49

340

WROXETER B, SHROPSHIRE - TECHNOLOGY

Fiona Macalister
Ancient Monuments Lab

A number of technological processes were carried out on the site, including iron smithing, bone working, a little copper working and possibly lead working, although the evidence for the latter is slight.

1) Iron working

Iron smithing was carried out on a small scale. The slags are of two principal types, smithing and fuel ash slag but there is a complete gradation between the two and much iron rich fuel ash slag. Some of the smithing slag is magnetic, due to the presence of hammer scale. The smithing slag, produced by secondary working of iron in a smithing hearth, is in the form of plano-convex hearth bottoms, which collected at the bottom of the hearth, dribbles, puddles and irregular lumps. There are also a few pieces of hearth lining, that is the clay lining of the hearth which becomes vitrified on one side and grades into fuel ash slag. All the evidence for the hearth lining comes from WB 83 111, which produced 12lbs of slag, and the lining varies in thickness from 3mm to 15mm. Evidence for the fuel used is found as wood and charcoal within both forms of slag. Various corroded iron oxide 'lumps', pieces of magnetic iron and corroded iron objects, such as nails, give further evidence for iron working on the site.

Total weight of slag: approximately 21lbs.

2) Copper working

The working of copper alloys was carried out on a small scale. There are three fragments of crucibles and a few 'dribbles' and 'puddles' of copper alloy and one piece of copper alloy ribbon. All these were analysed using X-ray fluoresence. No. 438 is part of the rim of a cruicible, 7mm thick and the inner surface, which is slightly vitrified, has traces of copper corrosion products. The elements detected were Zn, Cu, Sn, and Pb and therefore the crucible had been used to melt leaded gunmetal. No. 471 resembles part of a crucible but the only elements detected were Fe, Ca, and K all of which are present in the soil and thus it had probably not been used to melt metals. Similarly the almost complete crucible (unnumbered) , with diameter 6.2cms, only gave traces of Fe and Ca. Another unnumbered fragment of the base of a crucible, which had

998
8982

an extra outer layer and a total thickness of 1cm, showed the presence of Zn, (Fe), Cu and Ag, when analysed and had been used to melt base silver or silver solder.

There are 'dribbles', 'puddles' and droplets of copper alloy of varying composition. These may have been produced by the cooling of spilt molten metal. There are two pieces of bronze ribbon (Cu and Sn), 2mm wide, 2.3 and 3.2cms long and very thin in cross section (No. 3165), and No. 7048 is a conglomerate of fired clay and leaded bronze, Cu, Pb and Sn, with some charcoal adhering.

3) Lead working

Quite a lot of lead was found on the site as dribbles and puddles of solidified molten lead and also as fragments of lead sheeting. This may be the result of building debris, such as pipes, tank lining etc., which has fallen into a fire. It may also however be the product of lead working in the area. A few of the pieces have cut marks which might be expected to disappear if the lead had been subjected to heat. There are also various pieces of lead ribbon (No. 1783) and lead cuttings (eg. No. 3406), further evidence of lead working. Much of the lead has the characteristic white/cream lead oxide surface, and that found in WB 78 10 may be the product of a cupellation process. When analysed using X-ray fluoresence the only elements detected were Pb, Ca and K, the last two being present in the soil. The inner core is still pure lead but the outer surfaces have altered to lead oxide and lead carbonate, cerrusite, which suggests that this is the waste lead which collects in the hearth lining or is skimmed off during the cupellation process, carried out to obtain silver and gold, or may have been produced during ordinary lead working.

Note: Although the fragment of cruicible in which silver was found and the possible lead waste from a cupellation process do suggest that silver may have been both produced and worked on the site this cannot be stated with certaintity because these pieces were found in isolation.

4) Worked bone and antler

There are a number of unfinished bone and antler objects, indicating that these were worked on the site. Saws were used to cut these pieces to the required length and the marks these left are often clearly visible. On some, eg. No. 1560 the central cavity has been removed and the inner sides smoothed down, on others it remains eg. No. 1334. On some a central piece of bone has been used, on others the tip of the horn core or antler has been sawn off and worked. These would have been used, for example, as handles on knives etc.

Another important collection of finds are those which may be described as building materials such as mortar, wall veneers, wattle and daub etc. and there are also a few traces of pigment which were found on pottery sherds.

1) Building materials

a) Wattle and daub: There is much daub, most of which has impressions of wattle, eg. No.111,where it is clear that the sticks varied in size, some being 1.2cms and others 2.2cms in diameter. The impression of wattle and daub is seen in fine grained cement, No.69, and some of the daub has been burnt. eg.No.121. The daub consists of very fine clay with few inclusions.

b) Mortar and cement: One piece of mortar was examined, No.89. It contains rounded quartz grains, small irregular pebbles and iron oxides, and is curved in shape suggesting that it may have been a ridge tile.
There are at least two samples of cement, both fine grained and containing straw in fabric, (WB b28 and g28), 30mms and 9mms thick respectively.
There is also one sample of concrete, No.227, which has larger pebble inclusions and the impression of pieces of wood, approximately 2cms in diameter.

c) Wall veneer: Many kinds of rock were used as wall veneers and here there are examples of slate, No.3567, one face smoothed and the other remaining rough; igneous granodiorite, No.3527, 1.3cms thick and 4.8cms wide,both faces smooth and marble, No.1168, 1.9cms thick and 3.8cms wide, the upper face polished and the lower rough, and one side polished. The upper face has patches of grey paint or slip, with a lower white layer, with a margin of 7mms left at the bottom edge. Samples of 'paint' were removed and analysed using X-ray diffraction, and were found to be hydrocerrusite, or white lead.

d) Pigment: One fragment of Eygptian blue (No.3236), and two pieces of pottery containing traces of the same pigment were found (Nos. 3411 and WB 92 16).

2) Miscellaneous

A number of miscellaneous objects were examined and these included the end of a clay pipe[1], decorated at the end with ribbing, having an extra outer layer, probably used as a water spout; much wood and charcoal, burnt clay, one lump of kaolin, which may have been used in the production of pottery or paints, and a fragment, possibly from a mould, the lowered recess, with curved outer edge suggest that it may be part of a mirror mould, but this is not certain. The fragment was analysed using X.R.F., and zinc was detected.

Note 1: Outer diam. 6.9cms, inner diam. 2.7cms.

This may have been one of the elements contained in the alloy for which the mould would have been used. There were also a number of pieces of worked stone, such as a slate whetstone, a sandstone disc, probably used for sharpening knives etc.,a rectangular block of worked sandstone, 4.6 x 2.1 x 1.1cms, with parallel striations visible on one side, again used for sharpening tools. There are two fragments of stone bowls, one of limestone, with flattened base and rim, and one of marble. No traces of any remains were detected within these and so their definite purpose is unknown. There is one further object worth mentioning and that is a broken piece of poorly fired clay, which has a hole through the centre, and a white deposit or slip on the upper surface, with irregularly spaced spots of green glaze. A sample of the white 'deposit' was analysed using X.R.D. and was identified as an alumina silicate clay, and the glaze is an alkali glaze. The 'brick' had reached high temperatures and may have been used in an oven. A similar brick was found at Colchester, Sheepen, but this had no slip or specks of glaze.

CONCLUSIONS

The technological evidence was compared with the pottery phasing for the military areas and layers. A few general conclusions have been drawn but unfortunately we do not have the phasing for areas excavated after area 81, and this affects over half the lead samples, for example. Two pieces of lead come from areas of military occupation and one find from a layer of military demolition and lead is also found in the period of the baths construction and operation. Most of the iron slag is associated with military occupation although this too is scattered. Except for one find of bronze from a layer of military demolition the rest is either not yet phased or does not come from military layers. Most of the fuel comes from the period of military occupation and also much of the daub, although a little of this is also accociated with the Baths, and Pre-Baths layers.

There is evidence for a large number of industrial processes, as already described, some of which appear to be concentrated in certain areas, such as possible lead working in area 90, but generally the remains are scattered, indicating that all these processes were carried out on the site but the exact location of much of the working is as yet unknown.