Petrological Analysis of Bronze Age Pottery from Wheatpieces, Tewkesbury

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Four samples of Middle or Late Bronze Age pottery from Wheatpieces, Tewkesbury were submitted for thin section analysis. Macroscopically, the samples could be divided into two groups, a Malvernian group (samples V4452-4) and a grog-tempered fabric (V4455).

Thin sections were produced by Steve Caldwell, University of Manchester, and stained using Dickson's method (Dickson 1965). This staining distinguishes ferroan calcite (blue stain) from non-ferroan calcite (pink stain) or dolomite (no stain).

Description

Fabric 1: Malvernian rock tempered (V4452-4)

The three samples have a similar appearance in thin section and a single description can be given to all. The following inclusion types were noted:

- Rock fragments. Abundant angular fragments of varying lithologies. The fragments often show alteration (dark brown staining) along veins and crystal boundaries which clearly indicate that the fragments have mainly cracked along old lines of weakness rather than being crushed or fire-cracked. They range in size from c.0.2mm to 3.0mm. The following rock types were identified:
    - Hornblende-gneiss. This is the most common rock, consisting of hornblende with minor strained quartz. There is some evidence for foliation.
    - Quartz-mica schist. Sparse fragments, finer-textured than the hornblende gneiss.
    - Fine-grained basic (dolerite?). Moderate fragments with a well-sorted grain size c.0.2mm.
    - Gneiss. Sparse fragments of quartz/feldspar showing coarse schistocity.
    - Hornblende granite. Containing quartz, hornblende, orthoclase and plagioclase feldspar.
    - Altered Rhyolite. Dark brown with moderate feldspar laths up to 0.2mm long.
    - Quartz-epidote schist. A single example.
- Rounded Quartz. Sparse well-rounded grains c. 0.2-0.3mm across.

- Sandstone. Rare subangular fragments consisting of subangular quartz c.0.5mm across and opaque grains in a matrix of brown amorphous material and fine-grained silica.

The groundmass consists of dark brown optically anisotropic baked clay, moderate angular quartz up to 0.1mm across, sparse muscovite laths up to 0.1mm long. The clay is strongly laminated and some of the wider laminae and pores are lined with a light-coloured clay.

Fabric 2: Grog-tempered (V4455)

The following inclusion types were noted in thin section:

- Quartz. Sparse subangular and rounded quartz up to 0.5mm across.
- Limestone. Rounded and angular fragments of limestone of varying character up to 0.5mm across. All, however probably come from the same rock, with a sparry ferroan calcite groundmass containing fossils some of which are partially replaced by brown micrite. A single rounded fragment of echinoid shell is present.
- Grog. Angular fragments of similar texture to the groundmass but often of lighter colour (due to the lack of carbon). Voids of similar size to the limestone inclusions in the main body of the pot are also present as are sparse rounded quartz grains. One example of a grog fragment enclosed within a second grog fragment is present.
- Organics. Some laminae are surrounded by a darkened halo, suggesting that they contained organic material which has been burnt out during firing. The alternative interpretation is that the halo is due to organic contamination of the sherd after burial.

The groundmass consists of dark brown to black optically anisotropic baked clay minerals, sparse angular quartz, muscovite laths and dark brown clay/iron grains up to 0.1mm long.

Discussion

Malvernian rock tempered ware

The wide range of rock types present and the evidence for their being a natural breccia rather than humanly prepared temper points conclusively to a source for this fabric in the Malvern Hills area. The source can be localised closer because of the distinctive geology of the area. The rounded quartz grains are ultimately of Triassic origin but are the main component of Severn terrace sands. These only occur on the eastern side of the Malvern Hills, allowing a source to the west of the hills to be excluded.

Prospecting in this area in the 1970s to establish the source of the medieval Malvern Chase potteries established that rounded quartz was absent in the talus on the eastern slopes of the hills (i.e. to the west of Little Malvern and Malvern Wells) but that less than three miles further

west, at Castlemorton Common and Hanley Swan, it was common, and much more prominent than in this Bronze Age Fabric (and in the medieval coarseware). This indicates production in a zone perhaps three miles or so wide immediately east of the hills.

The composition of the angular scree found at the base of the hills seems to reflect the geology of the rocks exposed immediately to the west and there does not seem to have been much lateral movement (although one would expect some spread through flash floods). It is interesting, therefore, that neither the Roman pottery produced in the Malvern Wells area or the medieval pottery produced at the western end of Hanley Castle parish contain the same wide range of rock types as those found in the Bronze Age fabric. The Iron Age Malvernian ware fabric as described by Peacock is a coarser version of the medieval coarseware (Peacock 1968; Vince 1977, 258-262, Table 1 and Fig 1) and contains a higher rounded quartz frequency than this Bronze Age fabric.

The source of the rocks found in Fabric 1 can be pinpointed to the southern part of the Hills since it contains rhyolite, which occurs in the pre-Cambrian Warren House group, which outcrops on the eastern side of Herefordshire Beacon, and a quartz sandstone, which only occurs in the Malvern Hills in isolated inliers of Cambrian rocks in the Midsummer Hill/Hollybush hill area and as a major exposure on the southwest side of the hills. The only area where all these rock types ourcrop close together is between Herefordshire Beacon and Midsummer Hill and therefore the source of the pottery clay should lie in the block of land bounded by Little Malvern, Hollybush, Birts Street and Welland. This is appreciably further to the south than the Roman and medieval pottery industries.

Grog-Tempered ware

The texture of this vessel, containing angular well-defined fragments of similar character to the groundmass, is typical of may early to mid Bronze Age vessels and thin section of examples suggests that in some instances the fragments were denser, indurated pieces of the parent clay, indicating that there was little kneading of the clay before use and that it was used in a semi-plastic state. However, in this example, it is likely that the fragments have been fired before being added to the potting clay, removing the limestone inclusions and in some cases lowering the carbon content of the clay. These can indeed be classed as “grog” although there is no conclusive evidence that the fragments are crushed fragments of broken pots, which is the current potting definition of the term.

The rounded quartz grains indicate that the clay originated somewhere in the Severn Valley and this suggests that the limestone inclusions are of Rhaetic or Jurassic limestone rather than Palaeozoic limestone, a major Iron Age fabric group in this part of the Severn Valley (Peacock 1968). The limestone was probably a bioclastic limestone in which the shell fragments were partially replaced by micrite. This is a very similar description to the limestone found in Peacock’s Group B1, which he suggests is tempered with Palaeozoic limestone. However, there are not enough distinctive fragments present in the thin section to

confirm this identification, and the presence of a echinoid shell fragment does suggest the possibility of a Jurassic origin, perhaps in the Inferior Oolite which caps Bredon Hill, 5 miles to the north of the Wheatpieces site. No Malvernian rock fragments were present in the Grog-tempered sherd and the groundmass is of a slightly finer texture than that of the Malvernian fabric. However, in both cases the quartz silt includes some extremely angular shards and some grains which from their outlines could be feldspars. Both of these are features of the Mercian Mudstone, reflecting its deposition in desert conditions in which feldspars would not all be altered to muscovite. However, the rounded quartz grains appear to have the same sphericity and character to those found in the Severn Valley sands and this would discount a source in the main exposures of Palaeozoic limestone in the Malvern Hills, which occur on the west and southwest sides of the Hills. However, these is a small area along the Malvern ridge where Silurian limestones of the Ludlow Series outcrop, immediately east of Swinyard Hill (i.e. immediately north of the area suggested here as the most likely source of the Malvernian rocks found in the Malvernian rock-tempered ware.

Conclusions

The three samples of Malvernian rock tempered ware have a very similar composition to that of Peacock's Group A (Peacock 1968) and it is very likely that they are ancestral to the Iron Age ware. By contrast, they are rather different to that of the handmade early Roman ware and the medieval 12th to 13th century ware, both of which contain much less hornblende and no examples of dolerite or altered rhyolite. The industry therefore seems to have been moved a few miles to the north following the Roman conquest and then shifted further east in the medieval period. It is unlikely that the latter two industries have any connection with each other whereas it is quite possible that the shift from the area east of Midsummer Hill to the north took place within a few years.

It would be nice to claim the Grog-tempered ware as being similarly ancestral to Peacock's Group B1 limestone-tempered ware vessels, which could have been produced in an area immediately to the north of the Bronze and Iron Age Malvernian wares. However, there is definitely a fragment of echinoid shell present in the Wheatpieces sample and no definite fragments of brachiopod shell, crinoids or bryozoan fragments, all of which occur in Peacock's group B. Nevertheless, this identification cannot be ruled out and further investigation, either through further thin sectioning or chemical analysis might be able to test the matter conclusively. Certainly, the limestone does not seem to have been the locally-available Blue Lias, which is a calcite mudstone with common shell fossils and if not Palaeozoic limestone the nearest possible source would be the lower inferior oolite which caps Bredon Hill. The fact that the limestone fragments are mostly angular discounts a source in a calcareous Severn Valley gravel, which might also be obtainable locally to the Wheatpieces site.

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Bibliography

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