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Roman tesserae, stonetiles and building materials

Clarification of terms

There are two sets of terms used to describe rocks:

a. The nature of the rock e.g. colour, how the rock falls apart, sedimentary structures, non-clay minerals present, organic content, fossils.

b. The name of the parent rock formation as shown on the geological map and its age (Period).

The following is a summary of the various rock types associated with the Lopen and Dinnington sites.

Sandstones

1. Brown/reddish well-cemented, non-calcareous, medium grain size, bedded sandstone. Gilbert Green (another ex-BGS expert) confirms the rusty-brown sandstone may well have come from Mendip, possibly from Beacon Hill, where the Roman Road passes old quarries. Old Red Sandstone (Devonian period). Found in mosaic at Dinnington.

2. Clean, whitish, medium sized-grain, calcareous quartz sand. Upper Greensand (cretaceous) as a Warren Hill road cutting west of Crewkerne. May have been used in mortar.

Limestones (Over 50% $CaCO_3$)

1 Golden, bioclastic (= shell fragments), sandy, ferruginous, cross-bedded limestone. **Ham Hill Stone** (Jurassic) from Ham Hill. Found on many Roman sites e.g. Lufton, Ilchester.

2 Golden sandy or pate yellow limestones. **Inferior Oolite** (Jurassic) e.g. as at Seavington St. Mary SSSI (ST 390 145)

3 Yellow-brown ferruginous, sandy, oolitic limestone. **Inferior Oolite** (Jurassic) e.g. as at Seavington St. Mary quarry. See sheet 312 geological map for local outcrops.

4 White, mainly $CaCO_3$, blocky, structureless limestone. A **Chalk** formation (cretaceous) possibly from somewhere in Dorset. The nearby Chalk at Warren Hill (Chalk Marl) is different from the Chalk tesserae at Dinnington. Roger Bristow (ex BGS), who knows the Dorset Chalk very well, has suggested that a sample of the chalk tesserae from the Dinnington site might have been derived from the Lewes Nodular Chalk Formation. It has been used in Dorset and Wiltshire for building and walling. It would have come from the Chalk outcrop on Warren Hill as these are muddier and softer. Was there a 'factory' somewhere?

5 There were also much harder samples of Chalk at the Dinnington site. These samples have probably suffered from severe compression earth movements and one piece also shows striations indicating differential movement possibly associated with faulting. The lumps seemed rather big for tesserae. Also remember Chalk was used for liming fields. However that may be, Alan Graham reports (pers. comm.) that there were two styles of mosaic at Dinnington – the Corunium and the Dorchester 'schools'. The harder sample of Chalk may have come from the 'Dorchester school' mosaic. If this is so, it may have come from a chalk outcrop in Purbeck. Dr M.E. Jones has reported on 'White tesserae from Roman Dorchester', He concludes that.... 'The samples are definitely Chalk, most probably Middle or Upper Chalk (they contain no clay). This chalk is unusual insofar as it has undergone a rather complex diagenic history which is similar to that of the Purbeck ridge..... The same Chalk at Stonewall Down, shows major styolite surface, and numerous fractures which relate to the intense deformation and to the passsage of pore fluid through the rock. The tesserae sample almost certainly came from an outcrop of the material at Stonehill Down, or its equivalent.'

6 6. Thin, well-bedded, laminar, fissile, fine grain-sized, mudddy, grey, clayey limestone/mudstone. A visit to the now worked –out Station Quarry at Charlton Mackerell has demonstrated that the lowest strata show beds that are identical to tessera and stone tiles from Lopen. There is a perfect match with both. These beds belong to the **Blue Lias** Formation, the latter term referring to a collection of rocks of distinctive character that can be mapped. Much of the Blue Lias, as seen at Lyme Regis and the Somerset coast at Kilve, consists of alternating beds of limestones, mudstones and dark shales. However, the *lowest* beds are much thinner, and split into thin, even laminated sheets. They are very fine grained. They represent pulses of limy mud deposits in non-turbulent seas. They tend to be *grey, blue* or *off white*. The tops, bottoms and sides usually weather to a yellowish brown colour owing to the effects of weathering. The colours are the result of the incorporation of sulphide bearing clays. The *tilestones* tend to be some 12 mm thick whilst the *tesserae* are 20mm. There have been many quarries in the Blue Lias in the past that could have supplies these beds in the Langport-Somerton area.

7 It is possible that the thin beds of white lias were used for tesserae by the Romans. Can the tesserae from the Blue Lias and White Lias be distinguished ? The latter beds tend to have a white, more creamy outer surface the Blue Lias beds tend to be off white, grey or blue; many are blue hearted. A fresh surface of a split piece of White Lias observed with a hand lens shows a marble-like recystallised character and is pale fawn or creamy in colour. A fresh surface of Blue Lais may appear crystalline but is 'muddier' fawn and/or grey colour; some have a more earthy texture. Other beds are distinctly blue- grey. It must be remembered the each bed in the White and Blue Lias has its own unique set of characteristics with regard to thickness, colour, texture, grain size, composition and fossil content. The Dinnington and Lopen samples appear to have come from the Blue Lias.

The mortar

It contains smooth, well-rounded, very coarse white, translucent sand grains probably derived from the Upper Greensand. The mortar contains a lot of angular, small flint chips. Possibly 'sweepings' or sievings or broken with a hammer?

Hugh Prudden

As at 13 July 2002 consolidated report.