Ware I (1756) A complete body of architecture

Chap. XXIII

Of preserving LIME, *and making it into* MORTAR

As the lime is always best when the stone is carried immediately from the rock to the kiln *[replete with quarry-sap],* so the mortar is always best when the lime is slaked immediately on its coming out of the kiln.

The reason for this is evident, for the lime has at no other time so much strength: the air taking an effect upon it which is in a greater or lesser degree slaking, for in time it will be thoroughly slaked by the air, and fall to a weak powder. But it is not **always** convenient to work up the lime as soon as burnt; **sometimes** its is needful to keep it a long time, and finally, there are certain purposes which it never answers so well as when it has been thus preserved.

When lime is to be preserved only a little time after the burning for convenience of any kind, no more is required than to keep it dry, but when it is to be preserved longer, more caution is needful. For this purpose, let **a pit be dug in the ground,** and over this a vessel set**, as for making mortar,** with a hole stopped so as it may be opened at pleasure its bottom: **let the lime be slaked and worked up *[into a mortar]* in this vessel,** and then opening the hole, let it run into the pit *[whilst the slake is still underway, a sand/lime mortar will be liquid, before stiffening by evaporation of water and continued slaking].* As soon as the pit is filled let it be covered up with a **good coat of sand, and thus it will be kept moist and fresh.** *[this is 'wet-slaking' for storage as coarse stuff].*

Another method is to **cover up a quantity of fresh lime with a yard thickness of sand, and then pour on as much water as will slake it, but not reduce it to dust.** If the sand crack, and the smoak rises through the openings, close them up, and keep all fast and without vent. The lime will be thus preserved ever so long, and will acquire a new value by the time of its lying. It will be more tough and clammy than any other kind, and less free to shoot out its salts when worked *[to burst due to late slaking?].* No lime is so proper as this for inside work, where great nicety is required, and none is so fit for painting upon, because it will not destroy the colours *[this is probably not dry-slaking ('not reduced to dust'), but slaking to a stiff, moist coarse stuff for later knocking up with additional water].*

MORTAR is made of a mixture of lime, sand and water, other ingredients are added occasionally for particular purposes, but this is plain mortar, and is the foundation of the different kinds.

(the quality of the lime and the nature (and cleanness) of the sand have a great bearing on the quality of the mortar, as does the use of clean water)

Our people are very careless in both these particulars…They take sand from the first pit, and their water often from the nearest kennel (canal)…(sand should be washed before use)…Spring is not so good for making mortar as river water, but the best of all is that taken from a clear pond. If it be set in the sun for some hours before it is used, or a quantity made hot and mixed with the rest, that all may be warm, it will slake the lime the more readily and perfectly…soft water slakes lime better than hard, and hot water more perfectly and more readily than cold *[it will speed the slaking before this generates its own heat, particularly of impure quicklime}.*

…Palladio observes that a larger quantity of pit sand is needful in mortar than of river sand, but when the pit sand is washed it becomes altogether the same in nature, and is to be used in the same proportion.

The advice of the author, **and the practice of our builders,** differ greatly with respect to the quantity of sand that is to be used in this mixture. He orders **three times the quantity of lime is to be pit sand, and twice the quantity of river or sea sand *[1:3 or 1:2, quicklime to sand],*** and the common practice of this time allows less than a third part, more in some places, and in others they are made equal.

To speak from experience and the result of many trials, it seems that Palladio's proportion of sand is too great, at least for a mortar to be used in our climate, and that what we commonly allow is too little. The medium perhaps will be best, and if any general rule may be laid down, it should perhaps be that **two-thirds of lime and one of sand would be the best quantities.** *[both are right, since Palladio means 1 quicklime to 3 aggregate, becoming 2:3].* …

Chap.XXV *Of mixing up the* MORTAR

When the ingredients of mortars are carefully chosen, the limes sound and fresh, the sand clean and sharp, and the water soft and pure, there remains another consideration in which the antients were very careful, and we are very remiss and negligent, that is, mixing them well together….

Our people throw in a great deal of water and then a little labour does; the antients mixed all by little and little, and might be very well said, in the language of the French proverb, to dilute their mortar with the sweat of their brows. They employed a great number of labourers, who constantly worked worked together upon the the same quantity of

mortar, for many days, and it was this which blended every part of it so thoroughly together that when it united it hardened into stone.

We name these circumstances…to spirit up our builders to have more pains taken with that great article mortar, that they may make such as the antients did if they will take the pains the antients took to do it.

…The common floors used in mean buildings are made of **loam, well beaten and tempered with smith's dust, and with or without an addition of lime.** Some also make them of pure clay, ox blood and a moderate proportion of sharp sand, these three ingredients beaten together very strongly, and well spread, make a firm and good floor, and of a beautiful colour.