## Letters to the Editor

## Glare from Concrete Sidewalks

Sir,—That concrete is so rarely tinted or colored is rather remarkable, all things considered. The reflex effect of bright sunlight upon a white or light grey surface of large area cannot but be detrimental to human eyesight. A recent correspondent points out this defect and invites suggestions as to experience or remedy.

The Associated Portland Cement Manufacturers (England) publish a book entitled "Everyday Uses of Portland Cement," from which the following data are taken. Apart from this the book is almost unique in its practical utilitarian aspect and the major portion of its contents were originally contributed to a journal known as "Concrete and Constructional Engineering." The price of the book is 1s. 6d. paper covers, and 2s. 6d. cloth-bound, and its office of publication is Portland House, Lloyds Avenue, London E.C., England. There is probably no other publication which affords quite the same information, and its value is greatest to engineers who have not specialized in ferro-concrete construction or are inexperienced in the matter of cement. Further than this, it affords a fund of interesting fact and knowledge which, in the form given, helps to popularize cement construction in a general way. It was for this purpose mainly that it came into existence.

The data taken from this book regarding the coloring of concrete are as follow :---

"For the coloring of moulded concrete, the coloring matters in proportions depending upon the right shade, should be thoroughly mixed with the dry Portland cement before it is added to the coarse material. The following are suitable proportions: Three parts of silver sand to one part of the following mixtures:

"Red—86 parts finely ground Portland cement, 14 parts red oxide of iron (ferric oxide).

"Yellow—88 parts finely ground Portland cement, 12 parts yellow cchre. Alternative—90 parts finely ground Portland cement, 10 parts barium chromate.

"Blue—86 parts finely ground Portland cement, 14 parts azure blue or ultramarine.

"Green—90 parts finely ground Portland cement, 10 parts oxide of chromium.

"Chocolate—88 parts finely ground Portland cement, 6 parts black oxide of manganese, 4 parts red oxide of iron, 2 parts black oxide of iron or copper.

"Black—90 parts finely ground Portland cement, 10 Parts black oxide of manganese or any carbon black.

"White—67 parts finely ground Portland cement, 33 Parts powdered chalk or, barium sulphate (common barytes).

"Pink—97 parts finely ground Portland cement, 3 parts best quality crimson lake (alumina base).

"Experiments made to determine what effect these colors had upon the setting time of the cement showed that ferric oxide, yellow ochre, ultramarine, and chromium oxide had little effect, very slightly quickening it, but crimson lake made it quick-setting and barium chromate quickened it very considerably, while manganese oxide, red ochre and Chinese red had a slowing effect."

No data are given as to abrasion tests but in the writer's own experience red slabs colored with the cheapest of all the ingredients quoted, namely, oxide of iron, are durable and quite sightly. In the making of concrete tiles it is fairly usual practice to place a rich mixture of pure concrete and color in the first instance into the mould before the cement and sand backing is filled in. The facing is made of two parts of iron oxide to one of cement, made very fluid and poured into the moulds. This gives a very rich red color to the surface.

This points to the fact that similar methods in sidewalk work might prove good practice, one inch of facing being applied for colored surface. Red is undoubtedly the cheapest color to apply.

Experimental work to determine shade fancied is quite easy and as the cost largely depends upon the shade and proportion of material, this is in the hands of the contractor, who can determine by simple experiment the extra cost involved. Colored concrete is unusual, but for tile roofs a decorative effect can be obtained by contrast and pattern and considerable variation can thereby be made. A. L. HAAS.

London, England.

## Lemieux Island Bridge, Ottawa

Sir,—From time to time your publication has emphasized the importance of aesthetic considerations in the design of engineering structures. I think that the accom-



Downstream Elevation, Lemieux Island Bridge

panying photographs of the recently completed Lemieux Island Bridge, indicate that your precepts have been taken to heart.

This bridge was constructed primarily to carry the two 51-inch mains from the Ottawa city pumping station on Lemieux Island to the Ontario mainland. It also



Upstream Elevation, Lemieux Island Bridge

forms a link in the Ottawa Improvement Commission's plans. Ultimately it is proposed to extend the bridge to the Quebec side, thus giving the shortest possible route to the only available reservoir site, as well as facilitating