THE STRENGTH OF COMMON MORTAR.

Common mortar is a substance which is too commonly left to the "discretion" of those talented assistants who describe themselves as day laborers. Little wonder, then, that in setting and binding properties, the mortars which they succeed in making show such bad results. Possibly, too, very few of those who use mortar could give any good reasons for arranging the proportion of the ingredients in one way rather than in another. Hence the following experiments, by one who has tried to find out what is best, may be of interest.

Herr Beschetznick, whom we understand to be an Hungarian expert, has been investigating common mortars, feeling that too much attention has been devoted to the higher cements by scientific men in all countries. He tried various kinds of lime, and slacked them all under the same conditions, afterwards allowing them to mature for a week. Mixtures of lime thus treated and ordinary building sand with water were then prepared, and tested after they had been allowed to set for one, three and twelve months.

The result of the tests showed that poor limes set more quickly than fat limes, but that the strength of the latter was relatively greater when the mixtures used were poor in lime. Thus 1:5 mixtures of fat lime had nearly the same strength as 1:4 mixtures of poor lime.

An American, A. S. Cooper, has also been investigating the question of mortars, turning his attention to the influence of the character of the sand upon them. He used sands of varying fineness and character of grain, and after numerous experiments arrived at the following conclusions, namely:—

1. Other things being equal, a fairly coarse sand, for example, one passing through a 12 in. sieve (12 wires to the mesh), and caught on a 16 in. sieve, gives mortars of higher tensile strength than do finer sands.

2. This effect of size of grain disappears with sands fine enough to pass a 40-mesh sieve and caught in a 60-mesh sieve. Sands finer than this give similar results.

3. The character of the surface of the grains is of moment. Mere sharpness of grain is not the only point to be considered, for an extremely sharp sand may have a smooth surface on each facet, and a moderately rough surface is preferable.

All the above results, namely, those of Beschetznick and of Cooper, are of direct practical value, and should be made use of by those who have to use mortar, and are desirous of employing only a thoroughly trustworthy mortar, which will stand the test of time.

There ought to be as much unanimity of opinion concerning the strength of mortars as there is, or is supposed to be, concerning the strength of other building materials. Architects can turn to tables which are recognized as standards, and find at a glance the strength of the chief materials that are used. Similarly, the civil engineer can calculate from standard tables the strength of the various kinds of iron, steel, etc., to a nicety. The building of a bridge is no more important than that of a house, and there ought to be no guess-work about the one any more than there is about the other. It is certainly high time that the composition of the various cementitious materials used in building should be defined, and that the strength of such materials of known composition should be ascertained, so that nothing should be left to mere chance, or to the intelligent discretion of those talented assistants to whom we alluded in our opening paragraph.—British Clayworker.

USEFUL HINTS.

Shellac is an excellent thing for destroying stains on whitewashed ceilings.

A door knob that works with a combination similar to a safe knob is a late invention. By its use locking with a key becomes unnecessary.

Cadmium yellow cannot be mixed with pigments containing lead or copper as a base, because it is a sulphide, and will turn black in such admixtures.

A recently patented fire and water proof paint composition consists of equal portions of yellow ochre, sulphur, brown mineral, salt, and resin intimately mixed together. The iron oxide of the brown mineral and the yellow ochre combine to impart an impervious and bright glossy property to the paint. The mixture of the several ingredients mentioned is introduced into a proportionately large quantity of coal tar, and the whole is boiled until the resin has become completely melted. The inventor states that the sodium chloride combines with the tar to form a compound not easily ignited, and the resin combines to form a glazed and hardened surface.