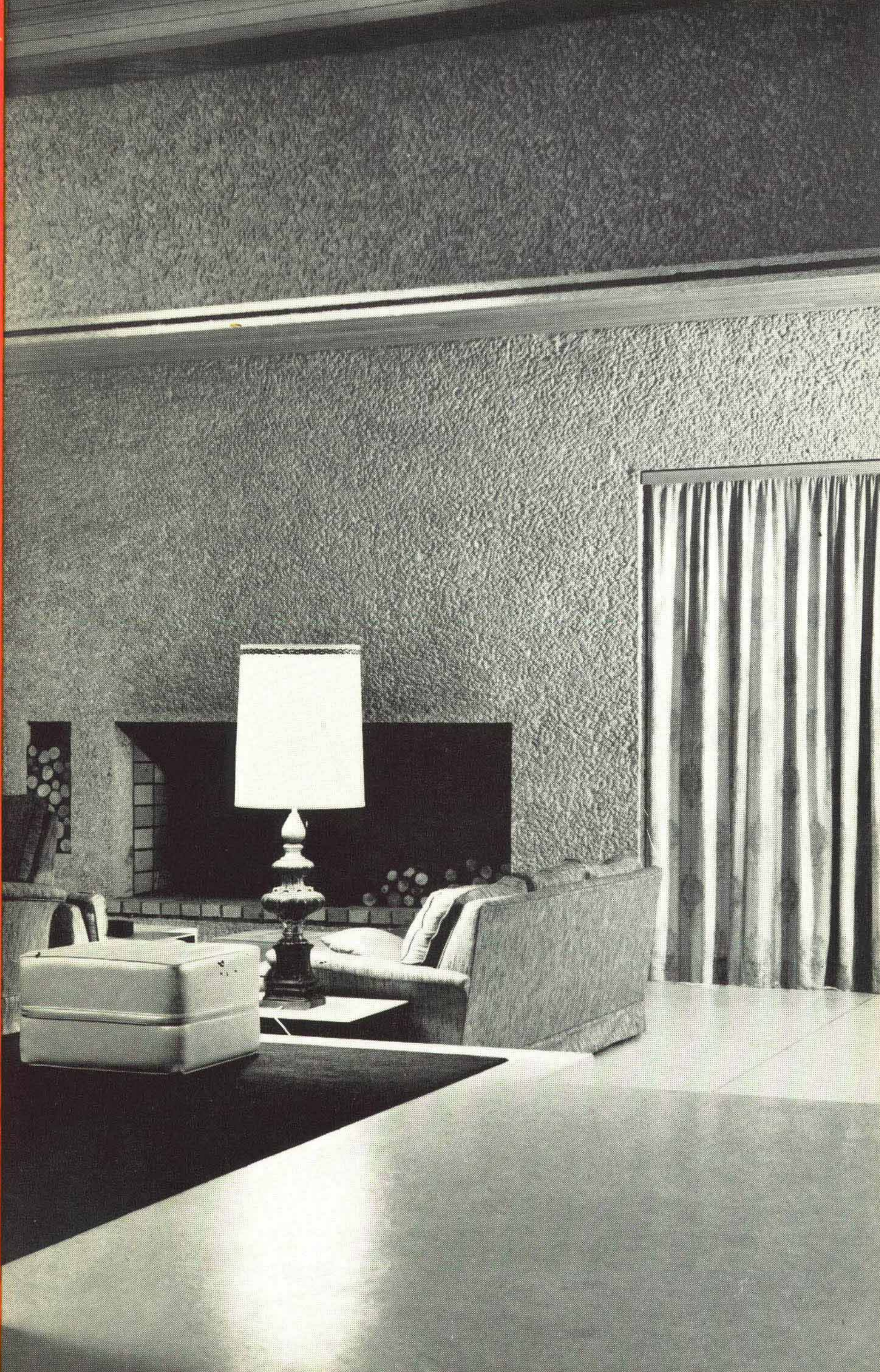
Concrete Quarterly 74



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Contents

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FRONT COVER: *A textured Naturbetong wall in the living-room of a villa in Oslo (page 15).*

FRONTISPIECE: *The Cripps Building, St. John's College, Cambridge – a view from the River Cam (page 2).*

IN FINLAND – on a Concrete Society visit earlier this year – there was something in the architectural air that gave one pause to think. To begin with, in this still remote northern country, the architect has status: he is a top boy, among the highest in the land – a circumstance which could not altogether be said to apply over here. And then design is an important business, and a highly skilled one, with no aura of superfluous luxury or crankiness such as occasionally hangs around here in certain quarters. In Finland architecture appears to be an exhilarating profession. There are about a dozen well-known architectural names to conjure with (what other country can you say that about?). Their work is highly individual and springs from original thinking, owing as little as possible to current fashion or dogma. All this, of course, is splendid. But it is no accident. It happens – quite simply – because in Finland the architect is expected to *design*, and this is his main job. Strange to think that in Britain it is by no means always the case.

In our country the architect has to be too many different people. If he is not dissipating his talents getting in the jobs, he is being an administrator or a committee man or a builder or a site foreman or a technician or even an engineer. And because it is not possible for one man to be all these things, the architect's reputation may suffer as a result. In any case, he often has little time for design. And, of course, there are those architects who have not been near a drawing board in years, sometimes through no choice of their own. Is it any wonder that the skilled art of designing, with all that it implies, should have become debased, when designers are so often expected to be doing something else? If architects were enabled to apply themselves more exclusively to the design process, then possibly we should not have so many sterile new buildings which are little more than an expression of economics or basic necessities.

In the offices of Alvar Aalto – the most famous of Finnish architects today – we were told that there the architect goes seldom to the site. His job is to take design decisions, to organize *space* and materials and the total environment around the complex needs of human beings. As anyone knows who has tried, this takes years of training and experience to do well and is incredibly difficult. But it is what the architect was meant to do in the first place. It is his special skill. Is it to get lost in a fog of technology and economics and functional efficiency?

Cripps Building, St John's College, Cambridge

RIBA Architecture Award 1967 (Eastern Region)

The following is an extract from a talk given by Philip Powell, FRIBA, *in the series "Architects' approach to architecture" at the RIBA last year.*

"MUCH OF THE middle of Cambridge is on a grander scale than Oxford, and the 200 new rooms at St. John's College, Cambridge, are a reflection of this – if only by their sheer stretch when compared with our Oxford work at Brasenose College and Christ Church. Yet it is still an example of collegiate infill – not a new community on a virgin site like Slough Hospital or Richard Sheppard and Partners' Churchill College or Jacobsen's St. Catherine's, Oxford. Nor is it the renewal of a decaying urban scene as in Churchill Gardens. Here are the famous greenery and water of the 'Backs': famous views, famous monuments and dominating it all – next to the site chosen – New Court. This last is Rickman and Hutchinson's 1830 Gothic wedding cake stage-set, of stone where it faces the Backs, of local grey brick – splendid in a gaunt, forbidding way on the north side – where it looks onto the building site. The eastern boundary is the River Cam with its punts and weeping willows. Much of the north boundary is taken up by Lutyens' red brick-and-tile Benson Court belonging to Magdalene College. Continuing the College's tradition of leap-frogging over water (New Court is joined with the main College buildings by the Bridge of Sighs over the Cam), this new site is bisected by a pleasant brook which joins the Cam near the Lutyens building. On the far, that is the west, side of the brook is the ancient School of Pythagoras, a crumbly stone hall from the twelfth century.

As in the last phase of Churchill Gardens, a long block – bent around corners – whilst never containing courtyards itself, gives the effect of courtyards by its confrontations with other buildings or with other parts of itself, continuing the collegiate pattern of court following court established in the older parts of the College.

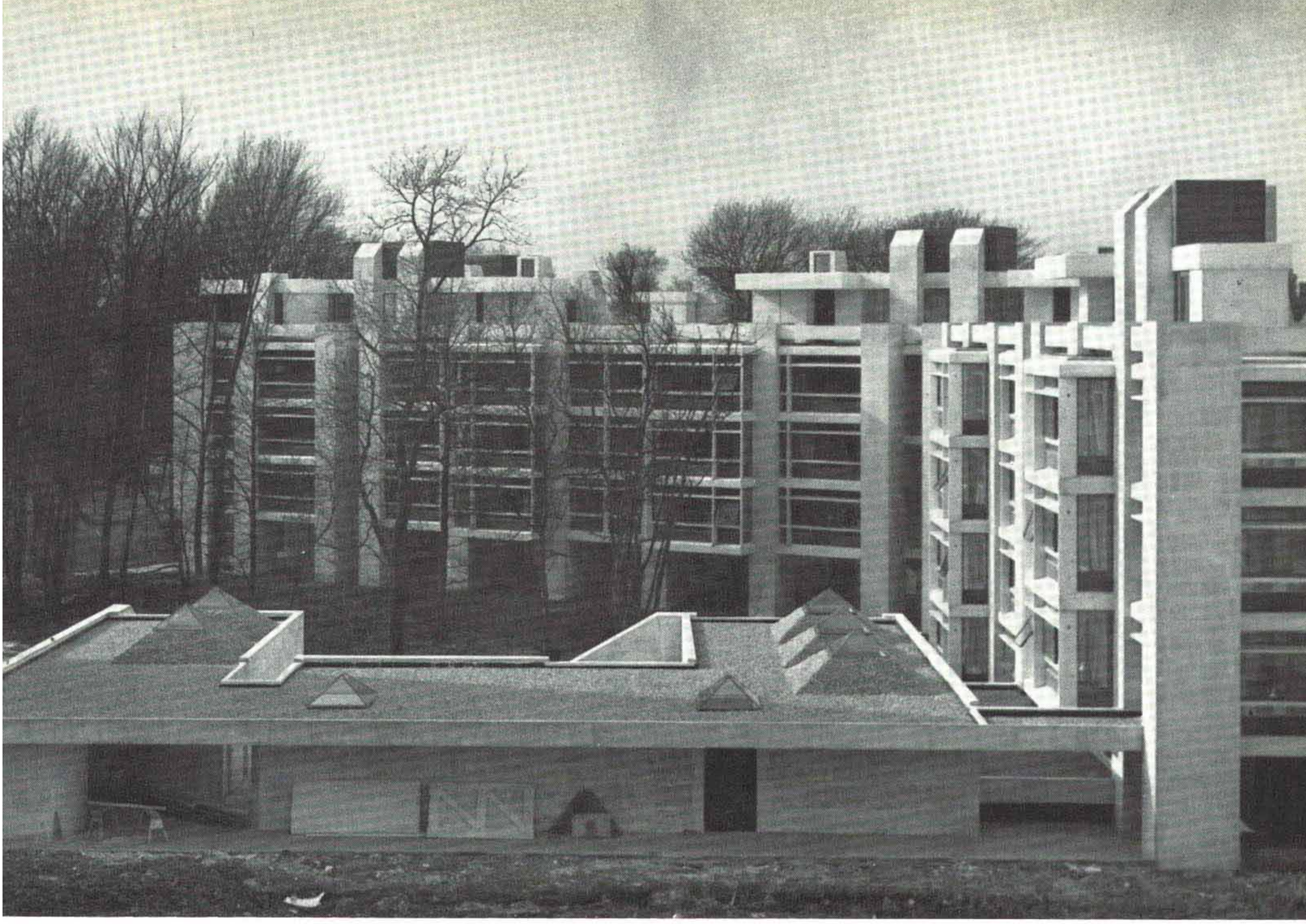
As at Brasenose we have tried to retain the scale and the texture of the varied surrounding buildings. This type of work can be very rewarding – in the aesthetic rather than the financial sense – for it is a pleasure, if a somewhat daunting one, to be working among buildings and scenes for which you have affection and respect. In Brasenose in particular, since the site was so small and the building just an extension, we tried to treat the new work not as a separate building but as another piece of the existing jumble.

The new John's buildings are surrounded by pinnacles, battlements, turrets, sloping roofs and chimneys, and the sliced-off effect of an unbroken, flat-roof silhouette would have been in disturbing contrast with them. Some of the top floor rooms push themselves upwards above the roof-line with their studio bedrooms which, with the two flats for Fellows of the College, form a penthouse opening onto the 800 ft. long roof promenade overlooking Cambridge and give a crenellated roof-line – a little less fidgety and jagged now than the cheese slices shown on the early block model.

As grassed or paved land, the site between Magdalene's Lutyens building and the new buildings might have been an aggressively funnel-shaped no man's land between two colleges. Instead, the brook – having gushed under the buildings in a newly contrived waterfall – has been widened just before it enters the Cam, to become a water court and punt harbour lapping up against the buildings.

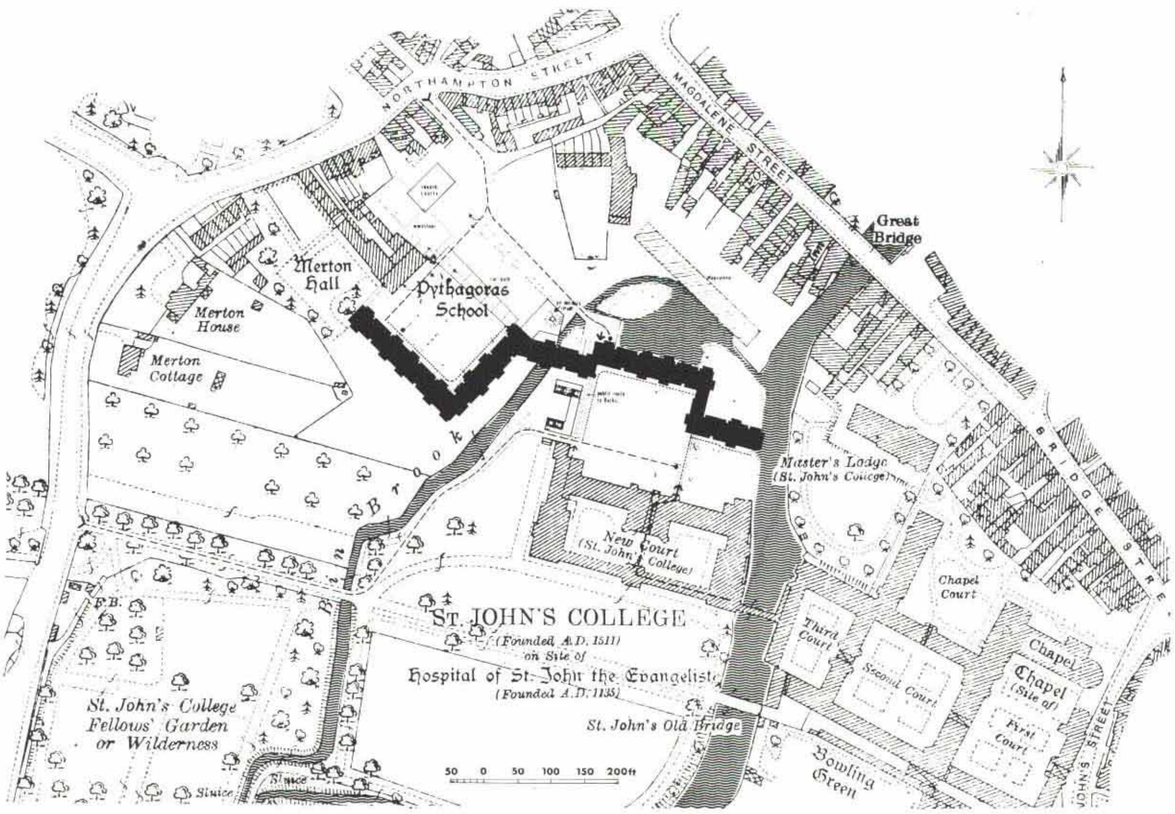
The detailed shape of the building, with its serrations and projections, has arisen from the grouping of the rooms and from their search for views (which is fairly easy) and for sun: some of the best views are to the sunless north. Off each staircase are two groups of four rooms only, each group planned around a landing with a window in it. In ranges of rooms where the top of the plan faces north, the end rooms are through rooms, usually with fine views from each end window and sun through one of them. Middle rooms have bay windows, so that they have east and west sun and oblique views, as well as the normal blinkered ones.

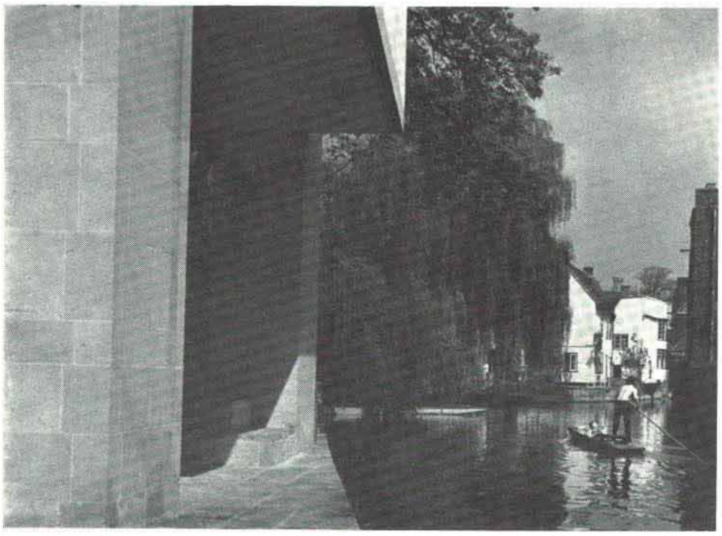
The College's wish was that the building should last at least 500 years, a noble if expensive requirement and running against the grain of nearly all other buildings of today. At the same time they wanted flexibility to alter and rearrange the interior as the centuries race by. Cross-wall construction – here the



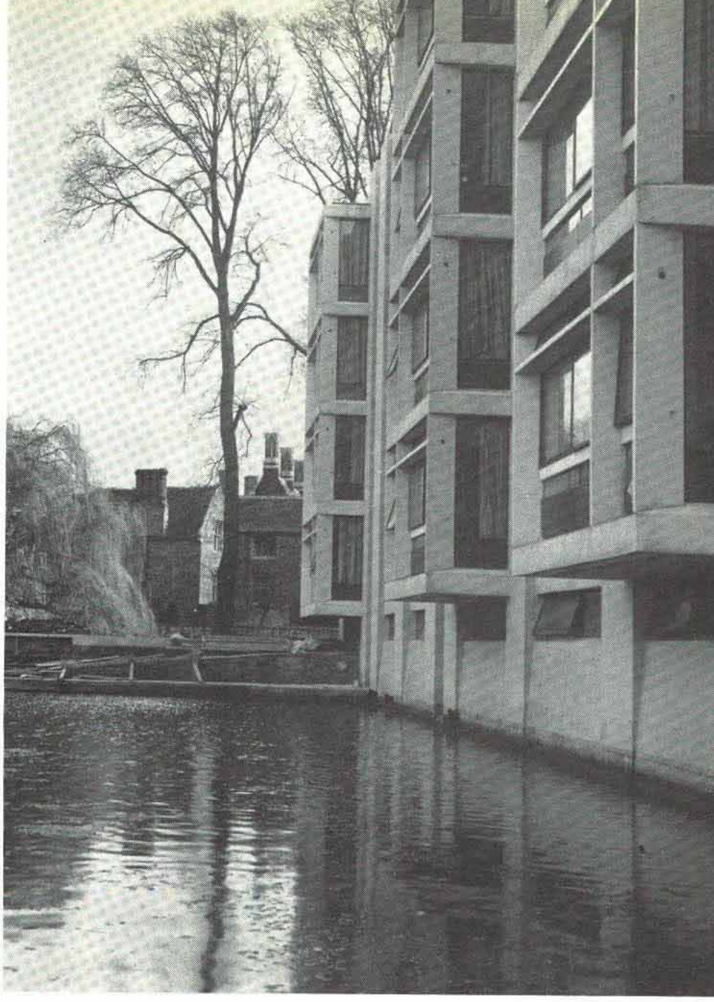
Above: The college building is a long block, bent around corners, giving the effect of courtyards without actually containing any. Below: Site plan.

Photographs by Michael Bass and John Rawson





A deep portico and landing for punts, in one corner of the building.



The punt harbour between the Cripps Building and the Magdalene buildings. External concrete units give depth to the façades.

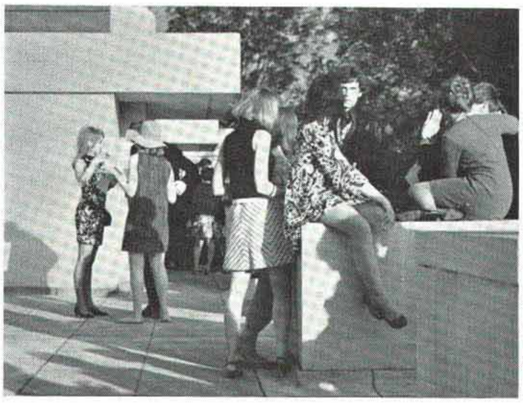
CRIPPS BUILDING: *continued*

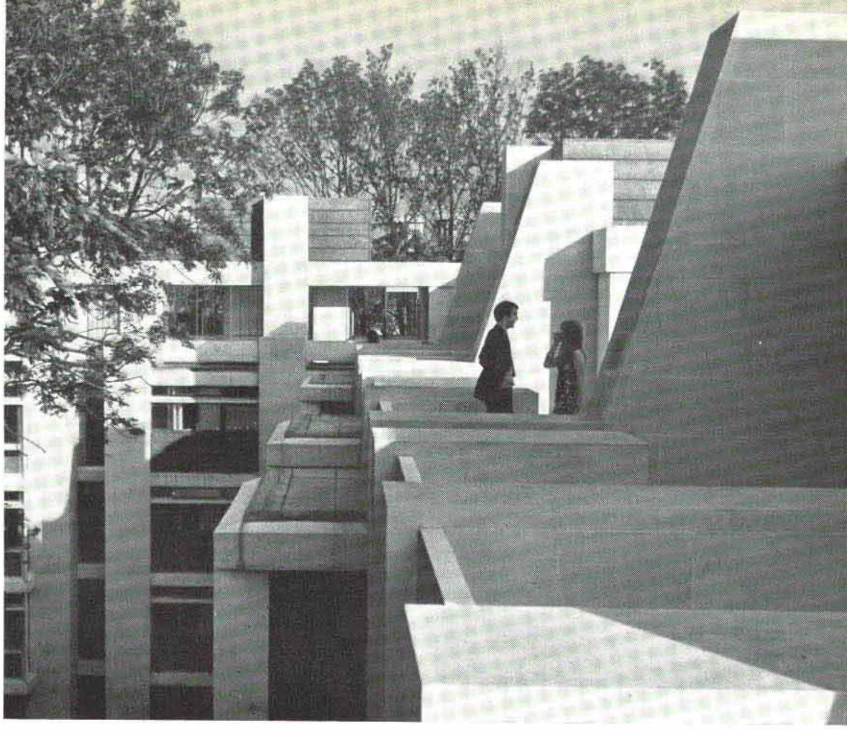
most economical – was therefore rejected for a frame. The columns are all on the outside and L-shaped, of in situ reinforced concrete, Portland stone-faced. They are all ducts, or potential ducts, and partitions are non-structural, even though for good sound-proofing they are fairly heavy. Parts of the ground floor – near the Cam and alongside the brook for example – are totally open: the rest has a covered walk. Together they take the form of a continuous cloister twisting its way along the 800 ft. length of the building. The L-shaped columns become 6 ft. by 4 ft. enclosed boxes when they are in the open air – there is therefore no change of emphasis in expression whether the building is closed in or open. However much the building may bend, bulge and crenellate, these columns are the one constant factor, all identical in girth and height. You are aware of their continuity even when, during the summer months, a great stretch of the building in its western reaches virtually disappears from sight as it snakes through the thick clusters of trees to reappear a hundred or so feet later.

In this sense, whilst superficially similar to the Brasenose building, it takes on a different and more repetitive character with its regular piers replacing the smaller scheme's raked-topped and irregular walls, set at opposing angles to each other to allow windows to steal a narrow view. At the same time, we have used the same materials at Brasenose – the Portland stone (smooth Whitbed for piers, pitted Roach for cloister walls), exposed aggregate white concrete floor edges, lead sheeting on infilling panels and sloping roofs – since we believed that they were still a valid choice and still financially possible.

The windows, too, have a family resemblance, although those at John's, with its wider views, are generally larger. We still cling without penitence to the belief that one of the most glorious and spiritually uplifting features that modern techniques have offered architects, is the ability to create wide expanses of glass. You can contract out of temporarily unwanted parts of a large window with screens, blinds or curtains; you cannot easily enlarge a mean window.

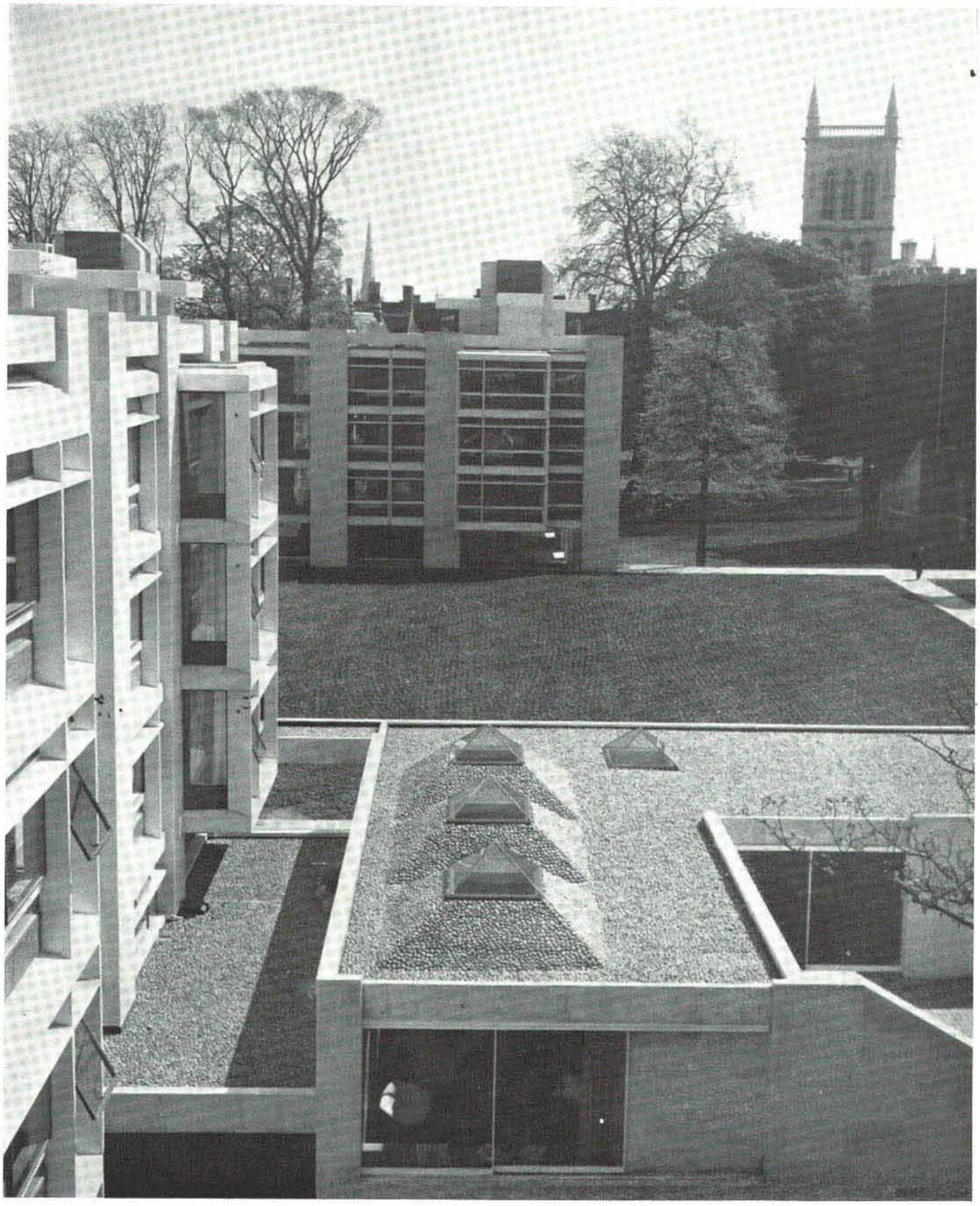
In the new block at Christ Church, Oxford – fairly near to the Picture Gallery and overlooking an old garden and Wren's Tom Tower – the bed-sitting rooms are similar in character though not in detail to some of those at St. John's, Cambridge. This is an example of something which, time and time again, we find ourselves trying to achieve: a setting where the outside view and *genius loci* are as important as the space inside, where you can enjoy the sun and the changing lights and shadows and where the transparent wall – with its surrounds, its ledges and window seats – is treated literally in depth to give a feeling of protection and seclusion: the ability to be at one moment part of the outside world and at the next to have the power to retreat from it."





Above and right: The roof top, with its concrete ledges and seats, being put to proper use.

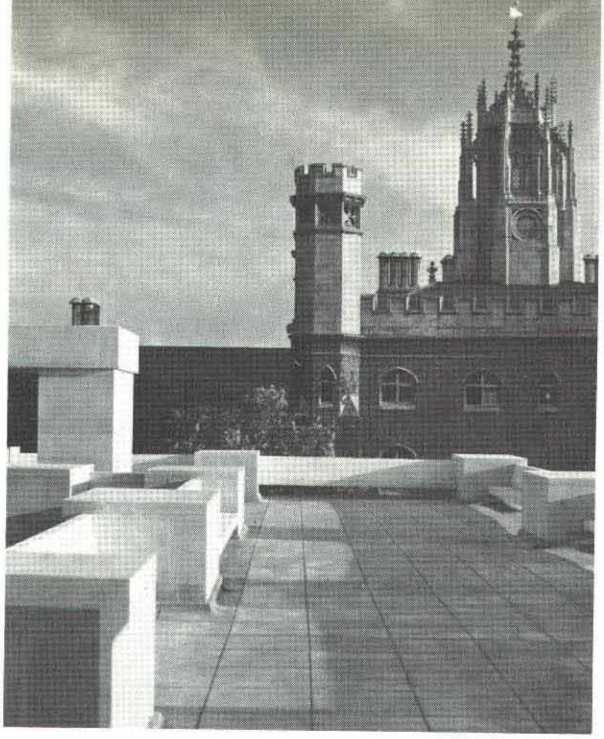
View over the roof of the junior common-room.



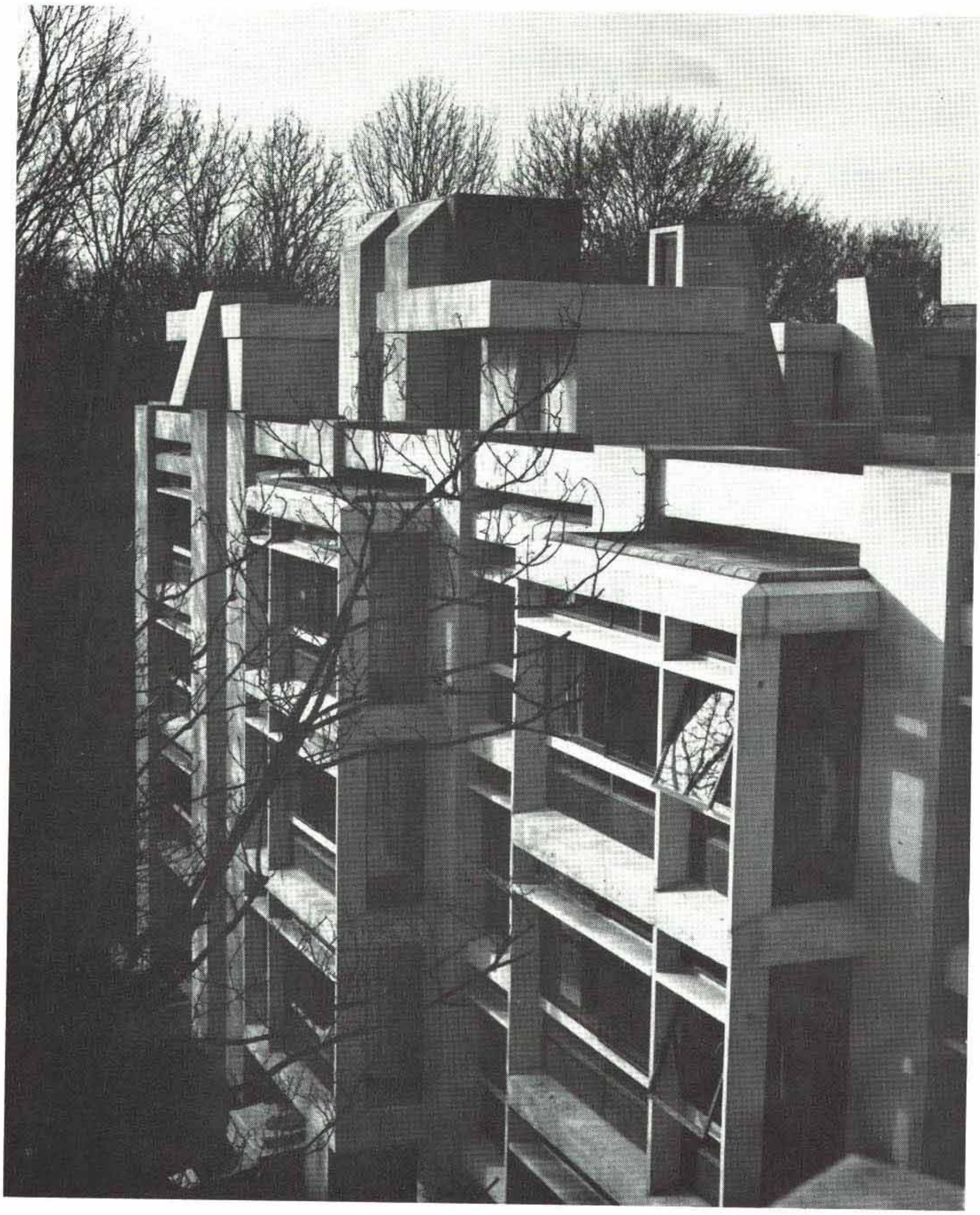
Construction

In situ reinforced concrete L-shaped columns round the perimeter of the building, faced with Portland stone. Flat, in situ reinforced concrete floor slabs, with edges of grit-blasted white concrete cast with calcined flint aggregate. Window mullions and transomes are of polished white concrete. Window frames are bronze. Apron panels below windows are lead-faced. Partitions are non-structural consisting generally of two leaves of 3 in. concrete blocks (mostly by Thermalite Ytong Limited) for good sound insulation. Hardwood block floors on screed on expanded polystyrene. Rough textured plaster on walls generally, with some hardwood panelling.

Architects: Powell and Moya.
Structural engineers: Charles Weiss and Partners.
Contractor: John Laing Construction Limited.



Looking towards the Gothic wedding-cake towers of New Court.



The building faces are deeply modelled, with window mullions and transomes of polished white concrete. Edges to floor slabs are of grit-blasted white concrete. L-shaped in situ columns are faced with Portland stone.

A week-end house at Kinsale, County Cork

SET IN THE heart of County Cork, on a green bank that slopes steeply down to the Bandon river, is an elegant glass and concrete house – designed for Mr. Michael O'Flaherty who is a collector of modern Irish art.

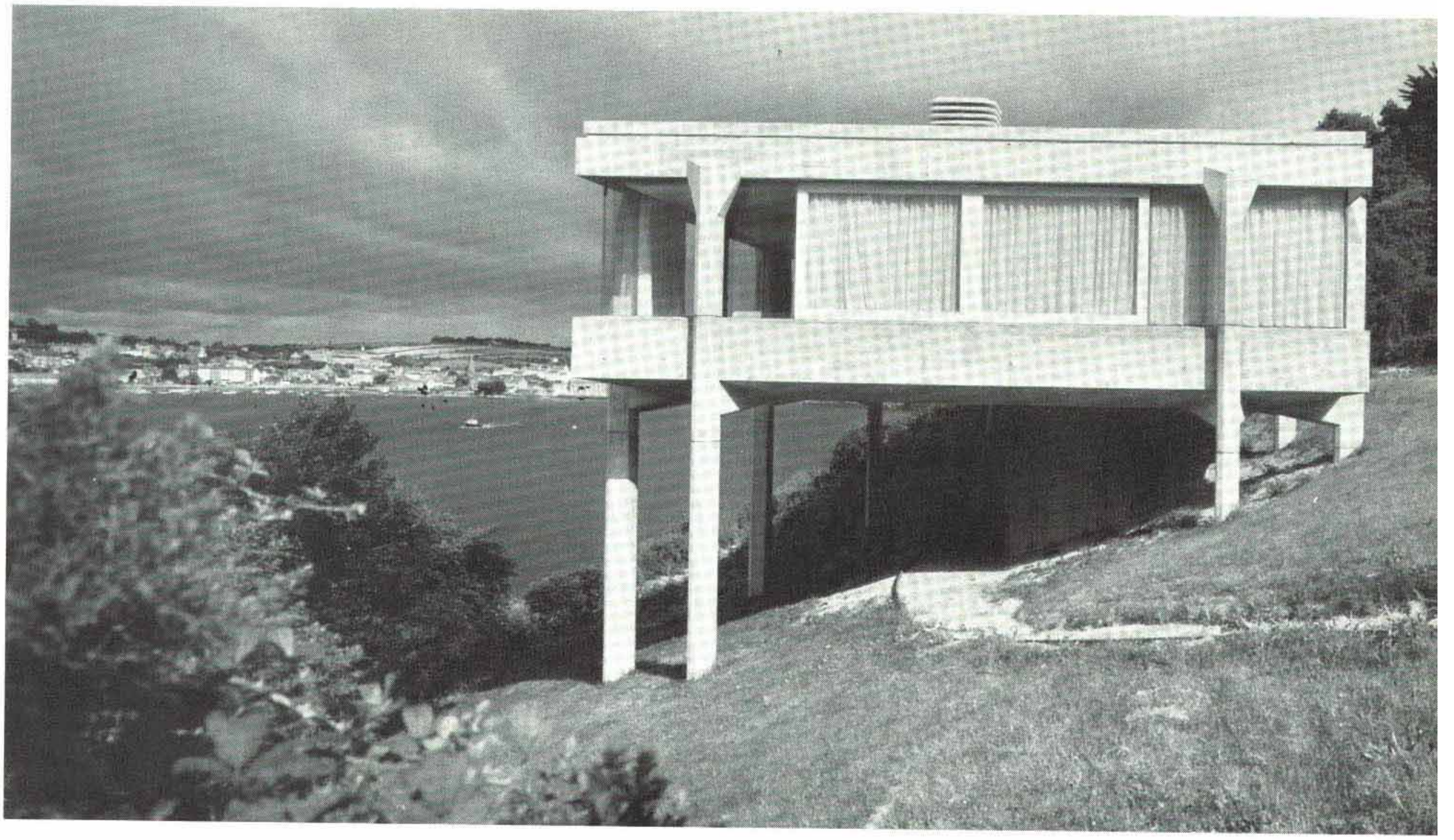
The flat-roofed house, jutting out from the bank and supported on slender columns, consists basically of a single square room sub-divided into living, dining, sleeping and service areas. The walls are glazed on all sides, so as to make the most of the magnificent southerly views across the sea, the entrance to the wide natural harbour of Kinsale, and – on the other sides – the rolling hills that surround this part of Southern Ireland. A private approach drive passes along the top of the bank, terminating in a paved terrace.

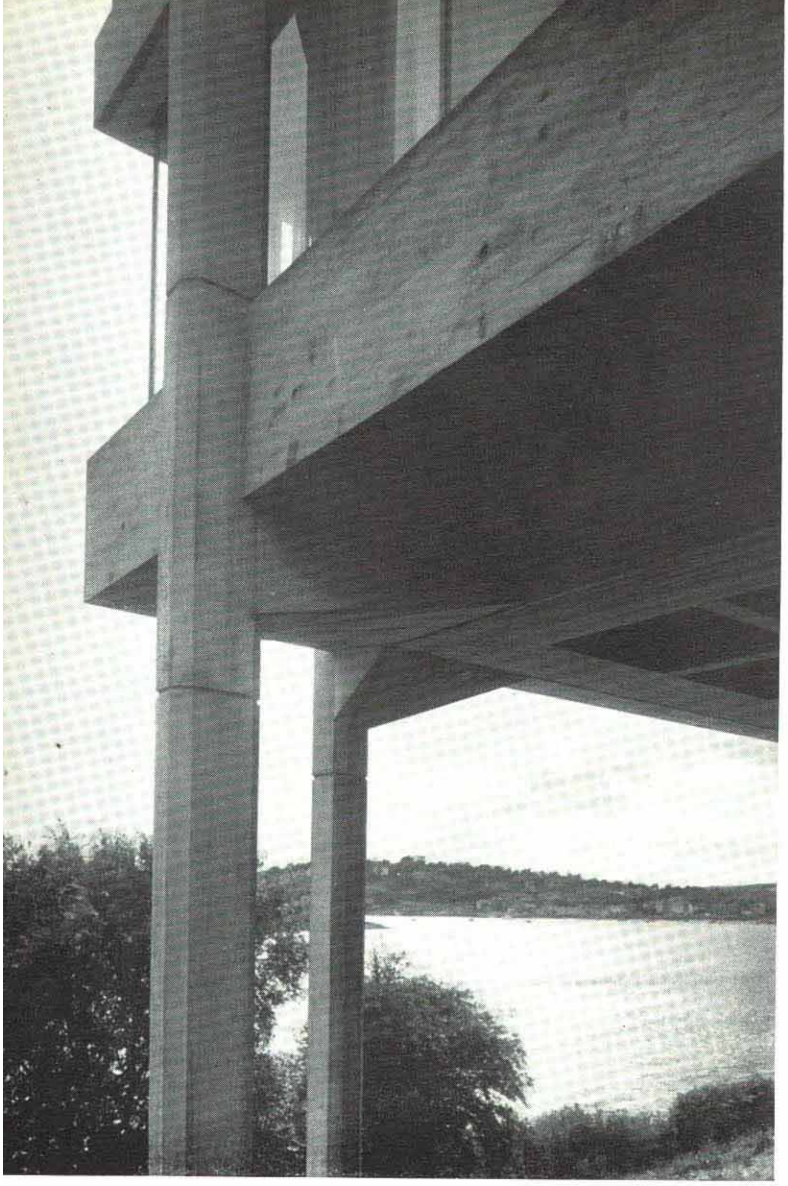
The owner uses the house at week-ends and for holidays, mainly by himself. However, a guest bedroom – a kind of concrete 'dugout' – has been built into the opposite side of the bank a short distance from the house. This is combined with a sauna bath, and the whole can serve as a summer-house.

As the house is sited on steeply sloping rocky ground, it seemed reasonable to build it on stilts. In situ reinforced concrete was the designer's choice for the structure, partly because of its proximity to the sea and partly to harmonize with the predominantly grey

Photographs by Henk Snoek

Side elevation of the house, with the harbour in the background.





A WEEK-END HOUSE AT KINSALE, COUNTY CORK: *continued*

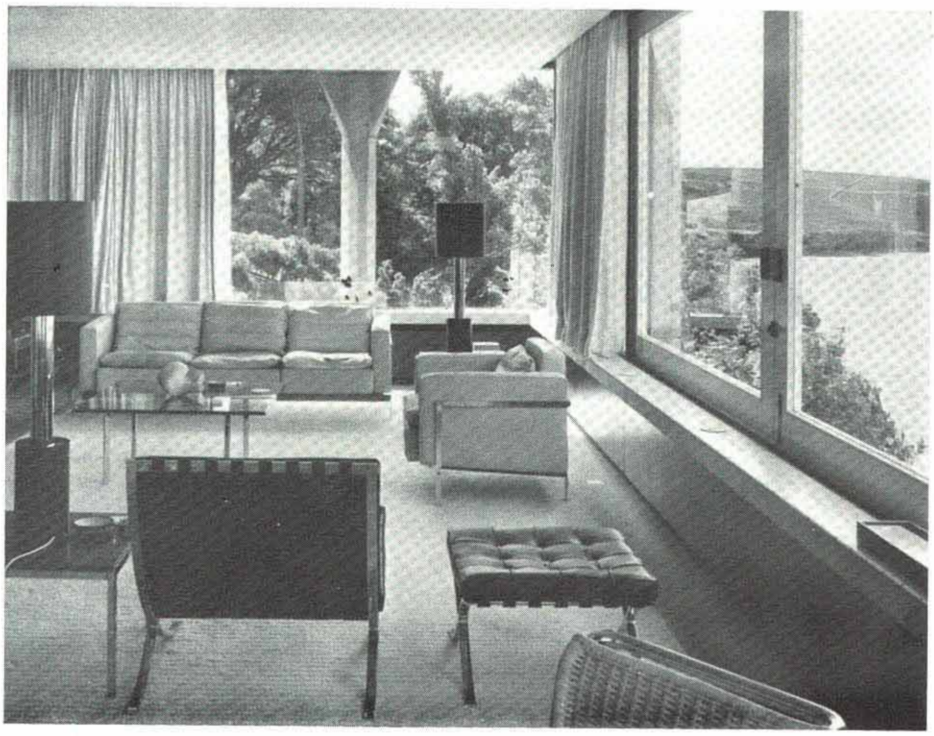
colour of the buildings of Kinsale; also, of course, concrete is the 'natural' building material in Ireland today. The floor, 36 ft. square, is supported on each side by two polygonal columns which are set proud of the edge beams and flare out at their tops where they support the roof. As construction joints were located on the columns, the concrete for the floor slabs needed to be placed in one continuous operation.

A local red sandstone aggregate was used in the concrete mix. For the board-marked exposed surfaces the architect specified formwork of 3 in. wide Douglas fir boards. Plywood facing was used on formwork for the concealed surfaces. As the roof is seen from the road, a concrete screed was specified for the surfacing.

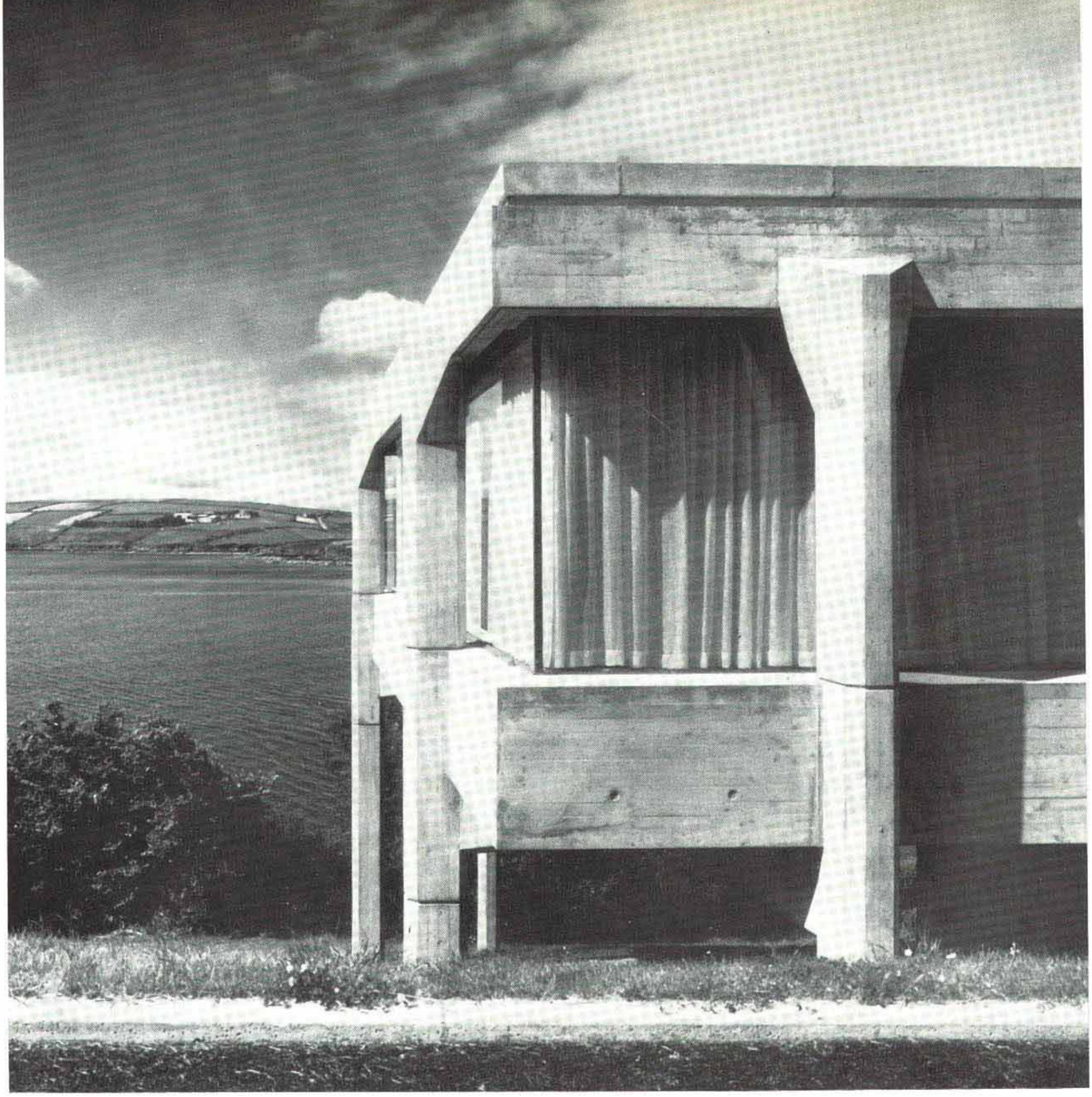
The large windows all round the house are set in bronze frames. Interior walls are panelled with timber, and ceilings are plastered. Thermal insulation is obtained by a layer of cork on the roof and also under the floor screed; the floor of the living area is also laid with cork. The furniture includes pieces designed by Mies van der Rohe.

The house was designed by Michael Scott and Partners; the partner-in-charge was Robin Walker, MSC, FRIAI, ARIBA. The consulting engineers were Ove Arup and Partners. The contractors were P. J. Hegarty and Sons Limited.

A corner of the house, viewed from below the main slab.

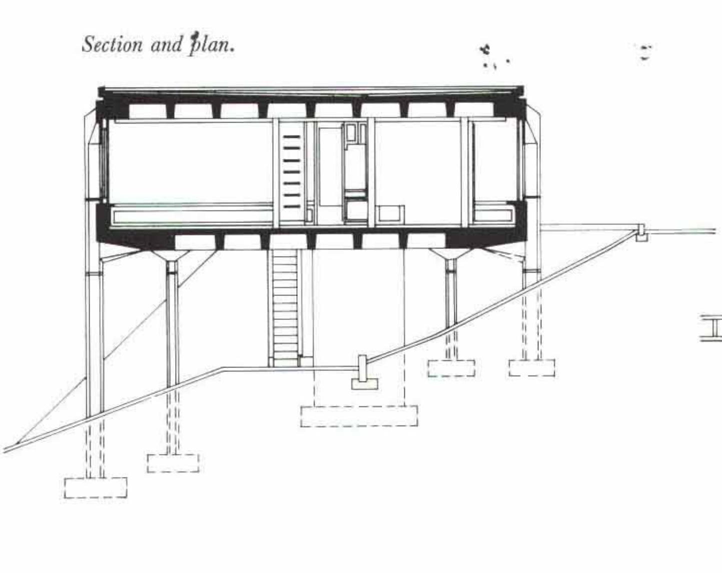


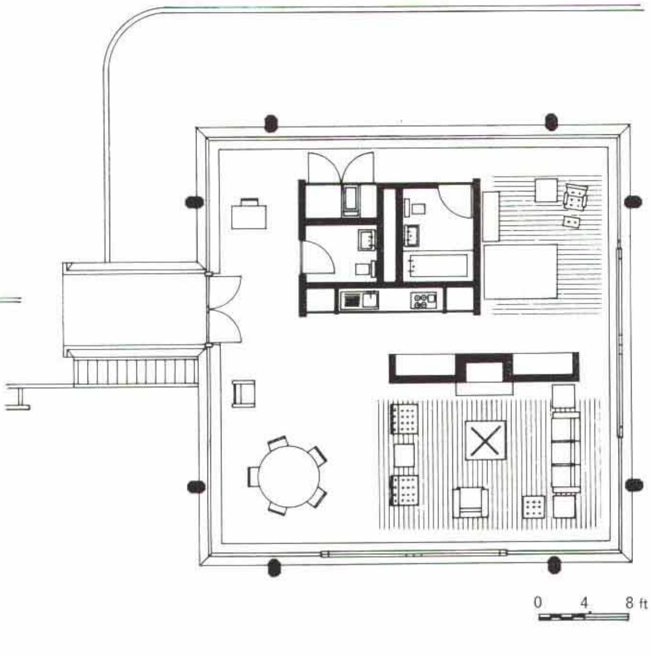
Interior of the living room.



The house from the top of the bank, showing the polygonal columns and exposed concrete structure.

Section and plan.





Photographs by Elsam, Mann and Cooper (Manchester)

A stepped approach to a way through the houses (see right).

Slum clearance at Oldham, Lancashire

Housing in St Mary's Ward with the 12M Jespersen System

GIVEN A MINISTRY looking for somewhere to try out an industrialized building system, and an architect with the job of replacing slums – bring them together, and you spark off the new St. Mary's Ward housing at Oldham, near Manchester.

It was by chance that Tom Cartlidge, Borough Architect and Planning Officer of Oldham, heard that the Ministry of Housing and Local Government was looking around for somewhere to implement an industrialized system (12M Jespersen, developed by them in collaboration with John Laing Construction Limited). Mr. Cartlidge, with the squalid housing conditions at Oldham very much on his mind, lost no time in persuading the Ministry that this was the ideal place for the experiment. Now – four years or so later – the first phase is completed and we can see that the experiment has paid off handsomely. In Mr. Cartlidge's office there are photographs on the wall of ragged bare-foot children, of derelict back yards, of soot-covered decaying brick. This, and worse, was all at one time on the present St. Mary's site. And it is against this background that the Oldham housing must be viewed. The scheme is the first part of a rebuilding programme for the worst housing in the area; the programme will take about ten years to complete.

Although the site, with its slopes of up to 1 in 8, is a complication for a building system, it is an immense asset from every other point of view. For, as we are now at last beginning to realize, landscaping is half the battle of housing – particularly low-rise housing such as this. The point was made again and again at the RIBA annual conference this year at Brighton, in which housing was the theme. Landscaping must be thought of as an integral part of housing, not just an extraneous trivial process done after the houses are finished. And as such, it is worth paying for – and should be part of the cost of housing. There is no *mystique* about this. It is obvious to anyone walking up any street of houses in any town: it is the details of path, planting, fence, car, grass, trees and dustbin that catch the eye and make or mar the scene – and the most important of these is probably trees. At Oldham, the steep slopes have resulted in a stepped arrangement of terraces which makes for great variety and the intimate sort of neighbourliness which is traditional in this area.

The social study at Oldham has been exhaustive and sympathetic. A survey of people living on the site was carried out by architects and sociologists in the Ministry. Generally, the people have been rehoused on the same site, as was their wish. There was a marked preference among those with families for a house rather than a flat. And the problems of old people living on their own were especially considered. Before moving in, the people were invited to discuss their problems with a woman housing official on the site. They were shown their houses or flats and – if they did not suit – were given alternatives whenever possible. This woman is still a key person in the social life of the place.

In all there are 520 houses and flats on the 16-acre

A way through between the prefabricated concrete walls faced with calcined flint.

Changes of level with ramps and stepped blocks of housing are a particular advantage from the landscaping point of view.

A street of houses terminating in a block of flats.

Gardens at the backs of houses, giving access to paved alleys by way of small flights of steps.

Walkway approach to flats.

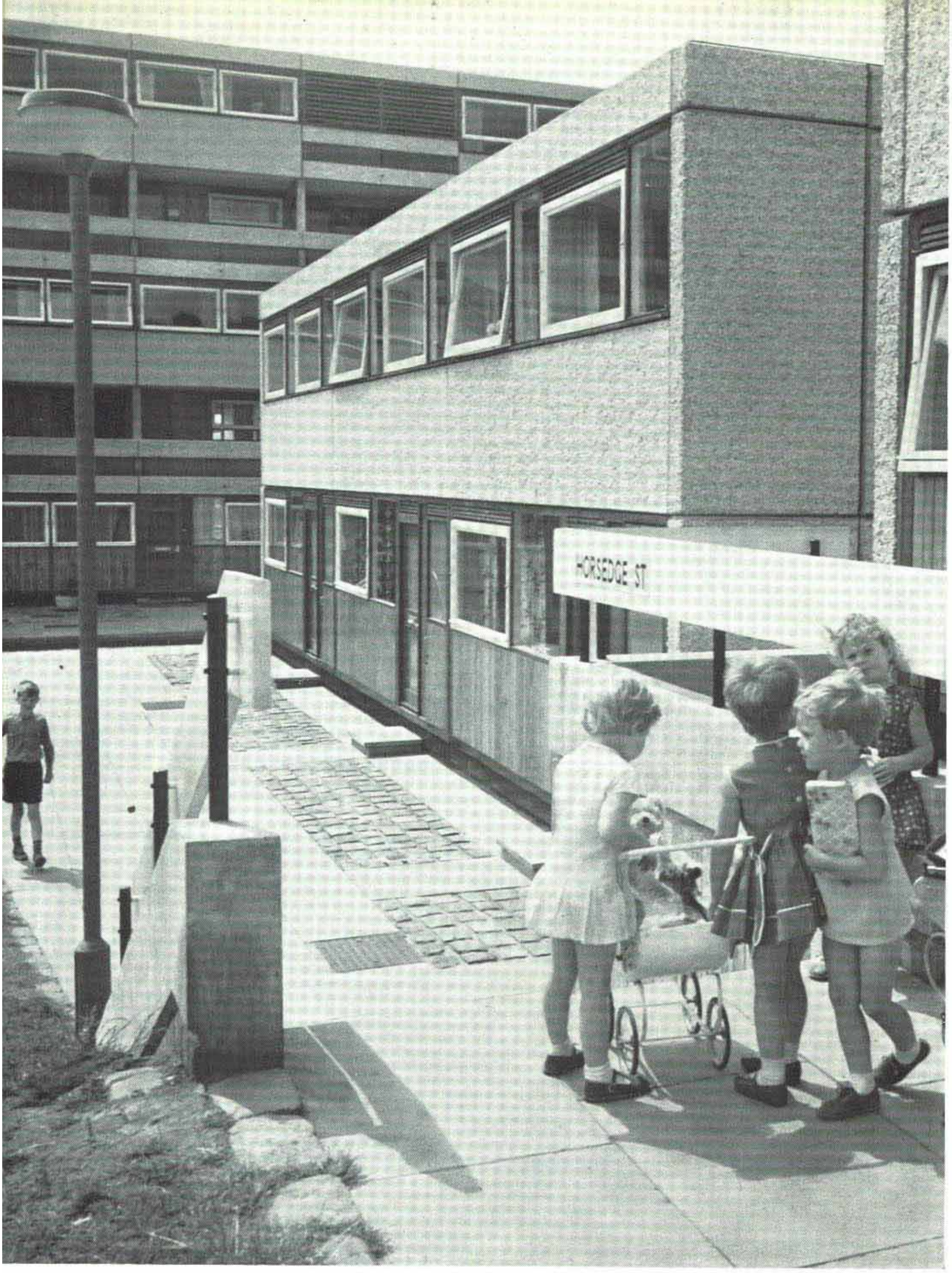
SLUM CLEARANCE AT OLDHAM, LANCASHIRE: *continued*

site. The brief was to rehouse the same number of people as were originally resident on the site; to make adequate provision for cars, with safety for pedestrians; to provide for children's play; to provide facilities for drying washing (which can, of course, dominate any housing scheme); and to build to the higher standards recommended in the Parker Morris report *Homes for Today and Tomorrow*.

The total accommodation amounts to 338 flats of varying size for 1–5 persons each, and 182 houses of six types for 4–9 persons each: the smallest of the houses is two-bedroomed and the largest five-bedroomed. No building is higher than five storeys. The density works out at 110 persons or thirty-two dwellings to the acre. Car provision has been made initially for one car to every three households. Ultimately this will be increased to one car for every household, plus parking space for visitors.

The contractors began erecting the precast concrete elements of their 12M Jespersen System with one crane in January 1966; a second crane was introduced in March. The superstructures were completed in January of this year, and the landscaping in June.

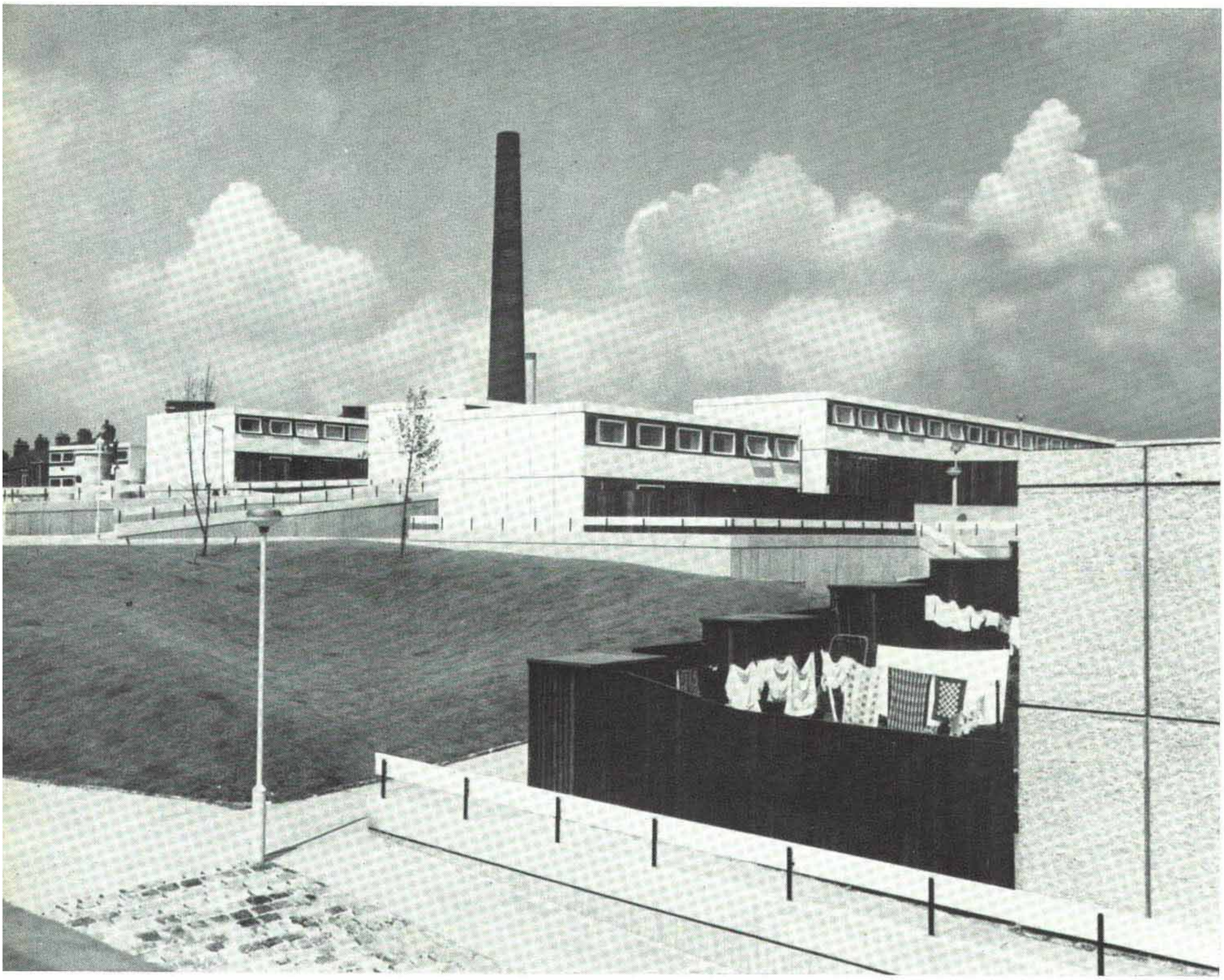
From the construction point of view, the basic requirements are worth noting. These were, first, that the system should make use of factory-made precast concrete walls and floors to reduce site labour and speed construction time. Medium-sized units were required, to combine standardization with reasonable



A sense of enclosure in the disposition of the buildings helps to encourage a neighbourly atmosphere.

planning flexibility. The system had to be suitable for small sloping sites, using mobile cranes of a capacity of 2½ tons. A high degree of accuracy and a good finish on walls and floors was also required, to make plastering and screeds unnecessary. The system was to be suitable for blocks up to five storeys high and, in due course, to be an open system available to any contractor able to use it efficiently. It was also to be no more expensive than alternative methods of construction and within the Ministry's cost yardstick. A range of external gable end walls and cladding panels were required as well as internal partitions and floor finishes. Exposed walls and floors were to have a thermal insulation 'U' value of 0.2 or better, party floors to give Grade 1 sound insulation and party walls better than Grade 1.

The 12M Jespersen system selected makes use of factory-made loadbearing crosswalls of unreinforced concrete and reinforced floor slabs. Its strong point is flexibility. Walls are 7 in. thick, for sound reduction, 4 ft. or 8 ft. long and standardized at 8 ft. 4 in. high including floor thicknesses. Gable walls have a standard inner loadbearing leaf and may have factory- or site-applied insulation and external finish. The majority of the exposed wall surfaces at St. Mary's are of textured white concrete with a calcined flint facing; joints are clearly expressed between slabs. Dark stained timber, and black-and-white window trims are also important. However, one of the most important points about the finishes is the fact that no more than two main materials have been used – the white textured concrete dominating throughout.



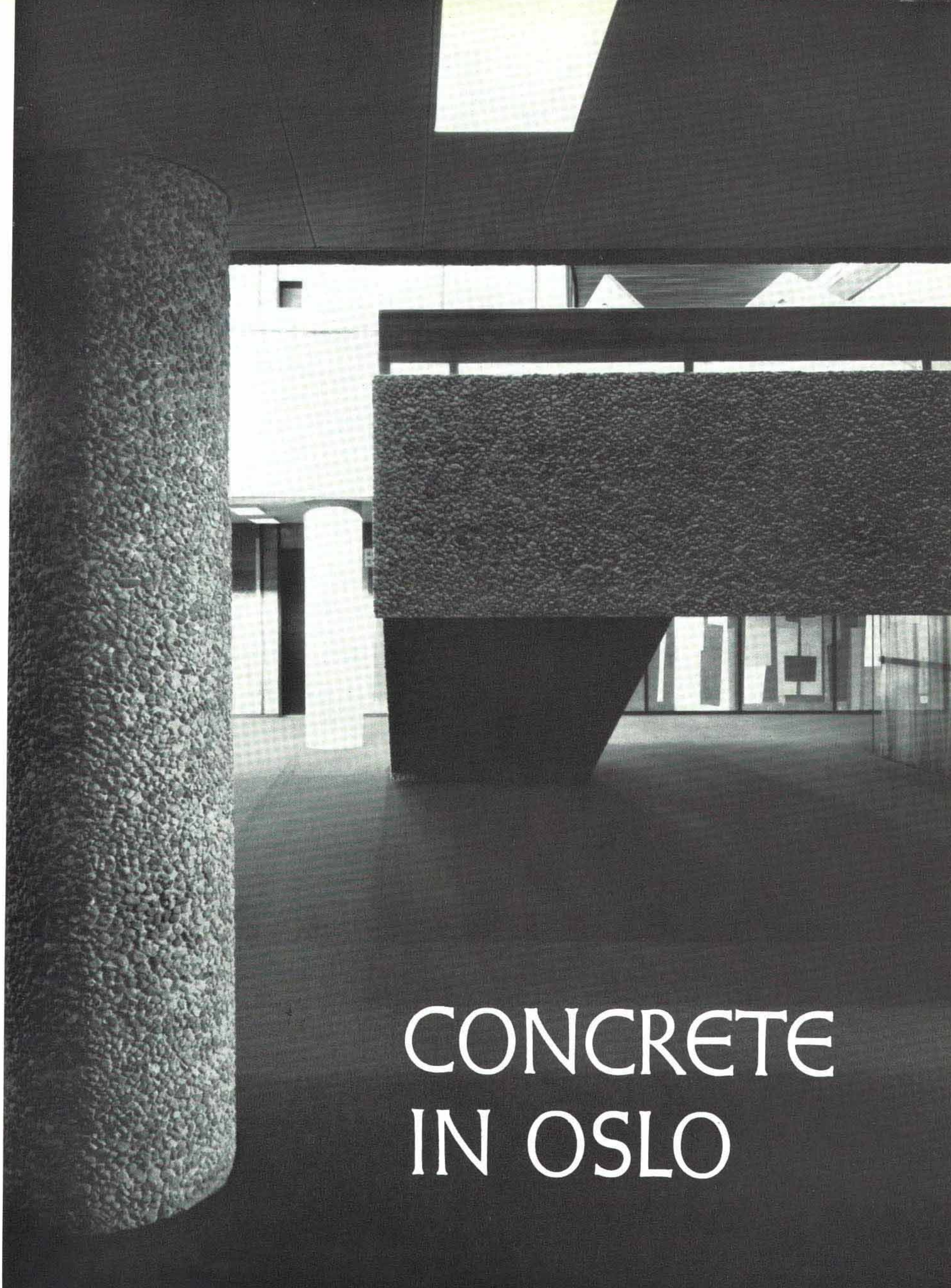
From slum mill-town of the nineteenth century to factory-built town of the twentieth. The quality and importance of landscaping – particularly when the trees have had time to grow – is here very apparent.

SLUM CLEARANCE AT OLDHAM, LANCASHIRE: *continued*

Hollow-cored floor slabs are standardized in 4 ft. widths, but may vary in length from 6 ft. to 18 ft. in multiples of 1 ft. The maximum weight of floor slabs is 2½ tons for a 4 ft. by 18 ft. solid slab.

Like all housing schemes, St. Mary's needs time to mature. But it is already intensely alive. In some ways, the scheme approximates – ironically – to the terrace housing which it replaces, as regards the pattern of living. But this sort of proximity has its value, particularly for Oldham people. And surely it is true that basically there is nothing much the matter with the pattern of life afforded by the old terrace housing, with the pub or shop on the corner. What is mainly wrong is the lack of amenities in these houses, their state of repair and their superficial dinginess. As a living unit the terrace house is often quite acceptable, and better than many other types. And it is to our vast stock of these that we should possibly be looking when it comes to injecting new life into old houses. It may then be that we will not need the half million new houses a year which we are trying so desperately to achieve. Apart from which, St. Mary's is without doubt a highly successful exercise in slum clearance by means of houses from the factory. It is hoped that this success will be carried through into the next phases of development around the site.

The scheme is the result of close collaboration between the Research and Development Group of the Ministry of Housing and Local Government, Max Lock and Partners in association with T. Cartlidge, ARIBA, AMTPI (Oldham Borough Architect and Planning Officer), and John Laing Construction Limited. The consulting engineers were Ove Arup and Partners.



Detail of Naturbetong column and stair in the ten-storey ELKEM BUILDING, *Oslo. Architect: Erling Viksjo.*

CONCRETE IN OSLO

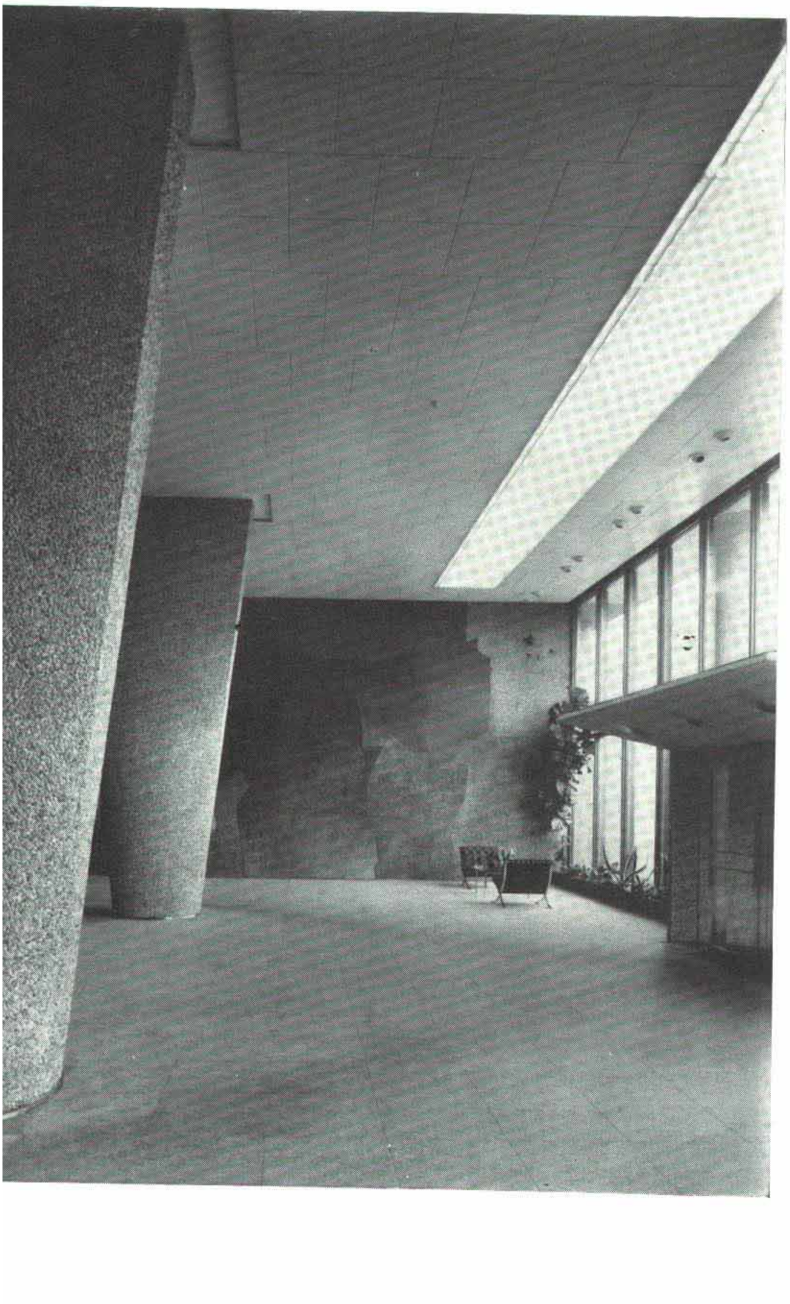
by George Perkin

OVER THE last few years the Cement and Concrete Association – and more recently The Concrete Society – have arranged several visits to Scandinavia for architects, engineers and contractors, usually with a fairly set pattern. Sweden and Denmark have been visited for their industrialized building systems, Finland for the general excellence of its modern architecture. And Norway? It is only quite recently that it has generally become realized that in Norway there is some very interesting new building, particularly in and around Oslo. To simplify a good deal, it could be said that the speciality of recent Norwegian building, when it comes to concrete, is surface texture. They have experimented widely with bush-hammering, with point-tooling, with hand-picking, with striated finishes and, of course, with that essentially Norwegian technique Naturbetong, first heard of in this country some eight years ago. All these are designed to expose the aggregate to a greater or lesser extent.

In and around Oslo there are at present at least a dozen highly interesting new buildings to be seen – some worth visiting for the surface finish techniques alone, others good all round. As regards the Naturbetong buildings there have been several new ones in the last five years.

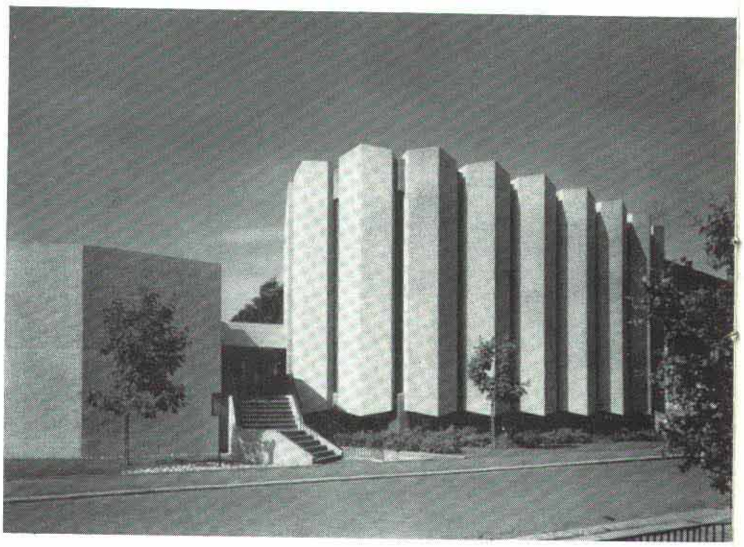
For those who are not familiar with Naturbetong, it involves, very briefly, placing selected coarse aggregates (rounded or crushed) into the forms, injecting a grout to fill the interstices and then sandblasting the surface soon after stripping the forms. The result is a beautifully even-textured concrete. A detailed description was given in *Concrete Quarterly* 44.

From the start it should be said that this article does not set out to suggest precisely how Naturbetong – so far an exclusively Norwegian technique – should cross the North Sea and establish itself in this country. Those who have tried already know some of the snags. Perhaps it is a matter of getting the right



Left: The entrance hall, NORSK HYDRO *– one of the earlier Naturbetong buildings designed by Erling Viksjo. These beautifully textured columns change in section from a circle at the base to a rectangle at the top for structural reasons.*

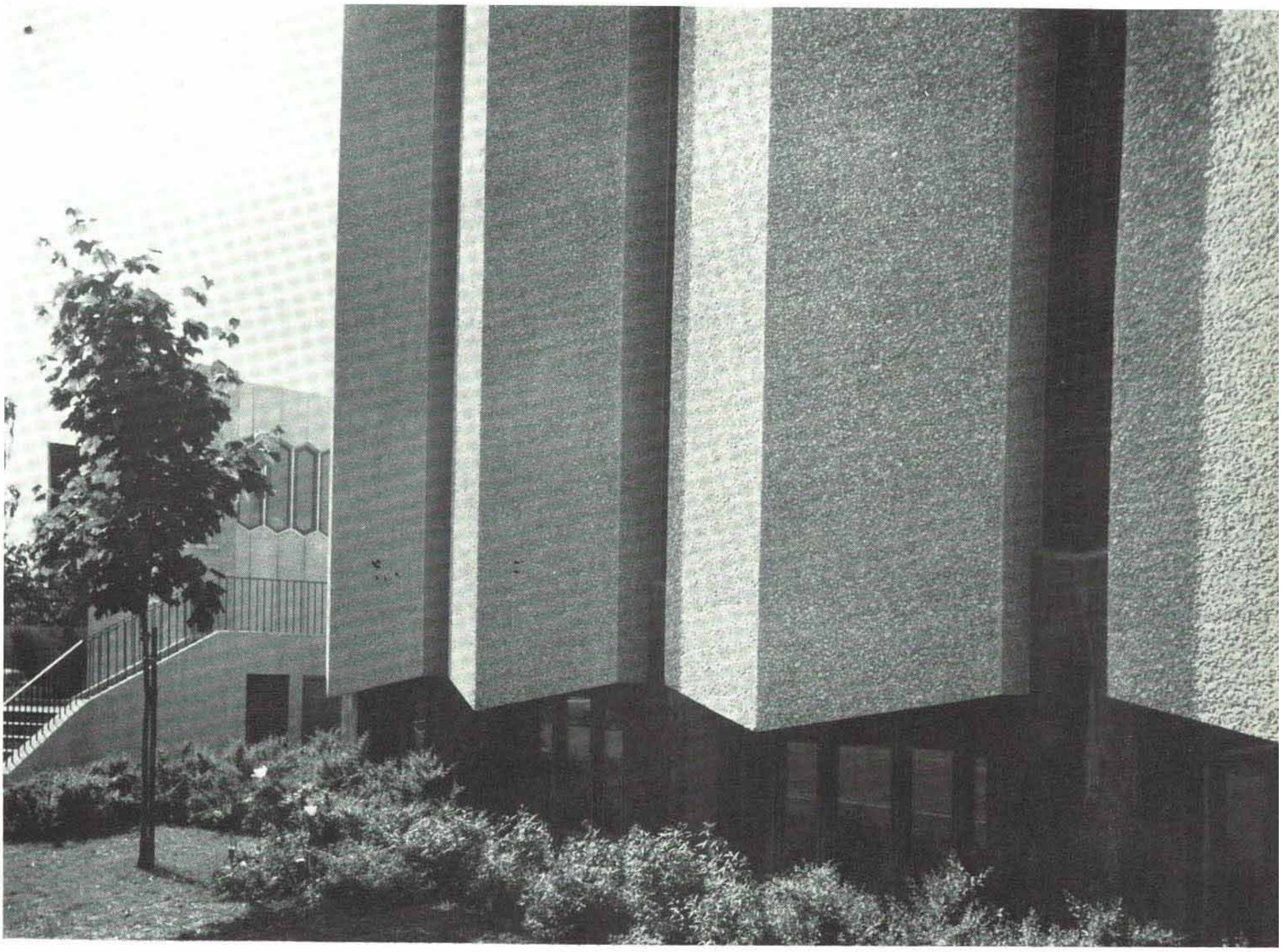
Below and right: THE AMERICAN LUTHERAN CHURCH, *Oslo. Built of Naturbetong using crushed white granite aggregate and white cement, the design depends to a large extent on the even texture of the white concrete faceted walls. Naturbetong was chosen after erecting on the site comparable panels of ordinary sandblasted and hand-chiselled concrete. The external walls are of sandwich construction, with $4\frac{3}{4}$ in. of concrete exposed on the interior, 4 in. of foam insulation in the core, and $4\frac{3}{4}$ in. of Naturbetong concrete externally. Architects: Sovik, Mathre and Madson of Northfield, U.S.A.*

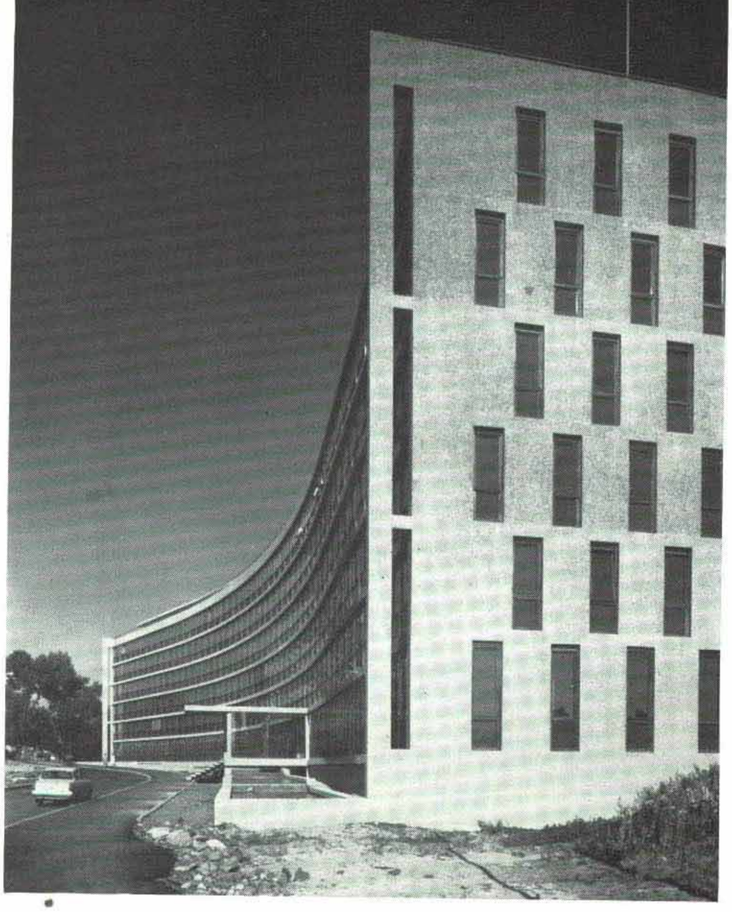


aggregates (although surely there are plenty in this country suitable for the purpose). It is true that the Norwegians have available an attractive multi-coloured granite aggregate of pink, green, buff and grey which blends well, but the technique is not restricted to these aggregates. A more serious difficulty is the lack of experience and know-how in this country. But then this is common to any new technique. There is also the fact that Naturbetong is at present covered by a Norwegian patent. But whatever the reasons may have been so far for the technique not catching on, the fact remains that it has produced some of the most outstanding exposed-aggregate in situ concrete finishes to be seen anywhere in the world, as those who have been to Oslo will confirm. It is thus true to say that this country has not so far had at its disposal what is evidently the finest method known of producing exposed aggregate finishes – a type of finish, moreover, that will weather better than many other kinds of natural concrete finishes.

So the point is simply this: is it worth trying? Is this technique good enough to warrant making efforts to overcome the initial difficulties? We think it is, and that the end product is worth a bit of trouble. One might also ask whether, in fact, the whole thing is so complicated as we imagine. The Norwegians do not think so. Obviously, however, it needs organization, and more than one person – or a company of some standing – to take it up. Also it needs close consultation with the Norwegian experts: there is an organization in Oslo called Internaturbetong which deals with interest from abroad.

To come down to the actual Naturbetong buildings worth looking at, there are at least six in the Oslo area finished in the last few years, apart from the early ones completed some eight years ago. These last include the multi-storey Government Building, now being added to, which was the first major experimental use of the technique. Then there was the triangular Bakkehaugen church out in one of the suburbs and – possibly the most successful of the three – the Norsk Hydro, still as good-looking as it was when built. All these were designed by the Norwegian architect Erling Viksjo who, together with the civil engineer Sverre Jystad, invented Naturbetong.



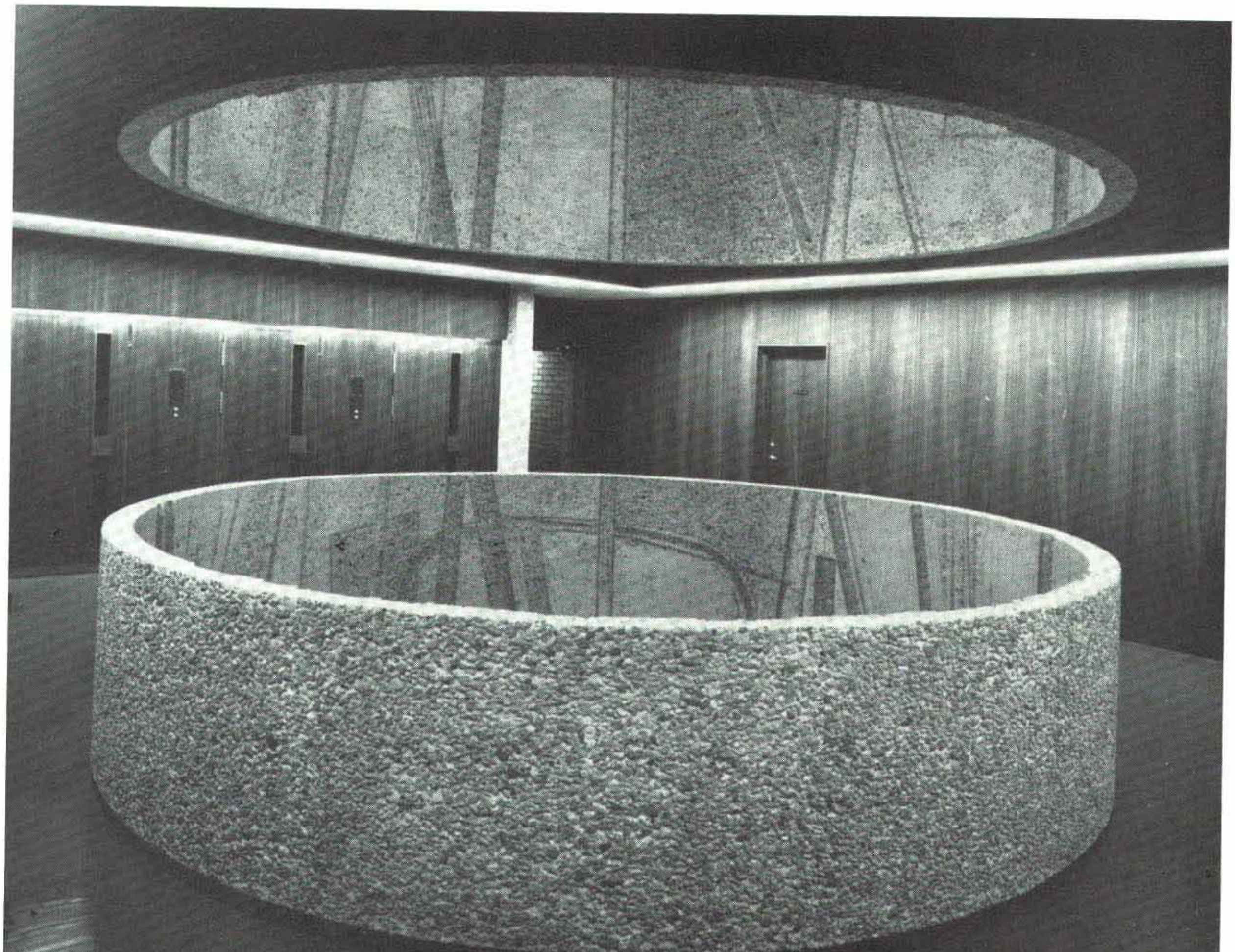


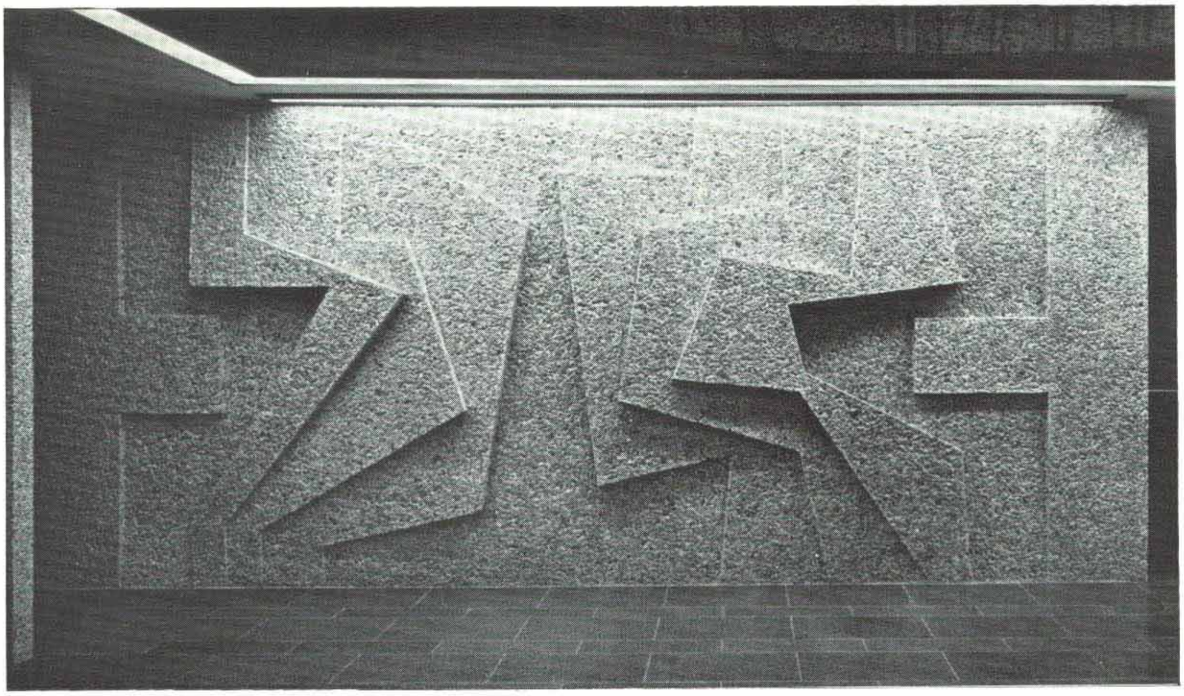
CONCRETE IN OSLO: *continued*

Of the new buildings there is the American Lutheran Church, a very good example – one of the best – in white concrete. There are two next door to each other, out by the Vigeland Park: the office building for the Norwegian Hydro-Electricity Administration, and the office building for the Electro-Chemistry Administration (Elkem), both multi-storey blocks entirely built of Naturbetong with some very interesting interiors. There is a delightful villa in Eckersbergsgate in which the material is used not only outside but also in living rooms as a finish instead of plastered walls (see front cover). There is a straightforward three-storey office block for Schreiner and Company and there is the most recent and impressive example, the Standard Telephones building, only just completed.

Perhaps an immediately striking aspect of Naturbetong in Oslo is its suitability as an interior as well as an exterior finish. And in most examples this is a strongly unifying factor in design – as may be judged from the accompanying photographs.

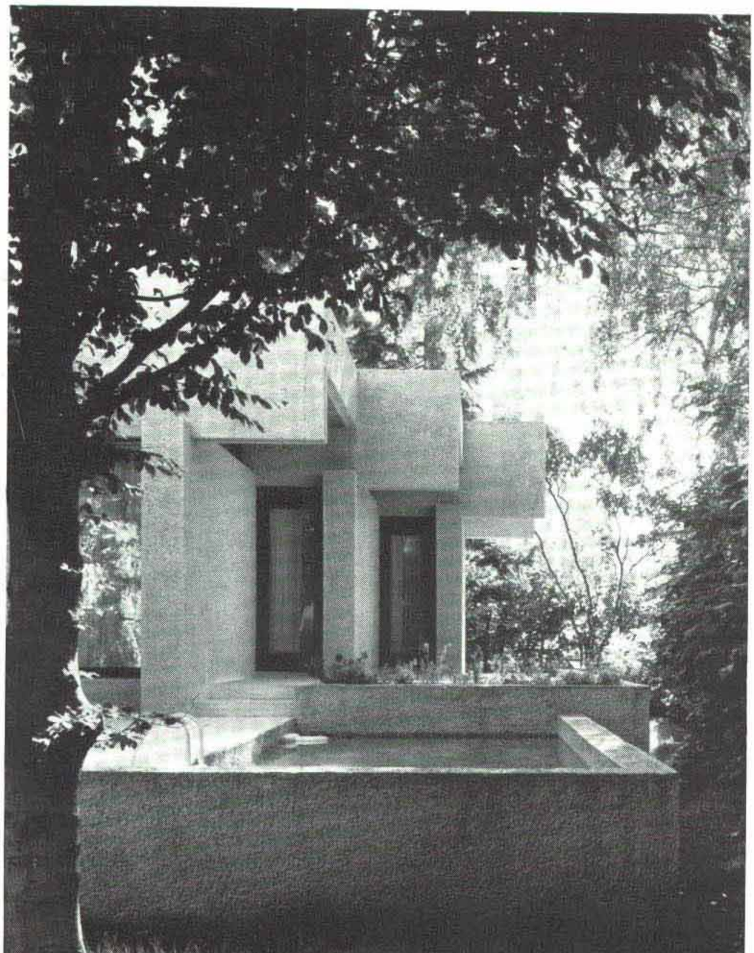
continued on page 24

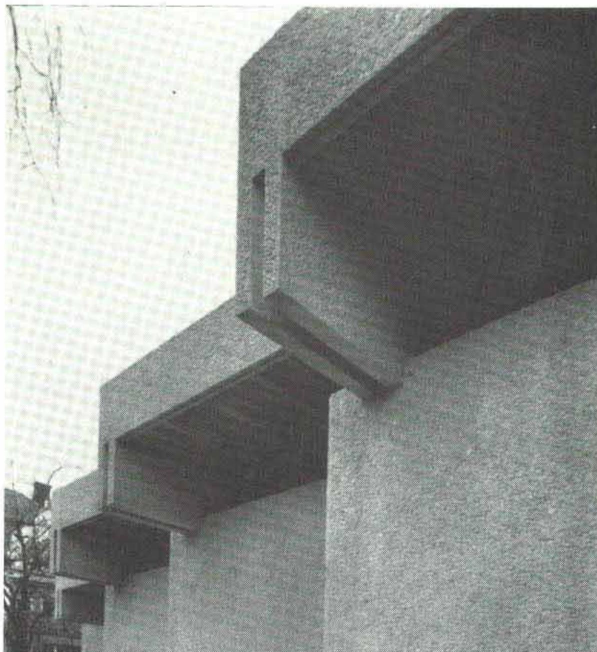


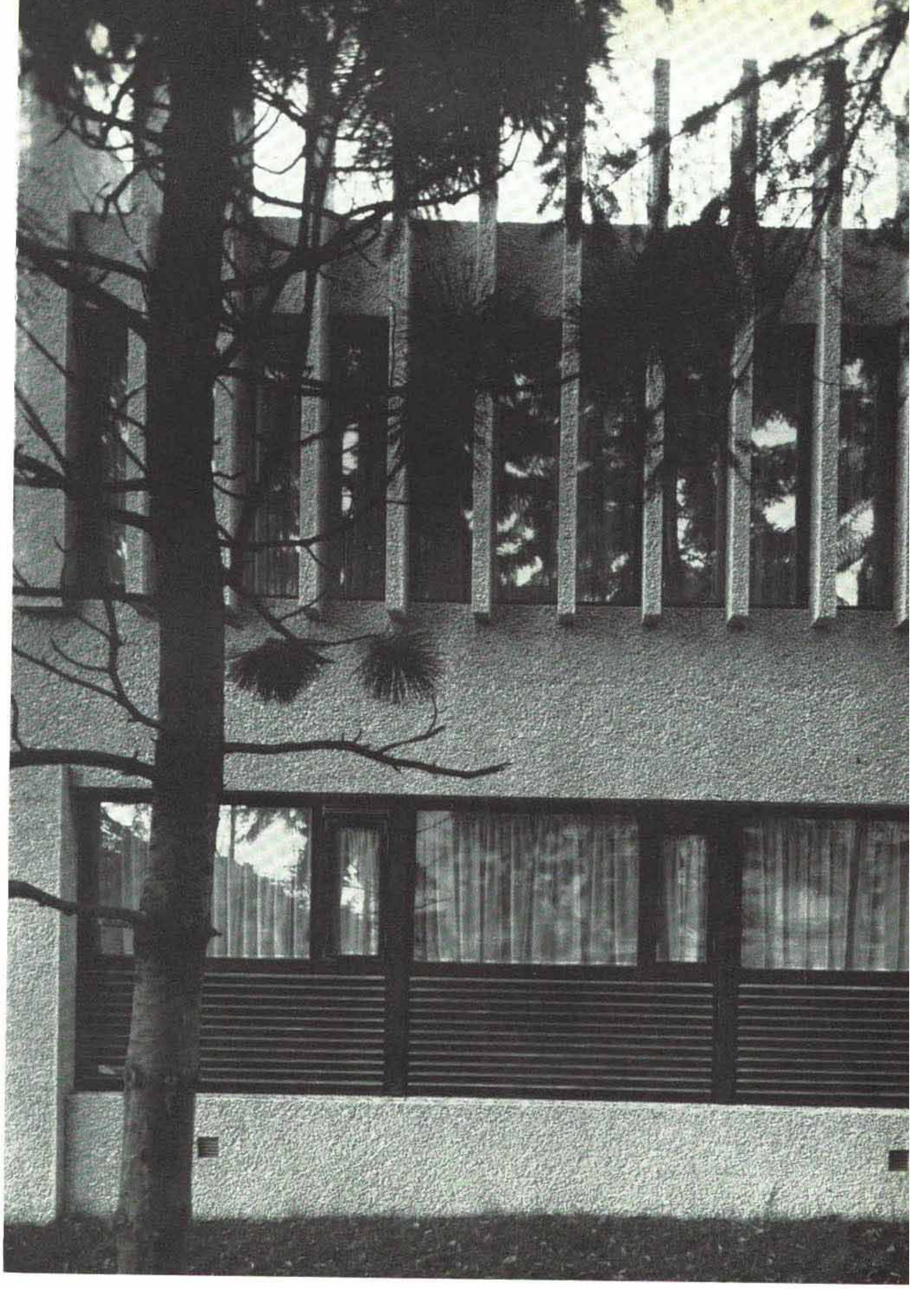


Opposite and this page: THE OFFICE BLOCK FOR THE NORWEGIAN HYDRO-ELECTRICITY ADMINISTRATION, *Oslo, entirely built of Naturbetong inside and out. A stream with shallow waterfalls runs along the front. All external concrete elements are textured, including the edge beams, gable end walls and entrance canopy. Inside, the technique is dramatically carried through to such details as the concrete balustrades around circular light wells which extend one over the other above the entrance hall (far left), the relief mural in the entrance hall (above) and the sculptured column also in the hall (left). Artist: Odd Tandberg. Architects: Lykke Enger and Knut Enger.*

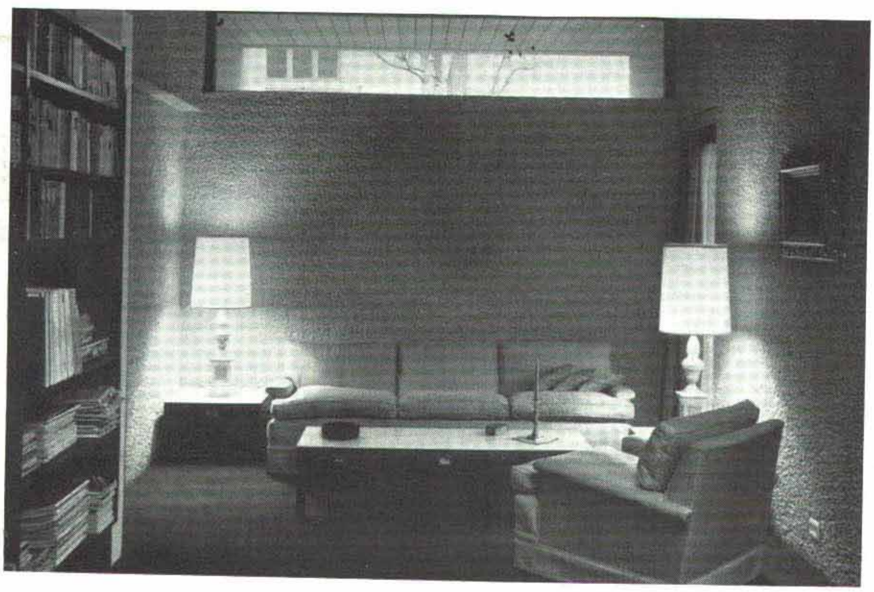
The office building for the ELECTRO-CHEMISTRY ADMINISTRATION (ELKEM) BUILDING – *see also page* 15.
This quietly harmonious interior occurs in a reception area on the top floor. All the concrete elements are in exposed Naturbetong—columns, stair balustrades and edge beams around the gallery. The concrete effectively contrasts in texture with soft carpets and fabrics. Architect: Erling Viksjo.

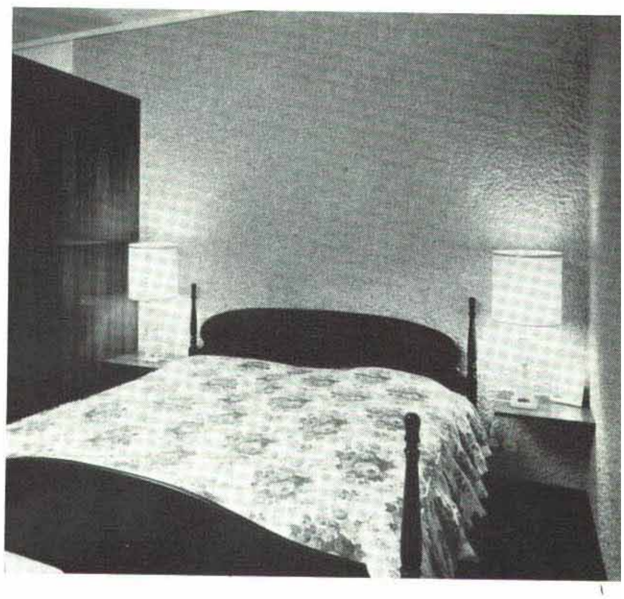


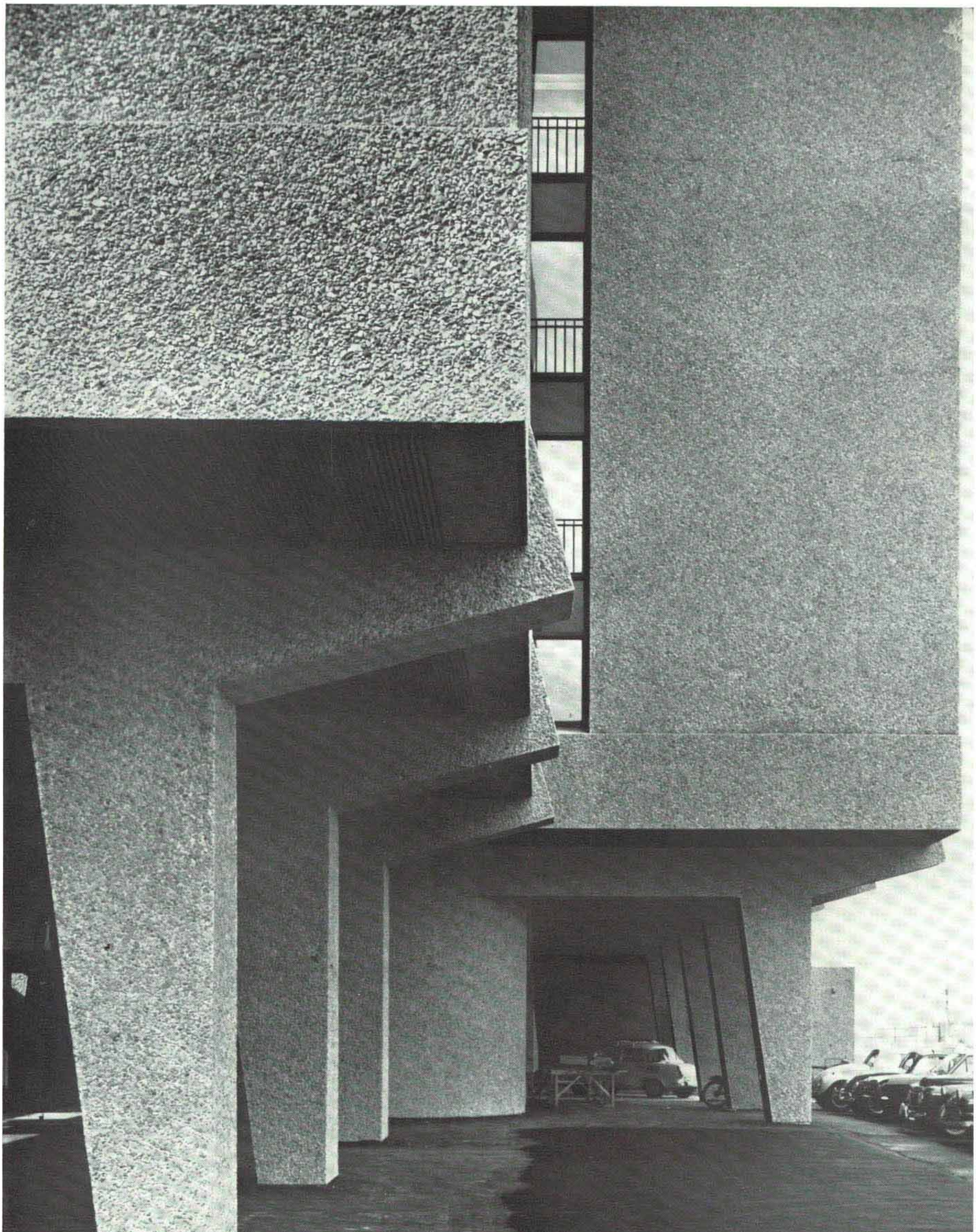


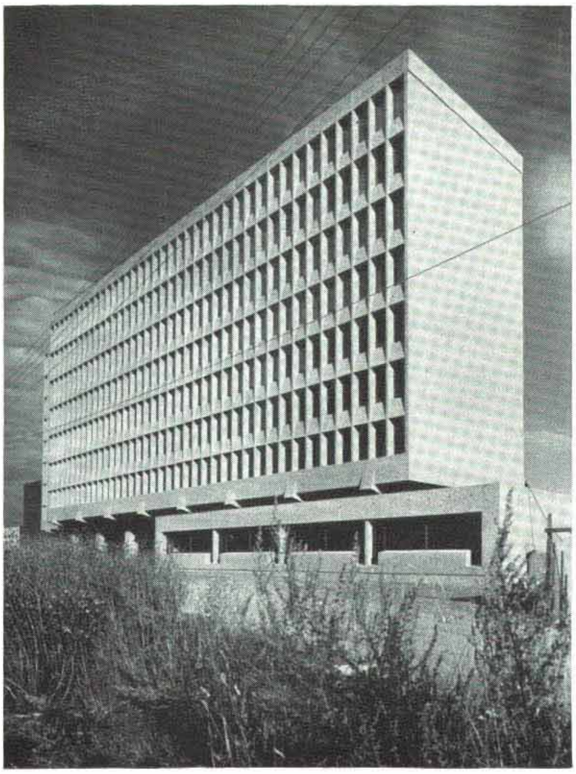


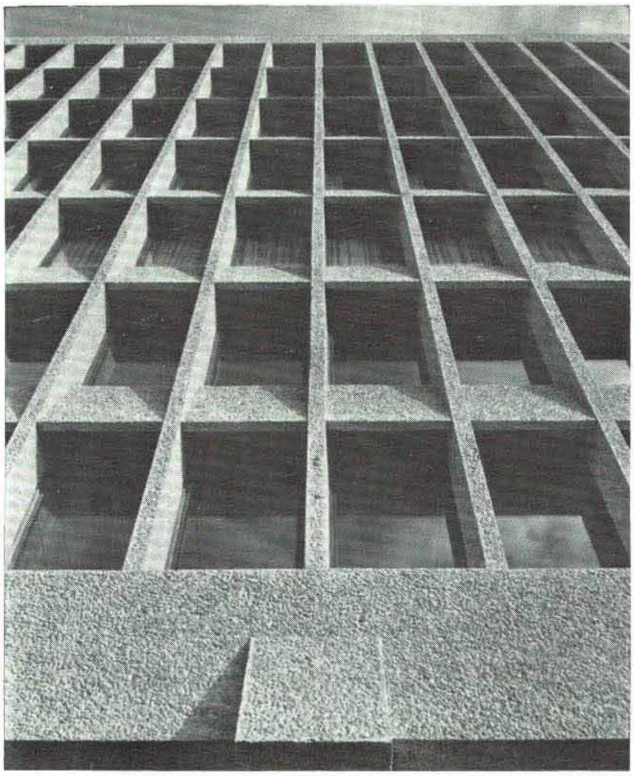
Below opposite and this page: VILLA IN ECKERSBERGSGATE, *in a suburb of Oslo. It is entirely built of Naturbetong using a crushed aggregate graded from ½ in. to 1½ in., and sandwich-construction walls. The evenly textured concrete is exposed outside and in, providing an unusual degree of unity between exterior and interior. Far left below: View from the garden showing deep-set windows and pool. Left below: Detail of roof beams. Right: The Naturbetong technique does not preclude thin elements such as these vertical fins on the upper part of the house, sandblasted on both sides. Below: Interior views of the living room and a bedroom showing the suitability of the technique for interior domestic use (see also front cover). Architect: Inge Hovig.*



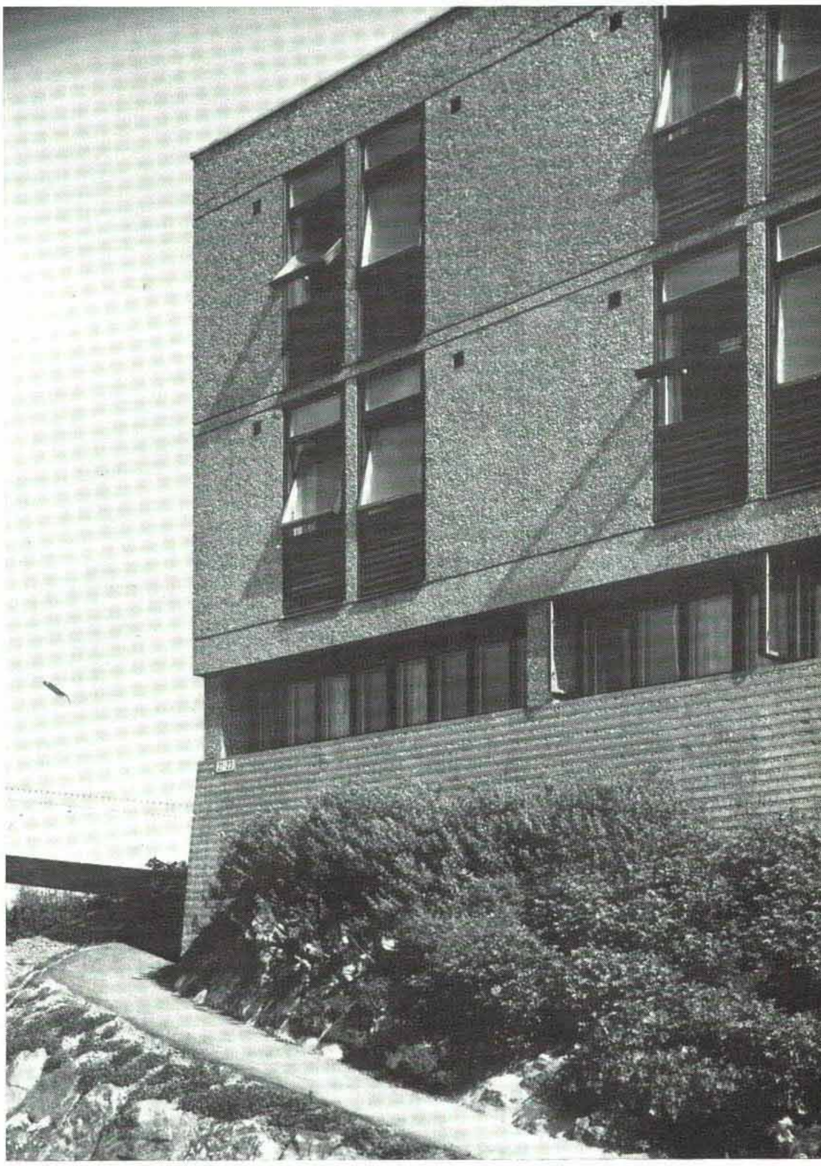




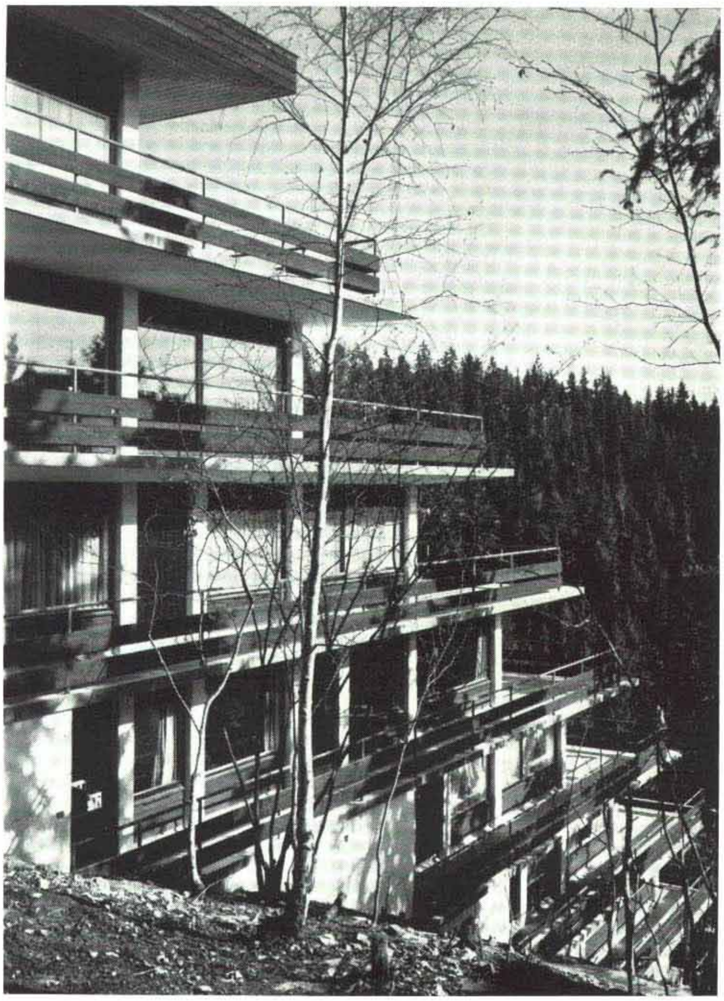




Opposite and above: The most recently completed Naturbetong building in Oslo, the STANDARD TELEPHONES BUILDING. *The sharp and clean modelling of the textured concrete columns is carried through into the entrance hall – again a strongly unifying factor in design. Architect: Erling Viksjo.*



Right: As a basis of comparison with the Standard Telephones Building, this STUDENTS' HOSTEL ON THE RINGVEI *was the first Naturbetong building to be constructed nine years ago. It was cast with black cement, the granite aggregate showing up white. The photograph was taken this summer, and no staining or streaking has taken place. Architect: Erling Viksjo.*



CONCRETE IN OSLO: *continued*

However, it is not only Naturbetong that is important in Oslo, architecturally speaking. There are several other good buildings, of which three outstanding examples should be mentioned. As regards housing, there are the apartment blocks at Ullern, a suburb of Oslo – a scheme which is neither high- nor low-rise. It comprises six different blocks containing fifty-four flats in all, built into a very steep hill with a 35° gradient. The flats are spacious and on the luxury side, rising up in stepped terraces one above the other, the living quarters at the front, the bathrooms and services built into the ground at the rear. The flats have reinforced concrete frames with cantilevered terrace balconies and timber balustrades. The blocks are dramatic in the extreme and can be seen from some distance away in the centre of Oslo, climbing up the hillside between the firs and silver birches. Architects: Olav Selvaag, Anne Tinne and Mogens Friis.

As a further example of surface texture, there is a simple and highly effective use of in situ concrete in the Haslum crematorium, just outside Oslo. This, in its purest sense, is a series of plain concrete intersecting walls and timber roofs, the concrete roughened on both sides with a hand-pick – a fairly common technique in Norway. In the main chapel the wall behind the altar is a sheet of glass fitted direct into the side concrete walls, revealing a small enclosed

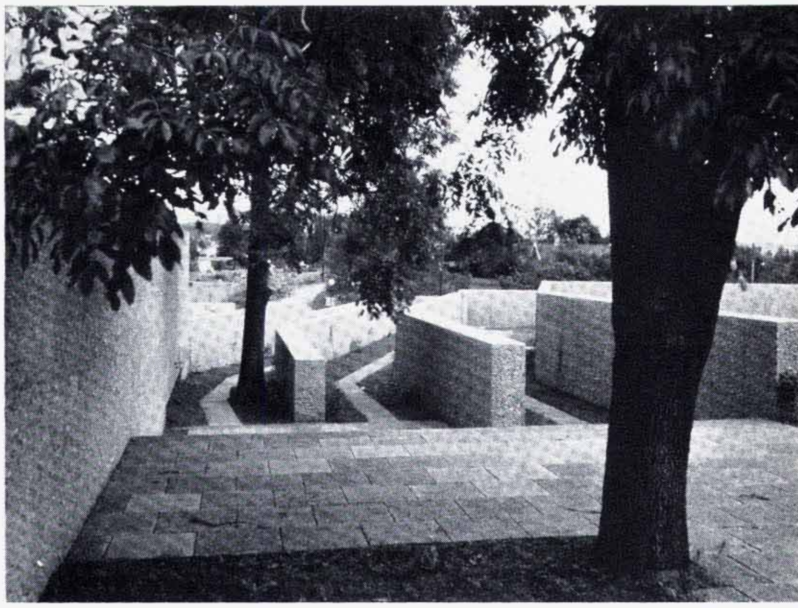
Top left and left: HOUSING AT ULLERN *on the outskirts of Oslo. The flats are built into a 35° hillside and have reinforced concrete frames with timber balustrades. There are fifty-four flats in six different blocks. Architects: Olav Selvaag, Anne Tinne and Mogens Friis.*

garden beyond. In this crematorium much of the effect depends on the rough texture of the concrete, with a good variety of colours in the aggregates. In its simplicity it manages to be extremely moving. An outstanding modern building. Architect: John Engh.

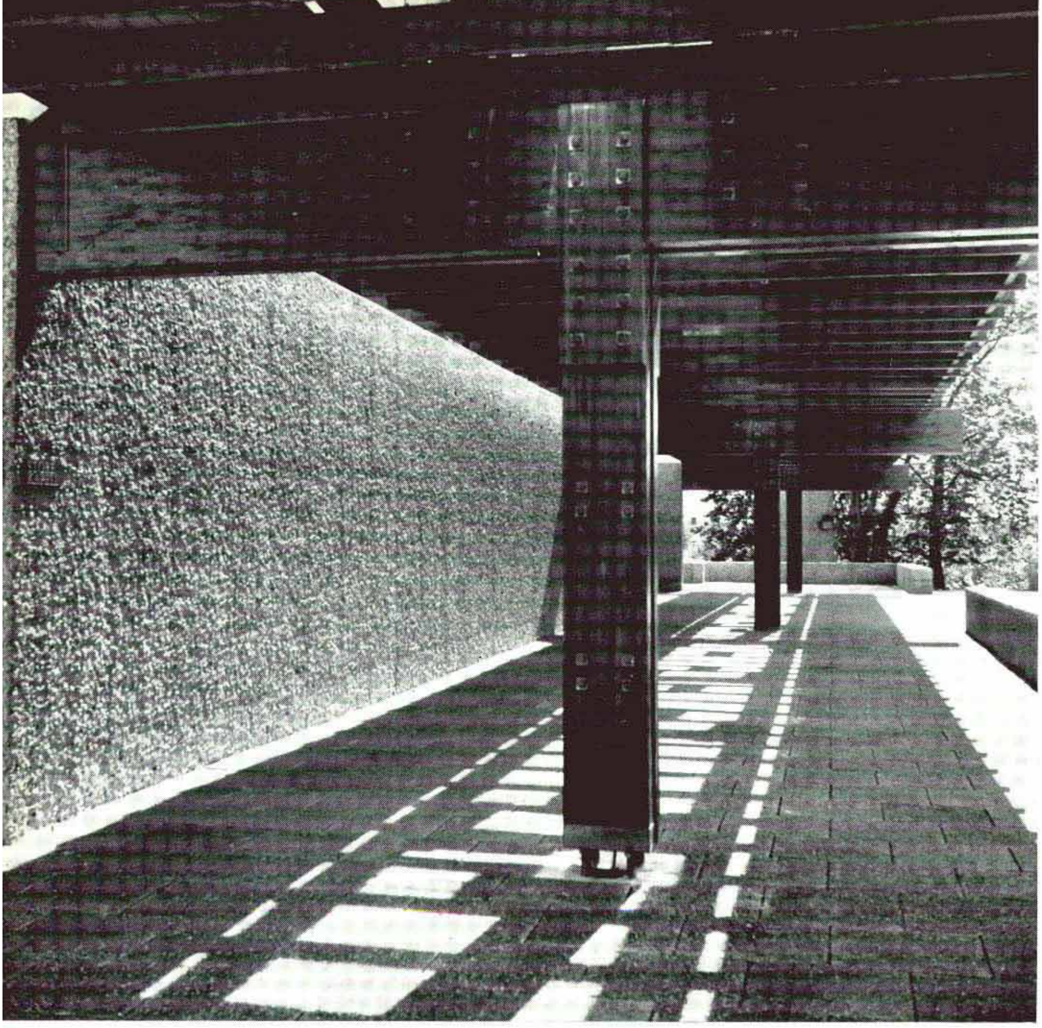
At Bredtvedt a school for dumb children has just been completed. This has something of the Japanese influence with upswept overhanging concrete eaves and exposed concrete frame painted grey. The roof tops are planted with grass – a traditional roof covering in Norway giving good insulation in summer and winter. Here the use of split concrete blocks for infilling panels is important, the blocks designed so that when laid the joints are automatically clean and raked, the mortar being contained behind projections on the top of each block giving a crisp, neat appearance to the walling. Architect: P. A. M. Mellbye.

Finally, one should not forget the handsome Asker Town Hall with its dark hand-chiselled concrete, fully described in *Concrete Quarterly* 66 and still a 'must' for every visitor looking at buildings in the Oslo area.

Although no definite decision has yet been made, it is possible that The Concrete Society will be arranging a visit to Norway next year, in which case details will be given later on. But even from this brief account it will be seen that Norway is now very much more on the architectural map than it was ten, or even five, years ago.



HASLUM CREMATORIUM, *just outside Oslo. This quietly dignified concrete building obtrudes very little on the landscape. The walls are textured by hand with a pick on both sides. There are no parapets at the tops of walls. Aggregate with a good variety of colours from Slemmestad is used. Above: The gardens inside the main walls. Below: The building sits entirely naturally on its hillside (see also over). Architect: John Engh.*



Left: HASLUM CREMATORIUM. *The approach to the main chapel. A covered way is formed of timber beams and columns with a concrete flank wall textured by hand picking. With its simple materials and textures, the building is extremely moving.*

Right: SCHOOL FOR DUMB CHILDREN AT BRETVEDT, *Oslo. The building has five residential blocks and one main building, seen here. The exposed in situ concrete frame and upswept eaves are painted grey. Concrete blockwork for infilling panels is of a high standard, the blocks being made so that no escaping mortar can spoil the crispness of the jointing. The rooftops, behind the deep concrete parapets, are planted with grass – a traditional Norwegian device for insulating roofs. Architect: P. A. M. Mellbye.*

Right: This curved pedestrian bridge of reinforced concrete is on Store Ringvei, just outside Oslo. The central span is 108 *ft., it is* 11 *ft. wide and curved horizontally and vertically. Designed in the City Architect's Department. Engineer: Elliot Stromme A/S.*

Photographs by George Perkin

Opposite and above: Details of concrete texture in the new UNIVERSITY BUILDINGS *in Oslo. Top left: Lettering on the Mathematics Building wall which is of bush-hammered concrete. Paving is of granite setts; timber strip ceiling to the covered way. Below left: The central courtyard with its fountains and pools enclosed by low walls of bush-hammered concrete. Above: The use of really strong texture in the concrete elements is here very successful. The columns are bush-hammered; the wall behind is of striated concrete, the projecting ribs hacked off by hand in the normal manner.*

Right: A house in one of the residential suburbs of Oslo, where the simple use of precast concrete T sections for floor and roof has proved effective.

ASKER TOWN HALL, *some twenty miles south of Oslo. One of the most handsome concrete buildings in Norway, built inside and out of hand-chiselled black concrete (see also* Concrete Quarterly *66). Architects: Kjell Lund and Nils Slaatto.*

University buildings Liverpool and Leicester

TWO NEW University buildings by the architects Denys Lasdun and Partners have recently been completed. One is a new sports centre for the University of Liverpool – a very interesting reinforced and prestressed concrete building in which the structural system derives directly from the planning. The other is the Charles Wilson Building for the University of Leicester – a mainly precast multi-storey building, the main function of which is to serve 2,750 lunches a day to staff and students. Both buildings show a good deal of original thinking as regards concrete structure and detailing.

Sports Centre, University of Liverpool

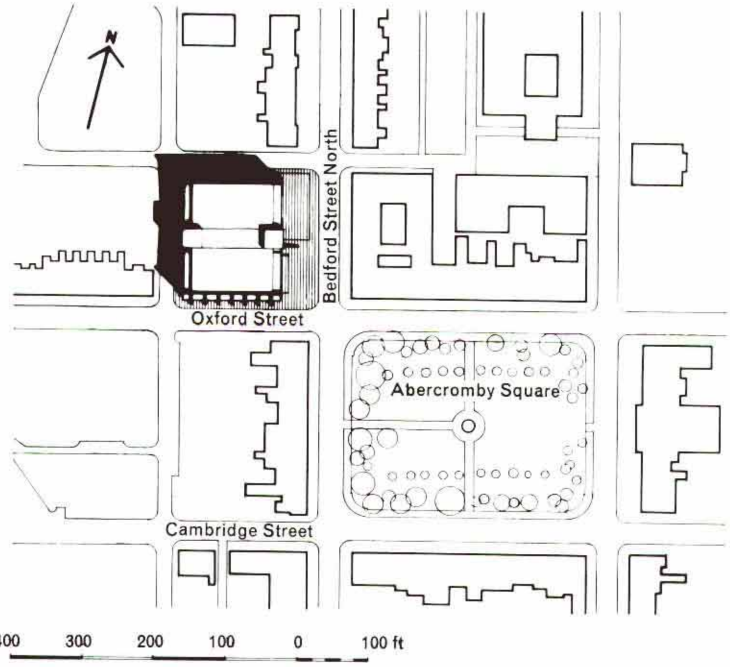
The sports centre forms part of the overall University development in Liverpool, and is at the junction of Oxford Street and Bedford Street North. It adjoins Abercromby Square and is about 100 yards from the Students' Union.

The centre includes a six-lane swimming pool, 110 ft. by 48 ft., with two underwater viewing windows and a gallery seating 150 spectators. There is also a sports hall 120 ft. by 64 ft., with an ingenious concrete and brick climbing wall for instruction in rock-climbing techniques, and four squash courts.

Basically the building comprises two main spaces – the swimming pool and the sports hall – planned on either side of a central core. The core contains squash courts, smaller rooms for sports and changing, and the vertical circulation. It also provides structural stability for the large envelope enclosing the two main spaces, in addition to providing central support for the roof structure.

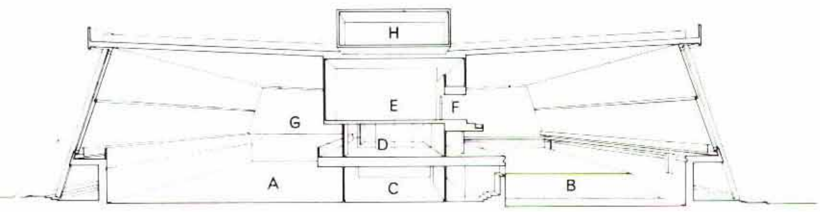
Briefly, the main structural elements comprise a series of raked precast prestressed concrete columns along two sides of the building, inclined inwards towards the central core. The main lattice-beam roof structure is supported by these columns at the outer edges and by the central core. The columns also transfer the fairly high wind loading on the building faces through the roof structure to the main core and thence down into the foundations. The core is a three-dimensional system of reinforced concrete floors and walls, two storeys in height, supported by a series

Site plan.

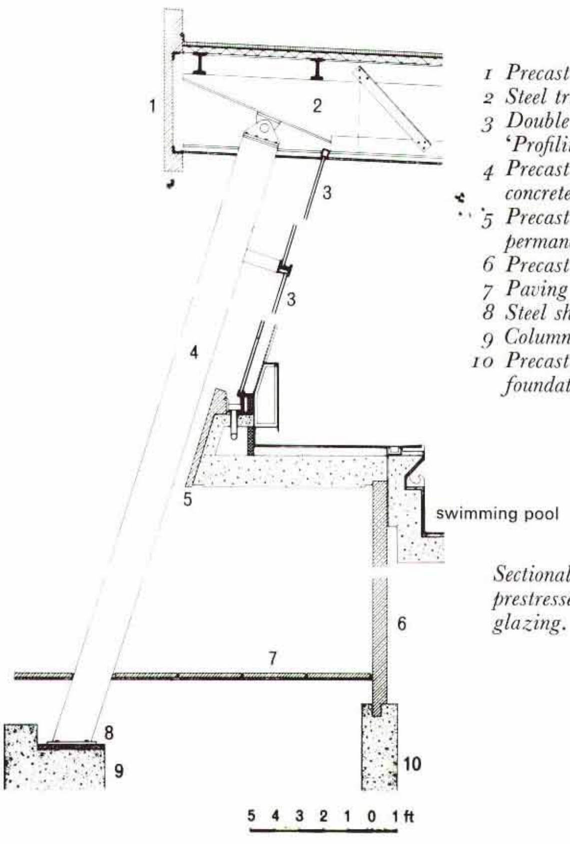


• Photographs by Richard Einzig

The structural system – with everything converging towards the central core – is plainly apparent from the outside of the building.



Cross section. A *Sports hall* B *Swimming pool* C *Studio* D *Dojo* E *Squash courts* F *Swimming pool gallery* G *Climbing wall* H *Plant rooms*



1 Precast concrete fascia
2 Steel trusses
3 Double glazing—'Profilit' panels
4 Precast prestressed concrete columns
5 Precast concrete fascia permanent formwork
6 Precast concrete unit
7 Paving slabs
8 Steel shoe
9 Column base
10 Precast concrete unit foundation

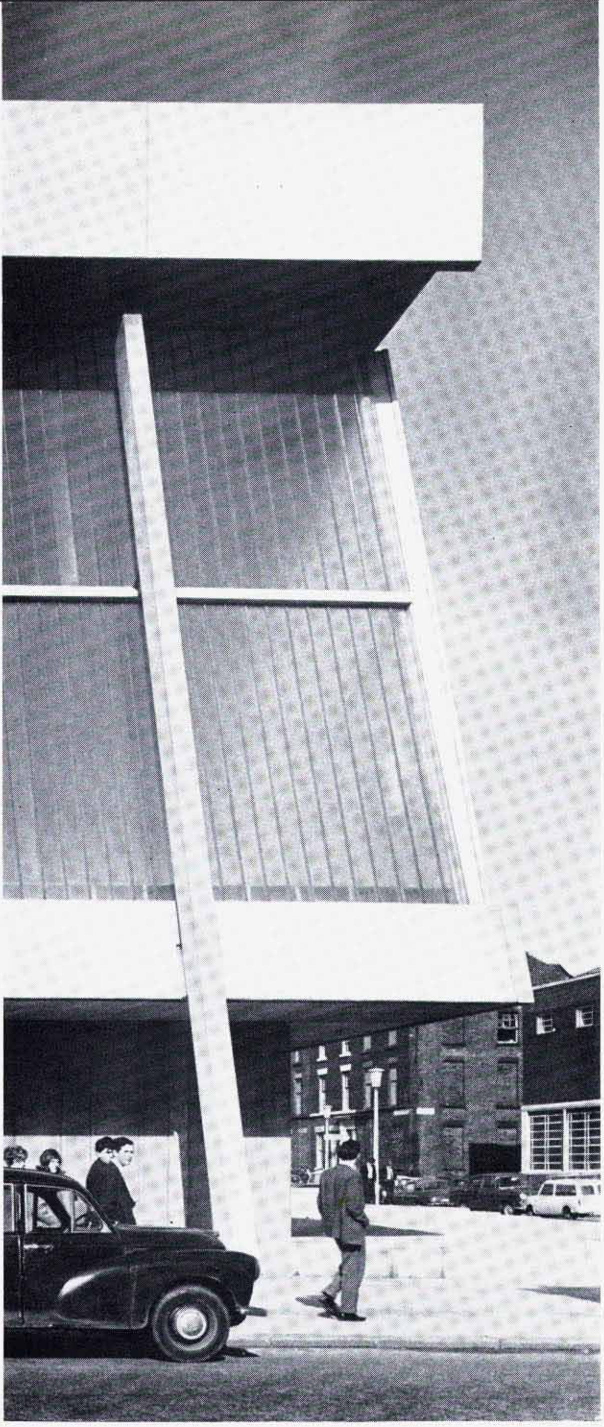
Sectional detail showing prestressed columns and glazing.

of reinforced concrete columns arranged in pairs. Strip foundations with pad footings transmit the structural loads down to the sandstone bearing strata. The structural system of the building as a whole is clearly expressed inside and outside.

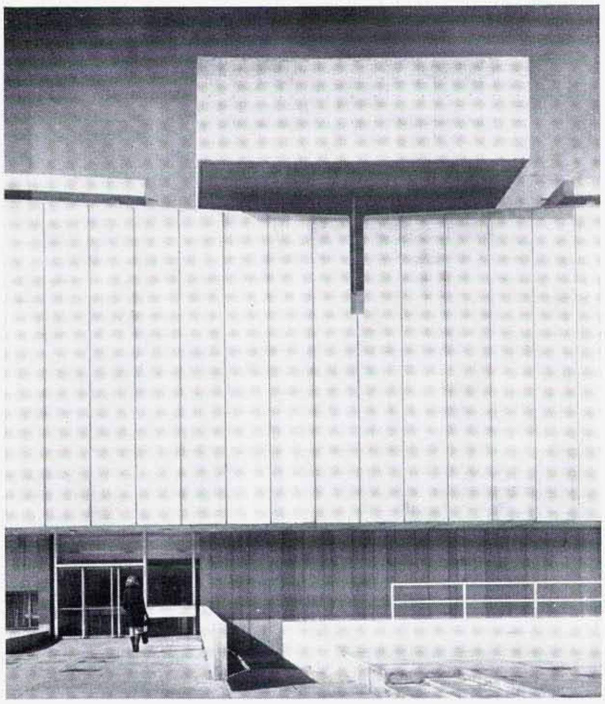
The slender raked columns were erected by two mobile cranes, one lifting the column whilst the other lifted the main roof lattice beam. The latter is supported by the former by means of a simple steel pin connection, the column and beam forming a pinned L frame. The gable walls are framed in lattice steelwork and clad with vertical precast concrete panels. The main swimming pool and sports hall areas are enclosed externally by vertical glazing units.

Concrete floor slabs 15 in. thick at first floor level form galleries round the sports hall and swimming pool. These are cantilevered and support the concrete cladding panels, the lattice steel gable walls and some internal brick panelling. The floor slabs receive support from inner walls and from the raked prestressed columns. The slabs which extend round the perimeter also resist lateral loading from wind forces and from the horizontal components of the raked columns. On the swimming pool side, the pool walls are designed as propped cantilevers to resist water pressure.

The swimming pool has been designed as an independent suspended structure within the building. It has a continuous expansion joint round the pool at first floor slab level to isolate it from any movement



A corner of the building showing one of the slender prestressed concrete raked columns and glass walling.



Entrance below a wall clad with vertical precast concrete panels.

View along one of the glazed walls showing the prestressed concrete external columns.

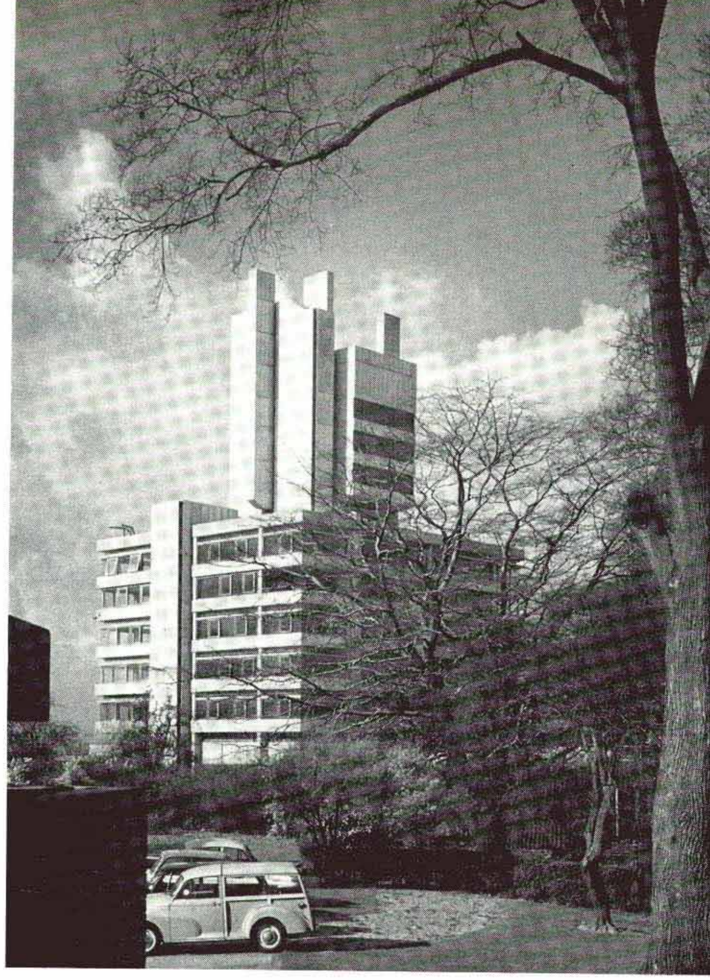
of the building which might cause cracking and leakage.

The column and two projecting cantilever arms which support the diving platforms are of concrete precast in one piece on the site.

Internally, the walls are of fair-faced brickwork or finished with glazed tiles. Floors are tiled or of hardwood strips. Ceilings are acoustically treated.

The consulting engineers for the building were Ove Arup and Partners. The general contractors were J. Jarvis and Sons Limited. The precast concrete columns and cladding units were made by Matthews and Mumby Limited.

Charles Wilson Building University of Leicester



The exterior of the building, showing the tower – with its common rooms and exhibition space on top – set over the main dining and common-room areas below.

The building is at the centre of the University teaching and administrative area, adjoining Victoria Park. Apart from its main function of serving 2,750 lunches a day for staff and students, it has common rooms, coffee bars, a large general purpose hall for examinations and physical education, and ancillary accommodation.

The main restaurant and common room areas are planned on the first to fifth floors which are all similar in arrangement with a central core for services. Above this level, the structure of the central core is carried up in the form of a small tower in which the seventh, eighth and ninth floors each have a single common-room. The top-lit tenth floor is for exhibitions, music recitals and similar functions.

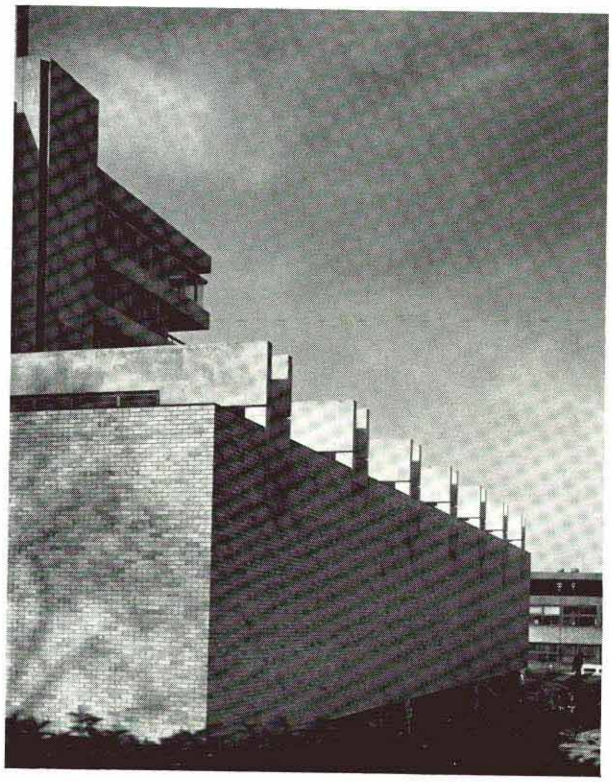
The whole of the structure from the ground level to the tenth floor is in reinforced concrete. Although the central core and its continuation as a tower are placed in situ, all the perimeter columns, beams, staircase walls and ducts up to the sixth floor are precast in order to achieve a uniformly high standard of finish. The precast units were manufactured at a works a few miles from Leicester and delivered to the site as required for erection by mobile crane. Plywood-lined timber moulds were used throughout. In spite of the units being up to 50 ft. long and weighing up to 10½ tons, a high degree of accuracy was obtained, with tolerances half those laid down in the then draft Code of Practice. The setting of beams on columns was made with a thin bed of mortar, and at each floor level the columns are linked by dowels, the holes for which were filled by pressure grouting. The joints between units were sealed with a polysulphide rubber compound.

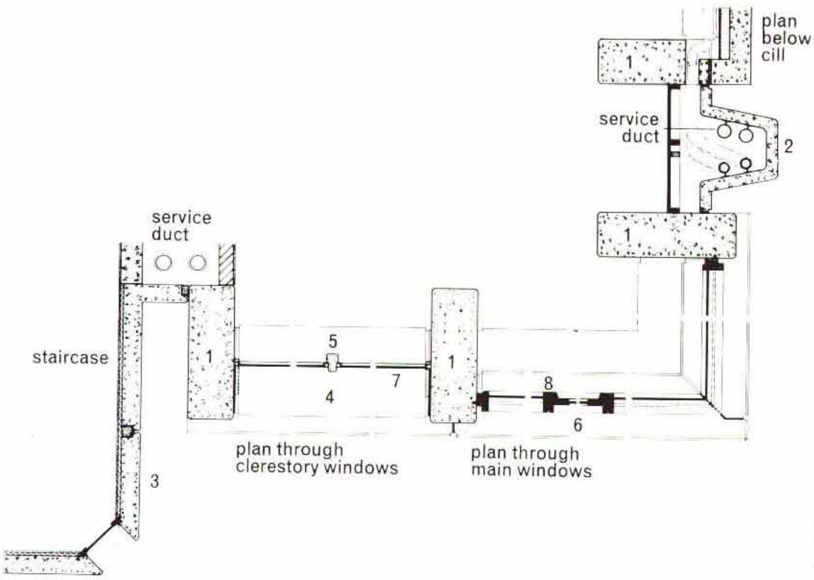
The windows of the first to fifth floors were designed so that they could be fixed and glazed from inside and this, combined with the precasting of the structural elements, eliminated the need for external scaffolding.

The walls of the general purpose hall and adjacent areas beyond the perimeter of the main structure are in loadbearing brick. The metal deck roof of the hall is supported on precast concrete beams seated on precast concrete padstones and grouped in pairs to form roof lights.

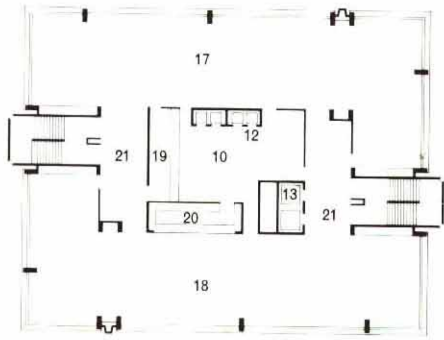
The consulting engineers for the Charles Wilson Building were Ove Arup and Partners. The general contractors were Johnson and Bailey Limited. The precast concrete units were made by E.C.C. Quarries Limited (Croft Granite Division).

The general purpose hall, with its pairs of precast concrete beams forming roof lights seated on precast concrete padstones.

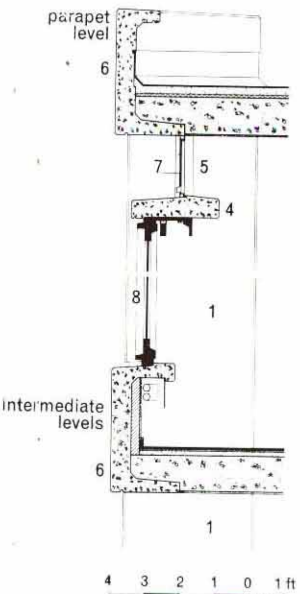




Second floor plan (also typical of 1st-5th floors)

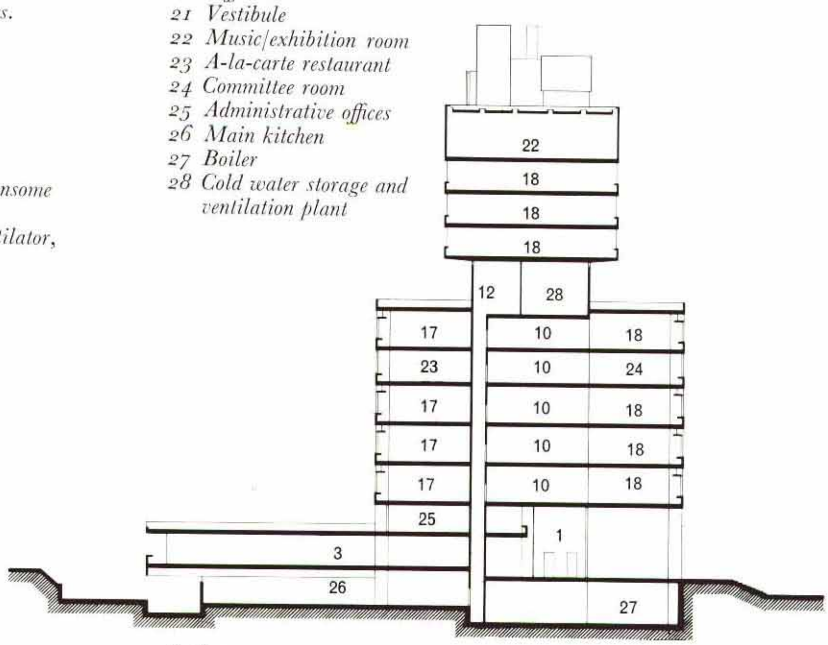


1 Entrance foyer
3 Snack bar
10 Servery
12 Four food lifts
13 Two passenger lifts
17 Self-service counter
18 Common room
19 Service counter
20 Coffee bar
21 Vestibule
22 Music/exhibition room
23 A-la-carte restaurant
24 Committee room
25 Administrative offices
26 Main kitchen
27 Boiler
28 Cold water storage and ventilation plant



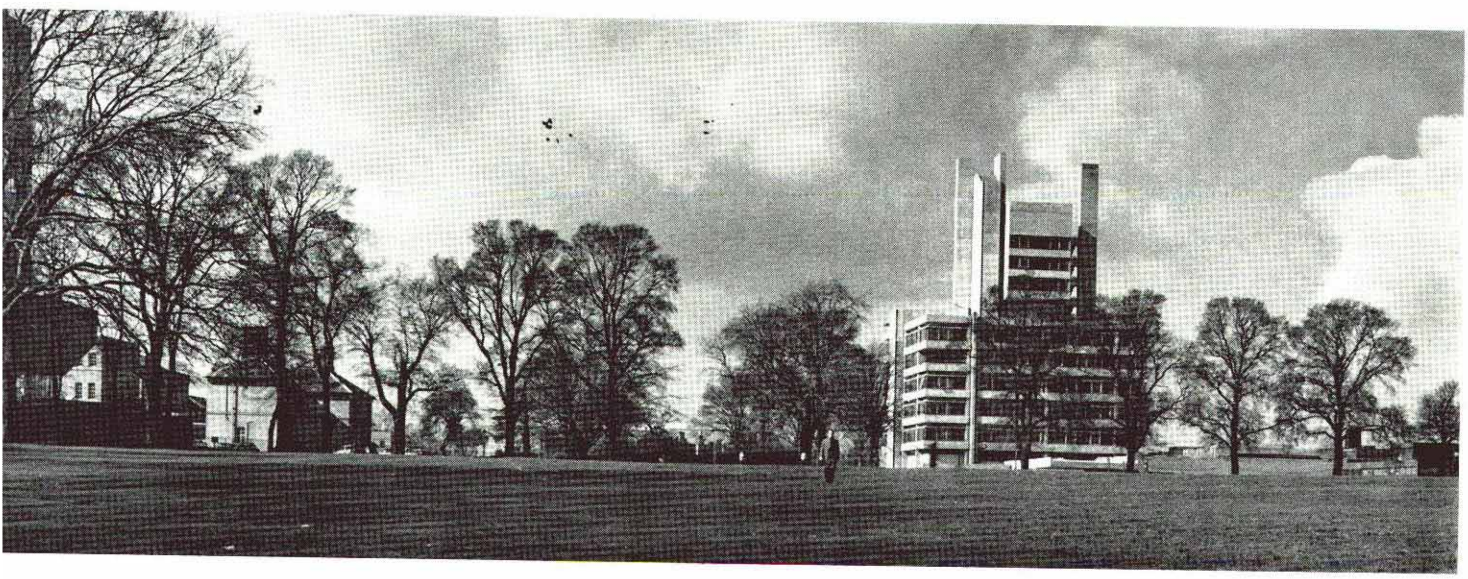
Perimeter structure, 1st to 5th floors. Above: Plan. Left: Section.

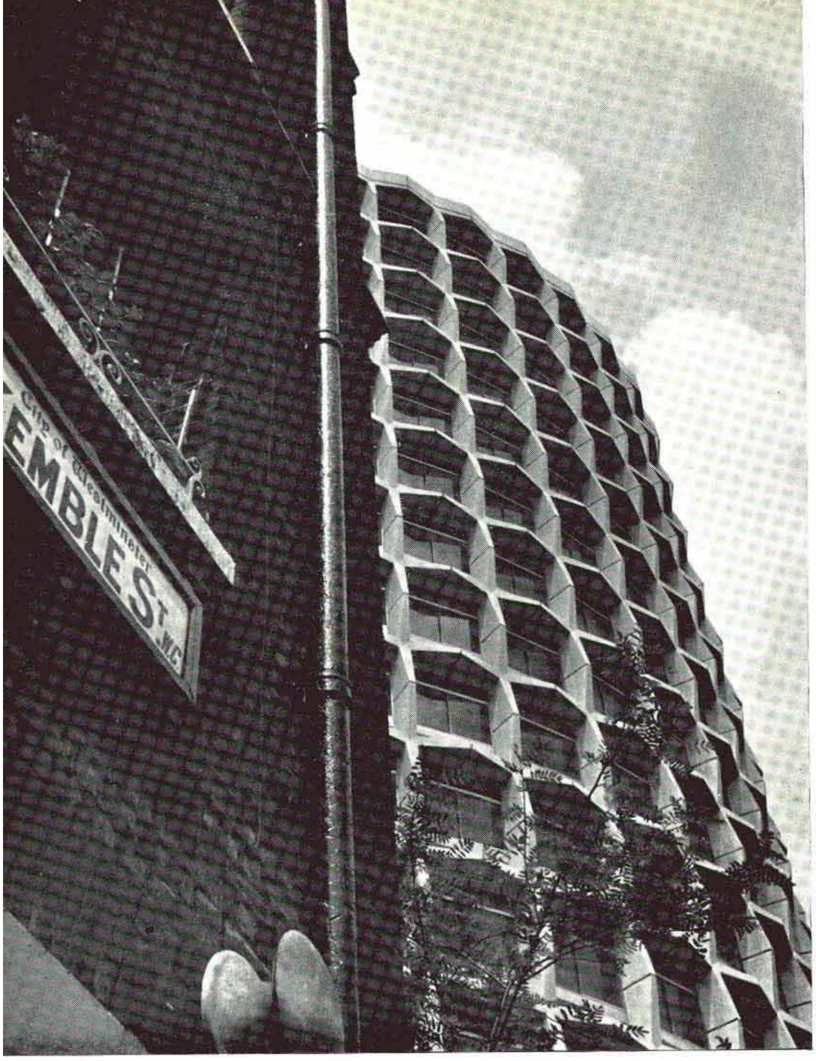
1 Precast column
2 Precast units for duct
3 Precast stair wall units
4 Precast transome
5 Precast mullion supporting transome
6 Precast beam
7 Steel window—permanent ventilator, fixed glazing
8 Timber window



Section

The tower in its open setting of parkland.





Photograph: Bill Duxbury.

Contrast of London brick and deeply modelled concrete façade.

SPACE HOUSE

Kingsway London

WE HAVE written before in this journal of the advantages of using strongly modelled precast concrete units on the façades of buildings (*Concrete Quarterly* 67). Now another good example – Space House, Kingsway – has recently appeared in London, in which white concrete units of this sort have been used.

The units completely encircle a round 16-storey block of offices and are cruciform in shape. They are structural and very deep, giving shade to windows, protection from vertigo and a lively rhythm to the building as a whole. They are also sharply faceted and have clearly expressed joints between.

Capstone concrete was used for the precast units, cast with white cement and polished smooth, and of similar specification to that used for the units on that well-known London landmark, Centre Point in Saint Giles' Circus. The two buildings were also designed by the same team comprising the architects R. Seifert and Partners (partner-in-charge G. Marsh, ARIBA), and the consulting engineers C. J. Pell and Partners.

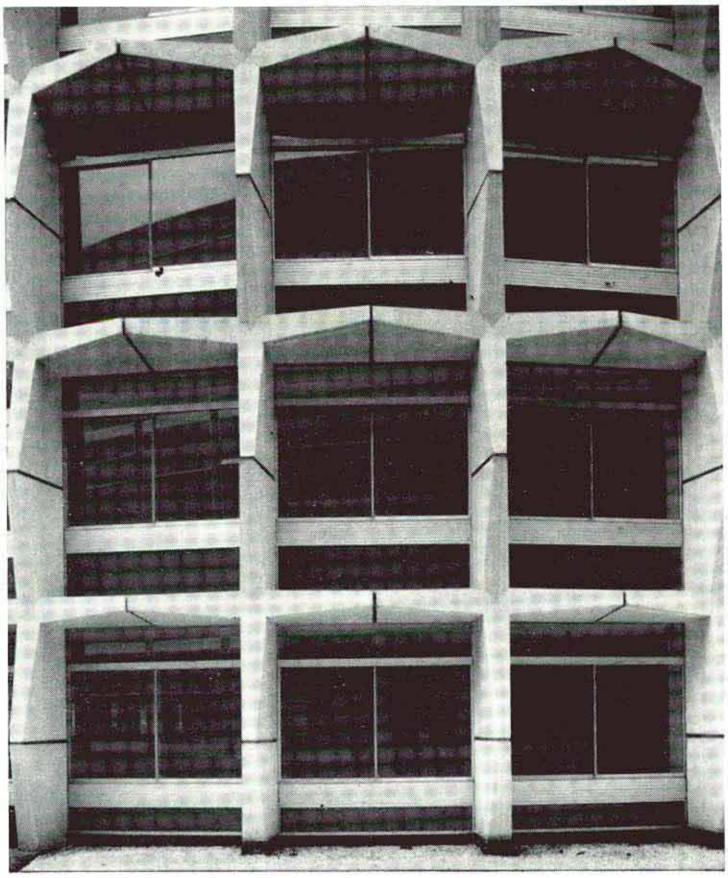
The cruciforms are 10 ft. high (storey height), the arms forming columns and beams. The horizontal arms forming the beams act integrally with a ring beam of in situ concrete placed behind the units at each floor level, from which precast concrete floor panels span radially to an inner ring beam around a central core. Vertical continuity between units is provided by dowel bars, pressure grouted, with a $\frac{1}{2}$ in. dry mortar bed joint.

At ground level, the whole outer structural system is brought down on to Y-shaped columns of in situ Capstone concrete, again strongly modelled in keeping with the cruciform units above. These columns are powerfully eye-catching from the street, proving once again that with tall buildings it matters vitally what goes on at ground level.

Infilling between the cruciform units is built up to sill level with lightweight concrete blocks, to receive

The jointing of units is accepted and plainly expressed rather than concealed.

Photograph: John Maltby.



Photograph: John Maltby

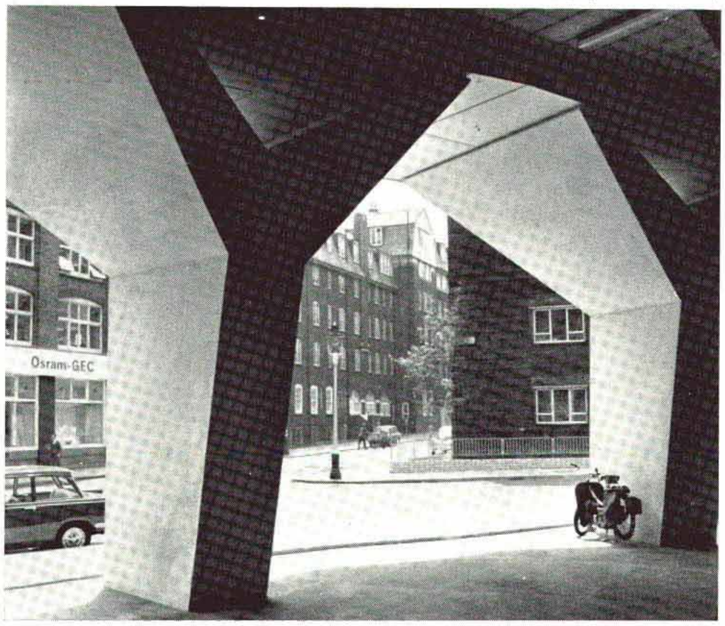
The circular tower viewed from the Peabody Buildings Estate at the rear.

the heating units, and faced with coloured spandrel panels. Glazing, with opening sections, is in aluminium frames.

The building is linked by a bridge with a seven-storey rectangular block facing onto Kingsway. The whole development comprises offices, showrooms, private and public car-parking areas, a petrol filling station, a District Bank and a sub-station for the London Electricity Board.

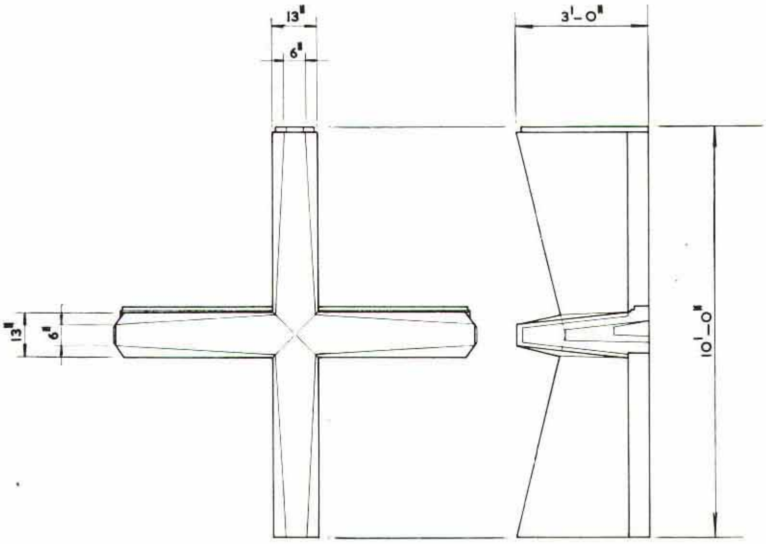
The contractors for Space House were Sir Robert McAlpine and Company Limited. The concrete units were made by Portcrete Limited.

Photograph: Bill Duxbury

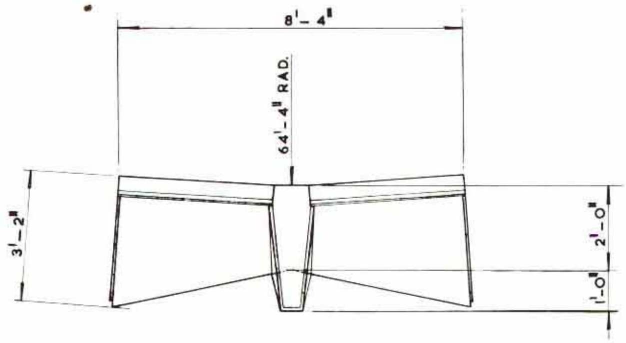


Looking out between the Y-shaped columns at ground level.

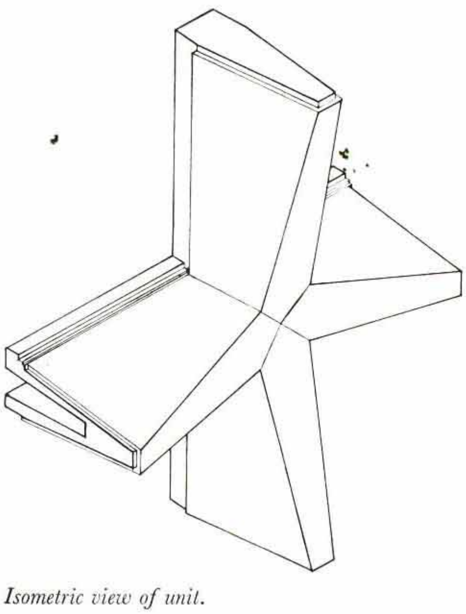
SPACE HOUSE: *continued*



Front elevation.

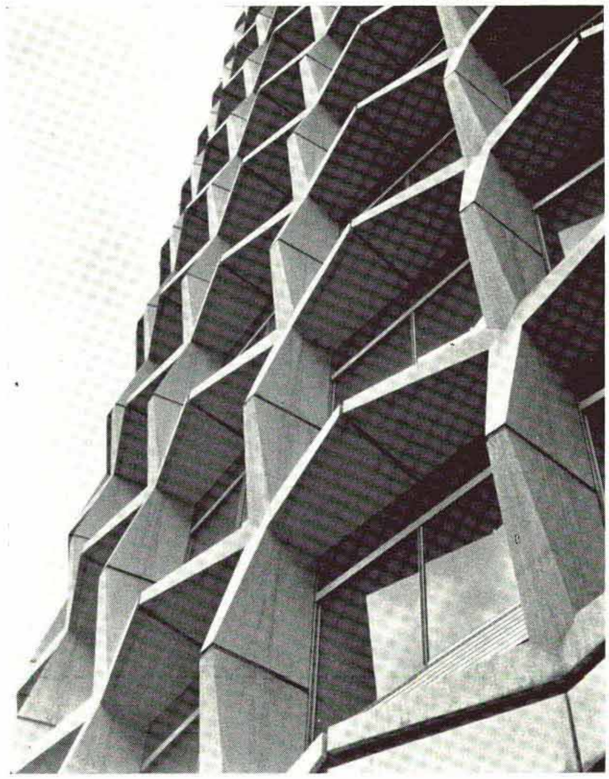


Side elevation.



Isometric view of unit.

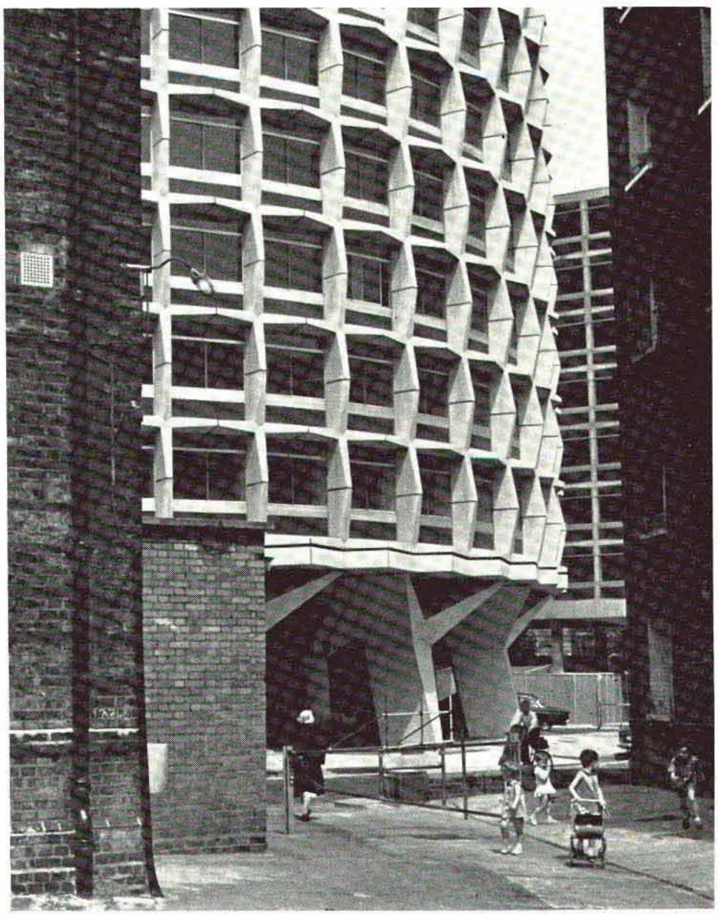
Photograph: Bill Duxbury

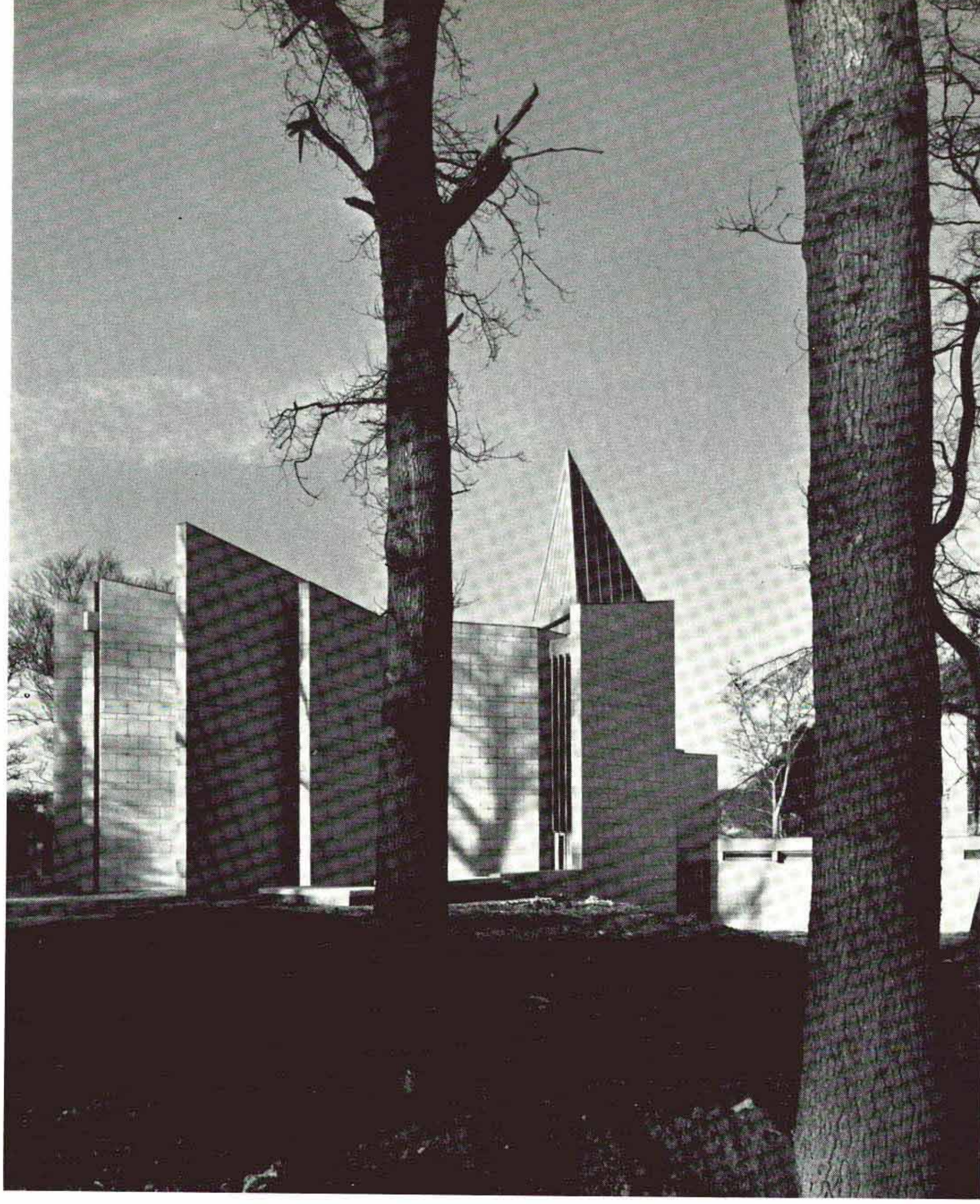


Façade detail showing the full value of the modelled units.

The lower half of the building and the surrounding spaces.

Photograph: Bill Duxbury





Photographs by A. L. Hunter

Mortonhall Crematorium Edinburgh *built of white concrete blocks*

THIS NEW crematorium, about three miles south of central Edinburgh, has the advantage of a setting in mature woodland, in a hollow beside a small stream. To make the most of this, the architects have set out to achieve a close relationship between the buildings and the natural wooded surroundings. The approach is from the existing driveway to the Mortonhall cemetery, with the crematorium encircled by a loop road. There is a place for parking cars among the trees and a waiting shelter nearby. From this the mourners can join the *cortège* on its arrival, and proceed with it to the appropriate chapel, in accordance with Scottish tradition.

There are three main elements to the crematorium group: the Mortonhall chapel seating 250, linked with the small Pentland chapel seating 50; the crematorium and services block behind and at a lower level; and the separate Remembrance chapel to the west.

The group is dominated by the fan-shaped Mortonhall chapel with its pyramidal lantern, and unified by

External materials are restricted to the white concrete blocks, laid in varying course heights, red cedar window frames and doors, and zinc for the covering of the triangular lantern of the Mortonhall chapel and round drum of the Pentland chapel.

the consistent use for all external walling of white concrete blocks laid in varying courses. By the skilful way in which these blocks are used, the whole group achieves a simplicity of line and surface.

The treatment of the interior of the Mortonhall chapel is in keeping with the restrained exterior. Its tall chevron windows are fitted with glass of yellow, amber, green, blue, purple and red which transmits coloured patterns to the severe white acoustic-plastered walls of the interior. The slatted timber ceiling is of natural pine, and the simply designed pews are of laminated pine planks on concrete blocks. They are angled on plan, in line with the floor pattern of dark grey concrete paving slabs.

The whole area of the catafalque is flooded with daylight from the tall, flanking windows and from the lantern. Simplicity dominates, with plain bush-hammered white concrete catafalque, plain wooden cross and unadorned pine lectern.

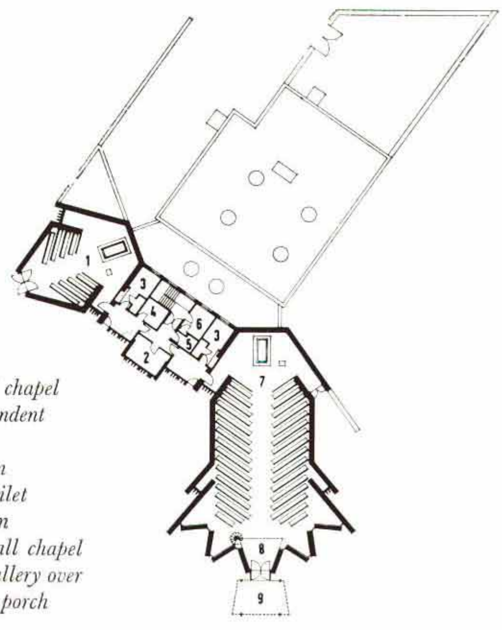
The materials used externally are equally restricted and carefully chosen. Besides the concrete blocks only natural weathered red cedar is used for windows and doors, and zinc for the cladding of the lantern, the drum of the two chapels, and the wallhead copings.

The concrete walling blocks are all 6 in. thick and 2 ft. 6 in. long, and of three course heights – 9 in., 1 ft. 6 in. and 2 ft. Special shapes and lengths were used for internal and external angles and raking wallheads. Their handling is simplified by the provision of a $\frac{1}{4}$ in. recessed bar in the top of each block.

The facing consists of $\frac{3}{8}$ in. white calcined flint chips, pressed into a facing matrix of 1 part white Portland cement to 3 parts crushed calcined flint – $\frac{3}{16}$ in. to fines – and washed with a fine spray to expose the aggregate fully. The joints are nominally $\frac{1}{4}$ in. wide throughout, and all the blocks are bedded and pointed in white cement mortar.

One final touch to this group of buildings is the distant white concrete cross to which one looks out over grass slopes from the Chapel of Remembrance – a moving link between the buildings and their surroundings.

The crematorium was designed by Sir Basil Spence, Glover and Ferguson in association with the City Architect of Edinburgh, Alexander Steele. The consulting engineers were Blyth and Blyth, and the main contractors were W. and J. R. Watson Limited. The concrete blocks were manufactured by Samuel Tyzack and Company Limited.



1 Pentland chapel
2 Superintendent
3 Vestry
4 Rest room
5 Public toilet
6 Staff room
7 Mortonhall chapel
8 Organ gallery over
9 Entrance porch

The simple and subtly-lit interior of the Mortonhall chapel. Finishes are white acoustic plaster, ceiling of natural pine, and pews of laminated pine planks on concrete blocks.

Proceedings of the Fifth International Congress of the Precast Concrete Industry

THE PROCEEDINGS of the Fifth International Congress of the Precast Concrete Industry, held in London from 21–27 May 1966, are now available. The Proceedings are published by the Cement and Concrete Association in two bound volumes and are illustrated. The first volume contains the opening address by Sir Robert Matthew with papers and discussions on structural precast concrete; developments in the manufacture and use of concrete blocks; concrete pipes, culverts and tunnel segments; research on concrete products; and the architect and precast concrete. The second volume contains national reports under the headings 'Review of international developments in machinery for the precast concrete industry, excluding blocks' and 'New products, new techniques and outstanding applications'.

The two volumes cost £10 and they may be obtained on request from Publication Sales, Cement and Concrete Association, 52 Grosvenor Gardens, London SW1. Cheques and postal orders should be made payable to Cement and Concrete Association.

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