Hot Mixed Harling

Most lime mortars historically were 'hot-mixed', quicklime being slaked in intimate association with the sand or other aggregate, or slaked separately in the first instance to a dry hydrate or to a thick, dough-like paste before swift engagement with the sand as soon as the slake was substantially complete. Mortars produced in this way were eminently workable, eminently adhesive and cohesive, with excellent water retentivity and bond with all kinds of porous and less than porous substrates. These properties endured after cooling of the mortar, but hot use offered faster initial set, swifter initial evaporation of surplus water and required no storage. Traditional hot mixed mortars were lime rich - 1 quicklime to 3 aggregate may be seen as a minimum proportion historically, the air quicklime generally doubling in volume as it slaked, delivering a mortar of 1:2 or 2:3. Many traditional lime mortars were richer in lime than this. Previously slaked lime – whether hydraulic for underwater or underground application, or air or feebly hydraulic for above ground construction - was mixed no leaner than 1:2. Feebly hydraulic limes were used as commonly as pure limes and were processed in the same way as air limes, and mixed to similar proportions. Where available, these were generally preferred for exterior harling and roughcast work or else pure limes might be made feebly hydraulic by the addition of small volumes of pozzolan, such as brick dust or wood-ash – these most commonly in vernacular traditions. Late-slaking of quicklime was much more common and likely the greater the hydraulicity of a natural hydraulic lime; and much less common or likely the purer the lime used. It was common to lay down a hot mixed plastering mortar for at least one or two weeks before use to avoid this risk and lime for finish coats was commonly run to putty and laid down for some days or weeks to avoid disruption of the final finished surface. Lime run to putty was generally considered to be weak in binding properties, however, and was rarely used or trusted as a binder, having likely been drowned during slaking, compromising the necessary minimum temperature of the slake (around 100 Degrees C). Lime putty was used on its own as a mortar for the finest (and least structural) joints in gauged brickwork and very fine ashlar and as a final finish coat on plaster schemes, sometimes gauged with plaster of Paris and sometimes with marble or other calcareous dust or very fine sand.

Harling of lime and well-graded, frequently quite coarse aggregate, was thrown in a slurry-like state onto a masonry substrate as soon as the slake was substantially complete from a typically broad and flat trowel. In Scotland, it was typically applied in a single, thin coat, usually no more than 10 mm thick and subsequently limewashed, presenting a sacrificial coating of eminently effective porosity, keeping the whole of the fabric dry and protecting masonry substrates from dampness and decay. In other parts of the British Isles, at least one coat of lime plaster was applied in the normal way, the final coat of 'rough-cast' being applied in similar fashion to the Scottish variety. Some levelling with a float or with rolled hessian sacking might be performed as the slurry began to stiffen – a hot-applied harl would stiffen to an initial set somewhat sooner than a cold-applied harl. Late slaking was rarely a significant issue in an exterior coating which was typically of roughened and open texture, not tight-finished with a fine

finish coat. The more free lime the mortar possessed the greater would be its effective porosity; the more its pore size distribution would promote necessary capillarity. Vapour permeability alone is a slow and inefficient mechanism for the drying of inherently porous building fabric. To achieve similarly successful performance in repair materials, these should be made of the same materials, processed in similar fashion, and used to similar ends.