

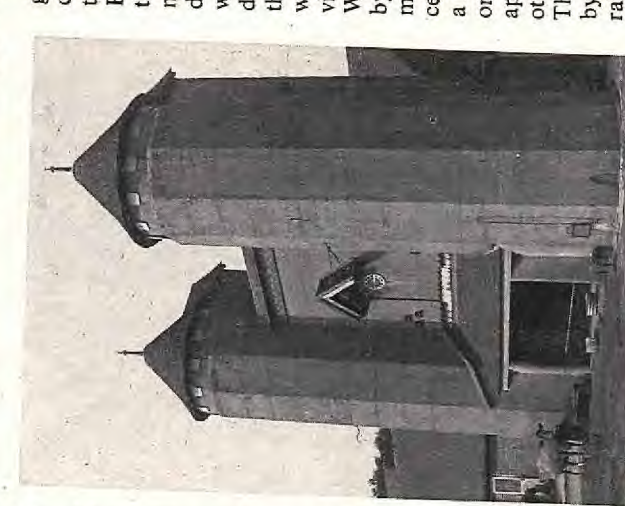
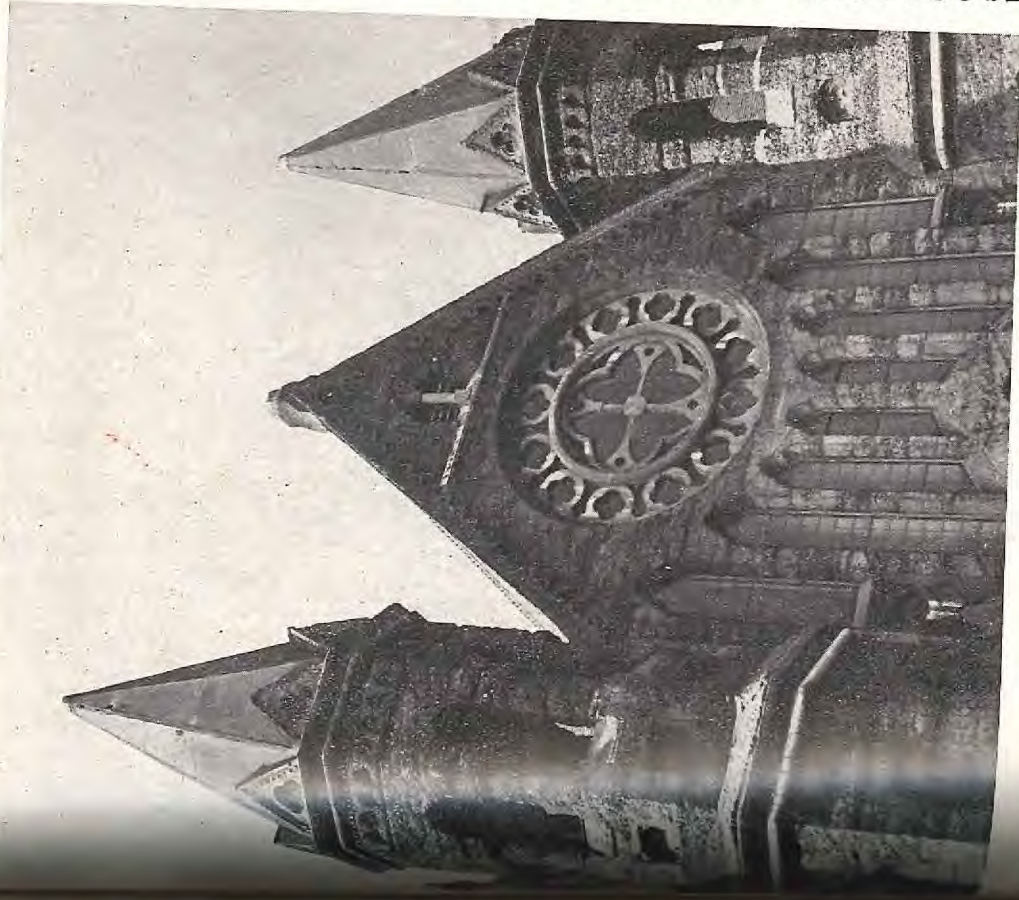
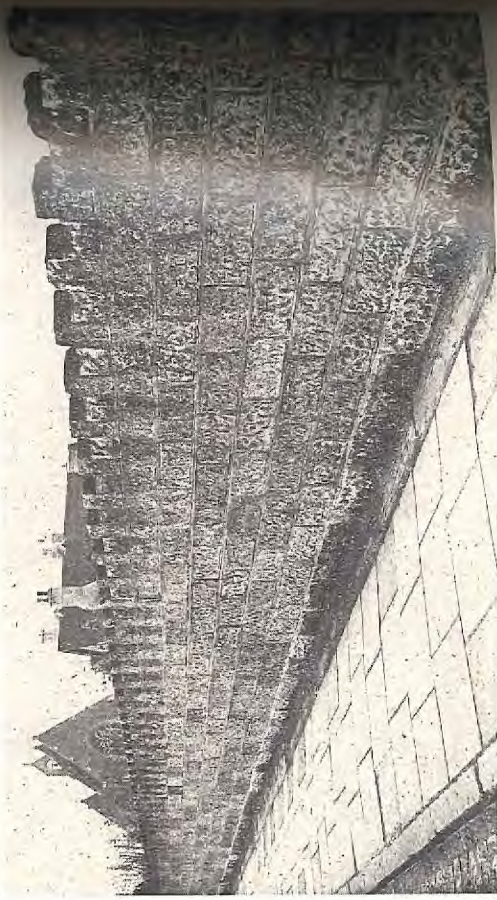
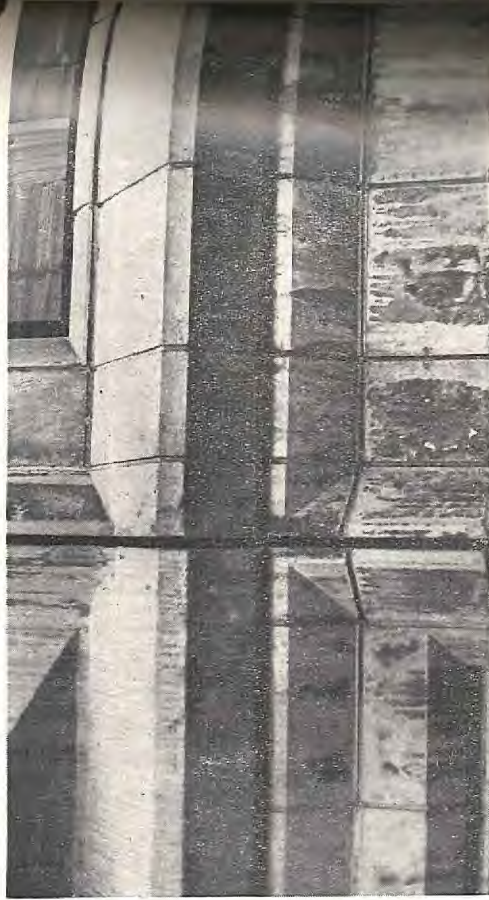
KEEPING UP APPEARANCES

W L Monks, senior building adviser with the C&CA, discusses the ageing appearance of concrete and concludes that failure to predict where dirt will accumulate necessitates frequent cleaning to maintain the designer's intentions.

Smooth concrete surfaces are aesthetically acceptable only when they are uniform in colour. Although they can sometimes be produced satisfactorily, they tend to discolour unevenly on weathering. Textured surfaces may survive without significant deterioration but, in any case, the extent to which the appearance changes with time depends to a large extent upon the shape of the structure and its architectural detailing. If projecting sills and copings are not provided, rain may wash certain areas of walls and allow dirt to collect in other places; where water runs off ledges, it often leaves traces of grime on the edge of its path. Construction joints can be unsightly; their location and treatment should also be considered in the design. Painting is a possible treatment giving scope for other colours but it incurs the penalty of a maintenance commitment. In recent years, more designers have devoted their attention to these problems and there are many structures which bear tribute to their success.

During the last decade, recommendations have been available for the production of a wide variety of high quality finishes for *in situ* and precast concrete in buildings and civil engineering structures, and contractors have acquired the expertise which the successful handling of the material demands. The result is that the majority of concrete produced is both technically sound and aesthetically acceptable. Nevertheless, there are occasions when concrete which is at first visually satisfactory is later found to have developed an unsightly appearance. The nature of the surface often has a greater effect on the appearance of a structure after it has been exposed to the weather for several years than it does when the structure is new. This is because the weather tends to accentuate design faults and variations in the porosity of

1. Smooth surfaced, lightweight-aggregate concrete panel cast in glass-fibre moulds; the staining is due to less than ten years' weathering. 2. A concrete block wall built in 1906. The rough-textured surface has weathered well and blends with the local stone on the church. 3. A 66 m high tower built 90 years ago in 1:1.5 concrete. 4. Concrete church built in 1883. It is designed as if it were built in traditional stone. 5. Farm building in bush-hammered concrete showing the horizontal construction joints.



a key for a rendering which, in fact, was never applied. The building, the top of which is shown in figure 3, thus provides an early example of an exposed aggregate finish which has withstood the effects of weathering without apparent deterioration.

In contrast, the fabric of a church in the industrial and dockland area of east London has been severely discoloured by atmospheric pollution in the 25 years since the church was built. Whereas grime is fairly evenly deposited on the rough-textured surface of the aggregate-faced panels, it has produced a disagreeable staining on the smooth concrete columns which are partly protected from direct rainfall.

A well preserved example

An early example of concrete construction is the church built near Crystal Palace in 1883. Figure 4 shows the rough-textured wall surface and the comparatively smooth roof, both built with the same material. The surface pitting was caused by ivy growing against the wall for many years. The concrete is of the dark reddish-brown colour of the clay which was dug on site and fired to produce an aggregate. No concessions appear to have been made to the comparatively new structural material, for the design looks exactly that which would have been specified had the building been constructed in natural stone. The intricate mouldings around the windows are all in concrete. Apart from white staining below circular windows, caused by pigeons, the concrete is still reasonably uniform in colour and does not convey an impression of its longevity.

The weathering of bridges generates a great deal of adverse comment about concrete as a face material. Extensive discoloration to the bridge abutments on one of Britain's motorways is to blame for much of this criticism. Such discoloration is caused mainly by water flooding from ledges and depositing dust and grime over surfaces which are never washed by rain falling directly on them. There is no coping to guide the water away and so the surface remains wet for long periods and this provides an environment for moss and algae to grow. Where the initial surface has been removed by tooling or grit-blasting, the appearance is more satisfactory than where the original cement-rich skin has been left. But it is only a matter of time before vegetation takes root on the damp concrete, to the detriment of the appearance. Staining can also be caused by other materials such as metal balustrading. This type of staining can often be prevented by the incorporation of a throating so that rainwater drops clear.

Visual defects on *in situ* concrete structures are often related to the construction joints.