Associates, Alberto Rosselli of PFR International Consultants and Dr. Constantine Doxiadis.

The landscape of Islamabad has natural ravine-pitted plains framed by the majestic Margala Hills. 1, the Government Secretariat, designed by the Italian architect Alberto Rosselli—the raison d'etre of what is at present a one-industry town. 2, aerial view of western half of G6 housing sector (with the Margala Hills behind). The Class V centre is on the extreme right. The two slab blocks are municipal offices: architect, E. Harvey Foster. Courtyard housing designed by Gerard Brigden contrasts strongly with the terrace housing beyond it, mostly by Doxiadis Associates. To the left of the Brigden housing is the Class IV centre designed by E. Harvey Foster (see page 215). Further left is the prominent rooflight of a primary school by Gerard Brigden (assistant, Colin Franklin), illustrated in World, page 170. In the background can be seen the first housing in G7, by Brigden (see page 216). The 'linear spine' of Islamabad will run along the Murree Highway (bottom left).







ISLAMABAD

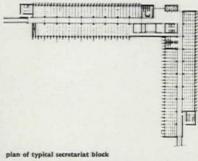




3–5, the Government Secretariat: architects, PFR International Consultants—Gio Ponti, Antonio Fornaroli; Alberto Rosselli: Structural engineers, Pietro Locatelli and Mario de Bernardinis. 3, detail of façade, showing sophisticated precast detailing and unsophisticated constructional equipment. 4, two kinds of façade, both oriented similarly, and service towers with a touch of applied areading. 5, entrance forecourt, land-scaped by Derek Lovejoy Associates, giving access to ground floor cloister. 6–8, Government Hostel: architect, Gerard Brigden. Environmentally the most successful building yet erected in Islamabad, it provides single rooms and suites for members of the National

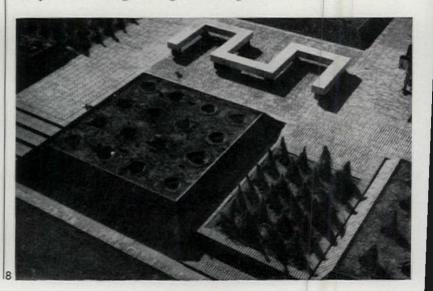






Assembly and senior civil servants, planned round two courtyards. 6, three-storey residential wing, showing voca-

bulary of materials: brick cross walls, in situ concrete floors, teak windows, precast jali screens to verandahs, tiebeams for earthquake resistance in front of service room recesses. 7, view from courtyard, landscaped by Derek Lovejoy Associates, back to entrance wing containing reception on ground floor, lounge and dining room on first floor. The shell concrete canopy roof, for extra protection in winter and extra insulation in summer, springs 1½ in. above the main roof. 8, detail of landscaping, with brick paving and seat of local white marble. Note circular depressions for watering newly planted shrubs and coverings of straw protecting them from the sun.



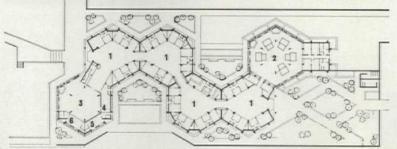


9, typical housing by Doxiadis Associates, showing the straightness of the grid. Pedestrians and vehicles are carefully segregated; the heavy bars make the windows of the houses burglar-proof. The flat concrete roofs have been criticized for inadequate insulation. 10, Doxiadis-designed street, showing overwhelming effect of barely five years' growth of vegetation. Each house is given one tree and one creeper. 11, covered bazaar; architect, Gerard Brig-



ation of type A house, designed by Doxiadis Associates plan

plan of type A house (300 sq. ft.)



plan of covered bazaar: key, 1, general market, 2, food market, 3, restaurant, 4, kitchen, 5, 6, market superintendant, bar

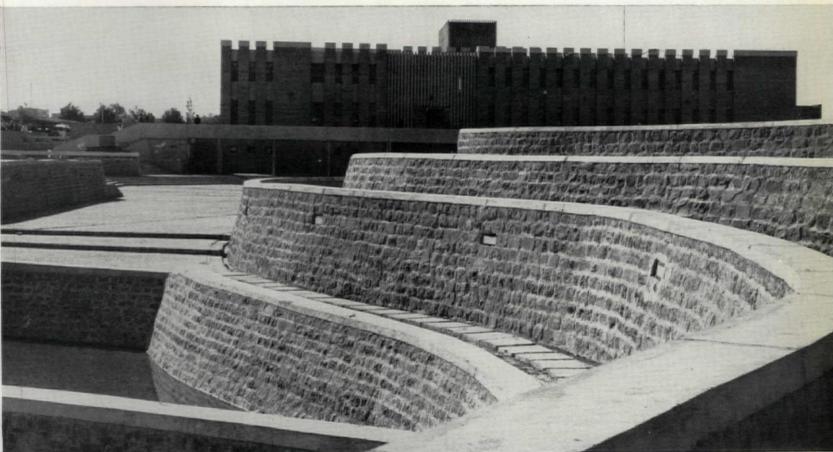


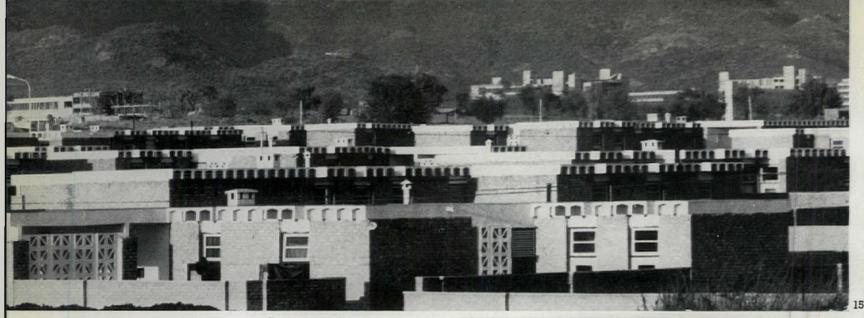
den; assistants, David Williams and Roger Guise. Four of the six rooflit hexagons have peripheral shops; the others contain restaurant and food market. The structure of concrete columns incorporating water shutes has infill walls of yellow-brown brick and double doors for dust and fly screening. 12, Class IV centre: architect, E. Harvey Foster; assistant, Robert Goodyear. Shops below, office and flats above, with precast jali screens and panels of rendered concrete. Brick paving to pedestrian square, with dark











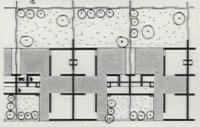
ISLAMABAD

blue tiled surrounds. 13, primary health centre: architect, Gerard Brigden; assistant, Derek Bradford. This has the same system of skell concrete outer vaults as the Government Hostel. Paved square landscaped by S. Tabata (Japan). 14, Class V square, with terraces and pool: landscape architects, Derek Lovejoy Associates. In background, principal municipal office block: architect, E. Harvey Foster—concrete-framed, faced in brick.

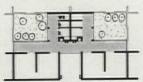
15, E type housing in G6 for middle classes: architects, William Perry Associates. In background, Secretariat (see page 213) and Margala Hills.
16–19, First quarter of G7 housing area: architect, Gerard Brigden. 16, B type

16–19, First quarter of G7 housing area: architect, Gerard Brigden. 16, B type houses—the second smallest, 450 sq. ft. each—see plan. The entrance rooms for receiving guests project, so as not to infringe purdah in the inner rooms. Reddish-brown brick walls, of 9 in. semi-cavity construction, support





plan of type B housing, G7 area



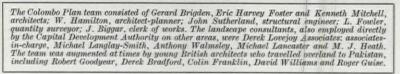
plan of type A housing, G7

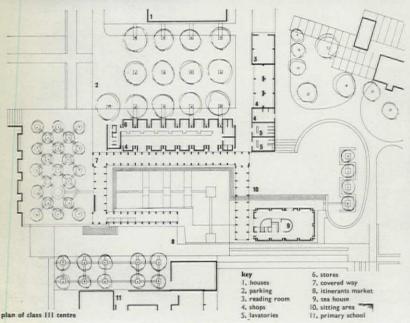
brick vaults on concrete beams which (unlike the purely decorative canopies on the Perry housing, above) allow air to circulate freely for insulation as well as shading windows on the garden side. Pedestrian way has precast paving and brick water channels (shown unfinished); the serrated walls are a deviation from the architect's plan. Assistants: Robert Goodyear and Derek Bradford. 17, A type houses, looking along pedestrian way towards mosque adapted from similar form by a local architect, Rizvi—a tribute to Brigden's assimilation of the genius loci. The bricks here are rendered. 18, A type housing of two different designs—that on left with projecting blocks to shade windows (partially). 19, Class III centre by Brigden: assistant, Colin Franklin. The colonnade of rendered brick vaults on concrete columns surrounds a land-scaped courtyard—see plan.











GALLERY

CROWD FORMATIONS

Robert Melville

It's always Saturday or Sunday in L. S. Lowry's paintings of the industrial scene. Or nearly always. I know of one rather small painting called 'Mill Scene,' 1, in which tiny figures are streaming out of the main gates of a factory and scattering like flakes of burnt paper along the streets. It was in one of his exhibitions at the Lefevre Gallery, but it wasn't included in his Retrospective at the Tate, and offhand I can't recall any others in which the people are going to work or coming away from it. This picture is not as panoramic as the big compositions, and the buildings lack the sharp definition which gives his best work its immense charm, but it's a nice example of the way he takes one for a zig-zag walk through the town and finally leaves one to one's own devices in the whitish murk of the background. In the street that appears to lead to the centre of the town there's a vehicle which resembles a hansom cab (but is probably the horsedrawn baker's cart which appears in some of his other canvases) and a blobbiness which is almost certainly a bus, but there are no bicycles and no cars. There never are.

His more typical paintings of the industrial scene are dedicated to a perpetual week-end.

No one is at work, and the ugly little towns share with Venice an almost total freedom from wheeled traffic. He is in fact far too selective to be described as a straight genre painter. His pictures are coloured by a happy childhood and a desire to remain there. He's the Peter Pan of English painting.

The large, handsome industrial panorama



1, L. S. Lowry: 'Mill Scene'. 2, 'The Pond', 1950. Oil on canvas 45 by 60 in.



entitled "The Pond,' 2, is really a fantastic playground. Quite apart from the big, oval boating pool in the centre, it's full of bits of waste ground that have been taken over by children, and even the main road which borders the pool, and swerves off to the left in a delicious curve, is perfectly safe for the casual walk-about. The only wheeled vehicle in the entire picture is a child's pram. Most of the factories are some way off, in a belt of mist next to the broader belt of white sky: they are unknown entities, mysterious and inaccessible, like the castles on distant hills in Breughel's 'Stormy Day.' The tall chimneys are as thin as flagpoles, and I'm convinced that their plumes of smoke are substitutes for flags.

There are some fascinating details. The line of children in the foreground, with the girl wheeling the doll's pram bringing up the rear, is pretending to be a procession. The outdoor privies for one block of dwellings are at the bottom of the garden, but in the next block they're built against the kitchen wall, one hut serving two houses. There is a semi-circular set of steps on the left which indicates that the piece of waste ground just behind the chapel is on a lower level than the roadway, but it appears to serve no purpose because a fence prevents access to the road; nevertheless, children and grown-ups seem to be amusing themselves by walking up and down it. Another group of people has collected at a particular spot by the wall of the pool and others are crossing the road to join it. The entrance to the pool, a few yards away, is deserted, and the people who are already bunched together looking through the railings which surmount the wall are presumably taking a free look at the activities; one supposes that the others are joining them because they think that a happening out of the ordinary may be taking place at that point. Lowry has an eye for the innocuous clustering of people, and pictures like 'The Pond' would be distinctly idyllic if he were less placidly delighted by his cleverness in devising a figurative shorthand. As it is, the figures lack substance, they are a kind of addenda, a feckless scribble on the face of the work. They look as temporary as mayflies. They look as if they could be sponged off the painted surface like bits of fluff and strings of cotton.

Lowry's development has been peculiar. While he was still a comparatively young art student he painted two brilliant pastiches of Courbet's still lifes of apples, and during the twenty years in which he attended art classes he produced a fair number of highly competent student works; but he didn't have a distinctive style until he hit on his eccentric but effective formula for the panorama, in which one can perceive not only the influence of Breughel

and Avercamp but of the twentieth-century French naive painters. The dichotomy, to which I have already alluded, between the topography and the figures, is evident enough if one compares the skinny, wraith-like figures of 'The Pond' with the sturdy skaters in Avercamp's ice scenes, which are conceived with the same beautifully meticulous realism as the houses and bridges; in spite of their smallness the people in Avercamp's pictures



3, L. S. Lowry: 'A procession,' 1938. Oil on canvas 18 by 24 in. 4, 'Street scene in snow,' 1941. Oil on panel 14½ by 24 in.

remain their undiminished selves. But perhaps an even more revealing comparison can be made between two of Lowry's own works. In one of them, 'A Procession,' 3, painted in 1938, the foreground figures are larger than in 'The Pond' and the comic element in the figuration is more obtrusive. The other picture, a charming snow scene, 4, painted three years later, reverts, as far as the setting goes, to the sober tonal realism he sometimes practised during his student years, and although the figures are insubstantial and ghost-like they seem to me to be infinitely preferable to the figures in 'A Procession.' At least the artist is not having a snigger at their expense.

His comic approach to the figure was probably due in the first instance to the influence of the naive painters, but his figuration has steadily deteriorated and has acquired an air of false naivety more insufferable than anything to be found in the work of a self-taught painter like Vivin. There is something rather sordid about his tirelessly facetious attitude towards the human image, and in his later works, where he abandons the industrial settings and concentrates on the figure, it's evident that he can produce only paltry, derogatory caricatures. Certain paintings which may well be intended to disclose a

tenderly humorous attitude to his fellow creatures seem to me to be distressing documents of a breakdown in communication, not really suitable for exhibition.

The figures do not spoil the best of the panoramas because the smaller they are the more human one can imagine them to be, and when Lowry observes from a distance the way people gather together under the slightest pretext he vividly conveys the gregariousness of the species.

The crowds in the paintings of Juan Genoves assemble under the spur of stronger feelings. There is no nostalgia or whimsicality in his work. They are the protesting crowds that have become a universal phenomenon of our time, and he doesn't particularize the people, but treats them as cells in a larger structure. The crowd considered as a sort of temporary organism, somewhat analogous to a swarm of bees, is a modern conception. It seems to derive from the political designation of the underprivileged as 'the masses,' but its treatment in painting is directly influenced by photography and the cinema. The influence of both is certainly evident in the paintings of Genoves. Some of them, 'La Fuerza,' 5, for instance, remind one of the silent films of Eisenstein, and the setting of the haunting



The simpleton:



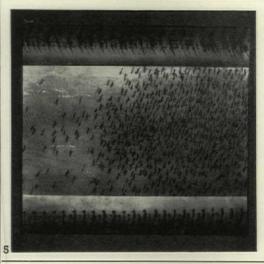


Legs. Arms. A back. A seat.
And a head this time. The style again is simple, uncluttered. Still the same intelligent workmanship to withstand the wear and tear of the featherweights or the heavyweights.
The price makes sense too. All in all it's a great comfort to the hard-headed business man.

NI2 HIGH COMPTON



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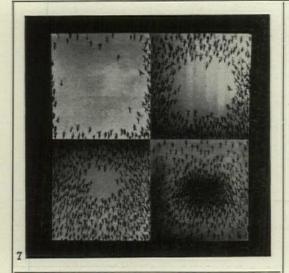


'Laberinto,' 6, where the people mill back and forth, trapped between long, doorless walls, with arms raised in the gesture of surrender as if in the forlorn hope of not being mown down, has something of the nightmarish quality of Orson Welles's settings for Kafka's 'The Trial.' It's clear too that he has learnt a good deal from the compartmented compositions of the American painter Andy Warhol. Genoves, thirty-six years old, is Spanish, and his work caused a great stir last year when it was exhibited at the Venice Biennale. The

fact that all the paintings in his very fine exhibition at Marlborough Fine Art were painted in 1966 is probably a sign that all his previous work has been snapped up. He is more objective than Lowry, but at the same time much more engaged. He takes an almost scientific interest in the movement of crowds; in the way they form and in the way they disperse. He handles pictorial serialization very adeptly, and the sense of swarming, when people press in from all sides, under the urge to express some sort of solidarity, until

5, Juan Genoves: 'La Fuerza,' 1966. Oil on canvas $14\frac{1}{4}$ by $51\frac{1}{4}$ in. 6, 'Laberinto', 1966. Oil on canvas $39\frac{3}{8}$ by $47\frac{1}{4}$ in.





7, Juan Genoves: 'Agrupamiento', 1966. Oil on canvas 47\frac{1}{2} by 51\frac{1}{2} in.

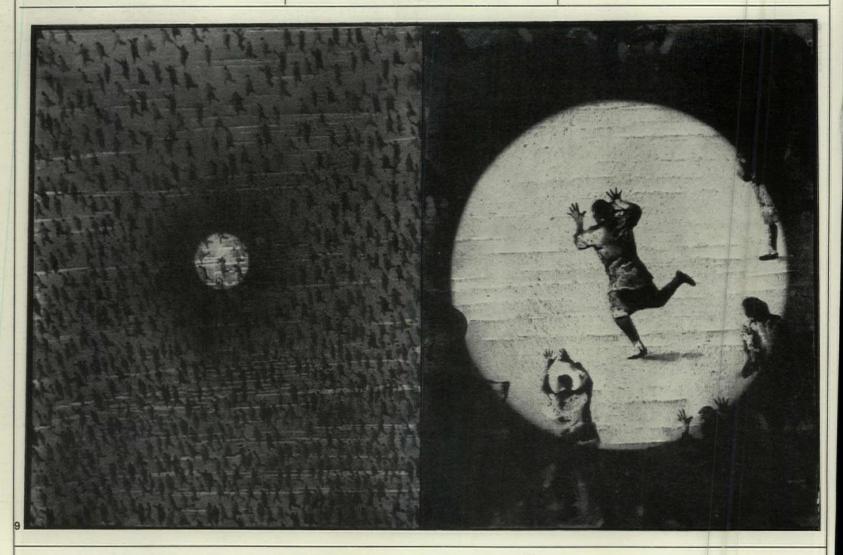
a solid and impenetrable core is formed, is superbly evoked in the compartmented picture called 'Agrupamiento,' 7.

It's perhaps the studies of violent dispersal which disclose where his sympathies lie. Like the best documentary photographers, it's in the selection of material and in the emphasis put on certain details that he declares himself. The 'Ensayo de Violencia,' 8, for instance, with its six separate studies of a policeman in action—just a bit like Muybridge but muzzy, as if enlarged details of a panoramic shot-or the painting 'Amplicaión,' 9, where the section on the left spotlights the centre of a dispersing crowd and the section on the right brings the people in the circle of light much closer, as if the figure isolated in the middle were about to be dealt with, do not leave one in much doubt that the artist is on the side of the protesters. One doesn't need to know what they're protesting about-they could even be a bunch of Fascist reactionaries-to align oneself automatically with the people running away. Genoves has a remarkable ability to arouse in one an acute sense of the vulnerability of the human back. His work is not self-consciously avant-garde, but like the paintings of Francis Bacon on the one

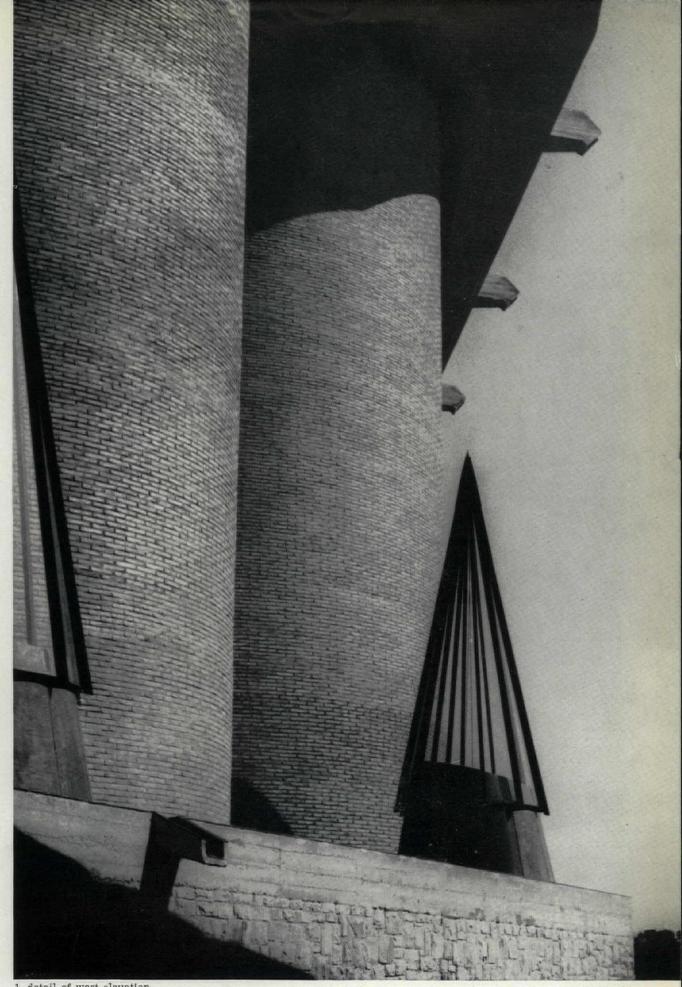


Juan Genoves: 'Ensayo de violencia', 1966.
 Oil on canvas 29½ by 41¾ in.

hand, and of certain aspects of Pop art on the other, it is a profound expression of contemporary sensibility. What he has to say may or may not be edifying, but he is something of a rarity in modern painting in being able to communicate on an understandable human level.



9, Juan Genoves: 'Amplicaion,' 1966. Oil on canvas 311 by 511 in.

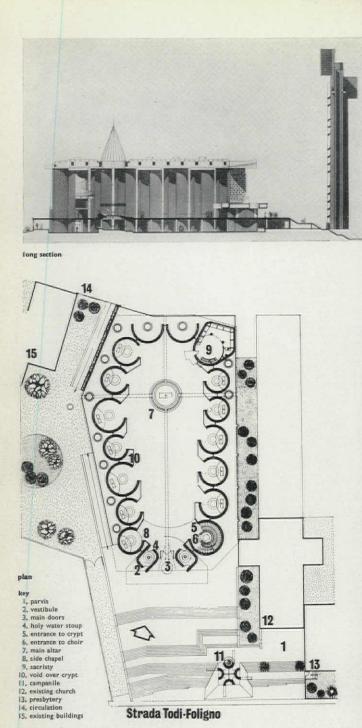


1, detail of west elevation.

CHURCH NEAR PERUGIA, ITALY

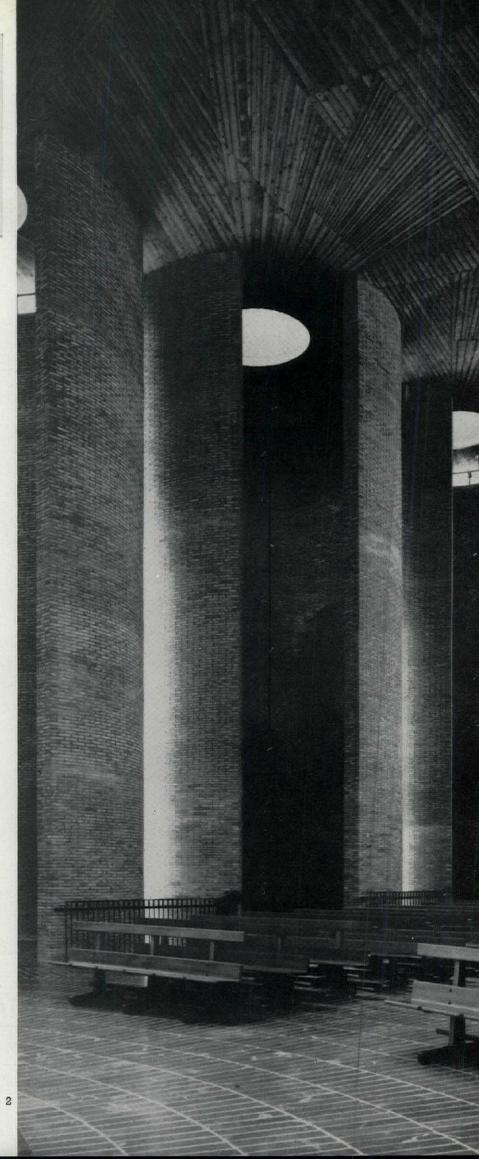
architect JULIO LAFUENTE

photographs by Julio Lafuente and T Okamura

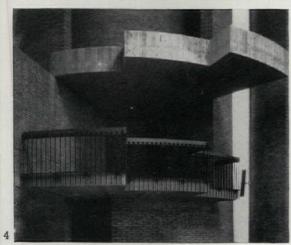


This is a pilgrimage church, sited on a hill at Collevalenza, about five miles from Todi. The structure (see plan) consists of a number of cylindrical brick elements of various sizes, those at the sides opening into the nace space and thus forming chapels, and the two at the east end (in this case half-cylinders) being pierced by small square openings. A central altar is raised on a circular platform and has a suspended baldachino and a circular rooflight over it; in addition each chapel has its own rooflight and light enters the nave directly by vertical slits between the chapels. The flat roof is of exposed concrete, patterned by board marking. Beneath the nave is a crypt and at the south-west corner of the site, at the foot of a broad flight of steps leading up to the west door and near a small church that existed before, is a free-standing bell-tower of open construction, also in brick and concrete. The crypt is lighted along either side through cylindrical rooflights, surmounted by cones of glass, ranged along the outer walls of the chapel. Consulting engineer, Gaetano Rebecchini. Structural engineer, Calogero Benedetti.

Strada Todi-Foligno

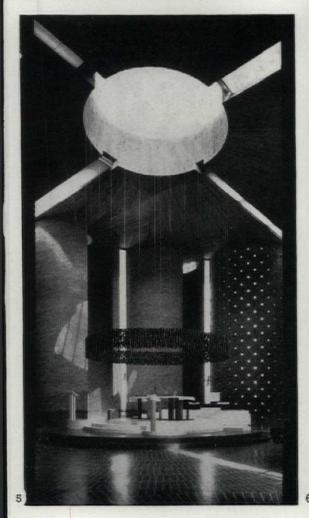


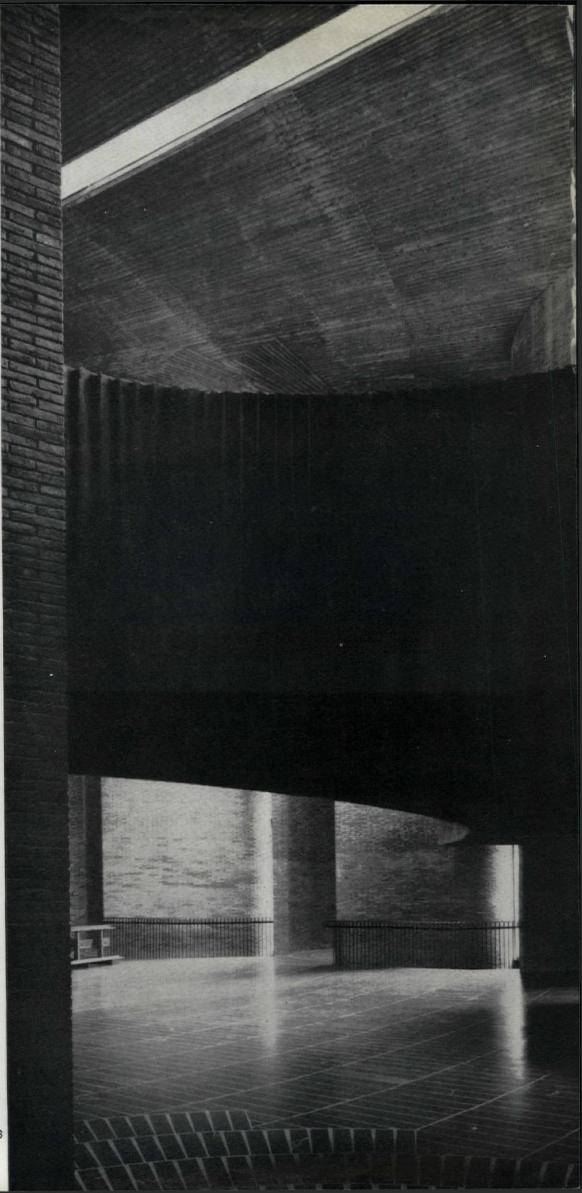




2 (opposite), nave and side chapels—see also frontispiece to this issue. 3, exterior view from the west with existing buildings in foreground. 4, organ loft above sacristy entrance. 5, main altar, showing baldachino and circular rooflight with diverging slit rooflights. 6, view from the first chapel on the west side.

CHURCH NEAR PERUGIA, ITALY



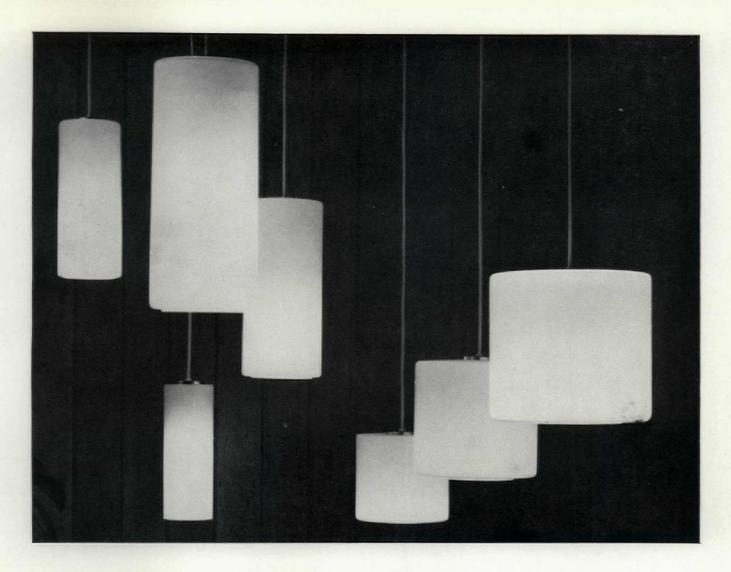


MISCELLANY

MORRIS IN HOSPITAL

Ventnor in the Isle of Wight is one of the most attractive of small Victorian seaside resorts, its bargeboarded villas with Italianate towers strung out along the 400 ft. south-facing cliffside, warmly sheltered and thick with scented vegetation. The climax of the town's prosperity as a resort (Marx and the young Churchill stayed there) was the establishment there of the Royal National Hospital for Diseases of the Chest, built in 1868-70 on a magnificent site along the coast road towards St. Lawrence. To give every patient the best sunshine and air, it was divided into separate pavilions, connected only by a central corridor, over a quarter-of-a-mile long, with cast-iron balconies facing seawards, 1. It was a late work of the prolific local architect, Thomas Hellyer of Ryde. In the chapel, added in 1871-2, which stands symmetrically in the centre of the hospital, he achieved a surprisingly creditable piece of neo-Perpendicular, 2. This was an unusual style for the date (Sedding's pioneering St. Clement's, Boscombe, was begun in the same year, G. G. Scott, Jn.'s St. Agnes, Kennington, three years later), and Hellyer's other work suggests a conscious 'survival' of the style from pre-



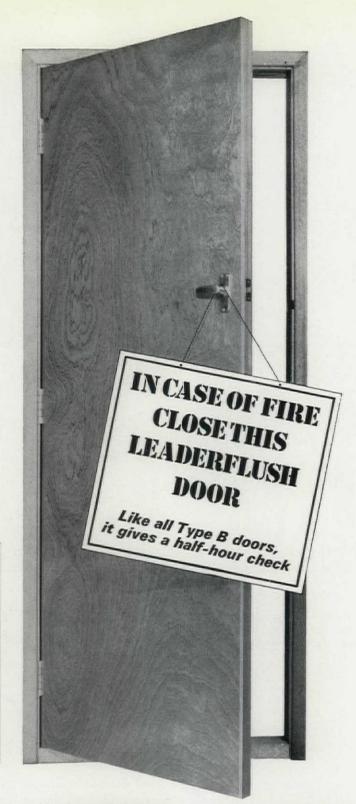


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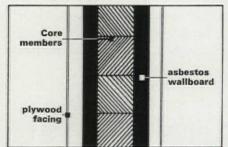
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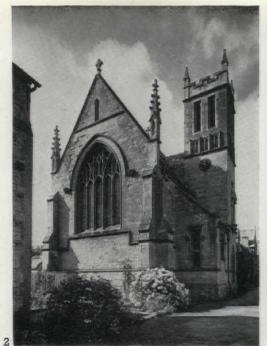
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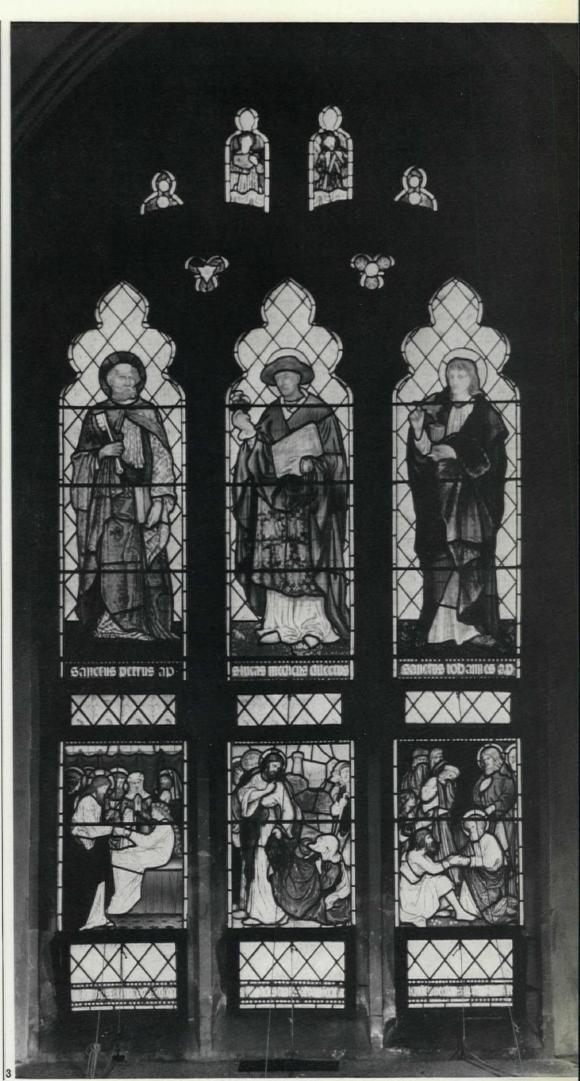
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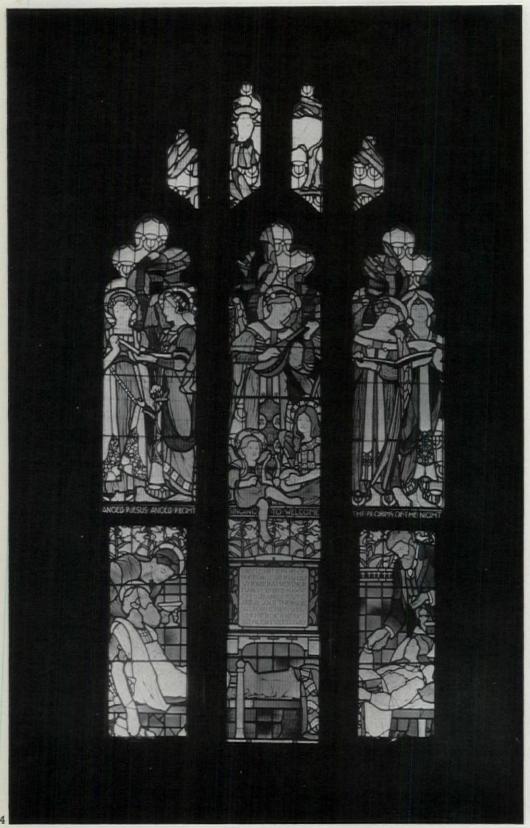
Victorian Gothic.* The perspective in *The Architect*, September, 1871, shows a thin spire on the tower, evidently not built. The interior is at first sight disappointing, but is redeemed by two of the windows, major works respectively of Morris & Co. and of the Art Nouveau artist Sir William Reynolds-Stephens. The hospital is now disused and the windows are in urgent need of protection.

The Morris window, 3, on the north side, just west of the chancel steps, was inserted in 1873 in memory of Robert H. Hamilton, John Hamilton and William S. Hamilton. The designs are by three different artists, but nevertheless form a well integrated whole. St. Peter, on the left, wearing a richly diapered gold robe over a white undergarment, and St. John the Evangelist, on the right, wearing a rich crimson robe lined with green, over white, are both from cartoons by Burne-Jones, the Peter having been originally designed in 1871 for a window at Peterhouse, Cambridge, and the Evangelist in 1869 for the Savoy Chapel, Westminster. The St. Luke in the centre, wearing a wide-brimmed straw hat, and a dull purple cloak lined with blue, over a sort of dalmatic in blue patterned with gold, and a long white undergarment, holds a large volume of Hippocrates in his left hand, and a flower in his right. This is a repetition of a cartoon designed in 1869 for Ladock by Ford Madox Brown. The outer panels below, representing the Raising of Jairus's Daughter and the Raising of Lazarus, are both by William Morris himself, the designs having been originally made about 1866 for a window at Pool-in-Wharfedale, Yorkshire. The central one, Christ healing the Woman with an Issue

^{*} Hellyer is known to have done ten other churches, dating from 1842 to 1869; Holy Trinity Ryde, St. John Oakfield, St. Saviour Shanklin, Seaview, Havenstreet and St. James East Cowes in the Isle of Wight, St. Luke and St. Simon at Southsea, Kingsclere Woodlands in Hampshire, and Searroft near Leeds. He also remodelled Kingsclere, Hants and Binstead, IOW; and restored Brading, IOW, and Thatcham, Berks.



of Blood, is the only part of the window specially designed for the Ventnor commission, by Ford Madox Brown, in August 1873. No other example of this design is known to exist. In the tracery are two and Crafts artist who later created the superb furnishings for Harrison Townsend's church at Great Warley*. It has a liquid, luminous colour quite different from Morris's, although recognizably of the



half-length figures of minstrel angels. There are some slight signs of deterioration and loss of detail in parts of the window, the large figures in particular, probably due to firing with a faulty flux, which occurred in a number of Morris windows at about this date.

The Reynolds-Stephens window, 4, has great interest as an early work of the Arts

same school. It was inserted in memory of Dr. G. J. Shaw, who died in March, 1892, and also of his wife and son, and it is signed low down by the artist. The main subject is a row of angels with long wings in the upper part of the lights; the one in the centre is playing a lute, with a little boy and girl seated at her feet, and two

* See John Malton: 'Art Nouveau in Essex,' AR, July 1959.

on each side are singing from books of music. They have graceful flowing robes and 'simple life' headdresses. The background quarries have an Art Nouveau 'lollipop' motif in the leading which is continued in the tracery behind a representation of the winged bull of St. Luke. Below the angels are clearly drawn capital letters quoting 'Angels of Jesus, Angels of Light, Singing to Welcome the Pilgrims of the Night.' In the lower part of the lights, above a central inscription panel, is a frieze of intertwined daffodils. Below on the left is a scene of a patriarchal old man being handed a cup of medicine by a youth. On the right is a young woman having her pulse taken by a bearded doctor (presumably a portrait of Dr. Shaw); her bed extends into the central light, forming a firm base to the design.

Instead of Morris's decorative semi-opaque background of quarries, Reynolds-Stephens uses much clear glass round the figures; and instead of Morris's rich High Victorian shadow effects and modulation of colours in the elaborate draperies (red and blue, brown and yellow), he uses a limited colour range with broad areas of unmodulated colour: mostly green and white for the angel's robes, red, brown and purple for the angel's wings, green for the background of the lower panels, white for the patients' clothes, purple for the doctor's velvet suit. The shapes are very clearly defined, the clear glass between being broken only by patterns in the leading. The effect is gently humanist, even secular, rather than religious. The winged bull seems like a peaceful cow, and the angels like artistic

Reynolds-Stephens (1862-1943) worked on many crafts as a belated pre-Raphaelite. mainly as a decorative sculptor in the Alfred Gilbert tradition. After his early Morris-cum-Art Nouveau period (of which this window is a rare example) he degenerated into sculpture and painting of a sentimentally crafty kind, thick with symbolism and history (his 'The Royal Game' of 1913 at the Tate Gallery, for example, which shows Elizabeth I and Philip of Spain, in copper, pewter and wood, engaged in a game of chess). Besides painting, furniture and interior decoration, he designed a frontal for Holy Trinity, Sloane Street, and a number of War Memorials. At his house in St. John's Wood, he had a vast collection of Chinese bronzes and other Oriental art.

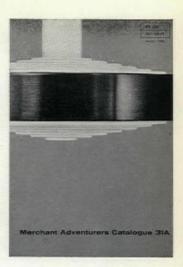
The Ventnor hospital was closed by the Ministry of Health in 1964, tuberculosis no longer being a major disease in this country. A scheme to turn the buildings into a Police College fell through because of the high cost of upkeep. The Ministry now intends to sell out to a property developer, who has put in a planning

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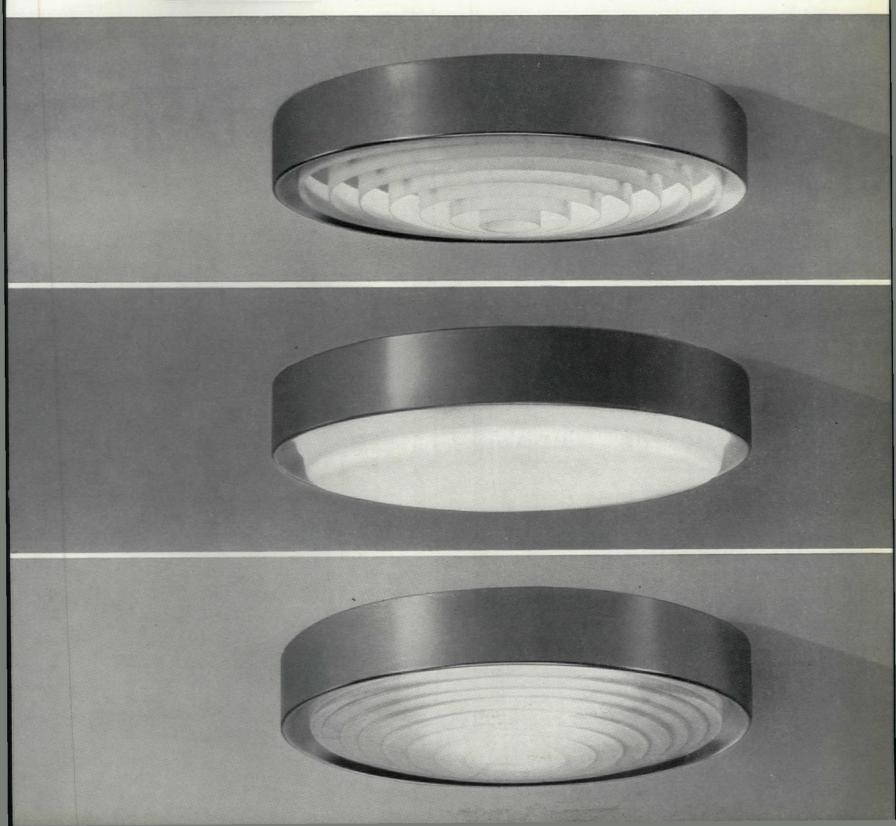
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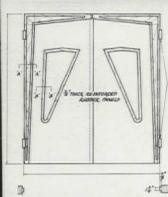


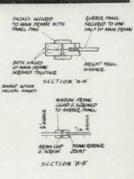
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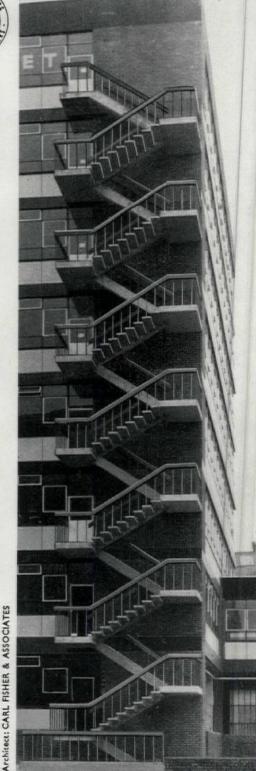
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application to build a housing estate on the site. The Minister of Housing has called in the case for his own personal decision, in view of the threat to the natural scenery of the cliffside. It is vital that he should help to protect man-made beauty as well. The windows could no doubt be transferred to another building. The new chapel at Newport Hospital, opened last autumn, does in fact include two windows salvaged from the porch of the Ventnor chapel—a sensible thing to do, but the windows chosen are of no aesthetic merit. Other possible caretakers would be the local parish church of St. Laurence (Sir Gilbert Scott, 1878) and the Ruskin collection at Bembridge School.

NICHOLAS TAYLOR
A. C. SEWTER

WASSER TURNE

For the last nine years Bernhard Becher (artist and photographer of Düsseldorf) and his wife have been engaged on documenting photographically early industrial structures of many kinds, mainly of the nineteenth century. They have built up a remarkable collection of material under various headings, at first in Germany, to some extent in Belgium and Switzerland and more recently in Britain, where last summer they made a comprehensive tour, helped by the British Council, photographing pit-head machinery and other structures in the coalfields of England, Scotland and Wales.

Herewith are some examples of their work: some photographs from their studies of German water-towers, mostly in the Ruhr and the Rhineland. Other subjects Mr. and Mrs. Becher have interested themselves in, besides pithead structures, include foundries, iron-ore mines, silos, gasometers, lime-kilns and cooling towers, all subjects that illustrate the variety of new forms and structures that grew out of the industrial revolution and at the same time fascinatingly reveal, especially in the ease of

the water-towers, the interplay of functional design with inherited or invented stylistic elements. The Bechers' pioneer work deserves the widest support because the interest they are helping to arouse in structures of this kind comes at a time when they are rapidly disappearing as a result of the processes of modernization, technological change and the relocation of industry.

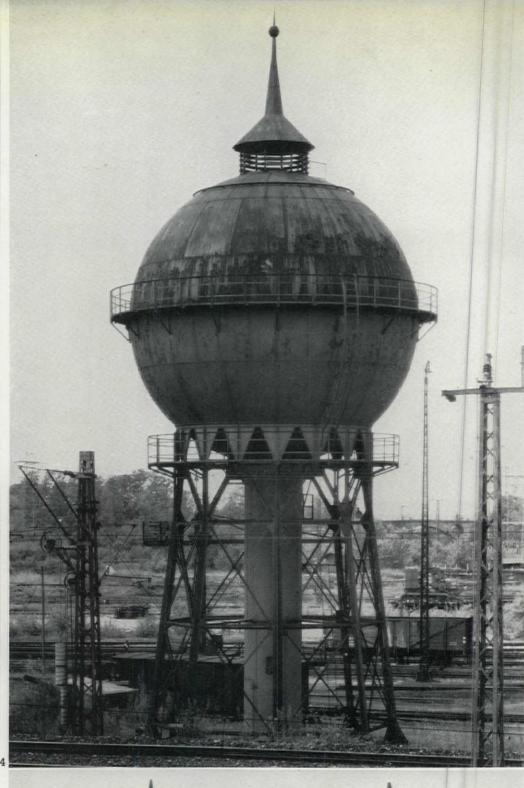
Their examples of water-towers are of a somewhat later date than some of the other material they have collected, since the largediameter water-pipe, and the distribution system on which its use in large-capacity highlevel tanks depended, did not come into being

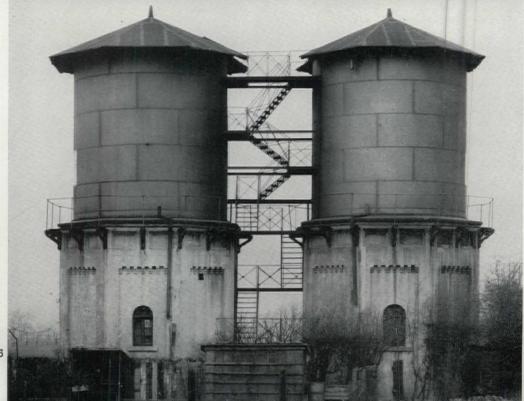


until the 1870s. After this date, however, many towns in flattish country found themselves dominated by bulky water-towers which played the role in the townscape played elsewhere by churches and cathedrals.

The German examples illustrated here are located as follows. 1, Bardenberg (a small town near Aachen): the municipal water-tower built in 1909–11; height 155 ft. 2, Mülheim











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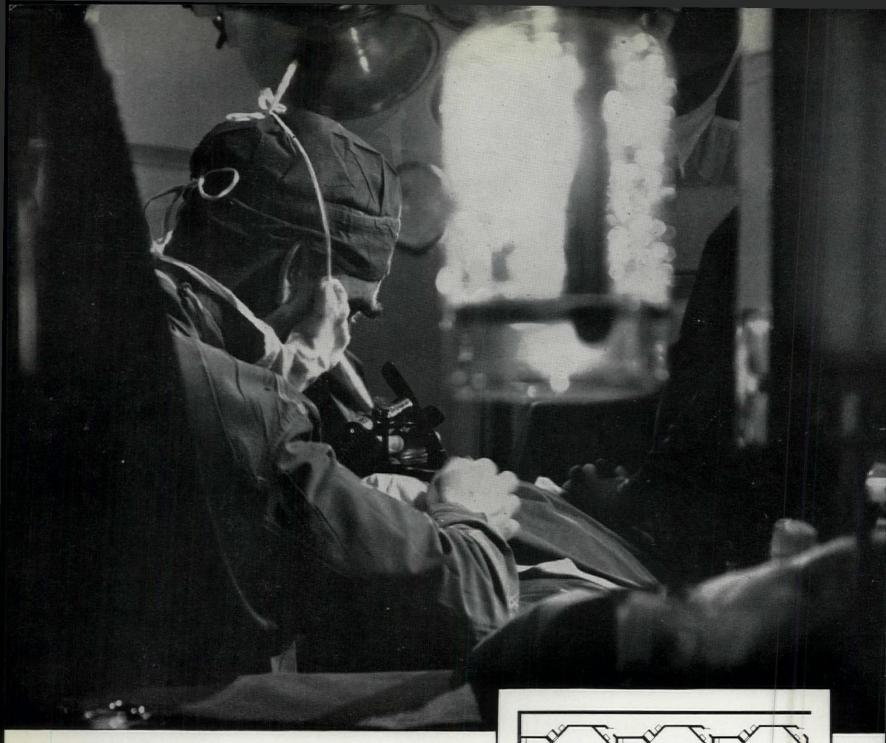
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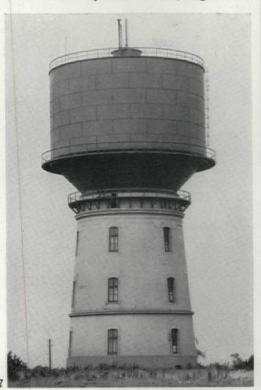
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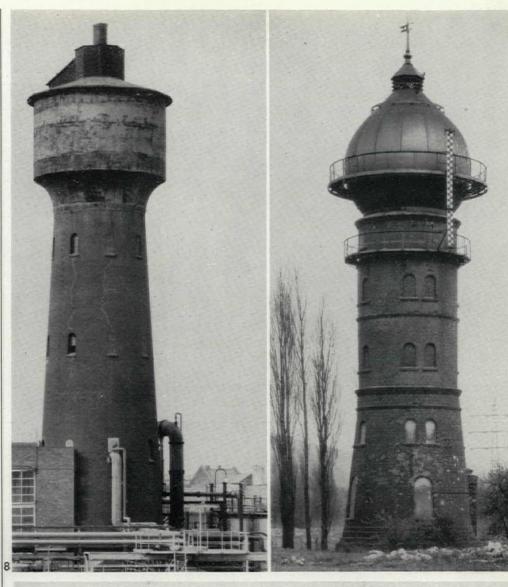
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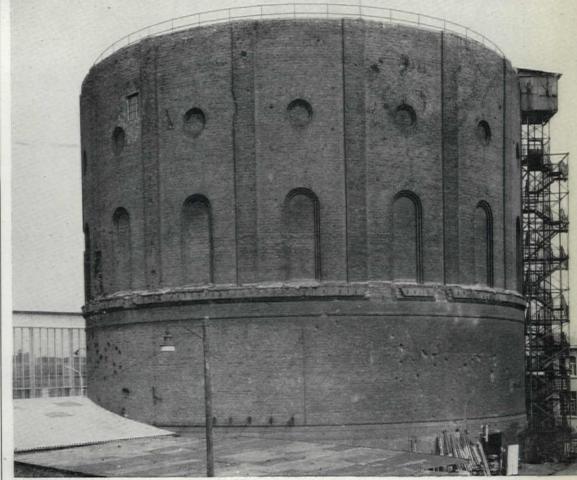
(Ruhr): railway-station water-tower built in 1901; height about 82 ft. 3, Essen: built in 1883; height 108 ft. 4, Weil (on the Rhine): the railway-station water-tower, built in 1913; height about 85 ft. 5, Hagen-Vorhalle: double water-tower built in 1898 for railway and industrialuse; height about 53 ft. 6, Alsdorf (also near Aachen): the municipal water-tower built in 1910; height 140 ft. 7, Essen-Leythe: municipal water-tower built in 1890; height 120 ft. 8, Cologne-Kalk: water-tower in a chemical



factory built in 1904; height 125 ft. 9, Hagen-Hengstey: railway-station water-tower built in 1913; height about 85 ft. 10, Cologne—in the centre of the city: built in 1872; height about







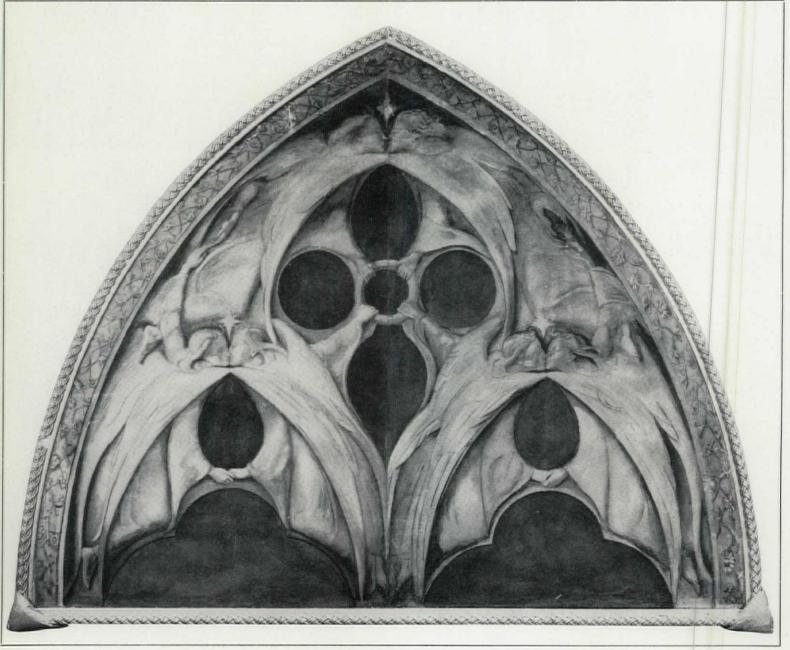
10

115 ft. 11, Düsseldorf-Heerdt: a factory watertower built in 1870-71; height about 92 ft. (to the upper cornice; the visible roof is a later addition).

MILLAIS AS MASTER MASON

An architectural item in the current Millais exhibition at the Royal Academy, Burlington House, London, is the 'Design for a Gothic Window' reproduced herewith, 1. The design (No. 324 in the catalogue, lent by Mrs. J. G. Links) is in the form of a charcoal and sepia wash drawing on paper, mounted on canvas and measuring 84 in. by 109 in. It is referred to in a letter from Millais, dated August, 1853, and written in Perthshire, in which he says: 'Ruskin and myself are pitching into architecture; you will hear shortly to what purpose. I think now I was intended for a Master Mason. All this day I have been working at a window, which I hope you will see carried out very shortly in stone. . . .' In a subsequent letter to Charles Collins, Millais wrote: 'Ruskin has discovered that I can design architectural ornamentation more perfectly than any living or dead party . . . the window I have finished represents eternal happiness and the struggle of life. . . .' According to Holman Hunt the design was made to illustrate the lines 'Where angels rising and descending met With interchange of gift' from Tennyson's Palace of Art. Apparently Ruskin sent the design to his father who wrote that he was 'Thunderstruck by it. It is the most angelic Painting or Frescoe I have ever set eyes on. This is pure sublimity.' Ruskin is believed to have used the design in one of his lectures, but the projected window was never carried out because of the prohibitive cost.

Founder in 1848, with Holman Hunt and Rosetti, of the Pre-Raphaelite Brotherhood, Sir John Everett Millais (1829–1896) was one of the most prodigiously gifted of all British painters. He entered the Royal Academy



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schools at the age of eleven and was elected a member at the age of twenty-four. He died a few months after succeeding Lord Leighton as President in 1896. The Royal Academy's present exhibition (which closes on March 15) contains 397 works and is the first devoted to Millais since the rather smaller commemorative exhibition held at Burlington House in 1898. It is particularly rich in items which reflect Millais's early friendship with Ruskin. Their close relationship ended with the annulment of Ruskin's marriage to Effic Gray in 1854 and Millais's subsequent marriage to Effie in 1855. In Mary Lutyens's recently published book Millais and the Ruskins it is stated that Effie was the model for the figures in this window. As a whole, the window is a Ruskinian prophecy of Art Nouveau even more remarkable than that at the Birmingham School of Art, published in last month's AR.







HINGERIEN PROPI

The occasions that have been most often associated with the striking of an architectural medal are either the laying of a foundation stone or the completion of a new building. An example of the latter was recorded in Loudon's Architectural Magazine of 18371 with the account of a bronze commemorative medal designed by Benjamin Wyon, perhaps the most illustrious member of a famous family of medallists.2 This medal is 11 in. in diameter and shows on the obverse, 1, the south-west facade of the former Western or Lower Markets at Exeter. On the reverse is the coat of arms of Exeter with the inscription 'Completed by the Council of Exter MDCCCXXXVII.' Loudon, writing as 'The Conductor,' hoped later to illustrate this 'for the purpose of stimulating other cities to follow the example of Exeter on similar occasions,'

The architect of the building was Charles Fowler (1792-1867) who had already established a reputation for the design of markets with his rebuilding of Covent Garden in 1830 and Hungerford Market, London, in 1833.3 In a letter explaining the origins of the medal Fowler writes:4 'The accompanying medal has been struck to commemorate the erection of the Western Market at Exeter. It is engraved by Mr. B. Wyon; and, therefore, it will no doubt be esteemed as a work of fine art, independently of any interest it may possess as an architectural memorial. In this latter respect, it may observed, as a remarkable coincidence, that, in excavating for the foundations of the new building a great number of Roman coins and other antiquities were discovered; and amongst them a medal struck on an occasion precisely similar; viz. the erection of a meat market at Rome by Nero; having on the reverse the representation of a building two stories high, crowned with a cupola and inscribed MAC:AUG:. This circumstance first suggested the idea of striking the present medal, which in execution greatly surpasses its Roman prototype; it might be added, that this mode of commemorating the erection of public buildings, besides being warranted by the ancients, is desirable in itself, as being likely to outlast all other records, and as giving employment to the medallic art which so well deserves encouragement.

The market was destroyed by fire in 1942 and the medal does in fact remain an interesting document to the principal façade. Benjamin Wyon was responsible for several other architectural medals including that for the opening of J. B. Bunning's Coal Exchange in 1849 and for some of the commemorative medals issued by the Art Union of London. In particular the bronze medal (diameter 21 in.) issued by the Art Union in 1855 has a fine portrait bust by him of Sir John Vanbrugh, 2, with on the reverse a façade of Blenheim Palace in high relief. A more contemporary memorial, also by the Art Union, was the medal of 1862 by Leopold Wiener showing a portrait of Sir Charles Barry, 3, with on the reverse the then almost completed Houses of Parliament. JEREMY TAYLOR

¹ Architectural Magazine, IV, London, 1837, p. 312.
² B. Wyon (1802-58) was the second son of Thomas Wyon the elder and was appointed to follow his father as Chief Engraver of Seals in 1831. See *The Biographical Dictionary of Medallists*, by L. Forrer, Vol. VI, Spink and Son, London, 1916.

3 See the control of the control of the second control of the control

³ See the article by Jeremy Taylor in AR, March, 1964.
⁴ Architectural Magazine ibid.



SALES COUNTER AT KING'S

Providing for the commercial needs of a famous Gothic monument presents a tricky architectural problem—witness the disastrous bookshop recently built on to the west front of Westminster Abbey. When the new structure has to be *inside* the building the problem is trickier still, even though the structure itself is inevitably more modest in scale, but Bernard Holdaway has solved it elegantly and discreetly with the sales counter, 1, he recently designed for King's College Chapel, Cambridge.

The counter is at the north-west corner of the chapel and was designed for the sale and display of guide-books, prints, colour-transparencies and gramophone records. Among the conditions were that it should be capable of being served and supervised by one attendant, that the selling area should be covered and locked when not in use and that it should be possible to dismantle the whole counter on the occasion of special services and festivals. For the last reason the counter is divided into four separate units, each composed of a rectangular carcase formed of 1 in. birch plywood

slabs containing the display and storage facilities. These are slung between metal uprights, housing lights and their control buttons, shown in 2, resting on castors. The metal is stove-enamelled egg shell black. The plywood is finished with ebony stain.

Mr. Holdaway describes the basis of his design as follows: 'An attempt was made to reconcile the commercial activity with the religious and

